SAFETY ASPECTS IN PILING

INTRODUCTION

Pile foundations are the deep foundations that carry heavy concentrated loads and transfer it to underlying competent strata.

Piles are constructed in a variety of ways which include either filling the concrete in the bore hole or driving pre-cast elements into the ground.

Piling involves special and heavy duty equipments with well defined methodology, and thus draws attention to very high safety standards.

Safety approach requires understanding the piling methodology and the working of the equipments.

The safety guidelines should be easily implemented by the employees of the piling agency as well as by the sub-contractors and workers employed at the site.

TYPES OF PILES :

Bored Cast-in-situ Piles: Deep foundation executed by removing the earth from the ground using a chisel, sludge pump or bailer or rotary rigs. Thereafter reinforcement cage is lowered and concreting is done on the spot. Sequence: Boring – Cage lowering – Concreting.

Driven Precast Piles: Deep foundation executed by driving precast elements into the ground where earth is displaced from its place to the sides.

Sequence: Pile casting in yard – Transport of pile to site – Lifting and Driving of Pile into ground.

Bored Precast Pile: Deep foundations executed by initial boring operations followed by lowering of precast elements. Post grouting operations are followed that fills the gap between the borehole and the pile surface.

Sequence: Pile casting in yard – Boring operations at site – Lowering of precast pile into the borehole – Grouting of the annular space between pile and soil.

Driven Cast in Situ Pile: Consists of driving a casing with a flat bottom shoe into the ground. This is followed by lowering of reinforcement cage and concreting on the spot, followed by lifting up and removing the casing.

Sequence: Casing driving with flat bottom shoe – lowering of cage – concreting – lifting and removal of casing.

SAFETY ASPECTS IN PILE OPERATIONS

1. Proper anchoring of the rig to firm base (anchor buried in ground etc).
2. Wire ropes duly checked during erection and maintained on weekly basis.
3. Workers climbing the rig for maintenance / concrete pouring to use full body harness and attach it to fall arrestor if climbing up or down the rig.
4. All workers to use ear plugs.
5. Workers working with wire ropes should wear hand gloves and wear goggles to protect eyes from flying iron particles from wire ropes.
6. Sufficient wooden logs in good condition to be placed and ground leveled before moving rig.
7. During rig movement only required persons to be around rest all to stay clear.
8. Workers climbing for sling removal / concrete pouring to use full body harness and attach firmly.
9. Proper rungs to be provided to one leg to enable worker to climb safely.
10. One worker to be earmarked who will only climb the tripod – should wear full body harness at all times.
11. Bentonite pit to be made at a safe distance away from the bore and properly connected to the bore by a channel.
12. Worker duly trained to start the winch by crank handle when required.
13. While changing auger bucket due care to be taken to ensure proper locking.

EFFECTS ON ADJACENT STRUCURES

1. Piling operations are known to affect the adjacent areas.
2. Due care should be taken as regards structure adjacent to where piling is going on.
3. At times the entire piling procedures may have to be revamped to address to the adjoining structures and the
4. social issues like noise and dust pollution should be taken care.
5. Effect of noise on the residents of adjacent structures.
6. Danger of rig collapsing on to the adjacent structure.
7. Issues of disposal of muck during bored piling.
8. Underpinning, sheet piling, shoring, bracing or by other means shall be taken to ensure safety and stability of adjoining structure.
9. Injury to any person should be avoided.