

Disaster Responder Roofing Safety

NRCA Enterprise Risk Management
2022

What is NRCA?

- One of the oldest construction trade associations
- Approximately 4,000 members
- Roofing contractors, manufacturers, architects, government and institutional members
- Involved with technical, safety, governmental and educational issues affecting roofing

Learning Objectives

- Increase awareness of roofing hazards generally and in disaster response situations specifically
- Introduce safe work practices and control measures to minimize the risk of injuries
- Increase awareness of equipment and tools to help safely perform the work

Site safety & roof access



Hazard or risk assessment— preliminary site

- Power lines/electricity
- Other utilities, propane, natural gas
- Standing water
- Structural integrity
- Trees, poles
- Debris
- People, pets

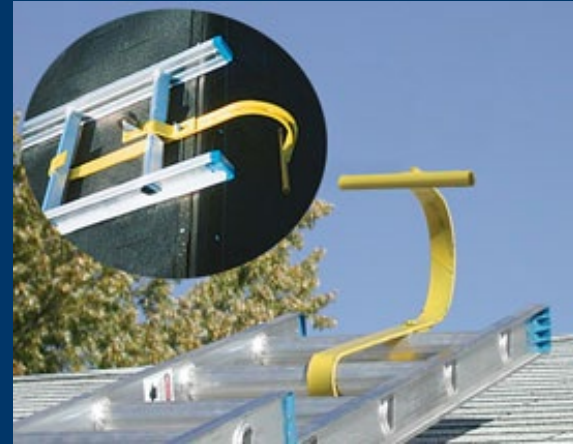




Hazard controls – power lines

- ALWAYS assume power lines are energized
- Always assume they are not insulated
- Keep ladders, scaffolds and workers at least 10 feet from lines
- Flag and barricade areas where fallen power lines are on the ground with orange cones, caution tape to prevent contact
- Follow instructions of utility workers

Roof access – ladder types



Ladder ratings



Type IAA—375 pounds

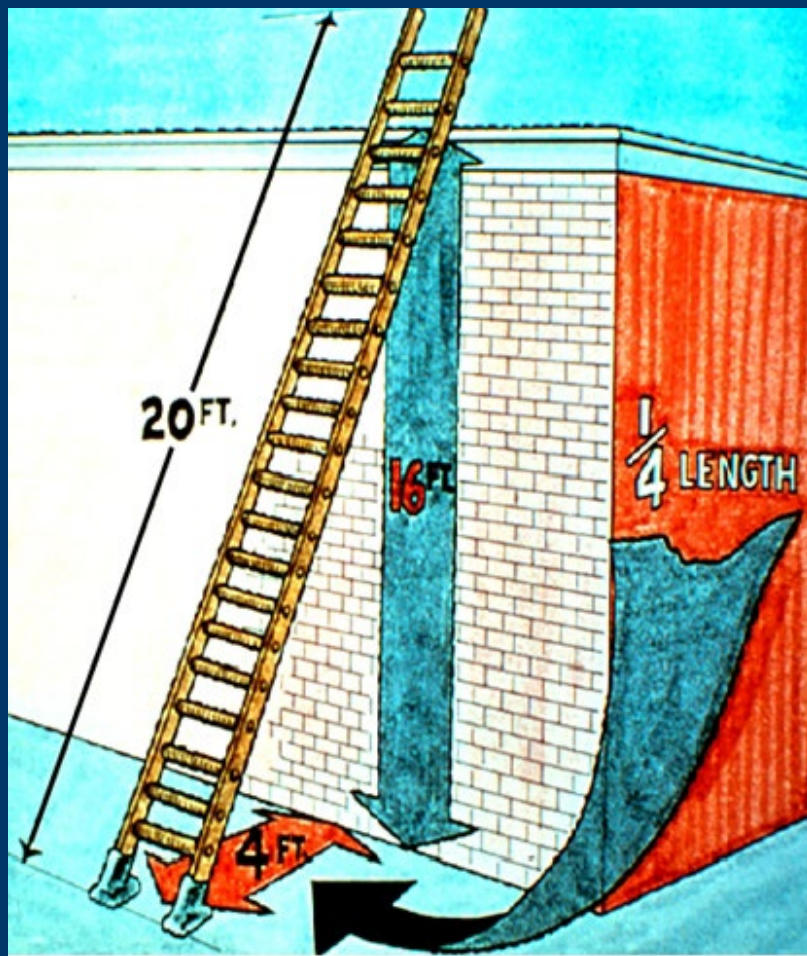
Type IA—300 pounds

Type I—250 pounds

Type 2—225 pounds

Type 3—200 pounds

Ladder Setup 1



Ladder Setup 2



Ladders must be tied off to prevent movement



Ladders must extend at least 3 feet over the eave or landing surface

Ladder Setup 3



A ladder must be placed on firm, stable and level ground



Securing the base of the ladder helps ensure stability



Ladder Setup 4



Rung locks, also called dogs or pawls, must be fully functioning and secure



Make sure rung locks are fully seated onto rung —this photo shows improper locking

Ladder Setup 5 – walking a ladder up



Place feet of ladder at the base of the building



While putting pressure on the ladder in the direction of the building, push the ladder upwards rung by rung

Ladder Use 1

- Do not carry anything up a ladder
- Use both hands to hold the ladder siderails or rungs
- Face the ladder when going up or down
- Only one person at a time on a ladder
- Do not load a ladder beyond its rated load capacity



Ladder Use 2



- Never stand on the top or top step of a stepladder
- Never use a stepladder in the closed position

Ladder Use 3



- Control access to areas around the ladder setup point
- Use the right ladder for the situation

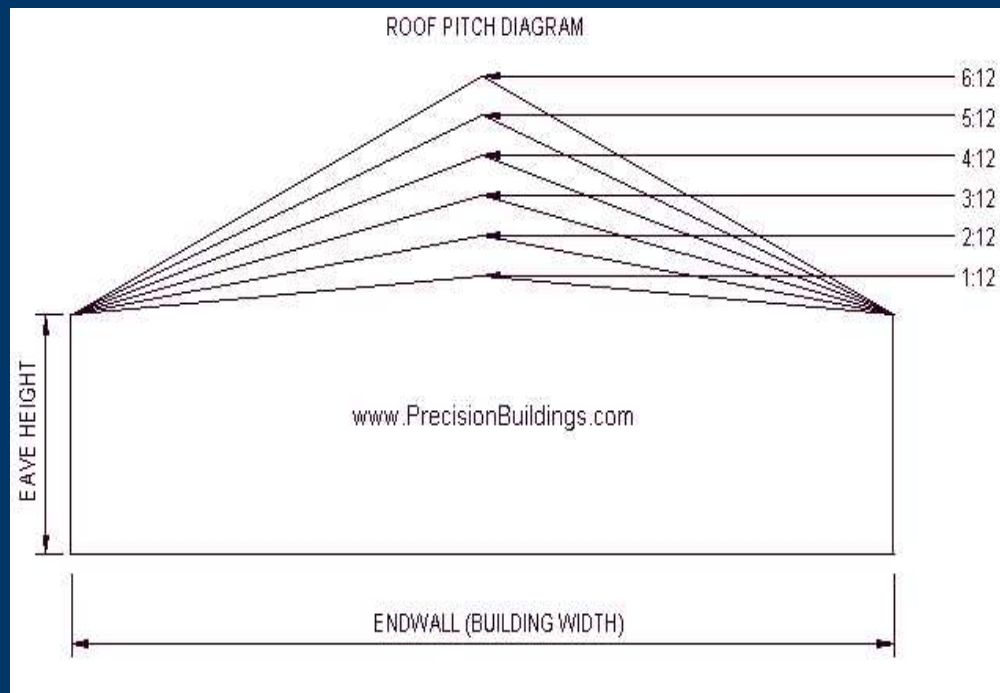
Roof access – scaffolds



- Scaffolds can provide stable roof access and staging areas but require ground clearance
- Integrated ladder access is often vertical making climbing difficult



Roof hazards – roof types



- Low-slope roof, 4:12 or less
- Steep-slope roof, greater than 4:12

Roof types



Gable roof



Hip roof

Roof types



Gambrel roof



Mansard roof

Roof slip hazards



Roof hazards – skylights and openings



Skylights



- Not capable of supporting the weight of a person
- Found on low- and steep-slope roofs

Openings



- May result from flying debris that damages roof; roof vents, solar tubes or skylights removed by force of wind

Roof hazards – deck integrity



- Rotten wood decking can be a serious hazard
- It is often hard to spot unless visible during an inspection
- Thin 3/8-inch plywood may be found on some roofs

Roof hazards – vent stacks, satellite dishes and cables

- All pose tripping hazards
- Lightning arresting equipment can also be present



Roof hazards – electrical



Electrical service drop
on roof



Solar panels on roof

Hazard Controls – skylights, openings

- Cover with plywood, usually requires $\frac{3}{4}$ -inch; larger openings may require additional framing
- Secure with nails or screws



Hazard controls – slip hazards



- Some footwear provides better grip on roof surfaces
- These work shoes are designed for increased grip and have replaceable outsoles

Fall Protection

- Personal fall arrest (PFA) systems and personal fall restraint systems are used in residential construction to prevent deaths and injuries from falls.



Criteria for PFA's

- PFAs often consist of a body harness, anchor, connectors, deceleration device, lanyard and lifeline
- Each worker must be connected to separate lifeline
- Lanyards and vertical lifelines minimum 5,000-pound strength
- Anchors must support 5,000 pounds
- Must limit free fall to 6 feet max
- Ropes and straps must be synthetic



Criteria for PFAs

- PFAs consist of a body harness, anchorage, connecting device and lanyard or vertical lifeline with a deceleration device
- Each lanyard or lifeline must be connected to an anchor capable of supporting 5,000 lbs.
- Lanyards and vertical lifelines must have minimum 5,000-lb strength
- Each worker must be connected to a separate lifeline
- Ropes and strap must be synthetic



Photo: Miller Fall Protection

Personal fall restraint



- Designed to stop a person from reaching the edge and falling
- Some fall arrest systems can be rigged in fall restraint

Anchors

- Anchors for personal fall arrest (PFA) equipment must be capable of supporting at least 5,000 pounds per employee attached



Photo: 3M DBI-SALA



Manufacturer's Installation Instructions

- Anchors must be installed following the instructions from the manufacturer
- Only the type of fasteners described by the manufacturer for use with the anchor may be used
- The quantity of fasteners described by the manufacturer for use with the anchor must be installed



Location for Roof Anchors – Residential

General guidelines

- Locate at roof peak when possible and at least 6 feet from any exposed roof edge
- DO NOT install roof anchors on unsupported roof structures, such as eaves or gable overhangs



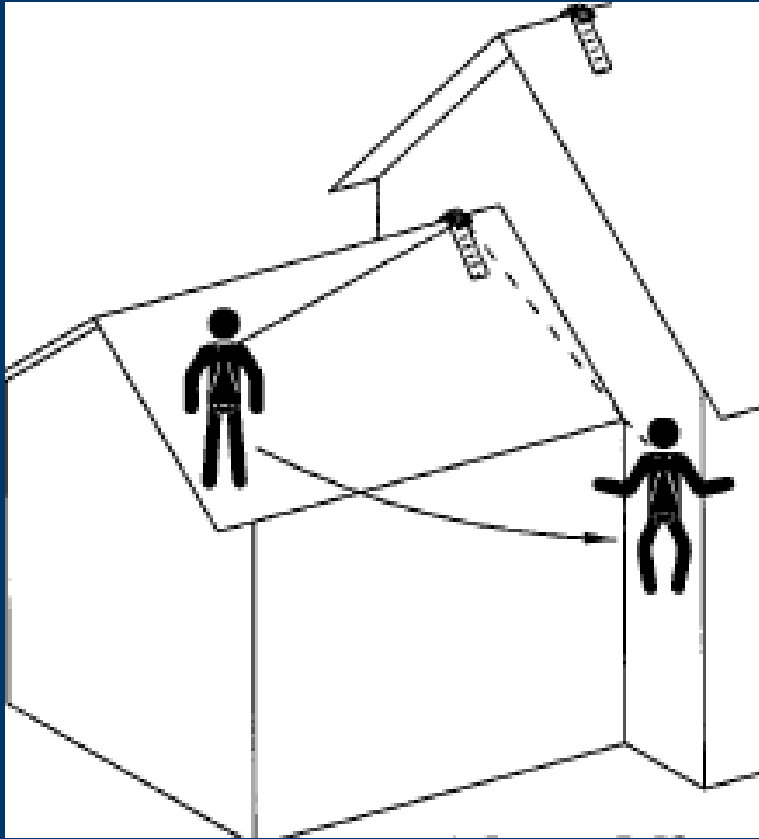


Location for Roof Anchors – Residential

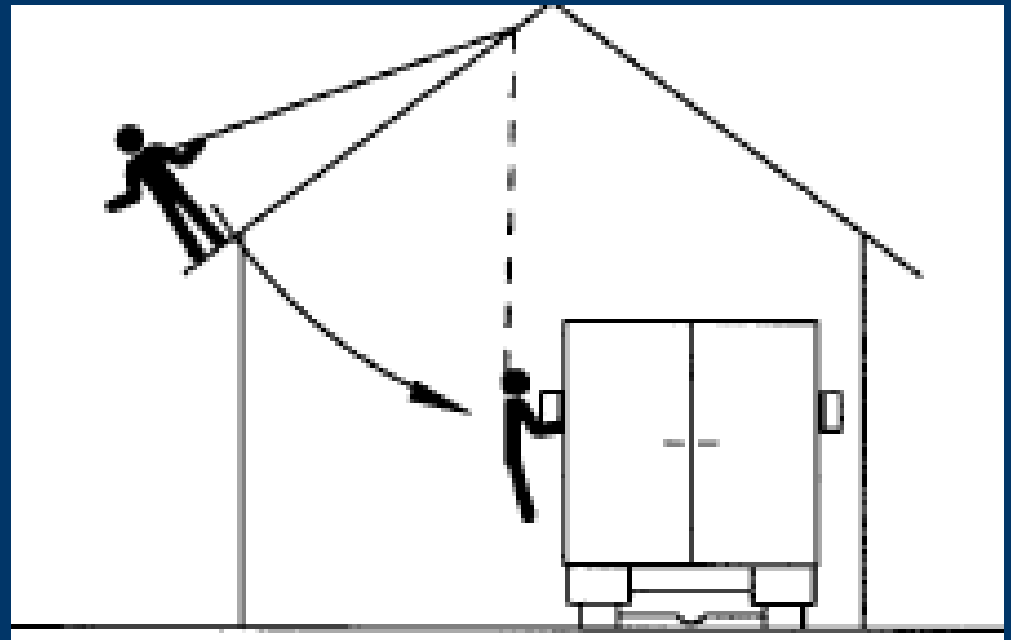
General guidelines

- Hip roofs may require a roof anchor at each hip face
- Reduce swing fall hazards on long roof faces by using multiple roof anchors installed at least 6 feet from the rake edge
- Best anchor position is directly above worker

Swing fall hazards



Swing Fall Hazard



Gable End Swing Fall

Slide guards



- In addition to PFA or personal fall restraint, slide guards may offer support and slip protection

Slide guards

- Slide guards consist of metal brackets that secure a section of minimum 2 X 6-inch lumber



Power Tools

- Power tools are widely used in the roofing industry
- Power tools fall into the following categories
 - Electric
 - Battery-operated
 - Pneumatic
 - Powder-actuated

Hazard: Power Tools

Hand-held electrical tools are especially dangerous because they make continuous contact with hands.



Ground fault circuit interrupter (GFCI)

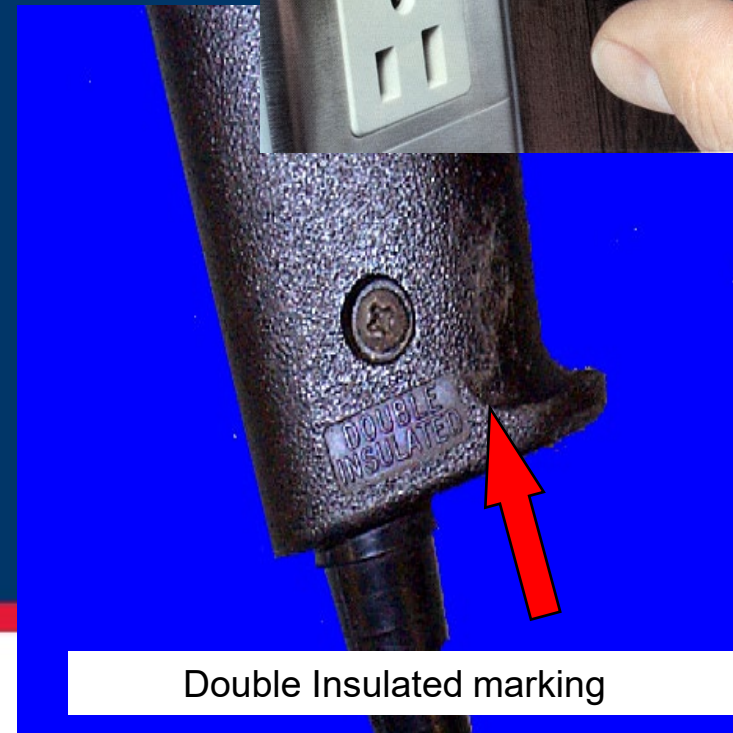
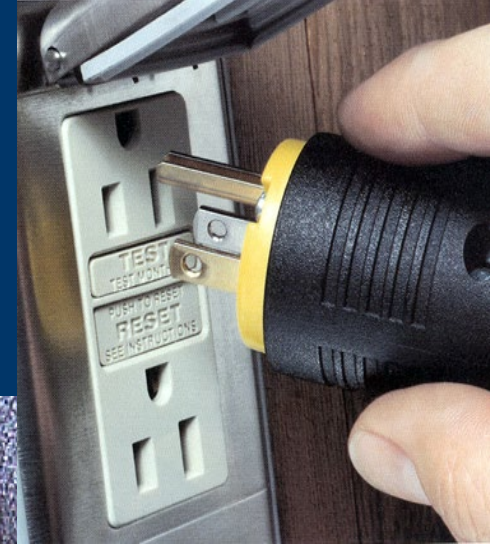
- Only device designed to protect people from dangerous shock from an electrical system.
- GFCI monitors and detects an imbalance of current between ungrounded (hot) and grounded (neutral) conductors
- If a ground fault (current imbalance) is detected, the GFCI will interrupt the electricity flow, protecting you from dangerous shock



Hazard Control: Power Tools

To protect from shock, burns and electrocution, tools must do one of the following:

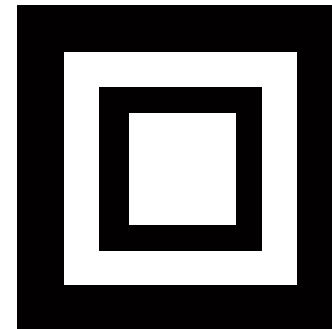
- Have a three-wire cord with ground plugged into a grounded receptacle
- Be double insulated (indicated by symbol of square within a square)



Double Insulated marking

Double insulated symbol

Double Insulated



Power Tool Safety Tips

- Inspect tools before each use
- Understand and follow manufacturer's safety instructions
- Choose the right tool and use correctly
- Use required personal protective equipment (PPE)
- Store in dry place—don't use in wet or damp conditions
- Keep working areas well lit
- Do not use damaged tools. Remove from service



Power Tool Safety Tips

- Ensure no tripping hazard exists
- Don't carry a tool by the cord
- Don't yank the cord to disconnect it
- Keep cords away from heat, oil and sharp edges
- Disconnect tools when not in use and when changing accessories





Personal Protective Equipment (PPE)

Head Protection



Kask.com



Msasafety.com



Milwaukeetool.com

Eye and Face Protection



Eye protection

- Eye protection must meet the requirements of ANSI Z87.1-1968
- Compliant eyewear will be marked Z87.1



Hearing protection

- May be necessary when operating loud powered equipment or if such equipment is in use in close proximity



Respiratory protection

- Exposures to gases, vapors, fumes, dusts and mists may necessitate respiratory protection.
- Some may want protection against nuisance dust by using N-95 dust masks.
- Be aware that use of respirators, even dust masks, can make breathing more difficult.
- Check with your doctor and follow all regulatory requirements.

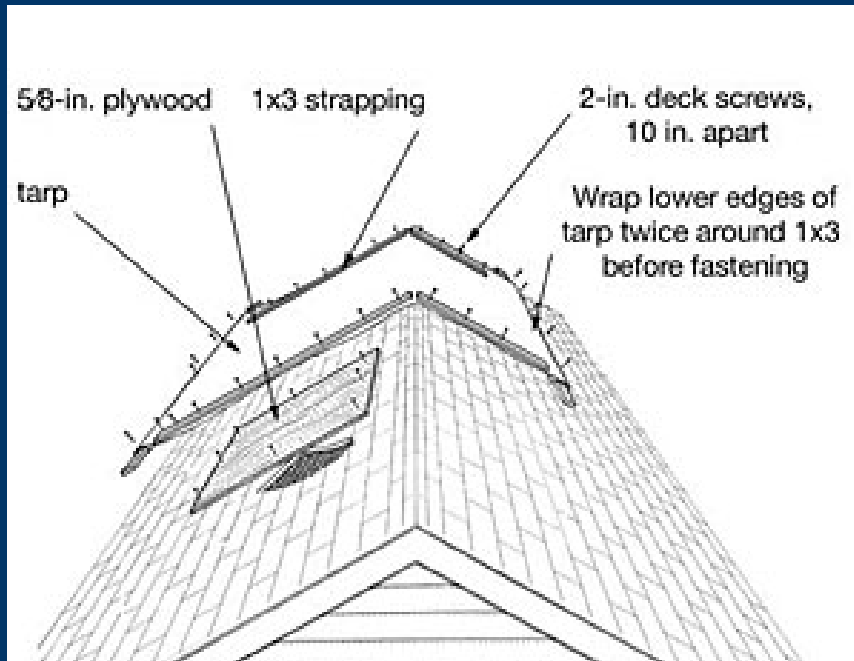


Hand protection



- Heavy leather or cut-resistant work gloves provide hand protection from nails & other sharp objects

Tarping procedures



Illustrations from This Old House website

Hazards of tarped roof?



QUESTIONS?

Contact Enterprise Risk Management Team

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