

The Minnesota Electrical Association, Inc.

The Voice of Electrical Contractors
www.electricalassociation.com

Electrical Toolbox Talks

The MEA Safety Committee is pleased to present you with your set of *Electrical Toolbox Talks*. This collection of safety topics is a collaborative effort between *MEA's Safety Committee, Federated Insurance Associated Risk Management Services Team, and Minnesota OSHA Consultation*. This is a series of short, concise, industry specific topics. We are including a sign-in form for OSHA documentation; please make copies of this sheet as needed. These talks may be used as topics for your short safety meetings, as a salary stuffer for your employees, or as a handout at your safety meetings.

Your new Electrical Toolbox Talks topics are enclosed:

- Aerial Lifts
- Arc Blasts
- Asbestos
- Back Safety
- Bloodborne Pathogen Safety
- Boom Trucks
- Carbon Monoxide
- Cold Stress
- Competent vs. Qualified Person
- Compressed Gas Safety
- Confined Space Safety
- Construction Sites
- Controlling Electrical Hazards
- Core Drilling
- Crystalline Silica
- Driving Safety
- Emergency Preparedness
- Excavations
- Extension Cords
- Eye and Face Safety
- Fall Protection
- Fatigue
- Fire Extinguisher Safety
- Foot Protection
- Fork Lift Drivers
- Guardrail Requirements
- Hand Safety
- Head Protection
- Hearing Safety
- Heat Stress
- High-Visibility Vests
- Injuries & Emergency Situations
- Ladder Safety
- Liquefied Petroleum Gas
- Lockout/Tagout
- Power Tools & Equipment Safety
- PPE Assessment
- PPE for Respirators
- Safe Lifting & Material Handling
- Safety Data Sheets
- Scaffolding Safety
- Security Safety
- Temporary Heating
- Temporary Lighting
- Temporary Wiring Panels
- Trips, Slips, and Falls
- Winter Driving

Acknowledgements: MEA Safety Committee Members, including our MN OSHA Consultation team members Andy Smoka and Tim Brown, and our Federated Insurance team members Jeff Stevenson and Pat Swetala.

Send your suggestions: Please send your suggestions and ideas for topics to mea@electricalassociation.com.

MEA – Working Together to Make the Industry Safer and Stronger!

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Director of Education

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Minnesota Electrical Association Electrical Toolbox Talks

Sign-In Form

Date _____ **Topic** _____

Conducted/Presented by _____

Notes or additional safety topics discussed:

Employee name (written legibly)

Job Title

1. _____
2. _____
3. _____
4. _____
5. _____
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19. _____
20. _____

Safety Director Signature: _____

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Aerial Lifts

Aerial Lifts include the following types of equipment

- Extendable boom platforms
- Aerial ladders
- Articulating boom platforms
- Vertical towers
- Combination of any such devices

Hazards Associated with Aerial Lifts

- Fall from elevated level
- Objects falling from lifts
- Tip-Overs
- Ejections from lift platform
- Structural failures (collapses)
- Electric shock (electrocutions)
- Entanglement hazards
- Contact with objects
- Contact with ceilings and other overhead objects



Training

Only trained and authorized persons are allowed to operate an aerial lift. Training should include all of the following:

- Explanations of electrical, fall, and falling object hazards
- Procedures for dealing with hazards
- Recognizing and avoiding unsafe conditions in the work setting
- Instructions for correct operation of the lift (include maximum intended load and load capacity)
- Demonstrations of the skills and knowledge needed to operate an aerial lift before operating it on the job
- When and how to perform inspections
- Manufacturer's requirements

What to do Before Operating an Aerial Lift

Pre-Start Inspection

Prior to each work shift, conduct a pre-start inspection to verify that the equipment and all its components are in safe operating condition. Follow the manufacturer's recommendations and include a check of:

Vehicle components

- Proper fluid levels (oil, hydraulic, fuel, and coolant)
- Leaks of fluids
- Wheels and tires
- Battery and charger
- Lower-level controls
- Horn, gauges, lights and backup alarms
- Steering and brakes

Lift Components

- Operating and emergency controls
- Personal protective devices
- Hydraulic, air, pneumatic, fuel and electrical systems
- Fiberglass and other insulating components
- Missing or unreadable placards, warnings, or operational, instructional, and control markings
- Mechanical fasteners and locking pins
- Cable and wiring harnesses
- Outriggers, stabilizers, and other structures
- Loose or missing parts
- Guardrail systems

Do not operate any aerial lift if any of these components are defective until it is repaired by a qualified person. Remove defective aerial lifts from service (tag out) until repairs are made.

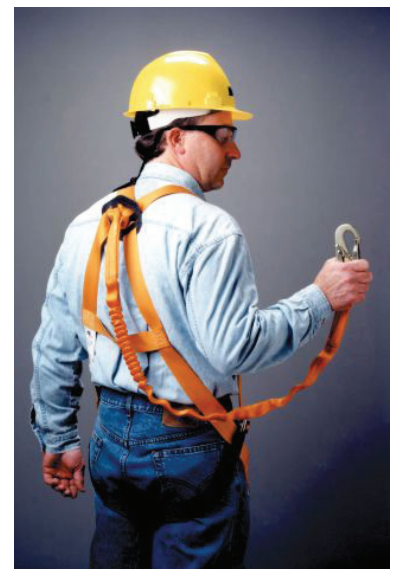
What to Do While Operating an Aerial Lift

Fall Protection

- Ensure that access gates or openings are closed
- Stand firmly on the floor of the bucket or lift platform
- Do not climb on or lean over guardrails or handrails
- Do not use planks, ladders, or other devices as a working position
- Use a body harness or a restraining belt with a lanyard attached to the boom or bucket

Operating/Traveling/Loading

- Do not exceed the load-capacity limits. Take the combined weight of the workers, tools and materials into account
- Do not use the aerial lift as a crane
- Do not carry objects larger than the platform
- Do not drive with the lift platform raised (unless allow by the manufacturer's instructions)



- Do not operate lower level controls unless permission is obtained from the worker(s) in the lift (except in emergencies)
- Do not exceed vertical or horizontal reach limits
- Do not operate an aerial lift in high winds above those recommended by the manufacturer
- Do not override hydraulic, mechanical, or electrical safety devices

Retraining

- Workers should be retrained if any of the following conditions occur:
 - An accident occurs during aerial lift use,
 - Workplace hazards involving an aerial lift are discovered, or
 - A different type of aerial lift is used.
- Employers are also required to retrain workers who they observe operating an aerial lift improperly.

Stability in the Work Zone

- Set outriggers on pads or on a level, solid surface
- Set brakes when outriggers are used
- Use wheel chocks on sloped surfaces when it is safe to do so
- Set up work zone warnings, such as cones and signs, when necessary to warn others



Insulated aerial lifts offer protection from electric shock and electrocution by isolating you from electrical ground. However, an insulated lift does not protect you if there is another path to ground (for instance, if you touch another wire). To maintain the effectiveness of the insulating device, do not drill holes in the bucket.

Source: www.osha.gov/Publications/aerial-lifts-factsheet.pdf (OSHA standards 1926.453)



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Arc Blasts


The general terminology for an arcing event is referred to “arc flash” the actual striking of the unintentional arc and the subsequent release of energy including thermal and light energy) and the “arc blast” (referring to the expansion of air that “blasts” away from the arc).

Here are some practical tips for preventing arc flash and arc blasts. These requirements are stated in OSHA and also NFPA70E.

- During new construction, fully complete your work on the electrical panel and have it inspected prior to energizing. Arcing can’t occur if there’s no power. Make sure the equipment is disconnected from the source of supply. Lock the circuit off, so that it cannot be inadvertently turned on while you are working on it. Check with a known functioning voltmeter to be sure the circuit is dead, even after you think it is locked out. The circuit identification may not be correct and the wrong circuit was disconnected.
- During service work, live electrical circuits should be de-energized before the employee works on or near them, unless the employer/employee can demonstrate that de-energizing introduces additional or increased hazards or is not feasible due to equipment design or operational limitations. Often a work “hot work permit” is required before working on a known live circuit.
- Use insulated fish tapes if working in hot panels. Replace metallic tapes so that you don’t have to worry about arc flashes at the panel or electrocution of the person holding onto the other end.
- Use voltage rated insulated tools to prevent contact with live circuits. Uninsulated tools can cause a significant arc at the equipment.
- Make sure you are using approved Arc Rated (AR) clothing of the proper category to protect yourself from arc flash (burning).



Voltage rated insulated tools

 WARNING	
Arc Flash and Shock Hazard Appropriate PPE Required	
24 inch	Flash Hazard Boundary
3	cal/cm ² Flash Hazard at 18 inches
1	PPE Level, 1 Layer 6 oz. Nomex, Leather Gloves Faceshield
480 VAC	Shock Hazard when Cover is removed
42 inch	Limited Approach
12 inch	Restricted Approach - 500 V Class 00 Gloves
Equipment Name: MIDWEST	

Sample of equipment labels for PPE requirements

- Ensure your workspace has adequate illumination. Otherwise, you might contact live parts that you couldn't see. Also, don't reach blindly into areas that may contain energized parts.
- You must wear a hard hat to protect yourself from arc flashes and blasts, unless you have a full arc rated clothing hood. Reaching down for a dropped screwdriver can put your head inside the panel. Hard hats are insulated to protect you from electrocution. A hard hat with a rated balaclava is needed if your head is within the arc flash boundary. Class E hard hats are rated up to 20,000 V.
- Wear safety glasses and a face shield as required as part of the safety requirement.
- Make sure that you're not wearing nylon or other synthetic clothing when working on or near live parts. An arc blast is bad enough. Burning and melting nylon can melt into your skin, and the petroleum based clothing supports burning.



More information on preventing arc flash/blasts can be found in the ANSI standards, NFPA 70E standards, or at: https://www.osha.gov/dte/grant_materials/fy07/sh-16615-07/arc_flash_handout.pdf.



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Asbestos

Asbestos Terminology

ACM: Asbestos-Containing Material (>1% by weight)

HEPA: High Efficiency Particulate Air

Friable: Can be reduced to dust by normal hand pressure

More than 3000 products in use today contain asbestos.

- pipe and duct insulation
- wall and ceiling panels
- roofing materials
- patching and spackling compounds
- brake pads and linings
- floor tiles
- textured paints
- toasters and other household appliances
- building insulation
- carpet underlays
- artificial fireplaces and materials
- potholders and ironing boards
- hair dryers
- electrical wires
- cements
- furnaces and furnace door gaskets

Response Actions

- repair
- O&M
- encapsulation
- enclosure
- removal

Three Most Common Types of Asbestos

1) Chrysotile

- a.k.a. “white asbestos”
- fine, silky, flexible white fibers (most commonly used asbestos in the U.S.)
- approximately 95% of building materials contain chrysotile
- mined in Canada

2) Amosite

- a.k.a. “brown asbestos”
- straight, brittle fibers that are light gray to pale brown
- most commonly used in thermal system insulation
- mined in Africa

3) Crocidolite

- straight blue fibers
- high temperature insulation applications
- mined in South Africa

Asbestos Diseases

Asbestosis

- scarring (fibrosis) of the lung
- scarring impairs the elasticity of the lung tissue
- hampers the lungs' ability to exchange gases
- restricts breathing; decreased lung volume
- latency period 20-30 years

Lung Cancer

- malignant tumor of the bronchi covering
- tumor grows through surrounding tissue invading and often obstructing air passages
- persistent cough, bronchitis, reduced breathing capacity
- latency period 20-30 years

	Non-Smoker	Smoker
Not exposed to asbestos	x	10x
Exposed to asbestos	5x	50-90x

Lung cancer risk and the effects of smoking.

Mesothelioma

- cancer of the mesothelium (lining of the chest of abdominal wall)
- rarest form of disease
- few symptoms
- cancer spreads rapidly and always fatal
- latency period 20-30 years

Regulations on Asbestos

- OSHA 1910.1001 (General Industry)
- establishes minimum requirements for working with asbestos
- exposure monitoring, engineering controls, PPE, training, hygiene, medical surveillance
- incorporates housekeeping after renovations under the construction standard (1926.1101)



Classes of Asbestos Work

- Class I: Removal of TSI and surfacing ACM and PACM
- Class II: Removal of wallboard, floor tile, sheeting, roofing, siding
- Class III: Repair and maintenance operations
- Class IV: Maintenance and custodial work where contacting but not disturbing ACM

Training Requirements

- Class I: Four-day course with 16 hours hands-on training with one-day annual refresher.
- Class II: Four-day course with 16 hours hands-on training with one-day annual refresher.
- Class III: 16 hours with one-day annual refresher.
- Class IV: Two hours with annual refresher.



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Back Safety

1. Bring the item as close to your body as possible before you lift it.
2. Put your feet about shoulder width apart with one foot slightly in front of the other.
3. Bend your knees to a comfortable degree and push up from the knees. Never bend at the waist. Your stronger leg muscles will bear more of the weight and your chances of injuring weaker back muscles is greatly diminished.
4. Always lift straight up slowly and smoothly in a continuous motion. Avoid jerky movements that can cause injuries.
5. Avoid twisting motions while carrying a heavy item as it can put your back in a vulnerable position.
6. Putting your load down is as important as picking it up. Use the same technique. Slowly and smoothly lower the load by keeping the back as straight as possible and bending at the knees so your stronger leg muscles bear most of the weight.
7. Always make sure the load is balanced.
8. Carry the load at arm length. Avoid lifting or carrying items above your head or on the side of your body.
9. If the load is too heavy for you to carry comfortably, get help. Never carry what can be placed on a dolly, pushcart, or other moving device.
10. Be prepared. Always check the floor for slippery or uneven spots and move any obstacles out of your path--before lifting and moving your load.
11. Back belts are no longer recommended by OSHA. Instead, workers with cardiovascular problems should avoid wearing them since they tend to raise worker's blood pressure during use. Instead of using belts, do blood pressure screening and an ergonomic assessment of the job.

Notes: For additional safety information, check manufacturer's guidelines, contact a competent safety professional or the OSHA Consultation Office.

These rules are samples only. Each employer is responsible for working with his/her employees to write rules that meet the specific needs of their individual company and type of work. Each employer is responsible for assessing the accuracy of their rules and keeping them up to date. OSHA requires a minimum of an update and employee re-training annually.

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Bloodborne Pathogen Safety

Bloodborne pathogens are microorganisms present in human blood that can cause disease in humans such as the AIDS virus, hepatitis B virus and the like. It is easy to become exposed to these when you are giving first-aid help to others.

Employer will designate first-aid responders and train them in this OSHA standard. While Good Samaritan acts performed by undesignated employees are not covered by the OSHA standard, employers may want to make sure all of their employees receive training in the dangers of bloodborne pathogens and exposure control.

You are exposed when blood, urine, vomit, body fluids, or other potentially infectious material comes in contact with your eyes, mouth, any open sores, or mucus membranes in your body. While giving first aid is a life-giving thing to do, you could get a potentially fatal disease from this exposure if you don't protect yourself.

1. Employees will do whatever it takes to stop exposure to blood or other potentially infectious materials when providing first aid. Employees will not touch any fluids without wearing plastic gloves or other non-absorbent protective materials.
2. Employees will wash their hands immediately after removing gloves or other protective equipment and after any hand contact with blood or potentially infectious fluids.
3. Employer will provide antiseptic cleansers for employees to use if a sink isn't available for hand washing. If employee uses an antiseptic cleanser, they will wash with soap and water as soon as possible.
4. Workers will always safely dispose of any personal protective equipment used in the process of giving first aid so no one else will be exposed to it.
5. Upon exposure to a bloodborne pathogen, employer requires that an immediate and confidential medical evaluation be conducted.
 - a. This evaluation must document how the exposure occurred, identify and test the source individual if possible, test the exposed employees blood if consent is obtained, provide counseling, and evaluate any reported illness.
 - b. The medical professional doing the exposure assessment must be provided with all relevant data needed to complete the employee's evaluation.
 - c. Hepatitis B vaccine should be given immediately after an exposure to any first-aid provider who has experienced an exposure to blood. (Employees who refuse to be vaccinated must sign a form declining vaccination and be provided with vaccination if they change their minds at a later date.)

Notes: For more information see OSHA 29 CFR 1910.1030, manufacturer's guidelines, a competent safety professional or the OSHA Consulting office.

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Boom Trucks

- Refer to the owner's manual for safe operation of the boom truck.
- Always check for overhead obstructions before elevating the boom platform.
- The brakes must be set, and when outriggers are used, they must be positioned on pads or a solid surface. Provided they can be safely installed, wheel chocks must be installed before using a boom lift on an incline. Before moving the boom truck, the boom must be inspected to be sure it is properly cradled and that outriggers are in a stowed position.
- Lift controls must be tested each day prior to use to ensure that they are in safe working condition.
- Employees must always stand firmly on the floor of the basket, must not sit or climb on the edge of the basket, or use planks, ladders, or other devices for a work position.
- An aerial lift truck must not be moved when the boom is elevated in a working position with men in the basket, except for equipment specifically designed for such use.

Fall Protection Requirements

Employees must use a "restraint system" or a personal fall arrest system when working in the bucket. Restraint systems can be used for fall protection if the lanyard and anchor point are arranged so that an employee is not potentially exposed to falling out of the bucket (This means you have a short lanyard with an anchor point inside the bucket). A restraint system includes the use of a body belt, lanyard, and anchor point. If the boom truck's anchor point is outside the bucket, then a personal fall arrest system must be used (including a full body harness and lanyard).



Working without fall protection is dangerous and against OSHA regulations.

Prevention of Electrocutation - Construction Industry Requirements

- When working near energized power lines or equipment, aerial lifts must be grounded or barricaded and considered as energized equipment, or the aerial lift must be insulated for the work being performed.
- Unqualified persons in an elevated bucket cannot be closer than 10 feet to power lines.
- When an unqualified person is working on the ground in the vicinity of overhead lines, the person on the ground may not bring any conductive object close to unguarded, energized overhead equipment.
- Material must not be passed between a pole or structure of an aerial lift while an employee working from the basket is within reaching distance of energized conductors or equipment that is not covered with insulating protective equipment.
- Employees standing on the ground may not contact the vehicle, mechanical equipment, or any of its attachments.

More regulations on Boom Trucks can be found at the following web site:
www.osha.gov or **OSHA Construction Standard 1926.453, 1926.955**

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Carbon Monoxide

Carbon monoxide is an odorless, tasteless, colorless, gas.

Source:

By-product of incomplete combustion from burning fuels. For example: fuels used in cars, trucks, small engines, stoves, lanterns, grills, fireplaces, furnaces or gas fireplaces.

Symptoms:

- lightheaded
- dizzy
- nauseous
- headache
- unconscious
- chest pain
- DEATH

Chemical asphixiant:

Deprives the brain of oxygen. When you breathe in carbon monoxide, it will replace the oxygen in your red blood cell and prevent your blood from carrying the oxygen to the cells necessary to live.

Flammable range: 12.5%-74%

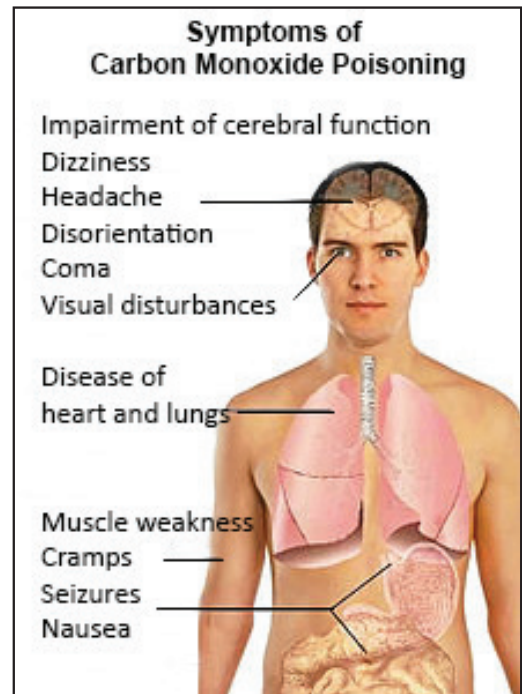
Vapor density: Weighs about the same as air.
Carbon monoxide = 0.97, and air = 1.0. Will travel wherever the wind/current takes it.

OSHA permissible exposure limit (8-hour exposure):

NIOSH recommended exposure level (REL) is less than 35 ppm over 8 hours. OSHA permissible exposure level (PEL) is 50 ppm over 8 hours. Any enclosed space that has over 200ppm over 15 minutes requires vacating the space.

Control:

Provide adequate ventilation, Open doors and enclosed spaces at least once every hour to allow for air flow to enter the room. **IMMEDIATELY MOVE AFFECTED PERSONS TO FRESH AIR AND CALL FOR EMERGENCY SERVICES IF SYMPTOMS ARE SEVERE.**



https://www.osha.gov/OshDoc/data_General_Facts/carbonmonoxide-factsheet.pdf



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Cold Stress

- Emergencies from cold temperatures can be the result of both local cooling (affecting one area of the body) or general cooling (affecting the entire body).
- The first line of defense to eliminate problems from the cold is setting guidelines for what temperature is too cold for employees. Remember, the effect of cold is greatly increased by wind chill. (See the wind chill chart on the next page). In addition, the Cold Stress card located at www.oro sha.org/pdf/pubs/336.pdf can be copied and given to your employees to use as a guide.
- The second line of defense is to dress in layers and wear clothing that wicks moisture from the body, including a hat. It is estimated 40% of heat loss occurs from a person's head. Note: if you must work outside in extreme temperatures, never work alone.

Frostbite and hypothermia are cold-related emergencies.

FROSTBITE - Signs and Symptoms:

Stages of overexposure to cold for body extremities:

- Frostnip: Affected area is red, then white. Upon entering a warm environment, the person may complain of a burning or tingling sensation. Many of us may have experienced this feeling after spending too much time outside in cold weather. If symptoms do not improve after a short time, seek emergency care for frostbite.
- Frostbite: Skin surface is hard. Tissue under the skin is soft. The skin color will appear white and waxy. This person should be treated by emergency personnel. Note: warming an area that is already frozen may further injure the area if done inappropriately. Follow instructions from emergency personnel.
- Freezing: Skin surface and tissue under skin is hard. Skin color will be blotchy white, grey, or blue. Again, this person should be treated by emergency personnel. Follow instructions from emergency personnel.

Cold Stress

(continued)

HYPOTHERMIA - Signs and Symptoms:

Stages of hypothermia:

- Mild: the person may shiver and have numbness involving various body parts. Take the person to a warm environment. If general warming does not improve symptoms, contact emergency personnel.
- Severe: the person may be drowsy, have slow breathing and slow pulse. Emergency personnel should be contacted immediately.
- Extreme: this person will be unconscious, possibly have no pulse or respirations, and be cold to the touch. Emergency personnel should be contacted immediately.

First Aid for Hypothermia

- Prevent further cold exposure
- Remove wet clothing
- Initiate CPR, only if required
- Re-warm by covering with blankets, sleeping bags and with body-to-body contact
- Handle gently during treatment and evacuation

Windchill Table

If you're unprepared for the cold, temperature and wind can put you at risk for hypothermia and frostbite. The table below shows the risk of frostbite on unprotected skin.

Wind (mph)	Temperature (°F)																		
	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63	-69
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72	-77
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77	-81
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81	-85
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84	-88
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87	-91
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89	-93
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91	-95
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93	-97
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95	-99
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97	-101
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-99	-103

Frostbite: 30 minutes 10 minutes 5 minutes

Consult your Right to Know written program or Minnesota OSHA for further information on this topic.



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Competent Person vs. Qualified Person

- A *Competent Person* is one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
- A *Qualified Person* is one who by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his or her ability to solve or resolve problems relating to the subject matter, the work, or the project.
- An example of a Competent Person may be an employee who has been selected by the employer based on the employee's knowledge. This is evident in scaffolding, excavation and fall protection. The competent person oversees that the procedures and equipment are utilized correctly. If not, the process is immediately stopped until changes are made to correct any problems.
- An example of a Qualified Person is someone that has attended specific training and acquired further knowledge in selected areas. Again, this could be in scaffolding, excavation or fall protection. The qualified person will design the system, and the competent person will ensure it is applied correctly.





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Compressed Gas Safety

Transportation

- protective cap installed
- roll on bottom edge to move; do not drag
- hoisted, secured on a cradle, slingboard, or pallet—NOT CHOKER SLINGS
- secured and upright

Storage

- secured and upright in designated area
- protect from being struck
- dry, well-ventilated areas (should be resistant to fire)
- keep temperature below 125°F
- protect from weather, dampness, and direct sunlight
- do not lay cylinder on its side

When empty, cylinders shall be stored:

- secured and upright
- valves closed
- separated from full cylinders
- oxygen cylinders in storage shall be separated from fuel or combustible materials a minimum distance of 20 feet or by noncombustible barrier at least 5 feet high and fire rating of 1/2 hour

Regulators

- Kept in proper working order
 - Glass is kept clean and intact
 - Lines are bled when not in use
- Kept away from oil and grease
 - cylinders and caps
 - valves and couplings
 - regulators and hoses
 - hands and gloves

Hoses

- distinguishable by color or touch
- not interchangeable
- no more than 4" out of 12" taped
- inspected daily
- flashback potential - test at twice the normal pressure - no greater than 300 p.s.i.

Torches

- tips kept clean
- inspected at the beginning of each shift
 - leaking shutoff valves
 - hose couplings
 - tip connections
- lighted by friction lighters—not matches!

Courtesy ES&H, Inc. - www.eshinc.com



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Confined Space Safety

A confined space is any area that:

- Has a limited opening for entry or exit that can be as small as 18 inches
- Is an area that is difficult to move through
- Is open topped, such as pits and excavations
- May require ladders or hoists to enter and exit

Confined spaces may have unfavorable natural ventilation such as:

- Not enough oxygen
- Deadly gases trapped inside
- Too much oxygen, which can increase the chances of an explosion

Confined spaces are not designed for continuous worker occupancy.

A “permit required confined space” is a confined space with at least one of the following characteristics:

1. Hazardous atmosphere
 - Levels of flammable gas or vapor that are over 10% of the substance’s lower flammable limit
 - Combustible dust at or above the substance’s lower flammable limit
 - Oxygen content below 19.5% or above 23.5%
2. Engulfment potential
3. Entrapping design

Employer Obligations

1. Evaluate the work place for “permit required confined spaces”
2. Take the following actions when a confined space is identified:
 - Post signs or warnings.
 - Use barriers or other means to keep unauthorized personnel out.
 - Develop and use a written space entry program.
 - Conduct air monitoring and other tests to evaluate the hazards in each space.
 - State entry conditions that make the space acceptable for entry.
 - Ventilate or otherwise eliminate the space’s hazards before allowing entry.
3. Entry into a confined space is not allowed unless there is a signed permit that identifies:
 - The space to be entered
 - Purpose, date, length of stay
 - Name of workers allowed to enter
 - Name of attendant

- Name of entry supervisor
 - Acceptable entry conditions
 - Equipment to be used in the space
 - Available emergency and rescue services and their phone numbers
 - Hazards of the space
 - Results of initial and periodic testing
 - Measures used to isolate the space and eliminate or control the hazard
 - Additional permits that may relate to the space
 - Any other special employee limitations
4. Test to help ensure that conditions are acceptable. Testing must be done in this sequence:
 - Oxygen content
 - Combustible gases and vapors
 - Toxic gases and vapors
 5. Provide at least one attendant.
 6. Develop and implement a rescue and emergency system.
 7. Coordinate procedures when a contractor or another employee is involved with a confined space.
 8. Review the confined space program annually.

Entry Supervisor Duties

- Help ensure that testing, equipment, and permit requirements are completed before signing the permit and allowing entry.
- Be familiar with the space's hazards.
- Terminate the permit.
- Help ensure rescue and emergency services are available.

Entrant Duties

- Know the hazards of the space.
- Know what equipment to use and how to use it.
- Use proper personal protective equipment.
- Have a rescue retrieval line attached to a fixed point outside the space. If the space is five feet or more deep, the line must be attached to a mechanical device.
- Be aware.

Attendant Duties

- Maintain a count of who is in the space.
- Keep unauthorized personnel out.
- Order immediate evacuation if the attendant's duties cannot be performed safely.
- Summon emergency and rescue services.
- Be aware.

Other Safety Tips

- Plan the job.
- Assemble tools and equipment ahead to help eliminate trips in and out of the confined space.
- Keep the space ventilated.
- Turn water, steam, heat, and power off (as applicable).
- Don't take food, drink, cigarettes or matches into the confined space.
- Don't enter if you are under the influence of drugs, alcohol, or medications.
- Don't enter if you are not feeling well.

Confined Space Safety

(continued)

Before you Enter

1. Always test the air before entry for:
 - a. combustibility,
 - b. adequate oxygen levels, and then for
 - c. toxic air hazards.

When testing:

- a. Test the area near the entry before opening the space to test further.
- b. Be sure to test the air inside the space from top to bottom. Some hazardous gases float at the top of the space while others sink to the bottom.
- c. If pretests find hazards you are unsure of or cannot protect against adequately, do not proceed. Contact your supervisor immediately.
- d. Depending upon conditions, continuous or periodic testing may be needed to insure the safety of the person in the confined space.

Unless the air is ventilated or has no potential hazards, a portable self-contained breathing device should be used. If the entrance is too small, an airline mask should be used and employee entering the space will also carry a 5-15 minute escape respirator in case something happens to the air tube.

2. Eye, hearing, and protective clothing will be used if determined to be needed.
3. Where possible, use ventilating equipment to maintain an oxygen level of a least 19.5% and to keep toxic gases and vapors within OSHA prescribed levels.
4. Use lockouts and tags to prevent any start ups while a person is working in confined space. Also make sure to cut off any steam, water, gas, power lines, or any other hazardous potentials that enter the confined space.
5. Only safe, grounded, explosion-proof equipment will be used in the area.

Rescues

- A minimum of one person must always be outside to summon help or offer help.
- This attendant will be equipped with the proper breathing equipment, and trained in first aid and CPR.
- The attendant will be in continuous contact with person inside confined space by radio, phone or visual.
- If an emergency arises or there is another reason to enter the space, the attendant must not enter until additional help arrives.
- A full body harness and lifeline attached to a block and tackle will be attached to the person in the space. A single person will be able to use that for a rescue. A rope tied to the person is inadequate since a single person could not use it without help.

Notes: For more information, see OSHA CFR Title 29, Part 1910.146, contact a competent safety professional or the OSHA Consultation office.

These rules are samples only. Each employer is responsible for working with his/her employees to write rules that meet the specific needs of their individual company and type of work. Each employer is responsible for assessing the accuracy of their rules and keeping them up to date. OSHA requires a minimum of an update and employee re-training annually.



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Construction Sites

Perimeter Barricades: The entire construction site should be fenced off or otherwise secured to prevent unauthorized people from intentionally or unintentionally entering the work site.

Internal Barricades: These help prevent workers from entering areas where there is danger of falling objects.

Tools: Tools will be well maintained and stored in their proper place when not in use. Use only the proper tool for the job.

Walkways: Walkways will be clearly marked and roped off to allow employees to safely enter and leave the work site.

Housekeeping: All employees are required to pick up debris, tools, and equipment and carry them to the proper disposal or storage location.

Above Ground Work: Ladders and scaffolds should be inspected _____ (daily/weekly) for damage and weakness.

Electricity: All electrical power sources not necessary for construction will be shut off. All wiring will be insulated. Warnings will be posted around live wires. Fuses, circuit breakers, and ground fault interrupters will be used to help prevent shock injuries.

Fires: Fire protection equipment is available in _____ (van/office/other location). Training for their proper use is held _____ (when) _____ (where).

Personal Protective Equipment: Hard hats, eye protection, hard toe shoes will be worn at all times. Employee will bring these to work every day and get replacements from the supervisor when replacements are needed. Employee will maintain these items in working order or get a replacement.

For additional safety information check manufacturer's guidelines, contact a competent professional or the OSHA Consultation Office.

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Construction Site Safety Checklist

Date: _____ Site: _____

Trailer/Site

- First Aid
- Posting requirements (OSHA, WC, EEOC, wages, etc.)
- Program review
- Fire extinguishers
- ERTK program
- Site emergency plan
- Site security plan
- Environmental--any special situations
- Potable water and toilet systems
- Other _____

Public Protection

- Barricades
- Flagging
- Traffic controls
- Other _____

Fire Protection

- Fire protection plan
- Gas cylinder storage
- Storage of flammable liquids
- Welding equipment
- Safety cans
- Other _____

Housekeeping

- Daily debris removal
- Clear access to exits and stairs
- Site areas clean
- Cords in walkways
- Adequate lighting
- Other _____

Personal Protective Equipment

- Respirator program
- Ear protection
- Eye protection
- Footwear
- Gloves
- Hard hats
- Proper clothing
- Other _____

Electrical

- GFCI
- Grounding
- No exposed live parts
- Hard usage three-wire cords
- Overhead lines
- Other _____

Fall Protection

- Site fall protection plan
- Floor holes
- Wall openings
- Guard rails
- Stair rails
- Perimeter rails
- Harness and lanyards
- Other _____

Excavations/Trenches

- Competent person
- Gopher State One Call
- Access/egress
- Cave-in protection (slope/box)
- Daily inspections
- Soil testing
- Spoil pile
- Other _____

Cranes

- Condition
- Load charts
- Annual inspection
- Frequent inspection/operator
- Swing radios
- Other _____

Ladders

- Condition
- Extends at least 3' above landing
- Secured
- Other _____

Heavy Equipment/ Tools

- Forklift
- Aerial lifts
- Skid steer
- Generators/Compressors
- Heaters
- Other _____

Scaffolds

- Competent person
- Daily inspections
- Mobile scaffold requirements
- Fabricated frame scaffold requirements
- Other _____

Miscellaneous/ Other

- _____
- _____
- _____

Note:
This list is not all-inclusive.



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Controlling Electrical Hazards

Employees must be aware of and employer will train them about the electrical hazards to which they will be exposed. Maintenance employees should be qualified electricians who have been well instructed in lockout and tagging procedures.

Insulation

Before employees prepare to work with electric equipment, check the insulation before making a connection to a power source to be sure there are no exposed wires. The insulation of flexible cords, such as extension cords, is particularly vulnerable to damage.

Circuit conductors must be insulated to prevent people from coming into accidental contact with the current. The insulation will be suitable for the voltage and existing conditions such as temperature, moisture, oil, gasoline, or corrosive fumes. All factors must be evaluated before a proper insulation choice is made.

Guarding

Live parts of electric equipment operating at 50 volts or more must be guarded against accidental contact. Employer will guard live parts by:

- locating in a room, vault, or similar enclosure accessible only to qualified people;
- using permanent, substantial partitions or screens to exclude unqualified people;
- locating on a suitable balcony, gallery or platform elevated and arranged to exclude unqualified persons; or
- elevating 8 feet or more above the floor.

Employer will mark entrances to rooms and other guarded locations containing exposed live parts with conspicuous warning signs forbidding unqualified people to enter.

Indoor electric installations that are over 600 volts and are open to unqualified people must be made with metal-enclosed equipment or enclosed in a vault or area controlled by a lock. Equipment must be marked with appropriate caution signs.

Grounding

Employer will make sure that all appropriate workers understand grounding and how to check for it and acquire it. Employees with any doubts will contact supervisor immediately.

Grounding is normally a secondary protective measure that creates a low-resistance path to the earth and substantially reduces the possibility of accidents when used in combination with other safety measures.

Controlling Electrical Hazards

(continued)

A “service or system ground,” where a “neutral or grounded conductor” is grounded at the generator or transformer and again at the service entrance is the building, is primarily designed to protect machines, tools and insulation against damage.

An “equipment ground” must be provided for further protection to workers by providing another path from the tool or machine through which the current can flow.

Circuit Protection Devices

Automatic circuit protection devices such as fuses, circuit breakers (used primarily for the protection of conductors and equipment) and ground-fault circuit interrupters (GFCI) (used in high-risk areas such as wet locations and construction sites) are used in case of a ground-fault overload.

Overhead Lines

If work is to be done near overhead power lines, the lines must be de-energized and grounded by the owner or operator of the lines, or other protective measures (such as guarding or insulating the lines) must be provided before work is started.

Unqualified employees and mechanical equipment must stay at least 10 feet away from overhead power lines. If the voltage is over 50,000, clearance should be at least 4 inches for each additional 10,000 volts.

When mechanical equipment is being operated near overhead lines, employees standing on the ground may not contact the equipment unless it is located so that the required clearance cannot be violated even at maximum reach of the equipment.

Employees who work constantly and directly with electricity must use the personal protective equipment required for the jobs they perform. This equipment may consist of rubber insulating gloves, hoods, sleeves, matting, blankets, line hose, and industrial protective helmets.

Employees must use tools that are designed and constructed to withstand the voltages and stresses to which they are exposed when handling energized conductors.

When work is performed around energized lines, employees will follow these basic procedures:

- Have the line de-energized.
- Ensure that the line remains de-energized by using some type of lockout and tagging procedure.
- Use insulated protective equipment.
- Keep a safe distance from energized lines.

Notes: For more information see OSHA 29 CFR 1910.178 and 1910.331-335, manufacturer’s guidelines, a competent safety professional or the OSHA Consulting office.

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Core Drilling

There are two items to consider when determining what type of safety procedures are needed to perform core drilling at jobsites: wet concrete method and dry concrete method. Regardless of the method, the following steps need to be followed:

- Hearing protection should be used.
- A control zone to restrict entry should be made under the core drilling area.
- Only qualified persons should perform core drilling (a qualified person is someone with the training and experience to perform the task).
- When drilling for fasteners, employees must stay inside the basket of the manlift—no over-reaching.
- Specific training should be provided for employees using the hammer drill.
- A core drilling manual should be obtained and used as a guide.



Wet Method

- A respirator is not needed.
- Surge protection should be provided for tools.
- A vacuum source is needed to collect the water.

Dry Method

- Respiratory protection should be used (at least N-95).
- A respiratory protection program is required when using a respirator (fit testing, evaluation and written plan).
- A Personal Protective Equipment Program should be in place to determine what types of safety equipment employees need when performing core drilling and other tasks.



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Crystalline Silica

OSHA Crystalline Silica Standard CFR 29- 1926.1153 to be enforced **starting September 23, 2017.**

What is crystalline silica?

- Crystalline silica is a common mineral found in many naturally occurring materials and used in many industrial products and at construction sites. Materials like sand, concrete, stone and mortar contain crystalline silica. Crystalline silica is also used to make products such as glass, pottery, ceramics, bricks, concrete and artificial stone.

Who is at risk from exposure to crystalline silica?

- Around 2 million workers are exposed to crystalline silica on the job. Simply being near sand or other silica containing materials is not hazardous. The hazard exists when specific activities create respirable dust that is released into the air.

How are electricians exposed to respirable crystalline silica?

- Respirable crystalline silica means quartz, cristobalite and/or tridymite is very small particles, typically 100 times smaller than ordinary sand found on beaches or playgrounds. It is created by high-energy operations like cutting, sawing, grinding, and drilling stone, rock, concrete, brick, block and mortar. Activities such as abrasive blasting with sand; sawing brick or concrete; sanding or drilling into concrete walls; grinding mortar; and cutting or crushing stone creates respirable dust. Crystalline silica is found in masonry products including concrete, mortar, quartz and even sand. Amorphous silica, such as silica gel, is not crystalline silica.
- Typically this standard does not apply to exposures that remain low as in mixing mortar, or pouring concrete- where water is used to reduce dusts. As masonry products are drilled or sawn, the dust contains respirable silica.
- Construction and maintenance workers could be exposed to this silica dust and that at least thousands of workers are exposed to levels higher than the **Permissible Exposure Levels (PEL) 50** micrograms per cubic meter of air over 8 hours
- Inhalation of the crystalline silica can cause silicosis (scarred lung tissues) making it difficult to breathe, contributes to lung cancer, other respiratory disease, and kidney disease.

Methods to control the inhalation of the dusts are required.

Small employers can use Table 1 in OSHA construction standards - 1926.1153 for guidance, or they can measure the workers' exposure and take measures to limit to the PEL.

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Crystalline Silica

(continued)

PARTIAL Table 1 below. Full table go to: www.osha.gov/silica/

Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤ 4 hours / shift	> 4 hours / shift
(vii) Handheld and stand-mounted drills (including impact and rotary hammer drills)	<p>Use drill equipped with commercially available shroud or cowling with dust collection system.</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</p> <p>Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism.</p> <p>Use a HEPA-filtered vacuum when cleaning holes.</p>	None	None
(i) Stationary masonry saws	<p>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</p>	None	None
(ii) Handheld power saws (any blade diameter)	<p>Use saw equipped with integrated water delivery system that continuously feeds water to the blade.</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</p> <p>- When used outdoors</p> <p>- When used indoors or in an enclosed area</p>	None APF 10	APF 10 APF 10
(iii) Handheld power saws for cutting fiber-cement board (with blade diameter of 8" or less)	<p>For tasks performed outdoors only:</p> <p>Use saw equipped with commercially available dust collection system</p> <p>Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.</p> <p>Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency.</p>		

Table 1: Specified Exposure Control Methods when Working with Materials Containing Crystalline Silica

Crystalline Silica

(continued)

Alternative measures to Table 1 may be used.

- Example using water for cutting to keep dust down, or using dust collection systems and a High Efficiency Particulate Air (HEPA) filters at 99.97 % efficiency
- Measure the amount of silica that workers are exposed to if it may be at- or above- an action level of 25 µg/m³ (micrograms of silica per cubic meter of air), averaged over an eight-hour day.
- Protect workers from respirable crystalline silica exposures above the permissible exposure limit of 50 µg/cubic meter, averaged over an eight-hour day.
- Use dust controls to protect workers from silica exposures above the PEL.
- Provide respirators to workers when dust controls cannot limit exposures to the PEL.

All construction employers are required to:

- Write and implement a control plan
- Designate a competent person to implement the plan
- Restrict housekeeping practices to limit exposure
- Offer medical exams to workers who are required to wear respirators. E.g., dust masks of Assigned Protection Factor (APF) 10 - or more.
- Train workers to limit exposure
- Whenever an exposure assessment indicates that employee exposure is above the PEL, the employer shall describe in the written notification the corrective action being taken to reduce employee exposure to, or below, the PEL
- Keep records



Without dust controls, using a handheld power saw to cut concrete can expose workers to high levels of respirable crystalline silica.

The key competent person(s) for this company is _____.

Three Ways to Comply with the OSHA Requirement

1) Use OSHA Table 1:

- If the standard says an integrated system that continuously feeds water to the tool, it must be part of the tool and not a separate stream of water.
- Different rules for outdoor use vs. indoor or an enclosed area
- Determine length of time for exposure
- Use approved vacuum systems NOT shop vacuums
- If drilling, use shroud or cowl with a dust collection system (part vii)
- May use hollow drill bits and dust collection

2) Use objective data or performance testing:

- Utilize third-party data in specific applications that would be in compliance with PEL.
- Be sure the data fits your current application and use of a tool.
- A general rule for vacuum when cutting is 25 CFM for each inch of saw wheel diameter

3) Scheduled air monitoring:

- Set up air testing for each situation of dust producing procedures
- If testing indicates that employees are subjected to excess dust, they must wear respirators.
- If employees are required to wear respirators, they must have a fit test and follow a medical surveillance plan
- If other trades are creating silica dust and not controlling it, all other workers in the area need to evaluate the situation in order to avoid exposure above the PEL

OSHA:

www.osha.gov/silica

Hilti Tool Helpful Hints:

<http://tiny.cc/yt3sny>

OR

www.hilti.com/content/hilti/W1/US/en/services/power-tools/osha-silica-dust-regulations/osha-silica-dust-knowledge-center.html <http://tiny.cc/yt3sny>



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Electrical

Toolbox Talks

Driving Safety

There is a degree of risk in everything we do in life. Driving is probably the single most risk-laden activity we undertake on a regular basis. Here are some tips for safe and defensive driving:

Distracted Driving

Common Driving Distractions

- Using a mobile device
- Eating and drinking
- Adjusting the radio
- Reading billboards & signs
- Shaving or fixing hair
- Using a navigation system
- Applying makeup
- Interacting with pets
- Talking

Cell Phone Safety

Minnesota Law as of August 1, 2019. Hands-free phone use in a vehicle.

**Office of traffic safety—Minnesota Department of Public Safety.*

What can I do under the new law?

The new law allows a driver to use their cell phone to make calls, text, listen to music or podcasts and get directions, but only by voice commands or single-touch activation without holding the phone. Remember, hands-free is not necessarily distraction-free.

What can't I do with my phone under the new law?

You may not hold your phone in your hand. Also, a driver may not use their phone at any time for video calling, video live-streaming, Snapchat, gaming, looking at video or photos stored on the phone, using non-navigation apps, reading texts and scrolling or typing on the phone.

Can I ever hold my phone?

Yes. Hand-held phone use is allowed to obtain emergency assistance, if there is an immediate threat to life and safety, or when in an authorized emergency vehicle while performing official duties

Can I use a GPS navigation device?

Yes. GPS and other systems that can only be used for navigation are exempt from the Hands-Free law. In-car screens and systems are also exempt. In both cases, most of these systems lock when the vehicle is moving

Does the new hands-free law address smart watches?

Drivers can use them as a conventional watch to check time, but smart watches are considered an electronic communications device under the hands-free law. That means the device has the same restrictions as a cell phone. Drivers can use a smart watch the same way they use a cell phone as long as it's by one-touch or voice activation. Drivers can't type, text or do the other things prohibited under the hands-free law

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Other Distracted Driving

Turn off your radio, fans, or anything else that may further divert your attention from the surrounding area. Heighten your awareness!

In Minnesota it is against the law-as well as being very dangerous, to read or send text messages, access the internet, send email, etc. while driving. Pull off the road, or out of traffic to use your mobile devices.

Getting Directions

When it comes to service work and deliveries, getting directions is part of the job. Please be responsible. Do not read maps or directions while driving. Reading and driving don't go well together! Please use good judgment on the road. If using GPS systems, be very careful when viewing the directional map. Place it where you can see the display without diverting your eyes from the road.

Seat Belts

Seat belt use is mandatory for drivers and occupants of company vehicles. Unbelted drivers and occupants are much more likely to be seriously injured or killed in the event of an accident. Air bags add another element of safety during accidents, but they can't work properly if the driver isn't properly restrained.

Tires, Brakes, and Lights

One of the main keys to safe driving is having a vehicle that can stop. Poor brakes and bad tires are a bad combination, especially during adverse weather conditions. If your company vehicle needs service, please take the time to ensure these maintenance items are at the top of the list. Make sure you headlights and tail lights are operational. Make sure your tail lights are "on" with the headlights. Often the headlights are on automatically, but the tail lights only come on when the headlights are switched on by the driver. Do a weekly check to see that your turn signals and brake lights work as well as your backup lights. If using a truck with back up warning signals, be sure the signal works.

Typical Accidents

There are three types of auto accidents that make up over 50% of all reports from contractors in the construction industry.

- Following too closely - The distance you travel behind other vehicles makes all of the difference. You should have a minimum of two seconds between your vehicle and the car in front of you. This is true at any speed.
- Intersections can be confusing. Other drivers can make errors. Be very careful. Anticipate light changes, and yield to other drivers who have the right of way.
- Backing accidents - If possible, avoid backing service vehicles such as vans or stake trucks. If you can't avoid backing, back into your parking spot when you arrive at your destination. Things can change during the day when you're on a jobsite. Use a spotter if your view to the rear is obstructed, and make sure your mirrors are properly adjusted.

Fatigue

Have you ever felt your eyelids drooping or experienced a fleeting moment of inattention behind the wheel? Believe it or not, most driver fatigue accidents occurred when drivers were behind the wheel less than two hours. This means that work and sleep schedules are involved in preventing this type of accident. Accident rates peak in the mid-afternoon when alertness dips. Tired? Pull over and take a 10-minute nap. You'll enjoy the drive much more, and you might prevent an accident. Look at it this way...24 hours without sleep corresponds to a blood alcohol content (BAC) of 0.1 percent, which is legally drunk!



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Emergency Preparedness

Notification of Emergency Warning

1. Workers receiving notification of a possible disaster (fire, tornado, earthquake, bomb threat, hazardous chemical spill, and the like) will immediately notify their supervisor.
2. Workers will notify other employees through the use of _____ (intercom, alarm system, paging system, other).
3. Upon hearing the above warning, employees will, if time permits, shut off power to equipment being operated and proceed to _____ (evacuation site or safe assembly area).
4. Employer will post a map for all evacuation sites, safe assembly areas and the proper route of exit. _____ (location of map)
5. With the exception of fire or bomb, employees will evacuate building when authorized by the Emergency Control Committee or ranking member of management.
6. Employer will place a list of all emergency phone numbers by each telephone.
7. If an emergency occurs, the _____ (office manager, ranking member of management present, other designated position) will be responsible for contacting the appropriate agency.
8. Neighboring businesses will be contacted by _____ (designated person) to provide mutual aid and warnings of natural disasters.

Emergency Control Committee

1. The Emergency Control Committee consists of the following people:

- a. _____
- b. _____
- c. _____

The ranking member on the committee is: _____

2. During an emergency situation, the ranking member of management will have the final authority to coordinate procedures and amend, modify, or supersede any provisions of this plan in order to ensure employee safety.

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Emergency Preparedness

(continued)

Utility Controls

1. Employer will tell all employees where the controls for shutting off the gas, electricity, and water services into the building are located and how to turn them off.

Water: _____

Gas: _____

Electricity: _____

Listing of Hazardous Materials

1. Employer has a list of hazardous materials and storage locations, Material Safety Data Sheets cataloged for all hazardous materials, and training information to explain proper material handling.
2. Employer has placed telephone listings of all emergency telephone numbers by each phone.

Notes on Tornadoes

Weather Emergency Tips for tornadoes are to:

- Monitor latest weather advisories
- Move personnel to designated safe assembly area
- Open any windows or doors to equalize pressure
- After tornado passes, restore calm and check for injuries and damage.

For additional safety information check manufacturer's guidelines, contact a competent professional or the OSHA Consulting Office.

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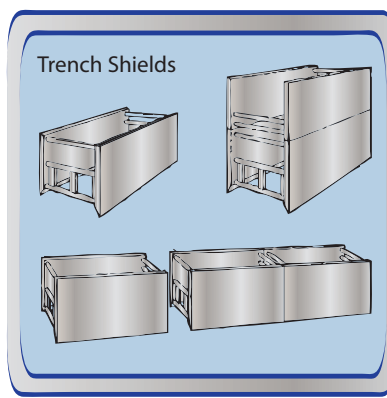
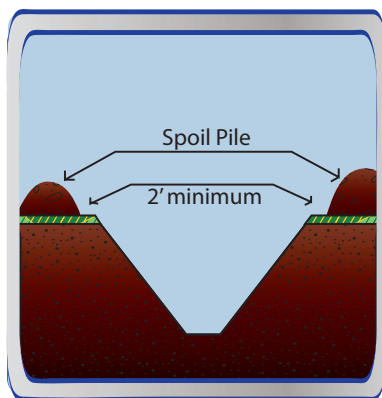
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Excavations

- Daily inspections of excavations, the adjacent areas, and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, failure of protective systems, hazardous atmospheres, or other hazardous conditions.
- Each employee in an excavation will be protected from cave-ins by a protective system, except when excavations are made entirely in stable rock or excavations are less than 5 feet in depth and examination of the ground by a competent person provides no indication of a potential cave-in.
- Means of egress from trench excavations - A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are 4 feet or more in depth so as to require no more than 25 feet of lateral travel for employees.
- Employees must be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection will be provided by placing and keeping materials or equipment at least 2 feet from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into the excavation.
- Don't work in trenches with accumulating water. Make sure it's controlled before you begin work.
- Exposed piping should be supported every 30 feet at a minimum.
- Some excavations can be a potential confined space. Be aware of toxic gases, especially working near landfills, septic tanks, etc.
- Before digging, confirm that the "One Call" has been completed. Write down or be aware of the ticket number that they issue for your jobsite.



Several OSHA violations are present in this photo: no egress, no high-visibility clothing, accumulation of water, and lack of a protection system such as sloping or trench box.



More information on excavation requirements can be found in OSHA booklet on Trenching and Excavations at: www.osha.gov/Publications/osa2226.pdf



Minnesota Electrical Association

Electrical Toolbox Talks

Extension Cords

Unless necessary for wiring of fixtures, connection of portable lamps or appliances, or connection of stationary equipment, extension cords may not be used:

- as a substitute for fixed wiring.
- where run through holes in walls, ceilings, or floors.
- where attached to the building surface.
- where concealed.

If it is necessary to use an extension cord in a manner similar to the above descriptions, make sure that bushings are used to protect against sharp corners, edges, etc. Don't use metallic fasteners to hold up cords; use plastic tie straps or plastic staples instead.

Extension Cord Do's & Don't's

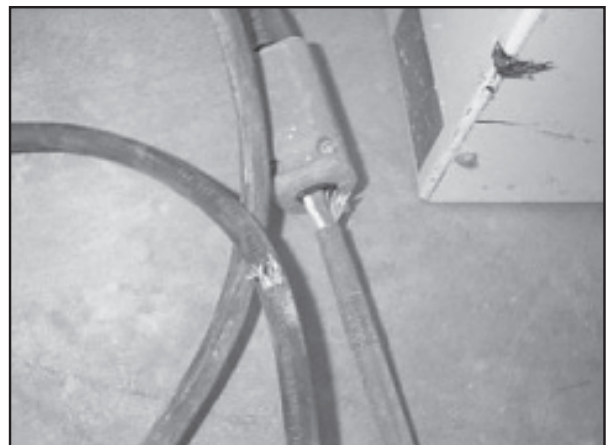
- Must be rated for hard or extra hard service.
- Must be 3-wire types only.
- Handle properly (don't tie in knots).
- Visual inspections performed daily before use.
- Must have a ground pin.
- Must have strain relief.
- Don't leave them coiled up in a pile while in use. This can create a heating effect on the cord which can cause damage over a period of time.
- Avoid crushing extension cord conductors. This means keeping them out of the path of scissor lifts, carts, gang boxes, etc.

Tip: Test extension cords by first testing the receptacle with your outlet tester. Next, plug in the extension cord to the outlet that has been shown to be good. Then, use your tester on the extension cord to ensure proper wiring, grounding, etc.

Note: all 15- and 20-amp circuits must be protected with GFCI on construction jobsites. More information on extension cords can be found at www.osha.gov and throughout subpart K.



Repair this badly damaged cord with quality dead front plugs or connectors, or replace cord altogether.



The outer insulation is damaged and the cord end has no strain relief.



Minnesota Electrical Association

Electrical Toolbox Talks

Eye and Face Safety

- Employees shall be provided with eye and face protection when machines or operations present potential eye or face injury from physical, chemical, or radiation agents.
- Eye and face protection equipment should meet requirements specified by the American National Standards Institute Z87.1-1968, Practice for Occupational and Educational Eye and Face Protection.
- If an employee's vision requires the use of corrective lenses when required by OSHA Regulation 1926.102 to wear eye protection, the eye protection should be of the following types:
 - 1) spectacles whose protective lenses provide optical correction
 - 2) goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles
 - 3) goggles that incorporate corrective lenses mounted behind the protective lenses
- Face and eye protection equipment shall be kept clean and in good repair. The use of this type of equipment with structural defects is prohibited.
- Table 1-E (See chart on following page) shall be used as a guide in the selection of face and eye protection for the hazards and operations noted.
- Protectors shall meet the following minimum requirements. They shall:
 - 1) Provide adequate protection against the particular hazard for which they were designed.
 - 2) Fit snugly and shall not unduly interfere with the movements of the wearer.
 - 3) Be durable.
 - 4) Be capable of being disinfected.
 - 5) Be easily cleaned.
- Every protector shall be distinctly marked to facilitate identification only of the manufacturer.
- When the manufacturer indicates limitations or precautions, they shall be transmitted to the user and care taken to see that such limitations and precautions are strictly observed.
- Employees exposed to laser beams shall be furnished with suitable laser safety goggles that will protect for the specific wavelength of the laser and be of optical density adequate for the energy involved.

More information on Eye and Face Protection can be found in the OSHA Regulations 1926 Subpart E.

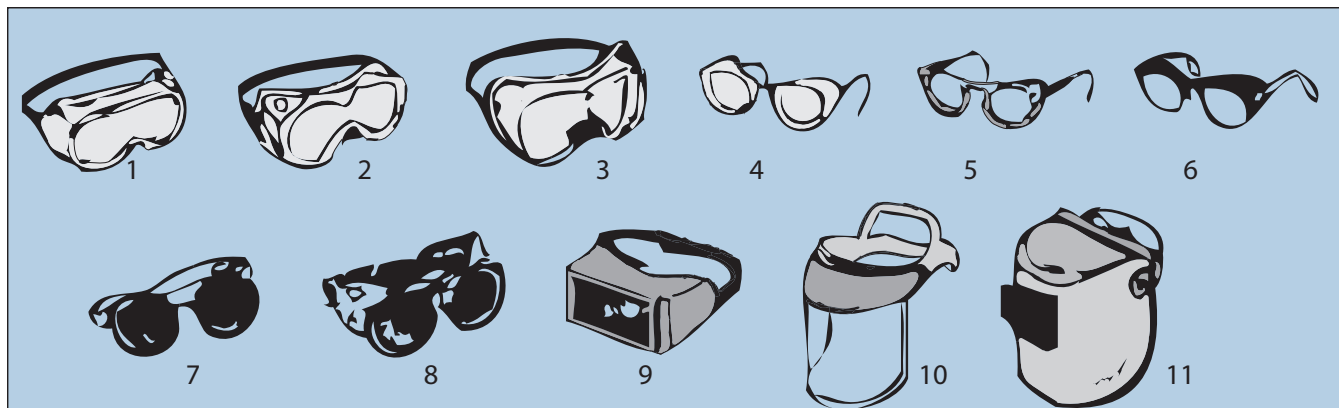
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Eye and Face Safety

(continued)



1. Goggles, flexible fitting - regular ventilation
2. Goggles, flexible fitting - hooded ventilation
3. Goggles, cushioned fitting - rigid body
4. Spectacles, metal frame, with side shields (1)
5. Spectacles, plastic frame - with side shields (1)
6. Spectacles, metal-plastic frame - with side shields (1)
7. Welding goggles, eyecup type - tinted lenses (2)
- 7a. Chipping goggles, eyecup type - clear safety lenses
8. Welding goggles, cover spec type - tinted lenses (2)

- 8a. Chipping goggles, cover spec type - clear safety lenses
9. Welding goggles, cover spec type - tinted plate lens (2)
10. Face shield (available with plastic or mesh window)
11. Welding helmets (2)

Footnote (1) Non-side shield spectacles are available for limited hazard use requiring only frontal protection.

Footnote (2) See Table E-2, in paragraph (b) of this section, Filter Lens Shade Numbers for Protection Against Radiant Energy.

Chart 1926.102 subpart E -- Applications

Operation	Hazards	Recommended protectors
Acetylene-burning Acetylene-cutting Acetylene-welding	Sparks, harmful rays, molten metal, flying particles.....	7, 8, 9
Chemical handling	Splash, acid burns, fumes.....	2, 10 (For severe exposure add 10 over 2)
Chipping.....	Flying particles.....	4, 3, 4, 5, 6, 7A, 8A
Electric (arc) welding.....	Sparks, intense rays, molten metal.....	9, 11, (11 in combination with 4, 5m 6m in tinted lenses advisable)
Furnace operations	Glare, heat, molten metal.....	7, 8, 9 (For severe exposure add 10)
Grinding-light.....	Flying particles.....	1, 3, 4, 5, 6, 10
Grinding-heavy.....	Flying particles.....	1, 6, 7A, 8A (For severe exposure add 10)
Laboratory.....	Chemical splash, glass breakage	2, (10 when in combination with 4, 5, 6)
Machines.....	Flying particles.....	1, 3, 4, 5, 6, 10
Molten metals.....	Heat, glare, sparks, splash.....	7, 8, (10 in combination with 4, 5, 6, in tinted lenses)
Spot-welding.....	Flying particles sparks.	1, 3, 4, 5, 6, 10

Eye and Face Safety

(continued)

TABLE E-2
Filter lens shade numbers for protection against radiant energy

WELDING OPERATION	SHADE NUMBER
Shielded metal-arc welding 1/16, 3/32, 1/8, 5/32 inch diameter electrodes	10
Gas-shielded arc welding (nonferrous) 1/16, 3/32, 1/8, 5/32 inch diameter electrodes	11
Gas-shielded arc welding (ferrous) 1/16, 3/32, 1/8, 5/32 inch diameter electrodes	12
Shielded metal-arc welding 3/16, 7/32, 1/4 inch diameter electrodes	12
5/16, 3/8 inch diameter electrodes	14
Atomic hydrogen welding	10-14
Carbon-arc welding	14
Soldering	2
Torch brazing	3 or 4
Light cutting, up to 1 inch	3 or 4
Medium cutting, 1 inch to 6 inches	4 or 5
Heavy cutting, over 6 inches	5 or 6
Gas welding (light), up to 1/8 inch	4 or 5
Gas welding (medium), 1/8 inch to 1/2 inch	5 or 6
Gas welding (heavy), over 1/2 inch	6 or 8

More information on Eye and Face Protection can be found at:

- OSHA Regulations 1926 Subpart E or
- www.cdc.gov/niosh/topics/eye/
- www.cdc.gov/niosh/topics/eye/toolbox-eye.html



Minnesota Electrical Association

Electrical Toolbox Talks

Fall Protection

29 CFR 1926 Subpart M (Construction)
29 CFR 1910 Subpart D and Subpart I (General Industry)

Each employee on a walking/working surface with an unprotected side or edge 6 ft or more above a lower level shall be protected from falling by the use of a guardrail system, safety net system or personal fall arrest system (PFAS) in construction areas. For general industry, the distance requirement is 4 ft.

In general requirements, all places of employment, passageways, storerooms, service rooms, and walking-working surfaces are kept in a clean, dry (to the extent possible), orderly, and sanitary condition.

Employees on Walking or Working Surfaces Shall be Protected from:

- Falling through holes (including skylights) more than 6 ft (for construction) or 4 ft (for general industry) above lower levels by PFAS, covers, or guardrail systems erected around such holes.
- Tripping or stepping into or through holes (including skylights) by covers or guard rails.
- Objects falling through holes (including skylights) by covers.

Stairways:

Open sides of stairs with 4 or more risers must be provided with a standard stair railing on each open side. The height of the top rail shall be at least 36" above the stair tread, in-line with the face of the riser, at the forward edge of the stair tread. Stairways with both sides enclosed must have a hand rail 30-37" above the stair tread, in-line with the face of the riser, at the forward edge of the tread.

Excavations during Construction:

- Each employee at the edge of an excavation 6 ft or more in depth shall be protected from falling by the use of guardrail systems, fences, or barricades when the excavations are not readily seen because of plant growth or other visual barriers.
- Use of a warning system, such as barricade, stop log, or signals, must be used when mobile equipment is operated near or approaching the edge of an excavation and the operator does not have clear view of the edge.
- Walkways constructed to traverse across an excavation 6 ft or more in depth, must be provided with a standard guard railing on each open side.
- Each employee at the edge of a well, pit, shaft or similar excavation 6 ft or more in depth shall be protected from falling by a guardrail system, fence, barricade or cover.

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Fall Protection

(continued)

Working Above Dangerous Equipment:

- Similar to the above requirements for “Employees on Walking or Working Surfaces,” employees working above dangerous equipment shall be protected from falling into equipment. Guard rails, travel restraint or other appropriate fall protection method can be used.
- See “ladder safety” for separate fall protection requirements

Roofing Operations (Construction):

Employees on steep roofs (more than 4/12 pitch) with unprotected sides and edges 6 ft or more above lower levels shall be protected from falling by a guardrail system with toeboards, safety nets or PFAS. Low-slope roofs (up to 4/12 pitch) can use the same as above in combination with a warning line system or a warning line system and safety monitor.

Roofing Operations (General Industry):

Working on roof tops for installation or repair of equipment are part of 29 CFR 1910.22 and .28. The employer must ensure that the employee has safe access and egress to and from the working surfaces. Any ladders used to gain access must meet the requirements for ladder safety.

Wall Openings:

If working at or near a (wall) opening where the inside bottom edge is less than 39 inches above the walking/working surface and the outside bottom edge exceeds the specified height criteria, it shall be protected from falling by the use of a guardrail system, safety net system or a PFAS.

Protection from Falling Objects:

When an employee is exposed to falling objects, the employer shall have each employee wear a hard hat and shall implement one of the following measures:

- 1) Erect toeboards, screens or a guardrail system to prevent falling objects.
- 2) Erect a canopy to protect from falling objects.
- 3) Barricade the area where the objects could fall and keep employees from entering the area. Keep objects that may fall from higher levels far enough from the edge so those objects will not go over the edge if they are accidentally displaced.

Hoist Areas:

Each employee in a hoist area shall be protected from falling to a lower level by use of a guard rail system, travel restraint system, or personal fall arrest system. When a portion of the guard rail system is removed to facilitate hoisting, and the employee must lean through or over the edge of the access opening, then a personal fall arrest system must be used.

See 1926.500 Fall Protection for more information on various fall protection systems.



Minnesota Electrical Association

Electrical

Toolbox Talks

Fatigue

On the job, as an electrical professional, fatigue and sleepiness are serious problems that can threaten your life. You must be attentive while working around moving equipment, with power tools, or with live power. These can be dangerous. Electricians need to be aware of their surroundings and be thinking clearly to avoid accidents or costly mistakes.

What is the difference between FATIGUE and SLEEPINESS?

- Fatigue is usually a more chronic (long-term) condition than sleepiness. Sleepiness is generally caused by not enough restful sleep, or a lack of stimulation. For sleepiness, the answer is to get more restful sleep.
- Sleepiness can be a symptom or an indicator of a medical condition. Fatigue, especially chronic fatigue, is usually linked to a greater medical problem.

People who suffer from fatigue feel they lack motivation and energy. Even though fatigue and drowsiness are not the same, drowsiness, or the desire to sleep, is a common symptom that accompanies fatigue. Apathy may also accompany fatigue.

Physical Fatigue

Physical fatigue, or muscle fatigue, is the temporary physical inability of a muscle to perform optimally. The onset of muscle fatigue during physical activity is gradual, and depends upon an individual's level of physical fitness, and also upon other factors, such as sleep deprivation and overall health. With physical fatigue - the person's muscles cannot do things as easily as they used to. Climbing stairs or carrying equipment or supplies may be much harder than before. Physical fatigue is also known as muscle weakness, weakness, or lack of strength. Doctors usually carry out a strength test as they go about diagnosing and trying to find out the causes of individual cases of physical fatigue. It can be reversed by rest

Mental (Psychological) Fatigue

- Mental fatigue may be life threatening, especially when the sufferer has to perform some tasks, such as driving a vehicle, operating heavy machinery, or working with live power. When symptoms are severe the sufferer might not want to get out of bed in the morning, or perform his/her daily activities. Mental fatigue often appears together with physical fatigue, but not always. People may feel sleepy or have a decreased level of consciousness, and in some cases show signs similar to that of an intoxicated state. The term sometimes heard is "punch drunk."
- Mental fatigue is a temporary inability to maintain optimal cognitive performance. The onset of mental fatigue during any cognitive activity is gradual, and depends upon an individual's original cognitive ability, and also upon other factors, such as sleep deprivation and overall health. Mental fatigue has also been shown to decrease physical performance.

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- Fatigue is a normal result of working, mental stress, overstimulation and under-stimulation, or lack of sleep. It may also have chemical causes, such as poisoning or mineral or vitamin deficiencies. Chronic blood loss frequently results in fatigue, as do other conditions that cause anemia. Fatigue is a normal response to physical exertion or stress, but can also be a sign of a physical disorder.

Stages of Fatigue

- *Prolonged fatigue* is a self-reported, persistent (constant) fatigue lasting at least one month.
- *Chronic fatigue* is a self-reported fatigue lasting at least six consecutive months. Chronic fatigue may be either persistent or relapsing. Chronic fatigue is a symptom of many diseases and conditions.

Some Causes of Fatigue

- Overweight/obesity is a rapidly growing problem in much of the world today. Obese people are much more likely to experience fatigue, for various reasons - having to carry a lot of weight is tiring, obese people have a higher risk of developing diseases and conditions where fatigue is a common symptom, such as diabetes and sleep apnea. Being underweight may mean there is less muscle strength; the very thin person may tire more easily.
- A certain amount of stress can invigorate us; in fact, most of us need some kind of mental pressure to get going. However, when stress levels become excessive, they can easily cause fatigue. Stress and worry are two emotions that commonly cause tiredness. Stress can reach a point in which the sufferer and is “unable to see the light at the end of the tunnel,” which leads them towards despair.
- Some jobs are more closely linked to a risk of fatigue than others. Examples include the police, doctors, nurses, firefighters, and shift-workers in general whose sleep patterns are “unnatural” for humans. The problem of fatigue is exacerbated if the shift-routines are regularly changed.
- Because disrupted sleep is a significant contributor to fatigue, a diagnostic evaluation considers the quality of sleep, the emotional state of the person, sleep pattern, and stress level. The amount of sleep, the hours that are set aside for sleep and the number of times that a person awakens during the night are important. A sleep study may be ordered to rule out a sleep disorder.

What you can do yourself to overcome persistent fatigue?

- Try to go to bed and wake up at the same time each day.
- Set your bedroom’s temperature at a comfortable level. It must neither be too cold nor too hot.
- Do not have your last meal less than two hours before you go to bed.
- As bedtime approaches, physically and mentally slow down. Have a warm bath and listen to some soothing music. Clear your mind of stressful and worrying thoughts.
- If you eat three regular meals each day, eat at the same time each day, and follow a well-balanced diet, your overall health will improve and so will your sleep patterns.
- If you are underweight, add more calories to your diet, but make sure you make a healthy choice.
- If you are overweight/ obese, follow a well-balanced diet and aim for a healthy body weight.
- Do not crash-diet. Your sleep may be affected.
- Drink in moderation, or not at all, alcoholic and caffeinated beverages
- Scientists from Hull York Medical School, England, found that patients with Chronic Fatigue Syndrome who ate dark chocolate, i.e., high cocoa content and no milk chocolate - had considerably reduced symptoms of fatigue. Not too much chocolate.
- Remember that fatigue-physical inactivity-fatigue is a vicious cycle. If you are unfit you are more likely to feel tired. Break that cycle. It is important that any physical activity is done properly and gradually. Regular exercisers sleep better and suffer much less from fatigue than other people.

Seek medical help if fatigue has not subsided.



Minnesota Electrical Association

Electrical

Toolbox Talks

Fire / Fire Extinguisher Safety

Prevention is the best defense against fire.

Housekeeping

1. Employees will keep their areas clutter-free and will dispose of flammable materials safely and promptly.
2. Employees will store all flammable materials safely in appropriate containers and used with extreme care. If there is a dangerous spill or fumes, employees will get help and call in a professional immediately.

Emergency Procedures

1. In case of a fire too large to extinguish by a handheld fire extinguisher, employees will:
 - Stay calm.
 - Alert all of the other employees to leave the building immediately.
 - All employees will immediately leave the building. The key danger is suffocation, so you must leave immediately.
 - Be aware of smoke and poisonous fumes. If there is a lot of smoke, drop to the floor and crawl out as fast as possible. Once outside, get away from the smoke and fumes from the building immediately.
 - Immediately go to the nearest phone in a safe location and call 911.
2. If the fire is of a small enough size to be put out by a fire extinguisher, immediate use of the fire extinguishers will be employed by the worker(s). Employee will hold the extinguisher in an upright position, pull the pin, and aim at the base (source) of the fire from about ten feet away.

Extinguishers

1. Employer will provide a fire extinguisher, rated not less than 2A, 20-pound BC, will be provided for each 3,000 square feet of the building or major fraction thereof. Travel distance to the nearest fire extinguisher will not exceed 100 feet.
2. One or more fire extinguishers will be provided by the employer for each floor. In multi-story buildings, at least one fire extinguisher will be posted adjacent to the stairway.

Fire / Fire Extinguisher Safety

(continued)

3. Fire extinguishers will be conspicuously located by employer and readily accessible at all times.
4. Employer will periodically inspect fire extinguishers (at least once a year) and make sure that they are maintained in operating condition.
5. Carbon tetrachloride and other toxic vaporizing liquid fire extinguishers are prohibited by employer.

Notes:

Each fire extinguisher is considered professional equipment. Its effectiveness in protecting property depends on knowing what it can and cannot do, how to use it, where to install it, how to maintain it, knowledge of classes or types of fires, what classes of fire the extinguisher is capable of extinguishing.

The classes of fires are as follows:

- Class A: Fires in ordinary combustible materials
- Class B: Fires in flammable liquids, gases, and greases
- Class C: Fires that involve energized electrical equipment
- Class D: Fires in combustible materials

For additional safety information, see OSHA CFR 1910.38 and 29 CFR 1910.157, check manufacturer's guidelines for additional safety information, contact a competent professional or contact the OSHA Consultation office.

These rules are samples only. Each employee is responsible for working with his/her employees to write rules that meet the specific needs of their individual company and type of work. Each employer is responsible for assessing the accuracy of their rules and keeping them up to date. OSHA requires a minimum of an update and employee re-training annually.



Minnesota Electrical Association

Electrical Toolbox Talks

Foot Protection

- Safety-toe footwear for employees shall meet the requirements and specifications in American National Standard (ANSI) for Safety-Toe Footwear.
- Clearly legible letters and numbers identify protective footwear that is certified to meet the ANSI standard. It shall be enclosed in a border and placed on the inside surface of either the tongue, gusset, inside shaft or quarter lining of the footwear. Check to see that your footwear has been certified.
- Safety footwear is available for several types of workplace hazards:
 - 1) Metatarsal impact and compression safety--foot and toes could be injured by falling objects or rolled over by equipment.
 - 2) Heat and cold--depending upon the working conditions, insulated or ventilated footwear may be required.
 - 3) Puncture--sharp objects can break through the sole of the footwear.
 - 4) Slips and falls--slip resistant soles are available for conditions that may include water, oil or other slippery conditions.
 - 5) Damp working conditions--can cause fungal infections and discomfort.

It is important to use the proper foot protection for your type of working environment. Here are a few examples: Conductive footwear, electrical hazard footwear, sole puncture resistant footwear, static dissipative footwear and extreme weather footwear.



Steel toecaps and stainless steel inner soles for puncture resistant safety.

More information on Foot Protection can be found in the OSHA Regulations 1926 Subpart D and American National Standard for Personal Protection--Protective Footwear.



Minnesota Electrical Association

Electrical Toolbox Talks

Fork Lift Drivers

The average fork lift weighs twice as much as a car. With a weight of 6,000 pounds and a capacity load of 16,000-pound load, tremendous damage can occur should a collision occur with a person or an object.

1. Employer requires all drivers to attend training.
2. Employer provides specific safety training for employees who work around fork lifts.
3. Only authorized employees who are fully trained and tested can drive fork lifts. Authorized employees must know:
 - safe and defensive driving rules
 - safety inspections
 - understand the correct uses of the equipment
 - how to maintain, clean, and secure the equipment
4. Drivers must comply with the following rules for operating fork lifts:
 - Drive defensively.
 - Watch for overhead obstructions when lifting a load or when moving a load.
 - Keep to the right, signal turns, and obey all speed limits.
 - Cross railroad tracks at an angle other than a right angle.
 - Slow down at all intersections, and honk at blind intersections.
 - When parking, make sure you are in a safe place where people will not need to move the lift or run into it accidentally. Make sure the forks are lowered, set the brakes, put it in neutral, shut the power off, and remove the key or plug. Never park on an incline, but if you must, then block the wheels carefully.
 - Stay alert, never move with a load blocking your view, and always know the direction of your forks. Avoid oil and grease spots. Avoid edges on loading docks.
 - Pedestrians always have the right-of-way.
 - Keep a buffer space of three vehicle lengths between you and other vehicles.
 - No horse play. Never pass another vehicle in narrow aisles. Never race lifts. Travel slowly and do not make sudden turns. Fork lifts will tip if sudden turns are made at high speeds. Fork lifts are extremely dangerous when they tip.
 - Riders, towing, or pushing are not allowed.
 - Keep arms and legs inside the fork lift at all times.

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Fork Lift Drivers

(continued)

- Wear personal protective equipment when required such as restraining belts.
- When going from bright areas to dim areas, give your eyes time to adjust so you can see clearly before driving.
- Always set the brake and block the wheels of any lift or vehicle being loaded or unloaded.
- Always be sure you stop completely before raising or lowering a load. Never travel with a load raised high. Never travel with unloaded forks more than six inches off of the floor.
- Make sure the load is balanced securely on the forks. When lifting pallets, make sure the fork lifts are all the way in and tilt the mast back for stability before moving. Do not move loads on broken pallets.
- Know the weight limits of your vehicle, and never lift loads heavier than the capacity of the lift or loads that are not well balanced.
- When unloading, tilt the mast forward slightly.
- When driving on an incline, drive forward up the ramp and use reverse gear when driving down the ramp. This will avoid tipping forward.
- Only do the maintenance and repair work you are trained and authorized to do.
- Check your vehicle before using, and do not drive if anything malfunctions.
- Make sure your break pedal holds the lift solidly and does not slip under pressure.
- Make sure your emergency, parking and/or seat brake are working properly and will hold. Check the clutch.
- With the engine running:
 - Make sure your steering wheel doesn't feel loose or squeal and that the wheel turns properly both ways to its stops.
 - Check to make sure the hour meter, head, tail and warning lights are all operating.
 - Make sure the fork pins are in place.
 - Check cowling and body parts looking for anything that is loose, broken, or worn including tires for amount of wear.
 - Check the oil pressure gauge, water temperature, ammeter, horn, air cleaner, fan belt, hydraulic fluid level, battery water, fuel, oil level, radiator water, hydraulic controls, and other controls.
 - Check the hour meter, record it, and report the need for maintenance when it's time.
 - If anything is not right, do not drive the vehicle. Report it to maintenance immediately.

Notes:

For more information see OSHA 29 CFR 1910.178, manufacturer's guidelines, a competent safety professional or the OSHA Consulting office.

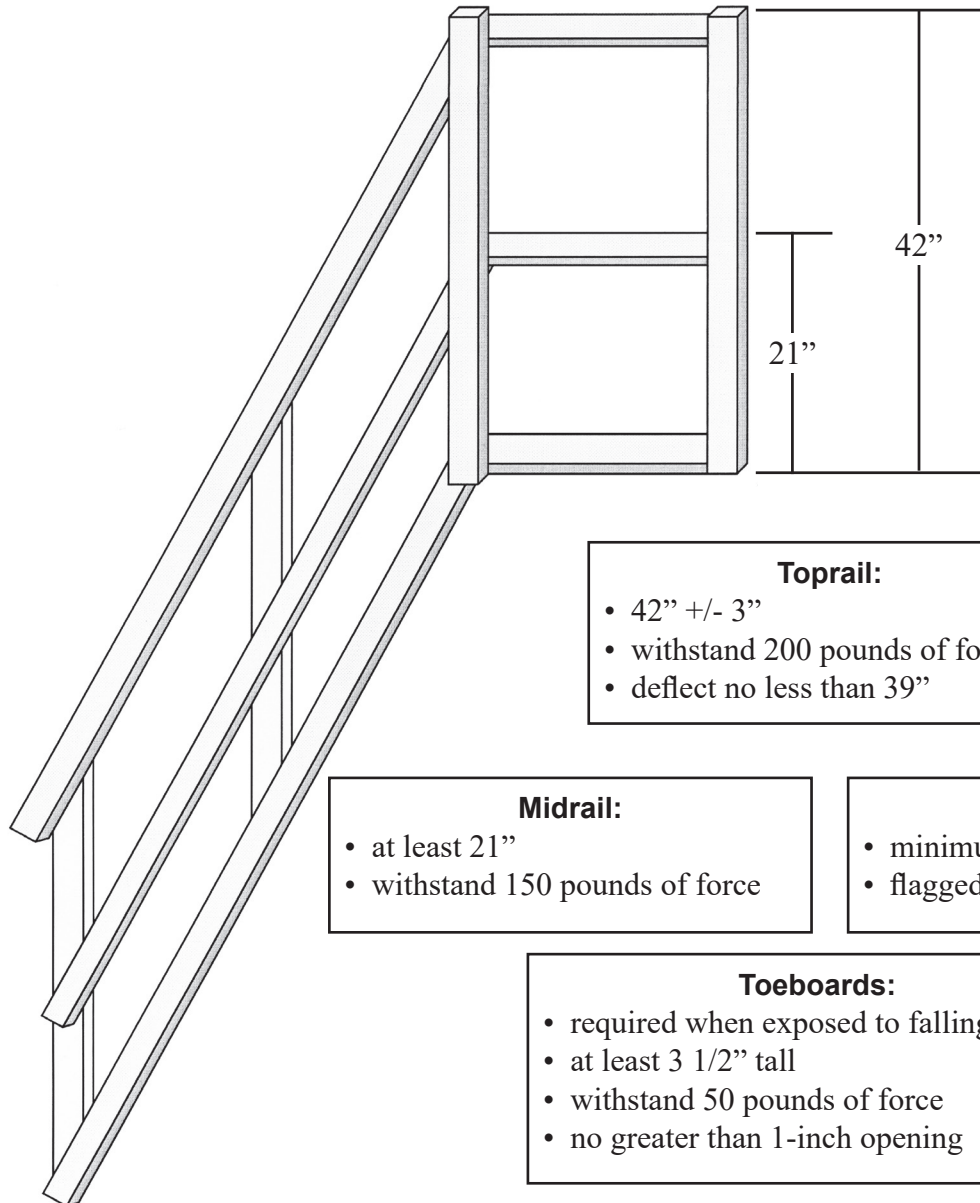
These rules are samples only. Each employee is responsible for working with his/her employees to write rules that meet the specific needs of their individual company and type of work. Each employer is responsible for assessing the accuracy of their rules and keeping them up to date. OSHA requires a minimum of an update and employee re-training annually.



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Guardrail Requirements



Notes: For more information, see 29 CFR 1926.502 (b) and (j)

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Toolbox Talks

Hand Safety

1. Employer shall look at each job and the job site to determine possible hazards to the hands that could cause injuries such as burns, cuts, electrical shock, absorption of chemicals, pinching, crushing, cold, amputation, vibration, repetitive motion, and the like.
2. Each employee shall immediately tell their supervisor of any hazard (not already covered in the training for that particular job or job site) that could cause injury to any worker on the job site.
3. Employer will study the work activities of the employees to determine the degree of dexterity required, the duration, frequency, and degree of exposure to hazards and the physical stresses that will be applied.
4. Each employee shall immediately tell their supervisor of any physical stress (as described in rule 3) they or any other employee is experiencing as it arises.
5. Employer shall determine what hand protection employees need and train employees in proper use.

Before purchasing gloves, employer shall request documentation from the manufacturer that the gloves meet the appropriate test standards for the hazards anticipated.

6. Employees will use hand protection in accordance with the employer's and manufacturer's training instructions. Employees will remind co-workers to do the same and will notify a supervisor immediately if a co-worker is endangering themselves by not using protective equipment properly.
7. Employees shall turn rubber gloves in for testing every six months or when the routine daily inspection turns up any evidence that the protective effectiveness of the gloves has been reduced by a hole, tear, or the like.
8. Employer and each employee shall make sure all tools are well maintained and the safety guards are in place before using them.
9. Employees may use only those tools and machines that they have been properly trained to use.
10. Based on company training and common sense, the employee will determine the proper protective equipment and proceed with the project only after reviewing the work involved thoroughly with the supervisor. Employees will obtain the personal protective equipment from the supervisor only.

Hand Safety

(continued)

11. Employees/all workers will prevent hand injuries by always doing the following:
- Use the appropriate protective gloves whenever necessary to protect against cold, sharp objects, heat, chemicals, electricity, tools and machinery with rotating or moving parts, grinders, drills, lathes, milling machines and other hazards.
 - Always remove watches, rings, bracelets, other jewelry and loose fitting clothing before starting work.
 - Use tools and equipment ONLY for the jobs they were designed for.
 - Keep your work place clean and organized and your equipment and tools well maintained.
 - Follow OSHA CFR 1910 guidelines relating to hand safety for specific rules applications.

Notes:

The following is a list of basic first-aid procedures for various types of hand injuries:

1. Bleeding: Control bleeding by gently applying direct pressure with a dry, sterile dressing. Always wear latex gloves or use other methods to protect against transmission of infection from the person's blood. Do not remove any impaled object. Immobilize the object instead. Seek medical attention immediately.
2. Fractures: Avoid moving the injured hand if at all possible. Check for symptoms such as swelling, deformity, pain, tenderness, and loss of use. Control bleeding but don't attempt to push any protruding bones back under the skin. Seek medical attention immediately.
3. Amputations: Control bleeding by applying direct pressure and elevating extremity. Always wear latex gloves or use other methods to protect against transmission of infection from the person's blood. Recover and clean amputated body part by rinsing with water. Wrap amputated body part with sterile gauze or dry, clean cloth, put in a water-proof container such as a plastic bag and place on a bed of ice. Transport to hospital with victim. Seek medical attention immediately.

Rubber protective equipment for electrical workers must conform to the requirements established in ANSI as specified in the following list:

- Rubber insulating gloves J6.6-1967
- Rubber matting for use around electrical apparatus..... J6.7-1935 (R 1962)
- Rubber insulating blankets J6.4-1970
- Rubber insulating hoods J6.2-1950 (R 1962)
- Rubber insulating line hose J6.1-1950 (R 1962)
- Rubber insulating sleeves..... J6.5-1962

For additional safety information, check the manufacturer guidelines, contact a competent professional or the OSHA Consultation office.

These rules are samples only. Each employer is responsible for working with his/her employees to write rules that meet the specific needs of their individual company and type of work. Each employer is also responsible for assessing the accuracy of their rules and keeping them up to date. OSHA requires a minimum of an update and employee re-training annually.



Minnesota Electrical Association

Electrical Toolbox Talks

Head Protection

- Employees working in areas where there is a danger of injury from impact, falling objects, flying objects or electrical shock and burns shall be protected by using a protective helmet.
- Helmets used for protection against impact and penetration of falling objects shall meet the specifications contained in American National Standards Institute (ANSI), Z89.1-1969, Safety Requirements for Industrial Head Protection.
- Helmets used for protection against high voltage electrical shock and burns shall meet the specifications contained in American National Standards Institute, Z89.2-1971.



Figure 1. Class A Hard Hat

The proper class of hard hat should be selected and worn for each type of hazard.

- Class A hard hats are used for general service such as construction. They offer good impact protection but limited voltage protection.
- Class B hard hats are designed for electrical and utility work. They offer protection from falling objects as well as high voltage shocks and burns.
- Class C hard hats are designed for comfort and offer limited protection. They protect from bumping against fixed objects, but do not protect against falling objects or electric shock.

Hard hats protect you by providing the following features:

- A rigid shell that resists and deflects blows to the head.
- A suspension system inside the hat that acts as a shock absorber.
- Some hats serve as an insulator against electrical shocks.
- Shields your scalp, face, neck, and shoulders against splashes, spills, and drips.
- Some hard hats can be modified so you can add face shields, goggles, hoods, or hearing protection to them.

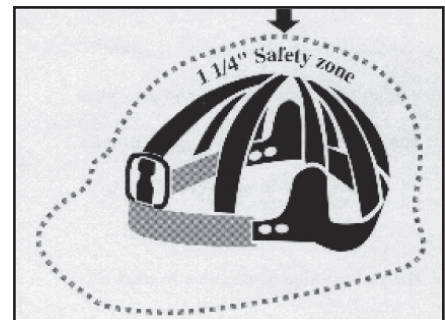


Figure 2. Hard Hat

More information on Head Protection can be found in the OSHA Regulations 1910.132, General Requirements Section.



Minnesota Electrical Association

Electrical Toolbox Talks

Hearing Safety

- Wherever it is not feasible to reduce the noise levels or duration of exposures to those specified in the table below, Permissible Noise Exposures in 1926.52, protective hearing devices should be provided and used.
- Ear protective devices inserted in the ear shall be fitted or determined individually by competent persons.
- Plain cotton is not an acceptable protective device.
- Protection against the effects of noise exposure shall be provided when the sound exceeds those shown in the table when measured on the A-scale of a standard sound level meter at slow response.
- When employees are subjected to sound levels exceeding those listed in the table, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of the table, personal protective equipment as required in Subpart E shall be provided and used to reduce sound levels within the levels of the table.
- If the variations in noise level involve maxima at intervals of 1 second or less, it is to be considered continuous.
- In all cases where the sound levels exceed the values shown, a continuing, effective hearing conservation program shall be administered.



Permissible Noise Exposures

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

More information on Hearing Safety can be found in the OSHA Regulations 1926 Subpart K and Subpart D.



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Heat Stress

Your body produces heat as part of its internal chemical processes. If your body is working in a hot environment, it may not be able to shed excess heat through exhalation (breathing) and evaporation (sweating). Emergencies due to excessive heat (hyperthermia) are often seen in people who exercise outside, work outside, or work indoors in poorly ventilated environments during peak hot periods in the summer. If the humidity is high, the evaporation process can slow even more. Keep in mind heat-related emergencies could result from both dry heat, when humidity is low, and days when the humidity level is elevated. (See the heat condition chart on the next page.) In addition, this chart may be copied and given to your employees to use as a guide.

NOAA's National Weather Service

Heat Index

Temperature (°F)

	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

- Caution
- Extreme Caution
- Danger
- Extreme Danger

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Heat Stress

(continued)

Heat cramps, heat exhaustion, and heat stroke are three heat-related emergencies.

HEAT CRAMPS - Signs, Symptoms, and Treatment

- This person perspires heavily and may have been drinking fluids throughout the day. As you sweat, your body loses water and salt. The water is usually replenished, but loss of salt can cause cramping. Cramps can develop in the legs, arms, and abdomen. Other signs are dizziness and fainting.
- Move person to a cool place and administer fluids with electrolytes. If the cramping does not subside, or if the person becomes worse or you feel the person needs further care, contact emergency personnel.

HEAT EXHAUSTION - Signs, Symptoms, and Treatment

- This person has been working or playing in a hot environment and has been exposed to excessive heat. The body has lost water and salt. The outside temperature and humidity is making it difficult for the body to cool itself. Results may include shallow breathing, cold clammy skin, dizziness, weakness, heavy perspiration, and possibly unconsciousness.
- Administer fluids with electrolytes if they are conscious, move person to a cool place and contact emergency personnel if the person does not improve quickly or you feel the person needs further care.

HEAT STROKE - Signs, Symptoms, and Treatment

- **THIS IS AN EMERGENCY!** This is the next stage after heat exhaustion. A person's body is not able to rid itself of excessive heat and the body actually stops sweating. This person may have one or more of the following symptoms: deep breathing, shallow breathing, red skin, a strong or rapid pulse, dilated pupils, seizures and unconsciousness. Emergency personnel should be contacted immediately! Try to cool the person and wait for emergency personnel.

Consult your Right to Know written program or Minnesota OSHA for further information on this topic.

Heat Stress

(continued)

Heat Condition Chart

Heat condition may be reported as:

- Category: 0,1,2,3,4,5
- Wet bulb globe temperature (WBGT)

Use heat condition information to determine required water intake and work/rest cycles. (The gray row shows the current condition.)

Heat Category	WBGT Index (°F)	Easy Work/Rest (Minutes)	Water Intake/Hr (Qts)	Moderate Work/Rest (minutes)	Water Intake/Hr (Qts)	Hard Work/Rest (minutes)	Water Intake/Hr (Qts)
0	<78°	NL	N/A	NL	N/A	NL	N/A
1	78-81.9°	NL	1/2	NL	3/4	40/20	3/4
2	82-84.9°	NL	1/2	50/10	3/4	30/30	1
3	85-87.9°	NL	3/4	40/20	3/4	30/30	1
4	88-89.9°	NL	3/4	30/30	3/4	20/40	1
5	>90°	50/10	1	20/40	1	10/50	1

N/A: Not applicable

NL: No limit

To help protect yourself from heat illness:

- Try to work in the shade so that you are not exposed to direct sunlight.
- Drink plenty of fluids. Avoid beverages that contain caffeine or alcohol. Drink fluids that will replace your electrolytes- like sport drinks
- Drink often and before you are thirsty.
- If you go for long periods before you need to urinate, you're probably not drinking enough.
- Wear lightweight, light colored clothing that breathes or will wick perspiration away.
- Modify work schedules to work in cooler parts of the day.
- If working in unconditioned space, take frequent breaks to rehydrate.

IF THE WORKER IS NOT ALERT or is confused, call 911 immediately and inform them that it might be heat stroke.

Resources: www.osha.gov/Publications/osha3154.pdf



Minnesota Electrical Association

Electrical Toolbox Talks

High-Visibility Vest Requirements

There are two different types of work that require the use of high-visibility garments on Minnesota job-sites: (1) working around earth moving equipment and (2) working on or near the road where vehicle traffic is present.

Earth Moving Equipment Exposure

A high-visibility Class 2 garment is required as of January 1, 2002, as specified by ANSI/ISEA Standard 107-1999. These vests feature more high-visibility taping and a solid fabric in place of mesh.

Earth moving equipment includes bulldozers, motor graders, scrapers, loaders, skid-steer loaders, compaction equipment, backhoes, end dumps, side dumps, and dump trucks.

Employees and equipment operators must be informed of unsafe or hazardous conditions such as overhead or underground utilities prior to starting work.

Safe work procedures on how to approach equipment should be understood by everyone. There are blind spots on various types of equipment. Stay out of these areas to avoid being struck by equipment.

Equipment operators should follow all known safety procedures when traveling, backing, parking, loading for transport, etc.

Roadside Work

Where exposed to passing vehicle traffic, workers on or near roadways will have a minimum requirement of Class 2 garments along with more stringent requirements based on volume, speed, daytime vs. nighttime activities, and protection levels from channeling devices. Contact your governing road authority for specific requirements on each roadside project. Phone numbers for governing road authorities are found in the Field Manual described below.

Note that all flaggers must be provided with special training and a copy of the flaggers handbook, Uniform Traffic Code, Section 6, which is called the *Field Manual* by most users.

Copies of the Field Manual are available by calling (651) 296-2216, or obtain the order form online at www.dot.state.mn.us.

Version 2019



A vest is required for this employee who is in close proximity to the bobcat operator.



This is not a Class 2 high-visibility best. There is not enough retro-reflective taping.

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Electrical Toolbox Talks

Injuries and Emergency Situations

1. Employer will post local emergency numbers near the phone at each job site.

Medical facilities near the main office are: _____

Phone: _____

Contact: _____

Ambulance: _____ Phone: _____

2. Employees must report all injuries **IMMEDIATELY** to the job supervisor. The supervisor is then responsible to report the injury to the office and to complete appropriate forms. Employer must report to OSHA within 8 hours of occurrence.* (*As of January 1, 2015, requirement for reporting all fatal accidents and all accidents involving 3 or more people be reported to OSHA within 8 hours of incident; all accidents that result in patient hospitalization, amputations, or loss of an eye must be reported to OSHA with 24 hours of incident.)
3. If job site is more than 3-4 minutes from an appropriate medical facility, employer will make sure one person on each crew will be trained in first aid. The courts have ruled on some aspects of OSHA's first-aid requirements: the requirement that there be a clinic, infirmary, or hospital in "near proximity" has been interpreted to include a response by a competent emergency assistance. However, whether the person is taken to aid, or aid comes to the person, the courts have held that a response time of 3-4 minutes is necessary for suffocation, severe bleeding, or other life-threatening injury or illness. Where the injury is not life threatening, a 15-minute response time is acceptable.

The names of trained first-aid people are:

4. Employees working alone on a job site, will do one of the following:
 - Carry a cellular phone at all times.
 - Call in every two hours to let the office know they are safe.

5. Employer will make sure first-aid kits are located in each company vehicle and in the main office. OSHA also requires that first aid supplies be sanitary and readily available for use by the trained personnel. If people are working with CHEMICALS or the potential for burns exists, then safety showers and eye baths are required near the areas of potential exposure. Everyone in the work area should be trained to use, or assist with, the emergency shower or eye bath. They should also be aware of the need for periodic testing of the equipment and the need to maintain clear access.

First-aid kits can be found in this location:

Minnesota's AWAIR program has specific requirements for safety on the job.

Basic First Aid

Bloody Nose

What to do immediately:

Lean slightly forward and pinch your nose just below the bridge, where the cartilage and the bone come together. Maintain the pressure for 5-15 minutes. Press an ice pack against the bridge.

What not to do:

Tilt your head back. You could swallow blood, and potentially some could go in your lungs.

An Object in the Eye:

Anything that gets in your eye, whether it's a speck of sand or a chemical, can cause pain and could damage the cornea.

What to do immediately:

Try to dislodge a small particle by blinking several times. If it's not budging, rinse the eye by holding the lid open under a running tap (if possible, remove contact lenses first).

What not to do:

Never rub your eyes. Even a tiny piece of dirt can scratch the cornea and cause an infection. Never try to remove an object that's deeply embedded—leave that to the professionals.

A Sprain:

Sprains occur when the ligaments surrounding a joint are pulled beyond their normal range. Sprains are often accompanied by bruising and swelling.

What to do immediately:

Alternately apply and remove ice every 20 minutes throughout the first day. Wrapping the joint with an elastic compression bandage and elevating the limb may also help. Stay off the injury for at least 24 hours. After that, apply heat to promote blood flow to the area.

What not to do:

Work through the pain

Injuries and Emergency Situations

(continued)

Burns

First-degree burns produce redness; second-degree burns cause blisters; third-degree burns result in broken or blackened skin.

What to do immediately: Place the burn under cool running water, submerge it in a bath, or apply wet towels. Loosely bandage a first- or second-degree burn for protection.

What not to do: Put an ice pack on major burns. Ice can damage the skin and worsen the injury. Don't pop blisters. Don't apply an antibiotic or butter to burns; doing so can breed infection.

A Blow to the Head

The skull is very protective, so hitting it rarely results in injuries to the skull itself. But if the force is great, the neck, the back, and soft tissues inside the head can be injured.

What to do immediately: If the person is unconscious, call 911. If the struck area is bleeding, treat it as you would any other cut, but follow up with your doctor, as there may be internal injuries. Icing a small bump can help reduce the swelling.

What not to do: Leave the victim alone, especially when he's sleeping. You should wake him up every three to four hours and have him answer simple questions to make sure there's no brain injury, such as a concussion.

Choking

True choking is rare. When a person is really choking, he can't cough strongly, speak, or breathe, and his face may turn red or blue.

What to do immediately: Call 911. For a victim age one or older: Have the person lean forward and, using the palm of your hand, strike his back between the shoulder blades five times. If that doesn't work, stand behind the victim, place one fist above the belly button, cup the fist with your other hand, and push in and up toward the ribs five times, as in the Heimlich. If you're alone: Press your abdomen against something firm, like a kitchen counter, or use your hands.

What not to do: Give water or anything else to someone who is coughing.

Poisoning

Potential household hazards include cleaning supplies, carbon monoxide, and pesticides. Bites and stings can also be poisonous to some people.

What to do immediately: If a person is unconscious or having trouble breathing, calls 911. In other cases, call the Poison Control Centers' national hotline (800-222-1222). Be prepared to tell what substance was involved, how much was taken and when, and the age and the weight of the victim.

What not to do: Wait until symptoms appear before calling for help. Do not give ipecac syrup or try to induce vomiting. The poison could cause additional damage when it comes back up. The victim shouldn't eat or drink anything, unless the hotline operator tells you otherwise.

An Open Wound

Breaks in the skin that bleed (such as a cut, a scrape, or a puncture) need to be treated promptly to avoid infection.

What to do immediately: Place a piece of sterile gauze (or a clean cloth) on the injury and apply direct pressure to stop the bleeding. For minor cuts and scrapes, wash with soap and water; follow with a thin layer of Vaseline or an antibiotic ointment and cover with a bandage.

What not to do: Wash or apply ointment to a wound that's large, deep, or profusely bleeding. Instead, seek medical help. If there's an object protruding from the injury, don't try to remove it.

Broken Bones or Fractures

There are several types of injury that affect extremities (arms and legs): broken bones (fractures), dislocations, sprains and strains. Persistent pain and swelling following an injury warrants a trip to the doctor. All extremity injuries need to be treated as broken bones until an X-ray can be obtained.

What to do immediately: If the foot or hand at the end of the injured extremity is cold or blue, call 911 immediately. Stabilize the extremity. Use padding to keep it immobile. Specific broken bones need specific treatment.

What not to do: Do NOT straighten the extremity if it is deformed--keep it in the position found



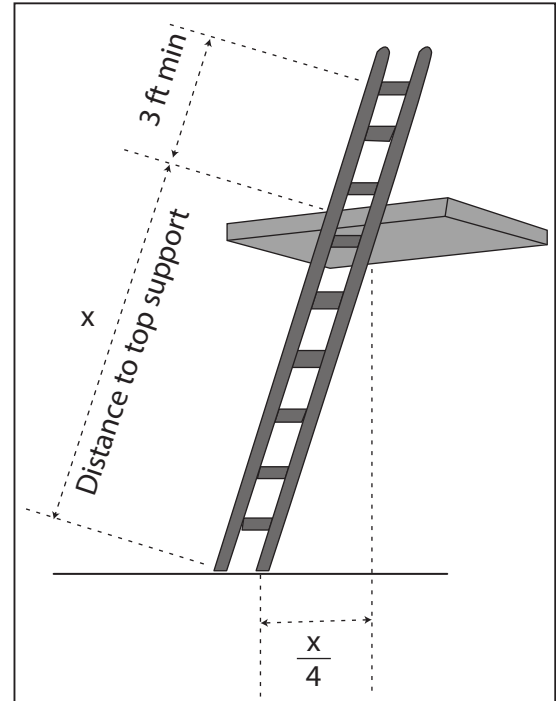
Minnesota Electrical Association

Electrical Toolbox Talks

Ladder Safety

Most ladder accidents occur from improper selection or use which results in over-reaching, tipping, and falls. Here are some guidelines for preventing ladder accidents on the jobsite.

- Ladders must be used on stable and level surfaces unless secured to prevent accidental movement. Also, ladders must not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental movement. Slip-resistant feet should not be used as a substitute for the care in placing, lashing, or holding a ladder upon slippery surfaces.
- Ladders should not be loaded beyond the manufacturer's rated capacity. Look at the labeling on the ladder to identify its rated capacity.
- Ladders placed in areas such as passageways, doorways, or driveways, or where they can be displaced by workplace activities or traffic must be secured to prevent accidental movement, or a barricade must be used to keep traffic or activities away from the ladder.
- Ladders must not be moved, shifted (walked), or extended when being used by an employee.
- Use nonconductive side rails if a worker or the ladder could contact exposed energized electrical equipment. Stay 10 feet from power lines unless you're qualified to be closer.
- When ascending or descending any ladder, you must face the ladder.
- You must use at least one hand to grasp the ladder when climbing. This rule requires you to maintain three points of contact at all times when ascending or descending.
- A worker on a ladder must not carry any object or load that could cause him/her to lose balance and fall. Use a hand line to raise and lower loads.
- Portable ladders with structural defects such as broken or missing rungs, cleats or steps, or broken or split rails, corroded components, or other faulty or defective components must be taken out of service.



www.osha.gov

Ladder Safety

(continued)

Extension Ladders

- When extension ladders are used for access to an upper landing surface, the side rails must extend at least 3 ft (0.9 m) above the upper landing surface. When such an extension is not possible, the ladder must be secured and a grasping device such as a grab rail must be provided to assist workers in mounting and dismounting the ladder.
- OSHA does not allow the top 3 rungs on an extension ladder to be used as steps.
- Extension ladders must be used at an angle where the horizontal distance from the top support to the foot of the ladder is approximately one-quarter of the working length of the ladder (20 ft up means 5 ft out). Some ladders have a special sticker on the side rail to help ensure that you have set up the ladder at the proper angle.
- The top of a non-self-supporting ladder must be placed with two rails supported equally unless it is equipped with a single-support attachment.



Slip-resistant feet

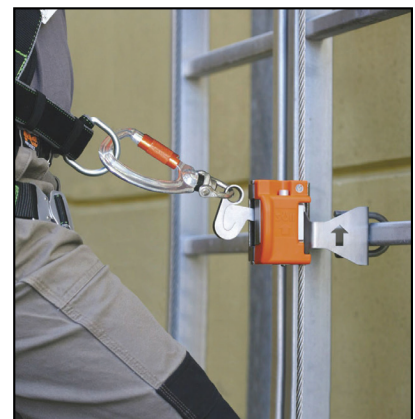
Portable Step Ladders

- The top plate and first rung down on a stepladder must not be used as a step according to OSHA rules. This is because the ladder becomes especially unstable at the very top of the ladder.
- Cross bracing on the rear section of stepladders must not be used for climbing unless the ladders are designed for it and are provided with steps for climbing on both front and rear sections.
- Spreaders must be fully extended before use.

Permanent (fixed) ladders (OSHA 1926.1053)

If the fixed ladder is 24 ft or more, ladder safety devices, and related support systems, shall conform to all the following:

- They shall be capable of withstanding without failure a drop test consisting of an 18" drop of a 500-pound weight;
- They shall permit the employee using the device to ascend or descend without continually having to hold, push or pull any part of the device, leaving both hands free for climbing;
- They shall be activated within 2 ft after a fall occurs, and limit the descending velocity of an employee to 7 ft/sec. or less;
- The connection between the carrier or lifeline and the point of attachment to the body belt or harness shall not exceed 9" in length.



Fall Restraint

More information on ladder safety can be found online at www.osha.gov.



Minnesota Electrical Association

Electrical Toolbox Talks

Liquefied Petroleum Gas

Source:

used to provide fuel to heat

Hazards:

- fire
- carbon monoxide

Valves:

- working pressure at least 250 p.s.i.g.
- shut off valves close to the container
- must be firmly attached

Hoses:

- no aluminum piping
- working pressure at least 250 p.s.i.g.
- should be as short as practical

Storage:

- level surface
- secured and upright
- heater at least 6 feet away from tanks
- blowers not directed within 20 feet

**Storage Outside Building:**

Quantity	Distance from Building
500 lbs. or less	0 ft.
501-6000 lbs.	10 ft.
6001-10,000 lbs.	20 ft.
over 10,001 lbs.	25 ft.

Fire Protection:

storage locations shall be provided with at least one fire extinguisher with a 20 B:C rating

Storage of LPG within buildings is prohibited!

See CFR 1926.153 Subpart F for more information.
Courtesy ES&H, Inc. - www.eshinc.com



Minnesota Electrical Association

Electrical Toolbox Talks

Lockout/Tagout

Practical tips for Lockout/Tagout

- Lockout the panels during remodeling/renovation work. Many contractors fail to perform this important task beyond “flipping the switch.”
- Lockout switches or breakers when installing new fixtures on an existing circuit.
- 1926.405z(j)(1)(I) Live parts - Fixtures, lamp holders, lamps, rosettes, and receptacles shall have no live parts normally exposed to employee contact.
- 416(a)(1) No employer shall permit an employee to work in such proximity to any power circuit in any part of an electric power circuit that the employee could contact in the course of work, unless the employee is protected against electric shock by de-energizing the circuit and grounding it or by guarding it effectively or by other means.
- During service work, live electrical circuits should be de-energized before the employee works on or near them, unless the employer/employee can demonstrate that de-energizing introduces additional, or increased hazards or is not feasible due to equipment design or operational limitations.
- 1926.417(a) Controls that are to be deactivated during the course of work on energized or de-energized equipment or circuits shall be tagged.
- 1926.417(b) Equipment or circuits that are de-energized shall be rendered inoperative and shall have tags attached at all points where such equipment or circuits can be energized.
- 1926.417(c) Tags shall be placed to identify plainly the equipment or circuits being worked on.
- Magnetic covers over open panels can only be used if a certified electrician is on the same floor and in close proximity.
- Electricians are encouraged to take the time to find the main disconnect if not readily apparent in order to achieve lockout/tagout.



More information on Lockout/Tagout can be found in the OSHA Regulations 1926 Subpart K.



Minnesota Electrical Association

Electrical

Toolbox Talks

Power Tools and Equipment Safety

1. Employer will survey each job for hazards and tools needed. Employer will make sure:
 - a. employees are trained in job site hazards,
 - b. employees are trained in the proper use, hazards, and safety precautions to use with all tools, and
 - c. tools and equipment are in safe condition for use.

Employees are responsible for:

- a. following training and safety precautions when using tools, and
 - b. properly using and maintaining tools.
2. Employer will provide employees using hand and power tools that cause hazards from falling, flying, abrasive, splashing objects, harmful dusts, fumes, mists vapors or gases with the appropriate personal protective equipment (and training) necessary to protect from these tool related hazards.

Employees will use this equipment and follow the instructions carefully and consistently.

3. Employer and employees will make sure that all tools, whether furnished by the company or the employee, shall be maintained in safe condition (and that the correct tool shall be used in the correct manner for every job).

Employee will report hazardous situations immediately to their supervisor.

4. Employer and employees will follow these five basic safety rules that will help prevent hazards associated with the use of hand and power tools:
 - a. Keep all tools in good condition with regular maintenance.
 - b. Use the right tool for the job.
 - c. Examine each tool for damage before use.
 - d. Operate according to the manufacturer's instructions.
 - e. Provide and use the right protective equipment.

Employees will use non-powered hand tools properly and only for the purpose for which they are designed. An example of damage caused when a chisel is used as a screwdriver is that such use may cause the top of the chisel to break and fly, hitting the user or other employee.

Any tools that are worn or damaged must be turned in for repair or replacement. Examples are:

- Axes or hammers with loose, splintered, or cracked wooden handles must never be used. The heads may fly off and hit another worker.
 - Wrenches with jaws that are sprung must not be used. They may slip and cause injury to the user or other employee working in close proximity.
 - Impact tools such as chisels, wedges, or drift pins with mushroomed heads must not be used. They are unsafe and might shatter on impact causing sharp fragments to fly and hit the user or other employees.
 - Employees will direct saw blades, knives, and other tools away from themselves, aisle areas and other employees working in close proximity.
 - Knives and scissors must be sharp. Dull tools are more hazardous than sharp ones.
 - Employer will provide and employees will use appropriate personal protective equipment such as safety goggles and gloves when using hand tools.
 - Employer and employees will make sure that floors are kept as clean and dry as possible to prevent accidental slips with or around dangerous hand tools.
 - Employer and employees will either use spark resistant tools (made of brass, plastic, aluminum or wood) or eliminate any flammable substances when sparks could be produced by work with or on iron or steel.
5. Power tools can be hazardous when used improperly. They may be powered by electricity, pneumatics, liquid fuel, hydraulics, and the like.

Employer will review the work to be done and will give direction to employees on which tools to use and make sure they are trained in their proper use, hazards, and safety precautions to use with those tools.

Employees will use power tools properly and in compliance with the training given by their employer.

Hand-held power tools:

To prevent hazards associated with the use of power tools, workers will observe the general precautions:

- Never carry a tool by the cord or hose.
- Never yank the cord or the hose to disconnect it from the receptacle.
- Keep cords and hoses away from heat, oil, and sharp edges.
- Disconnect tools when not using, before servicing, and when changing accessories such as blades, bits, and cutters.
- Keep all observers at a safe distance from the work area.
- Secure work with clamps or a vise, freeing both hands to operate the tool.
- Avoid accidental starting. Do not hold fingers on the switch button while carrying a plugged-in tool.
- Maintain tools with care. Keep sharp and clean for best performance. Follow instructions in the user's manual for lubricating and changing accessories.
- Be sure to keep good footing and maintain good balance.
- Wear proper apparel for the task. Loose clothing, ties, or jewelry can become caught in moving parts.
- Remove all damaged portable electric tools from use and tag them "DO NOT USE."

Employer will make sure safety guards are provided to protect the operator and others from the following:

- Point of operation.
- In-running nip points.
- Rotating part.
- Flying chips and sparks.

Power Tools and Equipment Safety

(continued)

Employees will never remove safety guards and will make sure all guards are on during operation.

Employer will put “contact on-off control switches” on drills, tappers, fastener drivers, angle grinders with wheels larger than 2 inches in diameter, disc and belt sanders, reciprocating saws, saber saws, and other similar tools. (These tools also may be equipped with a “lock-on” control, if it allows the worker also to shut off the control in a single motion using the same finger(s). Employer will train in proper use.

Employees will never disconnect any of these controls or switches and will always use as instructed by employer and manufacturer’s instructions.

Employer will equip the following hand-held power tools with a “positive on-off control switch”: platen sanders, disc sanders with discs 2 inches or less in diameter, grinders with wheels 2 inches or less in diameter, routers, planers, laminate trimmers, nibblers, shears, scroll saws, and jigsaws with blade shanks 1/4 inch wide or less.

Employer will equip hand-held power tools (such as circular saws having a blade diameter greater than 2 inches, chain saws and percussion tools that cannot be easily held) with a constant pressure switch that will shut off the power when the pressure is released.

Electric tools:

These general practices should be followed by employees when using electric tools:

- a. Operate electric tools within their design limitations.
- b. Use gloves and safety footwear when using electric tools.
- c. Store tools in a dry place when not in use.
- d. Do not use electric tools in damp or wet locations.
- e. Keep work areas well lighted.
- f. Do not allow cords to present a tripping hazard.
- g. Tools must either have a three-wire cord with ground and be grounded, be double insulated, or be powered by a low-voltage isolation transformer. Third prong may never be removed. If an adapter is used to accommodate a two-hole receptacle, the adapter wire must be attached to a known ground.

Power abrasive wheel tools:

Power abrasive grinding, cutting, polishing, and wire buffing wheels create special safety problems because they may throw off flying fragments.

- a. Before an abrasive wheel is mounted, employer will sound or ring test it to ensure that it is free from cracks or defects. (To test, wheels should be tapped gently with a light, non-metallic instrument. If they sound cracked or dead, they must not be used because they could fly apart in operation. An undamaged wheel will give a clear metallic tone or ring.)
- b. A wheel may disintegrate or explode during start up so an employee will never stand directly in front of the wheel as it accelerates. Portable wheels need to be equipped with safety guards.
- c. When using a power grinder, workers must:
 - Always use eye protection.
 - Turn off the power when not in use.
 - Never clamp a hand-held grinder in a vise.

Liquid fuel tools:

Fuel powered tools usually operate on gasoline, and the most serious hazard comes from fuel vapors that can burn or explode and give off dangerous exhaust fumes.

Employer will provide proper equipment and train employees on correct procedures for handling fuel and fuel-operated equipment.

Employee will be careful to handle, transport, and store gas or fuel only in approved flammable liquid containers according to proper procedures.

Employee will turn off the engine and allow it to cool before refilling the tank for a fuel powered tool (or explosion from the fumes can occur).

Employer must provide and employee must use effective ventilation and/or personal protective equipment adequate to avoid breathing carbon monoxide.

Employer must provide training, and employee must know where and how to use fire extinguishers.

When using pneumatic, power-actuated and hydraulic tools, consult OSHA guidelines.

7. Take special precautions when using power tools on a scaffold, or other locations where space is limited. Get a good footing, use both hands, keep cords clear of obstructions, do not over-reach.

Notes:

For additional safety information, refer to OSHA publication Hand and Power Tools #3080, check manufacturer's guidelines for additional safety information, contact a competent professional or the OSHA Consulting office.

These rules are samples only. Each employee is responsible for working with his/her employees to write rules that meet the specific needs of their individual company and type of work. Each employer is responsible for assessing the accuracy of their rules and keeping them up to date. OSHA requires a minimum of an update and employee re-training annually.

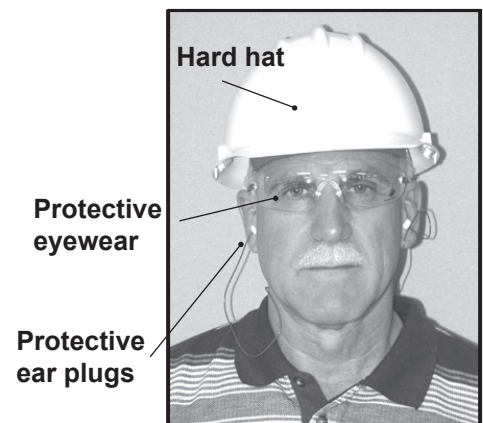
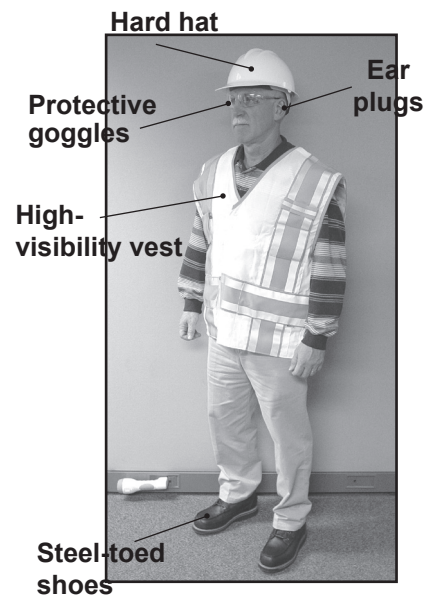


Minnesota Electrical Association

Electrical Toolbox Talks

Personal Protective Equipment (PPE) Assessment

- Protective equipment, including PPE equipment for eyes, face, head, extremities, protective clothing, respiratory devices, and protective shields and barriers shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment. This includes chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.
- If an employee provides their own protective equipment, the employer shall be responsible to assure it is adequate, including proper maintenance and sanitation of such equipment.
- All PPE shall be of safe design and construction for the work to be performed.
- The employer shall assess the workplace to determine if hazards are present or are likely to be present that necessitate the use of PPE. If hazards are present or are likely to be present, the employer shall:
 1. Identify each affected employee in the hazard assessment.
 2. Select PPE that properly fits each affected employee.
 3. Communicate selection decisions to each affected employee.
- The employer shall verify that the required workplace hazard assessment has been performed through a written certification. The person certifying that the evaluation has been performed should sign and date the assessment.
- Defective or damaged PPE shall not be used.



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- The employer shall provide training to each employee who is required by this section to use PPE. Each such employee shall be trained to know at least the following:
 1. When PPE is necessary.
 2. What PPE is necessary.
 3. How to properly don, doff, adjust, and wear PPE.
 4. The limitations of the PPE.
 5. The proper care, maintenance, useful life and disposal of the PPE.
- Each affected employee shall demonstrate an understanding of the training that is necessary for the above five points, and the ability to use PPE properly, before being allowed to perform work requiring the use of PPE.
- When the employer has reason to believe any affected employee who has already been trained does not have the understanding and skill required in the above paragraph, the employer shall retrain each such employee. Circumstances where retraining is required include, but are not limited to, situations where:
 1. Changes in the workplace render previous training obsolete.
 2. Changes in the types of PPE to be used render previous training obsolete.
 3. Inadequacies in an affected employee's knowledge or use of assigned PPE indicate that the employee has not retained the requisite understanding or skill.
- The employer shall verify that each affected employee has received and understood the required training through a written certification that contains the name of each employee trained, the date(s) of training, and that identifies the subject of the certification.

More information on PPE Assessment can be found in the OSHA Regulations 1910.132, General Requirements Section.



Minnesota Electrical Association

Electrical Toolbox Talks

PPE for Respirators

Respirators can prevent harmful fumes, dust, vapors, and gases that can cause serious diseases such as cancer or respiratory impairment.

1. Employer will provide respirator masks at each job site.
2. Employer will have employees fitted with proper respiratory equipment and train employees how to use respirator masks correctly.

The medical status of employees using respirators is reviewed initially and then annually to ensure they remain physically fit to perform work while wearing a respirator.

3. Employees and all visitors will wear respirator masks in areas containing harmful dusts, fogs, fumes, mists, gases, smokes, sprays, vapors, or in oxygen-deficient environments such as when welding or doing maintenance (using solvents, paint thinners, degreasers, and the like) where sufficient ventilation cannot be attained.
4. Employer or supervisor will recommend either an air-purifying filtering respirator or an air-supplying respirator. Air-supplying respirators are needed when not all dangerous substances can be filtered out or there is not enough oxygen in the air. If in doubt, always choose the air-supplying respirator since you cannot be too careful.
5. Where practical, employees who wear respirators are issued personal respirators for which they are responsible for the care and maintenance.

With every use of their respirator, the employee must do the following:

- Check the facepiece and head straps for damage, degradation, and cleanliness.
- Test to be sure the facepiece will not tear or the head straps break during use.
- Remove any accumulation of dust or foreign matter on the respirator inlets and outlets, which could decrease respirator function. If foreign matter cannot be removed, replace the components.
- Shake the cartridges to make sure the absorbent remains firmly packed inside. Loose absorbent can allow contaminants to by-pass the filters.
- Check the inhalation and exhalation valves for proper function.

Employees will do these two breath tests every time they wear respirators. They give an excellent indication of fit. Once respirator is in place, close the respirator's exhalation valves and:

Test One: Positive Pressure Test

Close the exhalation valve and gently exhale into the facepiece. A slight positive pressure should build up inside and remain for a few seconds after the wearer has stopped exhaling. This should cause the facepiece to bulge slightly and, if no air leaks out, the fit is acceptable.

Test Two: Negative Pressure Test

Have the wearer close the inlet opening of the cartridges and gently inhale. The facepiece should collapse slightly against your face. Hold your breath for at least ten seconds and, if the facepiece stays collapsed and no air leaks in, the fit is acceptable.

If there is any doubt, do not go into the hazardous situation, and consult with your supervisor. If you disagree with your supervisor, never endanger yourself. Some people cannot wear respirators because of face shape, contact lenses, breathing problems, asthma, heart conditions, claustrophobia, heat-sensitive, facial hair, or glasses because of the side pieces.

Where respirators are used by more than one person, they will be taken to a central area for inspection and cleaning.

6. The employee will perform the following respirator cleaning procedures after each use or more often if necessary:
 - Remove cartridges, valves, straps and speaking diaphragms from the facepiece. Wash facepiece and accessories in warm soapy water. Gently scrub with a brush. Rinse parts thoroughly in clean water. Air dry in a clean place or wipe dry with a lintless cloth. Reassemble.
 - Read the manufacturer's instructions and follow those instructions thoroughly if they are different from those covered above.
7. Employees may not ever use respirator equipment without proper training on that specific kind of equipment.
8. Employees will wear only the respirator they are instructed to wear.
9. Employees will inspect for signs of equipment deterioration before and after every use.
10. Employees will follow company procedures for care of respirator equipment such as decontamination, canister/cartridge replacement and storage.

Respirator Testing Procedure

1. Have workers smell either a weak concentration of irritant smoke or banana oil to familiarize them with the smell and to make sure they respond. Test kits can be purchased.
2. Have the worker wear the respirator at least 10 minutes before starting the fit test. Use a particulate filter for smoke, organic vapor filter for banana oil and combination filter for smoke and banana oil.
3. Explain the purpose of the testing to workers and ask them to tell you if they experience effects of test substances.
4. Inform employees that smoke can irritate eyes and instruct them to keep eyes closed. Use extreme caution to protect worker while eyes are closed. Explain that there are no harmful effects other than causing minor discomfort.
5. Have employees perform the positive and negative pressure seal tests. If a test fails, choose another respirator.
6. To test with smoke, follow the directions on a commercially available fit test kit. Tester may want to wear a respirator as well to protect from the effects of smoke.
7. If using banana oil, crush the tube and wave it around the seal.
8. For best results, conduct tests in a tent or a large and unvented plastic bag suspended over head or a hood. They are commercially available through safety suppliers. Caution should be used to prevent tripping or claustrophobia.

PPE for Respirators

(continued)

9. Have the test subject do the following exercises while the respirator is being tested. Each exercise should be performed for one minute:
 - Breathe normally.
 - Breathe deeply and regularly.
 - Turn head all the way from side to side. Be sure movement is complete and inhale on each side. Do not bump the respirator against the shoulders.
 - Nod the head up and down. Be sure motions are complete and made every second, and inhale when head is looking toward the ceiling. Do not bump respirator against the chest.
 - Talk aloud and slowly for several minutes reading the “Rainbow Passage,” which causes a wide range of facial movements. “When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow.”
 - Jog carefully in place.
 - Breathe normally.
10. Ask workers if they can detect the smoke or oil. If yes, stop the test and reset or reject it.
11. If workers cannot detect the substance, give them another sensitivity test to make sure they respond to it. If not, the test isn’t valid.
12. Workers who must wear respirators cannot have any facial hair, glasses or unusual facial structure. The worker must remove the interference if possible.
13. Record and retain test results including worker’s name, tester’s name, chemicals used, and make, model, and size of respirator. The wearer is approved only for this specific respirator.

Notes: Selection of a respirator should be made according to the guidelines in the National Institute for Occupational Safety and Health, Respirator Decision Logic, HHS/PHS/CDC/ DHHS (NIOSH) Publication No. 87-108.

For more information on respiratory protective equipment, see Title 29, CFR, Part 1910.134. For additional safety information, check the manufacturer’s guidelines, contact a competent safety professional or the OSHA Consultation office.

Respirator Test Fitting

Qualitative fit testing procedures (i.e., banana oil, irritant smoke) have been used to determine appropriate fit of respirators for the workers below. Fit testing is performed at least annually.

- Name/Wearer/Social Security #
- Name of Tester
- Test Chemical
- Make/Model/Size of Respirator
- Indicate Pass/Fail
- Test Date

These sample rules are suggestions only. Each employer is responsible for working with his/her employees to write rules that meet the specific needs of their individual company and type of work. Each employer is also responsible for assessing the accuracy of these rules, keeping them up to date as new changes are made by doing, at a minimum, an annual update and employee training.



Minnesota Electrical Association

Electrical

Toolbox Talks

Safe Lifting and Material Handling

1. Employees will lift only when unavoidable. Always use mechanical help (pushcarts, conveyors, two-wheeled carts, hoists, forklifts, etc.) to avoid lifting whenever possible.

When using lifting equipment:

- a. Make sure the lifting equipment you are using is adequate for the size and weight of the load.
 - b. Check to make sure the equipment is in safe operating condition before using. If not, notify your supervisor immediately and lock or tag the unusable equipment.
 - c. Maintain all equipment in safe operating condition.
 - d. Use only equipment you are trained to use. If not trained, have someone who is trained do the moving.
2. Employees will NOT attempt lifting tasks if not accustomed to lifting or other vigorous exercise.
 3. Employees will push when possible rather than pulling. Pushing runs less risk of back injury.

Plan and look before lifting and moving any object:

1. Employer will make sure all aisles and doorways are designated and permanently marked and kept clear to all unhindered passage if materials are moved through on a regular basis.
2. Employees will make certain there is adequate space and that the aisle ways are clear.
3. Employees will keep floors clean, dry and free of slippery substances such as oil.
4. Employees will make certain that aisles and doorways provide adequate clearance for the load you are moving.
5. Employees will plan for a place to set the load down before starting the move.
6. Employees will inspect for splinters, jagged or sharp edges, burrs, or rough or slippery surfaces.
7. Employees will wipe off greasy, wet, or dirty objects before trying to handle them.
8. Employees will keep hands free of oil and grease.

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Safe Lifting and Material Handling

(continued)

Employees will follow these lifting techniques:

- Bend from the knees--NEVER bend from the back.
- Get a good grip on the load by using the palms of your hands.
- Keep fingers away from pinch or shear points, especially when setting down.
- Get the load close to your body. The closer the load is to your spine, the less strain it exerts on your back.
- Test the load before handling it. If it appears too heavy, get help.
- Place your feet close to the load, put them far enough apart for stability, and have one foot slightly ahead of the other and pointed in the direction of movement.
- Tighten your stomach muscles (so your abdominal muscles will support your back).
- Lift with your legs--they are much stronger than your back.
- Keep your back straight and your head up whether picking up or putting down.

NEVER:

- Do awkward lifts
- Twist the back or bend sideways while lifting
- Lift at arms length
- Hesitate to ask for help
- Lift objects above shoulder level

When handling pipe, lumber or other long objects, keep hands away from the ends to prevent them from being pinched. Carry long objects on your shoulder with the front end high, making sure you do not inadvertently hit a person or an object.

Employees will assure safety by:

- Separating and labeling containers of combustible or flammable liquids.
- Using pallets and shelving of proper strength to support the load.
- Using hooks with safety latches when hoisting materials and by using securing chains, ropes, and slings that are adequate to support the load.

For additional safety information check manufacturer's guidelines, contact a competent professional or OSHA Consultation Office.

These rules are samples only. Each employer is responsible for working with his/her employees to write rules that meet the specific needs of their individual company and type of work. Each employer is responsible for assessing the accuracy of their rules and keeping them current. OSHA requires a minimum of an update and an employee re-training annually.



Power into
the future!

Minnesota Electrical Association

Electrical Toolbox Talks

SDS - Safety Data Sheets

In 2012, the United States adopted the **Globally Harmonized System (GHS)** of classification and labeling of chemicals. This system was designed as a global, or universal, system for all nations. This GHS system has replaced the old system of **Material Safety Data Sheets (MSDS)** that had been used for years in the United States. OSHA has adopted the GHS standards. This is part of the OSHA Hazard Communication (HazCom) Standard under 29 CFR 1910.1200 revised in 2012.

Beginning in December of 2013 this new system was implemented to aid in the response to dangerous chemicals and allow employees, first responders, and medical personnel, first-hand information as to the danger and the remedies needed when responding to chemical accidents. Employers need to train their employees on the new format for information on chemicals. The new sheets are referred to as Safety Data Sheets (SDS).

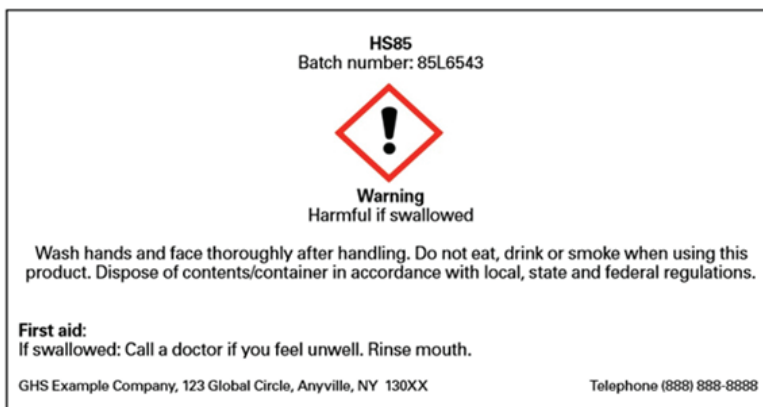
- All chemicals shipped after June 1, 2015, must have SDS labels.
- An SDS is a detailed 16-part standard format bulletin prepared by the manufacturer or importer that describes the physical and chemical properties, physical and health hazards, routes of exposure, precautions for safe handling and use, emergency and first aid procedures, and control measures. An SDS for each known chemical used, must be readily accessible to all employees in the workplace.
- Sections 1 through 8 contain general information about the chemical, identification, hazards, composition, safe handling practices, and emergency control measures (e.g., firefighting). This information should be helpful to those that need to get the information quickly.
- Sections 9 through 11 contain other technical and scientific information, such as physical and chemical properties, stability and reactivity information, toxicological information, exposure control information, and other information including the date of preparation or last revision. The SDS must also state that no applicable information was found, if the preparer does not find relevant information for any required element.
- The SDS must also contain Sections 12 through 15, to be consistent with the UN Globally Harmonized System of Classification and Labeling of Chemicals (GHS), but OSHA will not enforce the content of these sections because they concern matters handled by other agencies.
- Section 16 is other information

Minimum Hazard Communication Training Requirements.

Employee training shall include at least:

1. Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area - such as monitoring conducted by the employer, continuous monitoring devices, visual appearance, or odor of hazardous chemicals when being released, etc.);

- The physical and health hazards of the chemicals in the work area
- The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used;
- The details of the hazard communication program developed by the employer, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.












Sample Safety Label -- Signal words on the label indicate two levels of hazard. "Danger" is used for more severe hazards and "Warning" is the signal for less severe hazards

The SDS labels need to have: (1) Product identifier- the name of the product. (2) Signal word- indicating the level of potential hazard. The word - "Danger" indicates a more severe hazard and the word "Warning" indicates less severe danger. (3) A Pictogram as in figure that is red square on edge square, with a black hazard symbol inside. (4) Hazard statement - describes the nature of the hazard (for example: causes damage to the kidneys). (5) Precautionary statements – how to avoid or minimize adverse effects. (6) Name, address and phone number of manufacturer or supplier.

There are 9 standard pictograms as shown. These are not the shipping labels required by DOT but are the chemical container labels. Be sure to review the labels on materials you are using to avoid the dangers and to know what remedies are needed if you come into contact with the hazardous chemicals.

OSHA Standard, 1910.1200

Except as provided in of this section, the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information: (i) identity of the hazardous chemical(s) contained therein; and, (ii) appropriate hazard warnings, or alternatively, words, pictures, symbols, or a combination thereof, which provide at least general information regarding the hazards of the chemicals, and which, in conjunction with the other information immediately available to employees under the hazard communication program, will provide employees with the specific information regarding the physical and health hazards of the hazardous chemical. The manufacturer's name, address and emergency phone number should also be on the label. In the event of an emergency, having the emergency phone number on the label can save valuable time.

Health Hazard  <ul style="list-style-type: none"> • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity 	Flame  <ul style="list-style-type: none"> • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides 	Exclamation Mark  <ul style="list-style-type: none"> • Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder  <ul style="list-style-type: none"> • Gases Under Pressure 	Corrosion  <ul style="list-style-type: none"> • Skin Corrosion/ Burns • Eye Damage • Corrosive to Metals 	Exploding Bomb  <ul style="list-style-type: none"> • Explosives • Self-Reactives • Organic Peroxides
Flame Over Circle  <ul style="list-style-type: none"> • Oxidizers 	Environment (Non-Mandatory)  <ul style="list-style-type: none"> • Aquatic Toxicity 	Skull and Crossbones  <ul style="list-style-type: none"> • Acute Toxicity (fatal or toxic)



Minnesota Electrical Association

Electrical

Toolbox Talks

Scaffolding Safety

1. Supervisor and employees will check to make sure that scaffolding is capable of supporting at least four times the maximum load--including the weight of materials, workers, and the scaffold itself.
2. Supervisor and employees will check to make sure that the scaffolding height does not exceed four times the minimum base dimensions. Footings must be sound and rigid.
3. Supervisor and employees will check scaffolding before and as it is erected to make sure it isn't damaged.
4. Supervisor and employees will check scaffolding daily and make any repairs or adjustments needed.
5. Employer, supervisors, and employees will make sure that scaffolding planking is:
 - at least 2x10's that are scaffold grade and placed together to help keep materials and tools from falling;
 - that planks will be straight grained and free of shakes, large or loose knots and other defects;
 - that planks will be extended over the center line of the support from 6 to 12 inches and cleated or otherwise fastened so the planking stays in place.
6. Workers must not climb on scaffolding braces. Employer will provide a fixed or portable ladder, ramp, runway, stairway, or other safe means of access and they will always be used by any workers.
7. Workers who are using a mobile scaffold will:
 - always lock the wheels before beginning use.
 - not ride or allow anyone to ride on the scaffold while it is being moved (unless it is a specific alloy and piece of equipment designed for occupied horizontal travel).
 - will remove or secure material and equipment before moving the scaffold.
 - move scaffold ONLY with adequate help.
 - always be careful for holes in floors and for overhead obstructions.
8. Workers will NOT attempt to increase the height of the scaffold by using ladders or other devices that might cause people to fall or scaffolds to become unstable.
9. Workers will not allow tools and materials to accumulate in a manner that creates a hazard on a scaffold.
10. Workers will wear hard hats at all times and especially when working around scaffolding.
11. Workers who are working on a scaffold 10 feet or more above the ground



Scaffolding Safety

(continued)

must make sure it is equipped with guard rails and toe boards. The space between the toe board and the top rail will be screened. If this is not the case, stop work and contact your supervisor immediately. Proceed with work only after this equipment is in place. Workers will wear their safety harness and life line if such a railing is impractical.

12. When working near overhead electrical power lines, a minimum of 10 feet of clearance must be maintained. If the voltage is over 50,000, see the appropriate OSHA guidelines.
13. All workers will stay off scaffolds during storms, high winds or if scaffolds are covered with ice or snow.

If workers must work on a scaffold during these conditions, they are required to use their safety harness and life line and to remove any ice and snow before starting any work.

Notes:

For additional safety information, check manufacturer's guidelines, contact a competent professional or the OSHA Consulting Office.

These rules are samples only. Each employer is responsible for working with his/her employees to write rules that meet the specific needs of their individual company and type of work. Each employer is responsible for assessing the accuracy of their rules and keeping them up to date. OSHA requires a minimum of an update and an employee re-training annually.



Minnesota Electrical Association

Electrical

Toolbox Talks

Security Safety

Lighting

- Building openings, docks, yards, and alleys will be brightly lighted.
- Interior lighting will be provided.
- Security lighting will be controlled by a timer or photo-electric cell.

Locks

- All outside doors will have dead bolt locks.
- A bar extension lock will be used on overhead doors along with a hardened padlock.
- Door hinges will not be accessible from the outside.
- All windows and skylights will have locks, bars, or wire mesh.
- Metal locking bars may be added on outside doors to provide extra security if needed.
- Emergency locking devices that restrict exit from the building _____ (are/are not) installed.
- Single cylinder locks, panic bars, or alarmed releasing bars are provided on outside doors for life safety purposes.

Fencing

- A “man proof” type of fencing will be provided for the entire lot.
- Fencing will be checked _____ (daily/weekly/monthly) and any needed maintenance will be performed immediately.
- Fence gates will have hardened padlocks.

Notes:

Check manufacturers guidelines, contact a competent professional or the OSHA Consultation Office.

These rules are samples only. Each employer is responsible for working with his/her employees to write rules that meet the specific needs of their individual company and type of work. Each employer is responsible for assessing the accuracy of their rules and keeping them current. OSHA requires a minimum of an update and employee re-training annually.



Minnesota Electrical Association

Electrical Toolbox Talks

Temporary Lighting

- Protect the lamps against breakage/ contact. This OSHA requirement creates the need for the plastic “bird cages.” Avoid using higher wattage bulbs to prevent melting of the cages. NEC article 590.4(F) lamp protection.



OSHA Description of Hazard (advisory not obligatory): Metal halide lamps use quartz arc tubes, which operate at high pressures and extremely high temperatures (as high as 1832°F, 1000°C). These arc tubes can rupture unexpectedly due to internal causes or external factors. If the outer jacket of the lamp shatters, the hot quartz arc tube particles and outer jacket glass particles will be discharged against the luminaire's enclosure or into the environment. Many metal halide lamps require an enclosed metal halide luminaire designed to contain particles in the event of an arc tube rupture. Enclosed metal halide luminaires must comply with UL 1572.

- Do not hang lamps by their cord unless they are designed to do so, and never use bare wire, nails, or other metal straps for securing the temporary lighting cords. Plastic straps or insulated wiring can be used.
- Use a **10-pound rule of thumb** when suspending lights. If the weight of the cable and/or tension of the lights exceed 10 pounds, then more secure points are needed.
- Temporary lighting in wet/conductive locations should be provided with GFCI protection, or a 12V lighting system should be used.
- No splicing wires in stairways, and no tying up lighting to stairway handrails.
- Keep the temporary lights 8 feet off the floor.



Does this string meet the 10-pound rule of thumb?

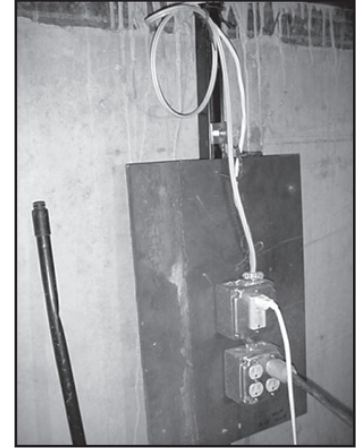
Temporary Lighting

(continued)

- Install temporary lights on separate circuits. Do not wire the lights into a circuit that is also used for power tools. This improper wiring method on the jobsite will create a dark room for someone if the circuit breaker is tripped and is a violation of Art 590.4(D)(1) of the NEC.
- Temporary lighting must meet the following minimum requirements according to OSHA regulations. This means that you'll need a light meter to ensure compliance in most cases.

Foot Candles Area of Operation

5	General construction area lighting.
3	General construction areas, concrete placement, excavation and waste areas, access ways, active storage areas.
5	Indoors: warehouses, corridors, hallways, and exits.
10	General construction plant and shops (e.g., mechanical and electrical equipment rooms, carpenter shops, active store rooms, and indoor toilets and workrooms.)
30	First aid stations, infirmaries, and offices.



Temporary lights must be on their own circuits. This photo is wrong!

More information on temporary lighting is available online at www.osha.gov.



Minnesota Electrical Association

Electrical Toolbox Talks

Temporary Heating

Winter work in the upper Midwest means we need heat to do electrical work and keep us productive.

Temporary heating provides needed heat but also comes with the need to take some precautions. OSHA has a standard for temporary heating devices. CFR 1926.154 The area of concern with portable or temporary heating devices deals with the possibility of combustion of nearby materials, but also a danger of low oxygen or high carbon monoxide in the working environment. Temporary heating devices comes with several hazards, including the hazards of fire, fumes from fuels, the consumption of oxygen, and burn/heat injury. Electric heaters do not have the hazard of releasing combustion byproducts into the air, but do have the heat source that can start surrounding materials on fire.

You may use temporary heating devices like circulating and radiant room heaters, LP-Gas heaters, or other types of temporary heating devices to make the temperature more comfortable and acceptable to work. Temporary heat units can be fired either directly or indirectly. Choose heating fuels based on your application.

- (A) Liquefied Petroleum Gas (propane), or natural gas
- (B) Liquid Fuel (kerosene, fuel oil)
- (C) Solid fuel (wood, coal, coke, etc.)

OSHA regulations REQUIRE that you do the following when using temporary heating devices for all types of temporary heat:

1. Naturally or mechanically ventilate the area adequately by supplying fresh air in sufficient quantities to maintain your safety and other worker's health and safety. (Air quality and excessive heat)
2. Do not set heaters not suitable for use on wood floors directly upon them or other combustible materials. When such heaters are used, rest them on suitable heat insulating material or at least 1-inch concrete, or equivalent. The insulating material should extend beyond the heater 2 feet or more in all directions.

	Minimum Clearance		
	Sides	Rear	Chimney Connector
Room heater, circulating type	12 in.	12 in.	18 in.
Room heater, radiant type	36 in.	36 in.	18 in.



Temporary Heating

(continued)

3. When using heaters in the vicinity of combustible tarpaulins, canvas, or similar coverings, locate them at least 10 feet from the coverings. The coverings should be securely fastened to prevent ignition or upsetting of the heater due to wind action on the covering or other material.
4. Set heaters horizontally level when in use, unless otherwise permitted by the manufacturer's markings.
5. Do not use solid fuel salamanders in buildings or on scaffolds.
6. Equip flammable liquid-fired heaters with a primary safety control to stop the flow of fuel in the event of flame failure. Barometric or gravity oil feed is not a primary safety control.
7. Use heaters designed for barometric or gravity oil feed only with the integral tanks. Heaters specifically designed and approved for use with separate supply tanks may be directly connected for gravity feed, or an automatic pump, from a supply tank.
9. Always follow safety guidelines. The most important instructions will be found on the side of the heating unit, though instructions will not be the same for all equipment.

Important Reminders:

- Never use a "fueled" heater within 10 feet of any debris piles, temporary enclosures, tarps, combustible materials, or flammable material.
- Maintain a good fresh air supply, to avoid oxygen deficient atmospheres; flame uses oxygen.
- Every heating unit, must have a fire extinguisher immediately available.
- Never leave an operating heater unattended during non-working hours.
- The use of temporary heaters in confined spaces is never recommended; when they are used, sufficient ventilation and temperature control must be provided.
- Allow the heater to cool down before it is re-fueled.
- Always turn off the gas supply when the heater is not in-use.
- Never store used or extra LPG containers inside. Only those in use should be present.
- Temporary heaters should be placed at least six feet away from the LP container and not fired toward the container, unless the heater is an approved integrated unit.
- Never manifold more than three 100 pound LPG cylinders together.
- LP cylinders must be secured in the upright position and protected from damage.

(A) LPG (Propane)

- Be aware that gases such as propane are heavier-than-air, and will settle into any low spots, such as a basement. If there is no way for them to exit, a spark or flame can ignite and explode the concentration of gas, causing great damage and injuries. Do not use LP gas below grade.



Propane Heater (aka Salamander)

Temporary Heating

(continued)

- When using any gas-fueled device: If you ever suspect a gas leak, turn off the gas supply at the source (only if it's safe to do so) and exit the area immediately. Don't use phones, lighters or anything else that could produce a spark until you've evacuated. Call emergency personnel after reaching a safe distance, and do not re-enter the area until they give the all-clear.
- The surfaces of portable heaters—and the air blowing out of them—can be very hot; take care not to burn yourself while near the heater and don't set it up in areas of high foot traffic. Use caution around the heater while wearing any loose-fitting clothes.
- If you are going to use a portable heat source in an enclosed area, such as a porch or for indoor emergency heat, be sure to choose a heater designed for that purpose. (approved for indoor use) These models will have safety features such as an automatic shutoff if the unit is tipped over and low-oxygen sensors (to shut off the unit if oxygen levels in the area dip too low). Do not leave a running heater unattended or use it while sleeping.
- Before starting the heater each time, make sure it's clean and inspect it for excessive dust, or corrosion that may interfere with its function. Check your owner's manual for maintenance recommendations and/or have your heater serviced periodically by a qualified technician.
- An unvented heating appliance, also called a vent-free appliance, has no chimney vent and is located in the space being heated. Combustion products are discharged into the heated space rather than exhausted to the outdoors through a chimney. Typical fuels are natural gas and LPG (propane). While convenience is the major advantage of vent-free gas heating products, the degradation of indoor air quality is a concern. In some areas state and local codes regulate unvented heaters.

(B) Kerosene Heaters

When using kerosene fuel for heat in your home or place of business, you should take precautions against a number of serious hazards. These dangers include:

- Fire or explosion. Fire could be caused by operating the heater too close to furniture, draperies or other combustibles, by knocking over a lighted heater, or by accidentally igniting fuel when filling the tank. Explosions could be caused by use of the wrong kind of fuel, or by operating the heater in an area where there are combustible fumes.
- Burns. Burns could be caused by direct contact with a heater, or by ignition of combustible clothing. Children especially should be kept at a safe distance from operating heaters. Even pets could be injured.
- Asphyxiation. Kerosene heaters consume oxygen as they burn. If they are operated in a small room or in an inadequately ventilated area, oxygen in the air could be reduced to a dangerous level. Reduced oxygen supply could lead to incomplete combustion of fuel and the production of carbon monoxide. Carbon monoxide is a colorless, odorless gas which in sufficient concentrations, or if breathed over a period of time, can kill without warning.



Indoor Kerosene Heater

Temporary Heating

(continued)

- Indoor air pollution. In addition to carbon monoxide, kerosene heaters can emit such pollutants as carbon dioxide, nitrogen dioxide and Sulphur dioxide. Breathing these substances can create a risk, especially to such people as pregnant women, asthmatics, individuals with cardiovascular disease, elderly persons and young children
- Fuel: Kerosene heaters require 1-K grade kerosene. When colored or cloudy kerosene is burned, it will give off an odor, smoke and cause increased indoor pollution levels because the fuel's higher Sulphur content sharply boosts Sulphur dioxide emissions. Kerosene other than 1-K grade can gum up the wick. Never use a substitute such as gasoline or camp stove fuel in a kerosene heater. Such fuels could start a fire or explode.
- Never attempt to move a lighted kerosene heater. Even a carrying handle could cause a burn. Extinguish the flame and allow the heater to cool before moving it.
- Never refuel a kerosene heater in living quarters or when the heater is still hot. Wait for it to cool.

(C) Barbecue grills—gas or charcoal—for inside heat?

Each year, there are about 10-20 deaths from carbon monoxide (CO) poisoning and about 400 emergency room treated injuries from CO poisoning resulting from charcoal grills. Charcoal produces CO when burned. CO is a colorless, odorless gas that can accumulate to toxic levels in closed environments.

- Do not use your outdoor grill inside, even in your garage. Charcoal and gas grills produce large amounts of carbon monoxide and even small amounts can kill you.
- Never burn charcoal inside of buildings, tents, or campers. Charcoal should never be used indoors, even if ventilation is provided. Since charcoal produces CO fumes until the charcoal is completely extinguished, do not store the grill indoors with freshly used coals.



Barbecue Grill



Minnesota Electrical Association

Electrical Toolbox Talks

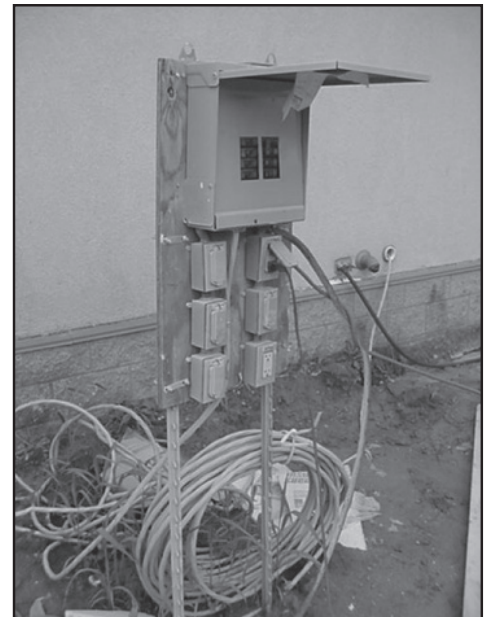
Temporary Wiring Panels

There are some basic requirements for installation of a temporary electrical panel. The following information will help your company build and install good quality panels that meet OSHA requirements.

- Make sure that the temporary panel is properly mounted or secured.
- Unused knockout openings should be covered with knockout plugs – not duct tape.
- Make sure that the temporary panel is properly grounded. OSHA requires that temporary panels be weatherproof if they are exposed to the elements. The photo to the right shows outlet covers that are weatherproof only when not in use. New products such as “in-use covers” are available to help make your panels weatherproof at all times.
- The temporary power supply on the jobsite should incorporate the use of approved cable, and standard romex should not be laid on the ground. Check with your building inspectors to identify acceptable types of wire.
- No light gauge wires for use in 220-volt systems. Avoid letting others “tap” into the panels for 220-volt equipment use. These taps are not always done properly, and the persons making the taps are not usually qualified.
- If you are providing outlets throughout the jobsite, know that metal 1900 boxes cannot be lying on the floor.
- Avoid crushing conductors. Conductors entering boxes, cabinets, panels, etc. must be protected from abrasion, which means that cables can’t run through sharp sheet metal openings without protection. Approved conductors on the ground should be protected from vehicle traffic.
- Each temporary outlet/panel shall have a cover or faceplate so that electrocution hazards are avoided. Magnetic covers with appropriate hazard warnings can be used during installation as a means of protecting exposed panels during the new construction/installation phase.



This was a good attempt at providing a weatherproof cover, but wind and rain would likely cause this to fail.



Weatherproof while in use?

Note: More information on temporary wiring is covered in the NEC.



Minnesota Electrical Association

Electrical Toolbox Talks

Trips, Slips, and Falls

Slips, trips, and falls account for about 15% of accidental deaths, second to automobile accidents.

- Slips are defined as too little friction between your feet and the walking surface. (caused by wet or slippery surfaces)
- Trips are the result when your foot strikes an object and your forward momentum causes you to lose your balance. (you did not see or did not notice an obstruction)
- Falls occur when the surface level changes unexpectedly or your trip caused you to fall. (stairs or missing platforms, including ladders, that you're expecting to support you)

Slips

1. Workers will mop spills immediately and post a sign stating: WET FLOORS. Workers will never leave spills unattended.
2. Employer will supply, and workers will use, an oil-absorbing material to control small oil spills in the work place.
3. Employer will make sure the work place is properly equipped to handle spills immediately and have sufficient materials on hand, such as warning signs and absorbent materials to keep spill prone areas safe.
4. During poor weather, employees will keep rugs, mats and floors dry. Assigned employees will remove snow and ice from all sidewalks, drives, and access points used by the general public or employees promptly.
5. If you must walk on a slippery surface:
 - Wear proper footwear for better traction on slippery surfaces
 - Point your feet slightly outward, keeping your center of balance under you
 - Take slow, small steps
 - Use your feet as probes to detect possible slip, trip and fall hazards
 - Get your feet underneath your body quickly to maintain your balance after an initial step
 - Use rails or other stable objects that you can use to hold on
 - Protect the more vulnerable parts of your body like your head, neck and spine if you do fall

Trips, Slips, and Falls

(continued)

Trips

1. Employer and assigned employees will keep all floors, stairs, ladders, walkways, sidewalks, and driveways in good repair.
2. Workers will not put electrical cords where people can trip on them
3. Employer will clearly mark stairs, aisles, and walkways. Employees will keep them free of any material.
4. Employees will travel slowly when carrying materials.
5. Employees will warn other employees or customers of potential problems and report the problems to the supervisor immediately.
6. Supervisors and employees will look at each job and work area to spot and avoid possible hazards and correct them immediately.

Falls

1. Nearly half of all falls occur on stairs.
2. Keeping stairs in good repair is essential to preventing accidents.
3. Make sure that stairways have secure handrails and guardrails, even surfaces, even tread heights and are free of deteriorating coverings such as frayed carpet.
4. Some simple ways to prevent a fall incident on stairways:
 - Whether going up or down stairs, always use the handrail
 - Make sure stairways are well lit, with on/off switches at the top and bottom
 - Make sure stairways are clear of any obstacles
 - If you are wearing footwear such as high heels or sandals, use extra caution while going up and down
 - If throw rugs are positioned at the top or bottom of stairways, make sure they are secured with a skid-resistant backing
 - Routinely check stairs for loose or worn carpeting
 - Report outdoor stairways if you notice ice, snow or water accumulation
 - When carrying objects up and down steps, be sure you are able to see where you are stepping and hold onto the handrail if possible

Accidents

The chance of fall accidents in stairways increases with inattention, illness, fatigue and haste. Take care when ascending and descending stairways.

1. If an accident occurs, employees will immediately contact the person in the area who is trained in first aid.

Trips, Slips, and Falls

(continued)

2. Employer will provide OSHA-approved ladders, which employees are to use rather than a step stool or chair.
3. Workers may never climb on or drop merchandise from shelves
4. Employer allows only authorized employees (18 yrs or older) to operate fork lifts.
5. Workers may never stock merchandise on the floor or in traffic areas.

First Aid Reminders:

For fractures, you will see swelling, deformity, pain, tenderness, and loss of use. Gently remove clothing from the area around the injury. Avoid moving the injured area if possible and check for the above symptoms. Control bleeding, but do not attempt to push any protruding bones back beneath the skin. Seek medical attention immediately.

Bleeding can be controlled by gently applying direct pressure with a dry sterile dressing. When saturated, do not remove it, simply add another dressing. You must wear latex gloves or use other protection against transmission of infection from the person's blood. Don't remove any impaled objects. Immobilize the object instead and seek medical attention immediately.

Neck and spinal injuries cause painful movement of the arms and/or legs, numbness, tingling, weakness, loss of bowel or bladder control, paralysis to arms or legs, deformity of head and neck. Check heart rate and breathing, administer CPR if necessary but **DO NOT USE HEAD TILT. DO NOT MOVE THE VICTIM IN ANY WAY** unless they are in immediate danger. Stabilize victim to **PREVENT ANY MOVEMENT**. Immobilize head and neck by placing objects on either side. Protect victim against shock or hypothermia by covering with jackets or blankets to keep them warm. **DO NOT ATTEMPT TO SPLINT A VICTIM**. Alert professional EMS help.

Construction standards required for fall protection are found at:
www.osha.gov/SLTC/fallprotection/construction.html

For more information, check manufacturer's guidelines, contact a competent professional or the OSHA Consulting Office.

PowerPoint materials from OSHA: https://www.osha.gov/dte/grant_materials/fy06/46e0-ht10-06.html

These rules are samples only. Each employer is responsible for working with his/her employees to write rules that meet the specific needs of their individual company and type of work. Each employer is responsible for assessing the accuracy of their rules and keeping them up to date. OSHA requires a minimum of an update and an employee re-training annually.



Minnesota Electrical Association

Electrical Toolbox Talks

Winter Driving

Winter creates the most difficult driving season for us in the Midwest. Snow and ice can create dangerous situations during even your most routine drives. Prepare yourself and your vehicle for the winter. Conditions can change rapidly from clear-and-sunny to treacherous-with-zero-visibility. The key to survival is to be prepared!

Vehicle Checks

- Check coolant level
- Check condition and power output of batteries
- Test heater, defroster and fans Inspect windshield for cracks; they will expand when glass is heated from inside
- Replace worn windshield wiper blades
- Have a full tank of gas
- Tires— Inspect tires for wear and proper inflation. The rubber used to make snow tires is specially designed for cold conditions. It's softer, which allows the tires to maintain better contact with the road. And the treads are designed to grip the road better. All-season tires are not the same as winter or snow tires.

On the Road

- Know condition of road surface, touch brakes to measure effectiveness
- Clear your windows, lights, and mirrors completely of snow and ice before you set off
- Slow down—drive the conditions, not the speed limit
- Do not use cruise control
- Reduce speed over bridges—they often freeze before the roads do
- Increase following distance
- If your vehicle is not equipped with ABS, pump your breaks when stopping

“Minnesota 511” App

**MnDOT's official resource
to track real-time road
conditions**

Winter Driving

(continued)

Emergency Preparedness

- Warm clothing hat, gloves, coat and boots should be worn or kept in car
- Cell phone
- Flashlight with new batteries
- First-aid kit
- Small shovel and sand/kitty litter
- Emergency food and bottled water
- Candles & blanket
- Jumper cables & tow ropes
- Stock up on extra fluids—windshield fluid, oil, de-icer, etc.

Accidents

- If you are stranded during a winter storm – Number 1 Rule: Stay with your vehicle!
- Call emergency services and let help come to you.
- Run the engine intermittently to keep warm, but make sure the exhaust pipe is free from snow!

Note on Black Ice

Perhaps the deadliest danger of all is “black ice,” which forms on a roadway, usually due to snow melting and re-freezing. It is almost invisible, so drivers fail to recognize it, resulting in very serious accidents. Always be alert to the possibility of black ice when temperatures are near or below freezing. Pavement that looks dry but appears darker in color and dull-looking should alert you to the presence of black ice. You can very easily lose control of your vehicle.

