Winger Contracting Company

Data & Communications Electrical
Fire Sprinkler Systems
Plumbing, Process Piping & Steamfitting
Service & Maintenance / HVAC / Sheet Metal
Millwright & Steel Fabrication

918 Hayne Street
P.O. Box 637
Ottumwa, IA 52501
Phone: 641-682-3407

WINGER companies

EMPLOYEE SAFETY HANDBOOK

2018

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Electric Arc Welding and Cutting

- Before starting to weld each day, check all ground connections to ensure they are properly connected and have suitable capacity for the specified maximum current.
- Verify that the frames of the electric arc welding units are grounded with a third wire in the cable containing the circuit conductor, or through a separate wire that is grounded to the source of the current.
- Arc welding and cutting cables **SHALL** be of the completely insulated, flexible type, capable of handling the maximum current requirements of the work in progress.
- Whenever possible, ground connections **SHALL** be made directly to the material being welded.
- The power supply switch to the equipment **SHALL** be "opened" or "shut-off" whenever the equipment is being moved or not being used.
- Electrodes **SHALL NOT** be left in the holder when unattended or not in use.
- Never place an electrode against a cylinder to strike an arc.

Gas Welding and Cutting

- All hoses and torches in use carrying acetylene, oxygen, fuel gas or any substance which may ignite or be harmful to employees SHALL be inspected at the beginning of each working shift. Defective hoses and torches **SHALL** be tagged **"DO NOT USE"** and immediately removed from service.
- Oil or grease **SHALL NOT** be permitted on any oxygen-acetylene equipment.
- Torches **SHALL** be lighted from friction lighters or stationary pilot lights, not by matches, cigarette lighters or from hot work.
- Gas welding and cutting assemblies **SHALL** be equipped with flashback protection equipment.
- When gas welding equipment is not in use, the cylinder valve **SHALL** be closed and the pressure in the hose released. Pressure regulators should be backed-off and cylinder caps SHALL be installed at the end of each shift.
- Torches and hoses **SHALL** be turned off, pressure bled, and removed from confined spaces when not in use.
- When handling cylinders, follow the guidelines listed in the section titled "Compressed Gas Cylinders" of this handbook.

IF YOU HAVE ANY QUESTIONS,
ASK YOUR FOREMAN or SAFETY TEAM!

Winger Phone Numbers

Winger Corporate Office, Ottumwa, IA	641-682-3407
Allen Petersen	641-799-0798
Andy Johnson	641-777-7669
Brian Jones	641-777-4238
Brian Keck	641-680-7509
Bryon Fleming	641-799-4695
Chas Hesling	641-777-8833
Chris McElroy	641-799-6194
Corey Sheets	641-680-1259
Dan McCoy	641-799-8769
Dan Stevens	641-680-5667
Dane Patton	641-777-5684
Danny Thrasher	641-680-4765
Dave Seabrook	641-777-7607
Debra Shaw	641-680-2284
Doc Brinegar	641-680-3129
Don Furman	641-680-2231
Duey Wilbanks	641-226-7049
Evan Pugh	641-799-3487
Grant Hjortshoj	641-680-2268
Jared Godbey	319-930-5907
Jason Bishop	641-777-2653
Jerelyn Merrill	641-777-5717
Jeremy Courtney	641-226-7918
Jim Keck	641-680-3250
Jim Potter	641-799-3695
Jobe Justice	641-680-0779
Kenny Keith	641-680-0932
Kelly Ver Steegh	641-777-4571
Lyle Collett	641-226-7994
Marc McLaughlin	319-540-7581
Mike Seabrook	641-799-2759
Mike Smith	319-550-0208
Nick Lara	641-799-7950
Nik Morrow	641-814-3444
Rick Wood	641-680-2179
Roy Launer	641-680-3540
Shea Bates	641-799-4444
Shane Luckey	641-680-3538
Steve Schmidt	641-777-6209
Tim Dolan	641-814-2046
Tom Keck	641-680-2056
Tommy Diewold	641-680-5655
Tim Wiley	641-226-7643
Travis Godbey	319-899-3457
Trent McDermott	641-226-4647

requirements under Federal regulations).

Welding, Brazing, Cutting & Grinding

Welding, brazing, cutting, brazing, and grinding or similar spark producing activities during fabrication and construction are commonly referred to as **"HOT WORK"**. Because of the high temperatures involved, and the potential for fire and serious personal injury, specific procedures must be followed to ensure that work activities are performed safely.

General Requirements for Hot Work Activities

- **When required, obtain a hot work permit for all welding, brazing, cutting, and grinding operations. No hot work will commence until all applicable permits have been obtained and approved.**
- All hot work activities **SHALL** only be performed by qualified employees.
- All employees involved in hot work activities **SHALL** wear appropriate personal protective clothing and eye / face protection.
- **ALWAYS** ensure that the ventilation is adequate before you start welding or cutting operations. Approved respiratory protection equipment may be required if adequate ventilation cannot be achieved.
- A fire watch **SHALL** be provided as required by location procedures and **SHALL** be maintained for at least 30 minutes after completion of the job.
- Suitable Winger fire extinguishing equipment **SHALL** be immediately available in all areas where hot work activities are performed. **DO NOT** proceed with any hot work activities without a fire extinguisher or water hose is immediately accessible.
- Welding and cutting operations **SHALL** be shielded by noncombustible or flameproof screens, which will protect employees and other persons working in the vicinity from direct rays of the arc and sparks.
- OSHA states that combustible materials within a 35-foot radius of the hot work to be performed **SHALL** either be moved or protected. Cargill policy is 50 feet.
- Consideration **SHALL** be given to open flooring and grating to make sure that combustibles on lower levels are shielded or protected.
- Spark containment **SHALL** be utilized during all welding, burning and grinding operations. Spark containment may include laying fire blankets, placing barricades, using 100% spark containment or by the use of a fire watch. Employees working around or below the welding, burning or grinding operation **SHALL** be protected from falling or flying sparks.
- Welding cables and gas hoses **SHALL** be positioned to minimize possible damage and to eliminate potential tripping hazards to personnel.
- Welding cables **SHALL NOT** have connectors or repairs within 10 feet of the electrode holder.
- Welding cables may only be repaired by using specifically designed heat-shrink tape.
- Welding and cutting assemblies **SHALL** be equipped with flashback protective equipment.

environmental hazards. Fluorescent bulbs as well as certain other bulb types contain mercury in the form of mercury vapor and powder coating inside the bulb. Because of the health hazards of mercury, waste bulbs are regulated under the Resource Conservation and Recovery Act (RCRA) as "Universal Waste". Breaking bulbs on jobsites is no longer permitted.

In addition to fluorescent bulbs, thermostats, telephones, alkaline batteries, H.I.D. Lamps such as metal halide, sodium and mercury vapor lamps all contain hazardous quantities of mercury.

- As little as 25 fluorescent lights can contaminate a 20-acre lake with enough mercury to cause health effects to people, fish and birds.
- Improper disposal of bulbs can result in fines up to $25,000 per day, per violation.
- Exposure to mercury can result in central nervous system damage, lung damage and corrosive effects on exposed skin.
- Mercury vaporizes rapidly at room temperature presenting and inhalation hazard. It can also be absorbed through the skin.

Packaging Procedures

- Unbroken bulbs should be evenly spaced in special waste disposal boxes or in the original cartons.
- Boxes **MUST** be kept closed, dry and indoors.
- When full, boxes should have all seams taped completely shut, along with any holes or weak spots.
- Containers of unbroken bulbs **MUST** be labeled "universal waste– lamps." Other types of waste **MUST** be stored and labeled in a similar manner, for example, waste– mercury thermostats.
- The date that collection was started, and the facility should be marked on the box.
- Containers of bulbs cannot be stored for more than one year.
- Any spill or release **MUST** be immediately contained.

Disposal

- All Universal Wastes **MUST** be disposed of by a licensed disposal firm.
- Arrangements **MUST** be made for waste bulbs to be picked up on-site or returned to the main office for disposal. Large quantities of waste bulbs should be collected for on-site pick-up by a licensed waste disposal service.
- Smaller quantities of bulbs can be returned to the shop for collection and proper disposal.

Spills

Spills of PCB oil from ballasts, switchgear, or transformers **MUST** be properly cleaned up. Immediately cordon off the spill area and notify the project manager and any facility environmental representatives. (There are specific notifications, testing and clean-up

OSHA IT'S THE LAW POSTER

OSHA® Occupational Safety and Health Administration

Job Safety and Health
IT'S THE LAW!

All workers have the right to:

- A safe workplace.
- Raise a safety or health concern with your employer or OSHA, or report a work-related injury or illness, without being retaliated against.
- Receive information and training on job hazards, including all hazardous substances in your workplace.
- Request an OSHA inspection of your workplace if you believe there are unsafe or unhealthy conditions. OSHA will keep your name confidential. You have the right to have a representative contact OSHA on your behalf.
- Participate (or have your representative participate) in an OSHA inspection and speak in private to the inspector.
- File a complaint with OSHA within 30 days (by phone, online or by mail) if you have been retaliated against for using your rights.
- See any OSHA citations issued to your employer.
- Request copies of your medical records, tests that measure hazards in the workplace, and the workplace injury and illness log.

This poster is available free from OSHA.

Employers must:

- Provide employees a workplace free from recognized hazards. It is illegal to retaliate against an employee for using any of their rights under the law, including raising a health and safety concern with you or with OSHA, or reporting a work-related injury or illness.
- Comply with all applicable OSHA standards.
- Report to OSHA all work-related fatalities within 8 hours, and all inpatient hospitalizations, amputations and losses of an eye within 24 hours.
- Provide required training to all workers in a language and vocabulary they can understand.
- Prominently display this poster in the workplace.
- Post OSHA citations at or near the place of the alleged violations.

FREE ASSISTANCE to identify and correct hazards is available to small and medium-sized employers, without citation or penalty, through OSHA-supported consultation programs in every state.

Contact OSHA. We can help.

1-800-321-OSHA (6742) • TTY 1-877-889-5627 • www.osha.gov

Safety Vision Statement

Winger Companies' Safety Vision is to provide a safe and healthy place of employment for our employees. The following safety values are integral components to our overall core business beliefs.

- *The health and safety of our employees is valued as **priority one** in every job that we perform.*
- *The **prevention of accidents** is our ultimate goal at all times.*
- *Safety is an **attitude** and a **culture** that each and every employee MUST take personal responsibility for.*
- *Each of us has an **obligation** to ourselves, our families, our fellow employees, and our customers, to work safely.*
- *Safety is **leading by example**.*
- *Zero injuries are **possible.***

*As a member of our organization, safety consciousness **MUST** always exist in your thinking and planning. After an accident occurs, it is too late to prevent it.*

The most recent and approved version of this handbook and the Winger Safety Programs are available on the Winger Contracting Company website:

www.wingercompanies.com
Employee Login\Password: WingerSafety

thermostats, and some electronics are required by law to be recycled in most states. Typically, the same wastes are generated on each of our job sites, such as general trash and scrap steel.

All trash MUST be disposed of properly. Place scrap materials in designated dumpsters marked for recycling. ALWAYS cut long pieces up. DO NOT place scrap materials in dumpster longer than the length of designated dumpster.

Many customers implement different recycling methods. Follow the environmental and waste disposal procedures at the facility you are working at. It is Winger policy to recycle as many items as possible.

Hazardous Waste

Hazardous waste would be products that would not be disposed of in general trash dumpsters. Designated locations must be located for proper disposal. Examples of Hazardous Waste include (but are not limited to):

- Solvents,
- Epoxy,
- "Empty" Aerosol Cans,
- Liquid Paint Waste,
- Refrigerants
- Degreasers that contain chlorinated solvents or waste that contains: Arsenic, Mercury or Methanol.
- Ignitable waste (solid or liquid) with a flash point less than 140 F,
- Liquid waste with a pH of <2,
- Reactive Waste (reacts violently with water),
- Nuclear radiation devices for level gauges are used in several different locations. Only personnel specifically trained to be a Radiation Safety Officer are allowed to work on these devices. Special disposal procedures must be followed for disposal.
- Used oil includes hydraulic fluids, lubricants, etc. and is collected for recycling. These must not be mixed with any other wastes such as antifreeze or any other process liquids. Used oil dry/absorbent is collected in designated locations and must not contain free liquids. To dispose of used oil dry material, put the material in a sealed bucket and put the entire bucket in the designated location on the job site.
- Universal waste includes all halogen and fluorescent light bulbs, lithium batteries, NiCad batteries, led batteries, and electronic equipment such as CPU's, monitors, printers, etc. All universal waste can be taken to a designated location for disposal.
- No wastes of any kind are to be removed from a customer facility unless by an approved and licensed vendor.

Handling and Disposal of Waste Bulbs and Other Products

Waste fluorescent light bulbs MUST be handled properly to prevent health and

midway between the top-rail and toe-board and be able to withstand a force of at least 150 pounds. A toe-board is 3.5 inches from the working level and must withstand 50 pounds.

- **Floor Loading Protection** Whenever loads or single items exceeding 350lbs are to be placed on grating or roofing structures, employees must determine the safe load capacity before taking this action. Loft areas used for storage must have the rated capacity posted.
- **Holes in Floors:**
  - Shall be constantly attended by someone or shall be protected by a cover, hard barricade or removable standard railing.
  - Every floor hole into which persons cannot accidentally walk (on account of fixed machinery, equipment, or walls, shall be protected by a cover that leaves no openings more than 1-inch wide.
  - The cover shall be capable of supporting, without failure, at least twice the maximum load weight of employees, equipment or materials that may be imposed at any one time.
  - The cover shall be secured in place so as to prevent accidental displacement by wind, equipment, or employees.
  - The cover shall be color coded and marked "**HOLE**" or "**COVER**" to provide warning of the hazard
- **Covers and Guardrails** Covers and/or guardrails shall be provided to protect personnel from the hazards such as open pits, tanks, vats, ditches, stairways, ladder ways, hatchways, skylights, pit/trap doors, manholes, floor holes, chutes, window wall openings, open-side floors and platforms. Skylight floor openings and holes shall be guarded by a standard skylight screen or a fixed standard railing on all exposed sides.
- **Guarding Floor and Wall Openings** Floor openings shall be guarded by a covers or standard guardrail system, including a top-rail, mid-rail, and if needed a toe-board. Wall openings from which there is a drop of more than 4 feet shall also be guarded.
- **Protection of Open-Sided Floors and Platforms** Open-sided floors or platforms 4 feet or more above adjacent floor or ground level shall be guarded by a standard guardrail system on all open sides, except where there is entrance to a ramp, stairway, or fixed ladder. Stairways having four or more risers shall be equipped with standard stair railing or handrails.

Waste Disposal

Trash and Recycled Waste

The goal of Winger Companies is to reduce or generate less waste by at least 50% into landfills and that processes shall be employed to ensure that this goal is met. Recycling products such as glass, aluminum cans, plastic, paper, wood, printer cartridges, etc. has greatly decreased the amount of trash in our landfills. Hazardous material containing products such as spent fluorescent lamps, batteries, mercury containing ballasts,

Introduction

This handbook was developed to provide employees of Winger Companies with our general safety policies and procedures. It is our company policy to provide a safe and healthy place to work, with the prevention of accidents being our ultimate goal at all times.

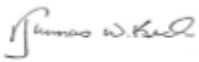
All employees of Winger Companies SHALL comply with applicable provisions of federal, state, and local safety regulations. In addition, Winger Companies has developed specific rules that are intended to provide our employees, suppliers, visitors, and subcontractors a safe work environment.

Purpose

As a member of our organization, you automatically accept a moral obligation to fellow employees and an economic obligation to the company to see that operations under your care, custody, and control are carried out in an efficient and safe manner. Safety consciousness MUST always exist in your thinking and planning. Because of this obligation, you MUST not only prevent obvious unsafe acts on the part of those who you work with, but you MUST anticipate potential hazards. Each of you is encouraged to demonstrate leadership ability by setting a good example.

This manual has been prepared to help you understand some of the general policies, working rules, and best practices of Winger Companies. You are expected to read the entire manual carefully. We believe you will find it to be a valuable reference resource during your employment. Whenever you have questions about company policies, procedures, or other matters regarding safety, you are encouraged to ask your supervisor, project manager, and safety personnel.

Implementation and enforcement of safety and health rules are the responsibility of all supervisory and management personnel with the support, cooperation and compliance by all employees. Unsafe conditions and actions will not be tolerated. The rules specified herein SHALL be strictly enforced. Failure to comply with all applicable safety rules will be cause for disciplinary action.



Thomas W. Keck

Safety Commitment

Safety is Winger Companies primary strategic objective and first consideration in every project that we execute. We share the belief that all **incidents are preventable** and we are committed to making this belief a reality in our organization. Our goal is to perform our work safely with **ZERO** injuries.

There is no job so important that it cannot be done **SAFELY.**

Working safely requires management leadership, employee and customer involvement, and a rigorous implementation of our safety program, best practices, and regulatory requirements. It is important to understand that we each have an important role in making our work environment a safe place to work.

Employer Responsibility for Safety

The employer has a primary responsibility for the safety and health of its employees. These responsibilities include, but are not limited to:

- The establishment of safe work practices and procedures to minimize workplace hazards.
- Training all employees in good safety and health practices.
- Provide the necessary personal protective equipment (PPE), tools and equipment and instructions on their use.
- Conduct pre-project and pre-task safety planning to prevent the occurrence of workplace injuries and illnesses.
- Conduct frequent safety inspections and audits to find and eliminate unsafe working conditions and practices, to control health hazards, and to comply fully with the safety and health standards for every job.
- Report and investigate, promptly and thoroughly, every accident or injury to find out what caused it to correct the problem so that it will not happen again.
- Provide for employee recognition for outstanding safety service or performance.
- Compliance with all company, client and federal, state, and local safety requirements.

Supervisor Responsibility for Safety

The supervisor MUST accept the day-to-day responsibility for assuring the safety and health of those employees working under his or her supervision. These responsibilities include:

- Plan safety into **EACH** day's work activities.
- Instructs all employees on safety procedures and job safety requirements. Follows up and insists on compliance.
- Explain job scope and re-assess when job scope changes.
- Provide each employee with the time, material, equipment, and training necessary to implement the work plan safely.

- All vehicles shall have a 5' warning flag attached to better identify them in the field.
- Hard hats and safety glasses shall be worn at all times when operating these carts on an active work site.
- No towing of any kind will be allowed with any ATV, golf cart, or utility vehicle.
- Arms, legs, and head shall remain inside the vehicle at all times.
- Keys are to be removed, from the vehicles, unless otherwise specified by the customer.
- When parked, they shall be left in gear and the parking brake engaged.

Walking / Working Surfaces

General Requirements

Many workers injured every year due to slips, trips, or falls generated by improper walking and working surfaces. Most of these accidents can be prevented if proper safety precautions are initiated. Slips, trips, and falls can be caused by conditions such as ice, standing water, grease, polished floors, loose flooring or carpeting, uneven walking surfaces, poorly placed objects (electrical cords, tools and materials), and damaged ladder steps. The controls needed to prevent these hazards are usually relatively simple, such as keeping walkways and stairs clear of debris, coiling up extension cords and hoses when not in use, keeping electrical and other wires out of the way, wearing appropriate footwear, and clearing parking lots, stairs, and walkways in snowy weather. The following provides information on walking/working surfaces hazards and prevention:

- **Aisles and Passageways**
  - Where mechanical handling equipment is used, such as forklifts, sufficient clearances shall be maintained for aisles, at loading docks, through doorways and wherever turns or passage must be made.
  - Aisles and passageways shall be kept clear and in good repairs, with no obstruction that could create a hazard.
  - Where doors or gates open directly on a stairway, a platform shall be provided, and the swing of the door shall not reduce the effective width to less than 20 inches.
- **Housekeeping**
  - All places of employment, passageways, storerooms, and service rooms shall be kept clean and orderly.
  - The floor of every workroom shall be maintained in a clean and, so far as possible, a dry condition.
  - Where wet processes are used, drainage shall be maintained, and false floors, platforms, mats, or other dry standing places should be provided where practicable.
  - When possible extension cords and welding leads should be ran at least 8' overhead.
- **Guardrail Systems** Guardrail systems consist of a top rail 42 +/- inches high and must withstand a force of at least 200 pounds. A mid-rail must be located

concrete beams, crane booms, girders, and trusses, etc.) which, because of their design, size, shape, or weight, must be fastened by special methods. However, any article of cargo carried on that vehicle must be securely and adequately fastened to the vehicle.

- Recheck the security of the load before you start off.
- Check the rack frequently during transit to make sure it is secured in place.
- Remember heavy loaded vehicles take longer to stop than lighter vehicles. A truck loaded with pipe or metal fab parts will take several seconds longer to stop than the same empty truck going the same speed.

What to Do In case of A Vehicle Accident

- Every driver of a motor vehicle involved in an accident from which results injury to or death of any person or person, or property damage of any kind, regardless of the amount, shall:
    - stop their vehicle as close to the crash scene as possible without blocking traffic,
    - protect the scene,
    - help the injured,
    - call 911,
    - call their supervisor and Winger Safety Director immediately to report any property damage or bodily injury,
    - stay at the scene,
    - identify themselves to others,
    - use a wrecker only with police say-so,
    - make a complete personal record,
    - don't sign anything or talk to anyone but the police,
    - post-accident drug screen
    - and complete the winger incident form and dot reports.
- Complete the accident report form and Iowa DOT report in detail (somebody unfamiliar with the accident should be able to fully understand what happened). Immediately send reports and digital pictures to the Safety Director. This must be received no later than the next business day (no exceptions).
- Should a tow be needed, contact Danny Thrasher, Winger Auto Manager, 641-680-4765.

ATVs, Golf Carts, and Utility Carts

- All Winger ATVs, golf carts, and utility vehicles shall be operated by Winger employees only.
- Under no circumstances should these vehicles be operated on public roads.
- No more riders than recommended by the manufacturer.
- Seat belts shall be worn.
- No passenger may ride in cargo areas.
- Load limits must be adhered to.
- Site speed limits shall be observed at all times.

- Pair new employee with experienced employee on jobs. New employees will have a yellow sticker on their hardhat with the word NEW and the date of hire. This will enable current seasoned employees to visually identify a new employee is on their jobsite and coach them in proper safety behaviors. The sticker may be removed after six (6) months.
- Be receptive and act on an employee's safety and health concerns.
- Encourage employee participation in the identification and correction of safety and health issues.
- Requires that all sub or trade contractors and their prime subcontractors to comply with all safety regulations. Reports any unsafe conditions existing on sub or trade contractor areas of the work to their supervisor and/or safety director.
- Assure that all employees fully understand what to do in the event of an emergency.
- Ensures that all injuries are cared for properly and reported promptly.
- Reviews all accidents with employee and safety director and ensures that corrective action is taken immediately.
- Administer disciplinary action if necessary, but do so in a manner that exhibits an example of a good leader.
- If at any time an imminent danger exists, the job must be stopped immediately. All hazards must be reduced or eliminated before proceeding.

Employee Responsibility for Safety

Each employee is expected to cooperate with all aspects of the safety and health program including compliance with all rules and regulations and for continuously practicing safety while performing their duties.

Employees are expected to:

- Accept primary responsibility for his/her personal safety and for the safety of others, and caution fellow employees and other persons in the workplace when they perform unsafe acts.
- Be familiar with the safety requirements that pertain to their jobs and follow all prescribed safety regulations, rules, practices, instructions and signs.
- Wear or use all required Personal Protective Equipment (PPE) while working at their job site.
- Before proceeding with a job, all employees **SHALL** assure themselves they can perform the work safely without injury. If they are assigned work they are not qualified to perform or are not comfortable performing, they **SHALL** inform their supervisor immediately.
- Any Winger employee has the right to **STOP WORK,** for any job, if they feel it is unsafe.
- Employees who leave their normal work environment and enter another work environment **SHALL** know, understand, and follow the safety rules of that work group.
- Report all near misses, unsafe conditions, accidents, injuries and illnesses immediately no matter how minor, so that appropriate responses may be made.

- Actively participate in safety training, meetings, and incident investigations, safety inspections, safety audits, industrial hygiene monitoring, medical surveillance, pre-task planning and other safety related matters or programs as requested.
- Know that disciplinary action may result from violation of the safety rules.
- Many of our customer's locations are tobacco free facilities. That means that **NO SMOKING or TOBACCO PRODUCTS** are allowed to be used onsite. That means you cannot have them laying on the table in your break area.
- Violations of any safety rules or policies set forth herein may result in discipline and/or discharge. Discipline may include, but is not limited to, verbal and written notice for a first offense: verbal and written notice and three (3) working days off without pay for a second offense; and discharge for a third offense. A flagrant violation, which puts you or your fellow workers in a dangerous situation, may result in immediate discharge.

STOP Work Authority Roles and Procedures

STOP Work Authority should be initiated for conditions or behaviors that threaten danger or imminent danger to person(s), equipment or the environment.

- Senior Management: Creates a culture that promotes SWA, establishes clear expectations and responsibilities. Demonstrates support for using SWA without the potential for retribution. Resolves SWA conflicts when they arise. Holds employees and contractors accountable for full compliance with the SWA program. All **STOP** Work reports will be reviewed by a Senior Management.
- Supervisors and Managers: Promotes a culture where SWA is freely exercised, SWA requests are honored and resolved before resuming operations. Ensures necessary **STOP** work follow-up is completed. All **STOP** Work reports will be reviewed by a supervisor/manager.
- Safety Director: Provides training, support, documentation and monitors compliance of the SWA program. All **STOP** Work Interventions will be documented by the Safety Director. Employees will be trained on **STOP** Work Authority practices. At a minimum, employees will be trained in: the importance of **STOP** Work Authority and the benefits of **STOP** Work Authority.
- Company employees and contractors: Initiate **STOP** work (in good faith) and support **STOP** work initiated by others. All employees have the authority to **STOP** work when the control of the HSE risk is not clearly established or understood. Employees will not be reprimanded for issuing a **STOP** Work Intervention.

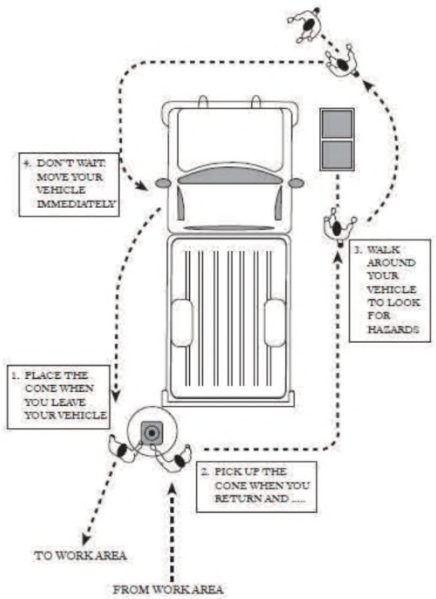
STOP Work Authority is a several step process; **STOP**, notify, correct and resume.

- **STOP-** When an employee or contractor perceives condition(s) or behavior(s) that pose imminent danger to person(s), equipment or environment he or she must immediately initiate a **STOP** work intervention with the person(s) potentially at risk. If the supervisor is readily available and the affected person(s), equipment or environment is not in imminent danger, coordinate the **STOP** work action through the supervisor. The **STOP** work action should be clearly identified as a **STOP** work action and initiated in a non-combative

Vehicle Material Handling

Our company business frequently requires transportation of pipe and metal fabrication parts on vehicles. Improperly installed racks or materials improperly secured to the rack can be extremely hazardous to others on the road or construction site. Take these precautions:

- Never exceed the GVWR (Gross Vehicle Weight Rating) of your truck, trailer or vehicle.
- All loads or equipment must be secured while in transit. Use as many tie-downs as you need to effectively secure the load you are transporting.
- Secure ladders to the rack in the same way.
- Use the correct load rated nylon straps with ratchets, chains and chain binders or come-alongs to secure heavy loads on trailers and materials to the rack. DO NOT use duct tape or wire to secure loads.
- Make sure pipe racks are securely bolted in place. Use lock washers to keep the nuts from vibrating loose.
- Avoid overloading the racks with too many items, such as sticks of pipe, conduit, etc. Avoid stacking materials too high as well.
- When using a pickup truck, install a steel grate over the back window to keep pipe and other objects from flying through the rear window due to an accident or abrupt stop.
- Material racks inside vans must keep items secured from sliding and falling inside the vehicle.
- For loads extending 3' or more, use warning flags (D.O.T. orange 18" x 18") on the highway, or caution tape around construction sites, to mark the end of the pipe or ladders sticking out over the back of the rack or tailgate.
- Projections beyond the rear of motor vehicles 4' or more shall have the following during hours when headlamps are required:
    - On each side of the projecting load, one red side marker lamp, visible from the side, located so as to indicate maximum overhang.
    - On the rear of the projecting load, two red lamps, visible from the rear, one at each side; and two red reflectors visible from the rear, one at each side, located so as to indicate maximum width.
- If cargo is not prevented from forward movement (for example, by the headboard, bulkhead, other cargo, or tiedown attached to the cargo), secure the cargo according to the following requirements:
    - 5 ft. or shorter and/or 1,100 lb. or lighter: minimum of 1 tiedown
    - 5 ft. or shorter and over 1,100 lb: minimum of 2 tiedowns
    - More than 5 ft. but 10 ft. or less: minimum of 2 tiedowns
    - When cargo is prevented from forward movement (for example, by the headboard, bulkhead, other cargo, or tiedown), secure the cargo according to the following requirements: All Cargo: 1 tiedown for every 10 ft., or part thereof.
    - A vehicle transporting one or more articles of cargo such as, but not limited to, machinery or fabricated structural items (e.g., steel or



florescent green only.

5. The placement of cones in this manner will require vehicle operators to remove them before moving the vehicle and encourage a survey of the area behind the vehicle prior to backing.

6. Placing a second cone at the left front of the vehicle can help increase the level of safety.

7. Winger employees are responsible for keeping their cones in good condition and keeping all writing legible. This is included on your daily vehicle inspections.

- Note: More than just backing accidents can be prevented by the "walk around." There are many incidents of property damage caused by vehicles sideswiping low stationary objects as the driver pulls away. Drivers are often focused on the task at hand and forget about obstacles they've seen when arriving. Most importantly, this practice will identify if there is anyone in the immediate area.

Cell Phone Laws

Drivers that use cell phone devices are four times likely to be involved in a vehicle accident. It is highly dangerous to divide your attention from the task of driving while using cell phones. Many of our customer have banned the use of cell phones while driving, operating or even walking inside their facilities. Safely pull over off of the roadway or sidewalk if necessary.

- Nation Wide as of April 30, 2018: Hand-held Cell Phone Use Ban: 16 states, D.C., Puerto Rico, Guam and the U.S. Virgin Islands prohibits all drivers from using hand-held cell phones while driving.
- All Cell Phone ban: No state bans all cell phone use for all drivers, but 38 states and D.C. ban all cell phone use by novice or teen drivers, and 21 states and D.C. prohibit any cell phone use for school bus drivers.
- Text Messaging ban: 47 states, D.C., Puerto Rico, Guam and the U.S. Virgin Islands ban text messaging for all drivers.
- Iowa Law: As of July 1, 2017, Iowa has updated its previous cell phone use law, and has banned use of electronic devices for text, email or the use of social media for all drivers while behind the wheel. Before reading or texting the vehicle must be brought to a complete stop.
- Drivers may still use hands free devices to talk or to check weather or traffic. Safely pull over off of the roadway if necessary.

manner.

- **Notify-** Notify affected personnel and supervision of the **STOP** work action. If necessary, **STOP** work activities that are associated with the work area in question. Make the area(s) as safe as possible by removing personnel and stabilizing the situation.
- **Correct-** Modifications to the affected area(s) will be made according to the corrections outlined in the **STOP** Work Issuance Form. The affected area(s) will then be inspected by qualified experts to verify completeness of the modifications and to verify all safety issues have been properly resolved. The completion of modifications will then be noted on the **STOP** Work Issuance Form.
- **Resume-** The affected area(s) will be reopened for work by personnel with restart authority. All affected employees and contractors will be notified of what corrective actions were implemented and that work will recommence. No work will resume until all issues and concerns have been addressed. In the event an employee still believes it is unsafe, they will be assigned to another job with absolutely no retribution. Operations Managers will provide the root cause analysis to the **STOP** work action and identify any potential opportunities for improvement as it is important to follow-up after a **STOP** Work Intervention has been initiated and closed.

IF YOU HAVE ANY QUESTIONS, ASK YOUR FOREMAN or SAFETY TEAM!

General Safety Work Rules

Your health and safety is a primary concern to Winger Companies. These rules have been designed with your safety in mind. It is essential that you read and understand these rules so that we can achieve an accident free work place.

- Use common sense. These general safety rules are a guide to safe work practices. Report unsafe conditions immediately. You are not required to work under unsafe conditions.
- Working while intoxicated or under the influence of controlled substances is strictly prohibited and may result in immediate termination.
- All incidents **MUST** be reported to your foreman and supervisor immediately.
- All safety rules, procedures, and practices set forth by Winger Companies and our customers will be followed.
- Keep the public, customers, and all other personnel in the workplace aware of potential hazards in order to eliminate on-the-job injuries and illnesses.
- Be a leader in the effort to provide a safe and healthful workplace by setting a proper example and by encouraging others to develop and maintain a strong, positive attitude toward compliance with all applicable safety standards.
- Assist less experienced employees in their efforts to comply with applicable safety practices and standards.
- Apply the principles of accident prevention in your daily work and use proper safety devices and protective equipment as required.
- Proper care will be given to all tools and precautions taken to protect them

from loss, damage, and theft.

- Vehicles and machinery will not be abused or misused.
- Work clothes will not be torn, tattered, or in need of repair. Clothing in this condition is a potential safety hazard and promotes a poor company image.
- Company provided Personal Protective Equipment (PPE) MUST be worn for the job being performed. This includes, but is not limited to the following items: safety glasses/goggles, hard hats, hearing protection, work gloves, face shields, fall protection harnesses, respirators, welding jackets, sleeves, and hoods, etc. See PPE section for specific instructions.
- Good housekeeping will be maintained at all times. DO NOT leave materials in aisles, walkways, stairways, roads or other points of egress. Do not store combustible items under stairways.
- Keep your work area clean. Remove scrap material and trash on a daily basis or more often if necessary.
- Pile and stack material safely. Use proper blocking / stacking practices and NEVER exceed a safe height.
- Only authorized and trained personnel may operate machinery or mobile equipment (i.e., forklifts, rough-terrain forklifts, aerial lifts, etc.)
- Additional safety rules in the Winger Companies Safety Manual should be read, understood, and followed.

Accident / Incident Notification and Investigations

All near misses and unsafe conditions, injuries and illnesses, vehicle accidents, fires, chemical and environmental spills and property damage, no matter how minor, MUST be reported immediately to your Supervisor and Safety Director so that appropriate procedures may be followed and treatment promptly rendered.

All incidents **MUST** be documented using a Winger Companies Accident Investigation reports and submitted to the Safety Director. All reports MUST include:

- Description of the near miss, incident / accident.
- Description of the injury.
- Cause or causes of the accident / incident.
- Corrective actions to be taken to prevent re-occurrence.
- Photographs, if necessary.
- Witness interviews.

The following general guidelines must be followed when faced with a situation requiring an accident / incident investigation:

- Investigate any injury, near miss, or property damage incident.
- **DO NOT** disturb the accident site until an adequate review has been conducted.
- Take photographs (where allowed), to document as much of the accident scene as possible.

act as an extra set of eyes.

- In addition to the procedure above, the act of backing will result in the reduction of the potential for property damages and/or personal injury.
- Avoid backing where possible, but when necessary, keep the distance traveled to a minimum and be particularly careful.
- When backing a vehicle or equipment for staging, extreme caution SHALL be exercised to avoid injury or property damage.
- When backing up, Winger employees will walk around the vehicle to inspect for damage & clearances. When possible, the preferred method is for a co-worker to spot vehicle movement.
- Check behind your vehicle. Back to the driver's side. Do not back around a corner or into an area of no visibility.
- Winger employees must stay clear of fire lanes; avoid blocking overhead doors, egress routes, etc. All vehicles must be parked in a manner that will comply with site rules, regulations, procedures, best practices, the facility PEO/EAP, and will not disrupt the work of others.
- Service vehicles shall not be left running while unattended. The only exception to this rule is for industrial diesel equipment during the cold months. Note: Upon request to the team Manager, Supervisor, or Superintendent may grant an exception when weather conditions are extreme.
- Set parking brakes when vehicles and equipment are parked and chock the wheels if they are on an incline. Some customers require chocking the wheels of any vehicle on their plant site that is not parked in their parking lot.

Safety Cone Policy

- This Safety Cone policy will help remind us all to establish a "circle of safety." A number of companies require their drivers do what is called "Walk the Safety Circle." Experience has shown that this "walk around" procedure creates a level of awareness and alertness that has been effective in preventing accidents.
- If practical, it is preferred that the vehicle operator select a parking location which does not require backing to re-enter the flow of traffic. When this is not possible, adhere to the following procedures:
  1. All Winger employees operating fleet vehicles (vans, trucks and vac trucks) will utilize a policy of placing a green Hi viz fluorescent green, 18" safety cone at the outer most corner of the outward direction of the vehicle or at the rear traffic side of the vehicle if parallel parked.
  2. The cone should be placed immediately after parking and picked up just before leaving.
  3. While walking around the vehicle to retrieve the cone, the employee will inspect for damages and clearances before moving the vehicle. The drivers get out of their vehicle and make a clockwise "walk around" their vehicle, and pick up the cones prior to backing up or driving away
  4. Only use the cones designated for vehicles. Orange barricade cones are not to be used as vehicle safety cones. Vehicle safety cones are to be

- Shaving
- Cell phones
- Navigation devices and PDA's

Parking and Backing Up Policy

- It has been Winger policy since May 1, 2015, to back into parking spaces such as parking lots, jobsites, etc. The best way to avoid a backing accident is: Don't Back Up! Think about it. If you don't back up, you won't have a backing accident.
- Audible back up alarm systems will be installed and maintained in working order on all fleet vehicles and powered industrial equipment operated by Winger employees. Verification of back up alarm operation will be performed before each vehicle use. To make sure the area is clear and you do not have an operable backup alarm or spotter, tap your horn twice to get the attention of others nearby, then back in.
- All Winger employees will make an effort to park in a manner where they will not need to back up. Example: Employee arrives at a parking lot, pulls through one stall to park in the next. This will allow him or her to pull out of the stall without the need to back up.
- When you arrive at a location, begin to think about how you will leave. As an alternative to backing later, enter the parking area looking for ways to avoid backing.
- Look for a pull-through situation. Look for curb-side parking with no restriction in front of you. Look for a way to beat the odds by steering clear of the backing maneuver whenever you can. The extra time you take won't make a dent in your schedule or make a mark on your driving record.
- The driver must use a "spotter", if available, when backing a vehicle or construction equipment. Agree on signals before starting, especially the signal for "stop".
- Position the spotter where you can visually see him/her, where he/she is out of your path of travel, and where he/she can clearly see behind the vehicle. Stop immediately if you lose sight of your spotter. If you are in doubt of the situation, stop immediately, get out of your vehicle and check the situation yourself.
- If a spotter is not available, the driver must check under and around the vehicle to make sure the area is clear before proceeding to back a vehicle. Use the rear view and side mirrors, and if possible, look behind you.
- Back up immediately, but slowly, before the present situation has time to change. Whether or not a spotter is available, while backing a vehicle, always periodically check the front of the vehicle.
- When another employee is there to assist the driver, they should act as a spotter. Even when using a spotter, the driver is still responsible if an accident occurs. Drivers can use the advice of the spotter; not to depend upon them. If they back into a fixed object or otherwise have an accident, they will be held responsible despite the use of a helper.
- The use of a spotter does not excuse the driver from making a "circle of safety," rather it enhances it. The driver can tell the spotter what to watch out for, and

- If you are injured on the job, you must be escorted by Winger safety personnel or ambulance for medical treatment.
- **DO NOT go to your own doctor on your own. Winger will arrange for the proper medical treatment if necessary.**
- Begin the incident investigation as soon as possible after notification. Ensure that proper medical treatment for any injured employees has been provided. The affected employee's immediate supervisor/foremen SHALL conduct the incident investigation.
- Complete the applicable incident investigation reports (Winger Incident Form and First Report of Injury and/or Motor Vehicle Report if applicable) on the same shift the incident occurs. If it is not possible to complete the reports on the same shift, it should be completed no later than 24 hours after the incident.
- Forward completed Incident Investigation Report Forms to the Winger Safety Director for review and follow-up.
- Incident reports are used in a positive manner to educate our employees how to reduce hazards in the workplace.

Vehicular Accidents

If you have a vehicular accident:

- **STOP immediately**. If possible, pull onto the shoulder or side of the road safely.
- Take immediate action to prevent further damage at the scene of the accident. Place warning signals promptly and properly.
- If anyone is injured, call **911** immediately. Stay calm and give the emergency operator as much information as you can about the accident.
- Don't leave the scene.
- **DO NOT** argue at the scene of the accident. Be courteous. Show your driver's license willingly.
- Secure and record all facts and pertinent information including other driver information and license plate numbers of the vehicles at the scene of the accident.
- Secure the names and addresses of any witnesses to the accident.
- **DO NOT** discuss the accident with anyone except the police officer, Winger supervision, or our company insurance representative.
- **DO NOT** sign any papers or forms except for the police report and Winger accident forms.
- Call your Supervisor and Safety Director immediately for any property damage or bodily injury accidents.
- Complete the Winger Iowa DOT Accident Form and submit to the Safety Director.

Aerial Lifts

Safe Work Practices

- Only authorized and trained personnel may operate and access aerial lifts. Specific training is required for each equipment model in use.
- **NEVER** operate an aerial lift until you have received the proper training.
- The second person in an aerial lift must be trained unless there is another trained person on the ground in case of emergency rescue.
- For elevated work, aerial lifts are always the first choice over ladders. Each foreman when planning their job needs to take into consideration the height of the work to be performed and have the appropriate aerial lift at the job.
- A pre-use safety inspection checklist **SHALL** be performed thoroughly and documented prior to daily use. Turn paperwork into the safety department or your foreman.
- When renting equipment, make sure that you do a thorough pre-use inspection. Report any deficiencies to your supervisor immediately. We are responsible for any damage that happens while renting the equipment.
- Any piece of mobile equipment that does not pass inspection **SHALL** be tagged and taken out of service until repaired by a competent person.
- Obey operating instructions, warnings and cautions for each aerial lift.
- **NEVER** utilize an aerial lift as material hoisting equipment.
- **NEVER** exceed the boom or personnel basket Rated Working Load (RWL) limits.
- When operating an aerial lift in a walkway or roadway, barricade the area with DANGER tape so vehicle or foot traffic will not be in your work area.
- Before moving the aerial lift, the operator **SHALL** make sure that no person or objects are in the path of travel. Communicate movement of the aerial lift to all personnel on and around the aerial lift. Use a spotter to help you move the aerial lift safely when you cannot see clearly or need escorted.
- Aerial lifts **SHALL ALWAYS** be operated at a safe speed for existing conditions.
- **NEVER** operate an aerial lift on soft ground or unlevel surfaces.
- **NEVER** operate any aerial lift on grating unless approved by an engineer.
- Lifts **SHALL NOT** be operated during strong winds >25 mph or severe weather.
- **ALWAYS** beware of overhead power lines. Check for wires before traveling or raising and lowering the platform. Depending on the voltage, maintain a minimum distance of at least 10 feet or more from all power lines.
- Lower the basket or platform to the ground before moving the aerial lift.
- When the aerial lift is equipped with outriggers or stabilizers, deploy these in accordance with the manufacturer's instructions. **NEVER** move an aerial lift with the outriggers or stabilizers extended.
- **ALWAYS** make sure the access gate is closed or safety chain is attached whenever the aerial lift is in use.
- **ALWAYS** enter and exit the platform with three-point contact. **DO NOT** exit using the "fireman's style".
- **ALWAYS** keep both feet planted firmly on the floor of the basket or platform.
- **NEVER** step up on the midrail or toprail to extend your reach.

the other driver, either directly or through mirrors.

- Turn signals must be used to show where you are heading; while going into traffic and before every turn or lane change.
- When passing, or changing lanes, view the entire vehicle in your rear-view mirror before pulling back into that lane.
- Watch other vehicles that have their turn signals on. Make sure they are turning in the designated direction before pulling out in front of them.
- When waiting to make left turns, keep your wheels facing straight ahead. If rear-ended, you will not be pushed into the lane of oncoming traffic.
- When stopping behind another vehicle, leave enough space so you can see the rear wheels of the car in front. This allows room to go around the vehicle if necessary and may prevent you from being pushed into the car in front of you if you are rear-ended.
- It is against the law to pass any vehicle within 100 feet of a railroad crossing or intersection.
- Always watch for motorcycles, bicycles, pedestrians and children as they can be easily hidden by other vehicles or obstructions. In 40% of motorcycle crashes, other vehicles were turning left while motorcycles were going straight, passing or overtaking the vehicles. Pedestrians and bicycles in the roadway always have the right of way.
- Be alert of other vehicles, pedestrians, and bicyclists when approaching intersections. Never speed through an intersection on a caution light. Approach a stale green light with your foot poised over the brake to reduce your reaction time should it be necessary to stop. When the traffic light turns green, look both ways for oncoming traffic before proceeding.
- Use extreme caution when crossing any railroad crossing. STOP, LOOK, and LISTEN before crossing any set of tracks. Don't depend on lights, they may be inoperative.
- Watch the weather and consider the extra time it will take you when traveling in fog, rain, sleet, ice or snow.
- Be especially careful on bridges and overpasses when the temperature is at freezing or below.
- Use traffic signs, barricades or flaggers when construction takes place near public roadways.
- Any employee exposed to vehicular traffic must wear high visibility traffic vests.
- Deer are more prevalent during spring and fall, especially during sunrise and sunset. Scan the road and ditches for any movement. If you see one, there are probably more.
- Don't swerve for any animal. Survival chances are better than swerving into oncoming traffic or rolling the vehicle over in a ditch.
- Distracted Driving- these are some of the distractions that occur while driving:
    - Traffic
    - Other drivers
    - Pedestrians, children, pets
    - Adjusting radio, A/C, heater
    - Eating, drinking
    - Applying makeup

intended use. Vehicles and machinery SHALL NOT be abused and misused. All Company vehicles are to contain a fire extinguisher, first aid kit, current vehicle registration, current certificate of insurance, and accident forms. If a vehicle does not pass inspection, tag the vehicle out of service and remove the key. This inspection includes the following:

- Body integrity
- Brakes, including parking (hand) brake, trailer brake connections and coupling devices
- Windows, windshield and wipers.
- Rear vision mirror or mirrors
- Steering mechanism, horn
- Headlights, tail lights, turn signals, lighting devices and reflectors
- Check fluids
- Tires, inflation and tread
- Backup alarm
- Safety cones are in good condition and writing is legible

Defensive Driving Rules

Defensive driving is defined as "driving to save lives, time and money in spite of the conditions around you and the actions of others":

- Drive defensively. Stay focused, concentrate on driving, anticipate hazards, and correct to account for those hazardous conditions or situations.
- You must not operate a vehicle at any time when your ability to do so is impaired, distracted, affected, influenced by alcohol, illegal drugs, prescribed or over-the-counter medication, illness, fatigue or injury.
- Wear seat belts while operating or riding in all vehicles.
- Drivers must honor posted speed limits. In adverse driving conditions, reduce speed to a safe operating speed that is consistent with the conditions of the road, weather, lighting, and volume of traffic. Tires can hydroplane on wet pavement at speeds as low as 40 MPH.
- Drivers must yield the right of way at all traffic control signals and signs requiring them to do so. Drivers should also be prepared to yield for safety's sake at any time.
- Drivers are required to maintain a safe following distance at all times. To estimate your following distance, pick a stationary object ahead of you. As the vehicle in front of you passes the object, begin counting 1001, 1002, 1003, etc. until you reach the same object. This counts the number of seconds between you and the vehicle ahead of you.
- Drivers of passenger vehicles should keep a two-second interval between their vehicle and the vehicle immediately ahead. During slippery road conditions, the following distance should be increased to at least four-seconds.
- Drivers of heavy trucks should keep a minimum of a three-second interval when not carrying cargo; and at least four-seconds when fully loaded. Following distance should also be increased when adverse conditions exist.
- Be aware of blind spots of both your vehicle and vehicles around you. Make frequent checks in your rearview and side mirrors for other vehicles behind you, pulling into and changing lanes and into your blind spot.
- Avoid driving in other driver's blind spots; attempt to maintain eye contact with

- **NEVER** use boards across the midrails. Reposition or discuss with your foreman
- **NEVER** use a ladder, bucket or other objects to extend your reach.
- Wear your fall protection gear at all times inside the personnel platform.
- Tie-off to the manufacturer's designated anchorage point on the aerial lift.
- **NEVER** tie-off to objects outside the aerial lift while working from the platform except when:
- If you need to exit the aerial lift to climb onto a pipe rack or structural steel, follow these procedures:
  - ✓ Designate this procedure on the Winger PJHA
  - ✓ Do NOT exit the lift in winds exceeding more than 20 mph
  - ✓ Workers shall remain 100% tied off at all times
  - ✓ To ensure 100% tie-off, the operator's primary SRL snap hook shall be attached to the lift's anchorage point
  - ✓ Position the personnel platform with the access gate facing the direction you will exit within 12 inches of the surface you plan on accessing
  - ✓ Attach secondary SRL snap hook to adjacent structure
  - ✓ Climb safely out of the lift using the midrail entry or gate, never by climbing over the rails
  - ✓ Unhook primary SRL snap hook
  - ✓ Perform your elevated work safely
  - ✓ When returning to the platform, operator must attach the primary SRL snap hook to the platform anchor point before detaching secondary SRL hook
- Keep hoses, electrical cords, and welding cables clear of moving parts when raising and lowering the personnel platform.
- **DO NOT** tie cords to the guardrails. This can cause tip-overs. Use a method for quick release such as spring clamps.
- Boom or platform must be lowered when parked. **NEVER** leave equipment with the boom in air.
- In extenuating circumstances, boom lifts may be used as an anchorage point as long as:
  - ✓ The pitch is no greater than 4:12 slope
  - ✓ Lift must be positioned a minimum of 4' from the leading edge
  - ✓ Spotter must remain on ground near the machine base controls to prevent unauthorized use and to prevent the machine from being used.

Ammonia Awareness

Ammonia is an extremely hazardous chemical that is widely used in many industries. Ammonia can be explosive, especially in an enclosed space or when other flammable chemicals are present. By itself, its flammable range is between 15 percent and 28

percent by volume in air. When mixed with lubricating oils, the flammable range increases. Ammonia will react dangerously with some chemicals – most notably, chlorine bleach. Ammonia is also incompatible with other halogens (for example, fluorine), oxidizing agents (for example, nitrogen oxide), and heavy metals (for example, mercury and silver).

Ammonia can be in liquid or gas form. Ammonia is colorless and has a strong pungent odor similar to your household cleaning ammonia. It is a common refrigerant in many industries. In agriculture, it is injected into soil as fertilizer. It is also used in the manufacture of plastics, dyes, textiles, detergents, and pesticides. Ammonia may be found in solution, as ammonia hydroxide (the form most people are familiar with), or packaged as a pressurized gas, in a waterless (anhydrous) form.

Anhydrous ammonia gas is lighter than air and will rise, so that generally it dissipates and does not settle in low-lying areas. However, in the presence of moisture (such as high relative humidity), the liquefied anhydrous ammonia gas forms vapors that are heavier than air. These vapors may spread along the ground or into low-lying areas with poor airflow where people may become exposed. Some examples may include, but not limited to:

- working on/near industrial refrigeration machinery rooms, equipment and/or piping
- working in petroleum refineries
- working with/near agricultural fertilizer
- working in industrial process facilities
- working in or around industrial meat packing plants

Anhydrous Ammonia can cause harm if inhaled and/or if it comes into contact with the eyes or skin. Ammonia interacts immediately upon contact with available moisture in the skin, eyes, oral cavity, respiratory tract, and particularly mucous surfaces to form the very caustic ammonium hydroxide. Ammonium hydroxide causes the necrosis of tissues through disruption of cell membrane lipids (saponification) leading to cellular destruction. As cell proteins break down, water is extracted, resulting in an inflammatory response that causes further damage.

Exposure of the eyes to ammonia may cause burning, tearing, temporary blindness and severe eye damage. Exposure of the skin to ammonia may cause severe burns and blistering. Exposure of the respiratory tract (mouth, nose and throat) to ammonia may cause runny nose, coughing, chest pain, severe breathing difficulties, severe burns and death. Skin and respiratory related diseases could be aggravated by exposure. A safe rule of thumb is to stay at least 60 feet from truck unloading areas.

Rule of Exposure:

- **5 PPM** – You can *smell* it
- **50 PPM** – It can *harm* you – Long Term Exposure
- **300 PPM** – Immediate *Danger to Life & Health*
- **5,000 PPM** – It can *kill* you

use, including having family members as passengers, is prohibited.

- No one outside the Company may drive your assigned vehicle.
- Riders and passengers are not permitted in Company vehicles unless specifically authorized by management.
- If you are assigned a Company vehicle and authorized to garage it overnight at home, then commuting to and from work is allowed.
- All accidents with Winger company vehicles MUST be reported to management and safety as soon as possible. Drivers must fill out a Winger Companies "Report of Motor Vehicle Accident" whenever there is property damage or bodily injury.
- Personal vehicles SHALL not be used for company business unless they have the proper insurance coverage and permission from Winger legal counsel. Remember:
    - YOUR auto liability insurance will be primary
    - YOUR physical damage insurance applies
    - YOUR personal insurance premiums can be greatly impacted
    - YOU are responsible for all maintenance and repairs
    - YOU are responsible if your car is in the shop for repairs
- Winger provides the required collision and liability insurances on its vehicles. If a company-owned vehicle is damaged or involved in an accident during unauthorized use, the employee-driver will be held financially responsible and may be subject to disciplinary action.
- Jobsite vehicles are not to be driven on public streets, unless properly licensed.
- Report theft of any Winger vehicle, tools or materials immediately to your supervisor.
- Obey all company, customer, state and federal safety rules, regulations, procedures, and instructions.
- Many of our customers have banned riding in the back of pickup beds for safety reasons. For those that still allow that practice, sit down in the bed. Body parts are not allowed outside the truck body. DO NOT ride on the fenders or stand up. DO NOT jump off any vehicle while it is in motion.
- Use every handhold and step available when getting in and out of equipment. NEVER jump down from equipment.
- Use traffic signs, barricades or flaggers when construction takes place near public roadways.
- Any employee exposed to vehicular traffic must wear high visibility traffic vests.
- Should you need a tow, call Danny Thrasher, Winger Auto Manager, for assistance.

Daily Inspection

As a driver, you are responsible for making sure your vehicle is safe to operate at the beginning of each trip or workday. Vehicle defects should be reported on the Winger Truck Inspection Form for the mechanic any problems you find during inspections. **DO NOT** operate a vehicle with critical safety problems. All vehicle maintenance must be done by qualified personnel approved by management. Windows should be kept clean so your vision will not be obstructed. Vehicles must be the correct size and designed for

equipment with a water hose or wet-wiping rather than with compressed air.

- Schedule work for workers when dust exposure is a minimum
- Wear disposable or washable protective clothes at the worksite.
- Shower if possible and change into clean clothes before leaving the worksite to prevent contamination of cars, homes, and other work areas.
- Use OSHA 1926.1153 Table 1 to determine the proper level of PPE and respiratory protection when engineering controls cannot keep silica exposures below the OSHA Permissible Exposure Limit (PEL).
- Respirators should not be the primary method of protection. If engineering controls cannot keep dust levels below the OSHA PEL, then half-mask or N-95 respirators must be used. PPE is always the last resort.
- Provide workers with training that includes information about health effects, work practices, and protective equipment for respirable crystalline silica.

Vehicle Fleet Safety

It is the driver's responsibility to drive or operate the vehicle in a safe manner and to drive defensively to prevent injuries and property damages. The company expects each driver to drive in a safe and courteous manner pursuant to the Winger Vehicle Fleet Safety Program and the Winger Employee Handbook.

Rules for Employees

- Company employees are required to complete the driving history questionnaire on the employment application and pre-employment process.
- Completing the Winger Motor Vehicle Report acknowledgement annually authorizes you to drive a Company vehicle for one year, unless rescinded. These reports shall be systematically reviewed to ensure good driving records are being maintained. The authorization is automatically rescinded if you are convicted of driving under the influence of drugs or alcohol in any vehicle, or if your license is suspended, revoked or expires
- Vehicles must be operated by authorized Winger employees only. You MUST have a valid driver's license and maintain a good driving record. If your driver's license has been suspended or revoked, you MUST report this situation to your Supervisor and the Safety Department immediately.
- It shall be in the discretion of Winger to restrict access to Company vehicles for any employee based on driving history and/or violations. Any violation of this policy shall be grounds for discipline, up to and including discharge.
- Drivers of vehicles with a GVWR of 26,001 pounds or more, vehicles which transport 16 or more passengers, or vehicles used in transportation of hazardous materials must have the appropriate Department of Transportation Commercial Driver's License (CDL).
- Driving a Company vehicle is a privilege. As with all Company-owned property, you are to take reasonable care of the Company vehicle that you drive, and ensure it is maintained in safe driving condition.
- Company vehicles are to be used only for valid business purposes. Personal

What to do if you are exposed:

- **Use an air monitor that detects ammonia in your work area.** You may become desensitized to ammonia and not realize how strong it really is. When the air monitor alarms, leave the area immediately.
- **Wear personal protective equipment.** Employees will be provided with and required to use impervious gloves, face shields or full-face respirators and other appropriate impervious protective clothing necessary to prevent any possibility of skin contact. Liquid ammonia can burn your eyes. Know where the emergency eyewash station is located in your work area and how to use it.
- **Take hot work permitting precautions** whenever hot work will be performed in areas where ammonia is present. If piping, vessels, or containers that have held ammonia will be welded, soldered, drilled, or cut, purge all ammonia first.
- **Use proper ventilation.** Never work with ammonia in an unventilated area. Always ensure that you have adequate ventilation, and make sure that ventilation is non-sparking or explosion proof.
- **Store ammonia separately** from incompatible chemicals, away from heat and ignition sources.
- **Know what to do in case of a spill or leak.** Employees should be aware of customers' contingency plans and provisions. Employees must be informed where ammonia is used in the host facility and aware of additional plant safety rules. Report the spill or leak so it can be appropriately controlled.

Asbestos

Asbestos-containing building materials are present on many of our job sites. If the building was built, or the material installed before 1980, asbestos-containing materials may be present. In addition to the potential health hazards of improper handling of asbestos, severe civil and criminal penalties may be imposed on both companies and individuals involved in illegal handling of asbestos materials. Avoid these hazards by following these guidelines:

Before Starting Work

- Laboratory testing is the only method for determining the presence of asbestos in a building material.
- All building and facility owners are required to have performed building surveys to identify asbestos materials before beginning any demolition or renovation work. Ask to see the survey before starting work so that you know what kinds of asbestos are present, where it is located, and what building systems are known to be constructed of, or covered with asbestos.
- If no survey is available, all potentially asbestos-containing materials MUST be presumed to be asbestos-containing until proven otherwise. This includes ceiling tile, floor tile, roofing, tars and coatings, plaster and spackle, spray-on

insulation, thermal system insulation, valve packing, gasket and surfacing materials, brakes and clutches, mastic, putty, cement board, cement pipe and cement panels. These materials are called PACM (Presumed Asbestos Containing Material).

- If you believe that asbestos materials or asbestos-containing dust and debris are present in your work area, report it to your supervisor immediately and stay clear of the area until the asbestos status of the material has been determined.

Working Around Asbestos

- Only trained and qualified individuals are authorized to inspect, sample, repair and perform housekeeping duties around asbestos containing materials. Only certified asbestos individuals, using protective clothing and special work practices, are permitted to handle asbestos.
- Employees **SHALL** treat all valve packing, insulation, gasket and surfacing materials, brakes and clutches as an asbestos containing material unless proven by otherwise by laboratory analysis or testing records.
- If you MUST work near asbestos-containing materials, recognize that vibration from drilling and hammering as well as air movement from air cooled tools can disturb or dislodge asbestos fibers.
- **NEVER** drill into, cut or damage any asbestos-containing material.
- If asbestos, containing ***friable*** (easily broken down by hand pressure) materials such as spray-on fireproofing or pipe insulation is present, all dust and debris in the area should be presumed to be asbestos contaminated until proven otherwise. All areas above drop ceilings where friable asbestos is present should be carefully evaluated or cleaned by certified asbestos workers before any other work is performed.

REMEMBER, HAZARDOUS LEVELS OF AIRBORNE ASBESTOS FIBERS CANNOT BE SEEN BY THE NAKED EYE. IF ASBESTOS IS BEING DISTURBED, AIRBORNE FIBERS MAY BE PRESENT!

Back Safety

Identify the Hazards BEFORE You Attempt to Lift

- Are you wearing the proper gloves for lifting tools and materials? Are they in good condition? Slick gloves will not give you the grip you need.
- Is the load too heavy or awkward for one person?
- Is anything protruding from the load, such as nails, splinters, sharp edges, or rough strapping?
- Is my path of travel flat and clear of obstructions?
- Are you using proper lifting procedures?

- Flagged warning lines, stanchions, or cones can be erected and strategically placed to warn operators when encroaching to the minimum approach distance of overhead powerlines.

Silica Exposure

The most common silica dust-generating tasks include drilling holes in concrete ceilings or beams to install pipe and duct hangers and cutting, or boring holes in concrete floors, walls and ceilings to run pipe and duct. However, it's important that mechanical construction workers be familiar with all of the activities that could generate respirable silica dust, even if they are not performing the activities themselves. That way they can prevent overexposure to respirable silica dust generated by other trades. For example, if fitters are hanging pipe in an area being used by masons to cut brick and block, there is the potential for overexposure to the fitters and any other worker in the area. The construction activities that are most capable of generating respirable silica dust when performed on silica-containing materials are those that result in cutting, pounding, scraping, grinding or otherwise pulverizing material that contains silica.

The key to preventing silicosis is to keep dust out of the air. Dust controls can be as simple as a water hose to wet the dust before it becomes airborne. Employers and employees should use the following methods to control respirable crystalline silica dust:

- Every Winger jobsite will be assessed by a competent person (foreman, lead journeyman, etc.) for respirable silica dust. These hazards could be created either from Winger personnel performing their job tasks or those created by others. Determine when silica dust may be generated and plan ahead to eliminate or control the dust at the source.
- Use OSHA CFR §1926.1153 Table 1. Engineering controls will be put into place to reduce the amount of respirable silica into the atmosphere.
- Engineering controls such as local exhaust ventilation (with dust collectors) or wet methods may be used to prevent the release of dust into the air.
- When cutting, drilling, sawing, cleaning, etc., use the wet method whenever possible. When the wet method cannot be used or is not allowed, vacuums with HEPA or approved filters, hollow drill bits, etc., will be used.
- Use the dust collection systems available for many types of dust-generating equipment and tools. When purchasing tools, look for dust controls.
- Winger employees will operate and maintain tools with manufacturer's instructions to minimize dust exposure during work, disposal of dust, and keep them in good working order.
- **DO NOT** use equipment if the dust control system is not working properly.
- Use equipment that provides water to the blade or grinder when sawing or grinding concrete or masonry. Be sure to only use blades and abrasive wheels that are rated as safe for use with water.
- Minimize exposures to nearby workers by using good work practices, such as marking and posting the boundaries of work areas where exposure to airborne dust can occur.
- **DO NOT** cause dust to become airborne during clean-up. Remove dust from

Signs, Signals & Barricades

Signs, signals and barricades are warning and protective devices used to protect employees from potential hazards and hazardous areas on jobsites and in traffic areas. When you see warning signs at your work site, you should know what they mean and why they are there.

- Constantly look for, be aware of, and obey all signs, signals and barricades while working. They are there for your protection.
- DANGER signs refer to an immediate/imminent hazardous situation which, if not avoided, will result in death or serious injury.
- WARNING signs indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury. Warning signs are typically on pieces of equipment warning operators of safety precautions.
- CAUTION signs refer to potential hazards or caution you against unsafe work practices. If this situation is not avoided, it could result in minor or moderate injury.
- ***Notice signs*** are used for instructional purposes and are also placed around jobsites in strategic locations.
- ***Directional signs*** are used to mark safe and efficient routes of travel both form vehicles and personnel.
- Employees that are hand signaling to direct traffic are required to wear ANSI Type 2 high visibility traffic vests and use 18" x 18" orange flags.
- Coordinate with other flagmen and communicate with a radio if you do not have visual contact.
- ***Exit signs*** point to safety. Exit signs when required, MUST have red legible letters at least 6 inches high, on white background and are placed to exit a building.
- ***Safety Instruction signs*** are used for injury/incident prevention. They are usually placed around jobsites in strategic locations.
- ***Accident Prevention tags*** are temporary warning tags usually placed on defective tools or equipment.
- ***Lockout tags*** used to tag out sources of uncontrolled energy that cannot be locked out with a lock.
- DANGER / CAUTION tape and signs/placards MUST be posted on all sides of entry.
- Do not mix DANGER and CAUTION signage. Use DANGER placards with DANGER tape. Use CAUTION placards with CAUTION tape.
- **As a safe work practice, if at all possible, place barricades at least six (6) feet back away from for your work area.**
- Place the tape with the print upright so it is clearly legible.
- **DO NOT CROSS an area barricaded off with red DANGER tape unless you have installed it or have received permission from the person who installed it.**
- **DO NOT** remove any DANGER / CAUTION signs, barricades or flags unless you have placed them there or have been authorized to remove them.
- After your work is complete, tape and signs **MUST** be removed and discarded appropriately. Do not leave bits and pieces laying around.

Proper Lifting Techniques

- As a basic starting point, one person should be able to lift an object weighing up to 50 pounds (Lifting loads heavier than about 50 pounds will increase the risk of injury and is against Winger policy):
  - ✓ If the object is at waist height and directly in front of the person.
  - ✓ If the object is within 7 inches from the front of his or her body.
  - ✓ If there is no twisting involved.
  - ✓ If there is a handle on the object.
  - ✓ If the load inside doesn't shift once lifted.
  - ✓ Face the load with feet shoulder width apart
  - ✓ Keep heels down and toes pointed slightly out
  - ✓ Squat by bending at the hips
  - ✓ Use leg and stomach muscles to power the lift
  - ✓ Maintain the backs natural curves while lifting by keeping the head up
  - ✓ Keep your nose between your toes. In other words, don't twist while lifting.
  - ✓ Test the weight of the object, if it is too heavy, ask for assistance or use material handling equipment
- If any of the conditions listed above is not met, then the load would be considered "unsafe," and modifications must be made to make it a "safe" lift. In order to make it a safe lift:
  - ✓ The weight of the load must be decreased, or
  - ✓ It needs to be a "two-person" lift, or
  - ✓ Mechanical assistance must be used (dolly, cart, lift, etc.).
- Perform stretches before lifting to prepare your body muscles for lifting.
- When possible, avoid physical lifting. When necessary, test the load and ask for help.
- Utilize the correct material handling equipment for the job. Use chain hoists, dollies, or mobilized equipment as lift aids.
- Keep the load as close to your body as possible.
- Stand close to the load with your feet spread apart about shoulder width, with one foot slightly in front of the other for balance.
- Squat down bending at the knees, not your waist. Tuck your chin while keeping your back as vertical as possible.
- Don't hold your breath! Every time you breathe in and out it flexes and extends your spine. Keep your breathing long and strong as opposed to stressed and shallow. When you lift, you should ALWAYS breathe out as this decreases the pressure on your spinal discs and helps prevent you "popping a disc".
- Get a firm grasp of the object before beginning the lift.
- Begin by slowly lifting with your legs. **NEVER** twist your body while lifting.
- Once the lift is complete, keep the object as close to your body as possible. As the load's center of gravity moves away from the body, there is a dramatic increase of force to the lumbar region of the back.
- **NEVER** twist your waist while carrying the load. Turn your body by using your feet.
- When lifting with another person, give verbal instructions clearly – say: "lift",

"walk", "set down" or "unload".

- When two or more employees are carrying an object, each employee should face the direction of travel when possible.
- Walk around and use backward-bending and/or stomach-lying stretching positions before or after bending or heavy lifting, especially if you've been sitting for a while.

How Can I Avoid Back Injuries?

- It has been a Winger policy since January 2014, to start your day with stretches and again throughout the day as needed.
- Remember, what you put into it your stretches will determine your outcome. Stretches must be done properly to achieve the desired results. Target areas are necks, shoulders, elbows, wrists, waist, back, hips, knees and ankles.
- Take care of YOURSELF! Be proactive. Your body is the most important asset you have. You can't be as productive at work or to your family if you have a strain or sprain.
- Get the rest you need. The gaps between your vertebrae will have increased and your cerebrospinal fluid will be replenished.
- Drink plenty of water. Drinking alcohol excessively after hours leads to dehydration.
- Warm up before you make a lift. Stretch your legs and your back before lifting anything.
- Pace yourself. Take many small breaks between lifts if you are lifting a number of things.
- Don't overdo it—don't try to lift something too heavy for you. If you have to strain to carry the load, it's too heavy.
- Make sure you have enough room to lift safely. Clear a space around the object before lifting it.
- Look around before you lift and look around as you carry. Make sure you can see where you are walking. Know where you are going to put down the load.
- Avoid walking on slippery, uneven surfaces while carrying something.
- Don't rely on a back belt to protect you. It hasn't been proven that back belts can protect you from back injury.
- Get help before you try to lift a heavy load. Use material handling devices as much as possible.

Battery Charging

Occasionally we need to charge batteries for our work trucks or mobile equipment. There are several hazards when dealing with charging batteries, Hydrogen gas, sulfuric acid, electrical shock, fire and explosion hazards and the battery weight itself, follow these safety precautions when jump starting a vehicle:

- Always wear proper eye protection and never lean over battery
- Inspect both batteries before connecting booster cables. Do not jump start a damaged battery

length. That sum is then multiplied by the duty rating. On a 5' x 7' light duty scaffold, the maximum load rating equals 875 pounds.

- The scaffold legs **MUST** be placed on a solid surface. Scaffold legs **MUST** rest on adjustable screw jacks with base plates. The base plates are to be set on wooden pads called mud sills. The base plates **MUST** be secured to the mud sills. The only place that does not require mud sills is on concrete.
- Each section of the scaffold **MUST** be plumb, square, and rigid. Cross-bracing components are to be installed for strength and stability.
- OSHA requires a guardrail system to be installed on all supported scaffold platforms 10 feet or more in height. This is measured from the ground to the platform deck. However, guardrail systems should be installed on all platforms at any height.
- Working platforms are to be fully planked with maximum spacing gaps of no more than 1" between planks. Only scaffold grade planking bearing a grade stamp or label is to be used. The planks are to be secured to the support bracing.

- Scaffold planks **MUST** be secured and extend over the end supports at least six inches but not more than twelve inches.
- Toeboards are to be a minimum of 3-1/2" high and MUST be installed along the edges of platforms 10 or more feet in height.
- Where there is a danger of tools, materials, or equipment falling from a scaffold and striking employees below, the area below the scaffold **SHALL** be barricaded to prevent entry into the area and injury to others.
- Supplies or materials packaged in bags, containers, or bundles should be stacked, blocked, and interlocked to avoid sliding, shifting, or collapse.
- Supplies and materials should be stacked to a height as low as practical.
- **DO NOT** lower materials or tools from any scaffold platform without being positive that no one is located below.
- Tie off to vertical scaffold member is allowed as long as the scaffold has been erected according to manufacturer's recommendations and approved.
- The manufacturer's recommended attachable component ladders are to be installed to provide access to each working platform. **NEVER** climb on the cross-bracing of a scaffold.
- Scaffold ladder access areas **SHALL** be kept clear of obstructions and free from dirt and debris to avoid slip and trip hazards.
- When climbing up or down scaffold ladders, face the ladder rungs and use both hands. **DO NOT** carry materials up the ladder.

Scaffolding

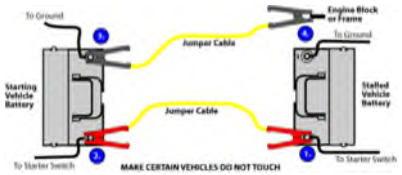
Winger Companies' policy states only employees that are trained in scaffolds are allowed to work on scaffolds. Most of our employees are Scaffold User trained in the safe use of scaffolding on our jobsites. Only employees that have attended Scaffold Erector/Competent Person Training are allowed to assemble and inspect scaffolding.

General Scaffolding Safety Requirements

- **WARNING:** Serious injury or death can result from improper use of electrical equipment while performing work activities from scaffold. **ALWAYS** be alert for electrical hazards, maintain minimum clearance distances, and follow safe electrical work practices and procedures.
- Only trained employees **SHALL** use scaffolding.
- All scaffolding MUST be erected, maintained, and inspected to conform to OSHA standards.
- Each scaffold MUST be inspected and approved by a **competent person prior to use each work shift.** This daily inspection **MUST** be documented on the scaffold inspection tag.
  - RED TAG: **DO NOT USE.** The scaffold is either in the process of being erected or dismantled, or it has not passed inspection.
  - YELLOW TAG: **100% TIE-OFF** is required. The scaffold is safe to work on, but fall protection is required due to missing guardrail components, or other potential fall hazards.
  - GREEN TAG: Has all of the required guardrail components and does not require fall protection when working on the scaffold.

- Any damaged or missing scaffold components **SHALL** be brought to the attention of the competent person who is responsible for the daily inspection of the scaffold. The scaffold **cannot** be used until such deficiencies are corrected.
- Scaffolds **SHALL** be capable of supporting at least four times the maximum intended load. **DO NOT** overload scaffolds. Materials should be brought up as needed.
- When the height of scaffolding exceeds **four** times it's minimum base width, it **MUST** be tied back or secured to the structure.
- There are three different load ratings for scaffolds:
  - **Light Duty** = 25 pounds per square foot on working surface
  - **Medium Duty** = 50 pounds per square foot on working surface
  - **Heavy Duty** = 75 pounds per square foot on working surface
- Always calculate the duty rating of scaffolds to include employees and expected load weight of materials and tools. Take the scaffold width times the

- Be sure vent caps are tight and level
- Make certain that the vehicles are not touching and both ignition switches are turned to the OFF position
- Connect positive (+) booster cable to positive (+) terminal of discharged battery.
- Connect other end of positive (+) cable to positive (+) terminal of assisting battery



- Connect negative (-) cable to negative (-) terminal of assisting battery
- **MAKE FINAL CONNECTION OF NEGATIVE (-) CABLE TO ENGINE BLOCK OF STALLED VEHICLE, AWAY FROM BATTERY**
- Start vehicle and remove cables in REVERSE order of connections.

Benzene

Benzene is clear liquid solvent made from petroleum. Benzene has a recognizable odor described as "pleasant and sweet". Benzene vapors are heavier that air and may travel to a source of ignition and flash back. The vapors are readily dispersed by wind movement and/or air currents. It evaporates into the air very quickly and dissolves slightly in water. Benzene is a highly flammable liquid that can accumulate static electricity. Liquid benzene tends to float on water and may travel to a source of ignition and spread fire. Benzene is highly reactive with no oxidizing materials. Gasoline contains 1% to 4% benzene which the reason it is found at refineries. As a gasoline (petrol) additive, benzene increases the octane rating and reduces knocking.

Benzene still ranks in the top 20 chemicals for production volume in the United States. Some industries use benzene to make other chemicals which are used to make plastics, resins, and nylon and synthetic fibers. Benzene is also used to make some types of rubbers, lubricants, dyes, detergents, drugs, and pesticides. Natural sources of benzene include volcanoes and forest fires. Benzene is also a natural part of crude oil, gasoline, and cigarette smoke. Toluene is now often used as a substitute for benzene. The solvent-properties of the two are similar, but toluene is less toxic and has a wider liquid range.

The following adverse health effects are important to remember where there may be a potential exposure to Benzene:

- **Acute:** At high concentrations (1000 PPM) Benzene has an acute effect on the central nervous systems causing headaches, dizziness, drowsiness, unconsciousness, and possible death. Acute exposure can also cause breathlessness, irritability, and giddiness.
- **Chronic:** Benzene has the chronic exposure effect on bone marrow (aplastic anemia leukemia). Chronic exposure can also cause convulsions, liver damage, heart damage, blood diseases (aplastic anemia), and cancer (leukemia). These symptoms can take months or years to surface and can develop without physical or visible indications.

Following are basic guidelines if an employee has been or is exposed to levels above OSHA permissible limits:

- Regular jobsite inspections by the Project Manager or competent person.
- Engineering controls help keep the source emissions low or limit the amount of exposure to the employee. Controls include ventilation systems that capture the contaminant at the source, or process changes to minimize the amount of time the employee spends around exposure sources.
- The areas where benzene levels are above the permissible exposure limit of 1 ppm are called "exposure control areas". These areas may change depending on the type of work that is done and the measured level of benzene in the air.
- The boundaries of the exposure area must be marked. These are areas where exposures are dangerous without proper protection and training. If you aren't authorized and trained to use a respirator, you can't enter these areas.

- Benzene liquid is highly flammable and vapors may form explosive mixtures in air. Fire extinguishers must be readily available in areas where benzene is used or stored.
- Wash your hands before eating, drinking or smoking or using the bathroom.
- Don't eat, drink or smoke in the work area where you are exposed to benzene. Separate areas will be provided for break and lunch activities.
- Cover containers when they aren't in use. The rule points out that this helps prevent unnecessary vapor exposure and helps prevent spills.
- Rigorous housekeeping is necessary to keep airborne benzene levels below permissible limits.
- If benzene liquid could splash on your skin or eyes, you'll need to wear protection.
- You must wear an approved respirator in designated "exposure control areas" – the areas with the warning signs.
- If benzene is spilled on your, or if you know or believe you have inhaled benzene, let your supervisor know immediately.
- Leave the area immediately.
- Do not attempt to clean up the spill.
- As mentioned earlier, benzene has a pleasant sweet odor which most people detect at a level above the permissible limit. If you can smell it, it probably means you have been overexposed to it. If you smell it while wearing your respirator, then your respirator is leaking and either needs to be fit properly or the reason for the leak determined. If you develop any symptoms commonly associated with benzene exposure, we will make a medical exam available to you.
- Benzene is one of the Lower Explosive Limit (LEL) components detected by our MSA Orion and Altair gas monitors.

Bloodborne Pathogens

Bloodborne pathogens are pathogenic micro-organisms that are present in human blood

Size		Wall Thickness & Weight									
Norminal Pipe Size in inch	Outside Diameter	Schedule - 5s		Schedule - 10s		Schedule - 40s		Schedule - 80s	
	(mm)	W.T. in (mm.)	Wt. kg/Mt.	W.T. in (mm.)	Wt. kg/Mt.	W.T. in (mm.)	Wt. kg/Mt.	W.T. in (mm.)	Wt. kg/Mt.
1/4	13.72	1.24	0.387	1.65	0.498	2.24	0.643	3.02	0.808
3/8	17.15	1.24	0.493	1.65	0.640	2.31	0.857	3.20	1.116
1/2	21.34	1.65	0.812	2.11	1.014	2.77	1.286	3.73	1.642
3/4	26.67	1.65	1.032	2.11	1.300	2.87	1.708	3.91	2.225
1	33.40	1.65	1.310	2.77	2.121	3.38	2.537	4.55	3.282
1¼	42.16	1.65	1.671	2.77	2.728	3.56	3.435	4.85	4.524
1½	48.26	1.65	1.923	2.77	3.150	3.68	4.101	5.08	5.484
2	60.33	1.65	2.421	2.77	3.986	3.91	5.515	5.54	7.588
2½	73.03	2.11	3.741	3.05	5.336	5.16	8.756	7.01	11.570
3	88.90	2.11	4.578	3.05	6.546	5.49	11.448	7.62	15.484
3½	101.60	2.11	5.248	3.05	7.514	5.74	13.756	8.08	18.891
4	114.30	2.11	5.918	3.05	8.483	6.02	16.296	8.56	22.628
5	141.30	2.77	---	2.77	9.593	---	---	---	---
6	168.30	3.40	---	3.40	11.722	---	---	---	---

Carbon Steel Tubing: Lbs. per Ft.
CLICK TABLE TO ENLARGE

wall	0.035 - 20 BWG		0.049 - 18 BWG		0.058 - 17 BWG		0.065 - 16 BWG		0.083 - 14 BWG		0.095 - 13 BWG	
OD	min wall	avg wall	min wall	avg wall	min wall	avg wall	min wall	avg wall	min wall	avg wall	min wall	avg wall
1/2"	0.1967	0.1740	0.2658	0.2362	0.3062	0.2740	0.3370	0.3023	0.4113	0.3700	0.4556	0.4113
5/8"	0.2501	0.2207	0.3408	0.3017	0.3944	0.3516	0.4358	0.3891	0.5382	0.4808	0.6012	0.5382
3/4"	0.3036	0.2675	0.4155	0.3672	0.4826	0.4291	0.5348	0.4760	0.6652	0.5918	0.7469	0.6652
7/8"	0.3570	0.3143	0.4903	0.4327	0.5708	0.5066	0.6336	0.5628	0.7921	0.7027	0.8926	0.7921
1"	0.4105	0.3611	0.5651	0.4981	0.6590	0.5841	0.7325	0.6497	0.9191	0.8136	1.0382	0.9191
1-1/4"	0.5174	0.4546	0.7148	0.6291	0.8364	0.7391	0.9303	0.8234	1.1730	1.0364	1.3295	1.1730
1-1/2"	0.6243	0.5481	0.8644	0.7600	1.0117	0.8941	1.1281	0.9971	1.4268	1.2573	1.6208	1.4268
1-3/4"	0.7312	0.6417	1.0141	0.8910	1.1881	1.0491	1.3258	1.1708	1.6807	1.4791	1.9121	1.6807
2"	0.8381	0.7352	1.1638	1.0220	1.3645	1.2041	1.5236	1.3445	1.9346	1.7009	2.2034	1.9346
2-1/8"	0.8915	0.7820	1.2386	1.0874	1.4527	1.2816	1.6225	1.4314	2.0616	1.8118	2.3491	2.0616
2-1/4"	0.9450	0.8287	1.3134	1.1529	1.5409	1.3591	1.7213	1.5182	2.1885	1.9227	2.4947	2.1885
2-1/2"									2.4424	2.1445	2.7860	2.4424
3"										2.5882	3.3666	2.9502
3-1/2"												

PLATE	
304	5513
304L	5511
316	5524
316L	5507
321	5510
347	5512
410	5504
17-4PH	5604
17-7PH	5528

STAINLESS STEEL PLATES							
Thickness in Inches		Pounds per Sq. Foot	Pounds per Sq. Inch	Thickness in Inches		Pounds per Sq. Foot	Pounds per Sq. Inch
Fraction	Decimal			Fraction	Decimal		
3/16	.1875	8.579	.0596	15/16	.9375	39.875	.2769
1/4	.2500	11.162	.0775	1	1.000	42.665	.2963
5/16	.3125	13.746	.0955	1-1/8	1.125	47.833	.3322
3/8	.3750	16.496	.1146	1-1/4	1.250	53.001	.3681
7/16	.4375	19.080	.1325	1-3/8	1.375	58.176	.4040
1/2	.5000	21.663	.1504	1-1/2	1.500	63.337	.4398
9/16	.5625	24.247	.1684	1-3/4	1.750	73.672	.5116
5/8	.6250	26.831	.1863	2	2.000	84.008	.5834
11/16	.6875	29.415	.2043	2-1/4	2.250	94.778	.6582
3/4	.7500	32.123	.2231	2-1/2	2.500	105.113	.7300
13/16	.8125	34.707	.2410	2-3/4	2.750	115.449	.8017
7/8	.8750	37.291	.2500	3	3.000	126.301	.8771
				4	4.000	163.264	1.1685

and can cause disease in humans. These pathogens include, but are not limited to, Hepatitis B Virus (HBV) and Human Immunodeficiency Virus (HIV). Universal precautions **SHALL** be used in all cases when there is potential exposure to Bloodborne Pathogens.

HBV and HIV are not transmitted by:

- Touching an infected person.
- Coughing or sneezing
- Using the same equipment, materials, toilets, water fountains or showers as an infected person.

You can contract either virus by;

- Potentially contaminated water such as sewage or industrial waste discharge systems.
- Sexual contact
- Shared hypodermic needles
- Accidental puncture from contaminated needles, broken glass, or other sharp objects
- Contact between mucous membranes and infected body fluids:
  - ✓ Blood
  - ✓ Open sores, Acne, Cuts, Abrasions, any sort of damaged or broken skin such as sunburn or blisters,
  - ✓ Saliva, Mucus, Vomit,
  - ✓ Bodily Secretions and Excretions,
  - ✓ Semen, Vaginal Secretions
  - ✓ Urine, Feces,
  - ✓ Eyes, Nose, Mouth
  - ✓ Open Body Tissues
- A splash of contaminated blood to your eye, nose or mouth could result in transmission. If blood is splashed in the eye or mucous membrane, flush the affected area with running water for at least 15 minutes.

Exposure Control Plan

The risk to blood borne pathogens is very minimal to employees in our line of work. Some of the ways we could become infected are:

- Working in public places such as hospitals, nursing homes, schools, etc.
- Working on plumbing or wastewater systems
- Sewage or river water
- Administering first aid or CPR
- Cleaning up after a co-worker drips blood around the work area

Following are some examples of the Universal Precautions that will help minimize occupational exposure to bloodborne pathogens among our workforce.

- Use and wear the appropriate personal protective equipment (PPE) to prevent human blood and body fluids from contacting your eyes, nose, mouth, or open cuts, punctures or abrasions in the skin:
  - ✓ Safety glasses or goggles.
  - ✓ Disposable medical exam nitrile gloves. Additionally, work gloves

should be worn in areas where sharp edges are present to reduce the potential for cuts.

- ✓ Surgical mask that covers your nose and mouth or a face shield.
- ✓ Rescue breathers with a one-way valve **SHALL** be utilized whenever resuscitation and /or CPR is administered.

- If you do come in contact with another person's bodily fluids, wash your hands or any exposed areas of your body immediately (or as soon as feasible) with antibacterial soap. Avoid harsh, abrasive soaps, as these may open fragile scabs or other sores. If a garment is contaminated by blood or other potentially infectious material, the garment **SHALL** be removed as soon as possible.
- Good housekeeping practices are critical. Any spill of blood or body fluids MUST be immediately cleaned up with approved disinfecting agents. The area should be cleaned and rinsed thoroughly with a disinfectant solution. Suggested solution is 1-part bleach to 10 parts water.
- All contaminated clothing, PPE, first aid supplies, and contaminated waste materials SHALL be bagged and disposed of according to customer site-specific procedures for disposal of infectious materials.
- Hepatitis B shots are available for personnel working on or in waste or sewer systems where the exposure levels would be higher.

IF YOU FEEL YOU HAVE BEEN EXPOSED TO BLOODBORNE PATHOGENS, CONTACT BOTH YOUR SUPERVISOR AND SAFETY DIRECTOR IMMEDIATELY.

Cadmium

Cadmium exerts toxic effects on the kidney, the skeletal system and the respiratory system and is classified as a human carcinogen. It is generally present in the environment at low levels; however, human activity has greatly increased those levels. Cadmium can travel long distances from the source of emission by atmospheric transport. It is readily accumulated in many organisms, notably mollusks and crustaceans. Lower concentrations are found in vegetables, cereals and starchy roots. Human exposure occurs mainly from consumption of contaminated food, active and passive inhalation of tobacco smoke and inhalation by workers in the non-ferrous metal industry. National, regional and global actions are needed to decrease global environmental cadmium releases and reduce occupational and environmental exposure.

Sources of Exposure to Cadmium

Cadmium is used frequently as a rust-preventive coating on steel and also as an alloying element. Acute exposures to high concentrations of cadmium fumes can produce sever lung irritation. Long-term exposure to low levels of cadmium in air can result in emphysema (a disease affecting the ability of the lung to absorb oxygen) and can damage the kidneys.

Cadmium fumes or fine dust are capable of causing serious injury or death when inhaled. It is easy to mistake cadmium-plated steel for galvanized steel. However, when heated,

TABLE OF GAUGES AND WEIGHTS

	Steel		Galvanized Steel		Stainless USS Gauge			Monel		Brass		Copper		Aluminum		Zinc		Tin	
	USS Gauge Rev.		USS Gauge			lbs. per sq. ft.		USS Gauge		B&S Gauge		B&S Gauge		B&S Gauge		Zinc Gauge		Tin Plate Gauge	
Gauge	Decimal Thick	lbs. per sq. ft.	Decimal Thick	lbs. per sq. ft.	Decimal Thick	Chrome Alloy	Chrome Nickel	Decimal Thick	lbs. per sq. ft.	Decimal Thick	lbs. per sq. ft.	Decimal Thick	lbs. per sq. ft.	Decimal Thick	lbs. per sq. ft.	Decimal Thick	lbs. per sq. ft.	Decimal Thick	lbs. per sq. ft.
32	.0100	.408	.0134	.560	.009	.371	.378	.....	.....	.0080	.353	.0080	.371	.008	.113	.....	.....	.0061	.2526
31	.0110	.449	.0142	.594	.010	.412	.420	.010	.459	.0089	.392	.0100	.464	.009	.127	.....	.....	.0066	.2755
30	.0120	.490	.0157	.656	.012	.495	.504	.012	.551	.0100	.441	.0108	.500	.010	.141	.....	.....	.0072	.2985
29	.0135	.563	.0172	.719	.013	.536	.546	.014	.650	.0113	.498	.0126	.584	.011	.155	.....	.....	.0077	.3214
28	.0149	.625	.0187	.781	.015	.599	.610	.015	.699	.0126	.555	.0135	.625	.012	.170	.....	.....	.0083	.3444
27	.0164	.688	.0202	.844	.016	.660	.672	.....	.....	.0142	.626	.0159	.737	.014	.197	.500	18.60	.0088	.3673
26	.0179	.750	.0217	.906	.0178	.736	.750	.018	.827	.0159	.700	.0162	.750	.016	.225	.375	14.00	.0094	.3903
25	.0209	.875	.0247	1.031	.021	.866	.882	.021	.965	.0179	.789	.0189	.875	.018	.254	.250	9.30	.0099	.4133
24	.0239	1.000	.0276	1.156	.0235	.972	.990	.025	1.148	.0201	.886	.0201	.932	.020	.282	.125	4.70	.0105	.4362
23	.0269	1.125	.0306	1.281	.026	1.072	1.092	.028	1.286	.0226	.996	.0216	1.000	.022	.310	.100	3.75	.0110	.4592
22	.0299	1.250	.0336	1.406	.0291	1.197	1.220	.031	1.424	.0254	1.115	.0226	1.050	.025	.353	.090	3.37	.0118	.4913
21	.0329	1.375	.0366	1.531	.032	1.319	1.344	.034	1.562	.0285	1.256	.0243	1.125	.028	.395	.080	3.00	.0123	.5143
20	.0359	1.500	.0396	1.656	.0355	1.462	1.490	.037	1.700	.0320	1.410	.0253	1.170	.032	.452	.070	2.62	.0130	.5418
19	.0418	1.750	.0456	1.906	.042	1.731	1.764	.043	1.975	.0359	1.582	.0270	1.250	.036	.508	.060	2.25	.0141	.5878
18	.0478	2.000	.0516	2.156	.048	1.979	2.016	.050	2.297	.0403	1.776	.0285	1.320	.040	.564	.055	2.06	.0149	.6199
17	.0538	2.250	.0575	2.406	.054	2.226	2.268	.056	2.572	.0453	1.996	.0320	1.480	.045	.635	.050	1.87	.0153	.6383
16	.0598	2.500	.0635	2.656	.0595	2.454	2.500	.062	2.848	.0508	2.238	.0323	1.500	.050	.706	.045	1.68	.0163	.6795
15	.0673	2.812	.0710	2.969	.067	2.762	2.814	.070	3.216	.0571	2.516	.0350	1.625	.056	.790	.040	1.50	.0171	.7117
14	.0747	3.125	.0785	3.281	.075	3.047	3.150	.078	3.583	.0641	2.825	.0359	1.660	.063	.889	.036	1.35	.0185	.7714
13	.0897	3.750	.0934	3.906	.090	3.710	3.780	.093	4.272	.0720	3.173	.0377	1.750	.071	1.000	.032	1.20	.0193	.8036
12	.1046	4.375	.1084	4.531	.105	4.328	4.410	.109	5.007	.0808	3.560	.0431	2.000	.080	1.130	.028	1.05	.0198	.8255
11	.1196	5.000	.1233	5.156	.120	4.946	5.040	.125	5.742	.0907	3.997	.0485	2.250	.090	1.270	.024	.90	.0207	.8633
10	.1345	5.625	.1382	5.781	.135	5.523	5.628	.140	6.431	.1019	4.490	.0508	2.360	.100	1.410	.020	.75	.0215	.8954
9	.1495	6.250	.1532	6.406	.150	6.183	6.300	.156	7.166	.1144	5.041	.0512	2.375	.112	1.579	.018	.67	.0229	.9551
8	.1644	6.875	.1681	7.031	.165	6.801	6.930	.172	7.855	.1285	5.662	.0539	2.500	.125	1.760	.016	.60	.0231	.9643
7	.1793	7.500	.....	.....	.1874	7.708	7.854	.187	8.590	.1443	6.358	.0641	2.970	.140	1.980	.014	.52	.0237	.9872
3/16"	.1875	7.660	.....	.....	.....	.....	8.579	.....	.....	.....	.....	.....	.....	.190	2.713				
1/4"	.2500	10.210	.....	.....	.....	11.16	11.160	.....	.....	.....	.....	.....	.....	.....	3.530				
5/16"	.3125	12.760	.....	.....	.....	15.75	13.750	.....	.....	.....	.....	.....	.....	.....	4.420				
3/8"	.3750	15.320	.....	.....	.....	15.97	16.500	.....	.....	.....	.....	.....	.....	.....	5.290				
1/2"	.5000	20.420	.....	.....	.....	.....	21.660	.....	.....	.....	.....	.....	.....	.....	7.060				
5/8"	.6250	25.530	.....	.....	.....	.....	26.830	.....	.....	.....	.....	.....	.....	.....	8.920				
3/4"	.7500	30.630	.....	.....	.....	.....	32.120	.....	.....	.....	.....	.....	.....	.....	10.580				
1"	1.0000	40.800	.....	.....	.....	.....	42.670	.....	.....	.....	.....	.....	.....	.....	14.110				

NOTE: To calculate weight per square foot of perforated screen
(a) subtract % open area from 100%
to determine % material in screen;
(b) multiply % material in screen times blank pounds per square foot of material. (Open area % does not include margins.)

WIRE ROPE CLIP DROP FORGED

Clip Size (Inches)	Rope Size (Inches)	Minimum No. of Clips	Amount of Rope to Turn Back in Inches	Torque in Ft. Lbs.
1/8	1/8	2	3-1/4	4.5
3/16	3/16	2	3-3/4	7.5
1/4	1/4	2	4-3/4	15
5/16	5/16	2	5-1/4	30
3/8	3/8	2	6-1/2	45
7/16	7/16	2	7	65
1/2	1/2	3	11-1/2	65
9/16	9/16	3	12	95
5/8	5/8	3	12	95
3/4	3/4	4	18	130
7/8	7/8	4	19	225
1	1	5	26	225
1-1/8	1-1/8	6	34	225
1-1/4	1-1/4	7	44	360
1-3/8	1-3/8	7	44	360
1-1/2	1-1/2	8	54	360
1-5/8	1-5/8	8	58	430
1-3/4	1-3/4	8	61	500
2	2	8	71	750
2-1/4	2-1/4	8	73	750
2-1/2	2-1/2	9	84	750
2-3/4	2-3/4	10	100	750
3	3	10	106	1200
3-1/2	3-1/2	12	149	1200

FIST GRIP CLIP

Clip Size (Inches)	Rope Size (Inches)	Minimum No. of Clips	Amount of Rope to Turn Back in Inches	Torque in Ft. Lbs.
3/16	3/16	2	4	30
1/4	1/4	2	4	30
5/16	5/16	2	5	30
3/8	3/8	2	5-1/4	45
7/16	7/16	2	6-1/2	65
1/2	1/2	3	11	65
9/16	9/16	3	12-3/4	130
5/8	5/8	3	13-1/2	130
3/4	3/4	3	16	225
7/8	7/8	4	26	225
1	1	5	37	225
1-1/8	1-1/8	5	41	360
1-1/4	1-1/4	6	55	360
1-3/8	1-3/8	6	62	500
1-1/2	1-1/2	7	78	500

STEP 1:
Apply 1st clip one base width from dead end of the rope. Put u bolt over dead end. Line end nuts in clip saddle. Tighten nuts evenly to recommended torque.

STEP 2:
Apply 2nd clip as close to loop as possible. Put U bolt over dead end turn nuts firmly but do not tighten.

STEP 3:
other clips space evenly between first two. Apply tension and tighten all nuts to recommended torque.
RE-CHECK NUT TORQUE AFTER ROPE HAS BEEN IN OPERATION

cadmium leaves an olive-drab color as it oxidizes. Always know the metal you are working with. Cadmium oxide fumes often cause no symptoms until a few hours after exposure.

Cadmium can be released to the environment in a number of ways, including: natural activities, such as volcanic activity (both on land and in the deep sea), weathering and erosion, and river transport; human activities, such as tobacco smoking, mining, smelting and refining of non-ferrous metals,6 fossil fuel combustion, incineration of municipal waste (especially cadmium-containing batteries and plastics), manufacture of phosphate fertilizers, and recycling of cadmium-plated steel scrap and electric and electronic waste; remobilization of historic sources, such as the contamination of watercourses by drainage water from metal mines. Cadmium releases can be carried to and deposited on areas remote from the sources of emission by means of long-range atmospheric transport.

Protection of Employees

When tasks are presumed to generate cadmium exposures greater that the permissible exposure limit (PEL) of 5 ug/m3 of air averaged over an eight-hour period, we will treat affected employees as if they were exposed above the PEL and implement procedures to protect workers until we perform an employee exposure assessment and document that an employee's cadmium exposure is not above the PEL. Tasks estimated to generate a TWA of 5 ug/m3 of air include:

- Manual demolition, manual scraping, manual sanding, heat gun applications, and power tool cleaning with dust collection systems where cadmium coatings or contaminants are present.
- Emergency operations involving cadmium or cadmium burning.
- Power tool cleaning without dust collection systems where cadmium contamination is present.
- Cleanup activities, where dry expendable abrasives are used, and abrasive blasting enclosure movement and removal where cadmium containing coatings or contaminants are present.

Based on historical data from previous cadmium jobs, we will take measures as recommended in 29 CFR 1926.62 to protect our employees. These measures include but are not limited to:

- Prohibit smoking in public places.
- Reduce emissions, increase recycling
- Know the materials you are working with
- Use ventilation and exhaust fans when possible
- Appropriate respiratory protection (protection factor of 10, 25, 5, or 100 depending on the tasks involved and the estimated exposures).
- Proper personal protective clothing and equipment
- Change areas
- Hand washing facilities
- Biological monitoring
- Medical surveillance program

Chlorine Awareness

Chlorine is a powerful disinfectant and bleaching agent. In both gas and liquid forms, chlorine is a toxic substance that presents a number of hazards. Gaseous chlorine refers to chlorine purchased in its elemental form, occurring in the gaseous or-liquid state. Chlorine has a characteristic penetrating and irritating, pungent odor. The gas is greenish yellow in color and the liquid is clear amber. Gaseous chlorine is 2.5x heavier than air and will initially remain in low-lying areas unless wind or other conditions provide air movement.

How Can People Be Exposed to Gaseous Chlorine?

Chlorine has a variety of uses. It is used to disinfect water and is part of the sanitation process for sewage and industrial waste. During the production of paper and cloth, chlorine is used as a bleaching agent. It is also used in cleaning products, including household bleach which is chlorine dissolved in water. Chlorine is used in the preparation of chlorides, chlorinated solvents, pesticides, polymers, synthetic rubbers, and refrigerants.

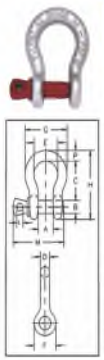
Chlorine is found in many industrial processes such as those used to make plastics, vinyl, and nylon, oil refineries, clean water treatment, sewage wastewater treatment, pulp/paper bleaching, pharmaceuticals, agricultural pesticides and the food/beverage industry, too. The electronics industry relies on chlorine in the production of microprocessors and computers. Chlorine supports the manufacture of gasoline additives, brake fluid, and antifreeze, as well as popular metals such as titanium, magnesium, and aluminum.

Dangers of Gaseous Chlorine Exposure

Chlorine is a respiratory irritant, and under conditions of sufficient concentration and exposure, can cause vomiting and death by suffocation. Chlorine, especially when combined with even small amounts of water, is highly corrosive, and can cause severe frostbite burns when brought into contact with skin and eyes.

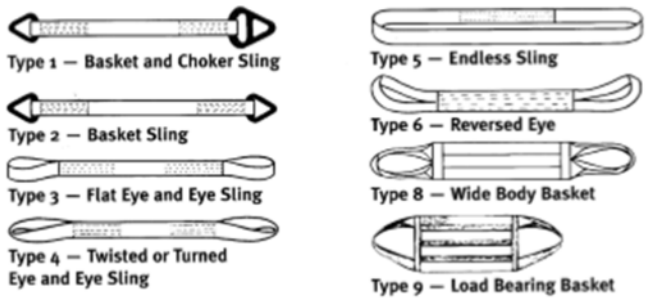
Because of its widespread use in industrial and commercial locations, exposure to chlorine could occur from an accidental spill or release, or from a deliberate terrorist attack. The most harmful route of exposure is from breathing chlorine gas. Exposure may also result from skin contact or eye contact with chlorine gas or by swallowing chlorine-contaminated food or water.

Chlorine reacts with many organic compounds to form chlorinated derivatives. Some reactions can be extremely violent, especially those with hydrocarbons, alcohols and ethers. Proper methods must be followed, whether in laboratory or plant, when organic materials are reacted with chlorine.



Nominal Size (in)	Working Load Limit (t)	Stock No. G-209	Stock No. S-209	Weight each (lbs)	Dimensions (in) A	B	C	D	E	F	G	H	L	M	P	Tolerance +/- C	A
3/16	1/3	1018357	-	.06	.38	.25	.88	.19	.60	.56	.98	1.47	.16	1.12	.19	.06	.06
1/4	½	1018375	1018384	.10	.47	.31	1.13	.25	.78	.61	1.28	1.84	.19	1.38	.25	.06	.06
5/16	3/4	1018393	1018400	.19	.53	.38	1.22	.31	.84	.75	1.47	2.09	.22	1.66	.31	.06	.06
3/8	1	1018419	1018428	.31	.66	.44	1.44	.38	1.03	.91	1.78	2.49	.25	2.03	.38	.13	.06
7/16	1-1/2	1018437	1018446	.38	.75	.50	1.69	.44	1.16	1.06	2.03	2.91	.31	2.38	.44	.13	.06
1/2	2	1018455	1018464	.72	.81	.63	1.88	.50	1.31	1.19	2.31	3.28	.38	2.69	.50	.13	.06
5/8	3-1/4	1018473	1018482	1.37	1.06	.75	2.38	.63	1.69	1.50	2.94	4.19	.44	3.34	.69	.13	.06
3/4	4-3/4	1018491	1018507	2.35	1.25	.88	2.81	.75	2.00	1.81	3.50	4.97	.50	3.97	.81	.25	.06
7/8	6-1/2	1018516	1018525	3.62	1.44	1.00	3.31	.88	2.28	2.09	4.03	5.83	.50	4.50	.97	.25	.06
1	8-1/2	1018534	1018543	5.03	1.69	1.13	3.75	1.00	2.69	2.38	4.69	6.56	.56	5.13	1.06	.25	.06
1-1/8	9-1/2	1018552	1018561	7.41	1.81	1.25	4.25	1.16	2.91	2.69	5.16	7.47	.63	5.71	1.25	.25	.06
1-1/4	12	1018570	1018589	9.50	2.03	1.38	4.69	1.29	3.25	3.00	5.75	8.25	.69	6.25	1.38	.25	.06
1-3/8	13-1/2	1018598	1018605	13.53	2.25	1.50	5.25	1.42	3.63	3.31	6.38	9.16	.75	6.83	1.50	.25	.13
1-1/2	17	1018614	1018623	17.20	2.38	1.63	5.75	1.54	3.88	3.63	6.88	10.00	.81	7.33	1.62	.25	.13
1-3/4	25	1018632	1018641	27.78	2.88	2.00	7.00	1.84	5.00	4.19	8.86	12.34	1.00	9.06	2.25	.25	.13
2	35	1018650	1018669	45.00	3.25	2.25	7.75	2.08	5.75	4.81	9.97	13.88	1.22	10.34	2.40	.25	.13
2-1/2	55	1018678	1018687	85.75	4.13	2.75	10.50	2.71	7.25	5.69	12.87	17.84	1.38	13.00	3.13	.25	.25

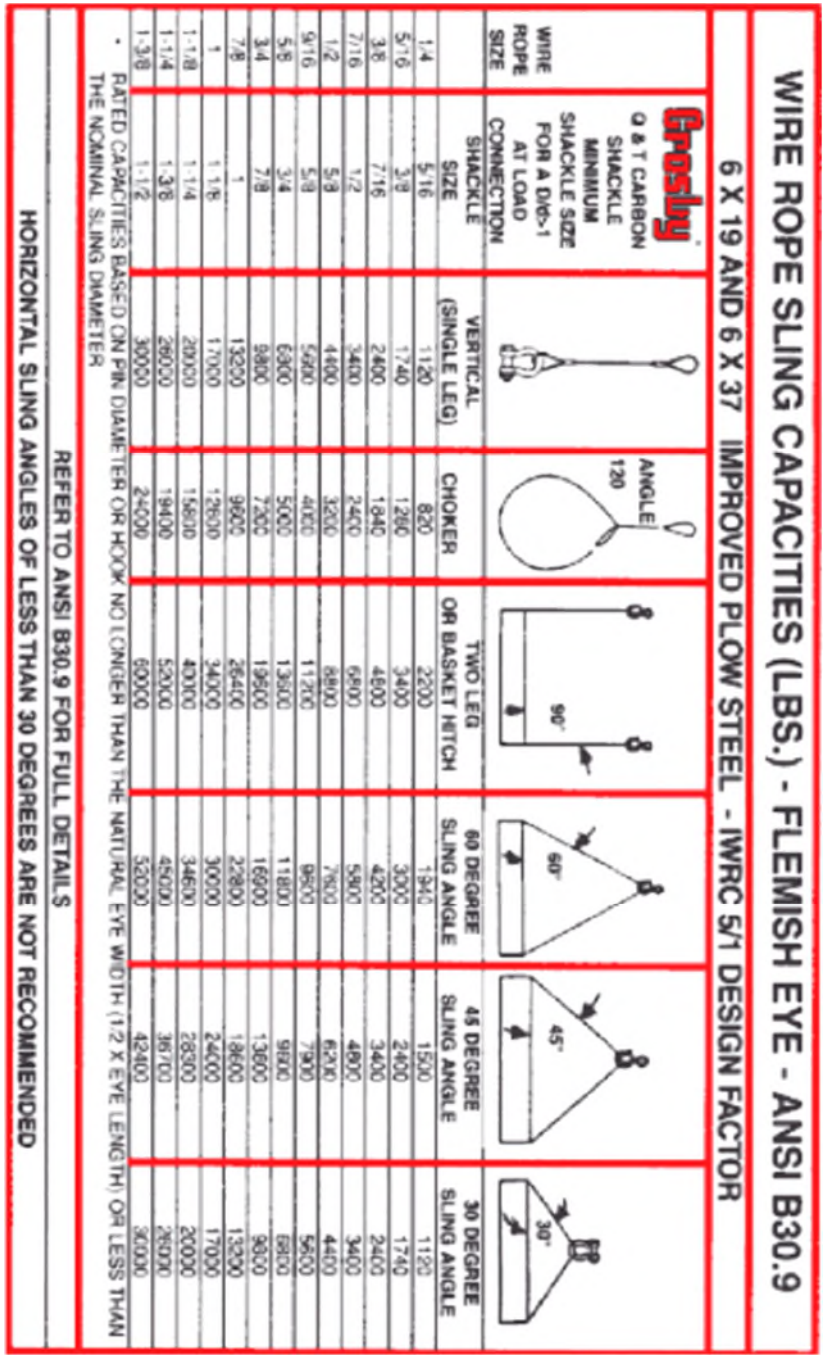
*G denotes galvanized
*S denotes self colored



Synthetic Web Slings - 1,000 Pounds per Inch of Width - Single Ply (Rated capacity in pounds)

Sling body width, inches	Triangle - Choker slings, Type I; Triangle - Triangle slings, Type II; Eye and eye with flat eye slings, Type III; Eye and eye with twisted eye slings, Type IV						Endless slings, Type V						Return eye slings, Type VI					
	Vert	Choker	Vert. basket	30° basket	45° basket	60° basket	Vert	Choker	Vert. basket	30° basket	45° basket	60° basket	Vert	Choker	Vert. basket	30° basket	45° basket	60° basket
1	1,000	750	2,000	1,700	1,400	1,000	1,600	1,300	3,200	2,800	2,300	1,600	800	650	1,600	1,400	1,150	800
2	2,000	1,500	4,000	3,500	2,800	2,000	3,200	2,600	6,400	5,500	4,500	3,200	1,600	1,300	3,200	2,800	2,300	1,600
3	3,000	2,200	6,000	5,200	4,200	3,000	4,800	3,800	9,600	8,300	6,800	4,800	2,400	1,950	4,800	4,150	3,400	2,400
4	4,000	3,000	8,000	6,900	5,700	4,000	6,400	5,100	12,800	11,100	9,000	6,400	3,200	2,600	6,400	5,500	4,500	3,200
5	5,000	3,700	10,000	8,700	7,100	5,000	8,000	6,400	16,000	13,900	11,300	8,000	4,000	3,250	8,000	6,900	5,650	4,000
6	6,000	4,500	12,000	10,400	8,500	6,000	9,600	7,700	19,200	16,600	13,600	9,600	4,800	3,800	9,600	8,300	6,800	4,800

1 - All angles are measured from the vertical
2 - Capacities for intermediate widths now shown may be obtained by interpolation.



WIRE ROPE SLING CAPACITIES (LBS.) - FLEMISH EYE - ANSI B30.9

6 X 19 AND 6 X 37 IMPROVED PLOW STEEL - IWRC 5/1 DESIGN FACTOR

Crosby Q & T CARBON SHACKLE MINIMUM SHACKLE SIZE FOR A D/d>1 AT LOAD CONNECTION

ANGLE 120 · 90° · 60° · 45° · 30°

WIRE ROPE SIZE	SHACKLE SIZE	VERTICAL (SINGLE LEG)	CHOKER	TWO LEG OR BASKET HITCH	60 DEGREE SLING ANGLE	45 DEGREE SLING ANGLE	30 DEGREE SLING ANGLE
1/4	5/16	1120	820	2200	1940	1500	1120
5/16	3/8	1740	1260	3400	3000	2400	1740
3/8	7/16	2400	1840	4800	4200	3400	2400
7/16	1/2	3400	2400	6800	5900	4800	3400
1/2	5/8	4400	3200	8800	7600	6200	4400
9/16	5/8	5600	4000	11200	9600	7900	5600
5/8	3/4	6800	5000	13600	11800	9600	6800
3/4	7/8	9800	7300	19600	16900	13800	9800
7/8	1	13200	9600	26400	22800	18600	13200
1	1 1/8	17000	12600	34000	30000	24000	17000
1 1/8	1 1/4	20000	15600	40000	34600	28300	20000
1 1/4	1 3/8	26000	19400	52000	45000	36700	26000
1 3/8	1 1/2	30000	24000	60000	52000	42400	30000

* RATED CAPACITIES BASED ON PIN DIAMETER OR HOOK NO LONGER THAN THE NATURAL EYE WIDTH (1.2 X EYE LENGTH) OR LESS THAN THE NOMINAL SLING DIAMETER

REFER TO ANSI B30.9 FOR FULL DETAILS

HORIZONTAL SLING ANGLES OF LESS THAN 30 DEGREES ARE NOT RECOMMENDED

Crosby Screw Pin Shackles

Chlorine Exposure

The first step is to prevent an injury from happening in the first place. Take all engineering and administrative actions before resorting to PPE. If that is not possible, prepare yourself and read the SDS for the product you are working with and follow the guidelines. If you have been exposed to a release of chlorine, take the following steps:

- In the event of an accidental spill or release, follow the emergency action plan at the facility you are working in.
- Quickly move away from the area where you think you were exposed. If the release was indoors, go outdoors.
- If it is safe indoors, shut and lock all doors and windows, turn off air conditioners, fans and heaters, and close fireplace dampers.
- Quickly remove any clothing that may have chlorine on it. If possible, clothing that is normally removed over the head (like t-shirts and sweaters) should be cut off the body to prevent additional contact with the agent.
- Place your clothing inside a plastic bag and seal the bag tightly. Do not handle the plastic bag and wait for instructions on proper disposal. Disposing of your clothing in a sealed bag helps protect you and other people from additional exposure. Store the bagged clothing in a secure location away from people, especially children.
- Quickly wash any chlorine from your skin with large amounts of soap and water and flush your eyes with large amounts of water for at least 15 minutes.
- Remove and dispose of contact lenses.
- Wash eyeglasses with soap and water before wearing again.
- If needed, seek medical attention right away.

There is no antidote for chlorine poisoning, but chlorine's effects are treatable, and most people recover. People who experience serious health effects (such as severe eye or airway irritation, severe coughing, difficulty breathing, pulmonary edema) may need hospital care.

Combustible Dust

Any combustible material (and some materials normally considered noncombustible) can burn rapidly when in a finely divided form. If such a dust is suspended in air in the right concentration, it can become explosive. The force from such an explosion can cause employee deaths, injuries, and destruction of entire buildings. Such incidents have killed scores of employees and injured hundreds over the past few decades.

Materials that may form combustible dust include metals (such as aluminum and magnesium), wood, coal, plastics, bio solids, sugar, paper, soap, dried blood, and certain textiles. In many accidents, employers and employees were unaware that a hazard even

existed.

A combustible dust explosion hazard may exist in a variety of industries, including: food (e.g., candy, sugar, spice, starch, flour, feed), grain, tobacco, plastics, wood, paper, pulp, rubber, furniture, textiles, pesticides, pharmaceuticals, dyes, coal, metals (e.g., aluminum, chromium, iron, magnesium, and zinc), and fossil fuel power generation.

Compressed Gas Cylinders

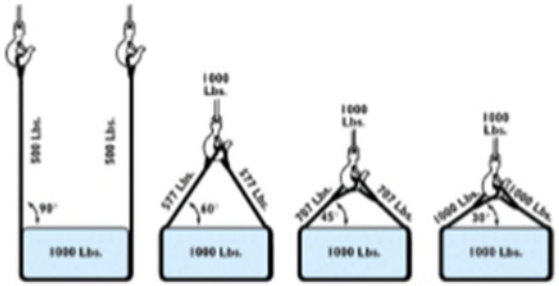
Use of Cylinders

- Before using any compressed gas cylinder, identify the gas, its dangers, and emergency procedures. This information can be found on labels, Safety Data Sheets (SDS), and cylinder markings. If you **DO NOT** know what is in a cylinder, **DO NOT** use it.
- Ensure the complete gas and hose system has been checked for leaks before use. A flame **MUST NEVER** be used to detect a leak.
- **DO NOT** remove the product identification label or change the cylinder color.
- Gas cylinders are exposed to many dangers at the job site. Select a location for setting up cylinders which will be exposed to as little contact as possible from moving equipment and material handling.
- Compressed gas cylinders **SHALL** be chained/fire retardant strap or otherwise secured in an upright position and **SHALL** be placed on cylinder carts whenever being moved to a different location.
- Chain/fire retardant strap shall be adjusted to the proper height for shorter cylinders.
- Gauges will be removed and valve protection caps **SHALL** be in place prior to moving the cylinder.
- Cylinders **SHALL** not be moved by tilting and rolling them on their bottom edges. They **SHALL NOT** be intentionally dropped, struck, or permitted to strike each other violently.
- Cylinders, full or empty **SHALL NOT** be used as rollers or supports.
- Cylinders **SHALL** be kept at least ten (10) feet away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them. When this is impractical, fire resistant shields **SHALL** be provided.
- The cylinders should not be exposed to continuous dampness or any kind of corrosive chemicals or fumes, as corrosion may damage them and cause the valve protection caps to rust or stick.
- Keep the cylinders clear of all electrical equipment or grounding cables and electrical circuits.
- **NEVER** strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit.
- **NEVER** attempt to lift a cylinder by its valve protection cap or guard.
- **NEVER** use oxygen as a substitute for compressed air.
- **NEVER** take gas cylinders into confined spaces.
- When in use, **DO NOT** open the valve more than 1-1/2 turns to allow for quick

How Angles Effect Sling Stress

As the angle between the legs of the sling increase, the load each leg has to lift increases. This applies to a single sling used in a basket hitch as well as a multi-leg sling or bridle.

1. First, divide the total load to be lifted by the number of legs to be used. This provides the load per leg if the lift were being made with all the legs lifting vertically.
2. Determine the angle between the legs of the sling and the vertical.
3. Then MULTIPLY the load per leg by the Load Factor for the leg angle being used (from the table at the right) to compute the ACTUAL LOAD on each leg for this lift and angle. **NOTE: THE ACTUAL LOAD MUST NOT EXCEED THE RATED SLING CAPACITY.**
4. Example: In the drawing below (sling angle of 45 degrees): 1000 2=500 (Load Per Leg if a vertical lift) 500 x 1.414 = 707 lbs. = ACTUAL LOAD on each leg at the 45-degree horizontal angle being used.



It is critical therefore, that rated capacities be reduced to account for sling angles. Angles less than 45 degrees are not recommended and those below 30 degrees should be avoided whenever possible. Use the formula and chart shown below to calculate the reduction in rated capacities caused by various sling angles.

Sling Angles in Degrees	Factor	Sling Angles in Degrees	Factor
15	.259	55	.819
20	.342	60	.866
25	.423	65	.906
30	.500	70	.940
35	.574	75	.966
40	.643	80	.985
45	.707	85	.996
50	.766	90	1.000

rigging.

- Install wire rope clips (cable clamps) properly. Use the correct size and number of clips.
- Store slings in a dry area out of direct sunlight, extreme temperatures, moisture, mechanical damage or corrosive environments. **DO NOT** leave them in the back of a pickup bed.
- **DO NOT** use nylon rigging slings for fall protection,
- **NEVER** install U-bolts on the live end of the wire rope. The live end is where the saddle goes, so remember, "**NEVER** saddle a dead horse".

Rigging a Load

Perform the following when rigging a load:

- Determine the weight of the load. **DO NOT GUESS**.
- Determine the proper size for slings and components. Look for a permanently attached identification tag on each sling stating the size, grade, rated capacity and the name of the sling manufacturer. If the identification is not attached, take the defective equipment out of service.
- Make sure that shackle pins and shouldered eye bolts are installed in accordance with the manufacturer's recommendations.
- Make sure that ordinary (shoulder less) eye bolts are threaded in at least 1.5 times the bolt diameter.
- Use safety hoist rings (swivel eyes) as a preferred substitute for eye bolts wherever possible.
- Use wear pads to protect slings from sharp edges. Remember that machinery foundations or angle-iron edges may not feel sharp to the touch but could cut into rigging when under several tons of load. Wood, tire rubber, or other pliable materials may be suitable for padding.
- Verify that each sling is capable of supporting the load based on the projected horizontal angle of the sling during the lift.
- Calculate the sling tension before the lift to ensure that it can support the load.
- Determine the center of gravity and balance the load before moving the load. Initially lift the load only a few inches to test the rigging and balance.
- Tag lines SHALL be used as required to prevent the load from swinging during the lift.

closing.

- For cylinders that are not equipped with a valve handle, a valve wrench SHALL be provided and kept on the valve in order to facilitate emergency shutoff.
- Close the cylinder valve and bleed off all pressure after each use.
- **NEVER** attempt to repair or modify cylinder valves or safety relief devices.
- Oxygen under pressure forms an explosive mixture when it comes into contact with oil and grease. Regulators, valves, gauges, and fittings **MUST** not have any oil, grease, or lubricant used on them. **DO NOT** handle these parts with greasy hands or gloves.
- Use cylinders in the order received from the supplier. When the cylinder is nearly empty, the valve should be closed, and the cylinder marked "EMPTY" or "MT".

Storage of Cylinders

- OSHA considers cylinders to be in storage when it is reasonably anticipated that gas will not be drawn from the cylinder within 24 hours. At that point storage requirements **MUST** be met.
- Oxygen cylinders in storage **SHALL** be separated from fuel-gas cylinders or combustible materials (especially oil or grease), by a minimum distance of twenty (20) feet, or by a non-combustible barrier at least 5 feet high and having a fire-resistance rating of at least one-half hour (30 minutes).
- **ALWAYS** store compressed gas cylinders in an area which is specifically designated for that purpose. It should be well-ventilated and away from highly combustible materials.
- Valve protection caps **SHALL** be in place and secured to protect the valve whenever the cylinder is not in use, being moved, in storage, or empty.
- **ALWAYS** store cylinders securely. Cylinders should be securely placed on a level surface and chained to prevent tipping over and should not be stored near elevators, stairs, and walkways or other places where they are likely to be knocked over.
- Store cylinders so as to avoid the possible destruction or obscuring of the cylinder coloring, tags, and other means of identifying the cylinder contents.
- **NEVER** store tools, materials, rope, extension cords, clothing or anything else on top of cylinders.

Confined Space Entry

Confined Space Definitions:

- It has adequate size and configuration for a person to enter it;
- It has a limited means for entry or exit; and
- It is not designed for continuous occupancy.

Examples of confined spaces include, but are not limited to: Examples of confined spaces

include, but are not limited to: heating, ventilations and air-conditioning ducts (HVAC), conveyors, pits, process vessels, digesters, turbines, chillers, bag houses, mixers/reactors, utility vaults, bins, silos, hoppers, pipelines, tunnels, shafts,, manholes (sewer, storm drain, electrical, communication or other utility), sewers, storm drains, water mains, lift stations, boilers, incinerators, tanks (fuel, chemical, water or other liquid, solid or gas), scrubbers, shafts, wells, rail cars, basements (before steps are installed), attics and crawl spaces.

Permit Required Confined Space:

A confined space that has one or more of the following characteristics:

- Contains or has the potential to contain a hazardous atmosphere; or
- Contains a material that has the potential for engulfing an entrant; or
- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- Contains other recognized serious safety or health hazards.

Permit Required Confined Space Requirements

- All personnel are required to comply with the procedures established by Winger Companies' Confined Space Program.
- Customer facilities are required to post all spaces that are classified as permit required spaces.
- Any space that meets confined space characteristics that is "not posted" will be evaluated by Winger Companies supervision and safety personnel to determine if the space meets permit required confined space criteria.
- Entry into permit required confined spaces **SHALL** be by permit only.
- Prior to entry, employees will be trained on the entry permit and procedures and **SHALL** follow all of the provisions for the duration of the entry. ONLY authorized and specifically trained employees may work at a confined space.
- **Safety personnel MUST be notified before any confined space entries.**
- **PRE-ENTRY MEETINGS** are absolutely critical in order to perform permit required confined space work activities safely. Prior to entry, a pre-entry meeting **MUST** be conducted with the customer and all personnel involved in the entry. This **MUST** include a review of the scope of the work to be done, the potential hazards, the means and methods to control those hazards, atmospheric testing results, the communication method to be used between the entrant and attendant, and the emergency procedures.
- A properly completed confined space entry permit is required prior to entering the space.
- The completed permit **MUST** be present at the entry location of the space to be entered.
- Any additional required work permits (e.g. cutting, welding / hot work) **MUST** be

- Defective equipment **SHALL** be removed from service and destroyed to prevent inadvertent reuse.
- **NEVER** exceed the designed load capacity, Working Load Limit—WLL, for any lifting device or rigging equipment.
- Rigging equipment not in use shall be removed from the immediate work area so as not to present a hazard to employees.
- **DO NOT walk or stand under any suspended loads.**
- **DO NOT** place your hands/fingers between a sling and its load while the sling is being tightened around the load.
- Keep all body parts away from the areas between the sling and the load and between the sling and the crane or hoist hook.
- Remain clear of loads about to be lifted and suspended.
- Taglines:
  - **ALWAYS** use tag lines unless they create a bigger hazard to control the load.
  - **ALWAYS** wear gloves when you handle a tagline
  - **NEVER** wrap any line around your arm or body as a way of stopping the load
  - **NEVER** step into a loop in the tagline
  - **NEVER** position yourself anywhere between an immovable object and a load that is not resting completely on the ground
  - **ALWAYS** release the tagline if you must to prevent yourself from becoming entrapped or constricted.
- Keep suspended loads clear of all obstructions.
- Employees are prohibited from riding on any lift, hook chain, or cable sling suspended from a crane or hoist.
- Ensure that, in a chock hitch, the choke point is only on the sling body, **NEVER** on a splice or fitting
- **DO NOT** rest or drop load on chain.
- **DO NOT** pull a sling from under a load when the load is resting on the sling.
- **DO NOT** drag slings on the floor or over abrasive surfaces.
- Ensure that slings are not constricted, bunched, or pinched by the load, hook, or any fitting.
- Eliminate all twists, knots or kinks before lifting.
- **DO NOT** shorten or lengthen a sling by knotting or twisting.
- **DO NOT** point load hooks. The load should be seated properly within the throat opening and centered in bowl of the hook.
- Balance the load to avoid undue stress on one leg of multi-leg slings.
- **NEVER** bounce, jerk or shock load a sling when lifting or lowering items. Remove slack by slowly applying the load to the chain.
- Avoid sudden starts and stops when moving loads.
- **DO NOT** use slings, eye bolts, shackles, or hooks that have been cut, welded, or brazed.
- Makeshift links or fasteners or other such attachments **SHALL NOT** be used.
- We use rope for a multitude of tasks, wire pulls, tag lines, tie downs, pulling up tools, and it would be suitable for smaller lighter loads for hoisting pipe and materials into a pipe rack or platform. In addition, we use multiple sizes of rope and rope made out of more than one material. **DO NOT** use manila rope for

when transferring liquids.

- Do not transfer flammable substances into plastic containers
- Vehicles:
  - Allowed only under permit procedures
  - Area must be tested at all times of entry and duration in yard
  - Be manned at all times, i.e. not left running during break
  - If engine stalls **DO NOT** restart equipment in area. Equipment must be pulled out of area before re-starting engine.

Rigging and Hoisting

Rigging and hoisting refers to the lifting and moving of loads using mechanical devices such as hoists, slings, wire ropes, shackles, chain-falls, etc., Improper design, use, or maintenance of hoists, lifting devices, and rigging equipment can cause equipment to fail or a load to be dropped, which can result in personnel injury, death, or significant property loss.

Employees that perform rigging activities have a critical role in helping to make sure each lift is a safe lift. The fact that an object is lifted off the ground does not mean it was rigged properly. Take the time to have your rigging checked, then double-checked by your supervisor or a competent person.

General Rigging Safety Requirements

- Only qualified personnel are authorized to perform rigging and signalperson activities.
- A Winger Pre-Lift Checklist **MUST** be utilized when using a crane to lift or set materials and/or equipment into place.
- Always perform a pre-lift to ensure rigging is correct before proceeding with the lift.
- A Crane Personnel Platform **MUST** be used only as a last resort.
- Personnel who perform rigging activities M**UST** be familiar with standard hand signals for controlling and directing the crane operator. If the operator sees that the signal person does not know proper signal techniques—**STOP** the lift and get a qualified signal person.
- Communication is a critical part of the lift procedure—not only with the crane operator, but also with co-employees working in close proximity to the hoisting operation. Make sure everyone in the area is aware a lift is taking place.
- Have materials delivered as close to the work area as possible.
- **ALWAYS** inspect hoists, lifting equipment, cables, straps and rigging equipment before using them each day.
- All slings **MUST** have permanently affixed and legible identification markings that indicate the recommended safe working load for the type(s) of hitch(es) used, the angle upon which it is based, and the number of legs if more than one. The load capacity limits **SHALL** be stamped or affixed to all rigging components. If missing, remove from service.

completed and approved prior to entry.

- Proper ventilation for each space must be calculated and planned accordingly. Ventilation could include natural, mechanical, positive and negative, and various openings in the space, etc. Depending on the size, the space should be ventilated for a minimum of 30 minutes before entry. Make sure ventilation air is not contaminated, i.e. carbon monoxide from nearby vehicles.
- Flexible ductwork for ventilation should be set up as straight as possible for optimal air flow. Every bend in the flexible ductwork reduces the air flow dramatically.
- Prior to entering a permit required confined space, the space **SHALL** be tested for hazardous atmosphere. Air monitoring testing **SHALL** be conducted for:
  - Oxygen (between 19.5—23.5%)
  - Combustible gases / vapors (LEL—Lower Explosive Limit <10%)
  - Toxic gases / vapors such as:
    - Sulfur Dioxide—SO2 <2 PPM,
    - Hydrogen Sulfide—H2S <10 PPM, or
    - Carbon Monoxide—CO <35 PPM
- Initial air monitoring tests **MUST** be conducted from outside the confined space and taken at the top, middle, and bottom of the space. Entry into the confined space is not allowed until acceptable atmospheric conditions have been met.
- The confined space **SHALL** be ventilated as needed to maintain a safe working atmosphere.
- The confined space atmosphere MUST be monitored and recorded during the duration of the entry. Continuous air monitoring is the preferred method. Recordings are documented on the permit every 30 minutes or more often if required. Documentation of the correct atmospheric conditions must be noted on the Winger Confined Space Permit. If the air monitor you are using does not have SO2 or Other, dashes will be utilized in those blanks denoting the air gas monitor does not detect those components.
- **If the atmosphere becomes hazardous, entrants MUST evacuate the space immediately. Re-entry is not allowed until a safe condition is achieved and a new permit is issued.**
- All entrants **MUST** wear a safety harness attached to a retrieval line unless the use of this equipment creates a significant hazard or inhibits self-rescue. For entries with a vertical drop of more than five feet from the opening, a mechanical device **MUST** be available to retrieve personnel.
- A Rescue Plan **MUST** be planned with appropriate rescue personnel on alert before entry. Rescue equipment **MUST** be set up.
- Upon completion of the work activities in the space, Winger Companies supervision and customer facility supervision **SHALL** terminate the entry jointly. At that time, the two parties should discuss any problems or other unusual situations that occurred in regards to the entry.

Alternate Procedures

- When using alternate procedures are used to enter a space under non-permit conditions ALL of the following conditions must take place and be satisfactorily addressed:

- It can be demonstrated that ALL physical hazards in the space are eliminated or isolated through engineering controls so that the only hazard posed by the permit space is an actual or potential hazardous atmosphere;
- It can be demonstrated that continuous forced air ventilation alone is sufficient to maintain the space safe for entry, and that, in the event the ventilation system stops working, entrants can exit the space safely;
- Develop documented monitoring and inspection data that supports the above 2 paragraphs;
- If initial entry is performed to support #3, it must be collected using permit confined space procedures;
- The determination and supporting data required are documented and are made available to each employee who enters the space or to their authorized representative.

- A permit confined space can be reduced to a non-permit confined space provided the following MUST take place:
  - Any conditions making it unsafe to remove an entrance cover must be eliminated before the cover is removed;
  - When the cover is removed, the opening must be immediately guarded by a railing, temporary cover or temporary barrier that will prevent an accidental fall through the opening and the will protect each employee working in the space from foreign objects entering the space;
  - Before the entrant enters the space, the internal atmosphere must be tested with a calibrated air monitor for potential toxic air contaminants. Entrants or authorized authority must be provided an opportunity to observe the pre-entry testing;
  - No hazardous atmosphere is permitted within the space whenever any employee is inside the space;
  - Continuous force air ventilation must be used as follows:
    - Entrant will not enter the space until the forced air ventilation has eliminated any hazardous atmosphere;
    - The forced air ventilation must be so directed as to ventilate the immediate areas where an employee is or will be present within the space and must continue until all entrants have left the space;
    - The air supply for the forced air ventilation must be from a clean source and must not increase the hazards in the space;
    - The space will be continuously monitored to ensure a hazardous atmosphere does not take place while an entrant is inside working in the space.
  - If a hazard is detected during entry:
    - All entrants MUST immediately evacuate the space;
    - The space must be evaluated to determine how the hazard developed;
    - Measures must be implemented to protect the entrants from the hazard before any subsequent entry takes place.
  - A safe method of entering and exiting the space must take place. If a hoisting system is used it must be designed and manufactured for

when repairing or maintenance of PSM systems. Winger employees shall work together with the customer to make sure these changes are managed correctly.

Process Safety Management applies to the following process equipment:

- Pressure vessels and storage tanks
- Piping systems and components such as valves and pumps
- Relief and vent systems and devices
- Emergency shutdown systems
- Controls including monitoring devices and sensors, alarms, and interlocks

Owners who utilize contractors to perform maintenance or repair, turnaround, major renovation, or specialty work on or adjacent to a covered process must follow these procedures:

- Obtain and evaluate information regarding contractor's safety performance and programs.
- Inform contractor of the known potential fire, explosion, or toxic release hazards related to the contractor's work and the process.
- Explain the emergency action plan.
- Control the entrance, presence and exit of contractors in covered process areas.
- Periodically evaluate the performance of contractors.
- Maintain a contractor injury and illness log in their process area.

Restricted Areas

According to OSHA, a restricted area (termed hazardous locations) is defined as a location which is classified depending on the properties of the flammable vapors, liquids or gases – or, in some cases, combustible dusts or fibers - which may be present in the area ***and*** a likelihood exists that a flammable, explosive or combustible concentration or quantity may be present in the area **and** a likelihood exists that a flammable, explosive or combustible concentration may be present. Restricted areas are fenced off, marked with signage and external gates locked. Combustible dust locations are typically not fenced off but have signs to let personnel know they are entering a volatile area.

Several facilities Winger employees work in have designated restricted areas that are classified as Class 1, Group D. These areas are very hazardous due to highly explosive environments. All Winger employees must receive Restricted Area Training or be escorted at all times when working in these areas.

Remember these simple rules:

- Follow all work permit procedures and sign in processes.
- Wear non-static clothing (100% cotton)
- EH or ESD footwear.
- Only intrinsically safe tools are allowed, i.e. flashlights, air monitors, brass coated tools. If it does not have a classification, don't use it. It is an ignition source.
- No cell phones or lighters
- For line breaks, grounding straps or a grounding system must be used as well as

all times.
- Spotters must wear hi-vis clothing.
- If tag lines are used, they must be non-conductive.

FREE Rigging off Forks

Free rigging is the direct attachment to or placement of attaching any of a variety of rigging equipment (such as chains, slings, shackles, rings, etc.) directly to the forks and suspending an object below the forks. DO NOT DO THIS PRACTICE! Always use an approved forklift attachment with load chart that is designed for this purpose. The problem is that free rigging, even though common, poses several safety hazards:

- Could affect the capacity and safe operation of the piece of equipment.
- The use of a sling on the forks or tines of the forklift or RTFL is not approved by the manufacturer.
- Loads are off centered, can shift and become unstable.
- Shifting/swinging loads can make the forklift or RTFL become unstable and possibly causing tip overs.
- Slings can slide off the forks if the operator inadvertently tilts the carriage forward.
- Friction from the sling rubbing against the edge of the fork can damage the integrity of the sling.
- Forks can be too wide for the sling "eye" and will stretch and cause irreparable damage.
- Our customers have forbidden this practice.
- DO NOT DO THIS PRACTICE!

Process Safety Management (PSM)

The purpose of Process Safety Management (PSM) is to prevent or minimize consequences of catastrophic releases of toxic, reactive, flammable or explosive chemicals in various industries such as refineries, etc.

Winger strives to ensure their employees are following safe work practices. Winger employees shall abide by Winger's safe work practices during operations such as lockout/tagout, confined space entry, opening process equipment or piping and controls over entrance to facility. Communication shall be made by the supervisor or foreman with the customer and obtain a Safe Work Permit before commencing any work. No work shall commence until the appropriate permit is received by the working crew.

Management of change (MOC) procedures (except for "replacements in kind") shall be used to manage changes to process chemicals, technology, equipment, and procedures and changes to facilities that affect a covered process. Communication shall be made

personnel hoisting;
  - The space must be verified that it is safe for entry and that the pre-entry measures required have been taken. A written certification must contain the date, location of the space and the printed name and signature of the person providing the certification.
- When there are changes in the use or configuration of a 'non-permit' confined space that might increase the hazards to entrants, each entry employer must have a competent person reevaluate that space and, if necessary, reclassify it as a 'permit-required' confined space.
- A space classified by an employer as a 'permit required' confined space may only be 'reclassified' as a 'non-permit' confined space when a competent person determines that all of the following have been met:
  - Space poses no actual or potential atmospheric hazards and if all hazards within the space are eliminated or isolated without entry into the space;
  - Testing and inspection during that entry demonstrate that the hazards within the permit space have been eliminated or isolated;
  - Continuous forced air ventilation is utilized to maintain safe for entry;
  - Document the basis for determining that all hazards in a permit space have been eliminated or isolated, through a certification that contains the date, the location of the space, and the signature of the person making the determination;
  - All physical hazards in the space are eliminated or isolated through engineering controls so that the only hazard posed by the permit space is an actual or potential hazardous atmosphere;
  - Space should have continuous monitoring unless the employer has supporting data that demonstrates continuous monitoring is unnecessary.
- If hazards arise within a permit space that has been reclassified as a non-permit space, each employee in the space must exit the space. The entry employer must then reevaluate the space and reclassify it as a permit space.

Entry Supervisor's Duties

- Know the existing and potential hazards of the space to be entered, including information on the mode of exposure and the signs, symptoms, and consequences of exposure.
- Verify that specified entry conditions such as permits, air monitoring, procedures, and equipment are in place before allowing entry.
- Verify that rescue services are available and that the means emergency action plan procedures are in place.
- Ensure that entry operations remain consistent with the entry permit and that acceptable entry conditions are maintained.
- Responsible for conducting a pre-entry meeting each working shift for the duration of the entry activities.
- Remove unauthorized persons who enter or attempt to enter the permit space.
- Terminate entry and cancel the permit when entry operations are completed or if a new condition or hazard is identified.

Authorized Entrant's Duties

- Participate in the pre-entry meeting.
- Know the existing and potential hazards of the space to be entered, including information on the mode of exposure and the signs, symptoms, and consequences of exposure.
- Follow all the provisions on the entry permit and procedures for the duration of the entry.
- **Remain alert** for the development of any hazardous condition and immediately evacuate the confined space if any hazard is detected or perceived.
- Use appropriate personal protective equipment properly to perform assigned tasks.
- Maintain communication with attendants as necessary to enable monitoring status and alert ability for evacuation measures when required.
- Exit from the permit space immediately when:
    - Ordered by the authorized person (attendant or supervisor)
    - When warning signs or symptoms of exposure are recognized
    - A prohibited condition exits
    - An automatic alarm is activated

Attendant's Duties

- Participate in the pre-entry meeting.
- Know the existing and potential hazards of the space to be entered, including information on the mode of exposure and the signs, symptoms, and consequences of exposure. Closely monitor for the possible behavioral effects of hazards exposure in authorized entrants.
- Follow all the provisions on the entry permit and procedures for the duration of the entry.
- Perform no other duties that interfere with the attendant's primary duty to monitor and protect the entrants.
- A confined space attendant MUST be stationed at the point of entry. **The attendant MUST remain at the opening at all times during the entry and maintain contact with the entrants unless relieved by another authorized attendant.**
- Ensure that unauthorized persons stay away from permit spaces or exit immediately if they have accidentally entered the space. Inform the entry supervisor that unauthorized persons have attempted to enter a permit space.
- Maintain communications with and keep an accurate count of all entrants in the permit space.
- The confined space atmosphere MUST be monitored during the entry. Readings MUST be documented on the permit every 30 minutes or more often if required.
- Attendants shall remain alert observing entrants during their work task. Attendants shall only leave their duty, when relieved by another trained attendant. Cell phones shall be allowed to be used for time management and emergencies only. No playing games, social media, etc. is allowed during attendant duties.
- Order evacuation of the permit space when:

piece of equipment that has already been inspected for the day by another employee.
- Safety glasses must be worn when operating or driving powered mobile equipment with the cab open or window down.
- Use every handhold and step available when getting in and out of equipment. **NEVER** jump down from equipment.
- Backup alarms and fire extinguishers are required.
- Loads must be secured.
- Tip the forks down to adjust the forks on the pivot shaft when adjusting forks on a forklift or rough terrain forklift. This prevents pinched fingers and muscle strains.
- Spotters must be used if the operator's vision is blocked or obscured.
- **No person shall be allowed to stand or pass under the elevated portion (boom) of any powered mobile equipment, suspended loads or equipment. For example, forklifts, Rough Terrain Forklifts (RTFL), cranes, etc.**
- When working closely with mobile equipment, keep your body away from pinch points, struck by or caught in-between hazards.
- Wear high visibility clothing/vests when required so operators and truck drivers can see you.
- When loading a truck be aware your surroundings.
- Always lower the man basket, bucket, or forks to the ground and apply the brake when leaving a machine.
- Use wheel chocks when parked on an incline to prevent the machine from rolling forward or backwards.
- When walking as a pedestrian, ALWAYS make eye contact with the operator before going into their area.
- Always use designated pedestrian walkways and be alert for mobile truck traffic, particularly around corners, in corridors, and in warehouses.
- Always use pedestrian doors instead of roll-up or warehouse doors.

ALWAYS beware of overhead power lines.

Table A
Minimum Clearance Distances

Voltage (nominal, KV, alternating current)	Minimum clearance distance (feet)
up to 50	10
over 50 to 200	15
over 200 to 350	20
over 350 to 500	25
over 500 to 750	35
over 750 to 1,000	45
over 1,000	as established by the utility owner, operator, or RPE

- Check for wires before traveling or raising and lowering equipment.
- Depending on the voltage, maintain a minimum distance of at least 10 feet or more from all power lines.
- Have the line de-energized and grounded or insulated. Most power companies will insulate powerlines for free.
- To maintain a safe work distance, erect and maintain an elevated warning line, barricade, or line of signs equipped with flags or similar high-visibility markings at the minimum clearance distance.
- Paint a clearly visible line on the ground and/or use stanchions for visual aids.
- If the operator cannot see the elevated warning line or visual aids, a dedicated spotter(s) must be used to signal the operator that the equipment is passing the marked line.
- The spotter (two if required) and operators must be able to communicate at

approved eye protection.
- Welder's caps protect your head and hair from flying sparks, spatter, burns and radiation.
- Welding sleeves and/or jackets must be worn to minimize skin burns caused by sparks, spatter, or radiation.
- Do not cuff your pant legs or gloves because of smoldering sparks.

Powered Mobile Equipment

Frequently Winger employees must operate powered mobile equipment to perform their job tasks. Powered mobile equipment includes forklifts, rough terrain forklifts, skid loaders, tractors, mini-hoes, utility vehicles, etc. Employees found not following these guidelines may have or will have their driving privileges revoked. The use of these vehicles is a privilege, not a right. Remember the following:

- Only trained and authorized personnel may operate and access powered mobile equipment. At no time is a Winger employee to operate any mobile equipment without the proper training.
- Operators must have a valid driver's license.
- Operators are required to review the operator's manual.
- Seat belts are required to be worn by everyone inside powered mobile equipment.
- Designated speed limits, or less depending on activities or congestion, must be followed at all times.
- All traffic signs must be obeyed. **STOP** and look twice before pulling out onto roadways or across railroad tracks.
- Yield to pedestrians.
- Always look in the direction of travel and around you. Be aware of pedestrians that may inadvertently walk or cross barricades into your work area.
- Do not operate the controls from outside the equipment such as a skid loader, ROPS cab, forklift, etc.
- Keep all body parts inside the cab.
- Do not use a cell phone while driving or operating equipment. Pull over and stop safely to take the call.
- Use powered mobile equipment for their intended use. For example, aerial lifts are designed to lift people and not designed to lift materials or parts into place or to be rigged from.
- All powered mobile equipment shall be pre-inspected daily and recorded on the applicable Pre-Use Checklist.
- Pre-Use Checklists are to remain with the equipment for the duration of that day. At the end of the day, checklists will be turned in to the appropriate person.
- Any equipment that does not pass inspection, must be tagged "out of service" and reported to your supervisor immediately.
- Quarterly inspections must be performed by a competent person. Any deficiencies must be noted and repaired as soon as possible.
- Winger employees should perform a quick walk around before operating a

  - A prohibited condition exits
  - An employee shows signs of physiological effects of hazard exposure
  - An emergency outside the confined space exists
  - The attendant cannot effectively and safely perform required duties
  - Summon rescue and other services during an emergency
- Perform non-entry rescues when specified by accepted rescue procedures.

Emergencies

- In the event of a confined space emergency, the attendant should activate the emergency response procedure by the methods discussed prior to entry (e.g. radio a control room, utilize a nearby phone, etc.).
- If the entrant is attached to a retrieval line, the attendant should try to remove the entrant using external rescue procedures discussed prior to entry. **EXCEPTION:** If the entrant is disabled due to fall or impact, they should not be moved unless there is an immediate danger to the entrant's life.
- In the event of a plant emergency evacuation, follow that facilities' Emergency Action Plan.

ONLY TRAINED RESCUERS ARE AUTHORIZED TO MAKE AN INTERNAL RESCUE

Crane Safety

Any time a lift is being performed with a crane, a winger pre-lift check list must be completed with the crane operator and rigging crew during the pre-lift meeting.

- Cranes **SHALL** be inspected daily by a competent person and operated only by qualified and trained personnel.
- **DO NOT** walk or stand under any suspended loads or inside the angle of a winch or towline.
- Safe working load limits (WWL) **MUST** not be exceeded for all cranes and rigging equipment.
- Be sure to use the correct load chart for the crane's current configuration and setup, the load weight and lift path.
- Watch for overhead electric power lines and maintain at least a 10-foot safe working clearance from the lines.
- Employees are prohibited from riding on any lift, hook chain, or cable sling suspended from a crane or hoist.
- The lift area and the swing radius of the crane **SHALL** be clearly marked and barricaded or attended by an authorized person to prevent an employee or other individuals and traffic from being struck.
- Employees not assisting in lifting or pulling operations **SHALL** stay clear of such areas.
- Only qualified riggers are authorized to perform rigging activities.
- All lifting cables and straps are to be inspected prior to use. If they show any

damage or excessive wear, they are to be removed from service immediately. Do not wrap hoist lines around the load.

- Winch lines, ropes or wire ropes **SHALL NOT** be guided by hand when standing within reach of a drum or sheave.
- The first lift of the day, the load **SHALL** be test-lifted by raising a few inches, held, verifying capacity/balance and brake system checked before delivering any load.
- Lifts **SHALL NOT** be made during strong winds >25 mph or severe weather.
- An employee **SHALL** be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means.
- Signals to the equipment operator **SHALL** be given by one qualified signal person designated to perform this task, but the operator **SHALL** obey the "**STOP**" signal given by anyone.
- Radios **MUST** be used if operator and rigger do not have clear vision of one another. Radio channels **MUST** be designated before lift begins.
- Bridge cranes and overhead chain hoists **SHALL** be used with correct rigging and close observance of the surroundings.

STANDARD HAND SIGNALS FOR CRANE OPERATORS

Extend Boom **Retract Boom** **STOP**

- Earplugs **MUST** be secured to your hardhat in food producing facilities due to federal regulations.

Silica

The following PPE must be worn for tasks involving silica dust **without** engineering controls such as drilling, chipping, and sawing concrete:

- Dust goggles
- Faceshield
- Hearing protection if sound is over 85 dB
- Hardhat
- Cut resistant / Dexterity gloves
- Safety toed work boots
- Clean shaven so as to not interfere with the seal of the respirator being worn
- Half mask respirator or disposable N-, R- or P-95 particulate respirator
- Ensure each employee wearing a respirator has the following:
  - ✓ Respirator Pulmonary Function test
  - ✓ Respirator Fit Test
  - ✓ Respirator Training

If engineering controls **are** put in place to eliminate the hazard of airborne dust, the following PPE may be worn:

- Safety Glasses
- Hardhat
- Hearing protection if sound is over 85 dB
- Cut resistant / Dexterity gloves
- Safety toed work boots

Welding PPE

- Welding helmets with appropriate shading **MUST** be worn by all employees performing the task of welding. These shields provide protection for your eyes and face from infrared or radiant light burns, flying sparks, metal spatter and slag chips encountered during welding, brazing, soldering, and cutting operations.

- Welding helmets are to protect you from welding activities, not grinding. Most do not have the impact resistance that face shields do.
- Replace lenses when scratched or pitted.
- Check shell and gaskets for cracks and headgear for deterioration.
- Safety glasses **SHALL** be worn to guard against flying particles when the helmet is raised.
- Wear eye protection if you are within 100 feet of an unshielded welding area.
- Wear a #3 or #5 shade if you are standing near a welding operation and **DO NOT** look directly at the arc.
- Other employees **SHALL NOT** observe welding operations unless they use

sharp objects, etc.

- Impermeable chemical resistant gloves **MUST** be worn when working with acids, corrosives, and other skin irritating chemicals. Common chemical gloves are constructed of Nitrile, neoprene, butyl rubber, and polyurethane. Read the Safety Data Sheet before use, to ensure you are wearing the correct chemical glove.
- Electrical insulated gloves and sleeves MUST be worn when working on/or when the distance and position will expose the employee to electric shock. (Di-electric gloves **MUST** be tested and inspected prior to use and subsequently every six months.)
- Disposable gloves **MUST** be worn when working with non-hazardous liquids, oils and bodily fluids.
- Welding gloves with cuffs **MUST** be worn to guard against UV rays, sparks and heat while welding.

Hard Hats

- The use of hard hats provided by Winger Companies is mandatory on all construction sites and customer facilities. This applies both to employees and visitors.
- Winger has selected Class 'E' hardhats tested to withstand 20,000 volts
- Replace your hard hat and/or suspension if it becomes worn, damaged (e.g., scratches, gouges, has sustained a severe blow, cracked, webbing stretched, or becomes discolored) or fails the inspection test.
- Test the hardhat by compressing the hardhat 1" from the sides. It should quickly spring back in shape.
- Many of our customers require hard hats are to be worn with the bill facing forward in order protect your eyes from the sunlight and your nose and face from falling objects.

Harness & Retractables are covered under the Fall Protection Section

Hearing Protection

Winger provides a wide choice of hearing protection devices, at no cost to the employee, such as several different types of ear plugs, ear bands and/or ear muffs.

- Hearing protection **MUST** be worn:
  - When noise levels exceed 85 dBA on an 8-hour time-weighted average. (Some customer requirements are 80 dBA.)
  - In all posted buildings and designated areas.
  - When using hand or power tools that exceed 85 dBA., i.e. grinders, thread cutters, cutting torches, etc.
  - If you have to raise your voice when talking to a person 2—3 feet away.
- Double hearing protection (e.g., earplugs and earmuffs) MUST be worn in areas where the noise exposure is 104 dBA or above.

Hoist the Load | Lower the Load | Swing

Raise Boom/Lower Load | Lower Boom/Raise Load | Dog Everything

Slowly Raise the Load | Slowly Lower the Load | One Handed Extend Boom

Raise Boom Lower Boom One Handed Retract

Demolition

Demolition work involves many of the hazards associated with construction. However, demolition incurs additional hazards due to unknown factors such as: deviations from the structure's design introduced during construction, approved or unapproved modifications that altered the original design, materials hidden within structural members, and unknown strengths or weaknesses of construction materials. To counter these unknowns, all personnel involved in a demolition project must be fully aware of these types of hazards and the safety precautions to take to control the hazards.

Before commencing demolition work:

- Ensure approval has been granted from the owner to proceed and the owner has provided a report of any asbestos containing materials.
- Review existing plans (if available) to identify structural systems. If plans are not available consult a structural engineer.
- Identify the plant and equipment to be used, safe means of access and egress to the site and adjoining buildings and any possible environmental impacts from the demolition process.
- Barricade area on all sides and each level below to prevent unauthorized persons to enter the work area. Barricades should be placed a minimum of 6 feet away from the work area.
- Locating and disconnecting utilities such as gas, water, electrical, steam, and sewer is a vital step of demolition. If it necessary to maintain any power, such as water or utilities, these lines shall be temporarily relocated as necessary or protected to prevent any damage.
- When applicable, proper lockout/tagout must be performed before the start of any demolition.
- For areas where engineering controls are not provided, such as open holes, guardrails uninstalled or removed, etc., 100% fall protection must be utilized at all times.
- Any openings cut in a floor for disposal or removal of materials or equipment shall

- **DO NOT** use a defective respirator.
- Inspect and clean the respirator according to manufacturer's instructions after each use. Thoroughly dry it and place it in a sealed bag.
- Respirator cartridges must be changed after each use.
- Store respirators carefully in a closed bag in a protected location away from excessive temperatures, excessive moisture, light, dust and chemicals.
- The voluntary use of dust masks is encouraged whenever an employee desires to provide an additional level of comfort and protection from nuisance dust.
- Employees **MUST** read and follow all instructions provided by the manufacturer on use, maintenance and care and all warnings regarding the respirator's limitations.

Foot Protection

- Work boots must be ANSI approved composite or steel toes.
- 6" leather uppers
- Soles MUST be oil, chemical, slip, and puncture resistant.
- Metal insoles may be worn to protect against puncture wounds.
- Metatarsal guards are a part of the boot or strapped to the outside of boots to protect the foot from impact and compression.
- Foot protection should provide adequate ankle support at least 6" high.
- Electricians **MUST** wear EH rated boots which are designed to be nonconductive to protect from workplace electrical hazards.
- Another rating for foot protection to reduce static electricity is ESD. This rating is required in customer's locations that deal with restricted areas, plastic or plastic wrap manufacturers, 3M, etc.
- Employees will not be allowed to wear slip-on sandals, sneakers or dress shoes in work areas.
- Employees should follow the manufacturers' recommendations for maintaining work boots in good condition, inspecting regularly and replacing when needed.

Gloves

- Winger policy is 100% glove use while working unless they present a greater hazard.
- Employees **MUST** wear the appropriate work gloves for hand protection when exposed to hazards such as skin absorption, cuts or lacerations, abrasions, thermal burns, electrical hazards, etc.
- Wear gloves that fit your hand. Gloves too small can fatigue your hands and gloves that are too large are clumsy to work with. They could also affect your dexterity.
- Gloves should be worn with caution near moving equipment or machinery parts. The glove could get caught and pull your fingers and hand into the equipment.
- Heat resistant gloves **MUST** be worn to protect your hands from burns.
- Cut resistant gloves **MUST** be worn to protect hands from accidental cuts and scratches from using cutting tools or workplace hazards such as sheet metal,

blue tinted lenses on, a yellow painted label will appear green. A red label will appear purple. Color coding is utilized for your safety.

- Safety glasses MUST be worn under faceshields.
- Safety goggles protects eyes, eye sockets, and facial area immediately surrounding the eyes from hazardous situations involving liquid splashes, fumes, vapors, and dust.
- Use dust goggles for dust/mist protection only. They are **NOT** for chemical exposure.
- Chemical goggles protect eyes, eye sockets, and the facial area immediately surround the eyes from impact dust and splashes.
- UVEX Futura chemical goggles are designed to fit over prescription safety glasses.
- All supplied goggles have an anti-fog coating.

Full Face Shields

- Full-face shields are required for grinding, abrasive cutting (chop-saw), sand blasting, heavy airborne dust, chemical splashes, working near batteries, etc.
- A face shield should **ALWAYS** be used with other eye protection such as goggles or safety glasses.
- Face shields and goggles with indirect venting are required when handling acids or other corrosive chemicals.

Respirators

Employees required to wear respirators **MUST** have the following:

- Medical approval to wear respirator.
- Fit tested to ensure proper fit.
- Respirator training.
- Approved respiratory equipment **SHALL** be worn when there is a potential exposure to harmful airborne particles, contaminants, vapors, or gases above established exposure limits or oxygen deficiencies in the work area.
- Winger supplies all respirator protection at no cost to Winger employees. Only trained and qualified employees will be allowed to wear respirators. Respirators are selected by a hazard assessment according to NIOSH standards. Wear the correct respirator for that particular hazard.
- A full-face respirator is required when performing a line break that has the potential of acids, corrosive chemicals, steam, etc.
- Facial hair is not permitted between the skin and the respirator seal. Employees **MUST** be clean shaven when wearing a respirator.
- Wear only the respirator you have been fitted to use. For example, **DO NOT** wear a full-face respirator, if you have only been fit-tested for a half-mask respirator.
- Check the respirator for a good fit before each use. Positive and negative seal checks **MUST** be conducted before each use.

be no larger than 25% of the total floor area.

- When not being utilized, floor or wall openings must be hard barricaded.
- Stairs, passageways, or ladders used to access the work area shall be inspected and maintained in a clean safe condition. Other access ways shall be entirely closed at all times.
- Work and access areas shall be illuminated.

Disposal Chutes

Disposal chutes are inclined channels or passages for disposing of scrap material from upper levels of buildings that are under construction, renovation or demolition. The bottom of the chute is usually positioned directly above a waste dumpster.

- **Use an enclosed disposal chute any time you are dropping materials more than 20 feet to a point outside a building.**
- When material is being dumped by a wheel barrow or mechanical means, a toeboard or bumper at least 4 inches thick and 6 inches high, shall be attached at the chute opening.
- Barricade the areas underneath floor openings that are not equipped with chutes whenever you have to drop materials through the openings to a lower level.
- Barricades should be at least 6 feet from the edges of the opening above and at least 42 inches high.
- Post warning signs on all sides of access to warn others about the overhead falling materials.

Electrical Safe Work Practices

General Safety Methods

Electrical safe work practices are procedures established to protect workers from electrical shock and arc flash hazards. Protect yourself when working with or near sources of electricity, or tools and equipment powered by electricity.

- **ALWAYS** be aware of your surroundings. Learn to recognize potential electrical hazards prior to beginning work.
- Implement all safe work practices necessary to protect yourself from electrocution, shock, burns, arc flashes, and arc blasts.
- **ALWAYS** wear the correct Hazard Risk Category (HRC) rated Personal Protective Equipment (PPE).
- **ALWAYS** use inspected GFCI protection with any electrical power tools or equipment you may use on the job.
- **ALWAYS** utilize LOCKOUT / TAGOUT methods for isolation.
- **ALWAYS** assume equipment is **"LIVE".**
- **ALWAYS VERIFY** that the power is off. **VERIFY** yourself by using the appropriate testing means and testers.
- Only install and repair equipment in accordance to local codes and legal requirements.

- **NEVER** modify approved or listed equipment with the manufacturer's permission.
- **DO NOT** stand on wet surfaces while working on energized electrical equipment.
- **NEVER** plug in cords that are wet or touch electrical equipment with wet hands.
- **DO NOT** climb onto, walk on, drive over, or tie equipment to electrical conduits.
- Maintain a three (3) foot clearance around electrical panels for quick access. Sufficient space **SHALL** be provided and maintained in the area of electrical equipment to permit ready and safe access of such equipment.
- Metal Ladders **SHALL NOT** be utilized while performing any electrical work. Only use inspected fiberglass ladders.
- Respect and maintain a safe distance from overhead power lines.
- When utilizing an aerial lift or fork truck, watch for overhead power lines and maintain clearance distance.
- Maintain a clear and clean worksite.
- Recognize and respect approach distances for high voltage. **DO NOT CROSS** red barricades unless you have permission from the qualified electrician.

Table A Minimum Clearance Distances	
Voltage (nominal, KV, alternating current)	Minimum clearance distance (feet)
up to 50	10
over 50 to 200	15
over 200 to 350	20
over 350 to 500	25
over 500 to 750	35
over 750 to 1,000	45
over 1,000	as established by the utility owner, operator, or RPE

Ground Fault Circuit Interrupter (GFCI's)

It is Winger policy that whenever any employee is using a power tool or extension cord they must be used with a Ground Fault Circuit Interrupter (GFCI). GFCI's must be installed at the power source. GFCI's, power outlets, equipment and power cords must be inspected and tested before work commences.

All 120-volt, single phase, 15 and 20 ampere receptacle outlets of construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, **SHALL** have approved Ground-Fault Circuit Interrupters for personnel protection. Receptacles on a two-wire, single phase portable or vehicle mounted generator rated not more than 5KW, where the circuit conductors or the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with GFCI's.

Ground Fault Circuit Interrupter Testing Procedure:

- When using a power tool without an extension cord:
  - Test GFCI.
  - Plug GFCI into receptacle.
  - Then plug the power tool into the GFCI.
- When using a power tool with an extension cord:
  - Test GFCI.
  - Plug GFCI into receptacle.
  - Plug the extension cord into the GFCI.
  - Then plug power tool into the extension cord.

Electrical PPE

TABLE 6 Protective Clothing and Personal Protective Equipment (PPE)		
PPE Category	PPE Requirements	
1	**Arc-Rated Clothing, Minimum Arc Rating of 4 cal/cm²** *(See Note 1)* Arc-rated long-sleeve shirt and pants or arc-rated coverall Arc-rated face shield *(See Note 2)* or arc flash suit hood Arc-rated jacket, parka, rainwear, or hard hat liner (AN)	**Protective Equipment** Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts) Heavy-duty leather gloves (See Note 3) Leather footwear (AN)
2	**Arc-Rated Clothing, Minimum Arc-Rating of 8 cal/cm²** *(See Note 1)* Arc-rated long-sleeve shirt and pants or arc-rated coverall Arc-rated flash suit hood or arc-rated face shield *(See Note 2)* and arc-rated balaclava Arc-rated jacket, parka, rainwear, or hard hat liner (AN)	**Protective Equipment** Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts) Heavy-duty leather gloves (See Note 3) Leather footwear
3	**Arc-Rated Clothing Selected so that the System Arc-Rating Meets the Required Minimum Arc-Rating of 25 cal/cm2** *(See Note 1)* Arc-rated long-sleeve shirt (AR) Arc-rated pants (AR) Arc-rated coverall (AR) Arc-rated arc flash suit jacket (AR) Arc-rated arc flash suit pants (AR) Arc-rated arc flash suit hood Arc-rated gloves (See Note 3) Arc-rated jacket, parka, or rainwear, or hard hat liner (AN)	**Protective Equipment** Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts) Leather footwear
4	**Arc-Rated Clothing Selected so that the System Arc-Rating Meets the Required Minimum Arc-Rating of 40 cal/cm²** *(See Note 1).* Arc-rated long-sleeve shirt (AR) Arc-rated pants (AR) Arc-rated coverall (AR) Arc-rated arc flash suit jacket (AR) Arc-rated arc flash suit pants (AR) Arc-rated arc flash suit hood Arc-rated gloves *(See Note 3)* Arc-rated jacket, parka, or rainwear, or hard hat liner (AN)	**Protective Equipment** Hard hat Safety glasses or safety goggles (SR) Hearing protection (ear canal inserts) Leather footwear

Notes: AN: as needed (optional). AR: as required. SR: selection required.
(1) Arc rating is defined in NFPA 70E
(2) Face shields are to have wrap-around guarding to protect not only the face but also the forehead, ears, and neck, or, alternatively, an arc-rated arc flash suit hood is required to be worn.
(3) If rubber insulating gloves with leather protectors are used, additional leather or arc-rated gloves are not required. The combination of rubber insulating gloves with leather protectors satisfies the arc flash protection requirement.

Eye Protection / Face Protection

Safety Glasses

- The use of safety glasses is mandatory at all work locations.
- Safety glasses MUST meet or exceed ANSI Z87.1.
- Prescription eye glasses with attached side shields MUST be ANSI Z87.1 or wear approved "over the glasses" protection.
- Many of our customer require wearing clear safety glasses lenses inside their buildings. There are many color-coded items such as HMIS signs, painted chemical lines, etc. that are color coded for a reason. For instance, if you have

tools, moving equipment or machinery.

- Jewelry, piercings, ear gauges and earrings are prohibited in many of our customer facilities.
- **NO** shorts or sleeveless shirts. Sleeves must be 4" or longer.
- Many of our customers require wearing long sleeved shirts at all times, no exceptions.
- Dress properly for the temperatures you will be working in.
- Flame retardant clothing **SHALL** be worn when working on energized equipment / lines or when the distance and/or position will expose the employee to electric arc or flash hazards.
- Wear flame-resistant long-sleeved shirts and pants when welding or flame torch cutting.
- Wear heat resistant clothing when working in elevated temperatures.
- Tyvek suits may be provided in work areas where you need additional protection.
- Leather chaps must be worn when using a chain saw.
- Pant legs should not be tucked inside work boots. Serious burns have developed from slag sliding down inside a worker's boot.

Line Breaks

For ALL line breaks, obtain and read the chemical SDS before performing ANY line break or work where the hazard of chemical exposure exists. Make sure you wear the appropriate chemical PPE for that product. Hardhat, chemical suits (i.e. Dominator, Ty-Chem, etc.), appropriate gloves (nitrile, butyl rubber, etc.), goggles, splash faceshield, and possibly a full-face respirator or Powered Air Purifying Respirator (PAPR) and chemical boots MUST be worn as determined by the chemical manufacturer's SDS. Suits should be sealed over the glove cuff and boot to prevent chemicals from contacting your skin. Chemical PPE may be removed after the line break is completed and has been determined that is safe to do so.

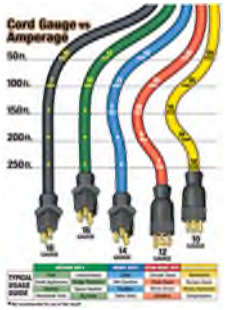
Vests

- All employees MUST wear high visibility garments or reflective safety vests when exposed to vehicular traffic hazards.
- When working where there is a danger of drowning, an employee **SHALL** wear an approved personal flotation vest or be protected by a fall arrest system or safety net.
- Cooling vests or harnesses manufactured with cooling vests, may be worn in high temperature situations where a chance of heat stress could occur.

Remember, these Ground Fault Circuit Interrupters were bought for your protection. Use them!

Temporary Power

- Always inspect your electrical cords before each day's use for defects. **This will only take a minute and could save your life.**
- Unplug electrical cord before inspecting. Wipe the cord clean and visually inspect each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug for deformed or missing pins or insulation damage, and for indications of possible internal damage.
- If any electrical equipment needs to be repaired, tag it as **"DO NOT USE",** what is wrong with it, your name, date, remove it from service, and notify your supervisor. Do not put it back in the gang box or work truck for someone else to pick up and use.



- Extension cords **MUST** meet OSHA standards for construction.
- Extension cords **MUST** be Heavy Duty 12 gauge.
- All extension cords and receptacles **MUST** be of three-pronged type.
- Verify that the extension cords you will be using is rated to accept the maximum current (amps) pulled by the portable power tool or equipment being used. Voltage drops over the length of a cord.
- Do not drive mobile equipment, such as scissor lifts or forklifts, over extension cords.
- **DO NOT** lay electrical and extension cords or cables on floors, in walkways, etc., unless it is impractical to do otherwise. They should be suspended or secured in such a way as not to block or hang in walkways, doorways, or work areas. If possible, hang all extension cords 8 feet above the floor to prevent damage and trip hazards.
- When cords and cables have to pass through doorways, windows, and holes or any other areas subject to trip hazards, pinching or abrasion, they MUST be protected.
- Some locations have Knapco doors available to run extension cords or welding leads through.
- Cords and cables **MUST** not run through fixture, cabinet or panel knockouts without bushing and strain relief.
- Extension cords **MUST** not be fastened with staples, hung by nails, or suspended by any un-insulated wire.
- **DO NOT** use extension cords to raise and lower tools or materials like a rope or a tagline.
- All electrical cords not essential to plant operations must be unplugged when not in use.
- All cords should be wrapped and stored properly when not in use.
- Non-metallic cable used to feed receptacles or light fixtures, **MUST** be secured at regular intervals, (no more than ten [10] ft. apart) to prevent twisting or flexing.

- Splices in cable assemblies MUST be made with connecting devices such as wire nuts or capped crimp-on connectors. Tape alone is not acceptable. Splices **MUST** be provided with strain relief to prevent the splice from separating. This may be accomplished by taping well back from the connecting devices.
- Repairs made to 110-volt cords, 240/480 cords, welding leads, or any other electrical cords, are permitted using the following guidelines.
    - Only appropriate shrink wrap material will be used to repair cords.
    - Only one (1) repair in 10' of cord is allowed.
    - No more than three (3) repairs within 50' of cord will be allowed.
- All plates and covers on electrical equipment **MUST** be closed and secured at all times unless necessary to open for repairs.
- Allow three (3) feet in front of electrical panels for emergency access.
- Direct connections to permanent building wiring **MUST** be made within boxes and **MUST** be provided with strain relief.
- Ground wires MUST be kept intact. Loose conduit and ground wires should be reported to your supervisor immediately.
- Receptacle boxes **MUST** be attached to fixed objects, or supported, and **SHALL NOT** be suspended by energized cables.
- **DO NOT** use knockout boxes as a receptacle on the end of extension cords.
- All receptacles and wall switches **MUST** have plates installed when energized. Missing knockouts and blanks **MUST** be replaced with approved covers.
- Panels **MUST ALWAYS** be covered when not attended to.
- Electric rooms and other hazardous areas in construction areas (where exposed conductors are present) **MUST** be barricaded and appropriate warning signs displayed.
- All live conductors **MUST** be protected from unqualified personnel.
- Unplug extension cords before rolling up. This is a great time to inspect each cord for defective areas.

Temporary Lighting

- Bulbs on approved types of temporary lighting **MUST** be protected by a guard.
- Missing, broken and burned out lamps **MUST** be replaced immediately.
- Light strings **MUST** be suspended by their sockets. Supplemental support to keep strings from damage may also be used. Suspension material may include pull string, cable ties or insulated wire. Conductive materials will not be utilized for supportive means.
- Light strings **MUST** be suspended off the floor (above head height), and away from potential damage.
- Barn lights and other types of lighting with metal cases or metal guards, **MUST** be grounded.
- Individual pig-tails, connected to permanent boxes **MUST** be suspended by the socket or bulb guard to eliminate strain on connections. Connections **MUST** be made with wire nuts.
- In any type of permanent light fixture used on a temporary basis, open conductors, **MUST** be connected inside the fixture case and a suitable cable brought into the case through a bushing with strain relief.
- All temporary lighting, except supplemental task lighting, **MUST** be installed on

Much of our work falls under the permit systems. Permits are utilized to ensure all hazards have been identified and eliminated before work begins. It is our responsibility to read and understand any permit required by the type of work we are about to perform. Any questions or permit deficiencies must be addressed, answered, and reviewed by the crew during the pre-job meeting. At no time is a Winger employee allowed to start work **BEFORE** they receive a valid customer's or have completed the applicable Winger permit with appropriate signatures.

Personal Protective Equipment (PPE)

Employers must protect employees from workplace hazards such as machines, hazardous substances, and dangerous work procedures that can cause injury. Employers must:

- Use all feasible engineering and work practice controls to eliminate and reduce hazards.
- **THEN** use appropriate personal protective equipment (PPE) if these controls do not eliminate the hazards. Remember, PPE is the last level of control.

Winger Companies will provide, at no cost to the employee, all personal protective equipment required for the job that the employee does not wear or use off the jobsite. According to OSHA § 1910.132(h)(2) through (h)(5), The employer is not required to pay for non-specialty safety-toe protective footwear (including safety-toe boots) and non-specialty prescription safety eyewear, provided that the employer permits such items to be worn off the job-site. Winger employees are allowed to wear these items off the job-site.

Personal protective equipment provided by the company MUST be worn when required for the job being performed. Example: hearing protection, safety harnesses, hard hats, safety glasses, goggles, chemical suits, respirators, face shields, welding gloves, welding hoods, etc. Proper care will be given to all tools and personal protective equipment and precautions taken to protect them from loss, theft and damage.

Personal protective equipment doesn't eliminate the hazard. If it fails or is improperly used, exposure can occur. Make sure all PPE is inspected, in good condition and fits correctly, and is appropriate for the materials and equipment you're working with. Personal protective equipment MUST not be altered.

Clothing

- The clothing that you wear to work is your first line of defense against injury and additional protection may be necessary.
- **DO NOT** wear clothing that is loose, torn, tattered or in need of repair. This is not only a safety hazard, but also portrays a poor company image. If your clothing gets torn, change clothes or repair with tape until you can change.
- Clothing with offensive or profane language is prohibited.
- Do not wear jewelry or sweatshirt strings that can become caught in power

injuries in the construction industry. Use these tips:

- Limit weight you lift to no more than 50 pounds. When lifting loads heavier than 50 pounds, use two or more people to lift the load.
- Use suction devices to lift junction boxes and other materials with smooth, flat surfaces. These tools place a temporary handle that makes lifting easier.
- Use ramps or lift gates to load machinery into trucks rather than lifting it.
- Materials that must be manually lifted should be placed at "power zone" height, about mid-thigh to mid-chest. Special care should be taken to ensure proper lifting principles are used. Maintain neutral and straight spine alignment whenever possible. Usually, bending at the knees, not the waist, helps maintain proper spine alignment.
- Refabricate items in a central area where mechanical lifts can be used. Only transport smaller, finished products to the site.
- Minimize bending and reaching by placing heavy objects on shelves, tables, or racks. For example, stack spools on pallets to raise them into the power zone.
- Take regular breaks and break tasks into shorter segments. This will give muscles adequate time to rest. Working through breaks increases the risk of musculoskeletal disorders (MSDs), accidents, and reduces the quality of work because employees are over fatigued.
- Whenever possible use the correct material handling equipment, such as forklifts, overhead hoists, chain falls, dollies, truck carts, cylinder carts, etc.
- Split larger loads into smaller loads. No lifting objects more than 50 pounds by yourself.
- All loads or equipment must be secured while in transit.
- Wear the proper gloves for the type of material being handled.
- Wear safety toed work boots with good soles to reduce slipping.
- When lifting and moving materials follow the back-safety tips.
- When lifting with another person, give verbal instructions clearly.
- Make sure the path is clear. Good housekeeping is a must.
- Never drop materials more than 20 feet.
- If you have to drop materials more than 20 feet, a chute must be used.
- Watch your body position. **DO NOT** place your hands, feet or body in the “line of fire”.
- Take time to look the job over. Just because it has always been done that way, doesn’t mean it is the best way.
- Seek help when:
    - Lifting objects more than 50 pounds
    - A load is too bulky to properly grasp or lift
    - When you can’t see around or over the load
    - When you can’t safely handle the load
- No person shall be allowed to stand or pass under the elevated portion (boom) of any mobile equipment. For example, forklifts, Rough Terrain Forklifts (RTFL), aerial lifts, and cranes.

Permits

dedicated circuits. No other equipment may be connected to the same branch circuit feeding temporary lights. Light strings **MUST** not be plugged into outlets unless the outlet is on a separate circuit from other equipment and the unused outlet covered to prevent tools from being plugged in.

Special Considerations

- Certain work on energized circuits of 50 volts or greater and constitutes a significant potential for arc flash exposure requires the use of company-provided Arc Flash Protective Equipment. Arc Flash Protective suits **MUST** be worn to cover any other garments being worn (closed to collar). A balaclava, hearing protection, and full-face shield with UV shade lens to protect ears, eyes, face and neck area from the hazards of arc blast or ultraviolet flash and flying debris. Rubber gloves of the appropriate class for the voltage to be worked on and leather protector gloves **SHALL** be worn. **The specific conditions under which this rule applies includes working with switchgear, switchboards, distribution gear on the line or load side.**
- When working on or in close proximity to exposed energized conductors, First Aid / CPR trained people **MUST** be present on the jobsite (company personnel, other trades, or the client).
- High capacity battery systems, even at low voltage, present significant hazards which requires use of all the protective measures normally used for work over 480 volts as well as special training, tools and PPE.

An arc flash risk assessment will be performed on the electrical system to determine if arc flash hazards exist. The arc flash risk assessment will contain the appropriate safe work practices, the arc flash boundary and PPE requirements. Two methods are allowed for the Arc Flash Risk Assessment. The first method is to perform an engineering analysis. The second “table method” can be used only where the system parameters defined in the tables are applicable to the specific tasks being performed. Either, but not both are allowed on the same piece of equipment.

- Incident Energy Analysis Method: The results of an engineering analysis are placed on the equipment label in the form of incident energy. Incident energy exposures will be calculated in cal/cm2 (calories per square centimeter at working distance) and shall be based on the working distance of the employees’ face and chest areas. The arc flash boundary will be calculated when using this method. NFPA 70E Table 130.7(C) (16) will be used to determine the appropriate PPE.
- Arc Rated Table Method: The 2015 version of the standard introduces a new multi-table format for choosing arc-rated clothing and PPE. Major revisions have been made to the table for determining risk, and additional tables have been added to determine proper PPE if a risk exists.
- Workers first look to Table 130.7(C) (15) (A)(a) to determine if arc flash PPE is required. This task-based table covers both AC and DC applications and

indicates if there is an arc flash hazard associated with each specific task—yes or no. If there is an arc flash hazard, workers move to Table 130.7(C) (15) (A)(b) or 130.7(C) (15) (B) to find the arc flash PPE category. They then refer to Table 130.7(C) (16) which lists the clothing and other PPE required for that category. Workers must wear all of the PPE listed.

- The tables contained within NFPA 70E provide some basic guidelines for common tasks, but even the tables require system information that may not be known. As described above, if the task is not in the tables, or the system parameters defined in the tables are not met, then an engineering analysis must be performed to determine what level of arc flash protection will be required.

Working with Energized Circuits

The OSHA standards for construction and general industry include specific requirements for working on or in close proximity to energized circuits.

- De-energization is the safest electrical state.
- Only "qualified" electricians may work on energized circuits or in close proximity to energized, unguarded parts.
- OSHA considers any circuit at 50 volts or above that is not locked out to be energized.
- OSHA requires at least two employees to be present when working on energized equipment at 600 volts and above.
- It is Winger policy when working with 50 volts or more that a Winger Electrical PJHA must be completed with crew. For 480v or higher a Winger Electrical Permit must be utilized unless a customer has one that meets or exceeds our expectations.
- Utilize appropriate barriers with conspicuous warning signs when appropriate.
- The correct rated Arc Flash Protective clothing **MUST** be worn whenever arc flash potential exists.
- All work on energized equipment **MUST** be performed with insulated hand tools and while wearing approved and tested di-electric rubber gloves. If the work or tool makes it likely that a hand can slip from an insulated tool and contact an energized part, additional protective measures **SHALL** be taken, (i.e. di-electric blankets, etc.).
- **ALWAYS VERIFY** that the power is off. **NEVER** take anyone else's word that the power is off. **VERIFY** by using appropriate testing means and testers: Phase to Phase/ Phase to Ground.
- **ALWAYS** utilize LOCKOUT / TAGOUT unless performing troubleshooting job tasks.
- Whenever possible, electrical circuits and equipment **SHALL** be de-energized, tested, and grounded before work is performed on them.
- **ALWAYS TEST BEFORE TOUCH.**
- Rings, watches and other conductive materials **MUST** be removed when working in close proximity to exposed energized circuits.
- Restrict access to unauthorized personnel in electrical MCC rooms with appropriate barricades and warning signs.

in welding fume may potentially be at risk for various short-term (acute) or long-term (chronic) health issues.

- The new TLV for manganese by the ACGIH was published in the 2013 Edition of its TLVs and Biological Exposure Indices (BEIs) publication. The new TLV of 0.02 mg/m3 for respirable manganese, which is applicable to welding fumes, represents a ten-fold reduction from the previous 0.2 mg/m3 TLV. The new TLV for manganese includes a 0.1 mg/m3 limit for inhalable manganese particulate. The Permissible Exposure Limit (PEL) of 5.0 mg/m3, ceiling, remains the US exposure limit for manganese enforced by OSHA.
- To thoroughly explore your welding fume control options, you should identify and assess your actual needs and operating conditions. Start by having an industrial hygienist take and analyze the appropriate number of samples of the air in the workers' breathing zone to give you a baseline relative to any exposure level.
- Be sure to check the safety data sheet for the products you use. It's important to not only evaluate the exposure to the welder, but also material handlers, stock keepers and others working in the facility. Fumes are not exclusive to the welder's work area as they may migrate to areas where other workers may be exposed. When measuring to a TLV limit, the measurements should be averaged throughout the worker's shift, which is typically eight hours.
- If there is any potential employee exposure to manganese or other compounds above their respective PELs, OSHA requires that engineering and work practice controls be installed first. The control options listed below should be used before considering a respirator. The use of ventilation/exhaust is often the most feasible method for controlling exposures. Respirators can further reduce exposures and can only do so to those who wear them.
    - Substitution – Review your current welding process, consumable, gas, welding procedure and equipment technology to determine if it's feasible and practical to replace it to generate less welding fume.
    - Isolation – Review your welding operation to determine if it's feasible and practical to isolate and separate the operation by moving it to a regulated area, by automating/ventilating the welding process and/or placing a barrier between the worker(s) and the source.
    - Ventilation/Exhaust – Review the welding fume path to determine if it's feasible and practical to control the path between the source and the worker through source, local and/or general shop ventilation/exhaust equipment.
- If adequate ventilation is not feasible, it may be necessary to protect employees with the use of personal protective equipment (PPE), such as a respirator.

Material Handling

Winger employees move materials, tools, etc. every day. Severe injuries can occur when manually lifting or moving materials. These injuries are the leading cause of non-fatal

the facilities where they are working.

- If machinery is already locked out or tagged out upon arrival at the job site, Winger Companies' supervision **SHALL** review existing facility procedures and implement Winger Companies' Lockout/Tagout Program before beginning work

AT NO TIME, IS THE EQUIPMENT OR MACHINERY TO BE LEFT WITHOUT ISOLATION PROTECTION.

Machine Guards

Moving machine parts have the potential to cause severe workplace injuries, such as crushed fingers or hands, amputations, burns, or blindness. Safeguards are essential for protecting workers from these preventable injuries. Any machine part, function, or process that may cause injury must be safeguarded. When the operation of a machine or accidental contact injure the operator or others in the vicinity, the hazards must be eliminated or controlled.

Different types of hazardous mechanical motions are rotating, reciprocating, transversing, cutting, punching, shearing, bending, and in-running nap points. Various types of protection of personnel from these hazards include guards, safeguarding devices, awareness devices, safeguarding methods, and safe work procedures.

Remember:

- Clothing, jewelry, long hair, and even gloves can get entangled in moving machine parts. Be aware your body positioning and line of fire at all times.
- **DO NOT** stand or walk on top of conveyors at any time. Conveyor covers deteriorate from the inside out. You cannot visibly see the condition of those covers until they are removed. A safe work procedure would to make sure the conveyor is locked out and put a piece of plywood on top to stand on.
- All equipment guards and safety devices **SHALL** be kept in place and in proper working condition.
- Guards removed to perform service or maintenance activities **SHALL** be replaced immediately upon completion of such activities, and the equipment **SHALL NOT** be operated while the guards are removed (except for maintenance / testing verification).
- No moving machinery SHALL be cleaned or repaired until proper energy isolating procedures have been implemented.

Manganese

The most common compounds in arc welding fume when welding on mild or carbon steel are complex oxides of iron, silicon and manganese, although many other compounds may also be in welding fume. Welders who are overexposed to substances

When working with electricity, ALWAYS use common sense and take all required precautions. The above requirements are the minimum necessary – DO NOT hesitate to STOP! Request and wear protective equipment when not required and take extra precautions to prevent potential incidents!

Table 3 Incident Energy Exposure Method PPE Selection Guidelines	
Incident Energy Exposures ≤ 1.2 cal/cm²	
Protective clothing, nonmelting (in accordance with ASTM F 1506-08) or untreated natural fiber	Shirt (long sleeve) and pants (long) or coverall
Other personal protective equipment:	Face shield for projectile protection (AN) Safety glasses or safety goggles (SR) Hearing protection Heavy-duty leather gloves or rubber insulating gloves with leather protectors (AN)
Incident Energy Exposures 1.2 to 12 cal/cm²	
Arc-rated clothing and equipment with an arc rating equal to or greater than the determined incident energy *(See Note 3.)*	Arc-rated long-sleeve shirt and arc-rated pants or arc-rated coverall or arc flash suit (SR) *(See Note 3.)* Arc-rated face shield and arc-rated balaclava or arc flash suit hood (SR) *(See Note 1.)* Arc-rated jacket, parka, or rainwear (AN)
Other PPE:	Hard hat Arc-rated hard hat liner (AN) Safety glasses or safety goggles (SR) Hearing protection Heavy-duty leather gloves or rubber insulating gloves with leather protectors (SR) *(See Note 4.)* Leather work footwear
Incident Energy Exposure ≥ 12 cal/cm²	
Arc-rated clothing and equipment with an arc rating equal to or greater than the determined incident energy *(See Note 3.)*	Arc-rated long-sleeve shirt and arc-rated pants or arc-rated coverall and/or arc flash suit (SR) Arc-rated arc flash suit hood Arc-rated gloves Arc-rated jacket, parka, or rainwear (AN)
Other PPE:	Hard hat Arc-rated hard hat liner (AN) Safety glasses or safety goggles (SR) Hearing protection Arc-rated gloves or rubber insulating gloves with leather protectors (SR) *(See Note 4.)* Leather work footwear

- A Winger LOTO Removal Form is utilized.
- Verification has been made that the employee who applied the padlock is not at the facility.
- All reasonable efforts have been made to contact the employee to inform them that the lock was be removed.
- Inform the employee that their lock was removed before they resume work at the site or facility on their next shift.

Shift or Personnel Changes

When work necessitating a lockout/tagout is not completed on a given shift and work continues into the next shift, off–going personnel involved **SHALL** remove their lockout/tagout padlocks and on-coming personnel **SHALL** monitor these situations, and if necessary, install their own lockout/tagout padlocks.

Leaving an Incomplete Job

Personnel who MUST leave an incomplete job **SHALL NOT** remove their padlock(s) immediately, but **SHALL**:

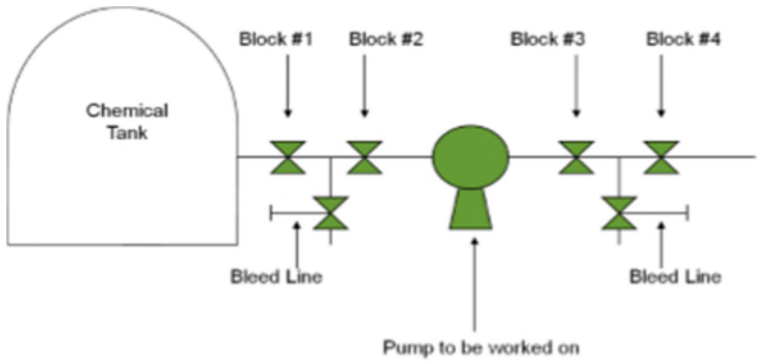
- Notify supervision that they **MUST** leave.
- Remove their padlock(s) only under the guidance of supervision who will, if necessary, use additional padlocks for the remainder of the task. **This will ensure that equipment or machine(s) being worked on or serviced remain locked out at all times during maintenance activities.**

Group Lockout Boxes

- If group lockout boxes are utilized, the authorized employee in charge of the lockout procedures for a specific piece of equipment has the prime responsibility of monitoring and managing the group lockout procedures. This includes notification, isolation processes, lockout devices, verification of energy isolation, and padlock removal.
- Keys to padlock(s) that isolate the energy for the equipment or machinery will be placed into the group lockout box. Each affected employee(s) **SHALL** affix his/her own personal padlock onto the group lockout box before beginning work and **SHALL** remove his/her padlock when work is complete.

Coordination with other Lockout / Tagout Procedures

- In most cases, Winger Companies' personnel will be working on machines or equipment that is under the jurisdiction and control of our customers' lockout/tagout program. It is absolutely essential that lockout/tagout procedures are communicated with all the parties involved and that the procedures set forth by this program are met at a minimum.
- Winger Companies' supervision **SHALL** ensure that their personnel understand and comply with requirements of the energy control procedures being used by



- **Single Source Lockout:** A machine or piece of equipment that has a single energy source that can be readily identified and isolated, i.e.:
  - Circuit breaker in electrical panel for light fixtures
  - Fans
  - Sump pumps
  - Instrumentation
  - Heating, Ventilation, Air Condition (HVAC) Systems
  - Electric Motors
- **Apply lockout or tagout device(s):** Lockout or tagout devices SHALL be affixed to each energy– isolating device by authorized employees. Position of each energy– isolating device **SHALL** be in the "off" or safe position.
- **Verification of isolation:** Prior to starting work, an authorized employee will verify that isolation and de-energizing of the equipment or machine has been accomplished. This **SHALL** be performed by trying to energize the system by its normal method and testing de-energizing with a meter.
- **Winger Companies' policy is that the verification process will be performed by at least two trained employees. This process will be performed by Winger Supervision/Foremen in conjunction with customer "authorized" employees.**
- **Return to Service:** Before lockout or tagout devices are removed and energy is restored, authorized employees **SHALL** ensure the following:
  - Equipment or machine inspection. Inspect the work area to ensure that non-essential items have been re-moved and to ensure that machine or equipment components are operationally intact.
  - Employees. Verify that all employees have been safely positioned or removed.
  - Notification. After lockout and/ or tagout devices have been removed, and before the equipment is started, affected and authorized employees SHALL be notified that the lockout devices have been removed.
- Removal of personnel lockout/tagout padlocks: Each personnel lockout/tagout padlock **SHALL** be removed by the employee who applied the padlock. When the authorized employee who applied the lockout/tagout padlock is not available to remove it, that padlock may be removed under the direction of Winger Companies' supervision provided that:

Table 3 - Continued

AN: As needed [in addition to the protective clothing and PPE required by 130.5(B)(1)].

SR: Selection of one in group is required by 130.5(B)(1).

Notes:

(1) Face shields with a wrap-around guarding to protect the face, chin, forehead, ears, and neck area are required by 130.8(C)(10)(c). For full head and neck protection, use a balaclava or an arc flash hood.

(2) All items not designated "AN" are required by 130.7(C).

(3) Arc ratings can be for a single layer, such as an arc-rated shirt and pants or a coverall, or for an arc flash suit or a multi-layer system consisting of a combination of arc-rated shirt and pants, coverall, and arc flash suit.

(4) Rubber insulating gloves with leather protectors provide arc flash protection in addition to shock protection. Higher class rubber insulating gloves with leather protectors, due to their increased material thickness, provide increased arc flash protection.

TABLE 7 Rubber Insulating Equipment Voltage Requirements (CFR 1910.137, Table I-4)

Class of Equipment	Maximum Use Voltage (1) A-C	Retest Voltage (1) A-C rms.	Retest Voltage (2) D-C avg.
00	500	2500	
0	1000	5000	20,000
1	7500	10,000	40,000
2	17,000	20,000	50,000
3	26,500	30,000	60,000
4	36,000	40,000	70,000

Footnote – The maximum use voltage is the a-c voltage (rms) classification of the protective equipment that designates the maximum nominal design voltage of the energized system that may be safely worked. The nominal design voltage is equal voltage is equal to the phase-to-phase voltage on multiphase circuits. However, the phase-to-ground potential is considered to be the nominal design voltage.

TABLE 8 Minimum Clear Distance for Working Spaces

Nominal voltage to ground	Condition 1	Condition 2	Condition 3
0-150V	3 ft (914 mm)	3 ft (914 mm)	3 ft (914 mm)
151-600V	3 ft (914 mm)	3 ft 6 in (1.07 m)	4 ft (1.22 m)
601–2500V	900 mm (3 ft)	1.2 m (4 ft)	1.5 m (5 ft)
2501–9000V	1.2 m (4 ft)	1.5 m (5 ft)	1.8 m (6 ft)
9001–25,000V	1.5 m (5 ft)	1.8 m (6 ft)	2.8 m (9 ft)
25,001–75 kV	1.8 m (6 ft)	2.5 m (8 ft)	3.0 m (10 ft)
Above 75 kV	2.5 m (8 ft)	3.0 m (10 ft)	3.7 m (12 ft)

Condition 1: Exposed live parts on one side of the working space and no live or grounded parts on the other side of the working space, or exposed live parts on both sides of the working space that are effectively guarded by insulating materials.

Condition 2: Exposed live parts on one side of the working space and grounded parts or surfaces on the other side of the working space. Concrete, brick, or tile walls shall be considered as grounded.

Condition 3: Exposed live parts on both sides of the working space (not guarded as provided in Condition 1) with the operator or worker in between.

Emergency Action Plan

Emergency Action Plan (EAP) Basic Elements

- Emergency telephone numbers **MUST** be posted at each job site. This includes, ambulance, fire, police, and utility company phone numbers as well as any Emergency Action Plans in the locations you are working. All employees **SHALL** be made aware of the nearest medical facility and the emergency evacuation procedures for their work location.
- If the customer where you are working does not have an established Emergency Action Plan, discuss your EAP utilizing your Winger PJHA. It is your responsibility to develop a plan that covers these four items:
    - Reporting procedures – establish a way for your crew to report emergencies.
    - Head Counting – establish procedure to account for all Winger personnel at that work location.
    - Muster Points – predetermine locations for crew to gather.
    - And rescue responsibilities – employees can only perform rescue duties according to their level of training.
- In case of an emergency, it is your responsibility to know the following:
    - Emergency Action Plan Phone Numbers (e.g., Cargill/Blair-3000; Cargill/Eddyville—55; John Deere—222; OGS—Line 5, your Foreman's cell phone number, Safety Director – (641) 777-5717; etc.)
    - Exit door locations
    - First aid kits locations
    - Nearest AED (Automatic External Defibrillator)
    - Do not approach a victim unless it is safe to do so
    - Fire extinguishers and water hose locations
    - Safety showers and eye wash stations locations (flush if allowed)
    - Emergency evacuation areas, routes and wind direction
    - Storm shelter locations
    - Report any spill within 15 minutes
    - Keep all emergency exits and pathways continuously free of obstructions.
    - Do not block emergency fire safety equipment or park in front of any fire hydrant.
- Depending on the work site, all emergencies should be reported immediately by contacting your foreman, supervisor, safety, and customer personnel.
- When there is an emergency, **DO NOT PANIC!** Carefully survey the scene. Look for hazards that could harm you and other responders such as fire, exposed power lines, confined spaces, or caved-in excavations, etc. If you are in danger, leave the area immediately! Call or send someone to call the appropriate Emergency Response Team or Emergency Medical Services (EMS) immediately.
- When reporting an emergency, give as accurate information as possible and stay on the line until you are dismissed by the individual taking the information. Report the following information to the proper authorities and/or facility personnel:
    - The nature of the emergency, such as injury, fire, explosion, spill, etc.
    - The location of the emergency. Be as specific as possible.

- **DO NOT** use another person's padlock.
- **DO NOT** use a customer's padlock unless authorized to do so.
- **ALWAYS** attach and remove your own lock. Don't have someone else do it for you.
- **DO NOT** attach your padlock to the last hole of the group lock box or scissor multi-hasp. Instead, use another scissor multi-hasp to attach your padlock. It is important that you **DO NOT** use the last slot as someone behind you may need to lock out also.
- **DO NOT** use locks and tags for any other purpose other than lockout/tagout.
- **DO NOT** leave the key inside the padlock. You MUST be in control of your own key at all times. **ALWAYS** keep your key with you.
- **NEVER** tamper with or remove another person's padlock.
- A Winger LOTO Removal Form must be utilized in order to remove a Winger employee's lock from a lockbox. That employee must be informed that his lock has been removed from the system.
- Confined Space Attendant and Fire Watch are required to place their locks on the group lockbox as well as the rest of the crew.
- Unless the customer instructs differently, you must remove your lock at the end of the day. Only the foreman or lead journeyman is allowed to leave their locks on at the end of the day to ensure the system is secured from being re-energized.
- Confirm the piece of equipment is the right one to be working on.

Sequence of a Lockout / Tagout System Procedure

- **Prepare for shutdown:** Before an authorized or affected employee turns off a machine or equipment, the authorized employee shall have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy. All written LOTO procedures must be followed to ensure proper LOTO steps have been taken.
- **Notification of affected and authorized employees:** All affected and authorized employees **SHALL** be notified that a lockout or tagout system is going to be utilized, the equipment to be involved, and the reason(s) why. Authorized personnel **SHALL** be informed of the energy source(s) to be controlled, and the methods or means to control the energy. Notification **SHALL** be given before the energy controls are put in place, and after the energy controls are removed. It is critical to communicate with affected, authorized and other personnel before the energy controls are removed for safety coordination purposes.
- Equipment or machine shut down: Shut off or shut down the equipment or machine using the procedures established for the equipment or machine.
- Equipment or machine isolation: **Identify and Release** the points of energy distribution and isolate all energy from the equipment to be worked on. Position the switch, valve or other energy– isolating device(s) to the "off" or "open" position so that the equipment is isolated from the energy source(s). Stored energy (such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems and air, gas, steam or water pressure, etc.) **SHALL** be dissipated or restrained by a method such as repositioning, blocking, bleeding down, etc.

- If you **MUST** work with a lead hazard, or the possibility of one, use wet methods, if you can, to keep down any dust.
- Before you use a torch for cutting, safely remove lead paint. Heating lead paint will produce lead fumes.
- Use long-handled torches to keep your distance.
- Use local-exhaust ventilation.
- Depending on exposure levels, respiratory protection may be required.
- When respiratory protection is required, be sure that you have the required training and proper respirator before starting work.
- **NEVER** smoke, eat or drink in work areas that contain lead products.
- **ALWAYS** wash your hands and face to remove any lead dust before smoking, eating, drinking or going to the bathroom.

Lockout / Tagout

Lockout / Tagout is the method used to control hazardous energy during the servicing or maintenance of machines, power tools, and equipment.

General

- Types of hazardous energy include:
  - Electrical (capacitors)
  - Mechanical (springs, conveyors, rotating flywheels, etc.)
  - Pneumatic (air, gas pressure)
  - Hydraulic (fluid pressure)
  - Thermal (steam pressure)
  - Chemical
  - Water

- All equipment **SHALL** be locked out and tagged out to protect against accidental or inadvertent start-up or operation when such equipment is being serviced, inspected, or repaired.
- Each person assigned to work on machines or equipment requiring lockout **SHALL** place a lockout/tagout padlock on the energy-isolating device(s). When an energy– isolating device cannot accept multiple locks or tags, a multiple lockout hasp or lock box **SHALL** be used.
- If an energy-isolating device is capable of being locked out, it **MUST** be locked out.
- When an energy– isolating device is not capable of accepting a lockout device, then and only then will a tagout program alone be utilized. However, when this is the case, the tagout device **SHALL** be attached at the same location that a lock would have been and the tagout system **MUST** provide a level of safety equivalent to that obtained by using a lockout program.
- Winger employees that will be performing lockout/tagout will be issued Winger lockout padlocks and will be tracked.
- Report lost or stolen padlocks to your foreman or safety team.
- ONLY use the personal lockout/tagout padlock and tags issued to you.

  - The number and condition of the victim(s), if any.
  - The location you are reporting from.
  - Your name and phone number.
  - The approximate time of the incident.
  - Other information as requested by the person taking the report.
- Winger employee's regular duties do not include any task that would need to be shutdown or monitored for critical operations before they evacuate.
- In the event of an emergency, all employees are to leave the work site immediately.
- Follow the appropriate escape procedures and escape route assignments as designated by our customer facility's EAP plans or your supervisor.
- All personnel should report to their immediate supervisor for head count.
- Ensure streets and paths are clear for emergency personnel to arrive at the scene.
- Notify local rescue team before entering and ending confined spaces.
- Remember to use proper equipment if you are involved in rescue of a fall victim(s).
  - Aerial lifts
  - Crane with man basket
  - Ladders
  - Retrieval devices with 4 to 1 ratio winch
  - Body harness – on victim, unless it would further endanger his life
- Notify local HAZMAT team or local authorities immediately in case of chemical spill or leak. Do not cleanup chemical spills or leaks yourself. Stay clear of the area until notified area is okay to return to work.
- If you are not needed at a scene, stay away from the area so emergency personnel can perform their duties.
- Do not volunteer information about the incident to anyone other than Winger, customer, or emergency medical services personnel. Winger personnel are not allowed to discuss any incident with the news media or social media. Media must be handled in a professional manner by the owner or designated alternate.
- When entering or exiting a secured location such as a customer's facility, each employee must scan in and out with their own scan/badge cards. This is used for your benefit in the event of an emergency. Do not scan in or out with another person's scan/badge card. Do not scan another person in or out with your scan/badge card. Employees not following this procedure will be immediately disciplined and/or terminated.
- Contact your Safety Director (641)777-5717, as soon as possible for reporting purposes.
- For further assistance with emergency evacuation procedures, contact your supervisor, foreman or safety personnel.

Excavations

An excavation is any manmade cut, cavity, trench or depression in the earth that was formed by the removal of earth. **PRIOR TO EXCAVATING**, make sure that all underground utilities such as sewer lines, telephone lines, fuel, electrical power lines, and water lines have been identified and properly marked.

Iowa One Call 800-292-8989. When you call Iowa One Call, be prepared to give the operator the following information:

For a location within a city, include the following information:

1. A street address or block and lot numbers, or both, of the proposed area of excavation.
2. The name and address of the excavator.
3. The excavator's telephone number.
4. The type and extent of the proposed excavation.
5. Whether the discharge of explosives is anticipated.
6. The date and time when excavation is scheduled to begin.
7. Approximate location of the excavation on the property.
8. If known, the name of the housing development and property owner.

For a location outside a city, include the following information:

1. The name of the county, township, range, and section.
2. The name and address of the excavator.
3. The excavator's telephone number.
4. The type and extent of the proposed excavation.
5. Whether the discharge of explosives is anticipated.
6. The date and time when excavation is scheduled to begin.
7. Approximate location of the excavation on the property.
8. If known, the quarter section, #911 address and global positioning system coordinate, name of the property owner, name of housing development with street address or block and lot numbers, or both.

American Public Works Association Utility Location & Coordination Council
Uniform Color Code Underground Utility Markings
What the Markings Mean

Red: Electric Power Lines, Cables, Conduit and Lighting Cables

Yellow: Gas, Oil, Steam, Petroleum or Gaseous Materials

Orange: Communication, Alarm or Signal Lines, Cables or Conduit

Blue: Water, Irrigation and Slurry Lines

Green: Sewers and Drain Lines

Pink: Temporary Survey Markings

White: Proposed Excavation

Purple: Reclaimed Water

a one-piece side rail made of the same material.

- Two or more separate ladders used to reach an elevated work area must be offset with a platform or landing between the ladders, **EXCEPT** when portable ladders are used to gain access to fixed ladders.
- Ladder components must be surfaced to prevent snagging of clothing and injury from punctures or lacerations.
- Wood ladders **MUST** not be coated with any opaque covering except for identification or warning labels, which may be placed only on one face of a side rail.
- A competent person must inspect ladders for visible defects periodically and after any incident that could affect their safe use. Ladders **SHALL** be inspected by a competent person and approved for use before being put into service.

Lead

Lead is a heavy metal that can cause serious health problems if inhaled or ingested in significant concentrations. Most lead exposure in the mechanical construction industry comes from soldering, servicing ductwork, welding, and flame-torch cutting or grinding on surfaces painted with lead-based paint. Lead is also found in many electrical applications, including lead sheath, high voltage cable, and lead anchors. Work involving the removal or disturbance of any lead-based products that would cause employees to be exposed above the PEL levels, requires awareness training, engineering controls, medical monitoring, and air sampling.

In accordance with OSHA 29 CFR 1910.1025, the PEL (Permissible Exposure Level) is 50 micrograms per cubic meter (50 ug/m3) of air averaged over an 8-hour period. An employee shall not be exposed above the PEL for lead averaged over an 8-hour period. For both construction and general industry, OSHA sets not just a permissible exposure limit, but what it calls an action level for lead. If employees are exposed to 30 micrograms of lead in the air over an eight-hour day, without wearing a respirator, employers must meet various OSHA regulatory requirements. These include:

- Monitoring the air around affected employees to determine lead levels.
- Giving blood tests to affected employees to determine blood lead levels.
- Providing a thorough medical exam before assigning an employee to a lead-containing area.
- Initiating efforts to reduce employee exposure.

If exposure is at or above the action level 30 or more days per year, an affected employee's blood must be tested for lead at least every six months

How to Protect Against Overexposure to Lead

- Wear gloves and wash hands when working with lead cable, lead anchors, or sheathing.
- If you're working with or near a painted surface that will be disturbed, ask your supervisor if the paint contains lead.

designed for multiple occupancy, such as a twin step ladder.

- Ladders used for access to an upper landing surface **SHALL** have side rails that extend at least 3 feet above the landing surface.
- Ladders, ramps or other safe means of access or egress for any excavation deeper than 4 feet is required. Whatever safe means of egress is used, it will be located at intervals with no more than 25 feet of lateral travel distance from employees.
- Never use a ladder as a brace, skid, lever, guy or gin pole, gangway, platform, scaffold, plan, material hoist, or for any other use for which it was not intended.
- When ascending or descending a ladder, the user shall face the ladder and shall use at least one hand to grasp the ladder. The user **SHALL** not carry any object or load that could cause him/her to lose balance and fall.
- Always maintain a 3-point (two hands and a foot, or two feet and a hand while facing the ladder) contact on the ladder when ascending and descending. Keep your body near the middle of the step and always face the ladder while climbing.
- You must be tied-off if working 4 feet or above and when working elevated 1 f within 6 feet of a handrail.
- Hoist tools or other materials up after you've reached the top of the ladder. Wear a tool belt to help you manage tools while you're working on a ladder. **DO NOT** carry objects or loads that could cause loss of balance and falling.
- All tools and materials shall be hauled up in a tool bucket or similar container or placed in tool belts rather than be carried up by hand.
- Work within the siderails. If your belt buckle goes past the side rail, you are leaning too far. Descend and move the ladder as needed to stay close to your work.
- Ladders used in doorways, passageways, driveways, or other areas where they could be displaced by workplace activities or traffic **NEED** to be secured, barricaded or have warning signs posted to keep disturbances away. Where a door could open into a ladder, either block the door open, keep the door locked, or have someone guard the base of the ladder.
- Double-cleated ladders or two or more ladders must be provided when ladders are the only way to enter or exit a work area where 25 or more employees work or when a ladder serves simultaneous two-way traffic.
- Ladder rungs, cleats and steps **MUST** be parallel, level and uniformly spaced when the ladder is in position for use.
- Rungs, cleats and steps of portable and fixed ladders (except as provided below) must not be spaced less than 10 inches (25 cm) apart, nor more than 14 inches (36 cm) apart, along the ladder's side rails.
- Rungs, cleats and steps of step stools **MUST** not be less than 8 inches (20 cm) apart, nor more than 12 inches (31 cm) apart, between center lines of the rungs, cleats and steps.
- Rungs, cleats and steps at the base section of extension trestle ladders must not be less than 8 inches (20 cm) nor more than 18 inches (46 cm) apart, between center lines of the rungs, cleats and steps. The rung spacing on the extension section must not be less than 6 inches (15 cm) nor more than 12 inches (31 cm).
- Ladders **MUST** not be tied or fastened together to create longer sections unless they are specifically designed for such use.
- When splicing side rails, the resulting side rail must be equivalent in strength to

Competent Person Responsibilities

A **competent person** will be assigned to each excavation in which employees MUST enter and work. A competent person will not be needed if employees **DO NOT** have to enter the excavation.

Competent persons are employees who are capable of identifying existing and predictable hazards in the surrounding area, or working conditions which are unsanitary, hazardous, or dangerous to employees, and has been given the authority to take prompt corrective measures to eliminate them, including temporary shutdown, if required.

In addition, competent persons are responsible for:
Designing structural ramps or seeking the qualified assistance of others in the construction of ramps that will be used as a means of access or egress from excavations.

- Monitoring water removal and equipment operations.
- Inspecting excavations, adjacent areas, and protective systems daily, prior to the start of work, as needed throughout the shift, and after every rainstorm or other hazard-increasing occurrence.
- Document required daily inspections on the Winger Trench & Excavation Safety Checklist.
- Removing employees from the hazard area until the necessary precautions are taken.
- Examining materials and equipment for continued use, and if unusable, removing from service.
- Classifying the soil by accepted methods and if necessary, reclassifying the soil after changed conditions. Unless appropriate tests have been made, the competent person **MUST** assume type C soil is present and protect accordingly.
- Reducing soil slope below maximum allowable slope when surcharge loads are present.

General Rules

- A cubic yard of soil weighs approximately 2700 lbs. or about as much as a mid-size automobile. A trench collapse may contain 3 to 5 cubic yards of soil.
- When employees are working in an excavation, materials, spoils and equipment **SHALL** be kept at least 2 feet from the edge of the excavation.
- Employees **SHALL NOT** work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation.
- All excavations, openings, obstructions, and hazards created by employees **SHALL** be properly guarded to protect other employees and the general public.
- Employees are **NEVER** to be positioned under digging or lifting equipment as

that exposes them to falling loads.

- When employees are required or permitted to cross over excavations, walkways or bridges with standard guardrails will be provided.
- Expose direct buried cables by careful hand excavation by probing within 2 feet of expected underground utilities with a hand probe and shovel.
- A trench should be opened in lengths in which work can be completed and the trench closed at the end of the day.
- When trenches have to be left open overnight, they **SHALL** be covered with suitable materials and/or barricaded during non-working hours.
- Barricades should be erected a minimum of 6 feet away from the edge of a trench or excavation.
- Barrier protection or immediate backfilling will be provided for any unattended or remotely located excavation.
- Backfill trenches with underground utilities with 2 feet of spoils, then lay caution tape or detectable underground utility locator tape as a precautionary measure. This will help prevent future excavations from hitting buried utilities.

Access and Egress

- Ladders, steps, ramps, or other safe means of access or egress for any excavation deeper than 4 feet is required. Whatever safe means of egress is used, it will be located at intervals with no more than 25 feet of lateral travel distance from employees.
- An earth ramp may be considered a safe mean of egress only if employees are able to walk the ramp in an upright manner when entering or exiting the trench.
- Ladders **MUST** extend at least 3 feet above the top of the excavation and be anchored securely on the top and bottom.

Hazardous Atmospheres

The air quality MUST be tested with a calibrated air monitor before employees enter and while occupied in excavation 4 feet or deeper where an oxygen-deficient or flammable atmosphere exists or could reasonably be expected to exist or when controls are used to protect employees from a hazardous atmosphere.

Trench Shoring/Shield Systems

- When shoring or shield systems are used, the system installation process **SHALL** progress as the excavation progresses and should follow as closely as possible to the equipment performing the excavation.
- Employees and subcontractors will be protected from the hazard of cave-in when entering or exiting the areas protected by the shields.
- Employees and subcontractors are not allowed in the shield when it is being

hooks. Scaffolds **MUST** be secured so they will not be knocked over.

- Choose the correct ladder. Each ladder must be long enough to afford access to the work area without having to stand on the top two steps on an ordinary stepladder, or the top three rungs of a straight ladder.
- Employees **SHALL** not work from either the top three rungs of a straight ladder or from the top two steps of a step ladder.
- **DO NOT** sit on top of a ladder.
- Use a ladder only on a firm, level and substantial base surface, unless it has been secured (top or bottom) to prevent accidental displacement.
- Ladders must have non-skid feet or be braced to prevent slippage.
- Always keep the area around the top and bottom of the ladder clear.
- For elevated work, ladders should be chosen **ONLY** when aerial lifts and scaffolds are not practical.
- **DO NOT** use ladders on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental movement. Do not use slip resistant feet as a substitute for exercising care when placing, lashing or holding a ladder upon slippery surfaces.
- Set up the ladder on a firm, solid surface. **DO NOT** place a ladder on boxes, barrels or other unstable bases to obtain additional height.
- Short ladders **MUST** not be spliced together to form a long ladder.
- Only use ladders and appropriate accessories (ladder levelers, jacks or hooks) for their designed purposes.
- Pay attention to the Ladder Load Rating. Type 1A is an Extra Heavy-Duty ladder made for construction use. It's load capacity is 300 pounds. Type 1AA is a Special or Super Heavy-Duty ladder made for heavy duty industrial and construction use with a 375-pound load capacity.
- Do not set a ladder up on a scaffold to gain extra height. **EXCEPTION**: a ladder can be set up on a scaffold is if all hazards are identified, permission has been granted from the scaffold builder, 100% tie-off is achieved, and the ladder is properly secured.
- Ladders **MUST** be secured by tying off, i.e. nearby structural steel, piping, etc. If there is not a place to tie-off the ladder, such as an MCC room or office area, someone else must hold the ladder.
- Do not use the top step/rung of a ladder as a step/rung unless it was designed for that purpose. Each ladder **MUST** be long enough to afford access to the work area without having to stand on the top two steps of a stepladder, or the top three rungs of a straight ladder.
- **AVOID ELECTRICAL HAZARDS**! – Look for overhead power lines before handling a ladder. Use ladders equipped with nonconductive side rails if the worker or the ladder could contact exposed energized electrical equipment. They also must be positioned at the designated safe distance away from the exposed energized equipment. Fiberglass ladders are the preferred choice of ladders on job sites. Winger employees are not to use metal or wooden portable ladders on the job site.
- Keep areas clear around the top and bottom of ladders.
- **DO NOT** move or shift a ladder while a person, tools or equipment is on the ladder.
- Only one person is allowed on a ladder at a time, unless the ladder is specifically

One of the most important responsibilities we have as Winger employees is Pre-Job Hazard Assessment (PJHA). A hazard is the potential for harm. This could be either a personal injury, to someone else or property damage. Identifying hazards and eliminating or controlling them as early as possible will help prevent workplace injuries or illnesses.

A job hazard analysis is a technique that focuses on job tasks as a way to identify hazards before they occur. It focuses on the relationship between the worker, the task, the tools, and the work environment. The analysis also can be a valuable tool for training new employees in the steps required to perform their jobs safely.

Management must demonstrate its commitment to safety and health and follow through to correct any uncontrolled hazards identified. If any hazard poses an immediate danger to life or health must be addressed immediately.

When filling out a PJHA ask yourself the following questions:

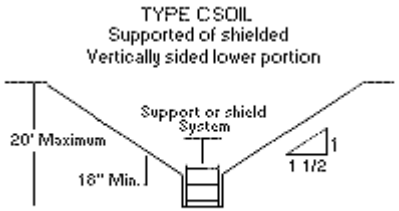
- What are the hazards?
- What can go wrong?
- What are the consequences?
- How could it happen?
- What are the contributing factors?
- How can I reduce the hazard?

For all job tasks, a Winger PJHA (Pre-Job Hazard Analysis) must be completed at the work site, discussed, understood, and signed by all crew members. A PJHA is good for one day, or at the end of the job if it is finished before the end of the day. These Winger PJHA's are then turned into the Safety Department.

Ladders

Ladder selection varies with each job and **MUST** be evaluated on an individual basis; not all ladders are suitable for all jobs. When selecting a ladder, consider the following:

- Read and follow all labels/markings on the ladder.
- **ALWAYS** inspect the ladder prior to using it. If the ladder is damaged, it must be removed from service and tagged until repaired or discarded.
- **DO NOT** exceed or load ladders beyond their maximum intended load, nor beyond their manufacturer's rated capacity. Be aware of the ladder's load rating and of the weight it is supporting, including the weight of any tools or equipment. nor beyond the manufacturer's rated capacity.
- Portable ladders **SHALL** be capable of supporting at least four times the maximum intended load. Take into consideration your weight and the weight of your tools and materials.
- Ladders **SHALL** be used only for the purpose for which they were designed.
- Ladders **SHALL** be maintained free of oil, grease and other slipping hazards. Ladders must be free of any slippery material on the rungs, steps or feet.
- Ladders must be kept in a safe condition. Store in designated areas on racks or installed, removed or moved vertically.
- Trenches 5 feet deep or greater require a protective system unless the excavation is made entirely in stable rock. If less than 5 feet deep, a competent person may determine that a protective system is not required.
- Trenches 20 feet deep or deeper require that the protective system be designed by a registered professional engineer or be based on tabulated data prepared and/or approved by a registered professional engineer in accordance with 1926.652(b).
- All excavations 20 feet or less in depth, which have vertically sided lower portions, shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1½ :1.



Fall Protection

Falls and falling objects can result from unstable working surfaces, ladders that are not safely positioned, and misuse of fall protection equipment. Employees are also subject to falls or to the dangers of falling objects when working near leading edges, unprotected sides, floor holes, and wall openings. Fall protection also applies to slips, trips, and falls on the same elevation.

When elevated work is to be performed, a complete analysis of the scope of work, environmental conditions, and fall hazards **SHALL** be conducted by supervision. All affected personnel **SHALL** be briefed and instructed as to requirements, protective system selection, and work procedures.

Any time an employee performs elevated work at a height of four (4) feet or more, or needs to get closer than six (6) feet to an unprotected edge, the employee MUST be properly secured from falling.

Additionally, full body harnesses are required when working from aerial lifts, personnel baskets, bucket trucks, suspended scaffolds, and other movable platforms per the manufacturer's requirements.

FALL PREVENTION refers to systems that **"prevent"** workers from falling such as guardrail systems, hole coverings, scaffolds or a personal fall restraint system (PFRS).

FALL PROTECTION refers to systems that help **"protect"** workers from injury when they do fall, such as a personal fall arrest system (PFAS) or a safety net system.

Fall Hazards

Falls hazards may be classified into three general categories:

- Slips, trips, and falls on the same level
- Falls on stairs and walk ramps
- Falls from elevations

Slips and trips are generally caused by a lack of good housekeeping and inadequate maintenance of walking and working surfaces. Employees should keep their area clean and orderly. Fall hazards may include icy walkways, wet floors, damaged floor coverings and stair treads, and missing or broken handrails and guardrails.

Fall hazards from elevations include, but are not limited to, unprotected sides and edges of roofs, excavations, skylights, floor holes, wall openings, and all other walking or working surfaces where personnel can possibly fall four feet or more to a lower level.

Personnel should alert their supervisors to potential fall hazards not already identified and controlled. The following are fall hazards which require protection:

- Open sided floors, platforms, and runways 4 feet or more in height.
- Open sided floors, ramps, walkways, etc., that are adjacent to or above dangerous operations MUST be guarded regardless of height.
- Wall openings from where there is a drop of more than 4 feet.
- Open windows from which there is a drop of more than 4 feet and the bottom of the window is less than 3 feet above the floor or platform.
- Hatchway and chute floor openings.
- Any opening more than 4 feet in elevation where a significant portion of the body is leaning over or through to perform work.
- Skylights that are even with the roof surface, or that may otherwise serve as a walking / working surface.
- Scaffolds over 6 feet in height.
- Aerial lifts devices.

Falling Object Protection

You need to protect yourself from falling when you work from an elevated surface and also be aware of those working above or below you. **ALWAYS** wear your hardhat and protect yourself and others from falling objects with one of the following methods:

- **Barricades and Fences:** Use these methods to keep personnel away from areas where they may be struck by falling objects.
- **Canopies:** Canopies may be required to be built in areas of high personnel traffic when work is going on overhead. These structures **MUST** be substantial enough to withstand the force of impact of dropped tools, materials, and debris.
- **Toeboards:** Toeboards **MUST** be erected on all scaffolds and working platforms whenever there are personnel working below them. Toeboards **MUST** be at least 3.5 inches tall.
- **Panel and Screens:** If you need to stack material higher than the top edge of a

contained breathing apparatus (SCBA) is required. No entry into and IDLH atmosphere will be made by a Winger employee. Winger employees are not trained in the use of self-contained breathing apparatus (SCBA) or rescue training under these circumstances.

- Winger's MSA 3200 full face respirator cartridges DO NOT protect you from Hydrogen Sulfide.
- Protective Engineering controls and work practices are generally sufficient to reduce exposures to at or below the PEL/STEL without the use of respirators. Where an area has been determined to be contaminated with hydrogen sulfide, work will be stopped until further evaluation and engineering practices can be implemented to prevent further exposure to Winger employees.
- Should an alarm sound on an H2S detector, immediately evacuate the area by holding your breath and moving quickly upwind. Immediately notify your foreman and safety director if you feel you have been exposed to or are developing potential signs or symptoms of hydrogen sulfide exposure. Do not re-enter the area until it has been determined safe for re-entry.

Imminent Danger

Definition Section 13(a) of the Occupational Health and Safety Act of 1970 defines imminent danger as ".....any conditions or practices in any place of employment which are such that a danger exists which could reasonably be expected to cause death or serious physical harm immediately or before the imminence of such danger can be eliminated through the enforcement procedures otherwise provided by this Act."

Requirements. The following conditions must be met before a hazard becomes an imminent danger:

- There must be a threat of death or serious physical harm. "Serious physical harm" means that a part of the body is damaged so severely that it cannot be used or cannot be used very well.
- For a health hazard, there must be a reasonable expectation that toxic substances or other health hazards are present and exposure to them will shorten life or cause substantial reduction in physical or mental efficiency. The harm caused by the health hazard does not have to happen immediately.
- The threat must be immediate or imminent. This means that you must believe that death or serious physical harm could occur within a short time, for example before OSHA could investigate the problem.

At Any Time, A Winger Employee Feels An Imminent Danger Situation Exists, They Are To Notify Their Immediate Supervisor And Safety Director Immediately. All Work Is To Cease Until All Hazards Have Been Addressed And Corrected.

Job Hazard Assessment

Hydrogen Sulfide (H2S)

Hydrogen sulfide is a colorless, flammable, extremely hazardous gas with a "rotten egg" smell. People can smell the "rotten egg" odor of hydrogen sulfide at low concentrations in air. However, with continuous low-level exposure, or at high concentrations, a person loses his/her ability to smell the gas even though it is still present (olfactory fatigue). This can happen very rapidly and at high concentrations, the ability to smell the gas can be lost instantaneously. Therefore, DO NOT rely on your sense of smell to indicate the continuing presence of hydrogen sulfide or to warn of hazardous concentrations.

In addition, hydrogen sulfide is a highly flammable gas and gas/air mixtures can be explosive. It may travel to sources of ignition and flash back. If ignited, the gas burns to produce toxic vapors and gases, such as sulfur dioxide. It is heavier than air and can collect in low-lying and enclosed, poorly ventilated areas such as industrial and food producing facilities, piping and corroded pipe repairs, pre-heat exchangers, basements, manholes, sewer lines wastewater treatment, excavations deeper than 4 feet, and underground telephone/electrical vaults, manure storage pits. It occurs naturally in crude petroleum and natural gas, and can be produced by the breakdown of organic matter and human/ animal wastes (e.g., sewage). Hydrogen sulfide can also exist as a liquid compressed gas. OSHA has set an acceptable ceiling limit for hydrogen sulfide of 20 parts hydrogen sulfide per 1 million parts of air (20ppm) in the workplace.

Health effects vary with how long, and at what level, you are exposed. Asthmatics may be at greater risk. The primary route of exposure is inhalation and the gas is rapidly absorbed by the lungs. Absorption through the skin is minimal. Symptoms from low exposure include coughing, eye inflammation, headache, fatigue, irritability, insomnia, digestive disturbances and weight loss. High concentrations could cause shock, convulsions, inability to breath, unconsciousness, coma and death. These effects can occur within a few breaths, possibly a single breath. Contact with liquid hydrogen sulfide causes frostbite. If clothing becomes wet with the liquid, avoid ignition sources, remove the clothing and isolate it in a safe area to allow the liquid to evaporate.

Safe Work Practices

- Wherever possible, exposure should be minimized by implementing adequate engineering controls and safe work practices. Our projects are typically multi-employer worksites. Communication must be made with the host facility to ensure our employees are not exposed to the above recommended levels.
- For work within confined spaces, use appropriate procedures for identifying hazards, monitoring and entering confined spaces.
- The air needs to be tested for the presence and concentration of hydrogen sulfide by a qualified person using test equipment. This individual also determines if fire/explosion precautions are necessary.
- If gas is present, the space should be ventilated and retested.
- Atmospheres containing high concentrations (greater than 100 ppm) are considered immediately dangerous to life and health (IDLH) and a self-

toe board, install panels or screens to keep the material from dropping over the edge.
- **Materials and Equipment:** When performing work near a leading edge, keep materials and equipment at least 6 feet from the leading edge unless there are guardrails installed. All materials stacked or piled near the leading edge **MUST** be stable and self-supporting.

Guardrail Systems

- Guardrail systems consist of a toprail, midrail, toeboards, and support posts.
- Guardrail systems can be constructed of 2 x 4 lumber, steel, wire rope, or other equivalent materials that meets the performance/ strength requirements for adequate fall protection.
- The anchoring of support posts and framing of members for railings of all types **MUST** be of such construction that the completed structure is capable of withstanding 200 pounds of force in any outward or downward direction.
- Guardrail system components **SHALL** have a surface that prevents injuries such as punctures and lacerations and prevents snagging of clothing.
- The height of the toprail **SHALL** be between 39 inches and 45 inches above the walking / working surface and be able to support at least 200# or more.
- Midrails **SHALL** be installed at a height midway between the top edge of the guardrail and the walking / working surface and be able to support at least 150# or more.
- Toeboards **SHALL** be a minimum of 3.5 inches in vertical height, with no more than 1/4-inch clearance to the floor, to help prevent tools and materials from falling to a lower level and be able to support at least 100# or more.
- When guardrails systems are used at hoisting areas, a chain, gate, or removable guardrail section **SHALL** be placed across the access opening when hoisting operations are not taking place.
- When guardrails systems are used at holes or skylights, they **SHALL** be erected on all unprotected sides or edges of the hole.
- When guardrail systems are used around holes used for ladder access, they **SHALL** be provided with a gate, or be offset so that a person cannot walk directly into the hole.
- When any part of a guardrail system is removed to facilitate material handling, all personnel working near the opening **MUST** use a personal fall arrest system (PFAS).

Cable Guardrails

- A cable guardrail system also consists of a toprail and midrail with an intermediate vertical member.
- **MUST** be at least 1/4" diameter wire rope and flagged every 6 feet with danger tape.

- Vertical upright members **MUST** be installed every 8'.
- Install wire rope clips (cable clamps) properly. Use the correct size and number of clips.
- **NEVER** install U-bolts on the live end of the wire rope. The live end is where the saddle goes, so remember, "**NEVER** saddle a dead horse".

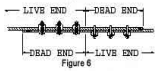


Figure 6

Holes / Wall Openings / Covers

- When a building is under construction, there may be many openings in the floors, roofs, and walls. Every opening **MUST** be guarded by one of these means:
  - A cover fastened over the hole/ opening and labeled.
  - A guardrail system that protects all exposed sides.
  - An employee guarding the hole / opening. For example, an employee may guard a chute for construction debris.
- A "hole" refers to 2 inches or more in its least dimension, in a floor, roof, or other walking / working surface.
- An "opening" refers to 30 inches or higher and 18 inches or wider, in a wall or partition, through which personnel can fall to a lower level.
- Hole covers are rigid covers that prevent personnel from falling through temporary openings and holes in walking / working surfaces.
- Hole covers **MUST** be capable of supporting, without failure, at least twice the weight of personnel, equipment, and materials that may be imposed on the cover at any one time. If plywood is used as a cover, it **MUST** be at least 3/4 inch thick.
- Hole covers **MUST** be secured when installed so as to prevent accidental displacement by the wind, equipment, or personnel.
- Install the hole covers so as to eliminate any tripping hazards.
- Hole covers **MUST** be labeled with the word "HOLE" or "COVER" to provide warning of the hazard.
- When the cover is not in place, the hole or opening **MUST** be constantly attended by someone acting as a "safety watch" or **SHALL** be protected on all exposed sides by a guardrail system.

Personal Fall Arrest Systems (PFAS)

A personal fall arrest system (PFAS) is effective only if you know how all of the components work together to **STOP** or arrest a fall.

- A personal fall arrest system (PFAS) includes the following components that work together to **STOP** a fall or to minimize the arrest force:
  - **Anchorage Points:** Are secure points of attachments for lifelines, lanyards, or deceleration devices, such as structural I-beams and large diameter piping.
  - **Full Body Harness:** A full body harness distributes the force of a fall over the thighs, pelvis, waist, chest, and shoulders.
  - **Deceleration Devices:** These devices help protect employees from the impact of a fall and include shock-absorbing lanyards, self-

- If possible, make sure there is clearance around a stockpile so workers or equipment will have enough room to maneuver.
- During the course of construction, alteration or repairs, form and scrap lumber with protruding nails and all other debris, including wire, cable and conduit, pipe and materials shall be kept clear from all work areas, passageways, and stairs, in and around buildings and other structures.
- All protruding nails shall be bent over to prevent injury.
- All employees are responsible for keeping their work area clean, including the inside and outside of buildings and work vehicles.
- Storage areas **SHALL** be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage. Vegetation control will be exercised when necessary.
- Place all stored parts and materials well clear of landings, stairways, walkways, stepladders, electrical panels, and emergency equipment.
- The area immediately surrounding eye wash stations and safety showers **SHALL** be kept clean and accessible at all times.
- Containers used for garbage and other oily, flammable, or hazardous wastes, such as caustics, acids, harmful dusts, etc., shall be equipped with covers.
- Keep floors clean of spills, oil, grease, solvents and water.
- Job trailers, shops and other permanent work areas **SHALL** be cleaned regularly and supplies neatly organized, away from aisles and walkways.
- Properly secure materials in an orderly manner so as to prevent their falling or spreading and to eliminate slipping, tripping and stumbling hazards.
- Tools, materials, and equipment subject to displacement **SHALL** be adequately secured.
- Use care when working with extension cords and welding leads. They are a major trip and stumbling hazard. Keep them **AWAY** from doorways, stairs and pathways. Suspend cords with nonconductive material where possible at least 7 feet overhead or run them next to walls. Cords/leads **MUST** be protected if you have to run them through a doorway. Coil up extension cords, line, welding leads, hoses, etc. when not in use. If any of these items need repaired or replaced, notify your supervisor immediately.
- **NEVER** leave tools or material such as nuts and bolts on top of ladders or other areas where they may fall.

Protection of the Public

Housekeeping is a priority in areas where members of the public or building occupants are present. In these areas:

- Use barricades, cones or signs to keep your work area separated from the public. If possible, place barricades a minimum of 6 feet away from your work zone.
- Where members of the public **MUST** pass through your work area, immediately remove debris as it is generated and keep tools on carts or in toolboxes when not actually in use.
- Pay special attention to tripping hazards caused by coils of cable, conduit, pipe, and other similar materials that **MUST** be placed on the ground. These materials **MUST** be cordoned off from the public.

- Use welding rods that produce a low fume. Up to 90% of the fume can come from the rod. Welding guns that extract fumes can capture 95% of the fume.
- If the ventilation is not adequate, respiratory protection is required.
- Wear proper PPE: long sleeves, welding jacket or welding sleeves, long pants, welding gloves, safety glasses or goggles under welding helmet and faceshield, safety toed leather work boots, and respirator if necessary. When respiratory protection is required, be sure that you have the required training and proper respirator before starting work.
- Use proper hygiene.

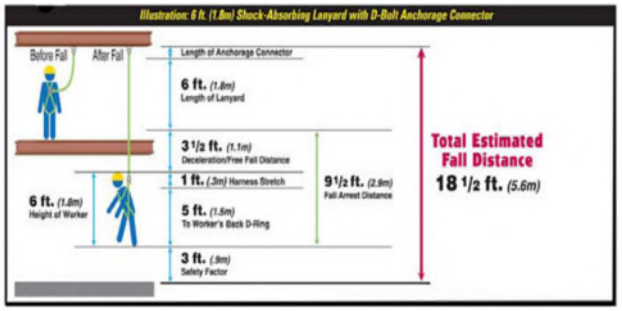
Housekeeping

General Requirements

Good housekeeping **MUST** be maintained at all times. Follow these general rules for good housekeeping at each job site:

- **All** employees are responsible for keeping their work area clean, including the inside and outside of buildings and work vehicles.
- At a minimum, work areas must be cleaned though out the day as needed and at the end of each work shift. This includes removal of trash, food waste, and construction/demolition debris.
- Job trailers, shops, and other permanent work areas **SHALL** be cleaned regularly and supplies neatly organized, away from aisles, stairs and walkways.
- Promptly dispose of food, waste, beverage containers and wrappings in closed containers or trash bags after eating.
- Fire extinguisher and fire-fighting equipment should **NEVER** be blocked. The same holds true for safety markings, placards, heating equipment, vents, lighting, welders and electrical equipment. Electrical panels and emergency equipment **must** have a minimum of 3 feet of clearance and be readily accessible.
- Properly labeled containers **SHALL** be provided for the collection and separation of waste, trash, oily and used rags, and other refuse.
- Combustible scrap and debris **SHALL** be removed at regular and frequent intervals during the course of construction.
- Keep walking and working surfaces clean of spilled oil, grease, solvents and water. If you observe a wet or slippery area, report it promptly to your supervisor.
- Properly secure materials so that they do not become a trip hazard later.
- Place all stored materials clear of landings, stairways, walkways, electrical panels and emergency equipment.
- When finished with tools, return them to the proper storage location.
- All materials should be stacked, blocked, and limited in height. This will allow the pile to be stable and safe from collapsing and/or sliding.
- Materials should be stored so that materials of similar sizes and types will be in the same pile. This makes it easier to keep track of material and select it when needed. This also reduces time of looking for something when you need it.

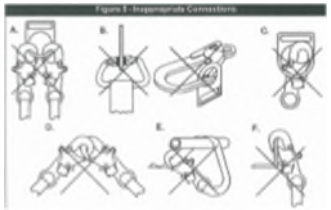
retracting lifelines (SRLs), and rope grabs.
  - **Connectors:** Carabiners, locking snap-hooks and D-rings.
- A person without protection will free fall 4 feet in ½ second and 16 feet in 1 second!
- Winger policy is that all employees wear and use fall protection when working at elevations of 4 feet or above unless otherwise protected.
- All systems will be installed so that an employee cannot free fall more than 6 feet, nor contact any lower level.
- A qualified person **SHALL** determine all anchor points, both temporary and permanent. Permanent anchor points **SHALL** be properly marked.
- Anchorage points for personal fall arrest systems **MUST** be capable of supporting 5000 pounds per employee attached and be independent of the surface that the employee is working on. If you are using retractable life-lines, that amount decreases to 1800 pounds per employee.
- Personal fall arrest systems **SHALL** have sufficient strength to withstand twice the potential impact energy of the falling employee.
- Personal fall arrest systems **SHALL** limit the maximum arresting forces to 1800 pounds with a full body harness.
- Personal fall arrest systems **SHALL NOT** be attached to guardrail systems.
- Swing hazards from a fall need to be considered when selecting anchor points.
- Follow manufacturers' instructions for using and wearing personal fall arrest systems.
- Inspect all fall protection equipment such as anchorage points, harnesses, and lifelines before you use them. Maintain them carefully. The storage area should be clean, dry, and free of fumes or corrosives.
- A shock absorbing lanyard reduces the impact on a worker during fall arrest by extending up to 3.5 feet to absorb the arrest force. Because of this, it is **CRITICAL** that the lanyard or lifeline stops the worker from striking the next lower level. **ALWAYS calculate the total distance of a possible fall before performing elevated work to make sure you have the right equipment.**



- Because of this calculated fall distance, lanyards shall not be used when working 18 ½ feet or below.
- Miller Turbo T-Bak or the DBI/Sala Nano-Lok self-retracting lifelines have replaced the 6' double legged lanyard for working at elevations between 4' - 18 1/2'. These have two 7 1/2' retractable lanyards that give the wearer more

mobility and security while working.

- Self-retracting lifelines (SRLs) are devices that are typically connected to a cross-arm strap or beam clamp that is attached to an I-beam, large diameter piping, or other structural anchorage points.
- Self-retracting lifelines (SRLs) are designed to arrest a fall within 2 feet.
- Self-retracting lifelines (SRLs) **MUST** be used by the wearer at less than a 15-degree angle from the device to minimize swing distance in case of a fall.
- Horizontal and vertical lifelines **SHALL** be designed, installed, and used under the supervision of a qualified person as part of a complete personal fall arrest system.
- A vertical lifeline consists of a flexible line connected to an overhead anchorage point. It **MUST** be connected directly to a worker's full body harness, or rope grab device, and be capable of supporting 5000 pounds.
- Unlike a vertical lifeline, the horizontal lifeline stretches between two anchor points. More than one person may be attached to a horizontal lifeline at time. The horizontal lifeline **MUST** be designed for, and capable of supporting 5000 pounds per employee attached.
- Each employee **SHALL** be attached to a separate lifeline when vertical lifelines are used.
- Lifelines **SHALL** be protected against cutting and abrasions.
- Taglines should be used between use on installed retractable lifelines to protect the cable or webbing and SRL internal components from damage.
- All connectors such as carabiners, locking snap-hooks, and D-rings **MUST** have a tensile strength of 5000 pounds per person.
- Two locking snap-hooks cannot be attached to a harness D-ring at the same time, i.e. D-ring extender attached at the same time to the harness D-ring as a lanyard. Injuries have resulted from snap-hooks failing by interfering with each other during a fall.



- Any personal fall arrest system or component that has been used to arrest a fall (impact loading), **SHALL** be immediately removed from service until it is inspected and determined by a competent person to be undamaged.
- **DO NOT** use rigging equipment for fall protection purposes.
- There are 3 reasons why people fall and get injured when working while elevated:
    - Lack of training
    - Employees not inspecting their equipment
    - Improper use of equipment

Don't just tie-off to be compliant, tie-off because it is the right thing to do.

- Labels shall not be defaced or removed. If a label becomes damaged over a period of time, a new label will be affixed to ensure all hazards and warnings are communicated to employees.
- Report any damaged, unreadable, or missing labels to your supervisor immediately for replacement.

Other Forms of Warning

- **Hazard Statement**—A hazard statement is a statement assigned to a specific hazard class and category that describes the nature of the hazard.
- **Precautionary Statement**—A precautionary statement is a phrase that describes the recommended measures to be taken to minimize or prevent adverse effects resulting from exposure to a chemical, or improper storage or handling of a hazardous chemical.
- **Signal Words**—A signal word is one word used to indicate the severity of hazard and alert the reader to a potential hazard. The required signal words are "Danger" or "Warning". "Danger" is used to the more severe hazards. "Warning" is used for less severe hazards.
- **Pictograms**—A pictogram is a symbol and other graphic elements intended to convey specific information about the hazards of a chemical. There is a total of eight pictograms required for labels by OSHA. The environment pictogram is not required since environmental issues to not fall under OSHA's jurisdiction.

Hexavalent Chromium

Hexavalent Chromium is a heavy metal component of stainless steel that can increase the risk of lung cancer in humans if inhaled in significant concentrations. The major concern in the mechanical construction industry is the potential for overexposure from fumes created by welding or plasma cutting on stainless steel pipe and ducts, dust from grinding on stainless steel and from skin exposure. In most applications, using localized exhaust ventilation and good welding work practices will mitigate the chances of overexposure. Respiratory protection **will** be required when adequate ventilation is not achievable.

How to Protect Against Overexposure

- Use localized exhaust ventilation to remove fumes and gases at their source in still air. Keep the exhaust trunk / hood as close to the fume source as possible in order to keep fumes and gases from your breathing zone.
- Use air blowers to draw fumes away from you and your immediate work area.
- Keep your head out of the smoke plume.
- Position your welding hood so that fumes will not rise up under it and into your breathing zone.
- Use the safest welding method for the job. Stick welding makes much less fume than flux core welding.

RED (FLAMMABILITY)

4—Will rapidly or completely vaporize at normal atmospheric pressure and temperature. Has a flash point below 73°F.

3—Liquids and solids that can be ignited under almost all ambient temperature conditions. Has a flash point below 100°F but above 73°F.

2—MUST be moderately heated or exposed to relatively high ambient temperature before ignition can occur. Has a flash point between 100°F and 200°F.

1—MUST be pre-heated before ignition can occur. Has a flash point over 200°F.

0—Will not burn.

YELLOW (REACTIVITY)

4—Readily capable of detonation at normal temperatures and pressures.

3—Capable of detonation if heated or shocked.

2—Violent chemical change at elevated temperatures and pressures.

1—Normally stable, but can become unstable at elevated temperatures and pressures.

0—Normally stable, even under fire exposure conditions.

WHITE (SPECIAL)

W—Reacts with water in an unusual or dangerous manner.

OXY—Material is an oxidizer, which can greatly increase the rate of combustion.

COR—Corrosive material which can be either a strong acid or base.

ACID—Material is an acid with a pH lower than 7.

ALK—Material is an alkaline / base with a pH greater than 7.

BIO—Bio-hazard.

- Radioactive.

CRYO—Cryogenic.

Labels

- Winger will ensure that each container of hazardous chemicals in the workplace is labeled, tagged, or marked in accordance with CFR §1910.1200(f)(6) product identifiers and words, pictures, symbols or combination thereof.
- Each supervisor **SHALL** be responsible for seeing that all portable containers used in their work area are labeled with the proper identity and hazard warning.
- Employees **SHALL** be trained on how to read and interpret warning labels.
- Labels or other forms of warning will be legible and in English, and prominently displayed on the container.
- **Each** container of hazardous chemicals **SHALL** be labeled, tagged, or otherwise marked, to show the identity of the hazardous chemicals, hazard warnings and name and address of manufacturer or supplier.
- The only exception to this rule is when a chemical substance is transferred into a secondary container. Portable containers into which hazardous chemicals are transferred from labeled containers for use by the employee does not have to be labeled as long as the product is used for immediate use and in their possession. In those situations, it is highly recommended to write the product name on the container with a Sharpie, or similar permanent marker, and disposed of properly when work is completed.

Fire Prevention and Protection

Fire prevention and protection are safe work practices and procedures to help prevent fires from occurring, and to protect personnel and property from unnecessary damage if a fire does occur. Fire prevention is everyone's responsibility. Employees MUST do their part by observing and complying with fire prevention regulations and procedures. Employees should report any potential fire hazard or condition that could cause a fire to their supervisor immediately.

Fire Prevention and Protection General Instructions

- Report all fire hazards to your supervisor immediately.
- The telephone number of the Fire Department and Ambulance **MUST** be posted at the jobsite. Know the location of these posted numbers.
- Know location of fire exits and fire alarms.
- Keep fire exits and passageways clear and ready for easy access.
- Ensure that fire extinguishers are not blocked by equipment, materials, or other objects that could interfere for immediate use in an emergency
- **DO NOT** park in front of fire hydrants.
- Smoke in approved areas only. Obey "NO Tobacco Products on Site", "Smoking in Designated Areas Only", "NO Smoking" and "NO Open Flame" signs!!
- Remove trash and debris from your work area at least once each day.
- Clean up chemical & oil spills and leaks immediately.
- Dispose of oily, greasy or paint-soaked rags and towels in approved metal containers with self-closing lids.
- Remove clothing that has absorbed flammable liquids immediately.
- Keep solvents and other flammable / combustible materials in approved, properly labeled containers, and store them in a proper location.
- **DO NOT** store flammable / combustible materials under stairways or in passageways.
- Keep ignition sources such as sparks, flames and excessive heat away from solvents and other flammable / combustible materials.
- Shut off engines of vehicles and other equipment before adding fuel.
- Ground containers during liquid transfer so you don't create static electricity. When pouring or pumping gasoline or other flammable liquids from one container to another, metallic contact **SHALL** be maintained between the pouring and receiving containers if possible.
- When communication equipment is need in potentially explosive work areas, only equipment that is verified to be "Intrinsically Safe" **SHALL** be used. This includes areas with high concentrations of combustible gas or dust. All other electronic equipment **SHALL NOT** be used in areas where a potential explosive hazard exists. (e.g., two-way radios, cell phones, pagers, lighting, etc.)
- Only non-sparking tools **SHALL** be used in areas where flammable gases or combustible dusts are present.

In Case of Fire

- **DO NOT PANIC!**
- Warn others in the area about the fire.
- Attempt to extinguish smaller fires with the proper extinguisher.
- If the fire is too large for you to control, report it and sound the fire alarm immediately.
- Evacuate all personnel.
- Keep a safe distance from the fire. Post lookouts to meet firefighting
- personnel and direct them to the fire.
- For electrical fires, attempt to de-energize the power, but only if it is safe to do so before attempting to put out the blaze.

Fire Extinguishers

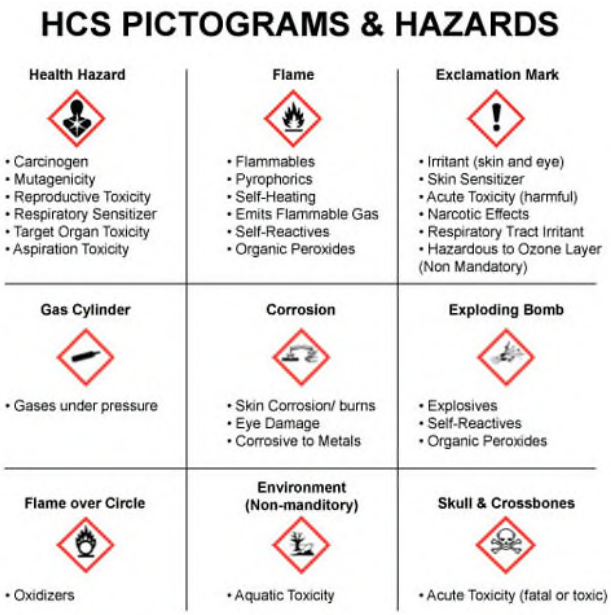
The National Fire Protection Association (NFPA) categorizes fires into four classes:

- Class A fires involve ordinary combustible materials such as paper, wood, cloth, and many plastics.
- Class B fires involve flammable liquids such as oil, gasoline, paints, and solvents.
- Class C fires involve electrical equipment and wiring.
- Class D fires involve combustible metals such as magnesium and sodium.

Portable fire extinguishers are rated and labeled to indicate the classes and sizes of fires that they can extinguish. Using the wrong type of extinguisher on a fire can intensify the fire or lead directly to personal injury.

- Know the location of the fire extinguishers nearest your work area.
- Fire extinguishers SHALL be readily available and located so that personnel **DO NOT** have to travel more than 75 feet to reach one.
- All Winger fire extinguishers **SHALL** be conspicuously located, readily accessible, and immediately available in the event of a fire for all cutting, welding and grinding operations.
- To prevent fire extinguishers from being moved or damaged, they should be mounted on brackets or in wall cabinets with the carrying handle placed 3-1/2 to 5 feet above the floor. Larger fire extinguishers need to be mounted at lower heights with the carrying handle about 3 feet from the floor.
- **DO NOT** remove an extinguisher from a designated location except for immediate use.
- Only personnel who have received fire extinguisher training may use portable fire extinguishers. If you have been trained in the use of fire extinguishers, and you believe that you can extinguish a small fire, observe these general precautions:
    - **NEVER** attempt to put out a fire that is spreading in a way that may block your escape path. Be absolutely certain that you can escape.
    - **NEVER** use a pressurized water extinguisher on electrical equipment. You may receive a serious electrical shock.

GHS Pictograms and Hazard Classes



NFPA 704 / HMIS Chemical Hazard Color Identification

The **NFPA 704 Diamond** placard is used by emergency personnel to safely identify, from a distance, the risks posed by nearby hazardous materials. This is necessary to help determine what, if any, specialty equipment should be used, procedures followed, or precautions taken during the first moments of an emergency response.

The placard is separated into 4 color-coded, diamond-shaped sections.

- Blue indicates the level of health hazard.
- Red indicates the level of flammability.
- Yellow indicates the level of chemical reactivity.
- White contains special codes for unique hazards.
- Each of the sections for health, flammability and reactivity is rated on a scale from 0 (no hazard; normal substance) to 4 (severe risk).

BLUE (HEALTH)
4—Deadly
3—Extreme Danger
2—Hazardous
1—Slightly Hazardous
0—No Health Hazard

Comparison of NFPA 704 and HazCom 2012 Labels

	NFPA 704	HazCom 2012
Purpose	Provides basic information for emergency personnel responding to a fire or spill and those planning for emergency response.	Informs workers about the hazards of chemicals in workplace under normal conditions of use and foreseeable emergencies.
Number System: NFPA Rating and OSHA's Classification System	0-4 0-least hazardous 4-most hazardous	1-4 1-most severe hazard 4-least severe hazard • The Hazard category numbers are NOT required to be on labels but are required on SDSs in Section 2. • Numbers are used to CLASSIFY hazards to determine what label information is required.
Information Provided on Label	• Health-Blue • Flammability-Red • Instability-Yellow • Special Hazards*-White *OX Oxidizers W Water Reactives SA Simple Asphyxiants	• Product Identifier • Signal Word • Hazard Statement(s) • Pictogram(s) • Precautionary statement(s); and • Name address and phone number of responsible party.
Health Hazards on Label	Acute (short term) health hazards ONLY. Acute hazards are more typical for emergency response applications. Chronic health effects are not covered by NFPA 704.	Acute (short term) and chronic (long term) health hazards. Both acute and chronic health effects are relevant for employees working with chemicals day after day. Health hazards include acute hazards such as eye irritants, simple asphyxiants and skin corrosives as well as chronic hazards such as carcinogens.
Flammability/ Physical Hazards on Label	NFPA divides flammability and instability hazards into two separate numbers on the label. Flammability in red section Instability in yellow section	A broad range of physical hazard classes are listed on the label including explosives, flammables, oxidizers, reactives, pyrophorics,combustible dusts and corrosives.
Where to get information to place on label	Rating system found in NFPA Fire Protection Guide to Hazardous Materials **OR** NFPA 704 Standard System for Identification of the Hazards of Materials for Emergency Response 2012 Edition. Tables 5.2, 6.2, 7.2 and Chapter 8 of NFPA 704	OSHA Hazard Communication Standard 29 CFR 1910.1200 (2012). 1) Classify using Appendix A (Health Hazards) and Appendix B (Physical Hazards) 2) Label using Appendix C
Other	The hazard category numbers found in section 2 of the HC2012 compliant SDSs are NOT to be used to fill in the NFPA 704 diamond.	Supplemental information may also appear on the label such as any hazards not otherwise classified, and directions for use.
website	www.nfpa.org/704	www.osha.gov **OR** www.osha.gov/dsg/hazcom/index.html

- **NEVER** use a pressurized water extinguisher on burning liquids. It may cause splattering of hot liquids and spread the fire.
- **NEVER** discharge a carbon dioxide fire extinguisher in a confined space or any small area with poor ventilation.

- ABC multi-purpose rated, 2.5#, 5#, and 10# fire extinguishers are the most common type of extinguisher and will handle most fires. **EXCEPTION:** Special applications may require special extinguishers.
- Fire extinguishers **MUST** be visually inspected monthly and receive yearly maintenance checks with dated tags on each extinguisher.
- Fire extinguishers that have been discharged **MUST** be turned in to your foreman or safety personnel to be inspected and recharged.

First Aid and Medical Treatment

OSHA requires that first aid kits MUST be present at all work locations. To comply with this requirement, at least one company provided, frequently inspected, fully stocked, first aid kit MUST be present at each work location (site building or department).

First aid kits (standard 25-person construction type, typically) will be maintained at all locations including field offices and trailers. Smaller first aid kits will be maintained in company vehicles. Personal medications (prescription or over-the-counter) are prohibited in company supplied first aid kits.

Employee Responsibilities:

- Know where the nearest first aid kit or station is located.
- Know who the people on your job site that are First Aid, CPR, and emergency response trained.
- Be aware of the nearest medical facility and the emergency procedures for your work location.
- Report all injuries immediately, no matter how minor to your supervisor and safety personnel to receive proper medical care.
- **DO NOT** go to your own doctor.
- **DO NOT** provide any first aid treatment to others beyond that for which you have been trained and certified to perform.
- **DO NOT** move an injured or seriously ill person unless it is necessary to prevent further injury from instances such as a fire or evacuation. Wait for Emergency Medical Technicians to arrive and prep the injured person for transportation.
- Treating all blood and body fluids as hazardous and follow "universal precautions." At minimum, this means **ALWAYS** wearing disposable gloves when assisting an injured person and preventing direct skin contact with any body fluids.
- Notify your supervisor or Safety personnel when first aid supplies have been used so that they will be replaced.

In the event an employee needs medical treatment and does not require an

ambulance, they SHALL be transported to a medical facility by their foreman, supervisor, co-worker, or Winger safety personnel.

Supervisor responsibilities:

- Ensure that all employees are aware of the nearest medical facility and the emergency procedures for their work location.
- Verify that first aid kits are present at the work locations.
- Regularly check the contents and frequently inspect the first aid kits to assure that all necessary supplies are available. And within their expiration dates.
- Arrange for replacement and refill of kits as necessary to maintain compliance with this policy.

First Aid Basic Guidelines

- Only employees who are trained in First Aid and/or CPR may perform any first aid and/or CPR necessary until the appropriate Emergency Rescue Teams arrive.
- Carefully survey the scene and call for help. If necessary, send someone to call the customer facility's Emergency Response Team or Emergency Medical Services (EMS) immediately.
- Look for hazards that could harm you and other responders such as fire, exposed power lines, confined spaces, or caved-in excavations. **DO NOT** approach the victim unless it is safe to do so.
- Perform injury assessment and provide aid if conditions dictate that it is necessary to move the victim(s) in order to avoid further injury or death. Moving the victim can cause additional harm.
- If you must move them, ensure that critical body parts, such as the head, neck, and back are immobilized or adequately supported as best as possible.
- If at all possible, protect yourself with medical exam gloves, safety glasses or some type of barrier **before** touching the victim. If it's wet and not yours, don't touch it.
- Monitor the victim(s) behavior and condition so that when emergency rescue personnel arrive, you can inform them of any changes or problems.
- Once you have begun CPR or first aid, do not stop until another trained person takes over or you are exhausted and unable to continue or in imminent danger.
- If they are conscious, keep the victim calm until emergency personnel arrive on the scene.
- Ensure streets, entryways, and walkways are clear for emergency personnel to arrive at the scene.
- Keep someone on the scene to control curious bystanders and unnecessary traffic in the area.
- If you are not needed at a scene, stay away from the area so emergency personnel can perform their duties.
- Contact your Safety Director as soon as possible.

Burns

For minor burns, including first-degree burns and second-degree burns limited to an area

Hazard Communication GHS

The Occupational Safety and Health Administration (OSHA) revised its existing Hazard Communication Standard in 2012 to conform to the United Nations' Globally Harmonized System (GHS) of Classification and Labeling of Chemicals. Employees need to understand both the GHS and NFPA/HMIS forms of hazard labeling.

The biggest difference between the GHS and the NFPA/HMIS system is that the level of warnings is reversed. In the GHS system, the most severe warnings start at the number 1 and go to the least severe to number 5. That is totally opposite of the old NFPA/HMIS system. Warnings start at 0 and go to the most severe to number 4. Caution should be taken when looking at warning labels and reading a new SDS to determine the hazard levels and ways to eliminate those hazards.

COMPARISON OF HMIS III/NFPA 704 RATING SYSTEMS & GHS HAZARD CATEGORIES	
HMIS III/NFPA 704 RATINGS	**GHS HAZARD CATEGORIES**
0 = Minimal Hazard	1 = Severe Hazard
1 = Slight Hazard	2 = Serious Hazard
2 = Moderate Hazard	3 = Moderate Hazard
3 = Serious Hazard	4 = Slight Hazard
4 = Severe Hazard	5 = Minimal Hazard

Hazard Communication

Hazard Communication, also referred to as the OSHA "Workers' Right to Know Act", is the system established to protect workers from inhaling, swallowing, injecting and absorbing harmful chemicals into their bodies. We need to ensure that our employees are informed and understand about the hazardous chemicals that they could be exposed to at the workplace, and the appropriate protective measures that they should utilize.

Chemical Lists & Safety Data Sheets (SDS)

The Hazard Communication Program relies on information provided from suppliers for purposes of hazard determination. A list of all specific chemicals and their associated Safety Data Sheets (SDS) that are used by Winger employees, are available upon request on the Mechanical Contractors of Iowa (MCAI) Safety Data Sheet (SDS) website. The website address is: http://www.sdsbinderworks.com; username: wingeroffice; password: winger. Customer SDS are available at each work site and should be reviewed before work commences.

Information found on the 16 sections of a Safety Data Sheet (SDS) include:

1. Identification, Product Name, Emergency Contact Information
2. Hazard (s) Identification
3. Composition/Information of Ingredients
4. First Aid Measures
5. Fire Fighting Measures
6. Accidental Release Measures
7. Handling and storage
8. Exposure Controls/Personal Protection (PPE)
9. Physical and Chemical Properties
10. Stability and Reactivity
11. Toxicological Information
12. Ecological Information
13. Disposal Considerations
14. Transport Information
15. Regulatory Information
16. Other Information

It is Winger policy that customer's SDS **MUST** be reviewed before any line breaks or the potential of chemical exposure. **READ** and **FOLLOW** all information listed on SDS (Safety Data Sheets) for each of the products and chemicals that you may use or come into contact with. If you **DO NOT** understand the instructions listed on a SDS, **ASK** your supervisor or safety personnel for assistance.

no larger than 3 inches (7.6 centimeters) in diameter, take the following action:

- Cool the burn. Hold the burned area under cool (not cold) running water for 10 or 15 minutes or until the pain subsides. If this is impractical, immerse the burn in cool water or cool it with cold compresses. Cooling the burn reduces swelling by conducting heat away from the skin. Don't put ice on the burn.
- Cover the burn with a sterile non-adherent bandage. Don't use fluffy cotton, or other material that may get lint in the wound. Wrap the bandage loosely to avoid putting pressure on burned skin. Bandaging keeps air off the burn, reduces pain and protects blistered skin.
- If the employee chooses they can take an over-the-counter pain reliever. These include aspirin, ibuprofen (Advil, Motrin, others), naproxen (Aleve) or acetaminophen (Tylenol, others).
- Minor burns usually heal without further treatment. They may heal with pigment changes, meaning the healed area may be a different color from the surrounding skin. Watch for signs of infection, such as increased pain, redness, fever, swelling or oozing. If infection develops, seek medical help.
- **Get a tetanus shot.** Burns are susceptible to tetanus. Doctors recommend you get a tetanus shot every 10 years. If your last shot was more than five years ago, your doctor may recommend a tetanus shot booster.

For major burns, call 911 or emergency medical help. Until an emergency unit arrives, follow these steps:

- **Don't remove burned clothing.** However, do make sure the victim is no longer in contact with smoldering materials or exposed to smoke or heat.
- **Don't immerse large severe burns in cold water.** Doing so could cause a drop-in body temperature (hypothermia) and deterioration of blood pressure and circulation (shock).
- **Check for signs of circulation** (breathing, coughing or movement). If there is no breathing or other sign of circulation, begin CPR.
- **Elevate the burned body part or parts.** Raise above heart level, when possible.
- **Cover the area of the burn.** Use a cool, moist, sterile bandage; clean, moist cloth; or moist cloth towels.

Chemical Burns

- **BEFORE you start working**, read the SDS for the hazardous substance you are working with.
- Make sure you wear the required PPE and know the first aid treatment.
- Know where the nearest safety shower and eye wash station is located. Flush system to reduce contamination to your eyes or body.
- Flush eyes or shower for a minimum of 15 minutes or longer if stated on SDS.
- Notify your supervisor and safety personnel immediately.

Cold Stress

- Dress in light-weight layers.
- Keep clothes dry.

- Cover your head. As much as half your body heat can be lost if your head is exposed.
- Wear winter gloves or leather glove with a liner. Nitrile surgical gloves used as a liner will retain heat better than without a liner.
- Wear winter insulated composite toe work boots with good soles.
- Frostbite is localized frozen tissue. **DO NOT** rub the area, limit body motion and warm slowly.
- Hypothermia is lowered body temperature. Symptoms include fatigue, nausea, confusion, lightheadedness and profuse sweating. Remove any wet clothing, use dry blankets and move to warmer area.

Eye First Aid

- Do not wear contact lenses.
- If you get something in your eye, **DO NOT RUB YOUR EYE**. This could make the object embedded causing more damage. Try to keep your eyelid from closing in tight against your eyeball. Let tears or eyewash flush the particle out.
- Metal foreign bodies can quickly form a rust ring and significant scarring. Seek help immediately.
- If you get something splashed in your eye, flush immediately for a minimum of 15 to 20 minutes. Hold your eye open while flushing.

Welder's Eye

- Use Industrial Eye Drops in our first aid cabinets. Due to contamination and infection reasons, do not let anyone else use your eye drops.
- Use cold compresses over eyes. If using ice in Ziploc bag, use a barrier such as a facecloth between your skin and the ice bag.
- Suggest taking Ibuprofen for swelling and Tylenol for pain.
- Eyes can swell temporarily.
- Welders that have been in the trade for several years also use sliced potatoes or moist tea bags to reduce soreness.
- If condition worsens or persists more than 72 hours contact your supervisor to get medical attention.

Heat Stress

To reduce the risk of a heat related illness, do the following:

- Drink at least 8 ounces of water or sports drinks every 15—20 minutes.
- Take electrolyte tablets to replace salt, potassium, calcium, and magnesium lost due to sweating.
- Take breaks to cool off.
- Wear light colors.
- Acclimate yourself to hotter work temperatures.
- Watch new employees that are not used to working in hot conditions for heat stress illnesses.

13. Remove all jewelry before working. Rings typically have a pull strength of over 1600 pounds. It is doubtful your ring will break before your finger is severely injured.
14. Make sure safety guards are in place before you begin any job.
15. **Never** reach into machinery to repair, oil, or adjust without using the proper lockout / tagout procedures.
16. Clean up with a rag or brush—never use your fingers or hands.
17. Wash your hands often. Don't ignore hand injuries.
18. Know the signs of dermatitis or skin injuries (results from contact with chemical, mechanical, biological and physical work tasks) and inform your supervisor or safety director immediately for prompt medical treatment.
19. When carrying items, make sure your path is clear. Check the width of a doorway before you venture through it to make sure your hands will fit.
20. Take one step at a time both going up and down stairways. Many people have tripped catching their hands-on handrails or walls and received serious hand injuries.
21. Never wrap a tag line around your hand.
22. Stay focused and pay attention to what you are doing.
23. Know the Danger Zones.
    - Poor hand or body position
    - Caught in pinch points
    - Material handling or struck by sharp objects
    - Caught in rotating equipment
    - Energized systems—LOCK IT OUT!
    - Struck by object
    - Misuse of hand or portable power tools
    - Contact with hot objects or materials
    - Contact with caustic or corrosive materials
    - Repetitive motion / poor equipment design

HAND INJURIES ARE ONE OF THE LEADING TYPES OF CONSTRUCTION INJURIES. CONCENTRATE ON WHAT YOU ARE DOING. THINK ABOUT YOUR HANDS AND GUARD THEM EVERY SECOND OF THE DAY.

be followed:

- Bench grinders **MUST** be equipped with "Deadman" switches.
- Set tool rest so that material to be ground is slightly higher than center line of the wheel. The tool rest **MUST** be set no greater than 1/8" from the wheel. When the wheel is too small to maintain this dimension, destroy and discard wheel. Failure to keep the rest correctly adjusted can result in a serious accident due to the work piece becoming jammed between the rest and the wheel. This can cause the work piece to fly or the wheel to burst.
- The adjustable tongue **MUST** be kept to within ¼" of the wheel.
- Use a wheel dresser if stone is grooved, irregular, or glazed.
- Keep hands at least 2 to 3 inches from the grinder. This may mean holding object in a vise and using a portable grinder.
- Make sure the guard covers over half the wheel and that the guard is between the employee and the work.
- When resting a tool, make sure the wheel has stopped turning and set grinder on its back**. DO NOT** set the grinder down on the wheel.
- Ensure no one stands directly in front of the wheel before starting the grinder.

Hand Safety

Your hands are your most valuable tool. Nothing has ever been invented that can match them for usefulness and adaptability. That's why it's so important to learn how to protect your hands, both at work and at home. Think for a moment what life would be like without one of your hands or fingers. Holding hands, picking up your children, getting cleaned up and dressed, driving, working, playing sports, etc., are all things we take for granted. Following are some common ways contractors get injured:

1. Always wear the correct type of glove to protect your hands unless this creates a bigger hazard.
2. Wear cut resistant gloves when using a cutting tool or working around sharp objects or materials. Normal leather gloves provide no cut resistance.
3. Keep your gloves as clean as possible to prevent slipping.
4. Keep gloves away from your face. Especially when working with something chemical like caustic.
5. Don't reuse chemical or disposable gloves.
6. Use the correct hand tool for the job and use it properly. Use hammers, chisels and screwdrivers for their intended purpose.
7. Watch your line of fire. Always pull on a wrench (but not towards your face) never push.
8. Always cut away from you.
9. Use penetrating oil to free up corroded or rusty bolts or nuts.
10. Keep hands away from pinch points and crushing hazards. Inspect materials for wood or metal slivers, jagged edges, burrs, and rough or slippery surfaces.
11. Always consider ergonomics of the hands.
12. Use gloves with padding when working with vibrating tools.

- Don't overexert yourself, only you can tell how hot you really are.
- Schedule work for cooler time periods.
- To prevent sunburn, use sunscreen and keep exposed skin covered.

Basic first aid steps for heat stress are:

- Move person to cooler, shady location
- Remove or loosen clothing
- Lower body temperature by applying cold compresses or misting with water
- Use fans if available
- If conscious give sips of cool water, if nauseas discontinue water intake
- For cramping muscles, massage area gently
- If heat stroke is expected, call for ambulance immediately

Flammable and Combustible Liquids

FLAMMABLE (EXPLOSIVE) LIMITS - When vapors of a flammable or combustible liquid are mixed with air in the proper proportions in the presence of a source of ignition, rapid combustion or an explosion can occur. The proper proportion is called the **flammable range** and is also often referred to as the **explosive range**. The flammable range includes all concentrations of flammable vapor or gas in air, in which a flash will occur or a flame will travel if the mixture is ignited. There is a minimum concentration of vapor or gas in air below which propagation of flame does not occur on contact with a source of ignition. There is also a maximum proportion of vapor in air above which propagation of flame does not occur. These boundary-line mixtures of vapor with air are known as the **lower and upper flammable limits (LFL or UFL)** respectively, and they are usually expressed in terms of percentage by volume of vapor in air.

This section applies only to the storage of flammable or combustible liquids in drums or other containers (including flammable aerosols) not exceeding 60-gallon individual capacity. Basically, flammable liquids have a flash point below 100°F. Combustibles have a flash point greater than 100°F.

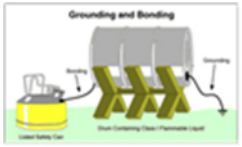
Follow these guidelines:

- Flammable and combustible liquids used in and around mechanical construction can be very hazardous. Especially since there are so many potential sources of ignition such as welding sparks, flames from acetylene cutting torches, brazing operations, cigarettes, etc.
- Whenever possible substitute flammable or combustible liquids with non-flammable/ combustible liquids that do the same job. Eliminating the hazard is the best option.
- When you can't substitute, keep the quantities of flammable/combustible liquids as small as possible. Keep only the amount you will use right away.
- Flammable cabinets should be positioned at least 25 feet from any doorway.
- Flammable liquids should be kept in flammable cabinets. Doors to cabinets must be closed.
- Not more than 60 gallons of Class I and/or Class II liquids, or not more than 120

gallons of Class III liquids may be stored in an individual cabinet.

- Flammable or combustible liquids, including stock for sale, shall not be stored so as to limit use of exits, stairways, or areas normally used for the safe egress of people.
- Common flammable and combustible liquids used in our business include gasoline, other petroleum products, benzene and other cleaning solvents.
- Keep these liquids in containers designed specifically for their use. Metal safety cans with self-closing lids that are UL Approved must be used.
- Every container should be properly and clearly labeled so workers won't unintentionally use the wrong liquid. For example, don't use a container labeled for gasoline to store a cleaning solvent or diesel fuel. Doing so could lead to a hazardous situation.
- Never mix different types of fuels. Always store fuel liquids in the properly marked and colored container. RED designates Gasoline; YELLOW designates Diesel Fuel; BLUE designates Kerosene.

- Be constantly aware of the location of these liquids in relation to sources of ignition.
- Keep them well away from ignition sources even though they are in approved containers.
- Static electricity can be a source of ignition. When transferring one of these liquids from a drum to a smaller container protect yourself from this ignition source by grounding the drum first. Then bond the drum and container by attaching a conductive wire from the drum to the container.



- Storage in inside storage rooms shall comply with the following:
  - With Fire Protection Provided, Maximum Floor Area 500 (ft^2), Total Allowable Quantity 10 gallons
  - Without Fire Protection, Total Allowable Quantity 4 gallons
- Every inside storage room shall be provided with either a gravity or a mechanical exhaust ventilation system designed to provide for a complete change of air within the room at least six times per hour. Ventilation is vital to the prevention of flammable liquid fires and explosions. It is important to ensure that air flow through the system is constant and prevents the accumulation of any flammable vapors.
- Ailes of at least 3 feet in width shall be maintained to access doors, windows or standpipe connections.
- At least one portable 10# fire extinguisher shall be located outside of, but no more than 10 feet from, the door opening into any room used for flammable storage.

Food Safety

Good Manufacturing Practices (GMP) and Standard Operating Procedures (SOP) are two tools for food or pharmaceutical facilities to produce high quality products for human

- Before the tank for a fuel-powered tool is refilled, shut down the engine and allow it to cool in order to prevent accidental ignition of hazardous vapors.
- If a fuel-powered tool is used inside a closed area, make sure there is adequate ventilation.
- Keep fire extinguishers readily at hand.

Powered Abrasive Wheel Tools

- All portable grinding tools **MUST** be equipped with safety guards to protect employees not only from the moving wheel surface but also from flying fragments in case of breakage.
- Grinders should be last resort when selecting a tool for cutting tasks just like ladders are the last resort for elevated work.
- For cutting tasks, grinders must be equipped with anti-kickback clutch and **BRAKE** feature. These grinders have proven to decrease kickback injuries during cutting tasks. Check to see that you are using the correct grinder for cutting tasks before use.
- Wear the proper eye protection and face shields when using powered abrasive wheel tools.
- Wear proper hearing protection. Noise extremes are another hazard when working with powered abrasive tools.
- **ALWAYS** turn the power off when not in use.
- **NEVER** clamp a hand-held grinder in a vise.
- **NEVER** force the disc at the metal or allow the disc to become trapped in the work piece, as this will cause the disc to break or the grinder to 'kick back'.
- The grinder **MUST** be marked with its maximum permissible speed. The information supplied with the abrasive wheel should be checked to ensure that the maximum permissible speed is NEVER exceeded when in use.
- Make sure the wheel hole, threaded or unthreaded, fits the machine arbor properly and that flanges are clear, flat, and of the proper type for the wheel you are mounting.
- Adopt a comfortable stance, with feet apart and well balanced, and a clear view of the job.
- **STOP** the grinder at regular intervals for a short break to rest your hands and arms. Switch off with your co-worker.
- Place welding screens, fire blankets, or tape off work area to protect other employees and equipment from flying particles and sparks.
- **DO NOT** use excessive pressure when mounting wheel between flanges. Tighten nut only enough to hold wheel firmly.
- **ALWAYS** use two hands to operate an angle grinder. One hand should grip the handle and "dead man" switch, while the other hand supports the weight of the tool.
- Keep the grinding disc at a 15 to 30-degree angle to the work.
- **DO NOT** grind soft metals or plastic.
- Because of so many safety infractions with bench grinders (dressing the wheel, adjusting the work rest, etc.) these have been taken out of service at many of our work sites. If you do have access to a bench grinder, these safety rules **MUST**

be a dangerous ignition source. Where this hazard exists, spark-resistant tools made from brass, plastic, aluminum or wood will be provided for safety.

- Personal pocket knives are not to be used on a job site by a Winger employee. Proper cutting tools and cut resistant gloves will be issued for cutting tasks.
- Chisels, drills, punches, ground rods, pipes, etc., **SHALL** be held with suitable holders (not with the hands) while being struck by another employee.
- Chisels, punches or drift pins, that become mushroomed or cracked **SHALL** be dressed, repaired or replaced before further use.
- Wrenches and hand tools **MUST** be kept free of oil and dirt to prevent slippage.
- **NEVER** push a wrench—pull it toward you for better control and safety.
- **ALWAYS** use a "striking-face" box wrench or heavy-duty box or socket wrench to free a "frozen" nut or bolt. Use of penetrating oil is also recommended.
- **DO NOT** grind wrenches to change their shape.
- **NEVER** use open-end wrenches with spread, nicked, or battered jaws or box-end wrenches with rounded or damage points. Replace wrenches with bent handles.
- **DO NOT** use a screwdriver with rounded edges or tips; it will slip and cause damage to the work or yourself.
- **DO NOT** use a screwdriver for prying, punching, chiseling, scoring, or scraping.

Power Tools

- **DO NOT** use frayed, broken, or ungrounded electrical cords or tools.
- Safety devices **MUST** not be removed except for the purpose of repairs.
- When a temporary power source is used, a GFCI **MUST** be used.
- Electrical ground plugs will not be removed**.** **NEVER** cut off the grounding prong on a 3-prong plug. Insert 3-pronged plugs only in 3-prong outlets.
- Electrical power tools should **NEVER** be used around water or wet areas.
- Avoid accidental startup. Ensure the switch is in the off-position before plugging the tool into a power source. **DO NOT** hold your finger on the switch button while carrying a plugged-in tool. Lock-on switches should **NEVER** be used on electrical tools.
- Unplug or disconnect tools when not in use, before servicing, and when changing accessories such as grinding wheels, discs, blades, bits and cutters.
- **DO NOT** raise or lower a power tool by its cord.
- **NEVER** yank the cord or hose to disconnect it from a receptacle.
- Protect your extension and power cords from sharp objects, excessive heat and damp or wet areas.
- Keep cords well organized in the work area. Standing and walking on cords cause many slips, trips, twisted knees, ankles, etc.
- Route power cords at least 7' overhead and out of walkways whenever possible.

Liquid Fuel-Powered Tools

- Liquid fuel-powered tools usually use gasoline. Fuel vapors can burn or explode and give off dangerous exhaust emissions.
- Handle, transport, and store gas in approved flammable liquid containers.

and animal consumption. It is extremely important to follow all customer, state and federal regulations to reduce food contamination.

- Persons with communicable diseases such as diarrhea, vomiting, fever, sore throat, or open and/or infected wounds must not enter production areas.
- All cuts, abrasions, and sores shall be covered at all times with clean Band-Aids that are food grade metal detectable.
- Work areas must be kept orderly and clean. Trash cans must be labeled and must have lids. They should be emptied often.
- Clothing and PPE must be maintained in good, sanitary condition along with a high degree of personal cleanliness and personal hygiene to prevent potential contamination.
- Hair nets and beard nets must be worn in all load-out and packaging areas and all other production areas when the process is open.
- Ear plugs must have the string attached and secured to your hardhat.
- Safety glasses are to be worn with chums.
- No tobacco products are allowed.
- No spitting is allowed.
- Take break in a designated break area. Do not take, eat, chew gum, candy or medication into production areas.
- Only plain water is allowed in production areas. Drink Gatorade or energy drinks at break or lunch.
- Wash your hands after using the restroom and before eating.
- Carrying of pens, pencils, etc., in pockets above the waist is prohibited.
- No jewelry, piercings necklaces, rings, earrings, or ear gauges. Wedding rings must be covered by tape or gloves.
- Follow all SOPs for the process system you are working on, i.e. purging, flushing, pipe ends capped or covered, etc.
- Remember the rule—" tools in, tools out". Ensure all parts, tools and materials are picked up and accounted for before returning systems back to service.

Formaldehyde

Formaldehyde is a colorless, strong-smelling gas often found in aqueous (water based) solutions. Commonly used as a preservative in medical laboratories and mortuaries. Formaldehyde is also found in many products such as chemicals, particle board, household products, glues, permanent press fabrics, paper product coatings, fiberboard, and plywood. It is also widely used as an industrial fungicide, germicide and disinfectant. Workers can inhale formaldehyde as a gas or vapor or absorb it through the skin as a liquid. They can be exposed during the treatment of textiles and the production of resins.

Formaldehyde is a sensitizing agent that can cause an immune system response upon initial exposure. Acute exposure is highly irritating to the eyes, nose, and throat and can make anyone exposed cough and wheeze.

Subsequent exposure may cause severe allergic reactions of the skin, eyes and respiratory tract. Ingestion of formaldehyde can be fatal, and long-term exposure to low

levels in the air or on the skin can cause asthma-like respiratory problems and skin irritation such as dermatitis and itching. Concentrations of 100 ppm are immediately dangerous to life and health (IDLH). In 2011, the National Toxicology Program named formaldehyde as a known human carcinogen which may cause cancer. All workers shall be protected from exposure to an airborne concentration of formaldehyde which exceeds 0.1 ppm (parts per million) parts of air.

Some customer sites could potentially expose our workers to formaldehyde while working on their industrial processes. Winger employees must:

- Follow all safe work and feasible engineering practices;
- Follow all permit procedures;
- Receive and review the Formaldehyde SDS from the customer before work begins;
- Always flush nearby eye wash stations and safety showers before any line breaks to remove stale or contaminated water. Let them run during work if allowed;
- Wear impervious clothing and gloves;
- Wear full face or powered air-purifying respirators;
- Respirator cartridges must be changed at the end of the work shift and/or between users;
- Know the reporting procedures for spills or emergencies of the facility you are working in;
- Report any exposure and/or symptoms to your foreman and safety director for medical surveillance.

Hand and Power Tools

General Safety

- Stay alert when using tools!
- Don't take shortcuts! You don't save time by taking a shortcut if you or someone else is sidelined with an injury.
- Use the proper tool for the job to be performed. Misuse can cause possible injury to the user and cause damage to the tool itself.
- **ALWAYS** follow the manufacturer's instructions and only use the tool within design limits.
- Inspect and keep all tools in safe working condition. **NEVER** use defective tools or equipment.
- Remove any damaged tools immediately from use and report them to your supervisor or tool crib personnel.
- **ALWAYS** wear the appropriate PPE when using any hand or power tool. For example, cut resistant gloves when using a cutting tool or faceshield when grinding.
- Avoid wearing neck chains, rings, watches and other jewelry that might become snagged in tools, machines and other moving equipment.
- Tie back long hair and secure sweatshirt strings that could get caught in a point of operations.

- Follow good ergonomic work practices. Stretching, taking rest breaks, and alternating work tasks, can prevent repetitive motion injuries such as carpal tunnel, etc.
- Where possible, keep the work at waist height.
- Make sure your grip and footing are secure when using tools.
- Position yourself so that a tool that falls or slips won't cause an injury to you or your co-worker. Keep yourself out of the "line of fire".
- Employees using grinders, saw blades, chisels or other tools, should direct the work hazard away from aisle areas and away from other employees working in close proximity.
- Put up signs and barricades to keep others away from your work area when necessary. This protects both you and them.
- Keep your work area organized. **DO NOT** leave tools lying around. This will prevent tripping hazard and damage to the tool.
- Good housekeeping practices are crucial to reduce slips, trips and falls. Keep cords and tools out of walkways and aisles.
- Secure work with clamping devices, freeing both hands to operate the tool.
- Tools **SHALL NEVER** be left unsecured on elevated places from which they may be dislodged.
- Carry tools securely in a tool belt or box. Use a tool lanyard to keep your tool from dropping and hitting someone below.
- **DO NOT** carry tools up ladders. Use a hoist or rope.
- Keep cutting tool edges sharp. Tools with dull edges are dangerous because they may slip off the material and cause a serious hand injury.
- Carry tools with sharp edges away from your body. Tools with sharp edges **SHALL** be stored and handled so that they will not cause injury or damage.
- Pass a tool to your co-worker by the handle.
- Always notify your foreman before doing any work where there is danger of coming in contact with electrical wires or equipment.
- The protective covering on hand tools **SHALL NOT** be depended upon to protect users from electrical shock. Only FM, UL, or CSA approved insulated hand tools may be used in lieu of rubber gloves on voltages less than 300 volts.
- Tools with metal or metal continuing through the handle and metallic measuring tapes **SHALL NOT** be used on or near energized electrical circuits or equipment.
- Pipe stands MUST have a safety mechanism, such as a lock washer, to prevent the upper part of the jack from falling into the stand. They MUST also have their capacity clearly labeled on the stand.
- Compressed air **SHALL NOT** be used for cleaning purposes, except where reduced to less than 30 pounds per square inch (psi) pressure and then only with effective chip guarding and personal protective equipment.
- Clean off tools after use to prolong life expectancy.
- Winger tools are company property. When you are finished working, make sure you store the tools properly. Be respectful and take care of them so you have them the next time.

Hand Tools

- Around flammable substances, sparks produced by iron and steel hand tools can