As part of an ambitious redevelopment of Howard Robertson’s original 1961 Shell Centre complex, adjacent to the London Eye on the South Bank, plans are in place to build a mixed use project comprising office, retail and residential space. Up to 790 homes are proposed as part of the scheme, including some affordable housing.

Apart from the iconic 1960s Shell Centre Tower, everything else on the site will be demolished to make way for eight new residential and office buildings, one of which will incorporate new offices and trading floors for Shell. If the application gets the go ahead, demolition could begin next autumn with construction scheduled for 2015 to 2019.

Sir George Iacobescu, chairman and chief executive of the Canary Wharf Group, has described their vision as “…a beautiful place to live and work in the cultural heart of the most exciting city in the world.” He adds: “Just as importantly, we look forward to working with the local authority and the community to ensure that local people get the best possible opportunities from this new development for many years to come”.

It is proposed to install a ground energy system comprising thermal piles to meet a proportion of the heating and cooling demands of the redevelopment. As part of the site investigation, a borehole heat exchanger (BHE) was constructed in the form of a mini-pile. A thermal response test (TRT) was then carried out to determine the thermal conductivity of the surrounding soil and the thermal resistance of the BHE. It was anticipated that when heated and cooled the mini-pile would expand and contract relative to the surrounding ground, and additional compressive stresses will be applied to it. Instrumentation was installed within the BHE to measure the axial strain within the pile, together with the internal and perimeter temperatures throughout the test. Data from the test is to be used for the final design of the thermal piles.

Data was collected by the instrumentation throughout the duration of the test which included seven days after the initial installation and before the TRT was carried out, followed by heating and cooling cycles over a 28 day period.

### Project Summary

<table>
<thead>
<tr>
<th>Name</th>
<th>Shell Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>May-September 2012</td>
</tr>
<tr>
<td>Client</td>
<td>Braeburn Estates GP Ltd</td>
</tr>
<tr>
<td>Contractor</td>
<td>Concept Site Investigations Ltd</td>
</tr>
<tr>
<td>Consultant</td>
<td>ARUP</td>
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</tbody>
</table>

### Monitoring

- **VW piezometer**: Measurement of pore water pressure in surrounding ground.
- **VW embedment strain gauges**: Measurement of strain within pile cage.
- **Thermocouples**: Monitoring temperature differentials within the pile during heating and cooling cycles.
- **GeoLogger 1000**: Multi-sensor data logger for monitoring and storing data from all sensors.
- **Support cage**: Due to height restraints, including working and installing 15 metres below ground in an underground car park, Geosense had to design a special modular cage into which the thermal loop and instrumentation were installed.
- **Fibre Optic Cables**: To measure strain & temperature.

### Products used

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Fibre Optic Cables

To measure strain & temperature.