

Roof Underlayment for Asphalt Shingle Roofs

Purpose: To provide recommended practices for use of roofing underlayment as an enhanced secondary water barrier in coastal environments.

Note: The underlayment options illustrated here are for asphalt shingle roofs. See FEMA publication 55, Coastal Construction Manual, for guidance concerning underlayment for other types of roofs.

Key Issues

- Verifying proper attachment of roof sheathing before installing underlayment.
- Lapping and fastening of underlayment and roof edge flashing.
- Selecting underlayment material type.

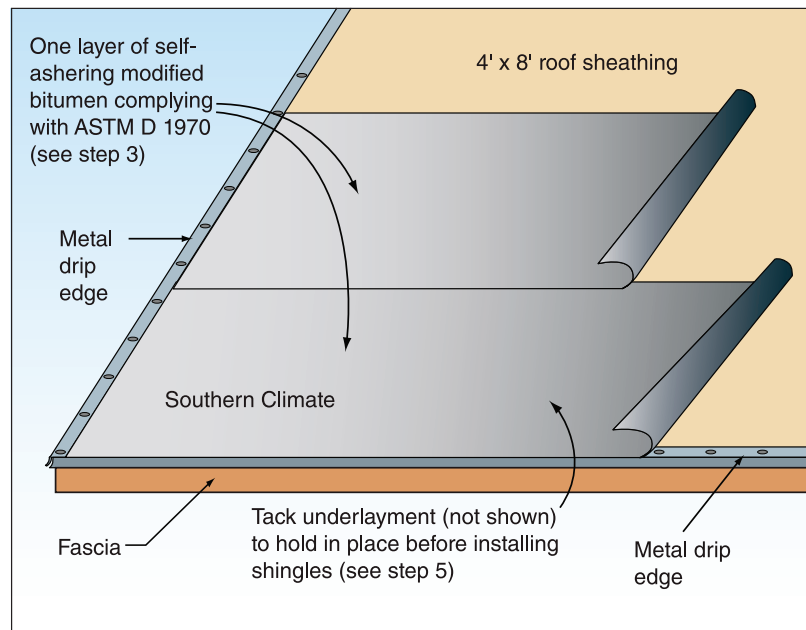
Note: This fact sheet provides general guidelines and recommended enhancements for improving upon typical practice. It is advisable to **consult local building requirements** for type and installation of underlayment, particularly if specific enhanced underlayment practices are required locally.

Sheathing Installation Options

The following three options are listed in order of decreasing resistance to long-term weather exposure following the loss of the roof covering. Option 1 provides the greatest reliability for long-term exposure; it is advocated in heavily populated areas where the design wind speed is equal to or greater than 120 mph (3-second peak gust).¹ Option 3 provides limited protection and is advocated only in areas with a modest population density and a design wind speed less than or equal to 110 mph (3-second peak gust).¹

Installation Sequence – Option 1² (for moderate climates)

1. Before the roof covering is installed, have the deck inspected to verify that it is nailed as specified on the drawings.
2. Broom clean deck before installing self-adhering modified bitumen products. If the sheathing is OSB, check with the OSB manufacturer to determine if a primer needs to be applied before installing these products.
3. **In Southern Climates, apply a single layer of self-adhering modified bitumen complying with ASTM D 1970 throughout the roof area.**
4. Seal the self-adhering sheet to the deck penetrations with roof tape or asphalt roof cement.



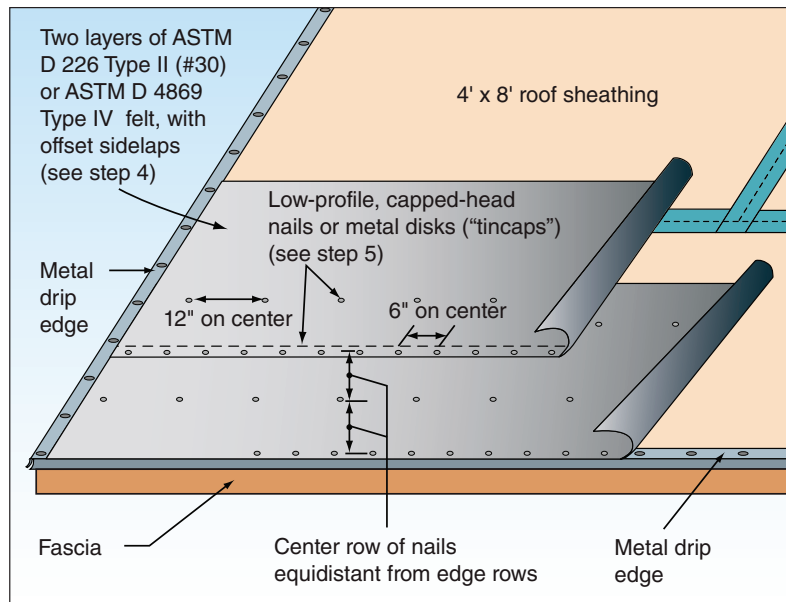
¹ The 110 and 120 mph speeds are based on ASCE 7-05. If ASCE 7-10 is being used, the equivalent wind speeds are 139 and 152 mph for Risk Category II buildings.



5. **Apply a single layer of ASTM D 226 Type I (#15) or ASTM D 4869 Type II felt.** Tack underlayment to hold in place before installing shingles.
6. **In northern climates**, after step 2, install self-adhering modified bitumen tape (4 inches wide, minimum) over sheathing joints; seal around deck penetrations with roof tape. Roll tape with roller.
7. **Apply a single layer of ASTM D 226 Type II (#30) or ASTM D 4869 Type IV felt. Attach per steps 8 and 9. Then install a single layer of self-adhering modified bitumen per steps 3 and 4, followed by installation of the shingles.**
8. Secure felt with low-profile, capped-head nails or thin metal disks (“tincaps”) attached with roofing nails.
9. Fasten at approximately 6 inches on center along the laps and at approximately 12 inches on center along two rows in the field of the sheet between the side laps.

Installation Sequence – Option 2²

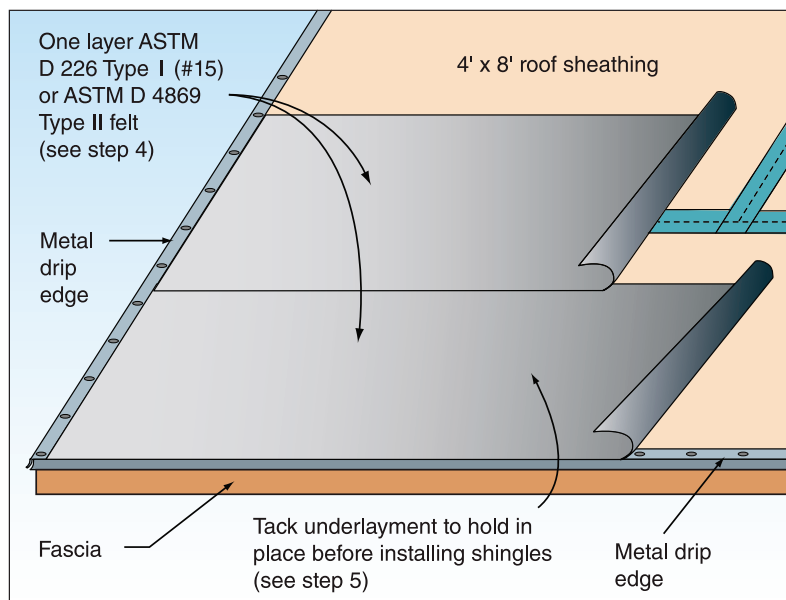
1. Before the roof covering is installed, have the deck inspected to verify that it is nailed as specified on the drawings.
2. Broom clean deck before taping. If the sheathing is OSB, check with the OSB manufacturer to determine if a primer needs to be applied before installing self-adhering modified bitumen products.
3. Install self-adhering modified bitumen tape (4 inches wide, minimum) over sheathing joints; seal around deck penetrations with roof tape. Roll tape with roller.
4. **Apply two layers of ASTM D 226 Type II (#30) or ASTM D 4869 Type IV felt with offset side laps.**



5. Secure felt with low-profile, capped-head nails or thin metal disks (“tincaps”) attached with roofing nails.
6. Fasten at approximately 6 inches on center along the laps and at approximately 12 inches on center along a row in the field of the sheet between the side laps.

Installation Sequence – Option 3^{2,3}

1. Before the roof covering is installed, have the deck inspected to verify that it is nailed as specified on the drawings.
2. Broom clean deck before taping. If the sheathing is OSB, check with the
- 2 If the building is within 3,000 feet of saltwater, stainless steel or hot-dip galvanized fasteners are recommended for the underlayment attachment.
- 3 (1) If the roof slope is less than 4:12, tape and seal the deck at penetrations and follow the recommendations given in The NRCA Roofing and Waterproofing Manual, by the National Roofing Contractors Association. (2) With this option, the underlayment has limited blow-off resistance. Water infiltration resistance is provided by the taped and sealed sheathing panels. This option is intended for use where temporary or permanent repairs are likely to be made within several days after the roof covering is blown off.



OSB manufacturer to determine if a primer needs to be applied before installing self-adhering modified bitumen products.

3. Install self-adhering modified bitumen tape (4 inches wide, minimum) over sheathing joints; seal around deck penetrations with roof tape. Roll tape with roller.
4. **Apply a single layer of ASTM D 226 Type I (#15) or ASTM D 4869 Type II felt.**
5. Tack underlayment to hold in place before applying shingles.

General Notes

- Weave underlayment across valleys.
- Double-lap underlayment across ridges (unless there is a continuous ridge vent).
- Lap underlayment with minimum 6-inch leg “turned up” at wall intersections; lap wall weather barrier over turned-up roof underlayment.

Additional Resources

National Roofing Contractors Association (NRCA). The NRCA Roofing and Waterproofing Manual. (www.NRCA.net)

ASTM Standard D6135, 2005, “Standard Practice for Application of Self-Adhering Modified Bituminous Waterproofing,” ASTM International, West Conshohocken, PA, 2005, 10.1520/D6135-05, www.astm.org.

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