

SPECIFICATION FOR JACK-IN-PILES

1.0 GENERAL

This work shall consist of the supply, installation and testing of piles in accordance with this Specification and the lines, levels, grades and cross-sections shown on the Drawings and as directed by the Engineer.

2.0 GROUND CONDITION

The Contractor shall check the existing site condition including levels, slopes, drainage, presence of obstacles such as foundation, tree stumps, etc and shall allow in his rate for completing the work as intended, no claims whatsoever in respect of any discrepancies shall be entertained.

2.1 Obstruction

The rates in the Bills of Quantities for piling work shall include for excavation of any material to remove obstruction below existing ground level which may prove to be sufficient to prevent installing or which interfere with the proper alignment of the piles, timbering, backfilling, the restoration of the ground around the piles and any other works which may require to complete the operation to the satisfaction of the Engineer. Obstructions below the level which occur during the course of work (e.g. broken sea wall shoes or piles, etc) shall likewise be removed by the Contractor at his own expense. Provision of preboring has been provided in the Bills of Quantities for overcoming the piling obstruction at deep level. No standing time for rigs or extension of time will be allowed in consequence of obstructions of any kind.

All materials shall be new. Materials, workmanship and conditions for the manufacture and installation of piles foundations shall be strictly in accordance with the relevant clauses of the specification. Where certain items of pile foundation are not covered by the specification, they shall comply with the latest British Standard specification, Code of Practice etc, with regard to design, workmanship, material, etc.

3.0 REQUIREMENTS FOR TOLERANCES

3.1 Setting Out

Setting out shall be carried out using the data and reference points as shown on the Drawings. Immediately before installation of the pile, the pile position shall be marked with suitable identifiable pins, pegs or markers.

3.2 Position

For a pile cut off at or above ground level, the maximum permitted deviation of the pile centre from the centre points shown on the Drawings shall not exceed 50mm for single and two pile groups (may limited the deviation to 25mm if small size reinforced concrete piles are used), 75mm for three pile groups and more in any direction unless otherwise directed by the Engineer.

3.3 Verticality

The maximum permitted deviation of the finished pile from the vertical is 1 in 75.

3.4 Forcible Corrections

Forcible corrections to concrete piles shall not be permitted. Forcible corrections may be permitted to other types of piles if approved by the Engineer. However, no forcible

corrections shall be made to piles which have deviated beyond the permissible limits specified in Sections above.

3.5 Piles Out of Alignment or Position

The Contractor shall, if ordered by the Engineer, extract and reinstall any pile which has deviated out of the position or alignment by more than the specified limit, or alternatively the substructure shall be modified to the approval of the Engineer. This shall only be relaxed if directed by the Engineer. The cost of such extraction and reinstallation or any extra cost in the design and construction of a modified foundation shall be borne by the Contractor if, in the opinion of the Engineer, such extra works have been made necessary due to the error and/or negligence of the Contractor.

3.6 Records

The Contractor shall keep record of the installation of each pile as required by the Engineer and shall submit two signed copies of these records to the Engineer not later than at noon of the next working day after the pile has been installed. The signed records shall form part of the records for the Works. Any unexpected installation conditions shall be reported in the records.

4.0 PRECAST JACK-IN-PILES

This work shall comprise the supply and installation of the precast reinforced concrete piles or precast prestressed piles, inclusive of pitching and driving, lengthening and cutting and preparation of pile heads, all in accordance with this Specification and to the details shown on the Drawings.

4.1 Materials

4.1.1 Concrete

The concrete to be used shall be of grade in accordance to the Drawings unless otherwise directed by the Engineer. Special care shall be taken during compaction to prevent segregation of the constituents of concrete and the displacement reinforcements.

4.1.2 Reinforcement

For precast prestressed piles, the Contractor shall show by calculations that sufficient prestressing steel in the form of high tensile wire, strand or bar are used so that the effective prestress after losses is sufficient to resist the handling, jacking and service load. Longitudinal prestressing shall not be considered as load bearing reinforcement.

4.2 Pile Shoe

Depending on the nature of the soil condition, pile shoes may be used. For piles sitting on the bedrock, rock shoes shall be placed. The Contractor has to propose the type of pile shoe to be used and approved by the Engineer prior to installation of the piles.

4.3 Handling and Storage

The method and sequence of lifting, handling, transporting and storing piles shall be such that piles are not damaged. Only the designed lifting and support points shall be placed on adequate supports located under the lifting points of the piles.

5.0 INSTALLATION

5.1 Pitching of Piles

Piles shall be pitched accurately in the positions as shown on the Drawings. At all stages during installation and until the pile has set, all exposed piles shall be cut off to the ground level (provided is minimum 2m above cut off level) by means of hydraulic breaker. All cutting of pile to the cut off level shall be by diamond cutter. All cut off piles shall be prevented from damage and deviated out of position. For all piles to specified lengths, pile head cut off shall be avoided by using suitable combination of pile lengths.

5.2 Installation of Piles

Each pile shall be hydraulically injected continuously until the specified pressure gauge reading and/or depth has been reached. A follower (long dolly) is not permitted unless approval has been obtained from the Engineer. The Contractor shall inform the Engineer without delay if an unexpected change in driving characteristic is encountered.

A detailed record of the driving resistance over the full length of each pile shall be kept. The log shall record loading resistance for every 300mm of pile penetration.

The pile other than frictional pile, will be considered SET when the pile has ceased to settle at the recorded pressure which gives a resultant load of 2.5 times the design load, unless otherwise agreed by the Engineer.

Unless otherwise specified in the Drawing, all friction piles shall be driven to the specified depth.

Piles shall be driven in an approved sequence to minimize the detrimental effects of heave and lateral displacement of the ground. When required, levels and measurements shall be taken to determine the movement of the ground or any pile resulting from the installation process. If any pile rise occurs as a result of adjacent piles being installed, the Contractor shall submit to the Engineer his method for correcting this and to avoid similar occurrences in subsequent work.

Piles can be jointed by means of mild steel sleeve. When the pile has been driven to the required set or depth, the head of the pile shall be cut off to the level specified or shown in the Drawings.

The jacking force has to be applied axially to avoid damaging the pile. If the system is applying the forced through gripping the body of the pile, the gripping mechanism shall not cause any defect on pile.

Dolly shall not be allowed in the pile installation.

5.3 Termination Criteria

The termination criterion is to jack the pile repeatedly to **2.0 times** of the design load or other safety factor as instructed by the Engineer, for not less than **three (3) cycles**. The corresponding pressure shall to be maintained for not less than **20 seconds** with settlement not greater than 2mm. A time interval of not less than **3 minutes** shall be elapse between cycles. The process shall be repeated if instructed by the Engineer.

6.0 PILE TESTING

Pile testing shall be carried out in accordance to Specification for Pile Testing.

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