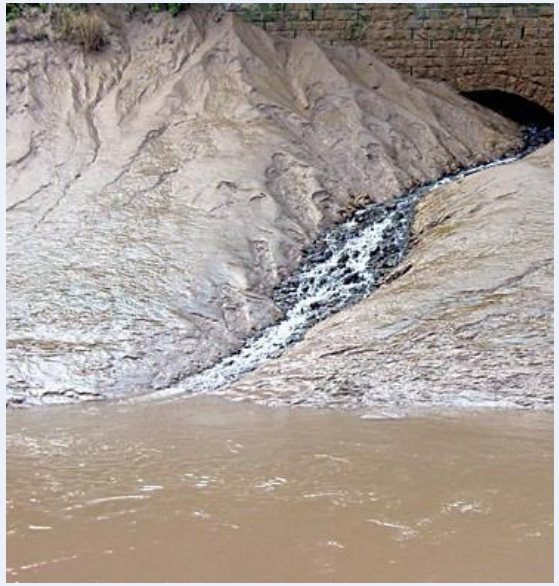
Grain size

refers to the diameter of individual grains of sediment

Clay

"Clay minerals are composed of aluminium and silicon ions bonded into tiny, thin plates by interconnecting oxygen and hydroxide ions." Clay - Wikipedia

Silt



Sand

Gravel

Gravel commonly occurs as river deposits, on flood plains, and as glacial deposits.

As rock erodes it gets broken down into smaller and smaller pieces.

Boulders are the largest – greater than 256mm in diameter. Then come cobbles, from 64mm-256mm.

Gravel can be classed as very coarse (32-64mm), coarse (16-32mm), medium (8-16mm), fine (4-8mm), very fine (2-4mm).

Sand grains can be very coarse (1-2mm), coarse (0.5-1mm), medium (0.25-0.5mm), fine (0.125-0.25), very fine (0.0625-0.125mm).

Silt is too fine to be imagined in millimetres and is classified as 3.9-62.5 micrometres.

Clay grains measure 0.98-3.9 micrometres, but clay is also different from the other grains because it is made up of clay minerals which give it properties such as plasticity. As a result, clay is ideal for making pottery but in our gardens it creates poor drainage.

London Clay

Most of the London Basin has thick clay at the surface, up to 150 metres thick in the east but thinner further west. In our area it's up to about 50m thick. Laid down in marine conditions, the London Clay is good for tunnelling through. It is impermeable, so water doesn't pass though, but if it dries out it shrinks and becomes brittle, which can affect shallow building foundations.

Cliffs at Reculver on the Thames estuary near Herne Bay, Kent

The coast is retreating here as the London Clay gets washed away by the sea.

photo by David Rayner / *Cliffs below Reculver Country Park* / geograph.org.uk - 6927.jpg

London Clay. Yeading Brook, Ickenham. Photo by J Gill (HHGS)

"At depth, where fresh, the London Clay is grey, blue-grey or grey-brown in colour.

Near the surface the uppermost metre or few metres typically weathers to clay with a distinctive brown colour produced by the oxidation of pyrite.

The London Clay may contain thin beds of shells, and fine sand partings or pockets of sand, which commonly increase towards the base and towards the top."

Londons-Foundations-2012_small.pdf (londongeopartnership.org.uk)

Local gravels

Photos by Allan Wheeler (HHGS)

Gravels found locally have been laid down at different times and mainly in cold climate environments of the last 3 million years. Huge gravel pits, exploited for the construction industry, are found in the Colne and Thames valleys. These gravels are composed largely of flint derived from eroded chalk and broken down by ice and meltwater.

Sand and gravel, probably Winter Hill gravel, Harefield.

Gerrards Cross Gravel at Watts Common, Harefield.

Sipson Gravel Pits - Langley Silt brickearth

Sipson Gravel Pits - Taplow gravel

Photos by Allan Wheeler (HHGS)

Lambeth Group layers

These are sedimentary layers found in the London and Hampshire Basins below the London Clay. In north-west London they rest on the Chalk, as can be seen at Harefield Pit SSSI.

Lambeth Group sandy clay, Ruislip (Eocene)

The Lambeth Group is a highly variable mix of clays, sands and some gravels which record the changing environment when sea levels fell, about 55 million years ago. Previously, this area had been covered by a warm, shallow sea, but the Lambeth Group gravels, sands and clays track the emergence of land from coastal floodplain and river estuary to an inshore environment.

This record is important evidence for the local environment at a time when temperatures were much hotter than today. Harrow and Hillingdon have some of the best surface exposures (along with south-east London).

Engineering projects, especially tunnelling, need to pay careful attention to the Lambeth Group layers. Cementation of the gravel has occurred at some locations and this is why we are looking into the drainage issue in Ruislip Woods and Pinn Meadows.

Harefield SSSI. Lambeth Group sands (Eocene)