Strip and trench fill foundations on level sites

(January 2024) (Third issue - supersedes January 2016)

Question

When excavating foundations, where there is no influence from trees or shrubs, should the foundation depth be measured from the finished, the original or the reduced ground level?

Considerations

- NHBC Standards clause 4.3.3. states that foundations in granular and frost susceptible soils, e.g. chalk, should be placed at least 450mm below finished ground level to protect against damage from frost action.
- Foundations in cohesive soils should be placed deep enough to avoid the effects of annual seasonal movement and drying out. This depth depends on the volume change potential of the soil as shown in NHBC Standards clause 4.3.3 Table 1.
- The guidance in NHBC Standards Chapter 4.2 should be followed when building near trees.

Answer

Foundations should extend a minimum of 100mm into the specified/required bearing strata and below the level of any desiccation.

Minimum foundation depths should be measured from the **reduced** level where the **reduced** level will be the **finished** ground level.

A) Granular and frost susceptible soils, e.g. chalk.

Foundations should be placed at least 450mm below the finished ground level to avoid the risk of the bearing strata freezing and causing damaging movement.

Where the finished ground level will be above the original ground level and the foundations are being cast when the ground is frozen, or is at risk of freezing before ground levels are raised to the finished level, the foundation depth should extend at least 450mm below the original ground level (see Figure 1).

B) Cohesive soils, e.g. clay.

Foundations should be placed below the level where annual seasonal movement would be expected to occur. This level varies according to the volume change potential (VCP) of the soil i.e:

High VCP = 1.0 m minimum depth,

Medium VCP = 0.9 m minimum depth,

Low VCP = 0.75m minimum depth.

The depth should be measured from:

- the **original** ground where seasonal desiccation of the soil is either unknown or is known to be present.
- the **raised finished** ground level where it is shown by recent tests that the original ground is not desiccated, providing that the foundations are on good bearing and do not bear onto any fill or topsoil (see following note).

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Notes:

If the foundation depth is measured from a **raised finished** ground level, which is not in place at the time of casting the foundation, it may result in the foundation being at a shallow depth i.e. less than the recommended minimum depths below the ground level at that time. A similar situation can occur when a deep site strip is carried out and foundation levels have been measured from the **original** ground level.

In such cases the supporting ground beneath the foundation is at risk of drying and shrinking particularly if left at a shallow depth for some significant time over the summer and autumn months. To reduce this risk the minimum depth of the foundation should be measured from the ground level at the time of casting (see Figure 2).

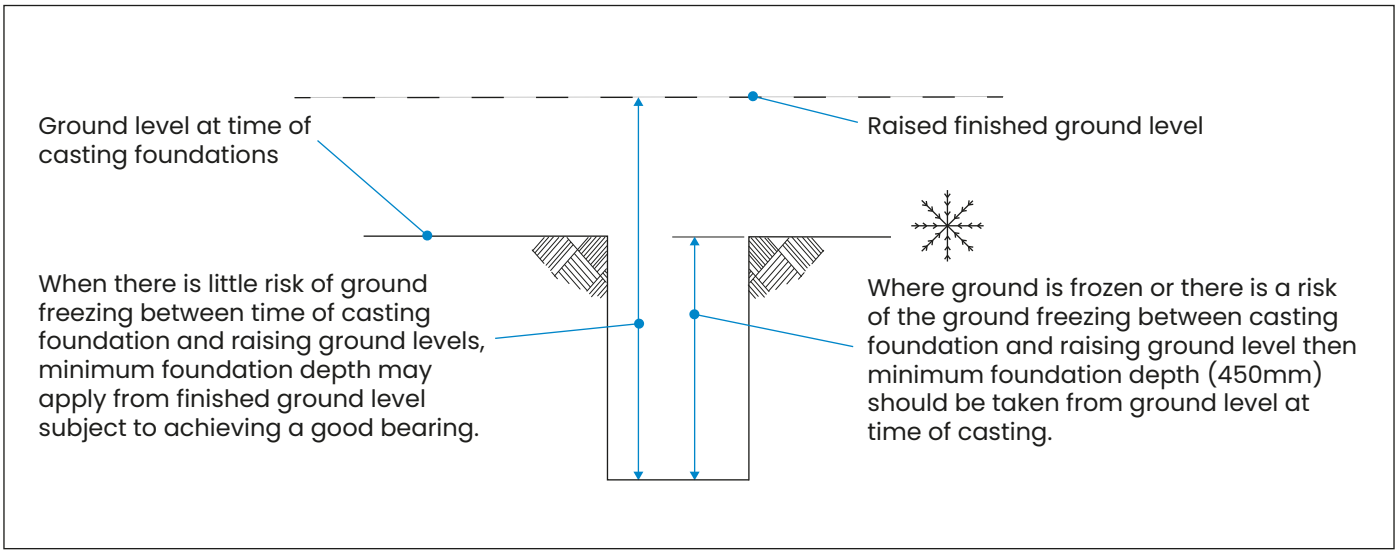

Figure 1 – Granular and frost susceptible soil

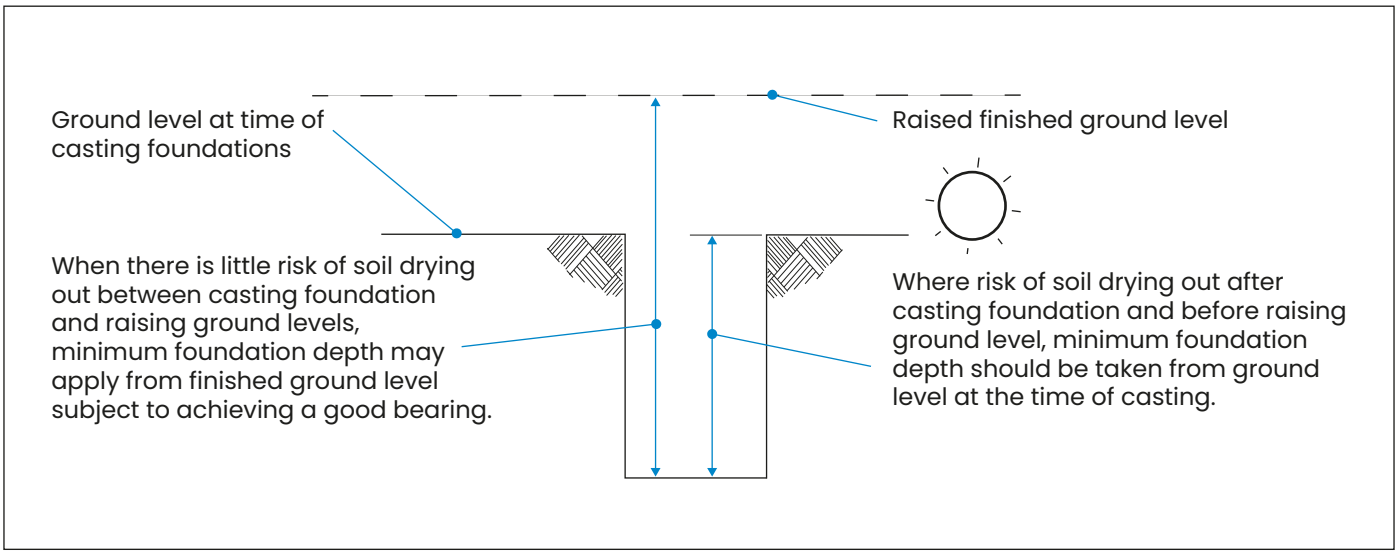

Figure 2 – Cohesive (clay) soil

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