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

The Clay Research Group

May 2012

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ASTON UNIVERSITY
BIRMINGHAM

The Annual Subsidence Conference
20th June, 2012

For details of the programme and how to book, see last page.

Hortlink Update

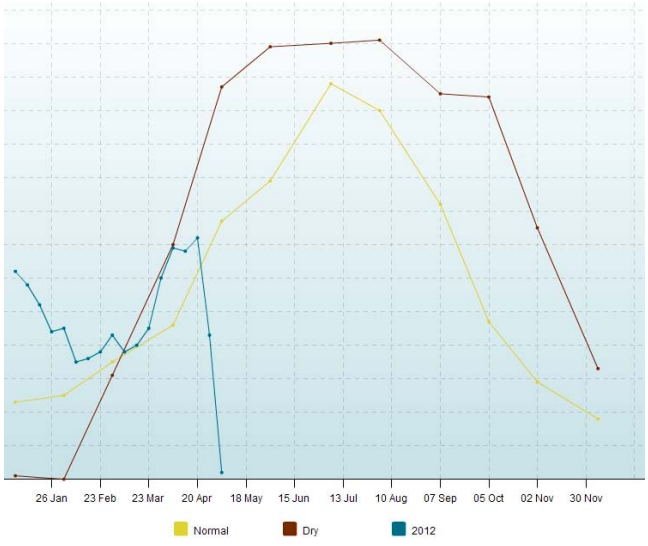
Margaret MacQueen is arranging a meeting of interested parties in London towards the end of May to progress the proposed extension of the Hortlink project.

Neil Hipps has provided a project outline and representatives of the London Tree Officers Association will be in attendance with the objective of researching the longevity of crown reduction as a solution to proven subsidence claims.

Hopefully Margaret will be able to provide an update on progress when she delivers her talk at Aston.

Weather Update

Following a record dry spell, we have the wettest April for 100 years, and the ground is already responding as can be seen from the SMD plot below. Just in time as trees come into leaf – hopefully.



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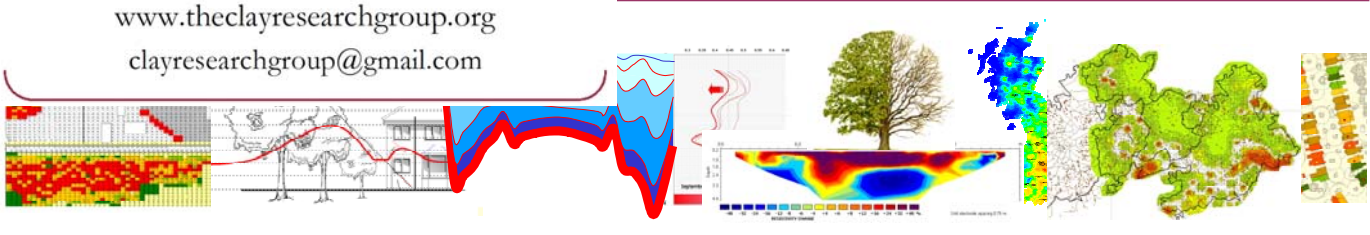

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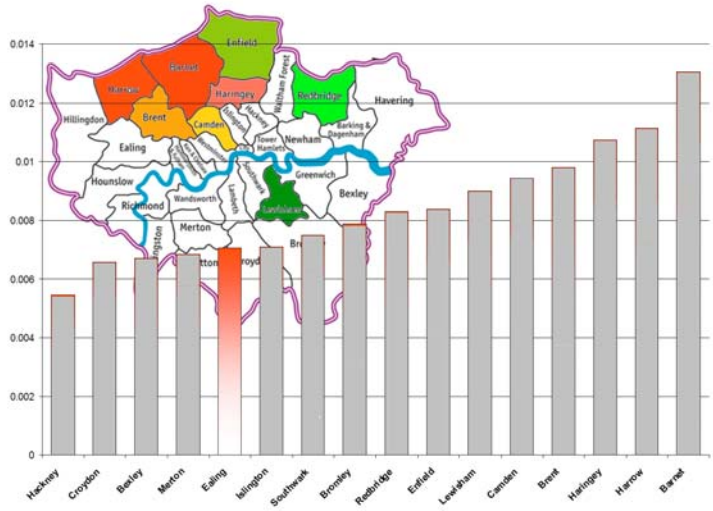
EALING – STUDY AREA

In this months newsletter we take a look at Ealing. We plot the geology and claims frequency plus the distribution of trees using the LiDAR dataset.



Although not one of the riskiest Boroughs (see above chart), it does contain a postcode sector in the 'top 50'. The Borough has a variable geology with outcropping London clay bordered and interspersed by alluvial soils.

The Aston Conference

Over the last 10 years Aston has attracted some excellent speakers, including industry experts Richard Driscoll, Giles Biddle, Tim Freeman and Hilary Skinner.

From the adjusting community we have heard from Robert Sharpe, Nigel Bareham, Gary Strong and others.

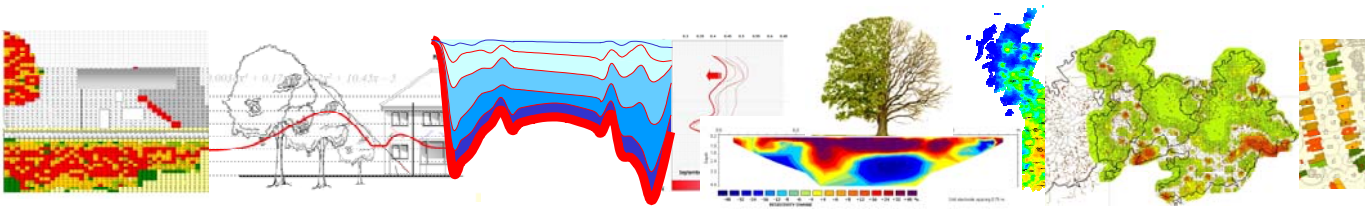
Arboriculturalists have been well represented as well. Last year we heard from Paul Thompson, Michael Lawson, Giles Biddle and Peter Osborne.

As for insurers, we have heard from John Parvin who has been closely involved with the Subsidence Forum, establishing the Joint Mitigation Protocol and the publication of the recently issued RICS Subsidence Handbook. Jill Hunt spoke about customer care. Malcolm Cooper gave us the underwriters view, explaining where subsidence stood in the scheme of things, and looking into the future.

Nigel Cassidy and Glenda Jones from Keele University spoke about geotechnics and the electrokinesis project. Malcolm Brown from the BGS explained about risk modelling using geological mapping.

The legal position has been outlined by Tony Greenfield, Alasdair Hobson, Paul Leighton and Jonathan Bingham.

Richard Rollit has kept the whole thing moving along acting as Chair, whilst making contributions on a range of topics. Aston is the 'subsidence only' event that attracts this calibre of speaker and provides an opportunity to meet colleagues and we hope to see you there.



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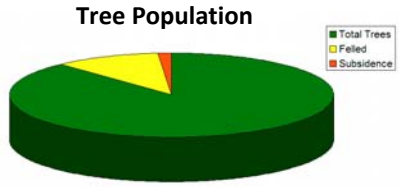
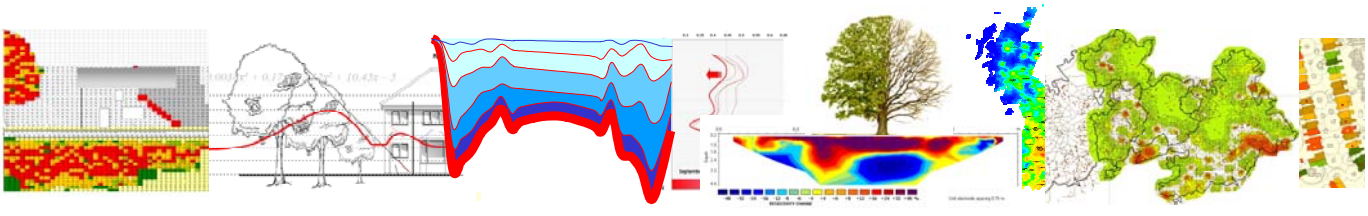
EALING – STUDY AREA



Data from London Assembly "Chainsaw Massacre"

Ealing Borough has an area of approx. 55.5sq km and is bordered by the M4 to the south, and Sudbury to the North. Wormwood Scrubs lies just to the East . Below, Normalised Risk Frequency (claims sample/population on a scale 0 - 1) across the Borough. Ealing estimate (London Assembly, 2007 "Chainsaw Massacre") that they have around 26,500 trees, of which 3,600 were felled over a five year period. Of the trees felled, 400 were thought to be associated with subsidence damage, representing 11% of the felled tree population.



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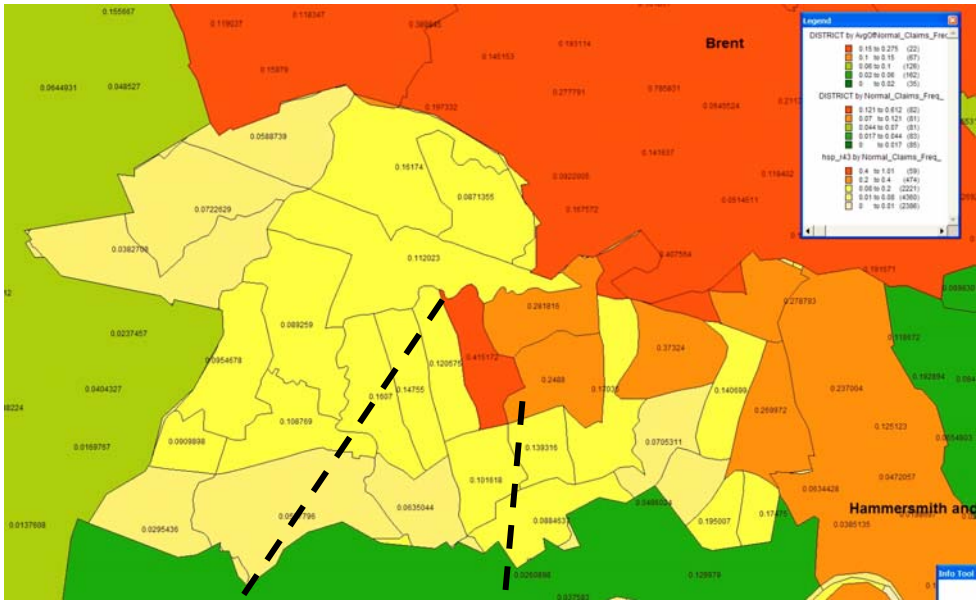
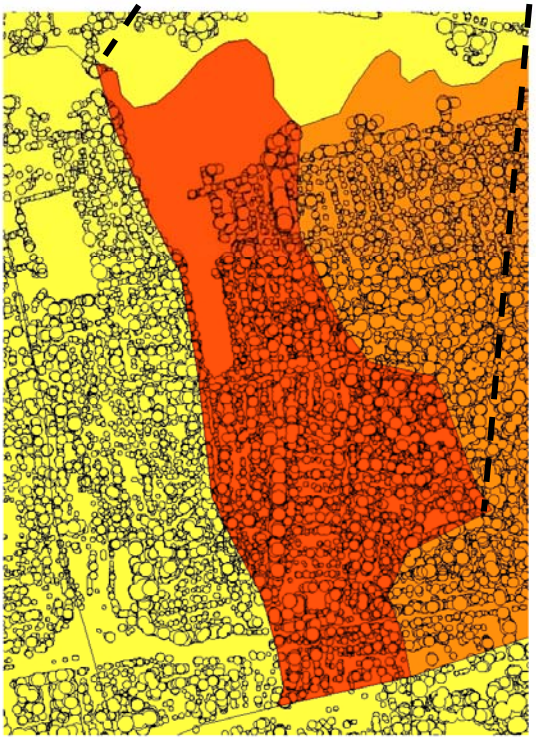


There is a wide variation of risk within the Borough, as can be seen above on the postcode sector map. This is a function of the underlying geology (see following page). There are alluvial deposits to the west and south of the Borough, and highly shrinkable clays elsewhere.



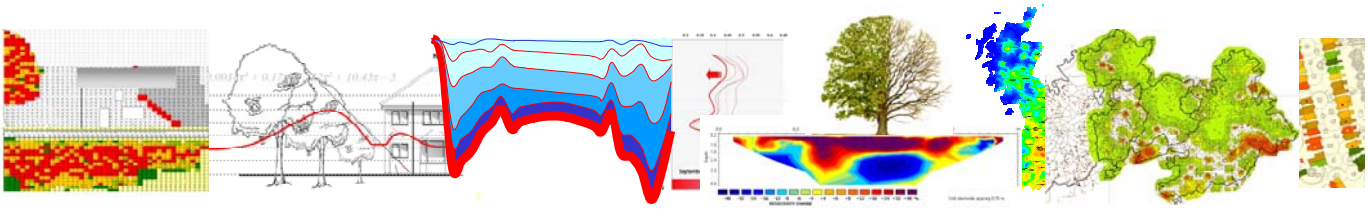
MODELLED ROOT ZONES SUPERIMPOSED ONTO THE OUTLINE OF POSTCODE SECTOR W13 8

Using LiDAR data to position trees and estimating the root zone as being equal to the tree height delivers the following:-

Modelled root zone = 874,000 sq mtrs
Postcode sector area = 1,264,000 sq mtrs

In summary, the modelled root zone covers nearly 70% of the sector.

Sector W13 8 is the riskiest in Ealing, in terms of subsidence claims frequency.



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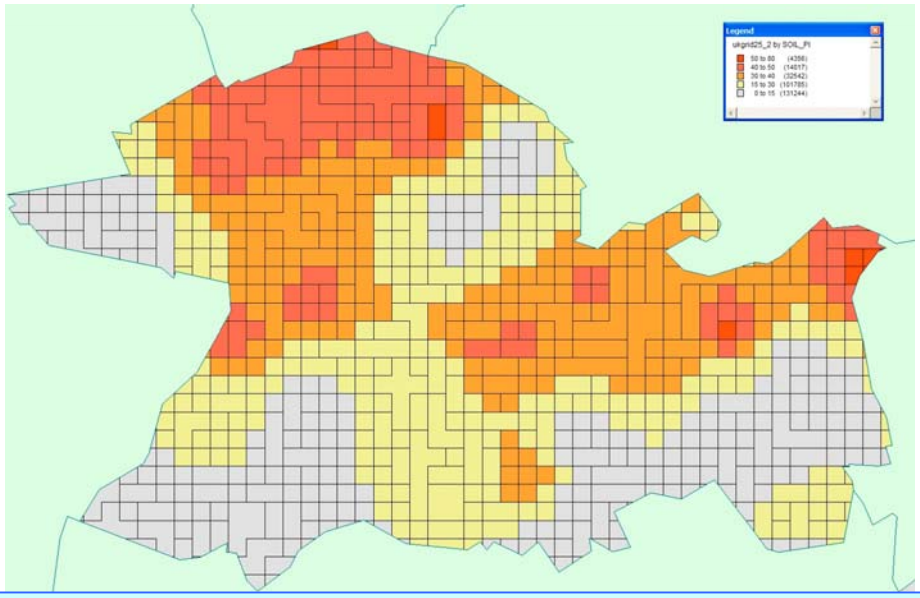
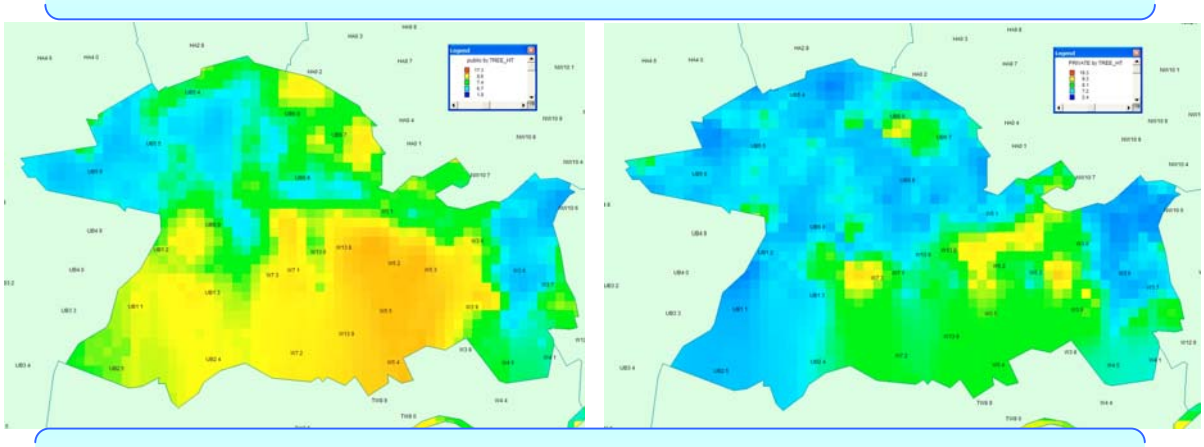
EALING – STUDY AREA – TREES & GEOLOGY

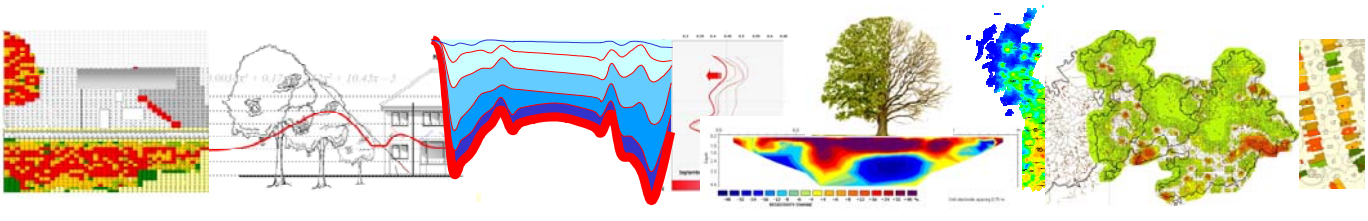
Ealing is situated just north of the Thames, and has alluvial soils to the south of the Borough and bordering the river Brent. This makes for a variable geological risk as can be seen from the postcode sector map.



The CRG geology map plots the PI on a 250m grid and has been built from actual investigations. The soil PI is higher to the north of the Borough, with low shrinkability soils interspersed. The index properties have been taken from a depth of around 2mtrs wherever possible to coincide with the depth of maximum root activity for mature, deciduous trees.



Distribution of trees by ownership and height. Left (public trees) and right (private). Grouping the trees by class of ownership reveals that, on average, they are taller to the south of the Borough than to the North, and Council trees are taller than those in private ownership.



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Drought Tolerant Plants

Megan K. Bartlett, Christine Scoffoni, Lawren Sack.
The determinants of leaf turgor loss point and prediction of drought tolerance of species and biomes: a global meta-analysis.
Ecology Letters, 2012; 15 (5): 393

A research team at UCLA have been investigating which plants and trees would be tolerant of the drought conditions resulting from Climate Change, and the underlying mechanism that provides protection. The authors explain …

"To keep their cells functional, plants depend on "turgor pressure" - pressure produced in cells by internal salty water pushing against and holding up the cell walls. When leaves open their pores, or stomata, to capture carbon dioxide for photosynthesis, they lose a considerable amount of this water to evaporation. This dehydrates the cells, inducing a loss of pressure."

"Drying soil may cause a plant's cells to reach turgor loss point, and the plant will be faced with the choice of either closing its stomata and risking starvation or photosynthesizing with wilted leaves and risking damaging its cell walls and metabolic proteins," Sack said. "To be more drought-tolerant, the plant needs to change its turgor loss point so that its cells will be able to keep their turgor even when soil is dry."

"The UCLA team has now demonstrated conclusively that it is the saltiness of the cell sap that explains drought tolerance across species. Saltier cell sap in each plant cell allows the plant to maintain turgor pressure during dry times and to continue photosynthesizing and growing as drought ensues."

"The pinpointing of cell saltiness as the main driver of drought tolerance cleared away major controversies, and it opens the way to predictions of which species could escape extinction from climate change." Sack said.

How we help plants (trees) "change their turgor loss point" is another matter. Our (CRG) initial proposals were to add salt to the Intervention Technique boreholes to trigger the production of Abscisic Acid, the stress hormone.

Perhaps we were on the right track, although the plant physiologists and arboriculturalists we consulted all agreed it would cause stress, and the tree may suffer as a result, which was good advice.

Climate Change will induce stress and naturally increase the salt concentration within the cell by virtue of water loss. Encouraging adaptation would be a positive step, although it is unlikely that the plant anatomy would respond for many generations.

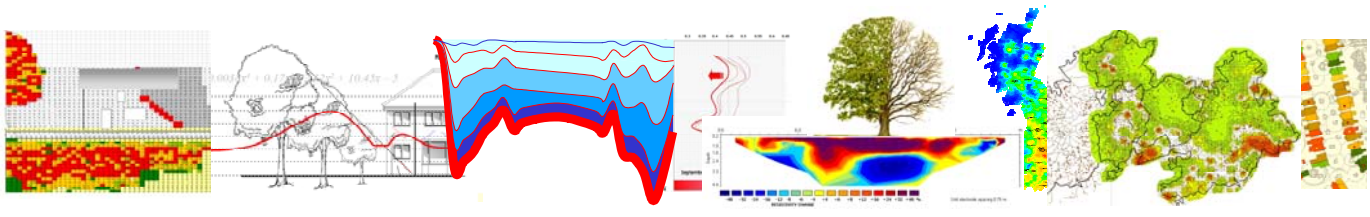
Global Warming

Daniel J. Rowlands, et al
Broad range of 2050 warming from an observationally constrained large climate model ensemble.
Nature Geoscience, 2012; 5 (4): 256

A project running almost 10,000 climate simulations on volunteers' home computers has found that a global warming of 3 degrees Celsius by 2050 is 'equally plausible' as a rise of 1.4 degrees.

The results suggest that the world is very likely to cross the '2 degrees barrier' at some point this century if emissions continue unabated, and that those planning for the impacts of climate change need to consider the possibility of warming of up to 3 degrees (above the 1961-1990 average) by 2050 even on a mid-range emission scenario. This is a faster rate of warming than most other models predict.

The research was made possible because volunteers donated time to run the simulations on their home computers through climateprediction.net as part of the BBC Climate Change Experiment.



Aston CPD Centre
BIRMINGHAM

presents a One-day Conference on Wednesday 20 June 2012
at Aston University

SUBSIDENCE
Topical Issues 2012

09.00 - 10.00	Registration and coffee
10.00 - 10.15	Opening by Chairman: **RICHARD ROLLIT,** Innovation
10.15 - 10.50	The Council as Tree Owner- or, seeing things from other side. **Paul Harris,** Chartered Engineer
10.50 - 11.25	*Rehydration: Case Studies* **Maciek Kawecki,** Director, Subsidence Management Limited
11.25 - 11.40	***Coffee***
11.40 - 12.15	*An Analysis of Clay Soil, Climate and Plant Interaction as this Relates to Claim Numbers 1975-2011* – **Mike Lawson,** OCA
12.15 - 12.45	Discussion
12.45 - 14.00	***Lunch***
14.00 - 14.15	*Changes to the TPO Legislation* **Margaret MacQueen,** OCA
14.15 - 15.50	*Recent Legal Developments and the Implication for the Subsidence Claim Industry.* **Rachel Bolt,** Freeth Cartwright **& Ian Brett-Pitt,** Innovation
15.50 – 16.05	***Tea***
16.05 - 16.30	*CRG Update. Rehydration using the Intervention Technique and EKO* **Richard Rollit,** Innovation
16.30 – 17.00	Discussion
17.00 - 17.30	Tea & Disperse

(Directed by Stephen Plante, The Clay Research Group)

For conference availability: enquiries@astoncpdcentre.co.uk **Telephone Enquiries:** 0121 204 3606
Fax: 0121 204 5079 **Website & Mailing Subscription:** http://www.astoncpdcentre.co.uk
Our conferences are intended to contribute towards the CPD requirements of the relevant professional institutions.
The views expressed at the conference are personal to the speakers and are not necessarily those of Aston CPD.
Conference Organiser: Dr M Sadeghzadeh 07788947658
Please note the programme is subject to change without prior notice

correspondence to: Aston CPD Centre, Aston House, 6 Greville Drive, Birmingham B15 2UU

Please reserve .....Place(s) at the course, (subject to terms & conditions) **Subsidence: Topical Issues – 20.6.12**

Delegate Name(s): ..... Company: .....

Address:.....

Post Code: ..... Email Address: ..... Tel: .....

Have you any dietary, access or other requirements? **YES/NO if YES** please state .....

Do you wish to be invoiced? (VAT exempt) **YES/NO** Purchase Order No: .....

Invoice address if different from above: .....

.....

Cost **£195** per delegate, VAT exempt, covering attendance, papers, lunch and refreshments during the day.
(Cheques should be made payable to **Aston CPD**)