



the human energy company™

MSW Initial/Refresher
Training:
Work at Heights

Work at Heights Standard

Purpose and Objectives

Purpose

The purpose of this standard is to ensure that all Work at Height is performed in a safe and controlled manner at Chevron facilities.

Objective

- Work at Height procedures are designed to help prevent potential injury or death resulting from falls from height in excess of 6 feet or 2 meters (4 feet or 1.2 meters for locations in the United States).
- Work at Height is defined as work performed where there is a potential for a person to sustain injury by falling from one surface to another surface that is not at the same level, including below ground level or while gaining access or egress (excluding staircases and fixed ladders).



Introduction

Work at Height includes, but is not limited to:

- Work over excavations (e.g., pits, trenches).
 - fall prevention and/or protection are required when working at the edge of or over an excavation or pit where the base of the excavation or pit is deeper than 6 feet or 2 meters (4 feet or 1.2 meters for locations in the United States - *1910.28 OSHA update Nov 2016*)
- Work over water.
- Work at elevations with unprotected sides or edges.
 - a fall hazard such as on building roofs and storage tanks that do not have standard guardrails.



-Work on top of Tanker Trucks, Isotainers and Rail Cars.

-Work over or near surfaces containing holes or openings (e.g. skylights), or where there is a possibility to fall through a covered surface (not designed to be walked on such as skylights).

-Elevated work over dangerous or sensitive equipment (moving parts, electrical equipment).



Introduction

There are two ways that we protect ourselves from the risk of falls:

- Fall **Prevention**
 - Permanent (i.e. permanent railings)
 - Temporary (i.e. scaffolding)
- Fall **Protection**
 - harness and lanyard

In general, which is better fall prevention or fall protection?

- Fall prevention if and when safeguards are designed and built perfectly in order to adequately safeguard the worker.
- Where feasible, eliminate the need for elevated work through design or facility modifications, or through the installation of permanent platforms with all necessary fall protection provided (e.g., handrails, toe-boards, drop bars, etc.).
- We also have administrative controls that help guide us in how to do the work safely, such as:
 - Work Permits
 - Work Instructions
 - JSAs
 - Work at Height Standard
 - Ladder Policy
 - Safety in Designs manual
 - Chevron Engineering standards



Work at Heights

Roles and Responsibilities

Person conducting Work At Height must:

- Know the scope of work and procedures to be followed
- Inspect the specific work-at-heights equipment being used (for example, ladders, scaffolds, mobile elevated work platforms, fall-arrest systems, etc.) before use
- Use and operate the specific work-at-heights equipment being used in accordance with the manufactures instructions and the Work at Heights SWP Standard
- Stop the work if unsafe conditions develop



Safety Standby for Fall Arrest System

- Knows the work planned and the hazards involved
- Ensures that the person working at height is wearing their harness properly and they are secured to the structure
- Remains at the immediate work area when the person is working at height.
- Maintains visual contact and communication with the worker at all times
- Does not leave the area unless replaced by another Safety Standby
- In case an emergency develops, use a radio or other means to call for help before attempting rescue
- If filling a dual role as a rescue person, meets all the requirements of a work at height rescue person and ensures that rescue equipment is immediately available
- **Stops the work** if unsafe conditions develop

Work at Heights

Roles and Responsibilities

Rescue Personnel for Fall Arrest System

- Reviews the pertinent information (for example, any permits) to determine hazards and appropriate mitigation measures prior to rescue
- Considers own safety before that of the victim
- Reviews the rescue plan prior to rescue
- Packages to victim appropriately for removal given the nature of the work at height, the hazards involved, and the injuries sustained by the victim
- During rescue, never allows the fallen worker to lay on the ground.
- Sends anyone who they think may have suffered suspension trauma to hospital.
- Stops the work if unsafe conditions develop



Work at Heights Standard

Control of Work & Hazard Analysis Requirements

Permitting requirements:

- All work at height that is non-routine work or periodic work, for which written operating procedures do not exist, requires permit authorization via the General Work Permit.
- It is the responsibility of the Person performing Work at Height to obtain the necessary work permit where required and to perform all work in accordance with the instructions on the General Work Permit and work form.
- Other high-risk work may be occurring when work is occurring at height. Determine if additional work forms or documentation are needed based on the hazard assessment.

Hazard Analysis requirements:

- Working at heights requires a Hazard Analysis to be completed.
- Hazard Analysis will identify any significant potential hazards, any other simultaneous operations, the need for safeguards such as gas testing, the need for any additional permits or prerequisites that may be required for additional safe work practices procedures involved in the work activity.
 - a) Any equipment and tools being taken aloft must be considered as a potential falling object.
 - b) Housekeeping requirements for work at heights must address the hazard of falling objects.
 - c) A warning line system, fall protection/prevention or similar control shall be used when working within 6 feet or 2 meters from an unprotected edge (i.e., without a standard guardrail.)



Work at Heights Standard

Fall Prevention and Fall Protection

Fall Prevention

- Engineered and permanent barriers to *Prevent* a person from falling.
 - These typically take the form of walls, guardrails and other fixed barriers.
- Design allows the Operator, Maintenance or Contractor to conduct their work safely without having to set up scaffolding, put on a harness and lanyard, etc. When designed correctly, it is the safest method of protecting the worker aside from conducting the work at ground level.
- When designing our facilities or making changes to our facilities, it is critical to use the MOC process and to follow the Technical Codes and Standards. At a minimum, we must adhere to the Chevron Engineering Standards. Links below for help finding the on design standards:
 - [Chevron Engineering Standards](#)
 - [Safety in Designs](#)

Fall Protection

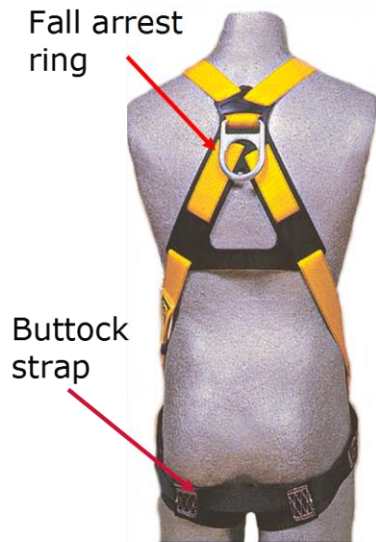
- Fall protection is a system of equipment that *protects* a worker from hitting the ground *after* they have fallen.
- A fall arrest system is comprised of:
 - Anchor points and lifeline systems
 - Harness
 - Lanyard
 - Other components, such as connectors
- Personal fall arrest systems shall be inspected prior to each use for wear, damage and other deterioration, and defective components shall be removed from service.
- Must be certified (at least) every two years.
- Anchorage points shall be tested in accordance with a recognized standard and/or approved by a qualified or competent person to verify that the points are secure and can support the required load.

Fall Protection

Fall Protection Harness

Is there a proper way to wear a Harness?

- The chest strap must not be too high nor too low. Should be around the middle of chest.
- The fall arrest clip or D clip must be positioned at the bottom of the shoulder blades
- The leg straps must be adjusted. The user's hand should not be able to fit completely under them.

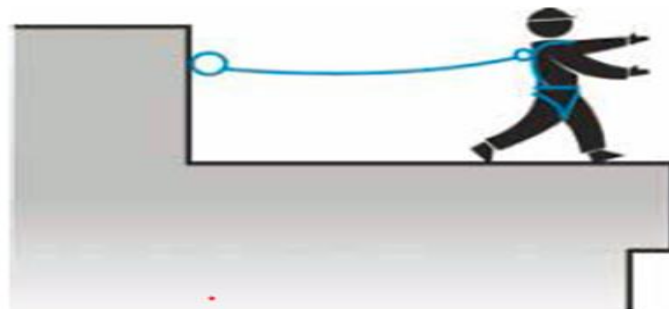


Fall Protection

Fall Protection Lanyard

Fixed Lanyard

- This style is used for fall restraint (see top picture) to keep a worker inside a protected area such as inside of a scissor lift, and does not allow the worker to leave that area



Shock Absorbing Lanyard

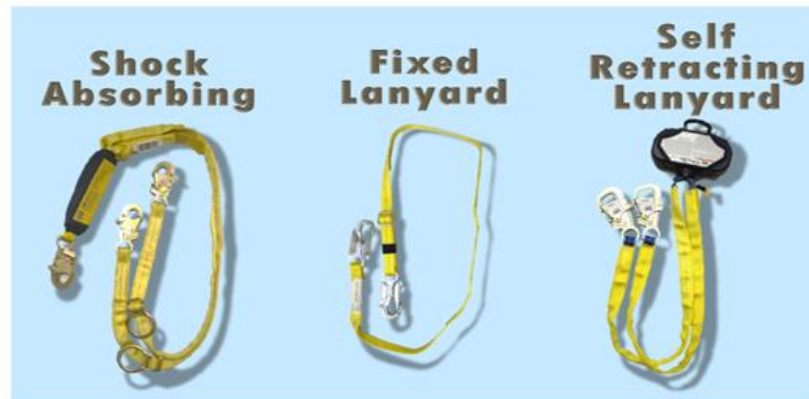
- This style of lanyard is used for fall arrest (see middle picture) when the worker is at least 6 meters (18 feet) above the ground or other hazard



Self Retracting Lanyard

- This style of lanyard is used for fall arrest (see bottom picture) and can be used at any height
- The shock absorbing and self retracting lanyards show 100% tie off styles
- Enables a worker to tie off to a second anchor point before disconnecting from the first one. A worker cannot disconnect from one anchor point before they tie off to the new one.

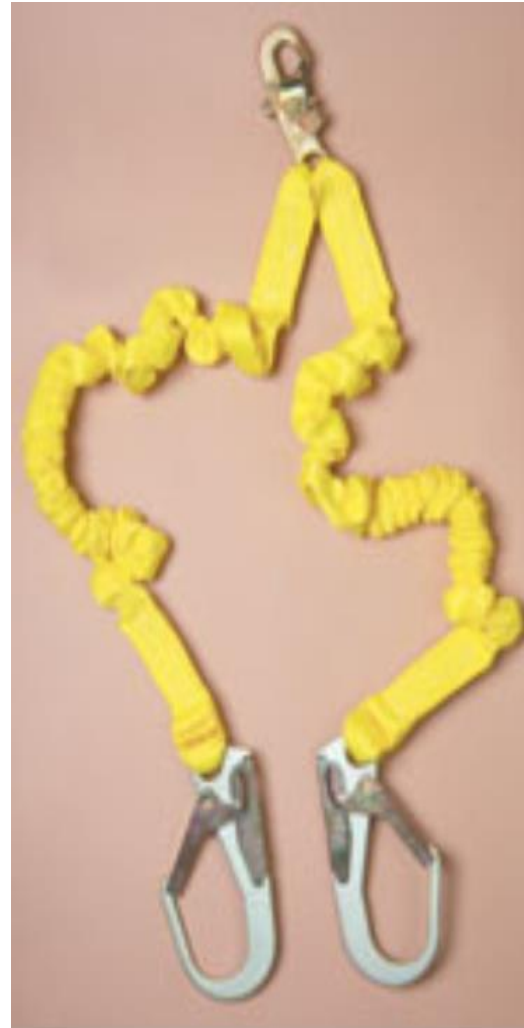
Worker must ALWAYS be connected!!! 100% tied off at all times!



Fall Protection

Shock Absorbing Lanyard

- A shock absorbing lanyard is made of material sewn together
 - When a fall occurs, the stitches come apart and the lanyard stretches while absorbing most of the dynamic force
 - Most shock absorbing lanyards stretch an additional 1.2 m (4 ft)
-
- 100% tie off version
 - Enables a worker to tie off to a second anchor point before disconnecting from the first one
 - Clip to D Ring on worker's body harness
 - Note: we must never tie a big clip to the back D ring

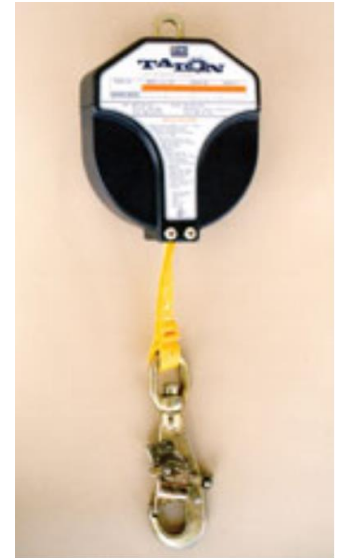


Fall Protection

Self Retracting Lanyard

Self Retracting Lanyard

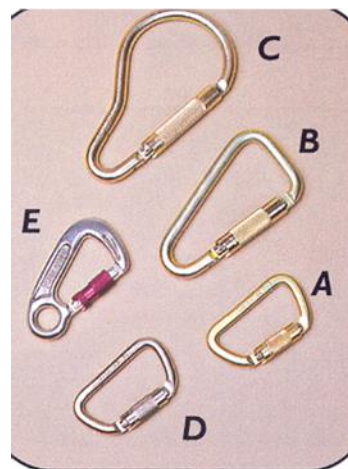
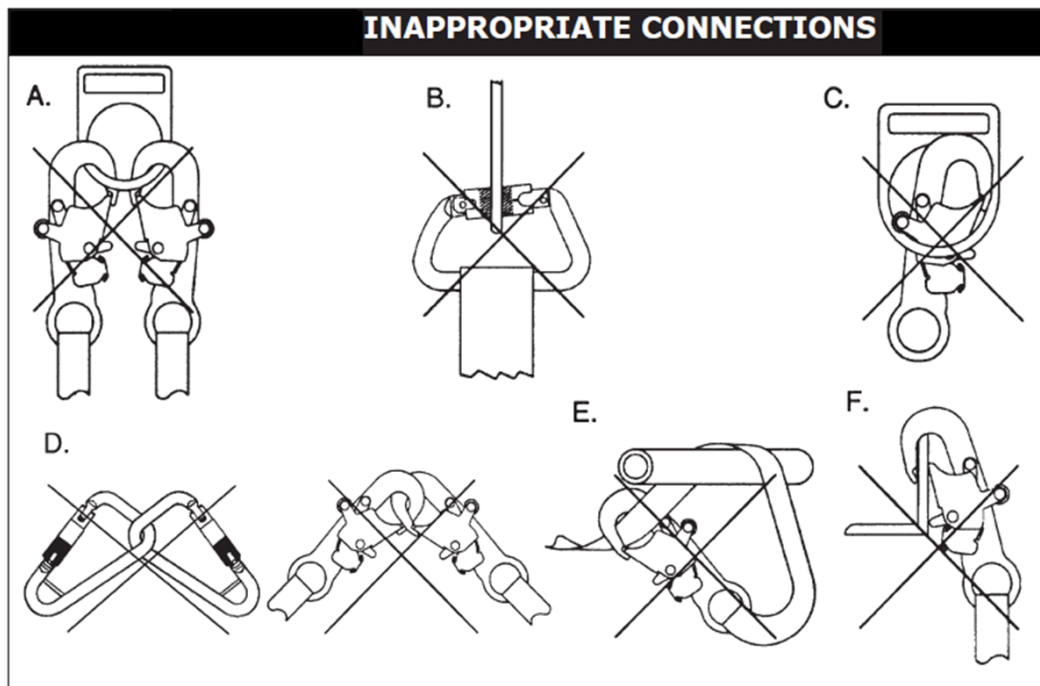
- Similar to the seat belt mechanism in a car
- Must not be used with a shock absorbing lanyard, WHY?
- Usually stops the fall within 15 cm (6 in) to 60 cm (24 in)
- Must be installed above the worker otherwise it will be overly stretched and the worker will be involved in a pendulum fall and/or could also possibly hit the ground
- 100% tie off versions



Fall Protection

Hooks and Clips

- Must automatically lock and must be checked to ensure it IS locked
- Two clips must never be attached together, the force could break their mechanism
- The clips of a locking type must always be clipped to a larger ring such as the back D ring



Fall Protection

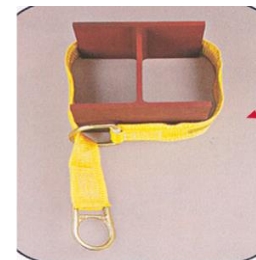
Anchor Points

Anchor Points

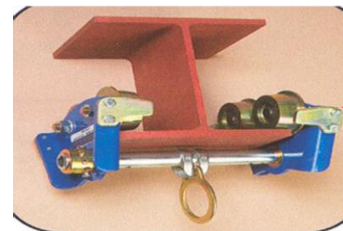
- Must be engineered to resist a dynamic force of 22.2 kilo Newton's or 5000 pounds
- Where feasible, the anchor point should be above the "D" ring of the harness the person is wearing
 - If it is not feasible, an evaluation must be conducted to see if the anchor point is suitable to protect the worker. This must be documented in the Hazard Analysis
- What about situations where there isn't an engineered anchor point?
 - This must be carefully considered during the Hazard Analysis phase of the project or task. The involvement of the plant OE Specialist and Engineer is critical to ensure that the right anchor point is selected. If it is not clear that there is a suitable anchor point available, then Stop Work Authority must be used.

Using I-Beam as Anchor Point

- Never tie off the lanyard on a beam, never make a knot in it, use a connector (arm strap)
- Protect your lanyard with a padded pass thru connector
- If you must move with the self-retracting device, you can attach it to a sliding beam anchor



Must have a padded pass thru tie off



Sliding beam anchor

Fall Prevention

Scaffolds

- Scaffolding should only be erected, altered and dismantled by competent persons who have the appropriate training, experience and qualifications
- Depending on the type of work, site conditions and workload, scaffolding may be freestanding, hanging, suspended, mobile or special
- The type must be selected to suit the intended purpose
- These must have complete floors, edge protection, safe access and egress
- There must be systems in place to prevent tools and equipment from falling.

A competent person must:

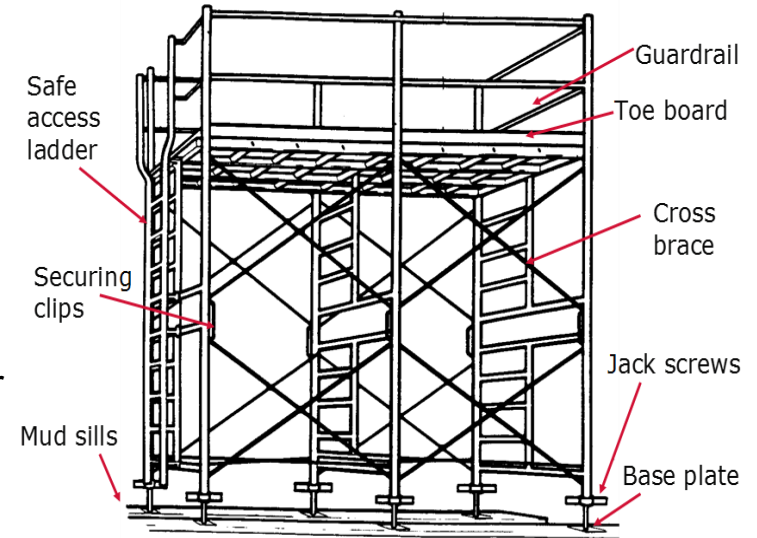
- a) Inspect the parts of the scaffold before assembly and decide if they can be repaired or must be replaced.
- b) Ensure components of scaffold match
- c) Choose the proper anchorage point for the workers assembling and dismantling the scaffold
- d) Ensure that only trained personnel erect, work on and dismantle scaffolds
- e) Supervise the assembly of the scaffold
- f) Decide how to secure the scaffold to the structure if required
- g) Supervise the dismantling of the scaffold



Fall Prevention

Scaffolding Components & Hazard Analysis

- Scaffolding must be plumb and level.
- Scaffolding must be complete with all of the components listed at right.
- Scaffolding should only be erected, altered and dismantled by competent persons who have the appropriate training, experience and qualifications for that particular job
- Scaffolding must be certified as complete and safe by a qualified person
- Scaffolding must be inspected by a competent person prior to use each day.
- If the scaffolding is greater than two sections high, the access ladder must be within the confines of the scaffolding instead of on the outside as shown at right.



A hazard analysis should also identify:

- Maximum loads that will be imposed upon working platforms, and on the scaffold as a whole
- Suitability and stability of the ground condition where the scaffold is to be erected
- Specific methods and locations for tying the scaffolding to the permanent structure with which it associated.
- Falls during scaffold construction (Always wear fall protection equipment [such as a safety harness and lanyard] when erecting any scaffold over 3 meters [10 feet] or where a fall from any height could result in harm.).
- Any additional bracing that may be required for the safe erection, use, and eventual disassembly of scaffolding
- Any overhead obstructions when workers are working on the scaffold.



Fall Prevention

Scaffolding – Design, Erection and Maintenance

The following general criteria apply to the design, erection, maintenance and inspection of scaffold:

- Access ladders to be secured to the scaffolding structure
 - Scaffold design to be appropriate to the purpose of the structure
 - protected from approaching vehicles.
 - kept approximately 6.2 meters away from overhead power lines.
 - Parts from various manufacturers must not be mixed and there must not be parts missing, twisted, badly rusted or bent.
 - Stop working on the scaffold during storms and high wind (say > 20mph).
 - Never work on a scaffold during lightning storms.
 - Fixed scaffolds will be inspected by a competent person on completion and then routinely inspected:
 - a) Prior to each work shift
 - b) Following any modifications
 - c) Following severe weather
 - d) Following any incident that could affect the scaffold's structural integrity
- Never work on scaffolding that resembles the picture at right!

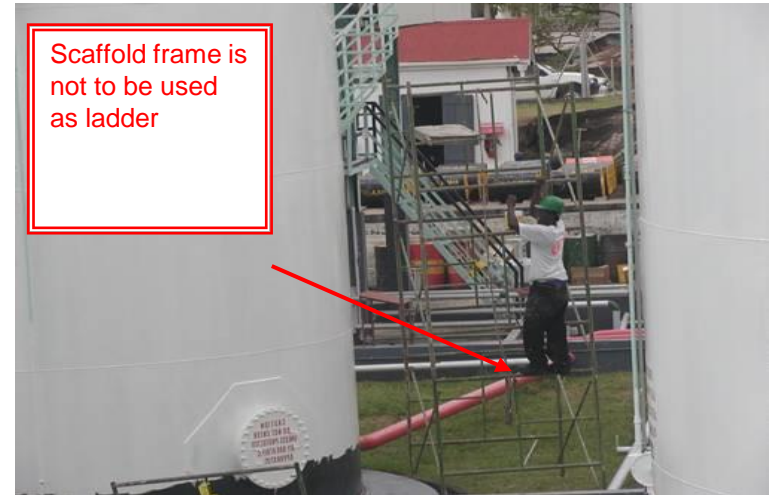


Fall Prevention

Scaffold Access Ladder and Guardrails

Access Ladder

- The frame of the scaffold is not a safe ladder
- The frame can **only** be used as access by the workers assembling the scaffold. However, these workers need to be protected against falls.
- The best are clip-on ladders and guardrail gates that can open, enabling the worker to access freely on top of the scaffold.



Guardrails

- Guardrail posts and rails capable of supporting at least 90 kg (200 lbs) in the center of the span.
- The top rail between 0.9 and 1.1 m (42" \pm 3") high, the mid rail halfway on the inside of the posts.
- Toe board min. 9 cm (3.5") high fastened inside of posts.

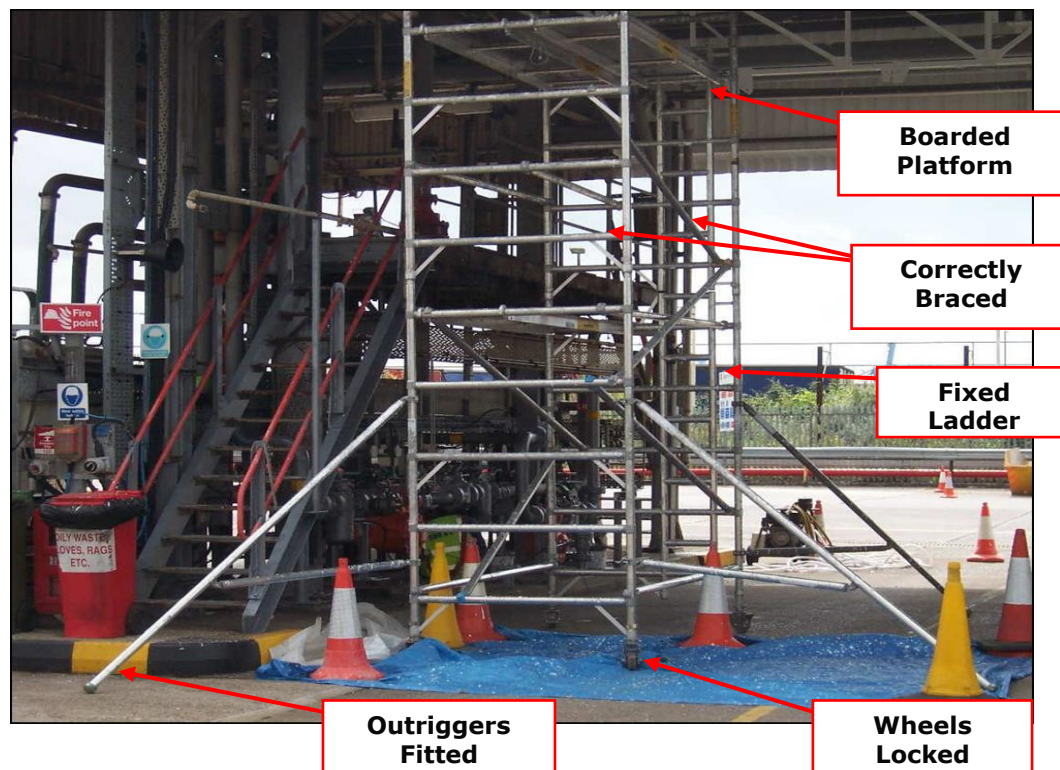


Fall Prevention

Mobile Scaffold Platform

The following additional criteria apply to mobile scaffold platforms:

- Swivelling casters with brakes will be secured to the uprights
- Foot ties are as close to wheels as practicable
- Stacked materials are secure, and brick guards are used where appropriate
- No riding is permitted on a mobile scaffold when it is being moved
- Wheels are locked correctly when the tower is in use
- No workers/materials on board while moving
- Watch for obstructions/hazards overhead when moving.



Fall Prevention

Scaffold Tags and Inspections

- Scaffold tags must be used to communicate any hazards or requirements when using the scaffold. Every scaffold must be tagged at each entry point onto the scaffold (typically at each ladder and/or stairway).
- The initial inspection and qualification will be done by an SME on scaffolding (usually an employee of the company who erected the scaffolding). Daily inspections will be done by a competent (someone with the knowledge of scaffolding requirements who is on the crew who will be using the scaffolding). Tags shall be used to indicate the safety status of the scaffold.
 - Green “SAFE FOR USE” Tags will be hung on scaffolds that have been inspected and are safe for use.
 - Yellow “CAUTION” tags are used whenever the scaffold has been modified to meet work requirements, and as a result could present a hazard to the user, this tag also informs the user of any fall requirements devices that may be needed.
 - Red “DANGER - DO NOT USE” tags will be used during erection or dismantling when the scaffold is left unattended and replace all green and yellow tags in the event a scaffold has been deemed unfit for use
- Daily inspections are noted on the designated inspection tag or in the designated space on the back of the green, yellow and red tags. The tag remains on the scaffolding until removed by the SME.
- If anything is found to be unsafe, then the worker must notify their supervisor immediately



Fall Prevention

Scaffold Tags and Inspections

- What to look for when conducting daily inspections:
 - All framework is complete, level and plumb
 - All clips and other securing devices are locked in place
 - Complete floor with no more than a 1” (25 mm) gap between boards. All flooring is secured to the frame to prevent movement
 - Top and midrail, and toe boards are in place
 - No damage to any component
 - No additional hazards present or Simops that weren’t identified prior
 - Barricading or other to prevent dropped objects.
 - Is a tag in place stating that it is ok to use

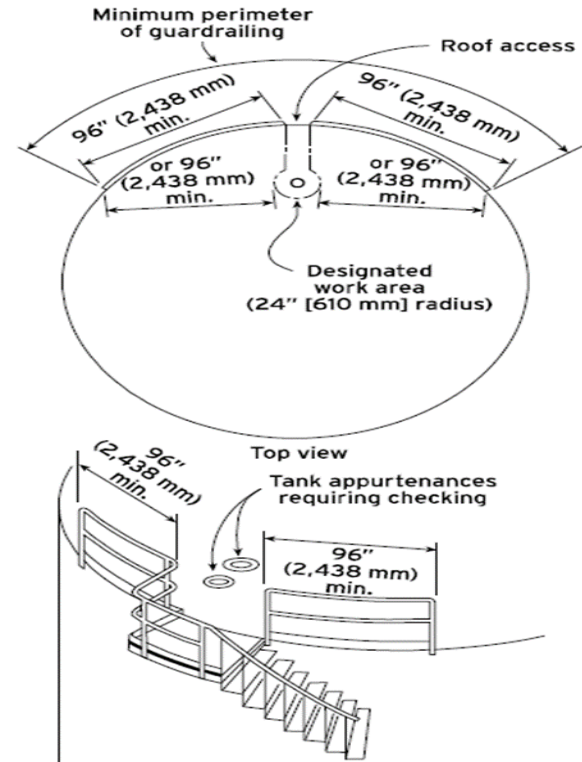


Scaffolding-Tag Inspection Record

Fall Prevention

Tank Roofs

- Railings on the tops of tanks should go completely around the top of the tank when feasible, or have a walkway that is completely guarded by railings.
- If the above is not possible, tank top railings need to be designed to allow adequate protection for a worker from the stairway landing, to the points needing to be accessed (gauge hatch, sample point, radar system, etc.) The general requirements are shown at right.
- The movement of worker should be restricted to the gauge hatch/sample point/radar system for which the railing system is designed. *If the worker needs to go beyond the specific designated area, then fall protection must be used.*
- To be considered safe, the railings need to adhere to the Safety in Designs requirements, which includes having a top rail, mid rail and toeboard.
- Fall protection is *required when* an adequate railing system is not in place. For facilities currently out of compliance, an effective administrative control must be put in place until a permanent solution can be implemented.



Fall Prevention

Tank Roofs

- Here is a good example of a tank top with proper guarding. Top rail, mid rail and toe board.
- In addition, there is a fixed emergency ladder that has a guard in place to prevent an accidental fall.
- *Note: a toe board is not in place at the ladder due to the risk of tripping in an emergency.*



Fall Prevention

Tank Roofs

- Roofs, on a tank must be adequate to support the weight of the workers and any tools or other equipment that they may be using.
- Roofs must be evaluated by a competent engineer in accordance with API inspection schedules to ensure that they have not deteriorated in any way as to diminish the integrity.
 - Rusting of tank roofs is one potential problem.
- Tank roofs that are walked on for any reason must be inspected in accordance with Engineering Standard M-I 901 Tank Inspection *annually*. Local/regional regulations may require a more frequent inspection schedule. (For instance, in California, tank roof thicknesses must be done annually.)
- The inspection shall be performed by an API 653 certified inspector.



Fall Prevention

Roofs of Buildings

- Roofs need to be evaluated to see if they conform to the requirements of an engineered Permanent Fall Prevention system.
 - one has a railing system that has the correct heights for top and mid rails, along with a toe board.
 - the bottom has a low protective wall that is a solid structure at least 107 cm (42 inches) high. Both are able to withstand the 90 kg (200 lbs) of horizontal force.
- In addition, roofs need to be designed to be walked on, verify it has not deteriorated so there is no risk of falling through. Skylights must also be guarded.
- Without these requirements being met, a fall protection strategy must be developed and put in place prior to anyone accessing the roof.



Fall Prevention

Roofs of Buildings

Warning Line System

- **Guard rails or walls are the preferred method to protect workers.**
- **Fall protection is generally the second best option.**
- A warning line system can be used under specific circumstances if neither of the above is feasible. This should be carefully evaluated in the hazard analysis phase of the project.
- The following must be in place to use a warning line system instead of fall protection (harness and lanyard)
 - You must place a warning line at least 15 feet (5 meters) from the edge
 - The warning line must have a minimum tensile strength of 500 pounds (227 kg).
 - Must also be marked or flagged at not more than 15-foot intervals with high-visibility material.
 - Lines must be between 34 (86 cm) inches and 39 inches (100 cm), above the surface.
- No personnel may pass into the area between the warning line and the edge;
- You must have as part of the permit that no personnel shall pass the warning line.
- There must be no pitch to the roof.



Fall Prevention

Roofs of Buildings – Skylights

- Skylights on roofs are particularly dangerous. There are many where workers have fallen through an unguarded skylight.
- Skylights can be protected through screens or barriers and capable of withstanding a load of at least 90kg (200 pounds). *If either of these are not available, then a person must wear fall protection while working within 2 meters (6 feet) of skylights.*
- Note: Even skylights that are designed to be walked on can become brittle and can lose their loading bearing capabilities. Never walk on any skylight due to this fact!



Fall Prevention

Roofs of Buildings – Learnings from an Incident

Roofs, of a building must be adequate to support the weight of the workers AND any tools or other equipment that they may be using.

Before



Top View



Closer View

- The photos to the left show a hole in the roof caused by a worker falling through.
- The person was working on the roof when the brittle roof tiles gave way. The worker could have been killed except that he landed on pallets of product that were stacked almost to the ceiling inside the warehouse.
- The photos at the right show the safeguards put in place after the incident.
- wire mesh system placed on roof to walk on.
- lifelines and harnesses put in place afterwards.

After



Fall Prevention & Protection

Trucks, Isotainers and Railcars

- Not all Fall Prevention/Protection looks that same at our facilities. We all load either isotainers, railcars and/or trucks and have different challenges to overcome in order to determine the best method of protecting their workers.
- It's critical that each facility look closely at the loading and offloading operations. Are your methods and equipment adequately safeguarding your workers?
- Capital funding is available to bring these operations to the standard necessary in order to adequately safeguard every worker.



Fall Prevention & Protection

Trucks, Isotainers and Railcars

We MUST provide safe access to the tops of trucks, isotainers and railcars. This can be accomplished through the use of a fall prevention measures or through fall protection systems.

Fall protection

- Fall protection, utilizing a harness and lanyard is, in most cases the better option. Together with a beam and trolley system or a lifeline system, they are a good safeguard for almost all situations and are inexpensive to install, relative to fall prevention equipment.
- Fall protection has the drawback of requiring someone to actively use it (wear the harness correctly, conduct good quality inspections of the equipment, etc.)

Fall prevention

- use of cages and railings are good protection for the workers because it does not require someone to actively do something to protect themselves.
- The problem with cages and railings is that they don't work for all types and sizes of railcars, trucks and iso tainers. We've seen two falls from railcars recently that illustrate that point. Also this system is usually much more expensive to install.



Fall Prevention

Trucks, Isotainers and Railcars

Safety Cages is a type of fall prevention that are typically attached to roll around ladders or gangways.

Safety Cages need to provide the same protection as permanent railing systems so as to prevent a worker from falling. They need to have a:

- **Top rail** of 106 cm (42 in)
 - **Mid rail** (or double mid rails) of 53 cm (21 in)
 - **and a toe board**. In the absence of a toe board, there must be an extra railing (in addition to the top and mid rails) that is no more than 30 cm (12 inches) from the surface of the vehicle.
- It is critical to assess every possible situation and vehicle that might be encountered to see if the cage will be adequate.



Fall Protection

Trucks, Isotainers and Railcars

The alternative to Fall Prevention is Fall Protection. Generally Fall Prevention is a better option, but with railcars and trucks it is often better to have someone in a harness and lanyard. This is primarily due to the different vehicle shapes and sizes that enter our facilities, which makes it hard to design or purchase a cage that will fit them all.

- The lanyard is of the self retracting style since the tops of vehicles are less than 6 meters (18 feet)
- For permanent solutions, make sure that the anchor point is above the workers head, meaning that if the person needs to move along the top of the vehicle, the harness and lanyard will move with them. This is accomplished via a trolley that will move along the anchor beam or lifeline.
- The anchor point is able to withstand 2267 kg (5000 lbs) per attached worker.
- Make sure that the worker is tied off 100% of the time, meaning that from the moment that there is any risk of falling from Height, they are tied off.

****MUST TIE OFF BEFORE WALKING
OUT ON THE TOP OF A VEHICLE****



Work at Heights Equipment

Mobile Elevated Work Platform

Mobile Elevated Work Platforms (MEWPs)

- Provide a temporary working platform which can be easily moved from one location to another
- Useful for short duration tasks, where the use of a ladder would be unsafe or the erection of a scaffolding platform, time consuming or impracticable in relation to the job to be done
- The height of the platform can be adjusted using articulation, scissor mechanisms, telescoping booms or towers
- They can be vehicle mounted, self-propelled, towed or manually moved
- A competent person must be designated to control the work platform, scissor lift, cherry picker, crane lift platform, building maintenance unit or man-lift

Some common hazards associated with the use of MEWP's include:

- Collapse or overturning of the MEWP
- People falling or being thrown from the carrier or basket
- People in the carrier or basket being trapped against fixed structures or contacting live electrical wires.



Work at Heights Equipment

Mobile Elevated Work Platform

Factors in the collapse or overturning incidents typically include:

- Equipment failure
- Soft, unstable or uneven ground conditions
- Outriggers not being used, used incorrectly or faulty
- MEWP being struck by a vehicle
- Overloading the carrier or basket
- Carrier or basket struck by a load

Factors in people falling or being thrown from the carrier or basket typically include:

- Sudden movements caused by an impact
- Ground movement
- Overreaching from the carrier or basket
- Climbing in or out of an elevated carrier or basket



Work at Heights Equipment

Mobile Elevated Work Platform

- A fall prevention system (harness and fixed lanyard) shall be used in conjunction with MEWP use. The fixed lanyard is to keep the user from falling out of the basket, not to protect them if they fall.
- Use within manufacturer guidelines (including boom and basket load limits).
- Employees shall follow local tie off procedures and manufacturer recommendations for tie off on scissor lifts. The person must be tied off 100% of the time while in the MEWP.
- Prohibited movement when the boom is elevated in a working position with personnel in the basket.
- Exiting the basket at height is permissible only if the basket is designed for access/egress.
- When exiting the basket at an elevated height above 4 feet, the worker must be tied off 100% of the time with appropriate full body harness and dual lanyards.



**Correct Use of Harness
While Using MEWP**

Work at Heights Equipment

Forklift Platform

It is not permitted to stand on the forks of a forklift or on a pallet to work at heights.

Only engineered platforms designed by a qualified person can be used, and shall be constructed and loaded in accordance with that design

- The platform cannot extend beyond 10 inches (250 mm) distance, greater than the overall width of the truck.
- Operating instructions, the safe working load of the platform and the weight of the empty platform must be attached in a prominent position
- It is critical that the total weight (platform weight + weight of personnel + weight of tools or objects) is well below the capacity of the forklift
- The platform must be secured to the forks so that it can not slide
- There must be an agreed signaling system used to denote movement of the hoist
- The forklift operator must be competent and remain at the forklift controls at all times
- Personnel working inside forklift platform must be tied off with a harness and lanyard 100% of the time
- Only vertical (up and down) movement of the forklift is allowed and the parking brake must be set when the person is in the platform



MINIMUM CAPACITY OF TRUCK ON WHICH THE PLATFORM CAN BE USED (LBS)		MAXIMUM LOAD INCLUDING PERSONNEL AND EQUIPMENT (LBS)				
2000		1000				
WEIGHT OF EMPTY PLATFORM						
MODEL NO.	MPL1	MPL2	MPL3	MPL4	MPL5	
WIDTH x DEPTH	36x32	36x36	36x48	48x40	48x48	
EMPTY WT (LBS)	152	163	198	207	239	

Work at Heights Equipment

Portable Ladder

Although ladders are neither fall prevention nor fall protection devices, they are included here because they are commonly used for working at heights.

- Ladders and Step Ladders are meant for short duration tasks (not to exceed 15-minutes)
- Working on a ladder should only be considered when there are no other practical means of performing the work
- Ladders must be maintained properly and inspected prior to each use
- Ladders will be placed on stable, level, and firm surfaces which can support the ladder and any intended load. Do not use ladders on slippery surfaces unless adequately secured.
- Ladders will be erected so that they will not become displaced; when more than 3 m (10 ft) high the ladder must be secured to prevent slipping or falling
- Ladders shall only be used for the intended design. Ensure worker and load will not exceed manufacturer's recommended load capacity

Ladder Inspection Guide

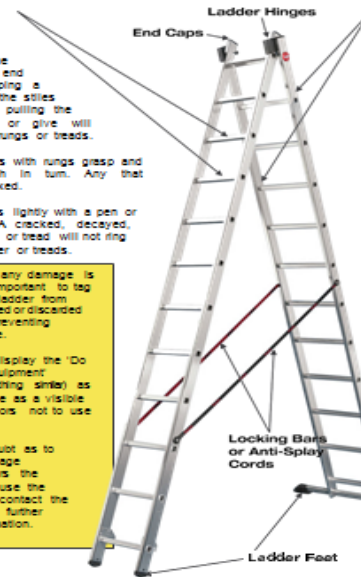
The Ladder Inspection Checklist is designed to be completed by someone who is suitably qualified and experienced to complete a detailed visual ladder inspection. These notes supplement the checklist - expanding on important points, and give additional reference information.

Rungs or Treads

Check the following:

1. With one end of the ladder resting on the ground raise the other end and with each hand grasping a stile end try to displace the stiles by pushing on one and pulling the other. Any movement or give will indicate insecurely fixed rungs or treads.
2. In the case of ladders with rungs grasp and attempt to rotate each 180 degrees. Any that move are not securely fixed.
3. Tap the rungs or treads lightly with a pen or small hammer handle. A cracked, decayed, loose or short grained rung or tread will not ring true compared to the other or treads.

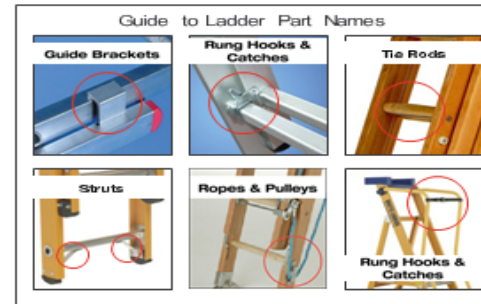
- In the event that any damage is discovered it is important to tag and remove the ladder from service until repaired or discarded thus physically preventing unauthorized use.
- The tag should display the 'Do Not Use This Equipment' message (or something similar) as clearly as possible as a visible warning to operators not to use this ladder.
- If there is any doubt as to whether the damage discovered renders the ladder unsafe to use the golden rule is to contact the manufacturer for further advice and information.



Stiles

Check the following:

- It is important that the entire ladder stile can be thoroughly and completely checked. Paint, labels, and dirt can easily cover up a major defect.
- At the top and bottom of the ladder, try to pull the stiles apart and then try to push them together using a reasonable amount of force. Any movement will indicate defective rung joints.
- For aluminum ladders check both stiles thoroughly for dents that may adversely affect the safe use of the ladder.
- For timber and fiber glass ladders check that the stiles are not warped, cracked or splintered. In addition please see the panel detailing further checks for fiber glass ladders.
- Remember to check the ends of the stiles for wear and damage.
- Any corrosive chemical contamination must be removed and areas of contamination thoroughly checked for ingress into the stiles or rungs. Any dirt, oil or grease must be cleaned from the ladder particularly the rungs.
- Areas subject to rot, mold or fungus should be carefully examined to ensure the structural integrity of the ladder has not been affected.



Ladder Duty Designated Classification
• IAA Special – 375 lb. weight limit.
• IA Industrial – extra heavy-duty 300 lb. weight limit.
• I Industrial – heavy 250 lb. weight limit.
• II Commercial – medium 225 lb. weight limit.
• III Household – light 200 lb. weight limit.



Work at Heights Equipment

Portable Ladder

- When transitioning (ascending or descending) a ladder of any type, three points of contact must be maintained
- Keep the area around the base and top of the ladder clear
- Do not use the top of the ladder as a step
- Do not move, shift, or extend a ladder while it is occupied
- Do not carry onto a ladder any object or load which may cause you to lose your balance (*tools or equipment to be taken up may be roped up once up the ladder*)
- For non-self-supporting ladders, ensure:
 - The top of the ladder extends 1 meter (3 feet) past the step-off point
 - The ladder must be secured against movement while in use
 - While in use a second person should 'foot' the ladder and it should be tied off at the top

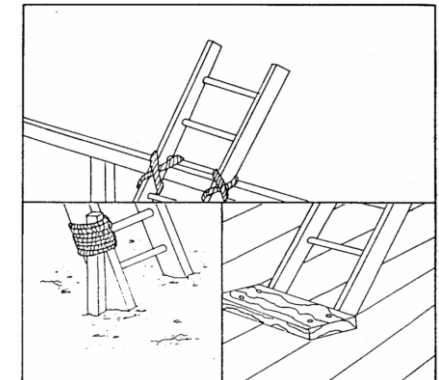
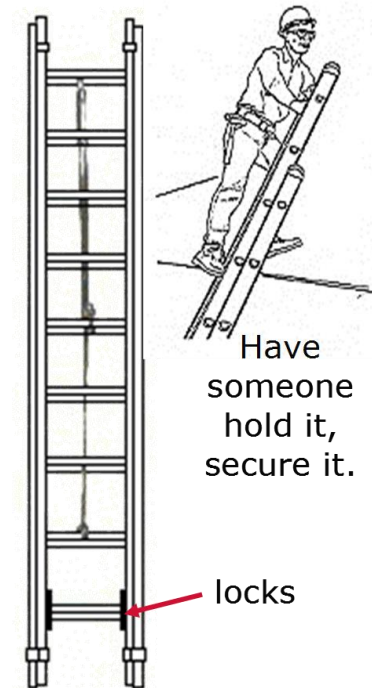


Work at Heights Equipment

Portable Ladder

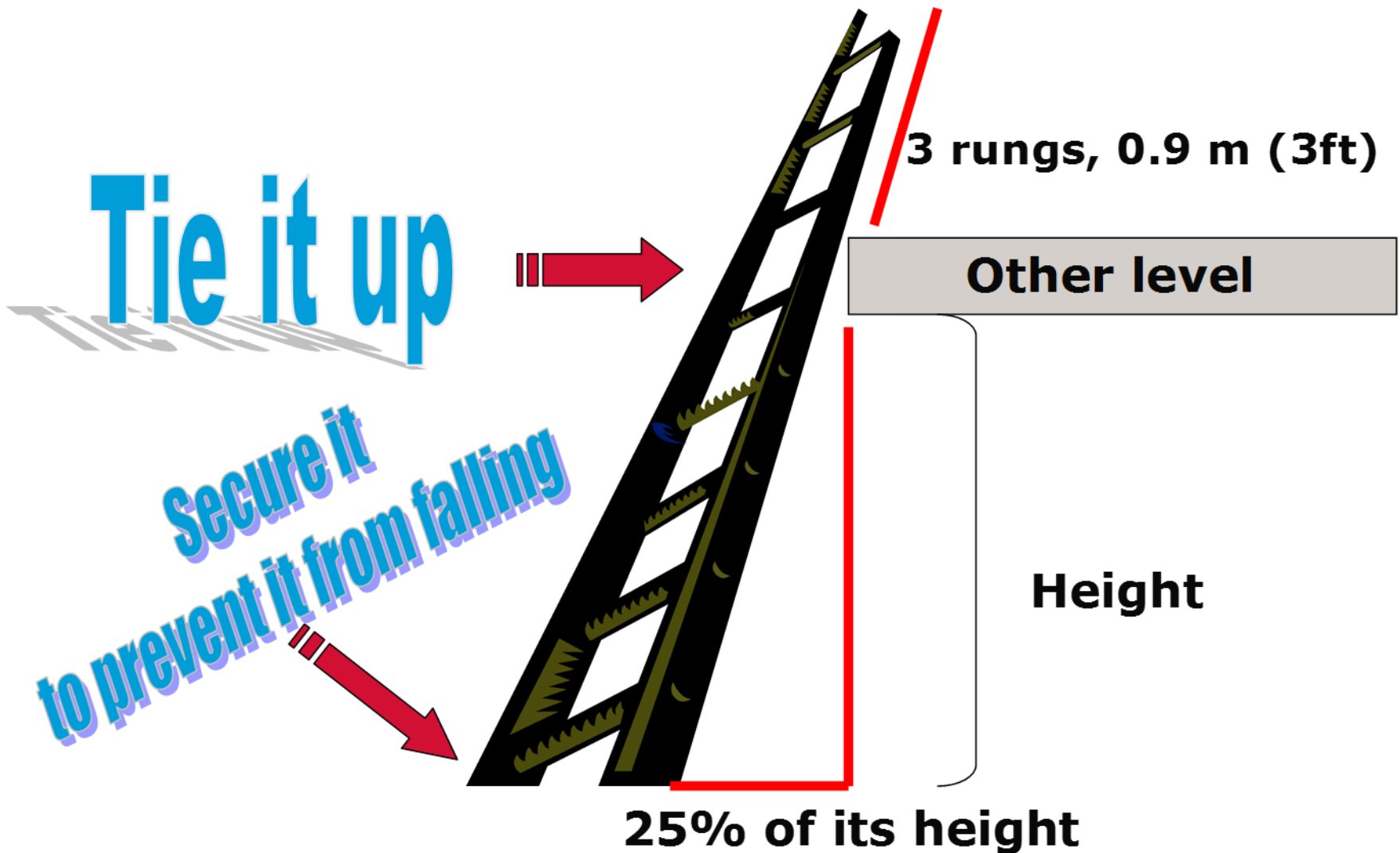
General Rules Applicable When Working at Any Height

- Secure the area with cones and barricades if the ladder is set up in a busy area
- Clear the area around the base
- Lock or block any door that may open in the ladder
- Look above before raising the ladder, the minimum clearing distance from overhead electrical cables is a minimum of 4 meters (13 ft), more is required for higher voltage
- Install the ladder on a level surface
- Install the ladder at the correct angle (1 to 4 ration or 25% distance from wall to height)
- Extension ladders require an overlap of 1.0 to 1.2 m (3 to 4 ft) and at least 3 rungs at the top when accessing another level
- Always adjust the extension ladder when standing at the base of the ladder so that you can observe if the locks are properly engaged. Never adjust it from top. Then tie the rope.



Work at Heights Equipment

Portable Ladder



Work at Heights

Emergency Rescue

A rescue plan **must be in place for all working at height when Fall Protection (harness and lanyard) are being used. A rescue plan can save someone's life.**

- An injury can be the result of what caused the fall (i.e - being struck by something), the fall itself (by striking objects on the way down), and from hanging in the harness while waiting for rescue. These injuries can be fatal if not dealt with promptly.
- The following must be considered when developing a rescue plan:
 1. How will the man watch notify rescuers. The man watch should not be the person responsible for rescue unless another qualified man watch first relieves them of their responsibilities.
 2. How quickly can the response team arrive. Suspension trauma can be fatal within 20 minutes. Also consider that there may be an even more life threatening injury that requires a quicker response.
 3. Type and availability of Rescue Equipment: How will the rescue be performed, what equipment will be required, where it will be staged so that it is readily available?



Work at Heights

Emergency Rescue

Rescue Plans need to have the practicality of how the rescue will actually take place:

- For instance, a Rescue Plan might say, “get the scissor lift and use the lift to retrieve the person hanging from the lanyard”.
 - Will it fit in the space the work is taking place?
 - Is the lift fully charged?
 - Is the lift being used elsewhere in the plant?
- Also, there is a heavy reliance in some of our facilities on an outside agency (fire department for instance) to perform rescues.
 - Can these outside agencies perform this operation in a timely manner?

Stand-by personnel are required for work at height activities when fall protection is being worn to ensure that a person is rescued if they fall. The standby person must understand the rescue plan and be capable of initiating response.

- Note: Stand-by person is not required when routine work in the form of tank truck, iso truck or rail car loading/unloading is being performed if the following conditions are in place:
 - Top surface of railcar/tank truck has designated walkway area
 - Worker must wear full body harness and self retracting life-line that is permanently attached at the work area
 - Worker has been trained and qualified for task to be performed
 - Worker has been trained in the use of the fall arrest system in-place
 - Work task has been assessed, current procedure is in-place, and active JLA is available for task being performed.



Work at Heights

Dropped Objects

Objects dropped from height is a serious concern. Tools, nuts, bolts, building materials, pieces of scaffolding, etc. all could result in a serious injury or fatality.

It is essential that the hazards of dropped objects be safeguarded against.

- Tools and loose equipment stored at height must be secured or/tethered at all times. Examples include:
 - Persuaders
 - Valve Wrenches
 - Nuts and Bolts
 - Blinds
- All hand tools and equipment shall have tool lanyards attached to the user or structure when working or stationed in elevated positions. Where tool lanyards are not feasible, appropriate control measures (debris **netting**, **perimeter netting**, overhead protection, **barricades to prevent entry below**, etc.) must be implemented to protect areas below from falling objects.
- Crews moving into areas below elevated work will notify personnel working above prior to beginning work.
- Crews moving into elevated areas shall notify any personnel below prior to beginning work.



Work at Heights

Dropped Objects

It is critical that methods of securing items and potential fall paths are identified.

- Control measures are implemented to protect workers from falling objects.
- Any protective devices used are securely attached.
- The existence and condition of protective systems such as netting and other physical barriers are in place and adequate.
- If barricades are used as a control measure, barricading material is properly and adequately installed.
- Housekeeping is in order.
- Secure methods of handling and transporting tools are in place.
- Tools used at height are tethered to prevent from falling during use.
- Tools and materials used at height are transported in a secured (enclosed) tool bag.
- Tools and materials shall not be stored on ledges, beams, etc. Material shall not be stored or stacked next to the edge of a platform. Material that is stored or staged in elevated areas must be secured from falling to lower elevations.



Tools & Material Handling / Storage

- When work activities involve the use of materials that can fall through grating, the grating shall be covered to prevent objects and materials from falling.
- Materials used to cover grating shall be secure and shall not cause slipping or tripping hazards.



Work at Heights

Dropped Objects

Perimeter Protection on Platforms

- Netting will be placed on scaffolds to prevent objects from falling off platforms. The netting will be secured with cable ties between the top rail and toe plate. On scaffolds that have top rails designed to be used as anchor points, the netting will be secured between the mid-rail and toe-board.
- Inspections of the netting shall be made prior to conducting work.
- Scaffolds shall be constructed to eliminate any gaps or holes where tools or materials could fall through.

Note that netting can be affected by wind and can cause a scaffold to topple over. Only use netting that is designed for the purpose of use with scaffolding and consider the effects of wind in the Hazard Analysis.



Work at Heights

Job Completion and Record Retention

Job Completion

- When the work has been completed, the Permit Requester/Holder must return the General Work Permit and all related documents to the Permit Issuer
- The Permit Issuer or the nominated Responsible Person will review the job site to ensure that:
 - i. The work area has been left in a safe, clean and tidy condition
 - ii. That the work area has been left in a safe condition
 - iii. The work performed meets the specific work scope and task specifications
- If the above conditions have been met the Issuer or Responsible Person will sign and date the General Work Permit as completed.

Record Retention

- Copies of all permitting and associated documents retained one year or from audit to audit, whichever is the lesser
- If an accident occurred while work was in-progress, then documentation must be retained for incident investigation
- If permitted job involved potential health hazard, consider retaining permit documentation for an extended period (beyond 90 days).

