Structural Engineers Registration Ltd

Certification Performance Criteria Guidance

B4.3 Piling

Revision A

Performance Criteria

Certifiers must satisfy themselves that adequate details for the piling have been prepared and that sufficient design calculations, which take account of the overall loadings and the findings of the ground investigation report, have been undertaken to demonstrate the adequacy of the design and that there is evidence that the design and details have had the appropriate level of checking.

Where Schedule 1 has been used Certifiers must satisfy themselves that adequate details for the elements have been prepared, that sufficient preliminary calculations have been undertaken or that there is other justification to demonstrate the adequacy of the solution proposed and that an adequate performance specification has been prepared.

Background

Section 1.1.4 in the Technical Handbook explains that the foundations of buildings should be designed to sustain and transmit the loadings to the ground in such a manner that there will be no ground movement which will impair the stability of the building or the stability of buildings in the vicinity.

Where it has been determined that the nature of the ground is such that it is likely that significant ground movement will occur piling is one of a number of techniques which, by the introduction of a slender columnar element into the ground, will allow the loads from the building to be transferred through weak, compressible strata or water on to stronger, more compact, less compressible and stiffer soil or rock at depth.

Certifiers must undertake sufficient enquiry to satisfy themselves that the designer of the piles has taken account of the predicted ground conditions and the loadings produced by the designer(s) of the superstructure and that the design has been checked by a suitably qualified person.

Guidance

The piling design is often undertaken by a specialist piling contractor who will frequently use a proprietary system where the design methodology is unique to the chosen system.

Guidance on the role of the building designer and on the preparation of a performance specification is provided in the publication: Specification for Piling and Embedded Retaining Walls; Institution of Civil Engineers (2nd edition 2007).

The Federation of Piling Specialists has also published a number of guidance documents. In particular, they have published: Minimum Requirements for Site Investigation. Certifiers should take account of such guidance to ensure that the ground investigation provides the information required by the pile designer.

Where appropriate, the certification of the design of piling may be carried out using the third party designed details option, with the work included on Schedule 1. Detailed guidance on the use of this option is given in B1.4. It should be noted that this option is only to be used where the finalisation of the design is being carried out by a specialist contractor; the warrant drawings must contain sufficient details of the initial or conceptual design and there must be adequate justification for this design.

Any specification for piling should include for in situ testing of the piles, by sonic and/or load testing as appropriate. The results should be reviewed by the relevant designers to see that the assumed design parameters have resulted in a satisfactory level of performance.

Certifier's must see that calculations, drawings, specifications, etc. for the piling works have been prepared and appropriately checked and that level of performance achieved is as assumed in the design for the building.

The BSD publication 'Procedural Guidance on Certification including information to be submitted with a Building Warrant Application' April 2010 version 2 (sometimes referred to the Blue Book) provides further details of what information should be included in the warrant submission which includes:

- Pile general arrangement
- Type of pile
- Assumed pile size
- Commencement level
- Cut off level
- Design load
- Site testing details

Examples of Major Non-conformances

Absence of or grossly inadequate evidence of the Certifier's review of the design for the piling.

The design for the piling clearly does not meet the requirements of Standard 1.1.

Absence of or grossly inadequate suitably checked calculations or other justification for the design shown on the warrant plans.

Absence of or grossly inadequate details for the piling shown on the warrant drawings

Absence of or grossly inadequate performance specification and details on the warrant plans, where piling was included on Schedule 1

Absence of or grossly inadequate suitably checked calculations or other justification for the preliminary design shown on the warrant plans, where piling was included on Schedule 1

Absence of or grossly inadequate evidence to demonstrate that a review of a third party's finalised design for the piling had been carried out by the Certifier before an interim or final Form Q was signed.

Drawings/specification do not describe requirements for site testing.

Examples of Improvement Issues

Insufficient evidence of the Certifier's review of the design for the piling.

Deficiencies in the warrant plans, for example, failure to identify pile type, size, locations, SWL and indicative cut off levels.

Inadequate or insufficient calculations.

Inadequate performance specification and details on the warrant plans, where piling was included on Schedule 1.

Inadequate calculations or other justification for the preliminary design shown on the warrant plans, where piling was been included on Schedule 1

Inconsistencies between the design finalised by external specialist/third party and the performance specification submitted as a part of the warrant application, where an interim or final Form Q has been submitted in respect of the design of the piling that was included on Schedule 1.

Insufficient evidence to demonstrate that a review of a third party's finalised design for the piling had been carried out by the Certifier before an interim or final Form Q was signed.

Requirement for site testing inadequately described on the drawings or in the specification.

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