

MAINTENANCE GUIDEBOOK V ROOF AND WATERPROOFING MAINTENANCE

CHAPTER TWO - SAFETY

SECTION A GENERAL

Roof work, by its nature, ranks high in the incidence of accidents. Therefore, safety and accident-prevention measures should be part of the roof maintenance and repair program. Complete coverage of safety precautions is beyond the scope of this Guidebook. However, the observation of the following safety suggestions will go a long way toward preventing common accidents.

SECTION B OSHA REGULATIONS

Occupational Safety and Health Administration (OSHA) regulations regarding protection of the individual should be followed as part of all roofing and waterproofing repair work. Particular attention should be given to requirements for protection required around skylights, other roof openings, and at roof edges. Many states have OSHA-approved job-safety and health plans that would take precedence over the federal standards. Construction Standards are found at 29CFR 1926 (Code of Federal Regulations). Contact OSHA at US Department of Labor, 200 Constitution Avenue, NW, Washington, DC 20001 (Phone 202/219-8148) for copies of the regulations and information on state authority.

SECTION C WEATHER CONDITIONS

Roofing work should be performed only during dry weather.

SECTION D EQUIPMENT

The following applies to all tools and equipment used in roofing and waterproofing:

- Tools and equipment should be in safe and serviceable condition and inspected periodically.
- Equipment with moving parts should be operated with guards in place.
- Equipment should not be repaired while it is in operation.
- Electrical equipment and extension cords should be equipped with a ground-fault interrupter.

SECTION E HAZARD COMMUNICATION

Maintain all records required by OSHA (OSHA 200 logs and safety training, for example), and ensure that all employees are properly trained in the OSHA Hazard Communication Standard.

- Material Safety Data Sheets (MSDSs) should be kept current.
- A written Hazard Communication Program should be both developed and available to employees and management.
- Materials should be properly labeled.
- A list of hazardous chemicals used should be provided.

SECTION F STORAGE AND HANDLING OF ROOFING MATERIALS

A few caveats on the storage and handling of roofing materials are the following:

- Segregate materials by kind and size and store neatly. If they are stored on the roof, place them in neat, orderly piles that are safe against falling, blowing, and other hazards. Avoid overloading roofs.
- Place warning signs in daylight and red lights at night on and around materials stored in walkways, driveways, or streets. Such stored materials should not hinder traffic.
- Cover and protect materials against damage from the weather, theft, and vandalism.

SECTION G MATERIAL SAFETY DATA SHEET (MSDS)

A typical Material Safety Data Sheet (MSDS) is a product summary prepared by the product's manufacturer. It describes the material and lists the manufacturer's identity, location, and phone number so that anyone needing more information can call. The MSDS will inform interested individuals if the product poses a serious health hazard and whether there are any special precautions that should be taken in the use of the product. The MSDSs should be collected for maintenance materials kept in stock by the HA and used during repair and replacement work. The MSDS sheets should be kept current. Request a new MSDS with each shipment of material from the manufacturer.

SECTION H PERSONAL SAFETY

1. HARD HATS

Hard hats meeting ANSI standards should be worn at all times where there is a possible danger of head injury from impact, falling or flying objects, or from electrical shock or burns.

2. EYE PROTECTION

When operations present the potential for eye or face injury from physical, chemical, or radiation agents, eye and face protection equipment should be worn. The equipment should be labeled or otherwise indicate that it meets ANSI specifications Z87.1-1989 "Practice for Occupational and Educational Eye and Face Protection."

3. FACE SHIELDS

Face shields meeting ANSI standards should be used by a kettleman loading the kettle or withdrawing bitumen.

4. SUN SCREEN

Barrier creams with high-level sun screen should be used.

5. HEARING PROTECTION

Utilize hearing protective devices where appropriate.

6. GLOVES

Gloves with snug-fitting cuffs that extend up under shirt sleeves should be worn at all times. The type of glove used depends on the type of work being performed.

7. SHIRTS

Shirts should be long-sleeved and should be buttoned at the cuff around the gloves. Shirt tails should be tucked in and the shirt should be buttoned up.

8. PANTS

Pants made of sturdy fabric should be full-length, cuffless, and fit snugly around the boots.

9. BOOTS

Safety boots and shoes are available in all sorts of styles—from gym shoes to dress shoes—with the ANSI approval code. It is vital to choose the proper protective footwear to suit the job.

10. RESPIRATORS

When operations present the potential for exposure to air-borne contaminants, use respiratory protection. Check MSDS for contaminant to which exposure may occur during the work. Use devices indicating that they are acceptable to the US Bureau of Mines for specific contaminants exposure. Comply with OSHA respiratory standards which are found at 29CFR 1910.134 for general industry and 1926.103 for construction.

11. LIFELINES

Lifelines should be used when work places are more than 25 feet above the ground or other surfaces; however, it is recommended that safety belts and lifelines be used at lower heights as well. Lifelines and lanyards should be a minimum 3/4-inch diameter and should be attached to safety belts with a breaking strength of 5,400 pounds. Lifelines and lanyards should be anchored to a structural member capable of supporting 5,400 pounds of dead weight.

12. FIRST-AID KITS

A first-aid kit should be on the job at all times along with a current list of emergency phone numbers. Employees should be informed of their location.

SECTION I FIRE PROTECTION

Appropriate, operable fire extinguishers should be on the job and accessible on the roof and near any stored flammable products or open-flame operations. Locate a fire extinguisher at the kettle and within easy reach of wherever hot material is applied near combustible construction. Check MSDS for proper type of fire extinguisher for hot material being applied.

- Flammable materials should be kept only in UL- or FM-approved safety containers. Other liquids should be kept in clearly marked containers.
- Kettles and tankers should have properly fitting lids, be kept in good condition, and be equipped with temperature gauges in good working condition.
- Kettle temperatures should be kept below the bitumen flash point. Loading and handling of bitumens and operation of heating equipment should be done in accordance with manufacturer's recommendations.
- Never direct burner toward fuel tank, LP bottle, hose, or flammable material.

SECTION J SLOPED-ROOF SAFETY

Methods of assuring safety while working on roofs depend, to some extent, on the slope of the roof in question and the extent of work to be performed. Perimeter protection should be provided on sloped roofs with a ground-to-eave height greater than sixteen feet when extensive repair work will be performed.

For roof slopes greater than 4:12, the following information taken from OSHA standard 1926.451(u) Roofing Brackets applies:

- Roofing brackets should be constructed to fit the pitch of the roof as illustrated in Figure 2-1.
- Brackets should be secured in place by nailing when possible without penetrating the roof coverage. When it is impractical to nail brackets, rope supports can be used. Rope supports should consist of first-grade rope of at least 3/4-inch diameter, or equivalent.
- A catch platform should be installed below the working area of roofs with a height of more than sixteen feet from the ground to the eaves and with a slope greater than 4 inches in 12 inches unless there is a parapet. The platform should extend two feet beyond the protection of the eaves and have a guardrail, midrail, and toeboard. A platform is not necessary when employees engaged in work upon the roof are protected by a safety belt attached to a lifeline.
- Wear rubber-soled footwear on pitched roofs.

SECTION K LADDERS

The following are some basic elements of a safety program involving work on ladders. For more detailed information on ladder safety refer to OSHA 29CFR Subpart X of 1926.1050.

- Inspect and test all ladders to determine whether they are strong enough to carry the intended loads.
- Construct wooden ladders of straight-grained materials free from defects. Apply slip-resistant material to ladder rungs. Do not paint wooden ladders, since paint may serve to conceal defects.
- Mark metal ladders with signs cautioning use around and against electrical wires and equipment.
- Provide ladders with non-slip bases and fasten at top when possible.
- Place foot of ladder one-fourth of its length away from the vertical plane of its top support.
- Extend ladders leading to landings or walkways at least 36 inches above the landing. Fasten or tie-off to prevent slipping.
- Do not splice ladders to provide longer sections, unless specifically designed for such use. Avoid splicing ladders whenever possible.
- Always face the ladder when ascending or descending the ladder.
- Ladder jacks should have positive fastening devices and should be used only on stable ladders.
- Construct "chicken" ladders or crawling boards at least 10 inches wide and 1 inch thick, with 1 x 1-1/2 inch cleats. The cleats should be equal in length to the width of the board and spaced at equal

intervals not to exceed 24 inches. Nails should be driven through and clinched on the underside. Crawling boards should extend from the ridge pole to the eaves, and should be secured to the roof with ridge hooks or other effective means so they cannot become loose. A fastened lifeline of 3/4-inch rope or equivalent should be strung beside each crawling board for a hand hold.

- Maintain clean areas around the top and bottom of ladders.

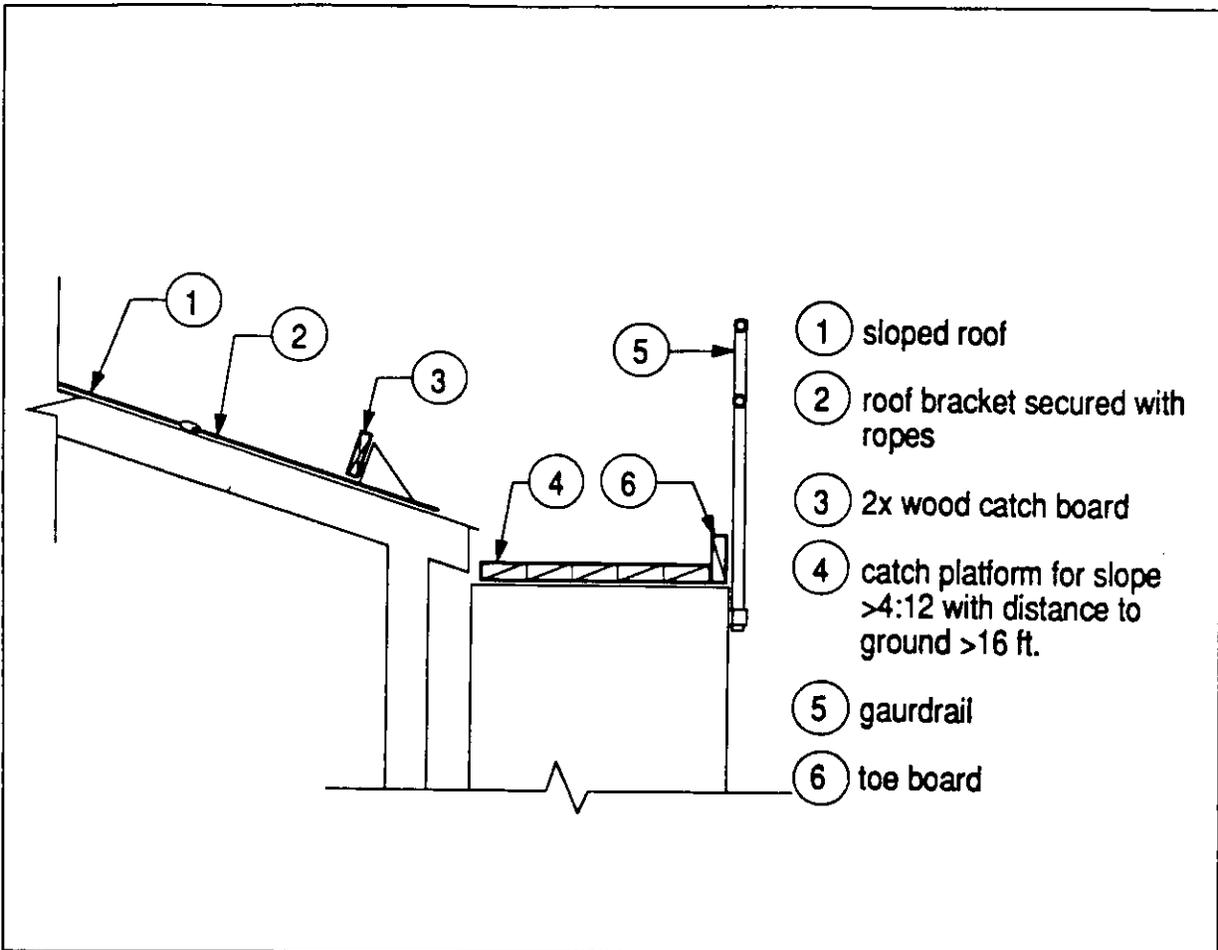


Figure 2-1

SECTION L SCAFFOLDS

Do not exceed the rated safe carrying capacity of scaffolds, and protect edges of all scaffolding with railings and toe boards. Do not use scaffolds for storage of materials except those currently being used. Clean scaffolds daily of all rubbish. Scaffolds should comply with OSHA's standards in 1926.451.

SECTION M HEATING AND HANDLING OF HOT BITUMINOUS MATERIALS

Heating kettles should be mounted on a firm, level, noncombustible foundation and be kept at least three feet from combustible materials. Kettles should be constantly attended and adequately protected from

personnel, vehicles, and other equipment. The kettles should have a close fitted lid that can be closed immediately if the heated material flames. Thermometers and temperature control devices should be used to prevent overheating of bitumens. Material must be thoroughly dry before it is added to heated contents of kettles. Add material by sliding it into the kettles and not by dropping it.

Do not thin or dilute material being heated with flammable substances. Shut down burners when refueling or if heated material bursts into flames. In hoisting material and handling hot substances, be sure that hoisting gear is strong enough to carry loads, is securely braced, and does not endanger workmen nearby or below. Require all persons handling hot substances to use proper foot and leg protection, goggles, gloves, and other personal protective equipment.

SECTION N TORCHING SAFETY

The following general procedures should be followed whenever torches are used:

- Torching equipment should be in good working condition.
- Hand-held torches and torching trollies should have an adjustable pilot light and an adjustable valve that controls flame size.
- Keep cylinders fastened securely in an upright position when being stored or transported, and be sure the container valve is closed with safety cap or collar in place.
- Cylinders should not be dropped or allowed to strike each other and should be checked before each use for rust and dents.
- Cylinders should be moved by means of a hand truck. If absolutely necessary to move them by hand, roll them on the bottom edge, never drag them.
- When in doubt, always assume that cylinders are full and handle them accordingly.
- The hose between the torch and the fuel tank should be at least 25 inches long and have the Underwriters Laboratory (UL) approval.
- Check hose prior to use for cleanliness, cuts, cracks, or worn places. Replace immediately if any of these are present.
- The pressure regulator and pressure gauge allow for an even flow of gas and should also have the UL approval.
- Tanks should be sized to meet the requirements of the burner equipment.
- A lit torch should never be left unattended.
- All combustibles should be properly disposed.
- Never torch to a combustible surface.
- At the end of the day, turn off the torch, then the tanks, and then bleed the line of excess gas.
- The foreman should perform at least a one-hour fire watch.

SECTION O SINGLE-PLY SYSTEMS

Ensure that confined work areas are properly ventilated, and allow no smoking around any single-ply products.

SECTION P ASBESTOS-CONTAINING ROOFING MATERIALS

Asbestiform minerals are still used in roofing materials to add durability and strength to them. Asbestos-Containing Roofing Materials (ACRM) may be found in nearly all types of roofing installations. Roofing cements which contain asbestos should be avoided. ACRM may include:

- Flashings,
- One or more layers of built-up roofing systems,
- Shingles,
- Roofing tar paper,
- Vapor-barrier material,
- Roofing and flashing cements,
- Miscellaneous materials used for patching.

HAs should be satisfied that the materials purchased for roofing repairs do not contain asbestos.

END OF CHAPTER TWO