GUIDANCE NOTES

Produced by

Tendring District Council
Building Control Service

Foundations for Domestic Extensions

FOUNDATIONS FOR DOMESTIC EXTENSIONS

This guidance is for the benefit of householders intending to have a domestic extension built to their house, or a detached outbuilding in their garden.

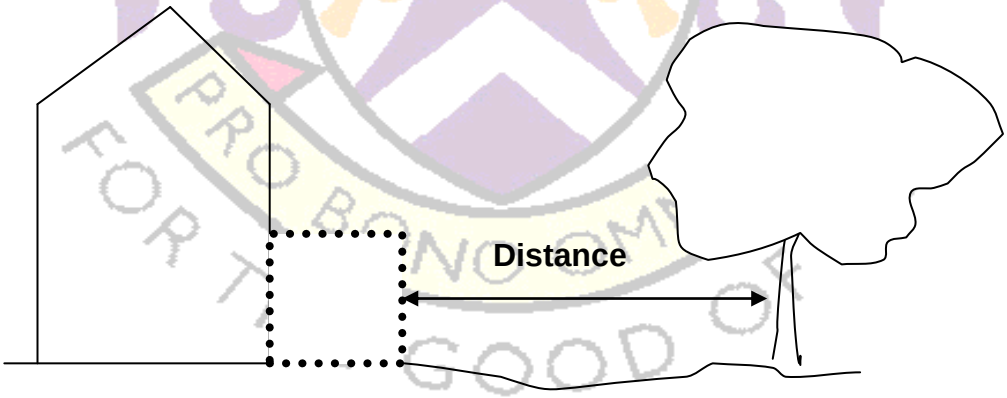
Throughout the Tendring area there is a London clay stratum with varying thicknesses of overlying deposits, which include silt, alluvium, peat, sand, gravel and ballast. New foundations should be placed on natural soil and not on backfill. In London clay, moisture movements and the possibility of slip circles in high ground, must be taken into account in the design of foundations.

Where the natural soil is sandy gravel, foundations may be constructed less than 1.0m deep by agreement with the local Building Control Surveyor.

London clay is highly shrinkable and this can cause houses to crack and have differential movement if the foundations are not deep enough. This clay expands and contracts with the amount of moisture available. It is important then to take foundations to a depth that is not affected by changes in available moisture.

If there are no trees within 32m, foundations in clay are normally a minimum 1.0m deep. The closer a tree to the building the more that the deepest roots affect the moisture in the clay supporting the building.

In the past, some houses were built with inadequate foundations and have had to have expensive underpinning done some years later.



Types of Tree

Some trees need more moisture than others.
The following examples are taken from the guidance issued by "Zurich" and "NHBC". The Tables below show 3 groups of water demand and illustrate the required foundation depths for the distance a tree is away from a proposed building in high shrinkage soils.

- High water demand trees,

Type for distance	**1.0m**	**11.0m**	**33.0m**
Eucalyptus	3.39m	2.28m	
Oak	3.40m	2.40m	
Lombardy Poplar	3.42m	2.65m	1.04m
Weeping Willow	3.38m	2.13m	
Lawson Cypress	3.27m	1.00m	

- Moderate water demand trees

Type for distance	**1.0m**	**5.0m**	**19.0m**
Plane	2.33m	2.04m	1.04m
Japanese Cherry	2.20m	1.47m	
Wellingtonia	2.27m	1.73m	
Yew	2.07m	1.0m	

- Low water demand trees.

Type for distance	**1.0m**	**4.0m**	**9.0m**
Beech	1.72m	1.48m	1.08m
Holly	1.67m	1.27m	
Magnolia	1.62m	1.00m	

Please discuss actual foundation depths needed for distance away of the trees near your property with the local Building Control Surveyor.

Removing trees does **NOT** solve the problem, as heave may occur. If a tree has not grown to its full mature height, the tree roots will not have gone so deep that the above distances are needed for a building's foundations. It may also be illegal to remove a tree under separate Planning Legislation.

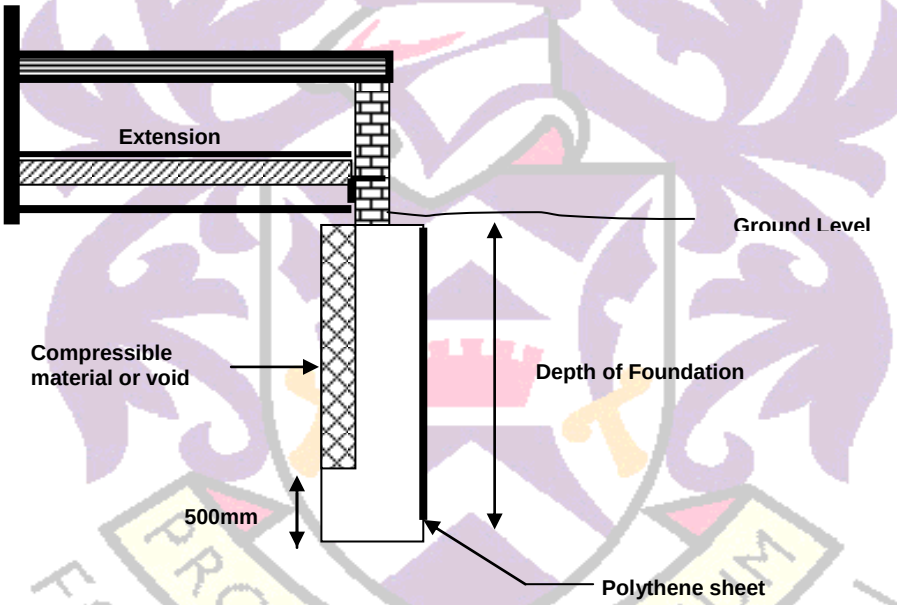
Types of Foundation

For extensions to houses, it is difficult to get suitable digging machines close enough and so foundations are often dug by hand. Deep foundations can be particularly difficult and expensive to excavate.

There are 4 main ways of providing a suitable deep domestic foundation:-

Trench Foundations with concrete fill

Where the foundation is deeper than 1.5m, 50mm of compressible material or void former should be provided to inside face of foundation. "Zurich" recommends having a polythene sheet to all faces of concrete.



Please note; With deep foundations there are important safety issues. See below for more information.

Ground Beam and pier foundations

Please contact your local Building Control Surveyor for more detailed guidance on how this can be constructed.

For single storey extensions, this foundation type can be useful as it reduces the amount of excavation where very deep foundations are needed. It does, however, require knowledge of reinforced concrete and the submission of design calculations, and so may be beyond the scope of homeowners and some smaller builders.

Piled Foundations,

This type of foundation usually involves a specialist mini-pile contractor inserting 250mm diameter piles to the appropriate depths at about 1.0m centres along where the proposed walls are to be constructed. Typically this mini-pile contractor will also cast the reinforced concrete ground beams and suspended concrete slab. Again, this will be subject to the submission of design calculations.

An ordinary builder can then start and build the extension on top of the completed foundations.

This method has the advantage of being very fast and, as there are no deep foundations, much safer.

Raft Foundations.

For detached buildings, this can be a very useful method of avoiding deep foundations.

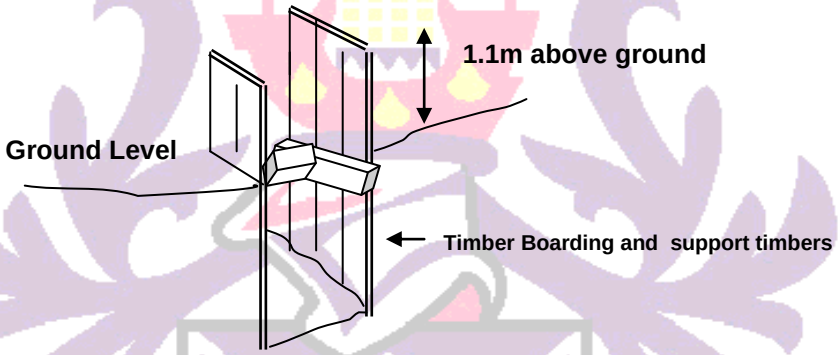
Raft Foundations are generally not recommended for extensions. For example, when the edge of the raft closest to a tree settles, a large crack may open up in the walls and roof joints at the edge of the raft next to the existing building. This allows rain to penetrate the building.

Suitable design calculations may need to be submitted where raft foundations are to be used.

Safe Excavations

For foundations more than 900mm deep a person could be completely buried if the sides of the excavation are not supported and collapsed on top of them.

For foundations more than 1.2m continuous support should be provided to the sides of the trench, excavated materials should be stored well away from the edge of the trench, and a suitable access ladder should be provided and tied into position. Suitable guarding should also be provided to the sides of foundations to prevent anyone accidentally falling into the excavation.



You are reminded to comply with all statutory provisions, which may affect the work under Health and Safety legislation and, in particular, the Construction (Design and Management) Regulations 1994.

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Suspended Floors for deep foundations

When a trench foundation with concrete fill method is used, vegetation and trees will no longer be able to remove moisture from clay under the extension. The clay may then expand in volume. This is called heave.

For this reason either a suspended timber or reinforced concrete floor should be used, if the foundation needs to be more than 1.5m deep because of the location and height of trees. It is advisable to leave space for heave to occur in the void below the floor in addition to that needed ordinarily.

For deep strip foundations typically the void under a timber floor joist would be between 200 and 300mm deep depending on how much heave is anticipated.

Further Information

Section 2E of Approved Document A (2004 edition) to the Building Regulations provides further information regarding strip foundations of plain concrete, including design provisions and minimum widths. Approved Document H (2002 edition) provides further information on depth of foundations where in close proximity to drains, including the protection of the drain from settlement and extending foundations locally (see clauses 2.23 to 2.26 in Part H1 and clauses 1.7 to 1.13 in Part H4).

This guidance is limited and may not necessarily cover all requirements under Building Regulations. Tendring District Council its staff, officers and members accept no responsibility for the accuracy of the information contained in this guidance leaflet.

For More Information please call
Tendring Building Control
01255 686131

or email us at BCInspections@tendringdc.gov.uk

or alternatively call into our offices in Thorpe Road Weeley, CO16 9AJ.

Other guidance leaflets can be downloaded using the following link:

Click here for further guides

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