

SPECIFICATION FOR PRECAST PRESTRESSED SPUN PILE

1.0 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.

1.1 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.

2.0 SETTING OUT

The Contractor shall be responsible for setting out final positions and levels of each pile from some given baselines and datum levels on the site agreed by the Engineer, and shall be responsible for the accuracy of the setting out. He shall employ a licensed surveyor approved by the Engineer to do the work.

3.0 TOLERANCE

The maximum permissible deviation of the centre of each finished pile from the correct centre point as approved by the Engineer is 75 mm in any direction. Allowable deviation of the centre of pile for any single pile group or single line of piles carrying structural load shall not be more than 25 mm laterally from its correct position.

The verticality of each pile shall not deviate at any point below the ground by more than 1 in 75 from the true vertical position. The Contractor shall bear the cost of any additional work which in the opinion of the Engineer, is necessary due to any pile being installed in a position not within this tolerance.

4.0 TENDERER TO ACQUAINT HIMSELF WITH THE SITE OF WORK

Before tendering, the tenderers shall be deemed to have visited the site to acquaint

themselves with the existing site conditions, means of access, nature and proximity of adjacent properties and other matter liable to affect their tenders. No extra payment will be entertained at a later date due to the tenderer's failure to allow for contingencies arising out of the work and the nature of existing site conditions.

5.0 ADJACENT PILES

Piles shall be driven in such a manner as to ensure that no damage and minimum disturbance is caused to previously driven piles in adjacent positions.

6.0 STRIPPING OR CUTTING OF PILES TO CUT-OFF LEVELS

Upon completion of piling, the Contractor shall strip off the piles to the required cut-off level as shown in the drawings provided. The piling contractor should allow for the above work in the contract price. From the cut-off level, pile starter bars should be constructed to not less than 40 times the bar diameter as per drawings, for an adequate embedment into the pilecap.

Stripping should be done carefully by the Contractor to avoid shattering and damage to the pile. Any cracked or defective concrete should be cut away and made good with new concrete properly bonded to the old one. The edges should be cut square unless the pile head is to be encased in a cap. The Contractor shall follow up directly by checking the levels and giving accurate details of the pile positions as compared with the positions as indicated on the pile layout drawings.

After stripping of pile to cut-off level by the Contractor, the pile shall be inspected by the Engineer. If in the Engineer's opinion, the pile is defective, the Contractor shall be responsible to carry off necessary remedial work as required by the Engineer. Also, the eccentricity of all piles shall be checked by a licensed surveyor, employed by the Contractor, at cut-off level. If the eccentricity exceeds the allowable limit, all expenditure to remedy the work shall be borne by the Contractor. The Engineer's decision in this regard shall be final.

7.0 CLEANING UP

The Contractor shall remove from the site at intervals during the course of the work and on completion, all unnecessary materials, plant, cut-off piles, rubbish and debris resulting from the piling operations.

8.0 EQUIPMENT AND LABOUR

The Contractor shall provide all frames, equipment, lifting devices and labour necessary for the driving of piles. He shall only use the type of piling rigs approved by the authority for the work.

Before the commencement of works, the Contractor shall submit to the Engineer full details of his working programme, including the type of hammer which he intends to use.

The Engineer shall order the removal or replacement of any equipment whenever he thinks that such equipment and staff are not suitable for the works.

9.0 OSLO POINT

If specified to be used in the drawings, the Oslo point tip shall have a Brinell Hardness greater than 300 and a yield strength of exceeding 700 MPa for a pile with 140 T capacity. All

components used shall be of high tensile steel. The welding shall be carried out to the requirements of the British Standard specification and the indication in the enclosed diagram. The Oslo points shall be fabricated as an integrated part of the starter pile.

10.0 PILE SHOES

Unless otherwise specified in the drawings, every pile shall have proper pile shoes of cast iron or fabricated steel should be provided where specified to protect and reinforce the tip of pile. The shoes should have a small hole for escape of trapped air and water during casting of the pile.

The pile shoes shall comply to the following as relevant:

- i. Chilled-hardened cast iron shoe as use for making grey castings to BS 1452. Grade 10 or
- ii. Mild steel to BS 4360, Grade 43A or
- iii. Cast steel to BS 3100, Grade A

For piles bearing in rock, pile shoes shall be made of hardened steel of Brinell Hardness 400-600.

11.0 SPLICING AND JOINTING

The number of joints shall be as minimal as possible. The distance between joints shall not be less than 12m unless otherwise approved by the Engineer.

Splicing of piles shall be made in accordance with the details approved by the Engineer. In the case of welded connections, splices, etc, all work shall be done with approved methods, materials and by qualified and certified welders, whose ability to perform acceptable welding shall be fully demonstrated to the satisfaction of the Engineer.

Before welding proceeds, the extension pile shall be accurately positioned and true to line and vertical with the main piles.

After welding is completed at the joints, the waiting time shall not be less than THIRTY MINUTES before driving of the piles continue.

12.0 HANDLING, PITCHING AND DRIVING OF PILES

The greatest care, to the satisfaction of the Engineer, shall be taken in handling and slinging of piles and no pile shall be lifted other than by slinging from approved lifting holes or points. Piles shall be pitched accurately in their positions and on the appropriate lines and levels. No pile which has deflected from its course or wrongly aligned shall be forcibly brought back to alignment.

Before commencing the driving of each pile, the leaders or guides of the pile frame shall be checked for plumb in any two directions and shall be maintained plumb during driving to the satisfaction of the Engineer. At no time during driving operation shall the centre of the pile monkey (or hydraulic ram) be more than 40mm off centre in respect to the pile being driven in any given direction.

During driving, the heads of piles shall be protected by helmets of cast or mild steel, fitted closely around the pile heads. A packing of coiled hemp rope or asbestos-free fibre, 25mm thick, covering the head of the pile and cushioning it, shall be placed within the helmet. The top of the helmet shall be recessed and fitted with a stub dolly 300mm long. The packing and stub dolly shall be renewed as often as necessary or as directed by the Engineer to prevent

any damage to the pile.

Driving of the piles shall be continuous without interruption. Hydraulic hammers are to be used to drive each pile to the required penetration length or the required set so as to provide the required load carrying capacity as pre-determined.

Any pile damaged during handling, pitching, driving or at any other times shall be replaced with new piles at the Contractor's expense, even if piles of bigger capacity are required.

The pre-determined weight, type, and the height of fall of the hydraulic hammer to be used and the final set to which the pile shall be driven, shall be strictly observed and shall be to the approval of the Engineer.

For pile to set : use of extension dolly or diesel hammer for driving piles to the required set as determined shall be strictly disallowed.

No driving shall be carried out without the presence of the Engineer or his representative who reserves the absolute right to take measurements as and when he deems fit and necessary. Sequence of driving of pile shall be to the approval or as directed by the Engineer.

Any pile which is cracked or damaged during driving shall be cut off and recast or rejected as the Engineer may decide. The welding/cutting and/or replacement of piles shall be at the Contractor's expense.

The extra cost involved in constructing bigger or different pilecaps as a result of the defects as described above, shall be borne by the Contractor.

All piles to be driven shall bear an identifying reference number marked in 300mm divisions measured from the tip throughout the length of the pile.

13.0 PILE DRIVING RECORD

The Contractor is to keep a complete continuous record for the actual penetration of each and every pile driven and shall furnish copies of these records signed by him and the Engineer's representative. These copies are to be submitted daily to the Engineer.

The piling records shall include data on the pile diameter or size, length, location, type, weight of hammer, calculated safe working load, rate of penetration and number of blows for every 300 mm penetration, penetration under the last thirty blows of the pile, temporary compression and set, cut-off level and final penetration and any other relevant information which the Engineer may require. The proposed type of recording forms to be used by the Contractor shall be approved by the Engineer prior to the commencement of the piling works.

14.0 RE-DRIVING

Observation and measurement shall be made at the site during the progress of driving piles, by any suitable method approved by the Engineer, to determine whether a driven pile has been lifted from its original seat during the driving operation of adjacent piles. The Contractor shall provide the necessary tools, instruments, and any other assistance to record these measurements.

Where such observations or measurements indicate that a pile has been unseated, it shall be re-driven to the specified set as determined by the Engineer. No payment shall be made for re-driving of heaved piles. The Engineer reserves the right and authority to accept or reject any pile unseated and heaved piles rejected under this circumstance shall be considered as "failed" and shall be replaced at the Contractor's expense as directed and to the satisfaction of the Engineer.

TABLE OF CONTENTS

	Description	Page
1.0	GROUND CONDITION.....	PPSP1
1.1	Obstruction	PPSP1
2.0	SETTING OUT	PPSP1
3.0	TOLERANCE	PPSP1
4.0	TENDERER TO ACQUAINT HIMSELF WITH THE SITE OF WORK	PPSP1
5.0	ADJACENT PILES	PPSP2
6.0	STRIPPING OR CUTTING OF PILES TO CUT-OFF LEVELS	PPSP2
7.0	CLEANING UP	PPSP2
8.0	EQUIPMENT AND LABOUR	PPSP2
9.0	OSLO POINT	PPSP2
10.0	PILE SHOES	PPSP3
11.0	SPLICING AND JOINTING	PPSP3
12.0	HANDLING, PITCHING AND DRIVING OF PILES	PPSP3
13.0	PILE DRIVING RECORD	PPSP4
14.0	RE-DRIVING	PPSP4