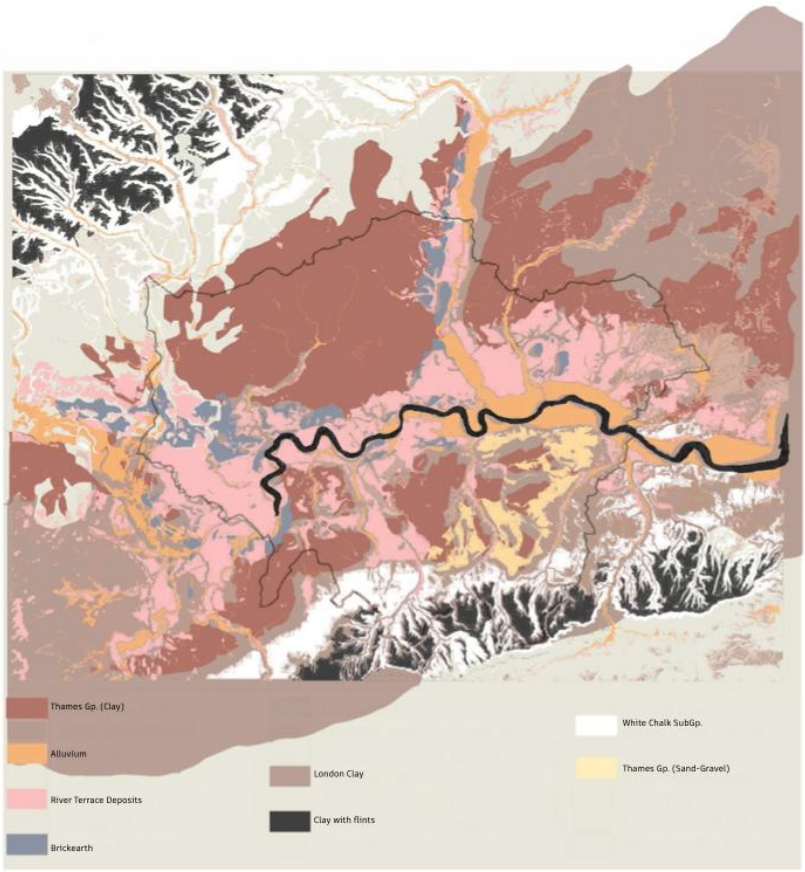



## Foundation properties of soil types

*Stiff fissured clays* like London Clay have a softened weathered surface. Below that they have a high bearing capacity and are low in compressibility, which is common amongst over consolidated clays. They are highly plastic clays and heavy structures settle very slowly in them. Stiff-fissured clays vary in volume according to their moisture content, the moisture levels alternate between wet and dry seasons. Because of this, foundations need to be constructed deep enough to where there is little to no movement through swelling and shrinkage of the clay. Furthermore, it is necessary to prevent accumulation of water at the bottom of excavations to prevent swelling and soil softening. Fissures in these soils cause a great disparity the clays shear strength. The fissured structure of these clays makes construction processes unpredictable and pose complications in keeping slopes, walls, unlined holes for deep pier, timbering or (sheet) piles stable during excavations.

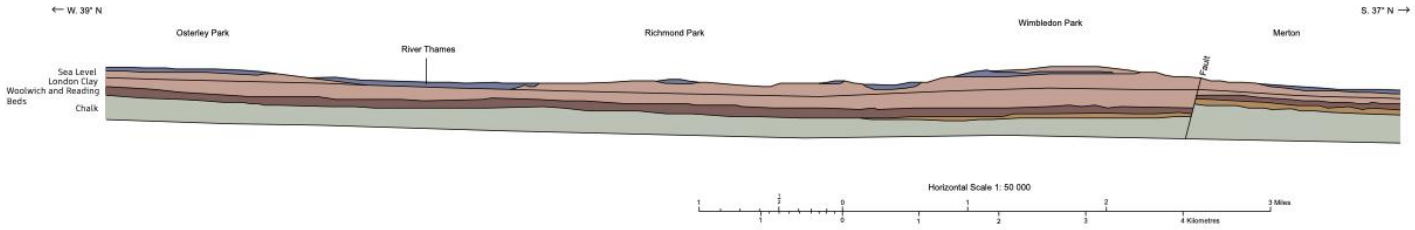
*Alluvial clays* are geologically recent materials formed by the deposition of silty and clayey material in river valleys, estuaries, and on ocean beds. They are „normally consolidated," that is, they have consolidated under their own weight and have not been subjected to impact, like stiff-fissured clays. Since they are ordinarily consolidated, their shear strength increases progressively with depth. Differing from very soft at ground surface to firm or stiff way below. Due to atmospheric drying and vegetation effects, alluvial clays form a stiff surface crust. In Great Britain, the crusts thickness lies at around 1 – 1.2m. Some regions display a number of desiccated layers, which are separated by soft, consolidated clayey strata.
Alluvial clays accommodate high bearing pressures. There is little to no settlement for foundations. Narrow foundation formulated close to the surface and do not transmit stress to the soft and highly compressible deposits below are suitable. When constructing wide or deep foundations in alluvial soils it is vital to implement a very low bearing pressure. Buoyancy rafts and piling, as long as the piles are driven through the soft layers into a rigid bearing level, (such as the chalk below the clay layer in London) are also adequate. Marine clays, categorized as alluvial clays, are very irritable to disruption. Even minor disturbances, such as soil sampling can cause a significant loss in the clays shear strength. Excavations under the dried-out crust require support through timbering or sheet piling; open excavations require to be laid or cut back to shallow slopes, according to their angle of repose to avoid slips and landslides. Excavations in soft clays over a certain depth-width ratio are subject to failure by heaving or considerable inward yielding of the side supports.
Same as with stiff-fissured clays, precautions must be taken towards foundations being affected by seasonal swelling and shrinkage and the drying actions of vegetation roots. Alluvial clays can frequently be found merged with layers of peat, sand, and silt.

*Silts* are found as glacial, alluvial or windblown deposits. An example is the "brickearth" located around the south-east of England. Glacial and alluvial silts are commonly water bearing and have a soft makeup. Silts are highly prone to slumping and "boiling," which is why they are considered one of the most troublesome soils in excavation work. They are also retentive to water and cannot be dewatered by conventional ground-water lowering systems. Silts are also liable to frost heave.

*Brickearths* are generally firm to stiff and even though they are categorized as silts, they do not generally present difficulties during foundation work.

Paraphrased from: Tomlinson, M. J. Foundation Design And Construction, 2001

**Section showing the general relations of the rocks in the London area**




## From pit to wall


1 Claypit


1 Clay


2 Piles of clay stored


4 Extrusion

1 Milling/raw material extraction — 2 Stockpiling — 3 Clay Preparation - Crushing - Mixing — 4 Forming - Extrusion - Cutting


4 Cutting


5 Drying


6 Firing in Clamp kilns


7 Fired brick


10 Masonry/Assembly

4 Forming - Extrusion - Cutting — 5 Drying - 24-48 hours — 6 Firing 5-7 days — 7 Cooling — 8 Sorting — 9 Distribution — 10 Use

Images - David Grandorge (http://www.wwmarchitects.co.uk/projects/cremer)