Κατεστραμμένα κτίρια στο Gundogdu, Τουρκία, από εκτεταμένες κατολισθήσεις λόγω πλημμυρών

ΕΛΛΗΝΙΚΗ ΕΠΙΣΤΗΜΟΝΙΚΗ ΕΤΑΙΡΕΙΑ ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ & ΓΕΩΤΕΧΝΙΚΗΣ ΜΗΧΑΝΙΚΗΣ

Τα Νέα της Ε Ε Ε Ε Γ Μ

31

ΑΚΡΑΙΑ ΚΑΙΡΙΚΑ ΦΑΙΝΟΜΕΝΑ

Τα ακραία καιρικά φαινόμενα, που επικράτησαν σε ολόκληρο τον πλανήτη κατά το δίμηνο Ιουλίου – Αυγούστου, είχαν σαν αποτέλεσμα την εκδήλωση εκτεταμένων κατολισθητικών φαινομένων και αστοχιών σε τεχνικά έργα και τον θάνατο χιλιάδων ανθρώπων. Ιδιαίτερα σημαντική είναι η κατολίσθηση στην British Columbia, η οποία ενεργοποιήθηκε λόγω της τήξης του παγετώνα Capricorn στο Mount Meager, καθώς και οι κατολισθήσεις στην νοτιοδυτική Κίνα και στην Τουρκία.

Πριν από την παράθεση κάποιων περιγραφών από αυτά τα φαινόμενα (βλέπε σελ. 32), θεωρούμε κατάλληλη την πρόταξη του άρθρου του Κώστα Συνολάκη, Καθηγητή Φυσικών Καταστροφών στο Πολυτεχνείο Κρήτης στην εφημερίδα «Η ΚΑΘΗΜΕΡΙΝΗ» της Πέμπτης 12 Αυγούστου 2010.

Οι αφύσικες καταστροφές

Τις προηγούμενες εβδομάδες γίναμε μάρτυρες, μέσω των μέσων ενημέρωσης, φυσικών καταστροφών με αντίκτυπο «πρωτοφανούς κλίμακος» σε ανθρώπινη δυστυχία σε ολόκληρο τον κόσμο. Για παράδειγμα, ο ΟΗΕ χαρακτήρισε τις πλημμύρες που πλήττουν το Πακιστάν (με 14 εκατομμύρια πληγέντες) ως χειρότερη ανθρωπιστική συμφορά από το τσουνάμι του Ινδικού Ωκεανού του 2004.

Τον Ιούνιο, καταστροφικές πλημμύρες σκότωσαν 18 ανθρώπους στην Πολωνία και προκάλεσαν καταστροφές που ανέρχονται σε πολλές εκατοντάδες εκατομμυρίων ευρώ. Στην

(συνέχεια στην σελίδα 32)

Αρ. 31 –ΑΥΓΟΥΣΤΟΣ 2010

SIMSG ISSMGE

Π Ε Ρ Ι Ε Χ Ο Μ Ε Ν Α

6ο Πανελλήνιο Συνέδριο Γεωτεχνικής και Γεωπεριβαλλοντικής Μηχανικής
29 Σεπτεμβρίου – 1 Οκτωβρίου 2010, Βόλος
http://portal.tee.gr/portal/page/portal/INTER_RELATIONS/INT_REL_P/SYNEDRIA_EKDHLWSEIS/2010/6thGeotechnic

Το Τεχνικό Επιμελητήριο Ελλάδας και η Ελληνική Επιστημονική Εταιρεία Εδαφομηχανικής και Γεωτεχνικής Μηχανικής διοργανώνουν το 6ο Πανελλήνιο Συνέδριο Γεωτεχνικής και Γεωπεριβαλλοντικής Μηχανικής.

Στόχος του Συνεδρίου είναι να καταγράψη τις προόδους της γεωτεχνικής και γεωπεριβαλλοντικής μηχανικής στην Ελλάδα του 21ου αιώνα κυρίως όπως αντικατοπτρίζονται στα σημαντικά γεωτεχνικά έργα που έχουν μελετηθή και κατασκευασθή ή κατασκευάζονται, όπως επίσης και σε άλλα έργα (σιδηροδρομικά, οδικά, λιμενικά, υδραυλικά, κτιριακά, περιβαλλοντικά) με σημαντικό γεωτεχνικό αντικείμενο.

Επιδίωξη είναι οι εργασίες του Συνεδρίου να αναδείξουν πρωτότυπα στοιχεία συμβολής της γεωτεχνικής και γεωπεριβαλλοντικής μηχανικής αλλά και να προβάλουν θεωρητικές και πειραματικές έρευνες σε εδαφικά, βραχώδη και ημιβραχώδη υλικά που βρήκαν ή μπορούν να βρουν εφαρμογή στην πράξη.

Χρόνος και Τόπος διεξαγωγής

Το 6ο Πανελλήνιο Συνέδριο θα διεξαχθή στο Βόλο από 29 Σεπτεμβρίου έως 1 Οκτωβρίου του 2010 στο συνεδριακό κέντρο «PALAIA- Πολυχώρος Τσαλαπάτα».

Θέματα του Συνεδρίου

Οι εργασίες του Συνεδρίου θα αρθρωθούν γύρω από τρεις βασικούς κύκλους θεμάτων. Ο ένας κύκλος θα περιλαμβάνη θέματα θεωρίας, έρευνας και πειράματος, ως προς τη συμπεριφορά των γεωυλικών, εδαφικών, ημιβραχωδών και βραχωδών (συμπεριφορά γεωυλικών, έρευνες υπαίθρου και εργαστηρίου, εδαφοδυναμική, γεωτεχνική σεισμική μηχανική, έδαφος και περιβάλλον). Ο δεύτερος κύκλος θα περιλαμβάνη θέματα που αφορούν θεωρητικά ή πρακτικά στα γεωτεχνικά έργα, δηλαδή έργα της αποκλειστικής ή κύριας αρμοδιότητας του γεωτεχνικού μηχανικού όπως πρανή, κατολισθήσεις, βελτιώσεις, ενισχύσεις, ειδικές γεωτεχνικές κατασκευές. Τέλος ο τρίτος κύκλος θα περιλαμβάνη γεωτεχνικά θέματα που αφορούν θεωρητικά ή πρακτικά σε έργα στα οποία συμβάλλουν περισσότερες ειδικότητες μηχανικών όπως θεμελιώσεις, βαθιές εκσκαφές και αντιστηρίξεις, σήραγγες και υπόγεια έργα, οδοστρώματα, επιχώματα, φράγματα, λιμνοδεξαμενές, περιβαλλοντικά έργα, μικροζωνικές. Επίσης θα εξετασθούν γεωτεχνικά προβλήματα της Μαγνησίας. Πιο συγκεκριμένα, τα επί μέρους θέματα του συνεδρίου θα είναι τα ακόλουθα:

- Βαθειές Εκσκαφές - Αντιστηρίξεις
- Βαθειές - Επιφανειακές θεμελιώσεις
- Βελτιώσεις Εδαφών
- Βραχομηχανική
- Γεωπεριβαλλοντικά Θέματα
- Γεωτεχνικά Προβλήματα Μαγνησίας
- Εδαφοδυναμική - Αλληλεπίδραση
- Εδαφοδυναμική - Ιδιότητες
- Εδαφοδυναμική - Σεισμικότητα
- Ενισχύσεις - Γεωσυνθετικά
- Επιχώματα (άοπλα και οπλισμένα)
- Θεμελίωση Γεφυρών
- Κατολισθήσεις
- Πολιτιστική Κληρονομιά και Γεωτεχνικά
- Πρανή
- Σήραγγες
- Συμπεριφορά Εδαφών
- Συμπεριφορά Εδαφών - Έρευνα Υπαίθρου και Εργαστηρίου
- Συμπεριφορά Εδαφών - Προσομοιώματα
- Φράγματα - Λιμνοδεξαμενές

ΑΡΘΡΑ

Geomembrane Installed to Control Leakage at Gem Lake Dam

To address continuing leakage at its Gem Lake Dam, Southern California Edison commissioned installation of a geomembrane on the upstream surface. Results indicate seepage through the dam has been reduced by as much as 90 percent since the geomembrane liner was installed three years ago.

By John C. Stoessel and John A. Wilkes

Like many other dam owners, Southern California Edison (SCE) is faced with aging infrastructure that has experienced decades of harsh environmental conditions. SCE owns and operates 37 dams with an average age of 80 years. Concrete deterioration, seepage, and degradation of facing materials are just a few of the issues that need to be addressed to maintain safe operation of dams. SCE has a comprehensive plan and schedule for critical dam rehabilitation that will allow these structures to continue to be valuable resources well into the new century.

One aspect of that plan is the installation of geomembrane liners on the upstream faces of four of SCE's concrete dams and all four of SCE's wood-faced dams. In 2006, SCE completed placement of the first geomembrane liner on Sabrina Lake Dam, a wood-faced rockfill dam on the Middle Fork of Bishop Creek.[1] The liner reduced seepage through the dam by 90 percent.

In the summer of 2007, Gem Lake Dam became the second SCE dam fitted with a geomembrane liner. This was needed to address freeze-thaw conditions that had led to concrete deterioration and subsequent seepage.

Structural deficiencies and complicating circumstances

SCE's 13-MW Rush Creek Power Project is on Rush Creek in Mono County, on the eastern slope of the Sierra Nevada mountains. The project consists of three dams (including Gem Lake Dam), three storage reservoirs, and one two-unit powerhouse.

Gem Lake Dam is a multiple arch concrete dam that impounds a reservoir with a capacity of 17,288 acre-feet. The dam is located in the Ansel Adams Wilderness Area. Gem Lake Dam is one of the first examples of multi-arch concrete dam design in the U.S. The dam is composed of 16 complete arches, each of 40-foot span between the centers of the buttresses. In addition, a partial arch at each end of the dam ties into the rock abutments. The dam is 688 feet long, with a maximum arch height of about 84 feet. The arches are 1 foot thick at the top and 3.95 feet thick at the bottom and are reinforced with concrete gravity sections up to elevation 9,027.5 feet. The buttresses range in thickness from 1.85 feet at the top to 4.25 feet at the lowest point. The buttresses are braced by counterforts ranging in width from 4.5 feet at the top (15 feet below the crest of the dam) to 11 feet at the lowest point. Double 12-inch by 18-inch concrete struts are placed between the buttresses.

The dam was built in 1915 and 1916 using aggregate found in the streambed of Rush Creek and adjacent rock. Because of the construction techniques of the time and the design of the concrete mix, the concrete is somewhat porous, which allows water to fill voids in the structure. In the winter, this water freezes, causing expansion and spalling of the concrete surface. Water migrating through the dam causes deterioration of the cement/aggregate matrix as cementitous material is leeched out, leaving pockets of loose aggregate. In several places, the concrete to a depth of 1 foot or more can be removed using a geologist's hand pick.

Seepage through Gem Lake Dam, completed in 1916, was severe and resulted in significant damage to the dam face.

In 1966, a program was undertaken to cover the entire upstream face with about 3 inches of gunite reinforced with heavy steel wire mesh. The gunite was sealed with polysulfide, placed in two coats over a primer. In 1969, a third coat of polysulfide was placed on the upstream face. The polysulfide coatings initially were successful in preventing water migration. However, their long-term performance proved less than desirable, as the coatings peeled away from the dam, leaving the gunite exposed.

Damage to the upstream face of Gem Lake Dam as a result of continuing seepage consisted of large cracks in the gunite and deteriorated polysulfide coating.

In 2006, SCE conducted an extensive site investigation to quantify the extent of concrete deterioration. Dean White, a

concrete consultant, observed the concrete condition, obtained corings, and took Schmidt hammer measurements. The conclusion of this investigation was that decades of uninterrupted freeze-thaw cycles had left substantial pockets of degraded concrete in two of the arches. Any attempt to repair those areas would be fruitless until the seepage through the dam was stopped.

Determining how to repair the dam

SCE identified and investigated three alternatives for dealing with the leakage at Gem Lake Dam:

– Remove the degraded polysulfide coating and replace with like in kind;

– Apply another gunite layer to the upstream face; and

– Apply a geomembrane liner over the upstream face.

With regard to the first two alternatives, removing the peeling polysulfide would require a method for collecting and disposing of the debris. In addition, the polysulfide coating already demonstrated a relatively short life-span (about 20 years). SCE had applied a layer of reinforced gunite in 1966 and, while it did significantly reduce seepage through the dam (by more than 50 percent), large cracks developed after about 20 years, allowing water to reach the original concrete and initiating the freeze-thaw cycles once again.

Geomembranes have been installed on more than 85 dams worldwide, constituting an area of more than 6.2 million square feet of dam face and a service life exceeding 850 years. Given this performance record, a life expectancy of more than 40 years was easily justified.

While the three alternatives had similar initial costs, they varied significantly in the estimated amortized annual costs (see Table 1). In addition, the geomembrane liner had a longer projected life (in excess of 40 years, compared with 20 years for coatings or gunite) and fewer environmental issues related to installation.

Table 1: Costs of the Three Rehabilitation Alternatives

	Projected Price	Life Expectancy	Yearly Amortization of Cost, at 4% Annual Inflation
Shotcrete upstream face	$2,750,000	20 years	$202,346
Polysulfide coating	$2,500,000	20 years	$183,950
Geomembrane liner	$2,750,000	50 years	$128,000

Design of the rehabilitation

The dam's location in a designated wilderness area provided some challenges. The primary means of transportation is a combination of two cabled tramways and a boat. Permits were required from several agencies, including the U.S. Forest Service (USFS), U.S. Fish and Wildlife (FWS), U.S. Army Corps of Engineers, and Regional Water Board. Activities in the wilderness require primitive methods to be used unless a compelling case can be made for mechanization. SCE showed that the liner could only be installed in a single season through the use of a mechanical excavator and four-wheeled vehicle. The effect on the wilderness environment, in the form of a drained reservoir, that would be incurred by extending the work to two seasons was greater than the effect of using mechanical equipment.

SCE negotiated a design and construction contract with CARPI USA in 2008. The contract included terms for ACE Restoration Company to perform grouting on the two arches suffering from significant damage. Before installing the geomembrane, CARPI provided a detailed design of the system, plans, and specifications. This included a constructability review with USFS and a pre-construction meeting of representatives from SCE, CARPI, ACE Restoration, and USFS to ensure all components of the installation were properly planned.

The design and execution of the Gem Lake Dam geomembrane system was complicated because of:

– Logistics involved with accessing the dam;

– Complicated geometry of the dam structure;

– Short window for construction due to high altitude; and

– Environmental constraints of working within a wilderness area.

The unique geometry of Gem Lake Dam required new design features and installation techniques to cost-effectively access the front face of the dam. On previous similar installations, CARPI's installation crew accessed the front face of the dam using scaffolding. For Gem Lake Dam, the cost to transport the scaffolding up the mountain and assemble it would be prohibitive (estimates were in excess of $200,000). In fact, if scaffolding was used it is unlikely the installation could have been completed in one season, a major goal of the installation.

In 2006, CARPI installed a geomembrane liner on Linach Dam in Germany. For this installation, CARPI personnel used swing stages to access the upstream face of the dam. A swing stage is a two-point adjustable suspension scaffold that is hung by ropes or cables connected to stirrups at each end of the platform. Swing stages typically are used by window washers but also are used in the construction industry. Although there would still be small areas of Gem Lake Dam that required scaffolding, the swing stages would allow access to more than 90 percent of the surface.

Because of their reduced transportation costs, use of the swing stage platforms would allow a significant reduction in potential costs to the project.

During this design phase, a careful preliminary design and analysis of the structure led to the conclusion that the typical method of installing tensioning profiles would not work at the intersection of adjacent arches. The geometry of the arches at Gem Lake Dam (relatively short arch spans) created an area at that intersection that was simply too tight. CARPI developed a new multi-layer system design and then constructed a full-size mockup, documenting each stage of the installation. This provided assurance to SCE and the California Department of Safety of Dams (DSOD) that the installation could be completed successfully.

Installing the geomembrane

Work to install the geomembrane liner at Gem Lake Dam began in June 2007 and involved many steps. In rough spots (about 3 percent of the surface), CARPI installed a 2,000-gram-per-square-meter geotextile directly on the surface to smooth irregularities and thus decrease surface preparation costs. Next, over the entire face, CARPI installed a Tenax Tendrain geonet (triplanar) for a drainage layer, with a thin geotextile to contain the existing polysulfide coating. CARPI then installed submersible watertight perimeter (stainless steel) seals along the foundation, crest of the two spillway arches, and both abutments. A non-submersible watertight perimeter (stainless steel) seal was installed along the crest of the 16 non-spillway arches. At three locations, CARPI installed drainage plates, with a drilled hole through the face at each location to allow discharge of water through the dam body. Stainless steel batten strips then were installed at the spring of the arches vertically, and stainless steel tensioning profiles were installed on the center of each arch vertically to hold the geomembrane to the dam.

The geocomposite, which consists of a polyvinylchloride (PVC) geomembrane 3 millimeters thick with 500 grams per square meter of geotextile, was installed in 1.05-meter widths horizontally on the face of each arch. Finally, CARPI personnel installed 3-millimeter-thick PVC geomembrane welding strips to cover the stainless steel tensioning profiles.

The key element of this system is the PVC geocomposite that waterproofs the entire face of the dam. This geocomposite consists of a geomembrane heat-coupled during extrusion to a non-woven geotextile. The geocomposite is attached to the face vertical profiles. This anchorage technique enables the geocomposite to elongate over large areas, minimizing stress to the material. The anchorage system also allows a drainage layer to be attached to the face of the dam because there is no adhesive layer to clog the drainage layer. This liner anchorage allows for two key benefits:

– Provides the possibility of drainage and subsequent discharge by gravity of seepage water that infiltrates the waterproofing liner or dam body. The water is collected and discharged downstream by a pipe installed through the dam; and

– Allows tensioning of the geomembrane to prevent the formation of wrinkles and sagging that can reduce the longevity of the installation.

Benefits from dam rehabilitation

Many benefits were achieved from installation of the CARPI geomembrane system at Gem Lake Dam:

A key design element of the geomembrane liner at Gem Lake Dam was a new attachment system in the spring of the arches (see arrow). This spring area was so tight that tensioning profiles at previous dams could not be used here.

The final area covered by the geomembrane system at Gem Lake Dam was more than 60,800 square feet over 16 complete arches and two partial arches with two arches grouted. All of this work was completed in 15 weeks.

– Seepage control. Seepage measurements taken since the geomembrane installation was completed in September 2007 show reductions of 50 percent to 90 percent and no visible seepage in the unbuttressed sections (upper 30 feet of arches).

– Eliminating freeze-thaw deterioration. Stopping the passage of water through the dam will dry the downstream face, eliminating the cause of freeze-thaw deterioration.

– Longevity. The CARPI system has a successful track record on more than 85 dams. Dam rehabilitation installations have been in operation for more than 30 years. It is expected that these installations will exceed 50 years, as documented in a geomembrane sampling study from six existing projects.2

– Cost effectiveness. The geomembrane system and the other options had effectively the same installation price.

However, with the proven longevity of the geomembrane system, the life-cycle cost analysis shows the

CARPI geomembrane to clearly be the most cost-effective. The geomembrane system had minimal environmental effects, while both shotcrete and polysulfide would have required significantly more environmental safeguards. Lastly, the volume and weight of materials required for the shotcrete option made it unattractive because of the additional cost of tram transport and likely maintenance issues from heavy use. The polysulfide and geomembrane system had similar transportation costs. However, the geomembrane system was significantly safer. Almost all the geomembrane system materials were solids so that if a load was lost during transit, there was no significant hazard. The polysulfide system involved liquids and paste that would have represented a significant clean-up risk in the event of an accident.

– Fewer environmental effects. The geomembrane system had significantly fewer project environmental effects than the other options. The geotextile on the geonet drainage layer enabled the existing polysulfide coating to be captured in place without any need to remove. Both the shotcrete and polysulfide options would have required this layer to be removed, which would have been expensive and difficult. The geomembrane installation at Gem Lake Dam was completed without any construction or alteration of the site. No sediment was released, as the reservoir shoreline was more than 100 feet upstream of the dam face. Minimum instream releases were maintained throughout the installation process.

– Greater aesthetic value. The geomembrane installation at Gem Lake Dam will remain mostly underwater more than 90 percent of the time, leaving the dam appearance essentially unaltered. When the geomembrane is exposed, either during low water years or drained reservoir conditions, the geomembrane is a neutral gray color that gives the dam a clean, uniform appearance that blends well with the surrounding terrain.

– Minimal maintenance. The CARPI geomembrane system is a passive system that requires no maintenance.

Future installations

SCE is investigating the benefits of installing similar geomembrane liners on several other dams, including Agnew Lake (concrete multi-arch), Hillside and Saddlebag (wood-faced rockfill), Shaver Lake (concrete gravity), and Tioga Lake (wood-faced rockfill main dam and concrete arch auxiliary dam).

John Stoessel, P.E., a senior engineer with Southern California Edison's Dam Safety Group, was project manager for the geomembrane installation work. John Wilkes, P.E., is president of CARPI USA, the company that manufactured and installed the geomembrane liner.

Notes

1. Tech Briefs, Hydro Review, Volume 26, No. 4, August 2007.

2. Cazzuffi, D., "Long Term Performance of Exposed Geomembranes on Dams in Italian Alps," International Conference on Geosynthetics Conference Proceedings, Industrial Fabrics Association International, Roseville, Minn., 1998.

ΓΕΩΤΕΧΝΙΚΗ ΟΡΟΛΟΓΙΑ

Γενική είναι η πεποίθηση ότι η ελληνική τεχνική ορολογία πολύ απέχει απ΄ το να έχει αναπτυχθεί σε βαθμόν εφάμιλλο προς την ορολογία της αγγλικής... Η κατάσταση της γεωτεχνικής ορολογίας δεν αποτελεί εξαίρεση απ΄ τον γενικό κανόνα. Κάθε άλλο μάλιστα· απ΄ την σωρείαν τον καινούργιων εννοιών και όρων που ξεπήδησαν τα τελευταία 30 ιδίως χρόνια ένα μέρος μόνον αποδόθηκε στα ελληνικά με τρόπον ορθολογικό… Με την πεποίθηση ότι η ελληνική είναι μία γλώσσα με αφάνταστη πλαστικότητα, λεξιπλαστική ευελιξία, προσαρμοστικότητα και ανεκτίμητον τρισχιλιετή πλούτο, στο άρθρο αυτό υποστηρίζω (συνοπτικά και κάπως αμέθοδα) την ανάγκη για την καλλιέργεια **ελληνικής** ορολογίας ως μέσου σκέψης και επικοινωνίας (και) στην γεωτεχνική.

Τα παραπάνω ανέφερε σε άρθρο του ο Γιώργος Γκαζέτας στο 1ο Πανελλήνιο Συνέδριο Γεωτεχνικής Μηχανικής (3-5 Φεβρουαρίου 1988, Τόμος 3, σελ. 73 – 76). Από τότε πολλοί γεωτεχνικοί όροι έχουν αποδοθή στην ελληνική γλώσσα, άλλοι επιτυχώς και άλλοι ανεπιτυχώς.

Η παρουσίαση της Διδακτορικής Διατριβής του Γιώργου Μπελόκα (ΤΑ ΝΕΑ ΤΗΣ ΕΕΕΕΓΜ, Νοέμβριος 2008, Αρ. 18, σελ. 6-9), ο οποίος έκανε μια εξαιρετική προσπάθεια απόδοσης παλαιών και νέων γεωτεχνικών όρων από τα αγγλικά στα ελληνικά, γέννησε την ιδέα της διοργάνωσης κάποιας διάλεξης – ημερίδας ή την σύσταση ομάδας εργασίας που θα ασχοληθή με αυτό το θέμα.

Με την ευκαιρία, λοιπόν, του 6ου Πανελληνίου Συνεδρίου Γεωτεχνικής και Γεωπεριβαλλοντικής Μηχανικής, όπου αρκετοί συνάδελφοι θα προσπαθήσουν να αποδώσουν στα ελληνικά στα άρθρα τους ξένους όρους, και 22 χρόνια μετά την πρώτη προσπάθεια του Γ. Γκαζέτα, δίνουμε βήμα για την παρουσίαση προτάσεων για ελληνική γεωτεχνική ορολογία, ξεκινώντας από τις κάποιες σχετικές ιδέες του Γ. Γκαζέτα και τις προτάσεις του Γ. Μπελόκα.

back pressure	ενδοπίεση
clay particles	αργιλικά πλακίδια
cyclic stress	ανακυκλιζόμενη ένταση
deterministic	προσδιορισμικός
deviatoric (stress)	διεκτροπική (τάση)
dilatancy	διασταλτικότητα (ή διαστολικότητα)
dynamic (cyclic) compaction	δυναμική συνίζηση (ή διατμητική ανακυκλική συνίζηση) – στην εδαφοδυναμική
excitation	διέγερση, εξαίτηση
(dynamic) impedance	σύνθετη δυναμική δυσκαμψία (στις ταλαντώσεις θεμελίων)
performance	επιτελεστικότητα
plastic limit	όριο πλασιμότητας
plasticity index	δείκτης πλασιμότητας
resonant column	δοκιμή συντονισμού
rocking	λικνισμός
swaying	παλινδισμός
Standard Penetration Test	Δοκιμή Κρουστικής Διείσδυσης (ή Τυποποιημένη Δοκιμή Διείσδυσης)
Stiffness	δυσκαμψία (γενικώς)
(soil) stiffness	(εδαφική) δυστροπία
strain	τροπή
unit weight	ειδικό βάρους εδάφους

(Γ. Γκαζέτας)

Ageing	Γήρανση
Angle of Shearing Resistance	Γωνία Διατμητικής Αντοχής
Apparent Precompression Pressure	Φαινόμενη Τάση Προφόρτισης
Apparent Preconsolidation Pressure	Φαινόμενη Τάση Προστερεοποίησης
Apparent Preloading [1]	Φαινόμενη Προφόρτιση
Associated Rule	Συσχετισμένος Νόμος
Axisymmetric	Αξονοσυμμετρικός
Axisymmetric Tests [2]	Αξονοσυμμετρικές Δοκιμές
Back Tensor	Τανυστής Μνήμης
Bedding	Στρωσιγένεια
Bonding [3]	Δέση
Bonds	Δεσμοί
Bulk Modulus	Μέτρο Ισόογκης Παραμόρφωσης
Cementation	Τσιμέντωση
Cluster	Συσσωμάτωμα
Coefficient of Compressibility Cc	Συντελεστής Συμπιεστότητας
Coefficient of Swelling Cs ή Cr	Συντελεστής Αποφόρτισης Επαναφόρτισης (ή διόγκωσης)
Collapsible Soil	Καταρρεύσιμο (ή Καταρρέον) Έδαφος
Compressibility	Συμπιεστότητα
Compression Modulus	Μέτρο Συμπίεσης
Conjugate Point	Συζυγές Σημείο
Consistency Condition	Συνθήκη Συμβατότητας
Consolidation	Στερεοποίησης
Contractancy	Συστολικότητα
Coupled Consolidation	Συζευγμένη Στερεοποίηση
Creep	Ερπυσμός
Critical State	Κρίσιμη Κατάσταση
Critical State Line	Γραμμή Κρίσιμης Κατάστασης
Critical Void Ratio = Critical State	Κρίσιμος Λόγος Κενών = Κρίσιμη Κατάσταση
Critical Volume [4]	Κρίσιμος Όγκος
Current State [5]	Τρέχουσα Κατάσταση
Current State [6]	Τρέχουσα Κατάσταση
Cyclic Hardening	Ανακυκλική Κράτυνση
Cyclic Loading	Ανακυκλική Φόρτιση
Cyclic Mobility	Ανακυκλική Κινητικότητα
Cyclic Softening	Ανακυκλική Χαλάρωση
Dense Sand [7]	Πυκνή Άμμος
Destructuration	Αποδόμηση
Destructured [8]	Αποδομημένο
Deviatoric	Διεκτροπικός
Diagenesis	Διαγένεση
Dilatancy	Διαστολικότητα
Discretization	Διακριτοποίηση
Dispersing Agents	Διαλύτες
Distortional Hardening	Στρεβλωτική Κράτυνση
Disturbance	Διατάραξη
Elastic Modulus	Μέτρο Ελαστικότητας
Erosion	Αποσάθρωση
Excess Pore Pressures	Υπερπιέσεις Πόρων
Fabric	Ιστός
Fabric Tensor	Τανυστής Ιστού
Fissure	Ρωγμή

Foliated	Φυλλώδης
Geomaterial [9]	Γεωυλικό
Glacial Deposit	Παγετώδης Απόθεση
Glacier	Παγετώνας
Hardening	Κράτυνση
Hardening Variables	Μεταβλητές Κράτυνσης
Heavily Preloaded [10]	Ισχυρά Προφορτισμένο
Increment	Επαύξηση
Index Properties	Φυσικά Χαρακτηριστικά
Inelastic [11]	Ανελαστικός
Infinitesimal	Απειροστός
Interlocking	Αλληλοεμπλοκή
Interparticle Strength	Διακοκκώδης Αντοχή
Interpolation Rule	Κανόνας (Νόμος) Προβολής
Intrinsic [12]	Εγγενής
Intrinsic Compressibility [13]	Εγγενής Συμπιεστότητα
Intrinsic Compression Curve [14]	Εγγενής Καμπύλη Συμπίεσης
Intrinsic Preloading Stress [37]	Εγγενής Τάση Προφόρτισης
Isotropic Hardening	Ισότροπη Κράτυνση
Joint	Ρηγμάτωση
Kinematic Hardening	Κινηματική Κράτυνση
Lacustrine Deposit	Λιμναία Απόθεση
Laminated	Λεπιοειδής
Leaching	Απόπλυση
Lightly Preloaded [15]	Ελαφρά Προφορτισμένο
Limiting Compression Curve [16]	Περιοριστική Καμπύλη Συμπίεσης
Liquefaction	Ρευστοποίηση
Loadind	Φόρτιση
Loose Sand [17]	Χαλαρή Άμμος
Macrostructural Characteristics [18]	Μακροδομικά Χαρακτηριστικά
Mapping Rule	Κανόνας (νόμος) Προβολής
Mechanical Properties	Μηχανικές Ιδιότητας
Microstructural Characteristics [19]	Μικροδομικά Χαρακτηριστικά
Mobilized Strength [20]	Κινητοποιούμενη Αντοχή
Modulus of Elasticity	Μέτρο Ελαστικότητας
Normal Compression Curve [21]	Καμπύλη Κανονικής Συμπίεσης (Φόρτισης)
Normally Consolidated [22]	Κανονικά Στερεοποιημένο
Normally Loaded [23]	Κανονικά Φορτισμένο
Oedometer [24]	Οιδήμετρο
One Dimensional Consolidation [25]	Μονοδιάστατη Στερεοποίηση
One Dimensional Deformation (Compression) [26]	Μονοδιάστατη Παραμόρφωση (Συμπίεση)
Peak Strength	Κορυφαία Αντοχή
Phase Parameter [27]	Παράμετρος Φάσης
Phase Transformation State [28]	Κατάσταση Αλλαγής Φάσης
Plastic [29]	Πλαστικός
Poroelasticity	Πορoελαστικότητα
Precompression	Προφόρτιση
Preconsolidated [30]	Προστερεοποιημένο
Preloaded [31]	Προφορτισμένο
Quick Clay [32]	Ταχεία Άργιλος
Reconstituted	Αναζυμωμένο
Remoulded	Αναμοχλευμένο
Residual Soil	Αυτόχθον Έδαφος
Rotational Hardening	Στροφική Κράτυνση
Sampling	Δειγματοληψία
Sedimentation Compression Curve	Ιζηματογενής Καμπύλη Συμπίεσης
Seepage	Διήθηση
Sensitive Clay	Ευαίσθητη Άργιλος
Softening	Χαλάρωση
Soil Memory [33]	Μνήμη Εδάφους
State Boundary Surface	Επιφάνεια Οριακής Κατάστασης
State Variables	Μεταβλητές Κατάστασης
Step Loading	Βαθμιδωτή Φόρτιση
Stiff	Στιφρός
Stiffness	Στιβαρότητα
Strain Localization	Εντοπισμός Παραμόρφωσης
Strain Path	Παραμορφωσιακή Όδευση
Stress History	Ιστορία Φόρτισης
Stress Path	Τασική Όδευση
Stress Variables	Μεταβλητές Τάσης
Stressing	Ένταση
Structure [34]	Δομή
Structureless [35]	Μη Δομημένο
Swelling Index Cs	Δείκτης Διόγκωσης
Tensor	Τανυστής
Thixotropy	Θιξοτροπία
Trial and Error Technique	Τεχνική της Δοκιμής και Πλάνης
Underconsolidated	Υποστερεοποιημένος
Unloading	Αποφόρτιση
Virgin Compression Curve [36]	Καμπύλη Παρθένας Φόρτισης
Void Index	Δείκτης Κενών
Voids' Ratio	Λόγος Κενών
Weathering	Διάβρωση
Yield	Διαρροή
Yield Stress	Τάση Διαρροής

[1] "Προφόρτιση" που δεν δικαιολογείται από την ιστορία φόρτισης μόνο

[2] Οι συνοριακές συνθήκες φόρτισης έχουν έναν άξονα συμμετρίας (π.χ. τυπική τριαξονική διάτμηση, μονοδιάστατη παραμόρφωση, ισότροπη συμπίεση)

[3] Κάθε είδους παράγοντας, εκτός της ιστορίας φόρτισης, που οδηγεί σε αυξημένη διακοκκώδη αντίσταση

[4] Στην στραγγισμένη διάτμηση, ο ειδικός όγκος ή λόγος κενών στην κρίσιμη κατάσταση (παραμόρφωση υπό σταθερό όγκο)

[5] Τρέχουσα τασική κατάσταση και λόγος κενών

[6] Η τασική και παραμορφωσιακή κατάσταση του υλικού. Συχνά αντί της παραμορφωσιακής κατάστασης χρησιμοποιείται ο ειδικός όγκος, ο οποίος σχετίζεται με την ογκομετρική παραμόρφωση

[7] Έχει διαστολική συμπεριφορά υπό διάτμηση

[8] Structureless ≠ Destructured

[9] Απαρτίζεται από τα εδαφικά και τα βραχώδη υλικά

[10] Έχει διαστολική συμπεριφορά υπό διάτμηση

[11] Μια κλειστή παραμορφωσιακή όδευση παράγει έργο

[12] π.χ. intrinsic properties: εγγενείς ιδιότητες, intrinsic states: εγγενείς καταστάσεις, intrinsic compression curves: εγγενείς καμπύλες συμπίεσης

[13] Ο συντελεστής λ στο επίπεδο v-lnp

[14] Περιγράφει μη δομημένες καταστάσεις και αποτελεί μια καμπύλη κανονικής φόρτισης (το αντίστροφο δεν ισχύει πάντα)

[15] Έχει συστολική συμπεριφορά υπό διάτμηση αλλά δεν βρίσκεται στη μέγιστη μέση ορθή τάση της ιστορίας φόρτισής του

[16] Καμπύλη συμπίεσης των άμμων

[17] Έχει συστολική συμπεριφορά υπό διάτμηση

[18] Χαρακτηριστικά κλίμακας μεγαλύτερης από το μέγεθος του κόκκου

[19] Χαρακτηριστικά κλίμακας αντίστοιχης του μεγέθους του κόκκου

[20] π.χ. $\varphi_m \leq \varphi_{peak}$

[21] Η καμπύλη κατά την οποία ο λόγος προφόρτισης (ή προστερεοποίησης) είναι ίσος με τη μονάδα (σε υλικά με δέση,π.χ. τσιμπεντωμένα, NCL και ICL δεν ταυτίζονται)

[22] Βρίσκεται στη μέγιστη μέση ορθή τάση της ιστορίας φόρτισης και έχουν εκτονωθεί οι πιέσεις πόρων

[23] Βρίσκεται στη μέγιστη μέση ορθή τάση της ιστορίας φόρτισης

[24] Συσκευή μονοδιάστατης παρμόρφωσης

[25] Στερεοποίηση και εκτόνωση πιέσεων πόρων σε μια διεύθυνση

[26] Παραμόρφωση σε μια διεύθυνση (συνήθως πλευρικά ανένδοτη παραμόρφωση). Δεν ταυτίζεται με την στερεοποίηση

[27] Βαθμωτό μέγεθος που συσχετίζει την τρέχουσα κατάσταση με μια ισοδύναμη κατάσταση αλλαγής φάσης. Χρησιμοποιείται ώστε να ξεχωρίσουμε τη διαστολική με τη συστολική συμπεριφορά. Προτιμάται έναντι του όρου παράμετρος κατάστασης

[28] Ο γεωμετρικός τόπος των καταστάσεων οι οποίες διαχωρίζουν τη συστολική από τη διαστολική συμπεριφορά

[29] Μια περιγραφή της ανελαστικότητας

[30] Υλικό το οποίο έχει βρεθεί σε μεγαλύτερη μέση ορθή τάση από την τρέχουσα και έχουν εκτονωθεί πλήρως οι πιέσεις πόρων

[31] Υλικό το οποίο έχει βρεθεί σε μεγαλύτερη μέση ορθή τάση από την τρέχουσα

[32] Ευαίσθητη άργιλος

[33] Όλοι εκείνοι οι παράγοντες, εκτός της τρέχουσας κατάστασης, από τους οποίους εξαρτάται η αντοχή, στιβαρότητα και διαστολικότητα

[34] Κάθε είδους παράγοντας που οδηγεί σε αυξημένη διακοκκώδη αντίσταση

[35] Υλικό στο οποίο η τρέχουσα τασική και παραμορφωσιακή κατάσταση επαρκούν για την περιγραφή της μηχανικής του συμπεριφοράς (αντοχή, στιβαρότητα)

[36] Η καμπύλη κατά τη φάση της ιζηματογένεσης

[37] Αντιστοιχεί σε μια ισοδύναμη μη δομημένη κατάσταση

ΟΡΟΛΟΓΙΑ – ΟΡΙΣΜΟΙ

Τρέχουσα κατάσταση: ορίζεται από την τρέχουσα τασική κατάσταση (δηλαδή τον τανυστή των τάσεων, **σ**, και τον τρέχοντα ειδικό όγκο, **v**, του εδαφικού υλικού.

Εγγενής κατάσταση: αποτελεί την κατάσταση κατά την οποία η μηχανική συμπεριφορά του υλικού περιγράφεται πλήρως από την τρέχουσα κατάστασή του.

Μη δομημένη κατάσταση ≡ εγγενής κατάσταση.

Μη δομημένα υλικά: τα υλικά η συμπεριφορά των οποίων περιγράφεται μόνο από την τρέχουσα κατάσταση (τασική κατάσταση, **σ**, και ειδικός όγκος, **v**). Βρίσκονται σε μη δομημένη κατάσταση.

Δομημένη κατάσταση: κατάσταση κατά την οποία η μηχανική συμπεριφορά του υλικού δεν περιγράφεται μόνο από την τρέχουσα κατάσταση, αλλά απαιτείται η γνώση της «μνήμης» του.

Δομημένα υλικά: τα υλικά που βρίσκονται σε δομημένη κατάσταση.

Υλικά με δέση: ονομάζονται τα υλικά τα οποία εμφανίζουν δομή για λόγους πρόσθετους από την ιστορία φόρτισης.

Κανονικά φορτισμένο υλικό: το υλικό που βρίσκεται στη μέγιστη μέση ορθή τάση της ιστορίας φόρτισής του υπό συνθήκες ακτινικής συμπίεσης.

Προφορτισμένο υλικό: το υλικό που δεν είναι κανονικά φορτισμένο.

Φαινόμενη προφόρτιση: η προφόρτιση που φαίνεται να έχει το υλικό και δεν δικαιολογείται μόνο από την ιστορία φόρτισής του.

(Γ. Μπελόκας)

Και για να τελειώσουμε το θέμα των όρων και των ορισμών με μια εύθυμη νότα, παραθέτουμε έναν πίνακα με συνήθεις εκφράσεις που συναντώνται σε επιστημονικά άρθρα και την «πραγματική» σημασία τους. Ο Πίνακα αυτός κυκλοφορούσε στο Τμήμα Εδαφομηχανικής του Imperial College 30 χρόνια πριν!

COMMON SCIENTIFIC AND TECHNOLOGICAL PHRASES AND THEIR REAL MEANINGS

INTRODUCTION

It has long been known that …	I haven't bothered to look up the original reference.
While it has not been possible to provide definite answers to these questions …	The experiments didn't work out but I figured I could get at least one paper out of the mess.

EXPERIMENTAL PROCEDURE

The W-Pb system was chosen as especially suitable to show the predicted behaviour …	The fellow in the next lab already had it made up.
High Purity Very High Purity Super Purity	Composition unknown except for exaggerated claims of supplier.
Three samples were chosen for detailed study.	The results of the others didn't make sense and were ignored.
Accidentally strained during mounting.	Dropped on the floor.
Handled with extreme care during the course, of the experiment.	Not dropped on the floor.

RESULTS

Typical results are shown.	The best results are shown.

Although some detail has been 'lost in reproducing the original photograph, it is clear that ...	It is impossible to tell from the photograph.
Agreement with predicted results is:	
Excellent	Fair
Good	Poor
Satisfactory	Doubtful
Fair	Imaginary
As good as can be expected under test conditions	Non-existent
The most remarkable and reliable values are those of Jones.	He was a student of mine.

DISCUSSION

It is generally believed …	Two other guys think so too.
It might be argued that …	I have such a good answer to this objection that I shall now raise it.
It is clear that much additional work will be required before a complete understanding …	I don't understand it.
Unfortunately, a quantitative theory to account for these effects has not been formulated.	No one else understands it either.
Correct within other of magnitude.	Wrong.
It is to be hoped that this work will stimulate further work in this field.	This paper isn't very good, but neither are any of the others on this miserable subject.

ACKNOWLEDGEMENTS

I acknowledge the help of J. H. Smith with the experiments and the valuable discussions with A. B. Brown.	Smith did the work, Brown explained what it meant.

MYTHS AND MISCONCEPTIONS IN GROUND ENGINEERING

The BGA have established a Lifed Panel to examine Myths and Misconceptions in Ground Engineering. At the BGA Annual Conference on the 18th June 2010, John Atkinson presented an introduction to the myths identified by the Panel. The full list of myths is now available on the BGA website (http://bga.city.ac.uk/cms/html/myths-list-020710.doc). Ground engineers are invited to read the list of myths and provide feedback (guidance for feedback is as at http://bga.city.ac.uk/cms/html/myths-feedback-020710.doc)

Myths and Misconceptions in Ground Engineering

Myth – something widely held to be true but which is in fact false.

We are considering beliefs generally held by engineers involved in ground engineering including structural engineers, local authority engineers, road and rail engineers and engineering geologists.

Bold text is the myth; *italic text is the reason.*

1 General

1.1 It is a myth that geotechnical engineering terminology is always clearly defined and understood.

There are many sets of words that are often used ambiguously. Some examples are: cohesion and undrained strength; compression, consolidation, compaction; yield and failure.

1.2 It is a myth that if it has been published it must be true.

There are many published examples of erroneous data unsubstantiated interpretations and conflicting conclusions.

1.3 It is a myth that a soil behaves differently in different laboratories.

A soil must behave in the same way wherever it is but some laboratories obtain less reliable data than others.

1.4 It is a myth that different countries need different soil mechanic theories.

Basic soil mechanics theories should be universal but many experimenters and engineers interpret their data within a local paradigm.

1.5 It is a myth that total and effective stresses are always correctly applied in design.

The key word is always. We all have anecdotal evidence that total and effective stresses are sometimes applied incorrectly.

1.6 It is a myth that soils are either fully drained or fully undrained.

In practice there is some drainage and some excess pore pressure throughout construction. Nearly all routine geotechnical analyses have to assume the soil is saturated and it is either fully drained or fully undrained.

1.7 It is a myth that the behaviour of a soil depends on either the water content or on the effective stress alone.

Soil behaviour depends on a combination of effective stress and water content; a convenient measure is state parameter which describes the current stress and water content in relation to a reference state. (At high stress dense sand will compress on shearing.)

1.8 It is a myth that empirical correlations and calibrated calculations are at least as reliable as the original data.

Since original data are scattered a correlation or calibration, which must employ an averaging, cannot be better than the original data.

2 Theoretical Modelling

2.1 It is a myth that problematic soils require special theories.

All so called problematic soils such as carbonate sands and quick clays can be reasonably well modelled by simple extensions and modifications to the current basic soil mechanics theories.

2.2 It is a myth that static and dynamic behaviour requires different theories.

Static events are the same as dynamic events in which strain rates are small and inertial effects negligible. They do not require different theories.

3 Strength and ULS

3.1 It is a myth that failure in soil can be characterised by one strength.

A soil has 8 identifiable strengths although under some conditions some may be the same. During monotonic shearing soil will successively reach states defined by; the peak stress ratio, the peak deviator stress, continuous distortion at constant effective stress and constant volume (this is the critical state) and a residual state involving laminar flow of clay plates. Each set may be for drained of for undrained shearing.

3.2 It is a myth that it is only necessary to consider the peak and residual strengths of soils.

The critical state or ultimate strength (for turbulent flow) is equally important. Critical state strength is a material parameter, the value depends only on the grains and so it is not influenced by sample disturbance.

3.3 It is a myth that peak strength can always be used safely for ULS designs.

The ULS implies there may be strains larger than those that correspond to the peak strength.. ULS designs based on the Mohr-Coulomb linear peak strength envelope can be unsafe even with a factor because (a) the strength decreases post-peak and (b) the curvature of the true envelope means the peak strength is smaller that the Mohr-Coulomb strength for normal stresses higher and lower than those to which the linear envelope was fitted.

3.4 It is a myth that the critical state strength has no practical application.

The ultimate or critical state strength normally governs the ULS. (Or, if there are pre-existing unfavourable shear planes the ULS may be governed by a residual strength.)

3.5 It is a myth that a sliding plane derived from ULS analysis with a peak strength is the actual slip surface.

The strength changes with deformation and hence the only reliable slip plane is when the critical state is reached and the critical state friction angle is used.

4 The Mohr-Coulomb Myth.

4.1 It is a myth that the linear effective stress Mohr-Coulomb envelope with c' and ϕ' is a reliable way to describe the peak strength of soil over a range of effective stress.

The strength of unbonded soil is zero when the effective normal stress is zero and at large effective stress the peak and ultimate (CS) strengths are the same. In between, the peak strength is larger than the ultimate strength. It is impossible to construct a linear envelope through these points.

4.2 It is a myth that there is nothing available that is better than the Mohr-Coulomb envelope.

A power law such as $\tau'_p = A\sigma_p'^b$ provides a better fit to experimental observations over a wide range of stress.

4.3 It is a myth that volume change during shearing is unimportant.

Volume changes during shearing explain the peak strength of unbonded soil through a stress-dilatancy law $\tau_p' = \sigma' \tan(\phi_c' + \psi_p)$. The angle of dilation ψ_p depends on state parameter. A stress dilatancy equation leads directly to the Cam Clay family of soil models.

4.4 It is a myth that the parameters used for the Mohr-Coulomb model are material properties.

The peak strength envelope varies with state (i.e. with a combination of stress and water content).

5 Deformations and SLS

5.1 It is a myth that numerical analyses are able to predict stresses and ground movements reliably even when advanced models are used.

Even with the most advanced soil models it is extremely difficult to make reliable predictions of stresses and ground movements throughout a region of the ground.

5.2 It is a myth that soil is perfectly elastic or perfectly plastic

Soil is soil and the words elastic and plastic describe theories or sets of equations; clearly soil cannot be elastic or plastic. The best that can be said is that under certain circumstances the theories of elasticity or plasticity can be used to obtain approximate solutions for soil.

6 Testing and evaluation of parameters

6.1 It is a myth that SPT N by itself can determine both strength and stiffness.

One observation, an N value, cannot be correlated to two independent variables. (There is no unique relationship between strength and stiffness of soils.) The best that can be said is that N value can be correlated to state parameter and N corrected for effective stress can be correlated to relative density or liquidity index.)

6.2 It is a myth that if the behaviour of one sample is modelled correctly, the results of geotechnical analyses will be correct.

In a sample the stress and strains are uniform and the boundary conditions are simple. In the ground it is to much more complicated.

6.3 It is a myth that in-situ permeability can be evaluated reliably from laboratory tests.

Permeability should be measured in in situ tests. For coarse grained soils these can be steady state pumping tests and for fine grained soils they can be dissipation tests.

6.4 It is a myth that a simple flownet can reliably predict pore pressures.

Flownet geometry is highly dependent on local variations of horizontal and vertical permeability in the ground and these influence spot measurements of pore pressure.

6.5 It is a myth that basic soil behaviour can be determined from samples containing slip planes without detailed non-conventional analyses.

In a sample with slip planes strains and volume changes are non-uniform and the shearing resistance may occur on planes other than those assumed in conventional analyses of test data.

6.6 It is a myth that a test on a soil sample with large effective stress and which does not form a slip plane can be terminated at 20% strain.

In such samples. large strain is necessary to reach the critical state.

6.7 It is a myth that the standard saturation procedure for triaxial testing does not damage the specimen

The procedure requires the specimen to compress and drain water to fill the spaces occupied by air in the drainage leads so the water content in the sample changes.

6.8 It is a myth that centrifuge modelling is of no use.

Centrifuge and other forms of physical modelling have important applications including examination of mechanisms and calibration of numerical analyses.

7 Education and Training

7.1 It is a myth that it is better to start by teaching consolidation theory and strength theory separately.

Unification of shear stress, effective normal stress and volume should be introduced right at the start. Only in this way is it possible to explain clearly features such as undrained strength and the relationships between peak strength, dilation and state.

7.2 It is a myth that all graduate civil engineers fully understand ground engineering theories and are able to apply any fundamental understanding they have into practice.

Everyone who has marked university examinations or who has acted as external examiner understands the skills levels of graduate civil engineers in the several major disciplines. Then supervising engineers train them to apply standard practices, themselves the subject to myth.

The brief from BGA is: "The starting point for the creation of this panel were concerns raised by Professor Andrew Schofield about the way in which soil strength has traditionally been characterised in soil mechanics. The brief for the panel will expand from this and will encompass traditional approaches to the characterising of soil behaviour in general not only soil strength."

The Panel have drawn up a list of myths and misconceptions. These were introduced in a talk given by John Atkinson at the BGA Conference. They have now been published on the BGA website.

The Panel invite feed-back and comment from the BGA Membership and from other Ground Engineering Professionals. Possible responses include:

1 I agree this is a myth

2 This is not a myth because it is true (and this is the evidence).

3 This is not a myth because few believe it.

4 Here are some more myths, with explanations.

ΛΟΓΟΣ - ΑΝΤΙΛΟΓΟΣ

Στο πρόσφατο μήνυμά του, 270 ημέρες μετά την εκλογή του, ο νέος Πρόεδρος της International Society for Soil Mechanics and Geotechnical Engineering Jean-Louis BRIAUD έθεσε το παρακάτω ερώτημα, ζητώντας να ενημερωθούν τα μέλη των εθνικών ενώσεων της ISSMGE:

ISSMGE or ISGE. Should we be called Geotechnical Engineers or Geo-Engineers? The word technical seems redundant alongside engineer. Indeed it is difficult to imagine a non-technical engineer. Also the word technical is close to technicians and may give the wrong idea about our profession. We also accept many words like geo-synthetics (not geotechnical synthetics), geo-materials (not geotechnical materials), geo-technique (not geotechnical technique), geo-environmental (not geotechnical environmental), the list goes on. Associated with this question is the question: should we be the International Society for Geo-Engineering (ISGE) rather than the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE)? I would like to hear your opinion on this matter.

Απαντήσεις

Dear Jean-Louis,

Although I agree with your idea in principle, it is too late to make the proposed change now. Geoengineering (or climate engineering) is a common term that is usually taken to mean proposals to deliberately manipulate the Earth's climate to counteract the effects of global warming from greenhouse gas emissions. The National Academy of Sciences defined geoengineering as "options that would involve large-scale engineering of our environment in order to combat or counteract the effects of changes in atmospheric chemistry." IPCC (2007) concluded that geoengineering options, such as ocean fertilization to remove CO2 from the atmosphere, remained largely unproven, and so on.

Actually the entry on geo-engineering in Wikepedia http://en.wikipedia.org/wiki/Geoengineering warns the readers not to confuse it with geotechnical engineering.

At this stage, changing geotechnical engineering to geo-engineering will only cause confusion.

Best regards / Med vennlig hilsen

Farrokh Nadim, ScD

Director, International Centre for Geohazards (ICG)
Web: www.geohazards.no

Dear Professor Briaud

Regarding the name of our society, I was honestly in favor of ISGE (International Society of Geotechnical Engineering) before receiving the recent email of Professor Pinto. His reasoning in his email convinced me that ISSMGE is the most representative name for our society. Therefore I vote for ISSMGE.

Sincerely yours,

Abbas Soroush

Chairman of the Board of Directors
Iranian Geotechnical Society (IGS)

Ανταπάντηση

ISSMGE or ISGE. Last month I asked you two questions. Should we be called Geo-Engineers? And should we drop the Soil Mechanics part of our society name? I received a total of 39 responses from 16 countries: some were emails "reply to all", some were emails sent to me only, I also had 7 phone calls where the matter was discussed. While most responses were not official, the results may be of interest to you.

- Geo-engineering: 21 No, 14 Yes, 4 neutral.
- Int. Soc. of Geotechnical Engineering: 21 Yes, 11 No, 7 neutral

So, while the discussion remains open, it seems that the idea of Geo-Engineering encountered strong opposition while the idea of ISGE encountered strong support. I suggest that we concentrate on the idea of ISGE. I would like to hear from more members and more countries on the idea of going from ISSMGE to ISGE. My view is that:

1. Some 80% of our member societies do not have Soil Mechanics in their own names,
2. If asked what they were, most of our members would likely answer: geotechnical engineer,
3. The title of our conferences rarely include the words soil mechanics. For example we do not say conference on soil mechanics and deep foundations or conference on soil mechanics and slope stability,
4. A change in name, although cosmetic only, sends a message of dynamism in our field,
5. The name of our society is unduly long,
6. Soil Mechanics is part of Geotechnical Engineering, it is the foundation of our field along with Soil Chemistry, Soil Thermodynamic, and others. It is not separate. Adding it is redundant, inefficient, and cumbersome.

That is my view. What is your view?

ΑΝΑΣΚΟΠΗΣΗ ΓΕΓΟΝΟΤΩΝ ΓΕΩΤΕΧΝΙΚΟΥ ΕΝΔΙΑΦΕΡΟΝΤΟΣ

www.decge2010.sk

Το 14th Danube-European Conference on Geotechnical Engineering (DECGE) διεξήχθη το διάστημα 2 – 4 Ιουνίου 2010 στην Bratislava της Σλοβακίας. Το συνέδριο διοργανώθηκε από την Czech and Slovak Committee of ISSMGE και το Department of Geotechnics of the Faculty of Civil Engineering, Slovak University of Technology (STU) υπό την αιγίδα της International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE).

Το κύριο θέμα του συνεδρίου ήταν «Από την Έρευνα στον Σχεδιασμό στην Ευρωπαϊκή Πρακτική» ("From Research to Design in European Practice"). Συμμετείχαν περίπου 250 σύνεδροι από 40 χώρες, 9 χορηγοί και 16 εκθέτες. Από την ΕΕΕΕΓΜ συμμετέσχε ο πρώην Γενικός Γραμματέας της ΕΕΕΓΜ Ομότιμος Καθηγητής ΕΜΠ Ανδρέας Αναγνωστόπουλος και ο Πολιτικός Μηχανικός Ξενοφώντας Φλώρος.

Μετά την εναρκτήρια τελετή παρουσιάστηκαν, σε ειδική συνεδρία, τέσσερεις βασικές ομιλίες (keynote lectures) : "Energy piles and other thermoactive ground-source systems" από τον Heinz Brandl (Πρόεδρο του επομένου DECGE), "The pressuremeter – some contributions to foundation engineering" από τον Jean-Louis Briaud (Πρόεδρο της ISSMGE), "Development of geotechnics in Slovakia" από τον Peter Turček (Πρόεδρο της Οργανωτικής Επιτροπής του συνεδρίου) και "Why do we need standards?" από τον Bernd Schuppener (BAW). Μετά τις διαλέξεις αυτές ακολούθησε συνεδρία για τους χαρακτηρισμούς των εδαφών (ground characterisation) και για τις νέες εξελίξεις στην εδαφομηχανική.

Το βράδυ της πρώτης ημέρας οι σύνεδροι παρακολούθησαν συναυλία της STU-Orchestra στο θέατρο της Σλοβακικής Ραδιοφωνίας και μια εντυπωσιακή παράσταση με παραδοσιακούς σλοβακικούς χορούς. Στο τέλος της βραδιάς η Jana Frankovská (Πρόεδρος της Czech and Slovak Committee of ISSMGE) παρουσίασε ένα τραγούδι ειδικά γραμμένο για τους γεωτεχνικούς μηχανικούς που θα αποτελέσει τον ύμνο τους: Bridges, buildings, constructions, built on our foundations, geotechnics saves it all, without us the world would fall.

Την δεύτερη και την τρίτη ημέρα παρουσιάστηκαν άρθρα, σε δύο παράλληλες συνεδρίες στα παρακάτω θέματα:

- Case studies using Eurocode 7
- Specific problems for environmental consideration
- Design methods for geotechnical structures
- Monitoring and supervision of geotechnical structures
- Numerical and physical models in geotechnical design
- Interactive design and other problems in geotechnical design

Το επόμενο DECGE Conference θα διεξαχθή στην Βιέννη το 2014, ακριβώς 50 years μετά το 1st Danube European Conference, που διεξήχθη στην Βιέννη το 1964.

(Ανδρέας Αναγνωστόπουλος)

ΠΡΟΣΕΧΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΚΔΗΛΩΣΕΙΣ

Για τις παλαιότερες καταχωρήσεις περισσότερες πληροφορίες μπορούν να αναζητηθούν στα προηγούμενα τεύχη του «περιοδικού» και στις παρατιθέμενες ιστοσελίδες.

Geologically Active 11th IAEG Congress, 5 – 10 September 2010, Auckland, New Zealand, www.iaeg2010.com

Tunnels and Underground Construction India, 13 - 16 September, 2010, The LaLiT, New Delhi, India, www.tunnelsindia.com

GBR-C 2k10 - 3rd International Symposium on Geosynthetic Clay Liners, 15 - 16 September 2010, Würzburg, Germany, gbr-c2k10@skz.de

1st International Conference on Information Technology in Geo-Engineering 16-17 September 2010, Tongji Univeristy, Shanghai geotec.tongji.edu.cn/ICITG2010

8th ICOLD EUROPEAN CLUB SYMPOSIUM
DAM SAFETY
Sustainability in a Changing Environment
22 – 23 September 2010, Innsbruck, Austria
www.iecs2010.tugraz.at

In the field of **sustainable water management**, dams have in the past proved themselves to be most effective and will go on to become even more important in the future. The construction of new dams is undergoing a renaissance in many European countries nowadays. In addition to this, maintaining and upgrading the numerous existing dams requires substantial efforts in order to sustain an adequate level of **safety**. Thereby, dam engineers not only fulfil the current state of the art standards, but also respond to the demands of the **public** who seem to be increasingly sensitive towards safety issues.

Sustaining dam safety means **sustaining the relevant knowledge and skills** by means of effective transfer from senior practitioners to the next generation of engineers and in doing so taking particular care of the "human factor".

With regard to these issues, the 8th ICOLD European Club Symposium should provide a most comprehensive and partially unorthodox approach to dam safety. **Special attention will be paid to young researchers and engineers**, who will be able to present their results and moreover be encouraged to enter the dam industry (young participants will benefit from a reduced attendance fee). Also, the opportunity to meet with experienced scientists, designers, contractors, dam owners, and representatives of the authorities may help to build not only a bridge between science and practice, but also a bridge between the generations, and establish a "market place", where future employers and employees can make contact.

Austria maintains a long tradition in dam construction. The dam sites in the mountains of the Alps provide particular challenges with regards to the construction, operation, surveillance, and maintenance of the structures. As a further special feature of the Symposium, outstanding examples of Austrian dam engineering will be presented during the study tours, where attendees will be able to encounter the dams and their monitoring facilities in detail.

In addition to the technical issues, the cultural atmosphere of the city of Innsbruck, set within a fascinating Alpine landscape and with a fine and stable climate should leave a long lasting impression on our guests.

So, on behalf of Austrian National Committee on Large Dams, I would be extremely pleased to welcome you in Innsbruck!

Rudolf Melbinger
President of ATCOLD

Conference Topics

- Sustainability of Know How
- Public Awarwness of Dams and Dam Safety
- Maintenance and Rehabilitation
- Regulations and Guidelines
- Small Dams
- Surveillance Practice

IECS2010 Organizing Committee
Stremayrgasse 10/II
8010 Graz
Austria (Europe)
E-mail IECS2010@TUGraz.at
Fax +43(0)316 873 8357

Workshop of the ISSMGE TC40 (Forensic Geotechnical Engineering) Failures, Disputes, Causes and Solutions in Geotechnics, 24-25 September 2010, Budapest, Hungary http://issmge-tc40-hungary.net/main.php

HYDRO 2010 "Meeting Demands for a Changing World", Lisbon, Portugal, 27-29 September 2010, www.hydropower-dams.com

Tunnels & Tunnelling 2010 Conference, 28 September 2010, London, United Kingdom, conference@tunnelsonline.info

II International Congress on Dam Maintenance and Rehabilitation, 28th-30th September 2010, Zaragoza, Spain www.damrehabilitationcongress2010.com

6ο Πανελλήνιο Συνέδριο Γεωτεχνικής και Γεωπεριβαλλοντικής Μηχανικής, 29 Σεπτεμβρίου – 1 Οκτωβρίου 2010, Βόλος http://portal.tee.gr/portal/page/portal/INTER_RELATIONS/INT_REL_P/SYNEDRIA_EKDHLWSEIS/2010/6thGeotechnic

International Symposium on Geomechanics and Geotechnics: From Micro to Macro 10 – 12 October 2010, Shanghai, China, geotec.tongji.edu.cn/is-shanghai2010

35th Annual Conference on Deep Foundations
Hollywood, California, USA, October 12-15, 2010
www.deepfoundations2010.org

Every Fall for the past thirty-four years, members of the deep foundations construction industry have gathered to learn from each other and discuss the state of the practice and the state of the art within our field. The DFI Members' Conference gives all industry members an opportunity to discuss, on equal footing, the technical concerns specific to the design and construction of deep foundations. Inclusive of all foundation elements and systems, the program and scope of the Conference is enriched by the presence of all disciplines in the industry, from around the world. Presenters will be chosen through an open call for abstracts distributed worldwide reviwed by an interdisciplinary committee of foundation industry leaders. Beyond the technical sessions the event presents every opportunity for attendees to interact and exchange ideas with each other during the breaks, Luncheons and Welcome Reception. In 2010 we are pleased to bring the conference to Hollywood, CA.

Deep Foundations Institute
326 Lafayette Avenue - Hawthorne, NJ 07506, USA
tel: 973.423.4030 - fax: 973.423.4031
email: staff@dfi.org

11th International Symposium on Concrete Roads, Seville (Spain) 13th - 15th October 2010, www.2010pavimentosdehormigon.org

TAILINGS AND MINE WASTE '10, October 17-20, 2010, Vail, Colorado, www.tailingsandminewaste.org

Sir Alan Muir Wood Symposium, 21 October 2010, London, United Kingdom, www.britishtunnelling.org.uk/meetings-2010.php

ARMS – 6 ISRM International Symposium 2010 and 6th Asian Rock Mechanics Symposium "Advances in Rock Engineering", New Delhi, India, 23 – 27 October 2010, www.cbip.org, www.arms2010.org

2nd International Conference on Geotechnical Engineering - ICGE 2010 Innovative Geotechnical Engineering, 25 – 27 October 2010, Hammamet, Tunisia, www.enit.rnu.tn/fr/manifestations/icge2010/index.html

Piling & Deep Foundations India 2010, 25 - 27 October, 2010, Mumbai, India, www.pilingfoundationindia.com

4th International Conference in Geotechnical Engineering and Soil Mechanics, November 2nd & 3rd 2010, Tehran, Iran, www.icgesm2010.ir

BRIDGES EUROPE

3 - 5 November, 2010, Warsaw, Poland
http://www.iqpc.com/Event.aspx?id=332758

Dear Bridge Engineer,

With the economy in an uncertain state, **NEVER** has it been more crucial to build upon the skills, knowledge and experience you possess in **bridge construction and delivery.** This will determine whether you **win that tender,** gain **project approval** and **deliver the project on time** and on budget in 2011 and beyond.

Bridge Construction Europe 2010 will equip you with these essential skills throughout the whole bridge project lifecycle. Whether it is in project preparation, planning, design, construction or maintenance of modern bridge systems that you specialise, Bridge Construction Europe will advance your understanding and most importantly, **keep you informed and in touch** with your fellow peers, clients and customers.

With **over 23 of Europe's most celebrated projects to date,** including a unique showcase of the eagerly anticipated Forth Replacement Crossing straight from the new Project Director, each detailed presentation will provide you with practical guidance that you can apply to your projects at home.

It's crucial that you learn the lessons, **whether successes or mistakes,** that your fellow industry peers have learnt. Bridge Construction Europe provides you with this opportunity through a comprehensive technical programme.

Devised in consultation with 76 Engineers from across Europe, the agenda includes 30 of Europe's leading Project Managers from Government, Contractor & Specialist Consultant Organisations.

In concert with the technical merits of the conference, you will also have the opportunity to share strategies, ideas and methods of practice with some of the foremost project managers and most active procuring authorities from the **Central and Eastern European Region.** This is a truly **Pan-European event** and one that you can not afford to miss.

Register online at www.bridgeconstructioneurope.com or contact us at +44 (0)20 7368 9300 or enquire@iqpc.co.uk.

31. BAUGRUNDTAGUNG mit Fachausstellung Geotechnik, 3 – 6 November 2010, ICM München, www.baugrundtagung.com

SECED YOUNG ENGINEERS CONFERENCE, 4 November 2010, University College of London, www.cege.ucl.ac.uk/events/yec

BANGLADESH GEOTECHNICAL CONFERENCE 2010 Natural Hazards and Countermeasures in Geotechnical Engineering, 4-5 November, 2010, Dhaka, Bangladesh, bsge.hgs@gmail.com, Bgc2010dhaka@gmail.com

International Conference on Geotechnical Engineering
5 - 6 November 2010, Lahore, Pakistan

The Pakistan Geotechnical Engineering Society (PGES) in collaboration with University of Engineering & Technology (UET), Lahore takes pleasure in announcing an International Conference on Geotechnical Engineering. The Conference will be held in Lahore, Pakistan on November 5-6, 2010.

The theme of the Conference is kept open to attract a diversity of quality papers from around the globe. The Organizing Committee of the Conference expects a very warm response from all the professionals across the globe to make this Conference a big success.

Contact person: HAMID MASOOD QURESHI
GT&GE DIVISION, NESPAK HOUSE, 1-C, BLOCK N,
MODEL TOWN EXTENSION
54700 LAHORE
PAKISTAN
Phone: 92-42-99090393
Fax: 92-42-99231950
E-mail: hamid833@hotmail.com
hamid.qureshi@nespak.com.pk

ICSE-5 5th International Conference on Scour and Erosion, 7 – 10 November 2010, San Francisco, USA, www.icse-5.org

ISFOG 2010 2nd International Symposium on Frontiers in Offshore Geotechnics, 8 – 10 November 2010, Perth, Western Australia, w3.cofs.uwa.edu.au/ISFOG2010

6ICEG 2010 - Sixth International Congress on Environmental Geotechnics, November 8 - 12, 2010, New Delhi, India www.6iceg.org

3rd INTERNATIONAL CONFERENCE
Geosynthetics Middle East
Waterproofing Systems and Reinforced Structures
9 and 10 November 2010, Abu Dhabi, UAE
www.skz.de/shop

This conference on geosynthetics will bring together geotechnical and environmental engineers, designers, consultants, manufacturers, distributors, researchers and environmental agencies. This event with accompanying exhibition provides a highly attractive international meeting point for exchange of experience and knowledge regarding geosynthetic materials, research and design, engineering constructions, case histories and field experience.

The key topics of this conference will be devoted to geoenvironmental and geotechnical projects such as the lining of reservoirs, ponds, tunnels, landfills as well as construction of retaining walls and marine structures in the Middle East.

The conference is jointly organized by SKZ, Germany and BMC Gulf, UAE and provides a podium for new interesting cooperations for future success.

Registration and Information
SKZ - ConSem GmbH
Frankfurter Straße 15 - 17, D-97082 Wòrzburg
Tel. +49 931 4104-164/-184
Fax. +49 931 4104-227/-274
Internet: http://www.skz.de/shop
E-Mail: anmeldung@skz.de

PILING & DEEP FOUNDATIONS NORTH AFRICA

22 - 25 November, 2010, Cairo, Egypt
www.pilingfoundationsnorthafrica.com

Successful construction project performance relies on efficient delivery of piling and foundations in a timely and cost-effective manner.

Optimising foundation design provides the opportunity to maximise the functionality of piling structures while minimising material use, resulting in favorable construction methods and ease and speed of implementation and testing.

Piling & Deep Foundations North Africa, an exclusive North African focussed instalment of the industry leading four-day Piling & Deep Foundation event series, will provide exclusive case study presentations, best-practice discussion, regulatory updates and an exchange of innovative methods. The summit will bring together the key regional and international stakeholders from the geotechnical, piling and foundations sector.

E-mail enquiry@iqpc.ae, Tel. +971 4 364 2975.

ΠΕΜΠΤΟ ΠΑΝΕΛΛΗΝΙΟ ΣΥΝΕΔΡΙΟ ΛΙΜΕΝΙΚΩΝ ΕΡΓΩΝ
Αθήνα, 22-25 ΝΟΕΜΒΡΙΟΥ 2010

Το Εργαστήριο Λιμενικών Έργων του Ε.Μ.Π. διοργανώνει το **ΠΕΜΠΤΟ ΠΑΝΕΛΛΗΝΙΟ ΣΥΝΕΔΡΙΟ ΛΙΜΕΝΙΚΩΝ ΕΡΓΩΝ**. Θα πραγματοποιηθεί στην Αθήνα στις 22 - 25 Νοεμβρίου 2010.

Αντικείμενο του Συνεδρίου είναι η παρουσίαση των νεοτέρων εξελίξεων στο χώρο των επιστημών και των τεχνολογιών που σχετίζονται με τα Λιμενικά Έργα και ειδικότερα την έρευνα, τον σχεδιασμό, την μελέτη, κατασκευή, προστασία, συντήρηση, διαχείριση, στις επιπτώσεις στο περιβάλλον καθώς και η ενημέρωση, η ανταλλαγή απόψεων και η προώθηση της τεχνογνωσίας στους τομείς αυτούς. Στόχος του είναι η ενημέρωση, η ανταλλαγή απόψεων και η προώθηση της τεχνογνωσίας.

Απευθύνεται στους ερευνητές, μελετητές, κατασκευαστές, ΑΕΙ, δημόσιους φορείς, ΟΤΑ, Λιμενικά Ταμεία, περιβαλλοντικές οργανώσεις και υπηρεσίες που ενδιαφέρονται και ασχολούνται με τα Λιμενικά Έργα, τους οποίους και προσκαλεί να παρουσιάσουν το έργο και τις εμπειρίες τους.

ΘΕΜΑΤΟΛΟΓΙΑ ΣΥΝΕΔΡΙΟΥ

- Περιβαλλοντικά μεγέθη σχεδιασμού και κατασκευής λιμενικών έργων (μετρήσεις, υπολογισμοί).
- Σχεδιασμός λιμένων, μελέτη και κατασκευή λιμενικών έργων.
- Χωροθέτηση λειτουργιών, διαμόρφωση λιμενικής ζώνης.
- Αστοχίες, βλάβες λιμενικών έργων. Επιθεώρηση, αποκατάσταση, συντήρηση.
- Μελέτη λιμένων σε φυσικό προσομοίωμα.
- Περιβαλλοντικές επιπτώσεις από την κατασκευή και λειτουργία λιμένων.
- Το Ελληνικό Λιμενικό Σύστημα.
- Διαχείριση, διοίκηση, λειτουργία λιμένων. Θεσμικό πλαίσιο.

ΠΛΗΡΟΦΟΡΙΕΣ

Οι ενδιαφερόμενοι για περισσότερες πληροφορίες μπορούν να απευθύνονται στο Εργαστήριο Λιμενικών Έργων Ε.Μ.Π. τηλ.: 210 7722367, 210 7722375, fax: 210 7722368 (Ε. Ν. Αναστασάκη, Θ. Γιαντσή, Β.Κ. Τσουκαλά), e-mails: lhw@central.ntua.gr, anastasaki@hydro.civil.ntua.gr

Tunnel Design & Construction Northeast Asia, 24 & 25 November, 2010, Hong Kong, www.tunneldesignconstruction.com

International business and technology conference on Waterproofing in Roofing and Geomembrane Liners 30 November - 2 December 2010, Cologne, Germany
www.amiplastics.com

Waterproof Membranes 2010, the 4th international industry conference organised by AMI, will take place at the Maritim Hotel in Cologne, Germany on 30 November-2nd December 2010. The focus is on roofing membranes and geomembranes. On the first evening there is a welcome cocktail reception and registration, followed by a 2-day programme of expert presentations. A small specialist exhibition runs alongside the conference.

Waterproofing has been in use for thousands of years from the bitumen with reed reinforcement in the green roofing of the Hanging Gardens of Babylon. There are a variety of materials available in today's market and this conference invites papers on all types of waterproof membranes, markets, applications, installation and joining, design, leak testing, durability, regulations and standards. The latest developments include adding functions such as solar power generation in reservoir covers and roofing.

Waterproof Membranes 2010 provides a global forum for all companies involved in waterproofing membranes, including end-users, specifiers, architects, expert installers, manufacturers, researchers, and suppliers to the industry.

For more information please contact Clara Fontana, Conference Organiser. Email: cf@amiplastics.com Tel: +44 117 924 9442

Geotechnical and Transportation Engineering, GEOTROPIKA 2010 "Sustainability in Geotechnical and Transportation Engineering", 1–3 December 2010, Sutera Barbour, Sabah, Malaysia seminar.spaceutm.edu.my/geotropika2010

VII Congresso Suramericano de Mecánica de Rocas - ISRM South American Regional Symposium 2010, 2 – 4 December 2010, Lima, Peru, eventos@iimp.org, asamaniego@svs.com.pe

Italian Geotechnical Journal – Special Issue on Seismic geotechnical design and retrofitting, agiroma.rig@iol.it

www.set.ait.ac.th/acsig/climatechange

The effect of climate change including global warming is not only limited in causing landslide disasters with increasing frequency but also increasing frequency of occurrence of variety of geo-disasters. Reports have been circulated regarding the flooding of residences of millions of people in densely populated and low-lying areas where adaptive capacity is insufficient owing to tropical storms, land subsidence, as well as the threat of sea level rise.

Moreover, riverbank and coastal erosions are now common occurrence due to increasing intensity and frequency of strong typhoons and associated heavy rainfall.

This Symposium aims to gather academics, practitioners, partners, and stakeholders to discuss emergency and urgent issues related to climate change as well as the innovative mitigation measures in the context of geotechnical and geosynthetics engineering.

The Symposium will be organized by the IGS Thailand, the Asian Center for Soil Improvement and Geosynthetics, the Southeast Asian Geotechnical Society and the Thailand Geotechnical Society. It will be held under the auspices of IGS.

Technical Themes

The Symposium will cover a wide range of topics including but not limited to:

- Geotechnical/Geosynthetics Engineering for Riverbank and Coastal Erosions
- Sustainable Methods including Limited Life Geosynthetics (LLGs)
- Geosynthetics for Mitigations of Geo-Disasters
- Case Histories on Slope Failures and Mitigations
- Other Topics on Geosynthetics Applications

Conference Secretariat
c/o Asian Center for Soil Improvement and Geosynthetics,
Asian Institute of Technology,
P.O.Box 4, Klong Luang, Pathumthani 12120 Thailand
Phone: +66-2-524-5500/12/23
Fax: +66-2-524-6050
E-mail: climatechange@ait.ac.th
Website: www.set.ait.ac.th/acsiq/climatechange

ISSMGE TC40 Forensic Geotechnical Engineering An International Symposium on FORENSIC GEOTECHNICS OF VIBRATORY AND NATURAL HAZARDS, December 14-15, 2010, Mumbai, India, http://www.geoengineer.org/events/FGEBrochure2010.pdf

5th International Conference on Earthquake Geotechnical Engineering, Santiago, Chile, 10 – 13 January 2011, www.5icege.cl

Piling & Deep Foundations Europe 2011
22 - 23 February, 2011, Warsaw, Poland
www.pilingfoundationeurope.com

Accurate Site Investigations, Innovative Piling Techniques & Delivering Projects on Time & to Budget

Following the overwhelming success of IQPC's global events in the Middle East, Asia and Australia, Construction IQ presents **Piling & Deep Foundations Europe 2011** to Warsaw, Poland this February.

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International Conference on Tunnelling and Trenchless Technology, 1-3 March 2011, Kuala Lumpur (Malaysia), www.iem.org.my/external/tunnel/index.htm

Geo-Frontiers 2011 - Advances in Geotechnical Engineering, 13-16 March, Dallas, Texas, USA, www.geofrontiers11.com

28 – 30 March 2011, Moscow, Russia
www.hydrovision-russia.com

HydroVision Russia is the hydroelectric power industry's premier event for addressing the challenges, issues and advancements associated with hydro energy production, maintenance and technology. Co-located with Russia Power, HydroVision Russia provides an overview of both traditional and renewable energy production methods for current needs, as well as methods for future growth.

HydroVision Russia is supported by RusHydro, Russia's biggest hydro-generating company and the second biggest in the world in terms of installed capacity. The exhibition and conference showcases the changing future of the Russian energy mix and highlights the great potential of this prevalent energy source.

HydroVision Russia comprises a high level conference programme covering the key business issues and latest technologies to promote the use of hydropower in the Russian energy mix. The conference is supported by a world-class Exhibit Hall featuring the leading Russian and international power technology suppliers, offering unrivalled networking opportunities for attendees and exhibitors alike.

Topics

Strategic

Economics and Financing

- Capitalization Growth
- Cost Containment Methods
- Portfolio Management
- Strategic Role of Hydro power in Russia's Economy

New Hydro Energy Production

- Integrating Hydropower with Other Renewable Energy Sources
- Multi-Purpose Uses of Hydro Projects
- Public Private Partnerships
- Pumped Storage
- Ocean / Tidal / Stream Power

Technical

Equipment

- Diagnostics and Monitoring
- Generators
- New Technologies
- Turbines

Operational Improvement

- Dam and Civil Structures Safety
- Modernization/Reconstruction of Existing Facilities
- Plant Maintenance Best Practices
- Reliability Improvements

Small Hydro Energy - Equipment Standardization

- New Development
- Retrofits

For further assistance or for further information about participating at the conference as a speaker or as a delegate, please contact:

Mathilde Sueur
Conference Manager
T: +44 (0) 1992 656 634
F: +44 (0) 1992 656 735
E: papershvr@pennwell.com

International Conference on Vulnerability and Risk Analysis and Management (ICVRAM) and ISUMA 2011 Fifth International Symposium on Uncertainty Modeling and Analysis, April 11-13, 2011 in Hyattsville, Maryland, USA, www.asce.org/instfound/cdrm/icvram

GEDMAR2011 Geotechnical and Highway Engineering - Practical Applications – Challenges and Opportunities at the Future 3rd International Conference on Geotechnical Engineering for Disaster Mitigation and Rehabilitation 2011 combined with 5th International Conference on Geotechnical and Highway Engineering 4 - 6 May 2011, Semarang, Central Java, Indonesia, reliabiity.geoengineer.org/GEDMAR2011

7th International Symposium on "Geotechnical Aspects of Underground Construction in Soft Ground", 16-18 May 2011, Roma, Italy, www.tc28-roma.org

WTC2011 Helsinki, AITES-ITA 2011 World Tunnel Congress and 37th General Assembly, 21-25 May 2011, Helsinki, Finland, www.ril.fi/web/index.php?id=641

The 14th Asian Regional Conference on Soil Mechanics and Geotechnical Engineering

Hong Kong, China, 23 - 28 May 2011
www.cse.polyu.edu.hk/14arc

The Hong Kong Geotechnical Society and The Hong Kong Polytechnic University take great pleasure in inviting all members and Member Societies of ISSMGE Asian region and interested geotechnical engineers and researchers from all over the world to participate in the 14th Asian Regional Conference on Soil Mechanics and Geotechnical Engineering (14th ARC 2011) to be held in May 2011 in Hong Kong, China. Hong Kong has only a land area of 1100 km2 and a population of 7 million. But Hong Kong is one of geotechnical gravity centres in the world with thousands of geotechnical people and lots of geotechnical activities. This conference will provide a forum for engineers and researchers from overseas and local community to meet together and share new ideas, achievements and experiences through presentations and discussions.

The theme of the 14th ARC is **Soil Mechanics and Geotechnical Engineering: Challenges and Solutions**. The topics in the theme area include:

1. Characterization of soils
2. Local and problematic soils
3. Slopes
4. Foundations
5. Geotechnics for transportation and infrastructure
6. Underground construction and tunnelling
7. Dam and embankment
8. Rock engineering
9. Soil dynamics and earthquake geotechnical engineering
10. Geoenvironmental engineering
11. Ground improvement
12. Geotechnical risk mitigation and management
13. Quantitative risk assessment
14. Geosynthetics
15. Forensic investigation
16. Case histories
17. Innovative technologies for geotechnical applications

For enquiries, please contact the Conference Secretariat :

Ms Sharon Lam
Department of Civil and Structural Engineering
The Hong Kong Polytechnic University
Hung Hom, Kowloon
Hong Kong
Email 1: 14arc.2011@polyu.edu.hk
Email 2: cesharon@inet.polyu.edu.hk
Fax: (852) 2334-6389
Tel: (852) 2766-6017

Dams and Reservoirs under Changing Challenges, June 1 - 2, 2011, Lucerne, Switzerland, www.swissdams.ch

5ο ΔΙΕΘΝΕΣ ΣΥΝΕΔΡΙΟ ΑΣΦΑΛΤΙΚΩΝ ΜΙΓΜΑΤΩΝ ΚΑΙ ΟΔΟΣΤΡΩΜΑΤΩΝ

Θεσσαλονίκη, 1-3 Ιουνίου 2011
http://iconfbmp.civil.auth.gr

Το Εργαστήριο Οδοποιίας του Τμήματος Πολιτικών Μηχανικών του Α.Π.Θ., σε συνεργασία με το BERI (Built Environment Research Institute) του Πανεπιστημίου Ulster, Αγγλίας και το CAIT (Center for Advance Infrastructure Technology) του Πανεπιστημίου Μισισιπή, ΗΠΑ, διοργανώνει το 5ο Διεθνές Συνέδριο Ασφαλτικών Μιγμάτων και Οδοστρωμάτων (5th ICONFBMP). Το Διεθνές Συνέδριο είναι συνέχεια τεσσάρων προηγούμενων Συνεδρίων που οργανώθηκαν με επιτυχία στην Ελλαδα τα έτη 1992, 1996, 2002 και 2007.

Το 5ο Διεθνές Συνέδριο υποστηρίζεται από τους διεθνείς οργανισμούς Transportation Research Board (TRB) και Federal Aviation Administration (FAA).

Σκοπός του Διεθνούς Συνεδρίου είναι η παρουσίαση νέων τεχνολογιών, τάσεων, προδιαγραφών και ερευνητικών δραστηριοτήτων τόσο στο εξωτερικό όσο και στην Ελλάδα, στα ασφαλτικά υλικά και οδοστρώματα.

Επίσης, η ανταλλαγή απόψεων και εμπειριών προς όφελος των ενασχολούμενων με την Οδοποιία και Αεροδρόμια και ειδικότερα την μελέτη, κατασκευή, συντήρηση και διαχείριση των οδοστρωμάτων οδών και αεροδρομίων καθώς και την παραγωγή και χρήση υλικών και ασφαλτικών μιγμάτων.

Στο θεματολόγιο του Συνεδρίου περιλαμβάνονται οι παρακάτω ενότητες:

- Άσφαλτος, τροποποιημένη άσφαλτος και ασφαλτικά γαλακτώματα
- Αδρανή υλικά ασφαλτικών μιγμάτων
- Αδρανή υλικά οδοστρωσίας
- Υλικά έδρασης οδοστρωμάτων
- Θερμά και ψυχρά ασφαλτομίγματα
- Σύγχρονες μέθοδοι και τεχνολογίες σχεδιασμού και κατασκευής οδοστρωμάτων οδών και αεροδρομίων
- Συντήρηση και ενίσχυση οδοστρωμάτων οδών και αεροδρομίων
- Επιφανειακά χαρακτηριστικά οδοστρωμάτων (ολισθηρότητα, επιπεδότητα, θόρυβος, κλπ)
- Μη καταστροφικές μέθοδοι καταγραφής κατάστασης και μηχανικών χαρακτηριστικών οδοστρωμάτων
- Ανακύκλωση οδοστρωμάτων και εναλλακτικά υλικά οδοποιίας
- Χρήση γεωϋφασμάτων και ασφαλτοϋφασμάτων
- Συστήματα διαχείρισης και λειτουργίας οδοστρωμάτων οδών και αεροδρομίων και οδικών δικτύων
- Ασφάλεια εργαζομένων και περιβαλλοντικές επιπτώσεις
- Εξοπλισμός οδού, υλικά διαγράμμισης και οδική ασφάλεια
- Προδιαγραφές και εναρμόνιση Ευρωπαϊκών προδιαγραφών (CEN)
- Παράταση ζωής και ενεργειακή θεώρηση ασφαλτικών μιγμάτων και οδοστρωμάτων

Για οποιαδήποτε πληροφορία μπορείτε να επικοινωνείτε τηλεφωνικά με την γραμματεία του Συνεδρίου, τηλ. 2310. 995826, 2310.995811, τοτ. 2310.995789, ή ηλεκτρονικά στη διεύθυνση 5iconfbmp@civil.auth.gr

3rd International Symposium on
Geotechnical Safety and Risk (ISGSR2011)
Munich, Germany, 2 ÷ 3 June 2011
www.isgsr2011.de

Safety, reliability and risk analysis and management have been attracting the interests of geotechnical society in recent years due to frequent occurrences of natural and man-made disasters. Modern societies require the engineering community to provide quantitative information concerning risks related to geotechnical hazards such as earthquakes, landslide, geo-structure failures, etc. For this reason, international exchange of information on these tasks is of vital importance today.

This symposium is a continuation of a series of symposiums and workshops on geotechnical risk and reliability starting with LSD2000 in Melbourne, Australia, IWS2002 in Tokyo and Kamakura, Japan, LSD2003 in Cambridge, USA, Georisk2004 in Bangalore, India and Taipei2006 in Taiwan. Realizing the importance of risk and safety in geotechnical engineering, it was decided to establish a series of symposiums: in 2007 the 1st International Symposium on Geotechnical Safety and Risk was held in Shanghai, followed two years later by the 2nd ISGSR held in Gifu, Japan which will be continued with the 3rd ISGSR in Munich in 2011.

Risk assessment and management is required in all aspects of geotechnical issues such as planning, design, construction of geotechnical structures, mitigation of geo-hazards, management of large construction projects, maintenance of structures and life cycle cost evaluation. With this background, the conference will focus on the following topics:

- Risk assessment and management through codes and standards
- Risk and reliability analysis of geotechnical structures
- Risk assessment and management of natural geotechnical hazards
- Practical applications and case studies

We invite researchers, practitioners, and educators to submit paper abstracts that are relevant to the symposium themes. Please submit a 500-word abstract using Microsoft Word latest **1 October 2010** at isgsr2011@baw.de

Official language of the conference is English. To maintain a high quality of the symposium the Abstracts and the Papers will be reviewed and refereed by members of the Scientific Committee to ensure that they fall within the scope of the symposium and are of an appropriate standard both in terms of technical and presentational quality.

Prior to the symposium there will be

Short course on Reliability Analysis and Design in Geotechnical Engineering

June 1st 2011, Munich, Germany

K.-K. Phoon, Ph.D., P.E. (National University of Singapore)
J. Ching, Ph.D. (National Taiwan University)

Reliability analysis is increasingly being used to calibrate multiple factor code formats, such as LRFD and partial factor approach. It is useful for practitioners to appreciate the theoretical basis that underlies these relatively new design codes. It is possible for practitioners to use reliability-based design beyond the simple closed-form lognormal reliability formula without an in-depth knowledge of probabilistic methods. This course can be considered as a reliability primer for the lay-person with emphasis on "how to calculate" and "how to apply". The first-order reliability method (FORM) will be taught using a relatively painless spreadsheet approach. Participants are encouraged to bring their laptops so that they can follow the hands-on EXCEL demonstrations and to try additional worked examples given in the course CD. This course is based in part on the textbook "Reliability-Based Design in Geotechnical Engineering: Computations and Applications" by KK Phoon (ed.), Taylor & Francis, 2008.

Course outcomes:

1. De-mystify basic reliability theory - get acquainted with "need to know" concepts

2. Demonstrate usefulness of reliability analysis and design using simple methods and examples

3. A course CD will be provided containing all presentation slides in PPS, selective public domain publications, and EXCEL examples.

Contact

Dipl.-Ing. Gerhard Bräu
Address: Arcisstraße 21, 80290 München
Phone: +49 (0) 89 - 289 – 27139, Fax: +49 (0)89 - 289-22441
E-mail: G.Braeu@bv.tum.de

XV African Regional Conference on Soil Mechanics and Geotechnical Engineering, Maputo, Mozambique, 13 - 16 June 2011, www.15arcsmge-maputo2011.com.

GEORISK 2011
Risk Assessment and Management in Geoengineering
June 26 – 28, 2011, Atlanta, USA
http://content.asce.org/conferences/GeoRisk2011

GeoRisk 2011 is a conference on risk assessment and management in all fields of geoengineering which is organized by the Risk Assessment and Management Committee of the Geo-Institute. The goal of this conference is to provide an opportunity for participants to learn more about how to explicitly consider risk and uncertainty in order to improve the value and scope of their service and to better serve the public. The coverage will be diverse, from theory to practice, with numerous geoengineering case histories. Professional engineers, managers, researchers, regulators, policy makers, educators, and students will interact across a broad range of keynote lectures, techincal sessions, panel discussions, short courses and software demonstrations.

Topics include, but are not limited to:

- Theory and practice on risk assessment and management in all fields of geoengineering
- Geohazards such as landslides, slope failures, dams and levees, earthquakes, and geoenvironmental hazards
- Code harmonization and acceptable risk levels
- Reliability-based design
- Load and resistance factor design (LRFD)
- Risk-sharing and communication among client, consultant, insurer, and financier
- Performance-based geoengineering practice
- Spatial variability and site characterization
- Uncertainty modeling
- Recent advances in the applications of statistics, probability, and reliability-based methods in geoengineering
- Teaching Reliability and Uncertainty in Geotechnical Engineering Courses

Contact Us

Conference Questions? Contact:
Elaine V. Watson
Manager, Conferences & Meeting Services
ewatson@asce.org

Geo-Institute Staff Contact:
Lauren Tighe
Board and Meetings Specialist
ltighe@asce.org

Technical Program Questions? Contact:
C. Hsein Juang
hsein@clemson.edu

Kok-Kwang Phoon
cvepkk@nus.edu.sg

Geotechnical Enginering for Disaster Prevention & Reduction
26 - 28 July 2011, Khabarovsk, Russia
www.igsh4.ru

The purpose of the symposium

The main attention is given to sharing knowledge on reliable preventive geotechnical measures directed towards damage minimization when the available information is either incomplete or inconsistent.

Experts are invited to take part in the Symposium, to present special lectures, oral and poster reports, to exhibit the equipments and devices, to introduce various achievements in the geotechnical engineering field and also to discuss the lessons learned from resent disasters and to share the modern knowledge & technologies implemented into practice for damage mitigation. As a result it is expected to receive papers dealing with the improved practical approaches and engineering solutions, unified new construction, codes and regulations to prevent and reduce the disasters before they strike again.

Introduction

Construction of infrastructure in complicated geological conditions and to be safe under natural disasters is a very challenging task and demands cooperating efforts from scientists, designers and contractors. Complicated geotechnical problems are confronted under conditions of high probability of earthquakes, landslides, mud flows, snow avalanches, flooding and other hazardous phenomena such as break of dams, underground mountain row collapsing, a large-scale and intensive oil and gas leakage, industrial and terrorist explosions and other techno/antropogenic impacts. The International Technical Committee №4 of Earthquake Geotechnical Engineering and Associated Problems (TC-4); The Asian Technical Committee №3 (ATC-3) of Geotechnology for Natural Hazards, The Commission on Earthquake Engineering and Mitigating Industrial & Natural Disasters (CoMIND), Centre on EQE&NDR (Cender), The Russia Society for Soil Mechanics, Geotechnics and Foundation Engineering (ROMGG&F) and Kazakhstan Geotechnical society are planning to organize the International Geotechnical Symposium on 26-28 July, 2011 in Khabarovsk (Russia) with special technical tours to lake Baikal and Kamchatka (Russia). Experts from the CIS countries (especially from Russia and Kazakhstan), Japan, the USA, Canada, Finland, Belgium, Holland, Poland, Australia and India are expected to take part in the Symposium.

Contact person: Professor S.A.Kudryavtsev
Street Serishev, 47,
Institute Transport Construction and Civil Engineering
Far Eastern State Transport University (FESTU)
680021 Kabarovsk
Russia
Phone: 74212407540
E-mail: info@igsh4.ru, its@festu.khv.ru
Website: www.igsh4.ru

IS – SEOUL 2011 Fifth International Symposium on Deformation Characteristics of Geomaterials, Wednesday-Friday, Aug. 31 – Sep. 3, 2011, Seoul, Korea, www.isseoul2011.org

6th International Symposium on Sprayed Concrete, 12-15 September 2011, Tromsø, Norway, www.sprayedconcrete.no

XV European Conference on Soil Mechanics and Geotechnical Engineering, 12 – 15 September 2011, Athens, Greece, www.athens2011ecsmge.org

XV European Conference on Soil Mechanics & Geotechnical Engineering
Athens, September 12-15, 2011

Workshop on Education with the theme

"Case histories in Geotechnical Instruction: Appropriate cases for each educational level"
September 14, Wednesday pm
Organized by ERTC 16
Local host: Dr. Marina Pantazidou

Case histories are recognized as an important part of geotechnical engineering education. However, most frequently, geotechnical instructors have to rely on their own practice to include case studies in their classes and rarely make this material available to the community of geotechnical educators in a format readily used by others. Perhaps the lack of publicly available instructional material for case histories is related to the lack of discussion on the characteristics of cases that make them suitable for different educational levels and different educational objectives.

The Organizing Committee of the XV European Conference on Soil Mechanics and Geotechnical Engineering kindly accepted the proposal of the Chairman of the European Regional Technical Committee 16 on Education & Training Prof. Iacint Manoliu, to include in the programme of the Conference a Workshop entitled: **"Case histories in geotechnical instruction: appropriate cases for each education level"**.

The workshop aims at advancing the discussion on educational uses of case histories and compiling case histories suitable for geotechnical instruction.

Contributions for the workshop are sought covering the following topics:

1) Suitable learning outcomes when cases are incorporated in instruction (e.g., students become aware of professional issues, students become familiar with a problem or an analysis method or comparisons between methods,

students get opportunities to practice a specific calculation method, get experience in design…)

2) *Case histories presented within the framework of specific geotechnical courses, accompanied with comments on the portion of the technical details students will be able to follow due to prior or concurrent instruction*

3) *Case histories used in a problem-based learning framework, i.e., case histories used to motivate theory instruction.*

Authors are encouraged to indicate, whenever possible, sources of materials suitable for instruction, such as the database built by ASFE – Association of Soil & Foundation Engineers, which has compiled descriptions of cases highlighting professional issues (see: www.asfe.org).

The workshop will close with a discussion on how can the geotechnical community contribute to the development of case materials suitable for instruction. To this end, Dr. Pantazidou will report on the results of an effort led by the ISSMGE to build a Case History Database (you can contribute too! Please visit http://www.issmge.org/web/page.aspx?refid=503 and http://www.civil.ntua.gr/docs/pantazidou/).

Contributions will consist of a written text, the PowerPoint presentation and accompanying case history materials, which will be included in the workshop's CD.

Relevant deadlines are as follows:

November 15, 2010: titles + abstracts of proposed papers are sent to mpanta@central.ntua.gr and manoliu@mail.utcb.ro. The abstracts need to make clear the relevance of the proposed article to the theme and description of the workshop; case histories unrelated or loosely related to instruction are not suitable submissions.

December 15, 2010: workshop organizers confirm that proposed paper is compatible with the theme and description of the workshop.

May 15, 2011: written texts are sent to mpanta@central.ntua.gr and manoliu@mail.utcb.ro

24th World Road Congress "Mobility, Sustainability and Development", 26 – 30 September 2011, Mexico City, Mexico, www.piarcmexico2011.org

XIV Panamerican Conference on Soil Mechanics and Geotechnical Engineering (October) & V PanAmerican Conference on Learning and Teaching of Geotechnical Engineering & 64th Canadian Geotechnical Conference, Toronto, Ontario, Canada, 2 - 6 October 2011, www.panam-cgc2011.ca

THE SECOND WORLD LANDSLIDE FORUM

www.wlf2.org

E-mail: secretariat@wlf2.org

Landslides and Geo-Environment, Geotechnical Symposium in Balkan Region, October 2011, Tirana, Albania, fatos.cenalia@gmail.com, erjon.bukaci@gmail.com

Beijing 2011, 12th International Congress on Rock Mechanics, 16 – 21 October 2011, Beijing, China, www.isrm2011.com

2011 AFTES Congress "Espaces Souterrains de Demain", Lyon, France, 17 – 19 October 2011, www.aftes.asso.fr/congres_presentation-organisation.html

ICAGE 2011

International Conference on
Advances in Geotechnical Engineering
7th - 9th November, 2011 - Perth, Australia
http://www.icage2011.com.au

The International Conference on Advances in Geotechnical Engineering (ICAGE 2011) is an inaugural international conference that aims to bring together academics and practitioners from across the world with a common interest in the field of Geotechnical Engineering.

The conference will provide a platform to discuss the recent advancement and address the future challenges within the profession of Geotechnical Engineering. It will be an excellent opportunity for exchange of information and ideas pertaining to the profession. Both academics and engineers are cordially invited to attend the conference to share and exchange their knowledge.

Conference Themes

The conference will consider papers in, but not limited to, the following topics:

- Material characterization (soil, rock, geosynthetics)
- Site investigations and in-situ testing and monitoring
- Foundations and pavements
- Geotechnics for transportation and infrastructure
- Ground improvement and soil stabilization
- Landslides and slope stability
- Anchored structures (soil and rock anchors)
- Computational and physical modelling

- Geoenvironmental Engineering
- Soil dynamics and geotechnical earthquake engineering
- Case histories and practical examples

Conference Chairmen:

Prof. Hamid Nikraz, Curtin University of Technology, Australia
Dr. Mohamed Shahin, Curtin University of Technology, Australia

ICAGE Conference Secretariat
T: +61 (8) 9389 1488
F: +61 (8) 9389 1499
E: info@eecw.com.au

5th Asia-Pacific Conference on Unsaturated Soils
14 - 16 November 2011, Pattaya, Thailand
www.unsat.eng.ku.ac.th

The series of Asia-Pacific conferences on unsaturated soils began in Singapore in 2000 with strong emphasis on both the theoretical aspect and practical significance of unsaturated soil mechanics in the region. With the continued support of the Technical Committee on Unsaturated Soils (TC6) of the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE), the 2nd, 3rd, and 4th conferences were held in 2003 in Japan, in 2007 in Nanjing, China and in 2009 in Newcastle, Australia respectively. The conferences have provided a forum for researchers and practitioners in the region and beyond to present their latest developments and exchange ideas in the subject, with strong relevance to problems in the region such as heave/desiccation shrinkage, collapse, rainfall-induced slope instability, contaminant transport etc. Latest developments in unsaturated soil mechanics will also lead to a much better understanding and solution of many emerging problems such as soil/atmosphere interaction, thermal & chemical influence, and climate change.

Objectives

The organizers of the 5th Asia-Pacific conference on unsaturated soils in Pattaya, Thailand aim that the event will continue to help bridge the gap between the theory and practice of unsaturated soils. In particular, young researchers/academics as well as practising engineers dealing with unsaturated soils from Asia-Pacific region are warmly encouraged to attend the conference and present papers. Well-documented case histories from the region are also particularly welcome.

Conference Topics

The conference covers a broad range of themes related to unsaturated soils, including but not limited to:

Unsaturated Soil Behaviour

- Chemical effects
- Dynamics
- Microstructure
- Soil-Water Characteristic
- Strength
- Stress-strain
- Thermal effects
- Volume change

Experimentation

- Advances in suction/moisture content measurement
- Centrifuge testing
- In-Situ testing
- Laboratory testing

Modelling

- Numerical analysis
- Fundamentals
- Coupled analysis
- Constitutive modelling

Case Histories

- Engineering applications
- Field monitoring
- Well-winnowed experience/Empiricism

Geotechnical engineering problems

- Embankments/dams
- Flow/infiltration
- Foundations
- Isolation barriers
- Natural hazards
- Pavements
- Problematic soils
- Rainfall-induced landslide
- Slope stability
- Soil cover systems
- Tunnelling in unsaturated soils/rocks

Multidisciplinary and new areas

- Bio-engineering/ Vegetation effects
- Climate change
- Energy issues (CO2 sequestration, gas hydrates)
- Geo-environmental Engineering
- Geoinformatics
- Rockfill mechanics
- Soil Physics/Pedology/Genesis
- Soil-Atmosphere interaction
- Swelling rocks
- Unsaturated zone hydrology

Contact person: Apiniti Jotisankasa
Department of Civil Engineering, Kasetsart University
10900 Jatujak
Bangkok
Thailand
Phone: 66819043060
Fax: 6625792265
E-mail: fengatj@ku.ac.th
Website: www.unsat.eng.ku.ac.th

4th International Conference on Grouting and Deep Mixing, February 15-18, 2012, New Orleans, Louisiana, USA, www.grout2012.org

GEOAMERICAS 2012
II Pan-American Congress on Geosynthetics
Lima, Perú, 6 - 9 May 2012
www.igsperu.org

The II Pan-American congress will take place from May 6th – 9th 2012, and will bring together researchers, consultants, environmental engineers, contractors, geosynthetic courses and exhibitors. It will be held at the modern Swissótel in Lima, Peru. Lima is the capital city of Peru, which is the fifth-most populous and the third-largest country in South America. Geoamericas

2012 will be organized by the IGS Perú under the auspices of the IGS.

Technical Program

The congress will highlight the main topics in the geosynthetics industry and application. Keynote lectures and selected papers will be presented on the main themes:

- Geosynthetics in Environmental Applications
- Geosynthetics in Dynamic Applications
- Geosynthetics in Hydraulic Applications
- Geosynthetics in Mining Applications
- Geosynthetics in Highways Applications
- Geosynthetics in Sanitary Applications
- Case Histories
- New Geosynthetics Products

More information will be available after August 2010 in the congress web site may be found in www.igsperu.org.

16th Nordik Geotechnical Meeting
9-12 May, 2012, Copenhagen, Denmark
www.ngm2012.dk

On behalf of the Organising Committee we have the pleasure of inviting you to the Nordic Geotechnical Meeting taking place at Tivoli Congress Center in Copenhagen 9-12 May 2010.

We hope you will find that Copenhagen lives up to its reputation as a friendly city with historic surroundings ideally suited to hosting a meeting like this. It is our intention to establish an inspiring atmosphere for the exchange of ideas and for building the foundation of new long-lasting collaborations.

We are looking forward to welcoming you in Copenhagen.

Contact person
Morten Jorgensen
Sortemosevej 2, DK-3450 Allerod
Copenhagen, Denmark
Phone: +45 4810 4207
Fax: +45 4810 4300
E-mail: moj@niras.dk

NGM2012 c/o DIS Congress Service
Tel: +45 4492 44 92 | Fax: +45 4492 5050
E-mail: ngm2012@discongress.com

ITA-AITES WTC 2012 "Tunnelling and Underground Space for a global Society", Bangkok, Thailand, 18 to 23 May, 2012.

EUROCK 2012 - ISRM European Regional Symposium - Rock Engineering and Technology, 27 – 30 May 2012, Stockholm, Sweden, eva.friedman@svebefo.se

12th Baltic Sea Geotechnical Conference
Infrastructure in the Baltic Sea Region
Rostock, Germany | 31 May – 2 June 2012
www.12bsgc.de

Invitation

On behalf of the ISSMGE, the German Geotechnical Society (DGGT) and the University of Rostock warmly invite you to participate in the 12th Baltic Sea Geotechnical Conference being held in Rostock, from 31st May to 2nd June 2012. This is the second extended Baltic Conference which we trust will be as successful as the first one, the 11th Baltic Sea Geotechnical Conference in Gdansk.

The goals and the scope of the conference

The main aim for all countries around the Baltic Sea and of the 12th Baltic Sea Geotechnical Conference is to provide a forum for an intensive transfer of ideas and experiences with other engineering and research groups. Significant contributions from industry are encouraged and hence the ultimate aim is to bring together state-of-the-art research in Geotechnics in maritime engineering with current industrial experiences.

The conference is not limited only to the countries of the Baltic Sea area and participants from other regions are also warmly welcomed.

The Baltic Sea area is a booming region with a lot of related problems with regards to infrastructure development. Sustainable development has to reflect on a balance of interest between industrial and touristic use and protection of nature. Additionally consequences of climate change and sustainability strategies regarding the population's need of protection and of future development are to be considered.

The topics of the conference related to global change and sustainability needs are as follows:

- Foundations for offshore wind energy plants
- Traffic infrastructure
- Coast protection
- Harbour construction
- Research and development projects
- Constructions in soft subsoil
- Environmental geotechnics

Correspondence:

On scientific programme issues:
Deutsche Gesellschaft fȯr Geotechnik e.V.
Gutenbergstr. 43, 45128 Essen, Germany
Phone: +49 201 78 27 23
Fax: +49 201 78 27 43
Email: service@dggt.de
Web: www.dggt.de

On organizational issues:
INTERPLAN AG
Eppendorfer Weg 204, 20251 Hamburg, Germany
Phone: +49 40 32 50 92 30
Fax: +49 40 32 50 92 44
Email: 12bsgc@interplan.de
Web: www.interplan.de

11th Australia - New Zealand Conference on Geomechanics, Melbourne, Australia, 15-18 July 2012

EUROGEO5 - 5th European Geosynthetics Conference, 16 - 19 September 2012, Valencia, Spain, www.eurogeo5.org

GEOSYNTHETICS ASIA 2012 (GA2012) 5th Asian Regional Conference on Geosynthetics, Bangkok, Thailand, 10 -14 December 2012, www.set.ait.ac.th/acsig/igs-thailand

ITA-AITES WTC 2013 "Underground – the way to the future", Geneva, Switzerland, 10 to 17 May 2013

First International Congress FedIGS, 12 – 15 November 2012, Hong Kong – China www.fedigs.org/HongKong2012

Conference to Commemorate the Legacy of Ralph B. Peck, 7th International Conference on Case Histories in Geotechnical Engineering & Soil Dynamics and Symposium in Honor of Clyde Baker Chicago, USA, April/May, 2013
http://5geoegconf2010.mst.edu

Missouri University of Science and Technology will host the Conference to Commemorate the Legacy of Ralph B. Peck, Seventh International Conference on Case Histories in Geotechnical Engineering and Symposium in Honor of Clyde Baker in April/May 2013 in Chicago, Illinois. This conference will commemorate the legacy of Ralph B. Peck and will include a symposium recognizing the accomplishments of Clyde Baker.

Invited speakers include:

Clyde Baker	Hesham El Naggar
W.D. Liam Finn	Jesus Gomez
Gholamreza Mesri	Sanjeev Malhotra
Edward Cording	Vijay Puri
Elmo DiBiagio	V.V.S. Rao
J. David Rogers	Rodrigo Salgado
Jonathan D. Bray	Cumaraswamy Vipulanandan
Buddhima Indraratna	Syed Faiz Ahmad
Kenji Ishihara	Jack Pappin
Harry G. Poulos	Shamsher Prakash
Rajendra Kumar Bhandari	Karun Sreerama
Adimoolam Boominathan	Alex Sy
H. Turan Durgunoglu	J.S. Vinod

18th International Conference on Soil Mechanics and Geotechnical Engineering
"Challenges and Innovations in Geotechnics"
1 – 5 September 2013, Paris, France
www.paris2013-icsmge.org

Dear Colleagues

The French Society for Soil Mechanics and Geotechnical Engineering (CFMS) is happy to propose to ISSMGE to host the 18th International Conference for Soil Mechanics and Geotechnical Engineering in Paris, France, in September 2013.

The proposed theme of the Conference is "Challenges and Innovations in Geotechnics':

France has a long history in the art of building, in civil engineering and in architecture: many dikes and canals, dams, harbours and airports, roads and motorways, railways, underground works, fortifications, retaining structures, special foundations and earth structures have been built since the 18th century. These constructions, that often appeared to be spectacular, could be achieved thanks to engineering progress and innovation. French engineers and researchers have made fundamental contributions in the field of soil mechanics and geotechnical engineering. One can mention: the experimental approaches of Vauban (1667), the theoretical developments of Coulomb (1773), the invention of grouting by Berigny (1802), the bases of elastic continuum mechanics by Navier (1821), the invention of sand piles by Moreau (1832), Collin's laboratory tests (1846), Darcy's hydraulic research (1856), the analytical stress and strain solutions of Boussinesq (1882), the electrical measurements by Schlumberger brothers (1912), the vibrating wire extensometer invented by Coyne (1930), the contributions of Caquot and Kerisel (1934), the pressuremeter test and the dynamic consolidation invented by Menard (1955), the invention of the Reinforced Earth by Vidal (1965).

Recent large construction works performed by French companies demonstrate the continuing creativity of geotechnical engineers and researchers in optimising materials and construction processes and in developing innovative tech-

niques: the Millau viaduct, high speed railway (TGV) lines, new underground lines in Paris, Lyon, Marseille, new harbour in Le Havre, etc. All major French companies are also very active worldwide.

Since the 1970s, the awareness of the need to preserve natural resources, to fight against climate change, to reduce CO2 emissions, to integrate social concerns and ecological safety in economic development models has become widespread. Theses challenges, as well as the constant need of new constructions and infrastructures, should guide the strategies and innovations. What should be the contribution of geotechnical engineers in order to encourage economic and social progress without jeopardising the equilibrium of the planet? This fundamental question could be the centre of our discussions.

France will be proud to host the 18th ICSMGE and CFMS will do its best to organize this conference and to offer to the delegates and accompanying persons an exciting and pleasant stay in Paris. The Conference will be held in the Paris International Conference Centre located at Porte Maillot, very near the Arc de Triomphe and the Avenue des Champs Elysees. The Louvre Museum and the historical centre of Paris are also readily accessible by several transportation means (bicycle, metro, bus and taxi).

The Conference will be held under the auspices and support of the French Ministry for Ecology, Energy, Sustainable Development and Town and Country Planning and the Ministry for Higher Education and Research.

For the French Society for Soil Mechanics and Geotechnical Engineering (CFMS),

Paris, 8th July 2009

Alain Guilloux President of CFMS

Conference Topics

Theme 1. Materials and modelling

1.1. Soil behaviour
1.2. Micro-macro transition
1.3. Numerical modelling 1.4. Physical modelling
1.5. Unsaturated soils
1.6. Thermal behaviour of soils
1.7. Seismic behaviour - Liquefaction
1.8. Renewable and recyclable materials

Theme 2. Protection of the environment and sustainable development

2.1. Improved use of natural resources
2.2. Cultural heritage and landscapes
2.3. Protection and rehabilitation of ecosystems
2.4. Assessment and treatment of pollution
2.5. Reversible construction
2.6. Geotechnics and renewable energies
2.7. Optimising construction and sustainable development

Theme 3. Natural hazards

3.1. Natural hazards and climate change
3.2. Landslides
3.3. Cavities
3.4. Floods
3.5. Drought
3.6. Earthquakes
3.7. Coastal and fluvial hazards (sea rise, tsunami, erosion)

Theme 4. Small and large works

4.1. Soil and site investigation
4.2. Foundations and retaining structures
4.3. Earthworks
4.4. Underground structures
4.5. Railways
4.6. Roads and pavements
4.7. Marine and fluvial geotechnics
4.8. Structures in seismic areas

Theme 5. Geotechnical cultures

5.1. National and international practices
5.2. Standards and design codes
5.3. Regulations and innovation
5.4. Geotechnical education and training
5.5. Tools for geotechnical engineering
5.6. Monitoring and observational design

Theme 6. Risks and responsibilities of geotechnical engineers

6.1. Status of geotechnical engineering
6.2. Legal framework
6.3. Insurances
6.4. Forensic engineering

6.5. Ethics
6.6. Economy issues in geotechnics

14th International Winter Road Congress 2014
4-7 February 2014, Andorra la Vella (Andorra)
www.aipcrandorra2014.org

The 14th International Winter Road Congress in 2014 will be held in Andorra la Vella. With its privileged geographical situation and unsurpassable climatic conditions Andorra is the perfect setting for holding this important congress on winter service.

10th International Conference on Geosynthetics – 10ICG
Berlin, Germany, 21 – 25 September 2014
www.10icg-berlin.com

The German Geotechnical Society (DGGT) and the International Geosynthetics Society (IGS) German Chapter, as a special group within the DGGT, cordially invite you to par-

ticipate in the 10th International Conference on Geosynthetics (10ICG) in 2014 in Berlin, Germany.

The conference will be held from 21 to 25 September 2014 in direct connection with the 33rd Baugrundtagung (German Soil Mechanics Conference) of DGGT (23 to 26 September 2014).

As the Baugrundtagung expects 1200 participants, great synergy and interaction is expected between these events, especially in the coorganized, co-located exhibition.

The overlapping of lectures from both events will also attract many additional experts from the geotechnique and geosynthetics professions.

Conference Themes

- Green Engineering, Sustainability and Durability with Geosynthetics
- Use of Geosynthetics for Renewable Energy
- Mining, Waste Management, Contaminated Sites and Environmental Protection
- Roads, Railways and Other Transportation Applications
- Reinforcement in Walls, Slopes, Embankments and Base Courses
- Flood Control, Levee and Canals, Dams, Reservoirs and Other Hydraulic Applications
- Drainage and Filtration Properties of Geosynthetics
- Geomembrane and Geosynthetic Clay Liner Barrier Systems
- Case Histories and Innovative Uses of Geosynthetics
- Quality Control, Quality Assurance and Accreditation
- On-site Installation Technologies and Monitoring Programs
- Soil-Geosynthetic Interaction and Large-Scale Performance Testing
- Design Approaches
- Regulations and Recommendations
- Looking to the Future with New Geosynthetic Products

For further information please contact:
Gerhard Bräu, Gerhard.Braeu@bv.tum.de
or Dr. Kirsten Laackmann service@dggt.de

ΕΝΔΙΑΦΕΡΟΝΤΑ ΓΕΩΤΕΧΝΙΚΑ ΝΕΑ

(συνέχεια από την πρώτη σελίδα)

Αυστραλία - στο νότιο ημισφαίριο είναι χειμώνας – παρατηρήθηκε ο πιο κρύος Ιούνιος των τελευταίων 30 ετών. Πριν από έξι εβδομάδες, έντονες βροχοπτώσεις και πλημμύρες προξένησαν την κατάρρευση φράγματος στην Πολιτεία Αϊόβα των ΗΠΑ. Η στάθμη του ποταμού που τροφοδοτούσε το φράγμα υπερέβη μόνο κατά ένα μέτρο το προηγούμενο ρεκόρ που ήταν το 2004. Στην κεντρική Ευρώπη, την προηγούμενη εβδομάδα σκοτώθηκαν 11 άτομα από πλημμύρες στον Δούναβη. Στην κεντρική Ρωσία, ο χειρότερος καύσωνας από τότε που μετριούνται οι θερμοκρασίες προξένησε εκτεταμένες πυρκαγιές και το επακόλουθο νέφος στην Μόσχα -με συγκεντρώσεις του δηλητηριώδους μονοξειδίου του άνθρακα που ήταν μέχρι και πέντε φορές μεγαλύτερες του επιτρεπτού ορίου- σκοτώνει καθημερινά διπλάσιους ανθρώπους. Το οικονομικό κόστος υπολογίζεται στο 1% του ετήσιου οικονομικού προϊόντος της Ρωσίας.

Ακραία φυσικά φαινόμενα γίνονταν πάντα και θα εξακολουθήσουν να συμβαίνουν. Η ερώτηση είναι, κατά πόσον η κλιματική αλλαγή είναι υπεύθυνη για αυτά που παρακολουθούμε, μέχρι στιγμής εξ αποστάσεως. Πριν από δύο μέρες, ο αντιπρόεδρος της αρμόδιας επιτροπής του ΟΗΕ (IPCC) δήλωσε ότι οι δραματικές αλλαγές στις μετεωρολογικές συνθήκες των τελευταίων εβδομάδων είναι συμβατές με ανθρωπογενείς κλιματικές αλλαγές. Η απόσπαση ενός τμήματος πάγου μεγέθους περίπου τέσσερις φορές όσο το Μανχάταν θα πρέπει να προβληματίσει τους συνωμοσιολόγους στην άκρα δεξιά και αριστερά που αρνούνται και το επιστημονικά προφανές και την κοινή λογική.

Δεν μπορούμε να προβλέψουμε το μέλλον. Αλλά καταλαβαίνουμε ότι όσο περισσότερο ασταθεροποιείται ένα φυσικό σύστημα, τόσο αυξάνεται το εύρος των ταλαντώσεών του από το ένα άκρο στο άλλο. Μπορούμε επίσης να εκτιμήσουμε ότι ακραία φαινόμενα, όπως ο καύσωνας στη Ρωσία ή οι πλημμύρες στο Πακιστάν δεν θα συμβαίνουν κάθε 100 περίπου χρόνια, αλλά κάθε δεκαετία ή νωρίτερα. Είναι θέμα χρόνου, μια μεγάλη φυσική καταστροφή - σεισμός, τσουνάμι, πλημμύρα, πυρκαγιά - θα έχει πάνω από 1 εκατομμύριο νεκρούς· ο σεισμός της Αϊτής του Ιανουαρίου είχε περίπου 220.000. Και ο λόγος δεν θα είναι η κλιματική αλλαγή, που μόνο επιταχύνει τη συχνότητα των ακραίων φαινομένων (εκτός των σεισμών), αλλά οι πληθυσμιακές συγκεντρώσεις. Επτά από τις δέκα μεγαλουπόλεις ανά τον κόσμο με πληθυσμό πάνω από 10 εκατομμύρια είναι ευάλωτες σε ακραία φαινόμενα.

Όσον αφορά εμάς, ακόμη και αν αποφύγουμε καταστροφή με δεκάδες χιλιάδες θύματα στο απώτερο μέλλον, με δρακόντεια εφαρμογή των οικοδομικών κανονισμών και επαγγελματικό προγραμματισμό της πολιτικής προστασίας, η άνοδος της στάθμης της θάλασσας θα εξαφανίσει τις περισσότερες παραλίες μας και οι πλημμύρες θα είναι ο κανόνας. Όταν πλέον θα έχουμε ξεχάσουμε τις συνέπειες της τωρινής οικονομικής μας κρίσης, θα εισπράττουμε τις συνέπειες της βλαχοδιαχείρισης της παράκτιας ζώνης από επιχειρηματίες, ξενοδόχους, εμπόρους, δικηγόρους, φαρμακοποιούς και άλλους «ειδικούς» μηχανικούς σε δημόσιες θέσεις, που πιστεύουν ότι η επιτυχία των πολιτικών αποδεικνύεται από τον συνωστισμό που επιβάλλουν στις πόλεις μας και τον γεωμετρικό όγκο τσιμέντου με το οποίο επιβαρύνουν τις απίστευτα όμορφες ακτογραμμές μας, για πρόσκαιρο προσωπικό όφελος.

Οι αφύσικες καταστροφές έχουν πιο μακροχρόνιες συνέπειες από τις φυσικές.

200 structures destroyed in Iowa dam flooding

CHICAGO – Standing water on Chicago-area expressways turned what should have been an easy Saturday morning drive into a soggy, snarled mess after heavy rains across the Midwest closed roads, stranded residents and punched a hole through an Iowa dam.

In Chicago, officials say more than 7 inches of rain fell early Saturday, inundating the sewer system and overwhelming waterways. Water covered portions of several Chicago interstates and the commuter train tracks that run along them, leading crews to divert traffic and call in bus shuttles. Portions of Interstate 290 west of downtown were closed for several hours.

In eastern Iowa, the Lake Delhi dam (created in the 1920s) failed as rising flood-water from the Maquoketa River ate a 30-foot-wide hole in the earthen dam, causing water to drop 45 feet to the river below and threatening the small town of Hopkinton.

Areas below and above the dam had been evacuated after heavy rain has pushed the river to 23.92 feet — more than 2 feet above its previous record of 21.66 feet in 2004.

Donna Dubberke, a meteorologist with the National Weather Service in Davenport, said areas below the dam will see an initial crest in the river caused by the dam's failure followed by a secondary crest as the high water above the dam made its way downstream.

"There will be initial wave from the sudden shot of water and a secondary shot behind it from the rainfall," she said.

(Yahoo News, July 25, 2010 / CNN στο ASCE SmartBrief, 26 July 2010)

Aerial view of the Lake Delhi Recreation Association Dam after it had been compromised.

Engineers say floodgate is suspect in Delhi dam failure

Iowa officials should fully investigate whether a broken floodgate on the Lake Delhi dam contributed to the northeast Iowa dam's failure last weekend, national experts said Wednesday.

"That's a huge question mark," said Brad Iarossi, an engineer who speaks about dam safety for the American Society of Civil Engineers.

A properly working dam should have been capable of handling the 13-inch downpour storms dropped upstream, they said.

The dam has three floodgates, which were designed to be raised or lowered to regulate water levels in the lake and on the Maquoketa River, which forms the lake. They were supposed to be open after heavy rains to allow water to flow out of the lake and into the river.

But one of the gates was inoperable, and it was partly closed when lake waters rose late last week. The lake water kept rising until it poured over the top of the dam, then chewed through an earthen portion of it. Most of the 440-acre lake drained out through the new hole.

Views from the dam at Lake Delhi that was breached.

Ron Corso, a Virginia engineer who is spokesman for the Association of State Dam Safety Officials, said Internet photos of the dam taken after the breach appear to show a significant floodgate problem. He said he hadn't seen details of water flows at the time, but logic dictates that a partially closed floodgate could have contributed to the catastrophe.

"What doesn't go through the gates goes over the dam," he said.

The Lake Delhi dam had three 25-foot-by-17-foot floodgates that were to be opened to allow water to flow into the Maquoketa River after heavy rains. The gate to the left was only partly open last weekend.

Delaware County Engineer Anthony Bardgett said Wednesday that he believes the broken floodgate could have contributed to the dam's failure. He said the gate appeared to

have been closed more than halfway. He said he expects state officials to sort out what happened.

Larry Weber, a University of Iowa engineering professor, agreed with his national colleagues that photos of the floodgates raise questions.

It's too soon to draw conclusions, he said, but it's important to determine whether something could have prevented the breach. He also said the investigation could help shape designs for a replacement dam.

Iarossi said that if the dam was releasing as much water as it was designed to, as the owners say, officials should investigate whether the dam's apparatus was sufficient for the size of the lake behind it.

He said other old dams around the country have been improved with the addition of gates or emergency spillways.

The dam failed after torrential storms upstream dropped as much as 13 inches of rain in 48 hours.

Iarossi and Corso both said the dam should have been able to cope with that much water.

"It was a huge rain, but in the world of dams, that's nowhere near what we design them to handle," Corso said.

Even if fully operational floodgates had failed to keep up with the water flows, they might have prevented a breach. That's because small amounts of water over a dam aren't necessarily fatal, he said.

"We have lots of examples of earthen dams that were overtopped and survived," Corso said.

(Tony Leys, The Des Moines Register (Iowa), July 29, 2010 στο ASCE SmartBrief, 30 July 2010)

Bridge collapse strands more than 100 residents

AZTEC — Part of the bridge on County Road 2900 that runs over Cox Canyon gave out during a flash flood Sunday night.

Officials and area residents said they hadn't seen a similar flood in the canyon for nearly 10 years.

A bridge on County Road 2900 is partially collapsed after heavy heavy rains and flooding Sunday night.

The bridge collapsed because the water running down the canyon hit the bridge at an angle and made an eddy current underneath the bridge, which ripped out the structure's support, said San Juan County public works administrator Dave Keck.

The Kiffen Canyon bridge has been under maintenance for about six weeks, Don Cooper, the San Juan County emergency manager said. The flood in that canyon was not as severe as the one in Cox, and it did not damage the construction project.

The surge of water came down at about 7 p.m. Sunday and the bridge was discovered with a massive hole in it by firefighters at around 8 p.m.

"The thing that was so strange about it was that it actually happened," said Rich Spriggs, who lives next to the collapsed bridge. "I've lived here for eight years and there hasn't been a trickle of water going down that canyon."

Every bridge in San Juan County is analyzed and the most recent study didn't show the bridge was susceptible to collapsing during a flood, Keck said.

Engineers design bridges to withstand 25-, 50-, or 100-year events, which describe how serious and rare the storm must be to destroy the structure, Cooper said.

"Whatever number they decided to use when they (built the bridge), the water that came down last night was more than it could withstand," Cooper said. "Regardless of how you plan to do something, Mother Nature always tries to outdo you."

Eight years ago, Keck said a similar storm damaged part of the bridge.

Bridges on main highways and inside the city are built to a better standard because only so many funds can be given to a bridge that is not regularly traveled, Cooper said.

"Every bridge in the world," Cooper said. "If the water gets high enough, it's going to erode."

(Ryan Boetel, The Daily Times 26.07.2010 στο ASCE SmartBrief 28.07.2010)

Bridge collapse kills dozens

The search continued Tuesday for 13 people missing following the collapse of a bridge amid heavy floods in central Henan Province central China that have killed at least 28, officials said.

A total of 42 people fell into the torrent Saturday when the Yi River Bridge collapsed. One person survived, and 28 bodies were recovered from the river, Li Yan, an official from Luanchuan County told the Global Times.

Li Xianghong, who survived, recounted the moment when the bridge collapsed.

"It all happened in an instant. The southern side of the bridge where I was standing collapsed first. In several seconds, dozens of pedestrians around me, including my nephew, were plunged into the water," he told the Dahe Daily.

He said he hung onto a willow tree 200 meters downstream and was hauled to the bank by villagers with a rope.

An initial investigation shows the bridge collapsed after fallen tree trunks became stuck underneath it, blocking the passage of the raging floodwaters, according to Xinhua.

Li, the local official, said that the cause of the accident was still under investigation and that they are now focused on rescue work, which has shifted downstream. He said it is most likely that the flood, which is unprecedented in the area, contributed to the collapse.

The foundation of the 153-meter-long bridge was made of stone. A sign at the northern end of the bridge recorded when it was built and maintained, but the sign was removed after the bridge collapsed, villagers told the Dahe Daily.

The bridge was repaired in 2009 after it had partially collapsed. Only white marble handrails were added, and the surface was paved with asphalt, but no reinforcement was made to the bridge's foundation, villagers were quoted by the Dahe Daily as saying.

The collapse of bridges has been a common occurrence in China. The collapse of Fenghuang bridge in Hunan Province was among China's worst in recent memory, as it killed 64 people and injured 22.

An investigation revealed that shoddy building materials and poor construction story were behind the collapse.

Cheng Daye, an engineer at the Building Construction Test Center at the Central Research Institute of Building and Construction, told the Global Times, "Many structures including bridges are built in haste with shoddy construction materials nowadays, making them more vulnerable to natural disasters such as earthquakes and floods."

A large number of bridges were built 20 or 30 years ago with the capacity to handle a much lighter traffic flow than today's flow, he added.

Huang Xingchun, a professor specializing in bridge engineering at Shanghai Jiao Tong University, told the Global Times Tuesday that heavy floods could have contributed to the collapse of the bridge if it was badly constructed.

Landslide leaves 21 missing

Meanwhile, a landslide in southwest Sichuan Province left 21 people missing Tuesday as flash floods forced officials to suspend boat traffic through the Yangtze River's Three Gorges Dam.

Huge swathes of rock and mud sliding from Ermanshan Mountain strike Shuanghe Village, Ya'an City, Sichuan Province Tuesday.

About 120,000 cubic meters of rock and mud slid down Ermanshan Mountain near Shuanghe Village, Ya'an City, at around 5 am Tuesday, leaving 21 people missing and 91 collapsed houses, according to a statement by the local government e-mailed to the Global Times.

Rescuers combing the rubble pulled out three survivors.

Weeks of torrential rains have hit large swaths of central and southern China in recent weeks, flooding riverside towns, causing landslides and mudflows and raising key rivers to dangerous levels.

Shipping services through the Three Gorges Dam were suspended at 10 pm Monday, for the second time this month, as engineers at the dam expect more floods.

The water flow through the dam is expected to peak at 56,000 cubic meters per second today, according to a Three Gorges Corporation official.

On Monday, a pre-dawn mud flow near the China-Myanmar border in Southwest China's Yunnan Province left 11 injured and another 11 missing. The search for the missing, including a 4-year-old Chinese girl and four Myanmar nationals, was ongoing.

A total of 333 people have been killed in rainstorms and floods across China since July 14, while 300 others are still missing, the Ministry of Civil Affairs said Tuesday.

Rainstorms have been lashing provinces such as Shaanxi, Sichuan and Henan, triggering floods and landslides, resulting in heavy losses of life and property, a ministry spokesman said.

As of 4 pm Tuesday, the rainstorms and floods had affected more than 40 million people, destroyed 140,000 homes and 417,000 hectares of crops, and had led to the relocation of 3.1 million people.

Direct economic losses from the rainstorms and floods were estimated to be 154.1 billion yuan, according to the Office of State Flood Control

(Song Shengxia, Global Times (China), July 28 2010 στο ASCE SmartBrief, 28.07.2010)

Dam collapses amid monsoon floods
At least 500 killed, over 400,000 affected by floods

PESHAWAR: As raging floods wreaked havoc across Khyber Pakhtunkhwa and some Fata regions, inundating large parts of Nowshera, Charsadda and Swat, the people of Dera Ismail Khan were warned on Friday of a similar disaster after 400,000 to 500,000 cusecs of water discharged from the overflowing Tarbela reservoir threatened all natural and man-made protective barriers in the district.

The calamity which a minister described here on Friday as the worst in the history of the province has claimed at least 500 lives.

Thousands of villages have been submerged by rivers bloated by torrential rains; roads have been blocked by landslides and about 400,000 people have been forced to leave their homes.

Flash floods and heavy rain have caused widespread devastation in Peshawar, Charsadda, Nowshera and Swat, while landslides and lightning have killed about 100 people in Kohistan, Upper Dir and Shangla districts.

Surges in the Kabul and Swat rivers have swept away houses, bridges and communications system and inundated agricultural land.

Dera Ismail Khan is facing a severe threat because of a heavy discharge of water from the Tarbela reservoir and authorities have warned local people to move to safe areas.

The release of water from Tarbela, according to the officials, could cause backflow in the river Kabul, causing further threat to Nowshera.

Parts of the Islamabad-Peshawar motorway, Grand Trunk Road and the railway line between Peshawar and Rawalpindi have been submerged.

Landslides triggered by torrential rains and lightning caused a large number of casualties in Kohistan, Upper Dir and Battagram.

In Kohat division two bridges have been washed away.

Four people died when a house collapsed in Malakand district on Thursday night.

The information minister said at least 60 bridges had been destroyed.

A newly constructed part of a dam in the Charsadda district collapsed, while the UN said it had reports 5,000 homes were under water in the area.

The meteorological department said an "unprecedented" 312 millimetres of rain had fallen in the region in 36 hours, but predicted only scattered showers during coming days.

Correspondents Abdul Sami Paracha from Kohat, Gohar Ali Gohar from Malakand and Zahid Jan from Upper Dir contributed to this report.

(Zulfiqar Ali, DAWN.COM, Saturday, 31 Jul, 2010)

At least eight dead, others missing after flood hits Nepal hydropower project

At least eight laborers died and at least two went missing after floodwaters swept through their sleeping quarters at a hydropower project under construction in Nepal, according to wire reports from the region. Some reports indicate that at least nine people were killed.

At least 14 people have died in landslides and flooding triggered by torrential rain in central and western Nepal's Dolakha and Jajarkot districts, regional media reported.

The hydropower plant flooding occurred when a river changed its course due to landslides, police said.

The flooding at the hydropower plant took place in the Dolakha district, which is about 150 kilometers east of Kathmandu.

The 10-MW Sipring hydropower project, which is being constructed, was flooded in the early morning hours Tuesday when the laborers were asleep, wire services reported.

On Tuesday, police said they had recovered eight dead bodies and rescued six injured. Two laborers were missing at that time, Deputy Superintendent of Police Dhiraj Pratap Singh told Kyodo News.

Damage caused by the flood to the hydro project is yet to be ascertained.

(PennWell, 4 August 2010 στο HYDROWORLD weekly, Tuesday 10 August 2010)

Landslide in British Columbia

VANCOUVER — A melting glacier triggered a massive rock slide on the unstable slope of a dormant volcano near Pemberton, B.C., on 5:30 a.m. Friday, August 6, diverting a river, blocking a creek and raising concern that a newly formed lake behind the slide could flood the valley below.

Where: Mount Meager, 65 kilometres north of Pemberton, 150 kilometres north of Vancouver

Volume: 40 million cubic metres of rock, sand and debris

Speed: 30 metres per second

Meager Creek Hot Spring – Capricorn Creek Outflow – Meager Creek at Lillooet River (από αριστερά προς τα δεξιά)

The landslide swept down from Capricorn Glacier on Mount Meager and formed a dam, 300 metres wide and two kilometres long that blocked Meager Creek and partially the Lillooet River, near Pemberton.

A portion of a glacier, top, is visible as mud and water continue to flow down a mountain after a landslide occurred near Meager Creek Hot Springs north of Pemberton, B.C., on Friday August 6, 2010

That sparked concerns that a build-up of water would eventually come gushing down the slope toward valley homes and residents.

The Squamish-Lillooet Regional District issued an evacuation alert several hours after the slide. Up to 2,000 people were evacuated from their homes.

But Mother Nature took care of the threat by Saturday morning as Meager Creek cut a new channel, easing the water build-up.

Jordan Sturdy, Pemberton's mayor, said the avalanche of debris was one of the largest slides Canada has ever seen.

"The biggest slide ever in Canadian recorded history is the Hope slide, and that was 46 million cubic metres," he said. "So we're really up there."

The Hope slide occurred in B.C. in January 1965 and resulted in four deaths.

The Frank slide that killed dozens of Alberta residents in 1903 had an estimated 30 million cubic metres of rock.

A portion of a glacier is visible as mud and water continue to flow down a mountain after a landslide occurred near Meager Creek Hot Springs north of Pemberton, B.C., on Friday August 6, 2010

Brent Ward, an earth sciences professor at Simon Fraser University, said Friday morning's slide was likely triggered due to recent warm weather and a nearby glacier.

Mud and debris fills a valley after a landslide occurred near Meager Creek Hot Springs north of Pemberton, B.C., on Friday August 6, 2010

"All that stuff that's melting is going into this really porous rock and that weakens it," he said in an interview. "It looks like a fairly big chunk (of rock) just broke right off."

The area has a long history of geological instability. A flood swept through the Meager Creek hot springs in 1985, damaging cars and bridges and forcing the rescue of visitors by helicopter. And in 1975, four consulting geologists doing geothermal studies for BC Hydro were buried in an avalanche at nearby Devastation Creek.

Three landslides were reported around Meager Creek in October 1990, triggered by heavy rains. The slides blocked access to the hot springs, a popular tourist spot, and stranded five tourists by knocking down a bridge.

In 1998 1.2 million cubic metres of material came down from Mount Meager, according to a report on the provincial government website. No one was killed or injured in that slide.

There have been other earth slides in B.C. this year.

On June 13, a massive mudslide destroyed five homes and severely damaged three others in Oliver, in B.C.'s Okanagan region, about 400 kilometres east of Vancouver.

That slide, which didn't injure anyone, was caused by the collapse of an 80-year-old earth-filled dam. The slide also wiped out several orchards and vineyards.

While nobody knows what the slide's long-term impact will be, it is expected to increase the possibility of future flooding and the debris will require close monitoring, said Rick Guthrie, a regional geomorphologist at the Ministry of Environment.

Flooding during the next rainy season — between November and February — is the most immediate concern.

"All that sediment that is now between the outlet of Meager Creek and Lillooet River is going to be transported downstream," Guthrie said.

"It will cause the river to change its behaviour. In some places it may erode, in others it may deposit. If we have large plugs of sediments and debris jams then we can get local flooding."

About 40 million cubic metres of rock, sand and debris will need to be monitored closely to determine how the sediment will be redistributed. It may pose threats to those who live within 30 to 60 kilometres downstream of the Lillooet River, said Guthrie.

Mount Meager, about 2,680 metres in elevation and located 150 kilometres north of Vancouver, has a long history of landslides and debris flows. The area surrounding the peak is made of altered volcanic bedrock, which falls apart easily. Mount Meager last erupted about 2,400 years ago, and it has been aging and breaking down ever since.

Mud and ice from the Capricorn Glacier fills the valley near Meager Creek and the Lillooet River following an avalanche in the remote valley near Pemberton on August 6.

"We have observed numerous tension cracks right up at the peak," Guthrie said. "Water is coming out of the cliff face, both adjacent to and at the actual location where the landslide occurred. That indicates that water is making its way deep into the mountain and it will go along planes and ruptured surfaces, and those become failure planes (the surfaces along which landslides occur)."

Climate change is also indirectly related to Mount Meager's increasing volatility, Guthrie said.

"The glaciers, in the long term, are melting," he said. "Melting glaciers are a water supply, and that's allowing for water to go into the bedrock and along those fissures. But the entire mountain is breaking down and irrespective of the weather in the next two years — it could be cold season, warm season — we would still have a real hazard up there."

Water and ice backs up on the Meager Creek behind a earthen dam.

Every mountain wants to meet ocean, and landslides are nature's way of bringing rock downstream to be eroded by rivers or to forge valleys, he said.

Though B.C. is considered a hazardous area because of its mountainous terrain, its low population density in mountainous areas means natural disasters are less likely to affect residents.

"The positive side of this is Mount Meager, though very volatile, is some distance back from the residential areas," Guthrie said. "But as urban areas in Squamish, Pemberton and Whistler push into the mountains, which presents a real hazard to people living there. Careful land use includes measures against future events, either by passively avoiding the area or actively protecting houses."

(The Canadian Press, Postmedia News, The Vancouver Sun, Global News, The Windsor Star, CTV Edmonton, Reuters, CBS News, August 7 and 08, 2010)

The Zhouqu County, China Mudslide

ZHOUQU, Gansu, Aug. 8 (Xinhua) -- At least 127 people have been confirmed dead in rain-triggered mudslides Sunday in a northwest China county, while rescuers are racing against the clock to search nearly 1,300 others who are still missing.

Heavy downpours triggered landslides and mud-rock flows in Zhouqu County, Gannan Tibetan Autonomous Prefecture in Gansu Province, early Sunday morning.

Buildings and roads are hit by mudslides in Zhouqu County, Gannan Tibetan Autonomous Prefecture in northwest China's Gansu Province, Aug. 8, 2010.

The rescue headquarters in Zhouqu estimated that 1,294 people are missing as of 9 p.m. Sunday. Earlier the provincial civil affairs department put the figure at nearly 2,000.

Rescuers work in the mudslides-hit Zhouqu County, Gannan Tibetan Autonomous Prefecture in northwest China's Gansu Province, Aug. 10, 2010.

Another 117 were injured, including 29 in serious condition, as of 9:25 p.m. In addition, 1,242 have been rescued from debris or brought to safety from places such as tops of buildings.

Policemen carry out rescue missions in Zhouqu County, Gannan Tibetan Autonomous Prefecture in northwest China's Gansu Province, Aug. 8, 2010.

About 45,000 people have been evacuated, according to a statement from the provincial civil affairs department.

The water level in the county seat of Chengguan Township had declined by 40 cm, after floodwaters carrying mud and rocks submerged half the town in the small hours on Sunday, said Mao Shengwu, head of the prefecture.

The Bailong River, which runs through the county seat, overflowed after being blocked by landslide and a large body of slow-moving water had engulfed Chengguan Township.

More than 300 homes in Yueyuan Village had been buried, with the number of casualties still unknown, Mao said.

The mud-rock flow has leveled an area of about 5 km long, 300 meters wide and 5 meters deep in the county seat with more than 2 million cubic meters of mud and rocks, severely damaging power, telecommunication and water supply facilities. More than 20,000 people have been affected.

Sludge as deep as two meters spread across some major roads in the county, driving many trapped residents atop buildings.

Torrential rain on Saturday night prompted an avalanche of sludge and debris to crash down on the county seat of Zhouqu early Sunday morning, ripping many houses off their foundations and tearing multi-story apartment buildings in half.

Policemen and residents carry out rescue missions in Zhouqu County, Gannan Tibetan Autonomous Prefecture in northwest China's Gansu Province, Aug. 8, 2010.

"Several small landslides have occurred in the valley before, but they didn't arouse much attention," Li Tiankui, a resident who lived near the Bailong River, said.

Water spewed out the sides of the Bailong River due to debris blocking it and took a different downstream course than usual, engulfing buildings along the riverbank.

The mudslides occurred at around midnight in Zhouqu County, when the residents were asleep, and a clogged lake formed on the Bailong River at around 1 a.m.

The barrier lake is 2.6 km long, containing 2 million cubic meters of water, according to the provincial flood control department.

Zhouqu County is located in the southeast part of the prefecture, the seat of which is about 276 km away from Lanzhou, the capital of Gansu.

At least 127 dead, 1,300 missing in northwest China mudslides

ZHOUQU, Gansu, Aug. 9 (Xinhua) -- A massive mudslide battered Zhouqu County, in Gannan Tibetan Autonomous Prefecture, early Sunday. At least 127 people are reported

dead and 88 are injured. An estimated 1,294 people are missing.

Water carrying mud and stones flow down hill in Zhouqu County, Gannan Tibetan Autonomous Prefecture in northwest China's Gansu Province Aug. 8, 2010.

The county is located in the Bailong River valley, flanked by mountains on both sides.

The blockage of the river created a barrier lake that overfilled and sent massive waves crashing down on the county, ripping houses from their foundations and tearing six-story apartment buildings in half.

Rescuers began to blast debris damming a west China river Monday in order to safely release potential flood waters in Zhouqu County, where at least 127 people died in a massive mudslide early Sunday.

Death toll from NW China mudslide rises to 702; 1,042 still missing

ZHOUQU, Gansu, Aug. 10 (Xinhua) -- The death toll from a massive rain-triggered mudslide in Zhouqu County in northwest China's Gansu Province has risen to 702, with 1,042 others still missing, local civil affairs authorities said Tuesday afternoon.

The water level in an artificial lake formed after debris blocked the Bailong River has fallen by more than one meter after several blasts, reducing the risks of further landslides.

Rescuers search for missing person by boat in the mudslides-hit Zhouqu County, Gannan Tibetan Autonomous Prefecture in northwest China's Gansu Province, Aug. 10, 2010.

(Xinhuanet.com (China) and English.news.cn, 9 ÷ 11 August 2010)

Φονικές βροχές πλήττουν τη βόρεια Τουρκία

ΑΓΚΥΡΑ. Τουλάχιστον έντεκα νεκροί είναι ο απολογισμός από τις κατολισθήσεις που προκάλεσαν οι καταρρακτώδεις βροχές στη βόρεια Τουρκία.

Η θεομηνία έπληξε την επαρχία Ριζούντας (Ριζέ) στα βορειοανατολικά της χώρας, στην περιοχή της Μαύρης Θάλασσας, αργά προχθές το βράδυ. Οι θάνατοι από τις κατολισθήσεις αναφέρθηκαν στην πόλη Γκουντγκντού, όπου πλημμύρισαν σπίτια και αποκλείστηκαν δρόμοι ως αποτέλεσμα της σφοδρής νεροποντής.

A man walks past a house tilted sideways after landslides and floods triggered by heavy rains swept through a Gundogdu near Turkey's Black Sea coast on Friday, Aug. 27, 2010. People were killed when the landslide collapsed homes in Gundogdu, in the tea-growing Black Sea province of Rize (Associated Press).

Τρεις άνθρωποι ανασύρθηκαν τραυματισμένοι σοβαρά από τα συντρίμμια τετραώροφου κτιρίου, ενώ γερανοί αναζητούσαν δύο ακόμη αγνοουμένους.

Το πρακτορείο Ανατολή, επικαλούμενο τον υπουργό Επικρατείας Φαρούκ Ναζίφ Οζάκ, ο οποίος βρισκόταν στην περιοχή, μετέδωσε ότι ο αριθμός των αγνοουμένων είναι έξι.

Οι φονικές πλημμύρες είναι συνήθεις στα τουρκικά παράλια στη Μαύρη Θάλασσα, καθώς οι σφοδρές βροχοπτώσεις οδηγούν σε υποχώρηση της σαθρής γης, όπου έχουν χτίσει οι κάτοικοι τα σπίτια τους. Πρόκειται για οικοδομές που δεν πληρούν τις κατασκευαστικές προϋποθέσεις τις οποίες θέτει η πολεοδομία της περιοχής.

Οι φωτογραφίες που έστειλαν τα διεθνή ειδησεογραφικά πρακτορεία ήταν συγκλονιστικές, με οικοδομές βυθισμένες κυριολεκτικά στη λάσπη, ξεριζωμένα δέντρα και αυτοκίνητα παρασυρμένα από χειμάρρους.

(Η ΚΑΘΗΜΕΡΙΝΗ, 28 Αυγούστου 2010)

Part of Blanka Tunnel collapses, again

A part of the Blanka Tunnel on Prague's ring road collapsed in the early hours of Tuesday. The CZK 21.2bn (USD 1bn) 5.5km tunnel was under construction when the collapse

occurred. The cause of the collapse, which buried an excavator driver along with his machine, is yet to be determined. A full investigation is underway.

Prague firefighters' spokeswoman Pavlina Adamcova told Czech national press that rescue workers had managed to extricate the buried man. He had no obvious injuries but remains in hospital. No other injuries were reported from the accident.

Czech national media reported that in one place, the cave-in caused a 15m crater. Local residents have complained about the construction in the past. Some say that parts of facades have fallen off. In 2008 the ground fell through in the Stromovka public park, creating a 20m crater, during construction.

T&T tried contacting the tunnel's contractor Metrostav, but without response.

The Blanka tunnel is to be a part of the Prague northwest ring road system. It will be over 6300m long.

(Tunnels & Tunnelling International, 7 July, 2010)

Two parts of the 6-kilometre tunnel being dug near Prague Castle collapsed on Tuesday, burying a worker for six hours and leaving a gaping hole in a garden of the Ministry of Culture. And it wasn't the first time; the Blanka Tunnel has collapsed on two other occasions in the course of its construction, and concerned citizens and officials are losing their patience.

The Blanka Tunnel complex will be the longest municipal tunnel in Europe when completed, and it has a price tag to match: at more than 28 billion crowns it is the most expensive construction project ever undertaken in Prague. But money, it seems, cannot buy peace of mind. In 2008, a 15-metre-deep crater emerged in the middle of a protected natural park above the tunnel. Five months later the same thing happened again nearby, leaving an even larger hole, and on Tuesday another accident left one of the buildings of the Ministry of Culture in a strikingly precarious position near the edge of yet another large crater.

Remarkably, no one was injured in any of these incidents – not even the bulldozer operator who the Metrostav construction company spent six hours digging out of the rubble Tuesday morning. But with locals watching their walls crack in the frequent tremors and the city already having promised to serve up a culprit for the last collapse, everyone affected is at their wits' end. As for the former group, many residents are demanding that their rent be reduced as their landlords work to repair falling plaster, and many are afraid, despite the fact that Metrostav promises a "1000% chance" that no buildings will fall into a sudden abyss. And where the politicians are concerned, the district mayor's office demanded, to the refrain of "fool me once, fool me twice", that the work be halted until someone – Metrostav, the Czech Mining Office, the police – can give a guarantee that the district will not be fooled a forth time. Meanwhile Pavel Bém, mayor of Prague and a man prone to occasional unexplained disappearances, has disappeared, and left the media to replay statements he made two years ago, saying he could not imagine that a culprit would not be found.

No culprit was found, by the police at least, but the media and the Czech Mining Office did find one. The office fined Metrostav 200,000 crowns for failing to adhere to preventative measures. Czech Television then found a confidential supervisory report early in 2010 that suggested that the city did not have sufficient technical or financial oversight over the construction, which swallows eight billion crowns each year. And so it is that on day two of the newest collapse, many a news headline wonders whether it be Pavel Bém and the Civic Democratic Party that go down the hole.

The police are now investigating the incident as a threat to public safety, promising a special commission decked out with foreign experts. For the time being work is halted; Metrostav says that it will now be filling the space to prevent any further collapse and will wait for the cause to be reported before determining how to excavate the mere fifty metres that remain to the end of the tunnel.

(Christian Falvey, ČESKY ROZHLAS, 07-07-2010)

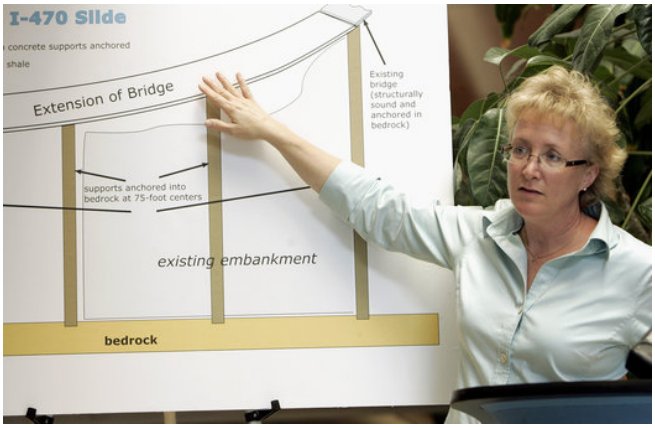
Bridge is to be built by October to replace collapsed ramp

Missouri highway engineers plan to sign a contract today for construction of a bridge that will replace the highway segment in the Three Trails Crossing that collapsed last weekend.

Engineers want the 225-foot-long bridge built by Sept. 30. It will restore a key artery between south Kansas City and the Kansas suburbs at a cost of up to $5.5 million.

Meanwhile, state and federal investigators are homing in on what caused the pavement to collapse in a four-hour span late Saturday afternoon. They are focusing on groundwater buildup near a retaining wall that supported the highway.

The scene of so many headaches for motorists — the collapse of this section of Interstate 470, which disrupted travel plans for thousands — should soon be a bustling construction zone. Here is how it looked this week.



Ideas for the repair were discussed Wednesday by engineer Beth Wright of the Missouri Department of Transportation. The solution, a bridge, will cost up to $5.5 million.

"If you have groundwater beneath a fill and you have a retaining wall that slides, that leads us to believe it was a contributing factor," said Beth Wright, district engineer for the Missouri Department of Transportation.

Wright conceded that most of the investigation so far has focused on the existing geology at that location and what would allow engineers to quickly repair the highway.

But MoDOT wants to know the cause, she said.

"We want to ensure as we build other walls or take care of the existing retaining walls that we have, that we're aware of all the issues," she said.

Clarkson Construction Co. said the retaining wall didn't fail but was brought down by shifting ground below.

Officials from the Federal Highway Administration also are investigating the collapse. They have some ideas about the cause, but couldn't be specific on Wednesday.

Earlier this week, soil experts drilled 20 feet down from the base of the retaining wall that supported the highway at that location. Ten feet down, they found groundwater that wasn't present when work on that portion of the highway started in 2001.

The presence of groundwater, blamed on heavy rains the last couple of years, led MoDOT to order that a bridge be built over the area instead of rebuilding the highway the same way.

The roadway in that area was supported by what's known in the industry as a mechanically stabilized earth wall.

There are more than 60,000 miles of such walls on highways across the country, commonly constructed to heights of 35 feet or higher.

The walls have been used for more than 30 years. Their popularity can be traced to the fact that they can be built quickly from prefabricated materials such as precast concrete panels or modular blocks. They are 30 to 50 percent less expensive than typical concrete walls.

The walls are now a staple of the highway industry with a solid reputation.

"We don't really fail a lot of these walls," said Silas Nichols, senior bridge engineer at the Federal Highway Administration.

Other states like Texas and Ohio have experienced limited problems with the walls, which are anchored into the ground with long metal strips protruding from one side of the wall face. The walls are supported by layers of compacted fill material with the metal strips in between.

Experts say that seeping water can pose problems, especially if draining water carries away the backfill that helps support the structure.

A material called filter fabric is intended to strain the water as it drains from the structure. But if it's not installed properly or damaged over time, the backfill can be washed away from behind the wall, creating a void that causes the structure to give way.

A wall can potentially collapse, too, if water doesn't drain properly and builds up behind the structure.

In 2005, Ohio closed a road along Interstate 270 in northeast Columbus because of a dip in the pavement caused by problems with a mechanically stabilized earth wall. In that case, the backfill washed away.

Tim Keller, the state bridge engineer for the Ohio Department of Transportation, said controlling the flow of drainage is essential to upkeep of the wall to prevent it from giving out.

"The key thing with these structures is to watch where your drainage is going," Keller said. "As long as you don't lose control of drainage, it's very reliable."

Wright couldn't answer any questions Wednesday about the integrity of the wall, saying it was still under investigation.

Clarkson Construction built the stretch of the highway where the pavement collapsed. Officials there said the wall did its part to support that section of highway, which opened in 2003 as part of a six-year project.

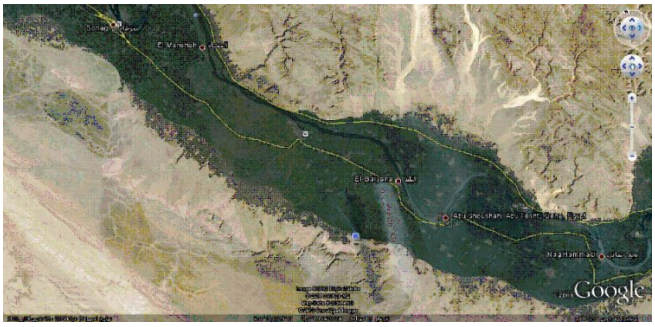
Bob Fry, operations manager at Clarkson, said the retaining wall moved with the slide underneath.

"The bottom of the retaining wall went with the slide," Fry said. "The slide was below what was actually constructed in 2001 …The retaining wall held the fill like it was supposed to."

(Brad Cooper, The Kansas City Star, 22 July 2010 στο ASCE SmartBrief, 22 July 2010)

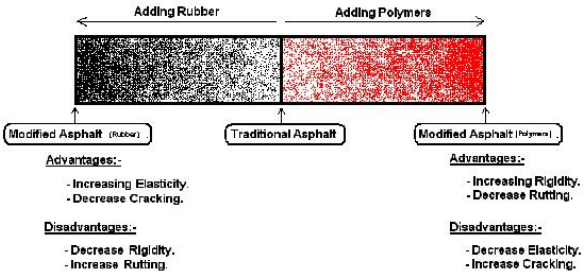
Surface Distortion and Cracking –problems for the highway

Highway defects can be divided into four groups, each of which can be considered as a family. Within each family these may have similar characteristics and require similar methods of repair. Also, any defect will belong to one of these four groups. Cracking and surface distortion are the two main groups of road defects and are also the most dangerous of the potential problems. Cracking defects affect pavement life rather than driving comfort while surface distortion defects generate the opposite effect, reducing driving comfort rather than pavement life. In the cracking group the specific problems include: alligator cracking; block cracking; edge cracking; longitudinal and transverse cracking and slidage cracking. And in the surface distortion category specific problems include: corrugations; depressions; shoving; rutting; swelling; sags and pumps; lane/shoulder drop off.



Surface distortion appears greatly in high temperature areas such as Upper Egypt, Arab Gulf countries and across much of North Africa. Due to this high temperature, dangerous defects affect most of the roads in these areas with rutting in particular becoming a common problem. So, many trials have been performed to avoid this defect, such as using modified hot mix asphalt (HMA). These modifications have been done by adding any material that can increase asphalt rigidity to deal with any distortion that may occur in the surface course. Polymers are the best known materials that can be added to reach the required rigidity and provide the necessary distortion resistance. Novavalt for example is one of the available polymers that can increase the rigidity of HMA.

To deal with the surface distortion problem, polymer modified asphalt is beginning to be used in the surface course for highways being constructed in Upper Egypt. This is because rutting is considered to be the most common defect of surface distortion and is found on many existing highways in the area, a problem that greatly decreases Percentage of Pavement Condition Index (%PCI). This %PCI is a factor reflects the current status of evaluating pavement surface, its range (0% : 100%). This factor resulted from using PCI method of evaluation which is approved by most codes all over the world.



A complete study was performed to check the benefits of using modified asphalt. This study focused on the Sohag – Abu Shoushah link which is built using polymer modified asphalt along around 63km of its length. The results were compared with the extension from Abu Shoushah – Nag Hammadi, which is built using conventional asphalt for a distance of around 28km. These highway links were chosen for comparison in the study as they feature the same traffic volumes and loads; have the same temperature and environment; use the same pavement construction except for the wearing course materials; have the same width and number of lanes.

These similar parameters ensured accuracy of the study and made for a close comparison between the two types of asphalt. The study measured the defects apparent by visual means, 6-7 years after construction. The study also took into consideration the local cost of modified asphalt as a material at 13 Egyptian pounds/m3, compared with 10 Egyptian pounds/m3 for conventional asphalt. The general concept for evaluating the benefit of using modified asphalt, is studying performance increment and comparing it with the increment of cost resulted due to using modified asphalt, whereas this benefit must be proportional with extra cost.

The results of the visual rating for the Sohag – Abu Shoushah – Nag Hammadi highway surprised the researchers however. The modified asphalt showed an ability to resist surface distortion, specifically rutting, with a better performance than for conventional asphalt. However, there were greater incidences of cracking than with conventional asphalt. Briefly, there was a small difference for %PCI between both modified and conventional asphalt against 30% extra cost for using modified asphalt. Comparing the increment of %PCI with extra cost, reflects that using modified asphalt in this area was not beneficial.

Generally, the study revealed that the side effect of using modified asphalt is the spreading of cracking and this is due to greater rigidity and lower elasticity. With these new properties, the asphalt wearing course copes less well with temperature changes during the 24 hour cycle (night and day), as well as temperature changes due to seasonal changes through the year (summer and winter). Modified asphalt is less able to bear volume changes that may also cause cracking defects in the asphalt wearing course as a result from any changes in sub-grade, sub-base or base volume.

There is another type of modified asphalt however, which features crumbed rubber and this offers the opposite performance to polymer modified asphalt. Using crumbed rubber allows the wearing course to cope with volume changes due to different ambient temperatures and helps prevent cracking. This is because the crumbed rubber increases elasticity and decreases rigidity. The disadvantage of using crumbed rubber in the mix is that it can spread surface distortion, with rutting being a potential issue and which may affect driving comfort.

Until now, the decision on whether to use rubber or polymers modifiers in the asphalt has depended on the environment and temperature of the proposed highway area. Specialists in these areas have shared this decision by expecting surface defects and opting for the solution that provides the least problems.

At present, there are efforts to use more than one modifier in the HMA so as to achieve the advantages of both and avoid the individual disadvantages. Making an optimum HMA mix could change all construction and maintenance plans for highways projects, deliver driving comfort, increase design life and keep excellent conditions for highway surfaces.

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(Mohammed Elsayed Mahmoud Eltantawy, World Highways eNewsletter July 2010 - 16.07.2010)

ΠΕΡΙΒΑΛΛΟΝΤΙΚΑ

Re-using asphalt

Recycling is a key issue for asphalt road construction, with many technologies now coming to market

With an ever increasing emphasis on sustainability forcing change in the construction sector in Europe and North America, the highway sector now has to seek new solutions. For asphalt road construction, recycling of road materials offers significant benefits in terms of reduced emissions and costs, with many new technologies now coming to market.

For the in-situ recycling in Newham SPL used its 500kW Wirtgen WR2500 Recycler pulverising the damaged road pavement to the required depth of 250mm

A new research project in the UK is offering the potential to realise significant carbon savings. An industry group, funded by investment from the Carbon Trust under the Industrial Energy Efficiency Accelerator (IEEA), has embarked on a two-year research initiative to develop a unique approach for more sustainable asphalt production. Led by Tarmac, the project team consists of Nynas UK, Atkins and the Mineral Industry Research Organisation (MIRO).

The group is working on designing, testing and demonstrating the viability of semi-warm and cold-temperature asphalt as an alternative to conventional hot-mix asphalt. The goal is to save energy in the asphalt production process, and reduce the carbon footprint of roads, by developing more carbon-efficient technology and new specifications.

Research conducted by the Carbon Trust has identified that the energy used to dry aggregates in existing hot mix production processes currently contributes 20% of the carbon generated by the aggregates sector. Presently, asphalt in the UK is produced at temperatures ranging from 150-1900C. The aggregates are heated at temperatures greater than 1700C to remove water, maximise the coating of the aggregates by the binder and improve the adhesion between aggregates and binder. The production of asphalt at warm or ambient temperatures will reduce or eliminate the need to dry aggregates altogether and maximise the use of recycled aggregates in asphalt.

Advances in cold-mix technology now allow it to be used as alternative to hot asphalt in certain circumstances. Cold-mix asphalt makes a significant contribution towards meeting government safety, health and environmental targets and should interest all local authorities tasked with meeting government sustainability targets.

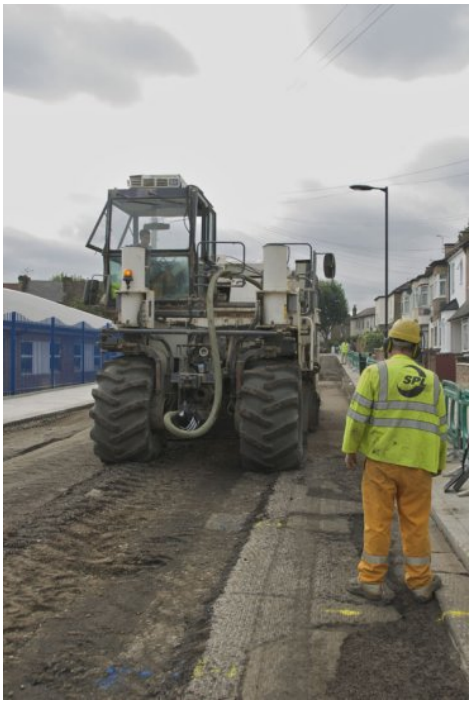
"By reducing the temperatures needed during asphalt production we can minimise energy consumption and achieve major reductions in asphalt-related carbon emissions. In addition to the technical research we're carrying out, this project will also deliver workable specifications that enable lower temperature asphalts to be adopted by highway operators," said Dr Nizar Ghazireh, project director at Tarmac.

"Early indications are that this approach can also offer significant carbon savings in transportation, a major carbon contributor in the aggregates sector, through the use of mobile plants and manufacturing cold mix using locally sourced recycled asphalt planings," added Dr Ghazireh.

"Low temperature asphalts have been used extensively but the technology has not been employed as much in the UK. A major obstacle has been a lack of client understanding about the products and how they should be specified," continued Nynas UK's product application manager for cold paving technology Dennis Day. "The support from the Carbon Trust will enable the project team to engage clients in developing guidelines which will help them specify lower temperature asphalts – assisting the industry in reducing its carbon footprint."

"Engineering a low carbon future is core to every aspect of Atkins' work and this project will help to bring significant reductions in the industry's carbon footprint. The outcome will provide a means for highway authorities to address their carbon reduction commitments by deployment of the technology in maintenance and construction works undertaken everyday on the highway network," concluded Alan Taggart, director, Atkins Highways and Transportation.

The benefits of using asphalt produced at lower temperatures have already been widely recognised across Europe. As part of the project, the group will undertake extensive production and demonstration trials to demonstrate the capabilities of semi-warm and cold-mix asphalt, including plant production, installation and in situ product performance.



Newham Council's highways department and consulting engineer Jacobs, decided to in-situ recycle the road as it proved to be faster, cheaper and more environmentally beneficial than other options

The project team, led by Tarmac, will research and identify how these materials have been used and specified across

Europe and through dialogue with key industry stakeholders develop a guidance note to facilitate their use across the industry. Tarmac and Nynas will work jointly using binder technology developed by Nynas in Europe and asphalt developed by Tarmac in the UK to lay the site trials. These sites will be monitored and evaluated by Atkins and Tarmac and the findings will be used to development working specifications.

Meanwhile some in-place recycling methods are already being used. The first road to be repaired in London in the last 20 years using in-situ recycling process, of rejuvenating and strengthening the existing damaged road materials, has provided considerable cost, time and environmental savings for Newham Borough Council. The Council's highways department saved around £80,000, four weeks of disruption and over 9tonnes of carbon dioxide emissions by using in-situ repairs to Dersingham Avenue.

The cold in-situ recycling process involves pulverising damaged or failed road pavements to depths of up to 320mm with a special rotovating machine and mixing in specific quantities of either lime, cement, pulverised fuel ash, bitumen emulsion, foamed bitumen or combinations of these ingredients. The revitalised mixture is then rolled, reprofiled, re-rolled and overlaid with an appropriate final surfacing for a fast return to traffic, all in accordance with the official specifications for structural maintenance of highway pavements by cold in-situ recycling.

Repairing the damaged road, using conventional reconstruction techniques, would have cost around £320,000 and taken about seven weeks. By adopting the in-situ recycling process Newham was able to considerably minimise disruption for residents by eliminating about 90 movements of 20tonne trucks, needed for conventional reconstruction, and complete the carriageway repairs in just three weeks at a total cost of around £240,000.

The Council's highways department, together with its consulting engineer Jacobs, decided to in-situ recycle Dersingham Avenue after considering alternatives as it proved to be a faster, cheaper and a more environmentally beneficial option. Dersingham Avenue is a one way residential road on a major route with heavy parking on both sides. The central strip of the carriageway had suffered severe deformation, rutting and potholing.

Jacobs carried out a detailed site inspection with ground penetrating radar and core testing of the 650m long carriageway. Jacobs also produced the design philosophy of in-situ recycling just the central, heavily trafficked strip of the road and inlaying the less trafficked edges, together with pavement design, including materials and thickness. In-situ recycling is faster, cheaper, much less disruptive to traffic and far more environmentally acceptable, with a carbon footprint that is considerably less than normal reconstruction methods. Also in-situ recycling does not generally require the disposal of surplus material or the importation of large quantities of new materials, unlike conventional repair techniques.

Newham Borough Council's term maintenance contractor F M Conway, based in Dartford, Kent, carried out all the necessary preparatory works prior to a start on the in-situ repair part of the project. The in-situ repair was subcontracted to the specialist road recycling and stabilisation contractor Stabilised Pavements, based in Lutterworth, Leicestershire. Stabilised Pavements rejuvenated just under 3,800m2 of the road using the in-situ recycling process and provided a 20-year design life of 2.5 million standard axles. Although Stabilised Pavements treated a couple of very short sections to the full width of the 6.6m road, the bulk of the in-situ recycling focused just on a central 3.8m wide strip along the full length of Dersingham Avenue.

For the in-situ recycling in Newham Stabilised Pavements used its 500kW Wirtgen WR2500 Recycler with a multi-tooth rotating drum cutter. The machine can rotovate a road to full depth while simultaneously delivering accurately metered quantities of water, bitumen emulsion or foamed bitumen into the mixture to strengthen and rejuvenate damage pavements in compliance with clients' specifications. But on Dersingham Avenue, Stabilised Pavements (SPL) used a blend of Ordinary Portland Cement (OPC) with pulverised fuel ash (PFA).

SPL started by pulverising the damaged road pavement to the required depth of 250mm. This was followed by reshaping with a grader and lightly compacted with a Hamm HD90 double drum vibratory roller back to the finished level. Blended OPC/PFA was then accurately applied in a thin blanket across the surface by a special lorry mounted spreader, at a ratio of 8% by volume of the material's dry density. This was then mixed in a single pass operation with the Wirtgen at the designated depth. At the same time water was injected into the mixture, from nozzles in the crown of the WR2500's rotovating drum chamber, to achieve the required material moisture content.

During the process the independent materials testing laboratory Bureau Veritas took samples to test and verify the design recipe. The rejuvenated and strengthened road base material was then reprofiled and levelled with the grader, prior to several passes of the Hamm roller to finally compact the strengthened road base to 95% of refusal density.

Once the required level and compaction was achieved the in-situ repaired section of the carriageway was sprayed with a sealing tack coat and gritted as a temporary running surface. "This is the first time in the last 20 years or so that in-situ recycling has been used to repair a damaged road in London," said SSPL director Gerry Howe, who has over 30 years' experience of the process. "And I was also involved with the last in-situ repair. The process is much, faster, cheaper, less disruptive to traffic than conventional repairs and also has a much lower carbon footprint. On this job we have saved about 9tonnes of carbon dioxide emissions."

Newham's Term Maintenance contractor F M Conway then followed on overlaying the full 6.6m width of Dersingham Avenue with a 60mm thick asphalt binder course followed by a 30mm surface course for a full and final return to traffic. "Newham opted for in-situ recycling because it was a lot faster and much cheaper than conventional reconstruction," said FM Conway senior contracts manager Paul Padfield. "The overall project only took three weeks, with the in-situ repair taking just four days. I have used the in-situ recycling technique before and Newham Borough Council was impressed with the operation. I am not aware of any other similar schemes programmed at the moment, but if the right job came along I will push to use the in-situ recycling technique again."

(World Highways eNewsletter July 2010 - 16.07.2010)

Vecor Recycles Waste From Coal Plants Into Building Materials

Vecor is taking refuse from coal-fired power plants and turning it into masonry. The Australian company plans to open a factory in China next year. WSJ's Emily Veach reports.

Coal power plants produce about a billion tons of waste each year, called fly ash. More than half of it goes to landfills and ash ponds. Fly ash is an environmental liability because it makes land uninhabitable and the particle-size dust pollutes the air. Vecor, a finalist in this year's Asian Innovation Awards, hopes to help eliminate fly-ash liability by recycling the waste into valuable raw materials and high-quality bricks, blocks, tiles and pavers.

Vecor founder Alex Koszo sums up the process like this: "We treat the ash with certain chemicals, we press it together, we fire it, at the end of the firing process it turns into a material much like volcanic rock. We can shape and form it in any way we like," he said by phone from Italy, where he is working with some of the world's best porcelain tile engineers.

The company is working with coal power plants and governments that are looking for solutions.

Mr. Koszo, who is Hungarian, learned of the sintering technology in an article published by the University of New South Wales, which helped him partner with scientists Obada Kayali and Karl Shaw.

David Harris, business-development director for Vecor Building Systems, holds a tile and a paver made of fly ash on Lamma Island, Hong Kong.

Already, companies use fly ash in road construction. In markets where there is high urban growth, there tends to be less of a fly-ash liability because the fly ash is recycled into roads, said David Harris, Vecor's business-development director, in an interview in Hong Kong.

In 2008 a fly-ash dam collapsed in the U.S., threatening the surrounding community. More than 3 million cubic feet of fly ash and water were released onto land surrounding the power plant and into nearby rivers, according to the U.S. Environmental Protection Agency.

Vecor's Mr. Koszo said the global financial crisis has been somewhat of a boon for his business. "When the market is robust it's very difficult to enter. Because our business model is based on partnerships, it's hard to get attention" in the industry, he said. Now, Vecor has found it easier to form partnerships as established companies seek new technology.

The market for green building materials world-wide was $455.3 billion last year, and is predicted to reach $571 billion by 2013, according to NextGen Research.

"In Europe, there is waning demand for building materials [overall], but for green building materials there is a definitely a pickup," Mr. Koszo said.

Governments and consumers are pushing for new technology, too, as environmental concerns gain in importance.

"There's a lot more focus by government and industry on the environmental aspect. We experienced a push and pull. Governments are pushing power stations not to dump waste into landfill," Mr. Koszo said. And consumers are "pulling" for sustainability.

The bricks Vecor makes are 80%-90% recycled material, while the tiles are 70%-80% recycled. The company says its products have performed better than industry standard in third-party laboratory tests of water absorption and durability. Vecor products are also fireproof.

In developing countries, Mr. Koszo said, unless your recycled product is cheaper or the same price as others in the market, "it won't sell."

"In India and China we see a great demand" for building materials, said Mr. Koszo. This year China's ban on clay mining will go into effect in certain provinces. "The result is that they can only use concrete bricks that contain cement," Mr. Koszo said. But Vecor's products aren't affected.

Fly ash gives Vecor "that competitive edge," Mr. Koszo said. Vecor's manufacturing costs for tiles are 20% less than standard Chinese tiles.

Vecor has a small pilot facility in China making prototype tile, brick and paver samples. The company plans to start commercial-scale manufacturing early next year. The company is working with Italian ceramic-machinery manufacturers to develop custom equipment to produce its patented products.

Mr. Koszo was inspired to form Vecor while traveling in China in search of business opportunities. When he saw the state of building materials in the country, where many residential buildings are covered in tiles, he noticed a need for new materials. "That made me choose recycling."

Now, the company is helping to find a solution to an environmental problem. Mr. Harris said, "I think that's really important, especially in a country like China where the pace of urbanization and development is very rapid."

(Emily Veach, The Wall Street Journal / Asia, August 17, 2010 στο ASCE SmartBrief on Sustainability, 19.08.2010)

Recycled asphalt good fit for paving secondary roads

When PennDOT finishes rebuilding Raccoon Creek Road in Beaver County, it will contain material recycled from at least 15 state roads.

The road transplant, of sorts, is becoming a common operation on the region's less-traveled roads as PennDOT looks for ways to cut costs during what state officials call a transportation funding crisis. The recycled material is up to 10 times cheaper than traditional asphalt.

"With budgets becoming tighter, these lower-volume roads probably wouldn't get addressed with (traditional) asphalt. This is a way for us to bring these roads back," said Jeff Karr, assistant district executive for PennDOT's District 11, which includes Allegheny, Beaver and Lawrence counties.

The district started using cold, recycled asphalt three years ago to rebuild roads in outlying areas -- generally ones with fewer than 2,000 vehicles a day.

The material is made from asphalt that is milled and collected during road construction projects. The millings are

crushed, ground and injected with oil and water before being applied and rolled. The road is sealed with tar and chips or a thin layer of asphalt.

"It's softer than (traditional) asphalt, so you can't use it on busy roads," Karr said. "But it's perfect for back roads that have become deformed."

Karr said the district will use 45,000 to 60,000 tons of recycled asphalt this year to pave up to 27 miles of road. Using the recycled asphalt will cost $40,000 to $60,000 a mile, compared with $250,000 to $400,000 a mile for traditional asphalt, he said.

No road transplants are scheduled in Allegheny County this year, but some routes in the southeast portion of the county will be done next year, Karr said.

PennDOT's District 12, which includes Westmoreland, Washington, Fayette and Greene counties, will use more than 200,000 tons of recycled asphalt to rebuild 40 miles of road and repair crumbling road shoulders, spokesman Steve Marsinko said. The district began using the material for such projects three years ago.

"It does help make us more cost-efficient and maximizes the budget we have," Marsinko said.

Although local PennDOT districts just recently started rebuilding roads with recycled asphalt, it's been done elsewhere since the 1970s, said Dave Newcomb, vice president for research and technology at the National Asphalt Pavement Association in Lanham, Md. About 100 million tons of asphalt are recycled each year, the association says.

The oil embargo drove its early use, Newcomb said. Asphalt is a by-product of oil refining. Interest was renewed in 2006 and 2007 when fuel prices soared, Newcomb said.

"It's a win-win for everyone," Newcomb said. "Departments of transportation are saving money, and it's definitely a good thing environmentally, in terms of there being less aggregate (used in asphalt) being taken out of quarries and the oil saved. The beauty is, you can continually recycle."

(Tom Fontaine, PITTSBURGH TRIBUNE-REVIEW, August 22, 2010 στο ASCE SmartBrief on Sustainability, 23.08.2010)

Schools plow playgrounds to reduce runoff

To be truly green, you have to get down and dirty, it seems. As Baltimore officials begin to tackle the polluted runoff fouling the harbor and the Chesapeake Bay, they are turning to a technique long used by farmers.

It's not enough simply to strip off some of the city's ubiquitous pavement and plant grass. The ground beneath that asphalt and concrete often remains as hard and impervious as the man-made surface it's replacing. And the rainfall will just keep running off — washing fertilizer, pet waste, oil and other contaminants into storm drains and nearby streams.

So to make that urban hardpan act more like a natural sponge and cut down on storm-water pollution, city officials are trying out the agricultural process known as "sub-soiling."

At Yorkwood Elementary School in Northeast Baltimore this week, a tractor plowed deep into a half-acre patch of playground that until recently had been covered in asphalt. The farm vehicle towed a claw-like contraption with long curved blades that slice far into the packed earth.

"That's what Freddy Krueger would have done if he was trained as an agricultural engineer," quips Stuart S. Schwartz, a senior scientist with the Center for Urban Environmental Research and Education at the University of Maryland Baltimore County. Schwartz, who's been studying how to reduce runoff for years, has a contract to monitor the Yorkwood project.

The ground behind the 51-year-old school probably hasn't seen sunlight in decades. It's so tamped down, though, that when Schwartz and his assistant, Brennan Smith, test the dirt's capacity to absorb moisture, it takes almost an hour and a half for an inch of standing water to soak in. Any but the gentlest of rains would just run off, though Schwartz says it's not the most water-resistant soil he's seen.

Standard asphalt or concrete pavement, of course, is practically a runway for water, quickly shunting it into gutters, storm drains and streams. With storm-water pollution a growing threat to the bay, experts say it's necessary to capture that runoff and filter out the pollutants fouling the water. That's what the soil did naturally, before development packed it down and paved it.

In cities — virtual seas of pavement because of their dense development — the challenge is to get rid of what you can.

Schoolyards are fertile ground for Baltimore's quest for pavement it can remove, because many have playgrounds covered with blacktop. Ten have had patches of asphalt and concrete not used for parking vehicles stripped off to make way for planting grass and shrubbery. But none has had the sub-soiling treatment Yorkwood is getting. Runoff from the site eventually drains into Herring Run, a tributary of Back River.

While grass is no doubt more eye-pleasing than pavement, those earlier school greening projects aren't doing as much as they could to curb runoff, said Prakash Mistry, acting engineer supervisor in the surface-water management division of the city's Department of Public Works. The city needs to reduce the runoff fouling streams flowing into the harbor by 20 percent now, and more later.

"You can grow grass on top of asphalt," Mistry says, with enough fertilizer and water. "That will not help us. Our intention is not just to grow vegetation but also to allow runoff to infiltrate into the ground."

One solution in many cases may lie with that old farm practice of sub-soiling.

"We've been sub-soiling for 30-40 years," says Russell B. Brinsfield, an Eastern Shore farmer and director of the University of Maryland's Harry Hughes Center for Agro-Ecology in Queenstown.

Growers sub-soil or deep-till their fields, he explained, when they find the soil has been compacted by repeated passes of heavy farm equipment and other factors. Plowing up not just the top few inches but deep into the ground improves drainage as well as crop yields, Brinsfield said.

Urban and suburban plantings might benefit in the same way, says Schwartz. Loosening up the earth enables grass and shrubs to send their roots deeper into the ground, making them stronger and more resistant to drought.

"Whether you're planting turf grass, making a community garden or putting it back in shrubs or wildflowers, the same holds," Schwartz says. "Compaction of soil determines vitality."

Sub-soiling can pay for itself in reduced fertilizer and maintenance cost on some planted landscapes, Schwartz said. And research in Wisconsin has shown that proper sub-soiling of the ground can reduce runoff 70 percent to 90 percent, he added.

Bill Stack, deputy programs director at the Center for Watershed Protection in Ellicott City, helped arrange for the Yorkwood project while he oversaw the surface-water division at the city's Department of Public Works until earlier this year. He believes this sub-soiling project could teach broader lessons.

"Every urban area has the same issue, and if the results show what a lot of studies have already demonstrated, then this is a tool that can really be used nationwide," said Stack.

The Yorkwood project has not been without glitches. Once the blacktop was removed, contractors found that the soil was not only hard as a rock, but full of rocks, explained Kimberly Burgess, program manager with EA Engineering, a consultant on the project. Fearing that the sub-soil tilling equipment might be damaged, the city directed that the top foot of that rocky earth be excavated, to be replaced with loose dirt.

Staying within the $205,000 budget for the overall project meant limiting the sub-soiling treatment to about half an acre of the schoolyard. When done, there will be a two-foot layer of loosened soil, mixed with compost, on which will be planted a variety of native grasses, shrubs and trees, including redbud, maple, gum and oak. There'll also be a "bioretention" area, or rain garden, specifically to collect runoff piped to it from the roof of the school.

Though not enough to derail the Yorkwood project, such complications indicate there might be cost or practical limits to using sub-soiling for controlling storm-water pollution in all urban and suburban settings, Schwartz says.

"It's not a magic bullet," he said. "There are no magic bullets."

The UMBC researcher says he expects to see "dramatic" reductions in storm-water running off the school yard once the work is finished. "The question is, how long will they last?" he asked.

For Deborah Sharpe, Yorkwood's principal, the project is already yielding educational dividends. She's eager to see what her 485 students can learn and do on the new green landscape they'll have when the work is finished in the next week or so.

Except for a small playground added three or four years ago, her pupils have had to spend their outdoor time on a cracked expanse of asphalt, she noted. Now they'll have a rain garden to tend, a place to take water samples and an outdoor classroom, she said.

"In addition to the blacktop being removed and the whole area being green," Sharpe said, it will be a better place "to explore and learn and play and just be with nature. I think the students will be so much more excited, they will be engaged and looking forward to it."

(Timothy B. Wheeler, The Baltimore Sun, August 20, 2010 στο ASCE SmartBrief on Sustainability, 23.08.2010)

ΑΡΧΑΙΑ ΕΛΛΗΝΙΚΗ ΤΕΧΝΟΛΟΓΙΑ

Διόλκος, 1500 χρόνια

Αναγγέλλουμε ευχαρίστως ότι η Εταιρεία Μελέτης Αρχαίας Ελληνικής Τεχνολογίας (ΕΜΑΕΤ,) με τη χρηματοδότηση του ΤΕΕ, ολοκλήρωσε τη δημιουργία της εικονοκινητικής (animation) ταινίας με θέμα τον **αρχαίο Διόλκο**, μέσω του οποίου διαπεραιώνονταν τα πλοία στον Ισθμό της Κορίνθου επί 1500 χρόνια.

Η ταινία των **Θ.Π. Τάσιου, Ν. Μήκα και Γ. Πολύζου** περιγράφει την άφιξη έμφορτου πλοίου (4ος αι. π.Χ.) στο βόρειο εσωτερικό λιμένα της Κορίνθου, την ανέλκυση του πλοίου, τη μεταφορά του κατά μήκος του Διόλκου (μήκους 6,3km), την επανακαθέλκυση στο σημερινό Καλαμάκι, τον πλού προς τον νότιο λιμένα, στις Κεγχραιές, τη φόρτωση κορινθιακών κεραμικών προϊόντων και τον τελικό απόπλου στο Σαρωνικό. Παρουσιάζονται θέματα ναυπηγικής, λιμενικών έργων, ανυψωτικών μηχανημάτων, αρχιτεκτονικής, αντλιών, χερσαίων μεταφορών κ.ά.

Η ταινία έχει λάβει έως τώρα δύο βραβεία:

- Καλύτερης ταινίας αναφερόμενης στην αρχαιότητα στο 5ο Διεθνές Φεστιβάλ Κινηματογράφου στην Κύπρο (Νοέμβριος 2009) και
- Καλύτερης εκπαιδευτικής ταινίας στην 8η Διεθνή Συνάντηση Αρχαιολογικής Ταινίας του Μεσογειακού Χώρου στην Αθήνα (Μάιος 2010)

Η ταινία έχει αναρτηθεί στο youtube σε τρία μέρη και μπορεί κανείς να τη δει ξεκινώντας από http://www.youtube.com/watch?v=XEnz2CJTfbE. Επίσης έχει αναρτηθεί και σε δημοσιογραφικές ιστοσελίδες, όπως στο βιντεοσκόπιο της Ναυτεμπορικής στο http://www.naftemporiki.gr/video/video.asp?id=27474&s=0

Το DVD έχει αναπαραχθεί και πωλείται πλέον από το ΤΕΕ (Νίκης 4 – Αθήνα) στην τιμή των €12.00 (πληροφορίες τηλ. 210 3291277).

Το ΤΕΕ και η ΕΜΑΕΤ θέλοντας να συμβάλουν στη διδασκαλία του αρχαιοελληνικού πολιτισμού, θα διαθέσουν 500 αντίτυπα στο Υπουργείο Παιδείας, για να διανεμηθούν στα Γυμνάσια και Λύκεια της Χώρας. Αντίτυπα θα σταλούν επίσης στα Πολυτεχνεία, σε βιβλιοθήκες και στα ΜΜΕ. Σχεδιάζεται η πραγματοποίηση εκδήλωσης δημόσιας προβολής της ταινίας σύντομα.

(Ανακοίνωση ΕΜΑΕΤ, 26 Ιουλίου 2010 – Φωτογραφίες από τιην ιστοσελίδα www.ecocrete.gr / Αρχαίος Διόλκος - Ένα μνημείο σε απόγνωση)

Ανάδειξη και αξιοποίηση του Λαβυρίνθου της Μεσσαράς

Την αξιοποίηση του Λαβυρίνθου της Μεσσαράς, ύστερα και από τις νέες ανακαλύψεις που έρχονται στο φως, ζητούν φορείς της Κρήτης.

Ο Λαβύρινθος της Μεσσαράς αποτελούσε μέχρι πριν από λίγες δεκαετίες σημαντικό τουριστικό προορισμό, με την πάροδο του χρόνου όμως υποσκελίστηκε από την προβολή άλλων σημαντικών μνημείων του Μινωικού πολιτισμού, στην

Κρήτη ακόμα και στην ίδια την περιοχή της Μεσσαράς. Το τελειωτικό χτύπημα στο μνημείο, το έδωσε η χρησιμοποίησή του από τους Γερμανούς ως αποθήκης πυρομαχικών κατά τον Β΄ Παγκόσμιο Πόλεμο και η ανατίναξη ενός μεγάλου τμήματος του Λαβυρίνθου.

Όμως, σύμφωνα με τους ειδικούς επιστήμονες και σπηλαιολογους, η κατάσταση του μνημείου τα τελευταία χρόνια είναι απογοητευτική, καθώς οι ρωγμές στα πετρώματα και η αποκόλληση κομματιών από τα τοιχώματα, δείχνουν ότι ο κινδυνος κατάρρευσης είναι ορατός.

Επίσης, οι απαντήσεις των Υπουργείων Εθνικής Άμυνας και Πολιτισμού σε παλαιότερη Ερώτηση βουλευτού, στηρίζουν την αδυναμία παρέμβασης στην γνωμοδότηση του Γενικού Επιτελείου Στρατού η οποία χρονολογείται από το έτος 2000, οπότε είχαν γίνει και οι τελευταίες εργασίες εκκαθάρισης των εισόδων του σπηλαίου.

Η παραπάνω γνωμοδότηση αναφέρει ότι δεν επιτρέπονται εργασίες ενίσχυσης των πετρωμάτων επειδή τα εσωτερικά τοιχώματα είναι ασταθή και υπάρχουν διάσπαρτα βλήματα από τον Β΄ Παγκόσμιο Πόλεμο.

Όμως οι τοπικοί φορείς και οι αρμόδιοι παράγοντες, πριν αρχίσουν οι εργασίες του ΓΕΣ είχαν ενημερωθεί από τον αρμόδιο καθηγητή, τότε Αντιπρύτανη του Εθνικού Μετσόβιου Πολυτεχνείου κ. Παναγόπουλο, ότι είναι δυνατή η εκκαθάριση και στη συνέχεια η αξιοποίηση του Λαβύρινθου. Μάλιστα, η Σχολή Μηχανικών Μεταλλειολόγων του ΕΜΠ αλλά και οι επιστήμονες λειτουργοί της είναι οι καθ΄ ύλη αρμόδιοι προκειμένου να αποφανθούν αν είναι δυνατή η παρέμβαση και με ποιους τρόπους και για τα βλήματα και τη στερέωση του σπηλαίου.

Πέραν αυτών, σύμφωνα με όσα προκύπτουν από τη συνέντευξη του κ. Λελούδα που δημοσιεύεται στην εφημερίδα «ΑΠΟΨΗ του ΝΟΤΟΥ», υπάρχουν νέες ανακαλύψεις από τον κ.Thomas Waldmann (δύο εντελώς νέοι θάλαμοι) και αναμένεται η διαπίστευσή τους από την Ελληνική Σπηλαιολογική Εταιρεία.

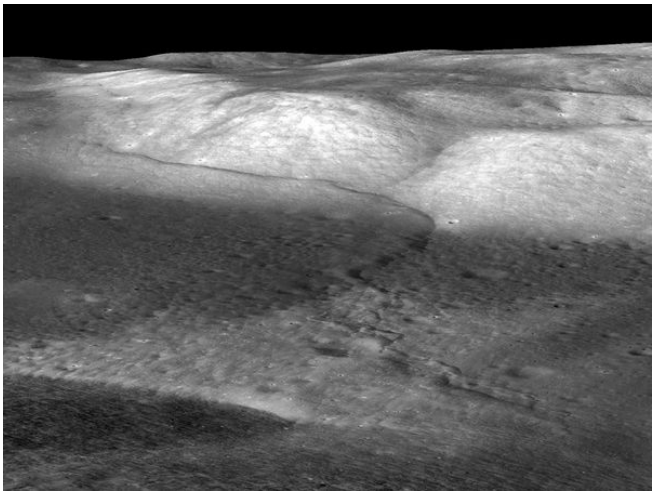
Τονίζεται ότι μέχρι σήμερα δεν έχει γίνει καμία προσπάθεια για καθαρισμό του Λαβυρίνθου, ούτε προβλέπεται οποιαδήποτε αρχαιολογική ανασκαφή στο χώρο, παρά το έντονο αρχαιολογικό ενδιαφέρον που παρουσιάζει ο Λαβύρινθος στην Ελλάδα και κυρίως στο εξωτερικό, την ώρα που στην ίδια συνέντευξη προτείνεται η δημιουργία Ταμείου για συγκέντρωση χρημάτων, με Διοικούσα Επιτροπή που θα στελεχώνεται από αποδεκτές προσωπικότητες, Ελλήνων και ξένων, με αναγνωρισμένο διεθνές κύρος.

Υπάρχουν προτάσεις της ελληνικής και διεθνούς επιστημονικής κοινότητας για την ίδρυση Ταμείου για τον Λαβύρινθο, με σκοπό, την ανεύρεση πόρων και στην συνέχεια με ευθύνη και καθοδήγηση του αρμόδιου Υπουργείου Πολιτισμού και Τουρισμού, να αξιοποιηθεί ένα μνημείο που παρουσιάζει έντονο αρχαιολογικό ενδιαφέρον αφού η επισκεψιμότητα του είναι δεδομένη εξαιτίας της φήμης που υπάρχει κυρίως στο εξωτερικό.

(Αγώνας της Κρήτης, 4 Αυγούστου 2010)

ΕΝΔΙΑΦΕΡΟΝΤΑ

The Moon Has Shrunk, and May Still Be Contracting



A lobate scarp (dark line at middle) snakes across the moon in a terrain model made from LRO pictures.

The moon has been shrinking, suggest scientists who spotted relatively young geological features that form when a planetary body cools and contracts.

Called lobate scarps, the features are made when land on one side of a geologic fault line is thrust upward, creating a slanting wall that can be several hundred feet high and several miles long.

"If you were walking up to one of these landforms, you would see basically what looks like a stair-step in the landscape," said study co-author Thomas Watters of the Center for Earth and Planetary Studies at the National Air and Space Museum in Washington, D.C.

"It would be steep in the front on the scarp face itself and then gently sloping on the backside."

The Apollo 15, 16, and 17 missions photographed about 70 lobate scarps near the moon's equator. (Read the original *National Geographic* magazine coverage of the Apollo 11 moon landing.)

But NASA's Lunar Reconnaissance Orbiter found 14 more scarps in several, widespread locations, suggesting the thrust faults are globally distributed across the moon's surface. (See some of the first moon pictures from the Lunar Reconnaissance Orbiter.)

Watters and colleagues think the scarps formed as the inside of the moon cooled from its original, molten state.

"As the interior cools, it contracts, and the crust of the moon has to adjust to the reduced volume," Watters said. "That causes this breaking of the crust into these small faults." Lobate scarps form when the contracting crust puts pressure along the fault planes.

What's more, all the scarps seen so far appear to have formed in the last billion years or so—relatively recent in the moon's roughly 4.6-billion-year history. (Take a moon mysteries and myths quiz.)

"They're very crisp, fresh looking features," Watters said. "There're constant micrometeorite bombardments on the moon, and features of this scale are probably not going to survive very long."

Based on the size of the scarps, Watters and his team estimate that the moon's width has shrunk by about 600 feet (182 meters) since the rocky body first formed.

Shrinking Moon a "Blockbuster" Discovery

Earth also has lobate scarps, although processes other than planetary cooling created the features. But scientists think scarps seen on Mars and Mercury—which are taller and longer than the moon's scarps—formed due to shrinkage.

The pristine state of the lunar scarps suggests the moon got cool enough to begin contracting only recently—which means it may still be shrinking, the study authors say.

This is surprising, given the moon's relatively small size, said Pat McGovern, a geophysicist at the Lunar and Planetary Institute in Houston, Texas, who called the new findings a "blockbuster result."

"Small planetary bodies tend to lose their internal heat very quickly," said McGovern, who was not involved in the new research.

"Heat is what drives the overall evolution of a planet, and the moon is thought to have lost most of [its heat] long ago. But the idea that you have very young faulting going on is very exciting, because it's somewhat unexpected."

While the moon might still be shrinking, its rate of contraction is probably slowing, and shrinkage will eventually halt completely, study co-author Watters said.

"The moon is going to contract less and less as time goes on, because its interior is cooling more and more," he said.

It's currently hard to say how much smaller the moon is likely to get, Watters added, but more images from NASA's lunar spacecraft could help answer that question.

"One of the exciting things about this is that we're continuing to image the moon with the Lunar Reconnaissance Orbiter," which is scheduled to operate for at least another two years, Watters said.

"Our hope is that with an extended mission we can produce a global map of the moon that's high enough resolution to see these lobate scarps everywhere."

(Ker Than for National Geographic News, August 19, 2010 στο ASCE SmartBrief on Exec Tech, 23.08.2010)

URS agrees US$ 52.4 million settlement for I-35W bridge collapse

URS Corporation will pay US$ 52.4 million to settle claims against it relating to the collapse of the I-35W bridge over the Mississippi in Minneapolis/St. Paul on 1 August 2007. This money, along with payments from a contractor and the state of Minnesota, will see some US$ 100 million paid out to the families of the 13 people killed in the collapse, and the 145 survivors.

URS was employed by the state of Minnesota to inspect the condition of its bridges, including the I-35W structure. An investigation by the National Transport Safety Board found the collapse had been caused by failures in gusset plates that were used to connect truss sections together.

The plates were found to be under-sized in some cases, and it was the failure to spot this that led to a court action being launched last year against URS. The trail was scheduled to start in early 2011, and could have seen URS pay punitive damages to victims.

A statement from URS said, "The I-35W bridge collapse was a tragedy, which the National Transportation Safety Board concluded was caused by a design flaw, compounded by large weight increases from upgrade projects over the years, and the traffic and construction loads on the day the bridge collapsed.

"URS was not involved in the design or building of the bridge, not was it involved in any of the later construction work, including the resurfacing work being done when the bridge collapsed. URS believes it is in the best interest of the company and its shareholders to resolve this matter and avoid the cost and distraction of protracted litigation. The settlement amount of US$ 52.4 million will be paid in full by the company's insurers."

(Chris Sleight, INTERNATIONAL CONSTRUCTION, 24 August 2010)

California is prepared for a major earthquake

With California residents abuzz about the "big one" expected to hit the Golden State, is San Diego County—with numerous major active faults—prepared for the long-anticipated earthquake disaster that will supposedly shake the state?

Since earthquakes are common in California, the state has been prepared since the 1930s (when the Field Act was mandated to require earthquake-safe construction for schools) and learned from the many major earthquake incidents like the 1989 Loma Prieta and 1994 Northridge earthquakes.

"In California, the codes are very, very well-designed and they result in very safe buildings," said Clay Westling, senior structural engineer in San Diego County's Department of Planning and Land Use building division. "The codes are upgraded after every major event as well as through research and academia."

Compared to many states and countries, California is considered the most earthquake-safe place, according to Westling.

"That's evidenced by looking at similar-sized earthquakes in other areas of the world," Westling explained. "Our buildings have performed very well. For instance, if you look at major earthquakes like the earthquake in Haiti recently, those buildings were not necessarily built to the same codes we have today. When we have similar earthquakes here, we would not have that sort of damage."

Mexicali road after the 7.2 quake on April 4, 2010

PREPARATION IN SAN DIEGO

According to an article on faults and earthquakes in San Diego County by Thomas Demere, a curator at the San Diego Natural History Museum, the rate of earthquake activity has doubled over that of the 50 years before 1984. As a result, the seismic zone rating for the county changed from three to four, which is a zone considered most at-risk for earthquakes.

"It's the highest threat we can consider the county to be in: Seismic zone four, which means we're all at the same risk as San Francisco and Los Angeles," said Senior Emergency Services Coordinator at San Diego County's Office of Emergency Services Tom Amabile. "We have the highest risk of an earthquake anywhere in the state."

This means the county requires a higher level of building codes and enforcements. Every few years, the building codes and seismic safety standards are reviewed by the Department of Planning and Land Use to see if they need to be upgraded or modified to require more strict building requirements.

"We have the most stringent building requirements as well as stringent seismic safety elements of the building codes possible under the current laws and regulation," Amabile said.

In addition, freeways, overpasses and county facilities were retrofitted to make them more resistant to earthquakes.

"New county construction at the new facilities is being constructed to the highest seismic safety codes available," Amabile added.

Most recently they completed a new draft of the hazard mitigation plan, which addresses preparation for natural disasters such as earthquakes, wildfires and storms.

RESEARCH & IMPLEMENTATION

UCSD researchers are looking into improving earthquake safety measures to protect people and buildings from possible seismic events.

For a three-year project, Shing and his research group are developing new design requirements for buildings to improve their resistance to earthquakes. The group is also developing new tools to measure seismic behavior to improve the cost-effectiveness and performance of buildings.

"Current design codes have some deficiencies so we want to improve the design method to make it more rational and to have more consistent performance," said structural engineering professor Benson Shing.

Shing said the deficiencies do not address cost-efficiency and performance in the design of low-rise masonry wall systems.

In collaboration with University of Texas at Austin and Washington State University, the research group is focusing on shear walls—which resist horizontal forces that cause most of the damage in earthquakes—in reinforced two-and-three-story masonry buildings commonly used for low-rise commercial and mid- to low-rise office buildings and hotels.

For the design, the group is considering multiple performance factors such as life safety, which Shing considers satisfactory in current building codes, and minimizing economic loss of structures to make the damage easier to repair and to restore functionality of building more quickly.

"We want the building to be repairable [so] it will not be damaged so severely in major earthquakes that it will disrupt the functionality of the building," Shing said.

The group is addressing this economic aspect by placing additional reinforcement in places where it is not needed, decreasing damage severity and increasing cost efficiency.

They will be testing their designs in a series of earthquake simulations using the world's largest outdoor shake table located at UCSD's Englekirk Structural Engineering Center. After publishing the findings, they will work with a co-development committee—which includes the Masonry Society, American Society of Civil Engineers and American Concrete Institute—to suggest code improvements for adoption to incorporate into code requirements. Cities and local governments then decide what codes they will adopt.

"San Diego has stringent code requirements for buildings so of course, they strictly follow the modern codes in the design," Shing said. "Definitely, the current code satisfies safety requirements but with this research project we will demonstrate design code is safe and further improve the safety of the buildings."

Besides analyzing and experimenting with designs of buildings, the findings on how seismic activities impact window films by another UCSD research group demonstrated that the films met the same specifications as those produced by by Solar Gard Films, which is manufactured by San Diego-based Bekaert Specialty Films.

Led by past graduate student C. Eva, structural engineering researchers looked at how window films, such as those manufactured by Solar Gard, fared under seismic behavior last spring. Solar Gard then used their data to show the benefits of safety film, which reduces injuries caused by broken glass due to a variety of events such as earthquakes, storms or an object striking a window.

"They tested [films, similar to Solar Gard's] in an earthquake-type scenario to understand what the impact was [and] what the benefit of the safety was when it applied to the window," said Jami Wong, who is Bekaert's product market manager for architectural film.

Intended for glass windows and doors in homes and businesses, the film has a shock-absorbing adhesive designed to keep the glass in place when events like an earthquake occurs, giving the glass very small chance of falling out of the frame.

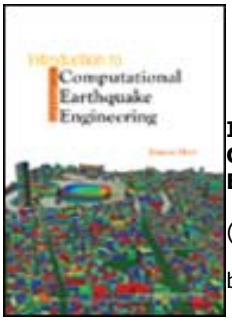
"When safety film is applied to windows, less than one percent of the glass that is shattered will actually fall out of the window frame. It protects people who are near the window from being at risk and injured as a result of broken glass," Wong said.

It costs between $2,000 and $4,500 to install safety films in a typical house, and can be subsidized with rebates and tax credits.

"As technology gets better—as building materials become more advanced, construction methods become more advanced— they revise the building codes," Amabile said. "One of the portions of the building codes is the seismic safety element. That's never going to be relaxed; it's going to be increased."

(Regina Ip, San Diego News Room, 24 August 2010 στο ASCE SmartBrief, 25 August 2010)

ΝΕΕΣ ΕΚΔΟΣΕΙΣ ΣΤΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΠΙΣΤΗΜΕΣ



INTRODUCTION TO COMPUTATIONAL EARTHQUAKE ENGINEERING

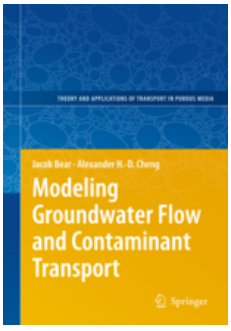
(2nd Edition)

by **Muneo Hori**

Introduction to Computational Earthquake Engineering covers solid continuum mechanics, finite element method and stochastic modeling comprehensively, with the second and third chapters explaining the numerical simulation of strong ground motion and faulting, respectively. Stochastic modeling is used for uncertain underground structures, and advanced analytical methods for linear and non-linear stochastic models are presented. The verification of these methods by comparing the simulation results with observed data is then presented, and examples of numerical simulations which apply these methods to practical problems are generously provided. Furthermore three advanced topics of computational earthquake engineering are covered, detailing examples of applying computational science technology to earthquake engineering problems.

Readership: Academic and industry: engineers, students; advanced undergraduates in the field of earthquake engineering.

(World Scientific, August 2010)



Modeling Groundwater Flow and Contaminant Transport

Series: Theory and Applications of Transport in Porous Media, Vol. 23

Bear, J. and Cheng, A.H.-D.

In many parts of the world, groundwater resources are under increasing threat from growing demands, wasteful use, and contamination. To face the challenge, good planning and management practices are needed. A key to the management of groundwater is the ability to model the movement of fluids and contaminants in the subsurface. The purpose of this book is to construct conceptual and mathematical models that can provide the information required for making decisions associated with the management of groundwater resources, and the remediation of contaminated aquifers.

The basic approach of this book is to accurately describe the underlying physics of groundwater flow and solute transport in heterogeneous porous media, starting at the microscopic level, and to rigorously derive their mathematiccal representation at the macroscopic levels. The well-posed, macroscopic mathematical models are formulated for saturated, single phase flow, as well as for unsaturated and multiphase flow, and for the transport of single and multiple chemical species. Numerical models are presented and computer codes are reviewed, as tools for solving the models. The problem of seawater intrusion into coastal aquifers is examined and modeled. The issues of uncertainty in model input data and output are addressed. The book concludes with a chapter on the management of groundwater resources. Although one of the main objectives of this book is to construct mathematical models, the amount of mathematics required is kept minimal.

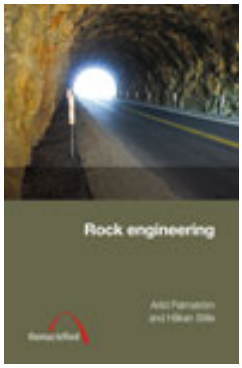
- Most comprehensive book on mathematical modeling of groundwater flow and contaminant transport

- Deep insight into the physics at the microscopic level and its description as averaged processes

- Addresses uncertainty and management issues

- Written by one of the most highly cited authors of groundwater books (Dynamics of Fluids in Porous Media, and Hydraulics of Groundwater)

(Springer, 2010)



Rock engineering

Arild Palmström & Håkan Stille

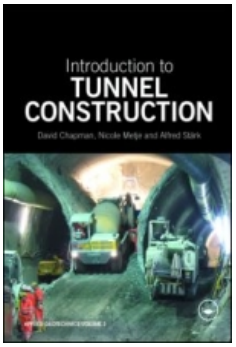
The first book to focus on risk and uncertainty, *Rock engineering* explains the geological principles and concepts required for successful geotechnical design and engineering of underground excavations.

Rock engineering is the essential, internationally applicable, practical guide for engineers and geologists who need to consider ground conditions on underground projects. An informative resource for clients, consultants and contractors hoping to understand the risk and uncertainties that can affect the project, this book is also and a valuable reference for advanced students on rock engineering and engineering geology courses.

Table of Contents

- Introduction
- Geology in rock engineering
- Investigations and measurements
- Derived ground information and location of project
- Ground behaviour
- Ground conditions and properties
- Rock engineering design tools
- Rock engineering in planning
- Rock engineering and excavation
- References and Appendix

(Thomas Telford, July 2010)



Introduction to Tunnel Construction

David Chapman, Nicole Metje & Alfred Stärk

Tunnelling provides a robust solution to a variety of engineering challenges. It is a complex process, which requires a firm understanding of the ground conditions as well as structural issues. This book covers the whole range of areas which you need to know in order to embark upon a career in tunnelling. It also includes a number of case studies of real tunnel projects, to demonstrate how the theory applies in practice.

The coverage includes:

- both hard rock and soft ground conditions
- site investigation, parameter selection and design considerations
- methods of improving the stability of the ground and lining techniques
- descriptions of the various tunnelling techniques
- health and safety considerations
- monitoring of tunnels during construction.

Clear, concise and heavily illustrated, this is a vital text for final year undergraduate and MSc students and an invaluable starting point for young professionals.

David Chapman is Reader in Geotechnical Engineering at the University of Birmingham, UK.

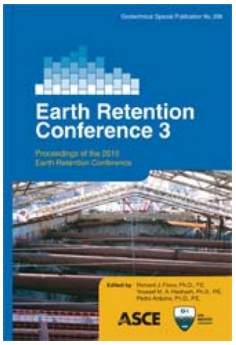
Nicole Metje is a Lecturer at the University of Birmingham, UK.

Alfred Stärk is a Senior Tunnelling Manager with the tunnelling contractor ALPINE BeMo Tunnelling GmbH in Innsbruck, Austria.

Contents

- Introduction to Tunnelling
- Site Investigation and Laboratory and Field Testing
- Tunnelling Techniques
- Tunnelling Design Issues
- Modelling
- Monitoring
- Case Studies
- Summary of Key Aspects
- Bibliography

(Thomas Telford, May 2010)



Earth Retention Conference 3

Richard J. Finno, Youssef M. A. Hashash & Pedro Arduino

Geotechnical Special Publications (GSP) 208

Proceedings of the 2010 Earth Retention Conference held in Bellevue, Washington, August 1-4, 2010. Sponsored by the Earth Retaining Structures Committee of the Geo-Institute of ASCE.

This collection contains 72 papers that examine the major developments over the past 20 years in the design and construction practice of earth-retaining structures worldwide.

Topics include:

- supported excavations
- mechanically stabilized earth retaining walls
- seismic evaluation of retention systems
- numerical analyses of retention systems
- load and resistance factor design
- landslide stabilization

(ASCE, 2010)

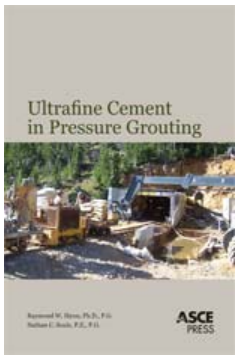
Compaction Grouting Consensus Guide

Standards ASCE/G-I 53-10

Compaction Grouting Consensus Guide focuses on the practical and engineering aspects of compaction grouting as a technique of ground improvement. Compaction grouting increases the density, strength, and stiffness of the ground through slow, controlled injections of low-mobility grout that compacts the soil as the grout mass expands. The technology can be applied to a wide range of soils, in most cases being used to improve the engineering properties of poorly compacted fills and loose native soils. Compaction grouting can be applied equally well above or below the water table.

This standard promotes good practice in compaction grouting and is essential reading for anyone involved in specifying, designing, or undertaking compaction grouting.

(ASCE, 2010)



Ultrafine Cement in Pressure Grouting

Raymond W. Henn & Nathan C. Soule

Ultrafine Cement in Pressure Grouting presents the technical and practical information required by engineers to plan and implement grouting programs that are cost effective and technically sound. As a key component of modern grouting programs, ultrafine cement is an ideal solution for geotechnical engineers and construction contractors who are grappling with the challenges of managing costs while developing sites that may be less than ideal. Increasingly, the virtues of ultrafine

cement lead engineers and con-tractors to use it rather than the less-expensive portland cements.

The authors concisely define ultrafine cement, describe its engineering properties, and explain its manufacture, packaging, and storage. Mixing and pumping procedures and quality control issues are covered, as well as recommendations for specifying ultrafine cement in contracts. An appendix offers 16 brief project descriptions.

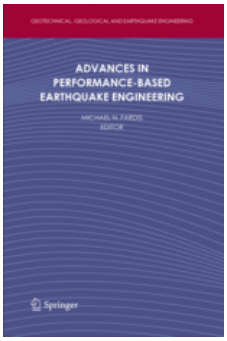
Ultrafine Cement in Pressure Grouting is a fundamental reference that will be consulted frequently by geotechnical engineers who specify grouting materials for construction projects.

About the Authors

Raymond W. Henn, Ph.D., P.G., is a principal of Lyman Henn, Inc., where he is responsible for tunnel and underground engineering and for construction management services. He is the author of *Practical Guide to Grouting of Underground Structures* (ASCE Press, 1996) and the editor of *AUA Guidelines for Backfilling and Contact Grouting of Tunnels and Shafts* (ASCE Press, 2003).

Nathan C. Soule, P.E., P.G., A.M.ASCE, is a project engineer at Lyman Henn, Inc., working on geotechnical and geological projects.

(ASCE, 2010)



Advances in Performance-Based Earthquake Engineering

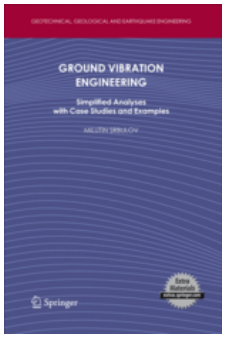
Series: Geotechnical, Geological, and Earthquake Engineering, Vol. 13

Fardis, Michael N. (Ed.)

Performance-based Earthquake Engineering has emerged before the turn of the century as the most important development in the field of Earthquake Engineering during the last three decades. It has since then started penetrating codes and standards on seismic assessment and retrofitting and making headway towards seismic design standards for new structures as well. The US have been a leader in *Performance-based Earthquake Engineering*, but also Europe is a major contributor. Two Workshops on *Performance-based Earthquake Engineering*, held in Bled (Slovenia) in 1997 and 2004 are considered as milestones. The ACES Workshop in Corfu (Greece) of July 2009 builds on them, attracting as contributors world-leaders in *Performance-based Earthquake Engineering* from North America, Europe and the Pacific rim (Japan, New Zealand, Taiwan, China). It covers the entire scope of *Performance-based Earthquake Engineering*: Ground motions for performance-based earthquake engineering; Methodologies for Performance-based seismic design and retrofitting; Implementation of Performance-based seismic design and retrofitting; and Advanced seismic testing for performance-based earthquake engineering.

Audience: This volume will be of interest to scientists and advanced practitioners in structural earthquake engineering, geotechnical earthquake engineering, engineering seismology, and experimental dynamics.

(Springer Berlin Heidelberg, 2010)



Ground Vibration Engineering

Simplified Analyses with Case Studies and Examples

Series: Geotechnical, Geological, and Earthquake Engineering, Vol. 12

Ground vibration consideration is gaining significance with people's decreasing tolerance of vibration, introduction of new environmental legislations, increasing use of equipment sensitive to vibration, ageing of existing buildings and expanding construction sites to/near collapsible/liquefiable/ thyrotrophic soil.

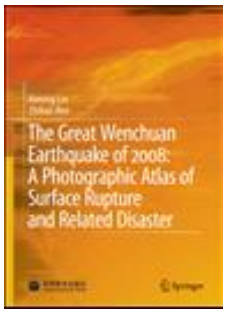
This volume bridges the gap that exists between rather limited provisions of engineering codes/standards and compled numerical analyses/small-scale tests.

The book contains descriptions of ground vibration measurements, predictions and control for engineers. Effects of most frequent sources of ground vibration arising from construction/demolition, traffic and machinery, ground wave amplification and attenuation as well as foundation kinematic and inertial interaction have been considered by simplified analyses aimed at ease and speed of use for major problems in ground vibration engineering. Comments on assumptions, limitations, and factors affecting the results are given. Case studies and examples worldwide are included to illustrate the accuracy and usefulness of simplified methods. A list of references is provided for further consideration, if desired.

Audience: This work is of interest to geotechnical engineers, engineering geologists, earthquake engineers and students.

Extra material: Microsoft Excel spreadsheets with the input data and results for the case studies and examples considered in this book are available at http://extras.springer.com

(Springer Berlin Heidelberg, 2010)



The Great Wenchuan Earthquake of 2008: A Photographic Atlas of Surface Rupture and Related Disaster

Aiming Lin & Zhikun Ren

The magnitude Ms 8.0 (Mw 7.9) Wenchuan earthquake occurred on 12 May 2008 in the Longmen Shan region of China—the topographical boundary between the Tibetan Plateau and the Sichuan Basin—resulting in extensive dam-age throughout central and western China. To understand the seismic faulting mechanism and surface deformation features associated with the Wenchuan earthquake, including rupture length, geometric characteristics, and slip distribution of co-seismic surface rupture, our survey group traveled to the epicentral area 2 days after the earthquake and undertook 10 days of fieldwork, during which time we collected fundamental data related to rupture structures and the spatial distribution of

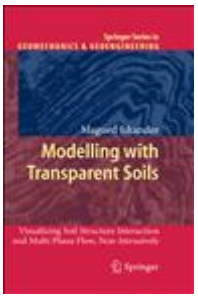
offset along faults. Based on the results of this preliminary fieldwork, we carried out additional detailed fieldwork along the co-seismic surface rupture over the following year.

This photographic atlas shows the main deformation characteristics of co-seismic surface rupture and the nature of the earthquake disaster and subsequent relief operations, based on photographs taken during our field investigations. This atlas is intended not only for geologists, seismologists, and engineers as a means of furthering their understanding of the seismic mechanisms and surface rupture deformation characteristics of large intracontinental earthquakes, but also for advanced undergraduates and graduate students as a textbook.

We are grateful to the many organizations and individuals who helped to make this book possible. Thanks are also due to Professor Dong Jia and Dr. Xiaojun Wu of the Nanjing University for their assistance in the field.

Aiming Lin & Zhikun Ren, Shizuoka May 2009

(Springer Berlin Heidelberg, July 2010)



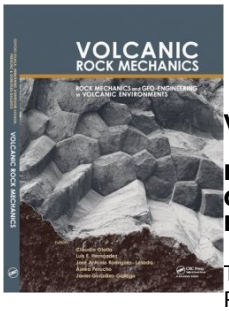
Modelling with Transparent Soils

Visualizing Soil Structure Interaction and Multi Phase Flow, Non-Intrusively

Iskander, Magued

Experimental models to measure spatial deformation patterns within a soil mass are typically limited by the fact that soil sensors do not provide a continuous image of the measureed continuum. Additionally, soil sensors exhibit static and dynamic characteristics that are different from those of the surrounding soils, and therefore can change the response of the measured continuum. The fundamental premise of this research is that transparent synthetic soil surrogates can be used to represent the behavior of natural soils in model tests in order to overcome these difficulties. This book presents experimental methods that are fundamentally different from previous experiment studies, where spatial flow patterns and deformations are obtained non-intrusively and continuously without interruption from sensors. In the short term, transparent synthetic soils and the proposed optical setup and image processing technique are expected to be easily adjusted and applied in geotechnical engineering research. In the long term, transparent synthetic soils should prove to be a powerful tool in solving many geotechnical and geoenvironmental engineering problems and become helpful in the design of many new structures.

(Springer Berlin Heidelberg, 2010)



Volcanic Rock Mechanics

Rock Mechanics and Geo-Engineering in Volcanic Environments

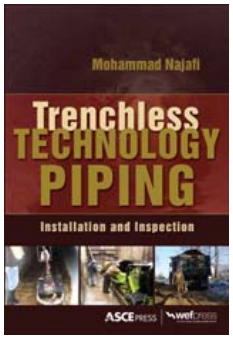
The 3rd International Workshop on Rock Mechanics and Geo-Engineering in Volcanic Environments has been held between 31 May and 3 June at Puerto de La Cruz, Tenerife, Canary Islands (Spain). It was organised together with the multidisciplinary Conference Cities on Volcanoes CoV6-Tenerife 2010.

Organised by the Spanish National Group of the ISRM (SEMR) and the Regional Ministry of Public Works of the Government of the Canary Islands and sponsored by the ISRM and the University of La Laguna, this event was recognized as an ISRM Specialized Conference and represents a continuation of the technical conferences on volcanic rock mechanics previously held in Madeira and Azores in 2002 and 2007, respectively.

Many activities took place during the conference, which allowed participants to enjoy the natural wonders of the Canary Islands. Two visits were especially preferred by workshop participants: the Teide Volcano Natural Park, with volcanoes specialists, and the tunnel under construction affected by volcanic materials.

The topics covered in the Workshop have been related to geomechanical characterization of volcanic materials, instabilities in volcanic islands and geo-engineering and infrastructures in volcanic environments. About 120 people attended the ISRM Workshop and a total of 50 papers were presented. A Keynote Lecture titled "Low stress and high stress phenomena in basalt flows" was given by Dr. Nick Barton. Articles submitted to the Workshop are contained in a proceeding printing volume titled "Volcanic Rock Mechanics". This volume is available at the SEMR secretariat (semr@cedex.es).

(SEMR, 2010)



Trenchless Technology Piping

Installation and Inspection

Mohammad Najafi

Trenchless Technology Piping is the first detailed guide to pipe installation and renewal using trenchless technology methods. This step-by-step resource explains how to create a more efficient process for the design, construction, and inspection of trenchless technology piping - and shows how to save time and money with a state-of-the-art project management system.

Packed with illustrations and a range of national and international case studies and examples, the book covers proper planning; contracting and procuring; and installation and inspection of different pipe materials, as well as testing and acceptance methods, project contract and delivery, and safety issues. This cutting-edge engineering tool also contains vital information on quality control and quality assurance (QC/QA) guidelines.

Topics include:

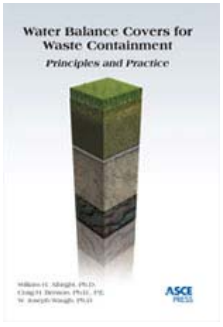
- Pre-installation, installation, and post-installation requirements
- Detailed coverage of field and laboratory testing
- Proven methods of project delivery and final inspection

- The latest information on asset management and sustainability of pipeline systems
- Effective procedures for project planning and contract administration

This expert guide to trenchless technology piping methods provides detailed information on each aspect of a project, inlcuding:

- trenchless technology design considerations
- project planning, contracting, and delivery requirements
- pre- and post-installation and requirements
- new pipe materials
- project layout
- project safety considerations
- quality control/quality assurance guidelines

(Copublished by McGraw-Hill Professional and ASCE Press, 2010)



Water Balance Covers for Waste Containment

Principles and Practice

W. H. Albright, C. H. Benson & W. J. Waugh

This book presents, for the first time in one place, the results of the latest research regarding water balance covers for solid waste sites, along with case studies drawn from current field testing. A viable alternative to conventional landfill cover systems, water balance covers (also known as store-and-release and evapotranspiration covers) cycle water from the soil to the atmosphere during growing season, minimizing the percolation of rainwater through the soil, and thus the production of leachate from land fill contents.

This book introduces water balance covers and compares them with conventional approaches to waste containment. The authors give detailed analysis of the fundamentals of soil physics and design issues, introduce applicable ecological concepts and revegetation practices, and then move on to construction, modeling, and maintenance.

This book will be valuable to practicing geotechnical engineers, as well as regulators and landfill managers.

(ASCE Press, 2010)

ΗΛΕΚΤΡΟΝΙΚΑ ΠΕΡΙΟΔΙΚΑ

International Journal of Geoengineering Case Histories
Volume 1, Issue #4, August 2010
http://casehistories.geoengineer.org

In this issue:

Giuseppe Lanzo, Giuseppe Di Capua, Robert E. Kayen, D. Scott Kieffer, Edward Button, Giovanna Biscontin, Giuseppe Scasserra, Paolo Tommasi, Alessandro Pagliaroli, Francesco Silvestri, Anna d'Onofrio, Crescenzo Violante, Armando Lucio Simonelli, Rodolfo Puglia, George Mylonakis, George Athanasopoulos, Vasil Vlahakis, Jonathan P. Stewart **Seismological and geotechnical aspects of the Mw=6.3 l'Aquila earthquake in central Italy on 6 April 2009, pp. 206-339**

Abdolreza Osouli, Youssef M. A. Hashash **Case studies of prediction of excavation response using learned excavation, pp. 340-366**

Fawad S. Niazi, Paul W. Mayne **Evaluation of EURIPIDES pile load tests response from CPT data, pp. 367-386**

www.geoengineer.org

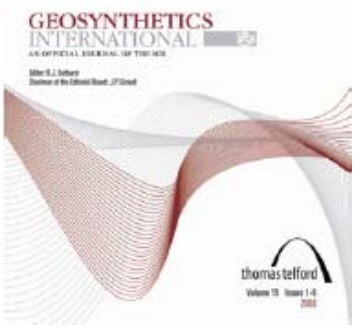
Κυκλοφόρησαν τα Τεύχη #67 και #68 του Newsletter του Geoengineer.org (Ιούλιος και Αύγουστος 2010) με πολλές χρήσιμες πληροφορίες για όλα τα θέματα της γεωτεχνικής μηχανικής. Υπενθυμίζεται ότι το Newsletter εκδίδεται από τον συνάδελφο και μέλος της ΕΕΕΕΓΜ Δημήτρη Ζέκκο (secretariat@geoengineer.org).

http://foundation.itacet.org/Newsletter/03_2010/newsletter_3_2010.php

Κυκλοφόρησε το Τεύχος No. 3 (Ιούνιος 2010) του ITACET Foundation.

www.geosyntheticssociety.org/Resources/Newsletters/IGS%20News%20V26%20I2%20July%202010.pdf

Κυκλοφόρησε το Τεύχος No. 2, του Τόμου 26 του Newsletter της International Geosynthetics Society (Ιούλιος 2010).



Geosynthetics International
www.thomastelford.com/journals

Κυκλοφόρησαν τα τεύχη αρ. 2 και 3 του 17ου τόμου (Απρίλιος και Ιούνιος 2010) του περιοδικού Geosynthetics International. Πρόσβαση μέσω της ιστοσελίδας www.icevirtuallibrary.com/content/issue/gein.

Geotextiles & Geomembranes

www.geosyntheticssociety.org/journals.htm

Κυκλοφόρησαν τα τεύχη αρ. 3 και 4 του 28ου τόμου (Ιούνιος και Αύγουστος 2010) του περιοδικού Geotextiles & Geomembranes. Πρόσβαση μέσω της ιστοσελίδας www.sciencedirect.com/geotexmem/journal.

ΕΕΕΕΓΜ
Τομέας Γεωτεχνικής
ΣΧΟΛΗ ΠΟΛΙΤΙΚΩΝ ΜΗΧΑΝΙΚΩΝ
ΕΘΝΙΚΟΥ ΜΕΤΣΟΒΙΟΥ ΠΟΛΥΤΕΧΝΕΙΟΥ
Πολυτεχνειούπολη Ζωγράφου
15780 ΖΩΓΡΑΦΟΥ

Τηλ. 210.7723434
Τοτ. 210.7723428
Ηλ-Δι. secretariat@hssmge.gr ,
geotech@central.ntua.gr
Ιστοσελίδα www.hssmge.org (υπό κατασκευή)

«ΤΑ ΝΕΑ ΤΗΣ ΕΕΕΕΓΜ» Εκδότης: Χρήστος Τσατσανίφος, τηλ. 210.6929484, τοτ. 210.6928137, ηλ-δι. pangaea@otenet.gr

«ΤΑ ΝΕΑ ΤΗΣ ΕΕΕΕΓΜ» «αναρτώνται» και στην ιστοσελίδα www.hssmge.gr