

# The Roof Deck and Tearing Off or Roofing Over 4

**YOUR OBJECTIVE:**

*To understand (1) how building design, deck construction and deck materials affect the entire roofing system and the warranties on the roofing products, and (2) to be able to recognize and predict deck-related problems.*

Roof deck performance can have a strong affect on shingle performance. A bad deck can be a real headache. The causes for many of the complications that a problem deck creates can usually be traced back to the design of the building, the materials used to make the deck, or the way the deck was installed.

CertainTeed suggests that you make it your business to learn how to properly install shingles over all the various types of decks discussed in this chapter. And, as your knowledge of the roofing business continues to grow, you'll eventually be in a good position to recognize when a serious roofing problem is in the making. If nothing else, when you see what you think may be a potential problem, be sure to bring it to the attention of your supervisor. By doing this, it's possible that you could save your employer from a lawsuit and the homeowner from a lot of future roofing system headaches.

## WHAT IS A ROOF DECK?

The roof deck is the structural surface over which the roofing materials are applied. The roof deck should be a stable, smooth, solid surface which will permit the shingles to be securely fastened. The deck must be strong enough to:

- ◆ Support the roofing materials and workers.
- ◆ Safely resist impact loads, such as a pile of shingles.
- ◆ Hold uniform loads, such as heavy snow.
- ◆ Provide resistance to wind force.
- ◆ Anchor the nails.

All five of these capabilities must remain effective during the service life of each application of shingles that may be installed on the deck now and in the future.

## THE SHINGLE MANUFACTURER'S WARRANTY

If you apply a shingle roof over a deck surface that is unacceptable to the shingle manufacturer and damage results, the warranty might not be honored. The manufacturer will not take the responsibility for:

- ◆ Poor deck design that contributes to damage to the roofing system or other parts of the house.
- ◆ Defects or damage caused by materials used as a roofing base, over which the roofing shingles are applied.
- ◆ Damage to the shingles caused by settlement, distortion, failure, or cracking of the roof deck.
- ◆ Defects, damage or failure of shingles caused by applications that are not in strict adherence with the written instructions of the manufacturer.
- ◆ Application over wood that is not dry or which has hard projections, such as partially driven nails, which can cause damage to the shingles or underlayment applied above.

## EXPANSION AND SEISMIC-CONTROL JOINTS

When applying shingles near a joint that is designed to move, the shingles must be isolated from the joint movement. One way to accomplish this is to build a curb tall enough to allow for the installation of wall flashing (base and counter flashing). Typically, expansion and seismic-control joints use a flexible rubber material like EPDM or neoprene to absorb the movement and remain water-proof. For more information on curbs and expansion joints, consult the SMACNA or the NRCA manual.

## ACCEPTABLE DECKS

### HOW DO YOU KNOW WHEN YOU'RE APPLYING SHINGLES TO A DECK ACCEPTABLE TO THE SHINGLE MANUFACTURER?

CertainTeed has found that most exterior plywoods, non-veneer oriented-strand board (OSB), non-veneer wafer board, COM-PLY panels, and certain types of wood boards make acceptable deck surfaces. These materials have proven to be very effective over the years. They all perform well if they meet certain specifications, including minimum thickness requirements and if the deck manufacturer's application guidelines are followed.

These decks are acceptable for direct application of asphalt shingles. Permission from CertainTeed is not required to use these types of deck materials if they meet the other standard requirements mentioned below.

*Here's a Tip...* When installing or repairing a plywood deck, to set the APA recommended  $\frac{1}{8}$ " gap between the panels, use eight-penny nails as temporary spacers. This will give you the  $\frac{1}{8}$ " gap.

*If decking has been installed with less than  $\frac{1}{8}$ " spacing, this spacing can be created by cutting a  $\frac{1}{8}$ " wide saw kerf down the center of each panel and re-nailing before applying the underlayment and shingles.*

## PLYWOOD AND FRT (FIRE RETARDANT-TREATED) PLYWOOD

To be acceptable to CertainTeed, a plywood deck must be built with plywood that is at least  $\frac{3}{8}$ " thick and supported by rafters spaced 16" or 24" on center. Thicker plywood will make a better deck. The plywood must have an American Plywood Association (APA) stamp or equivalent of either "Exposure 1" or "Exterior."

Plywood panels should be installed with a  $\frac{1}{8}$ " spacing between them or as specified by the manufacturer.

- ◆ Use shingle underlayment to ensure that the Underwriters Laboratories fire ratings are maintained.
- ◆ FRT ("Fire Retardant-Treated") plywoods are treated with fire-retardant chemicals, and may be more heat and moisture sensitive than standard plywood. Therefore, if the deck is made from FRT plywood, it is especially important to follow the plywood manufacturer's instructions for ventilation requirements, shingle application requirements, and to keep the material dry at the job site. Heed any other special requirements the manufacturer may have for use with this material.

## NON-VENEER ORIENTED-STRAND BOARD (OSB) AND NON-VENEER WAFER BOARD (WB)

For the non-veneer OSB/WB decks to be acceptable to CertainTeed, the panels must be at least  $\frac{7}{16}$ " thick and supported by rafters spaced 16" to 24" on center. Naturally, a thicker panel is better. Look for products approved by the APA or the equivalent.

The non-veneer OSB/WB panels should be installed with a  $\frac{1}{8}$ " spacing between them. If you are installing these panels, remember they can be extremely dry when they leave the factory. The American Plywood Association recommends that you give the panels time to become "conditioned" by absorbing some moisture and expanding before installation. If they have not expanded or swelled to accommodate ambient humidity, buckling, "picture framing" ridging, or sagging may occur.

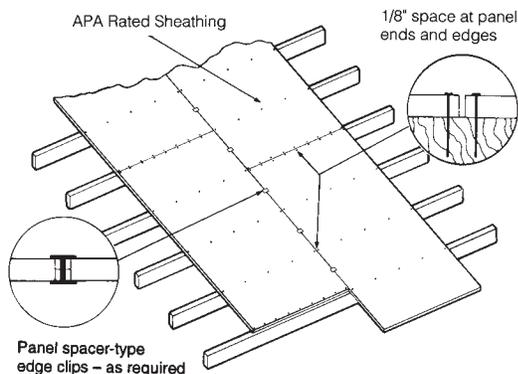


Figure 4-1: Proper installation of APA-rated sheathing for roof applications.

## COM-PLY PANELS

COM-PLY panels are composite panels made of wood veneer on the face and back, with an inside core of compressed wood strands.

The COM-PLY panels must be at least  $\frac{7}{16}$ " thick, supported by rafters spaced 16" to 24" on center, and have a minimum rating of "Exposure 1."

Just as with non-veneer panels, remember, COM-PLY panels are extremely dry when they leave the factory. It is best if they have had time to absorb some moisture, and adjust to local moisture conditions, before installation. If they have not adjusted, buckling, ridging and sagging may occur.

COM-PLY panels should be installed with  $\frac{1}{8}$ " spacing, or as specified by the manufacturer.

## WOOD BOARD DECK SHEATHING

- ◆ Wood boards must be a minimum of 1" thick (nominal thickness).
- ◆ Solid wood boards continuously expand and shrink as humidity and moisture levels change. Boards wider than 6" may need too large of a gap between them and may move more than the shingles can permit. The result can be unsightly buckling of the deck or shingles, or damage to shingles due to deck movement (cracking or splitting, for instance).
- ◆ Each board must be fastened with at least two 8d nails in each rafter.
- ◆ **SPACED BOARDS:** When applying an acceptable deck over spaced boards (i.e. purlins or lath boards), use minimum  $\frac{3}{8}$ " plywood or minimum  $\frac{7}{16}$ " non-veneer (OSB, WB) decking applied with the long dimension aligned vertically up the slope. This situation can arise when tearing off an old wood shake roof.

## WIDE BOARDS MAY CAUSE SHINGLE BUCKLES

Years ago the use of 1x6, 1x8, 1x10, and 1x12 wood board decking was common in roof construction. Today, because of cost efficiency derived from using larger plywood panels, this practice has become nearly obsolete. However, when performing tear-off work, a contractor may encounter existing wood board decking.

If the wood board decking has a high moisture content, it may shrink, causing horizontal buckling of the shingles. Wood decking with a low moisture content may pick up moisture and expand, resulting in the same problem.

What's a contractor supposed to do? To reduce the risk of shingle buckling, you can cover the boards with 4' x 8' nailable decking which could be plywood, OSB or COM-PLY, or cut through the center of the entire length of each wide board with a hand-held power saw, being careful not to cut into the rafter more than  $\frac{1}{8}$ ". This will create a new joint in the center of each board, resulting in wood decking that is narrower than 6". Fasten each side of the boards next to the new joint at every rafter using 8d nails. In some cases installing a power fan with a thermostat and humidistat can help minimize buckling. Now you're ready to go forward with the roofing job.

*Here's a Tip...* Be sure to determine what type of decking or sheathing is in place when you're inspecting older homes **prior** to making a cost estimate. If you discover wide wood board decking that needs to be cut or covered over to avoid potential buckling problems, be sure to take this cost into account. Tell the prospective customer what you intend to do and why. This bit of information may help set your proposal apart from a competitor who overlooked this important consideration.

## TIPS FOR REDUCING THE PROBLEM OF BUCKLED SHINGLES

Buckles in shingles are caused by the movement in the roof deck or the underlayment applied to it. Consider the following tips to reduce the likelihood of the appearance of buckles.

- ◆ Ventilate the attic properly. This reduces the amount of moisture absorption by deck panels and thereby reduces the amount of swelling and shrinking of the wood. It is this wood movement that causes much of the buckling. If the roof is over a cathedral ceiling, it may be necessary to add a ventilated deck over the existing deck. Consult with an expert regarding alternatives such as vapor retarders, insulating materials, and beneath-the-deck ventilation.
- ◆ If roof sheathing panels (plywood, OSB) will be stored at the site for a time before installation, place at least three stringers between each panel to allow them to acclimate to local humidity levels. Keep them off the ground. This reduces swelling after panels are installed. Panel swelling will produce buckles.
- ◆ Space deck panels  $1/8$ " apart on all sides when fastening them to the roof framing. Space nails 6" on center along the panel ends. Always be sure the framing is properly aligned before fastening the roof panels.
- ◆ Cover the roof panels with underlayment as soon as possible after installation to keep the wood dry. Remove or repair wrinkled underlayment before applying shingles.
- ◆ Heavy duty shingle underlayment, if not manufactured to high standards, can be a cause of serious buckling. A high quality standard shingle underlayment manufactured to meet ASTM standards is superior, and less likely to seriously wrinkle.
- ◆ Apply heavier shingles and/or dimensional shingles. They will resist buckling or disguise its effects better than lightweight shingles.

## INSULATED DECKS AND RADIANT BARRIERS

CertainTeed's Limited Asphalt Shingle Warranty, including SureStart™ coverage, will remain in force when its fiber glass asphalt shingles manufactured to meet ASTM D3462 are applied to roof deck assemblies (slopes  $\geq 2:12$ ) where foam insulation is prefabricated into the roof deck system (often called "nailboard insulation"), where insulation is installed beneath an acceptable roof deck system, or where radiant barriers are installed, with or without ventilation directly below the deck. Acceptable roof deck surfaces must consist of either minimum  $3/8$ " thick plywood or minimum  $7/16$ " thick OSB. If an alternate deck surface material is being considered, contact CertainTeed Technical Services. **See the following important restrictions.**

The design professional is responsible for ensuring 1) proper quality and application of the insulation and/or radiant barrier, 2) provision of adequate structural ventilation and/or vapor retarders as determined to be necessary, and 3) that all local codes are met (particularly taking into account local climate conditions). Special attention must be taken if cellular foam, fiber-glass, or cellulose insulations, or other highly-permeable insulation will be used in an unventilated system, or if the insulation/rafter or insulation/joist planes may create an air leak that could lead to moisture transmission and

condensation problems. *All these important factors and decisions, while **not** the responsibility of CertainTeed Corporation, are critical to assure proper deck system performance.*

CertainTeed shall not have any liability or responsibility under its warranty for a) Damage to or defects in its shingles caused by settlement, movement, distortion, deterioration, cracking, or other failure of the roof deck or of the materials used as a roofing base over which its shingles are applied, b) Damage caused by the growth of mold or mildew, or c) Defects, damage, or failure caused by application of its shingles not in strict adherence with CertainTeed's written instructions.

## INADEQUATELY VENTILATED AND NON-VENTILATED DECKS

Any shingles applied to an inadequately ventilated or non-ventilated decks, other than the shingles and deck systems described in the section titled "Insulated Decks and Radiant Barriers", are subject to a reduced limited warranty period of ten (10) years and do not qualify for SureStart protection. SureStart protection and the Warranty Period applicable to the shingle are available if the shingle damage was caused exclusively by a defect that is unrelated to the inadequate roof system ventilation (see warranty for details).

## VENTILATED NAIL-BASE ROOF INSULATION

Ventilated Nail-Base Roof Insulation products consist of rigid insulation (typically foam board) and some sort of material to provide air space above the insulation and below a nailable deck (which is typically minimum  $7/16$ " thick OSB or minimum  $3/8$ " plywood). These products can be a satisfactory way to provide soffit-to-ridge ventilation over cathedral-type ceilings, and their proper use will allow CertainTeed's Limited Asphalt Shingle Warranty to be unreduced. It is important to follow the deck manufacturer's instructions and ensure that sufficient ventilation is achieved. CertainTeed offers FlintBoard™ CV — cross-ventilating insulation boards with 1",  $1\frac{1}{2}$ " and 2" air channels.

## VENTILATION SPACING

CertainTeed defines unventilated, insulated decks as those lacking sufficient ventilation between the underside of the deck and the insulation. Ventilation spaces of less than  $3/4$ " are considered unventilated. Manufactured ventilated deck composites with  $3/4$ " spacing appears to be adequate on slopes of 6/12 and higher. We recommend that space should be at least  $3/4$ " in most cases. On slopes below 4/12 and areas that commonly experience snow loads of 12" and more should maximize ventilation space —  $3\frac{1}{2}$ " of clearance is not too much. It is important to seek the recommendations of a design engineer when unusual conditions exist.

A good rule of thumb is to use a minimum of 9 square inches Net Free Ventilation Area per foot of run, which calculates to about  $3/4$ " space. More ventilation space is almost always better, especially at low slopes and long rafter lengths. (also see figure 4-3).

*Here's a Tip... Snow is an insulator. Thick snow cover increases heat accumulation below. This can lead to melting and then ice-dam formations at the eaves. The thicker the snow, the more airflow is needed to dilute and remove the heat to prevent ice dams.*

## "PERMISSION-REQUIRED" DECKS

### DECKS THAT REQUIRE CONSENT FROM CERTAINTEED BEFORE THE SHINGLES ARE APPLIED

Certain other types of materials used for roofing decks are acceptable to CertainTeed, but it's required that the building designer or contractor first contact CertainTeed's Technical Services Department and receive permission, in writing, to use them.

### DECKS THAT REQUIRE SPECIAL APPLICATION PROCEDURES

Reviewing the installation specifications for these decks before granting permission to use them gives CertainTeed the opportunity to tell the roofer or designer that special application instructions available from the deck manufacturer should be considered, or to supply CertainTeed's supplementary application instructions regarding the need for ventilation, vapor retarders, special fasteners, and so on. Call CertainTeed if you intend to use either of the materials listed below. They require some type of special shingle application, defined by the deck manufacturer. When the deck manufacturer's application method is followed, the application of CertainTeed shingles is permitted.

#### LOADMASTER®

**NAILABLE DOUBLE BOARD ASSEMBLY:** A trademarked roof decking composed of a double layer of "mineral board," placed over a rigid insulation board (optional), and fastened to a steel deck. If rigid insulation board is used, contact CertainTeed regarding the shingle warranty duration. It is satisfactory for shingle application when installed according to Loadmaster's instructions and when the shingles are fastened with 1<sup>3</sup>/<sub>8</sub>" EG "Hardened Do-All Loc Nails." 1<sup>3</sup>/<sub>4</sub>" EG "Hardened Do-All Loc Nails" are required for Grand Manor™, or Carriage House™ applications.

#### HOMASOTE®

**ROOFING DECKING:** This is a high density wood fiberboard. It is acceptable to CertainTeed only when installed according to Homasote's instructions and when the shingles are fastened with Homasote #2125 nails. These nails have a 3/8" head, an annular thread, and are galvanized.

## UNACCEPTABLE DECKS

### DECKS THAT REQUIRE THE ADDITION OF AN ACCEPTABLE NAILABLE SURFACE

The materials listed in this section are not acceptable for use as a roof deck for direct application of CertainTeed's roofing products. These surfaces must be covered with an acceptable decking material, with ventilation as required, prior to the application of CertainTeed shingles.

All of the following products are not likely to provide a proper

surface for fasteners to hold and seal properly for the warranted life of the shingle. Direct shingle application can lead to over-driven or under-driven fasteners. Over-driven fasteners can damage the shingle, increasing the chances of wind blow-off and leakage due to wind-driven rain or ice-dam backup. The heads of under-driven fasteners, or of those that back out, may prevent shingles from sealing, reduce the wind blow-off resistance, and puncture the shingle tabs above, leading to leaks. Also, fasteners will not consistently seal and may leak if water reaches fasteners due to an ice dam or wind-driven rain.

**CEMENTITIOUS WOOD FIBER:** This material is made of shredded wood (excelsior) bonded with portland cement or magnesium oxychloride cement and formed into boards without a nailable surface.

**GYPSUM:** This deck material is made of either poured-in-place gypsum or of gypsum planks, reinforced with wire mesh cast, in a tongue-and-groove frame.

**LIGHTWEIGHT CONCRETE:** This is composed of portland cement and either expanded vermiculite or expanded perlite mixed with water, and smoothed to desired thickness over a base of vented steel decking.

**INSULATION BOARDS:** Rigid insulation products like Urethane, Isocyanurate, Polystyrene, Fiber Glass, and Phenolic Foam Boards; Perlite Board, Fiber Boards, and Fiber Glass Boards.

**DECKING OVER AN UNACCEPTABLE DECK:** The proper installation of an acceptable deck material over top of the unacceptable material described above is required to achieve an acceptable roof deck surface onto which CertainTeed roofing shingles may be applied. Fastening of the acceptable deck should be done in accordance with instructions provided by the manufacturer of the deck into which fasteners will be driven. (see figure 4-2)

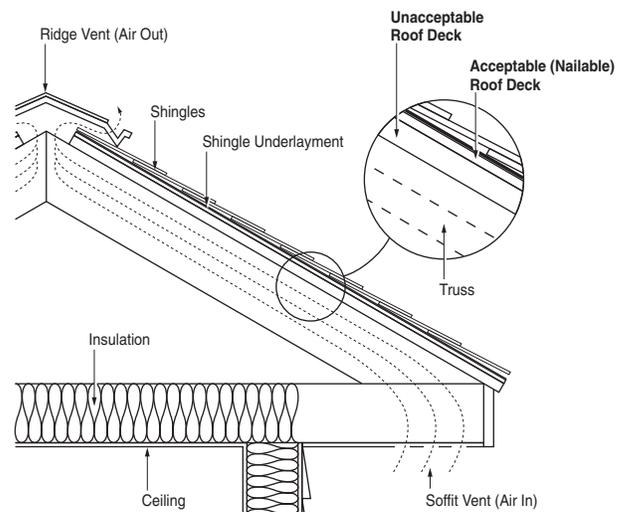


Figure 4-2: An acceptable deck applied over an unacceptable deck.

Figures 4-2 and 4-3 are construction schematics depicting examples of roofing systems that provide for isolation of the materials deemed "unacceptable" for direct shingle application and that are designed to provide an adequate surface to apply the shingles.

*Here's a Tip... Strike vertical lines to correct out-of-square decks or crooked rakes.  
(Thanks for this tip goes to Bernard Bower of Leopold, Indiana.)*

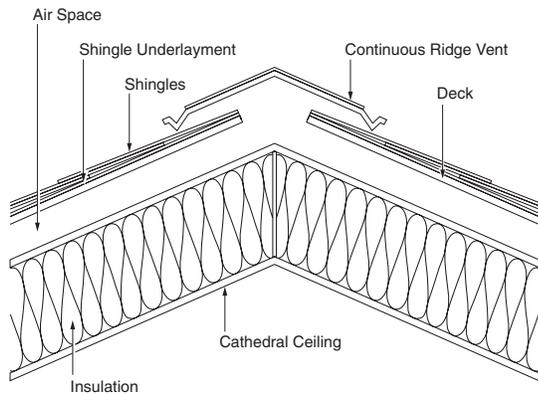


Figure 4-3: Preferred application method for a cathedral ceiling.

Figure 4-2 illustrates an application method where an acceptable deck is applied over an unacceptable deck which is properly ventilated beneath. Figure 4-3 illustrates a preferred application method for a cathedral ceiling, incorporating a soffit-to-ridge ventilation space beneath the top nailable deck and above the insulation of an “unacceptable” deck.

These system schematics do not contain **all** the necessary provisions for ventilation, vapor retarders, deck fastening, etc., but these features are important and should be considered by a design professional.

For Permission-Required decks and other information, call CertainTeed's Technical Service department at 800-345-1145.

## EFFECTS OF ROOF SLOPE ON APPLICATION AND MATERIAL SPECIFICATIONS

### LOW SLOPE (BELOW 4/12 TO A MINIMUM OF 2/12)

Because water drains slowly from these slopes, there is a greater chance of water back-up and damage from ice-dams. The application instructions for each CertainTeed roofing product indicate the minimum slope below which the product must not be applied, and a range of slopes where “low slope” application instructions must be followed. These instructions call for the use of a waterproofing shingle underlayment, such as CertainTeed WinterGuard™ Waterproofing Shingle Underlayment, or it's equivalent. Refer to the chapter on underlayments for more details. **However, careful consideration of local weather and the use of a waterproof underlayment meeting ASTM D 1970 are thought to be a good practice** by CertainTeed. Follow the application instructions for the particular shingle. Note the special low slope application requirements for the two products below:

- ◆ **LANDMARK TL AND PRESIDENTIAL TL SHINGLES:** Low slope application requires a layer of WinterGuard or an equivalent product over the entire roof deck. A **double layer of asphalt felt underlayment is not an acceptable alternative** when applying these products.

### STEEP SLOPE (EXCEEDING 21/12)

Roofing applications on steep slopes create some areas of risk that must be handled. Steep slopes tend to reduce the effectiveness of the factory-applied self-sealing adhesive (sealant), which could lead to shingle blow-off. In addition, shingles or their laminated tabs may slip out of place. Immediately following the application of roofing shingles on steep slopes, cement each tab in place with asphalt roofing cement meeting ASTM D4586 Type II.

Refer to the chapter on fastening and the application instructions for the particular shingle. Note that some types of shingles require extra fasteners for steep slope application.

## INSPECTING THE ROOF

A thorough inspection of the roof to determine whether the roofing must be removed before applying new roofing should include the following:

1. Check the condition of the rafters and sheathing in the space under the roof. If the rafters are sagging or if the sheathing is sagging between the rafters, the roofing must be removed and the conditions repaired before new roofing is applied.
2. Check for evidence of leakage into the area under the roof, such as patches of dry rot or fungus, or the presence of carpenter ants. If signs of rotting or moisture are widespread, it is best to remove the roofing and repair any damage before re-roofing.
3. Check the condition of the shingle roofing itself. Replace old roofing if it is severely deteriorated or damaged to the extent that the new roofing applied to it would have its appearance or performance negatively affected. However, there are many cases where new shingles can be successfully applied over old shingles.
4. If the old roof consists of architectural, lock-type, dutch lap or wood shingles other than sawn square-butt style, remove the existing roofing, repair decking and/or install new decking.
5. Check whether there is already a second roofing layer on the deck. Building codes in some localities do not permit a third layer of roofing and, in any case, it is better to remove the two layers of roofing rather than apply a third layer. Possible problems associated with a third layer include too much stress on the structure, difficulty in fastening through several layers, not enough room under some chimney and wall flashings, and reduced shingle life.

### ROOF-OVER INSTALLATIONS MAY BE CONSIDERED WHEN:

1. No more than one layer of shingles (not including a layer of sawn, square butt wood shingles if local codes approve this as a substitute roof deck) are in place on the existing roof.
2. After careful inspection, the roof deck is found to be strong and to provide a good nailing base.
3. The combined weight of the first and second layers of shingles will not exceed the rated carrying capacity of the deck.

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*Here's a Tip...* When tearing off shingles, use a leaf blower to remove loose debris (loose granules, dirt, etc.) from the roof.  
(Thanks to Erick Green from Virginia Beach, VA.)

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4. The contractor is certain all roof system components, especially flashing and valleys, can be properly repaired or adapted to the roof-over installation.
5. Manufacturer's instructions do not prohibit roof-over installations.
6. The cost to dispose of old roofing materials would be prohibitive.

**NOTE:** Concern is growing regarding the **disposal** of old shingle and roofing materials in landfills. Some landfills prohibit or restrict such disposal. Others charge a premium. Research has been underway for some time to develop recycling methods. Some progress has been made in the process of turning roof waste into a component for road construction. However, the profitability of recycling is yet to be proven. Some believe that roof-over is a desirable approach with the hope that one day an economically viable recycling method will be found that solves the problem. In the meantime, they believe old roofing is best stored on the roof.

7. Another argument in favor of roof-over is based on the belief that the first layer is additional insurance against leaks.
8. The homeowner enjoys a clear price advantage by avoiding the added cost of tearing off.

**NOTE: The Integrity Roof System™ requires tear-off.**

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### When Roofing Over Existing Shingles...

If old roofing will not be torn off, check local building codes for the maximum number of roofing layers allowed (usually two, sometimes three) and maximum weight per unit area. Check the underlying deck to be sure it is sound and will provide good anchorage for nails. Here are the requirements for specific types of shingles:

- ◆ **Shingles weighing more than 350 lb/square:** If the old roof consists of two or more layers of standard-weight shingles or one layer of heavyweight shingles, it is required to tear off existing roofing, repair decking and/or install new decking.
- ◆ **Other asphalt roofing shingles (except lock-type or dutch lap):** Make the old roofing surface as smooth as possible by replacing missing shingles, and splitting, nailing flat and securing all buckles, raised tabs, and curled shingles. It is recommended to cut old shingles back flush to the rakes and eaves. Another recommendation is to apply corrosion-resistant drip edge along the rakes and eaves to cover the edges of the old shingles. Use no underlayment over the old roof, and apply roofing in accordance with product application instructions.
- ◆ **Square-butt, sawn-wood shingles:** Apply beveled wood strips to all courses to obtain an even base.
- ◆ **Lock-type, dutch lap or wood shingles (other than sawn square-butt style):** Remove the existing roofing, and follow tear-off instructions.

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## PREPARING THE ROOF AND SURROUNDING AREAS FOR TEAR-OFF

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Before the first shingle is removed, it is important to protect the building and surrounding areas from damage and dirt that can result from tear-offs. It is also necessary to prepare safe, convenient access to the roof and assure a safe working environment on the roof. These preliminary tasks include:

1. Protect the windows, doorways, surrounding grounds and shrubbery with tarps or with temporary protective structures. If possible, attach a large tarp that covers the entire side of the building from the roof to the ground.
2. Have extra tarps or rolls of roofing felt ready to cover exposed areas of the roof deck in case of sudden rainstorms.
3. Cover the entire contents inside the attic area under the roof with plastic or tarps to collect dirt and debris that will fall through openings in the roof deck.
4. Locate a dumpster or prepare a place where roofing debris can be safely and conveniently contained before it is hauled away. Cover the debris each night during the course of the job. Cordon off the trash area and place signs prohibiting entry due to possible harm from sharp and heavy materials.
5. Prepare staging between the ground and the roof, or set planks on ladder brackets.
6. Research indicates that securing the tops of ladders prevents accidents. *Figures 1-1 and 1-2* show one good way to do this. To learn about ladder safety see *Chapter 1, "Safety First."*
7. Planks supported by metal roof brackets, nailed to the rafters every 6' up the roof, are useful on any sloped roof and are a necessary safety feature for steep slopes.
8. Take care to be in compliance with current OSHA safety standards. (See OSHA regulations in Chapter 1.)

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## TOOLS AND OTHER MATERIALS

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The basic tool for tearing off shingles is the ripping shovel or shingle ripper. It consists of a long handle (for leverage), connected at a steep angle to a flat blade with serrations along its leading edge for hooking around nails. An ordinary garden pitchfork can be substituted for the ripping shovel. Other necessary or useful tools and materials are:

1. A 16-ounce straight-claw hammer and a pry-bar for pulling nails and breaking up cemented areas.
2. A supply of tarps or large sheets of heavy plastic for protecting building features, items surrounding the building, and the roof itself in case of wet weather.
3. Metal staging, planking, roof cleats, ladders, and ladder and roof brackets (jacks) for supporting the planking.

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## TEARING OFF THE ROOFING

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**SAFETY:** Special attention should be given to avoiding injury. For example:

1. Workers on the roof should use rubber-soled footwear that reduces the possibility of slipping, avoid stepping on debris that might slide out from under them, and **use fall protection**.
2. Workers on the ground should wear hard hats, eye protection, and boots with thick soles and steel toes.
3. Workers involved in any part of the tear-off project should wear gloves.
4. Besides moving debris out of the way promptly, sweep loose granules from the shingles out of the work area to avoid creating slippery surfaces.
5. Build perimeter barriers at the eaves to prevent material from becoming a danger to individuals and property below.

**ORGANIZATION:** Starting at the peak of the roof and working down toward the eaves, the actual tear-off operation consists of three separate tasks that occur more or less simultaneously:

1. Ripping up the shingles.
2. Moving debris out of the path of the rippers and off the roof.
3. Putting debris in a dumpster or a safe accumulation area.

If there are four people involved in the operation, an efficient division of labor is to have two rippers; one person below them on the roof moves debris out of the way and off the roof, and one person on the ground puts debris in the dumpster, being ever alert for falling objects.

**RIPPING:** The actual ripping and tearing is pretty straightforward once an area of the deck is exposed. Here are some suggestions:

1. To avoid working with many small clumps of material, push the shingle ripper under as many layers as possible and try to spring the nails loose.

2. Work with sections about three feet square for greatest safety and efficiency. Be careful not to pull up too much of the roofing at once, because it is unsafe to move large sections off the roof.

**FLASHING:** Problem areas involving damaged sheathing and where damage can be caused during the ripping process are often found near flashing around chimneys, vents, skylights, roof-to-wall joints, and valleys. It is best to use a pry bar and hammer to remove shingles from these areas. Here are more tips for dealing with these problem areas:

1. Chisel away old roofing cement (e.g., around chimneys) and bend up the counter flashing, being careful not to damage it if it's to be reused.
2. At walls and skylights, it might be possible to save the counter flashing if it is in good condition. Just pry up the edges and clean under it. The new roof can often be installed above and below it. However, keep in mind that reused flashing should last for the life of the new shingle roof.
3. Even though valley flashing may appear to be sound, plan to remove and replace it. Small cracks in old valley flashing are hard to detect, and it is not worth risking a possible leak because of it.
4. Waterproofing Shingle Underlayment (WSU) cannot be removed. It adheres permanently to the roof decking. Under some circumstances, it can be covered by new WSU. In other cases, the decking will need to be replaced.

**CLEANUP:** When the sheathing is exposed and most of the debris is stowed in the dumpster or in a safe place ready to be hauled away, it's time to clean up as follows:

1. Sweep the roof.
2. Pull up or pound in all remaining nails.
3. Clean out all gutters. Aluminum gutters might buckle under the load of debris.
4. Rake the yard and the bushes, and sweep the driveway.
5. Use a rolling magnetic bar to pick up stray nails.
6. Leave the attic plastic sheet in place to catch additional debris if removal or repair has not been completed.

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### *Here are Some Tips...*

*If a roof is out of square at the ridge, hold tape at an angle when measuring the short side and snapping chalk lines. This helps recover when the ridge is not parallel with the eaves. (Thanks to Ken Ronchie from N. Kingstown, RI.)*

*Always cover the top of the plumbing vents when tearing-off (use a tin can with holes or even your hat!) It only takes one disk or piece of felt to disrupt your customer's plumbing. (Thanks to Greg Hansen from Lincoln, NE.)*

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