Basic Safety Lab

Program: Electrician Technician

Course: EL110 Basic Safety

Objectives: Under the supervision of your instructor, you should be able to do the following:

- Determine PPE (Personal Protective Equipment) items are safe to use
- Determine the serviceability of items:
- Properly don, fit, PPE items.
- Properly set up and climb/descend a ladder, demonstrating proper three-point contact.
- Explain the safe behavior on and around ladders, and proper working heights.

Lab Equipment:

- Step Ladder
- Extension Ladder
- PFAS
- Lanyard

Required Tools: N/A

Materials: •

N/A

Safety (PPE):

- Safety Glasses/goggles
- Hearing protection
- Gloves
- Hard hat

Resources:

- OSHA 29 CFR 1910.137: Electrical Protective Equipment
- ASTM D120-14a: Standard Specification for Rubber Gloves
- ASTM F496-20: Standard Specification for In-Service Care of Insulating Gloves and Sleeves
- ASTM F1236-19: Standard Guide for Visual Inspection of Electrical Protective Rubber Products
- North American Independent Laboratories (NAIL) for Protective Equipment Testing
- International Electrotechnical Commission (IEC) 60903:2014 Live Working – Electrical Insulating Gloves standard
- OSHA standard: 29 CFR 1926 Subpart X—Stairways and Ladders

Required Time: 180 Minutes

Shop Maintenance:

- All work will cease 20 minutes prior to the end of class.
- All work areas must be cleaned.

- Tools and equipment must be cleaned and returned to the designated areas (cage, tool room, cabinets etc.)
- Any broken or missing tools must be reported immediately.
- Tools and equipment are students' responsibility

Procedures: *(Eye protection must always be worn)*

1. Inspect all items on table (items identified in "Tools and Protective Wear").
2. Determine if they are safe to use, and if not, what is wrong with them.
3. Thoroughly inspect, don, fit, and remove gloves and a hard hat.

   Gloves: Prior to wearing them, electrical rubber gloves need to be inspected to ensure they are safe for use:

   - **Visual inspection**: Handle both gloves to ensure they do not feel tacky. Also, check for swelling as this may indicate contact with a petroleum product. Also, check the gloves for nicks. In addition, inspect between fingers for ozone damage. Finally, inspect the leather protectors to ensure there are no cuts in the leather and no sharp objects embedded in the leather.
   - **Air Test**: Inflate the gloves and hold them up to your cheek—check for air leaks.

   Proper Fitting for Electrical Gloves

   - To ensure proper fit and dexterity, everyone using electrical gloves needs to be fitted.
   - The correct fitting method is taking your dominant hand and measuring the circumference of the largest portion of your hand as well as measuring the middle finger to the base of your hand. The largest measurement (Size 7–11) is your glove size. Refer to the photos for assistance.

Hard Hats: Regular inspection is vital to keeping your hard hat working for you to keep you safe.

- **First Time Inspection** Before you use your hard hat for the first time, make sure that you have the proper type and class for your job. Be sure to assemble your hard hat as per the manufacturer's specifications. Once you have your hat assembled, adjust the harness for a proper fit, ensuring that it is snug but not too tight. Your hat should be tight enough to stay on your head without slipping, binding, or irritating your skin.
- **Regular Inspection** Each time you use your hard hat, you will need to inspect it. Look for any cracks in the outer covering. Any cracks, gouges or flaking can be problematic if you get bumped on the hat. Any deterioration, such as cracks or chalking, can cause the hat to break when hit, banged, or knocked. Look at the harness straps to ensure that they are not frayed and that the hat fits snugly but not too tightly on the head. All points of the suspension should be properly fitted into the slots that suspend it from the outer covering.
- Wearing a hard hat can save your life, but if you wear it improperly, you could be doing more harm than good. Below is a list of dos and don'ts to follow to properly wear your hard hat.

Fitting a hard hat

- Always adjust the harness suspension to maintain the proper clearance between your head and hat. There should be about 1 to 1 1/4 inches clearance from your head.
- Do not alter the shell or suspension, specifically do not drill holes in outer shell.
- Do not wear your hard hat backwards unless the manufacturer states that you can.

- Only use the manufacturer's recommended harness made specifically for a given shell.
- Do not wear anything, such as a sock cap or ball cap, under your hard hat.
- Avoid putting anything under your hard hat, except your head. Using it as an extra pocket will only result in injury.
- Putting stickers on your hat is fine but keep stickers to a minimum. Hats are often reflective, and stickers can reduce this necessary safety feature.
- Always remember to replace your hard hat if it has been dropped or forcibly struck.
- If a hard hat has been dropped more than 8 to10 feet or has been struck forcibly, it should be replaced immediately.
- Do not wear or carry anything in between the shell and the suspension of your hard hat.

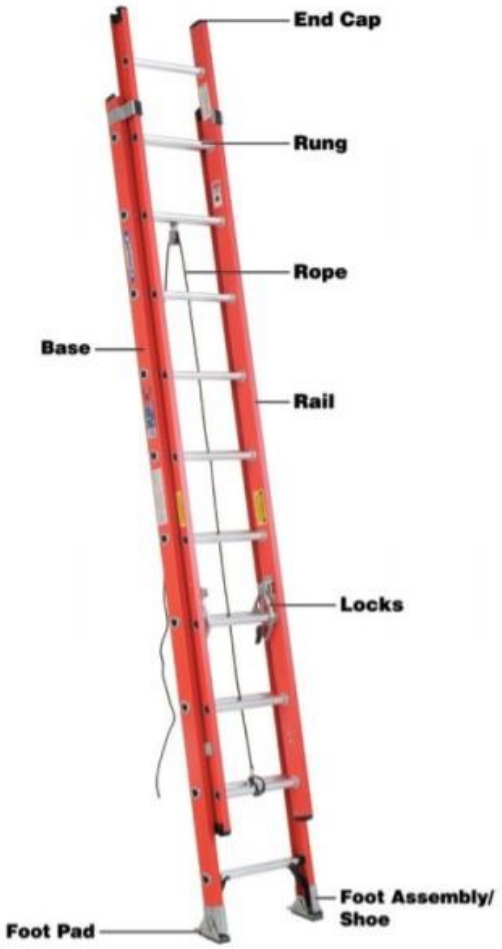
4. Thoroughly inspect, don, fit, and remove a PFAS (Personal Fall Arrest System).
   A personal fall arrest system is one option of protection that OSHA requires for workers on construction sites who are exposed to vertical drops of 6 feet or more.
   Inspect
   - Pick up the harness with its D-ring in the back.
   - Gently shake the harness to let the straps fall into place.
   - Make sure the buckles are unfastened.
   - Look for any damage, such as worn, frayed or missing threads, cracked webbing, or foreign material on the harness.
   - Check the metal strap fasteners and d-ring to make sure they are not cracked or deformed.
   - If your harness uses grommets, make sure they are attached and are not deformed or otherwise damaged.
   - Make sure buckle tongues are attached and not bent.

   How to Put on PFAS
   - Slip the harness over your shoulders like a vest.
   - Make sure the D-ring is in the middle of your back, directly between your shoulder blades.
   - Pull each leg strap up and fasten the buckles together.
   - Stand up straight and adjust the length of the side body straps as needed to make sure there is no slack.
   - Fasten the chest strap about mid-chest high.
   - Adjust the chest strap as necessary to remove any slack.
   - Make sure the shoulder straps and leg straps are snug, while still allowing full range of motion.
   - Eliminate any excess slack by tightening the straps in the buckle.
   - Make sure the loose ends of the straps are tucked into the strap retainers.

- With your hand held flat, you should be able to fit your fingers underneath your leg straps.

5. Properly climb up and down a step ladder, showing three-point contact.
   - Face the stepladder.
   - Keep your body centered between side rails.
   - Maintain three-point contact by keeping two hands and one foot, or two feet and one hand on a ladder always.
   - Keep a firm grip.
   - Make sure that footwear is in good condition.
   - Clean your footwear by removing mud, water, snow, ice, or grease.
   - Place feet firmly on each rung.
   - Wearing footwear with heels can help to stop the foot from slipping forward.
   - You have climbed too high if your knees are above the top of the ladder or if you cannot maintain a handhold on the ladder.
   - Rise or lower tools and materials using a hoist, handline, bucket, or other device.
   - In most cases, only allow one person on a ladder at a time. Wait until the other person has stepped off the ladder before another person uses it.
   - Have a second person hold the bottom of a long ladder, especially when tying or untying an extension ladder.
   - Use the appropriate safety devices when needed (e.g., safety belt, fall restraint, etc.). Check with your local authority for requirements when working at heights near or above 10 feet.
   - Make sure that any harnesses or ties do not interfere with safe travel when on the ladder.

6. Safely use an extension ladder.
   Also known as “portable ladders,” extension ladders usually have two sections that operate in brackets or guides allowing for adjustable lengths. Because extension ladders are not self-supporting, they require a stable structure that can withstand the intended load.



- A competent person must visually inspect all extension ladders before use for any defects such as: missing rungs, bolts, cleats, screws, and loose components. Where a ladder has these or other defects, it must be immediately marked as defective or tagged with “Do Not Use” or similar language.
- Allow sufficient room to step off the ladder safely. Keep the area around the bottom and the top of the ladder clear of equipment, materials, and tools.
- Set the ladder at the proper angle. When a ladder is leaned against a wall, the bottom of the ladder should be one-quarter of the ladder’s working length away from the wall.
- For access to an elevated work surface, extend the top of the ladder three feet above that surface or secure the ladder at its top.
- Before starting work, survey the area for potential hazards, such as energized overhead power lines.
- Set the base of the ladder so that the bottom sits securely and so both side rails are evenly supported. The ladder rails should be square to the structure against which it is leaning with both footpads placed securely on a stable and level surface.

- Secure the ladder's dogs or pawls before climbing.
- When using a ladder in a high-activity area, secure it to prevent movement and use a barrier to redirect workers and equipment. If the ladder is placed in front of a door, always block off the door
- Maintain a 3-point contact (two hands and a foot, or two feet and a hand) when climbing/ descending a ladder.
- Face the ladder when climbing up or descending.
- Keep the body inside the side rails.
- Use extra care when getting on or off the ladder at the top or bottom. Avoid tipping the ladder over sideways or causing the ladder base to slide out.
- Carry tools in a tool belt or raise tools up using a hand line. Never carry tools in your hands while climbing up/down a ladder.
- Extend the top of the ladder three feet above the landing.

- Keep ladders free of any slippery materials.

7. Clean up lab putting all equipment and supplies back in the appropriate place.