

SPECIFICATION FOR DRIVEN MINI PILES

HIGH FREQUENCY IMPACT MOLE BOTTOM DRIVEN TYPE

All piling undertaken by MG Construction Ltd will be in compliance with the General Requirements section including appendix 1 to 4 of The ICE Specification for piling and embedded retaining walls Second Edition (SPERW).

The guidance notes section C of SPERW shall also be deemed the reference for guidance on allocation of responsibilities under any contract agreement entered into.

SECTION A: GENERAL

1. This specification is to be read with the Company MG Construction Ltd's General Conditions of Contract Piling Schedule and Estimate and Schedule of Attendances and Services to be provided free issue.
2. The estimate is based on the use of the Company's normal bottom driving equipment. MG Construction Ltd shall not undertake their own ground investigation unless expressly instructed.
3. The Company shall not accept responsibility for the stability of existing structures adjacent or near to the piling operation. We recommend that a non-negligence insurance policy be taken out in the joint names of the employers and contractor. Where possible, the position of underground works and services shall be noticed to the Company before piling commences. Even though notified the Company shall accept no liability for damage to such underground works or services unless agreed in writing by the Company when the information is formally received. The Client shall be responsible for providing any protection deemed necessary to any existing structures local to our works. Attendance to this item and any suitable measures taken to be allowed for and carried out by others. It is assumed that the Client will have relevant insurances in place for non-negligence. We confirm that 21.2.1 type insurance can be arranged where specifically instructed at an additional charge subject to survey. We would recommend that the client should monitor the structure and any adjacent structures for any movement during our works.
4. It has been assumed that continuity of work and access to pile positions will be available at all times. Failure of the Client to provide such will result in standing time being chargeable. Protection of surfaces in the proximity of our works shall be provided free issue by the Client and any damage due to piling or other foundation works which may reasonably be expected, shall be reinstated by others and is not deemed included in our Offer price. Enabling works including removal of fixtures, fittings etc in advance of underpinning or piling may be required to be carried out and this shall be provided in advance of our works by the Client. Liaison with MG Construction Ltd is recommended.
5. Driven pile lengths shall be measured from the toe of the fully driven pile casing to the ground level at the top of pile unless an alternative datum is specified in the Company's estimate.

Casings shall be measured as provided by pitched height prior to cut down.
6. Unless otherwise agreed in writing by the Company, works and services shall be carried out by others, free of charge to the Company at the location of the piling works, as per enclosed Schedule of Attendances and Services.
7. Where new work supported by the piles links with work not on foundations, the Company shall not be responsible for damage due to differential movement and a construction and movement joint is strongly recommended.

SECTION B: MATERIALS

Unless otherwise stated in the estimate, the materials used shall be as specified below: -

- (I) Pile Casing - Grade 43 weldable steel tube assembled in suitable length sections by arc welding on site. The internal pile diameter of the casing shall not be less than the nominal pile diameter indicated in the estimate, within a tolerance of plus or minus 3mm.
- (II) Reinforcement - to piles, one 16mm high yield steel reinforcing bar centrally placed in the pile casing before or during concreting of the pile.
- to pile caps, steel reinforcing bars fixed in place prior to concreting, unless otherwise specified.
- (III) Concrete - to mini piles and pile caps C35 mix with ordinary Portland cement, 20mm nominal maximum size aggregate and a minimum cement content of 330kg/mm³ unless otherwise specified.

SECTION C: DESIGN AND CONSTRUCTION OF WORKS

The works to be carried out by the Company shall be as described in the estimate. The words or phrases used in the estimate or herein shall have meanings in accordance with the following glossary of terms and definitions.

1. DESIGN means supply calculations for the safe working load of piles. Piles are driven to a design set not a design length.
2. FORM PILES means where indicated, drive steel casing to achieve required set at depth. Record details of the driving. Supply and place single reinforcing bar to within 1000mm of the toe of the pile, supply and place concrete to cut off level or top of pile casing as required.
3. SETTING OUT means marking out the site in such a way that the required pile positions can be immediately and accurately identified by the Company's piling operatives.
4. PILE POSITION means the location of the pile centre as indicated on the setting out drawing, with a horizontal tolerance of 75mm in any direction.
5. VERTICAL means the pile shall be installed in a vertical attitude within a tolerance of 1 in 75 unless exceptional circumstances render this difficult to achieve or obstructions deflect the pile.
6. RAKING means the pile shall be installed at an inclination to vertical as defined on the Company's working drawing within a tolerance of 1 in 25 for raking piles up to 1:6 and 1 in 15 for pile raking more than 1:6.
7. SET means the rate of penetration of the pile casing, with the driving equipment in normal operating mode, as determined by the Company prior to commencement of work, at which the pile will be able to carry the calculated load with an ultimate Factor of Safety of at least three.
8. DRIVING RATE means the average rate of penetration of the pile casing, with the driving equipment in normal operating mode, from the commencement of driving of each pile to within 300mm of the final depth of the pile.
9. OBSTRUCTION means the presence of large stones, rocks, timber, hard filled material etc. Which impedes the penetration of the pile to the required depth or deflects pile out of vertical tolerance or position. Obstructions either natural or man made may force the pile out with specified tolerances. This may be unavoidable. Any works deemed necessary to rectify, redesign or de-rate piles shall be an extra to the contract considered requiring an instruction from the engineer or client. Subsequent amendments to cap designs shall not be the responsibility of MG Construction Ltd.

10. STANDING TIME means time that operatives and rig are standing or are unable to continue piling for any reason outwith the Company's control.
11. CUT OFF means the level specified by the Client or his appointed Agent for the top of the pile. Where the Client does not specify a cut off level, cut off shall be 100mm above ground level or to suit the Company's pile caps or other foundation works.
12. FORM PILE CAPS means excavate to the sizes, depths and in the positions indicated, trim tops of pile casings, supply and fix formwork and reinforcement, supply, place and compact concrete, then strike formwork; alternatively omit formwork and cast against adjacent ground or hardcore face.
13. PILING OF THIS TYPE (bottom driven) will be to a maximum depth of 16.0 metres, at which time, if design set not reached, we will advise client of recommended action to be taken.
14. A minimum useable pile length of 1.5 metres is assumed to ensure the piles fixity and stability. Piles which refuse under this depth may not be suitable for use dependant on individual conditions. We shall advise the Client of what action, if any, to consider if this occurs. Refused piles will remain chargeable through the contract, including any driving obstruction time.

SECTION D: CONTRACT SUM AND VARIATIONS

1. The estimate of pile lengths and any calculations for safe working load, stated in the estimate are based on the information known by the Company at the time of estimate and are given in good faith. Pile types and lengths may be varied from those estimated due to the actual strata found.
2. The Final Contract Sum shall be valued in accordance with the 'Basis of Estimate' notes together with any variations noted on the Company's piling record. This record shall be agreed by the Customer with the Company's representative on site at the time of driving or failing this shall be as prepared by the Company's Engineer from the record kept by the chargehand responsible for driving. Normally a summary will be sent to the Client or his representative on completion of works.
3. Where the driving is delayed by obstructions, the time spent in dealing with the obstruction will be charged at the extra over rate stated in the offer in addition to the normal piling rate. Unless otherwise indicated in the Company's Estimate, it shall be assumed that a driving rate of under 75 mm/min will be subject to an additional charge for obstruction time.
4. Should piles deflect out of tolerance in position or vertically due to hitting obstructions, and these piles are deemed not to be able to carry the full working load, the Client will select alternative position or positions for re-driving piles and issue an instruction to that effect. The cost of additional piles will be chargeable to the Client.
5. Any instruction to pile to depth in excess of 16.0 m will be at the clients risk for payment of any lost plant or recovery and delay costs.
6. Our normal driving rate, unless stated otherwise, is in excess of 150 mm/minute. Should this rate prove unattainable we reserve the right to adjust the contract rates per metre. This will take the form of additional plant and labour charges.
7. Pile log sheets shall be kept by the site personnel. These log sheets shall be available for inspection on site and will be submitted to the Client upon completion of the works. The log sheets shall form the basis of the contract valuation and shall be deemed to have been agreed.

SECTION E: PILE LOAD TESTS WHERE QUOTED OR INSTRUCTED

- 1.1 Capacity of Load Test Equipment
 - 1.1.1. Non Working and Working Piles

The test equipment shall be capable of safe application of 150% of the anticipated test load on a working pile or 200% if a trial pile is required.
- 1.2 Reactions for Static Load Test
 - 1.2.1 Tension Piles in Static Load Test

If tension piles are used to provide the reaction for the hydraulic jack these piles shall not be closer to the test pile than 1.5 metres measured centre to centre or a distance equivalent to five diameters of the largest pile whichever is the greater.
- 1.3. Static Load Testing

Incremental loading and testing shall be carried out in accordance with recommendations of the ICE Piling Specification (SPERW 1996) written report issued to the Client or his Engineer. A 2-cycle test shall be made.
- 1.4. Dynamic Load Testing

Dynamic Load testing shall be carried out on working piles or a trial pile by an independent consultant specialising in this field. Information on the specialist Company proposed shall be issued to the supervising officer prior to the test.
- 1.5. Working Piles
 - 1.5.1. Definition

Working piles shall be piles installed as part of the Foundation.
 - 1.5.2. Notice of commencement of Load Test

MG Construction Ltd shall give at least 48 hours notice of the commencement of each test to the Client.
 - 1.5.3. Test Report

The Contractor shall send to the Client within one week of completion of each test a report on test results.
 - 1.5.4. Working Piles as Tension Piles

The use of working piles as tension piles for the purposes of load tests may be adopted by MG Construction Ltd.
 - 1.5.5. Acceptance of Load Test Results

The deflection at the head of the working pile at the end of the period under the maintained calculated safe capacity during the first cycle of incremental loading will not exceed 15 mm.
- 1.6 Trial Pile / Preliminary Pile static testing

Trial Pile / Preliminary Pile static testing may under instruction be undertaken on the basis of verification of proposed pile SWL with adopted F.O.S. Should amendment of SWL be required, this variation shall be valued through the contract and any additional costs borne by the client.