

Geoscience solutions for the Thames Gateway

elcome to the **Second Issue** of the British Geological Survey's 'Foundations' Newsletter for the Thames Gateway Programme, which sets out to provide answers to your geotechnical problems.

Modelling Foundation Conditions in 3D

We have further developed our 3D modelling capabilities by linking the rock type model with physical properties such as soil moisture content and compression test data. A model of West Thurrock, a typical Thames Gateway area, split the ground conditions into six categories, varying from very compressible, corresponding to the presence of peat, to only slightly compressible, including engineered made ground. Chalk underlies the whole area. It weathers to a putty where it meets soil, but foundation conditions improve with depth. The 3D foundation model can tell you how deep approximately to go to reach unweathered chalk.

The foundation conditions model enables you to evaluate the ground conditions at proposed foundation levels. In West Thurrock, at 2m below the surface, nearly half the area's ground conditions are within the highly to very compressible category. At 5m below surface, only a small proportion is highly compressible. Such data can be used in a myriad of ways from predicting how difficult a project will be and how long it might take, to choosing where to build.



Foundation condition block model for West Thurrock shows how new modelling techniques can not only tell you about what rocks are beneath your feet but also their properties.



Distribution of SPT values in the Dartford Crossing area. Red – High, Green – intermediate and blue- low.

Urban Flooding

Surface water runoff has become a significant issue in urban areas where development has resulted in more hard paved surfaces,. Sustainable Urban Drainage Systems (SUDS), such as swales, balancing ponds and porous pavements, mimic natural drainage patterns. They can save money, reduce pollution and reduce flood risk. But project designers need to know early on if SUDS techniques will work for them. BGS can quickly and simply assess SUDS potential, using the 3D model of the rock type (e.g. sand, clay, peat), in combination with other data, including the topographic slope angle, the permeability of the nearsurface deposits, and the thickness of the unsaturated zone. Further information, such as possible past contamination, can also be added. This data is easily incorporated into the model for a more sophisticated site-specific interpretation, and is viewable in most GIS software packages.

London seminar 11th November 2004

The British Geological Survey launched its Thames Gateway programme at the Royal Society. This hugely successful event was the first opportunity for those working in the Thames Gateway region to view the data and resources available from BGS. Talks covered a range of topics including: BGS geoscience data holdings, aquifer vulnerability, flooding, sustainable urban drainage, 3D lithological modelling, predicting engineering properties, environmental and economic information for planning, and contaminated land.



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If you missed the launch and would like to find out more, a CD containing slides from all the talks can be provided free on request.

Visualisation Centre Launch and Open Days

Sir Keith O'Nions, Director General of the Research Councils, officially opened the new BGS Visualisation Centre on Friday 18th February 2005. The visualisation centre will enable a more interactive approach to modelling by allowing the user to become totally immersed in the model, and to see it in stereo. The initial launch will include a detailed look at the 3D Modelling work undertaken by the BGS over the past 12 months. This will be followed by the launch of the Centre to a wider audience in April and May 2005, with open days planned for individual groups.



3D block model of Thurrock displaying in detail the geology of the area. In this case, peat deposits (brown) are revealed beneath clay (yellow) sequences and overlying gravel (orange), man-made (grey) deposits and chalk bedrock in green.

Your Problems Solved

Many development projects within the Thames Gateway are in archaeologically rich areas. Often the focus of these deposits is within buried historic river channels or tributaries of the River Thames. If you're faced with this scenario you will need to know where the buried channels are. This is where detailed 3D modelling can help. We can model the river sediments and identify areas where hidden channels or tributaries lie. In every project the effect that your development will have on its environment has to be considered at an early stage. Questions such as: What will happen if current embankments are enlarged? What effect will piled foundations have on the water table? If your project crosses contaminated land how likely is it that you will contaminate the water table? At the British Geological Survey we can predict the answers to such questions, and suggest solutions, by combining 3D geological models with fluid flow and engineering property models. Taking such issues into account early on in development process should ultimately save you time and money.

New WebPages for the Thames Gateway:

The British Geological Survey has now posted WebPages focused on geological developments within the Thames Gateway. These can be found at www.bgs.ac.uk/science/thamesgateway.

If having read this newsletter and our new WebPages you would like to know more then please contact us directly and we will be happy to discuss topics of interest with you or to visit your office and give you a detailed presentation of our capabilities.



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Hydraulic conductivity block model of the Thurrock area, Red-high, orange -intermediate and green-low.