

AGS (HK)

香港岩土及岩土環境工程專業協會
ASSOCIATION OF GEOTECHNICAL &
GEOENVIRONMENT SPECIALISTS (HONG KONG)

AGS (HK) NEWSLETTER

Editorial

Welcome to the official newsletter of the AGS (Hong Kong). This is the first edition of what is planned to be a colourful and informative publication for years to follow. The newsletter will be used to feed vital information to Association members and non-members alike, covering the sub-committees, ground forums, courses and meetings and will provide a commentary on issues relating to geotechnical and geoenvironmental engineering in Hong Kong in general.

This year's Executive Committee, under the leadership of Chairman Michael Lacy has taken on the challenge of redefining the 'Way Forward' for the AGS. In this issue, a summary of the recent discussions and developments on the subject is presented as the Association wrestles to establish its identity in Hong Kong. In addition to this, there is an introduction to the ground forum to be held later this month on the topical issue of bored pile interfaces. We also offer our sincere thanks to Tracy Williams of Denton Wilde Sapte whom, between legal briefs and court appearances has taken the time to contribute an article examining the legal issues involved with defective piling.

If you are already a member of the AGS, we thank you for your continuing support and hope you will find the newsletter to be a valuable and interesting read. If your company is not a member, we invite you and your colleagues to become part of a unique and exciting organisation that is committed to the development of work practices in the industry and cooperation amongst its organisations.

Jonathan Li

Comments

Please feel free to send any comments on the content or design of this newsletter to:

Mr David Sein (Administrator and Editor)

The Association of Geotechnical and Geoenvironmental Specialists

c/o Gammon Skanska Limited

PO Box 9711 GPO Hong Kong

Fax: 2516 6352

e-mail: david.sein@lambeth.com.hk



The Way Forward for the AGS

What is the AGS and what does it do?

There is a good chance that you had never heard of the AGS until you picked up this newsletter or that you had heard the acronym mentioned, but were not familiar with the organisation's activities or purpose. You may also be forgiven for confusing the Association with a learned society or interest group. You may be interested to know that:

- The AGS (HK) was established in 1998.
- The original membership comprised a fairly even representation of consultants, contractors, academics and client bodies with what could be described as a "trade association" focus.
- The AGS has successfully held a number of popular ground forums, seminars and continuing professional development (CPD) courses, acted in an advisory role in the publication of geotechnical documents and actively participated in the Ground Investigation Working Party (GIWP).

Where is the Association at now?

It was agreed amongst the Executive Committee early this year that the Association needed to strengthen its sense of direction and purpose. It was also recognised that the membership of the Association no longer comprised as wide a representation of the industry as it had at its conception and the "trade association" focus had become less apparent. A series of actions were then implemented to better establish what the AGS should be and what the best way forward is to achieve this.

What do the Members think?

A questionnaire was issued to members in February this year. It asked respondents what they wanted from the organisation and how well they thought it was performing. Twelve member companies and individual members completed and returned the document.

Some of the more important points to note from the results are as follows:

- Members feel that the AGS should give priority to the promotion of the interests of its members in geotechnical work and in geoenvironmental work. The next highest priority should be given to the upholding of work quality.
- Specific activities that members favour include the following:
 1. The representation of members in public bodies and in liaison with regulatory bodies
 2. The provision of a forum for clients and other users of geotechnical services to share views
 3. The holding of lectures, seminars, conferences and exhibitions to promote geotechnical and geoenvironmental issues to members
 4. The compilation and promotion of standards and guidelines on good practice
 5. The assessment of the effects of existing and proposed legislation.

Members believe that the AGS has been performing well in (1) and (3), but see room for improvement in (2), (4) and (5).

Brainstorming

Organised discussions on the best way forward for the Association were held on two occasions. In early March, a visit to Hong Kong was made by the immediate past chairman of the AGS in the United Kingdom, Keith Gabriel. Gabriel gave a presentation on the AGS (UK) and this was followed by an open forum discussion on the way forward for the AGS (HK).

Gabriel pointed out that the bulk of the work carried out by the AGS (UK) is through its subcommittees. This allows the Executive Committee to direct its attention to managing the Association and to reviewing the subcommittees' progress and policies.

In late April, the Executive Committee held a further brainstorming session to review the opinions and ideas communicated to date.

The Way Forward

Following the April brainstorming session, a concrete strategy was developed for the way forward. The main components are planned to be put into place by the end of 2004 and include the following:

- The Association will aim to strengthen its 'trade association' identity by directing more attention to representing the interests of its members.
- The actions of the Association will aim to be based on a 'balanced view' concept i.e the Association will aim to fairly represent all players in the industry.
- The role of the subcommittees will become more prominent and new subcommittees will be formed.
- The term of the Chairman will be increased to 2 years.
- The Association will drive to attract new member companies with increased diversification.
- The website will be updated and improved and a regular newsletter will be published.
- More resources will go to the publishing of guidelines and notes on good practice.
- Seminars and forums will continue to be held regularly.
- The direction of the Association will be appraised regularly at 6-month intervals.

Letters - Opinions

The AGS 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 David Sein (refer to contact details on the front page under 'Comments'). Authors should indicate their intention for their letter to be published.

Ground Forum on Bored Pile Interfaces

In Hong Kong, post-construction proof drilling is generally required across the interface of every large diameter bored pile and barrette constructed. The requirement is usually included in the project specification and follows the recommendations of Practice Note for Authorised Persons and Registered Structural Engineers (PNAP) No. 66 - Pile Foundations. It is likely that to a certain degree, interface drilling encourages piling contractors to strive for higher quality. However, considerable uncertainty surrounds the interpretation of recovered cores, particularly in the cases where unbound material or core loss is encountered and the effects these have on pile performance. Other questions, such as the need to test 100% of piles constructed are also frequently raised.



Bored Pile Construction by Oscillator

On the 16th of September this year, the AGS will be holding a ground forum in which these and other issues related to concrete-rock interfaces at the bases of large diameter bored piles will be discussed. The forum is likely to be popularly attended due to the topic involving components of design, construction and testing.

As per the usual ground forum format, the event will comprise a few short presentations followed by an open forum with the participation of the audience. The presenters will include Dr Jack Pappin of Ove Arup and Partners (Hong Kong), Arthur So of China State Construction and Dr Andy Pickles of Geotechnical Consulting Group (Asia).



Recovered Cores displaying Pile Toe
Interfaces of Varying Condition

Jack Pappin will discuss the results of a study conducted by the Hong Kong Construction Association in association with Ove Arup and Partners. This included a review of 263 bored piles constructed in Hong Kong in which the occurrence of soil inclusions and unbound aggregate at the pile interface was established. Laboratory testing was also carried out of the stress-strain behaviour of typical materials encountered at interfaces such as decomposed granite and volcanics and unbound concrete aggregate. Other work included the finite element modelling of pile toes with interface inclusions of varying thickness.

Andy Pickles will introduce potential problems that occur with the interpretation of interface drilling results such as loss of core due to the use of high water pressures during drilling. Andy will also discuss design issues such as the amount of load typically resisted by bored piles in shaft friction, the implications of design based on presumed end bearing stresses and the possibility of using interface drilling as a means of upgrading allowable bearing stresses.

Arthur So's presentation will cover a wide variety of issues including practical construction techniques that can be adopted to minimise the chance of interface inclusions and unbound aggregate occurring, available remedial methods and their effectiveness and a discussion of the factors affecting the quality of rock core encountered during interface drilling.

Further details on the time and venue of the forum are provided under 'Diary Dates on the back page.



A Reverse Circulation Drill (RCD) Drilling Head

Book Prize for Best Ground Forum Notes

Students, graduates and other young attendants of the ground forums are encouraged to submit written records of the presentations and dialogue that take place at the forums. The AGS offers a book prize to the value of \$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:

Email: hfcchan@fugro.com.hk

Postal: c/o Fugro Geotechnical Services (HK) Ltd.

Units 8-11, 10th Floor

Worldwide Industrial Centre,

43-47 Shan Mei Street

Fo Tan, Shatin, N.T.

Introducing the GIG

Currently, the most active and established of the subcommittees is the Ground Investigation Group (GIG). The group is the successor organisation to the Ground Investigation Working Party (GIWP) that was initiated by the Hong Kong Institution of Engineers (HKIE) and was then run as a subcommittee of the Hong Kong branch of the Institution of Materials, Minerals and Mining (IMMM). The group was tasked with reviewing ground investigation practice in Hong Kong.

The work of the GIWP and the state of the ground investigation industry were reviewed at the AGS Ground Forum of 4th December 2002.

As a cross-party organisation, the GIWP came to realise that it would be pulled in several directions to suit the requirements of the various member organisations. This would slow down the development of initiatives that derived from both the GIWP report as well as from the floor of AGS meetings. Under the chairmanship of Leslie Swann, the AGS decided in 2002 that it would establish a group that would initially mirror the aims and functions of the GIWP. Being an independent organisation it would also be able to pursue its own developments and make recommendations without being beholden to other organisations.

In December 2002, at an inaugural strategy meeting it was decided that the GIG would issue a series of guidelines or good practice advice notes (also termed "GIGs") during 2003 for the benefit of AGS members and the industry. The GIGs will include material from earlier drafts prepared by the GIWP together with new initiatives. The intention was to introduce up to 4 GIGs with a target audience of young and less experienced geotechnical practitioners in mind and to launch the GIGs by the time of the AGS annual general meeting in December 2003.

Initially, GIGs will be published on the following topics:

- Planning Ground Investigations
- Procurement of Ground Investigations
- Contract Documentation for Ground Investigations
- Considerations for Designing Ground Investigations

The AGS sincerely thanks Graeme Jardine, Neil Ng, Julian Tyson and Greg Pinches whom have worked as the main contributors to the guidelines and Jeff James whom has taken over the chair of the group.

Measuring Damages For Defective Piling

In March 2000, following a detailed investigation by independent consultants, the Hong Kong Housing Authority announced that it would demolish two residential blocks in Shatin which had been constructed on defective piles. In reaching their decision, the Authority had to consider other options such as modifying the superstructure or foundations of the blocks and various methods suggested by the piling contractor for strengthening the defective piles.

Allegations of fraud and ICAC investigations accompanied this and other defective piling cases. Contractual claims followed. With public confidence shaken, foundation design on both public and private projects came in for close scrutiny. Projects were delayed while piles were investigated and more contractual claims ensued. Even today some of the issues arising are being resolved within the privacy of arbitration.

Before we close the book on defective piling, let us consider from a legal perspective the nature of the damage caused to the employer by defective piling.

Defective Workmanship

Failure to meet the employer's requirements as set out in the contract whether through use of improper materials or lack of skill and care in workmanship, is a breach of contract. This is so whether that failure is deliberate (fraudulent) or accidental (negligent). The employer is entitled in cases of breach of contract to financial damages that will put him in the same position as if the contract had been properly performed.

In building cases, the normal measure of damage for defective building represents the cost of effecting necessary repairs. In the cases where short piles are discovered before substantial building works are carried out, this might involve the cost of boring and concreting additional piles. Where the superstructure is already underway, pile-jacking or other engineering solutions can be considered. The appropriate date for measuring the reinstatement or repair cost is at the date of trial, it being reasonable for the employer to determine whether he can recover damages from the defendant before he incurs the cost of reinstatement.

In some circumstances, however, the cost of rectifying a defect or non-compliant work is disproportionate to the objective, namely to put the employer in a position as though the contract had been properly performed. In *Applegate v. Moss*, houses built on a wet clay slope with defective foundations were unmarketable and could not be repaired economically. In that case, damages were measured by deducting the value of the buildings as built from their value as they should have been built. The buildings as actually built were valueless as they were unsafe for habitation and were irreparable. The measure of those damages therefore represented the full value of the building constructed properly at the date of trial.

This raises an interesting question if the costs of construction or property values have materially reduced between the date the initial work was carried out and the date the issue comes to be tried. If the property is to be valued at the date the dispute is tried the employer may stand to recover less in damages than he paid for the initial defective construction. In the meantime too, the employer may have had to demolish the defective building and will have missed the benefit of his investment between its completion and the time taken for the dispute to come to trial. It might, however, be possible for him to recover these losses as consequential losses if they were reasonably foreseeable as a result of the breach of contract.

Defective Design

If the contractor was responsible for the design and the selected design fails to meet the employer's specification, then again there has been a breach of contract. The scale of damages would be measured as set out above in relation to defective works.

Where the contractor's defective design causes the employer financial or economic loss, the contractor may also, if he has exercised insufficient care in the preparation of the design, be liable in tort for negligence. These damages are intended to put the employer in a position as if there had been no negligent design and consequently no financial loss had been sustained. Damages compensate the employer for his financial loss by allowing him the difference in value between the defectively designed product and the building he contracted for. Since this test is based on a market value, it poses problems (see below) if the foundation design is one that technically fails to meet the employer's specification but does not in any way affect the safety or stability of the building as constructed.

If the design is provided by the employer, however, the contractor, in complying with that design may not be liable for damage caused. This is unless the employer can establish that the contractor had a duty (whether under the contract or by common law), to warn the employer if the design was defective.

Technical Breach

What happens if the breach of contract or negligence (whether defective design or workmanship) does not affect the commercial value of the building? Frequently in foundation design there is an element of over engineering or erring on the side of safety. A single failure to comply might not render a building unsafe. Query then, what is the

damage sustained by the employer? Arguably, rectification or remedial works are not necessary if there is no real problem with the safety of the building. Further, if the building is structurally sound, then its market value would not be affected and so the diminution in value of the building would also be nil and the employer will have suffered no financial loss.

Such a situation arose in the case of *Ruxley Electronics v. Forsyth* where the plaintiff built a swimming pool that was required under the contract to have a maximum depth of 7.5 feet. The pool as built had a maximum depth of 6.75 feet and was only 6 feet deep in the diving area. The short-fall

in depth was neither unsafe nor likely to reduce the value of the pool or Mr Forsyth's house on the open market though it was clearly non-compliant with the contract specification. Reinstatement costs would have been out of all proportion to the aim of putting Mr Forsyth in a situation as though his contract had been performed. Instead he was entitled to damages representing the diminution in value caused by the fact that the works were constructed as they were. This diminution was nil, though the court did award nominal damages for the employer's loss of enjoyment, as the project was intended to afford him personal enjoyment.

Conclusion

Recent piling frauds have caused economic repercussions, which are still being felt. Construction professionals should take great care over foundation design and construction until public confidence is restored so that piling scares can be consigned safely to history.

By Tracy Williams

(Tracy is a Senior Solicitor with Denton Wilde Sapte, specialising in construction and engineering issues).

Diary Dates

Event	Date	Time	Venue	Contact / Registration
Ground Forum on Bored Pile Interfaces	16 Sept 03	1830-2030	Joint Professional Centre	Limin Zhang cezhangl@ust.hk Tel: 2358 8720
CPD Course on Contaminated Land and its Legal Implications	25 Oct 03 (tentative)	0900-1700	TBC	Graeme Jardine gaj@mottconnell.com.hk
Evening lecture - 'Geology for Engineers: the Geological Model, Prediction and Performance' (updated 1997 Glossop Lecture) by Peter Fookes, Main Organiser - IMMM HK.	27 Nov 03	1800-2000	Theatre 1, HKCEC	IMMM HK: Dick Martin cgesm@landsd.gov.hk Tel: 2231 3773
Technical Meeting - 'Ground Investigation and Modelling for Engineering in Saprolite and Weathered Rock,' Main Speaker - Peter Fookes, Main Organiser - IMMM HK.	29 Nov 03	0830-1715	Lecture Theatre A, HKUST	AGS (HK): Michael Lacy
Evening Lecture - 'Total Geological History: A Model Approach to the Anticipation, Observation and Understanding of Site Conditions for Engineers', by Peter Fookes, Main Organiser - IMMM HK.	02 Dec 03	1800-2000	Rayson Huang Theatre, HKUST	michael.lacy@benaimgroup.com Tel: 2527 0223