



**METAL BUILDING
CONTRACTORS & ERECTORS
ASSOCIATION**

Metal Building Jobsite Safety Reference Guide

*A collaborative safety reference from the
MBCEA and SafetyWorks, Inc.*

SAFETYWORKS, inc.

Safety Management, Training & Consulting



A collaborative safety reference from the MBCEA and SafetyWorks, Inc.

METAL BUILDING JOBSITE SAFETY REFERENCE GUIDE

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A MESSAGE FROM THE MBCEA SAFETY COMMITTEE

The information in this handbook contains a combination of Federal OSHA regulatory information and industry-proven best practices that, when properly and consistently implemented, have proven to reduce loss in the workplace (injuries, illnesses, damages, fines, etc.).

But the success of any safety program depends on a combination of many important factors, over and above what a written policy can provide. Employer support, effective communication, quality training, and workplace inspections are but a few other facets that combine to help any written program reach its intended goals. If we fail to provide the financial, time, and personnel resources that an effective safety program requires, then any written policies we have will produce a very limited return on investment.

This handbook is intended to serve as a reference document in the development of your own company safety and loss control policy, and is not a replacement or substitute for it. This information was prepared to provide guidance with basic safety policy, procedures, and protections necessary to help your employees develop the work habits and skills for a long and fulfilling career in the metal building industry.

Employees should be expected to follow all company safety rules and procedures as a condition of employment. It is not only good for the employee, but also for business. And what's good for business is good for everyone.

This handbook is not warranted for accuracy or completeness, nor does it constitute legal advice on any specific requirement or compliance with regulations. While it summarizes many key elements of the Federal OSHA construction regulations (29 CFR 1926), **it does not cover all OSHA construction regulations, nor does it address unique requirements of State OSHA Plans.** In addition, the contents herein are not meant to replace, revise, supersede, or otherwise alter any OSHA regulations, interpretations or requirements.

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1. OSHA Inspections

Sooner or later an OSHA inspector may visit one of your projects. If this happens it is nothing to get excited or upset about. The entire inspection process is a part of business and should be approached in that mindset.

It is important that you do not volunteer information, but do answer questions truthfully. Keep in mind that the best truthful answer to a question may be, "I'm not sure, I'll have to check with my boss/office."

1.1 OSHA inspection tips & quick reference.

- 1.1.1 Upon arrival or notification – This is the point that we become aware of an inspection and are notified as to why the inspector is here and inspection scope. While you do have the right to refuse entry to the inspector and require a warrant prior to entry, this approach is usually not advised as it may lead to a longer and more comprehensive inspection.
- Assume that you have been under surveillance and photographed/videoed.
 - Be professional at all times.
 - Try to arrange to meet inspector in job trailer office.
 - Verify inspector photo ID & get business card before allowing inspection to progress.
 - Make your office contacts.
 - During opening conference, inquire as to why this site is being inspected. (*"What brings you here?"*)
 - If inspection is a result of complaint, request copy.
 - Inspector may ask to see safety policies and/or OSHA Injury/Illness logs (OSHA #300 & #300A logs)
 - Inform inspector of site-specific safety rules (including PPE) that will need to be observed.
 - Gather camera, cell phone, measuring tape & note pad/pen for walk-around.
- 1.1.2 Walk-around – This involves the actual inspection of the jobsite.
- Wear appropriate PPE.
 - ALWAYS accompany inspector.
 - Immediately correct any issues identified without admitting to knowledge, guilt, or responsibility.
 - Keep walk-through focused on purpose for visit. Do not walk more of site than necessary.
 - If you're a supervisor, watch what you DO & SAY... your actions/comments are on behalf of company.
 - Keep answers to questions brief & stick to facts.
 - Inspectors prefer to interview employees in private, but you have the right to have someone present.
 - No demonstrations of tools/equipment not in use or running.
 - Pay attention & take notes. Take photos, but only take photos of what inspector does.
- 1.1.3 Closing conference – This is when the inspector wraps-up the physical inspection and provides a summary of findings. He/she will usually make you aware of any alleged violations, however, this information is not set in stone. OSHA may add or delete violations for which fines are levied, pending further review or investigation of the inspector's report.
- Listen & note any "alleged violations" or stand-out comments. Do not be afraid to ask for clarification.
 - Provide inspector with office contact information for further correspondence & info requests.
 - Contact office when inspection is complete. Document pertinent information:
 - Date, jobsite, time
 - Personnel/subs on site
 - Inspector contact info (or submit copy of business card)
 - Reason for & scope of inspection
 - Results of inspection (alleged violations, who's responsible, pictures, corrective actions, etc.)
 - Names of persons questioned by the inspector
 - Inspector requests for documentation
 - Notable comments made by inspector
 - Initiate any follow-up corrective actions.

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1.2 OSHA Poster.

A summary of employee rights and responsibilities is given on the OSHA Poster. Prominently display this poster throughout the year where notices to employees are customarily placed.

1.3 OSHA's Multi-Employer Worksite Citation Policy.

Understand that OSHA can fine our company if we create a hazard or are exposed to one (whether or not we created or are responsible for it). We can also be fined for subcontractor safety violations.

Job Safety and Health

It's the law!

OSHA®
Occupational Safety and Health Administration
U.S. Department of Labor

EMPLOYEES:

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in that inspection.
- You can file a complaint with OSHA within 30 days of retaliation or discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have the right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violations.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records and records of your exposures to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.
- You must comply with all occupational safety and health standards issued under the *OSH Act* that apply to your own actions and conduct on the job.

EMPLOYERS:

- You must furnish your employees a place of employment free from recognized hazards.
- You must comply with the occupational safety and health standards issued under the *OSH Act*.

This free poster available from OSHA –
The Best Resource for Safety and Health

Free assistance in identifying and correcting hazards or complying with standards is available to employers, without citation or penalty, through OSHA-supported consultation programs in each state.

1-800-321-OSHA (6742)
www.osha.gov

OSHA 3185-02 2812R





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2. Safety-Related Disciplinary Action

2.1 Progressive disciplinary actions.

Individuals who violate safety policy, placing themselves, others, or property at risk of injury or damage, shall be subject to the following progressive disciplinary actions, at the company's sole discretion:

- 1st offense Documented verbal counseling and/or written reprimand
- 2nd offense Written reprimand and/or suspension without pay
- 3rd offense Meeting with executive management, suspension without pay, and/or termination.

We reserve the right to forego 1st, 2nd and/or 3rd offense actions where unsafe behavior is deemed to be serious, deliberate, willful or repeated.

Supervisory personnel shall be held accountable to the highest level of safety performance and may also be disciplined for policy violations committed by employees they supervise.

2.2 Employee protection from reprisal.

In no way shall anyone be disciplined, demeaned, or otherwise penalized for reporting incidents, reporting hazards, submitting constructive suggestions and/or for otherwise participating in our safety program. Any incident of ridicule or reprisal for good faith safety efforts is to be promptly reported to any member of executive management. The matter will be promptly addressed in a confidential and strict manner.

3. General Policies

3.1 "STOP WORK" orders.

Any employee has the authority to issue a "STOP WORK" order if he/she feels there exists a situation that could reasonably be expected to cause death or serious physical harm or damage. In the event of such an order, all work shall stop (or be placed into a safe hold position) until the matter can be resolved by the site supervisor, or project manager.

3.2 Equipment inspection & removal from service.

Any equipment, tool or vehicle that is not fit for safe use/operation or that violates OSHA regulation shall be IMMEDIATELY either:

- Tagged out of service
- Removed from jobsite
- Repaired

This may include, but is not limited to, bad cords, unsafe tools, partially disassembled scaffolds, slings, PPE, motorized equipment, etc.

3.3 Inclement weather.

Working on exposed portions of a structure during times of high winds, lightning, or icy conditions is not permitted. Don't try and "beat" an incoming storm. Get everything tied down and people off the structure before the storm hits.

3.4 Competent person.

"Competent person" is an OSHA term used to describe an individual who plays a key role in the coordination of jobsite safety, whether generally or for a particular trade/work task. Specifically, a competent person is:

- Experienced in the work he/she performs,
- Capable of identifying existing & reasonably predictable hazards,

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- Familiar with the OSHA regulations applicable to his/her work, and
- Authorized to take action necessary to eliminate hazards or worker exposure to them.

No work shall be performed unless a designated competent person is present on-site.

Per OSHA, the competent person is responsible to conduct, “frequent and regular inspections of the job sites, materials, and equipment.” The competent person is to use his/her experience & knowledge to determine inspection frequency & scope, based on site-specific work and conditions.

3.5 **Hazard detection & correction.**

- 3.5.1 **Universal responsibility for hazard detection & correction** – All employees are expected to continually evaluate their work areas for existing or predictable safety & health hazards, which may include unsafe acts, conditions, equipment, or materials. It is expected that prompt action will be taken (or sought through site supervision) to eliminate or reasonably control identified hazards/concerns.
- 3.5.2 **Fixes** – Where the fix to a hazard is quick and simple, employees are expected to take action themselves to eliminate the hazard. If the hazard is complex, serious, recurring and/or involves another employer, it shall be immediately reported to a supervisor. If the supervisor is not onsite or does not address the concern in a reasonable period of time, then the employee is to report the matter directly to the project manager or executive management.
- 3.5.3 **Promptness** – Hazards that could reasonably be life-threatening and/or capable of causing serious injury, illness or damage must be corrected before work begins or is allowed to continue. If persons are exposed to the hazard, they are to be immediately removed from the danger area until the corrective actions have been taken.
- Less serious hazards (ones not reasonably capable of producing serious injury, illness or damage) must be corrected as soon as reasonably practical. While work may continue in the general vicinity, it is expected that the hazard/hazard area be isolated or tagged-out of service until corrective action has been taken.
- 3.5.4 **Root causes for corrective actions** – It is expected that corrective actions address root causes – don’t stop at simply identifying unsafe acts and reprimanding persons. Look deeper to identify any equipment or procedure-related factors, gaps in safety policy, and/or any contributing factors related to safety supervision, program management, or organizational operations.

3.6 **Job safety analysis (JSA).**

JSA’s enable us to plan and uniformly communicate the safety aspects of a given work task. They represent a procedure whereby:

- A job task is broken down into basic steps
- Potential hazards are identified for each step, and
- Actions to eliminate or control hazards is identified

We may use JSA’s for any work that:

- Presents a high-risk exposure to injuries or damage (frequency &/or severity),
- Is new or significantly altered,
- Is required by the general contractor.

The JSA shall be developed by the site supervisor. Prior to the start of the work task, the JSA is to be reviewed with all personnel involved with the work task and refined as necessary. Personnel shall then be responsible for performing the work in accordance with the JSA.

3.7 **Permits.**

Depending on customer requirements and plant safety protocol, a written, properly authorized, and current permit may be required before you begin certain types of work. Permits may be issued for the duration of a job, or they may be issued daily or weekly. Following are a few of the more common permits used:

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- 3.7.1 Confined Space Entry Permit — Used to preplan and authorize entry into a confined space.
- 3.7.2 Safe Work Permit — Used to preplan and authorize work of any type in any area.
- 3.7.3 Scaffolding Permit — Used to preplan and authorize the erection and use of scaffolding.
- 3.7.4 Hot Work Permit — Used to preplan and authorize work that can produce heat, flame, sparks, slag, or other sources of ignition, particularly if within 35 ft. of flammable/combustible materials.
- 3.7.5 Live Electrical Work Permit — Used to preplan and authorize work on energized electrical equipment.
- 3.7.6 Excavation Permit — Used to preplan and authorize excavating, concrete breaking, or drilling work in certain areas.
- 3.7.7 Proximity Permit — Used to preplan and authorize work that is closer than 15 feet to overhead power lines or process lines.

3.8 **Electronic personal media/music devices (MP3 players, iPod, iPhone, etc.).**

Due to concerns over safety, the use of any electronic personal media device with ear buds or headset is prohibited at all times. This policy stands regardless of whether one or both buds are being used.

3.9 **Visitors.**

All site visitors must immediately report to the site supervisor or a company representative. We reserve the right to require photo identification and ID confirmation prior to granting site access to anyone.

3.10 **Smoking.**

Smoking is not permitted in any building, job trailer, storage trailer, building under construction (once the roof & walls are up), refueling area, within 50 ft. of flammable liquids/gases or in any other area where an accumulation of easily ignitable combustible material or debris may be found. Any other restrictions on smoking shall be determined on a site-by-site basis.

“NO SMOKING” signs shall be conspicuously posted at all entrances into buildings, job trailers, and in flammable liquids/gases storage and refueling areas.

3.11 **Job boxes, vehicles & trailers.**

To the extent feasible, keep all job boxes, vehicles & trailers closed and locked when not in use.

3.12 **OSHA postings.**

It is the site supervisor’s responsibility to be sure that the following OSHA postings are displayed on the jobsite:

- 3.12.1 OSHA poster – Prominently display where notices to employees are customarily posted. This poster must remain displayed throughout the year.
- 3.12.2 OSHA #300A summary log – Only required to be displayed during the full months of February, March & April, where notices to employees are customarily posted. Beyond April, this form may be taken down.

3.13 **Forms, documents & records release restrictions.**

Without executive management authorization, no forms, documents, reports or records (including our written safety policy) may be copied, emailed, faxed, duplicated, given to, or otherwise transmitted to non-company personnel.

The following documents are available for VIEWING ONLY on the jobsite:

- Company safety policies
- OSHA-required programs (hazcom, lockout/tagout, respirator, confined space entry, etc.)
- SDS & chemical inventory sheet
- Completed toolbox talks
- OSHA #300 & #300A injury/illness recordkeeping logs (may need to contact office)
- Incident reports, but not investigation reports

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- Safety training records
- Air/noise/chemical sampling data

Refer all requests for such documents to executive management.

3.14 Drug & alcohol-free workplace.

Employees shall not use, be under the influence of nor sell or be in the possession of alcohol, illegal or non-prescribed drugs or any form of intoxicant while on the job, when reporting to work, or operating company vehicles/equipment. Violators shall be immediately disciplined as per company policy.

If using medication that may cause drowsiness (prescribed or over-the-counter), the employee shall report to the site supervisor that he/she is using medication that may cause drowsiness and the supervisor shall properly plan that employee's daily work accordingly. The employee need not specify the name of the medication or the reason for taking it.

For additional and specific policy details, including provisions for drug/alcohol testing, reference the company Drug/Alcohol Free Workplace & Substance Abuse Policy.

4. Personal Aspects of Safety

4.1 Role of common sense.

Do not engage in any activities or practices that may be inconsistent with reasonable common sense. Be familiar with & follow regulations applicable to your work and incorporate safe work practices that have been established for your job tasks.

4.2 Work task safety instruction.

If you do not thoroughly understand your job task or how to perform it safely, speak with your site supervisor BEFORE you start.

4.3 Awareness.

Always be aware of your surroundings, not only in your work area, but also when you are passing through other areas of the jobsite. Never approach the operating radius of equipment until you have established clear communication with the operator and he/she is aware of your presence. Also, keep clear of moving parts, pinch points, elevated booms/buckets/forks, blind spots, restricted areas, hoistways, confined spaces and inadequately protected excavations.

Never walk or work beneath elevated equipment parts (forks, buckets, booms, support arms, scissors, dump beds, etc.), adjacent to vehicles being loaded or near the swing radius/blind spots of equipment. Exercise extreme caution whenever passing through a fall zone (area into which elevated objects may drop or fall).

4.4 Illumination.

Assure that adequate illumination is provided to do your work safely. If there is not enough light, use a light stand. Poor lighting can lead to serious injuries caused by unidentified hazards or inability to see work.

4.5 Concentration & distractions.

Concentrate on your job task and avoid activities that could cause you to lose focus. Never distract another worker while he/she is performing work – wait until the task is completed.

4.6 Catch hazards – clothing, hair & jewelry.

There are many catch and entanglement hazards inherent to this line of work and they are capable of producing serious injury. Be especially attentive and cautious when working in the vicinity of moving machine, tool or equipment parts.

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- 4.6.1 Clothing – Do not wear loose, baggy or torn/ragged clothing onto the job.
- 4.6.2 Hair – Long hair (longer than shoulder length) must be secured under the hardhat.
- 4.6.3 Jewelry – Exposed body piercings and loose, protruding or dangling jewelry is not to be worn on the job. Wedding rings, wrist watches and stud earrings are highly discouraged due to the catch and electrical hazards they present. For your own safety, rings should not be worn when working with tools or mechanized equipment.

4.7 Horseplay, fighting &/or possession of firearms.

Strictly prohibited in the workplace. In the case of threats of violence or possession of weapon, site supervisor is instructed to contact local law enforcement authorities immediately.

4.8 Safety signs and decals.

Employees are to heed the instructions given by any NOTICE, CAUTION, WARNING or DANGER signs or decals.

Use signs when necessary to alert others of relevant hazards. Signs must be legible and placed on barricade stands, posts, or other suitable and highly visible locations. Remove signs when they are no longer needed.

- 4.8.1 DANGER – An immediate and grave hazard exists in which there is a high probability of death or severe injury. Special precautions needed.
- 4.8.2 WARNING – A hazardous situation exists that has some probability to cause death or serious physical harm. Special precautions needed.
- 4.8.3 CAUTION – Potential hazards that could lead to minor or moderate injury. Also used to caution against unsafe practices. Do not use if hazard could lead to serious injury/death.

4.9 Records and information access.

Upon request, employees shall have access to their own medical and/or exposure records in accordance with OSHA regulations.



5. Housekeeping, Drinking Water, & Sanitation

5.1 Responsibility.

All site personnel share the responsibility of keeping jobsites free of clutter, debris, tools, rod ends, metal shavings, empty material packaging, scraps, spills, exposed sharp or pointy objects and slip/trip hazards. Place emphasis on the following areas:

- Exits, exit accesses, walkways & aisles
- Staging areas
- Stairways & areas around ladders
- Scaffold platforms and accessways
- Min. 3 ft. in front of electrical panels
- Fire extinguishers, alarm, sprinkler controls/connections & hydrant access
- Areas along the edges of excavations
- Areas in the vicinity of a confined space access
- Equipment & vehicle cabs & platforms
- Sidewalks
- Job trailers and the jobsite in general

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5.2 Waste containers.

Containers shall be provided for the prompt removal of trash and debris. Take care to not throw potential ignition sources (cigarette butts, etc.) in containers that hold materials that can burn. Put cigarette stubs in designated cans.

Separate receptacles shall be provided for oily/solvent-contaminated rags and for regulated wastes (biological materials, asbestos-containing materials, lead-containing materials, etc.). Do not discard these types of waste into ordinary waste containers. Also, separate containers may be used to sort building materials for recycling. Again, please discard building material waste into the appropriate container. If you are uncertain, ask your site supervisor.

5.3 Elevated dump areas.

When dump areas are at a height of six (6) ft. or more above a lower level, fall protection shall be provided for employees and a wheel stop shall be provided for carts/wheelbarrows.

5.4 Additional housekeeping expectations.

- Keep tools, work materials, and small objects in boxes, bins, or designated containers.
- Remove, cut off, or hammer down protruding nails and screws to prevent puncture wounds.
- Clean up all grease and oil spills immediately.
- Ensure that worktables are occupied only by work at hand, and tools required for work being done.
- Store and contain material so that fire has no place to start.
- Clean up tools and work areas as your job progresses.
- Place/protect cords & hoses such that they do not present a trip hazard and are not exposed to damage.
- Keep all material, tools, and equipment in a stable position (tied, stacked, or chocked) to prevent rolling or falling. Proper stacking is required for safety, easy access, and prevention of material damage.

5.5 Sanitation & drinking water.

- 5.5.1 Portable toilets – Toilets will be provided on every jobsite. The number of toilet units will be based on the number of employees on site and frequency of clean-out service. Any job toilets that are unsanitary are to be immediately reported to the site supervisor so that appropriate action can be taken.
- 5.5.2 Drinking water – The site supervisor shall ensure that a supply of drinking water and disposable cups is maintained on the jobsite each workday.
- 5.5.3 Wash facilities – Where employees may be exposed to dangerous chemicals on the jobsite (biological materials, lead, concrete, pesticides, corrosives, caustics, poisons, etc.), wash facilities that include soap and water will be provided. Where hands are the only likely source of contamination, a waterless hand sanitizer may be substituted for the wash facilities.

6. Personal Protective Equipment (PPE)

6.1 Basic provisions.

- 6.1.1 Responsibility – It is the employee's responsibility to wear and care for PPE in accordance with this policy. These requirements shall extend to site subcontractors, visitors, and suppliers (if their policy is not more stringent).
- 6.1.2 Company issued PPE – Employees will be provided PPE that is necessary to do their job safely and to fulfill the provisions of this policy. The only exceptions may be leather work boots and prescription eyewear.
- 6.1.3 Employee owned PPE – Any employee-owned PPE is subject to the provisions of this policy. Prior to its use on the job, it must be shown to the site supervisor so that it can be verified as being adequate and properly maintained. PPE that is questionable or that does not meet applicable ANSI standards shall not be permitted to be used.

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- 6.1.4 Inspection & maintenance – Employees are required to inspect their PPE prior to each use and to maintain it in good repair. PPE needs to be clean, sanitary and in a reliable condition. Damaged, defective or improperly fitted PPE shall not be used.
- 6.1.5 Precautions for eye care – Report all eye injuries and suspected foreign material in your eyes to your supervisor immediately. Do not try to remove foreign matter yourself. Seek help and use an eye wash. Keep hands away from eyes and don't rub your eye if you feel something in it.

6.2 Hardhats.

Unless company or site safety rules require hardhats to be worn at all times, hardhats shall be worn when there is an exposure to head injury from impact, falling/flying objects, or electrical shock/burn. Also, they are required if working on or around scaffolds and lifts, and if working in a trench or around heavy equipment.

All hardhats must be ANSI Z89.1, Class G or E compliant and worn with bill of cap facing forward. Hardhats will be permitted to be worn backwards as long as the hardhat manufacturer allows this, and then, as long as the internal webbing/adjustment band is reversed (so that adjustment is in back of head).

6.3 Safety glasses (with side shields) & goggles.

Unless company or site safety rules require safety eyewear to be worn at all times, safety eyewear shall be worn any time the potential exists for eye injury from physical hazards (object flying into/striking eye), chemical hazards (corrosives, caustics, etc.), biological substances, or radiation agents (infrared/UV). This provision applies regardless of whether you are actually doing the work or are simply in or adjacent to an area where such work is being done.

Some common examples include (but are not limited to):

- Overhead work
- Use of hand or power tools/equipment
- During demo operations
- During hot work (soldering, torching, brazing, welding, exothermic welding, etc.)
- Any work that generate flying particles or work in a windy area (that could blow particles into eye)
- While handling/using chemicals that are corrosive, harmful, toxic or caustic (lead, concrete, fuels, etc.)*
- While administering 1st aid or when exposed to blood or bodily fluids
- While exposed to infrared/ultraviolet radiation (lasers, welding, hot work)

** May require use of safety goggles. Refer to chemical's Safety Data Sheet (SDS).*

All safety glasses must be ANSI Z87 or Z87+ compliant and worn in a manner that is approved by its manufacturer.

- 6.3.1 Prescription glasses & sunglasses – Must be marked as meeting ANSI Z87 (or equivalent) specifications with side shields. Otherwise safety glasses must be worn over top of them.
- 6.3.2 Indirectly-vented safety goggles – Required (instead of safety glasses) if eyes could be exposed to mists, vapors, sprays, or splashes of a hazardous substance or for any work task that could reasonably be expected to produce flying debris capable of entering the eyes from behind or around safety glasses.
- 6.3.3 Hot work – When welding/torching, the appropriate shade of safety glasses must be worn.

Torching Operation	Min. Shade #
Soldering	2
Torch brazing	3 or 4
Light cutting (up to 1")	3 or 4
Medium cutting (1" to 6")	4 or 5
Heavy cutting (over 6")	5 or 6
Gas welding (light – up to 1/8")	4 or 5
Gas welding (medium – 1/8" to 1/2")	5 or 6
Gas welding (heavy – over 1/2")	6 or 8

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6.4 Face shields.

- 6.4.1 Impact hazards – Faceshields (solid or mesh) shall be worn with safety glasses for saw cutting, chipping, jackhammering, grinding, and similar activities that can produce large or high-speed flying particles.
- 6.4.2 Chemical hazards – Indirectly-vented safety goggles and a solid faceshield shall be worn for the handling of any chemical that is caustic, corrosive, or that otherwise presents a serious skin/tissue contact hazard. This PPE must also be worn if mists, vapors, sprays, or splashes of such a chemical could contact the face during the course of work operations.
- 6.4.3 Biological exposures – Safety glasses and a solid faceshield and protective mask (covering nose & mouth) must be worn anytime employees may be exposed to blood or bodily fluids that could foreseeably splash up to the face.
- 6.4.4 1st aid/CPR – Wear safety glasses and a mask (covering nose & mouth) in situations where the rendering of 1st aid or CPR may result in blood or bodily fluids coming into contact with the face.
- 6.4.5 Welding/molten materials – Solid faceshields/helmets (with appropriate shade) shall be worn with safety glasses at all times while welding. Face shields shall also be required if working with molten material (tar, etc.).

Welding Operation	Min. Shade #
Shielded metal arc: $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{5}{32}$ " dia. electrodes	10
Gas-shielded arc (non-ferrous): $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{5}{32}$ " dia. electrodes	11
Gas-shielded arc (ferrous): $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{5}{32}$ " dia. electrodes	12
Shielded metal arc: $\frac{3}{16}$, $\frac{7}{32}$, $\frac{1}{4}$ " dia. electrodes	12
Shielded metal arc: $\frac{5}{16}$, $\frac{3}{8}$ " dia. electrodes	14
Atomic hydrogen welding	10 – 14
Carbon arc welding	14

6.5 Footwear.

All field employees must wear leather over-the-ankle footwear that is kept laced and tied. No flip-flops, sandals or sneakers.

Safety-toed footwear (ANSI Z41 – class 75) and metatarsal guards are required for work where there exists a hazard capable of crushing or compressing the top of the foot. Such work may include, but not be limited to, jack hammering, tamping, steel erection, work around heavy equipment, etc. Since these sorts of exposures are inherent to most work in the metal building industry, safety-toed footwear should be required on all jobsites. Six-inch high boots tops are encouraged to prevent strains and sprains.

Wear rubber boots when working in concrete, mud, or water. Wear chemical protective boots (as recommended by substance SDS) when working with or around hazardous chemicals.

6.6 Clothing.

Shirts and long pants (jeans/work pants) must be worn at all times. Clothing must be substantial and suitable for the job you are doing – no shorts or sweatpants. Also, do not wear loose or baggy clothing that could present a catch/entanglement hazard.

For hot work (welding, torching, etc.), the outer layer of clothing must be flame resistant (FR) or equivalent. Prevent burns by fully buttoning FR jackets to top, not cuffing pant legs or jacket sleeves, allowing FR jacket to overlap pants, and pant legs to overlap boots.

6.7 High-visibility shirts/vests.

An ANSI 107, Class 2 hi-viz shirt or vest (with reflective striping) must be worn by anyone working within 15 ft. of a publically-travelled roadway, unless behind a guiderail or 2 ft. or more behind a curb. The shirt/vest must be class 3 if working during hours or darkness or along roadways with a posted speed limit in excess of 50 mph.

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It is recommended that a hi-viz shirt or vest be worn by all site personnel until all heavy equipment and forklifts leave the site. Reflective striping is not necessary unless work takes place during nighttime hours.

All vests should be tear-away and fit properly so as to not present a catch hazard. If welding/torching, vests should be FR rated (flame-resistant).

6.8 Protective gloves.

- 6.8.1 Cut-resistant gloves – Required when using tools or handling material with burrs or sharp/rough edges (ex: steel, siding, girts, purlins, or cable, during demo work, using utility knives, etc.). Also, required if working in vicinity of objects with sharp edges such that a slip could cause hand to strike edge and be cut.
- 6.8.2 Leather gloves – Must be worn for all torch work. Also, wear to protect hands from minor cut, puncture or abrasion exposures and from extreme temperatures. May be used as a substitute for cut-resistant gloves for demo work.
- 6.8.3 Chemical-resistant gloves – Use to be determined by SDS recommendations for specific chemicals. As necessary, acquire needed gloves from tool counter.
- 6.8.4 1st aid/CPR – Prior to offering first aid, nitrile or vinyl gloves must be worn to protect against exposure to blood or bodily fluids.
- 6.8.5 Vibration & impact-reducing gloves – Use is recommended for operating hand-held power equipment that produces significant hand, wrist or arm vibration or impact force (hammer drills, right angle drills, etc.).

6.9 Hearing protection.

Ear plugs or equivalent hearing protection must be worn anytime an employee:

- Uses any loud tool/equipment (requiring a raised voice to be heard & understood at arm's length)
- Uses grinders (to prevent hot grinding slag from entering the ear canal)
- Works in a loud work area (requiring a raised voice to be heard & understood at arm's length)
- Operates open-cab equipment, or equipment with doors/windows kept open
- Is directed to do so by supervisor or site-specific requirements

6.10 Respirators.

A properly selected air-purifying respirator (APR) can offer limited protection to the wearer by filtering airborne contaminants (dusts, mists, fumes, vapors, gases, etc.). Supplied air respirators (SARs) can actually provide a source of breathing air in an oxygen deficient environment. Different respirators do different things; therefore it is imperative that the correct respirator for the job be selected.

A separate written Respiratory Protection Program will be established for employees who are required to wear a respirator. The program shall remain accessible for employees to review. As a part of this program, any employee required to wear a respirator (other than voluntary use of dust mask) must be medically cleared, trained, and fit tested before wearing a respirator. The training and fit tests must be administered annually.

Employees who wear a respirator must keep their face free of facial hair in the seal area. They must also inspect their respirator daily and maintain it in good condition. Respirators must be properly cleaned on a regular basis and stored in a sanitary, dustproof container.

OSHA Information for Voluntary Use of Dust Masks

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

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You should do the following:

- Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
- Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
- Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
- Keep track of your respirator so that you do not mistakenly use someone else's.

7. Chemicals & Chemical Hazard Communication

Per OSHA, a hazardous substance is any substance, or its by-product, that exhibits a physical or health hazard. Physical hazards typically relate to flammability, compression, corrosiveness, or instability. Health hazards relate to short-term or long-term effects to the body.

There are many hazardous substances on your jobsite, and it is important to know their identities, hazards, handling precautions, and emergency response actions.

7.1 Chemical hazard labels.

All containers must have a label that clearly indicates:

- What is in the container, and
- Appropriate hazard warnings

If a container is not labeled, or if the label is not legible, you need to provide a new one. If you are not sure what or how to label, ask your site supervisor.

By mid-2015, chemical manufacturers and importers must provide a label that includes a signal word, pictogram, hazard statement, and precautionary statement for each hazard class and category.

The globally-recognized pictograms that will be used are shown to the right...

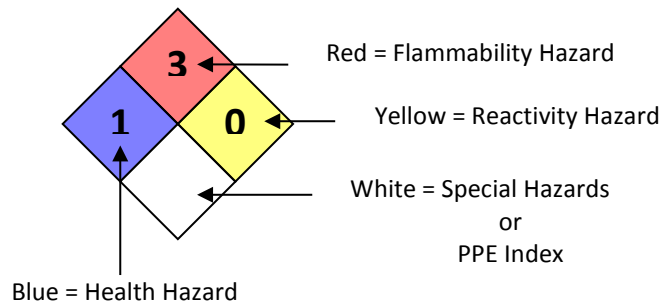
Also, sometimes a color-coded labeling system (NFPA diamond or HMIS symbol) may be used. While the color-coded labels are not required to be used, it is important to understand how to interpret them. They are shown on the next page...

HCS Pictograms and Hazards

Health Hazard  • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity	Flame  • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides	Exclamation Mark  • Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder  • Gases Under Pressure	Corrosion  • Skin Corrosion/ Burns • Eye Damage • Corrosive to Metals	Exploding Bomb  • Explosives • Self-Reactives • Organic Peroxides
Flame Over Circle  • Oxidizers	Environment (Non-Mandatory)  • Aquatic Toxicity	Skull and Crossbones  • Acute Toxicity (fatal or toxic)

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National Fire Protection Association (NFPA)



Hazardous Material Identification System (HMIS)

1	Health Hazard
2	Fire Hazard
0	Reactivity
	Other / PPE

0	No hazard
1	Slight hazard
2	Moderate hazard
3	Extreme danger
4	Deadly

Special Hazards

ACID	Acid
ALK	Alkali
COR	Corrosive
OXY	Oxidizer
W	Do not add water
	Radioactive

A				
B		+		
C		+		+
D		+		+
E		+		+
F		+		+
G		+		+
H		+		+
I		+		+
J		+		+
K		+		+
X	Consult your supervisor or S.O.P. for special handling directions.			

PPE Index

	Safety glasses
	Protective gloves
	Synthetic apron
	Face shield
	Dust respirator
	Splash goggles
	Vapor respirator
	Combination respirator
	Supplied air respirator
	Chemical protective suit
	Chemical protective boots

7.2 Safety data sheets (SDS) – formerly MSDS.

Safety data sheets (SDS) provide safety, health and emergency response information about the hazardous substances on our jobsites.

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SDS shall be maintained at a predetermined location on the jobsite (usually in the job trailer or supervisor's vehicle). They shall be kept freely accessible to all employees and visiting contractors at all times.

It is important to know where SDS are kept on your site. If you are unable to find an SDS for a specific product or chemical, notify your supervisor. If an SDS is needed, the supervisor shall promptly act to obtain it from the appropriate manufacturer or supplier.

By mid-2015, all SDS shall be uniform in layout...

The Hazard Communication Standard (HCS) requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) (formerly known as Material Safety Data Sheets or MSDSs) to communicate the hazards of hazardous chemical products. As of June 1, 2015, the HCS will require new SDSs to be in a uniform format, and include the section numbers, the headings, and associated information under the headings below:

Section 1, Identification includes product identifier; manufacturer or distributor name, address, phone number; emergency phone number; recommended use; restrictions on use.

Section 2, Hazard(s) identification includes all hazards regarding the chemical; required label elements.

Section 3, Composition/information on ingredients includes information on chemical ingredients; trade secret claims.

Section 4, First-aid measures includes important symptoms/effects, acute, delayed; required treatment.

Section 5, Fire-fighting measures lists suitable extinguishing techniques, equipment; chemical hazards from fire.

Section 6, Accidental release measures lists emergency procedures; protective equipment; proper methods of containment and cleanup.

Section 7, Handling and storage lists precautions for safe handling and storage, including incompatibilities.

Section 8, Exposure controls/personal protection lists OSHA's Permissible Exposure Limits (PELs); Threshold Limit Values (TLVs); appropriate engineering controls; personal protective equipment (PPE).

Section 9, Physical and chemical properties lists the chemical's characteristics.

Section 10, Stability and reactivity lists chemical stability and possibility of hazardous reactions.

Section 11, Toxicological information includes routes of exposure; related symptoms, acute and chronic effects; numerical measures of toxicity.

Section 12, Ecological information*

Section 13, Disposal considerations*

Section 14, Transport information*

Section 15, Regulatory information*

Section 16, Other information, includes the date of preparation or last revision.

*Note: Since other Agencies regulate this information, OSHA will not be enforcing Sections 12 through 15 (29 CFR 1910.1200(g)(2)).

Employers must ensure that SDSs are readily accessible to employees.

See Appendix D of 29 CFR 1910.1200 for a detailed description of SDS contents.

7.3 Chemical storage, handling & disposal.

Keep all containers closed when not in use. To reduce waste and to limit or prevent emergencies, only take as much of a chemical as is needed to do the job. Be on the lookout for and report leaking containers or containers without labels. If you are not familiar with how to safely store and/or properly dispose of a substance, refer to the product SDS or see your site supervisor.

Unless the chemical manufacturer indicates that it is safe to do so, do not discharge any chemical onto the ground, into water or down a drain.

7.4 Chemical spills.

Never attempt to manage or clean-up a significant hazardous substance spill unless otherwise directed by the site supervisor. In case of a significant spill, notify your supervisor IMMEDIATELY so that a decision regarding appropriate action can be made.

7.5 Hygiene & contamination.

7.5.1 Hand washing – To minimize the spread and ingestion of trace quantities of hazardous or biological substances, wash your hands at the end of the workday, prior to eating or drinking, prior to going to the

Metal Building Jobsite Safety Reference Guide

bathroom and/or before using tobacco or cosmetic-type products. Where soap and water is not available, a waterless hand sanitizer can be used.

- 7.5.2 Bodily contamination – Wash any potentially contaminated body parts as soon as possible after coming into contact with blood, bodily fluids, sewage, wastewater, hazardous chemicals or hazardous chemical residues. Where a substance has splashed into the eyes, rinse with clean water for at least 15 minutes.
- 7.5.3 Clothing contamination – Where clothing could be contaminated with hazardous or biological substances, wear coveralls to minimize exposure & simplify clean-up. Designate a change-out area close to – but separate from – the work area where contaminated coveralls/clothing can be removed.

If clothing becomes contaminated, make arrangements to change into clean clothes ASAP following exposure. Take necessary precautions to prevent contaminating your vehicle or personal items.

7.6 Special chemical hazards.

- 7.6.1 Silica dust – Silica dust is produced during masonry, stone & concrete cutting, sawing, grinding or drilling activities, as well as rock & stone breaking, dumping or crushing.

The smallest dust particles (the respirable portion of silica dust) are so small that they are not filtered by the upper respiratory system and can become lodged deep in the lungs. Long-term overexposure to this dust can lead to serious illness.

For this reason, use of a water spray (wet cutting) shall be required. If wet cutting techniques are infeasible, then a dust mask/respirator must be worn by all exposed workers when processing (cutting, sawing, grinding or drilling) block, brick, rock or concrete products.

- 7.6.2 Lead & asbestos – Lead is a systemic poison that can enter the body through inhalation of lead-containing dust/fumes or by inadvertent ingestion of trace quantities that contaminate the hands or other body parts. Inhalation of asbestos fibers can lead to respiratory illnesses and possibly cancer.

No work is to be conducted in any area where lead or asbestos is present and could possibly be disturbed and/or become airborne. Contact your supervisor for further instruction.

8. Hand & Power Tools

8.1 Instruction.

Do not use any tool unless you were first trained in its safe operation and understand the types of injuries that can occur while using it. All tools and equipment shall be used only by employees who are competent, trained and authorized to operate them.

8.2 Tool selection & maintenance.

Select the proper tools for the work task, including PPE. All tools and equipment must be used in a manner intended by the manufacturer.

Keep blades, bits, and cutting devices clean, sharp and periodically lubricated. This will best allow the tool to function properly, minimizing chance of injury and maximizing tool life. No blades, bits, accessories, etc. are to be adjusted or replaced unless the tool is unplugged or locked/tagged out. For pneumatic tools, be sure that the air source is disconnected and stored pressure is relieved.

Replacement parts & accessories must meet tool manufacturer specifications. (Ex: wheel/cutting bit composition, rpm rating, arbor diameter, etc.)

8.3 Inspection & tool condition.

All tools and equipment must be visually inspected prior to use. Look for damaged parts, missing/defective guards, loose fittings, nicked cutting bits/blades, improperly rated/sized wheels, damaged cords, and abnormalities.

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If found to be damaged, missing safety devices or otherwise not properly working, immediately tag the item out of service & report it to the site supervisor. If the tool or equipment is yours, please remove it from the jobsite until it can be properly repaired.

All personal tools, equipment, and PPE must be inspected by the site supervisor to ensure safety and suitability before being allowed on the job.

8.4 Guards & safety devices.

8.4.1 Manufacturer provided guards – Tools & equipment must be equipped with all OEM and retrofit guards and safety devices. These guards and safety devices must be properly installed, adjusted, and functioning when the tool or equipment is in use. Guards and safety devices may never be removed, defeated, wired back or otherwise altered.

8.4.2 Reciprocating, rotating and moving parts – Belts, gears, shafts, pulleys, sprockets, spindles, drums, flywheels and similar parts must be guarded if they could be exposed to contact by any employee or if they otherwise create a hazard.

The following devices (mechanical power-transmission apparatus), when within 7 ft. of a floor or work platform, must be guarded and/or so constructed that projection or catch hazards are eliminated or guarded:

- Flywheels, cranks, rods & shafts
- Pulleys, gears, sprockets, chains, belt/rope/chain drives & related equipment
- Friction drives
- Keys, setscrews & similar projections in revolving parts
- Revolving collars & shaft couplings
- Clutches, cutoff couplings & clutch pulleys

8.4.3 Bodily injury – Never place any body part into an equipment's point of operation or danger area unless the equipment is shut down and all hazardous energy sources are isolated. If the tool is plug-connected, unplug and keep plug end under your control prior to adjusting tool or changing accessories.

Secure loose clothing or hair and remove jewelry that can be caught in moving parts. As appropriate, keep sleeves buttoned up and away from rotating equipment.

Be aware of other workers in your area. Make sure they are aware of you and your work, and are wearing appropriate PPE.

8.4.4 Special hand tools – Use to place materials into or remove them from danger zones (tool/equipment point of operation). Special hand tools supplement effective point of operation guarding – they are not to serve as a replacement for guards.

8.5 Carrying tools & accessories.

Carry tools in a manner that is recommended by the manufacturer. Do not carry tools by cords/hoses and never hold a finger on the switch while carrying. Do not place sharp or pointy accessories in pockets.

Be sure to take all necessary tools and hardware with you. Do not ask someone to throw a tool to you. Organize tools in your belt so they won't fall out.

8.6 Secure work & footing.

Where possible, secure work so that both hands are free to operate and control the tool. Ensure secure footing before operating any tool.

Note that the rotating, circular motion created by drill, grinder, impact wrench, or saw can result in a strong, twisting force. Keep a firm hold on drilling tools, especially the hammer drills, so they don't twist and sprain your wrist. Be prepared in case of jamming.

Use tool holders when driving stakes, wedges, or when holding star drills, bull pins, and similar driven tools.

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8.7 Hand tools.

The heads of striking tools must be dressed square and without burrs. These would include: hammers, drift pins, bull pins, and chisels.

Always hold and use tools in such a way that if there is a slip or a miss, you will not be injured. Pull on a wrench, don't push on it. Do not lean on ratchets, teeth could strip and cause you to fall.

Worn tools are dangerous – hammerheads can fly off loose handles, and a pipe wrench may slip if the jaws are worn.

Don't use cheater bars or other devices to increase tool capacity. Similarly, don't use tools as pry bars.

Learn how to use tin snips properly, and watch out for jagged edges.

8.8 Switches.

Do not attempt to defeat or bypass safety switches.

8.8.1 Positive ON-OFF control – Permitted for hand-held powered platen sanders, grinders (2 inches or less wheel diameter), routers, planers, laminate trimmers, nibblers, shears, scroll saws and jigsaws (blade shanks ¼-inch wide or less).

8.8.2 Momentary contact ON-OFF control – Required for hand-held powered drills, tappers, fastener drivers, grinders (horizontal, vertical or angle with wheel diameters greater than 2 inches), disc sanders, belt sanders, reciprocating saws and saber saws. These types of equipment may have a lock-on control provided that it can be deactivated with a single motion of the same finger or fingers that are used to activate it.

8.8.3 Constant pressure switch – Required for all other hand-held powered tools such as circular saws, chain saws and percussion tools without positive accessory holding means. The constant pressure switch must shut off power when finger pressure is released.

8.9 Electric-powered tools & equipment.

8.9.1 Grounding – AC power tools must either have a plug with a grounding conductor (3-prong) or must be double insulated. Never remove or damage grounding prongs. Assure that the cords & receptacles you're plugging into are grounded.

8.9.2 Ground fault protection – AC power tools must be provided ground fault protection either through use of a tested and properly functioning GFCI or through means of a current Assured Equipment Grounding Conductor (AEGC) Program.

8.9.3 Prevent cord damage – Place cords so that they do not present a trip hazard or are subject to damage (cut, crushing, pinching, abrasion, etc.). Also, keep cords away from heat & oil/water.

8.9.4 Plugging/unplugging – Make sure hands and plug connections are dry when plugging or unplugging. If not possible, use gloves that protect against electrical shock. Pull cords apart by plug & receptacle caps, not the cord.

8.10 Pneumatic tools & equipment.

8.10.1 Hose coupling – Pneumatic tools must be coupled to the hose by a positive means that will prevent accidental disconnection.

8.10.2 Safety clips or retainers – Must be securely installed and maintained on impact tools to prevent accidental attachment expulsion.

8.10.3 Nailers & staplers – If these tools have automatic feed and operate at pressures exceeding 100 psi, they must have a safety plunger on the muzzle to prevent firing unless the plunger is in contact with the material being fastened.

8.10.4 Compressed air safety – Do not use compressed air for cleaning purposes unless pressure is below 30 psi and effective chip guarding and PPE is used.

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- 8.10.5 Safe operating pressure – Safe operating pressures for hoses, valves, pipes, filters and fittings may not be exceeded.
- 8.10.6 Improper use of hoses – Hoses may not be used to hoist or lower tools or equipment.
- 8.10.7 Hoses greater than ½-inch I.D. – Must have a safety device at the supply source or branch line to reduce pressure in case of hose failure.
- 8.10.8 Abrasive blast cleaning nozzles – Must have an operating valve that has to be held open manually. Also, must provide a support to mount the nozzle on when not in use.

8.11 Fuel-powered tools & equipment.

- 8.11.1 Refueling & maintenance – Must be shut off and allowed to cool prior to fueling. In addition, the spark plug wire must be removed from the spark plug prior to any servicing, maintenance or changing of blades.
- 8.11.2 Ventilation – Provide adequate fresh air ventilation if using a fuel-powered tool in a confined or otherwise poorly ventilated area.
- 8.11.3 Wheel rpm rating – The minimum rpm rating for the grinding wheel must be at least as great as that of the grinder. Make sure the wheel is being used for the purpose for which it was designed.

8.12 Powder-actuated tools.

- 8.12.1 Training – Only employees who have received training on the particular tool in use may use a powder-actuated tool.
- 8.12.2 Warning sign – Display a warning sign near any area where powder-actuated tools may be in use.
- 8.12.3 Daily test of safety devices – Must be conducted prior to initial loading in accordance with manufacturer's specifications.
- 8.12.4 Remove from service – Any powder-actuated tool that is not in proper working order or that develops a defect during use.
- 8.12.5 Loading – Do not load any powder-actuated tool until just prior to intended firing time. Also, never leave a loaded tool unattended.
- 8.12.6 Common sense – Never point a powder-actuated tool (whether loaded or not) at yourself or another person. Keep hands free of the open barrel end. Do not use these types of tools in areas that could contain a flammable or explosive atmosphere.
- 8.12.7 Driving fasteners – Do not drive fasteners into spalled areas (caused by unsatisfactory fastening) or into very hard or brittle materials, such as cast iron, glazed tile, surface-hardened steel, glass block, live rock, face brick or hollow tile. Conversely, do not drive fasteners into easily penetrated materials unless sufficient backing is provided to prevent pin or fastener penetration. Always ensure that the other side of the material into which you are driving the fastener is clear.

8.13 Hydraulic powered equipment.

Hydraulic fluid used must be fire-resistant. Safe operating pressures for hoses, valves, pipes, filters and fittings may not be exceeded. When checking for leaks, use a rag or similar object – never use your hand. Fluid under pressure can puncture your skin or otherwise cause serious injury.

8.14 Grinders.

- 8.14.1 Wheel rating – The minimum rpm rating for the grinding wheel must be at least as great as that of the grinder. Make sure the wheel is being used for the purpose for which it was designed.
- 8.14.2 Handheld grinders – A guard must be provided such that the maximum angular exposure of grinding wheel periphery & sides is 180°. However, such a guard is not required when the work location makes this type of guard impractical (then a safety flange must be used) or when wheels 2" in diameter or less are used.

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8.14.3 Bench mounted grinders – Must have flange guards to protect spindle, nut and flange projections. Guard must be properly aligned with wheel and be strong enough to contain a bursting wheel. Maximum angular exposure of grinding wheel periphery & sides is 90° (no more than 65° above rest plate). If the nature of the work requires grinding below the horizontal plane of the spindle, then the opening may be no more than 125° (no more than 65° above horizontal plane of spindle). Bench mounted grinders must also have safety shields and rest plates. The safety shields are not a substitute for wheel periphery guarding and proper PPE. The rest plates must be kept within 1/8-inch of the grinding wheel. When rest plate adjustment is needed, do it when the grinder is shut-off.

8.14.4 Wheel inspection & ring tests – Before mounting a grinding wheel, make sure that it is free from defects by closely inspecting it. Perform a ring test for bench mounted grinder wheels.

(Ring test – Tap wheel gently with a light, nonmetallic object, such as handle of a screwdriver. The sound produced should “ring.” If the tap produces a dull “clunk”, the wheel may be damaged and must not be used.)

8.15 Core drills.

Where someone on a lower level could be struck by a falling core, take whatever precautions may be necessary (barricades, spotter, etc.) to keep that area clear.

8.16 Lasers.

Display a warning sign near any area where a laser may be in use. Never stare directly into the beam of a laser or point it towards the face of others. Be aware of any reflective surfaces that could cause the beam to be redirected toward the face/eyes. All lasers are to be shut off or shuttered when not in use.

8.17 Woodworking tools.

8.17.1 Circular saws – Do not wire back retractable blade guard. Operator is expected to adjust rest plate so that no more of blade is exposed than is necessary beneath material being cut.

8.17.2 Radial saws – The sides of the lower exposed portion of the blade must be completely guarded with a device that self-adjusts to the thickness of the stock being cut and that remains in constant contact with the stock during the cut.

8.17.3 Table saws – Require blade guard. Also note that exposed pulleys and nip points on the underside of the cutting table may need to be guarded.

9. Electrical Safety

9.1 Cord inspection & condition.

All electrical cords must be inspected before use. They must be in good condition and free of cuts, excessive wear (abrasion) or crush damage. Damage which involves crushing, missing/cut cord sheath or which exposes the internal conductors of the cord cannot be repaired with tape – return these to the shop for repair or replacement.

If found to be damaged, immediately tag the cord/tool out of service. If the cord is yours, please remove it from the jobsite until it can be repaired.

9.2 Strain relief.

All extension & tool cords must have strain relief. If the cord sheath is pulling out of the plug end, receptacle end or tool end (such that internal wires are visible), then the cord must be removed from service and repaired by a qualified person.

9.3 Handling & plugging/unplugging cords.

Portable equipment shall be handled in a manner which will not cause damage to the equipment or its cord. Do not carry power tools by the cord and do not use electric cords for hoisting or lowering tools or materials.

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Pull plugs using the plug/receptacle end – not by tugging on the cord. Do not stand in a puddle and assure that your hands and plug connections are dry. If this is not possible, wear voltage-rated gloves that provide protection against the appropriate voltage level.

9.4 **Cord placement.**

Run all cords such that they:

- Do not present a trip hazard – Avoid the middle of walkways, stairs, hallways, rooms, etc.
- Are not exposed to physical damage – Avoid sharp edges, pinch points (unblocked doors or windows), material storage areas, vehicle or equipment travel areas, excessive temperatures, etc.
- Are not exposed to hazardous environments – Avoid puddles, oil, flammable liquids storage/usage areas...

9.5 **Grounding.**

All cords must have a 3-prong grounding plug, unless the cord is for a double insulated tool. All extension cords must have a 3-prong plug. Cords with missing or damaged grounding conductor prongs shall not be used until properly repaired. Adaptors may not be used.

9.6 **Ground fault protection.**

Ground fault protection, as provided by a GFCI or Assured Equipment Grounding Conductor (AEGC) Program, is required for all temporary power branch circuits (powering electric hand tools, extension cords, welders, etc.).

- 9.6.1 GFCI's – Shall be used for all 120V, 15/20A circuits, regardless of whether receptacles are temporary or permanent. GFCI's must be tested prior to use. Defective units shall be immediately removed from service and replaced. Cord set GFCI's are to be plugged into the receptacle and then the extension cord plugged into the GFCI.
- 9.6.2 Assured Equipment Grounding Conductor (AEGC) Program – This method provides an alternative means of acceptable ground fault protection where GFCI's are not practical (480V, excessive moisture conditions, etc.). The AEGC system involves establishing a program to cover cord sets, temporary receptacles, and equipment connected by cord & plug. Where used to provide ground fault protection, the following elements shall be in place:
- Written program – Must include the specific inspection and testing procedures adopted by the employer, and designate one or more competent persons on site to implement program. A copy of this written document must be available on the jobsite.
 - Daily visual inspections – Must include each cord, plug ends, temporary receptacles, and any equipment connected by cord and plug, except cords and receptacles which are fixed and not exposed to damage. Look for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective shall not be used.
 - Periodic tests – All cord sets, temporary receptacles, and cord- and plug-connected equipment required to be grounded must be periodically tested to ensure that all equipment grounds are properly connected and are electrically continuous. These tests must be performed:
 - *Before first use;*
 - *Before equipment is returned to service following any repairs;*
 - *Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example, when a cord set is run over); and*
 - *At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months.*

Any equipment not conforming to the above shall not be made available for use.

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- **Test documentation** – A test record shall identify each temporary receptacle, cord, and cord- and plug-connected equipment that passed the test and shall indicate the last date it was tested or the interval for which it was tested. This record shall be kept by means of logs, color coding, or other effective means and shall be maintained until replaced by a more current record. The record shall be made available on the jobsite.

9.7 **Other people's cords.**

Before plugging into anyone else's cords, assure that they are in good condition, properly grounded, and protected with a functioning GFCI.

9.8 **Temporary power.**

When temporary power is provided on the jobsite, do not plug into any box that does not have a cover installed and do not operate any breakers in a panel box without a dead front cover or with missing knock-outs. If there are any exposed conductors in your work area, speak with your site supervisor to seek corrective action.

All temporary circuits and disconnects must be marked as to what they control, unless purpose is obvious.

9.9 **Temporary lighting.**

Must have a functioning bulb in each socket with a protective cage. Strings must be properly hung in accordance with manufacturer instructions. (Most do not allow the strings to be hung by the cord.)

9.10 **Guarding/protection of live conductors.**

All live conductors over 50V must be guarded to prevent inadvertent contact.

- 9.10.1 **Receptacles, switches & junction boxes** – “Guarded” refers to the cover plate being properly installed at all times. The box may have no openings (missing knock-outs).
- 9.10.2 **Wires** – “Guarded” refers to the ends of all live conductors being contained within a junction box or covered with a wire nut and electrical tape – no exposed live wire ends/connections. Note that when changing from conduit or metal clad cable to non-metallic sheath cable (Romex), a junction box must be used.
- 9.10.3 **Panel boxes** - “Guarded” refers to the equipment manufacturer's cover being properly installed at all times when not directly attended by a qualified electrician. The cover may have no openings (missing blanks/knock-outs). Note that the use of makeshift covers (such as cardboard) for this purpose is prohibited. As an alternative, the area containing the exposed conductors can be secured to prevent access by unqualified persons (ex: locking door to room, etc.). These secured areas must have a DANGER sign posted indicating, “KEEP OUT – ELECTRICAL HAZARD – AUTHORIZED PERSONNEL ONLY”.

Nominal Voltage	Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating materials. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts	Exposed live parts on one side and grounded parts on the other side. Walls constructed of concrete, brick, or tile are considered to be grounded surfaces	Exposed live parts on both sides of the workspace [not guarded as provided in condition (a)] with the operator between
0 – 150V	3 ft.	3 ft.	3 ft.
151 – 600 V	3 ft.	3½ ft.	4 ft.

Nominal Voltage	Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating materials. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts	Exposed live parts on one side and grounded parts on the other side. Walls constructed of concrete, brick, or tile are considered to be grounded surfaces	Exposed live parts on both sides of the workspace [not guarded as provided in condition (a)] with the operator between
601-2.5kV	3 ft.	4 ft.	5 ft.

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2501-9kV	4 ft.	5 ft.	6 ft.
9001-25kV	5 ft.	6 ft.	9 ft.
25,001-75kV	6 ft.	8 ft.	10 ft.
Over 75kV	8 ft.	10 ft.	12 ft.

9.11 Lockout/tagout (LOTO).

9.11.1 Purpose – Lockout/tagout (LOTO) involves placing machines & equipment into a safe work condition by applying LOTO hardware (locks, tags &/or special isolation devices) to the isolation controls of hazardous energy sources. The process is designed to protect employees from injury or death that may result from the unexpected energization, start-up or release of hazardous energy.

9.11.2 LOTO is required – Machines, equipment, systems & circuits must be locked and tagged out during all “service and maintenance operations.” This scope of work includes construction, installation, repair, service, maintenance, adjusting, troubleshooting, inspecting, unjamming, setting-up, testing and cleaning of machines or equipment that are:

- Not in normal production operation, or
- In normal production operation, but the work requires the removal or bypass of an equipment guard or safety device, or
- In normal production operation, but the work requires an employee to place any part of his/her body into a point of operation or other recognized danger zone.

All live electrical parts to which an employee may be exposed during the course of work shall be deenergized and locked/tagged out before the employee works on or near them. Unless an electrical installation is under full lockout/tagout, it must be assumed to be live and the precautions contained in this section must be taken.

9.11.3 Cord- & plug-connected equipment – Does not need to be under LOTO if electricity is the only source of hazardous energy, the unexpected start-up or release of residual energy can be completely eliminated by unplugging the equipment (and, where appropriate by discharging and grounding any capacitors), and the plug can remain under the exclusive control and direct observation of the person performing the service/maintenance work.

9.11.4 Lock & tag restriction – No employee is authorized to remove or tamper with any lock or tag, or try to operate any isolation control device that is locked/tagged out (valves, breakers, etc.). Each person must apply their own lock/tag and only that person is authorized to remove it. Only DANGER tags shall be used for LOTO purposes.

9.11.5 LOTO procedure – This procedure is to be implemented, in its entirety, to prevent serious injuries from the unexpected energization, movement, start-up or release of hazardous energy during work on machines, equipment or circuits.

PREPARATION – To be done prior to leaving Lapp shop.

- ☐ Review this LOTO procedure & assemble necessary LOTO hardware.

NOTIFICATION

- ☐ Notify all persons affected by your work that requires LOTO. Explain what machine(s), equipment or circuit(s) will be shut down and locked/tagged out. Remind them of their responsibility not to tamper with or attempt to bypass lockout/tagout hardware.

SHUTDOWN

- ☐ Shut down the machine, equipment or circuit by established routine procedure.

Hazardous energy sources

- Electrical
- Mechanical
- Hydraulic
- Pneumatic
- Chemical
- Thermal
- Gravity

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- This step involves using the “on/off” control switches on the machine or equipment. Do not deactivate any electrical disconnects (breakers, fuses, etc.) until next step, as special electrical PPE will be required.

ISOLATION & HARDWARE APPLICATION

- Inspect, then put on electrical PPE. This will include the proper voltage-rated gloves and arc flash gear as referenced on the LOTO permit. This gear must be worn until the LOTO procedure is complete (thru verification).
- Stand to side & open electrical disconnects. If possible, visually verify that all blades of the disconnecting devices are fully open or that drawout-type circuit breakers are withdrawn to the fully disconnected position.
- Deactivate all other energy isolation devices.
- Apply LOTO hardware to each energy isolation disconnect/device in a manner that effectively secures the device in the “CLOSED”, “SAFE”, “OFF” or “0” position. Note that control devices, such as pushbuttons or selector switches, are not to be used as the primary isolating device.

DISSIPATION OF STORED ENERGY

- Dissipate any stored or residual energy. This may include electricity in capacitors, stored energy in springs or elevated parts, air/hydraulic pressure, etc. *(Note that capacitors & high capacitance elements must be safely discharged, short-circuited and grounded prior to work on or near them.)*
- If necessary, institute measures to prevent hazardous energy from reaccumulating or becoming induced. This may include the installation of temporary grounds, blocking devices, restraints, etc. If deenergized parts could contact other energized parts, apply ground connecting devices rated for the available fault duty.

VERIFICATION

- Operate control switches (first be sure no one is in danger area). Nothing should happen. Make sure the controls are returned to the “CLOSED”, “SAFE”, “OFF” or “0” position when finished.
- Select & inspect a voltage detector of appropriate voltage & category as referenced on the LOTO permit. Test the detector to assure proper function. Now test each phase conductor or circuit part both phase-to-phase and phase-to-ground. When finished, retest the voltage detector to assure proper function.

Now you are in an electrically safe work condition and your electrical PPE may be removed. Be alert to any events or conditions that could indicate an unsafe condition or ineffective LOTO (sparks, humming, flashes...).

9.12 Live electrical work.

Only qualified persons may work on energized parts and all such work on or near exposed live electrical conductors is prohibited unless the work is specifically authorized by the supervisor and performed in accordance with the most recent edition of NFPA 70E.

Authorization for live electrical work shall only be granted under the following conditions, and INCONVENIENCE IS NOT AN ACCEPTABLE REASON TO AUTHORIZE LIVE ELECTRICAL WORK:

- Greater hazard or risk – Lockout/tagout has the potential to create a hazard or risk greater than the electrical shock/flash hazards posed by live electrical work.

Examples: Interruption of life support systems, deactivation of emergency alarm systems in occupied buildings, shutdown of hazardous location ventilation, etc.

- Diagnostics, voltage testing & troubleshooting – Only for the duration of this work. Once voltage testing or troubleshooting is complete, the electrical equipment/installation must be locked & tagged out.

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- Infeasible – Work task is infeasible under LOTO due to equipment design or operational limitations.
Example: Work on circuits that form an integral part of a continuous process that would otherwise need to be completely shut down in order to permit work on one circuit or piece of equipment.
- Limited voltage – System is less than 50 volts and there is no increased exposure to burn or arc explosion.

9.13 Overhead power lines.

- 9.13.1 Location assessment – Before work begins, the site supervisor shall determine the location of any power lines that may be in proximity of work area. Where such lines exist, he/she shall contact utility company to determine line voltage.
- 9.13.2 Clearance – When working under or near overhead power lines, all employees, work, materials, vehicles and tools/equipment must remain at least 10 ft. away from lines rated 50kV or less (cranes & some states require greater clearances). For power lines over 50kV, required clearance is equivalent to 10 ft. + 4 inches for every 10 kV over 50kV. Cable TV & telephone lines do not require 10 ft. clearance – simply avoid contact.
- Where work requires approach within this clearance distance, prior arrangements shall be made with the utility owner to have the lines deenergized and grounded, relocated so that proper clearance can be maintained, or effectively guarded prior to the start of the work (consult with power line utility to determine if clearances mentioned above can be reduced due to the guarding).
- If a vehicle is in transit with its structure lowered, the clearance may be reduced to 4 ft. If the voltage is higher than 50kV, the clearance shall be increased 4 in. for every 10 kV over that voltage.
- 9.13.3 Spotters – Equipment operators & vehicle drivers are expected to make use of spotters where it is difficult to judge clearance.

9.14 Electrical PPE for buried electrical installations.

Voltage-rated gloves and overshoes shall be worn whenever:

- Hand digging to determine the location of a buried electrical installation that is not known to be encased in a duct bank or conduit, or
- When sawing asphalt/concrete that lies within the tolerance zone of any electrical marking.

These gloves and overshoes shall be rated to at least the voltage of the buried installation.

10. Ladders & Stairways

10.1 Need for ladder or stairs.

Required for personnel access points where there is a break in elevation of 19 inches or more and no ramp, sloped embankment (able to be ascended/descended without using hands) or personnel hoist is provided.

10.2 Access requirements.

Keep at least one point of access between work levels clear at all times. Where work areas contain more than 25 people, provide two or more means of safe access.

10.3 Employee training.

All employees who use ladders must be trained in:

- Nature of fall hazards in the work area
- Ladder capacity and proper use, care [& construction]
- Basic OSHA ladder safety requirements

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10.4 Ladders.

10.4.1 Improper use – Ladders may only be used as the manufacturer intends. Common ladder misuses include:

- Use from a scaffold platform
- Use as a horizontal work platform, workbench or brace
- Straddle top step
- Stand/sit on top, back or bucket holder
- Apply sideways force
- Moving, shifting or extending ladder while occupied
- Access from top or another ladder
- Using blocks or shims to level

10.4.2 Selection – Consider working height, load weight (person & materials) & whether or not there will be live electrical work exposures.

- Overloading – Ladders are rated for the maximum weight that they can handle safely. Each ladder has a sticker on its side rail that lists its “duty rating.” Do not overload your ladder – consider your weight, the weight of your tools and materials.
- Electrical exposures – Must have nonconductive side rails, but you must still maintain a minimum of 10 ft. clearance to energized power lines (50kV or less). Also, maintain this clearance to conductive materials handled from ladders. If not possible to maintain this clearance, notify the utility company so that the lines can be deenergized, moved or protected.

10.4.3 Inspecting ladders – Inspect ladders each day before use. Check presence, proper function & condition of:

- Feet & siderails
- Rungs & rung locks
- Spreader bars & cross braces
- Connectors (rivets, bolts, etc.)
- Sharp edges, painted or coated components
- Also be sure that the ladder is free of oil, grease and other slippery materials.
- Wood ladders may not be coated with opaque coverings.

Ladders exhibiting signs of damage or deterioration shall be immediately removed from service and returned to the shop to be discarded.

10.4.4 Set-up – When placing ladders on the jobsite, assure that the footing will adequately support the ladder without slippage or failure. Tie-off your ladder if it will be used on a surface that is not solid, firm, stable & level, if used on a slippery surface, or if work activities, pedestrian or vehicle traffic, materials handling, etc. could displace ladder. If it is necessary to place a ladder in or over a doorway, lock or barricade the door and post warning signs.

10.4.5 Access to an upper level (or out of a trench) – If the ladder is used to access an upper level, extend top of ladder 3 ft. above landing & securely tie-off. Install a grab rail if unable to extend ladder full 3 ft. above landing.

10.4.6 Extension ladders – Ensure proper ladder section overlap (as recommended by manufacturer) and check both rung locks upon set-up to assure that they are both properly engaged. Set the ladder at an angle of 1 ft. out at base for every 4 ft. working length. To accomplish this position the feet of the ladder against your feet and extend your arms straight out at shoulder height.

Siderails must support ladder equally, and the extension rope must be secured to a rung on the base section of the ladder.

Do not exceed maximum working height or extension of the ladder, and do not take it apart to use either section separately.

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- 10.4.7 Stepladders – Must be fully opened when in use, with spreader bars locked into position and all four feet bearing on a firm, solid, level surface. Never lean a stepladder against the wall to climb (like a straight ladder).

Do not stand on either of the top two steps – get a bigger ladder if needed. Do not climb on spreader bars or crossbraces.

- 10.4.8 Job made ladders.

- Must support 4x maximum intended load
- Rungs parallel, level & uniformly spaced
- Rung spacing: 10-14 inches on center
- Side rail separation: min. 11½ inches
- If spliced siderails, set-up at angle of 1 ft. out at base for every 8 ft. working length

- 10.4.9 Fixed ladders & fall protection – A cage, well, ladder safety device or self-retracting lifeline is required if:

- The length of climb is less than 24 ft., but the top of the ladder is over 24ft. above a lower level.
- The total length of climb equals or exceeds 24 ft.

- 10.4.10 Individual rung ladders & manhole access – Extend individual rung ladders at least 42 inches above the access level or landing platform either by continuing the rungs (as horizontal grab bars) or by providing vertical grab bars that have the same lateral spacing as the vertical legs of the rungs.

Exception: Individual rung ladders used where access openings are covered with manhole covers or hatches.

- 10.4.11 Ascending & descending ladder – Be sure that your shoes are free of mud, grease, or other substances that could cause you to slip. Face the ladder and maintain a 3-point contact.

Use ropes, hoists, forklifts, etc. to hoist materials or tools that may otherwise cause you to lose balance on the ladder. Do not climb or descend ladders with tools or pointy objects in your pockets.

- 10.4.12 Working from ladder – Work facing the ladder with both feet on the rungs. Do not reach out too far – your belt buckle should remain between ladder siderails at all times. Change the position of the ladder as often as necessary.

Do not hang tools or equipment from or place them on the rungs of a ladder.

- 10.4.13 Metal ladder restrictions – Metal ladders must not be used when performing electric welding, or in any area where contact with electricity is possible. The use of metal ladders should be restricted to special applications where fiberglass or wooden ladders are not practical.

- 10.4.14 Multiple ladders – Ladders may not be tied together.

- 10.4.15 Housekeeping & storage – Maintain the base of your ladder clear of materials, equipment, and debris. Always look around the base prior to descending and dismounting your ladder.

When not in use, the ladder should be taken down and stored in an appropriate location.

- 10.4.16 Fall protection – Normally, fall protection shall not be required when working from portable ladders.

However, as a matter of company policy, where a ladder is used within its height of an opening or edge (elevator shaft, window opening, floor edge, etc.), a personal fall arrest system must be used regardless of whether or not a guardrail has been installed at the edge/opening.

10.5 Temporary stairways.

- 10.5.1 Temporary stairway construction specifications.

Inclination	30° to 50°
Riser height & tread depth	Max. 19 inches & uniform ($\pm \frac{1}{4}$ " deviation)

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Metal pan stairs & landings	• Must be secured. • If used before concrete is poured, fit with wood or other solid material at least to top edge of pan and for entire width of stair and/or landing. • Replace wood if worn below top edge of pan.
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10.5.2 Landings.

- Required every 12 ft. or less vertical rise
- Min. landing dimension: 22" wide x 30" long
- Guardrail required, no matter what the platform height

10.5.3 Platforms.

- Provide where doors swing onto stairway
- Platform: min. 20 inches beyond radius of door swing
- Guardrail required, no matter what the platform height

10.5.4 Maintenance – Stairways, landings & platforms must be kept clear of tripping hazards (materials, debris, equipment, etc.), sharp edges that present a cut hazard, nail protrusions that present a puncture hazard, spills & accumulations that present a slip hazard and similar hazardous conditions.

10.6 Handrails & stairrails.

10.6.1 Requirement – A handrail or stairrail is required for stairs with 4 or more risers or that span a vertical elevation break of more than 30 inches.

10.6.2 Stairrails vs. handrails – Stairrails have a top rail and a midrail and are used to protect open sides/edges. Handrails have only one rail and are used as a handhold when a stairrail is not needed.

10.6.3 Handrail specifications.

Height	36 inches
Strength	Must support minimum force of 200# and remain at proper height range.
Clearance to wall	Min. 3 inches from wall.
Surfacing	Smooth; no projection hazards.

10.6.4 Stairrail specifications.

Top rail height	36 inches
Midrail height	Midway between top rail & leading edge of tread.
Midrail substitutes	Screens, mesh, balusters.
Strength	Must support minimum force of 200# and remain at proper height.
Surfacing	Smooth; no projection hazards

11. Fall Protection & Falling Object Protection

11.1 Duty to use fall protection.

Any employee exposed to a fall hazard (as defined by the following table) must institute fall protection, unless site-specific requirements dictate a more stringent policy. *Note that when performing service or maintenance work at a client facility, fall protection is required where a fall hazard of four (4) ft. or more exists.*

11.2 Regulatory compliance & competent person.

All fall protection methods must meet OSHA requirements. A competent person shall be assigned to manage jobsite fall protection, and a pre-plan shall be established before any work at heights shall be permitted.

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GROUP/ACTIVITY	TRIGGER HEIGHT	FALL PROTECTION OPTIONS
Floor sides/edges Wall openings ¹	6 ft.	- Guardrails - Personal fall arrest system - Fall restraint system - Safety nets
Walkway & ramp edges	6 ft.	Guardrails
Holes ² Skylights	All 6 ft.	- Cover - Guardrails - Personal fall arrest system
Stairways	4 or more risers	Stairrail for each open side. If no open sides, then provide a handrail.
Stairway platforms	All heights	Guardrails
Roof Any activity on any roof.	6 ft.	- Guardrails - Personal fall arrest system - Fall restraint system - Safety nets
Roofing³ work (max. 4:12)		Acceptable alternative: Warning line with safety monitor
Roof – Mechanical trades		Acceptable alternative: Modified warning line (min. 15' in from edge)⁴
Portable ladders	n/a	- OSHA does not mandate fall protection for portable ladders. - Company policy requires harness tie-off if working from ladder in vicinity (within ladder height) of floor/roof edge, elevator shaft or similar opening.
Steel erection General	Over 15 ft. in PA (Over 10 ft. in MD)	- Guardrails - Personal fall arrest system - Fall restraint system - Safety nets
Connecting⁵		- To 30 ft./2 stories (lesser of) PFA must be worn, but tie-off optional. - Over 30 ft./2 stories mandatory tie-off, safety nets or work positioning.
Decking		- To 30 ft./2 stories (lesser of) controlled decking zone (CDZ) may be used. - Over 30 ft./2 stories mandatory guardrails, PFA system or safety nets.
Scaffolds Supported	Over 10 ft.	- Guardrails - Personal fall arrest system only permitted if tie-off to independent anchor that will support 5,000 lbs. (usually cannot be the scaffold). - Work positioning may be permissible during erection/dismantling if competent person deems anchorage adequate for set-up.
Suspension		- Guardrails AND personal fall arrest system - PFA's must anchor to indep. lifelines (can't use scaffold suspension lines)
Lifts - Scissors lift - Boom lift (manlift) - Forklift (with man basket)	All heights	- Scissors – Guarded platform. - Boom – Guarded platform AND harness tie-off (restraint/positioning). - Forklift – Guarded basket. (Only permitted if basket is an attachment that is approved by the lift manufacturer.)
Tanks & towers	6 ft.	Personal fall arrest system
Masonry (overhand bricklaying ⁶)	6 ft.	- Guardrails - Personal fall arrest system - Fall restraint system - Controlled access zone (CAZ) - Safety nets

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GROUP/ACTIVITY	TRIGGER HEIGHT	FALL PROTECTION OPTIONS
Excavations	6 ft.	• OSHA does not mandate fall protection for open excavations except where not visible and for walkways. May use fencing or barricades • Where public exposure exists, company policy requires installation of fencing with DANGER signs.
Vertical pits & shafts	6 ft.	• Cover • Guardrails • Fence or barricade
Leading edge work ⁷ Precast concrete	6 ft.	• Guardrails • Personal fall arrest system • Fall restraint system • Safety nets • Written, site-specific alternative fall plan
Vertical form work & rebar	6 ft.	• Personal fall arrest system • Work positioning system • Safety nets

FOOTNOTES – OSHA DEFINITIONS

1. **Opening** means a gap or void 30 inches or more high and 18 inches or more wide in a wall or partition, through which employees can fall to a lower level.
2. **Hole** means a gap or void 2 inches or more in its least dimension, in a floor, roof, or other walking/working surface.
3. **Roofing work** means the hoisting, storage, application, and removal of roofing materials and equipment, including related insulation, sheet metal, and vapor barrier work, but not including the construction of the roof deck.
4. **Modified warning line (for mechanical trades).** The use of a warning line 15 feet back from the edge will be considered a de minimis violation of the guardrail criteria given the following conditions:
 - i. A warning line is used 15 feet or more from the edge;
 - ii. The warning line meets or exceeds the specifications of roofing warning line (height, strength, set-up, etc.)
 - iii. No work or work-related activity is to take place in the area between the warning line and the edge; and
 - iv. Employer effectively implements a work rule prohibiting the employees from going past the warning line.
5. **Connector** is a worker who, working with hoisting equipment, is placing and connecting structural members/components.
6. **Overhand bricklaying** and related work means the process of laying bricks and masonry units such that the surface of the wall to be jointed is on the opposite side of the wall from the mason, requiring the mason to lean over the wall to complete the work. Related work includes mason tending and electrical installation incorporated into the brick wall during the overhand bricklaying process.
7. **Leading edge** means the edge of a floor, roof or formwork for a floor or other walking/working surface (such as the deck) which changes location as additional floor, roof, decking, or formwork sections are placed, formed, or constructed. A leading edge is considered an "unprotected side/edge" when it is not actively and continuously under construction.

11.3 Pre-shift assessment.

Prior to the start of each work shift, the site supervisor and competent person shall assess the work area(s) for fall hazards and appropriate fall prevention/protection measures. Specifically, he/she shall:

- 11.3.1 Identify fall hazards that exist or that may be reasonably anticipated, and ensure that appropriate fall prevention/protection measures have been instituted. Salt or sand icy walking/working areas as necessary to eliminate slip hazards.
- 11.3.2 Inspect fall prevention/protection systems to ensure that they are properly maintained, used, and are in good condition.

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- 11.3.3 Ensure that employees are aware of the fall hazards that may be present in their work areas and of their responsibilities for using fall protection.
- 11.3.4 Ensure that walking/working surfaces have the strength and structural integrity necessary to support worker & tool/material loads.

Work shall not be permitted in any area until the above assessment has been made. Any fall prevention or protection method that does not meet OSHA requirements, is in unsatisfactory condition or that is not being used properly shall be corrected before work may proceed there. If necessary, use danger/caution tape to restrict site worker access to these areas.

11.4 **Training.**

All employees must have received training in:

- The nature of fall hazards in the work area.
- Procedures for erecting, maintaining & inspecting fall protection systems.
- Use and operation of fall protection systems that are implemented.
- The role of each employee in the safety monitoring system (for roofers).
- Mechanical equipment limitations on low-sloped roofs (for roofers).
- Correct procedures for erecting falling object protection.
- Correct procedures for safe handling/storage of equipment & materials.
- The role of employees in fall protection plans.
- OSHA standards concerning fall protection.

11.5 **Holes & covers.**

Use to prevent slip, trip & fall hazards into/through any hole that is two (2) inches or more in least dimension, regardless of depth. Also, use to prevent materials from passing through to a level below where someone could be struck. Covers shall meet the following criteria, as specified by OSHA:

- Strength – Must be able to support at least 2x the heaviest load that will be on it.
- Secured – Must be secured (nailed, screwed, etc.) in place to prevent inadvertent displacement.
- Labeled – Must be labeled, “HOLE” or “COVER”.

11.6 **Guardrails.**

A guardrail must have a top rail and a midrail, and meet the following criteria as specified by OSHA:

- 11.6.1 **Materials** – Wood (min. 2x4), pipe, steel and similar substantial materials may be used to construct a guardrail system. Be sure burrs, splinters & sharp edges are removed to prevent hand cuts. No steel or plastic banding may be used. Rope may be used, but it must be at least ¼-inch diameter and flagged with hi-visibility material at 6-foot intervals.
- 11.6.2 **Rail heights & strengths.**
 - Top rail: 39-45 inches from work surface to top of rail (with 200-lbs. applied)
 - Midrail: 21 inches or midway to top rail (with 150-lbs. applied).

All railings (including rope) must remain at the heights specified above when the corresponding weight is applied (200# for top rails & 150# for midrails).
- 11.6.3 **Projections** – Do not allow rails to project past end posts.
- 11.6.4 **Midrail substitutes** – As a substitute for a midrail, orange fencing may be used as long as it is secured to the top rail and to the floor/platform in a manner that will support at least 150 pounds. Balusters, spaced no more than 19 inches apart, may also be used.
- 11.6.5 **Points of access (ladderways)** – Guardrails must have gates or be offset so that a person cannot walk directly through the opening. Removing a guardrail section, removing a midrail, or leaving an opening in a run of guardrail is NOT acceptable – the access opening must be protected.

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- 11.6.6 Hoisting areas or holes (for passage of materials) – The chain, gate or removable section of guardrail must be replaced as soon as this activity is complete. No more than two sections of the guardrail may be removable. If an employee must stand at/near the access opening, lean through it or out over the edge (to receive, or guide equipment and materials, for example), that employee must use a PFAS (harness/lanyard system).
- 11.6.7 Toeboards – Toeboards must be used with a guardrail system for walkways where personnel may be walking or working below. Toeboards shall make use of a 2x4 (laid on edge), with no more than a ¼ inch gap between the bottom of the toeboard and the walkway. Where more than one 2x4 is needed, there may be no more than a one (1) inch gap between them.

11.7 PFAS – Personal fall arrest system.

PFAS is a system that uses a full body harness, which is connected by means of a shock-absorbing lanyard or retractable lifeline to an anchor point, such that a worker can free fall up to six (6) feet before the system engages and arrests the fall. Specially designed shock-absorbing lanyards and retractable lifelines help to reduce deceleration force transmitted to the body.

- 11.7.1 Equipment selection & proper use – All PFAS components must be specifically designed by the manufacturer to function as part of a personal fall arrest system. A stamp or marking of “ANSI Z359” shall be used to identify such equipment.

All PFAS equipment shall be strictly used in the manner intended by its manufacturer. Users shall have read instructions carefully to determine proper installation, use, and component limitations/incompatibilities. This material shall also be covered during training.

- 11.7.2 Harnesses – A full body harness must be used – the use of a body belt as part of a PFA system is not permitted. Harnesses must be properly worn and adjusted, and must be connected by lanyard to an acceptable anchor point (see below).

The need for special harnesses shall be determined by worker size/weight (worker & tools exceeding 310-lbs.) and work activity (arc flash, traffic exposure, hot work, harsh chemical exposure, work positioning, etc.).

Lanyards must connect to the D ring on the wearer’s back, between the shoulders. (Note that other D rings may be provided on the harness, but these are not designed for PFA system use – they’re designed for work positioning, ladder safety devices, fall restraint &/or retrieval.)

- 11.7.3 Anchor points – PFAS anchor points must be capable of supporting 5,000-lbs. per employee attached (or be designed to maintain a system safety factor of at least two) and cannot be used to support other platforms or work surfaces. Usually objects like conduit, ductwork, smaller pipes, scaffolds, and guardrails do not make acceptable anchor points because they cannot meet the 5,000-lb force requirement. In most cases, only one person may tie-off to a PFAS anchor point.

However, multiple workers may be able to tie-off to a horizontal lifeline, but these systems must be designed, installed, and used under the supervision of a qualified person. Where horizontal lifelines are used, a copy of the computational data used to support the system design shall be maintained on site.

- 11.7.4 Connectors (lanyards & retractables) – Harnesses must be connected to the anchor point by either a shock-absorbing lanyard or a retractable lifeline. Only one connector may be attached between the harness and the anchor point. Connection point to the harness must be in the center of the back (dorsal D ring) at or near shoulder level, unless the harness is being used for work positioning, fall restraint, or attachment to a ladder safety device.

Snaphooks & carabiners must be of the self-locking style. Hook/carabiner gates must completely close and lock, and not be loaded (weight bearing on gate instead of hook/carabiner throat). Shock-absorbing lanyards may not be used in a choker configuration unless specifically designed for this purpose.

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Available fall distance, mobility, convenience, sharp/abrasive surfaces and work operations shall be considered when selecting the appropriate connector. Retractable using a metal cable shall be used where cut, abrasion, or heat hazards could damage the connector (either during work or in event of a fall).

11.7.5 **Inspection** – All PFAS components must be inspected prior to each use. Look for signs of alterations, damage, defects, shock loading or deployment. Remove any damaged component from service immediately and replace with new. Arrangements shall be made to have a competent person inspect all PFAS equipment annually at the shop.

11.7.6 **Pre-planning.**

- **Available fall distance** – PFAS must be installed to prevent free falls of more than 6 ft. In assessing available fall distance, ensure that any employee who falls will not contact a lower level or swing into an object before the fall is completely arrested. This may require rigging the system to limit free fall to less than six (6) feet. Factors to consider in PFAS pre-planning include:
 - Length of lanyard & lanyard rip-out (or retractable deceleration distance)
 - Height of worker
 - Extra distances (cross arm strap, rope grab activation, stretch in vertical lifeline, etc.)
 - 3-foot safety factor
 - Swing hazards
- **Rescue** – The site supervisor must establish a fall rescue plan before work begins. This plan shall establish the means & method to be used to rescue an employee in the event of a fall and subsequent suspension from harness. The pre-plan shall consider both the employee being conscious and capable of safe rescue, and otherwise.

The longer a worker must remain suspended by his/her harness, the greater the chance of severe injury from blood pooling, lack of circulation to lower body and related complicating factors (suspension trauma).

11.8 **Fall restraint.**

Fall restraint refers to a set-up where one wears a harness and ties off to an object such that the tether prevents him/her from reaching a fall hazard.

Before using a fall restraint system, realize that although similar to PFAS, there is an important difference. With PFAS, the worker can fall and is brought to a safe stop by means of a harness and shock absorbing lanyard/retractable lifeline. With fall restraint, the worker is tethered to an anchorage that **PREVENTS A FALL** (the tether line is short enough to prevent the worker from reaching any edge, opening, or fall hazard).

For this system, the user must wear a body harness and connect to an anchorage that will withstand twice (2x) the force of the person walking or tripping/sliding across the walking/working surface. There may be no fall hazards (edges, openings, skylights, open hatches, etc.) within the distance that the restraint allows travel.

11.9 **Work positioning.**

This system utilizes a body belt or harness and a short connecting device (typically attaching to D rings at both sides of waist) to allow an employee to be supported on an elevated vertical surface and work with both hands free while leaning. These systems may be used for work on towers, form work, rebar, utility poles, etc.

The requirements for a work positioning system are generally the same as those PFAS, except:

- Max. fall distance = 2 ft.
- Harnesses or body belts may be used for work positioning
- Anchor point must support 3,000-lbs. or 2x impact load of employee's fall – whichever greater.
- Harness/belt is connected to anchorage by device designed for work positioning (attaches at waist).

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11.10 Warning lines with safety monitoring (roofers).

Warning lines represent a barrier erected on the roof to warn employees that they are approaching the roof edge. "Roofing work" (see "Limitations" below) may take place in this area without the use of conventional fall protection (guardrail, PFA's or safety nets) as long as a safety monitor is used.

11.10.1 Limitations:

- **This system is restricted solely to roofing work on low-slope roofs (max. 4:12 pitch).** "Roofing work" is defined as the hoisting, storage, application and removal of roofing materials and equipment, including related insulation, sheet metal and vapor barrier work, but not including the construction, demo, or repair of the roof deck. Mechanical and other (non-roofing) trades do not fall within this scope of work and may not use this fall protection method.
- **Note that fall hazards within the monitored area (skylights, open hatches, holes, etc.) must be covered or guarded (or PFAS used).** Warning lines/safety monitors cannot be used for fall protection around these.
- Roof blocking and similar work may only use this fall protection method if the blocking is installed as an integral part of installing the weatherproofing material on a low-sloped roof. If the blocking is installed separately from the weatherproofing (different location or different time), conventional fall protection (guardrails, PFAS) is needed. The use of conventional fall protection for roof blocking shall be required unless otherwise permitted in roof safety pre-plan.

11.10.2 Restricted area – Only trained, authorized employees actively performing roofing work are permitted in the area between the warning line and the roof edge. They must vacate this restricted area as soon as their work activity is completed. In the meantime, roofing work may take place here without the use of conventional fall protection, however, the worker(s) must be monitored.

No mechanical equipment (motor or human propelled wheeled equipment used for roofing work, except wheelbarrows and mopcars) is permitted in any area where a safety monitoring system is being used. If this equipment must be used in the area between the warning line and roof edge, then conventional fall protection (guardrails, PFAS) must be used there in place of the safety monitor.

11.10.3 Warning line specifications.

Lines	Rope, wire, chain or equivalent (min. 500# tensile strength).
Placement	Min. 6 ft. in from exposing roof edges. If mechanical equipment used, line must be 10 ft. in from roof edge perpendicular to travel. Erect warning lines around all sides of roof work area.
Height	34-39 inches
Stanchions	Must support 16-lbs. of force & not permit slack to be taken-up in adjacent sections.
Visibility	Flag line at 6-ft. intervals with high visibility material.
Access	Use 2 lines to mark worker/materials accessways. Offset or block-off entry point.

11.10.4 Safety monitors – Safety monitors are competent persons designated to watch over workers who are exposed to fall hazards while performing roofing work. They are to be used in combination with a warning line system, however, safety monitoring can be used alone (without warning lines) for roofing work on low-slope roofs (max. 4:12 pitch) that have a roof width of 50 ft. or less.

Safety monitors must:

- Be competent to recognize fall hazards
- Be identifiable to all workers in monitored area
- Be on same level, within sight of, and close enough to communicate orally with monitored workers
- Issue warnings to workers unaware of fall hazard or acting unsafe
- Not have other duties that could distract from their primary duty to monitor

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11.11 Modified warning line system (non-roofers).

11.11.1 Scope – While warning lines/safety monitors are restricted to “roofing work” only, there are special provisions that allow a modified version of a warning line to be used for “non-roofing work” on a low slope roof (max. 4:12 pitch).

11.11.2 Specifications – Same as previously indicated for warning line, **with these exceptions:**

- Modified warning line must be erected at least 15 ft. back from roof edge.
- No one is permitted outside of warning line area unless protected by PFAS, fall restraint or guardrails.
- Fall hazards within the warning line area (skylights, hatches, holes, etc.) must be covered or guarded.
- A safety monitor is not needed.

11.12 Controlled access zone (CAZ).

A CAZ is similar to a warning line in that it represents a barrier that warns workers of proximity to a fall hazard (unprotected edge), and then restricts access to this area. A CAZ may be used for leading edge*, precast, or overhand bricklaying work. The CAZ is used in place of guardrails that would parallel the leading/working edge. Only authorized and trained workers actively performing their work are permitted in a CAZ and they must vacate the CAZ as soon as their work activity is completed.

** A leading edge refers to the unprotected side and edge of a floor, roof, or formwork for a floor or other walking/working surface (such as deck) which changes location as additional floor, roof, decking or formwork sections are placed, formed or constructed.*

11.12.1 Leading edge & precast work – CAZ may only be used in conjunction with an alternative fall plan to mark the area of restricted access. Conventional fall protection (PFAS) is still needed for workers in the CAZ.

11.12.2 Overhand bricklaying – A CAZ may be used as THE means of fall protection for workers actively involved in overhand bricklaying. An alternative fall plan and/or conventional fall protection is not required as long as workers do not have to reach more than 10 inches below their walking/working surface.

- Overhand bricklaying is defined as, “The process of laying bricks and masonry units such that the surface of the wall to be jointed is on the opposite side of the wall from the mason, requiring the mason to lean over the wall to complete the work. Related work includes mason tending & electrical installation incorporated into the wall during the overhand bricklaying process.”
- Where guardrails are not in place prior to the start of overhand bricklaying, enlarge the CAZ, as necessary, to enclose all points of access, material handling areas, and storage areas.
- Where guardrails are in place, but need to be removed to allow overhand bricklaying work, only that portion of the guardrail necessary to accomplish that day's work shall be removed.

11.12.3 CAZ line specifications.

Line	Rope, wire, chain or equivalent (min. 200# tensile strength)
Placement	Leading edge: 6 – 25 ft. from edge Precast: 6 – 60 ft. (or ½ length of member being erected, if less) from edge. Overhand bricklaying: 10 – 15 ft. from edge.
Height	39-45 inches (50 inches for overhand bricklaying)
Set-up	Erect line parallel to exposing edge & connect to guardrails or walls on either end to enclose area. For overhand bricklaying, control lines may be used to mark end boundaries of CAZ (instead of guardrails or walls), but conventional fall protection must be provided outside of the CAZ (where other workers may be).
Visibility	Flag line at 6-ft. intervals with high visibility material.
Access	Use 2 lines to mark worker/materials access areas. Offset or block access point.

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11.13 Safety nets.

11.13.1 Fall distance – Max. 30 feet. (Keep net as close as possible to working level.)

Fall Distance	Outward Extension
Up to 5 ft.	Min. 8 ft.
Over 5 to/including 10 ft.	Min. 10 ft.
Over 10 ft. to/including 30 ft.	Min. 13 ft.

11.13.2 Obstructions & impalement hazards – The fall path to net and area beneath the net must be clear of obstructions. Tools, equipment or materials that fall into the net must be removed ASAP.

11.13.3 Net requirements.

Mesh/web size	Max. 6 inches square
Impact resistance	Min. 17,500 ft-lbs. (certified by mfr.)
Label	Nets must bear a label of proof test
Mesh crossings	Secured together to prevent enlarged openings
Net web border	Rope must have min. 5000-lbs. break strength
Panel connections	Strong as net components & max. 6 inches apart
Connections	Forged steel safety hooks/shackles

11.13.4 Inspection – Weekly & after any occurrence that could affect structural integrity. Look for wear, damage & web separation.

11.13.5 Drop tests.

- Frequency – After initial installation (before placed into service), whenever relocated, after major repair or at 6 month intervals if system left in place.
- Procedure – Drop bag of sand into net from highest exposing work level (min. 42"). Sand bag must weigh 400# and be 28-32 inches in diameter. Inspect netting for damage after test.

11.14 Controlled decking zone (CDZ).

A CDZ is a delineated area (using control lines) used to restrict access to areas where initial installation and placement of metal decking may take place without the use of conventional fall protection (guardrails, PFAS, fall restraint, safety nets), and where access to the zone is controlled. Only workers engaged in the initial placement of decking are permitted in a CDZ.

A CDZ may also be used for placement of metal roofing on an engineered metal building as long as the roofing serves as both a structural and weather-proofing component of the building. This work is typically done by a steel erector and is done during and as part of a steel erection activity.

Note that a CDZ may not be used for repair/replacement of decking since this does not involve the initial placement of decking.

11.14.1 Limitations – CDZ's may be used at heights over 15 ft. up to & including 30 ft. (or max. 2 stories, if less than 30 ft.) above a lower level. Where fall hazard over 30 ft./2 stories exist, a CDZ may no longer be used.

11.14.2 CDZ line specifications.

Line	Rope, wire, chain or equivalent (min. 200# tensile strength)
Height	39-45 inches
Placement	Erect line at least 6 ft. back from leading edge. Max. work area width is 90 ft. Extend line along entire length of the leading edge and approximately parallel to it. Connect to stanchions at each end (6 ft. from edge, or 15 ft. if more than 30 ft./2 stories)

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	Work may continue up to 90 ft. ahead of line before line must be moved within 6 ft. If fall hazard over 30 ft./2 stories (ex: bldg. sides/end), must use PFAS within 15 ft. of edge.
Stanchions	Must support 16-lbs. of force & not permit slack to be taken-up in adjacent sections.
Visibility	Flag line at 6-ft. intervals with high visibility material.
Access	Use 2 lines to mark worker/materials accessways. Offset or block-off entry point.

11.14.3 Additional requirements.

- Unsecured decking may not exceed 3,000 sq. ft. in the CDZ.
- Safety deck attachments required from the leading edge back; min. two (2) per deck panel.
- Final deck attachments & shear connector installation not permitted inside a CDZ.

11.15 Falling object protection.

11.15.1 Options – A means of falling object protection must be instituted to protect workers (& public) who may pass/work below. Options include:

- Toeboards – Min. 3½ inches high, no more than ¼-inch from working surface and no more than 1-inch horizontal gap between sections. Do not stack materials above toeboard unless panel or screen used.
- Screens – Extend from working surface to top rail. Must be securely attached at top & bottom.
- Debris nets, catch platforms & canopies – Must be constructed to protect all exposed workers below and must withstand anticipated impact forces.
- Barricades – The area below work (into which objects can fall) is barricaded, and entry into this area is prohibited. If personnel need to travel through zone, stop work above until area below is clear.

11.15.2 Materials storage.

- General – Keep min. 6 ft. away from internal floor openings and min. 10 ft. from exterior wall that does not extend above top of material stored.
- Overhand bricklaying & related work – Only masonry & mortar are permitted within 4 ft. of edge. Excess mortar & broken or scattered masonry units must be removed regularly from work area.
- Roofing work – No materials within 6 ft. of edge unless guardrails have been erected. Materials piled, grouped or stacked near roof edge must be stable & self-supporting.

11.15.3 Materials handling – Even with falling object protection in place, never blindly throw or drop anything from an upper level. Also, never throw tools or materials to another worker on an elevated surface.

12. Scaffolding

12.1 Inspections.

A competent person must inspect all scaffolds and scaffold components prior to each shift's use and after any occurrence that may have damaged the scaffold system (weather/wind, impact damage, supporting surface movement, electricity, etc.).

Any hazards that deem the scaffold unsafe for use – including accumulations of debris, ice or mud or deteriorating supporting surfaces – must be promptly corrected prior to being placed into service.

Make sure that there have been no alterations to any scaffold member (welding, burning, cutting, drilling, bending).

12.2 Out of service.

Any scaffold that is found to be damaged, missing safety devices (including guardrails and falling object protection), or otherwise not in a condition to be used shall be tagged out of service.

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12.3 Scaffold erection.

All scaffolds must be erected under the supervision of a competent person, and in a manner specified or approved by the manufacturer. Scaffold components, including planking and supporting surfaces, must be capable of supporting 4x the maximum intended scaffold load. As a matter of safe work practice, do not intermix scaffold components made from different manufacturers.

The competent person and all persons involved in scaffold erection/dismantling must know the rated capacity of the scaffold. Frame scaffolds exceeding 125 ft. in height require a registered professional engineer design.

12.4 Clearance to power lines.

A clearance of at least 10 ft. shall be maintained between energized electric lines (50 kV or less) and scaffolds/ladders, including any materials handled from them. Note that site-specific or state requirements may require greater clearance.

Additional clearance shall be required for power lines that are over 50kV (consult with power line owner).

12.5 Base plates & mudsills.

Base plates or casters (wheels) are required at all times – no exceptions. Whenever feasible, base plates or casters must be pinned in place.

Mudsills shall be provided as needed to provide a solid, level foundation. Mudsill length shall not be less than 18 inches and width not less than 10 inches.

Base plates & mudsills must be fully supported by the ground or supporting surface beneath. The use of hollow concrete block to provide a support for a scaffold leg is not permitted.

12.6 Crossbracing & frame coupling pins.

Crossbracing must be completely installed per manufacturer's instructions on all levels of the scaffold that bear weight – front & back, regardless of scaffold height.

Bucks of frame scaffold must be pinned together.

12.7 Planking & brackets.

All scaffold work platforms must be completely decked (staging or scaffold-grade lumber) and the decking/planks must be in good condition. No more than a 1-inch gap between planks (although up to 9½ inches is permitted to fit around posts).

When platform widths change, take special care to not leave gaps in the transition area between the edge of planks and the guardrail.

When overlapping plank, assure that the overlap spans at least 6 inches on either side of the frame bearer (support). At the ends of platforms, planks must extend 6-12 inches past the end frame, or be cleated or hooked. Hook safety devices must be engaged.

Brackets, when permitted by the manufacturer to be used, may support workers only and must be installed on the work face side of the scaffold.

12.8 Safe access.

A means of safe scaffold access must be provided. This may include use of a portable ladder, clamp-on ladder, climbable (ladder-style) end frames, a stair tower, or direct access from another scaffold/surface (within 14 inches horizontally and 2 ft. vertically). **Climbing crossbraces or walk-thru style (stirrup) endframes is not permitted.**

12.8.1 Hatchways – If climbing through a platform hatch onto a scaffold platform, make sure that the hatch cover is closed or guarded behind you.

12.8.2 Extension ladders – Check rung locks each time platform is raised or lowered. Make sure ladder extends above scaffold platform by at least 3 ft., or is tied to a grab rail at least 3 ft. high.

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- 12.8.3 Mast-climbing scaffolds – Reference scaffold manufacturer instructions as to when a PFAS (harness & retractable lanyard) must be used for fall protection while climbing. If the manufacturer does not address this concern, then the masts (if used for climbing) shall be considered fixed ladders and PFAS shall be required anytime a fall hazard of 24 ft. or more exists.

Follow the same precautions as you would for climbing a ladder. Do not carry tools or materials when climbing the scaffolding so that both hands remain free to grip the rungs.

12.9 Guardrails (fall protection).

Install guardrails around any occupied work platform where a fall hazard of over 10 ft. exists.

- 12.9.1 Protect all exposing sides & edges (this includes bracket platforms, if used). The front of the scaffold doesn't need a guardrail as long as it is within 14 inches of the work face and there are no openings through which a worker could fall (window opening, past end of wall, etc.).
- 12.9.2 Guardrails incorporate a top rail and a midrail. Top rails must be 38–45 inches high (measured from top of rail to work platform). The top rail must remain within this range with a 200# load applied. Midrail shall be installed midway between the top rail and the supporting surface and shall withstand a 150# load.
- A crossbrace may be used as a top rail if its midway pivot point is 38-48 inches above platform. A midrail would still need to be installed. A crossbrace may be used as a midrail if its midway pivot point is 20-30 inches above platform. In this case, a top rail would still need to be installed.
- 12.9.3 Guardrails may be temporarily removed to permit stocking or material removal. However, the rails cannot be removed until the lift is ready to land or pick-up the load at the platform and then, they must be immediately replaced as soon as the lift clears the platform (even if it will be returning for another load). During the time that the rails are removed, no employee may stand at or hang through the opening unless protected by a personal fall arrest system (harness, lanyard & anchorage).
- 12.9.4 Never climb on or rig from bracing or guardrail components.
- 12.9.5 When working from any scaffold platform that is not fully decked or that is missing guardrail components, a personal fall arrest system (PFAS), work positioning system, or fall restraint will be required.

12.10 Falling object protection.

Toeboards or similar means of protection must be installed whenever people walking or working below may be exposed to falling objects. Even with falling object protection in place, never blindly throw or drop anything from a scaffold platform.

- 12.10.1 Toeboards – Min. 3½-inches high, with bottom no more than ¼-inch off of the scaffold platform. When toeboards are used, take care to not pile tools or materials above the height of the toeboard unless additional safeguards have been taken to prevent falling objects (plywood between object and railing, setting object back from edge of toeboard, etc.).
- 12.10.2 Screens – Can be used against scaffold guardrails to prevent passage of materials above the toeboard.
- 12.10.3 Canopies – Can be used to protect walkways, doorways and other areas below where people could be walking/working. Canopies must be strong enough and large enough to effectively protect all exposed people below.
- 12.10.4 Barricades – Can be used to mark an area of restricted access below the scaffold (into which any falling objects would drop). No one is permitted in this area while work takes place above. If someone must pass below, work above must stop. Signs indicating, “DANGER – FALLING OBJECT HAZARD” should be posted along with the barricade.

12.11 Tipping restraint (tie-ins).

- 12.11.1 Frame scaffolds (5 ft. wide frames) – Tie into building/structure (using mfr.-specified equipment & instructions) every 20 ft. vertically at each end and every 30 ft. horizontally. If outriggers are used to

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increase frame width, then tie-ins are required at vertical intervals not to exceed 4x base width. If scaffold is tented or has pulley attached, then additional tie-ins are required per manufacturer specifications.

Note that site-specific or state requirements may require more frequent tie-ins.

12.11.2 Baker scaffold (Biljax) – One tier requires no outriggers. Two tiers require 18-inch outriggers on each side and at each end. Three tiers require 24-inch outriggers on each side and at each end. No use of this scaffold beyond three tiers.

12.11.3 Other scaffold types – Refer to scaffold manufacturer instructions.

12.12 Mobile scaffolds.

Mobile scaffolds shall be used only on level, smooth surfaces. Wooden or channel iron runners may be used to accomplish this, but they must support at least 4x the maximum intended load of the scaffold.

Casters must be pinned in place and locked prior to the platform being occupied. Horizontal diagonal bracing must be provided at the base and at vertical intervals of 20 ft. Do not use brackets on mobile scaffolds.

Watch for overhead clearance when moving a mobile scaffold. No one shall ride a mobile scaffold while it is being moved. All tools or materials that could fall during the move shall be removed from the work platform.

Wagon scaffolds must have the bottom frame mechanically fastened to the wagon gear to prevent the scaffolding from becoming detached at the base. Keep tires inflated to maximum rated pressure to provide optimum stability of the wagon.

12.13 Suspension scaffolds.

Swinging stages, toothpicks, boatswain (“bos’n”) chairs, floats, and needle beams require special training before they may be erected and used. They also require a PFAS (personal fall arrest system) anchorage that is completely independent of the scaffold and its suspension components. Users must be attached to the PFAS anchorage before stepping onto suspension scaffolds, and may not unhook until clear of the scaffold.

Lifeline must be tied off to a substantial anchorage on the building or structure that is independent of the scaffold’s anchor. Use one lifeline per person.

13. Excavations & Trenches

13.1 Excavation competent person.

A competent person shall be assigned by the excavator to oversee all excavation & trenching work. In accordance with OSHA requirements, this competent person shall be responsible for classifying soil, providing proper cave-in protection and inspecting the dig each day prior to entry and again as necessary throughout the day (weather or site changes that affect the dig – freeze/thaw, heavy rain, etc.). Any signs of soil distress or other significant hazards shall signal an immediate evacuation of the excavation until the hazard is abated.

13.2 Buried utilities.

The estimated location of underground utility installations that reasonably may be expected to be encountered during excavation and demolition work shall be determined prior to digging.

13.2.1 One Call – In accordance with state requirements, the competent person shall contact One Call to ascertain the approximate location of buried utilities prior to excavating or disturbing any depth of earth using mechanical equipment.

- The serial number for the call shall be recorded as proof of the contact.
- Each company excavating must make its own notification call for its work and receive its own serial number(s) (only the caller is protected by a notification).

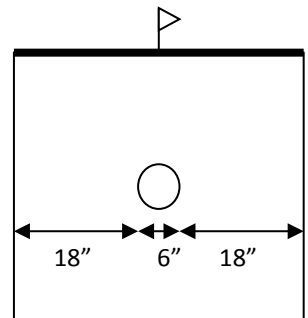
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- If, after receiving information from a One Call System or directly from a utility owner, there is a change to the location, scope, or duration of a proposed excavation, then a new One Call must be placed.
- If digging equipment is removed from the worksite for more than two (2) working days, a new One Call must be placed, unless other arrangements have been made directly with the utility owners.

13.2.2 Private property – Other means (locating equipment, locator service, facility maintenance, etc.) shall be used in addition to the One Call to identify private underground installations prior to the start of digging.

13.2.3 Emergency work – The 3-10 day prior notification requirement shall not apply to excavation/demo work in an emergency. Nonetheless, all facility owners shall be notified before any digging begins to receive instructions on how to proceed. ("Emergency" is defined as a sudden or unforeseen occurrence involving a clear & immediate danger to life or property, including but not limited to, serious breaks or defects in utility owner's lines.)

13.2.4 Tolerance zone – Markings are used to show the estimated location of buried installations. PA law affords for a leeway of 18 inches on both sides of a buried installation, creating a "tolerance zone." The tolerance zone equals 18 inches on either side of the installation PLUS the width of the installation itself. If no width is marked, you must assume that it is at least 2 inches in diameter. Any excavation within the tolerance zone must be done using prudent digging techniques (hand digging or equivalent safe means).



TOLERANCE ZONE

Where the buried installation is electrical in nature, electrical protective gloves and overshoes (rated for proper voltage) shall be worn during the hand digging process.

13.2.5 Markings – Should include utility owner name, initials or logo. If marked surface will be removed, offset markings will be used to supplement. These will align with the buried installation and indicate specific distance away. If buried installation is greater than 2 inches wide, the width will also be marked.

Use only the color white to mark a proposed excavation site.

13.2.6 Utility protection & service interruption – All unearthed installations must be protected if necessary to prevent inadvertent contact or damage. The local power company shall be summonsed to install protective casings around power lines.

Excavation/demo work which requires temporary or permanent interruption of a utility owner's service shall be coordinated with the affected utility owner in all cases.

13.2.7 Report damage – Report immediately to the utility owner any break or leak on its lines, or any dent, gouge, groove or other damage to such lines or to their coating or cathodic protection, made or discovered in the course of the excavation/demo work. Report damage regardless of whether or not you caused it. A report will need to be filed with the state (PA) within 10 days.

Immediately call 911 and take reasonable measures (commensurate with knowledge, training, experience and resources) to protect life, property and/or the environment in the event that any damage results in the escape of flammable, toxic or corrosive substance.

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- 13.2.8 Public protection – In the event of damage to a buried installation, immediately alert the occupants of nearby premises if their health or safety could be at risk.

13.3 Cave-in protection.

- 13.3.1 Soil classification – The competent person shall classify soil prior to selecting a cave-in protection method. **As a matter of company policy, neither stable rock nor Type A soil shall be recognized without supporting geo-engineering data that is kept on site.** To determine if you are in Type B or Type C soil, use the following test:

Plasticity test (wet thread test) – Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8-inch in diameter. Type B soil can be successfully rolled into threads at least 2 inches long without crumbling. If the soil crumbles before you can roll a thread of this length, then it is Type C soil.

- 13.3.2 Requirement to have cave-in protection – Proper cave-in protection (based on soil classification) must be provided, properly installed & maintained for every excavation which will be entered. This provision applies whether the dig is a trench or an open-sided excavation. The only exceptions to this rule are:

- The dig is in entirely stable rock (as supported by geo-engineering data kept on site), or
- The dig is less than 5 ft. deep at the deepest point that will be entered, and there is no sign of soil distress, movement, erosion, or pending cave-in.

All workers must remain within the confines of the cave-in protective system at all times while in the excavation, including periods when they enter/exit the dig.

- 13.3.3 Digs greater than 20 ft. deep – Cave-in protection requires registered professional engineer design. The design specs must be maintained on jobsite.

13.3.4 Trench boxes.

- Cave-in protection must be provided for open ends of boxes (end plates, sloping, etc.).
- Tabulated data sheets (engineering data) must be on site for each box in use.
- Based on soil type, boxes must be rated for the depth at which they will be used.
- All box strut pins must be properly installed.
- Stacked boxes must be coupled in accordance with manufacturer's specifications.
- Top of box must be at least 18" above toe of slope or top of excavation face.
- Max. dig below bottom of box = 2 ft. (box must be rated for entire dig depth & no soil loss at bottom).
- No gap is permitted between the box and excavation face.
- Keep the access ladder inside of the box.
- No one permitted in a box that is being installed, removed or moved vertically.
- Backfill as soon as box is removed.
- Keep workers clear of box sides during installation & removal.
- Beware overhead power lines (maintain at least 10 ft. clearance – 50kV or less).
- No modifications to structural components of box without manufacturer's written approval or recertification by a Registered Professional Engineer.

13.3.5 Sloping & benching.

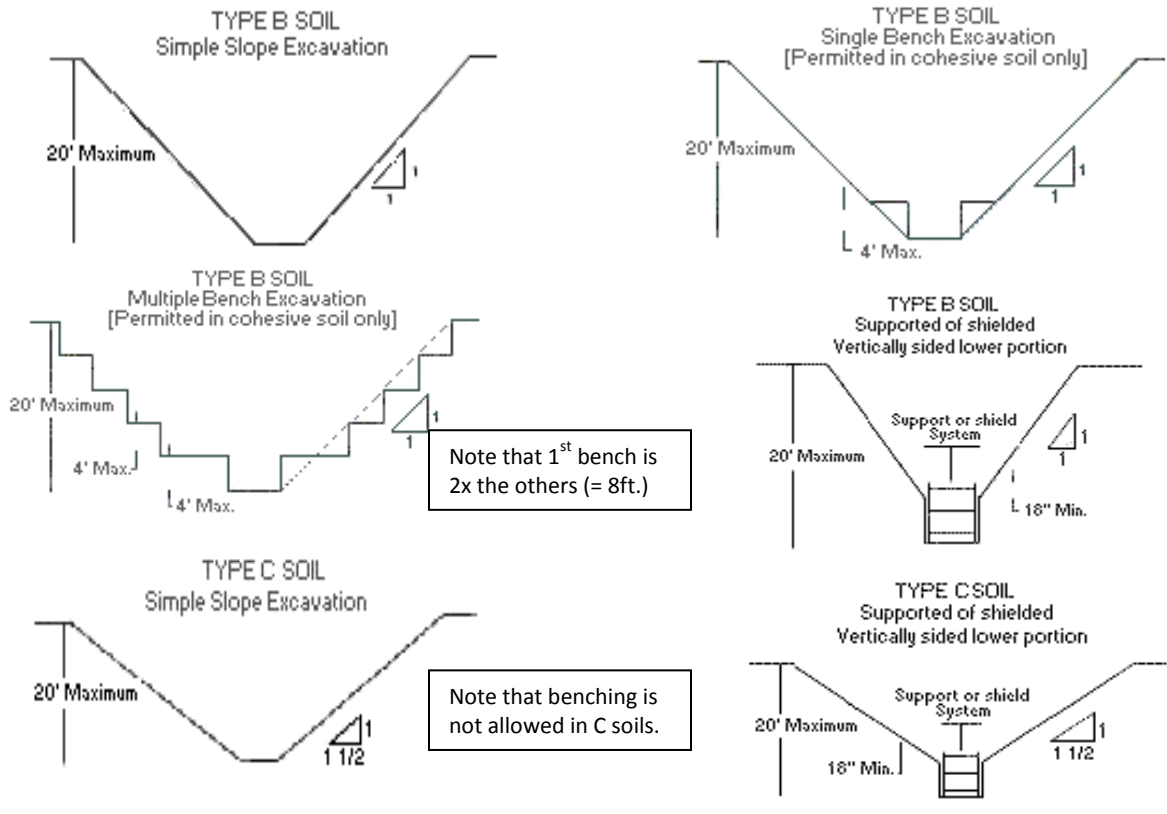
- The degree of slope or bench required is based on soil type:

Soil Type	Max. Allowable Slope (horiz : vert)
Type B	1 : 1 (45°) <i>Lesser angle if signs of soil failure/distress noticed.</i>
Type C	1½ : 1 (34°) <i>Lesser angle if signs of soil failure/distress noticed.</i>

- Slope/bench limitation = 20 ft. deep without registered professional engineer design.

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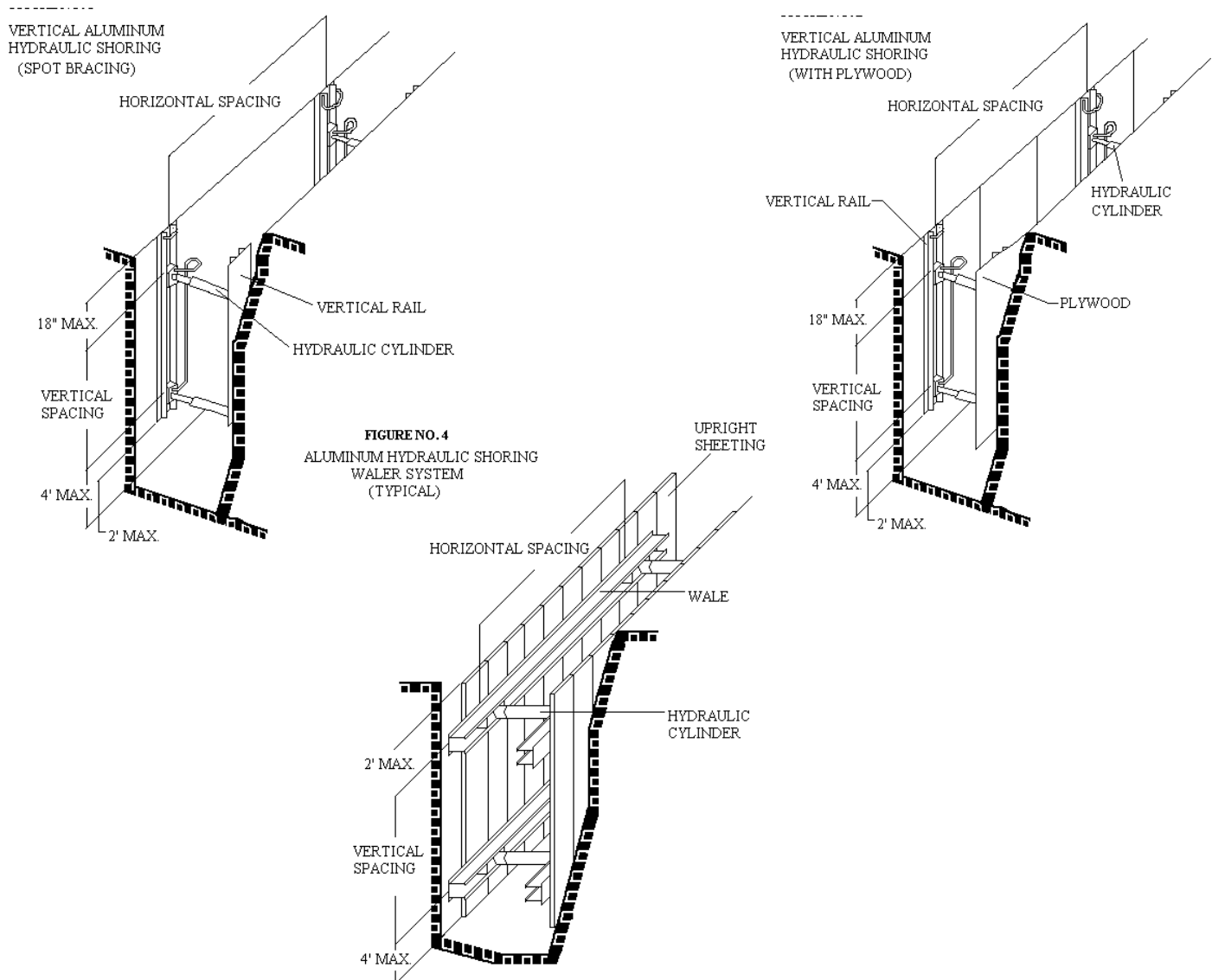
Type B Soil Options



13.3.6 Aluminum hydraulic shoring – There are two types of aluminum hydraulic shoring systems – vertical shore systems and waler systems. Vertical shore systems are used for type A or B soils only (not C soil), while the waler systems are for type B and C soils.

- Tabulated data sheets (engineering data) must be on site for each shore in use.
- Shores must be installed per engineering data, based on soil classification.
- Cave-in protection must be provided for open ends of boxes (end plates, sloping, etc.).
- Shores must completely bear against a vertical trench face.
- Max. dig below bottom of shore = 2 ft. (must be rated for entire dig depth & no soil loss at bottom).
- Keep the access ladder inside of the protected area.
- Workers must be protected at all times during system installation, moving, adjustment and removal.
- Close sheeting is placed edge to edge and is used to control local sloughing or to provide a flat surface for shores. Tight sheeting has interlocking edges and is used to hold back water seepage.
- Sheeting is NOT meant to be a structural member. Plywood used to prevent local raveling must be 1 1/8" softwood or 3/4" 14-ply arctic white birch.
- No modifications may be made to the structural components of the box without manufacturer's written approval or recertification by a Registered Professional Engineer.
- Backfill as soon as box is removed.

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13.4 Safe access/egress.

At a trench depth of 4 ft., a ladder or ramp must be readily accessible (laterally) within 25 ft. of your work area in the trench. Consider & include means of safe access/egress when determining needed cave-in protection.

13.5 Spoil piles & falling/rolling object hazards.

Keep spoil piles, equipment and tools at least 2 ft. from the excavation edge. Scale loose rocks/soil from the trench walls as necessary to protect workers in excavation.

13.6 Surface encumbrances.

Prior to digging, remove or support any objects that could fall into the excavation and/or onto workers. Examples: poles, rocks, fences, signs, trees, benches, hydrants, etc.

13.7 Adjacent structures, walls & walkways.

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Must be supported (shored, braced or underpinned) if stability is compromised. Never dig below the base/footing if employees may be endangered unless a support system is implemented, the excavation is entirely in stable rock, or a Registered Professional Engineer (R.P.E.) has been consulted.

13.8 **Exposure to traffic.**

Wear ANSI 107, high-visibility warning vests if exposed to the danger of being struck by public and construction traffic while working in highway/road construction work zones (within 15 ft. of traveled roadway). Refer to current editions of Penn DOT Publication 212 and 213 (or MUTCD – Part 6 if not in PA) for temporary traffic control requirements and traffic control plans.

13.9 **Falling & hoisted loads.**

Never work beneath hoisted/raised loads or earthmoving equipment. Also, stay clear of vehicles being loaded or unloaded. Vehicle operators may remain in cab if it is provided with a cab shield or canopy.

13.10 **Fall protection & excavation edge warnings.**

13.10.1 Remote pits, wells & shafts – Cover or guard when work is complete or suspended.

13.10.2 Walkways – Provide walkways where workers must cross over excavations that are 30 inches or more in width. The walkway must be at least 20 inches wide and extend over each side of the trench at least 24 inches. If the trench depth/fall hazard is 6 ft. or more, provide guardrails. Install a toeboard if workers may be present below the walkway.

13.10.3 Fall protection in general – Otherwise, OSHA does not require guardrails along excavation edges. HOWEVER, consider general public exposures. If the excavation poses a potential threat to the general public, students, children or host facility workers, take any necessary precautions (fencing, barricades, warning signs, etc.).

13.11 **Water accumulation.**

Water affects soil stability. Never enter an excavation where water has accumulated. Control water by diverting run-off, incorporating additional support systems and/or by using a pump. Where water has the potential to accumulate, increase inspection frequency to monitor trench stability.

13.12 **Hazardous atmospheres.**

Test the air in an excavation/trench at depth intervals of 4 feet if any of the following conditions could be anticipated:

- Oxygen deficiency (<19.5%)
- Presence of flammable gases/vapors (>20% LEL)
- Presence of toxic gases/vapors (> PEL)

Use an air monitor to measure and continuously monitor air quality readings. If hazardous conditions are present, provide fresh air ventilation (explosion-proof is needed if flammable readings are >75% LEL). Understand that simply allowing excavations/trenches with hazardous atmospheres to air-out may not be sufficient. Some contaminants are heavier than air and may not be diffused by simple natural ventilation.

Where hazardous atmospheres exist or could be reasonably expected to exist, emergency rescue equipment must be available and on site, ready to use. Equipment needs should be based on an analysis of site-specific hazards and needs. Equipment may include: safety harness with retrieval line, winch & tripod, a basket stretcher and/or SCBA's (if entry is required for rescue).

Verify that all employees are trained in:

- Air monitor use & operation.
- Identifying hazards presented by the air contaminants.
- Implementation of hazard control measures.
- Proper set-up and use of emergency rescue equipment and procedures.

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13.13 Backfill.

Backfill all trenches as work progresses. All digs are to be closed at the end of the workday. If this is not feasible, then take all necessary and prudent precautions to protect the public or other workers on site (fencing, barricades, signs, etc.). Secure fencing & signs are a must where the public (especially children) could enter or fall into the dig.

14. Fire Safety, Flammables, Extinguishers & Temp. Heat

14.1 Fire prevention precautions.

- 14.1.1 Good housekeeping – As construction progresses, fire hazard conditions constantly change. Accumulation of wooden forms, scaffolding, scrap lumber, packing, materials, paper wrapping, and other refuse appear at new locations daily. In addition, many ignition sources are present, such as torching/welding, grinding, temporary heaters, and lighting.
- 14.1.2 NO SMOKING signs – Post “No Smoking” signs within 50 ft. of flammables storage, use, and refueling areas. Strictly enforce this policy.
- 14.1.3 Sources of ignition – Keep all sources of ignition at least 50 ft. away from areas where flammables are being stored, dispensed or used. This includes smoking, welding/torches, any source of sparks or flames, powder-actuated tools, cell phones, radios, personal electronic devices, ordinary electrical cords & devices, and internal combustion or electric tools/equipment.
- 14.1.4 Ventilation – Ensure that all areas in which flammable gases/liquids are stored or used has sufficient natural ventilation to prevent flammable vapors from accumulating. Be aware that flammable vapors can travel great distances and, being heavier than air, may accumulate in low-lying areas/spaces.
- 14.1.5 Safety cans & flammables – All flammable liquids in quantities over one (1) gallon up to and including five (5) gallons must be stored in and dispensed from safety cans. *Exception: Any flammable liquid that is too viscous (thick) to be transferred into a safety can may be handled from its original container.* Quantities of flammable liquids one (1) gallon or less may be handled from manufacturer’s original container.

Some flammable materials that you may encounter on the job include: fuels, oil-based paints, epoxies, thinners, solvents, petroleum-based degreasers, and possibly even protective coatings.

Spraying flammables may increase the concentration of vapors, creating an increased fire and explosion hazard. Make sure you receive instructions from your supervisor before proceeding, and read hazard information on the chemical Safety Data Sheet (SDS).
- 14.1.6 Flammables storage areas – Never store flammable liquids or flammable gases near exits, ways of exit access, stairways or passageways. Do not place flammables between you and a path of escape from your work area. When storing outside, keep the storage area, shed or trailer at least 20 ft. from building.
- 14.1.7 Clothing contamination – Any worker whose clothing has become contaminated with a flammable or combustible liquid shall change clothes immediately. Do not smoke or approach any sparks, heat or flame in the meantime.

14.2 Refueling.

- 14.2.1 Sources of ignition – No smoking or sources of ignition within 50 ft. of refueling areas. Note that cell phones, radios, personal electronic devices, etc. are not to be used or turned on while you are in the process of refueling.

Vehicles/equipment must be shut-off and allowed to cool prior to refueling. Never refuel while running or hot.
- 14.2.2 Attended – The vehicle/equipment must be attended at all times during the refueling process.

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- 14.2.3 Static electricity – To prevent a spark from static electricity discharge, maintain metal-to-metal contact between fill spout and nozzle/safety can. Make sure fuel cans are on the ground before filling – do not fill can from vehicle or trailer. Also, do not re-enter vehicle while refueling – static charge could build-up from entering/exiting vehicle cab.
- 14.2.4 Fuel container transport – Always secure fuel containers in vehicles during transport and ensure adequate ventilation (particularly on hot days). If possible, try to avoid container exposure to direct sunlight.

14.3 Portable tanks (fuels & LPG).

- 14.3.1 Proper use – Make sure tank contains only the fuel for which it is listed and designed. The tank must be properly labeled and have emergency venting.
- 14.3.2 Location – Pre-plan and arrange to have the tank positioned in an area of the jobsite where it:
- Will not be exposed to vehicle or heavy equipment traffic. (*“Exposed to” refers to a location where the tank could foreseeably be struck or damaged as a result of vehicle/equipment operation, maneuvering or parking.*)
 - Will be at least 20 ft. away from the building (& 50 ft. from ignition sources).
 - Is well ventilated and free of weeds & combustible debris.
 - Is accessible for firefighting purposes.

If this is not possible, then arrange to have the tank positioned in a location of the jobsite that will least expose it to vehicle/equipment traffic. The tank shall then be protected by a physical barrier (concrete barriers, stone/dirt piles and heavy duty posts, etc.) that will provide sufficient protection from the vehicles/equipment being operated nearby.

While the use of a spotter is encouraged for traffic being maneuvered in the vicinity of a tank, the spotter shall supplement – not replace – the precautions explained above.

- 14.3.3 Containment – Provide secondary containment or diking to prevent any potential fuel leaks/spills from reaching a building, body of water, or other environmentally sensitive area.

14.4 Fire extinguishers.

- 14.4.1 Type & size – All fire extinguishers must be ABC multipurpose extinguishers that have a minimum classification rating of 2A:20B:C (minimum 5#). On the extinguisher label, in small print, you will find the classification rating (usually below the UL symbol). This is given as #A:#B:C (ex. 2A:20B:C). The larger the numbers, the greater the unit’s extinguishing capacity (& discharge time).
- 14.4.2 Location – Know the location of the nearest fire extinguisher and how to operate it.

Location	Min. Exting. Rating	Max. Travel Distance
Each floor	2A:20B:C	100 ft.
Storage or handling of more than 5 gallons or pounds of flammable liquids/gases		50 ft.
Welding, torching or hot work		35 ft.
Refueling areas		75 ft.
LPG tank storage		75 ft.
Flammables storage areas		50 ft.
Job trailers		Inside

- 14.4.3 Maintenance – At least monthly, there shall be a check of all extinguishers. Initial and date the back of the extinguisher inspection tags to verify it:
- Is properly located and readily accessible in the event of a fire
 - Is in a useable condition (charged, not damaged, lever pin in place, unclogged hose)

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- Has a valid annual inspection tag

Replace any fire extinguishers that are missing, damaged, out of inspection or not properly charged.

- 14.4.4 Using a fire extinguisher – Fire extinguishers are provided to extinguish small fires in an early stage and in a controlled environment. If you are not comfortable using an extinguisher, you are not required to do so. Alert your site supervisor immediately and evacuate the area.

If you choose to use an extinguisher, remember... “PASS”

Pull the pin out of the handle
Aim the nozzle at the base of the fire (stand back from the fire)
Squeeze the handle
Sweep the nozzle back & forth at the base of the fire

Also, keep the following precautions in mind:

- Extinguisher has a limited discharge time (about 15-25 sec.) and distance (about 10 ft.)
- Evacuate if nearby hazards (fuel storage, dangerous chemicals, highly combustible material)
- Don't get cornered & never turn your back to a fire that you have just extinguished
- Don't get in over your head! If fire grows or is nearing a dangerous area, EVACUATE!

- 14.4.5 Training – Fire extinguisher training will be conducted to familiarize personnel with how to properly use a fire extinguisher and on the hazards of early-stage firefighting.

14.5 Temporary heating.

- 14.5.1 Components – Heating units must be listed by an approved testing laboratory (ex: UL, FM, etc.), in good condition, and used in a manner prescribed by the manufacturer. The unit must have an automatic gas shut-off valve and have a minimum valve, hose & connection rating of 250 psig.
- 14.5.2 Set-up – Heating units must be set on a firm, level surface. Maintain proper clearance to combustible materials (see mfr. specifications) and keep tarps and other loose combustible material at least 10 ft. from the heating unit. Secure tarps if necessary to keep them from blowing into/toward unit.
- 14.5.3 Tanks & hoses – Locate tanks & hoses so they will not be exposed to high temperatures or physical damage. Make sure there are no kinks or strains in the hose. Keep tanks at least 6 ft. away from heating units and never direct hot air toward any LPG tank within 20 ft.
- 14.5.4 Ventilation – Assure an adequate supply of fresh make-up air.
- 14.5.5 LPG tanks – Must be stored outside, unless hooked to a regulator and temporary heating device. Store tanks in areas and in a manner whereby they will not be knocked over, damaged, or easily accessed by unauthorized persons.

The following chart shall be used to determine minimum storage distance from buildings and trailers:

LPG Quantity	Min. Distance from Building
500 # or less	0 ft.
501 to 6,000 #	10 ft.
6001 – 10,000 #	20 ft.
Over 10,000 #	25 ft.

15. Compressed Gas Cylinders, Torching, Welding & Hot Work

15.1 Pre-use inspection.

All equipment must undergo a pre-use inspection to ensure it is in a safe operating condition (no damage, safety devices present and functioning, etc.). Any equipment that is damaged, defective, or otherwise presents a safety risk must be tagged out of service until repaired or removed from the site.

- 15.1.1 Cylinders – Check for dents, gouges, damaged valves, leaks, excessive corrosion (esp. at base), and missing valve caps. If valve stem leaks upon valve opening, close valve and tighten gland nut. If leak persists, tagout & remove cylinder from work area.
- 15.1.2 Torch sets – Check torch tips (clogging), shutoff valves, regulator/gauge operation, and torch for damage.
- 15.1.3 Hoses – Check for leaks, tightness of & proper couplings, wear/tears/cracks, bulging, presence of oil/grease, signs of damage or flashback.
- 15.1.4 Oil, grease & petroleum-based products – Ensure that no oil, grease, or petroleum-based products are on or near oxygen cylinders, hoses, regulators, fittings or torches. Leaking oxygen can cause these substances to spontaneously erupt into flames. Similarly, keep grease-contaminated tools & equipment away (wrenches, dies, cutters, etc.).
- 15.1.5 Welding units – Check unit and leads for damage, proper grounding, and signs of malfunction. Inspect electrode holders to ensure that all current-carrying parts passing through the holder are insulated, and that no protective covers are cracked/missing. Cables must be checked for wear, cuts, and damage.

Welding cables must be fully insulated, flexible, and capable of handling the maximum current being used. No splices within 10 ft. of electrode holder are permitted, unless standard cable connectors are used or the splice has insulation equivalent to the cable's. Otherwise, splice or minor insulation repair is permissible with rubber or friction tape equivalent to that of cable's original sheath. Cables in poor condition must be replaced.

15.2 Compressed gas cylinders & torch sets.

- 15.2.1 Handling cylinders – Handle all compressed gas cylinders with care, using leather gloves, and eye/face protection as the pressurized gas can freeze unprotected skin.
- 15.2.2 Secure cylinders – Secure cylinders in an upright position at all times (on the job, in the shop, and in vehicles), regardless of whether or not they are empty. Use a chain or other fire-resistant device designed for this purpose.

NOTE: Propane cylinders (for forklifts) may lie flat in the storage cage as long as the relief valve is at the 12 o'clock position (top of cylinder end). This would allow pressure relief in the event that the cylinder becomes overpressurized.
- 15.2.3 Damage protection – Protect cylinders in use and in storage from physical hazards & fire hazards (sparks, flame, slag, energized electrical parts & other ignition sources). Never strike an arc from a cylinder.
- 15.2.4 Transporting cylinders – Use a carrier. Otherwise, carry in an upright position or take care by tilting the cylinder and rolling it along the bottom edge. Do not roll cylinder on its side and never lift by the valve protection cap. If cylinders need to be hoisted, use pallets or cradles – never use choker slings or magnets.
- 15.2.5 Backflash arrestor/check valve – Oxygen/fuel gas torches must have a backflash/check valve protective device installed on both the oxygen and fuel gas lines.
- 15.2.6 Regulators – Regulators are required when using torch sets. Ensure that the proper regulator is chosen for each gas. Before installing a regulator, "crack" the cylinder valve (quickly open & close) to remove any accumulated dust/dirt. Only crack valve in a ventilated area, at least 50 ft. away from ignition sources.

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After the regulator is connected, close the second stage of the regulator. Stand to one side of the gauge while the cylinder valve is opened slowly.

- 15.2.7 Cylinder valves & purging – Valves on fuel gas cylinders may not be opened more than 1½ turns. Leave the wrench in place to allow for quick shut-off. Oxygen tank valves may be opened fully.

When finished work, storing the torch set, preparing to remove regulators, or if cylinder is empty, close all valves, then purge lines & regulators in a ventilated area that is free of ignition sources.

- 15.2.8 Igniting torch – Only approved devices (friction lighters) may be used to ignite the torch. Use of matches, lighters, or hot work is not permitted. Open fuel gas to ignite torch, then add oxygen once torch is lit.

- 15.2.9 Cylinder storage – Cylinders that are not hooked to a regulator, or that will not be used within 24 hours, must be properly stored in an area that is clean, well ventilated, dry, and protected from damage, live electrical conductors, and heat/sparks/flame.

Cylinders in storage must have regulators removed and valve caps installed.

Oxygen cylinders must be stored separately from fuel-gas cylinders and/or combustibles (especially oil/grease). You can either:

- Separate oxygen & fuel gas cylinders/combustibles by at least 20 ft.; OR
- Use a non-combustible (½ hr. fire rated) barrier at least 5 ft. high between the oxygen and fuel gas/combustibles storage.

Note that this separation requirement does not apply to cylinders that are in a carrier and hooked to a regulator for use (within 24 hrs.)

- 15.2.10 Misuse of oxygen – Never use oxygen in pneumatic tools, to pressurize a container, to blow out lines/bolt holes, to clean-off clothing, or as a substitute for compressed air. Pure oxygen is a strong oxidizer that can create an immediate and violent fire.

- 15.2.11 Confined areas – Never take cylinders into a confined space. Immediately remove all hot work equipment (torch, hoses, cables, etc.) from the confined space when not in use. A slow leak could quickly create an explosive situation.

- 15.2.12 Hoses – Fuel-gas and oxygen hoses must be separately distinguishable (by color or texture) and may not be interchangeable. Hose sections may not disengage without the application of a twisting motion. Do not tape more than 4 inches out of every 12 inches of hose together. Tape not permitted to repair damage.

15.3 Electric arc welding.

- 15.3.1 Grounding – All work should have a separate and adequate ground. Pipelines containing gases or flammable liquids, and conduits containing electrical circuits are not acceptable grounds.

Ground leads should be pulled from the machine to the work location.

- 15.3.2 Live parts – Do not touch live electrical parts, bare cords, or electrodes. Do not touch energized electrode while in contact with work circuit, and do not stand in water while electric welding. Never wrap live cables around any part of the body.

Insulate your body from the work piece and ground through use of a dry insulating mat, electrical protective gear (such as dry, EH rated workboots), or equivalent electrical protective devices/gear.

- 15.3.3 Unattended units – Remove electrodes from the holder and place in metal container (not on floor/ground). Shut off welding unit when leaving it unattended. Place or protect holder so it does not touch other people or conductive objects.

- 15.3.4 Cooling electrode holders – Do not dip hot electrode holders in water.

- 15.3.5 Power down unit – Shut off power supply if leaving work (unless very brief), machine is moved, or if a fault or defect is noted (remove from service). Disconnect power if unit is left unattended or out of service.

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15.4 MIG/TIG special precautions.

15.4.1 UV radiation – Exposure is much greater than that of shielded metal arc welding. For this reason, you must:

- Erect screens or filter lenses to protect others
- Cover all exposed skin
- Use hand shields to protect from flash & radiant energy when helmet is lifted
- Use helmets with no openings or reflective surfaces
- Wear filter lens goggles under welding helmets if 2+ welders exposed to each other's arc

15.4.2 Chlorinated solvents – The UV radiation from MIG/TIG welding can breakdown chlorinated solvents into highly toxic byproducts. Keep chlorinated solvents at least 200 ft. away or shield them from the arc. (When checking the SDS of your solvent, look for components that contain “chloro-” compounds.)

Surfaces that have been prepped with a chlorinated solvent must be allowed to thoroughly dry before MIG/TIG welding on them.

15.4.3 Stainless steel – MIG/TIG on stainless steel produces nitrogen dioxide (NO₂), which is a deadly poison by means of inhalation. For this reason, local ventilation is required to be set-up in a manner that removes all welding fumes before they can pass through the breathing zone.

15.5 Protecting others.

Shield your work from others who are not protected from the hazards of your work (welders' flash, UV rays, sparks, molten metal, etc.). Use noncombustible or flameproof screens whenever possible.

15.6 Ventilation.

Minimize exposure to fumes, smokes, and gases by means of general ventilation, local exhaust, or respiratory protection, as prescribed by the electrode or base/filler metal SDS.

Ventilation shall be required for hot work in confined spaces.

Special precautions must be taken for metals with toxic significance:

METALS OF TOXIC SIGNIFICANCE	EXTRA PRECAUTIONS
• Zinc bearing base/filler metals or coated metals • Lead base metals • Cadmium bearing filler materials • Chromium bearing metals or coated metals	<u>Enclosed spaces</u> – Provide either dilution ventilation or local exhaust. <u>Open air</u> – Filtering-type respirator for all exposed workers
• Lead bearing metals or coated metals • Cadmium bearing metals or coated metals • Mercury coated metals	<u>Enclosed spaces</u> – Provide either local exhaust ventilation or an air-line respirator. <u>Open air</u> – Filtering-type respirator for all exposed workers.
• Beryllium bearing base/filler metals	<u>Enclosed spaces</u> – Provide local exhaust AND an airline respirator.

15.7 Closed drums, tanks & vessels.

Do not weld or burn on a closed vessel or tank that has held any liquid or chemical, until the vessel has been cleaned and you have reviewed your task with a supervisor.

15.8 Hot work permitting.

All hot work must be conducted in a fire safe area, where all materials capable of burning are removed at least 35 ft. away from the point of hot work activity. If this is not feasible, then the area must be made fire-safe, a hot work permit must be issued, and a fire watch must be established before work is allowed to start.

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Hot work is defined as work involving torching, welding, burning, or a similar operation that is capable of initiating fires or explosions. Hot work includes, but may not be limited to:

<i>Welding</i>	<i>Torching</i>	<i>Flame soldering</i>	<i>Brazing</i>
<i>Grinding</i>	<i>Thawing pipe</i>	<i>Oxygen/arc cutting</i>	<i>Powder-driven fasteners</i>
<i>Hot riveting</i>	<i>Heat treating</i>	<i>Thermal spraying</i>	<i>Torch-applied roofing</i>

Use of abrasive wheel equipment that can emit sparks while being used.
Similar applications that use or produce a spark, flame or heat.

Hot work does not include electric soldering irons.

16. Vehicles & Motorized Equipment

16.1 Company vehicles & personal/other vehicles used for company business.

- 16.1.1 Representation – Keep in mind that when operating a company vehicle, you are representing your company. You are expected to be a safe, courteous, and responsible driver.
- 16.1.2 Safe operation – All drivers are expected to operate fleet vehicles in a safe manner at all times and comply with all applicable federal, state and local laws. Vehicles are to be operated based on existing conditions (light, precipitation, traffic volume, etc.) rather than solely on posted speed limit. Safe following distances are to be maintained (at least 1 second for every 10 ft. of vehicle length – 2 to 3 seconds in poor weather).
- 16.1.3 Driver's license – Driver must possess a valid motor vehicle driver's license with the appropriate classification (and endorsements for CDL drivers) needed for operating the vehicle(s) assigned to the operator.
- 16.1.4 Seatbelts (vehicle restraints) – All occupants (drivers & passengers) of the vehicle must properly use a seatbelt at all times while the vehicle is being operated.
- 16.1.5 Awareness – Before moving or backing, take a quick walk around your vehicle to see what objects or people are around or behind you. Also, never park any vehicle, company or personal, in an area where it could be exposed to damage, hamper building egress, block emergency responder access or block motorist view of a work area.
- 16.1.6 Impaired driving – No driver shall operate any fleet vehicle while impaired. Impaired driving may result from drugs, medication, alcohol, fatigue, medical condition, emotional state, etc. This provision includes circumstances where the use of legally prescribed or over the counter medication may cause drowsiness.
- 16.1.7 Distracted driving, cell phones & texting – No driver shall operate a company vehicle while distracted. Distracted driving may result from taking notes, eating/drinking, personal grooming, reading, use of technology (radios, smart phones, computers, GPS, etc.), passengers, etc. Pull over or wait until the vehicle is safely parked to attend to the matter.

16.2 Authorized operation.

All motorized equipment shall be operated only by employees who are competent, trained, and authorized to operate them. Operators are expected to fully integrate the safe operating practices as specified by the manufacturer of the equipment and that were discussed as a part of operator training. This shall include not operating equipment beyond its rated capacity or design limitations.

16.3 Pre-shift inspection.

Prior to use on each shift, vehicles and motorized equipment must undergo a safety inspection. These safety checks must focus on integrity of the equipment and operability of safety devices – including horns and back-up/bi-directional alarms, lights, windshields/wipers, seatbelts, equipment maintenance/fluid levels, and safe operation. The inspection shall also include verification that data plates and operator manuals are present and

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legible. If anything is found to be damaged, missing safety devices, or otherwise not properly working, immediately tag equipment out of service & report it to the site supervisor.

16.4 **Elevated components.**

To prevent serious injury from falling components, release of stored energy, or inadvertent start-up, equipment & vehicles must be locked and tagged out so that they are completely inoperable prior to clearing, cleaning, repair, service or maintenance work. This applies to all work where guards need to be removed/defeated or where body parts will be under, between, in or near recognized danger zones (pinch points, crush hazard zones, etc.).

16.4.1 A warning tag must be applied to all controls that are deactivated during the course of work. Tags must be placed to identify plainly the equipment being worked on.

16.4.2 Elevated booms, buckets, blades, dump beds, scissors, forks, attachments & components must be completely lowered or securely blocked before work can begin.

16.5 **Guards & warnings.**

All OEM safety guards, interlocks & devices must be in place and properly functioning before operating any equipment or vehicle. Guards may only be removed after the equipment or vehicle is effectively locked & tagged out for service, maintenance or repair. Also, all OEM warnings and control markings must be kept in place and maintained legible.

16.6 **Seatbelts.**

The operator must properly wear a seatbelt at all times while operating equipment that was manufactured with or is able to be retrofitted with a seatbelt (per OEM recommendations).

16.7 **Horns & motion alarms.**

All motorized equipment operated on the jobsite must have an operational horn and back-up alarm that is clearly audible above surrounding noise levels. Operator shall always be looking in direction of equipment travel and shall not rely solely on a horn or alarm to assure a clear travel path.

Work vehicles shall incorporate a back-up alarm if there is a blocked view to the rear.

16.8 **Spotters for backing vehicles & equipment.**

A spotter must be used anytime:

- Equipment (or loads handled from them) could come within 10 ft. of power lines (50kV or less)
- Tight or congested work space increases risk of others being struck by maneuvering equipment
- Equipment must be operated within proximity of non-construction vehicles or people
- A near miss occurs

The spotter must remain visible at all times to the operator. If contact is broken, the operator is to immediately stop until contact with spotter is reestablished and signal is given for all clear.

The spotter shall keep people away from the backing vehicle and shall be aware of proximity to power lines (no closer than 10 feet – up to 50kV). The spotter shall never ride on the vehicle/equipment and shall take care not to enter traveled lanes of traffic.

Never come in contact with a crane, equipment, or boom that is touching overhead power lines. Also, never jump off of a piece of equipment that is in contact with high power lines.

16.9 **Loads on vehicles.**

All materials, tools, or equipment loaded onto pick-ups, vans, trucks or trailers must be secured prior to transit. The vehicle driver is responsible to assure that all materials and equipment are safely loaded, secured and, if necessary, flagged in accordance with DOT requirements.

Loads may not stick out more than 2 ft. past the front bumper or more than 6 ft. past the rear bumper. Loads that stick-out 4 – 6 ft. past the rear bumper must be clearly flagged with hi-visibility material.

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16.10 Vehicles being loaded.

Due to the hazard of being struck or crushed by a falling or rolling object, do not approach any vehicles that are being loaded by heavy equipment.

If a vehicle that is being loaded/unloaded does not have a cab canopy guard, the cab occupants must exit the cab and remain clear during loading/unloading operations.

16.11 Parking & storage.

Shut down all mobile equipment and set brakes when left unattended. Fully lower all implements (buckets, blades, forks, dump beds, etc.). Chock wheels when parking wheeled mobile equipment on slopes or uneven ground.

Never park or store any vehicles, equipment or materials in such a manner that it could block a fire hydrant or egress from a building. Park in areas that will not expose the vehicle or equipment to damage.

16.12 Speed & pedestrian traffic on jobsites.

A maximum speed of 10 mph shall be observed on jobsites and in the immediate vicinity of people & work operations. Pedestrian traffic shall always be given the right-of-way.

16.13 Riders & hoisting personnel.

Only operators are permitted on equipment – no riders. In addition, at no time shall anyone ride in/on or be elevated by equipment booms, hoists, cranes, equipment buckets, forks, truck beds, tailgates, or any loads carried by vehicles or equipment.

16.14 Elevated parts.

Due to the hazard of being stuck or crushed by a dropped or falling object, necessary precautions are to be taken to prevent anyone from passing beneath, under, or in proximity of raised loads, booms, scissors, buckets, attachments and forks/carriages.

16.15 Swing radius.

As necessary to prevent struck-by and crush injuries, barricade access to the swing radius of any equipment that poses this hazard, such as aerial manlifts, forklifts, and excavating equipment. (Barricading of crane swing radius is mandatory.)

16.16 Battery charging.

Battery charging gives off hydrogen gas, which is explosive. No smoking, open flames, sparks or electric arcs within 50 ft. of batteries. Ensure area is ventilated. Keep tools & metallic objects away from the top of uncovered battery terminals. Make sure battery vent caps are not clogged. Always pour the acid into water, never the opposite. Acid will spatter and could cause severe skin burns.

17. Forklifts

In addition to the provisions of the Vehicles & Motorized Equipment section, the following additional provisions apply to forklift operation.

17.1 Authorization.

Only trained, certified, and company-authorized personnel may operate lift trucks. Operators are expected to understand the hazards associated with the use of these vehicles and follow safe operating procedures to ensure the safety of themselves, the public & others on the worksite.

Lift truck operators must possess a current and valid driver's license.

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17.2 Training & periodic skills re-evaluation.

- 17.2.1 Initial training – Forklift operators will receive the OSHA-required classroom-style training and operating skills evaluation on same make & model of lift that will be used on the job (or a lift with similar mechanical and control characteristics). Proof of training shall be documented & kept onsite.
- 17.2.2 Re-evaluation of operating skills – Required for all forklift operators every three (3) years.
- 17.2.3 Retraining & reevaluation – Required in the following circumstances:
- Unsafe vehicle operation
 - Does not demonstrate satisfactory knowledge or implementation of the requirements of this policy.
 - Accident or near-miss
 - Poor evaluation
 - Assigned to a different type of vehicle
 - Workplace conditions change

17.3 Inspections.

Prior to each shift in which a lift is used, the operator shall evaluate the work area for hazards, and conduct a visual and operational check of the lift. Any hazards that deem the lift use unsafe must be promptly corrected prior to start of work (with lift).

- 17.3.1 Operator's manual – The operator's manual must be readily available on the lift at all times. The manual is to be kept in a weather-tight compartment that ensures its continued legibility.
- 17.3.2 Data plates – The lift's data plate must be clearly displayed in the cab of the lift. Attachments must also have a data plate to identify weight, serial number and/or load capacity.
- 17.3.3 Warning labels & load charts (extendible boom lifts) – Must be readily accessible to the operator and clearly legible. If they are missing or are not legible, consult the Operator's Manual until replacements can be provided. Only loads within the vehicle's rated capacity for specific boom angle and extension (extendible boom lifts) shall be handled.
- 17.3.4 Attachments – All attachments must be approved by the lift manufacturer and indicate safe lifting capacity. Unless otherwise specified by the manufacturer, count the weight of the attachment against the lift's load capacity.
- 17.3.5 Work area – Evaluate...
- Driving surface hazards – edges, holes, bumps, obstructions, excavations, tools/cords, debris, etc.
 - Overhead hazards – power lines, beams, sprinklers & piping, electrical & lighting installations, HVAC & gas installations, garage doors, low clearance wall openings, etc.
 - Hazardous locations – flammable gases/vapors, traffic, pedestrians, other site workers, other site equipment or vehicles
 - Supporting surface – adequate to support loaded vehicle, inclines/slopes, manholes
 - Adverse weather – wind, wet/icy surfaces, lightning
 - Other hazards – work operations in the area and the dangers presented by them/you
- 17.3.6 Lift inspection – Refer to manufacturer's instructions for conducting pre-use checks of:
- Structural integrity (loose, broken, missing or damaged parts)
 - Tire & wheel condition, wheel bolt tightness
 - Data plate (& load charts for extendible boom lifts)
 - Operating & emergency controls
 - Safety devices (presence & proper function)
 - Functioning back-up alarm (spotter may also be used)
 - Hydraulic & fuel system leaks
 - Battery condition, electrolyte level & charge (wear PPE)

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- Cables & wiring harnesses
- Placards, warnings & control markings (including capacity posting)
- Operator's manual
- Other items specified by manufacturer for specific make/model

17.4 Out of service.

Any lift that is found to be damaged, have missing/malfunctioning safety devices, or otherwise not be in a condition to be used safely shall be immediately tagged out of service. Never attempt to operate a lift with a leak in the fuel system.

17.5 Parking lift.

17.5.1 Procedure.

- Park on level ground – If must park on slope, park perpendicular/across the slope and chock wheels
- Fully lower and retract the boom/mast
- Set controls to NEUTRAL
- Set the parking brake
- Shut off power to the vehicle* (wait until vehicle completely stops)
- Chock wheels if on an incline

* If you are within 25 ft. of your lift and it is in clear view, then you are not required to shut off power to the motor if you will continue to use the lift in a short period of time (about 5 minutes).

17.5.2 Places to avoid parking lift.

- Dangerous areas – slopes, near excavations, near electrical panels
- Trafficked areas – roads, intersections, walkways
- Exits or means of exit access
- Firefighting equipment – extinguishers, hydrants, sprinkler controls, hoses

17.5.3 Security – Park in a secure area and remove the key to prevent unauthorized operation.

17.6 Clearance to power lines.

17.6.1 Presume lines are live & uninsulated – Assume all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.

17.6.2 Clearance – A clearance of at least 10 ft. shall be maintained between energized electric lines (50 kV or less) and any part of the forklift or objects handled from it.

Additional clearance shall be required for power lines that are over 50kV (consult with power line owner).

17.6.3 Work required within required clearance – If maintaining this clearance is not feasible, notify the power line owner/operator so that the lines can be deenergized, relocated or covered with an insulated protective sheath.

17.7 Personal safety.

17.7.1 Seatbelts – Seatbelts must be properly worn at all times while the lift truck is being operated.

17.7.2 PPE – Wear PPE that is appropriate for the work area and work operations. When determining what PPE to use, the operator must consider what would be needed if he/she were working in the area without the lift truck. Consider need for safety glasses, hearing protection, work boots, hardhats, etc.

17.7.3 No passengers/riders – No one (other than operator in cab seat) is permitted to ride on a lift, its forks/attachment or any load it carries.

17.7.4 Cab & cab access – Mount/dismount the lift using a 3-point contact and the grab irons (not control levers). Never try to enter a moving lift. Keep the cab reasonably clean & free of dirt, debris, snow, ice, oil, & grease.

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- 17.7.5 Prohibited access on or beneath booms/forks – No one is permitted on or beneath the boom or forks/attachment of the lift, regardless of whether the lift is loaded or not.
- 17.7.6 Crush hazards – Know and do not allow persons or body parts in crush danger areas. These include areas around tires, blind spots, moving engine parts, and/or boom/mast sections.
- Also, do not drive lifts up to (toward) anyone standing in front of a fixed object. Approach the pedestrian in a direction parallel to the fixed object.
- 17.7.7 Pinch & amputation hazards – Keep arms & legs in the cab at all times. While the lift is running, stay clear of moving parts, openings in the mast and any other areas with pinch/catch points (mast, engine compartment, wheels, etc.).

17.8 Personnel platforms.

Never use forks/attachments or other makeshift devices (such as pallets) as a personnel working/riding platform. Absolutely no elevating personnel on a forklift unless:

- *The lift mfr. specifically approves use of the lift in this manner, and*
- *A platform, meeting lift manufacturer specifications (including provisions for fall protection), is used.*

17.9 Lift operation.

- 17.9.1 Distractions – The lift operator cannot be engaged in any activity or use any devices that distracts his/her full attention while operating the equipment.

- 17.9.2 Safe operation – The operator must know, have been trained on, and heed all warnings, limitations, and safe operating procedures as set forth by the forklift manufacturer.

The forklift must be kept under control at all times, and operated at a speed consistent with conditions. Sudden starts, stops, turns, or maneuvers shall be avoided. The lift shall be completely stopped before shifting the directional lever. Lift controls shall only be operated from the operator's seat in the cab.

Horseplay, stunt driving or operation that is contrary to common sense or safe operation will not be tolerated.

- 17.9.3 Vision – Always keep a clear view of your travel path and ensure that people, tools and equipment are clear of travel path prior to moving. If the load obstructs forward view, use a spotter or travel in reverse (with load trailing).

- 17.9.4 Boom/attachment elevation during travel – For extensible boom lifts, never raise the boom (loaded or unloaded) more than about 4 ft. above the ground unless the vehicle is stopped and level from side to side. Use the level indicator (bubble level) in the operator's cab to make your determination as to whether or not the vehicle frame is level. Keep forks tilted back during travel.

For straight mast lifts, keep the forks/attachment within 1 ft. of the driving surface while traveling. Be alert to surface encumbrances that may require raising or lowering the load. Keep forks tilted back during travel.

If at all possible, avoid driving on sideways slopes and unstable driving surfaces. If absolutely necessary to traverse this terrain, keep load as close to the ground as possible so that it can be quickly lowered to the ground if lift suddenly loses stability.

- 17.9.5 Safe following distance & passing – Maintain a safe following distance of approximately three (3) forklift lengths from any lift/vehicle/equipment ahead. Do not pass lifts/vehicles/equipment that is traveling in the same direction, at intersections, blind spots or other dangerous locations.

- 17.9.6 Supporting surface – Be sure that the surface on which the lift (including outriggers) will be used can handle the weight of the loaded unit. Do not drive over or allow the lift to rest upon any covers (utility boxes, manholes, hatchways, etc.). It is also the operator's responsibility to ensure that the drop point can support load weight safely.

- 17.9.7 Load stability – It is the lift operator's responsibility to assure that loads are stable and safely arranged. Use caution when handling off-center loads which cannot be centered.

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- 17.9.8 Load weight – Operator must know and not exceed the load capacity of the forklift, as determined by the data plate (straight mast lifts) or load charts (extendable boom lifts). Heavy, long or high loads which may affect capacity may need to be divided or alternatively arranged.
- 17.9.9 Turning & swing radius – Turning with a load extended or raised higher than what is permitted during travel is prohibited. Always check your swing radius for people and objects before turning. Use a spotter if necessary.
- 17.9.10 Grades – Ascend and descend all grades slowly and in the direction of the grade. For grades in excess of 10% (a rise/drop of 1 ft. for every 10 ft. horizontally), drive loaded forklifts with the load pointed uphill and keep the load slightly tilted back for added stability. If the lift is unloaded, drive with forks pointed downhill to improve braking ability.
- 17.9.11 Intersections/blind corners – Slow down/stop and sound horn at crossways and other locations where vision may be obstructed. Proceed slowly. Do not cut short any blind or abrupt corners.
- 17.9.12 Excavations – Maintain a safe distance from the edge of excavations. This distance shall be at least as far away from the excavation as it is deep. Be aware that the weight of your lift truck could cause inadequately supported excavations/trenches to cave-in.
- 17.9.13 Edges, ramps, platforms & docks – Maintain a safe distance (enough distance to safely stop lift) to the edge of ramps, docks, platforms or elevated surfaces.
- 17.9.14 Unstable driving surfaces – Avoid running over loose objects on the driving surface, as this affects traction and lift stability. Also, slow down & do not lift (above travel height) on muddy, wet, icy, oily or other slippery surfaces (especially if tires lack tread).
- 17.9.15 Wind & storms – The lift may not be operated when wind speeds (sustained or gusts) exceed manufacturer's limits. Also, the lift may not be operated in the event of lightning.
- 17.9.16 Lighting – Use auxiliary lights when operating in dimly lit areas. Use a strobe if within 15 ft. of a publicly traveled road.
- 17.9.17 Site & pedestrian traffic – Observe worksite speed limits & customary traffic regulations when operating a lift. Use the horn to alert pedestrians of your approach and always yield right of way to them. Also, yield to any emergency response vehicles.
- In situations where foot traffic, location, or cramped work space present a reasonable hazards of persons being struck by a maneuvering lift, the swing/operation radius of the lift shall be barricaded prior to operation, and access into this area shall be prohibited.
- 17.9.18 Hazardous locations – Identify any hazardous areas that could be present in your work area and institute appropriate controls. Hazardous areas and controls may include, but not be limited to:
- Public vehicular traffic – Equip lift with flashing strobe and set-up temporary traffic control devices (cones, barricades, signs, flaggers, etc.) as necessary to prevent collision with lift. All workers exposed to public vehicle traffic must wear a high visibility vest (retroreflective vest if work is conducted during hours of darkness).
 - Locations with flammable gases/vapors – Do not use the lift in these areas unless the hazard source is eliminated/controlled or unless the lift manufacturer approves lift for use in the specific hazardous location.
- 17.9.19 Dockboards & bridgeplates – Dockboards or bridgeplates must be properly secured before they are driven over. When driving over them, do so carefully and slowly. Make sure that your loaded lift will not exceed their capacity.

17.10 Repairs & modifications.

If the lift is a rental, report damage or malfunctions to the rental company ASAP so that they can arrange repairs.

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All lift repairs must be made by a qualified lift mechanic, using OEM or manufacturer-approved parts. Do not modify or replace any lift components without express permission of the lift manufacturer. Doing so may cause serious injury/death and render the data plate information inaccurate.

17.11 Preventative maintenance.

Ensure that a PM schedule has been instituted as recommended by the manufacturer (refer to Operator's Manual). This PM schedule must include provisions for frequent (3 months or 150 hours) & annual inspections by a lift mechanic qualified for the specific lift make & model.

17.12 Trucks & trailers.

17.12.1 Truck brakes – Prior to loading/unloading a truck or trailer, it is the lift operator's responsibility to make sure that the truck's/trailer's brakes are set and rear wheels chocked to prevent movement.

17.12.2 Trailer jacks – Used fixed jacks to support an uncoupled semi-trailer to prevent upending during loading or unloading.

17.12.3 Truck & trailer inspection – It is the lift operator's responsibility to examine the floor of trucks, trailers and/or railroad cars for breaks and weakness before they are loaded/unloaded. Forklifts are very heavy and can easily collapse through weakened floors.

17.12.4 Opening freight doors – Do not use the lift to open or close freight doors.

18. Boom & Scissors Lifts

18.1 Authorization.

Only competent, trained, and company-authorized personnel may operate scissors or aerial lifts. Operators are expected to understand the hazards associated with the use of these vehicles and follow safe operating procedures to ensure the safety of themselves, the public & others on the worksite.

18.2 Training & periodic skills re-evaluation.

18.2.1 Initial training – Boom & scissors lift operators will receive classroom-style training and operating skills evaluation on same make & model of lift that will be used on the job (or a lift with similar mechanical and control characteristics). Proof of training shall be documented & kept onsite.

18.2.2 Retraining & reevaluation – Required in the following circumstances:

- Unsafe vehicle operation
- Does not demonstrate satisfactory knowledge or implementation of the requirements of this policy.
- Accident or near-miss

18.3 Lift operators & operation.

18.3.1 Manuals – Operator's and maintenance manuals must be readily available on the lift at all times. The manuals are to be kept in a weather-tight compartment that ensures their continued legibility.

18.3.2 Safe operation – The operator must know, have been trained on, and heed all warnings, limitations, and safe operating procedures as set forth by the lift manufacturer. Horseplay, stunt driving or operation that is contrary to common sense or safe operation will not be tolerated.

18.3.3 Platform occupants – The operator is responsible for assuring that other workers on the lift platform follow safe work practices and are warned prior to the lift/platform being moved.

18.3.4 Load weight – Operator must know and not exceed the capacity of the lift. Load weight must account for personnel, tools, equipment and material that the lift is supporting.

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18.3.5 Distractions – The lift operator cannot be engaged in any activity or use any devices that distracts his/her full attention while operating the equipment.

18.4 Inspections.

Prior to each shift in which a lift is used, the operator shall evaluate the work area for hazards, and conduct a visual and operational check of the lift. Any hazards that deem the lift use unsafe must be promptly corrected prior to start of work (with lift).

18.4.1 Work area – Evaluate...

- Driving surface hazards – edges, holes, bumps, obstructions, excavations, tools/cords, debris, etc.
- Overhead hazards – power lines, beams, sprinklers & piping, electrical & lighting installations, HVAC & gas installations, garage doors, low clearance wall openings, etc.
- Hazardous locations – flammable gases/vapors, traffic, pedestrians, other site workers, other site equipment or vehicles
- Supporting surface – adequate to support loaded vehicle, inclines/slopes, manholes
- Adverse weather – wind, wet/icy surfaces, lightning
- Other hazards – work operations in the area and the dangers presented by them/you

18.4.2 Lift inspection – Refer to manufacturer's instructions for conducting pre-use checks of:

- Platform & chassis operating & emergency controls
- Safety devices, guardrails & gates (presence & proper function)
- Functioning back-up/movement alarms (spotter may also be used)
- Air, hydraulic & fuel system leaks
- Battery condition, electrolyte level & charge (wear PPE)
- Cables & wiring harnesses for condition & good connections
- Loose, missing or damaged parts/components
- Tire & wheel condition, wheel bolt tightness & wheel locking mechanisms
- Extendible platform section (if equipped) is locked into position
- Placards, warnings & control markings (including capacity posting)
- Operator's manual
- Outriggers/stabilizers (if equipped) for condition & proper function
- Other items specified by manufacturer for specific make/model

18.5 Out of service.

Any lift that is found to be damaged, have missing/malfunctioning safety devices, or otherwise not be in a condition to be used safely shall be immediately tagged out of service.

18.6 Clearance to power lines.

18.6.1 Presume lines are live & uninsulated – Assume all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.

18.6.2 Clearance – A clearance of at least 10 ft. shall be maintained between energized electric lines (50 kV or less) and any part of the lifts or objects handled from it.

Additional clearance shall be required for power lines that are over 50kV (consult with power line owner).

18.6.3 Work within required clearance – If keeping this clearance is not feasible, notify the power line owner so that the lines can be deenergized, relocated or covered with an insulated protective sheath.

18.7 Lift stability & loading.

18.7.1 Supporting surface – Be sure that the surface on which the lift will be used can handle the weight of the unit. Do not use lifts from trucks, trailers, scaffolds and similar surfaces unless the manufacturer expressly

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permits otherwise. Do not drive over or allow the lift to rest upon any covers (utility boxes, manholes, hatchways, etc.).

- 18.7.2 Surface grade – Supporting surface must be completely level before raising lift platform (unless specified otherwise by lift manufacturer). If the lift is equipped with an out-of-level alarm, do not rely solely on this safety device in case it is not properly functioning. When driving the lift on sloped surfaces, do not exceed maximum grade permitted by manufacturer – refer to “gradability” on data plate.
- 18.7.3 Outriggers – If lift is equipped with outriggers, or similar stabilization devices, use as manufacturer requires prior to elevating platform. Make sure outriggers rest on firm footing (solid surface or substantial cribbing).
- 18.7.4 Capacity & platform loading – Know and do not exceed manufacturer’s platform load limit. Be aware of reduced capacities for platforms with extendible sections. Where possible, distribute load evenly over platform surface.
- 18.7.5 Platform stability – Do not lean platform against adjacent structures to steady lift.
- 18.7.6 Brakes – Verify that brakes are set prior to beginning work from elevated platform.
- 18.7.7 Misuse as a crane or jack – Do not use lift as a crane or jack. Lift work tools & materials from within the platform unless the lift manufacturer allows otherwise. Stay within lift load limits.

18.8 Safe operating practices.

- 18.8.1 Safe footing – Keep both feet on the platform deck. Do not climb, stand or sit on platform rails and never use planks, buckets, ladders, scaffolds, etc. to increase your platform work height.
- 18.8.2 Direction of travel – For maximum visibility, drive with platform control box in direction of travel. For aerial lifts, drive with platform facing uphill.
- 18.8.3 Hazard avoidance – Take precautions necessary to avoid or control hazards identified during pre-shift inspections.
- 18.8.4 Housekeeping – Prevent needless trip/slip hazards by maintaining good housekeeping on the lift platform. Use toolbelts to keep smaller tools off of platform and keep materials and larger tools neatly placed away from your feet. Coil sections of hose or cords.
- 18.8.5 Entanglement – Take precautions necessary to prevent cords, hoses, ropes and other equipment from becoming entangled in the lift or from being snagged or pulled by other site vehicles/equipment.
- 18.8.6 Hazardous locations – Identify any hazardous areas that could be present in your work area and institute appropriate controls. Hazardous areas and controls may include, but not be limited to:
 - Other site vehicle/equipment traffic – Tape-off, block or barricade area as necessary to call attention to your work position. Use substantial barriers where other site equipment or vehicle traffic presents collision hazards.
 - Public vehicular traffic – Equip lift with flashing strobe and set-up temporary traffic control devices (cones, barricades, signs, flaggers, etc.) as necessary to prevent collision with lift. All workers exposed to public vehicle traffic must wear a high visibility vest (retroreflective vest if work is conducted during hours of darkness).
 - Locations with flammable gases/vapors – Do not use the lift in these areas unless the hazard source is eliminated/controlled or unless the lift manufacturer approves lift for use in the specific hazardous location.
- 18.8.7 Travel speeds – Operate the lift at a safe speed as determined by surface conditions & slope, work area congestion, platform height, visibility from platform and work area hazards.
- 18.8.8 Wind & storms – The lift may not be operated when wind speeds (sustained or gusts) exceed manufacturer’s limits. Also, the lift may not be operated in the event of lightning.

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- 18.8.9 Maneuvering the lift – Always check that people, tools and equipment are clear of lift prior to moving the lift or lowering platform.
- 18.8.10 Driving with platform elevated – Whenever possible, drive lift with platform in lowered position (lowered & retracted for boom lifts). When necessary to drive from an elevated position:
- Verify driving surface is safe (firm, dry & level)
 - Maintain a clear view of travel path
 - Maintain a safe distance to ground-based hazards
 - Maintain a safe distance to overhead hazards
- 18.8.11 Chassis lift controls – Use only in event of emergency or if permission is granted from platform occupant(s).
- 18.8.12 Platform access – Always access lift platform by means intended and permitted by the lift manufacturer. Use a 3-point contact and never climb up/down scissors or boom assembly. If using a lift to access an elevated surface, use the operator's manual to determine manufacturer requirements.
- 18.8.13 PPE – Wear PPE that is appropriate for the work area and work operations. Always wear a hardhat while working on or around a scissors lift.
- 18.8.14 Lockout/Tagout (LOTO) – Where the position of your lift or work platform falls within or in close proximity to a recognized danger zone (moving equipment or hazardous energy sources), LOTO the equipment or hazardous energy source prior to using the lift in the danger area. Use your own lock & tag for the LOTO and keep your lock key with you at all times.
- 18.8.15 Malfunctions – Immediately report lift malfunctions to supervisor/foreman. If the malfunction(s) compromise safety, cease operation of unit and prevent further use until proper repairs can be made.
- 18.8.16 Barricade swing radius – In situations where foot traffic, location, or cramped work space present a reasonable hazards of persons being struck by a maneuvering lift, the swing/operation radius of the lift shall be barricaded prior to operation, and access into this area shall be prohibited.
- 18.8.17 Secure the vehicle after use – Park lifts on a firm & level surface, and in a secure area. Lower (& retract) the platform, turn off power and remove the key to prevent unauthorized operation.

18.9 Fall protection.

The fall protection requirements specified below apply at all times and regardless of platform height.

- 18.9.1 Scissors lifts – Require a fully guarded platform (top rail & midrail). The platform's point of access must be fully guarded when occupied – be sure that the top rail AND the midrail gate or chain is in place.
- Harnesses and lanyards are not required on a scissors lift unless the site controlling contractor or host facility requires otherwise. If required, anchor your harness connector to a designated tie-off point either inside (preferred) or outside the lift. Do not anchor to guardrails, as they are not designed for this purpose.
- 18.9.2 Aerial (boom) lifts – All platform occupants must wear a harness and be tied-off (in restraint) to designated anchor points. Also, platform must be completely guarded. Each occupant must be tied-off at ALL TIMES – even when driving the lift with the boom lowered &/or retracted. Either a short (restraint) lanyard or a retractable (short enough to keep occupant in basket) shall be used as the connecting device – do not use a 6-ft. lanyard. Refer to specific lift manufacturer recommendations.

18.10 Falling object protection.

Use toeboards, screens, or barricades as appropriate to protect workers &/or the public below from the dangers of falling or dropped objects. Note that although most lifts come with toeboards around the base of the platform, the toeboard may not be adequate to stop an object that falls from overhead. Platform toeboards mainly serve to prevent objects from being accidentally kicked from the platform.

If barricades (or caution tape) are used below, be sure that they enclose an area sufficient to contain any dropped or falling objects. Keep this area clear of people at all times when work is taking place above.

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Even with falling object protection in place, never blindly throw or drop anything from a lift platform.

18.11 Repairs & modifications.

All repairs must be made by a qualified person, using OEM or manufacturer-approved parts (including batteries). Do not modify or replace any lift components without express permission of the lift manufacturer. If the lift is a rental, report damage or malfunctions to the rental company ASAP so that they can arrange repairs.

18.12 Preventative maintenance.

Ensure that a PM schedule has been instituted as recommended by the manufacturer (refer to Operator's Manual). This PM schedule must include provisions for frequent (3 months or 150 hours) & annual inspections by a lift mechanic qualified for the specific lift make & model.

19. Materials Handling, Storage & Removal

19.1 Manual materials handling.

19.1.1 Cut & crush injury prevention – Protect your hands and fingers from rough edges, sharp corners, and metal straps. Keep fingers and other body parts out of pinch points between the load and other objects. Use steel pry bars to shake loose steel members to prevent crushing injuries.

19.1.2 Back injury prevention – Take care of your back! Understand and avoid common causes of back injury.

- Stretch before lifting – Before each lift, make sure that your body is ready to handle the weight. Take a moment to limber-up first thing in the morning, after periods of static activity and in cold weather.
- Assure clear travel path – Plan your travel path and make sure that it is clear of slip, trip or fall hazards.
- Use proper lifting technique – First, make sure that the load is stable and will not shift or fall apart during your lift. When ready to lift, squat and secure the load close to your body, keeping your back straight and using your legs to make the lift. Avoid twisting your back while lifting and carrying objects. This will require you to avoid awkward or tight positions while handling loads.

When lifting and working as a team, everyone should lift together at a prearranged signal. When carrying long loads, carry on the same shoulder and walk out of step. Set the load down carefully, never drop or throw down the load.

- Know your limits – Know and respect your physical limitations. As you age or if you have suffered a previous back injury, you cannot lift the same weight that you used to. Whenever possible, use handles, dollies, carts, cranes, hoists, forklifts, or equipment to move heavy or awkward materials.

Know the weight of any object to be handled. Where manual lifting or materials handling is necessary, you are expected to seek help for heavy, large or awkward objects.

- Back belts/braces – There is no scientific evidence that suggests back belts/braces contribute to or prevent back injuries. If you choose to use one, keep in mind that these devices do not make you a superhero – use the same safe lifting techniques that you would without them. Also, loosen the belt when you are finished lifting, otherwise your back will begin to depend on the brace and your muscles may actually grow weaker.

19.2 Materials storage.

Take care to ensure that all materials are stored in a manner that does not present a hazard to others on the jobsite. Ensure that storage locations are capable of safely supporting the load and, where possible, are located in areas with minimal or no foot/vehicle traffic. See that stacked and vertically-oriented materials are stable, able to be unpackaged without collapse, and are limited to a reasonable height.

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Make sure the materials will not inadvertently blow away, shift, slide, or collapse from high winds. Secure sheeting and large surface area materials with banding, straps, or rope every evening. Chock all materials that are capable of rolling or sliding (pipe, drums, tanks, reels, trailers, wagons, etc.).

Where walls are not erected to a sufficient height to prevent falling objects, do not store any tools, equipment or materials within 10 ft. of the perimeter of the building or within 6 ft. of interior building openings (stairwells, elevator shafts, holes, etc.).

When working at heights, secure all tools and equipment from falling. Do not store materials or tools on girts, ducts, lighting fixtures, beam flanges, hung ceilings, or similar.

19.3 **Material/debris removal & barricades.**

Do not throw materials from elevated surfaces (roofs, upper floors, ladders, scaffolds, etc.) without verifying that the area below is clear. Designate (barricade) areas below where persons could accidentally walk into an active drop area. Be sure work above stops when debris pile removal is taking place.

Barricades must be 42 inches high, square, and level. Erect barricades before the work activity above is allowed to commence. Post the appropriate DANGER or WARNING signs to alert others of the nature of the hazard.

20. Slings, Rigging & Hoisting Activities

20.1 **Inspection.**

20.1.1 Inspection frequency – A competent person must inspect slings and associated rigging equipment:

- a) Initially – Prior to use, inspect all new, altered, modified or repaired slings/rigging.
- b) Pre-shift – Before each shift inspect the sling/rigging that will be used.
- c) Post incident – After any incident that may have damaged or otherwise compromised the rigging equipment or its ability to function properly. Examples may include:
 - Shock loading/jerking
 - Critical lifts (those exceeding 75% of the rigging's capacity)
 - Contact with power lines/electricity or reactive chemicals (acids or caustics)
 - Following use in an abusive environment
 - After repair or alteration

The purpose of the inspections is to identify rigging that is at/near the end of service life and remove it before it causes an accident.

20.1.2 Condition of rigging & removal from service – Make sure rigging gear is clean, and take more time when inspecting gear that is older or that is subject to particularly harsh or damaging conditions.

Rigging that is damaged, defective, improperly used or of questionable integrity shall be tagged & immediately removed from service.

20.1.3 Alloy steel chain slings – All alloy steel chain slings need to be recertified on an annual basis.

20.2 **Removal from service criteria.**

20.2.1 Alloy steel chains – Remove from service if:

- Chain is not grade 80 (G8) or grade 100 (G10)
- Missing ID tag.
- Excessive link wear at bearing points (refer to mfr. allowable limits)
- Link stretching, twisting, bending or deforming
- Link binding (links should move freely)

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- Chain elongation (refer to mfr. allowable limits)
- Pitted links
- Nicks, cracks, breaks or gouges (refer to mfr. allowable limits)
- Weld splatter
- Discoloration from excessive temperature; corrosion/chemical damage

20.2.2 Wire rope – Remove from service if:

- Excessive reduction in rope diameter:
- Kinked, crushed or birdcaged (forcible unwinding) rope segments
- Core pop or main strand displacement.
- Damage resulting in distortion of the rope structure.
- Discoloration (excessive temperature).
- Corrosion/chemical damage.
- Localized wear of $>1/3$ diameter of outside individual wires.
- Worn, damaged or displaced thimbles or collars.
- 10 randomly distributed broken wires in one rope lay or 5 broken wires in one strand of one rope lay
- Total # of broken wires exceeds 10% of the total # of wires over a length equal to eight diameters.
- Protruding ends of wire rope strands are not covered or blunted.

Wire Rope Diameter	Allowable Wear
Up to 5/16"	1/64"
3/8" – 1/2"	1/32"
9/16" – 3/4"	3/64"
7/8" – 1 1/8"	1/16"
1 1/4" – 1 1/2"	3/32"

20.2.3 Synthetic web – Remove from service if:

- Missing ID tag.
- Holes, tears, cuts or snags that could affect sling strength (refer to mfr. allowable limits)
- Broken or worn stitching in load-bearing splices.
- Elongation exceeding manufacturer's limits.
- Selvage edges separated from webbing.
- Abnormal wear – variation in width or thickness of sling body.
- Internal powdery dust build-up (sign of excessive wear).
- Excessive wear (fibers separate upon scratching with fingernail).
- Knots in any part of sling.
- Heat damage – melting or charring.
- Hard or brittle sections (UV deterioration from UV ray exposure).
- Chemical damage from exposure to caustics or acids.
- Other damage that could affect sling strength.

20.2.4 Hooks – Remove from service if:

- Safe working capacity is unknown.
- Cracks, bends or visible distortion.
- Excessive nicks or gouges.
- Excessive wear ($>10\%$ orig. dimension).
- Excessive hook throat opening (15% or more than original)
- Twisted hooks (10° or more than original)
- Hook safety latch missing or damaged (does not apply to grab hooks).

20.2.5 Wire rope clips – Remove from service if:

- Clips are improper size.
- Improper number and spacing of clips.
- Improper clip installation. (Clip saddle goes over live end of rope – U bolt goes over short cable end)
- Clips not torqued adequately.
- Cracks, corrosion or distortion.
- Excessive wear.

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20.2.6 Shackles & other rigging hardware – Remove from service if:

- Safe working capacity is unknown.
- Excessive twisting, bending, nicks, cracks, breaks, pitting or gouges.
- Excessive wear at bearing points.
- Corrosion/chemical damage.
- Discoloration from excessive temperature.
- Shackle pin does not move freely without binding.
- Shackle pin does not completely seat.
- Shackle pin shows signs of damage or of being deformed.
- Shackle pin is replaced with a bolt or other unapproved component.
- Rings are stretched, twisted, bent or elongated.

20.3 Safe rigging practices.

20.3.1 Supervision – All rigging should be supervised by a qualified rigger.

20.3.2 Proper use – All rigging must be used in a manner, for applications, and within limits intended by its manufacturer. Do not modify, substitute or shorten rigging by means of knots, twisting, bolts or other unapproved measures. Never use makeshift or unapproved rigging to lift loads.

Chain hoists are designed so that one person can operate the hand chain to lift the maximum load for the chain hoist. When using these devices, never wrap the load chain around the load to be lifted – use slings.

Come-alongs shall be of substantial construction and designed for industrial use. Handles made of stamped, thin-gauge metal are not acceptable.

20.3.3 Safety latches – Required for all crane and sling hooks, but not for grab hooks or other specialty hooks so designed by the hook manufacturer.

20.3.4 Load weight, capacities & loading – Always verify the weight of a load before attempting to lift. Also, make sure that crane, hoe, or lifting device is capable of safely hoisting the load from pick point to drop point.

Do not overload rigging or hoisting equipment. The WLL for rigging equipment shall never be exceeded.

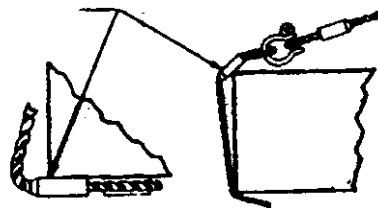
Rigging capacities (WLL – working load limit) must be plainly marked. Do not use any rigging for which you do not know the WLL. Know the weight of the load to be lifted and the effects of hitch type and sling angles on rigging capacity. Refer to rigging equipment manufacturer for WLL reductions due to angles.

20.3.5 Repairs – Any rigging repairs must be permitted by and in accordance with the rigging manufacturer's recommendations. All rigging repairs shall be done by a qualified person.

20.3.6 Cut, pinch, crush & falling object hazards – To minimize chance of hand/finger injury, wear protective leather gloves when handling wire rope slings.

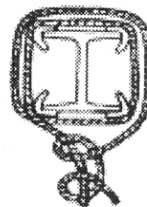
Keep all body parts away from slings & rigging when slack is being taken up and when object is being hoisted. Keep all people and body parts from beneath a hoisted load. Never hoist or suspend a load over anyone. When guiding an object into place, position yourself at the end, not along the side of the object.

20.3.7 Sharp edges & small radius bends – Pad abrupt edges or tight bends, otherwise significant capacity may be lost. Never allow bending near any splice or attachment fitting.

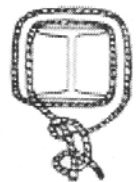


NO

NO



YES - padded



NO – steel can cut sling

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20.3.8 Overhead hazards – Verify that lifting path is clear of power lines, obstructions and personnel.

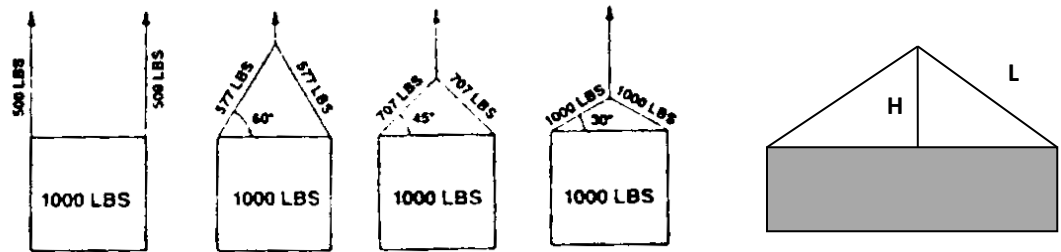
You must maintain a minimum 10 ft. clearance to all power lines 50,000 volts (50 kV) or less. Additional clearance is required for lines over 50kV. If not possible to maintain this clearance, contact the utility owner to have the lines protected, removed or deenergized.

20.3.9 Sling length & angles.

- Basket & vertical hitches – Select a sling length that maximizes the sling angle (the closer to 90° the better). Do not use the sling if it makes an angle less than 30°.
- Choker hitches – Select a sling length that does not permit the choke to bear on sling eyes or eye splices. Keep choke angle at least 120°.

20.3.10 Vertical hitches.

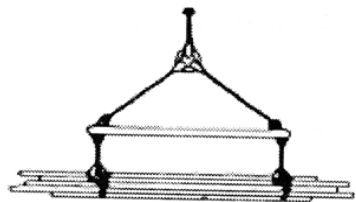
- Number of legs – Do not divide the load among more than 2 legs, even if the sling has 3, 4 or more legs. Throughout a lift, it is difficult to maintain equal loading among 3 or more legs and thus, the load is often primarily carried by 2 legs at any one time.
- Sling leg tension – Tension on each leg of a sling increases as the angle between the legs is increased. Try to keep sling angle with horizontal at least 60 deg. and never less than 30 deg. You can ensure a 60 deg. angle by laying each sling leg flat on top of load. If eye of one sling at least reaches load attachment point of adjacent sling, then you have an angle of at least 60 deg.



A field method to determine sling leg tension for symmetrically loaded slings is to use the following formula:

$$\text{SLING LOAD (tension)} = \text{vertical leg load weight} \times \text{load angle factor } (L \div H)$$

- Long loads – Use double slings when hoisting 2 or more pieces of material over 12 feet long.



YES

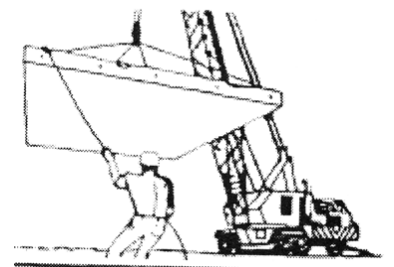


NO

20.3.11 Tag lines – Do not hold onto material. Use tag lines (non-conductive & dry whenever possible) to prevent load swing & rotation, as this can unwind hoisting cable and reduce capacity. Never wrap a tag line around hands or body.

20.3.12 Rigging and preparation to hoist load.

- Prepare material – Eliminate jagged/sharp edges & protruding nails/wires. Set on pallet/dunnage for ease of handling.



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- Assure load stability, balance & control – use multiple wraps for baskets/chokers if load could slide.
- Remove all loose materials (bolts, tools, lifting gear...) from the load before it is moved.
- Always keep the load centered directly below the boom tip and load blocks.
- Do not twist or kink sling legs.
- Do not reeve through load connections – use separate vertical hitches.
- Place hooks with opening facing outward.
- Never use plate grips, tongs, pipe clamps, etc., as substitutes for beam clamps.
- Only two eyes per hook. Use a shackle to hold more than two eyes.
- Pull choker hitches hand tight prior to hoisting, but do not beat down the choke.
- Rest sling/rigging in hook bowl – do not load hook tip.
- Secure all unused sling legs.
- Be sure load is not secured to ground or other surface prior to lift.
- Ensure that hoisting route is clear – watch for power line & snag hazards.
- Only one signaler to equipment operator.
- Keep hands and other body extremities away from and out of pinch points.
- Suspend hoisting operations when poor weather present hazards to personnel, property, or public.



NO



YES – No cutting action on running lines

NO – Cutting action of eye splice on running line

NO – Shackle pin bolt can rotate loose.

20.3.13 During lift.

- No one permitted to ride on the load, sling, or hoisting device.
- Never allow anyone to pass under a suspended load.
- Lift slowly and uniformly – do not allow load to drag across ground.
- Do not shock load rigging – use slow, controlled maneuvers.
- Lift only as much as needed to accomplish task.
- Do not leave load suspended.
- Do not drop loads on slings.
- Never unhook a load until it is safely landed and properly blocked or secured.
- Do not pull slings that are pinched beneath a load. Set load on blocks.
- Remove rigging from immediate work area when not used (prevent damage/trip).

20.3.14 Rigging from structural members – Get approval from your supervisor before rigging from any structural member to ensure that it will support the load being raised/suspended.

20.3.15 Storage & care – When rigging equipment is not in use, it should be removed from the immediate work area so as not to present a hazard to workers. Do not drag rigging on the ground or over an abrasive surface. Before storing, clean rigging and inspect for damage. Store the rigging in an area where it will not be damaged. Hang slings in a dry, ventilated, shaded area to avoid direct sunlight, moisture, harsh chemicals & tangling/kinking.

21. Crane Safety

21.1 Power lines.

- 21.1.1 Warning signs – There must be at least one electrocution hazard warning conspicuously posted in the crane cab (in view of operator), and at least two on the outside of the crane (except for tower cranes).
- 21.1.2 Presume lines are live & uninsulated – Assume all power lines are energized unless the utility owner/operator confirms that the power line has been and continues to be deenergized and visibly grounded at the worksite.
- 21.1.3 Pre-work assessment (power lines) – Prior to the start of crane work, the crane's work zone shall be identified to determine whether or not an exposure to power line dangers exists.

If there are no power lines within 20 ft. of a work zone that encompasses the area 360° around the crane and out to the crane's maximum working radius (based on load charts), then no further power line precautions are required. (Site-specific or state requirements may vary.)

- Power lines 50kV & less – Where line voltage is verified (by contact with power line owner/operator) to be 50kV or less, then the 20 ft. clearance may be reduced to 10 ft.
 - Power lines over 350kV – Clearance requirements shall be determined by power line owner/operator.
- 21.1.4 Power lines within required clearance to work zone – If power lines exist within clearance requirements stated above, then one of the following precautions must be taken:
- Deenergize & ground – Coordinate with the power line owner/operator to have the lines deenergized and visibly grounded.
 - Erect visible boundary – Use warning signs/flags to mark a boundary (limit) of crane operation that is no closer than the required clearance (see above) from the power lines. The entire boundary must be clearly visible to the crane operator and he/she must prevent all parts of the crane, load line, rigging, and load from going beyond the boundary.

As an alternative, a range limiting device or range control warning device on the crane may be substituted for the warning signs/flags as long as the required clearance can be maintained.
 - Boundary not completely visible – When all or parts of the warning boundary are not clearly visible to the crane operator, and incursion into the clearance zone could occur, then the following encroachment precautions shall be instituted:
 - (i) A planning meeting must be conducted between the crane operator and other workers that will be in the area of the crane/load. Purpose of the meeting shall be to review location of power lines & steps that are being taken to prevent encroachment within required power line clearance.
 - (ii) Tag lines (if used) must be nonconductive.
 - (iii) An elevated warning line, barricade, or line of signs (equipped with flags or similar hi-viz markings) must be set-up at the required clearance from the power lines.
 - (iv) If operator is unable to see elevated warning line, must use dedicated spotter and one of the following:
 - Proximity alarm set to warn/prevent encroachment
 - Device that warns operator when to stop movement (ex: range control warning device)
 - Device that automatically limits range of movement
 - Insulating link

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21.1.5 Work required within required clearance – In situations where work will require incursion into the required clearances, then the power line owner/operator shall be contacted to have the lines deenergized and visibly grounded.

21.2 Crane operator qualifications.

Must be qualified and hold current certification to operate the type/class of crane that is in use on the jobsite. The certification must either be through an accredited testing organization (such as NCCCO or NACB), or an audited employer program as specified by OSHA. This requirement shall not apply to equipment with a maximum manufacturer-rated capacity of 2,000# or less.

21.3 Crane signal persons.

21.3.1 When crane signal person is needed – Qualified crane signal persons must be utilized if:

- Anytime or location that load travel/placement is not in full view of operator;
- The view in direction of crane travel is obstructed;
- Crane operator or load handler feel that site-specific conditions necessitate the use of a signal person

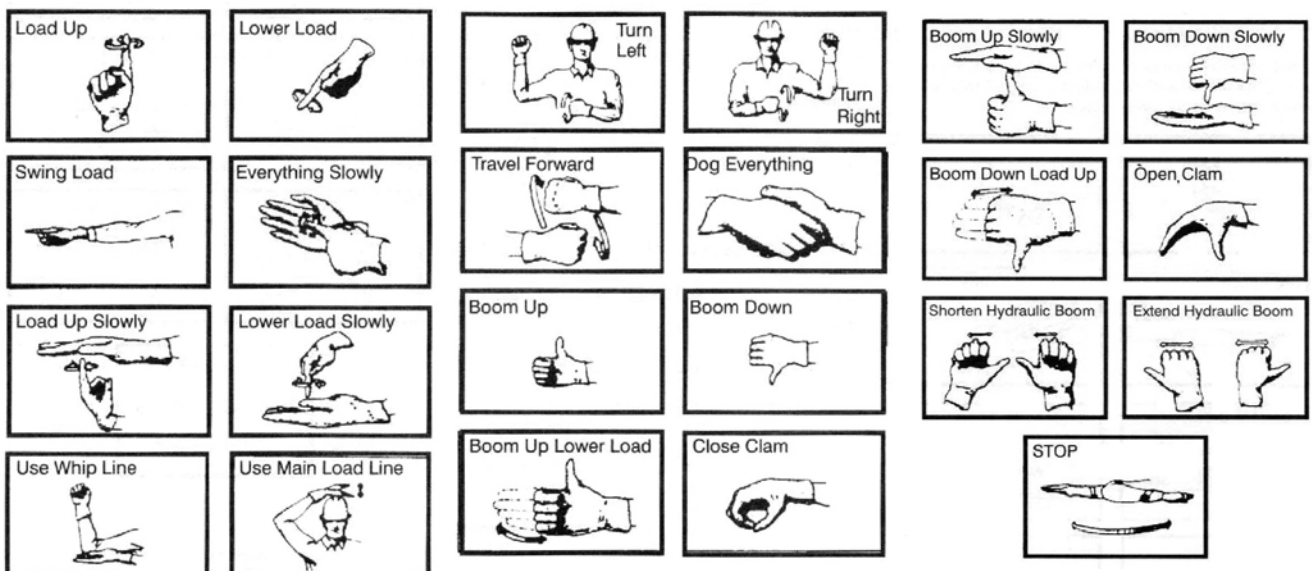
21.3.2 Crane signal person qualification – All crane signal persons must be qualified in accordance with OSHA requirements for crane signal persons. Documentation of employer qualification (such as wallet card) must be kept on the jobsite at all times during signaling operations. Crane signal persons must:

- Know & understand type of signals used & OSHA crane signaling requirements
- Be competent in application of signal(s)
- Basic understanding of crane operation, limitations & hoisting dynamics
- Pass written/oral test & practical test

21.4 Crane signaling operations.

21.4.1 Poster – A poster that depicts standard method crane hand signals shall be conspicuously posted on the crane, or in the hoist area.

21.4.2 Signaling method – Prior to the start of each day's lifting work, the method used to signal a crane (hand signals, verbal/radio) shall be determined based upon site-specific conditions such as weather, visibility, noise, language barriers, etc. If conditions change such that the chosen method of signaling is no longer viable or safe, then lifting work shall cease and a new signal method shall be implemented.



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- 21.4.3 Hand signaling – Only standard method hand signals shall be used, unless alternative signals have been discussed and agreed upon before the lift. This pre-lift meeting shall take place between the signal person, crane operator, and lift director.

Every employee on site should know the Emergency Stop hand signal, and use it as any condition may warrant.

- 21.4.4 Voice/radio signaling – A pre-lift meeting shall be held to review voice signals and signaling procedure, as well as to coordinate the lift operation. Also, radio devices (if used) shall be tested at this time. Radio devices shall make use of a dedicated channel.

- 21.4.5 Signals to operator – Only one designated signal person shall give signals/directions to the crane operator. These signals (especially verbal directions such as “left” or “right”) shall always be given from the perspective of the crane operator.

- 21.4.6 Immediate stop – The crane operator shall immediately stop crane operations if communication with the signal person is lost at any time. Work shall not resume until effective communication has been reestablished.

21.5 Ground prep & subterranean hazards.

- 21.5.1 Ground preparations – The crane operator shall ensure that ground conditions are firm, drained, level, and meet the set-up specifications as called for by the crane manufacturer. Blocking or cribbing may be used to provide an adequate set-up foundation as long as permitted by the crane manufacturer and in accordance with their specifications. Where site improvements are needed, this work shall be coordinated by the general contractor. When needed, outriggers must be fully extended and supported.

- 21.5.2 Subterranean hazards – Prior to crane set-up, any information regarding below ground installations or hazards shall be communicated (in writing) to the crane operator. This shall include existence or presumed existence of buried utilities, voids, tanks, vaults, pipes, etc.

21.6 Crane assembly/disassembly.

All crane assembly and disassembly operations shall be overseen by an onsite Assembly/Disassembly (A/D) Director, who functions as both a qualified and competent person for this work. This person shall ensure that:

- A pre-task assessment is made to identify and address site-specific hazards that may pose a danger to the A/D operations.
- Proper power lines clearance & A/D encroachment precautions are maintained, as required by OSHA’s construction crane regulation in 29 CFR 1926 Subpart CC.
- The A/D procedures and prohibitions established by the crane manufacturer for that specific make/model of crane are followed.
- The A/D crew is given site- and activity-specific instructions to ensure that they understand their tasks, the hazards associated with their tasks on this job, and hazardous positions/locations they need to avoid.

21.7 Inspections.

Unless specified otherwise by the crane manufacturer, crane inspections shall be conducted for the following reasons with the corresponding frequency:

Reason for Inspection	By Whom - When
Pre-shift	Competent person – prior to use
Monthly	Competent person – monthly
Annual	Qualified person – annually
Modified equipment	Qualified person – prior to use
Repaired/adjusted equipment	Qualified person – prior to use

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Post-assembly	Qualified person – following assembly, prior to use
Severe service	Qualified person
Out of service 3 mo. or more	Qualified person – conduct a “monthly” insp. prior to placing back into service
Mfr. specifications	Refer to crane manufacturer requirements

21.7.1 Documentation – Documentation for the following inspection types shall be maintained onsite:

- Pre-shift
- Monthly inspections
- Annual inspection
- Out of service 3 mo. or more

21.7.2 Out of service – A crane shall be placed out of service if an inspection deficiency is deemed to constitute a safety hazard. If a crane safety device fails during inspection or operation, work shall cease until the device is repaired.

21.7.3 Modifications – Any modifications or additions that may affect the capacity or safe operation of the crane are not permitted without written approval from the crane manufacturer or approval from a registered professional engineer.

21.8 Crane operators & operation.

21.8.1 Responsibility & authority – The crane operator is responsible for the safe set-up and operation of the crane in accordance with crane manufacturer procedures. The operator has authority to stop or refuse to handle any load if there is a safety concern, until a qualified person can determine that safety is assured.

21.8.2 Procedures & manuals – Procedures (operator manual, load charts, warning stickers, etc.) must be readily available and legible in the cab at all times. The operator must know, have been trained on, and heed all warnings, limitations, and safe operating procedures as set forth by the crane manufacturer.

21.8.3 Load weight – Operator must verify load weight by a recognized source, such as data plate, calculations, scale, shipping documents, etc. The use of a crane device, such as a load weighing device, load moment indicator (LMI), rated capacity indicator or rated capacity limiter, may be used as long as the load weight does not exceed 75% of the crane’s capacity for the pick. If it does exceed this amount, then a recognized source must be used.

21.8.4 Stop – The crane operator must obey a STOP or EMERGENCY STOP signal, regardless of who gives it.

21.8.5 Weather – The crane operator must account for the effects of wind, ice & snow on the crane’s stability and capacity, and determine if it is necessary to secure the crane upon approach of inclement weather.

21.8.6 Distractions – The crane operator cannot be engaged in any activity that distracts his/her attention while operating the equipment.

21.8.7 Leaving controls – The crane operator may not leave controls with load suspended, except where:

- Operator is directly adjacent to the crane & has no other duties
- Load suspended longer than for normal lifting
- Competent person determines that it is safe to do, and measures taken to restrain crane function
- Barricades/lines & warnings erected to prevent access to crane & lift area

21.8.8 Vertical load line – Always lift with a vertical hoist line to minimize load swing and undue boom stress.

21.8.9 No riders – Under no circumstances are riders permitted on the load, the hook, headache ball, or in the crane cab. The only personnel who may access the top of a crane are maintenance personnel.

21.8.10 End of shift – The operator shall secure access to the crane at the end of the work day/shift.

21.9 Work area precautions.

21.9.1 Tag lines – Shall be used as necessary to prevent load swing and/or rotation.

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- 21.9.2 Load/hoist travel path – No load shall be lifted/swung over anyone unless precautions to prevent injury from an inadvertent following load have been implemented. Persons necessary for rigging and load placement are permitted into this zone as long as load is rigged by a qualified rigger.
- 21.9.3 Restricted access – No persons (other than essential for rigging & placement of load) shall be permitted beneath a load to be lifted, or beneath an elevated boom. Where necessary, precautions shall be taken to restrict access to these areas (ex: caution tape, barricades, fencing, etc.).
- 21.9.4 Barricade swing radius – The swing radius of the crane shall be barricaded prior to operation, and access into this area shall be prohibited. If entry into this hazard area is necessary, the crane operator shall be notified before entry and shall not swing until given the ALL CLEAR signal by person(s) that were in the area.

21.10 Training.

All persons associated with crane operations shall have been trained in accordance with the requirements of OSHA's construction crane standard, 29 CFR 1926 Subpart CC.

22. Steel Erection

22.1 Written notifications.

Prior to the start of steel erection activities, the controlling contractor must provide written notification that the concrete/mortar has attained 75% intended minimum compressive design strength or sufficient strength to support steel load.

Also, written notification must be given of any repair, replacement or modification to anchor bolts.

Steel erection work may not begin or progress without these notifications.

22.2 Safe layout area.

Coordinate safe site layout with the site controlling contractor. The controlling contractor is responsible to ensure that the following is provided and maintained:

- Safe access roads for cranes, delivery trucks & necessary equipment
- Firm, graded, drained & readily accessible storage areas for materials & equipment
- Means & methods for safe movement of pedestrians & vehicles
- Adequate room for safe access to materials & operation of equipment

22.3 Falling object protection.

Work below steel erection is prohibited unless adequate falling object protection is provided. Adequacy of falling object protection will be dependent on site-specific factors such as nature of falling object exposures, object weights, fall distances, etc.

When materials must be dropped to the ground, take care to ensure the landing area is clear of workers. Whenever possible, use the forklift to lower debris. Never throw roof panels down from a roof. Use ropes or the crane.

Keep connection bolts and tools in pouches or containers that will prevent them from falling while making connections. When drift pins are being knocked out, take care to prevent them from falling to the ground.

22.4 Work under suspended loads.

Anytime steel erectors must work under a suspended load (those involved with rigging or connection of steel), materials must be rigged by a qualified rigger in a manner that prevents unintentional displacement. Hook safety latches (or equivalent protection) must be used.

22.5 Multiple lift rigging (Christmas treeing).

Multiple lift rigging (Christmas treeing) may be performed only under the following conditions:

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- A multiple lift rigging assembly must be used.
- Max. five (5) members permitted to be hoisted per lift
- Only beams & similar structural members lifted
- Employees engaged in this practice have been trained in OSHA reg's & rigging mfr. instructions
- Crane manufacturer permits the crane to be used for multiple lifts
- Rigging capacities for entire assembly and for each attachment point – min. 5:1 safety factor
- All loads within capacity for crane, individual rigging points, and entire rigging assembly
- Members rigged from top-down, at center of gravity (reasonably level), min. 7 ft. separation
- Members set from bottom-up
- Controlled load lowering required when load is over connectors

22.6 Plumbing-up, guying & bracing.

If needed to maintain structural stability, this equipment must be properly installed (under supervision by competent person) before construction loads are placed, such as joists, decking, bridging, etc. Plumbing-up equipment may only be removed under approval of competent person.

22.7 Beams & columns

22.7.1 Column anchorage – All columns must be anchored by at least four (4) anchor bolts.

22.7.2 Final placing of solid web structural members – Min. two (2) bolts per connection must be drawn wrench tight before load may be released from rigging. Do not apply additional loads until all connections have been safely bolted solid.

For solid web structural members used as diagonal bracing, a min. of one (1) bolt drawn wrench tight is required. For cantilevered members, the competent person shall determine if more bolts are needed to assure stability of cantilevered members.

22.7.3 Double connections – Must use one of the following options when connecting two structural members (that share common connection holes) on opposite sides of a column web, or a beam web over a column:

- At least one (1) bolt, connected to 1st member, must remain wrench tight while 2nd member connected.
- A shop- or field-attached seat may be used to secure the 1st member while the 2nd member is attached. The seat must be designed to support the load during the double connection and must be securely bolted or welded to both the support member & 1st member before the double connection is made.

22.7.4 Connector coordination – When connectors (a qualified assembler specializing in bolting up primary steel) are working together, only one person shall give signals. That person should make sure that his/her partner or others working on the job are in the clear.

When connectors are working in pairs, one end of the piece should be bolted before going out to connect the other end and then only one connector should go out to bolt the other end.

22.8 Attachment of joists/girders.

Each joist must be attached to the support structure, at least on one end (both sides of seat), immediately upon placement in the final erection position and before rigging is removed or additional joists are placed.

22.8.1 Joists 40 ft. or more – Unless pre-assembled into panels, connections of individual steel joists to steel structures in bays of 40 ft. or more must be field bolted during erection. During this period, joists/girders are not acceptable as a PFAS anchorage, unless written approval is obtained from a qualified person.

22.8.2 Joists 60 ft. or more – For joists over 60 ft., both ends must be attached before hoisting cables may be released or additional joists placed.

22.8.3 Panels – Panels that are pre-assembled with bridging must be attached at each corner before hoisting cables are released.

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22.9 Erection bridging.

Where bolted diagonal erection bridging is required, it shall be indicated on the erection drawing and the erection drawing shall be the exclusive indicator of proper bridging placement.

22.9.1 Common connections – When two pieces of bridging are attached by a common bolt, the nut used to secure the first piece may not be removed to secure the second.

22.9.2 Erection bridging for joists that equal/exceed OSHA's Table A/B spans (up to 60 ft.)

- Install row of bolted diagonal erection bridging near midspan of joist.
- Do not release hoisting cables until all bolted diagonal erection bridging is installed & anchored.
- Max. 1 worker on spans until all other bridging is installed & anchored.

22.9.3 Erection bridging for joists that are over 60 ft. through 100 ft.

- All rows of bridging must be bolted diagonal bridging.
- Install two rows of bolted diagonal erection bridging near the 1/3 points of joist.
- Do not release hoisting cables until all bolted diagonal erection bridging is installed & anchored.
- Max. 2 workers on spans until all other bridging is installed & anchored.

22.9.4 Erection bridging for joists that are over 100 ft. through 144 ft.

- All rows of bridging must be bolted diagonal bridging.
- Do not release hoisting cables until all bridging is installed & anchored.
- Max. 2 workers on spans until all bridging is installed & anchored.

22.9.5 Erection bridging for joists that are over 144 ft.

- Use same method as for beams & columns. (Min. two (2) bolts per connection drawn wrench tight before load released from rigging. For diagonal bracing, a min. of one (1) bolt drawn wrench tight is required.)

22.9.6 Bottom chord bearing joists with span over 60 ft. through 144 ft. or that exceed Table A/B.

- Install a row of bolted diagonal bridging near the supports.
- Install & anchor this bridging before releasing hoisting cable.

22.10 Metal decking.

22.10.1 Hoisting & placing decking – Before loading structure, all joist bridging must be installed & anchored, and all joist bearing ends must be attached. Load bundles so they can be supported in a manner that enables removal of banding without dislodging of decking. Never hoist decking by packaging/straps (unless so designed).

22.10.2 Roof/floor holes & openings – Must be decked over until ready to be filled. If not possible, provide fall protection (guardrails, PFA system, safety nets, or fall restraint). This includes skylight panels, roof curb openings, and other roof openings (greater than two inches in least dimension).

22.10.3 Decking gaps around columns – Use wire mesh, plywood, or equivalent to prevent falls and falling objects around columns where planks or metal decking do not fit tightly. The materials used must be strong enough to prevent personnel and/or objects from falling through.

22.10.4 Installation – Decking must be laid tight and placed to ensure full support by structural members. Decking must be immediately secured, unless in a controlled decking zone (max. 3,000sf unsecured decking).

22.10.5 Roof sheeting/decking – Start roof decking from a scissors/boom lift, approved forklift basket or scaffold. Work at eaves using one of the same methods. If possible, install ridge cover as roofing progresses.

When possible, the direction of sheeting should be with, not against, prevailing winds.

Throw a sheet onto the insulation ahead before stapling tabs. This will help hold the insulation in place and provide a landing surface if anyone should fall forward while stapling.

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If only one side can be sheeted at a time, secure the top of each top panel to prevent it from kinking and folding between the purlins.

22.11 Systems engineered metal buildings.

22.11.1 Structural column anchoring – Min. four (4) anchor bolts required.

22.11.2 Maintaining structural integrity.

- Hoisting equipment release – Rigid frames must first have at least ½ of their bolts (or # of bolts specified by mfr., if greater) installed & tightened on both sides of the web adjacent to each flange before hoisting equipment may be released.
- Loading of structure – Construction loads not permitted on any structural framework unless the framework is safely bolted, welded or otherwise adequately secured. When that is the case, the load must be placed in a zone within 8 ft. of centerline of primary support member.
- Joists – Both ends of all steel or cold-formed joists must be fully bolted/welded before releasing hoisting cables, allowing any worker on the joist, or allowing any construction loads on joist.

22.11.3 Girt & eave strut-to-frame common connections – At least one bolt with wrench-tight nut must remain connected to first member while second member is installed, unless a seat or similar connection device is used to secure the first member in place while the second is attached.

22.11.4 Purlins & girts – Purlins & girts are not acceptable as a PFAS anchorage unless written approval is obtained from a qualified person. Purlins may only be used as a walking/working surface when installing safety systems, and then only after all permanent bridging has been installed and fall protection is provided. Load roof sheets to keep purlin traffic to a minimum.

When handling girts and purlins, take extra care to not roll them onto your partner's wrists. This is a common injury usually requiring several stitches. Coordinate your actions to avoid unexpected movements.

22.11.5 Stability – When erecting the building, one bay should be erected with all wind brace rods and purlins installed and tightened to make sure that the building is properly braced.

22.12 Additional steel erection safety items.

22.12.1 Sheeting – Place sheets as close as possible to where they will be used. Keep a tight hold on sheets so they don't slip and cut your hands. Do not try to hang on to sheets suddenly caught by the wind. If it's too windy, don't sheet!

22.12.2 Safe access between levels – Use ladders to get on and off of the building. Never slide down columns.

22.12.3 Insulation – Never walk or step on insulation. If you are handling insulation in an enclosed area, wear a dust mask.

22.12.4 Haunch connections – If haunch connections (rafter to column) cannot be made from a basket or manlift, then they should be made from a properly secured ladder.

23. Confined Spaces

23.1 Definition & hazard.

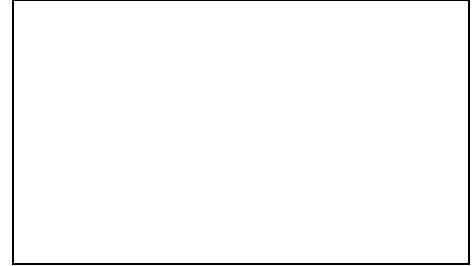
A confined space is any space having a limited means of entry/exit, which has the possibility of unsafe air quality (low oxygen content, presence of toxic or flammable contaminants), or any other safety/health hazard capable of producing serious injury or illness.

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Confined spaces may present life-threatening hazards and can only be entered after careful evaluation and implementation of hazard controls, which may include a permit and special equipment.

23.2 Restricted access.

No one is authorized to enter a confined space unless he/she has undergone confined space entry training, tests air quality, and conducts the entry in accordance with established Confined Space Entry protocol.



24. Rebar & Concrete/Masonry Construction

24.1 Rebar.

Install reinforced rebar caps to protect the exposed ends of rebar onto or into which employees could fall or become impaled. Mushroom caps are NOT acceptable to protect against impalement hazards.



24.2 Unsupported walls.

Never work along a masonry/concrete wall that is unsupported or not adequately braced. Stay out of areas where caution tape is erected along unsupported walls.

24.3 Cast-in-place concrete.

24.3.1 Formwork – Must be designed, fabricated, erected, supported braced & maintained so that it will be capable of supporting without failure all reasonably anticipated vertical & lateral loads.

Drawings or plans (including all revisions) for jack layout, formwork, shoring, working decks and scaffolds, shall be available at the jobsite.

Stripped forms and shoring should be removed and stockpiled promptly after stripping. Nails should be pulled as forms are taken apart.

24.3.2 Shoring inspections.

- Prior to erecting – Inspect for proper rating (see spec's) & damage
- Prior to, during & after concrete placement – Inspect for damage, proper placement and firm contact with foundation & formwork. If damaged or weakened during concrete placement, immediately reinforce.

24.3.3 Reinforcing steel & mesh – Must be adequately supported to prevent overturn or collapse. Prevent unrolled wire mesh from recoiling (secure each end, overturning roll, etc.)

24.3.4 Reshoring – When concrete must support loads in excess of its capacity, reshoring must be erected as original shores and forms are removed. Do not remove reshoring until the concrete being supported has attained adequate strength to support its weight and the weight of any loads placed upon it.

24.3.5 Removal of formwork & reshoring – Do not remove forms/shores until concrete has gained sufficient strength to support weight/loads (engineering plans/specifications or break test/ASTM compressive strength test). Exceptions – slabs on grade & slip forms.

24.4 Masonry walls under construction & limited access zone.

24.4.1 Limited access zone (LAZ) – Must be established as follows:

- LAZ must be established prior to start of wall construction.
- LAZ must run the length of the wall under construction and extend away from the unscaffolded side of the wall a distance equal to the height of the wall to be constructed PLUS 4 ft.

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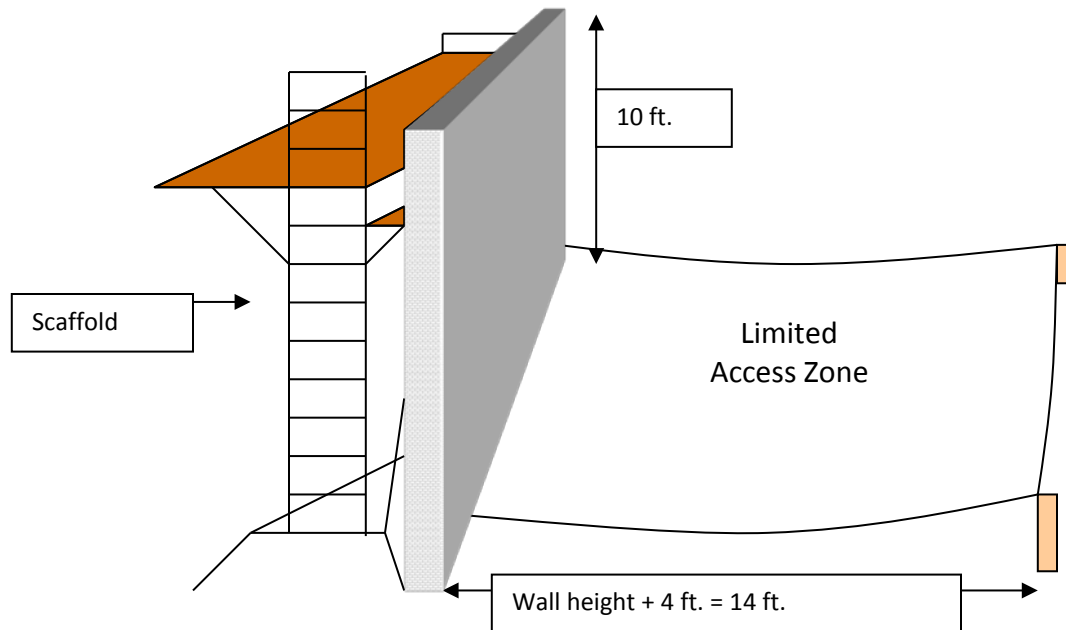
- Entry into the LAZ is restricted to employees actively engaged in the construction of the wall.
- LAZ must remain in place until walls are adequately supported or braced to prevent overturning or collapse.

24.4.2 Masonry walls over 8 ft. high – Must be adequately supported or braced to prevent overturning or collapse. The supports or bracing may not be removed until permanent support elements are in place. Employees may work in proximity to the wall as long as it is adequately supported or braced and as long as their work activity does not compromise the supports/braces in place.

Where work on wall construction continues above a section that has been supported/braced, the LAZ must extend away from the wall a distance equal to the height of the unsupported wall section PLUS 4 ft.

24.4.3 Green masonry walls over 8 ft. high – Use a limited access zone until the wall can be braced. The wall must be braced as soon as it has cured sufficiently to be supported by bracing.

Limited Access Zones (LAZ):



24.5 Precast.

24.5.1 Prevent overturn/collapse – Support until permanent connections made.

24.5.2 Limited access – No one beneath units being lifted or tilted into position (unless required for unit erection).

24.5.3 Lifting insert strength for tilt-up precast:

- Tilt-up members – 2x max. intended load transmitted
- Other precast – 4x max. intended load transmitted

24.5.4 Lifting hardware strength for tilt-up precast – 5x max. intended load applied/transmitted to it.

24.6 Concrete buckets.

A safety latch is required if the bucket is equipped with a hydraulic or pneumatic gate (to prevent inadvertent dumping). No one is permitted to ride a concrete bucket, and no one is permitted beneath it when being hoisted/lowered.

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24.7 Trowels.

24.7.1 Kneepads or kneeboards – Must be used when troweling wet concrete.

24.7.2 Powered trowels – Those that are manually guided must be equipped with a control switch that automatically shuts off power when the operator removes his/her hands from the equipment handles.

24.8 Tremies.

Secure sections of tremies/concrete conveyances with wire rope (or equiv.) in addition to regular connections.

24.9 Concrete pumping systems.

Discharge pipes must be provided with supports designed for 100% overload. Compressed air hoses must have positive fail-safe joint connectors to prevent inadvertent separation of hose sections when pressurized.

24.10 Structural loading.

No construction load may be placed on a concrete structure unless the structure can support the load, as determined by a person qualified in structural design.

24.11 Post-tensioning.

No employee (except those essential to the post-tensioning operations) shall be permitted to be behind the jack during tensioning operations. Signs and barriers shall be erected to limit employee access to the post-tensioning area during tensioning operations.

24.12 Bulk cement storage bins & silos.

Must have tapered bottom and mechanical or pneumatic means of starting material flow. No employee entry into the bin or silo unless the ejection system has been shut down, locked out and tagged. Also note that bins and silos are confined spaces and a permit may need to be issued prior to entry.

25. **Blood & Bodily Fluids (Bloodborne Pathogens)**

Special PPE and protective work clothing is necessary for work where the potential for contact with biological substances exists (blood, bodily fluids, mold, raw sewage, etc.). Work in areas where these substances exist shall be restricted to specially trained and equipped personnel.

If blood, bodily fluids or raw sewage comes in contact with your clothes, make arrangements to change clothing ASAP. If these substances come into contact with your body, stop work and wash with soap and water immediately. If any of these substances may have come into contact with your eyes, nose, mouth, broken skin or mucous membrane, report the incident to your supervisor immediately. You will be instructed to wash the body part for at least 15 minutes and then instructed to schedule a medical evaluation with a panel physician.

26. Preventing Heat & Cold-Related Injury



Protecting Workers from Heat Stress

Heat Illness

Exposure to heat can cause illness and death. The most serious heat illness is heat stroke. Other heat illnesses, such as heat exhaustion, heat cramps and heat rash, should also be avoided.

There are precautions your employer should take any time temperatures are high and the job involves physical work.

Risk Factors for Heat Illness

- High temperature and humidity, direct sun exposure, no breeze or wind
- Low liquid intake
- Heavy physical labor
- Waterproof clothing
- No recent exposure to hot workplaces

Symptoms of Heat Exhaustion

- Headache, dizziness, or fainting
- Weakness and wet skin
- Irritability or confusion
- Thirst, nausea, or vomiting

Symptoms of Heat Stroke

- May be confused, unable to think clearly, pass out, collapse, or have seizures (fits)
- May stop sweating

To Prevent Heat Illness, Your Employer Should

- Provide training about the hazards leading to heat stress and how to prevent them.
- Provide a lot of cool water to workers close to the work area. At least one pint of water per hour is needed.



- Schedule frequent rest periods with water breaks in shaded or air-conditioned areas.
- Routinely check workers who are at risk of heat stress due to protective clothing and high temperature.
- Consider protective clothing that provides cooling.



How You Can Protect Yourself and Others

- Know signs/symptoms of heat illnesses; monitor yourself; use a buddy system.
- Block out direct sun and other heat sources.
- Drink plenty of fluids. Drink often and BEFORE you are thirsty. Drink water every 15 minutes.
- Avoid beverages containing alcohol or caffeine.
- Wear lightweight, light colored, loose-fitting clothes.



What to Do When a Worker is Ill from the Heat

- Call a supervisor for help. If the supervisor is not available, call 911.
- Have someone stay with the worker until help arrives.
- Move the worker to a cooler/shaded area.
- Remove outer clothing.
- Fan and mist the worker with water; apply ice (ice bags or ice towels).
- Provide cool drinking water, if able to drink.

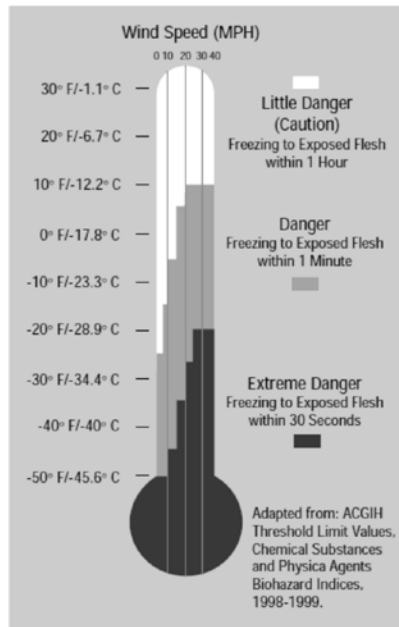
IF THE WORKER IS NOT ALERT or seems confused, this may be a heat stroke. CALL 911 IMMEDIATELY and apply ice as soon as possible.

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THE COLD STRESS EQUATION

LOW TEMPERATURE + WIND SPEED + WETNESS = INJURIES & ILLNESS

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result. Hypothermia can occur when *land temperatures* are above freezing or *water temperatures* are below 98.6°F/37°C. Cold-related illnesses can slowly overcome a person who has been chilled by low temperatures, brisk winds, or wet clothing.



FROST BITE

What Happens to the Body:

FREEZING IN DEEP LAYERS OF SKIN AND TISSUE; PALE, WAXY-WHITE SKIN COLOR; SKIN BECOMES HARD AND NUMB; USUALLY AFFECTS THE FINGERS, HANDS, TOES, FEET, EARS, and NOSE.

What Should Be Done: (land temperatures)

- Move the person to a warm dry area. Don't leave the person alone.
- Remove any wet or tight clothing that may cut off blood flow to the affected area.
- **DO NOT** rub the affected area, because rubbing causes damage to the skin and tissue.
- **Gently** place the affected area in a warm (105°F) water bath and monitor the water temperature to **slowly** warm the tissue. Don't pour warm water directly on the affected area because it will warm the tissue too fast causing tissue damage. Warming takes about 25-40 minutes.
- After the affected area has been warmed, it may become puffy and blister. The affected area may have a burning feeling or numbness. When normal feeling, movement, and skin color have returned, the affected area should be dried and wrapped to keep it warm. **Note:** If there is a chance the affected area may get cold again, do not warm the skin. If the skin is warmed and then becomes cold again, it will cause severe tissue damage.
- Seek medical attention as soon as possible.

HYPOTHERMIA - (Medical Emergency)

What Happens to the Body:

NORMAL BODY TEMPERATURE (98.6°F/37°C) DROPS TO OR BELOW 95°F (35°C); FATIGUE OR DROWSINESS; UNCONTROLLED SHIVERING; COOL BLUISH SKIN; SLURRED SPEECH; CLUMSY MOVEMENTS; IRRITABLE, IRRATIONAL OR CONFUSED BEHAVIOR.

What Should Be Done: (land temperatures)

- Call for emergency help (i.e., Ambulance or Call 911).
- Move the person to a warm, dry area. Don't leave the person alone. Remove any wet clothing and replace with warm, dry clothing or wrap the person in blankets.
- Have the person drink warm, sweet drinks (sugar water or sports-type drinks) if they are alert. **Avoid drinks with caffeine** (coffee, tea, or hot chocolate) or alcohol.
- Have the person move their arms and legs to create muscle heat. If they are unable to do this, place warm bottles or hot packs in the arm pits, groin, neck, and head areas. **DO NOT** rub the person's body or place them in warm water bath. This may stop their heart.

What Should Be Done: (water temperatures)

- Call for emergency help (Ambulance or Call 911). Body heat is lost up to 25 times faster in water.
- **DO NOT** remove any clothing. Button, buckle, zip, and tighten any collars, cuffs, shoes, and hoods because the layer of trapped water closest to the body provides a layer of insulation that slows the loss of heat. Keep the head out of the water and put on a hat or hood.
- Get out of the water as quickly as possible or climb on anything floating. **DO NOT** attempt to swim unless a floating object or another person can be reached because swimming or other physical activity uses the body's heat and reduces survival time by about 50 percent.
- If getting out of the water is not possible, wait quietly and conserve body heat by folding arms across the chest, keeping thighs together, bending knees, and crossing ankles. If another person is in the water, huddle together with chests held closely.

How to Protect Workers

- Recognize the environmental and workplace conditions that lead to potential cold-induced illnesses and injuries.
- Learn the signs and symptoms of cold-induced illnesses/injuries and what to do to help the worker.
- Train the workforce about cold-induced illnesses and injuries.
- Select proper clothing for cold, wet, and windy conditions. Layer clothing to adjust to changing environmental temperatures. Wear a hat and gloves, in addition to underwear that will keep water away from the skin (polypropylene).
- Take frequent short breaks in warm dry shelters to allow the body to warm up.
- Perform work during the warmest part of the day.
- Avoid exhaustion or fatigue because energy is needed to keep muscles warm.
- Use the buddy system (work in pairs).
- Drink warm, sweet beverages (sugar water, sports-type drinks). Avoid drinks with caffeine (coffee, tea, or hot chocolate) or alcohol.
- Eat warm, high-calorie foods like hot pasta dishes.

Workers Are at Increased Risk When...

- They have predisposing health conditions such as cardiovascular disease, diabetes, and hypertension.
- They take certain medication (check with your doctor, nurse, or pharmacy and ask if any medicines you are taking affect you while working in cold environments).
- They are in poor physical condition, have a poor diet, or are older.

27. Emergency Preparedness & Response

27.1 Preparation.

- 27.1.1 Communications – A means of emergency communications (cell phone, land line, 2-way radio, etc.) must be available & operational on site at all times in case emergency services are needed. If on a site where cell service is less than adequate, the site supervisor shall be responsible for finding and communicating to crew the closest point where an acceptable cell signal can be found.
- 27.1.2 Site-specific emergency action plan – At the start of each project (and thereafter as conditions dictate), the site supervisor will assemble an Emergency Action Plan that identifies:
- a) Name, physical (street) address & phone number of the jobsite
 - b) Site personnel who have current 1st aid/CPR certification
 - c) Emergency contact numbers (if not 911)
 - d) Site evacuation signal, evacuation procedure, assembly area & head count protocol
 - e) Nearest emergency care center – name, address, phone number & directions to
 - f) If needed, a location where cell phone signal is adequate for emergency calls
- 27.1.3 First aid kits & related supplies – A first aid kit is to be readily available on each jobsite. Each kit must include eyewash, hand sanitizer, a supply of vinyl gloves, a CPR faceshield and supplies to prevent transmission of bloodborne diseases. Supervisors are responsible for seeing that the kits remain adequately stocked with supplies (considering number of people on site).

27.2 Response.

- 27.2.1 Emergency response procedures – Appendix A contains basic response actions for some of the more foreseeable emergency events that could occur on our jobsites.
- 27.2.2 Initial response – Upon report of any incident, secure the scene by identifying and neutralizing present or foreseeable hazards that could produce further damage or risk of injury to workers, emergency responders or the public. As appropriate, barricade areas, remove/shut down equipment, deenergize systems, extinguish fires, etc.
- Concurrently or immediately thereafter, arrange for prompt medical treatment for the injured or ill.
- 27.2.3 Evacuations – In the event of an evacuation order, all site personnel (including visitors, vendors, customers, sub's, etc.) are to IMMEDIATELY shut down equipment and quickly proceed to the congregation & head count area. All persons must remain at the head count area until dismissed by site supervisor (following approval of emergency responder's site incident commander).
- 27.2.4 Directing emergency responders onto the scene – When emergency responders are summonsed to a jobsite, send someone to meet them at the entrance to the site (or at a nearby intersection if the entrance to the site is difficult to find). This person should then direct the responders to the immediate scene of the incident.
- 27.2.5 Media inquiries – Under no circumstances are there to be any statements to or contacts with the media in relation to any incident on a work site or which involves the company. Simply state that ALL media requests are to be directed to executive management.
- 27.2.6 Rendering 1st aid/CPR/AED assistance – This safety policy does not expand any employee's job description to require him/her to provide 1st aid/CPR/AED assistance in the event of injury or illness.

However, on jobsites where professional medical attention is not accessible within 4 minutes, at least one person holding current 1st aid/CPR/AED certification shall be assigned to the site. It is preferred that at least two certified persons be assigned to the site.

For the protection of everyone involved, those who choose to offer 1st aid/CPR/AED assistance must:

- Hold current 1st aid/CPR/AED certification (Amer. Heart Assoc., Red Cross, military or equiv.)

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- Only offer assistance within the scope of the 1st aid/CPR/AED training they received
- Follow Universal Precautions in accordance with their training

28. Orientation, Training & Participation Opportunities

A system of documented safety training and education will be used to build and maintain employee knowledge of industry-accepted safe work practices, OSHA requirements and the provisions of this policy.

28.1 New hire orientation.

New hire orientation will include an introduction to company safety policy and jobsite safety basics. The new hire will also be asked to demonstrate several basic safety skills. In the field the new hire will be assigned a safety mentor to serve as a peer resource, answer/explain safety-related questions, and provide positive coaching that will help to shape safe work practices.

28.2 Safety training sessions.

All notified employees are expected to attend and participate in safety training. This includes topics presented during company meetings, as well as stand-alone and special training events.

In most cases, the objective of our safety training will be to educate workers on hazard identification & control, OSHA regulations and/or new safety policies, procedures, equipment or tasks aimed at incident prevention.

28.3 Task-specific & site-specific training.

Site supervisor shall provide or arrange for task-specific and/or site-specific training where unique hazard exposures exist and for which employees have not received prior training.

Also, the site supervisor shall arrange for any additional safety instruction or mentoring based upon employee skill and experience level.

28.4 Toolbox talks.

A combination of toolbox safety talks shall be presented as a part of monthly field personnel meetings. After each talk is presented, questions shall be answered and the sign-in sheet shall be signed by all in attendance. The sign-in sheet shall be kept on file for training documentation purposes.

28.5 Trainer qualifications.

Training shall be administered by a person who is knowledgeable of and competent in the subject matter presented.

28.6 Documentation.

Training documentation shall include, at a minimum: 1) Date(s) of training; 2) Names of attendees; 3) Topic outline (content summary of training curriculum); and 4) Name of trainer(s).

APPENDIX A – BASIC EMERGENCY RESPONSE ACTIONS

INJURY, MEDICAL EMERGENCY & ELECTRICAL SHOCK

- Assess & secure the scene – make sure area is safe before entering.
- Call 911 – send someone to meet EMS responders.
- Don't move an injured person unless his/her life is in immediate danger.
- Call for someone trained in 1st aid/CPR.
- Have someone retrieve the 1st aid kit (and AED, if one is available).
- Notify supervisor or office of incident.

FIRE – MINOR

- Alert people in the immediate area.
- Use fire extinguisher to fight any small fire (if comfortable doing so).
- Do not use water on a fire that may involve electricity or chemicals.
- Evacuate & call 911 if fire grows, is near flammable or toxic chemicals or is difficult to extinguish.

FIRE – MAJOR, EXPLOSIONS & COLLAPSES

- Evacuate affected area and congregate in a predetermined, safe area.
- Call 911.
- Supervisor shall complete head count & report to EMS responders.

NATURAL & WEATHER EVENTS

- If there is time, secure all loose materials, equipment, tools & debris. Also, back-up documents off-site.
- If severe weather is imminent, immediately evacuate areas on and around scaffolding, unsupported walls, power lines, unsecured materials and elevated surfaces. Seek substantial shelter.
(Basement, small interior room on lowest floor, interior hallway on lowest floor or otherwise in any place that puts as many structurally supported walls as possible between you & outside. Avoid areas near windows and unsupported structures and areas where flying objects/debris could present a danger.)
- Following the weather event, the supervisor shall conduct a head count and assess any need for emergency medical assistance – call 911 if needed. Then, he shall assess damage and report to office.
- Order an evacuation and call 911 if there is any question as to building structural integrity, chemical spill/release, downed power lines or presence of any other dangers that may pose a risk to personal safety/health.

CONTACT WITH OVERHEAD POWER LINES

- Immediately remove all ground personnel from vicinity of equip. (50 ft. or more).
- Instruct equipment operator to remain in cab & attempt to break contact with power line.
- Call local power company emergency number &/or 911.
- Do not approach or touch downed lines, equipment, loads, load lines or injured persons in vicinity until lines are deenergized by power company. Keep other people away.
- Equipment operator is to remain in cab until lines are deenergized unless any situation arises that leaves the operator with no decision but to exit the cab to avoid certain death (large fire develops in/around cab, etc.). In these situations, operator shall jump clear of cab, taking care not to touch equipment/power line and ground at same time. Equally as important, the operator must land on ground with both feet together (not falling down or otherwise touching ground). From this point, operator shall carefully hop away on one foot or with both feet together until a safe distance away (where other people are standing safely). Once outside the cab, do not walk or run away.

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- When safe to do so, assess need for medical attention – if needed, call 911 & send someone to meet EMS responders.
- Call for someone trained in 1st aid/CPR.
- Have someone retrieve the 1st aid kit (and AED, if one is available).
- Prevent unauthorized access to incident scene.

CONFINED SPACE EMERGENCY

- Do not enter space to rescue.
- Initiate rescue procedure as specified on entry permit.
- Assess need for medical attention – if needed, call 911 & send someone for EMS.
- Call for someone trained in 1st aid/CPR.
- Have someone retrieve the 1st aid kit (and AED, if one is available).
- Prevent unauthorized access to confined space.

CAVE-IN

- Immediately evacuate trench & take head count.
- DO NOT ENTER THE DIG.
- Call 911 – send someone to meet EMS responders.
- Eliminate nearby sources of vibration (except water pumps, if running).
- Set-up safe perimeter at least 50 ft. away to prevent secondary cave-ins.
- Span tension cracks with planks or sheeting.
- If necessary to approach dig, approach from short ends.
- If victim is partially buried, don't enter to help – allow him to dig self out.
- DO NOT:
 - Enter unprotected trench
 - Use equipment to dig out victims
 - Pull on partially buried victims
 - Move any of victim's tools or equipment

TRAFFIC ACCIDENT

- Assess & secure the scene – make sure area is safe to enter.
- Assess need for medical attention – if needed, call 911.
- Don't move an injured person unless his/her life is in immediate danger.
- For less serious accidents, pull safely to side of road & notify police. Ask for copy of report.
- Exchange information with other parties & identify witnesses.
- Make note to yourself of any damage or possible injuries.
- Do not admit guilt, accuse, argue or become confrontational.

SPILL CONTROL

- Assess & secure the scene – make sure area is safe to enter.
- Call 911 if potential for personal injury or property damage or environmental impact.
- Evacuate if potential for personal injury/illness – head count
- Alert adjacent properties/businesses if appropriate.
- Assess need for 1st aid/CPR
- If safe to do so, stop source of spill, cover drains & dike/divert. Absorb
- Gather information on chemical spill from SDS

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EMPLOYEE SAFETY ACKNOWLEDGEMENT STATEMENT

I have read and believe that I understand the safe work rules and procedures explained in this handbook. I agree to follow my company's safety policies, the safe work rules described in this handbook, and pertinent Federal, State & Local safety regulations.

I will consult the appropriate Safety Data Sheets (SDS) for recommendations that pertain to the safe handling of various chemicals and solvents that I may encounter in the workplace.

I understand that I am responsible for my own safety and that of my fellow employees. I will bring to the attention of my foreman or other representative of management, any conditions or work practices that I feel violate company safety rules or that, in my opinion, could lead to property damage, personal injury, or loss of life.

Name

Signature

Date

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NOTES

EMERGENCY INFORMATION

Telephone numbers

- Fire: _____
- Ambulance: _____
- Hospital: _____
- Police: _____
- Physician: _____

Jobsite Location Information

- Project: _____
- Manager: _____
- Phone: _____
- Street Address: _____
- City/ State/ Zip: _____