

Minimum Supervision Requirements for Piling Works

| Stages of piling works | Objectives of supervision | Minimum supervision to be provided by |
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| (a) <u>Driven piles</u> (i) Setting out of piles | To check that the set-out locations of piles agree with the contract drawings | Survey team 100% checking of all piles I AN E AN SE AN |
| (ii) Driving test | To check that design assumptions of site conditions agree with actual site conditions. | I FT E 100% checking of all test piles SE 1 st test pile |
| (iii) Driving of piles | To check that the accepted working procedures are followed and anomalies rectified. | I FT E AN SE AN |
| (iv) Splicing of piles | To check the accuracy of design details. | I FT E 5% (min. 1 pile) SE AN |
| (v) Final sets | To check that the required final set has been achieved and the capacity of each pile has complied with contractual requirements | I 100% E 10% (min. 2 piles) SE 2% (min. 1 pile) |
| (vi) Proof test (Verification of the performance of the as-constructed piles by the imposition of test load) | To check that the testing procedures and acceptance criteria are in accordance with the specification and measurements are properly recorded during the test. | I FT E 100% of essential measurements SE Essential measurements of at least one pile |

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| (b) <u>Large Diameter Bored Piles, Barrette Piles and the like</u> (i) Setting out of piles | To check that the locations of piles agreed with contractual drawings | Survey team 100% checking of all piles I AN E AN SE AN |
| (ii) Pre-drilling (To determine the proposed founding levels of piles) | To supervise the drilling operation, the logging of soil/rock samples and to measure the depth of drill holes. To ensure the retrieved samples are not tampered. | I FT E 10% (min. 1 pile) SE AN |
| (iii) Verification of founding stratum | To measure the depth of excavation and check the quality of retrieved materials at the founding stratum. | I FT E 100% SE 1 pile (for less than or equal to 10 piles) 2 piles (for more than 10 piles) |
| (iv) Installation of piles (Grouting operation when required) | To check that proper working procedures are followed and anomalies rectified. To check the correct grout mix, grout pressure and grout volume are being used and the adjacent building structures are not adversely affected. | I FT E 10% (min. 1 pile) SE min. 1 pile |
| (v) Preparation of pile base | To ensure pile base is clean. | I FT E 10% (min. 1 pile) SE AN |
| (vi) Fabrication (including splicing) & installation of rebar cage and placing of concrete | To check that sufficient and correct amount of rebars are provided and proper concreting method is used. | I 100% E 10% (min. 1 pile) SE AN |
| (vii) Interface core-drilling | To supervise the drilling and to check that the quality of concrete and foundation rock conform with that specified in the contract and that concrete and rock are in good contact at the interface. | I FT E 10% (min. 1pile) SE 1 pile (for less than or equal to 10 piles) 2 piles (for more than 10 piles) |

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| (viii) Sonic tests of completed piles | To supervise the sonic test operation | I 100% E 10% (min. 1 pile) SE 1 pile (for less than or equal to 10 piles) 2 piles (for more than 10 piles) |
| (ix) Proof drilling of completed piles (when required) | To supervise the drilling operation and the logging of concrete/rock samples and to measure the depth of drill holes. To ensure the retrieved samples are securely stored and delivered to laboratory for testing. | I FT E 20% (min. 1 pile) SE AN |
| (x) Proof drilling of completed piles (when required) | To check the logging of extracted concrete/rock samples and the depth of drill holes. | I FT E 100% SE min. 1 pile |
| (c) <u>Mini-piles, Socketted H-piles and the like</u> | | |
| (i) Setting out of piles | To check that the locations of piles agree with contract drawings | Survey team 100% checking of all piles I AN E AN SE AN |
| (ii) Pre-drilling (To determine the proposed founding levels of piles) | To supervise the drilling operation, the logging of soil/rock samples, and to measure the depth of drill holes. To ensure the retrieved samples are not tampered. | I FT E 10% (min. 1 pile) SE AN |
| (iii) Verification of founding stratum | To measure the depth of excavation and check the quality of retrieved materials at the founding stratum. | I FT E 100% SE 1 pile (for less than or equal to 20 piles) 2 piles (for more than 20 piles) |

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| (iv) Installation of piles (Grouting operation when required) | To check that proper working procedures are followed and anomalies rectified. To check the correct grout mix, grout pressure and grout volume are being used and the adjacent building structures are not adversely affected. | I FT E 10% (min. 1 pile) SE min. 1 pile |
| (v) Installation of reinforcements and grouting | To check that sufficient and correct amount of reinforcements are provided and proper grouting method is used. | I 100% E 10% (min. 1 pile) SE min. 1 pile |
| (vi) Proof test (Verification on the performance of the as-constructed piles by the imposition of test load) | To check that the testing procedures and acceptance criteria are in accordance with the specification and measurements are properly recorded during the test. | I FT E 100% of essential measurements SE Essential measurements of at least one pile |
| (vii) Post-installation borehole drilling (when required) | To supervise the drilling operation and logging of the extracted samples; To check and verify the rockhead profile and socket length of pile. | I FT E 30% (min. 1 pile) SE AN |
| (viii) Post-installation borehole drilling (when required) | To check and verify the rockhead profile and socket length of pile | I FT E 100% SE AN |

- Legend:
- I - Inspectorate staff or Assistant Engineer (Not more than 50% of the required supervision may be delegated to Works Supervisors, whose work shall be closely overseen by the I who should be full time on site during the relevant stages of piling works. The percentage may be in terms of supervision time or number of piles, and the site staff should exercise their judgement according to the circumstances of each site.)
 - E - Engineer (or RE)
 - SE - Senior Engineer (or SRE or an equivalent staff from the consultant's office in case there is no SRE for consultant administered contract)
 - FT - Full time supervision of the relevant stages of piling works in the first column of the table, including the checking or supervision specified in the second column of the table.
 - % - Percentage of piles to be checked or supervised according to the checking or supervision specified in the second column of the table.
 - AN - As necessary

- Note:
1. The above table only specifies the minimum supervision requirements. The actual supervision arrangement for each site should be determined according to the scale and complexity of the piling works. If, for any reason, the minimum requirements in this appendix cannot be met, approval of a D1 officer or above shall be sought.
 2. For pile types or piling stages not covered by the above table, the minimum supervision requirements can be derived on the basis of the above table.