

# The Clay Research Group

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## RESEARCH AREAS

Climate Change ♦ Data Analysis ♦ Electrical Resistivity Tomography  
Time Domain Reflectometry ♦ BioSciences ♦ Ground Movement  
Soil Testing Techniques ♦ Telemetry ♦ Numerical Modelling  
Ground Remediation Techniques ♦ Risk Analysis  
Mapping ♦ Software Analysis Tools



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July 2012

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## CONTENTS

### Page 1

**Richard Rollit**

The Work of the CRG - Update

### Page 2

**Paul Harris**

The Council as Tree Owner

**Maciek Kawecki**

Rehydration & Root Barriers

### Page 3

**Michael Lawson**

Soil Moisture Deficit

**Margaret MacQueen**

Changes to TPO Legislation

**Rachel Bolt and Ian Brett-Pitt**

Trees and the Law

### Page 4

**Stephen Plante**

R&D and the Business Model

### Page 5

Aston 2013

## Aston Conference

This edition reports on the annual subsidence conference at Aston University. Presentations and papers from the day are available for download from the CRG and RICS websites– see addresses below.

It proved to be a lively day with a high approval rating from those that attended.

## Weather Update

Thoughts of a surge year are diminishing with the recent rainfall. The SMD data for grass cover in tile 161 stands at 7mm at the time of issue. One of the lowest recorded.



## Hortlink Revisited

A meeting was held in June to continue discussions into Margaret McQueens initiative to extend the original Hortlink project .

Rachel Bolt hosted the meeting at the London offices of Freeth Cartwright. A follow up meeting is planned in September to discuss scope and funding.

## R.I.C.S. to Visit Aldenham

Gary Strong of the RICS has suggested reviewing the research site at Aldenham, and a meeting is to be arranged shortly.

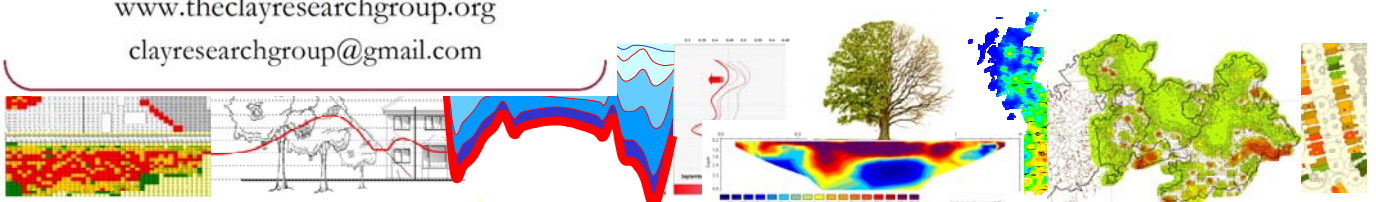
The RICS also have links to the conference papers. They can be accessed by visiting...

<https://mail.google.com/mail/ca/#inbox/1383890020b726a9>

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[www.theclayresearchgroup.org](http://www.theclayresearchgroup.org)

[clayresearchgroup@gmail.com](mailto:clayresearchgroup@gmail.com)



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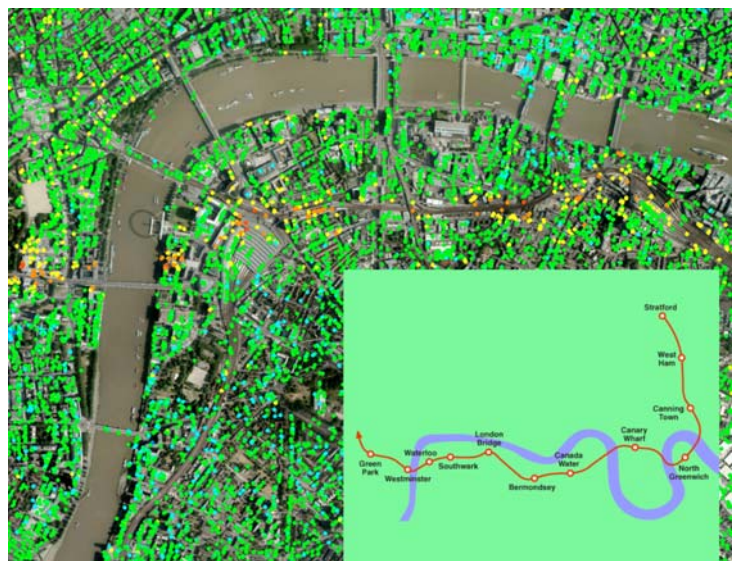
## The Work of the CRG - Update

Richard Rollit not only chaired the conference, but he also spoke about the work of the CRG, including the Intervention Technique and remote monitoring using satellite imagery. John Hogg from RBSi had pointed Richard in the direction of TRE who have devised an algorithm for measuring ground movement by comparing satellite data over time.

This was timely as we were reading reports about how Big Ben was tilting by about 450mm, and we were granted access to the system which revealed movement of around 40mm or so over a ten year period.

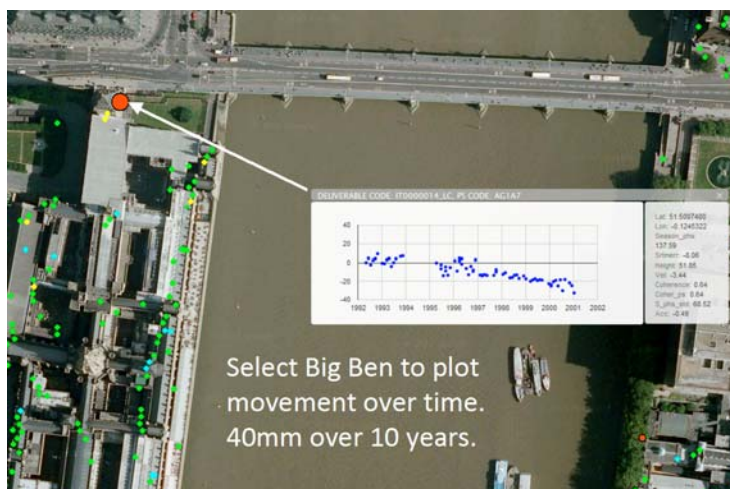
Although the technique doesn't appear to offer hope in terms of individual houses we can see scope for using it in cases of widespread ground movement – mining or landslip etc.

TRE have been put in touch with Geotechnical Consulting Group who are involved with diagnosing the cause of subsidence to Big Ben.

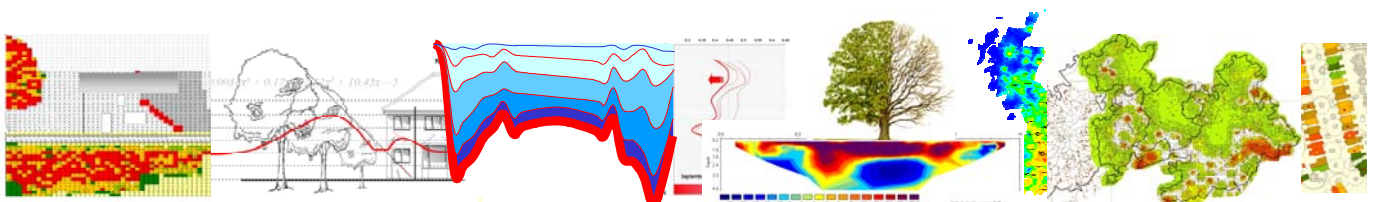


Above the data shows a pattern of subsidence (yellow and red dots) following the Jubilee Line and passing directly beneath Big Ben and the Thames.

See the relationship between the Jubilee Line and the Thames in the insert map.



Left, the monitoring station immediately above Big Ben has been selected and the scatter graph shows around 40mm of subsidence for the period from 1992 to 2002.



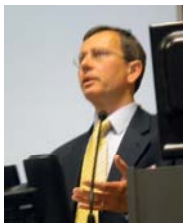
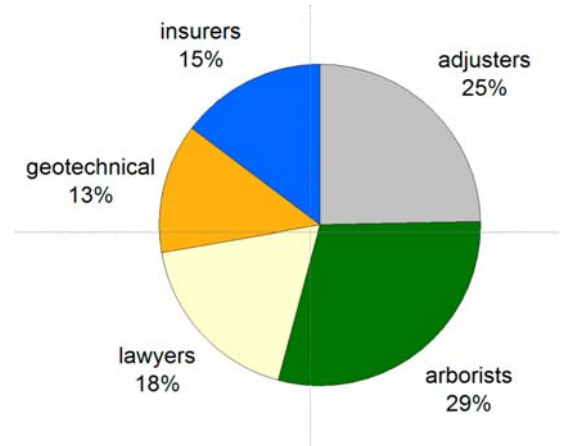
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## REPORT from ASTON

The Aston Subsidence Conference was a great success this year, both in terms of atmosphere and the quality of speaker. The lecture theatre was full, with attendees from a broad cross section, see right.

Papers are available for viewing on the web, listed by presenters name. The views expressed are those of the individual speakers and we suggest that you contact them direct if you have any queries.



First to take the stand was **Paul Harris**. Paul is a chartered adjuster, insurer and engineer and acts for numerous Local Authorities defending tree related claims. He outlined the viewpoint of the Local Authority Arboricultural Officers and suggested that claimants – insurers and their agents – might want to consider adopting a different approach.

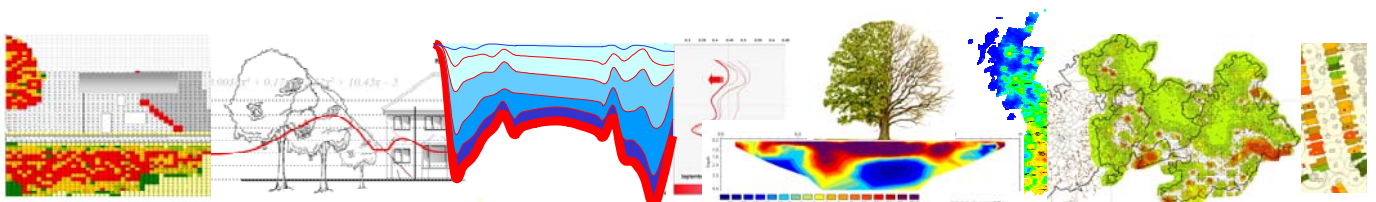
When sending through a bundle of highly technical documents, some containing complex graphs and data listing various soil properties, it might be worth considering putting together a covering report explaining what they mean. He feels that current ‘business process’ leads to standard template style reports that are not always easy to understand. He also made the point that putting the Local Authority on notice before the evidence is available can be counterproductive.

His delivered a persuasive argument for making the whole thing a little more human.

**Maciek Kawecki** provided examples where rehydration schemes and/or root barriers had been installed to overcome cases of root induced clay shrinkage.

Maciek advised that rehydration was suitable for use when the tree was to be removed, and the foundation had to be lifted to their former position to close cracks and remove distortions prior to tree removal.

The root barrier was useful where the tree could not be removed for some reason.



# The Clay Research Group

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**Michael Lawson** delivered a full explanation of how the Soil Moisture Deficit is derived, and how it is used to model individual years.

The Met Office model uses a value of 308mm of water as a peak moisture deficit for trees. Michael has found a link between the number of weeks at this 308mm deficit and surge years.

He goes on to propose three categories of SMD profile and looks at what he terms “wet and dry phases” to distinguish between years that start off dry, and others that have a zero moisture deficit.

He also explained the difference between values for bare ground, grass and trees, setting aside the notion expressed by some that an SMD of say 250mm might be due to sunshine or grass, which of course, it can't be. High values tell us “it's the tree” was the clear message.

**Margaret MacQueen** spoke about recent changes in the TPO legislation, explaining their significance.

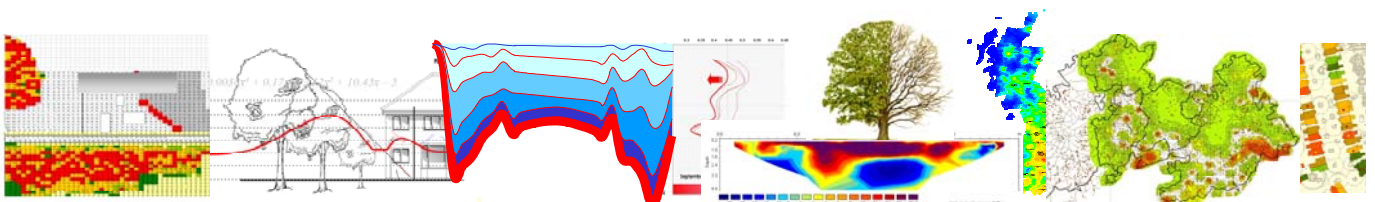
Apparently, the protection afforded by Certificate 5 has been removed. Margaret reported that going forward, TPOs will now consist of only the Map and the Schedule. They can no longer be confirmed after 6 months have elapsed. More details appear in her presentation, which is available for download from the CRG web site.



**Rachel Bolt and Ian Brett-Pitt** gave a presentation outlining Case Law relating to root induced clay shrinkage claims, citing various defences, and detailing the Courts decisions.

Amongst them were “my tree was there before the extension was built”, “the damaged structure had poor foundations”, “ I wasn't given the opportunity to abate the nuisance” plus many more.

The informative talk covered most commonly encountered defences.



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**Stephen Plante** explored the relationship between pure research and the business model.

What does electrical resistivity tomography have to do with the bottom line?

The cost of settling claims has fallen dramatically over the last 20 years, and this has been due to our developing understanding of the peril. Instead of underpinning 50% of valid claims as was the case in 1990, we now underpin 5%, and nothing terrible has happened.



Fears that houses would fall down as a result of not being underpinned, and that large volumes of claims would re-open, haven't materialised. Extending this idea to the routine handling of claims – measuring performance across all criteria – is central to ensure we deliver what the client wants, rather than replicate what we have been doing for the past 20 years.

Research is the foundation to business analytics and development.

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## Increase in Root BioMass Associated with Drought

Klein *et al*, (2011), "Hydraulic adjustments underlying drought resistance of *Pinus halepensis*", published in *Tree Physiology*, Oxford University Press.

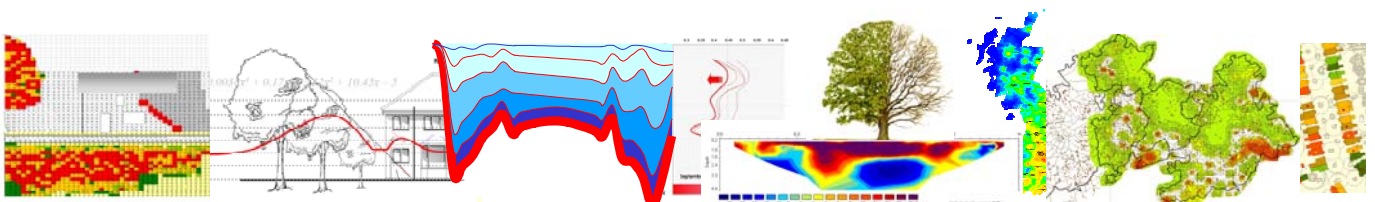
Under intense or prolonged drought, Klein *et al* from the Department of Environmental Sciences and Energy Research, Weizmann Institute of Science, Israel, report the root system increased, accounting for 100% of the added biomass, while the stem tissue biomass decreased, associated with up to 60% reduction in xylem volume.

## Wetter Weather Associated with Climate Change?

Professor Robert Allen from the University of California Riverside, writing in the journal *Nature*, suggests that we may see more rain associated with Climate Change.

'The southern portions of the United States may get drier if the storm systems move further north than they were 30 years ago.

Indeed, some climate models have been showing a steady drying of the subtropics, accompanied by an increase in precipitation in higher mid-latitudes.'



# The Clay Research Group

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## Aston 2013



Above, **Andrea Plunknett** from Welwyn and Hatfield Council, and **Jake Tibbetts**, the arboricultural Officer from Islington discuss the day.

Jake has kindly agreed to speak next year, although Andrea wasn't as brave. We have also enlisted **Anna Madichie** from Plexus.

Aston rated the conference as delivering 100% positive feedback. The following comments were received from attendees ...

In response to "what would you change", the response was "fine as it is. Varied agenda ... useful information ... a useful and enjoyable day".

One delegate added "an excellent technical conference containing a wide range of thought provoking topics".

Many thought a slower pace, possibly with one less presentation to allow more discussion, would be beneficial.

Suggestion for topics that should be included – FOS decisions, 'the customer journey' in relation to insurance claims, more on the work of the CRG, and covered in greater depth. Exploring the business model. Efficiencies, measuring technical performance etc., and also underwriting and risk modelling.



2013 should be quite exciting as we are also making plans to have a soil testing break-out group for those interested in seeing how the various tests are carried out, and what the results mean, sponsored by MatLab.

The conference is meant to cover topics that are relevant and we welcome feedback.

We look forward to seeing everyone next year but in the meantime, abbreviated reports and presentations are available for download from the web site at ...

[www.theclayresearchgroup.org](http://www.theclayresearchgroup.org)

Selects 'Newsletters' and look for the speakers name.

