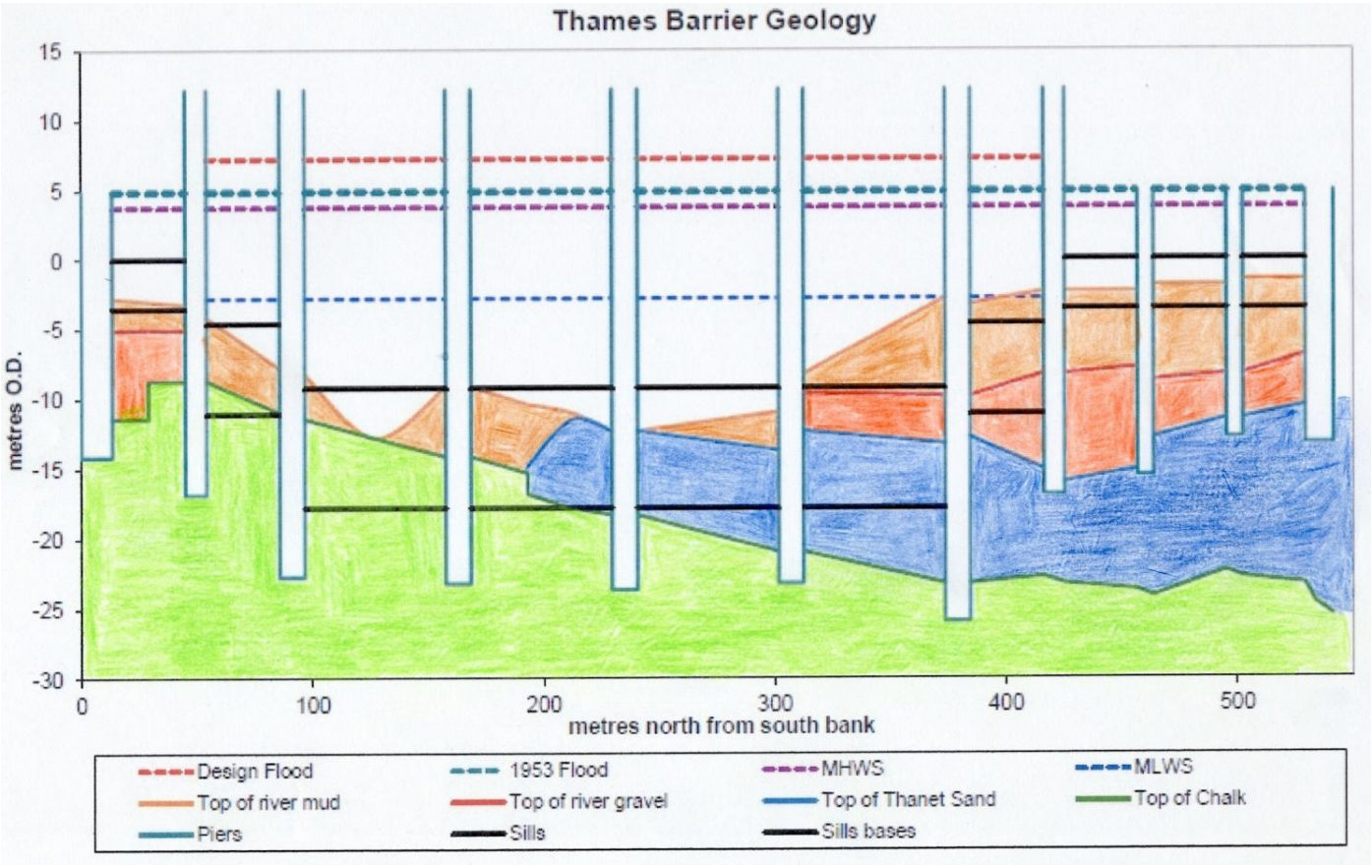
SGI 11 Thames Barrier

Royal Borough of Greenwich
Thames Barrier, Unity Way, Woolwich SE18 5NJ
Grid reference: TQ 415 793

Opened in 1984, and pictured on the front cover of the latest British Geological Survey Special Memoir for London (Ellison, 2004), the Thames Barrier is an impressive civil engineering achievement. Extending across the river at Woolwich Reach, the barrier is part of London‘s defences against the risk of flooding and comprises a series of giant movable gates which can be closed when an exceptional high tide is expected. The level of high tides in the Thames Estuary has been steadily rising and since the severe east coast flooding of 1953 it has been recognised that there was a need to improve London’s flood defences. The increasing flood risk is due to rising sea levels as a result of global warming combined with the fact that South-East England is slowly sinking leading to an increase in the tidal range. Tide records indicate an alarming 8 millimetre per year rise in the level of the Thames Estuary. Design and construction of the Thames Barrier has been well documented. Because the design of the piers, sills, gates and machinery could not tolerate any movement in the foundations the ground investigations had to be extremely thorough. Seventy three boreholes were sunk which revealed that the northern half of the site is underlain by Thanet Sand and the southern half by Upper Chalk. Fortunately the chalk bedrock was below that affected by periglacial activity (i.e. permafrost conditions) during the Ice Age which has turned the surface of the Chalk elsewhere into an unstable rubble by frost shattering. However, some difficulties were encountered such as minor faults with lateral and vertical displacements of up to 50 metres and five metres respectively. The Thames Barrier, in fact, sits astride the Greenwich Fault Zone, a major fracture in the deep bedrock of the region. The Greenwich Fault Zone, part of the Wimbledon-Woolwich Tectonic Axis passes across the northern limb of the Greenwich Anticline and continues north-east into Essex. This is thought to have been responsible for the Essex Earthquake of 1884 and so seismic studies were carried out as part of the investigations which concluded that there was insignificant risk of further tremors in the area.



Cross-section of Thames Barrier showing the position of the piers and underlying geology
(Paul Rainey, LGP)

Access

The Thames barrier has a visitor centre and a terrace café on the south bank of the river. Special arrangements can occasionally be made for groups to visit the barrier itself. The Thames Barrier is easily accessible by train to Charlton from where it is about a 20 minute walk to the east, or there are 161 or 472 from North Greenwich along Woolwich Road, stopping at Greenwich Trust School from where the Barrier is signed.

Text derived from GeoEssex/Essex Field Club with thanks.

Thames Barrier, October 2011 during the annual closure showing the barriers and cranes
Photo: Laurie Baker

References

Ellison, R.A. 2004. *Geology of London. Special Memoir for 1:50,000 Geological sheets 256 (North London), 257 (Romford), 270 (South London) & 271 (Dartford).* British Geological Survey p. 80.

Fookes, P. 2006. Thames Barrier 21st anniversary. *Geology Today* **22**:48-50.

Gilbert, S. and Horner R. 1984*. The Thames Barrier.* Thomas Telford Limited. Pp 82-85.

Greenchain Walk Geotrail: www.londongeopartnership.org.uk/geotrails.html

Thames Barrier website with information on access: www.gov.uk/guidance/the-thames-barrier.