Engineers India Limited

Net Zero by 2035

CASE STUDIES
– A LEARNING FROM MISTAKES

Delivering Excellence Through People

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Case Study-1

Brief description of Incident:-

- Excavation for drain work was in progress at Site by deploying an excavator which was being operated by an operator.
- The bed level of the drain was being recorded by surveyor and the victim was holding the leveling staff inside the excavated trench of drain under consideration (depth-1.2 to 1.5 mtrs).
- After completion of the task, victim was trying to come out from excavated trench.
- However, to come out of the trench, victim had opted to use excavator's bucket. As the operator was trying to move the bucket for reaching an approximate height of 2 Mtrs above the bed level, during this process, victim lost his body balance & fell inside the trench and sustained injury/pain in his neck area.
- Victim was rescued immediately by nearby workers and shifted to nearest local hospital.

Photograph

Case Study-1

Probable Cause of Incident:

- After completion of the task, victim was trying to come out from excavated trench where excavated earth was already kept like a bund (with an average height of approx.1 Mtr.).
- However, to come out of the trench, he had opted to use excavator's bucket instead of walking approximately 15 mtrs along the length of the trench.
- He was already holding a Levelling Staff and with that he stepped into the excavator's bucket, signaled the operator to lift the bucket.
- As the operator was trying to move the bucket, upon attaining an approximate height of 2 Mtrs. because of it's sideways movement and jerking, victim lost his body balance, fell into the trench, and sustained injury in his neck area.

Case Study-1

Lesson Learnt / Recommendations:

- Proper access (i.e. ladder or ramp arrangements) to be provided at the interval of Max. 15-20 m for going down and coming up in each and every excavated area (foundation/ trench etc.).
- Do’s and Don’ts of heavy mobile equipment (e.g. excavators/dozers/hydra etc.) in pictorial form to be pasted in operator’s cabin.
- Operators of the excavators to be sensitized that excavators are not meant for lifting workmen or shifting of materials and they should not allow any worker to get into the bucket of excavators.
- Signal Man shall be available all the time during heavy mobile equipment operations.

Case Study-2

Brief description of Incident:-

- A worker along with team entered inside the Sump for assigned job.
- While he was performing the chipping activity by using electrical hand breaker at the bottom end of pile head for removal of the pile head suddenly the pile head gave away at mid point during this process.
- Resulting in victim sustained severe cut injury on his left leg. He was rescued immediately by nearby workers.
- Subsequently victim was shifted to hospital for medical treatment.

Photograph

Case Study-2

Probable Cause of Incident:

- The Victim had chipped 0.8mtr of the pile head approximately from pile cut of level (height of pile head was found 2.4mtrs from the cut off level) to expose the steel reinforcement and subsequently cut all exposed reinforcement by grinding machine.
- While he started making V-Groove on bottom of the pile head at pile cut off level by using electrical hand breaker during this process Pile head sheared from 1.6mtrs due to vibration and fell down on the victim left leg.

Case Study-2

Lesson Learnt / Recommendations:

- More emphasis on job specific tool box talk to be conducted for working crew by the concerned job supervisor and all associated hazards to be communicated to workers.
- Availability of immediate job supervisor to be ensured prior to start any critical activities
- Before breaking the pile head, wherever pile casting is done 1.5mtrs beyond the pile cut off level anchoring should be done by providing minimum two numbers of Guy Rope which will be anchored in earth/adjacent pile prior to start of chipping, so that fall of pile head can be ensured in the desired direction (opposite to chipper).
- After exposing the reinforcement and bending the same outwards, concrete block (concrete free from reinforcement) should be removed safely by farana/suitable equipment /manually under supervision of job engineer/supervisor of contractor.

Case Study-3

Brief description of Incident:-

- The victim along with fellow worker was engaged for de-shuttering works of RCC foundation when the incident happened.
- The victim was standing on the concrete surface by the side of the foundation and was trying to remove shuttering supports.
- Apparently due to recent rains, the soil condition might have loosened which could have resulted into collapse of side soil and the victim got stuck up in between the shuttering board and collapsed soil heap.
- He was immediately rescued by site personnel and shifted to Occupational Health Center by Ambulance.
- Subsequently, the victim was shifted to Apollo Hospital for medical treatment.

Photograph

Case Study-3

Probable Cause of Incident:

- Excavated loose soil was stacked nearby the excavated pit. Due to effect of the rain and/or activities being performed by the victim, the side soil collapsed into the pit.
- In previous day rain, the pit was filled with some rainwater, which might have weakened the toe of the excavated pit.
- This workplace was very near to main material entry road on which heavy vehicles were plying on regular basis which might have produced vibrations leading to weakening of the side soil.

Case Study-3

Lesson Learnt / Recommendations:

- Suitable side slope/step cutting to be adopted wherever excavation is carried out. Edges of excavated area to be protected by providing shoring & strutting.
- Excavated soil to be kept minimum 1.5 meter away from the edge of the excavated pit or removed
- Safety points mentioned in HIRAC/JSA for activity to be implemented at workplace.
- Avoid dividing/separation wall between two adjacent excavated pit/area. Further, deep excavation should not be kept open for a longer duration.
- Hard barricading to be ensured all around the excavated pit.
- Vehicles movement should be restricted minimum three meters away from the excavated pit. Hard barricading with warning signage to be ensured.
- Recent excavation/backfilling history of area to be known & shared among all concerned working crew and construction activities to be planned accordingly.

Case Study-4

Brief description of Incident:-

- Two workers were engaged in scaffold dismantling activity at 72.0mtrs height in Technological Structure.
- One worker (victim) has mistakenly dismantled the scaffold pipe in which he was anchoring his full body safety harness & got unbalanced resulting in victim fell down from 72.0mtrs height to ground level and sustained severe injury on his body.
- The victim was immediately rescued by nearby workers and shifted to Hospital by ambulance. However, he succumbed to his injuries.

Photograph

EXHIBIT-07

Photograph

Case Study-4

Probable Cause of Incident:

- The injured worker was engaged in scaffold dismantling activity along with one more worker.
- During the investigation, it was found that the injured person might have first opened farther side clamp and then the clamp of scaffolding pipe tightened with column and after that he might be trying to open the third clamp, before that he got unbalanced and fallen down, during falling some jerks might came on the scaffold pipe on which he had anchored his harness due to that the scaffold pipe got opened and his harness hook slipped from the scaffold pipe and he fell down to the ground.
- Non availability of secondary fall protection measures like Retractable type fall arrestor.

Case Study-4

Lesson Learnt / Recommendations:

- Job specific Tool Box Talk to be carried out by immediate supervisor prior to start the construction activity. In generic nature Tool Box Talk to be avoided.
- Specialized Training to be ensured among workers prior to deploy them at workplace for all critical activity.
- Erection / modification/ dismantling activity of scaffold to be carried out in sequential manner.
- Availability of secondary fall protection measures like Retractable type fall arrestor to be ensured.

Case Study-5

Brief description of Incident:-

- Pile boring work was under progress in Flare area by Hydraulic Rotary Drilling Rig, during this process a fault was detected in Radiator suction hose pipe by rig machine operator.
- The faulty Hose pipe was replaced & Mechanic checked Rig Machine for running & positioned the Kelley in vertical position thereafter operator switch off the Rig Machine & came out from the Cabin of the Rig Machine.
- During site visit in flare area by night shift supervisors, noticed that a fire caught in Rig Machine.
- Site Staff immediately tried to extinguish the fire by using the fire extinguishers but they were unable to control the fire & thereafter immediately intimated to Fire & Safety Dept., staff rushed to incident spot and controlled the fire by using the Fire Tender.

Photograph

Case Study-5

Probable Cause of Incident:

- Since Pile boring works by Hydraulic Rig was under progress in close proximity of running flare and after closing the day activity, Rig Machine was switched off and was left as is condition by the operator in unmanned position at the same working location.
- Therefore, Fire ball from Flare vertical riser might have fallen on the floor of Hydraulic Rig Machine, which must have been wet with diesel, a flammable substance, has resulted in fire inside the Hydraulic Rig Machine.

Case Study-5

Lesson Learnt / Recommendations:

- Hydraulic rig machine or any diesel /petrol driven equipment must be relocated/parked in safe location after completion of day activity.
- No equipment's/vehicles shall be kept in unmanned condition in flare area.
- Strict supervision by site supervisors/engineers needs to be implemented for work and also availability of supervisory staff must be ensured at all work places during changeover of shift.
- Arrangement of adequate quantity of fire extinguishers to be ensured at workplace to meet the any exigency.
- Regular inspection of equipment's to be done by experienced P&M Person.

EIL
THANK YOU