

# Helical Steel Piles

(April 2022) (first issue)



## Question

Are helical steel piles acceptable to NHBC?

## Considerations

- Helical (screw) piles in this context would generally comprise a lead section with helix steel plates attached to a central steel shaft and extension sections, with or without additional helix plates
- Helix steel piles are typically suitable for use in loose to medium dense coarse soils and low to medium strength fine soils, but their use is not necessarily limited to these soils
- Helix steel piles like any other piling system should be able to meet the performance requirements of Chapters 4.2 and 4.4 of the NHBC Standards
- Clause 4.4.1 of the NHBC Standards says that piled foundations shall comply with NHBC Technical Requirements and provide adequate support to load bearing elements. Clauses 4.4.3 and 4.4.4 of the NHBC Standards also requires all piled foundations to be designed to take account of site conditions and hazardous grounds respectively
- Where helical steel piles are to be used on sites with shrinkable soils and they are to be located near trees, their design and installation should demonstrate compliance with the requirements of clauses 4.2.3, 4.2.4 and 4.2.8 of the NHBC Standards. On such sites, helix plates located in soil zones likely to experience ground movement will not be acceptable.
- Where helical steel piles are to be used for their relatively low embodied carbon content, the implications of the embodied carbon used in their treatment when galvanised and/or imported into the UK, if manufactured overseas, should not be ignored in the overall embodied carbon assessment

## Answer

Steel Helical piles as a piling system or part of a foundation system are acceptable to NHBC to support residential or mixed-use development for warranty purposes provided, they

1. meet NHBC Technical Requirements, and
2. have an independent third-party certification or equivalent acceptable to NHBC.

Further information on what constitute an independent technical approvals authority acceptable to NHBC is available in our Technical Guidance Note 2.1/20

The third-party assessment/certification of helical steel piles should address the following as part of an overall independent technical assessment:

- a. Manufacture - helical pile system components must be CE or UKCA marked and produced in compliance with BS EN 1090-1 & 2, with audited surveillance of factory production control
- b. Installation - helical piles must be installed in accordance with BS EN 12699 and the system holders' instructions. Joints between pile segments should be mechanically connected (i.e. bolted) and not site welded
- c. Structural performance - the system must be able to demonstrate a satisfactory structural performance through an acceptable design method in accordance with BS 8004 and/or EN 1997-1. The system should be shown to have adequate strength and stiffness to sustain the loads to which it will be subjected from manufacture to installation to in-service use. The performance of the system should be demonstrable in different soil types and/or combinations of soil types, and there should be a robust strategy in place against which it is possible to verify performance of the installed piles. Helical steel piles should not be designed solely on empirical rules relating soil resistance to the torque measured during pile installation

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- d. Durability - the piling system need to demonstrate they achieve a 60-year life. This can either be achieved by use of sacrificial thickness or appropriate treatment of the steel components
- e. Load carrying capacity - a satisfactory means of pile testing to be provided to be able to verify the performance of the piles on site