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Substructure and ground bearing floors 5.1

4 FOUNDATIONS

5 SUBSTRUCTURE, GROUND FLOORS, DRAINAGE AND BASEMENTS

5.1 Substructure and ground bearing floors

5.1.1 Compliance

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5.1.17 Ground floor slab and concrete

5.1.18 Laying the ground-bearing floor slab

5.1.12 Walls below the DPC Also see: Chapters 6.1 6.2

**Substructure and walls below the DPC shall be suitably constructed. Issues to be taken into account include:**

a) construction of walls acting as temporary retaining walls

b) concrete cavity fill.

Construction of walls acting as temporary retaining walls

Backfill should be placed in layers of equal thickness to both sides of the substructure walls, so that compaction on one side is not more than one layer ahead of the other. Where backfill is placed and compacted on one side of the foundation trench before the other side is backfilled, the wall will be acting as a temporary retaining wall.

In such cases, the wall should either be designed by an engineer in accordance with Technical Requirement R5 or the thickness (T) should be as indicated in Table 2.

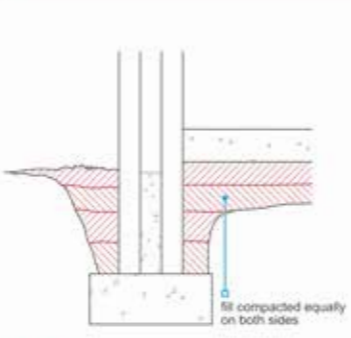
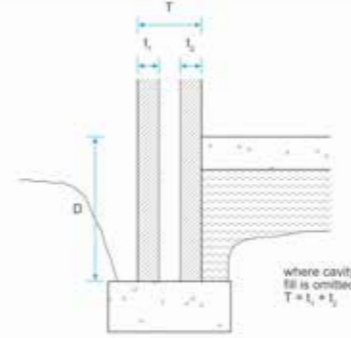
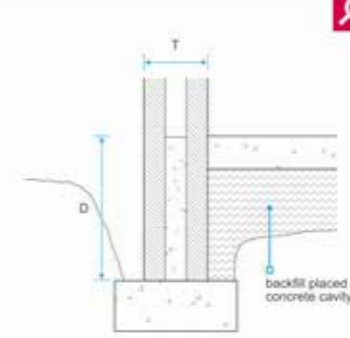




Table 2: Acceptable D:T of temporary retaining walls

Depth (D) of filled trench	Minimum thickness (T) of wall leaf supporting fill
Up to 1100mm	200mm
1100-1400mm	300mm
1400-1700mm	400mm
1700-2000mm	500mm

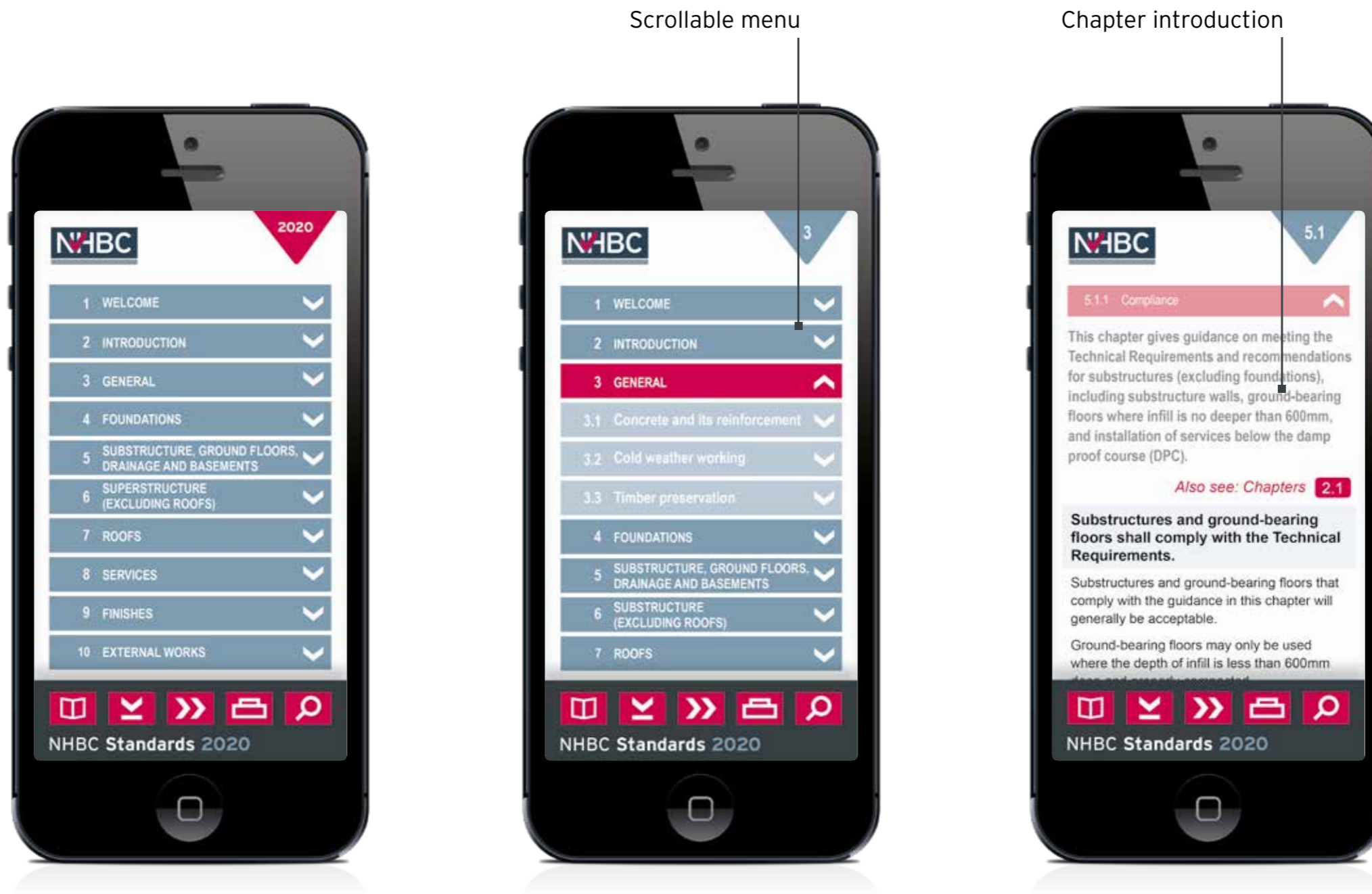
This guidance is only applicable to the temporary condition and where problems such as hydrostatic pressure are not present.

Concrete cavity fill

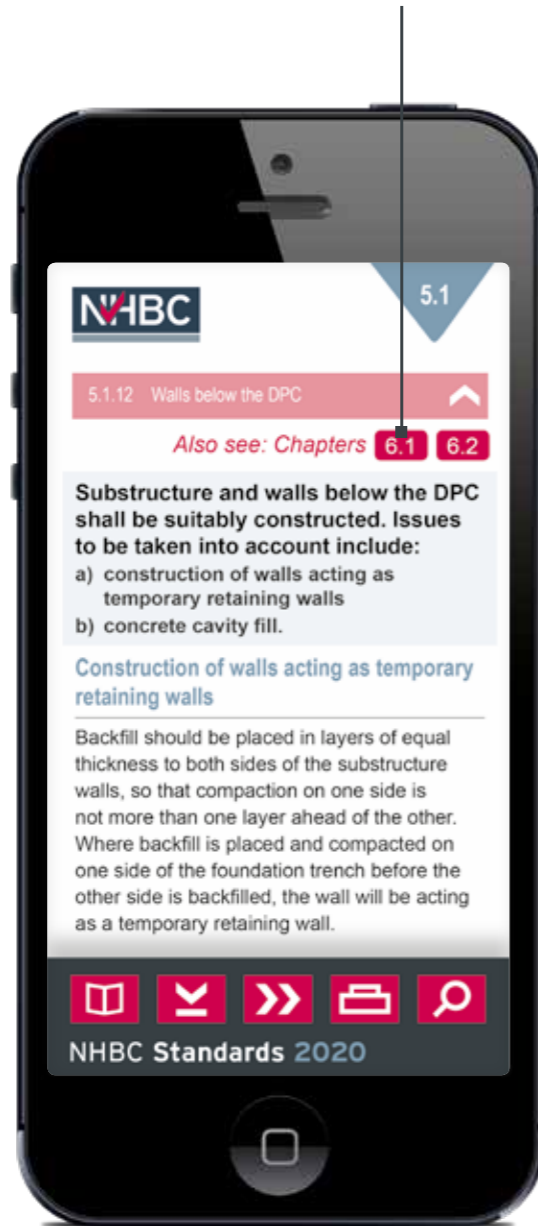
A minimum 225mm clear cavity below the DPC should be maintained. When specialised foundations are used, including those for timber framed buildings, the minimum clear cavity depth may be reduced to 150mm below the DPC, provided that weep holes and other necessary measures are taken to ensure free drainage.

NHBC Standards 2019

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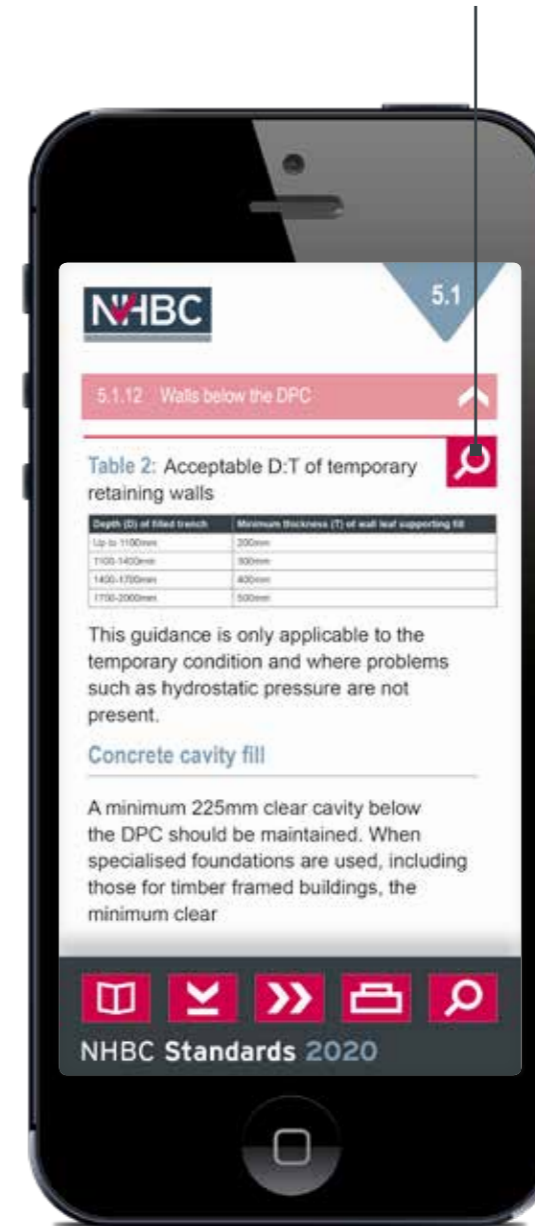
Navigation button to direct to suggested chapters



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Building near trees **4.2**

3 GENERAL

4 FOUNDATIONS

4.1 Land quality – managing ground conditions

4.2 Building near trees

4.2.1 Compliance

4.2.2 Purpose of information

4.2.3 Building near trees

4.2.4 The effects of loads on shrinkable soils

4.2.5 Foundations in all soil types

4.2.6 Excavation of foundations

4.2.7 Foundations in shrinkable soils

4.2.8 Design and construction of foundations in shrinkable soils

4.2.9 Foundation depths for specific conditions in shrinkable soils

4.2.10 Tree preservation

4.2.11 New drainage

4.2.12 Trencher depth tables

4.2.13 Foundation depth tables

4.2.14 Examples

4.2.15 Further information

4.3 Strip and trench fill foundations

4.4 Pile, pier, pier and beam foundations

4.5 Vibratory ground improvement techniques

5 SUBSTRUCTURE, GROUND FLOORS, DRAINAGE AND BASEMENTS

### 4.2.9 Foundation depths for specific conditions in shrinkable soils

**Foundations in shrinkable soils shall be designed to transmit loads to the ground safely and without excessive movement. Items to be taken into account include:**

- strip and trench fill foundations in non-shrinkable soils overlying shrinkable soil.
- measurement of foundation depths
- granular infill beneath raft foundations in shrinkable soils
- steps in foundations.

**Strip and trench fill foundations in non-shrinkable soils overlying shrinkable soil**

Non shrinkable soils such as sands and gravels may overlie shrinkable soil. Foundations may be constructed on overlying non-shrinkable soil if all the following are satisfied:

- Conditions of Chapter 4.3 'Strip and trench fill foundations' are met.
- Consistent soil conditions exist across each plot and this is confirmed by the site investigation.
- Depth of the non-shrinkable soil is greater than  $\frac{1}{4}$  foundation depth X, where X is the foundation depth determined using charts in Clause 4.2.12, tables in Clause 4.2.13 or the Foundation Depth Calculator App, assuming all the soil is shrinkable.
- The thickness T of non-shrinkable soil below the foundation is equal to, or more than, the width of the foundation B.
- Proposals are submitted to, and approved by, NHBC prior to work commencing on site.



Where any of the above are not met foundation depths should be determined as for shrinkable soil.

**Measurement of foundation depths**

Where ground levels are to remain unaltered, foundation depths should be measured from original ground level.

Measurement of foundation depths where ground levels are reduced or increased, either in the recent past or during construction, should be as shown in figures 1, 2 and 3.



Use the lower of:  
a) foundation depth based on appropriate tree height (see Table 3a)  
b) foundation depth based on mature height of tree.

Figure 2: Levels from which foundation depths are measured where trees or hedgerows

Figure 3: Levels from which foundation depths are measured where trees or hedgerows

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