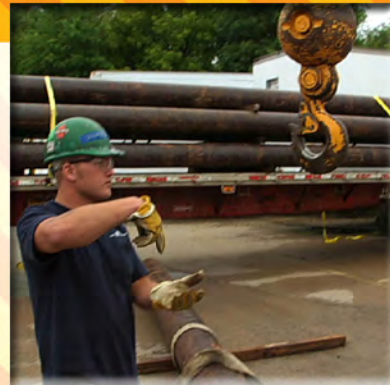


MCAA Toolbox Safety Talks Volume V



Mechanical Contractors Association

MCAA

of America



MCAA Toolbox Safety Talks (Volume V)

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Training Documentation for Test # _____

The undersigned workers have participated in safety training covered by the MCAA Toolbox Safety Talk that corresponds to the number in the space above.

1. _____

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Instructions for the Toolbox Safety Talk Presenter

Preparation:

1. Select the most appropriate talk for the week.
2. Keep track of the talks you present so you don't inadvertently repeat them.
3. Photocopy the talk you plan to use (one for each participant).
4. Print a copy of the generic training documentation sheet and write in the number of the Toolbox Talk in the blank at the top.

Presentation:

1. Answer any questions from the previous week's talk that you were unable answer at the time of the talk. Give a copy of the new talk to each participant.
2. Present the content of the talk slowly and clearly.
3. Relate any experiences you've had that deal with the topic.
4. Ask the participants to share their own experiences that relate to the topic.
5. Ask whether there are any questions or comments.
6. Write down any questions that you can't answer and any comments that you think would be useful to the company.
7. Have each participant sign the training documentation sheet.
8. File the training documentation sheet where you can access it quickly if needed.

Follow-Up:

1. Be sure to re-read the questions and comments you recorded.
2. Find the answers to the questions you were unable to answer. Start the next week's talk by answering those questions.



Qualified Riggers

#1

As of November 8, 2010 riggers involved in the assembly or disassembly of a crane or derrick or working in what OSHA describes as the “fall zone” have to be “Qualified Riggers.”

- A Qualified Rigger is a rigger who has a recognized degree, certificate or professional standing, or extensive knowledge, training and experience, and can successfully demonstrate the ability to solve/resolve problems related to applicable rigging applications.
- A fall zone is any area (including, but not limited to, the area directly beneath the load) where partially or completely suspended materials could fall in the event of an accident.
- If you received rigger training from your local union, including during your apprenticeship training, request copies of the training documentation from the union and provide a copy to your supervisor.
- If you received rigger training from any other source, obtain copies of the training documentation and provide a copy of each to your supervisor.
- Be sure to familiarize yourself with the rigging safety requirements established by OSHA in its standard on *Cranes and Derricks in Construction*.
- Before participating in the assembly or disassembly of any crane or derrick and/or before performing work in a fall zone, be sure that your employer has evaluated your rigging knowledge and skills and considers you to be a Qualified Rigger.

Pre-Lift Safety Reminders for Riggers

#2

As you prepare to rig a load for a lift operation, perform some pre-task planning. Go over the following list of reminders before you start to rig the load. If you have any questions about any part of the lift operation, check with your supervisor before you get started.

- Check the weather conditions before the lift. If the weather is extreme, postpone the lift until the weather becomes cooperative.
- Make sure the system of communication you have in place with the operator is effective and is functioning properly.
- Check the lift area and load path for obstructions such as buildings, poles, towers, power lines, antennas, satellite dishes, etc.
- Also check the receiving area. Make sure it is firm, flat and free from loose objects that could fly up when the load is delivered.
- Always wear a hard hat and sturdy work gloves.
- Be sure that your work boots or work shoes have built in toe protection. It is especially important to have this protection when you are receiving a load. The boots or shoes should meet the requirements of American Society for Testing and Materials (ASTM) standard F2413-05, formerly the American National Standards Institute's (ANSI) Z41-1999.
- Whenever possible plan to rig the load so that it will be lifted straight up, which will help prevent the load from swinging.



Lift Operation Safety Reminders for Riggers

#3

As the operator prepares to lift the load, conduct some pre-lift planning. Go over the following list of reminders. If you have any questions about any part of the lift operation, check with your supervisor before you get started.

- Think about where to place your hands so that when the sling starts to tighten around the load your hands won't be caught between materials or between the sling and the material.
- Watch carefully when the lift begins in case the load starts to swing.
- Be sure to stay out from under the load when it is being lifted and moved.
- Use as many tag lines as necessary to control the load.
- If you are the designated signal person, signal the operator to deliver the load slowly. (Signal persons must become "Qualified Signal Persons" before they can start to signal. For information about "Qualified Signal Persons," see Toolbox Talk #23 in this publication).
- Guide the load onto the blocking so that it will not be dislodged when the tension comes out of the sling or slings.
- Watch the placement of your feet as you receive the load.
- Give the stop signal immediately if something does not appear to be safe.

Rigging Safety Tips (Part 1)

#4

Here are some safety tips for some of the common mechanical construction industry rigging applications.

- Never tie two or more slings together.
- Always connect two slings with an appropriate-sized shackle.
- Never attach a sling directly to a lifting lug. Always use a shackle.
- Likewise, never run a sling through a set of lifting lugs or eyebolts. Doing so creates too much tension on the lugs or eyebolts.
- Always choke below the threads on flat synthetic web slings.
- Take wire rope slings out of service immediately if they become defective. A wire rope is defective if there are five or more broken wires in one rope lay and/or three or more broken wires in one strand of one rope lay, (a rope lay is the length along the rope where one strand makes a complete revolution around the rope).
- Some companies have established a policy that wire rope is defective when a single wire breaks. Check with your supervisor about your company's policy before using wire rope slings.
- "Never saddle a dead horse." When using wire rope clips be sure to attach the wire rope clips with the inside curve of the U-bolt up against the very end (dead end) of the wire, and the inside of the U-bolt clip (saddle) up against the live end of the wire.

Rigging Safety Tips (Part 2)

#5

Here are more safety tips for some of the common mechanical construction industry rigging applications.

- Never allow a synthetic sling to bunch up on a shackle.
- Always use the right size shackle for the job. For example, a 1 inch shackle is too small to use with a 1 ½ inch wire rope sling. However, a 2 inch shackle works safely with a 1 ½ inch wire rope sling.
- Never make a shackle to shackle connection.
- Be sure to use a safe shackle orientation. Don't allow the inside loop of a wire rope sling to place tension on a shackle pin directly where the pin screws into the shackle or directly where the pin comes through the hole on the opposite side of the shackle. Doing so would place too much tension on the shackle ears.
- Never orient two slings in a shackle so that they would pull the shackle in opposite directions that are parallel to the shackle pin.
- Be sure not to orient a shackle/sling on a shackle pin in a manner that could result in the shackle pin becoming unscrewed during the lift.
- Make sure that you choose the right size sling/sling loop based on the size of the crane or derrick hook.
- Be sure not to "point load" crane or derrick hooks. The rated capacity of the hook decreases as the angle increases and the load moves out away from the center of the hook.



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10 Common Rigging Safety Rules

#6

These 10 common rigging safety rules will help you remember some of the most important safe rigging practices.

- Be sure to establish the weight of the load.
- Determine the proper type of hitch based on the type of load.
- Understand the relationships between angles and tension as they pertain to slings and hardware. If you don't understand the relationships, or if you have any questions, check with your supervisor before you proceed.
- Make sure that you select the right sling for the job based on the type of load to be lifted.
- Also, select the right hardware based on the type of load and the type of sling or slings that will be used for the lift.
- Inspect each sling before you use it. Never use a defective sling. Take defective slings out of service immediately and follow your company's procedure for handling defective equipment.
- Inspect all rigging hardware before you use it. Never use defective hardware. Take defective hardware out of service immediately and follow your company's procedure for handling defective equipment.
- As you rig the load, protect slings from cuts and tears.
- Determine the load's center of gravity.
- Pay close attention to detail at the time of the lift.

Establishing the Weight of the Load

#7

To ensure the safety of rigging operations, manufacturers are required to establish rated capacities for rigging slings and rigging hardware. Riggers must be able to determine whether the load to be lifted weighs more than the rated capacity established for each piece of rigging equipment. Therefore, riggers must be able to determine the weight of the load.

- Manufacturers often paint the weight per foot on the pipe. Just multiply the weight per foot times the length of the pipe in feet.
- You can also determine the weight of pipe using a pipe chart.
- If you have to calculate the weight of a piece of pipe, check with your supervisor to obtain the pipe weight calculation formula.
- When lifting more than one object of the same weight, count the number of pieces per lift and multiply that number by the weight of one of the objects.
- For HVAC units, check to see if the weight is listed on the equipment. If not, contact the manufacturer or supplier and request the specifications in writing.
- To determine the weights of other types of equipment such as pumps, fans, welders, boilers, etc., contact the manufacturer or supplier and request the specifications in writing.
- When determining the weight of compressed gas cylinders, first determine whether the cylinders are full or empty. If the cylinders are partially full, treat them as if they are completely full for the purpose of your calculation. Use approved cylinder handling cages/devices and include its weight in your calculation. Large cylinders typically weigh 240 lbs. full and 220 lbs. empty.

The Proper Rigging Hitch

#8

The type of hitch you will need to use depends on the type of load. There are three basic hitches and some variations. The three basic hitches include the vertical hitch, choker hitch and basket hitch. To ensure a safe lift operation, the hitch you use must be able to safely support the specific load that will be lifted.

- A 2-Leg Bridle Hitch works well for moving single pieces of pipe.
- A Double Choker Hitch also works well for moving single pieces of larger pipe.
- A Single Choker Hitch will work for large, short pieces of pipe and large pipe fittings.
- A 2-Sling Double Wrap Choker Hitch is a good choice for multiple pieces of pipe. With this type of hitch the slings snug up evenly around the load of pipe as the load starts to lift so individual pieces of pipe won't slip out.
- A 2-Sling Double Wrap Basket Hitch is also a good choice for multiple pieces of pipe. This type of hitch works like the 2-Sling Double Wrap Choker Hitch referenced above in that the slings snug up evenly around the load of pipe.
- A 2-Basket Hitch works well on most large cylinders.
- A single vertical hitch has various applications, but it works well on loads with multiple slings connected to a single shackle and will remain balanced when the shackle is attached to and lifted by a crane or derrick hook.

Angles/Tension for Slings and Hardware

#9

The amount of tension applied to rigging slings and rigging hardware can change depending on the angles created during the lift. The types of rigging equipment, sizes and applications can all affect the angles. Here are some basic safety considerations regarding angles and tension.

- The lower the angle between the load and the sling, the higher the tension on the sling.
- Angles also create additional tension on rigging hardware.
- The rated capacities of rigging hardware decrease when it is pulled from any direction other than vertical.
- For example, as the angle of pull on a rigging eye bolt increases as it is being pulled by the crane cable/hook away from vertical, there is a constant decrease in the percentage of rated capacity. This applies to the rated capacities of crane hooks as well. Be sure to check with the manufacturer about changes to rated capacities before you begin rigging for lift operations.
- When using multi-leg slings, ensure that the rated capacity of each sling is adequate for the load. To make that determination accurately, consider how many legs there are on the sling and how each leg supports the load.
- Each leg of a two-leg sling shares the load.
- Each leg of a three-leg sling shares the load.
- On a four-leg sling, only two of the legs may be carrying the majority of the load. The other two legs tend to balance the load.

Choosing a Safe Rigging Sling

#10

The most frequently used slings in the mechanical construction industry are synthetic web slings, synthetic round slings, wire rope slings and alloy steel chain slings. There are pros and cons to each type of sling. The safest sling for one type of lift operation may not be the safest one for another type of lift. Several things to consider while choosing a sling for a specific application follow.

- Is the sling compatible with the type of hitch you need to use to perform the lift safely? The rated capacities of slings change depending on the type of hitch. For example, the rated capacity of a synthetic round sling used with a choker hitch is considerably less than the same sling used with a basket hitch. Be sure to check the manufacturer's rated capacities of each sling according to the type of hitch you need to use. The information will be on the sling.
- Do the design and composition of the sling make it strong enough to perform the work safely? Be sure to consider reductions for sling angles.
- Are all parts of the sling in good condition?
- Is all of the rigging hardware in good condition?
- Is the sling compatible with the rigging hardware?
- Will the type of sling and hitch that you are thinking about using keep the load secure and stable?
- Could the specific lifting operation cause the sling to break or become damaged during the lift?

Choosing Safe Rigging Hardware

#11

Hooks, shackles, eyebolts and U-bolt wire rope clips are some of the most frequently used rigging hardware in the mechanical construction industry. Selecting the right hardware is critical to safe lift operations. Several things to consider while choosing rigging hardware for a specific application follow.

- Do the design and composition of the hardware make it strong enough to perform the work safely? Rigging hardware is rated based on straight linear tension. The rated capacities decrease any time the angle of pull is no longer vertical. The more the angle increases out from vertical, the more the rated capacity decreases.
- Will the hardware keep the load secure?
- Is the hardware compatible with the sling?
- Is the hardware in good condition?
- Capacity tables should only be used for pre-project planning purposes. The same sizes and types of hardware may have different rated capacities depending on the manufacturer. For example, the rated capacity of a 7/8 inch eyebolt may have a rated capacity that is hundreds of pounds different from the exact same size and type of eyebolt made by a different manufacturer.
- Always use the rated capacities provided by the manufacturer specifically for each individual piece of hardware.

Sling Safety Inspections

#12

No matter how careful you are with sling use and storage, slings of every type wear out over time. Worn out slings are very dangerous and should never be used. Conduct regular inspections of the slings you will be using and take them out of service if they're not in good condition.

- Get in the habit of inspecting your slings before each and every use. A quick inspection takes very little time and is well worth the effort since defective slings are very hazardous.
- Check for any and all signs of damage and excessive wear.
- Be sure to carefully inspect any permanently attached fittings as well.
- If during your inspection you become unsure about whether a sling is safe to use, check with your supervisor before you use it.
- When you come across a defective sling, take it out of service immediately. Follow your company's procedure for taking defective equipment out of service.
- If your company does not have a policy for handling defective equipment be sure to tag the sling as defective so that no one else will use it. Make the tag large and conspicuous. It is also a good idea to take it out of the lift operations area so that it is not inadvertently used by someone else.
- Be sure to inform your supervisor about the defective sling. Let him know where you placed it and that you tagged it out of service.

Synthetic Web Sling Safety

#13

Synthetic web slings are strong and have relatively long service lives when cared for properly. However, they are susceptible to damage from burns, cuts, broken stitching, etc. Be sure to inspect them thoroughly before using them.

- Start by looking for the permanently attached identification. Make sure it includes the manufacturer's name or trademark, code or stock number, rated capacities based on the three basic types of hitches, the angles on which the capacities are based, the type of core material that makes up the sling and the type of cover material, if it is different than the core material. If the identification is missing, the sling is defective.
- Inspect the entire sling inch by inch. Look for melting and/or charring, which would indicate exposure to excessive heat or flames. Look also for cuts, tears, snags, or any other type of fiber damage. Watch for discolorations. Observe these areas carefully looking for brittle or hardened fibers, which indicate contact with chemicals or excessive heat.
- Carefully observe the stitching throughout the sling. Watch for broken and worn stitches. Watch for abraded areas too, especially where the sling rubs against the load, a fitting or rigging hardware. If the sling has been knotted take it out of service immediately. Knots can permanently damage synthetic web slings.
- Check carefully for bends, cracks, gouges, corrosion, rust and other damage to all permanently attached fittings.
- If any part of the sling is defective, take it out of service immediately.

Synthetic Round Sling Safety

#14

Synthetic round slings are unaffected by unusually hot air temperatures and they are highly resistant to mildew. However, they are susceptible to damage from cuts, burns, snags, etc. Be sure to inspect each sling inch by inch before using it.

- Find the permanently attached identification. Make sure it includes the manufacturer's name or trademark, code or stock number, rated capacities based on the three basic types of hitches, the angles on which the capacities are based, the type of core material that makes up the sling and the type of cover material, if it is different than the core material. If the identification is missing, the sling is defective.
- Watch for cuts, tears, snags, burns or any other type of fiber damage that expose the core yarns. Observe carefully for acid and caustic burns, which will significantly weaken synthetic round slings.
- Watch for abraded areas, especially where the sling rubs against the load, a fitting or rigging hardware. If the sling has been knotted, take it out of service immediately. Knots can permanently damage synthetic round slings.
- Watch for discolorations. Observe these areas carefully looking for brittle or hardened fibers, which indicate chemicals or excessive heat exposure.
- Check carefully for bends, cracks, gouges, corrosion, rust and other damage to all permanently attached fittings.
- If any part of the sling is defective, take it out of service immediately.

Wire Rope Sling Safety

#15

Wire rope slings are strong, flexible and somewhat resistant to heat. However, they are susceptible to damage from environmental conditions, kinking, cracking from small radius bends, etc. Be sure to inspect each sling inch by inch before using it.

- First, look for the permanently attached identification tag that states the size, grade, rated capacity and the name of the manufacturer. If the tag is missing, the sling is defective.
- Look for broken wires. If there are five or more broken wires in one rope lay, the sling is defective. If there are three or more broken wires in one strand of one rope lay, the sling is defective (a rope lay is the length along the rope where one strand makes a complete revolution around the rope). Some company policies state that a single broken wire renders the sling defective. Be sure that you know your company's wire rope sling policy. Carefully observe the areas of the wire rope that attach to fittings. If there are one or more broken wires in these areas, the sling is defective.
- Check the end connections including the thimbles for signs of damage.
- As you're inspecting the sling, watch for worn and abraded wires. Also look for kinking, signs of stretch, corrosion, rust, pitting, discoloration, unraveling (bird caging), strands that are separated from the rest of the wire rope, melted areas, burns or any other signs of damage.
- If any part of the sling is defective, take it out of service immediately and follow your company's procedure for handling defective equipment.

Alloy Steel Chain Sling Safety

#16

Alloy steel chain slings are strong and somewhat resistant to heat. However, they are susceptible to damage from sudden jerks, stretching, rust, nicks, gouges, etc. Be sure to inspect each sling link by link before using it.

- First look for the permanently attached identification tag that states the size, grade, rated capacity and the name of the manufacturer. If the tag is missing, the sling is defective.
- Only Alloy Grades 80 or 100 may be used for overhead lifting. If the slings do not meet these criteria, take them out of service immediately.
- Carefully inspect the sling link by link looking for bends, cracks, gouges, and any other signs of excessive wear.
- Look to see if any of the individual links have stretched, paying special attention to where the links pull and rub against other links. If any of the links are binding against other links or against the eye of the hook they have been stretched and weakened rendering the sling defective.
- If the sling has multiple legs, you can look for stretching by hanging it up and determining whether any one leg is longer/shorter than any other leg.
- If any part of the sling is defective, take it out of service immediately and follow your company's procedure for handling defective equipment.
- If you're not sure whether a sling is defective, take it out of service and check with your supervisor before using it.

Rigging Hardware Safety Inspections (Part 1)

#17

Rigging hardware such as shackles, eyebolts, hooks and wire rope clips will wear over time no matter how well you take care of it. Conduct regular inspections of the hardware you will be using and remove it from service if it is not in good condition.

- Get in the habit of inspecting rigging hardware each time before you use it. The inspections can be done quickly and still be effective.
- Learn how to identify defective rigging hardware. Be sure you know what to look for in the different types of hardware.
- When you conduct your inspection, be thorough. Look for every conceivable type of damage.
- If you come across a piece of hardware that you are not sure about, check with your supervisor before you use it.
- When you identify defective rigging hardware, take it out of service immediately. Follow your company's procedure for taking defective equipment out of service.
- If your company does not have a policy for handling defective equipment, be sure to tag it as defective so that no one else will use it. Make the tag large and conspicuous. It is also a good idea to take it out of the lift operations area so that it is not inadvertently used by someone else.
- Be sure to inform your supervisor about the defective sling. Let him know where you stored it and that you tagged it out of service.

Rigging Hardware Safety Inspections (Part 2)

#18

Rigging hardware weakens over time from normal use. The shelf life decreases even further when the hardware is misused and abused. Weakened rigging hardware won't support the rated capacities established by the manufacturer when the hardware was new. It is dangerous to use and should be taken out of service immediately. Learn how to inspect rigging hardware so that you will know when it is time to replace it.

- First look carefully at each piece of rigging hardware for identification markings. If the identification information is missing, the hardware is defective.
- Carefully examine each piece looking for cuts, gouges, corrosion, rust and pitting. Look for areas that were melted, show signs of welding arc strikes, hot slag or other heat-induced markings.
- Pay special attention to the areas of the hardware that bear most of the weight during lifting operations.
- Watch for bent, twisted, stretched, cracked and broken parts of the hardware.
- Observe the threads of shackles and other hardware that use screw-in pins. If the threads appear damaged or stripped, it does not seat properly or it appears stretched, the hardware is defective.
- If you're not sure whether a piece of rigging hardware is defective, take it out of service and check with your supervisor before using it.

Protecting Slings

#19

Unprotected slings are often susceptible to cuts and tears during lifting operations. This is especially true for synthetic web slings. Unprotected slings can fail if they are cut or torn from the combination of the tension on the sling and a sharp edge or object up against it. Slings can and should be protected from cuts and tears during lifting operations or they may fail creating a significant safety hazard. Here are some safety considerations for lifting operations.

- The edges of the load being lifted do not necessarily have to be razor sharp to cut a sling that is not properly protected.
- Wide synthetic web slings are particularly susceptible to tearing where they come into contact with the corners of a load.
- Place padded material between the sling and any sharp edges that could cut the sling when the tension increases.
- Make sure that the material you use is strong enough to withstand the increased force of the edges when the load is lifted.
- Consider using commercial softeners for padding.
- Commercial corner protectors are also available. These protectors are shaped and designed to force the sling to round out at the points of contact.
- Take the time and effort to properly protect your slings. Doing so will help prevent falling loads.

Preventing Falling Loads

#20

One of the most important things you can do to help prevent a falling load is to properly determine the load's center of gravity. The center of gravity is the point within the load at which it balances evenly in all directions.

- While rigging a load, determine its center of gravity so that it will remain stable throughout the lift.
- The safest way to lift a load is straight up, directly above the center of gravity.
- When rigging objects that are uniform in shape and size such as a large piece of pipe, determine the center of gravity by measuring the object. The precise middle of the object will be its center of gravity.
- When rigging objects that are not uniform in shape and size, use your best judgment regarding the center of gravity.
- Complete the rigging and signal the operator to lift the load slowly and carefully a few inches at a time, stopping and starting so that you can determine whether the rigging needs adjustment.
- If the load tilts, have the operator lower the load. Adjust the rigging and repeat the process.
- Continue to use this trial-and-error method until the center of gravity is established. Determining the center of gravity for each load will significantly reduce the chances of losing a load during lifting operations.



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Lift Time Details for Safety (Part 1)

#21

Immediately prior to a load being lifted by a crane or derrick, several specific details require your attention, including testing the load and attaching the taglines.

- Be sure you are wearing your hardhat, gloves, safety glasses and protected toe boots or shoes.
- Make sure that the sling stays in the correct position as it tightens around the load.
- Look for potential sling and hardware failures as the sling tightens.
- Whenever possible, ensure that the load is raised directly above its center of gravity so that the load will not swing.
- Be aware of pinch points as the sling is tightening and keep your hands and body clear of them.
- Position your body so that you will not be trapped or crushed if the load shifts after it leaves the ground.
- Use taglines to keep the load from rotating and swinging out of control.
- Use as many taglines and properly trained tagline operators as necessary to safely control the load.
- Make sure that all tagline operators and everyone else in the area are wearing their hardhats when the lift begins.



MCAA Toolbox Safety Talks (Volume V)

Lift Time Details for Safety (Part 2)

#22

Immediately prior to a load being lifted by a crane or derrick several specific details require your attention including identifying obstructions, clearing the area and communicating with the operator.

- Consider where the load will be delivered in relation to where it will be rigged.
- Look carefully for any obstructions that may be in the path of the load as it is lifted and moved. Be especially alert for overhead power lines.
- When you identify an obstruction, communicate with the operator. Make sure he knows about it.
- Before the lift, clear the workers and others in the work area as much as possible from the lift area, and the path beneath where the load will travel.
- Make sure that a signal has been established for the workers in the area so that they will know when the lift is about to take place.
- Ensure that only one signal person will be communicating with the operator.
- Regardless of the type of communication you will be using, be sure that you know the standard hand signals in case other forms of communication break down.
- If you will be communicating with the operator by voice, make sure that both of you will be using the same standard voice signals.

Qualified Signal Persons

#23

As of November 8, 2010 OSHA requires that workers who are signaling crane and/or derrick operators (signal persons) must be “Qualified Signal Persons” when, during lift operations, the point of view is not in full view of the operator, the view in the direction of travel is obstructed during equipment travel, and/or site-specific safety concerns are an issue because the operator or the person handling the load determines that a signal person is needed.

- A Qualified Signal Person is a worker who has received documentation from a Qualified Evaluator indicating that he has met all the signal person qualification requirements established by OSHA, including general signal requirements and the requirements covering radio, telephone or other electronic transmission signals, voice signals and hand signals.
- If you received signal person training from your local union, including during your apprenticeship training, request copies of the training documentation from the union and provide a copy to your supervisor.
- If you received signal person training from any other source, obtain copies of the training documentation and provide them to your supervisor.
- Be sure to familiarize yourself with the signal person safety requirements established by OSHA in its standard on *Cranes and Derricks in Construction*.
- Before participating as a signal person in any crane or derrick lift operation, make sure that you have received documentation from a Qualified Evaluator stating that you are a Qualified Signal Person.



Safety Tips for Signal Persons (Part 1)

#24

Signal persons have a lot of safety responsibility. Inappropriate actions on the part of the signal person or failure to act when necessary can result in severe injuries to workers on the site. Here are some general safety tips for signal persons.

- Use the Standard Method for hand signals.
- On the rare occasions when the Standard Method for hand signals is not feasible or the operation or equipment attachment is not covered by the method, you can use non-standard hand signals under certain conditions.
- If you have to use non-standard hand signals, communicate with the equipment operator ahead of time. Make sure you both agree on the hand signals you will use.
- If you have to use signals other than hand, voice or audible signals, check with your supervisor first to ensure that your company meets the requirements for the use of alternative types of signals.
- Whatever signals you decide to use, make sure they are appropriate for the jobsite conditions.
- Make sure that you are the only person signaling the operator.
- Be sure that the directions you give to the operator are provided from his direction perspective.
- Always be prepared to give the emergency stop signal. Give the signal immediately anytime you become aware of a potential safety problem.

Safety Tips for Signal Persons (Part 2)

#25

Signal persons have a lot of safety responsibility. Inappropriate actions on the part of the signal person or failure to act when necessary can result in severe injuries to workers on the site. Here are some general safety tips covering electronic transmission signals, voice signals and hand signals.

- Immediately before the lift operation begins be sure to test all electronic transmission signal devices such as radios and telephones.
- Make sure that signal transmissions go through a dedicated channel.
- Before the lift operation begins, and once the dedicated channel has been selected, communicate with the operator on that channel to ensure that good communication is taking place.
- When using voice signals, communicate with the operator, and lift director if there is one, before the lift operation begins. Make sure you agree on the voice signals that will be used.
- Be sure that each voice signal includes the following elements in this order:
function (hoist, boom, etc.) direction;
distance and/or speed; and
function stop command.
- Before starting the lift operation using voice signals, make sure that the operator speaks and understands the language you will be using.
- When using hand signals, it is often helpful to have the Standard Method hand signal chart posted in the hoisting area.

Portable Generators

#26

Portable generators can be hazardous. There is the risk of electrical shock, carbon monoxide poisoning and fires from improper handling of flammable fuels. Here are some general tips for working safely with portable generators.

- Read through the generator manufacturers' recommendations for use, storage and maintenance. If necessary, you should be able to access the recommendations online.
- Inspect the generators before you use them. If anything looks broken or out of place, do not use it. Take it out of service immediately and contact your supervisor.
- Keep the generators out of the elements as much as possible. Be sure not to leave them out where they will be exposed to bad weather. When you're finished using them for the day, store them in a dry place.
- Be sure not to operate portable generators in enclosed areas.
- Don't use the generators in outside areas where exhaust fumes can be drawn into a building such as near vents, open windows, doors, etc.
- Before refueling, be sure to shut the generators off.
- Be careful not to spill fuel while you're refueling, and be sure not to store fuel near the generators.
- Make sure the generators are properly grounded before you start to use them.

Diesel Fuel

#27

Diesel fuel is common on the jobsite. It is used to fuel many different kinds of equipment and is safe when used properly. However, there are hazards associated with improper use of diesel fuel. The health hazards include skin irritation and respiratory issues. Also, diesel fuel is moderately flammable. Here are some tips for working safely with diesel fuel.

- Before using diesel fuel, make sure there are no ignition sources nearby such as lighted cigarettes, hot work, grinding sparks, power tools, etc.
- Fuel the equipment in a well ventilated area.
- If you're ever overexposed to vapors from diesel fuel, leave the area immediately and seek out fresh air.
- Avoid letting diesel fuel come into contact with your skin. When using portable fuel containers, wear impervious protective gloves designed specifically for use with diesel fuel.
- If diesel fuel comes into contact with your skin, wash the area thoroughly with clean water.
- If a spill occurs, be sure to clean it up immediately and dispose of the clean-up material properly so that it will not become a fuel source for fire. Inform your supervisor about the spill.
- Diesel fuel is not as flammable as some other fuels such as gasoline. However, it is just as hazardous when it catches on fire. Be sure to have an adequate size, fully charged Class ABC fire extinguisher close at hand.

Fueling Construction Equipment

#28

Fueling construction equipment with gasoline is so commonplace we often become desensitized to the hazards. However, overexposure to gasoline poses hazards including irritation to the nose, throat, respiratory tract, skin and eyes. It is, of course, also highly flammable.

- Make sure that all fueling is done in well ventilated areas.
- Do not allow smoking to take place anywhere near the fueling operation.
- Identify and eliminate other potential ignition sources before you begin fueling. Even electronic devices that are not designed to be intrinsically safe such as cell phones and hand-held radios can become unexpected ignition sources.
- Be sure to turn the equipment off before you start fueling. Equipment that is running is its own potential ignition source.
- Be sure to have an adequate size and fully charged Class ABC fire extinguisher close by.
- Keep the fuel from coming into contact with your skin. Wear the appropriate impermeable protective gloves if fuel might make contact with the skin on your hands.
- Be sure not to overfill the fuel tank. If a spill occurs, be sure to clean it up immediately and dispose of the clean-up material properly so that it will not become a fuel source for fire. Do not forget to inform your supervisor about the spill.

Using Knives Safely

#29

There are many different kinds of knives designed for many different purposes. All of them are useful tools and are safe when used properly. However, knives are involved in an inordinate number of disabling workplace injuries each year. Here are some important things to consider when using a knife in the workplace or at home.

- Use knives only for cutting the types of materials they are designed to cut. Knives should never be used for anything but cutting. Be sure to use the right tool for every type of job.
- Dull knives are dangerous. Keep your knife properly sharpened and simply refuse to use a dull knife.
- Make all cuts going away from your body and away from anyone else who is close by.
- Put the least amount of force on the knife that is necessary to make the cut. A good-quality sharp knife should not need much force to make it cut smoothly.
- Refuse to use knives that are broken, bent or defective in any other way.
- If you use a folding knife, always close it carefully as soon as you are finished using it. If you are using a sheath knife, put it back in its sheath as soon as you are finished using it.
- There are many types of cut-resistant work gloves on the market. When you have to cut, wear cut-resistant gloves to protect your hands.

Vibrating Tools

#30

The use of vibrating tools such as hammer drills, grinders, etc. can lead to body fatigue, especially in your hands and arms. Constant use of vibrating tools has been known to cause more severe problems such as pain in muscles, tendons and/or ligaments. Here are some things you should do to reduce the incidence of fatigue and the risk of more severe problems when using vibrating tools.

- Choose the best tool available for each specific job. Some tools have built-in vibration reduction features. Whenever possible, use tools with these features.
- If the work you are doing requires constant use of vibrating tools, alternate using the tools with other tasks so your body has time to recover. You can also alternate with your co-workers so that no one worker is overexposed to the vibration.
- Let the tool do the work for you. Maintain a firm grip, but do not grip the tool too tightly. Always wear work gloves. Keeping your hands warm will reduce the risk of incurring some of the more severe problems associated with vibrating tools. Also, the right kind of work gloves will help you maintain a good grip.
- If the tools have bits or blades, make sure they are sharp, which will reduce the friction, and therefore reduce the vibration.
- If you start to feel the effects of excessive vibration, such as a tingling sensation in your fingers and hands, do not continue the task. Do something else for awhile until your body recovers.

High Water Pressure

#31

If you are working anywhere near a source of high water pressure you need to be properly protected from the potential hazards. For example, you could be exposed to high water pressure on a jobsite when there is hydrostatic pressure testing of a piping system occurring, use of a pressure washer in your work area, etc. The potential hazards include, but are not necessarily limited to, losing an eye or incurring a laceration from a stream of highly pressurized water, being knocked off a ladder or some other elevation due to sudden, unexpected exposure to a failed piping system, etc. Here are some things that you should be aware of when working near sources of high water pressure.

- Always wear safety glasses while working. When working with or near sources of high water pressure, wear a face shield over your safety glasses or safety goggles.
- When testing a piping system, put some distance between yourself and the system, especially the fittings. Stand behind an appropriate barricade if possible.
- Use the least amount of pressure necessary to properly complete the test. Never exceed the maximum recommended pressure for testing a piping system.
- When using a pressure washer, use the least amount of pressure necessary to complete the job. Keep in mind that some pressure washers/nozzles create enough pressure to remove an eye or cut through skin and muscle.
- If someone else is using a pressure washer in your work area, make sure they know where you are working and watch them carefully.

Temporary Heat

#32

Temporary heating devices are used on most jobsites in the winter to make the working environment as comfortable as possible until the building's permanent heating systems are working. These heating devices are safe to use when used properly. However, they can be hazardous if they are not used properly. Here are some things you should know about temporary heating devices.

- When using temporary heating devices that are not fueled by electricity, make sure that the work areas in which they will be used are well ventilated with fresh air.
- Make sure that any heaters fueled by LP gas are properly equipped with a device that will automatically shut off the gas flow if the flame fails, preventing a build-up of potentially explosive LP gas in the work area.
- Be sure that solid fuel salamanders are never used inside buildings or on scaffolds, even if the scaffolds are set up outside.
- Position temporary heating devices at least 10 feet away from plastic or canvas tarps and other flammable material area covers.
- Securely fasten area covers in place so that high winds will not cause them to displace temporary heaters. Place heaters away from flammable liquids and materials and locate them where they will not be knocked over by normal construction activity.



Material and Personnel Hoists

#33

Material and personnel hoists are powered machines used to raise materials or workers from one level to another. Requirements for the material hoists and personnel hoists are different. Personnel hoists have additional requirements regarding worker protection. Here are some things you should know about hoists.

- Be sure not to use a hoist designed only for moving materials to move workers or other personnel.
- The recommended operating speeds, hazard warnings and any special instructions regarding the hoist should be posted on the cars or platforms.
- Material hoist entrances/exits should be equipped with full-length gates or bars that are marked with contrasting colors, such as black and yellow stripes.
- Personnel hoists should have doors or gates that are at least six feet six inches high and equipped with mechanical locks that cannot be operated from the landing side of the hoist. The locks should only be accessible to workers in the car.
- Make sure that overhead protective covers are in place on top of the personnel hoist cage or platform.
- If any of these information sources or protective measures are not in place, do not use the hoist. Report the problem or problems to your supervisor immediately.

Overhead Hoists

#34

Overhead hoists are used frequently in the mechanical construction industry. They are useful pieces of equipment, but they can be hazardous if they are not used properly. Here are some things you should know when working with overhead hoists to move pipe, fittings and other materials.

- When choosing the overhead hoist that you will use, make sure that it will meet all of the manufacturer's recommendations regarding installation, use, maintenance, testing, etc.
- Make sure that the manufacturer's established working load of the hoist is indicated on the hoist. If it is not there, do not use the hoist. Follow your company's procedures for taking defective equipment out of service.
- Never exceed the manufacturer's established safe working load.
- The supporting structure must, at a minimum, have a working load capacity that is equivalent to that of the hoist.
- Be sure that the hoist is attached to the support in a way that will allow you to line it up directly over the load.
- The hoist should also be rigged in a manner that will allow you and your co-workers to stand clear of the load when it is being hoisted.
- If any of these information sources or protective measures are not in place, do not use the hoist. Take the hoist out of service immediately and report the problem or problems to your supervisor.

Lasers

#35

Lasers are being used more and more by mechanical construction workers and most of the other trades because they are easy to use and they save a lot of time. These tools generate visible radiation, which we use for leveling, measuring and other functions on the jobsite. For the most part, they are very safe to use, but they can be harmful if they are not used properly.

- The biggest concern when working with or around lasers is eye damage from the visible radiation (laser light).
- When you are using a laser you can control it, and therefore, ensure that it is being used safely. However, be aware of other workers on the jobsite, who may not be using a laser safely.
- Make sure that you have received the proper safety training before you use a laser.
- Wear the proper anti-laser eye protection whenever you could be exposed to laser light.
- Reflected laser light can be just as harmful as direct laser light.
- Turn off or block laser light beams with beam shutters or caps when the laser is not being used.
- If you have any problems or concerns when working with a laser or in an area where someone else is using a laser, talk with your supervisor about it immediately.

Dust

#36

Dust is tiny particles of solids. It is generated from disturbing solid material, such as when workers are cutting, sanding and grinding, etc. Inhaling large concentrations of certain types of dust can be harmful. Some of the types of dusts that we could be exposed to in the mechanical construction industry include asbestos, lead and silica. For example, when we drill into concrete ceilings to install pipe hangers or through concrete walls to run pipe, we are creating dust and some of it could be silica dust. Here are some ways to reduce your exposure to dust.

- You can use water (Wet Method) to keep dust from becoming airborne where it could be inhaled. Some types of boring and cutting equipment are designed to be used with the Wet Method. However, you do not necessarily have to have specially designed equipment to keep dust wetted down. You could use a hose with a spray attachment or a pressurized-spray system to wet down the dust.
- Use tools equipped with dust extraction systems whenever possible.
- When drilling into concrete ceilings to hang pipe hangers, use dust collection attachments (cups) on the drill.
- Use point-of-operation ventilation designed to vacuum and trap dust.
- Keep the work area as well ventilated as possible. Even local exhaust ventilation systems can help you reduce your exposure to dust.
- If necessary, use a respirator, but be sure you are properly trained on respiratory protection before you proceed.

Fumes

#37

Fumes are formed when a metal is heated above its boiling point and the vapors condense into fine particles. Welding fumes, fumes from gasoline engines and many other types of fumes are lighter than air. They appear in the form of smoke and can be inhaled by workers if they do not take appropriate precautions. Some fumes are merely irritants, while others can cause more severe health problems. Some of the fumes that mechanical construction workers have to be concerned about include zinc fumes (zinc fume fever), lead fumes and hexavalent chromium fumes. For example, when we perform hot work on stainless steel, the chromium in the steel can convert to hexavalent chromium and become airborne in the form of fumes. Here are some ways to reduce your exposure to fumes.

- Be sure not to use equipment powered by internal combustion engines inside buildings or in other enclosed areas.
- Keep the work area as well ventilated as possible. Local exhaust systems will help reduce your exposure to fumes. When they are not available, keep doors and windows open and use large fans.
- Use point-of-operation ventilation systems whenever possible to suck up the fumes and trap the harmful particles at their source.
- When welding, keep your welding hood down and position your body, including your chin, so that the fumes cannot get up underneath the hood and into your breathing zone.
- If necessary, use a respirator, but be sure you are properly trained on respiratory protection before you proceed.

Protecting Your Skin

#38

Mechanical construction workers are susceptible to dermatitis, an inflammation of the skin that can be caused by contact with many different substances, such as organic solvents, equipment fuels, mineral oils, etc. There are several different types of dermatitis, but most of them result in a rash caused by an allergic reaction to a specific allergen. When mechanical construction workers contract dermatitis, the rash usually appears on the hands and arms because that is where skin contact with the substance (allergen) most frequently occurs. Here are some things you can do to reduce the risk of contracting dermatitis.

- Read the label on the container of a chemical substance before you use it. Find out whether the substance has the potential to cause dermatitis and, if so, follow the recommendations for prevention. Become familiar with the part of the label that provides manufacturer recommendations for what to do if the chemical substance comes in contact with your skin.
- When using chemical substances, keep your skin covered. Wear long sleeve shirts and use impermeable gloves designed to protect your skin from the specific chemical you will be using. Use barrier creams when necessary for skin protection.
- Wear a face shield if there is any chance of getting a chemical substance on your face. And always wear safety goggles under your face shield when working with chemical substances.
- If you get a chemical substance on your skin, follow the manufacturer's recommendations for how to handle it, and report to your supervisor if the contact causes any problems with your skin.

Lyme Disease

#39

Lyme disease is a tick-borne disease that can be extremely harmful to humans if not treated properly and immediately. The tick most commonly associated with Lyme disease is the deer tick, which is about the size of the head of a sewing pin. The larger dog ticks can carry the disease too, but it is important to know that not all ticks carry the disease. Here are some things you should know about Lyme disease when working in or near brushy or overgrown areas.

- Lyme disease is prevalent throughout much of the nation and continues to spread. The disease was first identified in the upper northeast, but has spread as far south as Florida, and as far west as California. Not all states have reported cases of Lyme disease, but most have done so.
- If there are mice and/or deer and ticks in the area where you are working, it is possible that you could contract the disease. When you have to go into brushy or overgrown areas to pick up materials, etc., tuck your pants legs into your boots and spray a commercial tick repellent on the outside of your clothing.
- Look yourself over carefully for ticks after working in such areas. If you find one, remove it immediately. Ticks have to be attached to your body for at least 24 hours to spread the disease, so the sooner you remove them, the better. If symptoms of Lyme disease occur anywhere from 3 to 30 days after being bitten by a tick, go to your doctor immediately. Symptoms may include some, but not necessarily all, or any of the following: skin rash, which may or may not have a red ring like a target; fever; chills; fatigue; muscle pain; joint pain; and/or headaches.

Hexavalent Chromium

#40

Hexavalent chromium is generated when steel that contains chromium is heated above its boiling point. In the mechanical construction industry, we are most likely to be exposed to hexavalent chromium while performing hot work on stainless steel. Hexavalent chromium is a known carcinogen. Overexposure to hexavalent chromium over a period of time can lead to lung cancer. Here are some things you should know to help you protect yourself from overexposure to hexavalent chromium.

- The composition of stainless steel pipe and other stainless steel materials includes chromium for its anti-corrosive characteristics. However, some stainless steel materials contain more chromium than others. Materials with higher concentrations of chromium typically generate more exposure
- To prevent overexposure, implement protective measures to keep you from inhaling the fumes while performing hot work on stainless steel. Keep the work area as well ventilated as possible. Local exhaust systems will help reduce your exposure, but when they are not available, keep doors and windows open and use large fans to move the fumes away from your breathing zone.
- Use point-of-operation ventilation systems whenever possible to suck up the fumes and trap hexavalent chromium at the source.
- When welding, keep your welding hood down and position your body, especially your chin, so that the fumes cannot get up underneath the hood into your breathing zone. If necessary, use a respirator, but be sure you are properly trained on respiratory protection before you proceed.

Zinc

#41

When performing hot work on galvanized metals, fumes are created when the metal reaches its boiling point. The fumes contain zinc oxide, which can be harmful if inhaled. Most welders are aware of zinc fume fever, which is caused by inhaling zinc oxide. Here are some things that you should know about zinc and your exposure to zinc when performing hot work on galvanized metals.

- Good ventilation is critical when performing hot work on galvanized metals. Zinc oxide is a heavy metal that is present in the fumes. It can cause acute (short-term) illness if inhaled.
- The illness is commonly referred to as zinc fume fever or metal fume fever. The symptoms are very similar to those that you would exhibit if you had the flu.
- The symptoms may include a fever, which rarely goes over 102 degrees Fahrenheit, chills, nausea, dryness in the throat, cough, fatigue, and aching in the head and the rest of the body. If you get to fresh air immediately the symptoms rarely last more than 24 hours. However, that 24-hour period can be miserable.
- To prevent overexposure to zinc oxide, make sure your work area has plenty of ventilation when you are working with galvanized metals. Local ventilations systems are great when they are in place and working, but on the jobsite you are more likely to need a good-size fan or a point-of-operation ventilation system such as a smoke sucker if one is available.
- If the ventilation is inadequate, you may need a respirator. Make sure you have the proper training before using any type of respirator.

Pinch Points

#42

Pinch points occur where two or more objects come together. For example, the point at which a suspended separator attaches to a boiler is a pinch point until it is bolted in place. Another example is when a load of pipe moves together as the sling is tightening around the load during a lift operation. Pinch points can be extremely hazardous. Body parts such as hands and feet can get caught in them as can objects that we are wearing. Here are some ways to avoid pinch points on your jobsites.

- Conduct brief pre-task planning before you start to work. Observe your work area for the day. As part of the process identify any pinch points that you may encounter.
- Make sure the lighting in your work area is adequate so you can see well.
- When you have to work around equipment with moving parts or objects that are in motion, pay close attention to where you place your hands, feet and head.
- Be sure not to reach into moving equipment or machinery or between moving objects.
- Use tools instead of your hands to line up pipe and pipe fitting connections.
- Make sure that all machine and equipment guarding is in place and functioning properly before you start your work.
- Be sure to use all of the proper work procedures established by your company.



Worker Safety Responsibilities

#43

All of the worker safety training and equipment in the world will not, by itself, keep you safe. Somewhere between 80% and 90% of accidents are caused by worker misconduct. However, many companies work millions of work hours without incurring any injuries. Here are some of the things you should do to keep yourself and your co-workers safe on the jobsite.

- Learn the safety and health rules and regulations that affect your company. Help your company comply with the applicable safety and health regulations.
- Pay close attention to all of the safety training you receive. Even the short duration toolbox talks are important. Even if you have heard it all before listen to it again carefully. If nothing else, it will re-sensitize you to the applicable hazards.
- Be sure not to circumvent any safety signs, tool or equipment guards, barricades, etc.
- Wear a hardhat, the appropriate work gloves, and safety glasses 100% of the time while working on a jobsite.
- When you identify damaged equipment or tools, take them out of service so they will not be used by anyone else, and report this to your supervisor immediately.
- Watch out for co-workers, especially the less experienced ones. Do not be afraid to help them learn to do things safely or confront them if needed.

Pre-Task Safety Planning

#44

We conduct pre-task planning daily, and much of the time we do not even realize that we are doing it. We think about the task itself, the tools, equipment and materials that will be needed, the amount of time it will take, problems that may occur, etc. Safety should become a constant part of your regular pre-task planning process. Let's refer to it as pre-task safety planning.

- A potentially hazardous task is any task that presents a substantial probability of death, serious physical harm or significant impairment to health without appropriate safety or health protective measures.
- While planning out a potentially hazardous task, consider safety and health with each phase. Break the task down into steps.
- Identify the hazards associated with each step. For example, if one of the steps involves climbing an extension ladder, a fall from the ladder would be one of the potential hazards.
- After identifying the hazard in each step, establish protective procedures that will help you eliminate, or at a minimum, reduce each hazard.
- Make sure you have all of the safety equipment that you are going to need. Make it part of the same process that you use to identify the construction tools, equipment and materials you will need for task.
- Before you start the task, brief everyone who is going to be involved with it. Make sure all of you are in agreement about how each protective procedure will be implemented.

Jobsite Hazard Assessment

#45

Mechanical construction workers should conduct a brief hazard assessment when they first arrive at a new project. Keep in mind that most work related injuries in mechanical construction are from improper material handling, falls from heights (mostly ladders), being struck by objects, being hit in the eyes by flying objects or particles and slipping or tripping on working surfaces. Here are some things to consider while assessing jobsite hazards.

- Is the pipe and other materials placed as close as possible to your work area? Is there material moving equipment in place such as pipe carts, mobile pipe racks, etc.? Is there space enough for you to use proper lifting techniques when you have to pick up and move materials by hand?
- Are the proper types and lengths of ladders available for your use? Will you be able to follow all of the procedures for safe ladder use? Is there anything about the jobsite or any specific tasks that would prevent you from following all of the procedures for safe use of the aerial lifts?
- Are the overhead areas where others are working barricaded so you will not inadvertently walk under those areas where you could be struck by a falling object? Are there other protective measures in place to prevent objects from falling from overhead, such as toe boards and wire mesh or other materials on guardrail systems?
- Are the walking and working areas clear of slippery substances such as grease, trash, tools, welding hoses, extension cords, materials and everything else that could result in someone slipping or tripping?

The Most Common Hazards

#46

Even though mechanical construction worker safety is much better than it used to be, injuries still occur in our industry. The types of injuries that occur most frequently have not changed much over the years. If you become familiar with them, and stay alert for them, it will be much easier for you to protect yourself on the jobsite.

- Injuries from Improper Material Handling – Most of the material handling injuries to mechanical construction workers are lower back injuries caused by failure to use material moving equipment and proper lifting techniques, and lacerations from not wearing work gloves while handling pipe and sheet metal.
- Injuries From Falls – Most of the fall-related injuries are from reaching out too far while working on ladders, carrying tools and/or materials by hand while climbing ladders and stepping up in the mid-rail or top-rail of an aerial lift to extend reach.
- Injuries to Eyes – Most eye injuries are caused by failure to wear safety glasses or safety goggles, or using the improper type of fall protection such as using safety glasses instead of safety goggles while working with liquid chemicals.
- Injuries from Slips and Trips – Most of these types of injuries are caused by poor housekeeping. Mechanical construction workers are slipping on wet or greasy surfaces or tripping on extension cords, welding hoses, pieces of scrap pipe, pipe hangers, tools, trash and other items left on the ground in walking and working areas.



General Safety Training

#47

Frequent and consistent safety and health training and education are more important than you may realize. It is your right to receive the training and education, and your responsibility to absorb the knowledge and implement what you learn. Here are some things you should know about your safety and health training and education before you start work.

- When you are receiving safety and health training, make sure that you understand how to recognize and avoid the unsafe conditions described in the training/education and the safety procedures needed to control or eliminate the hazards and exposures.
- Make sure you have received and fully understand the training and education on the poisons, caustics and other substances that you will be using, including the potential hazards and safe handling and use of them.
- Education and training on the recognition of hazards and avoiding unsafe conditions applies to work with flammable liquids and gases and to toxic materials. Make sure you understand the safe handling and use of these substances.
- When you are required to enter confined spaces, you must receive training and education on the nature of the hazards, how to protect yourself from them, and how to use the necessary protective and emergency equipment.
- If you do not feel like you understand hazard recognition and avoidance of the potential hazards addressed in your training and education sessions, ask your supervisor for help.

Means of Egress (Emergency Exit)

#48

Even in new buildings that are under construction, it is important to establish and remain aware of the fastest and safest way out. You could have to exit quickly for any number of reasons such as fire, partial building collapse, inadvertent release of flammable gases or toxic substances, etc. Here are some things to think about concerning means of egress.

- Every time you go to your work area, think about more than one way to get out of the building in a hurry. Establish in your mind a couple of emergency exit routes.
- Your quickest and safest way out of a building one day may not be the best way the next day. Jobsites change constantly. Watch for changes on the jobsite that may affect your established means of egress. Establish new routes whenever necessary.
- If you see unnecessary obstructions in doorways, walkways, stairwells or other areas that would affect egress, let your supervisor know immediately.
- Be sure not to lock or block doors so that workers and others in a building cannot get through in an emergency.
- When you are establishing your exit routes look at the exit signs in your area. If you discover that existing exit signs are covered, damaged, or are not in place, let your supervisor know immediately.
- Find ways to remain aware of your personal means of egress. For example, every time you see an exit sign remind yourself about your own emergency exit routes.

Emergency Action Plans

#49

Emergency action plans are established so that everyone who could be involved in an emergency knows where to go, what to do and will be accounted for after the emergency has been addressed. Here are some things you should know regarding emergency action plans.

- Make sure you are familiar with your company's emergency action plan. Emergency actions plans are specific to each individual site so make sure you familiarize yourself with the plan each time you arrive at a new site.
- The plan should include emergency escape procedures. Be sure to establish a couple of emergency escape routes from your own work areas and change them whenever it is necessary due to changes on the jobsite.
- Be sure you know the procedure that is in place to account for all of your company's workers. If an emergency occurs be sure to follow the procedure.
- Be sure you know who is responsible for administering first aid, including CPR and Automated External Defibrillator (AED) use, and how to immediately contact that person(s). The means you will use to make contact should always be immediately accessible and working properly.
- Know the established means for reporting fires, medical emergencies and any other types of emergencies.
- Determine whether the building you are working in has an alarm system in place. If so, make sure you know how to sound the alarm if it becomes necessary.

Critical First Aid Kit Supplies

#50

First aid kits are available on all jobsites. There are many different types of kits, but only certain first aid supplies are needed for life-threatening emergencies such as if someone stops breathing, is experiencing severe bleeding or has gone into shock. If you have not been trained in first aid and CPR, you should consider getting the training as soon as possible in case you need to respond to an emergency. Here are some things you should know regarding first aid kits.

- Know exactly where the first aid kits are kept on your jobsites. Become familiar with the components of the kits. All kits should have a CPR mask, splash glasses or splash goggles and rubber gloves to protect the rescuer from bloodborne pathogens and other unpleasant problems.
- Each time you go to the kit for any item, look things over to make sure the kit is fully stocked, especially with the items that could be needed to address life-threatening emergencies and emergencies that could result in the loss of someone's eyesight.
- Each kit should have a couple of triangular bandages and a large supply of sterile gauze pads to help stop, or at least slow, severe bleeding.
- There should be a blanket in the kit, or very close to the kit, and something to prop up the feet of a victim. Keeping a victim warm and propping up his feet will help in the treatment of shock.
- The kit should also include an adequate supply of emergency eye wash.
- If any of these items are missing from any of the kits, let your supervisor know immediately.

Automated External Defibrillators (AED)

#51

Automated External Defibrillators (AEDs) are becoming more and more prevalent in public areas. You see them in gyms, shopping malls, commercial jets and many other places. AEDs are also becoming more prevalent on construction jobsites. These devices are used to shock a victim's heart back into a normal rhythm when a cardiac arrest has occurred and the heart is in a state of fibrillation. These devices are simple to use. If you have not received training on how to use them, you should consider getting the training as soon as possible in case you are the only one available to respond to a cardiac arrest emergency.

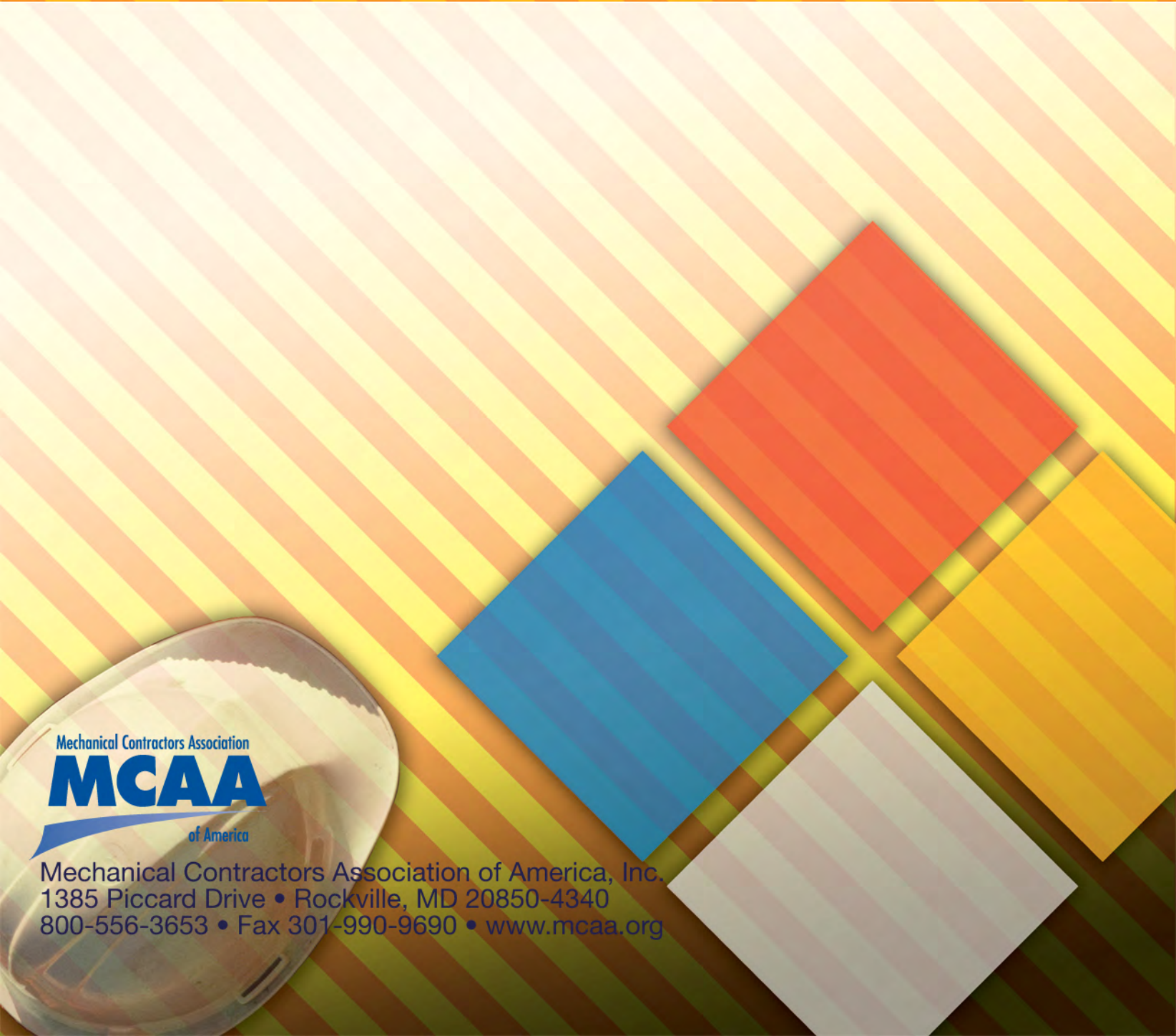
- Time is of the essence. If someone starts CPR on a victim right away and a defibrillator is put to use within the first six minutes of cardiac arrest, the victim has somewhere in the neighborhood of a 70% to 80% chance of survival. With each passing minute from that point, the survival rate is reduced by somewhere around 10%.
- AEDs are extremely simple to use. Many of them coach you through the process. With most of them, all you have to do is turn it on and listen to the commands.
- AEDs will not let you inadvertently administer a shock to the victim so you do not have to worry about shocking a victim whose heart is already beating normally.
- Get training on how to use an AED. Your supervisor can help you find a qualified trainer. Then learn whether AEDs are kept on your jobsite and, if so, find out where they are located. Hopefully, you will never have to use an AED. However, you never know when you might need one to save a life.

New Information on CPR

#52

Cardiopulmonary Resuscitation (CPR) has been around for a long time. The CPR methods have changed over the years due to constant research on the effects of CPR. Here are some things you should know about CPR and recent changes/options regarding CPR technique.

- When properly done, CPR squeezes the heart between the rescuer's hands and the victim's backbone. The constant squeezing and letting up pushes blood through the victim's circulatory system, which is the function of a healthy heart.
- If you have not received training on CPR, you should consider doing so. The survival rate for victims when CPR is administered by itself is not very good, but it may be all you have at the time. Better yet, when CPR is used in conjunction with an Automated External Defibrillator (AED) the victim has a much better chance of survival.
- If you receive formal CPR training, you will learn how to assess a victim's condition and provide rescue breathing and chest compressions when it is necessary to do so.
- A new CPR technique was established fairly recently that does not require rescue breathing. The technique is effective and can be used by persons who do not have formal CPR training, or those who do have formal training but have reservations about mouth-to-mouth contact with a victim they do not know.
- The more workers on the jobsite who know how to administer CPR, the safer the jobsite will be.



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