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PURPOSE:
This standard is not all inclusive because it cannot address every situation in the workplace. It is meant, however, to establish minimum requirements to be followed for the reduction of the likelihood of injury to persons working where the potential for a fall exists. It is also intended to provide options for employees and supervisors in analyzing fall potential situations.

OBJECTIVE:
Establish levels of responsibility for an effective fall protection program for the facility.
Define minimal requirements for protection of personnel working in elevated locations.
Define approved P.P.E. devices used in fall protection systems.
Establish training guidelines for proper use of P.P.E.
Establish safety work practices for working in elevated situations that could result in a fall.

SCOPE:
This applies to all PPG personnel when they are required to work in the PPG Lake Charles facility.

RESPONSIBILITIES:

Employees:
Know and understand the approved applications and limitations of the equipment used.
Use and store equipment properly and in accordance with the manufacturer’s recommendation and training received.
Inspect equipment prior to use. Ensure that equipment is not past due for inspections by the qualified person.
Report any fall or near miss to supervision immediately so that it can be addressed appropriately.
Return any equipment subjected to fall forces to the tool room.

Tool Room
Perform annual inspections of personal fall protection equipment
Return equipment to manufacturer as required for periodic recertification
Supply equipment for checkout during turnarounds and low frequency jobs which do not justify the purchase of equipment by the individual department involved.

Persons Planning Jobs (Planners and Supervisors of the workers):
Evaluate the need for fall protection as an integral part of job preplanning.
Ensure that fall hazards are identified and properly addressed prior to job initiation.
Provide JSI for individuals performing the assigned work prior to beginning work. (Planners discuss fall protection situations with supervision so that it can be included in the job planning and discussed with the workers doing the job.)
Supervision will ensure that employees are trained on the equipment they will be expected to use.
When fall prevention and/or protection systems are necessary, procure and provide proper equipment and ensure that it is used properly.

Engineering:
Ensure that fall hazards are addressed during project design in accordance with the established hierarchy
1.) Eliminate the need for the elevated work
2.) Provide fall prevention
3.) Provide fall protection anchorages
Provide assistance to others as required to ensure fall protection systems maintain a safety factor of 2 (or 3600 lb) if the 5000 lb requirement is not assured.
Safety Department:
- Monitor, review, and provide periodic Competent Person level training.
- Monitor, review, and provide Awareness level training.
- Periodically review fall protection equipment and recommend changes if needed.
- Periodically review the Fall Protection procedure and make update as needed.
- Specify acceptable fall protection equipment for purchase.
- Audit tasks for compliance with this policy.
- Train rescue team.

SCENARIOS:

Roofing work
Persons involved in roofing work must be protected by either a fall prevention or fall protection system regardless of their distance from the roof edge.
Where parapets meet the requirements for a standard guardrail additional fall protection is not required (See Appendix C). Additional fall protection such as vertical lifelines are not required on low sloped roofs or roofs that are not sloped in excess of 4” X 12” pitch.
A designated area is acceptable on low sloped roofs if employees are not required to be within 6 feet of the edge. If this is required, then guardrails, restraint lines, or fall protection must be provided when within 6 ft of the edge.
A designated area is not acceptable on steep roofs.
Fall protection is required on all roofs where the structural integrity of the roof may be in question. See Appendix A (Checklist For Using Crane Hook as Anchor Point For Personal Fall Protection.)

Scaffolds
General
Fall protection is required for scaffold builders and sometimes for scaffold users. The fall prevention (guardrails) is usually adequate on scaffolds except when there are ‘openings’ greater than 12” in the deck, missing or removed guardrails (even for a short period of time), or the decking is greater than 14” from the face of the working surface.
Decks
Guard rails are required at 10’ on scaffolds. Platform decks whose height is between the 6’ target height for personal fall protection and the 10’ guardrail requirement for scaffolds, the platform is considered an ‘open sided platform’ and some sort of fall protection/prevention is required. Guardrails are recommended.
Access ladders
Open access ladders above 20’ shall be provided with fall protection such as a davit arm system or internal or external built stairs or rope grab system or ladder rail system.
Rest platforms will be available every 20’ in height where stepping off the ladder to reach the other ladder is necessary.
Working levels will have a swing gate access/egress where possible to limit exposure of climbing over the top rail.
Access ladders should be angled up to 90 degrees where possible to facilitate stepping off of working level onto an access ladder.

Docks
Loading –
Loading Dock gates are up and in place when dock is not in immediate use.
Only trained shipping personnel perform loading and unloading duties in that area.

Dock door is kept closed when a truck is not backed against it or some sort of fall prevention must be utilized.

**Wharfs**
Depending on the surface of the area below, either a life jacket is to be worn over water or a tether/ Self-Retracting Lifeline over rocks etc. if working 6’ from the edge or closer without a guardrail system already installed.

**Aerial and scissor lifts**
A safety harness with the lanyard attached to the inside of the basket or the boom of the Aerial Lift must be worn when working in the basket.

When out of the basket, the lanyard must be attached to an anchor point other than the boom or the basket unless there is no other option for anchorage.

Personal fall protection is not required while working in a scissor lift. It is considered a rolling scaffold.

Do daily inspection and tag out of service if deficiencies are found.

Lifts should be lowered when being moved from location to location.

**Using crane hook as anchor:**
When there is NO other way to provide fall protection including tying off to the roof, (other restrictions may apply when this is done such as height of roof), a crane hook may be used as an anchor given certain conditions are met. (See Appendix A)

Additional considerations: Barricade area below, traction on the roof (slippery when wet), structural integrity of the roof, roof composition and number of workers needed.

The crane operator must remain in the cab at all times while work is being conducted.

Self Retracting Lifelines must be used (recommend the 20’ steel cable SRL)

Crane operator of the anchorage crane CANNOT perform the rescue in the event of a fall. The manlift used to access the roof may be used for the rescue. Shift Safety must be contacted before this system may be used to plan for rescue.

**Floor and Wall openings** –
All floor and wall openings are safely covered or blocked from access.

Floor holes – 1” to 12” at it’s smallest dimension (falling objects)

Floor openings - 12” and above at it’s smallest dimension (fall protection)

If not safely covered and blocked from access, the opening has someone assigned for constant attendance to it while workers are present.

**Personnel lifting basket**
Other means of fall protection must be considered before lifting personnel with a crane basket. This procedure is not a preferred method but acceptable under certain circumstances. Consult with the Safety Department when applying this method.

Follow the procedure in Appendix B.

**Stairs**
**Portable**
Locking mechanisms must be engaged while working from the stairs.
Use handrails to ascend or descend the platform.

Personal fall protection is required when working from stairs above 6’. It is considered an open sided platform.
Fixed
Form of fall prevention – always use handrails when ascending or descending stairs.
Watch for oil, grease or debris on the stairs.

Ladders
Working While on Ladders:
Fall protection is required on portable ladders if the working elevation is 6 feet or more above (measured from the feet) and the work requires the use of both hands.
Care should be taken not to place the climbing side of a portable ladder within 4 feet of a handrail since the backwards or sideways could result in the climber falling a significant distance over the handrail. Where this is not possible and the potential fall hazard of the handrail is 6 feet or more, fall protection must be worn by the user of the ladder regardless of the working height.

General
Make sure the ladder is on a firm level surface
Try not to block passageways. Set out barricades or cones as well as notification signs if other workers could be affected.
Keep area clean around the top and bottom of ladders
Use both hands for climbing – 3 point contact. Hoist tools and/or material or place in a belt holder.
Use a hand line to handle material or tools that will not fit onto a belt.
Face the ladder while ascending or descending.
Don’t stretch to try to reach something. Climb down and move the ladder.
Use wooden ladders where possible to prevent electrical contact.
While doing you pre-use ladder check, make sure that it has a current inspection sticker
Do not use a ladder for anything other than a ladder.

Straight Ladders
Straight ladders must be tied, blocked or otherwise secured to prevent slippage.
The pitch of the ladder should be 4:1 for stability of the climb. The top of the ladder should extend at least 3’ above the surface of the landing for easy access to and from the working surface.
Working off of a ladder above 6’ requires personal fall protection. It is considered an unguarded platform when work is done. The workers centerline shall not extend beyond the side rail of the ladder.
Never exceed the load rating of a ladder.
(Type 3- Light duty household ladder: 200 lbs
Type 2- Medium duty commercial ladder: 225 lbs.
Type 1-Heavy duty industrial ladder: 250 lbs.
Type 1a-Extra Heavy duty industrial ladder: 300 lbs.)
Never use a defective or unserviceable ladder.
Return ladders to their proper storage when the job is completed.
Never use metal ladders near electrical sources.

Extension Ladders
Extension ladders can be 2 or 3 sections of not longer than 20’ each.
Have a co-worker help you raise and lower the ladder. Have co-worker help you carry the ladder if necessary. They can be very heavy and awkward.
The pitch of the ladder should be 4:1 for stability of the climb. The top of the ladder should extend at least 3’ above the surface of the landing for easy access to and from the working surface.
Make sure there is a 3 to 4’ overlap between ladder sections when extended.
Do not take sections apart and use separately.
Make sure that the safety dogs or latches are fully engaged before usage.
Working off of a ladder above 6’ requires personal fall protection. It is considered an unguarded platform when work is done. The workers centerline shall not extend beyond the side rail of the ladder.

**Step Ladders**
Always be sure that the step ladder is fully open and the spreaders are locked into position prior to use.
Do not climb, stand or sit on the top two rungs unless specifically designed for that purpose.
Step ladders are not required to be tied off unless the stability of the ladder is questionable or the ladder exceeds 8 foot (the foot level is 6 feet).
Do not carry loads when climbing or descending a ladder.
Do not place tools and/or material on the steps
Working off of a step ladder above 6’ requires personal fall protection. It is considered an unguarded platform when work is done.
Never use a defective or unserviceable ladder.
Never use a step ladder as a lean-to (extension) ladder.

**Fixed Ladders**
If longer then 20’ run, must have some sort of fall protection system. This could be in the form of a cage system, vertical rope grab, rail system or davit system.
Rest landings are established between 20 and 30 feet on a run.
Self closing gates are used on most fixed caged ladders otherwise some sort of chain or restraining device must be used to guard against the opening.

**Special purpose**
Safety Department approval is required for purchase of the very narrow ladders used for access into certain vessels.
Safety Department approval is required for purchase of collapsible ladders.
Safety Department approval is required for purchase of rope ladders.
Safety Department approval is required for purchase of any specialty ladders used in the facility.

**Confined Spaces**
A line may be attached to a full body harness to expedite non-entry retrieval
Harnesses are worn mainly for rescue purposes.
A full body harness with lifeline attached is mandatory for a 5’ vertical entry into a Confined Space (i.e. a tank or sump). A tripod will set up and used to make non-entry rescue unless determined by the Safety Department to create a greater hazard.

**Excavations**
Crossing excavations that are 6’ deep or deeper requires a walkway with handrails.
Ladders will be used for safe entrance and egress of excavations and will be placed so that the worker will have no more that 25’ of lateral travel to reach the ladder.
Ladders will also extend at least 3’ above the edge of the excavation for easy access and egress.

**Pipe racks**
Acceptable means of fall protection must be utilized at all times. Tethering to the superstructure to prevent access to the outer portion of the rack is an option as is tying off to a pipe overhead in the center of the rack. Care should be given with fall distances so as not to hit the ground or other objects if a fall should occur.
Self-retracting lifelines are preferable because they allow for 3000 lb anchor points, limit the free fall distance and help reduce swing radius if a fall should occur.
Prioritize anchorage points. First look to tie off between pipes to the superstructure instead of the pipes themselves. When this is impractical, tying off to the pipe is acceptable given the limitations in Attachment 2.

If a temporary platform is erected while working in an area, the platform must be substantial, be as level as possible and personal fall protections must also be worn.

Load/Unload and Related Activities:
- Designated load/unload areas such as railcar and truck load racks will have either fall prevention or protection systems.
- Silica’s rail loading rack, caustic loading rack, and chlorine loading rack are examples where fall protection systems are needed.
- Loading docks should incorporate the use of a warning device, such as removable chains or gates or be well marked near any edges (Painted black and yellow stripes for example).
- Silica loading dock, warehouse truck dock, Derivatives truck loading dock

Lifting material
- Under no circumstances shall a component of a personal fall arrest system (harness, lanyards, lifelines, etc.) be utilized for lifting of materials.

Harnesses and Lanyards –
- Harnesses and lanyards for use by PPG personnel shall be purchased only through the Tool room.
- Harnesses shall be a full body, parachute style restraining device with the attachment point located in the center of the wearer’s back near shoulder level.
- Harnesses shall be inspected annually by qualified personnel in the Tool Room and documented.

Positioning Systems:
- Positioning systems shall be rigged such that an employee cannot free fall more than 2 feet. The anchorage to which the system is connected must be capable of supporting at least 3000 lbs. The remaining elements of this standard associated with fall protection also apply to positioning systems (inspection, training, use, etc.)
- Where possible, a fall protection system is required in conjunction with, but separate from, the positioning system components.
- Conversely, fall protection must not be used for positioning (such as locking a retractable and leaning out from it).

Suspension Systems –
- Fall protection is required in conjunction with suspension systems such as boatswain’s chairs or suspended scaffolds. The fall protection system, including anchorage, must be independent of the suspension system and comply with the remaining requirements of this standard.

GENERAL PROVISIONS:

Purchase –
- Fall protection equipment is considered Personal Protective Equipment (PPE). Only equipment approved by the Safety Department may be purchased.
- New fall protection equipment will be purchased and received by the Tool Room in Warehouse II. It will be tagged with the next inspection due date and entered into a tracking system with the date put into use and the name of person or department to which it was issued.

Removal from Service –
All components of a fall protection system must be immediately removed from service and returned to the Tool Room if subjected to fall forces. Also notify supervision immediately of the incident.

**Exclusive Use** –

Fall protection or positioning body devices, lanyards, lifelines, and anchorage connectors are to be used only for personal protection.

Any such equipment or component which could be used for other activities (such as slings, chokers, carabiners, etc.) must either be tagged or otherwise identified as fall protection equipment (a vendor or ANSI tag suffices).

**Storage** –

Fall protection equipment not being used must be stored in an area away from exposure to extreme heat or other weather effects and chemical effects.

Caution should be taken when storing harnesses and lanyards in tool boxes. Throwing tools in on top of the fall protection equipment could cut, tear, or disfigure the equipment compromising its integrity for the next use.

**Prior Use Inspections** –

All equipment must be inspected by the user prior to each use. Do not use equipment which does not pass this inspection or which has passed its date for its next required inspection by a qualified person.

**Training** –

Employees who use fall protection and persons planning elevated work activities must be trained on this standard as well as on the use, inspection, and proper maintenance of the specific type of equipment of new equipment being used. Users must demonstrate competency for inspection and useage.

Equipment retraining is only required if a lack of proficiency in equipment use is demonstrated or if new equipment features are involved.

Retraining in this standard must occur every three years and may be done through CBT’s. All training must be documented, including the name or other identifier of the employee, the date of the training, and the signature of the person conducting the training.

Contract owners must train contract employees.

**Distance Considerations** –

The entire fall protection system should not allow more than a 6 foot free fall. The user must not be allowed to contact the next lower level should a fall occur. Therefore the total fall distance must be less that the height above the next lower level. This includes:

- Free fall distance (based on where the anchor point is located)
- System elongation (length of lanyard, retractable before it 'catches', etc.)
- Deceleration distance (up to 3.5 feet)
- Employee’s height

A safety factor of 2 to 3 feet is added in case of a miscalculation in distances.

**Anchorage Location** –

Anchorage points should be harness Dee-ring high or overhead to minimize the potential for swing fall and to minimize free fall distance. It also should be independent of the work surface if possible. It must be independent if the fall hazard is the potential collapse of the surface (such as with a suspension system).
EQUIPMENT REQUIREMENTS:

Anchorage Connectors – Anchorage connectors are used when a fall arrest system cannot be directly attached to an anchorage. Examples of connectors are slings, carabiners, chokers, shackles, trolleys, or other equipment designed for that purpose. Connectors must meet the strength requirements of 5000 lb per person or a safety factor of 2 designed by a qualified person.

Body Device – When personal fall arrest systems are required, a body harness must be worn snug at the upper legs, with all straps tucked in so as not to get caught. The chest strap must be about at the nipple line and the Dee ring between the shoulder blades.

Snaphooks – Only self-closing, self-locking type snaphooks will be allowed for fall protection use to reduce the potential for accidental ‘roll-out’. The snaphook must open and close freely and must be fully closed around the anchorage or the anchorage connector. To avoid side loading the snaphook, only lanyards with snaphooks designed for that purpose may be wrapped around a pipe and snapped back onto itself. The back-biter lanyard is designed to take a side load of 5000 lbs and can be looped back onto itself.

Deceleration Devices – A deceleration device is required as part of an overall fall protection system. These incorporate into the overall system (such as a brake mechanism in a retractable lanyard or rope grab, the rip-stitch portion of a lanyard, etc.) separately.

Ropes, Lanyards and Knots – Natural fiber ropes are not allowed in fall protection systems. Knots are also not allowed in any load bearing lines as the knot may reduce the strength of the rope by up to one half.

Lanyards, General – The shortest length lanyard possible should be used. Wear with the shock absorber at the harness Dee-ring end. Always use a separate lanyard per person. Use a softener (cut or heat resistant) if the lanyard may be exposed to abrasive edges or hot surfaces. When worn but not in use, ensure the lanyard(s) is wrapped or tucked in so as not to present a tripping hazard.

Retractable Lanyards – These devices are designed to arrest a fall within 2 feet. Never allow these devices to retract uncontrolled as the cable may become damaged or the uncontrolled cable may contact personnel in the area. This may require the use of a tag line to extract retract the line. Be sure however, to remove the tag line as it may become a tripping hazard or become entangled while the device is in use. These devices must be used with the wearer at less than the angle specified by the manufacturer to avoid the potentially serious swing fall impact and ensure the brake mechanism is operating in a vertical plane.

Vertical Lifelines – These must have a formed eye termination on one end for suspension from the anchorage point and must extend below the lowest level of travel. The grab device must be compatible with the size and type of rope or cable used and should remain above the shoulders of the user. Some manufacturers require specific grade ropes (such as those with visible wear lines). The lower end of the lifeline must be attached to a second anchor point or be weighed down to provide stability. The weight may be attached with a know since at this point the rope is not load bearing. A separate vertical lifeline is required for each employee. Rope lifelines may have considerable elongation (up to 15 feet for 100 feet of nylon rope lifeline). This should be taken into consideration (use minimum of 12 feet total fall distance if using rope) in ensuring the employee does not contact the next lower level should a fall occur.
Horizontal Lifelines – These must be designed by a qualified person with a safety factor of 2. Purchased systems have been designed by the manufacturer with the appropriate safety factor and must be used strictly in accordance with the instructions provided. If the span of the lifeline requires intermediate supports, these must be designed to allow freedom of movement throughout the length of the lifeline. If not, a dual lanyard will be required to maintain continuous fall protection. These can be checked out from the tool room on a temporary basis while the work is going on.

Proper job planning is required to ensure that the maximum number of users is not exceeded for temporary systems.

Permanent installation may be desirable based on the frequency of access to an area. Prior to work being conducted in that area, an inspection of the lifeline must be conducted by a competent person and any discrepancies corrected prior to beginning the work.

Safety Nets – Only nets designed by the manufacturer as personnel nets may be used for fall protection. These must be installed as close as possible to the work level and extend outward from the surface.

The net may have maximum 6” by 6” openings and must either pass a 400 lb drop test prior to use, whenever relocated, after repair, and every 6 months if left in place or be certified by a qualified person. If certified, the most recent record of certification must be available on the jobsite and include the identification of the installation to which it pertains as well as the name of the qualified person making the certification and the date.

Nets must be inspected weekly for wear, damage, and other deterioration. The net should remain free of materials and debris. The distance that the net extends outward is dependent upon the distance below the working surface.

DEFINITIONS:

- **Anchorage** - means a structural member which provides a secure point of attachment to which the fall protection system is ultimately connected.

- **Body belt (safety belt)** - means a strap with means both for securing it about the waist and for attaching it to your work site as a positioning device.

- **Body harness** – means a set of interconnected straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders with means for attaching it to other components of a personal fall arrest system.

- **Competent Person** – means one who is capable of identifying existing and predictable hazards in the surrounding or working conditions which are unsanitary, hazardous to employees, and who has authorization to take prompt corrective measures to eliminate them. A Competent Person holds a training certificate showing verification of understanding of rules and principles of Fall Protection.

- **Connector** - means a device which is used to couple (connect) parts of the personal fall arrest system and positioning device systems together. It may be an independent component of the system, such as a carabineer, or it may be an integral component of part of the system (such as a buckle or Dee-ring sewn into a body harness or a snap-hook spliced or sewn to a lanyard or self-retracting lanyard).

- **Controlled access zone (CAZ)** - means an area that is designated and clearly identified to demarcate where personal fall arrest systems are required in an elevated location. Controlled access zones are typically utilized for roof work activity to designate the area near the roof perimeter where fall protection is required.
Davit Arm System – a small arm protruding from a scaffold leg with a fall protection device, usually a self-retracting lifeline, used to assist personnel in case of a fall while climbing the access ladder. The trigger height for this application is that if the scaffold deck is over 20 feet in height, a davit arm system will be installed as an alternate fall protection system. The Self-Retracting Lifeline is attached to the Dee-ring on the back of a full body harness.

Deceleration device (Shock Absorber) - means any mechanism, such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on an employee during fall arrest.

Deceleration distance - means the additional vertical distance a falling employee travels, excluding lifeline elongation and free fall distance, before stopping, from the point at which the deceleration device begins to operate. It is measured as the distance between the location of an employee's body harness attachment point at the moment of activation (at the onset of fall arrest forces) of the deceleration device during a fall, and the location of that attachment point after the employee comes to a full stop.

Designated Area – Generally used with a Controlled Access Zone. A barrier erected 6 feet back from the unprotected edge and which serves as a warning to persons that they are approaching a fall hazard. Work may be performed within the designated area without a personal fall arrest system. See Appendix C for specific requirements.

Equivalent - means alternative designs, materials, or methods to protect against a hazard which the employer can demonstrate will provide an equal or greater degree of safety for employees than the methods, materials or designs specified in the standard.

Fall Prevention – means used to stop the initiation of a fall to a lower level, designed that the employee cannot reach the unprotected edge. See Appendix C for examples and specific requirements.

Fall Protection – the use of passive equipment designed to stop and/or control the free fall once a fall had been initiated.

Failure - means breakage or separation of component parts. Breakage is the point where the ultimate strength is exceeded.

Fall Arrest Force – the force applied to the body during a fall.

Floor Hole – An opening measuring less than 12 inches but more than 1 inch in its least dimension, in any floor, platform, pavement, or yard, through which materials but not persons may fall, such as a belt hole, pipe opening, or slot opening.

Free fall - means the act of falling before a personal fall arrest system begins to apply force to arrest the fall.

Free fall distance - means the vertical displacement of the fall arrest attachment point on the employee's body belt or body harness between onset of the fall and just before the system begins to apply force to arrest the fall. This distance excludes deceleration distance, and lifeline/lanyard elongation, but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.

Guardrail system - means a barrier erected to prevent employees from falling to lower levels. See Appendix C for requirements.
Infeasible - means that it is impossible to perform the construction work using a conventional fall protection system (i.e., guardrail system, safety net system, or personal fall arrest system) or that it is technologically impossible to use any one of these systems to provide fall protection.

Lanyard - means a flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body harness to a deceleration device, lifeline, or anchorage.

Lifeline - means a component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

Low-slope roof - means a roof having a slope less than or equal to four in twelve (vertical to horizontal).

Lower levels - means those areas or surfaces to which an employee can fall. Such areas or surfaces include, but are not limited to, ground levels, floors, platforms, ramps, runways, excavations, pits, tanks, material, water, equipment, structures, or portions thereof.

Orthostatic syncope – means a medical condition where the blood flow to the heart is severely restricted from the lower extremities. Prolonged suspension can cause nausea, fainting or death, based on personal tolerance if not rescued in a timely manner after a fall.

Qualified Person – A qualified person “means one who, by profession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve or resolve problems relating to the subject matter, the work, or the project.” This person is usually an engineer.

Parapet – a low protective wall or railing along the edge of a raised structure such as a roof.

Self Retracting Lifeline (SRL) – means a device that locks as soon as enough acceleration is generated to stop a fall.

Snaphook - means a connector comprised of a hook-shaped member with a normally closed keeper, or similar arrangement, which may be opened to permit the hook to receive an object and, when released, automatically closes to retain the object. It takes two separate movements to open a Snaphook. The use of a non-locking snaphook as part of personal fall arrest systems and positioning device systems is prohibited.

Steep roof - means a roof having a slope greater than four inches every twelve inches. (vertical to horizontal).

Toeboard - means a low protective barrier that will prevent the fall of materials and equipment to lower levels and provide protection from falls for personnel.

Unprotected sides and edges - means any side or edge (except at entrances to points of access) of a walking/working surface, e.g., floor, roof, ramp, or runway where there is no wall or guardrail system at least 39 inches (1.0 m) high.

Walking/working surface - means any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel but not including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.
**Warning line system** - means a barrier erected on a roof to warn employees that they are approaching an unprotected roof side or edge, and which designates an area in which roofing work may take place without the use of guardrail, body belt, or safety net systems to protect employees in the area.

**Work area** - means that portion of a walking/working surface where job duties are being performed.
REFERENCES:

OSHA 29 CFR 1910 - General Industry Standards

- .22 General Requirements
- .23 Guarding Floor and Wall Openings and Holes
- .24 Fixed Industrial Stairs
- .25 Portable Wood Ladders
- .26 Portable Metal Ladders
- .27 Fixed Ladders
- .28 Scaffolding
- .29 Manually Propelled Mobile Ladder, Stands and Scaffolds
- .30 Other Working Surfaces
- Subpart F - Powered Platforms, Manlifts, Vehicles Mounted Platforms
- Subpart J – Confined Spaces

OSHA 29 CFR 1926 Construction Standards

- .104 Safety Belts, Lifelines, and Lanyards
- .105 Safety Nets
- .106 Working Over or Near Water
- .556 Aerial Lifts
- .1053 Ladders
- Subpart L - Scaffolding
- Subpart M - Fall Protection

American National Standards Institute (ANSI)

- Fall Protection A10.14 (old); A 10-32
  - Z359.1 (old); Z359.0-Z359.4
- Ladder safety devices A14.3
- Scaffolding A10.8

Appendix

A. Check list for Using Crane Hook as an Anchor
B. Check list for Lifting Employees by Crane
C. Fall Protection System Requirements

Attachment

1. Inspection and Maintenance
2. Anchorage Points: Acceptable and Unacceptable
APPENDIX A

CHECKLIST FOR USING CRANE HOOK AS ANCHOR POINT
FOR PERSONAL FALL PROTECTION.

PERSON COMPLETING CHECKLIST: ____________________________  DATE: __________

CRANE OPERATOR: ____________________________  CRANE USED: ____________________________

LOCATION OF CHECKLIST: ____________________________  DEPT: ____________________________

PURPOSE OF THE WORK: __________________________________________

*NOTE: ALL ITEMS MUST BE CHECKED AS COMPLETE BEFORE USING CRANE AS AN ANCHOR POINT FOR FALL PROTECTION.

NOTE: ANY WORK TO BE DONE NEAR HIGH VOLTAGE EQUIPMENT MUST BE APPROVED VIA SAFETY AND ELECTRICAL DEPT.

1. A complete job review has determined that no other method for performing this work is practical and/or less hazardous.

2. Calculate the maximum number of personnel that may be anchored to the crane hook as shown by the Load Chart or Computer reading. Use 3,000 lb. per person as the standard. MAXIMUM LOAD TO BE HANDLED _________ #. The stinger or jib may not be used.

3. Firm footing for the crane must be assured and the crane must be within 1% of level.

4. Hook must be of positive latch type, and personnel must use a Self Retracting Lifeline attached to the crane hook by a screw type shackle and pinned. (Recommend the 20’ steel cable SRL)

5. Crane to be used must be a hydraulic type that cannot “free fall” the load line.

6. The job must stop in adverse weather (wind or rain storm) or if adverse weather is approaching the work site.

7. The crane operator shall not leave the cab of the crane at any time while personnel are attached to the hook. The anchor ball should be maintained as directly overhead as possible.

8. Under no circumstances is the crane to be used as a lifting device with personnel attached. The crane hook, under these circumstances, shall be an anchor point only.

9. Designate one person to communicate with the crane operator by hand signals or radios. If radios are to be used for communications, obtain a separate frequency dedicated to this operation.

10. Barricade the area below the lift and around the cranes to limit personnel exposure

11. Provide a thorough JSI, including the objectives and precautions that need to take place.

12. Approved by Area Maintenance Team Leader. ____________________________

13. Approved by Area Safety Representative. ____________________________

DISTRIBUTION: This completed form is to be kept at the jobsite until the job is completed, then forwarded to the Terry Messenger for audit purposes.
APPENDIX B

CHECKLIST FOR LIFTING EMPLOYEES BY CRANE.

PERSON COMPLETING CHECKLIST: ____________________________     DATE: __________

CRANE OPERATOR: ____________________________     CRANE USED: __________

LOCATION OF LIFT: ____________________________     DEPT: __________

PURPOSE OF LIFT: ____________________________

*NOTE: ALL ITEMS MUST BE CHECKED AS COMPLETE BEFORE MAKING THE LIFT.

*NOTE: A NEW CHECKLIST MUST BE COMPLETED EACH TIME
THE CRANE POSITION (location on the ground) IS MOVED.

GENERAL

1. A complete job review has determined that no other method for performing this work is
   practical and/or less hazardous.

CRANE REQUIREMENTS

1. Hoisting shall be performed in a slow, controlled, cautious manner with no sudden
   movements of the crane or platform.
2. Load line has a seven times maximum load safety factor.
3. All brakes and locking devices are engaged when platform is in the stationary working
   position.
4. Firm footing within 1% of level and outriggers extended.
5. The load at the above angle and radius will not exceed 1/2 of the rated capacity of this
   equipment.
6. A variable angle boom has an indicator readily visible to the operator.
7. Telescoping booms shall be equipped with devices to clearly indicate the boom length to
   operator.
8. Anti-two-block device is used.
9. Load line hoist drum has a system on the power train, other than the load hoist brake,
   which regulates the lowering rate (No free fall) (Torque converter or gear set coupled to the
   engine).

PLATFORM

1. Designed by a qualified engineer of competent structural designer.
2. 42” Top rail, Midrail Toe Plate (enclosed from toeboard to midrail).
3. Grab rail installed inside entire perimeter of the platform.
4. Access gate does not swing outward and has a restraining device.
5. Headroom available to standing workers.
6. Platform designed to support 5 times the maximum intended load.
7. Overhead protection for falling objects exist.
8. No rough edges.
9. Plate installed showing working weight of platform and its rated maximum load.

RIGGING
1. Center point or 4 point hookup.
2. Wire rope bridle shall be connected to master link line or shackled to ensure even loading.
3. Attachment assemblies shall be closed and locked or shackled with bolt, nut and retaining pin.
4. Eyes in the wire rope shall be fabricated with thimbles.
5. Wire bridles and associated rigging shall only be used on platforms and for no other purpose.
6. All rigging component’s strength must be 5 times maximum intended load.
7. Safety line attached above hook.

LIFT
1. Persons to be lifted are equipped with safety harness and lanyards.
2. Lanyards must be connected to the platform during the lift and while employee(s) is working from platform.
3. Keep all body parts inside platform during lift.
4. Secure platform to structure while working unless unsafe to do so.
5. Pre-lift Test conducted at 2 times the intended load at less than 50% of hoist rated capacity.
6. Pre-lift conducted each time the hoist is set up in a new or previous location.
7. Boom angle will be lower than:
8. Radius will not exceed:
9. Maximum load will not exceed:
10. Visual inspection of crane, rigging and personnel platform conducted by competent person after each trial lift.
11. Operator has been instructed that no lift is to be used in adverse weather and shall be discontinued if such weather is observed approaching area of lift.
12. Communication will be maintained with operator by hand signals or radio.
13. Fuel level is ½ or more.

Pre-lift was conducted. Date: ________________
Approved by Area Maintenance Team Leader: _____________________________________
Approved by Area Safety Representative: _______________________________________

**Note: Copy must be posed at the jobsite then sent to Terry Messenger upon completion of lift.**
Appendix C
Fall Protection System Requirements

TEMPORARY GUARDRAILS

TOP RAIL
Capable of 200 lbs in outward or downward direction with no permanent deformation and deflection to height not less than 39 inches. 42 inches high, +/- 3 inches

MID RAIL
Capable of 150 lbs with no permanent deformation Installed midway between the top rail and the working surface but with no openings greater than 19 inches.

OPTIONS FOR MATERIAL OF CONSTRUCTION

Wood
At least 2” by 4” top rail and 1” by 6” midrail
On 8 foot maximum centers
Minimum 1500 psi construction grade lumber

Pipe
1.5” Outer Diameter on 8 foot maximum centers

Steel
2” by 2” by 3/8” angle iron on 8 foot maximum centers

Wire Rope
¼” diameter cable stretched taunt
Flagged with highly visible material at not more than 6 foot intervals

RESTRAINT LINES

Capable of 3000 lb tensile load
Limit travel so no edges reachable in ANY direction

DESIGNATED AREA

Use only if low sloped area, floor opening, or excavation.
System must be erected 6 feet or more from the unprotected edge
Access path with warning lines to ladders, storage areas, etc.

Stanchions
Capable of 16 lbs tipping strength horizontally

Line/Rope
Capable of 500 lbs break or tensile strength
Between 34” and 39” above the work surface
Flagged at 6 ft intervals with high visibility materials
Attachment 1

Inspection and Maintenance

To maintain their service life and high performance, all fall arrest devices, in addition to the annual inspection, shall be visually inspected before each use. If any of the conditions listed below are found the equipment should be taken out of service.

Harness Inspection

1. Straps and Rings: For harness inspections begin at one end, hold the body side of the belt toward you, grasping the belt with your hands six to eight inches apart. Bend the belt in an inverted "U." Watch for frayed edges, broken fibers, pulled stitches, cuts or chemical damage. Check Dee-rings and Dee-ring metal wear pads for distortion, cracks, breaks, and rough or sharp edges. The Dee-ring bar should be at a 90 degree angle with the long axis of the belt and should pivot freely.
2. Attachments of buckles and Dee-rings should be given special attention. Note any unusual wear, frayed or cut fibers, or distortion of the buckles. Rivets should be tight and not removable with fingers. Body side rivet base and outside rivets should be flat against the material. Bent rivets will fail under stress.
3. Inspect frayed or broken strands. Broken webbing strands generally appear as tufts on the webbing surface. Any broken, cut or burnt stitches will be readily seen.
4. Tongue Buckle: Buckle tongues should be free of distortion in shape and motion. They should overlap the buckle frame and move freely back and forth in their socket. Rollers should turn freely on the frame. Check for distortion or sharp edges.
5. Friction Buckle: Inspect the buckle for distortion. The outer bar or center bars must be straight. Pay special attention to corners and attachment points of the center bar.

Lanyard Inspection

When inspecting lanyards, begin at one end and work to the opposite end. Slowly rotate the lanyard so that the entire circumference is checked. Spliced ends require particular attention. Hardware should be examined under procedures detailed below.

1. Hardware
   - Snaps: Inspect closely for hook and eye distortion, cracks, corrosion, or pitted surfaces. The keeper or latch should seat into the nose without binding and should not be distorted or obstructed. The keeper spring should exert sufficient force to firmly close the keeper. Keeper rocks must provide the keeper from opening when the keeper closes.
2. Thimbles:
   - The thimble (protective plastic sleeve) must be firmly seated in the eye of the splice, and the splice should have no loose or cut strands. The edges of the thimble should be free of sharp edges, distortion, or cracks.
3. Lanyards
   - While bending webbing over a piece of pipe, observe each side of the webbed lanyard. This will reveal any cuts or breaks. Due to the limited elasticity of the web lanyard, fall protection without the use of a shock absorber is not recommended.
4. Shock-Absorbing Packs
   - The outer portion of the shock-absorbing pack should be examined for burn holes and tears. Stitching on areas where the pack is sewn to the Dee-ring, belt or lanyard should be examined for loose strands, rips and deterioration.
Visual Indication of Damage to Lanyards

1. **Heat**  
   In excessive heat, nylon becomes brittle and has a shriveled brownish appearance. Fibers will break when flexed and should not be used above 180 degrees Fahrenheit.

2. **Chemical**  
   Change in color usually appears as a brownish smear or smudge. Transverse cracks appear when belt is bent over tight. This causes a loss of elasticity in the strap.

3. **Ultraviolet Rays**  
   Do not store lanyards in direct sunlight, because ultraviolet rays can reduce the strength of some material.

4. **Molten Metal or Flame**  
   Webbing may be fused together by molten metal or flame. Watch for hard, shiny spots or a hard and brittle feel. Webbing will not support combustion, nylon will.

5. **Paint and Solvents**  
   Paint will penetrate and dry, restricting movements of fibers. Drying agents and solvents in some paints will appear as chemical damage.

Cleaning of Equipment

Basic care for fall protection safety equipment will prolong and endure the life of the equipment and contribute toward the performance of its vital safety function. Proper storage and maintenance of the equipment after use is just as important as the cleaning of the equipment of dirt, corrosives or contaminants. The storage area should be clean, dry and free of exposure to fumes or corrosive elements.

**Nylon and Polyester**  
Wipe off all surface dirt with a sponge dampened in plain water. Squeeze the sponge dry. Dip the sponge in a mild solution of water and commercial soap or detergent. Work up a thick lather with a vigorous back and forth motion. Then wipe the belt dry with a clean cloth. Hang freely to dry but away from excessive heat.

**Drying**  
Harness and other equipment should be dried thoroughly without exposure to heat, steam or long periods of sunlight.
Attachment 2

Anchorage Points

ACCEPTABLE ANCHORAGE POINTS

Metal Pipe
- 4" or greater diameter in good condition (1 person) not to exceed 7’ span
- 6" or greater diameter in good condition (1 person) not to exceed 18’ span
  (2 people) not to exceed 9’ span
- 8” or greater diameter in good condition (1 person) not to exceed 34’ span
  (2 people) not to exceed 17’ span

Non insulated, cannot be hot to the touch
With permission from owner

Structural Steel
- I-beams

Cable
- as certified by Engineering

Vertical Scaffold
- Utilize anchor strap on uprights above rosette after 2 poles have been attached to the rosette for stability.

Members

UNACCEPTABLE ANCHORAGE POINTS

Electrical Conduit or Cable Tray

Fiberglass reinforced piping, any size

Plastic Piping

Insulated Piping
(unless approved by owner)

Handrails

Hoists

Grating

Uninsulated steam lines