Dropped Object Prevention Scenario Guide

Construction work sites should have a Dropped Object Prevention Plan in place whenever risk assessments have identified a need, or scenarios with potential dropped objects have been identified. To guide teams in assessing potential scenarios and planning mitigation measures, we have put together this guidance. This list does not cover all potential scenarios and others may occur on your site.

The potential mitigation measures are a pick list for teams to use in preventing dropped objects. You should not depend on one barrier alone such as a toe-board but instead look for a combination of barriers which will prevent dropped objects.

1216443 – I&D services, Concept & Visualisation, Rijswijk. Version August 2017

Potential dropped objects can arise from many sources: scaffolding materials, hand tools, small objects (cell phones, nails, screws, washers, nuts and bolts, cameras, hard hats, water bottles), items lifted by cranes or hoists, plywood being used as hole covers, trash and debris, installation aids (clips, wedges, jack stands), welding rods, hoses, cords, cables and many more.

Please consider the threats to personal safety of all of these objects in different scenarios and take corrective actions.

For all of the scenarios, the following need to be considered:

1. The height at which you are working when creating your barricade zone; the higher you are working, the larger the barricade zone needs to be.
2. Wind loads: you should always verify wind loads when anything such as netting is added to temporary structures and or moving equipment.
3. The means of connecting tool lanyards must be inspected regularly to verify their integrity.

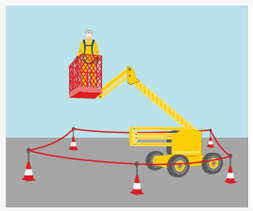
Dropped Object Scenarios

Upper level platforms with grated or solid flooring

Objects from Trailers during Loading/Off-Loading or Transport

Scaffolding building, dismantling or use

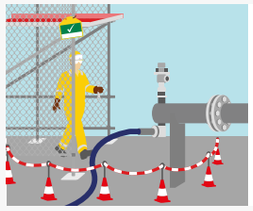
Materials Left After Jobs, Creating Dropped Object Potential



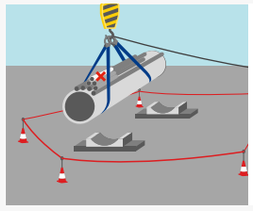
Man Lift Basket

Windy Conditions

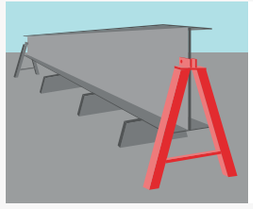
Carrying Materials to an Upper Level



Pedestrian Areas below Upper Levels

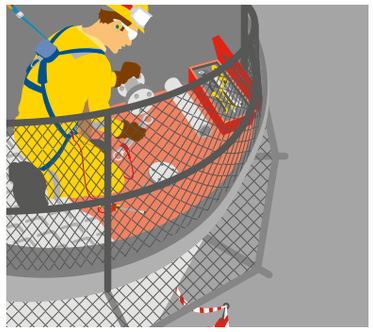


Materials Dropping from Cranes or Other Lifting Equipment



Girders, Beams, and Pipe Stands, etc.

Upper level platforms with grated or solid flooring



Potential Hazards

- Smaller materials falling through the grating or flooring
- Grating or flooring not secured and falling when shifted
- Materials falling from the edge
- Falling through or bouncing over/through handrail
- Unsecure tarps/plywood becoming a dropped object
- Materials bouncing off the flooring or wooden decks
- Open penetrations/drains in deck (existing and being created)

Potential Mitigation Measures

- Verify flooring is secure and anchored
- Plywood covering (manage weight and fire considerations) or fire blanket (sufficient size) covering work area
- Platform has standard handrails and toe boards in place
- Netting* on sides or handrails
- Use plywood or other materials to cover open holes that meets the CSSS open holes standard
- Tool lanyards used for all tools (includes cameras, phones etc.) not secured in tool pouch or container
- Baskets, or pouches for loose materials
- Netting* underneath the platform or around work area
- Use canvas (tarpaulins) of sufficient size
- Keep rain water issues in mind
- Consider smaller mesh grating
- Tether flooring materials properly when removing or installing
- Walk-abouts to identify potential issues
- Use correctly sized materials to cover open penetrations
- Cover penetrations, gaps and openings around pipes with tarpaulins or other material
- Beware you do not create tripping hazards with the mitigation measures
- Barricade around and below the open penetration if it can’t be covered securely

**or other materials that would catch or block a dropped object*

Scaffold building, dismantling or use

Potential Hazards

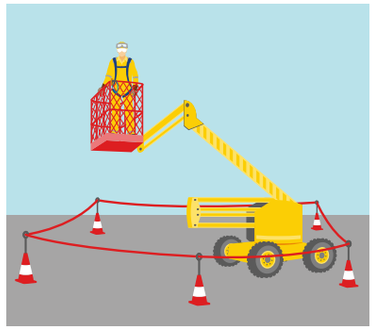
- Scaffold flooring not secure
- Materials going through scaffold flooring
- Materials falling on the outside of the edge
- Materials falling when being passed between workers or while building, modifying or dismantling scaffolding
- Tools and materials left in scaffold tubes
- Improperly built scaffolding
- Dropped tools or material as work is being performed from scaffolding.

Potential Mitigation Measures

- Ensure that scaffold has been inspected and tagged
- Use certified/qualified scaffold builders
- Follow scaffold tag requirements
- Verify the scaffold flooring is secure and has no gaps
- Netting* covering sides or handrails
- Tool lanyards used for all tools (includes cameras, phones etc.) not secured in tool pouch or container
- Baskets or pouches for loose materials
- Netting* underneath the platform
- Verify standard toe-boards are in place and properly secured
- Barricades/tape, covered walkways, procedures on hand-offs
- Mechanical lifting of scaffolding materials instead of manual handling
- Inspect horizontal scaffold tubes for tools and materials before dismantling – e.g. welding rods, pin bars, etc.

**or other materials that would catch or block a dropped object*

Man Lift Basket



Potential Hazards

A. Materials going through basket flooring
B. Materials falling from the edge
C. Materials hit by the basket getting knocked loose
D. Tools and other materials dropped as work is being performed
E. Parts from the man lift coming loose and becoming a dropped object

Potential Mitigation Measures

- Cover the openings in the flooring
- Netting* covering sides or handrails
- Tool lanyards, baskets, or pouches for loose materials
- Barrier tape with cones on the perimeter of the lift area
- Netting* around work basket (verify that this is done in a manner that does not prevent safe exit or impact wind load)
- Inspect the man lift for loose bolts or materials prior to use

**or other materials that would catch or block a dropped object*

Carrying Materials to an Upper Level

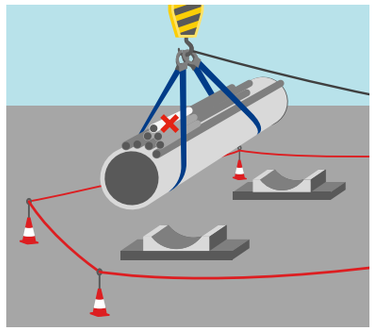
Potential Hazards

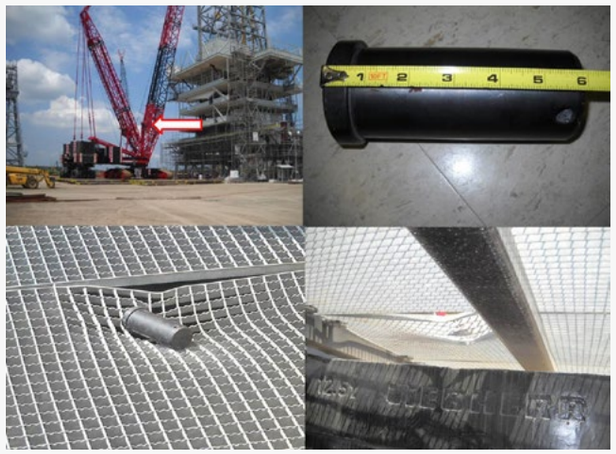
A. Dropping materials as you are moving
B. Materials coming out of pockets as you climb
C. Materials getting blown from the wind causing you to lose your grip
D. Ladder cages catching items in your pocket or bag causing them to fall

Potential Mitigation Measures

- Getting help for larger materials, using buckets, pouches, etc. for loose items
- Use of tool tether and lanyards
- Use of small tool/equipment baskets to lift by crane to elevated areas
- Use of certified guide pole with appropriate lifting bags
- Use of proper scaffolding staircases instead of monkey ladders
- Equipment and material in special containers are the worksite

Materials Dropping from Cranes or Other Lifting Equipment



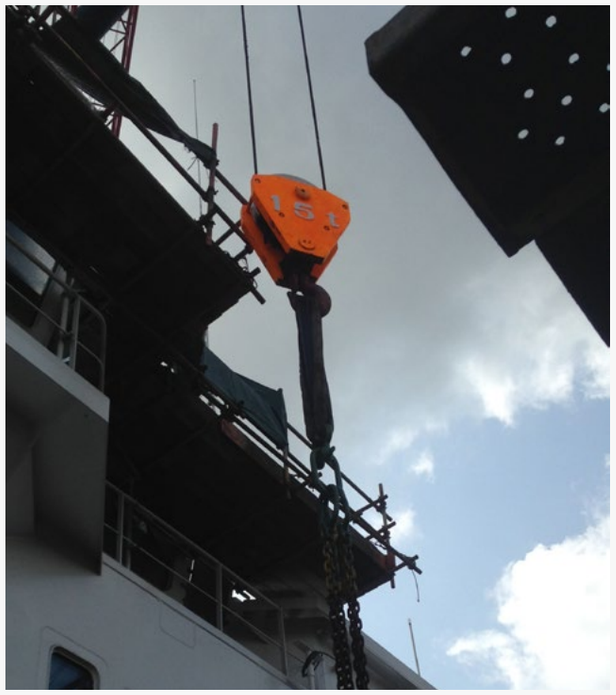


Potential Hazards

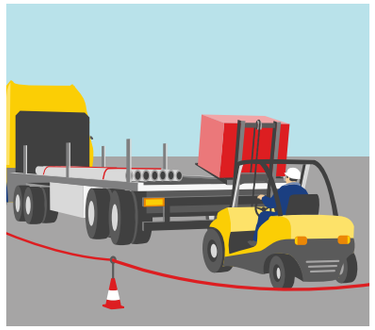
A. Rest pads, bolts, other ancillary equipment coming loose and falling
B. Equipment getting caught/hung-up or striking an object during lifting
C. Lifting equipment failing during lift
D. Dirt, debris, and other materials left in or on the lifted material

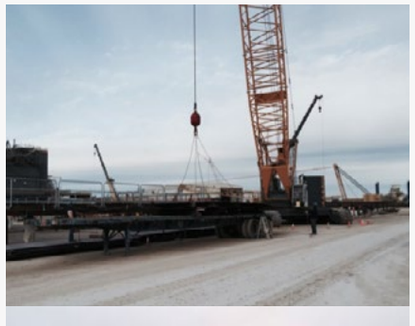
Potential Mitigation Measures

- Inspection of equipment at regular intervals
- Tethers on potential dropped objects
- Verify lift path for obstructions
- Verify tagline will not get hung up on equipment
- Include blind spots in pre-lift discussions or JSA
- Verify no loose materials are on the equipment being lifted
- Sufficient barricading
- Dedicated lifting crew
- Proper use of lifting baskets or proper rigging techniques to secure load
- Lift plan that includes dropped object potentials and wind loading



Objects from Trailers during Loading/ Off-Loading or Transport





Potential Hazards

A. Materials falling from the edge
B. Mobile equipment (i.e. forks) striking, knocking over or pushing material from the trailer
C. Unsecured, improperly secured, or unbalanced load falling from the trailer
D. Small tools left within load
E. Materials shifting due to trailer not being on level ground
F. Materials being moved knocking other materials off the trailer
G. Dunnage, other packing materials, and load securement materials falling from the trailer
H. Road debris (i.e. ice, mud, etc.) build-up on materials during transport
I. Equipment on rollers or wheels moving

Potential Mitigation Measures

- Visual inspection prior to and after loading and off-loading
- Verify no shifting of the load due to unlevel ground
- Inspect for loose items (tools, ice, mud, etc.) in or on the equipment and load
- Spotters in place to assist forklift or crane off-loading, with focus given to load or fork collision
- Barricade or control access to the area around the trailer
- Manage the area to ensure everyone remains a safe distance from the load (Line of Fire)
- Ensure loads are properly secured prior to departure, taking into consideration potential for load tipping/falling

Materials Left After Jobs, Creating Dropped Object Potential

Materials that were found and removed from site during a Hazard Hunt

Potential Hazards

A. Welding rods, debris, slag, grinder discs, boards, nails, bolts, nuts, metal waste, etc.
B. Lifting appliances such as chain hoists, etc.
C. Scaffolding materials that are left loose

Potential Mitigation Measures

- Walk about hazard hunts to identify potential for dropped objects
- Supervisor walk about to verify an area is safe prior to the end of the shift
- Training and pictures on what not to leave
- Make use of proper waste bins at height, not plastic bags
- Dedicated working at height housekeeping crew
- Reduce material stored at elevated areas, like scaffolding etc.

Example of bad practice

Windy Conditions

Potential Hazards

A. Unsecure objects that can be blown off platforms and structures
B. Unsecure objects that can be blown off of yourself or other workers
C. Materials laying on unsecured tarps or plywood which lifts in the wind
D. Scaffold or structures failure due to wind load from tarp use

Good practice of lanyard use

Potential Mitigation Measures

- Hard hat lanyards
- Chin straps
- Equipment tie downs
- Hazard hunts
- Weather or high wind policy

Pedestrian Areas below Upper Levels

Potential Hazards

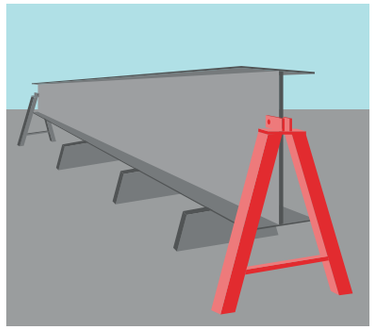
A. Falling materials when walking in the area
B. Inadequate cover materials (strength and size)
C. Barricades restricting ingress and egress

Potential Mitigation Measures

- Covered walkways, barricades/tape
- Netting* over the area
- No-go areas clearly marked
- Pedestrian areas should be verified prior to barricading

**or other materials that would catch or block a dropped object*

Girders, Beams, and Pipe Stands, etc.



Potential Hazards

A. Steel members falling on top of someone
B. Materials left on girders when lifted
C. Mobile equipment striking or knocking over material
D. Inadequate amount or improper placement of stands
E. Improperly sized stands (weight and size)
F. Domino effect (materials stored in close proximity)
G. Storage base or flooring failing

Potential Mitigation Measures

- Securing the ends with supports
- Clearing off materials prior to lift
- Controlling the lift area
- Base meets proper height and width ratio or use of stands
- Match the proper stand or storage base to the material (weight and size)
- Use of spotters with mobile equipment
- Use of barricading where applicable