The Clay Research Group

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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www.theclayresearchgroup.org

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Climate Scientists Forecast Permanently Hotter Summers

The tropics and much of the Northern Hemisphere are likely to experience an irreversible rise in summer temperatures within the next 20 to 60 years if atmospheric greenhouse gas concentrations continue to increase, according to a new climate study by Stanford University scientists.

"According to our projections, large areas of the globe are likely to warm up so quickly that, by the middle of this century, even the coolest summers will be hotter than the hottest summers of the past 50 years," said the study's lead author, Noah Diffenbaugh,

Ice Age is Coming

Britain and Continental Europe could see mini-ice-age winters over the next few decades according to Professor Mike Lockwood at Reading University. His paper, published in the Institute of Physics Journal, suggests a probability of 1 in 10 that we could see a drop of 2 degrees Centigrade in the winter months.

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Annual Subsidence Conference

The Aston Conference was one of the most enjoyable we have attended with leading experts in our industry talking about underwriting, the risk presented by trees and the influence of Climate Change. See inside for details.

Swiss Re Warns of Growing Subsidence Risk

The Insurance Post report on a new loss model developed by the re-insurer and the Swiss Federal Institute of Technology which predicts that soil subsidence will worsen and spread in Europe, with some areas seeing a more than 50% rise in future losses.

The Post explain "large parts of Europe will experience more sporadic rainfall and drier soils in the future and these areas will therefore face greater losses from shifting soil, the model shows. In some regions, the soil subsidence loss potential for the period 2021–2040 is expected to increase by more than 50% compared to today."

Higher Density Means World Forests Are Capturing More Carbon

Forests in many regions are becoming larger carbon sinks thanks to higher density, U.S. and European researchers say in a new report. In Europe and North America, increased density significantly raised carbon storage despite little or no expansion of forest area, according to the study, led by Aapo Rautiainen of the University of Helsinki, Finland, and published in the online, open-access journal *PLoS ONE*.

Even in the South American nations studied, more density helped maintain regional carbon levels in the face of deforestation. The researchers analysed information from 68 nations, which together account for 72 percent of the world's forested land and 68 percent of reported carbon mass. They conclude that managing forests for timber growth and density offers a way to increase stored carbon, even with little or no expansion of forest area

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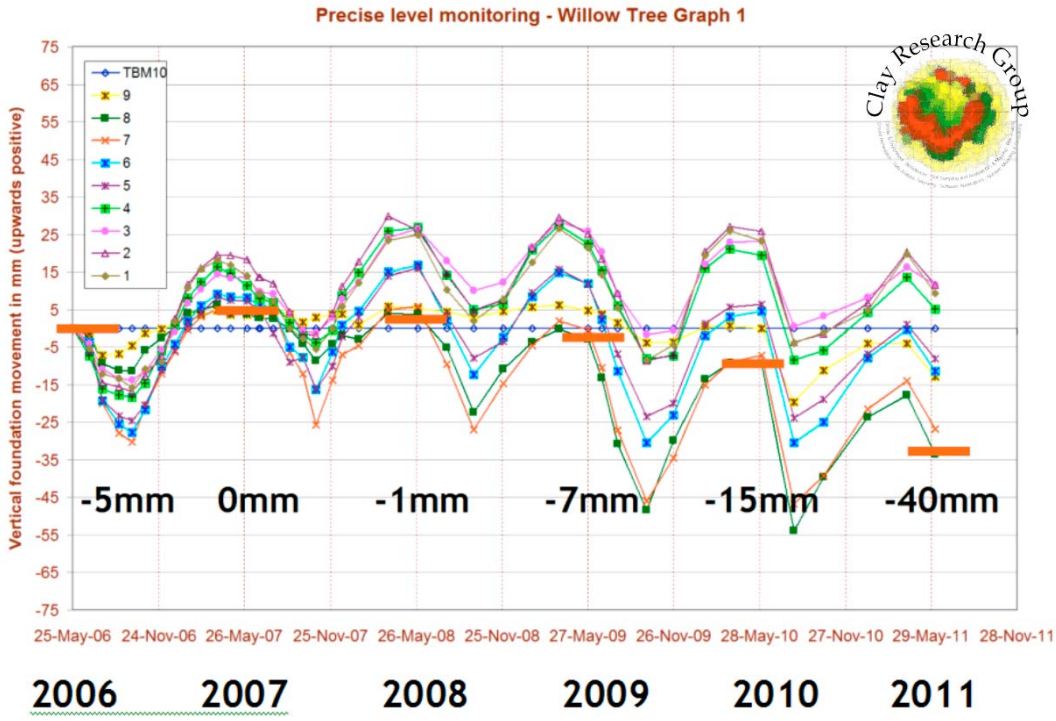
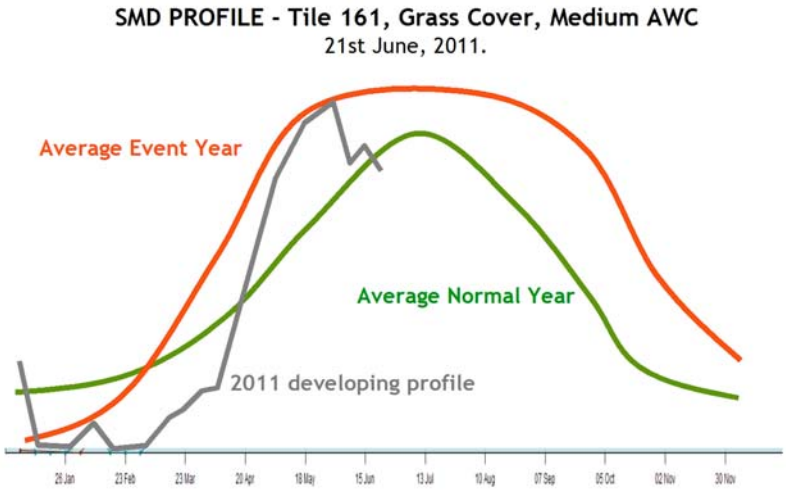
CLIMATE UPDATE
~ Ground Movement ~



Comparative ground movement at the site of the Aldenham Willow, comparing the figures at the end of May, commencing in 2006 through to the current time. All values relative to May 2007.



~ SMD ~

The SMD at the end of June suggests that the risk of a surge is receding as the values reduce to those recorded in 2007.

The irregular patterns forecast by climatologists has made predicting the future even more difficult as periods of exceptionally dry weather are interrupted by heavy rainfall.

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THE ASTON CONFERENCE

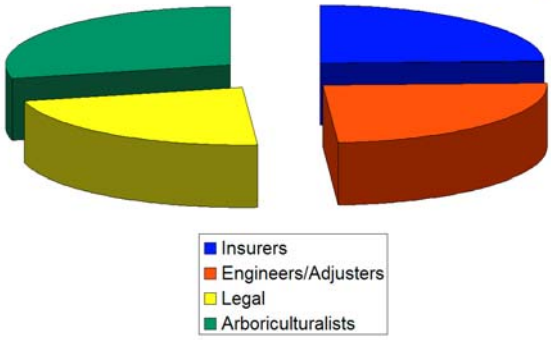
One of the most entertaining of the Aston conferences generating a 95% approval rating from the delegates. We heard a diverse range of views from some of the industries leading experts.

Malcolm Cooper opened the conference by explaining how subsidence is viewed by underwriters, putting it in context with other perils. Although it isn't one of the premier perils at the moment, it is regarded seriously and accounts for sizeable losses.

Malcolm's slideshow demonstrated the development of the SMD profile for the year to date, and answered questions from the audience relating to the options available to insurers.

For example, was it likely that insurers might withdraw cover altogether for some high-risk properties, and how did the industry deal with houses that had suffered an episode of movement? Is the policy excess due to increase?

He explained that insurers were a responsible body and withdrawal of cover would be entirely exceptional.



Attendees were evenly spread between four groups as can be seen above. Local Authorities were poorly represented due to cut-backs.

On the matter of obtaining insurance following the satisfactory repair of a subsidence damaged house, he felt the risk should be retained by the insurer who dealt with the claim. The excess? It has been at £1,000 for around 20 years so it may be time to take account of inflation but there are no proposals at this stage.

Giles explained the benefits of precise level monitoring and commended it as providing the most reliable evidence to prove – or disprove – if a tree is implicated in damage.

Giles explained that where crack width monitoring might reveal 1mm of movement, for the same amount of subsidence this would translate to around 10mm of level movement making it far easier to detect.

Paul Thompson from Marishall Thompson spoke about Climate Change, outlining the background to the Climate Fix Foundation he is establishing. A very sophisticated presentation with video and sound showed disturbing images of ice cap melt and the effect on plants and animals across the world.

Peter Osborne challenged the framework of a legal system that supported the felling of trees and asked what the insurance policy was for? Why didn't insurers visit houses on clay soils to assess the risk when providing a quotation? Why is it that the Council have to meet the cost when the tree is proven to have caused a nuisance?

Mike Lawson provided the counter argument. He pointed out that sometimes, trees are a nuisance and should be felled. Of the trees felled in London, only 5% were associated with subsidence and he wondered if too much fuss was being made. After all, with every asset there is a liability, and although everyone recognises the value of trees, there are times when felling is the only option.

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CROWN REDUCTION RESEARCH
~ Aston Conference ~

Richard Rollit explained where we were with the extension of the Hortlink II project, an initiative put forward by Margaret MacQueen of OCA. The objective is to understand whether or not crown reduction provides a sustainable resolution to cases of root induced clay shrinkage subsidence claims. If so, at what intervals and does it vary by species, height and distance etc.?

Crown reduction is used extensively by Local Authorities as part of their Risk Limitation Strategy.

The proposal is that Neil Hipps of East Malling Research would extend the original Hortlink Project. The initial work confirmed that crown thinning was ineffective. It led to an increase in water uptake.

The working party came to the view that by using actual claims, we would have a wider base of experience that was relevant to the question, accounting for variations in tree species, height and distance and pruning regimes etc. If Councils and adjusters agreed, we would ask adjusters/engineers to notify street tree claims. Participating Councils would arrange to crown reduce on a pre-agreed basis so that Neil Hipps could be provided with a record. Precise levels would be taken before and after crown treatment, and aligned with weather data.

Anonymised results (in the format Ref AG123...) would be gathered in a uniform template-style report recording tree metrics, species, soil type, investigations, weather records, damage, tree surgery and would be given to Neil Hipps for analysis. Funding for East Malling to be resolved. Procedure will be for the working party to agree the research proposals initially, followed by a broader meeting to discuss and firm up the proposals, taking account of feedback. Funding to be sought and the project bought to the attention of the ABI, DTAG and other groups.

TREES, PEOPLE AND THE BUILT ENVIRONMENT

Conference helps co-operation

Fresh from the "Trees, People and the Built Environment" conference, I was on a domestic property site in Derby where I met the insured – quite a feisty 101-year-old lady – and Ruth Baker, the Tree Officer for Derbyshire County Council, who had also attended the conference and recognised me.

I was able to ask her to recall that, four slides into my presentation on domestic subsidence in the UK, I had said: "Let's remember every claim has a human face".

I, along with the case loss adjuster, was pleasantly surprised at just how positive the meeting was. We all, including the neighbouring tree owner, came together to agree a resolution. This will mean tree loss, but four new trees will go back for the two being removed, plus a huge financial situation was averted. Every room is damaged with the prospect of beautiful parquet flooring throughout the property having to also be removed to facilitate the repairs.

The interior restoration costs on top of the repair costs for a full footprint piled raft simply don't bear thinking about. Importantly, the resolution means that the lady's family will be able to avoid having to move her to a nursing home during the course of the repairs. Once the trees have been felled the house will be left to stabilise before a scheme of repairs will be implemented with the lady staying at home.

Just how different it all might have been if Ruth and I hadn't been at the conference and taken on board the conference message. So, thank you to all concerned here for working in co-operation to find a solution.

Picture: Barrell Tree Consultancy

Trees too close to buildings can cause major problems for the owners

Margaret MacQueen MICFor, Consultant Arboriculturist. Margaret addressed the "Trees, People and the Built Environment" conference in Birmingham.

The international conference held by the Institution of Chartered Foresters was a great success with excellent feedback from delegates. Margaret MacQueen provided evidence of this in a case study, featured right in the Chartered Foresters Journal.

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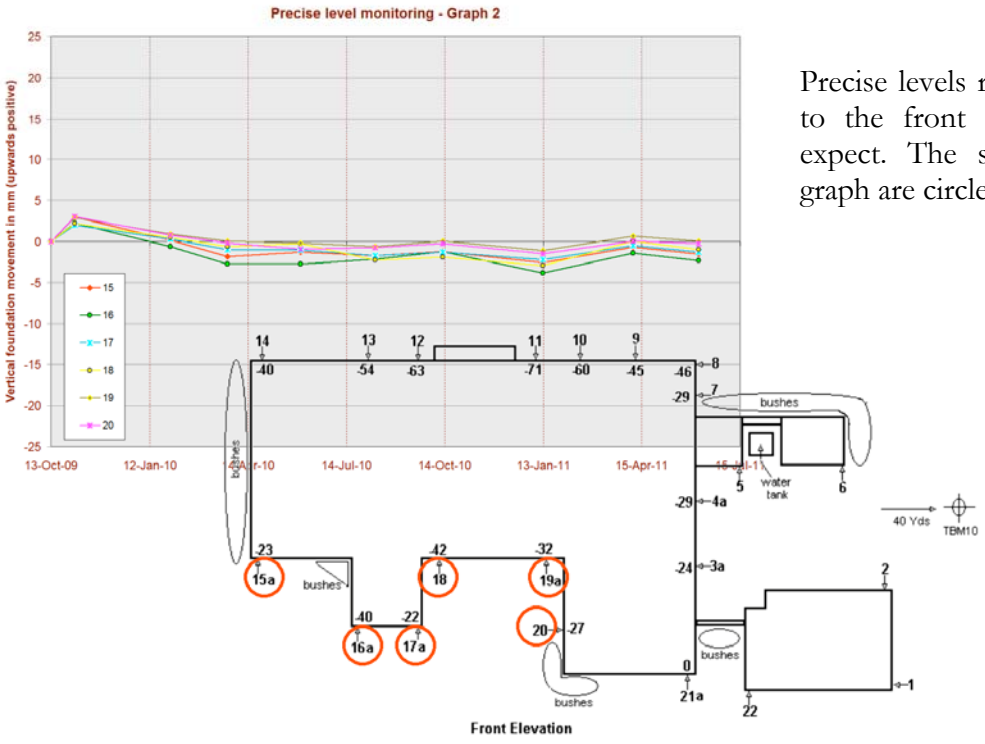
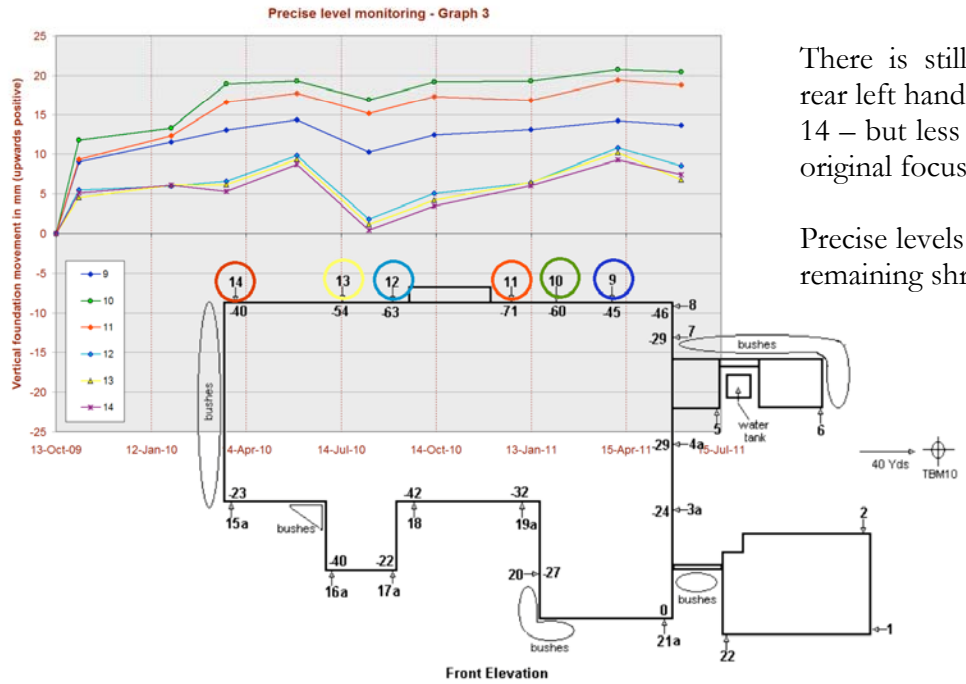
HEADMASTERS HOUSE



Precise levels reveal very little movement to the front house wall, as we might expect. The stations appearing in this graph are circled in red.

Along the rear wall – see below - there has been marked recovery following removal or cutting back of some shrubs, combined with rehydration using small bores.

The data reveals the value of precise levels in understanding exactly which parts of the building are moving relative to another.



There is still some activity towards the rear left hand corner – Stations 12, 13 and 14 – but less at Stations 9, 10 and 11, the original focus of movement.

Precise levels have identified which of the remaining shrubs have to be removed.

Cyril Nazareth is undertaking a survey shortly to plot the remaining vegetation along the rear wall.

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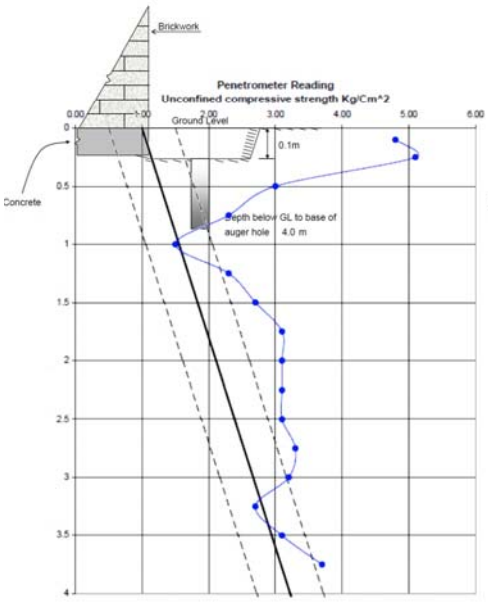
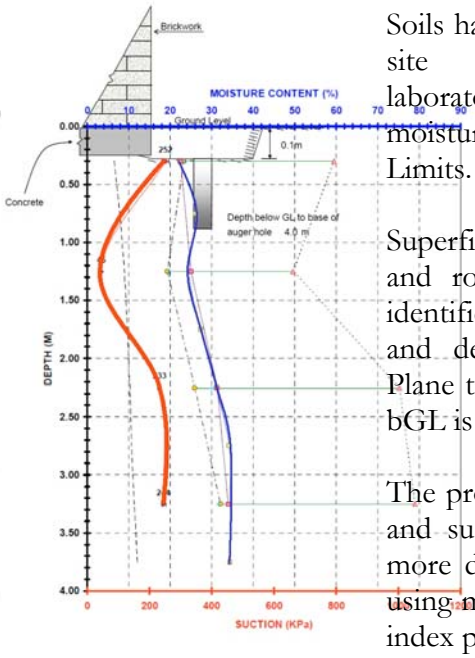
Comparison Soil Tests



Penetrometer readings reveal a superficial band of dry soil extending down to 0.75mtrs bGL, and root induced desiccation from 1.25 – 3mtrs bGL.



Soil suctions (red) reveal a similar pattern. It is difficult to detect desiccation using the moisture content profile (blue)

Soils have been tested using the on-site penetrometer (far left), laboratory soil suctions (red) and moistures compared with Atterberg Limits.

Superficial drying from evaporation and roots from shrubs is clearly identified using the penetrometer, and deeper root activity from a Plane tree, peaking at around 2mtrs bGL is also evident.

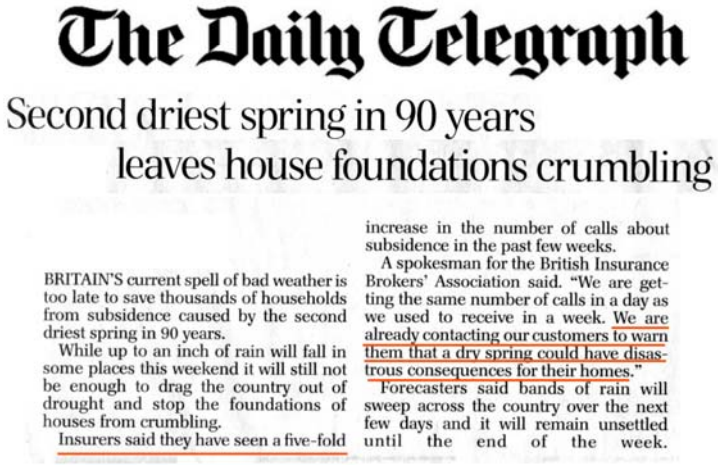
The profiles from the penetrometer and suctions are comparable. It is more difficult to detect desiccation using moisture comparison with the index properties.

In the Press

Apparently, or at least, according to the Daily Telegraph, insurers are phoning homeowners "to warn them that a dry spring could have disastrous consequences for their homes".

Apparently this is due to the Spring dry spell leaving "house foundations crumbling".

Just imagine receiving that call.



The Daily Telegraph

Second driest spring in 90 years leaves house foundations crumbling

BRITAIN'S current spell of bad weather is too late to save thousands of households from subsidence caused by the second driest spring in 90 years.

While up to an inch of rain will fall in some places this weekend it will still not be enough to drag the country out of drought and stop the foundations of houses from crumbling.

Insurers said they have seen a five-fold increase in the number of calls about subsidence in the past few weeks.

A spokesman for the British Insurance Brokers' Association said. "We are getting the same number of calls in a day as we used to receive in a week. We are already contacting our customers to warn them that a dry spring could have disastrous consequences for their homes."

Forecasters said bands of rain will sweep across the country over the next few days and it will remain unsettled until the end of the week.