

KEY TERMS

Term	Definition
Subsoil	For the purposes of foundation design, the strata below topsoil with an adequate bearing capacity that can support applied loads.
Foundation	Structural elements that transfer building loads to the layers of subsoil or rock that have sufficient bearing capacity and settlement characteristics to support them.
Shallow Foundation	Used where loads imposed by a structure are low in relation to the bearing capacity of the natural subsoil.
Deep Foundations	An engineered solution to providing a foundation where imposed loads need to be transferred to deeper layers and higher bearing capacity.
Geology	The study of the materials from which the Earth is made, including their structures and the processes acting upon them.
Hydrology	The science concerned with the properties, distribution and circulation of water on and below ground.
Basement	Part of a building that is partially or completely below ground level. In dwellings, a basement is a habitable room as distinct from a cellar, which is designed only for storage or to house heating plant etc.
Retaining wall	Vertical structures designed to retain or hold back material on one side, preventing it from collapsing.

SITE INVESTIGATION

Investigation of subsoil properties and ground conditions is an essential stage of every construction project to determine:

- whether the site is suitable
- where the best place to build on the site is
- the type and depth of foundations required
- the extent of any necessary ground improvements.

Larger construction projects will require an EIA (Environmental Impact Assessment) which will include an assessment of the impact on ground conditions involving both desk-based research and a field survey.

DESK-BASED SITE INVESTIGATION

Studies based on geological maps, mining records and other historical and environmental sources to establish information such as:

- flood risks, water table, natural springs or water courses
- soil types and risks of landslides or subsidence
- historic use, buried structures, former mine workings, possible ground contamination
- proximity to any proposed buildings or excavations
- location of existing underground services.

The desk-based research will inform the requirements for further investigation on site.

Planning policies intended to prevent unacceptable risks from pollution and land instability, and limit the effects of pollution on health, the natural environment or general amenity, should be identified and detailed proposals for securing a safe development put forward at the planning stage.

FIELD STUDY / SITE INVESTIGATION

A site survey will establish physical features, levels and dimensions, including details of surrounding infrastructures.

The site survey needs to include ground investigations to help determine:

- water table level and water flows
- nature of underground faults or voids
- subsoil layer thicknesses and depths
- properties, including bearing capacity, of subsoil.

Various survey methods can also be used to verify research findings and investigate ground conditions, including:

- Excavation of trial pits to investigate shallow ground conditions and establish soil types and depths.
- Drilling of boreholes to investigate deeper geological formations, obtain rock samples and check for voids, such as old mine workings.
- Sampling of soils
 - Undisturbed samples. Typical/actual soil conditions used to assess structural properties.
 - Disturbed samples. Where the structure of the soil has been compacted or otherwise changed. Used to assess particle size, water content etc.

Soil testing can also be carried out on site, including:

- Standard penetration test to establish resistance to penetration by driving a sampler into the soil using a standard weight.
- Vane test to estimate shear strength of soft soils such as saturated clays.
- Plate bearing test to measure ground bearing capacity.

