

Ð EQUIPEUP 01295 670990

Also included:

- - Management
- - Concentrations

Advice from our Health and Safety Expert on staying safe on site in the cold and snow.

ARE YOU WRAPPING

\V<u>\</u>V<u>/</u>4\|<u>R</u>}

Cable Percussion Guarding **Bender Element Test Analysis** Geotechnical Knowledge Normal Background





SAFE SUPERVISION OF GEOTECHNICAL SITES

This three day course is certified by IOSH, is specifically focussed on the geotechnical industry and provides a totally unique and relevant Health and Safety course for managers and supervisors.

The course is aimed at anyone who is or will be expected to run sites where geotechnical works are carried out. The course meets all of the requirements of the UKCG and has been approved by The Environment Agency, Thames Water and The Association of Geotechnical and Geoenvironmental Specialists.

13th - 15th February 2013 **NEXT COURSE DATES:** 10th - 12th April 2013

AVOIDING DANGER FROM UNDERGROUND SERVICES

This one day course is aimed at anybody involved in specifying, instructing, managing, supervising or actually breaking ground. Important aspects include the use of real examples from the geotechnical industry and delivery by chartered advisors who are from within the industry.

This course is definitely not another CAT and Genny course and is the **only** externally verified course in the UK carrying the IOSH badge. The course is built around HSG47 and current industry best practice.

To book your place, please contact Equipe Training: ⊠ info@equipetraining.co.uk www.equipegroup.com 0 01295 670990 10 01295 678232

8th March 2013 **NEXT COURSE DATES:** 19th April 2013







Bender Element Test Analysis Software **Development for Laboratories**

Karl Snelling and Dr Sean Rees, Managing Director and Geotechnical Specialist at GDS Instruments discuss the test analysis software development for laboratories that has been developed to interpret the data from bender element test analysis.

Geotechnical Knowledge Management

Dr Roger Chandler, Managing Director of Keynetix and member of the AGS Data Management committee talks to theGeotechnica once again. This month, Roger examines geotechnical knowledge management, focusing on the benefits of Keynetix HoleBASE SI technology.

Guarding for Cable Percussion Rigs

This is the second in a series of articles on safely managing all working geotechnical sites, penned for theGeotechnica by the experts at the Equipe Group. This month we focus on safely guarding cable percussion rigs, as well as a brief examination of PUWER and LOLER regulations.

Cover Article: Wrap Up Warm, It's Cold Outside!

21 snowy conditions.

What Are Normal Background Concentrations?

In this latest article from Geraint Williams, Alcontrol Laboratories' Senior Environmental Scientist, Geraint writes for theGeotechnica on the subject of new studies carried out by the BGS into normal background concentrations.

Directory

13

17

23

ontents

Writing for theGeotechnica once again is Tom Phillips of RPA Safety Services. This month Tom imparts some valuable health and safety advice for those of us working outside in cold and



This seminar/workshop presents a unique opportunity to understand and see practical demonstrations of the self-boring pressuremeter and the seismic dilatometer.

The day will include presentations from Clive Dalton of Cambridge Insitu and Dr Sara Amoroso of Marchetti, who will explain the equipment's uses, the techniques invloved in their operation and interpretation of the data that they produce.

During the day there will be practical demonstrations of the devices adjacent to our training facilities followed by interpretation of the data obtained.

This is a not to be missed chance to see the tools in use and learn from the world's leading authorities on the techniques involved in their use. There will be ample time to ask questions and debate the use of the devices and the parameters they produce.

To book your place, please contact Equipe Training:

| \boxtimes | info@equipetraining.co.uk |
|-------------|---------------------------|
| 0 | www.equipegroup.com |
| 2 | 01295 670990 |
| 0 | 01295 678232 |

SPONSORED BY MARCHETTI - DMT Cambridge Insitu Ltd

Manufacture for supply to the global drilling market

- Environmentally friendly drilling fluids
- Grouts and sealants including geothermal grouts, bentonite pellets and granules
- Drilling fluid mixing/recycling systems and high pressure mud pumps
- Hard rock drilling tools and accessories
- Technical support and training



clear solutions

T: +44 (0) 1939 235 754 F:+44 (0) 1939 232 399 E:info@drilling-products.com www.drilling-products.com



Welcome to the 18th Edition of theGeotechnica - the UK's fastest growing online geotechnically focussed e-magazine.

This month we once again have a number of edition of theGeotechnica, Roger examines incredibly interesting and valuable articles. Our Geotechnical Knowledge Management, with a cover article this month places a heavy focus on focus on Keynetix Hole BASE SI technology. the disrupting and unfortunate snowy weather that we have had to endure recently. Tom We also have entries in the Directory and Jobs Phillips of RPA Safety Services offers his advice sections, with positions available at Geotechnical on keeping safe in the snow and what you can Engineering as well as Gardline Geosciences. do to ensure your well-being is maintained in such icy conditions.

Tom's article is not the only must-read section of this month's magazine. We also have the second in our series of articles on geotechnical



site safety. Following on from last month's focus on spatial awareness when operating Cable Percussion rigs, we have an article from the Equipe Group on Cable Percussion guarding something that is often overlooked in today's Rotary-driven industry.

On page 7 we have an article from GDS Instruments examining the Bender Element Test. GDS have developed Analysis Software for the test and discuss it's advantages against conventional Bender Test Analysis.

Once again we have another insightful article



from Alcontrol Laboratories Geraint Williams. This month Geraint's contribution concerns Background Concentrations and what is considered normal in todays climate.

Finally, we have another excellent contribution from DrRogerChandlerofKeynetix.Inthismonth's

As with every new edition of the magazine, the Editorial Team here at theGeotechnica will be on the lookout for even more new, original and interesting content from all corners of the sector, and would actively encourage all readers to come forward with even the slightest bit of appropriate and relevant content - whether it be a small news item or a detailed case study of works recently completed or being undertaken. If this content is media rich and interactive, then all the better. We are looking to increase the already large readership of the magazine through better social media integration and promotion, as well as improving content month on month.

Once again, for any content that is submitted we will ensure that advertising space, proportionate to the quality of content provided, is available for that single edition of the magazine. From then on, if you have submitted content, you will receive a discount on all further advertisements placed within theGeotechnica.

We hope you enjoy this month's edition of the magazine and are inspired to contribute your own content for the coming editions of theGeotechnica.

Editorial Team, theGeotechnica

BENDER ELEMENT TEST ANALYSIS SOFTWARE DEVELOPMENT FOR LABORATORIES

Writing for theGeotechnica this month are Karl Snelling and Dr Sean Rees, Managing Director and Geotechnical Specialist at GDS Instruments. In this in-depth article Karl and Sean discuss the test analysis software development for laboratories that has been developed to interpret the data from bender element test analysis.

become increasingly commonplace in soil laboratories since its introduction in the Bender elements are made displacement due to the wave late 1970s by Shirley and Hampton (1978). The test bimorphs, and are used in pairs then read by a data acquisition allows straightforward small- to measure the shear wave unit. Through knowing the strain stiffness measurements velocity in a soil specimen. This to be made in soil specimens, involves inserting each element and can be performed in a wide a small distance into the top time required for the shear variety of test systems.

"To this day however there is still no recognised standard for interpreting the data obtained from bender element tests."

To this day however there is still no recognised standard for interpreting the data obtained from bender element tests. This fact provided motivation for GDS Instruments, who specialise in providing soil and rock laboratory test systems, to help address the main aspect of subjectivity of the test interpretation - the determination of the shear wave propagation time. This resulted in the development of a user-friendly piece of software to automate the propagation time analysis.

Bender element testing has How does the bender element to pick up the shear wave test work? that has propagated through

> from piezoelectric ceramic and base of a specimen, then applying an excitation voltage to one element to generate a shear wave in the soil, as illustrated in Figure 1.

The other element is used estimate.

Element generating shear wave 14 Element receiving propagated wave

the specimen, with its

inducing a voltage, which is

distance between the two

elements, and observing the

wave to propagate, a value of

the shear wave velocity can be

obtained. From this point only

the specimen dimensions and

soil bulk density are required

to produce a shear stiffness

Figure 1 – Illustration of the bender element test (left); GDS bender elements inserted into a triaxial top-cap and pedestal (right).

What complicates the interpretation of bender element test data?

Although the bulk density and distance between elements can be measured accurately in the lab, the time taken for a shear wave to propagate through the soil is somewhat subjective. Consider the idealised received waveform shown in Figure 2 - which point would you say defines the time of shear wave

"...if two engineers agree on using the same point to define the arrival, would they necessarily record the exact same time purely through visual observation of the wave?"

arrival? Further to this, if two engineers agree on using the same point to define the arrival, would they necessarily record the exact same time purely through visual observation of the wave?

These considerations are of course not recent, with many numerical methods already proposed in the geotechnical literature to objectively determine the propagation time of a shear wave. Such methods typically analyse the test data in either the time or frequency domain, and tend to vary in their complexity.

"However implementing such methods on a routine basis can often be difficult and time-consuming..."

However implementing such methods on a routine basis can often be difficult and time-



element.

consuming for labs without the test data is removed, and strong software coding skills, a number of propagation time or knowledge of which analysis estimates are provided. methods have previously been suggested. The task presented Given the tool was developed to the GDS team was therefore with the larger geotechnical clear: review the literature, community in mind, there determine the methods available, and develop specifications: be simple-toa simple-to-use software tool use, and be flexible enough to that objectively finds the shear analyse data taken from any wave propagation time in bender element test system, bender element tests.

Bender Element Analysis Tool

The development process led GDS to create the Bender Element Analysis Tool, or GDS BEAT for short. The tool is unique in that it does not simply settle on one specific numerical analysis method, of these specifications were obiective of Point A, B, C, and D via of software familiar to most software algorithm, cross- practicing engineers. The tool correlation of the generating was split into two Excel Addand receiving element signals, Ins, each having a specific use and a cross-power spectrum – the first allows the user to estimate propagation time in sheet, then select the various the frequency domain. This parameter values required to decision provides distinct run the analysis, whilst the advantages to the user, as the second permits multiple hard-work required to process GDS data files to be simply

Time

Figure 2 – Idealised shear wave recorded by a receiver bender

Development of the GDS

analysis were two other important not just the GDS system. Both

| "Both | of | tł | nese |
|------------------------|---------|------|------|
| specificati | v | vere | |
| achieved | by | U | sing |
| Microsoft | Excel | as | the |
| platform, | a pi | ece | of |
| software f | amiliar | to r | nost |
| practicing engineers." | | | |

but instead implements three: achieved by using Microsoft determination Excel as the platform, a piece calculation of the signals to load one data set into an Excel

| lender Elements: Travel time analysis 🛛 🔻 🗙 | Bender Elements: Batch travel time an |
|--|---|
| GDS | GDS |
| Worksheet data Load from file | Select data files |
| Select worksheet cells/columns that contain data | Add GDS Bender Element (.bes) data hies to the list below. |
| Sampling rate | |
| Sampling frequency [Hz] Timestamps [ms] | Name |
| Source wave parameters | |
| O Wave frequency [Hz] ⊙ Wave period [ms] | |
| Source wave | |
| | S |
| Received wave | 1 |
| | Tip: You can drag and drop files into the p |
| User-specified travel time [ms] (optional) | |
| | Options |
| | Zero-pad source and received waves |
| Options | Zero values to append |
| Zero-pad source and received waves | |
| Zero values to append | |
| Output calculation worksheets | L |

dropped into the tool and batch analysed. Screenshots of each are displayed in Figure 3.

"It was also important to ensure the analysed data was presented in a clear format, both numerically in Figure 4, this combination and visually."

It was also important to ensure the analysed data was presented in a clear format, both numerically and visually. With this in mind the tool produces two tabs in Excel following the analysis – one listing numerical

S BEAT Add-Ins values

the wave propagation time estimates and analysis metrics, and the other giving visual plots of the recorded element signals relative to the estimated propagation times. Presented

of reporting allows the user to rapidly validate the analysis data, and to further process the information as required.

How well does GDS BEAT perform?

Developing BEAT was the first Element System (BES) after step for the GDS team, but it saturation and consolidation

was also necessary to verify of the software performed as

> "A triaxial specimen of Leighton Buzzard sand was therefore prepared in a GDS Dynamic Triaxial Test System (DYNTTS)..."

alysis **v** X

or analysis

Browse...

Remove nel above.

0 0

Calculate

specified during testing. A triaxial specimen of Leighton Buzzard sand was therefore prepared in a GDS Dynamic Triaxial Test System (DYNTTS), with bender element tests conducted using a GDS Bender



Figure 4 – Numerical (top) and visual (base) representations of a GDS BEAT analysis.

"This quickly showed how useful BEAT may be in laboratories..."

were complete. This quickly showed how useful BEAT may be in laboratories immediately after saving the bender element data, files were dropped into the tool, with rapid analysis providing on-the-spot estimates for the shear wave propagation time.

While this demonstrated the user-friendly nature of GDS BEAT, further review was conducted post-test to check how accurate the propagation time estimates really were when compared with traditional observation. To do this, the raw test data was sent to an

"To do this, the raw test data was sent to an academic familiar with bender element analysis, and asked to provide his own estimates..."

academic familiar with bender element analysis, and asked to provide his own estimates by viewing the generated



"The agreement between BEAT and the academic was highly encouraging: all but the cross-spectrum analysis method led to 5 m/s band..."

and received waveforms. The agreement between BEAT and the academic was highly encouraging: all but the crossspectrum analysis method led to shear wave velocities being calculated within a 5 m/s band, which is just 2.2 % of the estimated 225 m/s shear wave velocity, when comparing



Figure 5 – Leighton Buzzard triaxial test specimen used to verify the performance of GDS BEAT (left); bender element signals obtained from the specimen (above).

across a sensible range of shear demonstration can be found by wave frequencies.

new software tool, GDS BEAT, will not only be useful for engineers interpreting bender References element data, but will also generate discussion within the Shirley D. J. and Hampton shear wave velocities geotechnical community and L. D. (1978). Shear-wave For all those interested, Acoustical Society of America further details and video 63 (2), 607-613.

visiting www.gdsinstruments. com, along with free download Ultimately GDS hope their of the software for a limited time only.

being calculated within a contribute in the move towards measurements in laboratory recognised test standards. sediments. Journal of the





GEOTECHNICAL **KNOWLEDGE HoleBASE**^{SI} MANAGEMENT Professional

Dr Roger Chandler, Managing Director of Keynetix and member of the AGS Data Management committee talks to **theGeotechnica** once again. This month, Roger examines geotechnical knowledge management, focusing on the benefits of Keynetix HoleBASE SI technology.

Have we been here before?

The more you know about a site that have been incorporated and the surrounding area before you start a Site Investigation the better you will be able to design the investigation. Technology has come to our aid here and these days we waste no time jumping on the internet to visit Bing Maps[®], Google Earth ®, or Google into the way we work over the The four factors that stop us Street View ® to learn about last few years. But more often above ground information and than not we don't fully benefit Process: to surf the BGS website and from the in-depth knowledge order an Envirocheck ® report our company already holds. to try to understand what may be underground.

These are fantastic resources

"But more often than not we don't fully benefit the in-depth from knowledge our company already holds."

This is not a new problem. You so popular because it is very

have probably heard stories of people purchasing their own borehole logs from the BGS or buying the same historical data several times for the same job. So why, when we have all these great resources available to us, do we not make the most of the knowledge our organisation already has?

are Time, Availability, Cost and

Time

The online services have proved



quick to access the information. retrieving what was contained that can be opened and plotted Aerial photographs in less than 30 seconds and now even the delivery of BGS borehole logs measured in seconds rather than days.

For some companies it is far can be difficult to order or filter quicker and easier to use the BGS service to locate their geotechnical than it is to find it internally, especially if the information is is a mapping/GIS system. This to ensure that the KML file is not readily available in the first is the ideal answer but throws place.

Availability

"lf your company's knowledge is held in the head of your senior staff then your team will have severely restricted access to it."

If your company's knowledge is held in the head of your senior staff then your team will have severely restricted access Several companies have side for tracking project data, if they to it. Following the recent stepped the requirement for have more confidence that this streamlining of our industry you may even find these people have left and there is no way of

in these heads.

Most companies have a project list somewhere, usually in the form of an Excel spreadsheet, or database. However this data by geographic location.

information The answer that up all sorts of other problems, and distributable to everyone. such as cost and process.

Cost

companies find it problematical some projects being missed. to purchase and maintain a GIS system as this is a direct This causes a problem as users software outlay and GIS training for staff.

their own GIS and have piggy is being kept up to date. backed off Google Earth by creating a project list KML file

| The lot have | e Cherry | on Cost Property | Training of the second s | |
|---------------------------------------|-------------------|------------------|---|-------------|
| Inter Dates | 1.0.00 | Minth (Minte | thead . | |
| Al Data - | Earston Details 1 | 1.00 | | |
| · B tenter | Longton III | T it Louton T | a later with the | PT. 7 8 200 |
| Eleven Deskith | 8-6 | | 348801.00 | 112300.74 |
| + 🗿 Samples It Lab Tents ID | 8108 | | batan (M | 112000-48 |
| + 2 Nandormi III | 8+41 | (D) 40 | 140771.74 | 11213448 |
| * 🗿 Hole Construction (200) | 84123 | 10 m | Telepine. | TOTAL N. |
| + 🗿 butta Tanta 10 | 81423 | di ni | 146751.07 | 11,0410.88 |
| 🖌 📮 Geological Jahamanan (PR) | 8-114 | O < | 146763.22 | 112199-01 |
| - El Decordinaly (May 1) | 81423 | 0× | hertoward. | 112465-88 |
| 10 Next Generative Descriptions (78) | 8104 | | 146412.78 | 11210103-14 |
| C Parties Sandra 15 | 80-127 | 10 K | 146535.61 | 11234421. |
| I I I I I I I I I I I I I I I I I I I | 81128 | ⊕ ≈ | sector.co. | 112712-00 |
| C brustering (1 | 8107 | 10 × | 10001101 | 112-08.79 |
| A G Asserts | 842 | do no | 140314.07 | 112540-00 |
| + 3 Superio | 8108 | 0 % | 24009.32 | ILPHOLE. |
| · · · | BHUL | (D ==) | 148757.00 | 112918.26 |
| · # Designot | 8402 | 10 M | 148501.55 | 107122-18 |
| | 8-01 | (1) = | 34875115 | 11243841 |
| | 8104 | ⊕ ≈ | hereight ber | 102447.15 |
| | 8+125 | 0 10 | 34660177 | 112571-41 |
| | 8113 | © ≈ | LANSTN IN. | 112220-24 |
| | 8114 | 0 K | 148021.04 | 112/7649 |
| | 841 | © ≪ | 1405101 | 112441.10 |
| | 214 | | 140742.00 | 110017-09 |
| | and . | 0 10 | 146754.14 | 112417.72 |
| | | - | | |

in Google Earth. This works well except that it needs additional "This works well except that it needs additional software to be installed on the machine."

software to be installed on many the machine. It also requires companies have implemented the correct process in place updated and copies controlled

Process

If the process for keeping your Everyone is currently very cost archive up to date includes conscious, especially when many steps and additional staff the costs cannot be allocated training then the content of the to a specific project. Many system may fall behind with

overhead, often requiring a will start to lose confidence that all the data is in the system and they revert to the simple spreadsheet solution



••

The options

nothing, available wherever you are and is quick and easy to use.

OnesuchsystemistheHighways Agency's Geotechnical Data Management System www. HAGDMS.co.uk which many engineers who work for the **and are accessible through** Agency are already using. Although this does not cost anything to use, it has had significant investment which would be difficult for a small or medium sized organisation to These additional features are and make it much easier to justify.

However, later this month, and are accessible through the Keynetix will launch a system same interface used to manage For more information on that could transform the your current site investigation HoleBASE SI please visit www. way you view your archive. data, produce and read AGS files keynetix.com/holebase HoleBASE SI is an upgrade and plot your borehole logs. It

to the popular HoleBASE 3.1 also ensures that projects are So the solution is simple. You system and includes a range automatically added to the need an archive system that is of tools that allow users to archive system to ensure the built into your processes, costs easily locate geographical process is maintained. information from both external sources and your own internal The new system also enables borehole information.

> "These additional features are provided at no additional cost as they are part of HoleBASE SI the same interface used to manage your current site investigation data..."

provided at no additional cost as they are part of HoleBASE SI been here before?"

you to import your existing project list very easily so it appears to tick all the boxes the industry needs.

Time will tell, but it certainly looks like Keynetix have produced a very exciting upgrade to their popular product that will transform the way we view our organisation's own geotechnical knowledge answer the question "Have we

PBA Natural Cavities and Mining Cavities Databases

- >47,000 cavity records
- National coverage
- Specialist historical archive research





Ground stabilisation schemes and validation testing

Land instability risk assessments

Geohazard mapping and modelling

Bespoke investigations and solutions

For further information contact: Clive Edmonds or Asmi Desai

cedmonds@ peterbrett.com 🖂 adesai@ peterbrett.com

www.peterbrett.com



STRUCTURAL SOILS LTD

DRILLING FOREMAN/SUPERINTENDENT - BRISTOL

Structural Soils Ltd, along with the geosciences division of RSK Group plc, is one of the largest site investigation contractors in the UK. We are looking for an experienced foreman to manage and develop a fleet of SI drilling rigs throughout our nationwide offices. You must be able to demonstrate extensive knowledge and practical experience of rotary drilling including wireline and be NVQ qualified with an understanding of cable percussion and dynamic sampling.

Also recruiting:

- Cable percussion driller based around Hemel Hempstead.
- NRSWA trained operatives for Hemel Hempstead and Bristol.

For more information and to apply please call:

Sarah Murphy, Deputy HR Manager

on 0117 3004295 or email smurphy@rsk.co.uk



Equipe Training are offering comprehensive Rotary Drilling Training that will take place over the course of three days. Each day will focus on a specific aspect of rotary drilling with the aim to give all attendees a high level of understanding of the skills, techniques and knowledge required to safely and effectively operate rotary drilling rigs.

DAY ONE - ROTARY DRILLING AWARENESS

Day One is a must for those specifying, managing, supervising and carrying out rotary drilling operations so that they can understand the drilling activity and interact more professionally with the drill crew.

- Rigs and Applications
- Ancillary Plant
- Flushing Media
- LOLER Requirements & Inspections

DAY TWO - DRILLING APPLICATIONS

Day Two is a must for those drillers and drilling engineers serious about drilling properly, efficiently and knowledgably. The day will incorporate hands on practicals where attendees will obtain a better understanding about how geology and hydrogeology may affect the drilling process, coring and core barrels and the drills themselves including demonstrations.

- Eurocode explained for drilling
- Eurocode sampling and reporting
- Applied Geology in Drilling

DAY THREE - MINI MUD SCHOOL

Designed to improve borehole efficiency, Day Three is a real eye opener for those who would like a better understanding of muds and polymers, when, what, where and how to use them.

- Maximising productivity when should additives be considered
- Maximising hole integrity during drilling

Attend one, two or all three days. £150 + VAT per day – limited availability.

To book your place, please contact Equipe Training:

| \bowtie | info@equipetraining.co.uk |
|-----------|---------------------------|
| 0 | www.equipegroup.com |
| 8 | 01295 670990 |
| 0 | 01295 678232 |

Eauipment - Health, Safety and Environmental Aspects - Techniques

- Coring and Core Barrels - Demonstrations

- Understanding and use of muds & polymers - Measuring – viscosity etc - Stabilisations

GUARDING FOR CABLE PERCUSSION RIGS



This is the second in a series of articles on safely managing all working geotechnical sites, penned for theGeotechnica by the experts at the Equipe Group. This month we focus on safely quarding cable percussion rigs, as well as a brief examination of PUWER and LOLER regulations.

Following on from last month's been overlooked in recent advice about the necessary years - the guarding. Recently The Engine spatial awareness required the focus of the industry has when working with Cable largely been on Rotary rigs and now be able to get our rig to our

"The next question we must then ask ourselves is: How do we ensure that the rig itself is safe to Cable Percussion rigs also have completely covered to prevent use?"

rotating parts; however Rotary is unnecessary here. However rigs are not alone in having a older rigs such as the one number of dangerous moving parts.

a number of equally dangerous moving parts, and these parts all fall under the same PUWER borehole position safely. The (Provision and Use of Work next question we must then ask <u>Equipment Regulations 1998</u>) ourselves is: How do we ensure as our Rotary rigs and therefore that the rig itself is safe to use? must therefore be guarded One of the most important correctly to enable the rigs to The Winch components of CP rig use has be operated safety.

Most modern rigs have electric start engines with recessed Percussion (CP) rigs, we should the guarding of their dangerous starting handles, so guarding displayed in Figure 1 have exposed shafts - these must be guarded. The shafts should be entanglement when starting the engine. Failure to have proper guarding in place can be dangerous. The shaft can easily be covered and guarded, as seen here in Figure 2.

There are two parts of a Cable





Percussion rig's winch that must be guarded: The open winch itself and the winch shaft. The winch itself must be guarded, again to prevent entanglement. Figure 3 shows us a simple method of guarding the winch, which does not affect the operation of the rig in anyway.

"The winch shaft must be guarded as the rotating shaft could cause injury - it can again be covered without affecting the operation of the winch."

The winch shaft must be guarded as the rotating shaft could cause injury - it can again be covered without affecting the operation of the winch. Figure 4 demonstrates a simple guard that is available for retro fitting to all ages of cable tool rigs from manufacturers.

Capstan Winches

Although only found on the Dando range of CP rigs, these open winches have no place on modern drilling sites - the skills needed to operate them have long since become unnecessary. Despite this they are often left completely unguarded but never used, as shown to

pass a PUWER "To Inspection they should be permanently covered and not used..."

the right in Figure 5. To pass a PUWER Inspection they should be permanently covered and not used, as currently there is no safe method of operating this open winch whilst adhering to current guarding regulations.







Gearboxes and Chain/Belts

by the manufacturer from new,

"...any evidence of the gearbox or drive chain being exposed during operation constitutes the operator having either LOLER modified or removed the guard - both of which are illegal."

therefore any evidence of the gearbox or drive chain being exposed during operation constitutes the operator having either modified or removed the guard - both of which are illegal. If this is the case, the rig should not be used and removed from of theGeotechnica, but it is still inspected then look for the the field.

There is however one very or indeed enforce these basic dangerous area of the Cable standards. Percussion rig which currently cannot be guarded and that In simple terms, every part of a find the item's unique ID then is the drill string itself at drilling rig which relates to the

"...without guarding should present we **ensure that there is a safe** case of a drilling rig itself this method of work in place and that the Lead Driller and Support Operative "...accessories such as can both prove their swivels, sinker bar loops, competency in their role."

the borehole. Here, without guarding present, we should ensure that there is a safe method of work in place and that the Lead Driller and Support Operative can both blocks, and safety hooks (etc.) prove their competency in their should be examined every 6 role.

that all moving parts which check; ask yourself what is have the potential to cause the main purpose of the piece practices.

injury are completely guarded of equipment? If your answer These will have been guarded before starting to use the rig on site. Remembering which components of CP rigs need guarding is quite simple: If it is moving and could cause injury, then guard it.

The subject of LOLER (Lifting **Operations Lifting Equipment** Regulations 1998) has been covered in an earlier addition

"...it is still abundantly clear that some companies do not understand or Currently all pieces of indeed enforce these basic standards."

abundantly clear that some companies do not understand

lifting falls under the LOLER Regulations and therefore needs to be examined. In the examination must be carried out every 12 months. However

snatch blocks, and safety hooks (etc.) should be examined every 6 months..."

accessories such as swivels, sinker bar loops, snatch months to ensure that they are compliant with the regulations. Next month It is essential to always ensure This is again quite simple to

starts with or includes the word 'LIFT' it will undoubtedly fall under LOLER.

"Currently all pieces of inspected equipment under LOLER must carry a unique ID, so if you are unsure whether something has not been inspected then look for the ID."

equipment inspected under LOLER must carry a unique ID, so if you are unsure whether something has not been ID. If a piece of equipment has no ID then it has NOT been inspected and should not be used under any circumstances. On the other hand, if you do check it against the certificate administered by the competent person(s) who carried out the

"This certificate should always be available for inspection."

inspection. This certificate should always be available for inspection.

Hopefully this guidance has given you an overview of what to be wary of when examining your Cable Percussion rigs for compliant guarding. If you require any further information, please contact the Equipe Group.

we will be examining geotechnical sampling and testing best Sign Up **NOW** for Early-Bird **Booking Rates**



The UK's Largest Geotechnical **Trade Show and Exhibition**

Geotechnica

www.geotechnica.co.uk



Warwickshire Exhibition 10th & 11th July Centre nr. Royal Leamington Spa

Communicate. Promote. Network. Learn.



equip^e

Writing for theGeotechnica once again is Tom Phillips of RPA Safety Services. This month Tom imparts some valuable health and safety advice for those of us working outside in cold and snowy conditions.

HSE Principal Inspector of Construction, bring additional challenges occur in the winter.

"Cold weather and shorter periods of daylight mean there is more potential for accidents to happen."

a little planning, and common sense, these can be avoided." out for?

Moving vehicles

therefore vitally important that all staff take responsibility for their actions on dynamic sites.

To this end, operators of construction plant such as diggers, telehandlers etc must ensure they regularly clean their windows so they can safely see all around. This should be if available. Stopping smoking combined with constant use of mirrors and a banksman where appropriate. Lights on fingers during work breaks. all vehicles should be cleaned regularly to ensure vehicles are visible at all times, and vehicle Those who have staff carrying depots and marshalling yards out lone working, must always should be well lit and gritted to ensure they have a suitable, avoid slip and trip hazards.

Peter Black, Workplace transport accidents has recently been quoted as account for many of the deaths saying "For those working and injuries investigated by the outdoors, the winter months HSE every year. Many of these

Welfare

In winter it is important to ensure that water supplies do not freeze to ensure adequate drinking water and that any gas heaters provided, have to keeping safe. Cold weather adequate ventilation. Portable and shorter periods of daylight chemical toilets should only mean there is more potential be used for short duration for accidents to happen. With projects and here appropriate, provision should be made for drying rooms for wet clothing. So what do you need to look Hot water for washing is even more important than usual.

Hand Arm Vibration

These are a major hazard in People who are exposed to the geotechnical industry vibration from power tools where, unlike the majority of should improve their blood construction activities, it is not circulation by keeping warm deemed reasonably practicable and dry, where necessary to provide vehicle segregation wearing gloves, a hat, and demarcated walkways. It is waterproofs and heating pads

> "Stopping smoking improves blood circulation, does as massaging and exercising work during fingers breaks."

> improves blood circulation, as does massaging and exercising

Lone working

robust procedure in place to



make sure lone workers are safe. In winter this is even more vital. Ask yourselves:

If a worker fell and broke a leg in a remote location in the dark, how would they summon help?

Who would be responsible for ensuring they had returned home safely at the end of the day?

Recent cases, including the tragic death of a gamekeeper, have highlighted the vital importance of ensuring lone

workers are protected and have the communications they need during winter months.

Chilblains

injury, chilblains are caused by the repeated exposure of skin suffered by outdoor workers. to temperatures just above

"The cold exposure causes damage to the capillary beds..."

freezing. The cold exposure causes damage to the capillary beds (groups of small blood meal a day also helps, as it published.

vessels) in the skin. This helps warm the body. damage is permanent and the redness and itching will return Those at risk, particularly with additional exposure. The diabetics, redness and itching typically encouraged to check their A painful and debilitating occurs on cheeks, ears, fingers, feet regularly, to put on warm and toes and is regularly clean socks at regular intervals

> Stopping smoking during caffeine based drinks or

should be and moisturise skin to prevent cracking of the skin.

working hours and avoiding So there you go - a few simple tips to keep everyone safe on decongestant medicines, all site this winter. But I'm sure help to improve blood flow that given the variability of the and keep the skin temperature UK weather, it will be tropical raised. Having at least one hot outside as soon as this is In this latest article from Geraint Williams, Alcontrol Senior Laboratories' Environmental Scientist, Geraint writes for theGeotechnica on the subject of new studies carried out by the BGS into normal background concentrations.

Department The for Environment, Food and Rural Affairs (Defra) commissioned the British Geological Survey (BGS) to provide guidance background normal on (NBC) of concentrations contaminants to support the revised Statutory Guidance. The project was intended to provide significant cost benefits to Local Authorities by simplifying guidance to make investigations more cost-effective. It was also intended to reduce regulatory uncertainty and is consistent with a drive to focus attention

"BGS's published work health or the environment;" now provides a systematic and transparent method for defining NBCs."

on higher risk sites. BGS's published work now provides a systematic and transparent method for defining NBCs. It has delivered technical guidance on the distribution of arsenic, cadmium, copper, mercury, lead, nickel and benzo(a)pyrene.

Normal presence of contaminants is referred to in section 3.2 of the Statutory Guidance: "Normal levels of contaminants in soil should not be considered to cause land to qualify as contaminated land, unless there is a particular reason to consider otherwise"



(para 3.2.2).

Normal levels may result from:

"(a) the natural presence of contaminants at levels that might reasonably be considered typical in a given samples are collected at a area and have not shown to pose an unacceptable risk to

of "(b) the presence caused by contaminants low level diffuse pollution and common human activity other than specific industrial processes. For example, this would include diffuse pollution caused by historic use of leaded petrol and the presence of benzo(a)pyrene from vehicle exhausts ...that might reasonably be considered typical (para 3.2.3)".

by BGS go on to explain how NBCs should be used in the context of Part 2A.

The NBC undertaken in four work (WP1 and WP2) were the data

Geochemical Baseline Survey of the Environment (G-BASE) and the National Soil Inventory (NSI). NSI samples cover all of England at a density of one site per 25km2. G-BASE higher density - urban samples at four sites per km2 and rural samples at one site per 2km2. However, the G-BASE sample coverage is only for central and eastern England. These data sets were also supplemented by other less densely sampled surveys which, in combination, provide information about how contaminant concentrations varied with depth and between different analytical methods. The final report states that only samples collected systemically were included in the work to estimate NBCs.

The series of reports produced As there is spatial variability in the distributions, the approach of the project was not to apply a single national NBC but to delineate the principal project was areas of the country where the important controlling packages, the initial packages factors can be identified and a NBC calculated. The gathering and data exploration term domain was used

Geotechnical ObservationS Bespoke Monitoring Solutions





- Link-up mpowered by Achiller Qualified via Audit
- Inclinometers
- Extensometers
- Piezometers
- Shape Arrays
- Dataloggers
- Interpretation

KeyLogbook® developed by Equipe Geosolutions and Keynetix

KeyLogbook® revolutionises the way site data is captured, recorded and transmitted. Drillers and engineers no longer need to keep re-entering the same data over and over again thus reducing errors and making the whole process simpler, faster, smarter, greener and more efficient. The system records all site data at source and transmits it direct from site saving time and money from the outset.



KeyLogbook is available in both Fully-Rugged and Semi-Rugged Solutions



- Confidence that all data is complete
- AGS data available immediately.
- Accurate financial control.
- Quicker and more efficient turnaround of logs and data.
- Quicker scheduling of laboratory testing.
- Easier to maintain chain of custody.
- No delays due to re-scheduling or re-drilling.
- Enables rapid informed decisions.





Our approach is characterised by quality and driven by understanding



For more information, or to purchase KeyLogbook, please contact Equipe Geosolutions on:

🖂 info@equipegeosolutions.co.uk www.equipegroup.com 01295 670990 01295 678232





distinguishable factors. controls were determined as: percentile confidence intervals. non-ferrous mineralisation and associated mining/processing activities;

"The area remaining outside domains, defined the Principal Domain."

remaining outside domains, other statistical information. defined by these controlling Principal Domain.

Information on As, Cd, Cu, Ni GIS and Pb is derived from a very large data set, though when data. A full understanding Cave, MR, Johnson CC, Ander subdivided into domains, some of the derivation of NBCs is EL and Palumbo-Roe, B. domain NBCs are only based on a small number of samples. Fewer overall data points for Hg and BaP were available to use in the data exploration phase. In the case of BaP data from **knowledge is important.**" Wales and Scotland was used to calculate NBCs. Asbestos, initially considered with the tables. Awareness of where Johnson CC, EL. Ander, Cave contaminants above, was not there are gaps in knowledge MR and Palumbo-Roe, B. explored further because it is important. It is evident that 2012. Normal background was recognised there was further data is needed for BaP concentrations of contaminants insufficient available on occurring asbestos minerals. priority contaminants, although Survey Commissioned Report, The reports highlight where this work provides a statistical CR/12/035. there are gaps in knowledge methodology for others to but the methodology allows use at a more local scale or to Defra, 2012. Environmental for recalculation of NBCs, to determine NBCs not previously greater levels of confidence, investigated (providing there is Contaminated Land Statutory when more data becomes systematically collected results Guidance. available.

to identify areas where high developed to quantify NBCs the planning, however on concentrations of a contaminant and generate percentage the back of this work, local can be attributed to readily information. Percentiles for the authorities can inevitably controlling domain data sets are generated expect challenging debate with The three main along with calculations of the underlying parent material The upper limit for a NBC has References upon which the soil has formed; been defined as the upper Ander, EL. Cave, MR., Johnson (TGS) supplementary factors, is referred to as percentiles are listed in the TGS CR/11/145. supplementary information - where it may be useful to Ander, EL. Cave, MR., Johnson consider the definition of CC and Palumbo-Roe, B. and urbanisation. The area normal levels in the context of 2012. Normal background

> resources polygons) and supplementary required and they should not 2012. Methodology for the be used as simple look-up determination

"Awareness of where there are gaps in

information and Hg. It is also clear that in English soils: Final project naturally NBCs are needed for more report. of appropriate quality). NBCs Department for Environment, were not originally intended Food and Rural Affairs. HM A statistical methodology was to be used in the context of Government

consultants.

metalliferous confidence limit of the 95th CC and Palumbo-Roe, B. percentile. The final work 2011. Normal background package produced a series of concentrations of contaminants Technical Guidance Sheets in the soils of England. with accompanying Available data and data information exploration. British Geological by these controlling for each contaminant. Other Survey Commissioned Report,

concentrations of contaminants in the soils of England. Results factors, is referred to as the The project has delivered of the data exploration for Cd, readily available information Cu, Hg and Ni. British Geological in the form of TGS for NBCs, Survey Commissioned Report, (domain CR/12/041.

> of normal background contaminant concentrations in English British soils. Geological Survey Commissioned Report, CR/12/003.

British Geological

Protection Act 1990: Part 2A April 2012.

Site Investigation Soil and Rock Testing Borehole Drilling Engineering Consultancy Telephone 01452 527743 zeotechnical Fax: 01452 720314





Geolabs perform a wide range of geotechnical tests on soils, aggregates and rocks, many of them UKAS accredited, including:

Geolabs Limited Bucknalls Lane, Garston, Watford Hertfordshire, WD25 9XX Tel: +44 (0)1923 892 190 email: admin@geolabs.co.uk

Geotechnical Engineering Built On Trust Web www.geoeng.co.uk

 Stress Path with piezo benders & local strain Effective & Total Stress Triaxial Testing Triaxial, Rowe Cell & Horizontal Permeability Large and Small Direct Shear & Ringshear Hydraulic, CRS & Incremental Consolidation UCS, Young's Modulus & Poisson's Ratio Classification (PSD, LL&PL, compaction etc) Custom research & development projects

Directory

WANT TO ADVERTISE IN

- 1. Select your advert size. (Full, Half, Quarter Page, Directory Entry)
- 2. Select timescale. (1, 3, 6 or 12 Months)
- 3. Format your artwork. (Adobe PDF, .jpg or .png)
- 4. Send your artwork to us. (magazine@geotechnica.co.uk, or contact us on 01295 670990)

THEGEOTECHNICA?

| Advert Size | Standard Rate | Member's Rate | 3 Months | 6 Months | 12 Months |
|-----------------------|-----------------------------------|-----------------------------|-----------------|---------------|--------------------|
| Full Page | £550 | £500 | POA | DOM | BOA |
| Half Page | 6310 | 6980 | non | FUA | POA |
| Quarter Page | P.C. | F500 | POA | POA | POA |
| Quarter Page | £100 | £145 | POA | POA | POA |
| Directory | £30 | £25 | POA | POA | POA |
| All adverts placed by | Drilling Academy [™] mer | mbers will benefit from dis | scounted rates. | 2012 Advertis | ring Potos (C) All |

borehole surveying software

<u>GEOMEM</u>

24 John Huband Drive, Birkhill, Angus, DD2 5RY United Kingdom Tel: 01382 329 011 Fax: 01382 230 256 Email: tech@geomem.com

consultants

GROUND TECHNOLOGY

Ground Technology Services, Maple Road, Kings Lynn, Norfolk, PE34 3AF Tel: 01553 817657 Fax: 01553 817658 Email: mail@groundtechnology.co.uk

drilling contractors

APEX DRILLING SERVICES

Sturmi Way, Bridgend, CF33 6BZ **Tel:** 01656 749149 **Email:** <u>thomas.martin@apex-drilling.com</u>

BOREHOLE SOLUTION SITE INVESTIGATION

13 Great North Road, Buckden, St Neots, Cambridgeshire, PE19 5XJ **Tel:** 01480 812457 **Mob:** 07969 715655 **Email:** boreholesolutions@gmail.com

<u>CONCEPT</u>

Unit 8 Warple Mews, Warple Way, London W3 ORF Tel: 020 8811 2880 Fax: 020 8811 2881 Email: si@conceptconsultants.co.uk

DYNAMIC SAMPLING UK

37 Kingsway Industrial Park, Kingsway Park Close, Derby, Derbyshire, DE22 3FP **Tel:** 01332 224466 **Mob:** 07836 365533 **Email:** info@dynamicsampling.co.uk



GEOTECHNICAL ENGINEERING

Centurion House, Olympus Business Park, Quedgeley, Gloucester, GL2 4NF **Tel:** 01452 527743 **Fax:** 01452 729314 **Email:** <u>geotech@geoeng.co.uk</u>

RGI GEOTECHNICAL INVESTIGATION

Unit 37, Longfield Road, Sydenham Industrial Estate, Leamington Spa, Warwickshire, CV31 1XB

Tel/Fax: 01926 886329 **Mob:** 07748871546 **Email:** rgi10@aol.com

TERRA FIRMA GROUND INVESTIGATION

Rowan Tree Farm, Blackwell Hall Lane, Ley Hill, Buckinghamshire, HP5 1UN Tel: 01494 791110 Fax: 01494 791108 Email: <u>enquiries@terrafirmagi.co.uk</u>

drilling equipment

DRILLWELL

Unit 3, Rotherham Close, Killamarsh, Sheffield, S21 2JU Tel: 0114 248 7833 Fax: 0114 2487997 Email: sales@drillwell.co.uk

field instrumentation

<u>CONCEPT</u>

Unit 8 Warple Mews, Warple Way, London W3 ORF **Tel:** 020 8811 2880 **Fax:** 020 8811 2881

Email: si@conceptconsultants.co.uk

GEOTECHNICAL OBSERVATIONS

The Peter Vaughan Building, 9 Avro Way, Brooklands, Weybridge, Surrey KT13 OYF **Tel:** 01932 352040 **Fax:** 01932 356375 **Email:** info@geo-observations.com

geophysics

EUROPEAN GEOPHYSICAL SERVICES 22 Sansaw Business Park, Hadnall, Shrewsbury, Shropshire SY4 4AS Tel: 01939 210 710 Fax: 01939 210 532 Email: eurogeophys@europeangeophysical.com

TERRADAT Unit 1, Link Trade Park, Penarth Road, Cardiff, CF11 8TQ Tel: 08707 303050 Fax: 08707 303051 Email: web@terradat.co.uk

geotechnical software

KEYNETX LTD

Systems Park, Moons Park, Burnt Meadow Road, Redditch, Worcestershire, B98 9PA **Tel:** 01527 68888 **Fax:** 01527 62880 **Email:** <u>sales@keynetix.com</u>

geotechnical specialists

GEOTECHNICAL ENGINEERING

Centurion House, Olympus Business Park, Quedgeley, Gloucester, GL2 4NF **Tel:** 01452 527743 **Fax:** 01452 729314 **Email:** geotech@geoeng.co.uk

GEOTECHNICAL OBSERVATIONS

The Peter Vaughan Building, 9 Avro Way, Brooklands, Weybridge, Surrey KT13 OYF **Tel:** 01932 352040 **Fax:** 01932 356375 **Email:** info@geo-observations.com

health and safety

<u>EB SAFETY</u> **Tel:** 01926 642465 **Mob:** 07881858271 **Email:** <u>ebetts@ebsafety.co.uk</u>



Emma J Betts: BSc(Hons) MSc GradIOSH Health & Safety Consultant

▶ 01926 642465 ➤ e.betts@ebsafety.co.uk ➤ 07881 858271 www.ebsafety.co.uk



laboratory services

ALCONTROL LABORATORIES

Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, Flintshire CH5 3US Tel: 01244 528 700 Fax: 01244 528 701 Email: hawarden.sales@alcontrol.com

CONCEPT

Unit 8 Warple Mews, Warple Way, London W3 ORF Tel: 020 8811 2880 Fax: 020 8811 2881 Email: si@conceptconsultants.co.uk

GEOLABS

Bucknalls Lane, Garston, Watford, Hertfordshire, WD25 9XX Tel: 01923 892 190 Fax: 01923 892 191 Email: admin@geolabs.co.uk

K4 SOILS LABORATORY

Unit 8, Olds Close, Watford, Hertfordshire, WD18 9RU Tel: 01923 711288 Fax: 01923 711311 Email: office@k4soils.com

site investigation

CONCEPT

Unit 8 Warple Mews, Warple Way, London W3 ORF Tel: 020 8811 2880 Fax: 020 8811 2881 Email: si@conceptconsultants.co.uk

training and education

EOUIPE GROUP

The Paddocks, Home Farm Offices, The Upton Estate, Banbury, Oxford, OX15 6HU Tel: 01295 670990 Fax: 01295 678232 Email: info@equipegroup.com



Geotechnical Engineering Ltd is a long-established ground investigation specialist, employing some 125 people from its base in Gloucester. We have our own drilling rigs and drillers, laboratory and field technicians, geotechnical and geo-environmental engineers. We offer a full range of services to a wide variety of Clients throughout the UK.

We believe that further opportunities are now opening up for us in several of our markets, and are intending to recruit additional senior staff to the following roles:

COMMERCIAL MANAGER

geotech

To head up a team of estimators, assessing and pricing ground investigation contracts throughout the UK. Should have 10 to 15 years minimum experience in the industry, including a solid grounding in tendering and contract managing.

SENIOR CONTRACTS MANAGER

To take responsibility for large and/or complex ground investigations, working with other Managers, staff and sub-contractors. Should have at least 8 years experience in the industry, including significant contract management.

2 no. HIGHLY EXPERIENCED (ROTARY) DRILLERS

To bring additional skills and experience to the drilling team, and to mentor, develop and set an example to more junior drilling staff. Should have at least 10 years varied ground investigation drilling experience, mostly on rotary and multi-purpose rigs.

GEOTECHNICAL CONSULTANT

To bring technical and managerial skills to a relatively young team of geotechnical and geo-environmental engineers, and to help to develop their full potential. Should have at least 15 years experience in both technical and commercial areas, and preferably be chartered with an MSc.

PRINCIPAL GEOTECHNICAL ENGINEER

To further strengthen this young team of engineers (above), both technically and commercially. Should have at least 10 years experience, an MSc, and be working towards chartership.

www.geoeng.co.uk

Rotary Drillers

We have vacancies available for experienced Lead Rotary Drillers, both in the UK and Worldwide.

All interested applicants, please forward your CV to:

Gardline Geosciences is an established and highly respected independent marine geotechnical investigation company and part of the Gardline Group of Companies.

Gardline Geosciences performs marine rotary drilling with **Geotechnical Engineers** wireline tools and seabed CPT's from its own in house fleet of vessels as well as vessels of opportunity in water depths £ Negotiable that range from the nearshore to 2000 metres. Our operations are worldwide, with prestigious projects for major oil and gas clients having recently been completed in the Antarctic; South America; off the Grand Banks of Canada as well as the North Sea.

Due to our increasing workloads we are currently seeking to recruit engineering geologists / geotechnical engineers at all levels to help plan; specify and supervise marine seabed investigations. Core skills required Include logging of soil and rock to British and European Standards; a working knowledge of cone penetration testing; laboratory strength and classification testing and the preparation of factual/interpretative reports.

Salary is negotiable depending on experience and all positions carry an attractive offshore allowance.

| a | Brian Georgious | |
|-----------------|--|------------------|
| t - | Gardline Geosciences | |
| Ň | 1 Hewett Park, Hewett Road | |
| Reply CV to: | Gapton Hall Industrial Estate Great Yarmouth, Norfolk NR31 0NN | Or bri |

interested?

Please email your CV to andrew.milne@geoeng.co.uk



Engineering Geologists/

theGeotechnica



Driving our industry forward...

Equipe Group The Paddocks, Home Farm Drive The Upton Estate Banbury, OX15 6HU



| : | |
|--------------|--|
| | |
| Group | 0 |
| | |
| Group | |
| | |
| Training Ltd | - |
| | |
| | |
| | - |
| | |
| - | Concession in which the real value of the local division of the lo |
| | |