Toolbox Talks

NAC

Mechanical ♦ Electrical ♦ Fabrication
Building Technology ♦ 24 Hour Service

2020

January

Wk	S	M	T	W	T	F	S
1				1	2	3	4
2	5	6	7	8	9	10	11
3	12	13	14	15	16	17	18
4	19	20	21	22	23	24	25
5	26	27	28	29	30	31	

February

Wk	S	M	T	W	T	F	S
5							1
6	2	3	4	5	6	7	8
7	9	10	11	12	13	14	15
8	16	17	18	19	20	21	22
9	23	24	25	26	27	28	29

March

Wk	S	M	T	W	T	F	S
10	1	2	3	4	5	6	7
11	8	9	10	11	12	13	14
12	15	16	17	18	19	20	21
13	22	23	24	25	26	27	28
14	29	30	31				

April

Wk	S	M	T	W	T	F	S
14				1	2	3	4
15	5	6	7	8	9	10	11
16	12	13	14	15	16	17	18
17	19	20	21	22	23	24	25
18	26	27	28	29	30		

May

Wk	S	M	T	W	T	F	S
18						1	2
19	3	4	5	6	7	8	9
20	10	11	12	13	14	15	16
21	17	18	19	20	21	22	23
22	24	25	26	27	28	29	30
23	31						

June

Wk	S	M	T	W	T	F	S
23		1	2	3	4	5	6
24	7	8	9	10	11	12	13
25	14	15	16	17	18	19	20
26	21	22	23	24	25	26	27
27	28	29	30				

July

Wk	S	M	T	W	T	F	S
27				1	2	3	4
28	5	6	7	8	9	10	11
29	12	13	14	15	16	17	18
30	19	20	21	22	23	24	25
31	26	27	28	29	30	31	

August

Wk	S	M	T	W	T	F	S
31							1
32	2	3	4	5	6	7	8
33	9	10	11	12	13	14	15
34	16	17	18	19	20	21	22
35	23	24	25	26	27	28	29
36	30	31					

September

Wk	S	M	T	W	T	F	S
36			1	2	3	4	5
37	6	7	8	9	10	11	12
38	13	14	15	16	17	18	19
39	20	21	22	23	24	25	26
40	27	28	29	30			

October

Wk	S	M	T	W	T	F	S
40					1	2	3
41	4	5	6	7	8	9	10
42	11	12	13	14	15	16	17
43	18	19	20	21	22	23	24
44	25	26	27	28	29	30	31

November

Wk	S	M	T	W	T	F	S
45	1	2	3	4	5	6	7
46	8	9	10	11	12	13	14
47	15	16	17	18	19	20	21
48	22	23	24	25	26	27	28
49	29	30					

December

Wk	S	M	T	W	T	F	S
49			1	2	3	4	5
50	6	7	8	9	10	11	12
51	13	14	15	16	17	18	19
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Toolbox Talks

Table of Contents

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Injury Prevention

Safety is our priority, so you can go home happy and healthy, every day. Lets make the year ahead a success, so if you see something unsafe, say something! By working together to identify and anticipate hazards, we can help control those hazards and keep eachother safe.

Low-hanging fruit, like not wearing safety glasses, may seem minor, but it may indicate a culture that does not priotize safety. Set a good example, and make sure you take care of those easy hazards so they become second nature and build a good jobsite safety culture.

High-hazard activities may result in ***Serious Injuries and Fatalities (SIFs).*** When inspecting your jobsite, consider if there is a SIF potential. If an accident happens, would it change your life forever? The majority of SIFs are caused by high-hazard situations, like Slips/Trips/Falls, Lockout/Tagout, Confined Space Entry, Heavy Equipment/struck-by, Trench Collapse/crush-by, and Electrical hazards. Identify and control these hazards through pre-task planning, and you will significantly reduce the risk of a serious injuries and fatalities on your jobsite.

Injuries, Incidents, Near Miss

Report all Injuries, Incidents, and Near Misses/close calls to your supervisor, even if it seems minor, we may be able to prevent a future SIF. Supervisors must document, and report to NAC safety.

Incident Details

https://nac-hvac.com/incident-injury-reporting/

Injured employee: _____
Phone #: _____
Trade: _____DOB_____
Injury Date _____Injury Time_____
Shift start time:_____

Describe how the injury occurred: _____
_____
Injured body part: _____
_____
Tools/equipment involved: _____
_____
Injury Site Location: _____
Hospital/clinic name (if applicable):
_____

Your name: _____Date:_____
Foreman:_____
PM:_____
Return doctor release forms or bills to the office.

If there is reasonable suspicion of drug or alcohol use, contact NAC safety.

Safety Coordinator
Steph Hagen: 651-280-8265
shagen@nac-hvac.com

Vice President CFO
Julie Krueger: 651-255-3532
jkrueger@nac-hvac.com

Go to https://nac-hvac.com/incident-injury-reporting/ for reporting details.

1. Seek Treatment as needed: Serious Injuries may require ER visit, but a minor cut may be cared for at Urgent Care. NAC has preferred clinics for sprains/strains and follow-up care. Not sure? Contact NAC safety.
2. Complete Paperwork: First Report of Injury and Incident Report
3. Return to Work + Follow up: We seek to get all employees back to work.

Be Prepared:
Do you know where the first aid kit is? What about the eye wash station? Which clinic is closest to you?

- ID the nearest clinic or hospital for emergencies.
- Always discuss changes in emergency exit routes.
- Do pre-task planning for high-hazard activities.
- Keep an eye on your co-workers, especially during extreme weather, strenuous activities.
- Know who is trained in first aid and CPR.

Preferred Clinics

Minnesota Occupational Health (MOH) Clinics
8am - 5pm | 651-968-5300

- St. Paul: 1661 St Anthony Ave #2 55104
- Blaine: 10230 Baltimore St. #300 55449
- Eagan: 1400 Corporate Center Curve # 200 55121

Health Partners Occupational Health Clinics
612-339-3663

After Hours ER or Urgent Care: Tell them it is work comp. Return paperwork to NAC Safety. You will likely go to a preferred clinic for follow up.

Weekly Pre-Task Plan + Toolbox Talk Sign-in

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☐	Falls over 6' + Holes	☐	Cuts, Abrasions, Pinches	☐	Electric Shock/Live Utilities
☐	Falls from Ladder / Elevated Work/ Lifts	☐	Heavy Equipment / Crush hazards	☐	Extreme weather + exit plans
☐	Fall Harness – trained to use?	☐	Sprains/Strains/ Overexertion	☐	Fires / chemical storage
☐	Falling Objects/ Overhead Work	☐	Crane Lifts	☐	
☐	**Hot Work: PERMIT**	☐	**Confined Space: PERMIT**	☐	**Trenches/Excavations**
☐	Flammables, Fire extinguishers, Cylinders up + secure, Ventilation	☐	Air Monitoring, Ventilation, Rescue Plan, Attendant, Entrant, Hazards, eliminated	☐	Competent person inspect daily. Ladder-4', Slope 5'

Inspections-check if required		**Inspected by:**
Lifts, Hoists, Heavy Equip.	☐	
Ladders/ Scaffolds	☐	
Trenches	☐	
Tools + Equipment	☐	
Fall protection equip.	☐	
Guardrails/barricades/holes	☐	

Additional Notes/reminders:

Employee Name	**Signature**	**Employee Name**	**Signature**

The Basics Toolbox Talk

Do your part to maintain a safe job-site and prevent injuries. On the job-site, it is essential that employees identify task hazards to help prevent injuries and reduce risk. Before you start your task, take a moment to plan it out. Gather all your materials, consider what safety equipment is required, and inspect your tools and equipment. Do you have the right training for the task? If not ask your supervisor for training. Don't forget to document your trainings!

Harassment + Discrimination

- Harassment and Discrimination are unacceptable. If you observe harassment or discrimination, report it immediately to your supervisor or to senior management. Harassment is any unwelcome conduct that interferes, intimidates or creates a hostile environment. NAC is an equal opportunity employer and prohibits discrimination defined by state and federal laws based on race, color, religion, national origin or sex.

Disciplinary Action

- Failure to follow safety or company policies, may result in disciplinary action or termination. Disciplinary actions are based on individual circumstances of each situation, and may include written warnings, suspensions without pay, or termination. Management reserves the right to remove an employee from a job-site for violations. All employees have stop work authority. If they identify a dangerous situation or action, any employee has the right to stop work until a safe work method is implemented.

Drugs + Alcohol Policy

- Drugs and Alcohol use on the job is unacceptable. If you suspect someone is under the influence of drugs or alcohol, this puts everyone on the jobsite at risk. Stop what you are doing, and tell your supervisor. Remove suspected employee from any safety sensitive task until action can be taken. Employees suspected of on the job use or impairment are subject to disciplinary actions and reasonable suspicion drug testing.

Company Vehicles

- Employees authorized to drive company vehicles must maintain a valid driver's license, and be used for work purposes. Do not transport non-NAC employees.
- Vehicles should be kept clean and be inspected daily for damage. Drive safely and respect others. No texting and driving. Vehicles are equipped with hands-free devices and are recommended.
- Seatbelts are required! Obey all traffic laws.
- Report damage of vehicles or accidents immediately.

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Emergencies, Incidents + Injuries

For each job

- Identify the nearest clinic or hospital
- Locate emergency exit routes + refresh if changed
- Know where your meeting spot is
- Know who to call in emergencies

Where is your:

- ✓ Emergency exit route
- ✓ Nearest Clinic
- ✓ First aid kit + Eyewash
- ✓ Fire Extinguishers

Do you know who is trained in first aid and CPR?

Report All Injuries + Incidents to your supervisor!

- Report ASAP, even if you don't go to a clinic.
- Every injury, incident, or near miss gives a clue about how we can make improvements and prevent future injuries, so reporting seemingly insignificant things is essential!
- Keep an eye out for your co-workers, especially during severe weather and strenuous activities. If
- *Note: If there is reasonable suspicion that an injury resulted from the use of drugs or alcohol, a drug and alcohol test may be required. Contact the office or safety coordinator for details.*

Minor Injury (first aid only)

1. Treat Injury with first aid and notify supervisor.
2. Notify the safety coordinator of injury
3. Keep an eye on injury and use triple antibiotic to prevent infection.

Clinic Visit/ Urgent Care or Emergency Room

Seek Medical Attention: Go to nearest clinic or Urgent Care. Not sure? Call the clinic to speak to a nurse.

- **MOH or Urgent Care:** Muscle injuries, debris in eye, non-severe cuts/abrasions. Occupational clinics know more about your job and common workplace injuries compared to urgent care. *MOH clinics and urgent care is faster than ER.*
- **ER:** Severe Injuries needing immediate attention, or after hours. *Drive injured person if objects in eye, excessive bleeding, or exposure to chemicals, etc.*

911: Severe or Life-Threatening Injuries

(Employee is unconscious, cannot be moved, or is bleeding profusely)

1. Call 911
2. Make sure the scene is safe + and check injured person
3. Get help from trained first aid provider. Perform first aid: Stop bleeding, perform CPR, get AED.
4. Stay with injured person until help arrives.
5. Accompany injured person to hospital and contact management and safety with updates.

Report Incidents

https://nac-hvac.com/incident-injury-reporting/

- Find Clinics in Network
- Complete Incident Investigation Form
- Fill out First Report

Contact NAC Safety:

Stephanie |651.280.8265 |shagen@nac-hvac.com

- **Incident Report:** What happened? How? What Tools? Why? Could anything have prevented the incident?
- If you receive restrictions, report to work. Our goal is to get you to return to work. There is almost always a task for you within your restrictions.

CLINIC INFO

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Health Partners Occupational Health Clinics

612-339-3663

**Return any work restrictions, release forms or bills to safety.*

Note: if a severe incident occurs, never post information online, speak to reporters, or provide information to others outside the company. NAC will designate representatives to communicate information to the public.

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Cold Stress

Hypothermia

When exposed to cold temperatures, your body begins to lose heat faster than it can be produced. Prolonged exposure to cold will eventually use up your body's stored energy. The result is hypothermia, or abnormally low body temperature. A body temperature that is too low affects the brain, making the victim unable to think clearly or move well. This makes hypothermia particularly dangerous because a person may not know it is happening and will not be able to do anything about it.

Symptoms of hypothermia can vary depending on how long you have been exposed to the cold temperatures.

Early Symptoms

- Shivering
- Fatigue
- Loss of coordination
- Confusion and disorientation

Late Symptoms

- No shivering
- Blue skin
- Dilated pupils
- Slowed pulse and breathing
- Loss of consciousness

First Aid

Take the following steps to treat a worker with hypothermia:

- Alert the supervisor and request medical assistance.
- Move the victim into a warm room or shelter.
- Remove their wet clothing.
- Warm the center of their body first-chest, neck, head, and groin-using an electric blanket, if available; or use skin-to-skin contact under loose, dry layers of blankets, clothing, towels, or sheets.
- Warm beverages may help increase the body temperature, but do not give alcoholic beverages. Do not try to give beverages to an unconscious person.
- After their body temperature has increased, keep the victim dry and wrapped in a warm blanket, including the head and neck.
- If victim has no pulse, begin cardiopulmonary resuscitation (CPR).

Frostbite

Frostbite is an injury to the body that is caused by freezing. Frostbite causes a loss of feeling and color in the affected areas. It most often affects the nose, ears, cheeks, chin, fingers, or toes. Frostbite can permanently damage body tissues, and severe cases can lead to amputation. In extremely cold temperatures, the risk of frostbite is increased in workers with reduced blood circulation and among workers who are not dressed properly.

Symptoms of frostbite include:

- Reduced blood flow to hands and feet (fingers or toes can freeze)
- Numbness
- Tingling or stinging
- Aching
- Bluish or pail, waxy skin

First Aid

Workers suffering from frostbite should:

- Get into a warm room ASAP
- Do not walk on frostbitten feet or toes- this increases the damage.
- Immerse the affected area in warm-not hot-water (the temperature should be comfortable to the touch for unaffected parts of the body).
- Warm the affected area using body heat; for example, the heat of an armpit can be used to warm frostbitten fingers.
- Do not rub or massage the frostbitten area; doing so may cause more damage.
- Do not use a heating pad, heat lamp, or the heat of a stove, fireplace, or radiator for warming. Affected areas are numb and can be easily burned.

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WEAR YOUR PPE!

PPE is required on jobsites, whenever hazards are present, either from your work or others in your area.

- Hearing Protection
- Eye Protection
- Hand Protection
- Head Protection
- Hi-Visibility vest
- Heavy duty work boots-safety toe preferred

HEARING PROTECTION - Loss of hearing can happen gradually over a life time or from an acute exposure to very loud noises. It is not curable. Wear earplugs properly when loud noises are present. Some signs you should be using hearing protection include:

- Speech or music sounds muffled after you leave work
- Your car stereo is blasting in the morning
- You hear ringing in your ears at the end of the workday
- You need to yell to hear someone 2 feet away

These symptoms indicate a temporary threshold shift (temporary hearing impairment). Loud noises cause your inner ear hairs to lay flat from too much noise, but with rest your ear hairs can often recover. Over time, however, this takes its toll, and causes hearing loss.

EYE PROTECTION - should be:

- Keep clean + sanitary
- Select safety glasses for the hazard and environment, and look for "Z87+" mark.
- Wear glasses? You can wear the over the glasses, goggles or safety glasses provided by NAC, or choose to get prescription safety glasses.
- Wear a face shield when exposed to flying/projectile particles.

FOOT PROTECTION -

A heavy duty work boot or shoe should be suitable for worksite conditions, and provide the following when necessary: safety toe, metatarsal protection, electrical grounding, and puncture resistance.

HAND PROTECTION - should be worn when exposed to environments, which are prone to:

- Hazards from chemicals
- Cause cuts, lacerations, abrasions or punctures. (Level 3+ is best)
- Burns or harmful temperature extremes
- Exposure to biological pathogens (always wash hands after)

HEAD PROTECTION - Make sure to keep your hard hat in good condition by storing it out of the sun, cleaning it regularly to remove dust and dirt, and checking for defects or cracks.

RESPIRATORS – should be a last resort. Always try to substitute a work method or hazardous substance, use engineering controls and ventilate before you consider using a respirator. If you are required to use one, or choose to use filter/cartridge style you must first complete a medical questionnaire to ensure your lungs are capable of breathing through a filter cartridge. For required use, you must complete a fit test to make sure it fits properly. Voluntary use is allowed for dust mask style N95 respirators.

- Airborne dust particles are present
- Strong Fumes can cause affixation
- Hazardous Atmosphere

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Employee Name	**Signature**	**Employee Name**	**Signature**

Fire Extinguishers

INSPECTIONS:

1. Visual Inspections: Check monthly – in place, good condition, not used, seals intact, pressure gauge in green
2. Annual Maintenance: Do they have a tag with month/year?
3. Hydrostatic Testing: 5 years-wet chemical, 12 years-dry chemical, Retire non-chargeable extinguishers after 12 years

FIND A PROBLEM?

Return to NAC shop. Licensed inspector will be called to conduct a full maintenance inspection.

- Operating instructions are not legible
- Safety seals are broken or missing
- Fullness can't be confirmed (as determined by weighing or lifting)
- Evidence of physical damage, corrosion, leakage or a clogged nozzle
- Pressure gauge readings are not in the operable
- Evidence of use

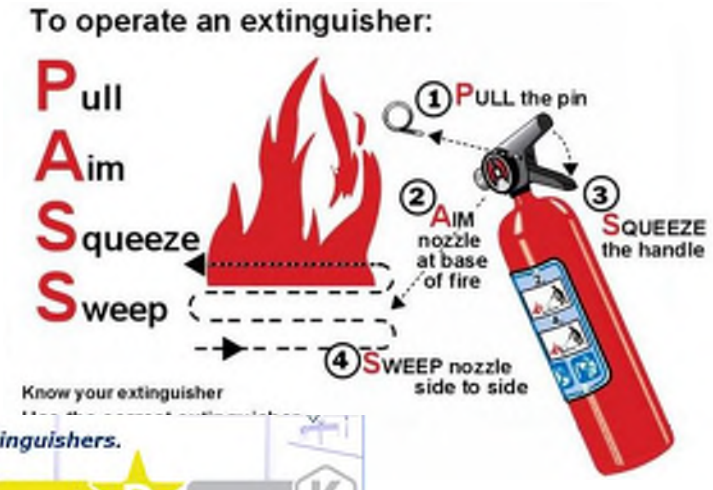
REMEMBER

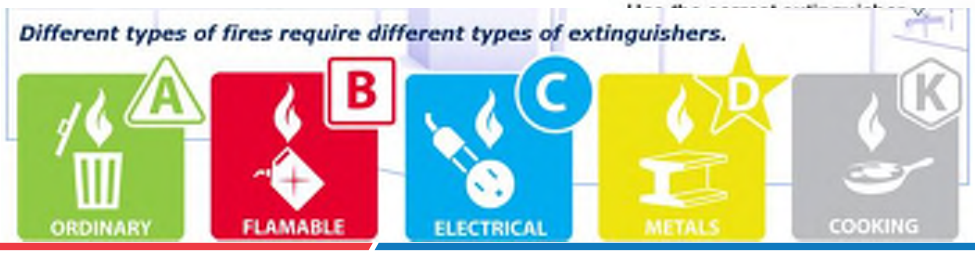
- Do not store anything in front of fire extinguishers
- Do not hang anything on fire extinguishers like coats
- Visually inspect once per month. Ensure it is: In its designated spot, no damage, retainer pin in place, and the pressure gauge in the green.
- Swap out old with new yearly at the shop (Annual inspections are completed at NAC's Shop by a Licensed Inspector)

HOW TO USE : PASS

Fire extinguishers only contain enough material to last about 10-20 seconds.

- Aim at the base of the fire before you spray, and ensure you are at an appropriate distance. Too far may be ineffective and too close may cause flames to jump back at you.
- After use, remove from service, and never replace a pin after removed. Pressure can slowly release





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Employee Name	**Signature**	**Employee Name**	**Signature**

If you have a crew, sign and keep for your records.

Spill Prevention + Response

Did you know it's not technically illegal to have a hazardous spill, but it is a crime to if you don't have an effective response plan or if you fail to notify government agencies in Emergency situations or contaminated waterways. On your jobsite, make a plan to control potential spills. Look at the slopes, for waterways and drains, and check SDS's for chemicals on-site. Know effective response procedures, and local laws. Sediment, carwash soap, fuel leaks, and concrete washout areas are all examples of releases or spills that can affect the environment. Always notify your supervisor if you have a spill.

Always have a plan!

1. **Prevent** Spills
   - Regularly inspect and maintain equipment
   - Know your chemicals, your risk, and have effective response plans based on risk
   - Have a plan to catch small leaks so they can be easily contained and cleaned
   - Work with a hazardous waste contractor before a spill for prompt response and disposal
2. **Contain**, capture, and minimize affected areas especially liquids spills from entering drains, waterways, and wetlands. A shovel is your best tool!

   - **Block** access to drains and waterways
     - Make damns or ditches to trap, block or divert liquid spills away from drains and waterways
     - Use socks or berms to block or divert spills
     - If spills enter a drain, was the material fully contained within the catch basin, and can it be safely removed?
   - **Absorb it!** (easier to control + clean up)
     - Take absorbent pads, pillows, socks, etc. to contain smaller spills
     - Use loose fill absorbents or regular kitty litter to absorb liquids
     - Mix with dirt! Yes, take a shovel and just start mixing soil with the spill to prevent downhill. Its cheaper to clean up and dispose of contaminated soil than to clean up miles of a watershed

3. **Clean up** Spills – Call in a specialist to help for waterways, or large spills.
   - Mark any contaminated ground with white spray paint and take photos throughout to show cleanup progress
   - Place contaminated absorbents in hazmat buckets and call for disposal
   - Call in the experts clean, absorb, excavate and dispose of contaminated material.

Report hazardous releases/spills that pollute ANY waterbody, sewer or drains, are large reportable quantities or large spill areas, are life threatening, pose imminent danger, are highly flammable, or require area evacuation. Report to NAC, then to the MPCA: 651-649-5451

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Other Hazards to Monitor					
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☐	Falls over 6' + Holes	☐	Cuts, Abrasions, Pinches	☐	Electric Shock/Live Utilities
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☐	**Hot Work: PERMIT**	☐	**Confined Space: PERMIT**	☐	**Trenches/Excavations**
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Inspections-check if required		**Inspected by:**
Lifts, Hoists, Heavy Equip.	☐	
Ladders/ Scaffolds	☐	
Trenches	☐	
Tools + Equipment	☐	
Fall protection equip.	☐	
Guardrails/barricades/holes	☐	

Additional Notes/reminders:

Employee Name	**Signature**	**Employee Name**	**Signature**

Lead – EPA's Lead Rule

Toolbox Talk

Lead is harmful when ingested or inhaled. The permissible exposure limit is 50 µg/m³. Lead poisoning can cause developmental and behavioral problems in children and adults. No level of lead is safe, and children are an especially vulnerable population. The EPA has guidelines under the Renovation, Repair and Painting Program to help reduce exposure to children. Renovation work may put occupants at risk of lead exposure, so the following requirements shall be followed.

EPA RULE: When working in **residential houses, apartments, and child-occupied facilities built before 1978,** contractors must:

- **Distribute** EPA's lead hazard information pamphlet "Renovate Right" before starting renovation work.
- **Document** compliance with this requirement; EPA's pre-renovation disclosure form may be used.
- Prevent Exposure: use engineering controls + lead safe work practices
- Be Trained:
  - Company Certification
  - Employees trained in lead-safe work practices to minimize occupant exposure (certified renovators or on-the-job training)

When does the EPA lead rule apply?

In pre-1978 housing and any child-occupied facilities, like schools or day care centers.

- Remodeling and repair/or maintenance
- Plumbing, carpentry, electrical and painting preparation.
- Window replacement and partial or full demolition

Exceptions: minor repair and maintenance that disturb 6 sq ft or less of paint per room inside, or 20 sq ft or less on exterior are exempt from the rule.

You should still use engineering controls and work practices to reduce lead exposure.

Lead Safe Work Practices

1. Contain the work area + post warning signs to prevent dust and debris from leaving the work area.
   - Contain the area with plastic to isolate
   - Cover floors and furniture that can't be moved
   - Seal off doors and heating/cooling vents
2. Use work practices that limit dust and vapor.
   - Use Local Exhaust Ventilation with HEPA filter when welding/cutting or use hydraulic shears rather than cutting
   - Use wet methods: mist area before sanding or scraping
   - Score paint before separating
   - Pry/pull apart components rather than breaking them.
   - Cut on either side of lead joints, rather than cutting the joint
   - Use chemical strippers, power tools (needle guns) or other methods rather than burning to remove lead based paint from surfaces.
3. Clean up thoroughly
   - Clean daily + clean before removing any plastic containment HEPA vacuum + Wet wiping and wet mopping with plenty of rinse water.
   - Verify all dust and chips are gone before removing containment area.

Prevent Exposure

The permissible exposure limit (PEL) for lead is 50 µg/m³ Engineering controls and work practices are essential to help reduce the risk of exposure. Use isolation, ventilation, work practices and good housekeeping and hygiene to reduce exposure levels.

Avoid:

- Open flame burning or torching
- Using a heat gun at temperatures more than 1100F
- Sanding, grinding, planing etc. with power tools not equipped with a shroud and HEPA vacuum attachment or using wet cutting methods.

If engineering controls are not effective or feasible, you may be required to wear a respirator. You must complete a medical questionnaire, fit test, and training before you wearing a required respirator. Contact your safety coordinator with questions.

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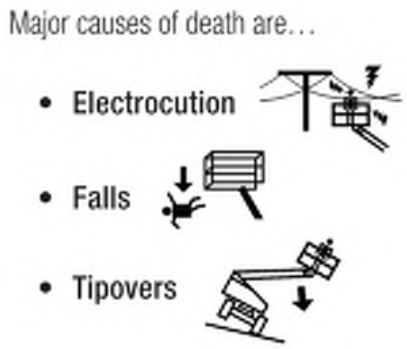
Scissor Lifts

Scissor Lifts are machine powered elevated work platforms used to reach areas directly overhead. They pose risk of falling out and tipping over if not used correctly.

- Must be **trained** prior to use: know hazards, inspection requirements + safe operation
- **Inspect lift** prior to use. If defects or leaking fluids are found, remove from service. Do test run.
- **Inspect environment** for hazards: power lines, potholes, inclines, high winds/weather.
- **MOM is law** (Manufacturer's Operating Manual) follow manual's instructions.
- Keep materials and attachments inside the basket. (unless approved/designed by manufacturer)
- Do not exceed the load capacity.
- Balance materials to maintain center of gravity.
- **Fall Protection**
  - **Personal fall arrest system is required if your feet leave the platform!**
  - Use designated tie-off locations.
  - Ensure guardrail or gate/chain is latched.
  - Keep your feet on the platform floor.
  - Do not stand on toe-kicks, mid-rails or guardrails.
  - Do not lean over edge to reach beyond basket.



Anticipate + Control Hazards

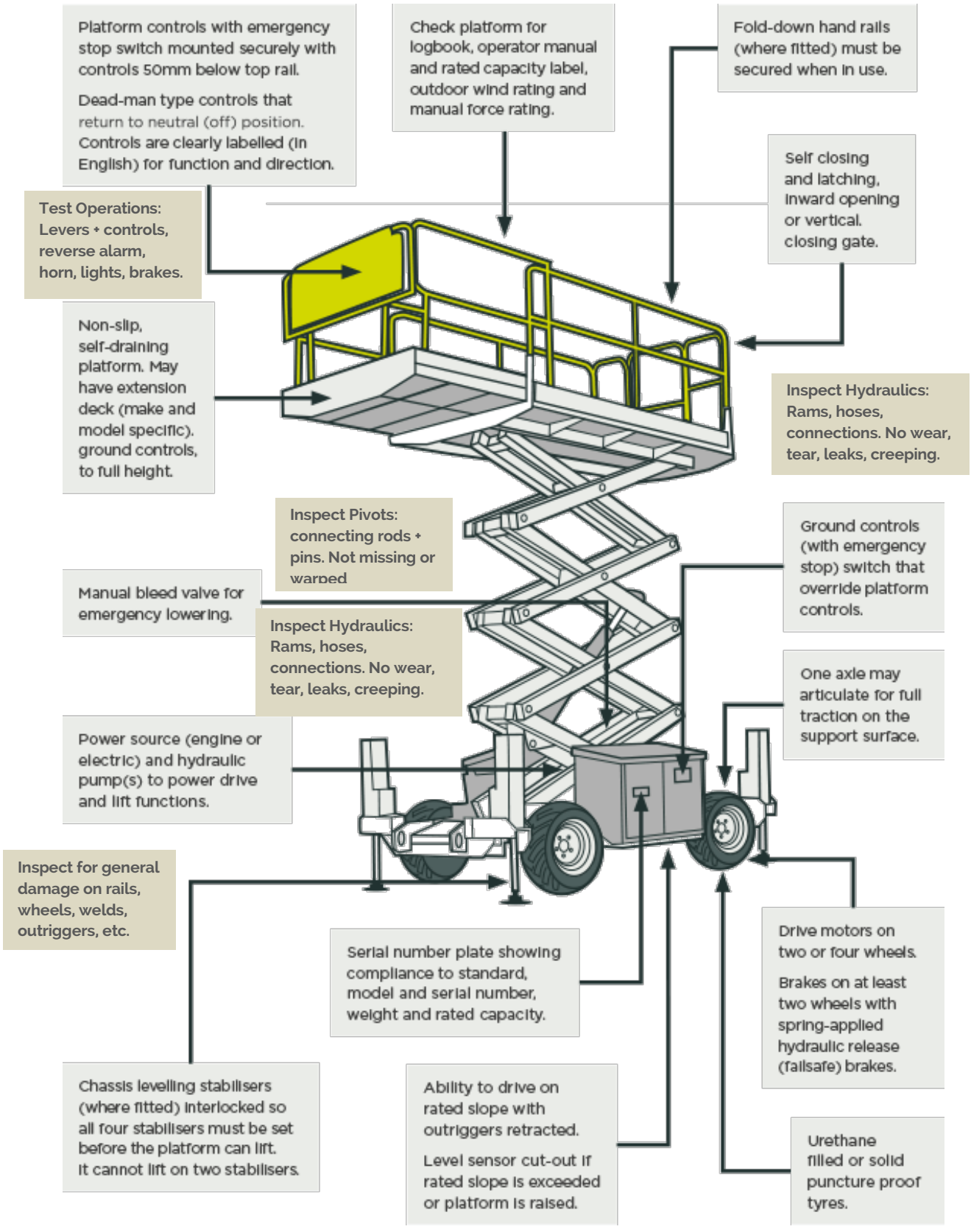
- Always consider the risk. If the lift is more likely to tip, tie off overhead. If you are more likely to fall out of a stable lift, tie-off inside the lift on the designated tie-off spots.
- Risk of driving off an edge or into a pothole? Use a 2x4 or toe-kick to create a barrier from the edge.
- Can't reach your work area? Maintain 100% tie-off if feet leave the lift platform. Use a double lanyard to tie off inside lift, then overhead.
- If people are working below lifts, use tool tethers, nets or barricades.

Aerial Lifts

Aerial Lifts / Boom Lifts: Are versatile elevated work platforms that help access hard to reach areas. Aerial lifts operate differently than scissor lifts, so employees must have specific training to operate. Users must maintain 100% tie off in aerial lifts.

- Must be trained + authorized to use
  - Hazard Identification
  - Limitations of lift
  - Safe Operation
- Review manual, Inspect lift + Inspect work area prior to use. Do a test run prior to use to get the feel of the lift.
- **100% tie-off required.** Always wear a full body fall harness with retractable connected to aerial lift's designated tie-off point
- Always maintain at least 10 feet from overhead power lines.

Scissor Lift Overview and Inspection



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Toolbox Talk

Asbestos

Asbestos enters the body when inhaled or ingested. When its inhaled, it gets trapped in the lungs and disrupts cell function. It may lead to asbestosis, lung disease or cancer.

Grease duct gasket, pipe "lagging" and insulation containing asbestos

WHAT IS ASBESTOS?

Asbestos is type of mineral classified by the way it breaks apart into thread-like structures. Because it resembles thread, it can be made into fabrics that are flame resistant. It is also very strong.

WHERE CAN YOU FIND ASBESTOS?

Old pipe insulation, furnace tape, duct gaskets, cement pipes, flooring, glues for flooring, ceiling pucks, walls, siding, shingles, roofs, and many more areas. Asbestos was phased out, however it can still be found in some new products if it is labeled. Visual ID is not enough. You must get it tested by a professional.

Asbestos is only harmful when it is broken apart, and releases microscopic fibers that can be inhaled. When left alone, intact, and covered, it does not pose a risk.

SEAM TAPE ON FURNACE DUCT (BOAT WORKS, HOPKINS MARINE STATION)

Canvas Duct

ASBESTOS CLOTH AT EXHAUST DUCT & FAN CONNECTION (HERRIN LAB)

Suspect Asbestos?
Stop! Tell your supervisor.
Block the area

NAC does NOT abate asbestos.

Asbestos is the responsibility of the property owner. NAC employees shall not work in potential asbestos areas until it is tested, and made safe to do so.

Ceiling tile pucks and wall adhesive containing asbestos

Prevent Exposure:

- Heed all warning signs.
- Containment: Ensure area is thoroughly blocked with plastic with negative pressure. Area or sections should be encased and area wetted down to prevent airborne particles.
- Wear Tyvek Suit. Wash your hands and face before eating, drinking or smoking, and never smoke in an area with potential contamination.
- Change your clothes before going home, you don't want to bring it home to your family.

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Trenches + Excavations

Toolbox Talk

CALL 811 BEFORE YOU DIG!

Always barricade the area to prevent people from access

Always keep spoils, material and tools at least 2 feet away from the trench

Vibration and vehicles will affect stability of the soil.

If your spoils is piled high, consider what would happen if it falls; does it pose a hazard, is it at least 2 ft back?

Use boards and slope the grade away from trenches to prevent vehicles from getting too close to edge of trench.

Pooling water is cause for an immediate downgrade to type C soil. Pump water out, and slope to at least 1: 1 ½

If you see a dangerous condition in a trench or excavation, EVACUATE trench workers immediately until problem is resolved.

1	Competent person required onsite
2 feet	• Min distance spoils pile to edge of excavation • Max distance excavate below support system • Max distance from top of hydraulic vertical shore cylinder can be below grade
3 feet	Distance ladder extended above trench box/grade
4 feet	• Ladder is mandatory in trench 4+ ft deep • Atmosphere must be tested if hazard exists • Max bench height in type B soil • Max vertical distance between hydraulic vertical shore cylinder in Type C soil
5 feet	Protective system required (sloping, benching shoring)
6 feet	Fall protection required
8 feet	First bench must be set back 8 feet in multiple, 4 foot benching, Type B Soil
10 feet	Min vertical distance to stay away from powerlines
18”	Min distance from grade level to top of trench box when also sloped
20 feet	Max depth of protective systems used without site-specific engineering
25 feet	Max distance of travel between ladders in a trench
30”	Max step distance across a trench before a walkway/bridge is required

The Competent Person

The person who has the knowledge, training and experience that allows them to be able to identify hazards in trenches and excavations. They also must have the authority to make immediate changes when necessary. They are responsible for inspecting the trench daily for structural stability and safety. They must check trenches, excavations, soil condition, protective systems, water control systems.

Egress

You can use a soil ramp as a means of egress out of a trench, but it can only be for people (not heavy equipment).

Do not use benches as steps to exit the trench. It affects the structural integrity of the benching system.

> 4 ft deep: Use a ladder and extend it 3 feet above the edge.

Rigging + Hoisting into a trench

- Never stand underneath a load when it is being lifted into a trench.
- Use a tagline on loads to control the load, while keeping you out of harm’s way.
- Never allow an operator to excavate while a person is in the trench.
- When unloading materials and equipment, ensure it is secure until necessary, and you have an adequate unloading zone and staging area.

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EMERGENCY PREPAREDNESS

Plan ahead so you can be prepared when an emergency arises to prevent serious injury, property loss, or loss of life. A major disaster can be a fire, tornado, earthquake, bomb threat, or hazardous chemical spill requiring emergency response, evacuation, or cleanup.

At each new job location, think of your emergency plan. Every work environment is different, so orient yourself with the jobsite, and the site requirements before you start work. Identify the following:

- Exit ways + evacuation routes and meeting areas
- Bathrooms & Eyewash facilities
- Fire Extinguishers
- Chemicals
- Environmental conditions
- Potential hazards

In the event of a fire:

- Stop what you are doing and leave now! Do not get valuables or even a coat, just get out of the building ASAP
- Shut off electrical appliances if time permits
- Leave lights on
- Close doors and windows
- Alert others around you
- If you are in charge of critical systems and keeping others safe, follow your training.

For bad weather or a tornado:

- Find shelter in a low or covered place, away from windows.
- View weather updates on a media source, and heed all warnings.
- Do not leave the shelter to watch the storm.

If a chemical spill occurs:

- Review precautions on MSDS sheets
- Contact the Fire department if further assistance is need
- If it is safe to do so, perform spill response procedures.

For a bomb threat, active shooter or explosion:

- Stay calm
- Exit evacuate the area if possible, barricade in place if not possible.
- Call 911 for assistance

Remember: After an evacuation, always take a head count. Never let anyone re-enter the building.

A basic evacuation plan should be developed between the supervisor and their workers. TAKE THIS TIME to discuss your work area's emergency plan.

What is the plan for: FIRE? SEVERE WEATHER? SPILLS? ACTIVE SHOOTER?

How will you take headcount?

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Heavy Equipment

Toolbox Talk

- Equipment Operators must be trained and authorized to operate equipment
- Check equipment at the beginning of each shift, repair if defective.
- All bi-directional equipment must have an operational horn.
- Travel backwards only if equipment has an audible backup alarm or a signal person is used
- Be aware of other equipment and obstacles in the area
- Stay at least 10 feet from all power lines
- Always lockout equipment prior to lubricating, adjusting and repairing, and attach guards after service
- Secure and lock equipment when not in use to prevent unauthorized use

Be aware of the danger zones near heavy equipment. Maintain eye contact with operators and be aware of the machine's blind spots, rotation, travel path, and swing radius.

Always wear HI-VIS VESTS around heavy equipment.

Remember

- Train new employees on how to safely work around heavy equipment
- Always remain alert around heavy equipment
- Make sure you are visible to the operator, but never assume they see you
- Never stand under suspended loads, in blind spots, or travel/rotation path
- Never stand in trench while equipment is operating at the edge. Use a tag line to guide loads to avoid standing under loads.
- If you are the signal person, you shall be trained and know the flagging signs and hand gestures
- Never take breaks in areas with heavy equipment.

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Toolbox Talk:

Never enter an unprotected excavation!

You may encounter trench work on the job, at home, or out in public. Knowing how to identify and control excavation + trench hazards may save yours, or someone else's, life.

Hazard | Control

1. Hitting underground utilities or overhead power lines

- Call 811 before you dig
- Hand-dig within 2 feet of locate markers
- Stay 10+ feet away from overhead power lines
- If >50kV, Distance = 10ft + .4" for every 1kV

2. Soil + equipment, falling + crushing workers

- Keep soil + equipment 2+ ft from edge
- Use warning system (hand signals, warnings, stop logs)
- Don't stand under elevated loads, use tag-lines
- Exit trench during equipment operation in trench

3. Collapsed Walls

Sloping

- Inspect Daily by competent person. Look for fissures, standing water, instability, and other nearby hazards.
- 5ft deep: protect by slopingInspect soil: visual test and manual test
    - Soil type C (sand, gravel, doesn't stick together) 1.5 :1 slope
    - Soil type B (sticks together) 1:1 slope
    - Soil type A (undisturbed-very rare) .75:1 slope

Trench Box

- 5ft+ deep: protect with trench box
- Never dig > 2ft below trench box or support structure
- Ensure entire wall is supported
- Inspect braces, angles and ensure follow manufacturer instruction son trench box
- Ensure soil is filled in around outside of trench box

4. Access + Additional Protection

- 4ft deep: Get a ladder or ramp for access
- Barricade if greater than 6 feet to prevent falls
- Use 4-gas monitors if there is a risk of atmospheric hazard in trench

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Inspections-check if required		**Inspected by:**
Lifts, Hoists, Heavy Equip.	☐	
Ladders/ Scaffolds	☐	
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Fall protection equip.	☐	
Guardrails/barricades/holes	☐	

Additional Notes/reminders:

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Toolbox Talk: Soil Type + Sloping

Did you know?
1 cubic yard of soil can weigh over 3,000 pounds!

That's as much as car!

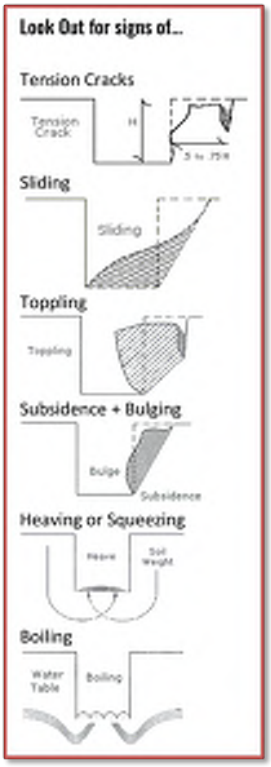
Slope to prevent Cave-ins!

Before Entering a Trench

1. Who is the competent person, and did they **inspect** each day? Any fissures, standing water, instability, or nearby hazards.
2. Is there safe **access** into the trench? At **4 ft**, use a ladder or ramp just for people.
3. What's the soil type, and what's going on around you? Do you need to **slope** to prevent cave-ins (if **5 ft deep**, yes!)

Test the Soil

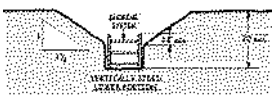
1. **Visual Test**: **What does the soil look like, and what's going on in the area?**
   - Sandy soil or gravel? Does it hold together well, or crumble? Is it wet?
   - Nearby structures, utility lines, weather, sides of excavation: cracks, fissures, layered soil types, vibration, seeping water
2. **Manual Test: What does it feel like? Does it stick together when squeezed?**
   - **Thumb Penetration Test**: unconfined compressive strength (or use pocket penetrometer). Take a clump of soil, and press thumb into it. No dent=A, Dent to nail=B, Dent to knuckle=C.
   - **Dry Strength Test** (fissure test) Attempt to break apart. Does the soil stick together or fall apart? If it breaks into clumps that don't break down further it is unfissured.
   - **Plasticity Test** Roll moistened soil into a thin thread the width of a pencil and hold it. If it doesn't tear it is cohesive.



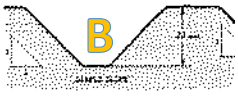
SOILS -- REFERENCE 1926.652. APPENDIX A (Check if present on site)					
	Type C (1½:1)		**Type B (1:1)**		**Type A (¾:1)***
	Fissures		Previously disturbed Type A or B		Undisturbed
	Porous soil		Fissured Type A		Type of soil (circle one): Rocky Clay Silty clay Sandy clay Clay loam
	Vibration		Subject to vibration Type A		
	Water (Rain, etc.)		Type A rock not stable		
	Submerged soil		Type of soil (circle one): Silt Silty loam Sandy loam Crushed rock		
	Previously disturbed soil				
	Type of soil (circle one): Gravel Sand Loamy sand				Compressive strength ≥ 1.5 tsf
					Test Method(s) Used by Investigator
	Compressive strength ≤ 0.5 tsf		Compressive strength > 0.5 tsf, but Compressive strength < 1.5 tsf		Pocket Penetrometer
					Manual Method

* (½:1) Allowed if 12 ft. in depth or less, and open 24 hours or less.
tsf – tons per square foot

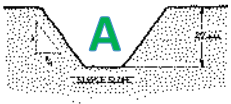
C: Sand, gravel, granular, doesn't stick together. Unstable. **Slope 1 ½ :1|34°**



B: Typical Soil, some granules, sticks together. **Slope 1:1 |45°**



A: Undisturbed, very rare. Highly cohesive, no cracks/fissures, no vibration nearby. **Slope ¾:1 |53°**



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SECURE YOUR WORK

Remember to secure your work well! When drilling, never assume you can hold the work piece in place with just your hands. Before you know it, your work will spin around and bite you, and hopefully it will leave all your fingers intact.

Traditional methods of securement may be difficult on some jobsites and may require some innovative thinking, HOWEVER ensure your methods are effective at keeping you SAFE! Rushing your work or taking shortcuts that bypass safety will lead to more work in the end. Plan ahead to work smarter, not harder! Do it right the first time, so you can be proud of the quality work you do, and go home each day as good, or better than you came in!

Work Procedure Best Practices

Measure twice, cut once; Do it right the first time.

Example: Electrical - Making the right size hole in a panel for conduit.

1. **If there is an existing hole** that is larger than your conduit, use *reducing washers* to create an accurate size hole.
2. **If you need to create a hole in a panel:**
   - Mark the center of where you want to drill.
   - Drill a hole using a carbide bit. Never use any drill bit larger than 1" if possible. (or should I say 1 3/8"?)
   - For a hole larger than 1", it is best to use the knock-out method:
     - First, drill a starter hole with a carbide bit
     - Then, use a *knock-out ratchet set* to get the appropriate sized hole for the conduit.
3. **If you need to create a hole in a 1900 blank for patching:**
   This should only be done if *reducing washers* will not be sufficient, or if the panel needs to be reinforced around the conduit hole.
   - Secure the work in a safe manner to ensure rotation will not occur.
     - Examples:
       - Use clamps and vices to secure work before you drill
       - Screw the work into a secured surface before you drill
       - Securely brace the work to prevent rotation.
     - Do NOT Hold with hands to "secure"
4. **If you are using a hole saw** (and other methods are not feasible):
   - Be sure to use extra caution while using hole saws, especially larger ones. Their teeth have a tendency to grab, so you should use them on lower speeds.

Activity

Describe a time that you or someone you were working with did not secure their work properly. What tools were they using? Did they recognize the hazard? What was the outcome? Did they ever do it again?

_____
_____
_____
_____

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Fall Protection Stand-Down

A great example of a bad idea. NOT safe!
Always tie-off in aerial lifts and don't leave them. Never add ladders to elevated work platforms, and do not stand on the very top of ladders. Don't work over water without life vest, and maintain a safe distance from overhead powerlines, at least 10 feet.
Also...why is there a pole in the river!?

Fall Protection

Falls account for over **1/3rd** of construction deaths every year. Over **10,000 people** in the U.S. are seriously injured by falls each year.

- **PLAN** ahead to get the job done safely.
- **PROVIDE** the right equipment.
- **TRAIN** everyone to use the equipment safely, and inspect before use.

Exposed to falls greater than 6 feet?

1. Set up a *Guardrail* (42" +/- 3") with mid-rail + toe-board.
2. Use a *Hole-Cover* for any opening greater than 2"(capable of withstanding 2x possible load, be secured + labeled "hole").
3. Set up a *Warning Line* (at 15 feet from hazard with flagging every 6 ft). Use PFAS if going beyond warning line.
4. Wear a Personal *Fall Arrest* System *PFAS* (fall harness + lanyard/SRL + anchorage 5000 lbs of force). Ensure your system would actually work!
5. Personal *Fall Restraint* System (withstand 3000 lbs of force).

Ladder Safety:

- Ladder is secured + stable
- Don't stand on top step or very top
- Ensure access is unobstructed and protected against falls
- Use 3 points of contact and face ladder when climbing and descending.

If you see something unsafe. Stop and address the hazard. You may save a life.

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CONFINED SPACES

A **Confined Space (CS)** is:

1. Large enough to fully enter and work,
2. Is not meant for continuous human occupancy, and
3. Has limited or restricted entry or exit.

Permit Required Confined Spaces meet all of the above criteria and have the potential for at least one of the following hazards:

- Oxygen deficiency
- Exposure to toxic substances
- Combustible or Explosive atmosphere
- Engulfment, Entrapment or caught-between hazard, converging walls.

TRAINING: All employees must be trained on hazards, roles + responsibilities, and rescue plan.

Supervisor: *Has ultimate authority to approve Confined Space Entry.* Must review, approve and sign-off on Permit before entry.

Entrant: *Performs work in the space.*

- Wear 4-gas monitor and perform self-rescue if alarm sounds
- Communicate with attendant (2 way radios work good)
- Wear PPE (safety glasses, hard had, respirator if approved, etc…)
- Keep the space clean by removing debris regularly

Attendant: *must always monitor a space during entry.* If monitor leaves, a replacement is required or all workers shall exit the space. Attendants must exclusively attend the space, know signs of hazards and health risks, and know how to execute the non-entry rescue plan.

FILL OUT PERMIT: Assess the space using the CS Permit, test the air for atmospheric hazards, identify and control hazards (lockout/tagout, ventilation, etc.), and develop a rescue plan.

- Test the air in the space for hazards with 4-gas monitor. (Bump test monitor first!)
- Ventilate to continually flush out the space with fresh air. If space cannot be vented, wear proper respiration equipment
- Perform Lockout Tagout and other control methods to make the space safe to enter and work.
- Be aware that spark producing equipment should never be used to flush out confined spaces

DEVELOP RESCUE PLAN:

- Ensure the plan is valid! Never stray from plan. Do not rush to the aid of a fellow employee inside a confined space if you are not trained. If entrant is required to wear respirator, rescue team must be present on-site.
- Rescue hierarchy: 1- self-rescue, 2- non entry rescue, 3- entry rescue (fire dept. or hired team). Ensure non-entry rescue is feasible! All rescuers must be competent in the use of rescue equipment.

Remember: Confined spaces can have unknown hazards: Assess and control hazards and verify controls are successful. Fill out the permit, use safe work practices and have an effective rescue plan. 60% of people who die in confined spaces are would-be rescuers.

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Confined Space– Air Monitoring

Never enter a confined space if you can't confirm its safe!
NAC uses Honeywell's Microclip 4-gas monitor. Follow all manufacturer instructions. An outside contractor calibrates devices according to manufacturer instructions, and calibration logs are maintained.

Prior to entry: Conduct a bump test on the gas monitors. Conduct and record air monitoring to assess current conditions, then ventilate the space, and finally conduct air monitoring again, to ensure ventilation was effective.

During Entry: Place your gas monitor as close to your breathing zone as possible while entering the space. Gases have varying densities and may sit at different levels in one space. Sometimes, pockets of gas settle in corners and become disturbed upon entry, so testing at different levels is necessary to get an accurate measurement.

Ventilation:

Purge time is based on the volume of the space, and the CFM output of the fan. A typical confined space fan lists the CFM output based on different angles. Use NAC's ventilation nomograph to approximate effective purge times.

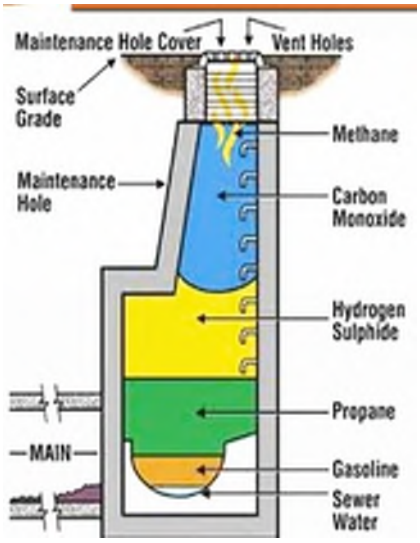
Ventilation Purge Time Guide (purge =7 air change/min)

90° Bend	Output	500 ft3	1000 ft3	2500 ft3	10,000 ft3
None	1275 CFM	5 min	6 min	18 min	57 min
1	661 CFM	6 min	11 min	37 min	110 min
2	582 CFM	7 min	12 min	45 min	120 min

Note: Other Fans can be used as long as they are pulling from a fresh air source and have adequate CFMS for size of space.

INSTRUCTIONS: BUMP TEST DAILY BEFORE USE

1. Turn on gas monitor by holding down the front button
2. Wait for gas monitor to cycle through testing
3. Connect plastic hose bracket to gas monitor
4. Connect test tubing to bump gas cylinder
5. Pinch/hose with fingers so balloon fills with test gas, and inflates to the size of a small orange
6. Release bump gas, and testing alarms should sound.
7. After successful bump test, Use monitor



RESULTS & TROUBLE SHOOTING

- All alarms sound after bump test = ready to use.
- One or more alarms do not sound = re-test: inflate balloon larger
- Contact NAC Safety Coordinator if:
  - Alarms don't sound on re-test
  - Gas monitor is dropped in water or damaged

REMEMBER:

- Always bump test in fresh air away from hazardous atmosphere
- Fill Out Confined Space Permit

See the diagram to the left indicating layering of gases based on densities in a manhole. Below is an exerpt from NAC's confined space permit. Record the levels measured for the top middle and lower layer before and after venting to get an idea of the potential risk. Also, record periodically, especially if the entry occurs over a full day.

3	TEST THE AIR + VENTILLATE			
Prior to Ventillation*		Just before Entry*		BUMP TEST 4-gas Monitor before use Vertical Entries: TEST IN LAYERS; gas densities vary. Ventillate + purge according to size + shape
Hydrogen Sulfide H2S <10 ppm	Carbon Monoxide CO <35 ppm	Hydrogen Sulfide H2S <10 ppm	Carbon Monoxide CO <35 ppm	NOTES:
Oxygen O2 19.5 % - 23.5 %	Lower Explosive Limit LEL < 10 %	Oxygen O2 19.5 % - 23.5 %	Lower Explosive Limit LEL < 10 %	

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Confined Space Rescue – Tripod Setup

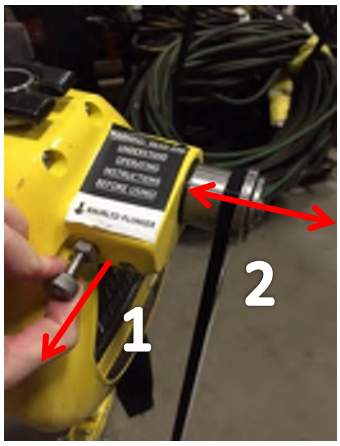
Non-Entry Rescue: Set up the tripod, or mechanical means of removal and connect to entrant's fall harness prior to entering confined spaces. Tripod setup acts as rescue and fall arrest for vertical confined spaces such as manholes. Remember to set up guardrails around the entry opening to prevent falls.

Entry Rescue: Performed only by trained and authorized people. Confirm space is safe to enter. Test the air for hazards, Identify and control additional hazards. Rescuers will need respiratory protection for the space (e.g. SCBA respirators) if atmospheric hazards are not confirmed safe. *Attendant must still be present!*

Tripod Setup

1. Lay tripod flat on ground. Remove all 6 pins: 3 pins on tripod head, one on each leg
2. Extend legs + secure with pins
3. Lift to upright position.
4. Secure each leg to tripod head with pins.
5. Attach the yellow *Fall Arrest 3-way unit* to one of the tripod legs (cable opening facing up).
    a. Disengage crank (free movement) to connect the pulley to attachment point on tripod using a carabineer.
        1. Pull out the pin (knurled plunger) at base of handle and
        2. Pull the base of the handle out, then release pin to allow free movement of crank arm
    b. Engage crank (rescue mode)
        1. Pull out pin (knurled plunger) and
        2. Push handle base back into place.
6. Attach work winch (suspension/lowering) to the inside of one of the unused tripod legs.
7. Connect winch pulley to other attachment point on tripod head.

Adjust crank function on *fall arrest 3-way*
1. Release Pin (knurled plunger)
2. Pull the base of handle outwards to allow free movement. Push base in to crank.



Never enter a confined space without a rescue plan!
Prior to entry: conduct air monitoring to assess current conditions, then ventilate the space, and finally conduct air monitoring again, to ensure ventilation was effective.

Non-Entry Rescue (preferred): Set up the tripod prior to entering manholes or other vertical confined spaces as a means of fall protection and non-entry rescue. Set up guardrails around the entry opening to prevent falls. For Horizontal entry, like tunnels, using a rope may work best if on a creeper cart. If many obstacles are in the way, entry rescue may be the only valid option

If equipment is damaged, Do not use!. Take out of service and send back to the shop to be fixed.

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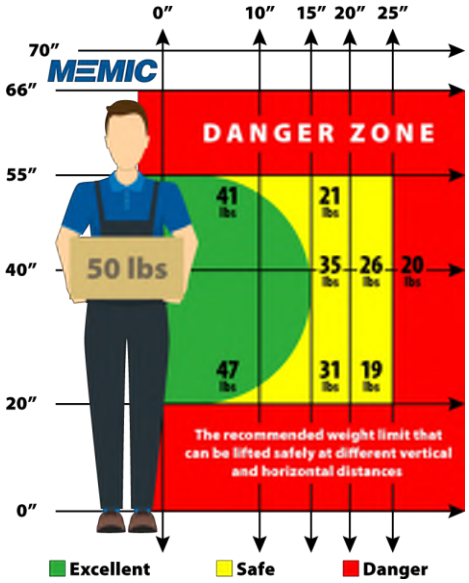
Ergonomics + Safe Lifting

Ergonomics: fitting the job task to the worker, rather than the worker to the job.



Its the beginning of the summer rush. With that comes new workers, new tasks, and a lot of risk. Prevent muscle sprains + strains, and other injuries with good ergonomics and safe lifting techniques.

Daily Huddles

1. Do brief morning stretches/warm ups. This helps prepare your body and your mind for the work ahead. It may also help identify any risk factors for that day like a sore back or dizziness.
2. Use pre-task planning to make sure you have the right equipment for the right task.
    - Lift heavy materials with a material lift or chain falls.
    - Lift anything over 50 lbs with a buddy.
    - Lift with your legs, keep the object close to your body, and make sure you have a good grip
    - Avoid twisting and and bending. Pivot your feet and squat down instead.
    - Wear PPE. Its your last line of defense, but can make a world of a difference.
        - Cut resistant gloves improve grip, and have significantly reduced hand cuts.
        - Cut resistant sleeves are used to prevent arm cuts when handling larger, cumbersome objects.
        - Knee pads, help protect your knee bones, but can also help prevent infections often caused by kneeling on debris.

NEW HIRES

Always make sure your new hires are prepared to work on your jobsite. Everyone comes with their own unique history, and ensuring they know the expectations of the jobsite is essential in preventing injuries and making a successful project.

- Did they get New Hire Orientation in the office? If not, provide on-site.
- Do they have the training to perform the task properly?
- Do they know the emergency action plans for the site, and locations of first aid kits, extinguishers, and other safety equipment?
- Do they know how and when to use fall protection?
- Do they know what to do if they identify a hazard?

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Inspections-check if required		**Inspected by:**
Lifts, Hoists, Heavy Equip.	☐	
Ladders/ Scaffolds	☐	
Trenches	☐	
Tools + Equipment	☐	
Fall protection equip.	☐	
Guardrails/barricades/holes	☐	

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Rough Terrain Forklift

Rough terrain forklifts require the right operators to handle them or it can lead to serious accidents. The workhorses are designed to handle heavy loads and operate on challenging terrain. Most rough terrain forklift accidents are caused by operator error. The right training procedures can help your employees understand how to carefully operate the equipment to prevent serious accidents.

Three most common accidents on rough terrain:

- Rollovers
- Tipovers
- Collisions

Accident Causes:

- Slopes
- Dips, holes, and trenches
- Narrow aisles
- Ground and overhead obstructions

Discuss Hazards Beforehand

One of the most important things to do is hold a training session with your employees before they drive on the rough terrain. Discuss the hazards so they know what can occur if they do not practice the right safety habits when driving their forklifts. While the vehicles do move slowly, you can end up with serious problems if you do not load them correctly, and you can end up driving too quickly with the load.

1. Poor Visibility/ Obstructed View

It is important to keep the windows clean and to make sure people can see when they are driving the forklift. Do they need to wear glasses? Vision testing can help to ensure you have people who can see when they drive the forklift. Not having a clear line of sight when driving can easily cause an accident.

2. Failure to Pay Attention

How often do you find yourself dozing off when you are working? Employees often end up failing to pay attention when they work long hours, or they do the same job several times. A routine can end up causing people to get careless on their job, which can lead to wrecks. Inattention while driving is something that you need to address as it does cost the company thousands of dollars if an accident occurs.

3. Failure to Yield to Other Vehicles

Some wrecks occur when people fail to yield to other vehicles. If you hit something with a rough terrain forklift, it can end up causing major damages to the forklift and the other vehicle, not to mention the drivers. Not only do drivers need to yield to other vehicles, they need to be aware of the pedestrians who cross their paths.

4. Overloading

If your forklift is overloaded, it can cause it to tip to the side when you turn or when you are near a steep edge. Overloading the machine can be hazardous when you are trying to drive the machine forward as it is easy for the machine to be pushed to the side.

5. Misjudging Terrain

People often drive the machine on rough terrain and assume the forklift will be able to handle anything. While the machine is designed to work on rough terrain, it isn't always set to work on all types of terrain. Misjudging terrain is something that can end up leading to serious accidents.

6. Failure to Inspect the Forklift

If a forklift is not inspected and serviced properly, it could end up with major problems. It is important to have the machine correctly maintained and inspected to provide you with adequate results.

7. Improper Loading or Unloading

Another major reason why accidents occur is due to improper loading and unloading of the forklift. A rough terrain forklift is set up to deal with a number of weights and loads, but the operator is the key source who focuses on keeping everyone safe and the machine safe.

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Hazard Communication + GHS

NAC's SDS book is found on our website.

- For each new chemical, notify the Safety Coordinator to include it in the SDS book
- Review the SDS sheet to understand the hazards, first aid guidelines, storage requirements, PPE, and precautionary measures.
- Make sure you label a secondary container with the product name and manufacturer.
- Avoid using empty drinking containers as secondary containers.
- GHS compliant labels contain
    - Product identifier (name/CAS#)
    - Supplier info
    - Pictogram
    - Signal Word : either Warning or Danger
    - Hazard statement
    - Precautionary statement (PPE, first aid)

Whether you are on a construction site, on a service call, or at home, you are exposed to chemicals that require specific precautions based on their hazards.

Globally Harmonized System (GHS)

Because we are in a global economy, we must ensure products information is consistent regardless of the country of origin. The GHS helps us easily navigate the Safety Data Sheets (SDS) to identify safe handling, storage and first aid for each chemical we come across.

SDS' have 16 sections to help you identify what to do.

Pictograms provide a visual cue of the hazard, but the definition is not always on the label or SDS, so take the time to get to know the symbols below.

	**Exploding bomb** (for explosion or reactivity hazards)		**Flame** (for fire hazards)		**Flame over circle** (for oxidizing hazards)
	**Gas cylinder** (for gases under pressure)		**Corrosion** (for corrosive damage to metals, as well as skin, eyes)		**Skull and Crossbones** (can cause death or toxicity with short exposure to small amounts)
	**Health hazard** (may cause or suspected of causing serious health effects)		**Exclamation mark** (may cause less serious health effects or damage the ozone layer*)		**Environment*** (may cause damage to the aquatic environment)

If an exposure occurs, ensure you bring the SDS sheet to the hospital.

Target organ toxicity means that a chemical will cause harm to a specific organ. Some chemicals are extremely harmful with just one exposure, whereas others cause harm after repeated exposure. Sensitization means that over time, you may become more susceptible to an extreme reaction with a smaller exposure.

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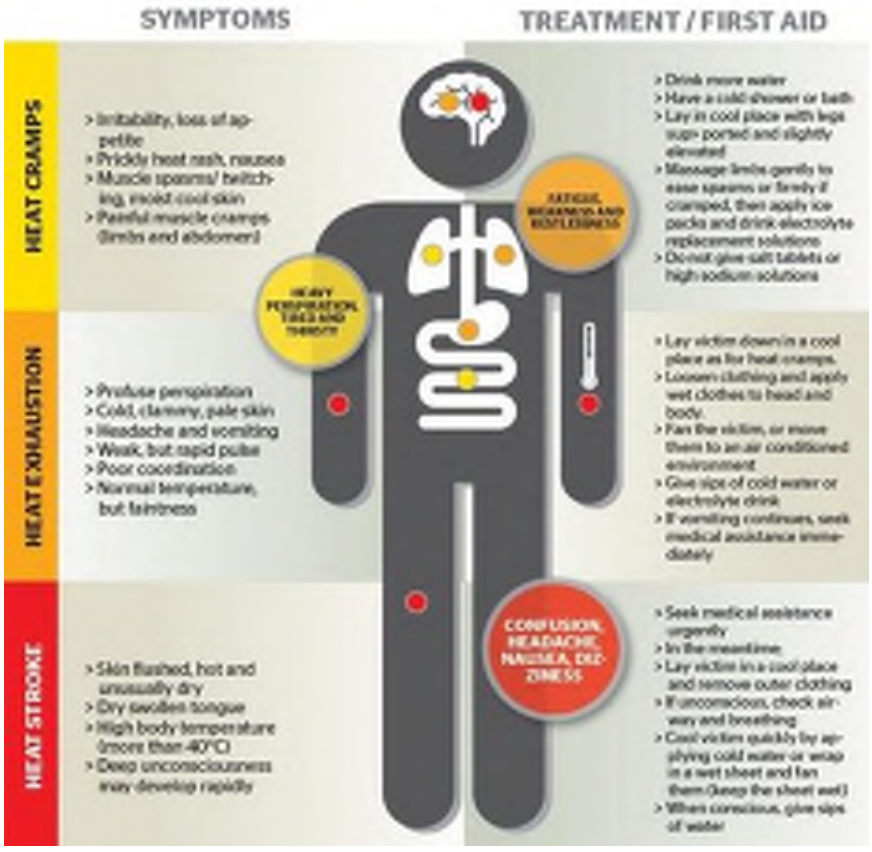
Heat Stress Toolbox Talk

Its Getting Hot!

With high humidity, it can feel like its over 100 degrees. Are you acclimated to the heat yet? It takes 3 days to acclimate, so plan your hottest work in the early morning, and make sure you keep an eye on each other for signs of heat stress, stay hydrated, and take breaks as needed. High humidity reduces evaporative cooling from the skin and increases your risk for heat illnesses.

Prevent Heat Illness:

- Increasing air flow to improve sweat evaporation
- Wear loose fitting clothing, it can help improve evaporation and keep you cooler
- Avoid Sunburn. Sunburn reduces evaporation, making it harder to cool the body.
- Stay hydrated. Drink Gatorade or other “electrolyte” drinks to put back the electrolytes lost during sweating. If you sweat all your salt, drinking plain water may be difficult for the body to absorb. Also, avoid caffeine, energy drinks and alcohol to maintain good hydration.
- Get cool: put cold packs on the neck, armpits, groin, etc., to keep your core temperature cool.
- Reduce humidity. Dehumidifiers may make the ambient air hotter, but it may feel cooler because of improved evaporation from the skin.



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Holiday Safety

Happy Fourth of July!

July Fourth is almost here! While working, stay focused on your tasks and keep an eye out for hazards on the jobsite. Mitigate hazards immediately to prevent work injuries leading up to the holiday. There are many hazards associated with the holiday from fireworks, driving, and heat illness. In 2018, 5 people died from fireworks and over 9,000 people were treated in hospitals for firework related injuries. The #1 cause: firecrackers. For kids under 5: sparklers.

Every year, some fireworks and other products get recalled because of safety concerns and hazards. Check out recalls at https://www.cpsc.gov/Recalls

The first week in July is one of the busiest, and most deadly, holidays for driving.

- Stay safe on the road:
- Buckle up
- Don't Drink and Drive
- Hands-free phone use only!
- Drive the speed limit, and go slow in work zones.
- Load your vehicles and trailers properly. Ensure everything is secured properly. Bungee cords are not sufficient securement devices.

Other Tips:

- Supervise kids while swimming
- Always wear your life vest
- Keep your pets away from fireworks too.
- Stay hydrated
- Watch for signs of heat illness. Seek medical attention right away if someone is showing signs of severe heat illness.

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Fall Protection: Personal Fall Arrest Systems

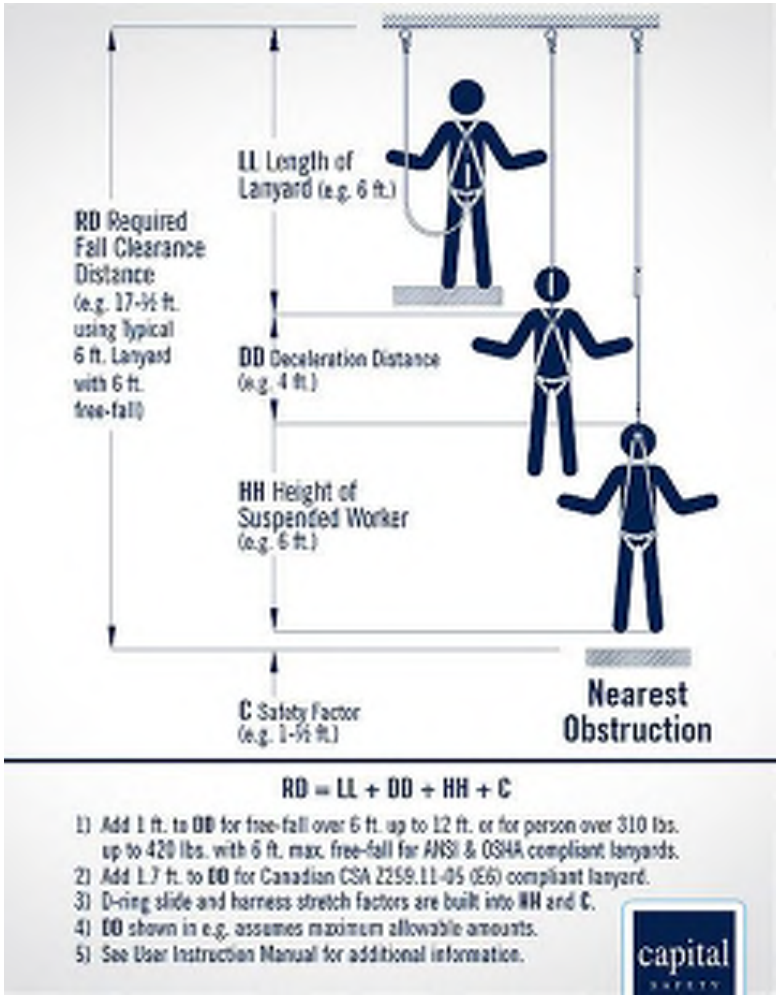
Focus on fall hazards

Falls 6 feet or greater require fall protection. If you are not protected by a guardrail, or warned at 15ft by a warning line, you must use a personal fall arrest or restraint system to prevent a serious fall injury.

- Inspect your equipment before each use. All equipment is designed for fall protection.
- Determine your fall clearance.
- Set up your system .
    - **Anchorage Poin**t: rated for 5000 lbs of force. Follow directions for use and/or installment.
    - **Connector:** Shock absorbant lanyard or Retractable.
    - **Fall harness:** is nice and snug, fitted properly.
- Have a rescue plan: if you fall, how will you get rescued ASAP to prevent suspension trauma?

Fall Clearance Calculation: You need at least 17 1/2 ft of clearance.

Check the labels on your equipment to determine the Deceleration distance, and always try to tie off overhead to reduce freefall.



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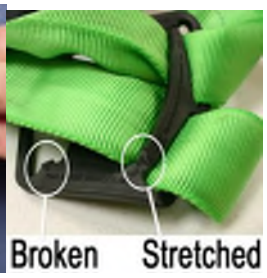
Fall Protection: Inspect Equipment

Inspect before each use! If hazards are found. Take out of service immediately.

- Fall Arrest Safety Indicators: look for the tags and other safety indicators on your equipment. If it reads "Remove from Service. Safety Indicator."
- Check webbing for damage: No holes, chemical damage, UV damage (white and fuzzy), and welding slag or burns.
- Check hardware: No degradation, warping or bending, or other damage that affects the integrity of the hardware. Safety indicators on hardware are often RED colored.
- Check functionality: retractables, make sure it stops like a seatbelt when you tug it, pulls in and out smoothly, and no slack.
- Anchorage points and equipment: Check the integrity of your anchorage point and the device, and be sure to use it properly. Always follow directions.



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HAND TOOLS & POWER TOOLS

Without the use of hand tools and Power tools, the completion of a construction project would be nearly impossible. Proper use of tools is essential for jobsite safety.

Before you start a job when using tools:

- First do a pre inspection of your worksite, determine the right tool for the right job
- Determine if personal protection equipment is needed (safety glasses, gloves, ear plugs etc…)
- Next prepare your worksite: clean up your area, set up a cut table or stand if possible
- Then inspect your tools before using them. Ensure guard is in place. Never adjust when on or plugged in.
- Get training on proper use if you are unfamiliar with a tool.

For hand tools:

- Be sure the cutting edges are sharp and free from chips
- Blades should be oiled or lubricated
- Tools should be kept clean and shavings and dust should be removed regularly
- Bits should be sharp and square
- Handles should be smooth

For power tools:

- Be sure your tools are properly grounded or double insulated (i.e., a plastic body and three pronged plug, square within square).
- Ensure your guards are in place, and working properly.
- Look the cords over to make sure they are not broken or defective
- Make sure no switches are defective or loose
- Examine the brushes, do they spark when operating (if they do they should be replaced)
- Make sure the body of the tool is not cracked or missing attachments
- Never use a tool unless the guards are in place and in working order
- Powder actuated tools require training and certification. Always carry your certification card with you. Never leave loaded or unattended. Follow directions for misfired loads and other

Once your tools have passed the inspection and they are ready to use:

- Remove the chuck or adjusting key
- Firmly secure your work
- Be sure you have firm footing
- Always use proper personal protective equipment
- Be sure to tuck in loose clothing and remove jewelry if it might get in the way
- Maintain good housekeeping
- Never carry a tool by its cord

When you are finished using a tool:

- Be sure to dust off the surfaces, neatly fold up the tool and role up cords
- Make sure to put your tools back in their cases (this will protect the tool and keep things organized)
- Clean up your jobsite
- Never use a tool in such a way that you will be injured if it slips
- Put your tools back where you got them from! (Check tools in and out from the toolcrib, and report if damaged.

Remember: Each tool is designed to perform a specific function. As long as you use the right tool and keep it in good operating condition, the various hand tools will serve you well. When you begin to improvise, expect the unexpected—injuries.

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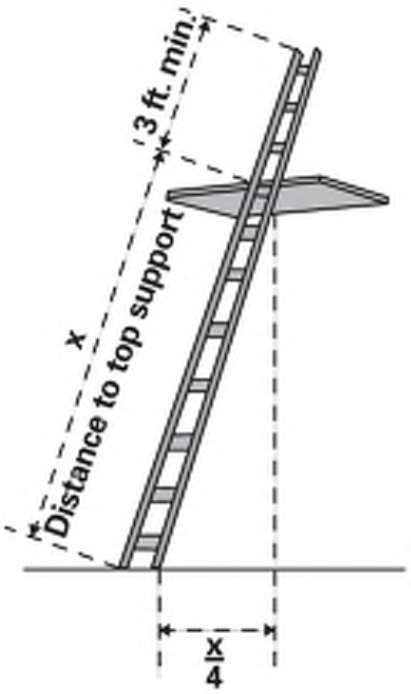
Ladder Safety

Use your ladder properly to prevent falls and injuries.



- Read labels to learn about the ladder limitations and use requirements.
- Inspect for damage. Remove from service if damaged. Inspect rungs, rails, spreader bars. On extension ladders, inspect pulleys ropes, locks, footings and pads.
- Set it on stable, level ground. Don't set on mud or ice, and don't elevate yourself with bricks or other material to gain height. Use a taller ladder.
- Secure the ladder against falling if stability is questionable.
- Don't lean too far. Keep your belt buckle between the side rails of the ladder. This reduces the chance of tipping it over and/or falling off. Secure ladder, or tie-off overhead to help prevent falls.
- Always face the ladder when ascending or descending, and use 3 points of contact. Have your hands free to grab the rails if the ladder shifts.
- "3-Point Rule": At least two hands and one foot, or two feet and one hand, should be in contact with the ladder at all times.
- Maintain a safe distance from powerlines, and do NOT use a metal stepladder near power lines.
- If working near a doorway, use barricades and/or signage to notify pedestrians of work.

- Step Ladders: Use the right size ladder!
  - Never stand on the very top or second to top rung of the ladder. Increased risk of tipping over.
  - Do not straddle the ladder. Its not meant to be used like that.
  - Only used when fully open. Do not lean against a wall to use when closed. The feet do not adjust like they do on extension ladders, risking slipping out from under you.
  - Don't climb on the cross braces or back of ladder.

- Extension Ladders:
  - Extend 3 feet above the edge, have a 3 foot overlap in the center, and secure against falling.
  - Set up at a 1:4 ratio. For every 4 feet up, it should be set one foot out.

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☐	Flammables, Fire extinguishers, Cylinders up + secure, Ventilation	☐	Air Monitoring, Ventilation, Rescue Plan, Attendant, Entrant, Hazards, eliminated	☐	Competent person inspect daily. Ladder-4', Slope 5'

Inspections-check if required		**Inspected by:**
Lifts, Hoists, Heavy Equip.	☐	
Ladders/ Scaffolds	☐	
Trenches	☐	
Tools + Equipment	☐	
Fall protection equip.	☐	
Guardrails/barricades/holes	☐	

Additional Notes/reminders:

Employee Name	**Signature**	**Employee Name**	**Signature**

Scaffolding Safety

- **Fall protection**: is required when working over 10 feet: guardrails or a fall arrest system OK. (single-point and two-point adjustable suspended scaffold need both a PFAS and a guardrail). *1926.451(g)(1)*
- **Guardrail height**: Toprail for scaffolds manufactured and placed in service after Post-2000: 38-45" tall, Pre-2000, 36-45" *1926.451(g)(4)(ii)*
  - **Crossbracing**: When the crosspoint of crossbracing is used as a toprail, it must be between 38-48"tall*. 451(g)(4)(xv)*
  - **Midrails:** Midrails must be installed approx. halfway between toprail and the platform surface. When using crosspoint of crossbracing as midrail, it must be between 20-30" tall. *1926.451(g)(4)*
- **Footings**: Scaffold footings shall be level and capable of supporting loaded scaffold. Legs, poles, frames, and uprights shall bear on base plates and mud sills. *1926.451(c)(2)*
- **Platforms**: Supported scaffold platforms shall be fully planked or decked. *1926.451(b)*
- **Securing:** Guying ties, and braces - Supported scaffolds with a height-to-base of more than 4:1 shall be restrained from tipping by guying, tying, bracing, or the equivalent. *1926.451(c)(1)*
- **Capacity**: Scaffolds and scaffold components must support at least 4 times the maximum intended load. Suspension scaffold rigging must at least 6 times the intended load. *1926.451(a)(1) and (3)*
- **Training**: Employers must train employees who work on a scaffolds on hazards and procedures to control the hazards. *1926.454*
- **Inspections:** Before each work shift and after any occurrence that could affect the structural integrity, a *competent person* must inspect the scaffold and scaffold components for visible defects. *1926.451(f)(3)*

A Competent Person, "Is *capable of identifying existing and predictable hazards, and has the authority to take prompt corrective measures to eliminate them." The CP must:*

- **Inspect** scaffolds and components, ropes on suspended scaffold, and rope used for guardrails for hazards and authorize prompt corrective actions.
- **Determine Safety:** is the scaffold safe to use? Is it safe to work on scaffold during storms or high winds ensure personal fall arrest system or wind screens protect? Is a scaffold structurally sound when intermixing components from different manufacturers? Has galvanic action affected the capacity when using components of dissimilar metals?
- **Train** employees involved in erecting, disassembling, moving, operating, repairing, maintaining, or inspecting scaffolds to recognize associated work hazards. **1926.454(b)**
- ***Suspension Scaffolds:*** evaluate direct connections to support the load, and evaluate the need to secure two-point and multi-point scaffolds to prevent swaying.
- ***Erectors and Dismantlers:*** CP *S*elects and directs employees who erect, dismantle, move, or alter scaffolds, determines the feasibility and safety of providing fall protection and access, and trains erectors and dismantlers to recognize associated work hazards.

Note: a professional engineer is required to design tube and coupler or fabricated frame scaffolds over 125 feet, pole scaffolds over 60 feet, or scaffolds that are moved when employees are on them.

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Powder Actuated Tools

Powder-actuated tools (PATs) are power by an explosive charge that drives fasteners into hard surfaces. They operate like a loaded gun, and should be handled as such. Unauthorized or improper use may result in serious injuries or death. Only trained, competent, and authorized employees are permitted to operate powder-actuated tools. A *Certification Card* should be issued upon completion of training. Operators should carry the card with them.

1. Test the tool each day before loading. Use manufacturer's test method.
2. Inspect the tool, and ensure the protective shield is centered and perpendicular to the barrel to stop flying fragments. It should not fire unless shield is in place. Tag and remove from service if damage is found.
3. Wear PPE: Safety glasses, ear plugs, hard hat.
4. Post Signage: post sign warning of use of powder actuated tools in the area.
5. Ensure no-one is on the other side of the material you're fastening,
6. Read the Manufacturer's Instructions, and follow all safety precautions.
7. Store unused cartridges in their boxes and PATs in their case. Discard spent and misfired cartridges according to manufacturer instructions.
8. Never point at others, and keep hands clear of the barrel end.
9. Never leave a PAT loaded and unattended. Load just prior to using.
10. Don't use a PAT in flammable, combustible or explosive environments.

Operation:

- Choose the correct cartridge for the fastener being used and appropriate materials. Test according to manufacturer instructions.
- Never drive fasteners into very hard or brittle materials like cast iron, glass blocks, glazed tile or other material that the fastener could shatter, ricochet off or pass through. Don't drive fasteners into a spalled area or where a previous fastening was unsuccessful.
- Hold the tool firmly against, and perpendicular to, the surface. Securely brace yourself when using PATs on ladders or scaffolds to maintain good balance. Use fall protection when needed.
- When driving fasteners into materials like brick or concrete, stay at least 3 inches away from an edge or corner. With steel, the fastener must not come any closer than one-half inch from a corner or edge.

Misfires:

- If a PAT misfires, wait at least 30 seconds, and then try firing it again. If it still doesn't fire, wait another 30 seconds so that the faulty cartridge is less likely to go off. Then, carefully remove the cartridge, and place it in water.

Do you need a certification card for your tools? Check the manufacturer's website for more information on how to obtain training, or contact your Safety Coordinator.

POWDER-ACTUATED TOOL SAFETY

Tool Box Talk

When used properly, powder-actuated tools are very effective and increase productivity by utilizing a small, controlled burst to drive a specialized nail, stud, or other fastener into solid base materials like steel, concrete, or masonry. Choose safety and minimize risks associated with powder-actuated tool use by increasing user safety awareness and participating in training programs provided by tool manufacturers.

General handling:

- Clean and maintain tools according to the manufacturers' instructions
- Only individuals trained in the safe use of a powder-actuated fastening tool should use equipment
- Only load cartridges into the tool just prior to firing
- Always remove the cartridges whenever the powder-actuated tool is not in use, being transported or stored, and before performing any maintenance or repair on the tool

Tool operation:

- Inspect tool for damage and check that tool operates properly (DO NOT operate the tool if parts are damaged or does not operate properly)
- ENSURE THE BARREL IS NEVER POINTED TOWARDS A PERSON
- Do not operate in areas congested with people
- Use proper ANSI Z87.1+ eye protection
- Use hearing protection when driving fasteners in enclosed areas
- Hold the tool perpendicular to the work surface when fastening
- Clear the area of personnel on the opposite side of the work surface

Maintenance and storage:

- Tool should be cleaned in accordance with manufacturer's instruction
- Remove cartridges and nails prior to cleaning and storage
- The ventilation slots must be unobstructed and kept clean at all times
- Do not disassemble the tool while it is hot
- The cartridges and unloaded tool should be stored in their box or case

General safety practices are addressed: read the tool operator's manual for complete information

Hilti, Inc. (U.S.) 1-800-879-8000
en español 1-800-879-5000 www.hilti.com

BC • 04/19

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Fall Protection: Anchorage Points

Anchorage points must be strong enough to hold you in the event of a fall. The force of the body with a freefall of 6 feet or less may put as much as 5,000 pounds of force on that anchorage. Ensure your anchorage point is rated for 5000 pounds of force, or engineered properly.

- Only use appropriate anchorage devices for your fall protection system.
- Check the labels and manufacturer instructions to ensure you are using and installing it properly.
- Inspect your anchorage surface/material and anchorage device before and after installation.
- Any fall protection equipment must be exclusively used for fall protection.
- Avoid using any rigging straps as anchorage devices they are not rated according to force of a fall
- When using a D-ring Choker, ensure it is “choked” or wrapped through the larger d-ring to prevent movement.

There are a variety of anchorage devices available for many situations, from D-ring Chokers, Beam Clamps, Concrete bolds, or carts to use when no other anchorage point is available.

Do Not Use these as anchorage points:

- Standard Guardrails
- Standard Railings
- Ladders/Rungs
- Scaffolding
- Light fixtures
- Conduit or Plumbing
- Ductwork or Pipe Vents
- Lanyards
- Vents
- Fans
- Roof Stacks

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HAZARD ALERT

CPWR
THE CENTER FOR CONSTRUCTION RESEARCH AND TRAINING

NAIL GUNS

Serious – even fatal – injuries are happening even when used as designed.

PHOTO COURTESY STEPHAN MANN, MD, MPH

What's the problem?

Nail guns are popular for a reason. They get the job done in a blink of an eye.

But that rapid-fire action can work against you. In a split second, a nail can enter your finger, your hand, or worse.

Nail gun injuries are much more common than people think. Most injuries involve puncture wounds to hands or fingers, but serious, even fatal, injuries are also associated with the use of these tools.

How most nail gun injuries happen

- Accidental or unintended firing, often associated with recoil of the tool after firing
- Ricocheting nails
- Nail going through work surface
- Airborne nails
- By-passed safety features
- Unsafe work practices
- Holding finger on contact trigger

About nail guns

Although there are many types of nail guns (framing, finishing, flooring, etc.), there are two common triggers:

Contact Trip Triggers fire anytime the trigger and the nose of the gun (contact element) are both depressed. Trigger can be held down to allow "bump" or bounce nailing.

Sequential Triggers require the nose of gun to be depressed before the trigger is pulled. That avoids accidental firing of nails.

Dual Triggers are new models that allow workers to switch back and forth from contact trip to sequential. Confusing the two can lead to injuries.

WARNING

All triggers look alike. Test guns before using. If you can "bump nail" by holding the trigger down and bouncing the nose against a nailing surface, that is a contact trip trigger gun.

USE EXTREME CAUTION.

How to prevent injury

- Ask for a nail gun with a sequential trigger mechanism.
- Do not press the trigger unless the nose of the gun (contact element) is firmly pressed against the work material.
- NEVER walk around with your finger on the trigger.
- NEVER clean or clear jams or adjust a nail gun when it is connected to the air supply.
- Avoid nailing into knots and metal; nails are more likely to ricochet. Dense materials, like laminated beams, are also difficult to nail.
- NEVER remove or bypass safety devices, triggers, or contact springs.
- NEVER use a defective tool. If a tool is malfunctioning, it needs to be tagged and taken out of service.

Why it's important:

1. Workers using the contact trip or "bump nailers" have **double the rate of serious injury** of those workers using sequential trigger guns.

2. **Accidental firings** are most common following recoil of tools with contact trip triggers.

3. Serious, even fatal, injuries are happening to workers, even when using nail guns as designed. **Get training on nail guns,** even if you are using a sequential trigger gun.

What's the risk?

Researchers found that 44% of apprentice carpenters in one program were injured by nail guns before they finished their training. A study measuring productivity found that most of the variability in speed had to do with the nail gun's user rather than the type of trigger used. Another study found 12% of nail gun injuries happen to workers not even using a nail gun.

To get more information about nail gun safety (including videos and training tools), go to **www.nailgunfacts.org**

For more safety and health information, visit **www.elcosh.org**

If you think you are in danger:
Contact your supervisor.
Contact your union.
Call OSHA
1-800-321-OSHA

To learn more about CPWR, visit **www.cpwr.com**

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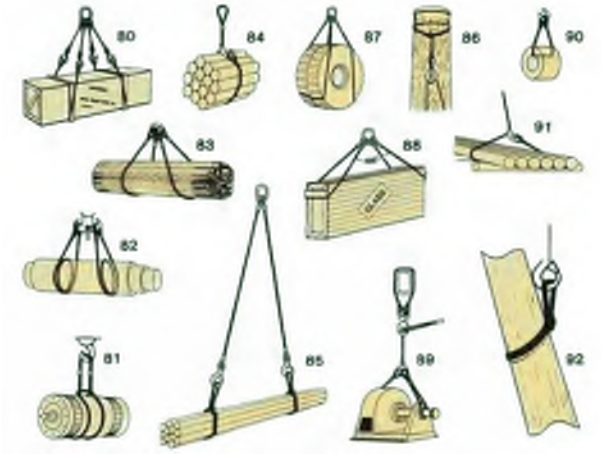
Additional Notes/reminders:

Employee Name	**Signature**	**Employee Name**	**Signature**

Material Handling - Pipes

Loading + Unloading Pipes

- Use stakes to prevent material from rolling off during loading
- Use chocks to stabilize the pipes and prevent rolling
- Use wood dunnage and chocks between layers of pipe or offset stacking for stability, ensuring groups of pipes are belly wrapped together when necessary
- If pipes are nested, strap through center to prevent movement
- Secure the load (to handle 50% of load weight) 2 straps in the first 10 feet, and at least one for every other 10 feet of load
    - Cinch Strap/belly strap- pull strap under and around load and attach to other side, cinch together
    - Strap down to trailer + cinch tighter
    - Re-cinch until all are tight
- When unloading, ensure the area is clear to allow safe unloading.
- Coordinate with crane, lull or lift to ensure they are onsite and ready to assist with unloading

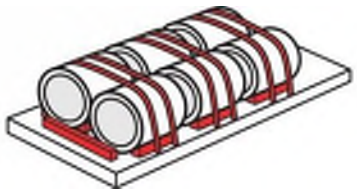


Secure your load from movement, and ensure your straps and attachments are not damaged. Use padding to protect straps and cargo. When unloading, ensure hoists straps will effectively secure the load.

Construction Fatality

On February 20, 2017, a truck driver died after he was crushed by a 2,500-pound pipe at the HWY169 construction site in Minnetonka, MN.

The Minnesota State Patrol said the driver, a 38-year-old from Missouri, was helping unload metal pipes at the site. When he unstrapped the load, one of the pipes rolled off the trailer and landed on him, killing him.



Remember:

- Stay 10+ feet away from overhead power lines
- Always set brakes and chock wheels of truck when loading or unloading.
- Ensure the area is free from obstructions
- Wear PPE: reflective vest, safety glasses, hard hat, gloves and safety toe boots
- Inspect straps, hoist and rigging equipment for damage
- Use a tag-line to help position load and avoid standing under raised load
- Do not remove securements until you are ready to unload.
- Never use bungee cords for securement

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MATERIAL STORAGE

Proper material storage is a vital part to every job site and is key to maintaining safety, efficiency, and good housekeeping. Store materials correctly the first time.

Why Organize Storage?

Poorly stacked materials are dangerous to everyone on a jobsite. Organized storage of any item improves work flow, inventory tracking and distribution. Proper storage can prolong the life of material and protect against damage.

Tips for Material Storage:

- Keep aisles and passageways clear; never store materials in a way that it blocks a path or emergency exit.
- Never store materials within six (6) feet of a hoist way entrance or floor opening. Stored material can fall or cause personnel to fall or be crushed between loads and stored material. Hoist ways and floor openings require fall protection (guardrails, hole covers, and/or personal fall arrest systems). Ensure stored material can be accessed safely without posing a risk of crushing or falling.
- Separate incompatible materials. Don't stack flammables next to combustibles and store according to SDS and label requirements.
- Unless you are using material immediately do not store excess material on scaffolds or runways.
- Remove all nails or sharp objects from lumber stacks.
- Block and chock all cylindrical storage areas to prevent spreading, rolling or tilting
- When possible, cross-tie straps of a material to increase support.
- If heavy materials or large quantities of materials are to be stored on floors above grade, know the load limits of the floor and don't exceed them.
- Never store tools or materials on the top of ladders, they may not be visible and can fall of and hit someone when moved.

Proper Stacking Methods:

Stack pallets laying down, don't lean on their sides. Stack and block/chock pipes to prevent rolling. Keep heavy items lower. Ensure loads are secure. Plan ahead if you need special storage equipment.

BRICK **BLOCK** **PINWHEEL** **IREGULAR STACKING**

Loading Moving Carts:

- Always familiarize yourself with the safe operation of powered pallet jacks.
- Make sure the load is stable and centered over the base of the cart or truck (as the weight is extended past the base it multiplies the load upward, like a lever arm)
- If moving long or awkward objects, ensure balanced and secured properly against shifting.
- When propelling a cart manually, always push the cart instead of pulling the cart. Pulling increases back strain risk. Also always plan your path to prevent injuries from obstacles.

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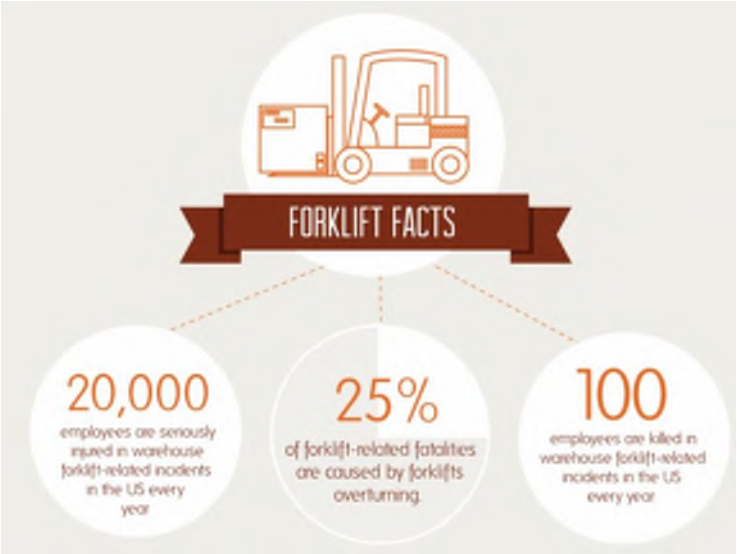
Forklifts

Operation:

- Inspect Daily!
- Operate a forklift only while in the seat or operator's station. Never start it or operate the controls while standing beside the forklift.
- Do not reach outside of cage when traveling, or lifting.
- Ensure roll-over protection cage is in place
- Always look in the direction of travel and keep a clear view of the travel path.
- Travel in reverse if the load blocks your view.
- Travel with your load uphill when on an incline.
- Do not travel with load elevated
- Keep a distance of at least three forklift lengths between you and any forklift traveling in front of you.
- Never drive a forklift up to anyone in front of a bench or other fixed object – crushing hazard.
- Never allow anyone to walk or stand under the elevated forks.
- Always check that there is adequate clearance under overhead objects.



Restrictions:

- You must be trained with a hands-on training prior to operating a forklift
- You must be 18 years or older to operate a forklift
- You must wear your seatbelt
- Do not let anyone stand under an elevated load
- Do not not allow passengers on a forklift (unless designed to)
- You must not make modifications to lift, attachments or counterweight unless approved by manufacturer
- Do not exceed weight capacities.

Remember:

- If a problem is found during your daily inspection – Remove from service and call vendor for maintenance.
- Always make sure delivery trucks have chocked wheels when unloading
- If you have an accident, NEVER attempt to jump out of the lift. Brace yourself to prevent the roll-over cage from crushing you

Prevent Injuries by stacking + storing properly

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Fall protection equip.	☐	
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HOT WORK + Fire Prevention

Performing any hot work on a job site, like grinding, cutting, and welding, can spark a fire. Any fire in the workplace has the potential to cause serious injuries and property damage. Prevention is key to eliminating the hazards that increase risk of fire on the jobsite.

Prepare the jobsite

- Keeping work areas clean and clutter free.
- Remove flammables from the area, or isolate using fire blankets or other means.
- Know how to properly handle and store chemicals and dispose of flammable waste.
- Know what you are expected to do in case of a fire emergency. Know where the exits and fire extinguishers are.
- Call for help immediately; don't let a fire get out of control (this applies to a fire wherever you are).
- Have a fire extinguisher or sufficient water source present during hot work.
- Ensure fire extinguishers are in good condition, and inspected monthly.

Minimize potential hazards

- Ensure fire sprinklers and hose streams are in service and operable. If there is a risk for accidentally tripping sprinklers in an area, coordinate prevention methods with clients.
- Hot work equipment is inspected and in good condition
- Dust, lint, debris, flammable liquids and oily deposits are removed.
- Combustible floors should be wet down, covered with damp sand or fire blankets.
- Confined spaces are cleaned of all combustibles such as grease, oil, flammable vapors
- Explosive atmospheres must be verified eliminated before any work begins.
- Use a trained fire watch, with extinguisher, during and for 30 minutes after hot work when necessary. Longer watches may be required for higher hazard areas.
- Ensure fire watch is available for all areas that sparks may ignite, below if open floors, or on other side of walls, etc.

Hot work Permits

- Know jobsite requirements. Are hot work permits required?
- If hot work permit forms are not provided by client, use the permits in the NAC Safety Manual
- Make sure to display permits in a visible area
- Always document and retain your permits. Return to client as required.
- Hot work permits help you plan, and ensure a fire doesn't ignite.

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WELDING AND CUTTING

To prevent injury, extreme caution should be taken when using any types of welding or gas cutting equipment. Injury can result from fire, explosions, electric shock, or harmful agents.

Please take the following precautions while welding and cutting:

- Protect Your Eyes:
  - Wear proper eye safety protection during welding and cutting operations.
  - Always wear required eye protection to guard against slag while chipping, grinding and dressing of welds. Always wear a welding hood to protect eyes from flash burn.
  - Choose appropriate protective shade numbers for your operation.
  - Ensure you have extra batteries for your auto-darkening lenses, and replace before they run out.
- Make Sure the Air is Safe to Breath:
  - Good ventilation should be provided whenever welding, cutting or heating is being performed.
  - Smoke eaters or local exhaust ventilation may be necessary.
  - Respirators: Dust mask styles may be worn for nuisance levels, and tight-fitting respirators or PAPR's may be needed when other controls are insufficient.
    - If respirators are required, you must fill out a respiratory questionnaire, and have a fit test conducted to ensure your respirator fits properly.
    - Choose respirators for your hazards. 3M
- Prevent Fires, Injuries, and Property Damage
  - Arc welding and cutting operations will be shielded by noncombustible or flameproof shields to protect employees from direct rays.
  - A suitable fire extinguisher should be readily available when welding, cutting or heating operations are being conducted.
  - Always clear the area below cutting or welding operations so hot slag will not drop on hoses, cables, or employees.
  - Always store cylinders properly on a welding cart or secured to a wall with a chain.
  - Do not cut or weld around gasoline tanks or attempt to weld or cut a container that has stored a flammable or combustible liquid.
  - Welding or cutting equipment should not be operated unless proper training has been provided.
  - All tank valves should be closed when equipment is not in use.
- Prevent Electric Shock
  - When electrode holders are left unattended, electrodes should be removed and the holder should be placed or protected so it cannot make electrical contact all arc welding and cutting cables should be completely insulated.
  - Fuel gas and oxygen hoses must be easily distinguishable. Inspect hoses daily and repair or replace if defective.

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Preventing Welding Flashback

Oxy-acetylene torches have been used for many years for cutting, welding, brazing, and heating of metals. The equipment used today is safe, but every year, hundreds of employees are injured or die as a result of improper use. Knowledge and precautions can prevent fires and violent explosions.

Gas Pressure: One cause of fires and explosions is high acetylene pressure. When more than 15 pounds of pressure is used, acetylene becomes unstable and decomposes explosively. This is the major reason for using other fuel gases such as MAPP, propylene, propane, and natural gas which may be safely used at higher operating pressures.

Burnback: If your oxygen cylinder is low or empty, reverse flow of gas may occur. The fuel gas, being at a higher pressure, can travel up the oxygen line and mix with gas in the hose, regulator and cylinder. If you light your torch without purging the lines, a *burnback* may occur with explosions in the hose, regulator, or cylinder.

Backfire: The same thing can happen with high oxygen pressure and low fuel gas pressure if a backfire occurs, which is usually caused by holding the cutting torch too close to your work. This causes gas starvation of the cutting flame and results in the flame being sucked into the torch head. Usually, you will hear a popping sound that turns to a whistle when this **happens.**

Flashback: When a backfire takes place in a mixing chamber, unless you shut off the oxygen valve, the flame burning in the torch head may ignite gases in the hoses and result in a flashback. A flashback is an *explosion* that progresses through the torch, hoses, regulators, and into the cylinders. The consequence can range from a burst hose to a violent explosion of the regulator and cylinders.

There are several things you can do to help prevent flashbacks, fires and explosions:

1. If using acetylene, keep the pressure below 15 pounds.
2. Purge your hoses before lighting the torch.
3. Never light your torch with a mixture of fuel and oxygen. After purging the lines, light the torch with only the fuel gas valve open.
4. Check valves should be installed on both torch inlets and operating properly. Check valves can stop the reverse flow of gases, but will not prevent flashbacks.
5. To prevent flashbacks, flashback arrestors must be installed on the outlets of both regulators, and/or torch inlets.

Check The Torch: How can you tell if the torch you are using has flashback arrestors and check valves? If you look at the torch you will notice a small cylindrical valve on each inlet with the hoses screwed onto this valve instead of hooked directly to the torch. Most of these valves are combination flashback/check valves and will say so on the valve body. Often, combination valves are also installed on regulator outlets.

Before welding, take time to inspect the equipment you will be using to be sure check valves and flashback arrestors have been installed. This precaution can prevent a deadly cylinder explosion.

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Silica

Toolbox Talk

The Silica Standard:

Purpose: To reduce occupational exposure to respirable crystalline silica (RCS) using engineering controls (wet cutting + vacuum attachments) and good work practices.

The Permissible Exposure Limit (PEL) has been reduced to 50 µg/m^3 for an 8-hour time-weighted average (TWA). Tasks that remain below the Action Limit (AL), 25 µg/m^3 TWA, are not within the scope of this standard. Some short duration, occasional tasks may create exposures that seem high, but the average TWA remains below the AL. Controlling visible dust reduces risk of exposure to invisible respirable dust.

How to Comply:

Minimize exposure to respirable dust with a combination of engineering controls, good housekeeping practices and restricted access.

- **Option 1:** Use Table 1- engineering controls based on task, tools, duration and PPE use.
- Option 2: Follow work procedures developed by NAC based on *objective and performance data* providing evidence that control methods are effective.
- Option 3: Air monitoring on a regular basis to prove below the PEL (50). Can stop monitoring after 2 consecutive tests are below the action level of (25).

Why is Silica Harmful?

Silica is one of the most common minerals on earth (quartz rock) and is found in concrete, stone, masonry, and other manufactured materials. When we use power tools on silica-containing materials, Respirable Crystalline Silica (RCS) is created. RCS is a very small fraction of visible dust and is 100x smaller than a grain of sand on the beach. When inhaled, it can settle deep into the smallest vessels in your lungs causing inflammation that leads to lung disease, silicosis, cancer and even kidney failure.

Ensure you protect yourself and others by using engineering controls and good work practices to minimize RCS and visible airborne dust.

Wearing a Respirator?

If you are required to wear a respirator according to Table 1 (jackhammers, chippers, vacuums on < 8" power saws):

1. Fill out Medical Questionnaire.
2. Get fit tested annually - to make sure your respirators fit (facial hair cannot affect seal)
3. Be trained on resp. selection & use.
4. Track days you're required to wear a respirator for silica exposure. If worn 30+ days/year for silica, a medical exam and surveillance is offered.

Exposure Control Plan Work Practices

Equipment/Task	Control Methods
Isolate: Restrict Access + Contain Exposure Areas	Restrict access, set up caution tape, post signs, or use containment methods like plastic (if necessary) to reduce exposure to others. Use appropriate ventilation in space.
Sweeping Floors + Housekeeping	Use wet sweeping or sufficient sweeping compound to minimize visible dust. Do not clean with compressed air. Use vacuums with HEPA filters. Empty vacuums and clean filters frequently, as needed. Keep up on housekeeping, and contain dusty debris in sealed plastic bags.
Good Work Practices	Use ventilation and stand upwind from source to reduce exposure. Equip shop vacs with HEPA filter and filter bag. If minimal exposure, hold vac hose up to source to reduce dust.
Dry Core and Hammer Drill	Use integrated vacuum collection system to contain dust. Clean holes with HEPA filter vac.
Concrete Chipping + Jackhammer	Use vacuum system to contain dust or use continuous wet method. Also, wear a respirator (APF 10) when working inside (or outside more than 4hrs).
Handheld Power Saws: Cutting silica material	Use integrated water delivery system according to manufacturer instructions. Also, wear respirator (APF 10) when working inside, or more than 4hrs outside.
Excavation, mixing concrete, dusty jobsites	Monitor work area for visible dust. Wet surface during excavation to prevent airborne dust or be in enclosed cab. Isolate mixing/exposure areas, or schedule high exposure tasks to avoid exposing others.

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COMPRESSED GAS CYLINDERS

Compressed gas cylinders are under pressure ranging from 250 psi to 2200 psi. Improper storage, exposure to high temperatures, or damage poses a risk of igniting fires, leaking hazardous gases, depleting oxygen in the area, and creating a missile-like bomb. Always follow safety precautions when handling and storing compressed gas to prevent severe injuries.

When handling compressed gasses remember to:

Store Properly

- Always store and transport compressed gas cylinders in an upright position, and secured from movement, even if you think its "empty."
- Always store or transport with protective caps on, over the valves. When in use or, ensure regulators are in place.
- Store *Flammables* separately from *Oxygen*:
    - 20 ft apart, or
    - 5 foot tall, ½ hour fire wall between.
- Store *Empty* cylinders separate from *Full* ones.
- Avoid storing cylinders in areas with high temperatures or in enclosed, unventilated areas.
- Do not transport cylinders in the cab of a vehicle. Leaks may displace oxygen. Remove from vehicle when you arrive at destination to prevent pressure buildup.
- Never hoist cylinders with a sling or magnet. Use a cylinder cradle, designed specifically for cylinders or lift as a palletized group.

Using Cylinders

- Never tamper with any safety devices on the valve or cylinder.
- Always open valves slowly, and only use cylinder specific wrenches.
- Never use cylinders for rollers or sawhorses. Do not weld or cut on cylinders.
- Never attempt to repair valves or regulators.
- Do not try to transfer gases from one cylinder to another.
- Keep a fire extinguisher nearby when handling or working with compressed gas cylinders and flammable liquids.
- When in use, keep cylinders secured to a cart designed for that use. Ensure regulators are in place, and flashback arrestors are used.
- Remove empty cylinders from the work area to prevent damage.
- Never expose cylinders or gases to oil or grease. Never grease a cylinder valve.
- Never use copper components with acetylene.
- Never "crack" hydrogen cylinders
- If acetylene is laying down for a period, it must stand upright for the equivalent period of time prior to use.

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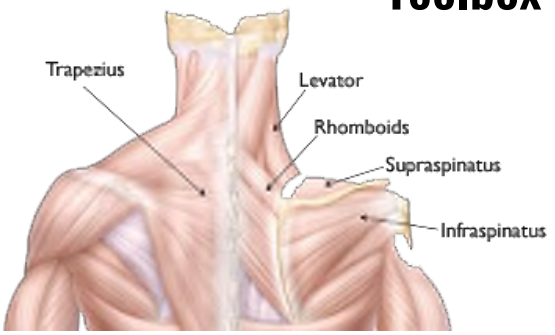
Toolbox Talk

Ergonomics - Shoulder Safety



The shoulder is a ball-and-socket joint. The ball-like head of your humerus (long bone of your upper arm) is twice the size of the shallow shoulder socket, making the joint mobile, but unstable. Its movement and stability relies on the four muscles that make up your rotator cuff. Rotator cuff muscles originate on your shoulder blade and insert, or connect, as a tendon on the humerus in your upper arm. Ligaments in your shoulder and the rotator cuff muscles provide shoulder stability by holding the ball portion of the joint in the deepest, widest area of the socket.

Some repetitive motions increase rotator cuff stress and may lead to injury. Actions that make your shoulders more prone to injury include the overhead reaching and throwing motions found in sports, and in professions including construction, hair styling, and painting. Reduce risk and recovery time of shoulder injuries by focusing on shoulder health.

Shoulder Stretch Exercises:

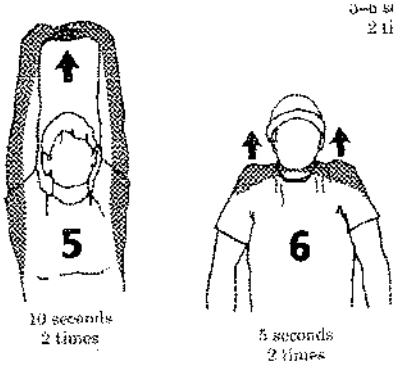
- Stretching the back of your shoulder
- Hand-up-your-back stretch
- Wall stretches

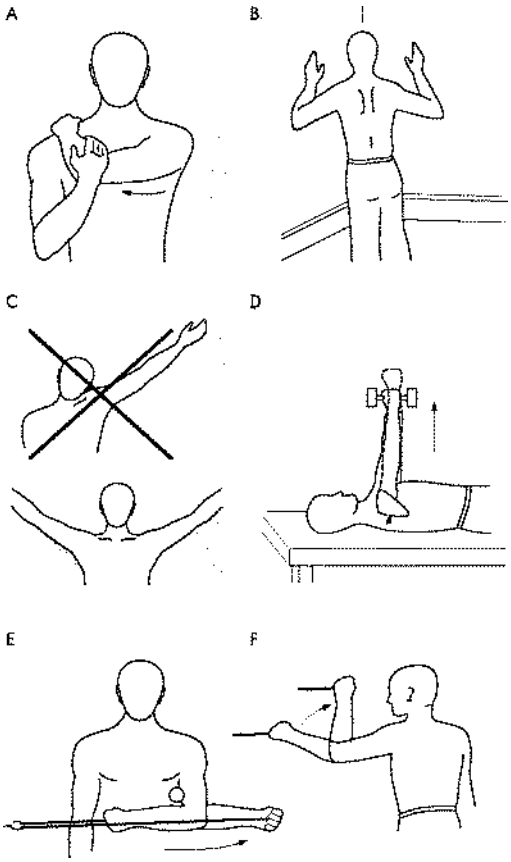
Shoulder Strength Exercises:

- Internal and external rotation exercises
- Wall push-ups
- Arm reach
- Arm raise

Exercise strengthens and stretches the muscles and tendons of your shoulder joint, conditioning muscles helping to reduce shoulder injury and improve shoulder performance. Regular stretching has shown to improve recovery time if a person does become injured. Doing regular shoulder strength exercises can help prevent injuries.

Shoulder Exercises: For each exercise, do 3 sets of 15 reps, 3 times per week.





Reduce shoulder stress:

- Stay hydrated! Dehydration reduces muscle elasticity and recovery.
- Don't do something if it hurts. Avoid over stretching or lifting too much. If using weights, use light weights or resistance bands.
- Maintain good posture: Keep your head over your shoulders and shoulders back. Don't your scrunch neck during exercises.
- Don't carry a backpack or bag over just one shoulder.
- Avoid working with your arms overhead too long, take breaks to allow muscles to recover.
- Take regular breaks for repetitive tasks. Vary your positions often.
- Use material lifting aids and avoid lifting over 50 lbs by yourself.
- Lift and carry objects close to your body. Try not to lift heavy loads with outstretched arms or with awkward posture.
- Keep your thumb up when you reach for something with your arm

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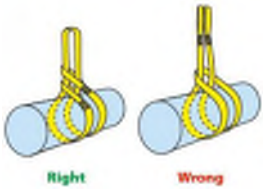
HOISTS & RIGGING

Every year, workers lose their lives as a result of improper rigging or rigging failure that allowed a load to fall while being hoisted. Some deaths occur when the loads fall or equipment fails.

Always use precaution when lifting. Never use a defective sling or chain, or overload your equipment. Do not modify equipment as this can affect load capacity. Sometimes lifting in tight spaces, like boiler rooms, can be difficult and pose ergonomic hazards. Make a plan for a safe lift to prevent injuries. Plan your task and discuss with your crew.

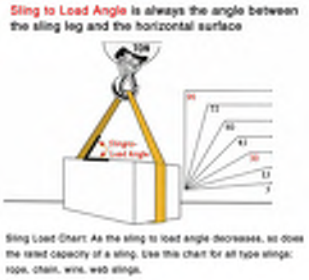
Choose the right tools for the job:

- *Chains* – are strong, resistant to heat and able to adapt to the shape of a load; however chains are heavy and links can be broken because of sudden shock if not sized appropriately
- *Wire rope* – high strength, resistant to heat; less flexibility
- *Fiber/ Synthetic rope* – lightweight, flexible; susceptible to heat and other environmental exposures which can make fibers brittle.



Make a plan before you lift!

- Read the manual and inspect equipment
  - Know rated capacity of the slings, hoists, and lifts
  - Follow manufacturer recommendations
- Assess your work area for hazards + make a plan to mitigate
  - Crushing, falling objects, muscles sprains/strains, low light, etc.
  - Ensure anchor points can support equipment being lifted.
- Know the load and lift right
  - Load Size, Weight, & Center of Gravity
  - How to position for safe lift
  - Determine the sling setup: sling configuration and sling-load angle
  - Remember: Smaller angles (shorter legs) will cause more stress on the slings, and reduce load capacity.



Hoists

Hoists can be useful in areas that are too tight to use a crane or lift in. While using hoists be sure to:

- Follow the proper requirements for lifting and rating capacities
- Properly secure the hoist to its hanging position, make sure the surface can support lift
- Before hoisting any objects make sure that the environment is safe from obstructions or other hazards
- If the hoist is mounted on the ground make sure it is on a stable level surface and its brakes are set

Rigging

Inspect all rigging prior to use to minimize the possibility of rigging failure:

- Look for wire or rope deformation, strain, binding or kinking
- Do not wrap hoist lines around the load
- Know the rated capacities of rigging and slinging and use the proper size
- Ensure that loads are rigged to minimize the potential for dropped loads
- Watch sharp corners on loads when using synthetic slings
- Do not tie knots in slings

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Inspections-check if required		**Inspected by:**
Lifts, Hoists, Heavy Equip.	☐	
Ladders/ Scaffolds	☐	
Trenches	☐	
Tools + Equipment	☐	
Fall protection equip.	☐	
Guardrails/barricades/holes	☐	

Additional Notes/reminders:

Employee Name	**Signature**	**Employee Name**	**Signature**

BLOODBORNE PATHOGENS (BBP)

In the workplace, blood borne pathogens (BBP) may be transmitted when blood or other infectious body fluids come in contact with mucous membranes (your eyes, nose, mouth); non-intact skin (due to cuts, abrasions, burns, rashes, paper cuts); or by handling or touching contaminated materials or surfaces. Bloodborne pathogens are also transmitted by "injection" under the skin via a contaminated sharp object puncturing or cutting the skin causing a wound. Exposure may also occur in sensitive work areas such as hospitals, schools, clinics, and during plumbing work.

Individuals who are infected with Hepatitis B Virus (HBV) or Human Immunodeficiency Virus (HIV) may not show symptoms and may not know they are infectious. For this reason, all human blood and body fluids should be considered *as if infectious*, and all precautions should be taken to avoid contact. This simple rule is known as "universal precautions."

Hepatitis B Virus versus Human Immunodeficiency Virus:

- Hepatitis B Virus is more persistent than HIV and is able to survive for at least one week in dried blood on environmental surfaces. However, HIV will not survive for more than a few minutes when exposed to room temperature air, and will usually die within seconds.
- A teaspoon of infected blood may contain over one billion HBV particles, while a teaspoon of infected HIV blood contains about 15 HIV particles.
- Hepatitis B Virus usually has mild symptoms which makes diagnosis difficult. HIV infections usually are not diagnosed for years and symptoms may not appear for many months or years.
- Hepatitis B can be prevented with a vaccine. At the present time there is no preventive vaccine for HIV.
- No cure is presently available for HBV or HIV.

If you perform work where you may come in contact with contaminated materials, like working in hospitals, or if you administer first aid to an injured person in the workplace and there is a potential for contacting any body fluids. You should use the precautionary principal and follow "universal precaution" guidelines.

- Wear impervious gloves when there is a chance of exposure to blood or body fluids.
- Wear a face shield to protect your entire face, and safety goggles to provide the most complete eye protection. You may also choose to wear a healthcare particulate respirator with a NIOSH rating, depending on the situation. Follow respiratory protection program requirements.
- Use resuscitation devices when performing cardiopulmonary resuscitation (CPR).
- Report all BBP exposures, or potential exposures to your supervisor immediately.
- Immediately wash your hands and affected areas with soap and warm water.
- Flush your eyes, nose or other mucous membrane areas with water, if exposed.
- Wash down areas which body fluids may have been contacted with the use of a mild solution of household water and bleach (10:1).

If you are exposed to BBP, you have the option to seek medical attention to receive vaccinations against common BBP that prevent contraction of some diseases. Contact your Safety Department for guidance.

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LOCKOUT/ TAGOUT

The work you do likely involves working with hazardous energy like Electricity, Heat, Steam, Pressure, Hydraulics, Gravity, and Chemicals. Before you work, you have to control this hazardous energy to ensure you are protected from harm. If you do not have exclusive control of a shutoff within site, it must be locked out to protect you from unintended startup or hazardous energy. If there is more than one step required to lockout a machine or system, a written procedure should be used to ensure proper lockout. Always follow a site's lockout procedures, and verify lockout was successful. Lock, Tag, Try!

LOTO is Required during servicing /maintenance activities, certain routine adjusting, cleaning or setup activities, or whenever an employee removes machine guarding, bypasses guards, interlock, or other safety device, places part of body in harm's way, or performs any major servicing or maintenance work.

LOTO Not Required for Normal Operations: Work done during normal operation that is a part of the machine's intended use is exempt from lockout-tagout. Servicing work done during normal operation is not exempt unless it falls under one of the following situations:

- ***Plug Systems***: Cord and plug equipment, where electrical energy is the only hazardous source and can be under the exclusive control of the employee is exempt. The electrical disconnect must be a plug located near enough to the equipment that it cannot be energized without the authorized employees knowledge.
- ***Hot Tap Work***: Hot tap operations may be exempt for lockout-tagout provided the employer can show that: Continuity of the system is essential to plant operations, shutdown of the system is impractical, and; other safety measures are used to provide additional protection to employee(s).
- ***Minor Servicing Activities***
  Minor servicing activities such as minor tool changes and adjustments, that take place during normal operating conditions, may be exempt from LOTO if: The work is routine, The task is repetitive, and the task is integral to the use and operation of the equipment.

De-Energization: Follow these steps as a general rule for Locking out Systems/Equipment

1. Notify all "affected employees" that the equipment will be shut down.
2. Shut down the equipment by normal stopping procedures.
3. "Isolate" all the equipment's energy sources.
4. Lock out and/or tagout the energy isolating devices with assigned, individual locks.
5. Release or restrain any *stored* energy by grounding, blocking, bleeding down, etc.
6. Assure that no personnel are exposed, and then *test* the equipment to assure that it will not operate.

Restoring Equipment Back to Service:

1. Check to assure that all employees have been safely positioned or removed from the area.
2. Verify that equipment controls are in neutral.
3. Remove lockout devices and/or tags and re-energize the machine or equipment.
4. Notify affected employees that servicing is complete and the equipment is ready for use.

Things to keep in mind: Parallel Systems Be aware of systems powered by two sources, the main and an emergency backup. Ensure both routes are shutdown and locked out to prevent unintended startup. Also, be careful of backfeeding in dual-systems. Locked-On: Critical systems, such as fire suppression and ventilation, are locked and tagged ON, to prevent people from shutting them down. Know the difference between locked-out and locked-on! When in doubt, lock it out!

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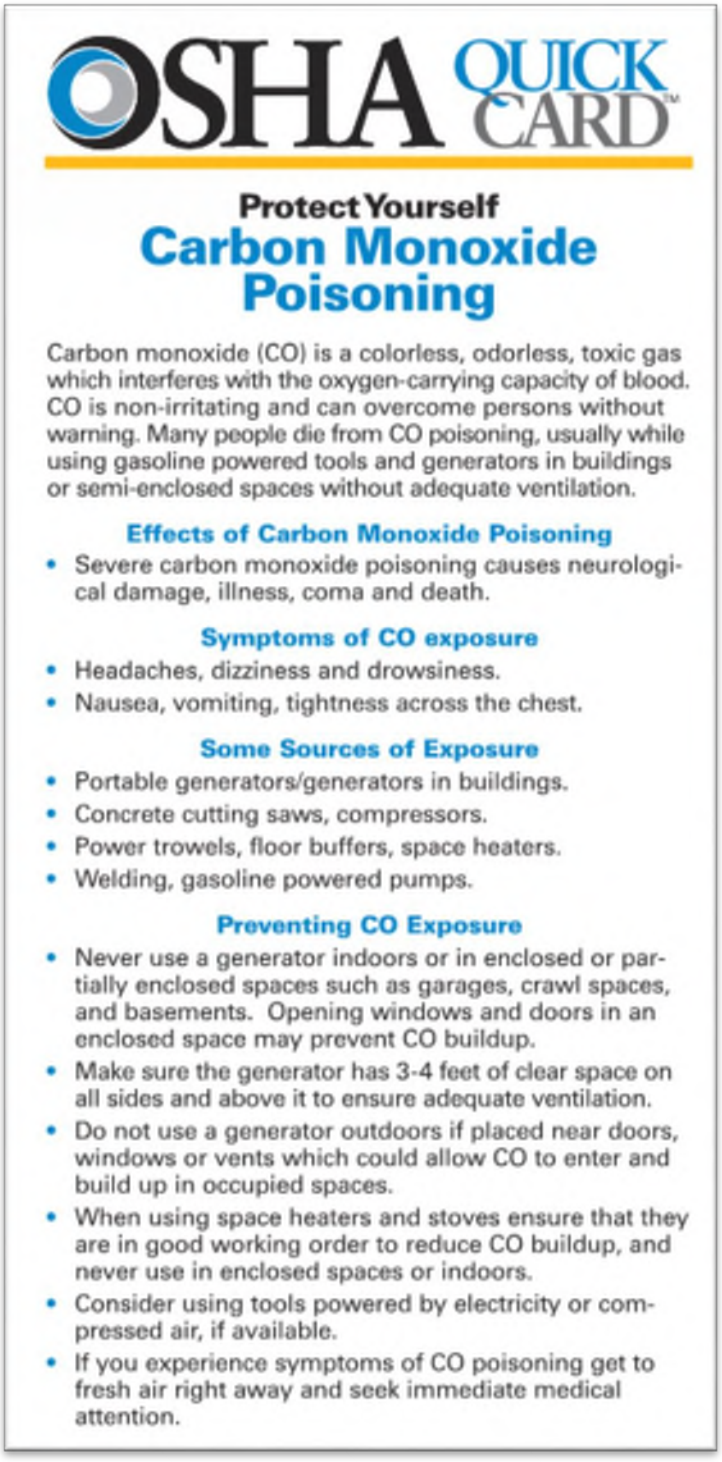
Holiday Safety

We know you're excited for the holiday, but stay focused on your tasks this week so you can go home safe each day and stuff yourself to the brim on Thursday!

- Stay focused on your job and plan ahead.
- Use the right tool for the job. Don't improvise or take short cuts.
- Fall hazards are still fall hazards, even if just for a minute. Protect yourself!
- Watch out for ergonomic risks. Stay hydrated, have stable footing, and don't lift objects greater than 50 lbs by yourself. You want to make sure you can enjoy your holiday.

At Home:

- Use GFCI extension cords to prevent electric shock, and don't overload your outlets. If a fuse trips at home, there's probably a reason, and you should re-think your setup! And remember, never assume the power is off unless you verify it.
- If you're using temporary heat or power, remember to have a fresh source of air to prevent carbon monoxide exposure, and ensure your CO monitor and fire detectors are working.
- Holiday Decorating? Use a sturdy ladder with stable footing. Flip the feet on extension ladders so they dig into the snow and soil. Maintain a safe distance from overhead power lines. Electricity can jump through the air to a conductive surface, like an aluminum ladder.
- Traveling for the holiday? Drive safe, drive sober. Bad weather? Take your time or have plan B.



OSHA QUICK CARD™

Protect Yourself

Carbon Monoxide Poisoning

Carbon monoxide (CO) is a colorless, odorless, toxic gas which interferes with the oxygen-carrying capacity of blood. CO is non-irritating and can overcome persons without warning. Many people die from CO poisoning, usually while using gasoline powered tools and generators in buildings or semi-enclosed spaces without adequate ventilation.

Effects of Carbon Monoxide Poisoning

- Severe carbon monoxide poisoning causes neurological damage, illness, coma and death.

Symptoms of CO exposure

- Headaches, dizziness and drowsiness.
- Nausea, vomiting, tightness across the chest.

Some Sources of Exposure

- Portable generators/generators in buildings.
- Concrete cutting saws, compressors.
- Power trowels, floor buffers, space heaters.
- Welding, gasoline powered pumps.

Preventing CO Exposure

- Never use a generator indoors or in enclosed or partially enclosed spaces such as garages, crawl spaces, and basements. Opening windows and doors in an enclosed space may prevent CO buildup.
- Make sure the generator has 3-4 feet of clear space on all sides and above it to ensure adequate ventilation.
- Do not use a generator outdoors if placed near doors, windows or vents which could allow CO to enter and build up in occupied spaces.
- When using space heaters and stoves ensure that they are in good working order to reduce CO buildup, and never use in enclosed spaces or indoors.
- Consider using tools powered by electricity or compressed air, if available.
- If you experience symptoms of CO poisoning get to fresh air right away and seek immediate medical attention.

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Electrical Safety

Never assume equipment is in good condition or safe to work on until you VERIFY! You never know what hazards are lurking inside!

Electrical Safety

1. Use electric power-operated tools shall be double insulated (box within a box icon) or grounded (3 prong plug in a grounded outlet). Ensure cords are of construction grade.
2. Use GFCI on jobsites and in wet areas. Always inspect GFCIs before use, and document tests regularly.
3. Inspect cords for damage before use. Do not run over wire/cords. Always protect against damage.
4. Always maintain a safe distance from overhead power lines (10 feet).
5. Do not use aluminum or conductive ladders around power lines or energized sources.
6. Always follow product manufacturer instructions. Do not splice into extension cords or temp lighting cords as this likely affects the UL rating and may pose risk for electric shock.
7. Ensure no live parts are exposed.
8. Never work on live parts above 50 Volts. Shut it down, lock it out. You must ensure you create an electrically safe work environment.
9. Trace the line back, and always test to verify there is no power feeding the system you're working on. Test phase-to-phase and phase-to-ground.
10. Working on equipment live is permitted when energization creates additional hazards or increased risk, or if it is infeasible to perform the task in an electrically safe work condition. Ensure you can do it safely and in accordance with NFPA 70E.
    1. Conduct an electrical hazard risk analysis and arc flash assessment.
    2. Determine the equipment and PPE necessary to protect you from severe injuries.
    3. Make a plan to perform work safely, and share the plan with all employees involved.
    4. Complete the live electrical work permit

Working on equipment live poses a risk of electric shock, arc flash/blast, equipment damage, life threatening injury, or death. Employees shall follow NFPA 70 E procedures to reduce the risk of severe injury.

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Electrical: ARC FLASH

Shock – happens where current passes through the human body. It can be fatal if current passes through heart lungs or brain. Always seek medical attention for shock, even if it seems minor. Heart failure can be delayed, and diagnostic tests must be completed.

Arc Flash – occurs when current passes through the air or ungrounded conductors and grounded conductors. Temperatures can reach 35,000 degree F (four times hotter than the sun) Arc Flash Burns can kill. Create an electrically safe work condition according to NFPA 70E, and utilize appropriate PPE for the hazard based on Incident Energy Level, Shock hazard and Arc Flash assessment to prevent fatal burns in the event of an arc flash.

Arc Blast – is a pressure wave associated with an arc flash caused by the rapid expansion of gasses and conducting material which causes projectile molten metals and shrapnel. High pressure blasts can exceed hundreds to thousands of PSI knocking workers off ladders, rupturing eardrums, and collapsing lungs. The sound can exceeding 160 dB and pieces of shrapnel can travel at 700 MPH. There is never enough time to jump out of the way of an arc flash/blast.

Protect yourself from electrical hazards:

1. **Plan the Task**- Conduct a risk assessment/hazard analysis to know the hazards and mitigation required to perform job task safely.
2. **Create a safe work condition –** Do not work on equipment greater than 50V live. De-energize, lockout/tagout, and verify de-energized by testing phase-to-phase and phase-to-ground**.**
    - **Energized work** will be permitted when energization *creates additional hazards* or an increased risk, or it is *infeasible* to perform task in electrically safe work condition. Energized work requires you to complete an energized electrical work permit. (Found on employee webpage).
        - *Example of Additional hazards or Increased Risk: interruption of life-support equipment, deactivation of emergency alarm systems, and shutdown of hazardous location ventilation equipment.*
        - *Example of Infeasibility: diagnostics and testing (startup or troubleshooting) of electrical circuits that can only be performed with the circuit energized and work on circuits that form an integral part of a continuous process that would otherwise need to be completely shut down in order to permit work on one circuit or piece of equipment.*
3. **Training–** Qualified employees must maintain certifications and licensure to ensure they understand the hazards, risks, and mitigation methods to perform work safely and in accordance with regulatory requirements. NAC provides general electrical safety training and refresher training for identification and anticipation of electrical hazards, including arc flash/blast and shock. If further information or training is needed, contact NAC Safety.
4. **Select & use PPE** (last line of defense)– Select PPE based on Shock and Arc Flash hazard analysis. It is the qualified worker's responsibility to determine and wear appropriate electrical PPE as according to NFPA 70E. Non-conductive clothing/accessories should be worn, and Fire Resistant clothing, or natural materials that do not melt, shall be worn beneath arc flash suits. NAC will provide arc flash suits and shock resistant rubber gloves and protectors.

PPE CATEGORY 1

Minimum Arc Rating of
4 cal/cm²

Arc Rated Clothing:

- AR long-sleeve shirt and pants, or AR coverall
- AR face shield, or AR flash suit hood
- AR jacket, parka, rainwear, or hard hat liner (as needed)

Protective Equipment:

- Hard hat
- Safety glasses or safety goggles
- Hearing protection (with inserts)
- Heavy-duty leather gloves
- Leather footwear (as needed)

PPE CATEGORY 2

Minimum Arc Rating of
8 cal/cm²

Arc Rated Clothing:

- AR long-sleeve shirt and pants, or AR coverall
- AR flash suit hood, or AR face shield and AR balaclava
- AR jacket, parka, rainwear, or hard hat liner (as needed)

Protective Equipment:

- Hard hat
- Safety glasses or safety goggles
- Hearing protection (with inserts)
- Heavy-duty leather gloves
- Leather footwear

PPE CATEGORY 3

Minimum Arc Rating of
25 cal/cm²

Arc Rated Clothing:

- As required: AR long-sleeve shirt, AR pants, AR coverall, AR flash suit jacket, and/or AR flash suit pants
- AR flash suit hood
- AR gloves
- AR jacket, parka, rainwear, or hard hat liner (as needed)

Protective Equipment:

- Hard hat
- Safety glasses or safety goggles
- Hearing protection (with inserts)
- Leather footwear (as needed)

PPE CATEGORY 4

Minimum Arc Rating of
40 cal/cm²

Arc Rated Clothing:

- As required: AR long-sleeve shirt, AR pants, AR coverall, AR flash suit jacket, and/or AR flash suit pants
- AR flash suit hood
- AR gloves
- AR jacket, parka, rainwear, or hard hat liner (as needed)

Protective Equipment:

- Hard hat
- Safety glasses or safety goggles
- Hearing protection (with inserts)
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LOCKOUT/ TAGOUT

Why do we have to Lockout/Tagout?

- To prevent the release of hazardous energy that can seriously injure or kill an employee.
- To ensure other people are aware of what is going on, and recognize the hazards. Tagout provides the information that a person should not turn on or energize the machine
- To ensure people cannot physically energize a machine, accidentally or intentionally. Lockout physically prevents the ability to energization.

When do we have to Lockout/Tagout?

Place locks and tags on energy shutoffs during servicing /maintenance activities, certain routine adjusting, cleaning or setup activities, or whenever an employee removes or bypasses guards, interlocks or safety devices that puts them in harm's way.

When is LOTO Not Required?

- **Single Source Shutoff with Exclusive Control** and within eyesight of employee. Verify effective isolation. If other employees are working in the area, exclusive control may not be possible.
- ***Plug Systems***: Cord and plug equipment, where electrical energy is the single hazardous source and is under exclusive control of the employee.
- ***Hot Tap Work***: Hot tap operations may be exempt if the employer can show that: Continuity of the system is essential to plant operations, shutdown of the system is impractical or creates additional hazards. Other safety measures must be used to provide additional protection.
- ***Minor Servicing Activities***
  Minor servicing activities such as minor tool changes and adjustments, that take place during normal operating conditions, may be exempt from LOTO if: The work is routine, The task is repetitive, and the task is integral to the use and operation of the equipment.

What can go wrong with Lockout/Tagout?

1. **Control methods not being tested and verified.** Secondary sources such as pneumatic, hydraulic or spring loaded must also be controlled. Releasing energy or blocking with special devices may be necessary.
2. **Procedures not being followed.** You should always review the lockout procedure provided by the client/owner to ensure you have identified all energy sources. Don't forget to still verify.
3. **Human factors.** Fatigue, complacency, rushing to finish the job, and making assumptions can all contribute to serious incidents. Failure to clear work areas before restarting can pose a serious risk of injury. Removing someone else's lock assuming they are done can seriously injure or kill. Ensuring good communication and taking the time needed to verify safe will go a long way to prevent incidents.

Remember: Lock, Tag, Try. Your life depends on it!

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Line Breaking

Line break procedures are used to protect employees from injury caused by unexpected release of hazardous materials while opening or disconnecting a system of piping, process piping, or equipment that cannot be verified clear and/or depressurized.

Prepare for Line Breaking:

Pre-task plan: Before you start any work, develop a plan and communicate it with all workers, facilities, and any subcontractors influenced by the line break. Ensure isolation will be effective, and known shutoffs and lockout/tagout locations are identified.

Post warning signs, setup limited access to demolition areas, and get all necessary permits from the host client such as lockout/tagout, hotwork, fire watch and confined space permits, etc.

Set up work area such as tools, materials, and equipment to ensure that the task can be carried out in an efficient and timely manner. Including but not limited to mechanical caps, pumps, fire extinguishers etc.

Procedure:

1. Trace the line and verify successful lockout/tagout and shutoff.
2. Setup the work area with drop cloths, poly, buckets/hoses, etc. to contain fluids. Wear PPE to protect against exposure during riskier tasks.
3. Release pressure from the line and drain, ensuring effective containment.
4. Clean flush may be required. If hazardous contents are present, ensure host client is involved to flush and verify as needed according to their process safety management procedures.
5. Remove required sections in manageable pieces and utilize material handling aids to prevent falling objects, injuries, and muscle strains.
6. Remove pieces from the area, ensuring to contain fluids and prevent drips and runoff.
7. Perform work to close the system. Repair, seal, cap, or close as needed.
8. Once work is completed, inspect again to ensure no leaks. Perform any pressure tests or other required tests to verify system integrity. Walk the line to verify no leaks, and initial or tag as you go along to show you inspected and found no leaks. If leaks detected, repair and re-test until successful.
9. Close any open permits, notify facilities that work is complete. Remove tools and materials
10. Reenergize the system by removing locks and tags, and opening valves.

Sanitary Work:

Anyone working with sanitary systems or in hospitals should ensure they are up to date on their vaccines. The CDC and Trade Unions recommend Hep A, Hep B, and Tetanus. Talk to your doctor for more information.

When working on sanitary systems in large facilities, you may not be able to guarantee shutdown of the drain system as people may not follow restrictions. Take additional precautions to protect against exposure.

1. Shut down the water supply to the building whenever possible and use lockout/tagout.
2. Ensure all tenants are aware of restrictions.
3. Wear PPE and develop a plan to ensure workers are not at risk of exposure.
4. Setup an open drainage system with diversion upstream from work area to reduce risk of exposure from unintended pressure buildup of contents. Any blocking devices must be strong enough to hold pressure of potential contents, and allow for safe, effective drainage.

Weekly Pre-Task Plan + Toolbox Talk Sign-in

Identify tasks relating to the safety training onsite, or experienced in the past.

Task Describe upcoming tasks	**Hazards Identified** Describe task hazards	**Control Methods** How will you monitor and control hazards?

Other Hazards to Monitor					
☐	Slips, Trips	☐	Grinding – guards/face shields	☐	Lockout/Tagout or Linebreak
☐	Falls over 6' + Holes	☐	Cuts, Abrasions, Pinches	☐	Electric Shock/Live Utilities
☐	Falls from Ladder / Elevated Work/ Lifts	☐	Heavy Equipment / Crush hazards	☐	Extreme weather + exit plans
☐	Fall Harness – trained to use?	☐	Sprains/Strains/ Overexertion	☐	Fires / chemical storage
☐	Falling Objects/ Overhead Work	☐	Crane Lifts	☐	
☐	**Hot Work: PERMIT**	☐	**Confined Space: PERMIT**	☐	**Trenches/Excavations**
☐	Flammables, Fire extinguishers, Cylinders up + secure, Ventilation	☐	Air Monitoring, Ventilation, Rescue Plan, Attendant, Entrant, Hazards, eliminated	☐	Competent person inspect daily. Ladder-4', Slope 5'

Inspections-check if required		**Inspected by:**
Lifts, Hoists, Heavy Equip.	☐	
Ladders/ Scaffolds	☐	
Trenches	☐	
Tools + Equipment	☐	
Fall protection equip.	☐	
Guardrails/barricades/holes	☐	

Additional Notes/reminders:

Employee Name	**Signature**	**Employee Name**	**Signature**

Additional Toolbox Talks

Gas Can Safety – Flammable Liquids

Don't use plastic gas cans, use the metal ones that meet DOT standards.
OSHA Standard 29 CFR 1926.152(a)(1) states "Only approved containers and portable tanks shall be used for storage and handling of flammable and combustible liquids. Approved safety cans or Department of Transportation approved containers shall be used for the handling and use of flammable liquids in quantities of 5 gallons or less.

A safety can is (29CFR1926.155(1) an approved, closed container, of not more than 5 gallons capacity, having a flash arresting screen, spring closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.
Approval is given by a nationally recognized testing laboratory, for example, Underwriters' Laboratory, Inc.

Fire Risk
Several vehicle fires have occurred as a result of filling metal portable gasoline cans while placed on the back of pickup trucks with plastic bed liners. The insulating effect of the plastic surface prevents the static charge generated by the gasoline flowing into the gas can from grounding. As static charge builds, it can create a static spark between the gas can and the fuel nozzle. When the spark occurs in the flammable range in the gasoline vapor space near the open mouth of the gas can, a fire can occur. Some tips:

1. Do not fill any container while it is inside a vehicle, a vehicles trunk, pickup bed, or on any surface other than the ground.
2. Use only an approved container with a cap that fits tightly.
3. Remove the approved container from the vehicle and place it on the ground. Keep container a safe distance away from the vehicle, other customers, and traffic.
4. Keep the nozzle in contact with the can during filling.
5. Fill container about 95% full to allow for expansion.
6. If gasoline spills on the container, make sure it is evaporated before putting it in your vehicle.

Equipment Refueling

- Shut off motor on equipment and give motor rime to cool off before refueling.
- Don't refuel near an open flame or near a sparking situation. No Smoking!
- Keep a fire extinguisher nearby.
- Don't spill the fuel.
- Don't overfill the fuel tank. On hot days, allow for expansion.
- Stay safe. Only use approved gas cans.

Storage

- Don't store in areas used for exits, stairways or safe passage of people.
- Store in well ventilated areas. Don't store in trunks or enclosed areas.
- Avoid storing on high shelves or near windows.
- More than 25 gallons of flammable liquids must be stored in an acceptable cabinet [metal or wood, see 1926.152(b)(2)(i)].
- Always make sure your container has a legible label.

Color Coding (EPA rule):

- Red containers are intended for gasoline and other highly flammable liquids.
- Blue containers are used for storing kerosene.
- Yellow containers are used for diesel fuel.
- Green containers typically are designed for storing oil

Weekly Pre-Task Plan + Toolbox Talk Sign-in

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Inspections-check if required		**Inspected by:**
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Ladders/ Scaffolds	☐	
Trenches	☐	
Tools + Equipment	☐	
Fall protection equip.	☐	
Guardrails/barricades/holes	☐	

Additional Notes/reminders:

Employee Name	**Signature**	**Employee Name**	**Signature**

Manbaskets - Training

Toolbox Talk

Using Manbaskets:

- Employees must be trained. Review procedures and the pick plan with those in manbasket, on the ground, and crane operator, etc.
- Discuss what to do in case of an emergency, and where to go.
- 100% tie-off required.
- Inspect equipment and tie-off to designated tie-off points.
- Secure tools (tool tethers) to prevent dropping objects.
- Spread tools/materials uniformly for even weight distribution in the basket.
- Communicate with crane operator.
- Barricade the area to keep people out of the swing radius and other hazardous areas.
- Read the label to view load restrictions, and never exceed load capacity.
- Certified crane operator runs crane, and prior to use, performs test lift of basket to location, and with anticipated load.

Man Baskets must:

- Be designed by a certified engineer and meet OSHA/ASME standards.
- Be capable of supporting their own weight, plus 5x the intended load.
- Have doors open towards the inside.
- Have solid/mesh on the guardrails to prevent falls and falling objects.
- Rigged so bridles are evenly positioned with hooks that close and lock.
- Support lines must support at least 7x the intended load.

If you see something unsafe, say something!

Communication:

Communication is essential!

Maintain constant communication using walkie talkies so everyone can hear what is going on, and can communicate risks immediately.

Date: _____

NAMES:

1._____
2._____
3._____
4._____
5._____
6._____
7._____
8._____
9._____
10._____
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13._____
15._____

Weekly Pre-Task Plan + Toolbox Talk Sign-in

Identify tasks relating to the safety training onsite, or experienced in the past.

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Inspections-check if required		**Inspected by:**
Lifts, Hoists, Heavy Equip.	☐	
Ladders/ Scaffolds	☐	
Trenches	☐	
Tools + Equipment	☐	
Fall protection equip.	☐	
Guardrails/barricades/holes	☐	

Additional Notes/reminders:

Employee Name	**Signature**	**Employee Name**	**Signature**

Rough Terrain Forklift

Rough terrain forklifts require the right operators to handle them or it can lead to serious accidents. The workhorses are designed to handle heavy loads and operate on challenging terrain. Most rough terrain forklift accidents are caused by operator error. The right training procedures can help your employees understand how to carefully operate the equipment to prevent serious accidents.

Three most common accidents on rough terrain:

- Rollovers
- Tipovers
- Collisions

Accident Causes:

- Slopes
- Dips, holes, and trenches
- Narrow aisles
- Ground and overhead obstructions

Discuss Hazards Beforehand

One of the most important things to do is hold a training session with your employees before they drive on the rough terrain. Discuss the hazards so they know what can occur if they do not practice the right safety habits when driving their forklifts. While the vehicles do move slowly, you can end up with serious problems if you do not load them correctly, and you can end up driving too quickly with the load.

1. Poor Visibility/ Obstructed View

It is important to keep the windows clean and to make sure people can see when they are driving the forklift. Do they need to wear glasses? Vision testing can help to ensure you have people who can see when they drive the forklift. Not having a clear line of sight when driving can easily cause an accident.

2. Failure to Pay Attention

How often do you find yourself dozing off when you are working? Employees often end up failing to pay attention when they work long hours, or they do the same job several times. A routine can end up causing people to get careless on their job, which can lead to wrecks. Inattention while driving is something that you need to address as it does cost the company thousands of dollars if an accident occurs.

3. Failure to Yield to Other Vehicles

Some wrecks occur when people fail to yield to other vehicles. If you hit something with a rough terrain forklift, it can end up causing major damages to the forklift and the other vehicle, not to mention the drivers. Not only do drivers need to yield to other vehicles, they need to be aware of the pedestrians who cross their paths.

4. Overloading

If your forklift is overloaded, it can cause it to tip to the side when you turn or when you are near a steep edge. Overloading the machine can be hazardous when you are trying to drive the machine forward as it is easy for the machine to be pushed to the side.

5. Misjudging Terrain

People often drive the machine on rough terrain and assume the forklift will be able to handle anything. While the machine is designed to work on rough terrain, it isn't always set to work on all types of terrain. Misjudging terrain is something that can end up leading to serious accidents.

6. Failure to Inspect the Forklift

If a forklift is not inspected and serviced properly, it could end up with major problems. It is important to have the machine correctly maintained and inspected to provide you with adequate results.

7. Improper Loading or Unloading

Another major reason why accidents occur is due to improper loading and unloading of the forklift. A rough terrain forklift is set up to deal with a number of weights and loads, but the operator is the key source who focuses on keeping everyone safe and the machine safe.

Weekly Pre-Task Plan + Toolbox Talk Sign-in

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Ladders/ Scaffolds	☐	
Trenches	☐	
Tools + Equipment	☐	
Fall protection equip.	☐	
Guardrails/barricades/holes	☐	

Additional Notes/reminders:

Employee Name	**Signature**	**Employee Name**	**Signature**

OSHA® FactSheet

Tube and Coupler Scaffolds — Planning and Design

Workers building scaffolds risk serious injury from falls and tip-overs, being struck by falling tools and other hazards, and electrocution from energized power lines. Before starting any scaffold project, the employer should conduct a hazard assessment to ensure the safety of workers.

A tube and coupler scaffold has a platform(s) supported by tubing, and is erected with coupling devices connecting uprights, braces, bearers, and runners (see Fig. 1). Due to their strength, these scaffolds are frequently used where heavy loads need to be carried, or where multiple platforms must reach several stories high. These scaffolds can be assembled in multiple directions, making them the preferred option for work surfaces with irregular dimensions and/or contours.

Scaffold Planning

Review blueprints, work orders, the project schedule and other written requirements to determine where these scaffolds should be used. Next, select the right size scaffold for each job. Scaffolds are generally rated as light, medium or heavy duty. Light-duty scaffolds can support a limited number of workers and hand tools (25 lbs. per sq. ft.). Medium-duty scaffolds must be able to safely hold workers, hand tools, and the construction materials being installed (50 lbs. per sq. ft.). Heavy-duty scaffolds must support workers, tools and the weight of stored materials (75 lbs. per sq. ft.).

The following factors should be considered in the planning phase:

- The shape and structure of the building to be scaffolded.
- Distinctive site conditions and any special features of the building structure in relation to the scaffold (i.e., overhead electric power lines or storage tanks). Also consider the proximity and condition of surrounding buildings.
- Weather and environmental conditions.
- Fall protection requirements for workers using scaffolds, such as guardrail systems or personal fall arrest systems.

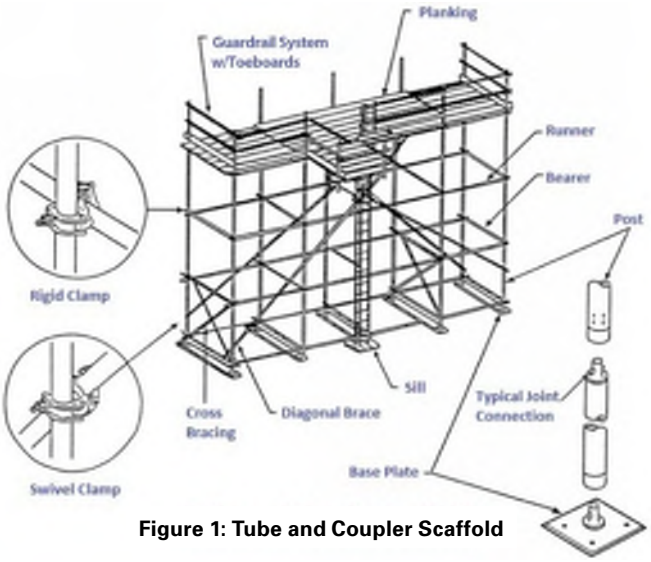

Figure 1: Tube and Coupler Scaffold

- The type and amount of scaffold equipment needed to access all areas to be worked on.
- Proper storage and transporting of scaffolding components, materials and equipment.
- The manner in which workers will access the scaffold (i.e., via ladders, stair rail systems, etc.).

Design

Scaffolds must be designed by a qualified person. Tube and coupler scaffolds over 125 feet (38 m) in height must be designed by a registered professional engineer. Tube and coupler scaffold design must comply with 29 CFR §§ 1926.451–.452. The scaffold design must include:

- Proper materials to construct the scaffold.
- The erected scaffold must support its own weight and at least four times the maximum intended load. To accomplish this, the scaffold design must incorporate a realistic assessment of maximum intended loads on the scaffold at all stages of erection and loading. For example, if wrapped with mesh,

will the scaffold support expected wind loads? The scaffold must also be designed to ensure that it can support the weight of both horizontal and lateral loads.
- Construction and loading must comply with engineered designs and manufacturers' requirements.
- Guardrails and toeboards.
- The amount of time needed to erect and dismantle the scaffold.

For more information on scaffolding, see OSHA's Safety and Health Topics page at www.osha.gov/SLTC/scaffolding.

Contact OSHA

For more information, to report an emergency, fatality or catastrophe, to order publications, to file a confidential complaint, or to request OSHA's free on-site consultation service, contact your nearest OSHA office, visit www.osha.gov, or call OSHA at 1-800-321-OSHA (6742), TTY 1-877-889-5627.

Worker Rights

Workers have the right to:

- Working conditions that do not pose a risk of serious harm.
- Receive information and training (in a language and vocabulary the worker understands) about workplace hazards, methods to prevent them, and the OSHA standards that apply to their workplace.
- Review records of work-related injuries and illnesses.
- File a complaint asking OSHA to inspect their workplace if they believe there is a serious hazard or that their employer is not following OSHA's rules. OSHA will keep all identities confidential.
- Exercise their rights under the law without retaliation, including reporting an injury or raising health and safety concerns with their employer or OSHA. If a worker has been retaliated against for using their rights, they must file a complaint with OSHA as soon as possible, but no later than 30 days.

For more information, see OSHA's Workers page.

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OSHA® FactSheet

Tube and Coupler Scaffolds — Erection and Use

Workers building scaffolds risk serious injury from falls and tip-overs, being struck by falling tools and other hazards, and electrocution from energized power lines. Before starting any scaffold project, the employer should conduct a hazard assessment to ensure the safety of workers.

A tube and coupler scaffold has a platform(s) supported by tubing, and is erected with coupling devices connecting uprights, braces, bearers, and runners (see Fig. 1). Due to their strength, these scaffolds are frequently used where heavy loads need to be carried, or where multiple platforms must reach several stories high. These scaffolds can be assembled in multiple directions, making them the preferred option for work surfaces with irregular dimensions and/or contours.

When Erecting a Scaffold

- Use footings that are level, sound, rigid and capable of supporting the load without settlement or displacement.
- Plumb and brace poles, legs, posts, frames, and uprights to prevent swaying and displacement.
- Position the first level of bracing as close to the base as possible.
- Plumb and level the scaffold as it is being erected.
- Fasten all couplers and/or connections securely before assembling the next level.
- Install guys, ties, and braces according to the manufacturer's recommendations.
- Do not intermix scaffold components from different manufacturers, unless you can do so while maintaining the scaffold's structural integrity.
- When platform units are abutted together to create a long platform, each abutted end must rest on a separate support surface.
- Once erected, provide toeboards on all railed sides to prevent falling object hazards.

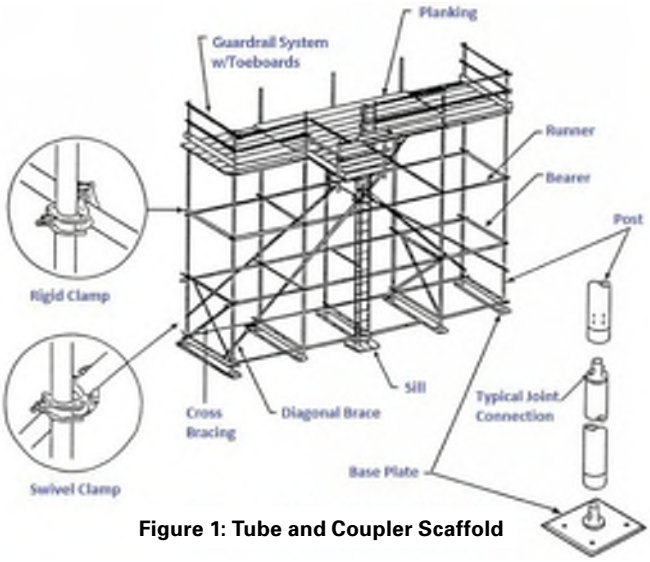

Figure 1: Tube and Coupler Scaffold

When Using a Scaffold

- Make sure that a competent person inspects the scaffold before each work shift.
- If during the inspection a defect or damage to the scaffold is discovered, the scaffold must be tagged out and not used until repairs are made. Attach tags at the access point to the scaffold.

One common tagging system uses the following tags:

Red tag indicates: unsafe, do not use.
Green tag indicates: ready to use.

- Use scaffolds according to the manufacturer's instructions.
- Never load a scaffold beyond its maximum intended load or rated capacity.
- Do not use makeshift methods to increase the working height of the scaffold platform, such as with ladders, buckets or blocks.

- Employees must not work on platforms covered with snow, ice, or other slippery material.
- The employer must provide suitable access to and between scaffolds, such as portable ladders, hook-on ladders, attachable ladders and stairway-type ladders.

When Dismantling a Scaffold

Check to ensure that the scaffold has not been structurally altered in a way which would make it unsafe. Before beginning dismantling procedures, reconstruct and/or stabilize the scaffold as necessary.

Training Workers

Only trained and authorized persons should be allowed to use a scaffold. This training must be provided by a qualified person who understands the hazards associated with the type of scaffold being used and who knows the procedures to control or minimize those hazards. Training must include how to safely:

- Use the scaffold, handle materials on the scaffold and determine the maximum load limits when handling materials.
- Recognize and avoid scaffolding hazards such as electric shock, falls from heights, and being hit by falling objects.
- Erect, maintain and disassemble fall and falling object protection systems.

Erectors and dismantlers of tube and coupler scaffolds are at particular risk because their work starts before ladders, guardrails and platforms are completely installed. These workers must also be trained to:

- Recognize scaffold hazards.
- Properly erect, move, operate, repair, inspect, maintain and disassemble the scaffold;
- Identify the maximum load-carrying capacity and intended use of the scaffold.

Employers should train workers on the following safety factors:

- The shape and structure of the building to be scaffolded.
- Distinctive site conditions and any special features of the building structure in relation to the scaffold (i.e., overhead electric power lines or storage tanks). Also consider the proximity and condition of surrounding buildings.
- Weather and environmental conditions.
- Fall protection requirements for workers using scaffolds, such as guardrail systems or personal fall arrest systems.
- The type and amount of scaffold equipment needed to access all areas to be worked on.
- Proper storage and transporting of scaffolding components, materials and equipment.
- How to access the scaffold, (i.e., via ladders, stair rail systems, etc.).

Workers building scaffolds risk serious injury from falls and tip-overs, being struck by falling tools and other hazards, and electrocution from energized power lines.

To avoid scaffold hazards, employers must:

- Ensure that a competent person supervises and directs workers erecting, moving, dismantling, or altering a scaffold.
- Provide a safe means of access for each worker erecting or dismantling the scaffold. As early as possible, install hook-on or attachable ladders.
- Ensure that workers do not climb diagonal braces to reach the scaffold platform.
- Provide fall protection for workers erecting or dismantling the scaffold.
- Secure scaffolds to the structure during erection and dismantling.

For more information on scaffolding, see OSHA's Safety and Health Topics page at www.osha.gov/SLTC/scaffolding.

Contact OSHA

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Worker Rights

Workers have the right to:

- Working conditions that do not pose a risk of serious harm.
- Receive information and training (in a language and vocabulary the worker understands) about workplace hazards, methods to prevent them, and the OSHA standards that apply to their workplace.
- Review records of work-related injuries and illnesses.
- File a complaint asking OSHA to inspect their workplace if they believe there is a serious hazard or that their employer is not following OSHA's rules. OSHA will keep all identities confidential.
- Exercise their rights under the law without retaliation, including reporting an injury or raising health and safety concerns with their employer or OSHA. If a worker has been retaliated against for using their rights, they must file a complaint with OSHA as soon as possible, but no later than 30 days.

For more information, see OSHA's Workers page.

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: 1-877-889-5627.

For assistance, contact us. We can help. It's confidential.

OSHA® Occupational Safety and Health Administration

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

U.S. Department of Labor

DOC FS-3759 11/2014

OSHA® FactSheet

Narrow Frame Scaffolds

Narrow frame scaffolds, also known as Baker/Perry style scaffolds, are among the most popular pieces of construction equipment. Due to their versatility many contractors use them instead of ladders because they allow workers to maintain their balance and work more easily from the platform.

What is a narrow frame scaffold?

A narrow frame scaffold has wheels and is often used as a mobile scaffold with the end frame measuring 3 feet or less in width. (See Fig. 1.) Designed to be easily moved, they are used for operations such as painting, drywall installation, plastering, and other jobs where workers must frequently change position. Scaffolds can be adapted to stairs, ramps, and other uneven surfaces.

In some instances scaffolds may be a better and safer choice than ladders.

Minimizing hazards

Some of the hazards associated with narrow frame scaffolds, ***can*** *lead to personal injury or death; they include*:

- Falls from an elevated level
- Tip-overs
- Electric shocks
- Structural failures (collapse)

Training workers in scaffold safety

Under the *Occupational Safety and Health Act* employers are responsible for providing a safe workplace.

All training must be conducted in a manner and language which the worker is able to understand.

- Only trained and authorized persons should be allowed to use a scaffold. This training must be provided by a qualified person who recognizes the hazards associated with the type of scaffold being used and who understands the procedures to control or minimize those hazards. Training must include how to safely:
  - Use the scaffold and determine the maximum load limits when handling materials.
  - Recognize and avoid scaffolding hazards such as electric shock, falls from heights, and being hit by falling objects.
  - Erect, inspect, move, operate, maintain, and repair scaffolds.

Figure 1

For more information on scaffolding, see OSHA's Safety and Health Topics page at www.osha.gov/SLTC/scaffolding.

Scaffold Safety

Employers must ensure the following:

- Follow the manufacturer's allowable load for the casters, scaffold components and platforms, along with recommended bracing to ensure a rigid and structurally sound scaffold.
- Assess the work area, site conditions, and work to be performed.
- Conduct a pre-operation inspection to verify that all scaffold components are functioning properly and/or are correctly assembled.
- Keep the platform free from tripping hazards such as hand tools, equipment, or materials.
- Lock scaffold wheels with positive wheel and/or wheel and swivel locks to prevent movement while in use.
- Use guardrails which include top rails, mid-rails, and toe boards, or fall protection at working platform heights of 10 feet or higher.
- Stay at least 10 feet away from energized power lines.
- If outriggers are installed, deploy installed outriggers on both sides of the scaffold. All locking pins must be engaged before using the scaffold.

Employers must ensure that workers have been effectively trained in the following:

- Not to stand on the guardrail or use any components of the scaffold or other items (e.g., stepladders, buckets, boxes, barrels, etc.) inside the scaffold to gain additional standing height.
- Not to try to pull yourself from one location to another while standing on the platform.
- Not to use a scaffold if it is incomplete, broken or has missing or ill-fitting parts which need replacement. Contact your employer immediately.
- Not to move the scaffold with worker(s) on the scaffold when:
  - The worker(s) on the scaffold is unaware of the move and/or the surface under the scaffold is not within 3 degrees of level and free of pits, holes or obstructions.
  - The worker is on any part of the scaffold which extends outward beyond the wheels, casters, or other supports.
  - Manual force is not being applied as close to the base as practicable. Manual force must be applied not more than 5 feet above the supporting surface (1926.452(w)(3)).
  - The height to base width ratio of the scaffold during movement is greater than 2 to 1, unless the scaffold is designed and constructed to meet or exceed nationally recognized stability test requirements (such as ANSI/SIA A92.5 and A92.6) (1926.452(w)(6)(ii)).

Retraining

Employers must retrain employees when inadequacies are observed, changes in worksite conditions occur or when it is believed that an employee lacks the skill or understanding needed for safe work involving the erection, use or dismantling of the scaffold.

This is one in a series of informational fact sheets highlighting OSHA programs, policies or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to Title 29 of the Code of Federal Regulations. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

For assistance, contact us. We can help. It's confidential.

OSHA® Occupational Safety and Health Administration

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

U.S. Department of Labor

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Weekly Pre-Task Plan + Toolbox Talk Sign-in

Identify tasks relating to the safety training onsite, or experienced in the past.

Task Describe upcoming tasks	**Hazards Identified** Describe task hazards	**Control Methods** How will you monitor and control hazards?

Other Hazards to Monitor					
☐	Slips, Trips	☐	Grinding – guards/face shields	☐	Lockout/Tagout or Linebreak
☐	Falls over 6' + Holes	☐	Cuts, Abrasions, Pinches	☐	Electric Shock/Live Utilities
☐	Falls from Ladder / Elevated Work/ Lifts	☐	Heavy Equipment / Crush hazards	☐	Extreme weather + exit plans
☐	Fall Harness – trained to use?	☐	Sprains/Strains/ Overexertion	☐	Fires / chemical storage
☐	Falling Objects/ Overhead Work	☐	Crane Lifts	☐	
☐	**Hot Work: PERMIT**	☐	**Confined Space: PERMIT**	☐	**Trenches/Excavations**
☐	Flammables, Fire extinguishers, Cylinders up + secure, Ventilation	☐	Air Monitoring, Ventilation, Rescue Plan, Attendant, Entrant, Hazards, eliminated	☐	Competent person inspect daily. Ladder-4', Slope 5'

Inspections-check if required		**Inspected by:**
Lifts, Hoists, Heavy Equip.	☐	
Ladders/ Scaffolds	☐	
Trenches	☐	
Tools + Equipment	☐	
Fall protection equip.	☐	
Guardrails/barricades/holes	☐	

Additional Notes/reminders:

Employee Name	**Signature**	**Employee Name**	**Signature**