Provision of information

It is essential that the following information is available on site:

- Site investigation report & vegetation survey (including soil volume change potential, tree species (existing or removed), original and final ground levels etc.)
- Full set of current drawings (including site layout, location of services, design of drainage system, vegetation planting schedule, position of existing drain and service trenches, the position of previous below ground structures on re-development sites etc.)
- Foundation details (including dimensions, type and depth of foundations, ducts & services passing through the foundations, manufacturer's information etc.)
- Technical method statements, including critical sequences of construction

If not available, request the information is provided.

Does the information available on site match the information contained within the Technical Services summary sheet? Yes / No

Ground conditions

Are shrinkable soils present? Yes / No

What is the worst case volume change potential of the soil? Low | Medium | High

If unsure, check with NHBC surveyor / engineer for clarification

Identification of trees

Is/was there vegetation on and/or adjacent to the site that may affect the proposed foundations? (check getmapping.com) Yes / No

Are the proposed foundations within the zone of influence of trees, is the foundation depth greater than 1.5m based on the appropriate tree height, or are there any signs of root activity at foundation level? Yes / No

If yes, heave precautions will need to be considered (if unsure, check with NHBC surveyor / engineer for clarification)

Are heave precautions and a suspended ground floor required? Yes / No

Note: Suspended ground floors should be used in all situations where heave can occur within the area bounded by the foundations.

Please specify the type(s) of foundation required on site including plot numbers

<table>
<thead>
<tr>
<th>Type</th>
<th>Plots</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strip foundations</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Trench fill foundations</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Raft foundations</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Pier and beam foundations</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Pile foundations</td>
<td>Yes / No</td>
</tr>
</tbody>
</table>

Note: Strip and trench fill foundations greater than 2.5m deep, raft foundations, pier and beam foundations, pile and beam foundations, and foundations not covered in the above to be Engineer designed.

When heave precautions are required on foundations to be used

Trench fill foundations

Check that the proposed foundation depths and heave precautions are adequate (see NHBC Foundation Depth Calculator app).

Strip and trench fill foundations greater than 2.5m deep will only be acceptable where they are designed by an engineer.

It is essential that compressible material is provided to the entire area shown, and the foundation excavation has a vertical face.

It is essential that where the excavation is battered or if there is over break or concrete over spill an engineer is consulted.

The minimum compressible materials and voids should be as per those noted in the general requirements table.
To use alternative means of catering for the movement when sufficient falls cannot be provided, for example by deepening the excavation and laying pipework on a granular level formation.

With gradients which may need to be greater than those in Chapter 5.3 Drainage below ground, as these do not account for possible ground movement.

To protect against the effects of heave, drainage should be designed:
- To take account of potential ground movement as shown in the table below, including where pipes and services pass through substructure walls or foundations.
- With gradients which may need to be greater than those in Chapter 5.3 ‘Drainage below ground’, as these do not account for possible ground movement.
- To use alternative means of catering for the movement when sufficient falls cannot be provided, for example by deepening the excavation and laying pipework on a granular bedding of suitable thickness to reduce the extent of potential movement.

*For guidance on drainage below ground please see NHBC Standards Chapter 5.3 ‘Drainage below ground’.

### Minimum void dimensions (mm)

<table>
<thead>
<tr>
<th>Potential Volume Change</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under ground beams and suspended in-situ concrete floors</td>
<td>150</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Under suspended timber and Precast concrete floors</td>
<td>300</td>
<td>250</td>
<td>200</td>
</tr>
<tr>
<td>Against the side of ground beams or foundations</td>
<td>35</td>
<td>25</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: The void dimension measurement for suspended timber and precast concrete floors is from the underside of beam or joist to ground level and includes 150mm ventilation allowance. Note: For compressible material the void dimension is the amount the material should be able to compress to accommodate heave. The actual thickness of compressible material required should be established from the manufacturer. For void formers the void dimension is the remaining void after collapse. The actual thickness of void former required should be established from the manufacturer’s guidance.

### Heave precautions for drainage

Shrinkage and heave of clay soils can affect pipelines.

To protect against the effects of heave, drainage should be designed:

- To take account of potential ground movement as shown in the table below, including where pipes and services pass through substructure walls or foundations.
- With gradients which may need to be greater than those in Chapter 5.3 Drainage below ground, as these do not account for possible ground movement.
- To use alternative means of catering for the movement when sufficient falls cannot be provided, for example by deepening the excavation and laying pipework on a granular bedding of suitable thickness to reduce the extent of potential movement.

*For guidance on drainage below ground please see NHBC Standards Chapter 5.3 ‘Drainage below ground’.

<table>
<thead>
<tr>
<th>Volume change potential</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential ground movement</td>
<td>150mm</td>
<td>100mm</td>
<td>50mm</td>
</tr>
</tbody>
</table>

Existing land drains should be maintained or diverted. Where the void beneath suspended floors is liable to flooding, drainage should be provided.

### General Recommendations

Drives and pathways should be designed and detailed to cater for the likely ground movement.