

Safety & Health Circular No. 43 / 2014

Safety Measures for Ground Investigation Work

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In a recent fatal accident happened on a non-Housing Authority (HA) site, a worker was struck to his death by a backstay of a drilling rig which was being dismantled. To prevent recurrence of similar accidents on HA sites, contractors should consider to take the following safety measures when carrying out ground investigation work:-

1. The drilling rig should be examined by a Registered Professional Engineer (RPE) (Mechanical) before operation and a copy of valid certificate should be displayed on the drilling rig.
2. Safe working load should be displayed clearly on a prominent location of the drilling rig.
3. A crane should be used for mobilization of the drilling rig and winch should be avoided for self-pulling the drilling rig whenever possible. Risk assessment should be conducted and safety precautionary measures should be implemented when self-pulling work is unavoidable.
4. The drilling rig mast should be lowered down before mobilization. When lowering the mast, an independent signaler should coordinate the speed of the lowering mast and ensure that the two backstays are not obstructed. If workers need to hold the backstays, their bodies and hands must be kept away from the end of backstays and end-hole for a distance of at least 20cm. Also, the sufficiency of hydraulic oil should be checked.
5. The drilling rig should rest on levelled and firm ground surface. If the ground condition is rough, uneven and loose, the site agent or above should be informed to arrange an excavator for levelling and compaction before loading down the drilling rig in place.

6. A drain outlet near the drill rod location should be excavated and relevant drain outlet facilities (including water pump and drain water hose, etc.) should be arranged to ensure that the dry, clean and firm ground surface is maintained.
7. Machinery guard should be installed in front of a drilling rod and should be used during operation.
8. All rotating parts of the drilling rig and water pump should be guarded.
9. The drilling rig should be powered off immediately when the machinery guard is damaged. The site agent or above should be informed for arrangement of repair work before re-commencement of the drilling operation. The engine should be powered off during the repair of the drilling rig or the water pump.
10. Lifting wires should be kept in good condition with valid certificates and identification tags. Hand spliced wire is prohibited to be used.
11. Only wires with valid colour code should be used for lifting.
12. When lifting and extending or dismantling the drill rod or casing, control panel should be operated by the drill operator, whereas the drilling assistant should be responsible for the assembling and disassembling of drill rod/casing. Good and effective communication between both should be maintained.
13. Avoid holding the end of casing by a single hand and fingers should not be placed under the casing. Instead, the casing should be carried by both hands.
14. Only when a lifting load is completely stationary, then installation/dismantling of drill rod/casing can be taken by hand tools (e.g. plier and chain plier, etc.). Use plier to loosen and chain plier to take out the drill rod/casing. The drill operator should ensure that the worker has fixed the hand tool in position and kept his body away from the machinery before re-operating the drilling rig.
15. The drilling rig working area should be barricaded and no entry is allowed except authorized persons.
16. Ear plugs should be put on when working within a hearing protection zone.

17. All hand tools should be checked regularly to ensure that they are in good working condition.
18. Casing rack should be kept at least 1m away from the location of the drill rod to provide sufficient working space.
19. For sloping ground, drill rod should not be propped on the ground for adjusting the drilling rig. When it is seated on an even and levelled surface, the following conditions should be observed for adjustment of drilling rig:-
 - i. When the drill rod is propped on the ground, the base of the drilling rig should not be propped up for more than 200mm from the ground. (The vertical angle of the drill rod should not be exceed 30°)
 - ii. The drill operator with a valid license should supervise the whole process of drilling rig mobilization.
20. The stacking height of sample boxes should not exceed 1.5m.
21. All hand tools should be stored in a tool box before mobilizing the drilling rig.
22. Prior to disassembling the drilling rig mast by head mast wire before moving the rig out of the site, the working area should be barricaded to prevent unauthorized entry.
23. Provide adequate supervision, training and instruction to the workers to ensure that the safety measures are strictly implemented.