

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

## **Editorial**

Welcome to a further edition of the AGS(HK) Newsletter. The geotechnical and geoenvironmental industry may not have quite yet returned to the heady days of the mid '90s. However, last year saw the commencement of a significant civil and foundations project in Hong Kong the KCRC Kowloon Southern Link train line, linking East Tsim Sha Tsui Station to West Rail's Nam Cheong Station and covering the construction of a new station and 3.8km of bored and cut and cover tunnels. Major building projects continue to find conception in Macau, requiring Hong Kong based geotechnical engineers to refamiliarise themselves with working in soft marine clays. And the promise of new challenges in the form of the MTRC West Island Line and the new Government Offices at Tamar maintains a certain level of optimism amongst practitioners.

The AGS(HK) thanks Joseph Lo of Maunsell Geotechnical Services for his hard work as Chairman of the Association during 2005. Under Jo's leadership, AGS(HK) continued it's active participation in the geotechnical and geoenvironmental industry, covering a busy schedule of three CPD courses, three ground forums and various other events.

In 2006, the AGS(HK) welcomes Michael Hendy of Geotechnical Consulting Group (GCG) who takes over from Jo as Chairman. Rajan Khemlyani (Jacobs Babtie) continues as Treasurer and Jonathan Li (Gammon Construction) takes over as Secretary. All members of last year's executive committee, subcommittees and working groups and the speakers of the various CPD courses and forums are thanked for their hard work throughout the year.

In this issue, Michael Hendy introduces himself to readers through his 2006 Chairman's Address, articles are included on various events held by AGS(HK) over recent months including the 2005 Mercer Lecture and AGS(HK) thanks C Y Choi and P Y Howe for their continued contribution of legal advice through an article on negotiation/mediation.

The AGS(HK) is committed towards promoting the interests of its member organizations. Please contact us with your views on how the association might better serve the geotechnical and geoenvironmental profession. Volunteers who wish to get involved or contribute towards the activities of the AGS(HK) are also encouraged to do so.

We hope you enjoy the newsletter.

#### Comments

Please feel free to send comments to : Mr Jonathan Li (Secretary and Editor) The Association of Geotechnical and Geoenvironmental Specialists (Hong Kong) c/o Gammon Construction Limited 28/F Devon House, TaiKoo Place, 979 King's Road, Hong Kong Fax: 2516 6352 e-mail: jonathan.li@gammonconstruction.com

# 2006 Chairman's Address

#### Dear Members

I am honoured to be acting as Chairman of the AGS(HK) in 2006. We have made great strides over the last 2 or 3 years and progressed many of the new initiatives that we had programmed into our 18-month plan. For this I thank the enormous effort and enthusiasm



AGS(HK) Chairman Michael Hendy (Geotechnical Consulting Group)

of all the committee members. I can see a new 18-month plan developing. I hope that during my time as chairman we will expand those early initiatives and develop these into new areas. I encourage our audience to include more of those organizations to whom geotechnics and the geoenvironment really matters.

Over the last couple of years I have sometimes been asked: What does the AGS do? To this I respond that we aim to provide a balanced professional view to the industry. This enables those who need to be heard, but are sometimes drowned out by the noise, to have a voice. Our Articles state that our purpose is to promote and enhance the quality of professional practice and we are able to do this visibly through our GIG's, seminars and Forums as well as our Newsletter. Many of our committee also serve on other geotechnical committees and the informal communication this provides allows us to keep our focus on those professional issues of concern.

We have recently upgraded our website and this year aim to expand access to the technical information from our GIGs and talks. We have made some in-roads into the geoenvironmental field and we will continue to provide GIG's and seminars in this fledgling area. We don't underestimate the importance of the geo-environment to a sustainable Hong Kong and see it as an area of significant importance in the future. It's great to be here at the start.

The strength of the AGS(HK) depends on the support from our members. Of course the membership has changed a bit over the last few years but the buzz in the air seems to be a confident one and with much work in Macau and expanding horizons in China, the outlook seems bright. We aim to be in the race.

We will continue to organize forums and seminars and judging by the support we have had, this has been welcomed by the engineering community. We have continued to support some of the other geotechnical groups in Hong Kong and are likely to continue this whilst still maintaining our position of a balanced view. AGS(HK) will also continue to support the universities by offering annual donations. I was pleased to be able to attend the HKPolyU Donor's Reception in May 2006 as it confirmed that there remains some excellent talent and enthusiasm amongst the fledglings in our profession.

The strength of the AGS(HK) is very much dependent on the support provided from it's members. I would like to take this opportunity to invite any members of the geotechnical or geoenvironmental community who would be interested in being involved with the organisation to get in touch. I believe that collectively we can make a difference.

Yours truly,

#### **Michael Hendy**



The 2005 Mercer Lecture was presented by Doctor J P Giroud, at the Hong Kong Productivity Council Building on 10 April 2006. Dr Giroud had previously presented the Lecture in Europe, the United States, South Africa and Turkey and will also be speaking in Japan. The biennial lecture is sponsored by Tensar International in memory of Dr Brian Mercer, the firm's founder and pioneer of the development of geogrids in soil reinforcement and ground stabilisation. The Hong Kong presentation was held with the joint support of the Geotechnical Division of the Hong Kong Institution of Engineers (HKIE), the Hong Kong Geotechnical Society (HKGS) and AGS(HK).



The 2005 Mercer Lecture was presented by Dr J P Giroud in Hong Kong on 10 April 2006

The lecture series is endorsed by the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) and the International Geosynthetics Society (IGS). It aims to promote co-operation and information exchange between the geotechnical engineering profession and the geosynthetics industry by providing an eminent practitioner the opportunity to undertake a lecture tour on the subject of geosynthetics in geotechnical engineering.

Dr. Giroud is Past President of the IGS and Chairman Emeritus of GeoSyntec Consultants. A practicing engineer with extensive field experience, he has developed and published many of the methods used to design applications of geosynthetics in landfills. Dr. Giroud has presented keynote lectures to numerous international conferences. In February 2005, he delivered the Vienna Terzaghi.

Dr JP Giroud gave a balanced lecture entitled *The Contribution of Geosynthetics to the Geotechnical Aspects of Waste and Liquid Containment.* Geosynthetics cover various products including geomembranes (geotextiles, geonets), geocomposites, geogrids, geomats and geocells. The lecture covered the use of geosynthetics in modern waste containment, geotechnical and geoenvironmental engineering, as well as the benefits and drawbacks of their misapplication.



Dr Giroud highlighted the disadvantages of design based solely on regulations or manufacturer's brochures and the danger of adopting "equivalent solutions" to match "prescribed solutions."

Dr Giroud discussed options that are currently available for monitoring geosynthetic performance such as leachate and gas extraction pipes. He suggested that further methods should be developed to monitor integrity, stresses, permeability/clogging, water pressures and temperature in a similar manner to which dams are monitored. Dr Giroud described how an increase in temperature from 20 to 40 degrees Celcius for example can alter hydraulic conductivity by 50%.

A number of the challenges that have been faced in the past few decades in the application of geosynthetics and the methods by which they are being overcome by industry were described by Dr Giroud. These include wrinkling of composite liners, the characteristics of which vary with the type of liner material adopted. Equations have been developed relating stiffness to wrinkle height and spacing and flexible geomembranes with a high angle of interface frictional resistance are recommended.

A further common problem is the cracking of clay in composite liners. Practitioners initially predicted that this would be prevented by the presence of the geomembrane. Research has since found that cracking occurs due to entrapped air becoming saturated during the day and then condensing and migrating down the slope face during the night. The problem can be overcome to some degree through the use of a GCL synthetic. However, GCL is itself prone to shrinkage. Dr Giroud remains optimistic that through innovation, existing and new problems can be progressively tackled.

Dr Giroud highlighted the differences between various liners in their effectiveness in preventing the migration of organic and inorganic contaminants. He compared Geomembrane-GCL liners to Geomembrane-Compacted Clay liners. GCL for example can be less effective at blocking organic contaminants. Double liners may also be considered in which a drainage layer is provided between two layers. This could be utilised for gas extraction in addition to minimising water pressure build-up on the secondary liner. Double liners may be suitable for hazardous waste whereas single composite liners may be satisfactory for solid municipal waste.



Dr Giroud further discussed slope stability and how this can be adversely affected by leachate recirculation and gas pressure. Waste slopes are more sensitive to a rise in pore water pressure than soil slopes due to their lower density. Geosynthetics are further less forgiving than granular drainage layers in terms of design and Dr Giroud recommends that a higher factor of safety be adopted accordingly.

The lecture was followed by a question and answer session and a vote of thanks, led by John Cowland. The lecture was well attended by contractors and consultants, members of the government and students.

# Hong Kong University AGS(HK) Scholarships 2005–2006

AGS(HK) regularly provides scholarships to universitites in Hong Kong, typically for the study of postgraduate degrees in geotechnical engineering and earth sciences. Scholarship recipients from Hong Kong University for 2005-2006 include **Patrick Ho** and **Lillian Li**, each of which have provided a few words below.

### Patrick Ho

I am delighted to have received the Association of Geotechnical and Geoenvironmental Specialists (Hong Kong) Scholarship 2005-2006. It is my honour to receive this recognition of my achievement. I wish to express my deep gratitude to the Association for presenting me with the award.

I graduated from the Earth Sciences programme at the University of Hong Kong in 2005 and joined the government as an Engineering Geology Graduate. This has partly fulfilled my aspiration to become an engineering geologist in Hong Kong, but I am aware that it is a very challenging job that requires a great deal more knowledge and experience other than only what we receive in a bachelor degree.

From my reading and experience I am aware that an engineering geologist requires a good grounding in Geology and then years of on-the-job working with engineers to acquire sound engineering judgement.



Patrick Ho, recipient of a HK\$10,000 AGS scholarship to study a part-time Master of Science in Applied Geosciences at the University of Hong Kong

In order to meet the demands of my job, I decided to pursue an advanced degree over my bachelor degree. With the encouragement of Prof A.W. Malone and Dr L.S. Chan, I decided to take the part-time Master of Science (Applied Geosciences) at the Department of Earth Sciences, the University of Hong Kong. Although the fees are not as high as for other international MSc programmes in engineering geology, the cost is quite significant for someone such as myself. The financial help from AGS makes a significant difference.

I have now completed the first year of my two years of study. I have found that the programme is extremely useful to my work in the engineering geology field. The programme provides me not only with textbook basic knowledge, but also with practical solutions to working problems, as well as precious experiences shared with experts working in the field. I would definitely recommend this programme to anyone working or planning to work in the engineering geology field.

After all, I am still a beginner in this field and there is still a great deal more for me to learn. May I say thank you again to AGS(HK) for the scholarship. This award has not only financially supported my study fee, but it also increases my confidence in my study and work. Hopefully I can contribute more to the professional field in the future.

#### **Patrick Ho**

## Lillian Li

Lillian is currently working at Wong Pak Lam & Associates as an Assistant Engineer and is studying a part time MSc degree in Geotechnical Engineering. She has been involved in the project coordination and design of various geotechnical, civil and structural works. In particular, she is currently in charge of the piling design for the Ma Tin Road Residential Development in Yuen Long, which comprises driven H-piling design in a difficult marble area. In the design and supervision works at Ma Tin Road, a number of problems were encountered requiring a wide range of geotechnical knowledge.



On 25 January 2006, Dr Alan Kwong presented a HK\$10,000 AGS scholarship to University of Hong Kong recipient Lillian Li on behald of AGS(HK).

There is a real need for furthering the studies of graduates through suitable MSc courses to allow them to obtain more indepth knowledge of geotechnical engineering and reinforce their understanding of sound geotechnical principles that may otherwise be lost amid the various other challenges encountered during professional working. The Hong Kong Government is further putting greater emphasis on geotechnical expertise through the introduction of the Registered Geotechnical Engineer (RGE) stream and more stringent requirements on site supervision of geotechnical works. To quote Lillian, *"I thank AGS(HK) whole-heartedly for their kind support."* 



Students, graduates and other young attendants of the ground forums are encouraged to submit written records of the presentations and dialogue that take place. AGS(HK) offers a book prize to the value of HK\$500 for the most concise and well-written record for each of the ground forums held. Suitable records may be sent to Dr Cyril Chan at:

e-mail: hfcchan@fugro.com.hk postal: c/o Fugro Geotechnical Services Ltd Units 8-11, 10th Floor Worldwide Industrial Centre 43-47 Shan Mei Street Fo Tan, Shatin, N.T.



On 21<sup>st</sup> May 2005, AGS(HK) held a CPD short course on "Site Investigation" at the Hong Kong University of Science & Technology. Suitable ground investigation of a site is fundamental to identify the various ground related and historical factors that could influence the design and construction of civil engineering and building works. How to effectively and correctly plan a site investigation is knowledge that engineers normally have to learn on the job. The objective of the course was to introduce younger engineers and geologists to well planned site investigations and the associated techniques. This also provided a valuable opportunity for more experienced practitioners to refresh on the subject of site investigation. Over 80 people attended the course that was divided into five sessions. Speakers from the government authorities, consultants and contractors were invited to deliver presentations.



Over 80 people attended the CPD Course, "Site Investigation" in May 2005

The first session was jointly presented by Mr Y.C. Lam and Mr Tim Leung, both of Maunsell Geotechnical Services on the topic of horizontal directional drilling. They shared their experience on the recent application of horizontal directional drilling at Eagle's Nest Tunnel for the construction of Route 8. Their presentation provided the audience with ideas on the working principles, construction procedures, lessons learnt and suggested improvement for carrying out horizontal directional drilling works.

#### HDD Successfully Drilled



The Eagle's Nest Tunnel of Route 8 which relied on Horizontal Directional Drilling

The second session was presented by Mr. Michael Hendy, a director of Geotechnical Consulting Group and the current Chairman of AGS(HK) under the topic "Site Investigation for Contaminated Sites". Mike's presentation focused on the general principles and varying techniques for investigating contaminated sites. Mike further described some past examples of contamination site investigations.



Mike Hendy presents on the ground investigation of contaminated sites

The third session was presented by Mr. Frank Collar under the topic "Geophysical Techniques for Site Investigation (Typical and Recent Development)". Frank is a geophysicist and director of Consine Ltd. Frank described some typical applications of geophysical techniques and discussed some of the commonly adopted geophysical methods in Hong Kong. These include the Seismic method, Magnetics method, Gravity method and Electrical & Electromagnetic method. A cost comparison of the methods was also discussed.

The course then focussed on the personnel involved in ground investigations with a presentation by Mr. Kei. Fung. Mr. Fung is a geotechnical engineer working in the Geotechnical Engineering Office (GEO) of the Civil Engineering and Development Department (CEDD) of the Hong Kong Government. Mr Fung provided the audience with an overview of the requirements of site supervision personnel for private developments under the building ordinance and for public works projects under the Works Bureau. The required qualifications of site supervision personnel from both consultants and contractors was clearly explained.



Trial Pit Logging

The final session of the course was presented by Mr. Steve Parry on the topic "Site Investigation for Natural Terrain Hazard Assessments". Mr. Parry is a chartered geologist and a chartered engineer working for the GEO, CEDD. Mr. Parry divided his topic into two parts. The first concerned the use of geomorphology and API to develop natural terrain hazard models. Mr. Parry then described how the detailed ground investigation is utilised to assess and refine the hazard model.



The various speakers of the CPD course on "Site Investigation"

# AGS Seminar on Effective Instrumentation

A seminar on Effective Geotechnical Instrumentation was held on 22<sup>nd</sup> October 2005 and was co-sponsored by the HKIE Geotechnical Division. Delegates heard from a number of experienced practitioners in the instrumentation field covering instrumentation designers and consultants, to specialist suppliers through to main contractors.

Dr Angus Maxwell from Maxwell Geosystems began proceedings with a description of the forensic investigations needed as part of the planning of a project. Structures and the ground in which they are founded both move in response to daily and yearly fluctuations in temperature, water level and pressure.



Instrumentation Management Systems now sport GIS functionality as standard.

These fluctuations must be added to the known accuracy in the instruments before sensible trigger values can be set. In the case of slopes and reclamations there may be long-term permanent changes in level. Similarly the long-term trends have to be identified and factored in.

Tony Frame and David Sein from Gammon/Lambeth described a case history from Singapore where the Observational Method of design was used to optimise and track the design and construction of a deep basement. Revision of designs on the basis of observational results held in the web based Geomon system allowed Gammon to reduce the number and capacity of struts and therefore save time and money. Of interest, instrumentation results showed increased strut loads of 200 to 300kN in response to temperature fluctuations alone. The loads reduced following the painting of the struts with white paint.



David Clayton from Foundation Technique described the variety of instruments currently in use today and presented some common areas and scenarios where instruments do not perform as hoped. David also provided some indication of the future developments of instrumentation technology.

Ian Solomon from Fugro described similar recent advances from the electrical engineer's perspective and described how database systems are taking over from spreadsheets as the main tool for the management of construction data. Mr Solomon set out some guidelines on how such systems should be constructed and described new advances in wireless telecommunications that can be applied to instrumentation data transfer.



Typical Instrumentation adopted in the Implementation of the Observational Method for an Excavation Design in Singapore

The seminar was brought to a close by Dr Jack Pappin from Ove Arup and Partners who described progress on the CEDD consultancy to investigate the instrumentation of landslides in the New Territories that may be subject to prolonged slow creep. A number of possible instruments were identified including some rarely used methods for the measurement of soil moisture content.

Agreement to negotiate / mediate – A matter for careful drafting

## Synopsis

Dispute resolution provisions have today taken on a new meaning. Not too long ago, one would have associated dispute resolution provisions as just a clause dealing with the agreement to arbitrate.

When mediation became vogue, mediation-arbitration provisions became popular and such provisions then required parties to consider mediation proceedings before they could resort to arbitration.

When even mediation was perceived to be long-drawn, overly legalistic and expensive (an unfair spin-off from the common misconception that anything that involved lawyers are long-drawn and expensive), ingenious draftsmen came up with a new provision that can be conveniently named the "discussions-mediation-arbitration" provision.

Usually, this means that another layer of discussion was added before mediation proceedings could take place and these discussions themselves often have further "sub-layers" with the result that often, mandatory discussions between executives at different levels are required (if talks fail at one level, they then move to another) before parties can consider mediation (let alone arbitration). This process can take months and depending on which side you are on, may lead to the happy result of the dispute dying a natural death due to the sheer exhaustion of the negotiators. It may surprise some practitioners that such provisions have been held to be enforceable under English law (see *Cable & Wireless plc v IBM UK Ltd* [2003] BLR 89) and there is also English authority to suggest that court proceedings can be stayed if parties have not first resorted to and complied with such provisions (see e.g. *Channel Tunnel Group v Balfour Beatty* (1993) 61 BLR 1).

They must however avoid being mere "agreements to negotiate" since such are unenforceable for lack of certainty (*Paul Smith Ltd v H&S International Holding Inc*[1991] 2 Lloyds Rep 127; *Courtney & Fairbairn v Tolaini Brothers (Hotels) Ltd* [1975] 1 WLR 297).

Which side your provision falls on depends very much on its wording and the recent decision in Hong Kong of *Hyundai Engineering and Construction Co Ltd v Vigour Ltd* [2005] 1 HKC 579 provides useful guidelines in this respect.

## The Provision

In the *Hyundai* case, the agreement in question contained the following provision:

"...the parties will start to discuss together to resolve any differences under or in connection with the above Contracts and any arguments that may come up now and in the future for anything about the above Contracts that cannot be finalised <u>will be resolved</u> and decided by the managing directors of the ultimate shareholder group of the highest level, provided failing an ultimate agreement then both parties shall agree and submit to Third Party Mediation procedure, which shall be conducted and completed as soon as possible and in any case no party will exercise the right to sue against each other..."(underlining added)

#### The Decision

The Hong Kong Court of Appeal held that an agreement that states disputes "will be resolved" by party representatives is unenforceable for lack of certainty (*Watford v Miles [1992] 2 AC 128*). This was so even if the agreement is framed as parties using "best endeavours" to negotiate.

Argument was then made (apparently using the judgment of Kirby P in *Coal Cliff Collieries Pty v Sijehama Pty Ltd (1991) 24 NSWLR 1*) that the provision would be rendered enforceable by its statement that failing agreement during negotiations, parties would "*agree and submit to Third Party Mediation procedure*".

The Court held that this wording did not render it any more certain. According to the Court, the purported "mediation agreement" lacked precision because it did not lay down specific steps, such as a timetable, for a formalised alternative dispute resolution procedure (court compared this with a variant of such a provision in *Cable & Wireless v IBM UK Ltd* [2003] BLR 89 which was held enforceable because there were specific details laid down for a formalised alternative dispute resolution procedure). It held that such a general reference to mediation meant nothing more than negotiations assisted by some unspecified third party.

Even if that provision is to be read against a more detailed mediation clause in the parent contract (Clause 86 of the standard Kowloon-Canton Railway Corporation Contract Form), it still did not save it because Clause 86 related to something different and the procedure described in that clause leads to arbitration at the instance of either party – something which parties to the agreement in question apparently did not intend to happen.

Another provision in the agreement which purports to exclude formal proceedings and stated that parties would not continue or bring any arbitral or legal proceedings "forever" was also held to be unenforceable because the agreement in question did not itself provide any means to resolve disputes (the provision for mediation being held to be unenforceable as mentioned above).

The Court thought that it <u>might be</u> feasible to enforce such an exclusion provision if the agreement within which the exclusion provision is contained itself resolved any issues arising from the parties. Since that was not the case, the exclusion provision cannot be enforced.

In the course of arguments, it was also submitted that such an exclusion provision would be unenforceable on public policy grounds because it purports to oust the jurisdiction of the courts. The court did not have to deal with this argument because of the position it had taken above.

### Conclusion

The enforceability of a "negotiate first" provision is often important whether as a primary means to allow key stakeholders to talk and manage the relationship or if only just so as to buy time to prepare its case and avoid adverse market reactions. Business leaders may (and often do) make aggressive project decisions on the assumption that the fallout from the small print can be sorted out in lengthy and compulsory negotiations. If these provisions turn out to be unenforceable, the consequences can be disastrous. The stakes also become higher when there are no other alternative dispute resolution mechanisms (e.g. arbitration) available to resolve disputes and one is forced to go to the local courts for a decision.

The *Hyundai* case therefore illustrates the point that whilst "negotiate first" provisions are useful, they have to be carefully drafted to avoid having your commercial/business teams meet with unwanted surprises.

### FURTHER INFORMATION

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# Letters – Opinions

AGS(HK) encourages discussion on issues affecting the Association and the industry and the editor will be happy to publish letters from readers on relevant topics. Letters may be sent by e-mail or postal mail to Jonathan Li (contact details refer to front page). Authors should indicate their intention for their letter to be published.

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