**TECHNICAL MEMORANDUM 017**

# BUILDING FOUNDATIONS

Trees local to any proposed new building can create issues with your proposed building.

**Your designers should always in the first instance and <u>before any building work commences</u>:**

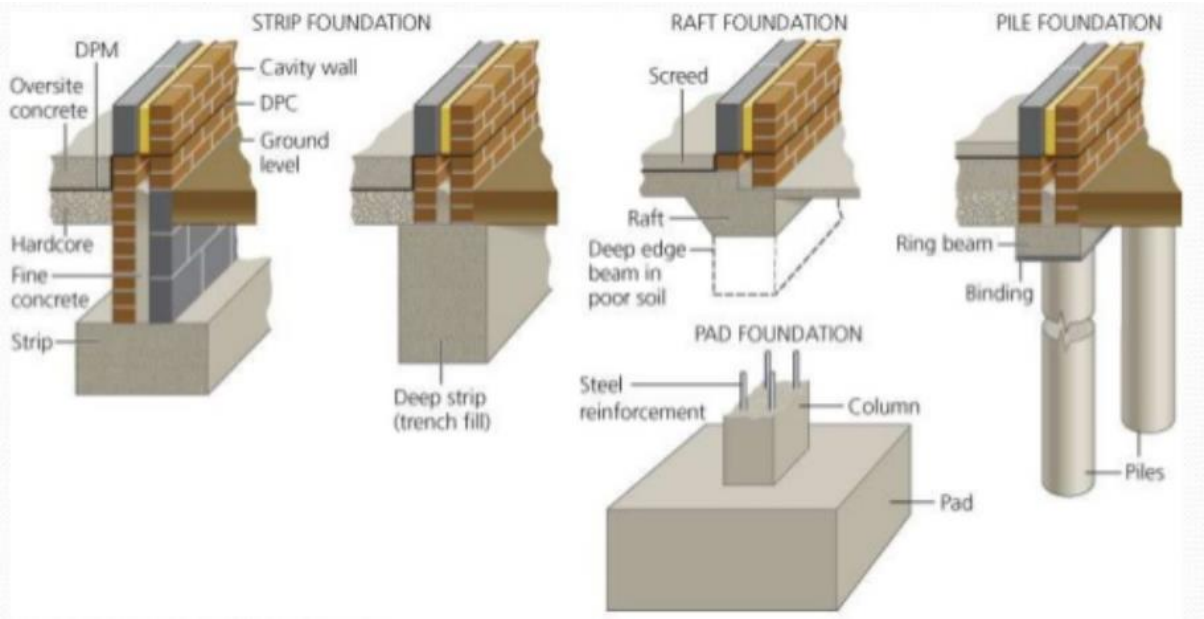
1. Produce and supply you with structural plans which identify any local trees

2. Produce a foundation design suitable for the soil condition and which takes into account any tree root activity.

3. Produce a foundation design that addresses any localised drains running through, under or local to your proposed building foundations.

   The following foundation types are commonly adopted :

   a) Traditional Strip foundation
   b) Deep Strip - Trench fill foundation
   c) Raft foundation
   d) Piled foundations
   e) Pad foundation




4. Design plans that show all relevant floor levels and site boundaries, including any existing below ground drains.

**Please be aware that if insufficiently designed plans have been submitted to our building control offices, and upon carrying out our first site inspections, trees, below ground drainage, or other sub-structural issues are identified, our surveyors will most likely NOT APPROVE foundation excavations which appear to us as not having taken into account, existing tree root activity, local below ground drains or other existing sub-structures e.g cellars, or wells etc**

**Approved Document Part A STRUCTURE** provides ample guidance relating to the structural aspects of your proposals.

Trees and other vegetation can affect moisture content considerably, leading to soil shrinkage or swelling (commonly known as heave) where clay subsoils are present.

This can cause cracking and movement of foundations and damage to whole structures.

And it is not just trees in close proximity to your site that pose danger. Trees up to 30m away have been known to draw moisture from the soil at a proposed building site.

The worst trees to be aware of are:

- oak (all varieties)
- willow (all varieties)
- hawthorn
- elm
- cypress (Leyland, Monterey, Lawson's)
- poplar (all varieties)

But all trees need to be considered.

Different trees have different water demands, so it is important to also consider and identify trees on your site and adjacent sites.

Please also be aware that your neighbours may be reluctant to trim or to pollard their trees. Their trees may continue to grow and mature quickly over the forthcoming years, and so may eventually have an effect upon your building's foundation.

Once you have identified your trees, you may wish to use the **NHBC Chapter 4.2 Building near Trees** Tables to give you an idea how deep your foundation trenches will need to be. It is advisable that an appropriately qualified designer produces foundation designs.

The depth of foundation is determined by the:

- plasticity index of soil
- water demand of the tree
- mature height of the tree
- distance of relevant trees to nearest part of foundations and distances elsewhere if stepping foundations
- allowance for climatic conditions

Because the **NHBC Chapter 4.2 Building near Trees** calculator allows you to select the actual plasticity index of the soil (if known from testing), it gives more accurate results for foundation depths, which can save you having to dig deeper than actually necessary.

The **NHBC Chapter 4.2 Building near Trees** covers the vast majority of trees found in the UK.

If a tree is not listed you should consult a structural engineer and an arborist for advice.

## Site assessment

A desk study and initial walk over of your site and surrounding area should be carried out by a suitable person to identify any potential hazards and problems at an early stage.

Items to be taken into account should include;

- Geology of the area including any protection measures required for Radon ground gas.
- Landfill and tipping including any protection measures required for methane and carbon monoxide ground gases and foundation design requirements.
- Surface and ground water including flooding.
- Soils and previous industrial, commercial or agricultural uses including any protection measures required for ground contaminates.
- Mining and quarrying including any special foundation design requirements.

Further guidance on site preparation and the resistance to contaminants and moisture is provided in Approved Document Part C. Typical construction details in Part A of this guidance contains details on how to achieve basic and full radon protection in sub structures.

Sources of information include: Local Authority (building control, planning departments, environmental health departments), Environment Agency, Coal Authority, Utility Companies, Health Protection Agency, British Geological Survey, Ordinance Survey Maps, etc. Where hazards are suspected, a detailed site investigation should be carried out by a specialist.