



MAIN FOUR HAZARDS

The top four hazards in construction that attributed to the majority (90%) of construction deaths and injured workers across America are; Fall Hazards, Electrical Hazards, caught in Hazards and Struck by Hazards. E Light will strive to provide a safe and healthful work place for its employees and subcontractors, to the extent that this outline was developed. E Light superintendents will conduct frequent and routine job site audits to provide compliance, awareness, and if necessary enforcement to reduce or eliminate these risks in accordance with the Safety, Health, and Environmental Program. (SHEP.) The Director of Safety and Loss Prevention will ensure that the Four Main Hazards are the subject of Weekly Safety Talks regularly and that they are posted on the Trello communication boards. The Director of Training will ensure that the Four Main Hazards are included in Apprentice curriculum, Continuing Education Curriculum and are part of ongoing training efforts.

OBJECTIVE: The intent of this police is to provide an outline of the four main hazards, so employees will recognize and understand the top four hazards, and how to correct the conditions pro-actively before an accident or incident happens.

The four hazards, in order, that attribute to the majority of fatalities and injuries in construction are:

- 1) Fall Hazards
- 2) Electrical Hazards
- 3) Caught in Hazards
- 4) Struck by Hazards

Each hazard category will have a general overview; the rule; the standard; and common errors or violations.

FALL HAZARDS

Fall hazards include falls on the same level and falls from heights. Fall hazards alone account for one third of construction deaths in America.

Falls on the same level are normally from slips or trips caused from housekeeping issue, debris, ice, snow or an un-level working surface. Normally, a person falls on to something that causes them harm, such as materials, trash, bracing, debris, or their own tools worn on their waist. Injuries include but are not limited to puncture wounds, impalement injuries, broken ribs causing internal damage, or head injuries. Any of above situations can lead to serious long term injuries or death

Falls from heights are usually caused from losing footing, loss of balance, walk



platforms too narrow, or platforms that are too weak to hold the weight. Possible injuries that can occur from this type of fall include: paralysis, broken bones, internal injuries, impalement, head injuries, and impact injuries. Any of these falls can lead serious long-term injuries or death.

In many cases, an employee that has taken a fall must be under medical care for the first several days. The trauma to the internal organs must be monitored, as the trauma can cause an organ to swell, malfunction, or stop working, causing a delay in the outcome.

A condensed version of the OSHA rules:

- Walking and working surfaces must be kept clear of scrap and debris at all times.
- A ramp or stairway must be provided anytime there is a break in elevation over 19 inches high.
- Work platforms must be at least one unit wide. A unit found in the UBC is a minimum of 18 inches wide.
- Nails protruding from lumber must be removed or bent over. Impalement hazards such as rebar or bolts must have protective caps. Note: for work on same level, standard mushroom caps are sufficient, however, if working above the rebar, you must have impalement proof caps.
- General Fall protection on walking or working surfaces for General Industry is four (4) ft.
- General fall protection for walking or working surfaces for Construction is six (6) ft.
- Fall protection on Scaffolding is ten (10) ft. Work should be stopped due to weather.
- Fall protection for steel erection is 15 to 30 ft. or two stories whichever is less.
- No employee can walk an exterior wall. Employees in residential construction can however, walk interior walls. As the walls are set into place, so must fall protection on all wall openings and floor openings. A floor opening is any floor hole greater than 2" X 2". The protection can be a guardrail or cover. If a cover is used it must be secured in place and marked
- The employer such as scaffolding, ladders, or sawhorses, to gain access to set floor joist or roof trusses, must supply alternate means of egress.
- For roof sheathing and roofing the most efficient, economical, and easiest way is the use of a harness, rope grab, rope and anchor.

ELECTRICAL HAZARDS

Electrical hazards include: electrical shock, electrocution, and secondary injuries such as pull away injuries. These injuries are caused by:



Power tools not wired correctly or just wearing out and not having a proper grounding path, causing an electrical shock to employee and possibly secondary injuries, such as a fall.

Improper strain relief

Employee winds cord and strain relief is not provided causing live ends to pull off terminal screws and shock employee. Several cases having secondary accidents cause the employee to pull back, fall, fall from height, or strike objects with limbs.

Frayed or exposed live parts

Hazards are electrocution, shocks, and secondary accidents.

No GFCI or bad GFCI protection

GFCIs are normally used on 15 and 20 amp breakers. The thought is the GFCI will trip within 5 milliseconds or less, protecting from electrocutions. In buildings or structures that have permanent power, construction persons may use one tool plugged directly into the outlet. However, continuity checks must be made on the power tools to insure they are wired and working properly. If an extension cord and power tool or two power tools are used a GFCI must be used.

No employee can be exposed to live parts of electrical equipment over 50 volts. This includes: breaker boxes, power tools, cords or any electrical equipment. This means two forms of protection must be provided. An example would be, outer insulation and inner insulation of an extension cord. (Double insulated tools)

All lights for construction less than seven (7) ft. from the floor or working surface must be protected from accidental contact. It must be fully enclosed by a guard and/or glass, or a cage.

Cords or electrical equipment with reverse polarity, cause the tool to wear quickly and expose the operator to unnecessary risk of electrical shock and secondary accidents.

Temporary wiring must be correctly protected, wired correctly and be an approved SO insulation.

Overhead power lines

Coming into contact with overhead power lines can cause electrocution, and secondary accident. Employees and equipment must stay a minimum of 10 ft. from any overhead power line.

Underground power lines

Employees must call for locate and take additional care when digging, drilling, or trenching.



CAUGHT IN HAZARDS

Caught in or caught between hazards are cave ins, unguarded machinery or equipment. Each contractor needs to perform a pre-operation check on their work area, power tools, equipment and machinery to ensure that guards are in place and working properly.

TYPES OF GUARDING:

Chip Screen, or shields are freestanding screens used as safety barriers against flying chips, objects and scraps, made from metal, expanded metal, or canvas.

Eye Shields made from metal frames with glass or plastic windows used on abrasive wheel machines, routers and like machines.

Perimeter guards protect the perimeter of a machine, operation or dangerous task. In construction barricade tape, caution tape and alike are used to protect controlled access zones, areas below work taking place, and when dangerous equipment or machinery are being used. An example would be providing tension on post tension cables.

Abrasive wheel guards are normally made of metal and fully or partially enclosed, to keep the operator from coming in contact with the spinning wheel. The guards keep flying particles from striking the operator, or nearby workers. It also keeps the wheel contained if it malfunctions and blew apart.

Saw guards are normally made of metal or heavy plastic. They cover the saw blade to keep the operator from coming into contact with the moving blade. The guard keeps the flying particles contained and directed, as not to strike the operator or a nearby worker. The guard also keeps the saw blade contained in case a tooth flies off or breaks apart. Most guards come in two parts, an upper and lower. They are marked with the direction of the blade and normally only half of the guard is movable and should work freely.

Belt pulley, rope, chain and sprocket guards, shaft, and gear guards, are normally made of metal, expanded metal, or heavy plastic, designed to keep the operator from coming into accidental contact with moving parts and nip points. They are also designed to contain broken or flying parts of the equipment. If chain breaks the guard will keep the chain contained and not strike the operator or nearby worker.

Operator guards are made of metal, plastic, or glass, designed to keep the operator from coming in contact with the machinery or the moving equipment parts. Example, a bobcat skid steer, has operator guards on both the left and right of the operator. Without the guard, the operator could put his head out the side of the skid steer and lower the bucket or arms down, putting his head in a pinch point between the frame of the bobcat, and the bucket arms. Roll over protection is another good example of operator guarding.

Drills, routers, planes and other small moving parts. Most of these guards are made of metal or plastic. They are designed to keep the operator from coming into contact



with the moving piece. They also help the control of flying particles most are very high speed.

General guarding, of moving, spinning, rotating, pinching, cutting and shearing parts of equipment or machinery must be guarded to keep employees from accidentally coming into contact with a dangerous condition. Other items to be guarded would be fan blades, transmissions, fly wheels and other similar items.

Shoring or trench boxes are normally made of metal, aluminum or wood and are designed to protect workers in excavations, by keeping the collapsing soil from covering the workers. They are also designed to keep debris from being kicked in, or falling on top of workers. In place of shoring, contractors can slope the walls of the excavation depending on the type of soil. Example: class A soil 3/4 to 1 angle or 53 degrees, class B soil at a 1 to 1 angle or 45 degrees, and class C soil at 1 2 to 1 angle or 34 degrees. To obtain the angle on the sidewalls benching is allowed in class A or B soil but not in type C soil. (See 29 CFR 1926.650)

NOTE: Most manufactures supply the equipment and machines with proper guarding, however, there are some that do not. You can buy pieces of equipment without proper guarding, best practice is to always checking.

STRUCK BY HAZARDS

Struck by hazards include falling objects and vehicles. The injuries from struck by hazards are impact injuries, crushing injuries head injuries and multiply trauma injuries, and several are fatal.

- Traffic control persons must face oncoming traffic.
- Employees must use toe-boards if items, tools, equipment, or material can fall to below.
- Employees must wear hard hats.
- Employees exposed to vehicular traffic must wear a reflective warning vest.
- Areas below workers must be barricaded off.
- Floor holes should be guarded or covered as not to allow items to fall to below.
- Controlled access zones or controlled decking zones clearly marked.
- Spotters should be used when backing up.
- Back up alarms must be used and in good working order.
- Rigging must be pre-inspected prior to use.
- All employees shall be kept clear of loads about to be lifted and of suspended loads. (29 CFR 1926.550 (a)(19))
- Tag lines should be used to control the load.



- Lifting should be stopped due to bad weather.
- All employees should be trained and qualified. This is a performance standard the company decides how to train and who is qualified to complete the task safely.

NOTE: Most of the above are performance standards; the competent person must determine what to do in specific situations. However, a few guidelines do exist; an example would be for bad weather, in the STD 3-01 A. It specifies to stop work when the wind reaches 40 mph, or if lightning is within 1/4 mile.

It is understood that this outline is to provide a brief understanding of the four main hazards and does not take the place of each individual safety policy. For more information, review the individual policy or standard. (Example: for information on fall protection see the fall protection policy or fall protection standard 29 CFR 1926.500.)

MOST COMMON CITED VIOLATIONS

1. Fall Protection in Construction (1926.501)
2. Hazard Communication (1910.1200)
3. Scaffolding in Construction (1926.451)
4. Respiratory Protection (1910.134)
5. Lockout/Tagout (1910.147)
6. Powered Industrial Trucks (1910.178)
7. Electrical – Wiring Methods (1910.305)
8. Ladders in Construction (1926.1053)
9. Machine Guarding (1910.212)
10. Electrical – General Requirements (1910.303)