

Sketches of Approved Roofing Applications

Improper installation of flashing is the greatest cause of failures of roof-covering systems. Whenever one plane of a roof intersects another plane, flashing is required where the planes intersect. Thus, flashing is required at valleys and intersections of the roof with vertical surfaces, such as walls, parapets, sides of chimneys, etc. Furthermore flashing is required around all edges of the roof, such as at eaves and rakes, to prevent the entry of water underneath the roofing.

This sketch shows the approved application of valley flashing for asphalt shingles. The roof valley flashing shall not be provided of less than 0.016-inch (No. 28 galvanized sheet gage) corrosion resistant metal (Diagram A). Please be aware that there are many lighter gage materials available at building supply stores. These materials are intended for other uses and are not acceptable for valley flashing or other flashing applications. Valley flashing shall extend at least 8 inches from the center line each way. Sections of flashing shall have an end lap of not less than 4 inches. Alternatively, the valley shall consist of woven asphalt shingles applied in accordance with the manufacturer's printed instructions (Diagram B).

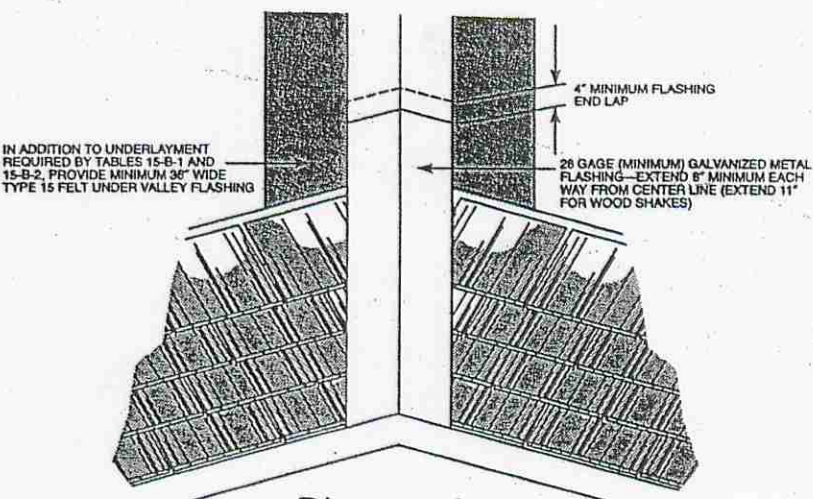


Diagram A

VALLEY FLASHING
(Asphalt or Wood Shingles and Wood Shakes)

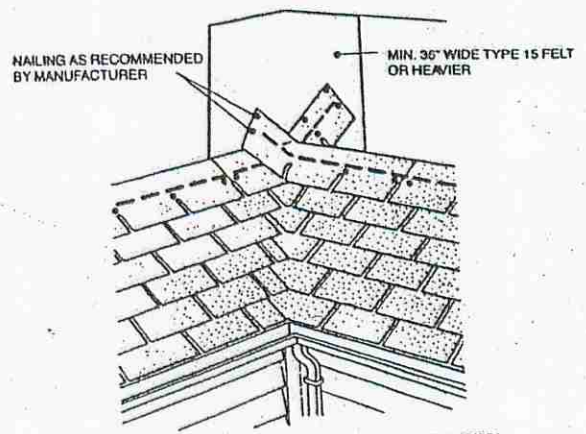


Diagram B

ALTERNATE VALLEY FLASHING
(Asphalt Shingles)

At the juncture of the roof and vertical surfaces, flashing and counterflashing shall be provided per the roof manufacturer's instructions and, when of metal, shall not be less than 0.019-inch (No. 26 galvanized sheet gage) corrosion resistant metal. Because of the exposure of these flashing materials they are required to be of a heavier material than the valley flashing. To maintain water resistance, it is necessary to apply flashings so that differential movements caused by settling, etc., are accommodated. Secure base or step flashing to the roof deck (not to the wall) and secure cap flashing to the masonry or vertical wall, as shown. Do not fasten the cap flashing or siding to the base or step flashing. In most cases where the roof meets the wall, the siding will serve as the counterflashing (Diagram C). Counterflashing is sometimes referred to as cap flashing and is flashing embedded in the vertical surface that caps over the flashing materials that extend up from the roof surface (Diagram D). Caulking or black jack is not an acceptable substitute for counterflashing.

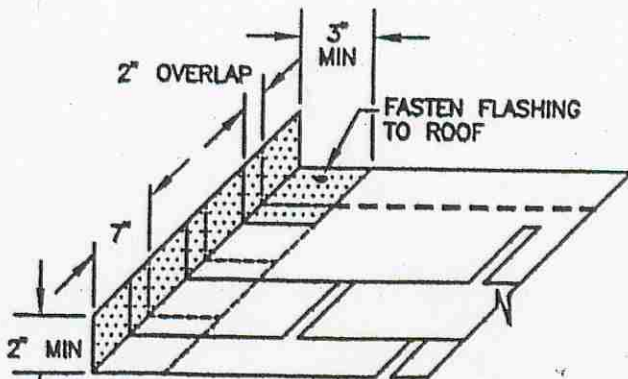


Diagram C

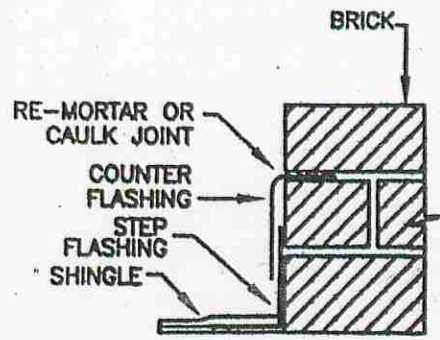
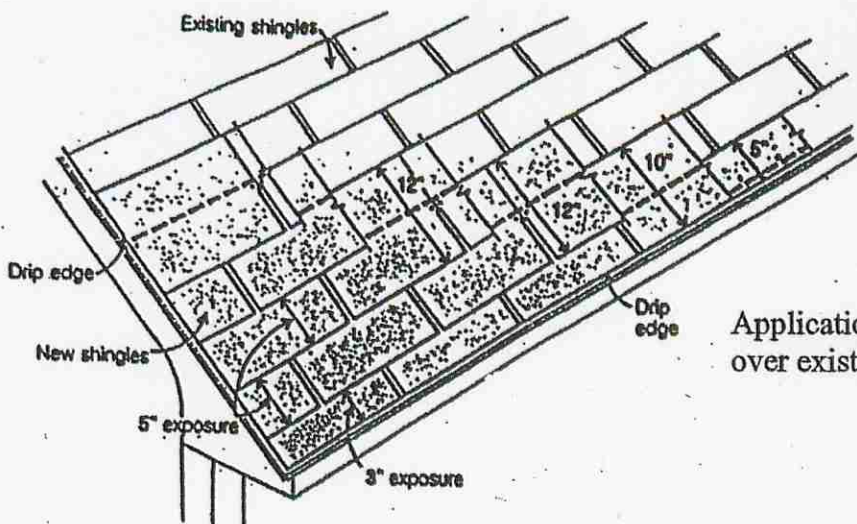
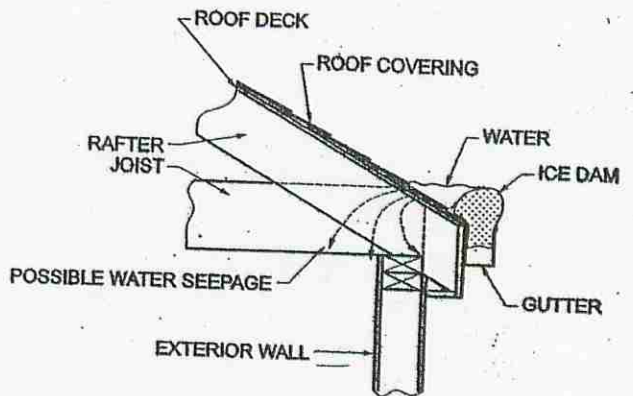
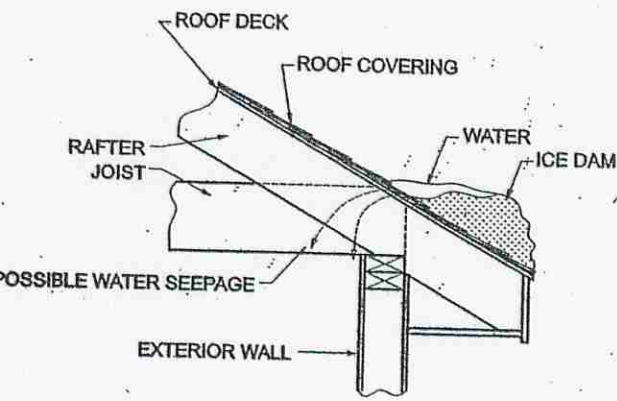


Diagram D



Application of new asphalt shingles over existing asphalt shingles.



POSSIBLE WATER DAMAGE AT ICE DAMS

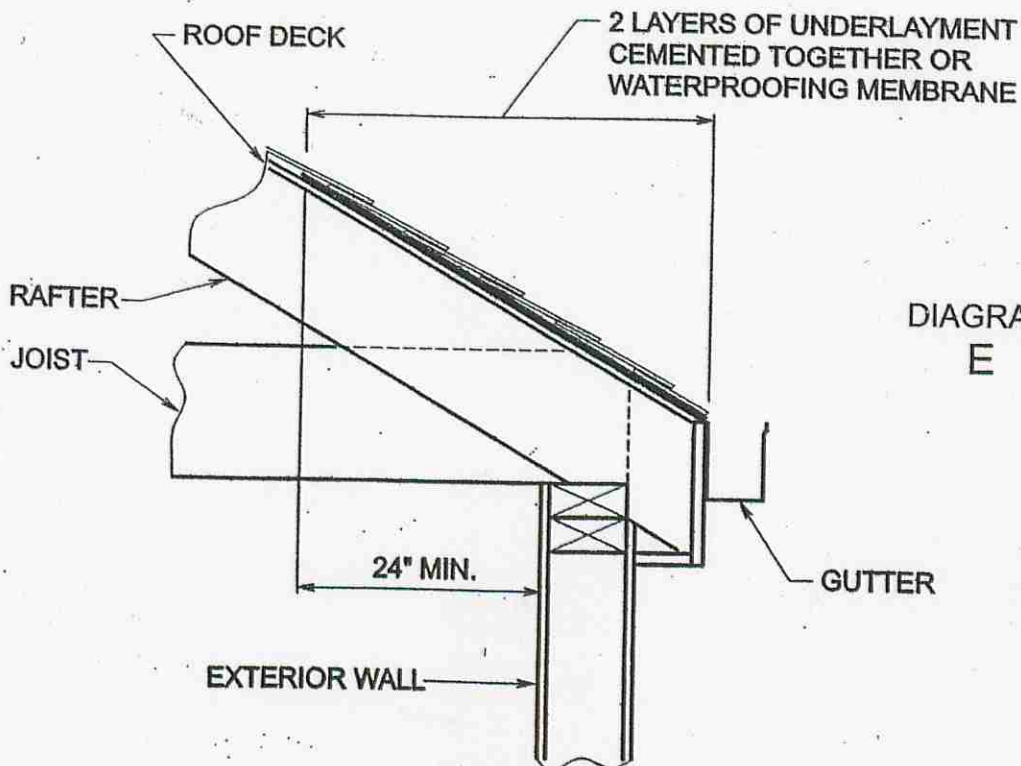


DIAGRAM E

PROTECTIVE ICE SHIELD INSTALLATION



CITY OF WATERLOO, IOWA

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LOUIS CUTWRIGHT, JR Building Official / Maintenance Administrator

Definitions

Eaves: The lower edge of the roof, which runs parallel with the wall.

Rake: The edge of the roof that runs from the eaves to the peak or highest point of the roof.

Roof Edge: A preformed metal edging, which is installed on roof edge to extend the drip line.

Roof Pitch: Roof pitch is the amount the roof rises from horizontal in a 12-inch distance. Usually expressed as a fraction. Example: 4/12 (common in this area).

Square: A roofing term that means 100 square feet of roofing. Most asphalt shingles are packaged so that three packages, called bundles equal one square.

Sheathing: The sheet material over the rafters or trusses, which forms the deck of the roof. Usually 4 foot by 8 foot sheets of plywood or oriented strand board.

Underlayment: Felt material, which is placed over the sheathing and under the shingles.

Spaced Sheathing: Boards applied with spaces between boards, which formed the decking under wood shingles. Not acceptable for asphalt shingles.

Ice Dam Protection: Ice dam protection is accomplished by installation of a special roofing material membrane which is adhered to the roof sheathing from the eaves to a specified dimension inside the outside wall line. Some brand names of this product are: Winterguard, Ice-shield, Rubberized Felt, Ice & Water Barrier and Weatherguard. These names are not a recommendation and are only listed to clarify understanding.

Soffit: Underside of the part of the roof that extends past the wall line.

Overlay or Tear-off?

- The reroofing of a structure having asphalt shingles may be accomplished by either **overlay**; adding an additional layer of asphalt shingles (one overlay is permitted over an original shingled roof) or **tear-off**; completely removing the existing shingles, underlayment, flashing, etc., and then roofing as if new construction.

To assist in making the decision whether to overlay or tear-off, consider the following:

- Check the framing beneath. It must be adequate to carry the additional weight of new materials plus the weight of roofers and their equipment.
- Check the condition of the existing deck sheathing. It must be adequate for both support and anchorage of new roof fasteners.

- Check the condition of the roofing surface. If it is warped, curled, or badly weathered to the point where providing a level surface for the new material will be difficult, it should be removed. If the surface is defective to the point where it will not serve as underlayment, it should be removed.

Sheathing

- Roof sheathing shall be checked prior to reroofing and repaired or replaced if rotted or unsound. Replacement sheathing shall conform to the requirements of the Building Code. For sheathing over existing spaced sheathing 7/16 thick sheathing is the minimum that will meet the requirements of the Building Code.

Roof Pitch

- Asphalt shingles shall in no case be used on roofs with less than 2/12 pitch.

Underlayment

Roof Pitches from 2/12 to less than 4/12

- Two layers of 15# felt applied shingle fashion. Starting with an 18-inch wide sheet and a 36-inch wide sheet over it at the eaves, each subsequent sheet shall be lapped 19 inches horizontally.

Roof Pitches of 4/12 and over:

- One layer of 15 pound felt lapped 2 inches horizontally and 4 inches vertically.

Ice Dam Protection

- Ice dam protection is required on all heated structures where the potential for ice dams exist. It is required on attached garages whether they are heated or not. It is required on porches attached to the house. Unheated detached accessory buildings and detached garages are not required to have ice dam protection.
- Ice dam protection shall extend from the eave's edge to a point at least 24 inches inside the exterior wall line of the building. The exterior wall line is the inside face of the exterior wall. See Diagram E.

Valley Lining

- For closed alleys (valleys covered with shingles), need to be lined with one of the following:
 1. One layer of one ply smooth roll roofing at least 36" wide
 2. One layer of winterguard 36" wide
 3. One layer of 24" valley flashing corrosion-resistant metal

Flashing

- Intersections of roof surfaces with vertical walls, chimneys, and projections through the roof create potential areas of leakage that must be protected by corrosion resistant metal flashings.
- To maintain water resistance, it is necessary to apply flashings so that differential movements caused by settling, etc., are accommodated. Secure base or step

- flashing to the roof deck (not to the wall) and cap flashing to the masonry or vertical wall as shown. (See sketch back page). Exterior wall siding may serve as cap flashing. Do not fasten the cap flashing or siding to the base or step flashing.
- Each metal flashing piece (commonly call tin shingles) is to be placed slightly up the roof from where the exposed edge of the next overlapping shingle will be located, so as to hide the flashing.
 - These flashings need to be installed as each course of asphalt shingles are installed. If you have doubts about correct installation seek information. These flashings will not be effective if installed incorrectly and are very difficult to change once installed incorrectly.
 - Roof Edge is required on both eave and rake edges. Be careful to install rake piece on top of eave piece to enable it to shed water.

Ventilation

- The total net free ventilating area shall not be less than 1 to 150 of the space to be ventilated except that the total area is permitted to be reduced to 1 to 300, provided at least 50 percent and not more than 80 percent of the required ventilating area is provided by ventilators located in the upper portion of the space to be ventilated at least 3 feet above eave or cornice vents with the balance of the ventilation provided by eave or cornice vents. As an alternative, the net free cross-ventilation may be reduced to 1 to 300 when a vapor barrier having a transmission rate not exceeding 1 perm is installed on the warm side of the ceiling.
- Tear-offs and overlays with inadequate ventilation shall be upgraded to meet the requirements.

Fasteners

- Asphalt shingles shall have the minimum number of fasteners required by the manufacturer. For normal application, asphalt shingles shall be secured to the roof with not less than four nails per strip shingle or two fasteners per individual shingle. Nails shall not be less than 12 gauge with 3/8-inch minimum diameter head.
- Nails shall be of sufficient length to penetrate through roofing material and at least 3/4 inch into roof sheathing or through the thickness of the roof sheathing, whichever is less.

Roofing Contractors

- Some guidelines may be helpful in working with a roofing contractor:
- In Waterloo roofing contractors are required to be licensed and insured. You should call Building Inspection Department to determine if a contractor is licensed and insured.
- Do not obtain the permit for a contractor doing work for you. This would make you the responsible party for the project meeting the code instead of the contractor. It would seriously handicap the Building Inspection Department from regulating the work done by the contractor.

- A reliable contractor should be able to provide you with current references you may contact to determine if previous customers were satisfied.
- You may call Building Inspections Department to determine the current projects a contractor have obtained permits to perform the work.
- Check at start of work to determine if contractor has obtained permit.
- Inquire of contractor if they would be willing to include in contract that final payment will not be made to contractor until project passes final inspection by the Building Inspection Department.

Building Permits

- Homeowners doing their own roofing are required to obtain a building permit.
- To obtain a permit you need to know the address, the quantity of squares of roofing, whether it is a tear-off or overlay, and whether sheathing will be replaced.

Inspections

- For a roofing project the only inspection required is a final inspection when the work is completed.

**This handout was developed by the City Of Waterloo under the current adopted Residential Code as a basic plan to help in the building process. It is not intended to cover all circumstances. Check with the City Of Waterloo Building department for additional requirements. Department hours are Monday thru Friday 7:30 to 5:00 **