ASPHALT ROOFING MANUFACTURERS ASSOCIATION®

TECHNICAL BULLETIN

Nail Application of Asphalt Shingles

Revised July 2024

The International Building Code (IBC) and the International Residential Code (IRC) require that roofing nails be utilized to fasten asphalt shingles. Proper nailing is essential to good performance. To ensure proper nailing during shingle application, it is required that you follow the shingle manufacturer's instructions and also consider the IBC, IRC, National Building Code of Canada (NBCC), and other applicable codes. The Asphalt Roofing Manufacturers Association (ARMA) supports these requirements (several referenced below) and additional installation recommendations as outlined below.

- Nails are required to have a minimum nominal shank diameter of 12 gauge (0.105") (2.7 mm) and a minimum head diameter of 3/8" (0.375") (9.5 mm). See Figure 1 for an example.
- Nails are required to be corrosion-resistant galvanized steel, stainless steel, aluminum, or copper roofing nails. Galvanizing by various processes is the typical means of achieving corrosion resistance. Aluminum roofing nails do not require additional coatings for corrosion resistance.
- Select nails long enough to penetrate at least ¾" (19 mm) into the roof deck. If the deck sheathing is less than ¾" (19 mm) thick, use nails long enough to penetrate through the roof sheathing at least 1/8" (3 mm). In determining nail length, consider the number of layers of shingles, shingle thickness(es), underlayment, hip and ridge caps, and flashing (eaves, rakes, sidewall, valley, etc.).
- If the underside of the deck is exposed to view, using nails of the recommended length will result in the nail points penetrating through the deck and being exposed to view. Consult the roofing material manufacturer and building code requirements for approved alternatives if visible nail points are considered aesthetically objectionable.
- All nails are to be driven by hand or with a pneumatic nailing tool that has been properly adjusted to drive the nails correctly. Failure to use a properly adjusted pneumatic air system can lead to problems, including, but not limited to, sealing failures, raised tabs, distortions, and blow-offs of shingles.
- For most asphalt shingles, a minimum of four nails is required per full-size strip shingle. For some shingles and application circumstances, the required number of nails may be different. Follow the specific installation instructions of the shingle manufacturer to ensure the intended performance and compliance with building codes.

Placing and Driving Nails

Nails that are improperly located and/or driven can lead to sealing failures, blow-offs, raised tabs, and buckling. The following practices reflect the general recommendations of most shingle manufacturers. Follow the specific installation instructions of the shingle manufacturer.

Align each shingle carefully. Whenever possible, make sure that no cutout or end joint is less than 2" from a nail in an underlying course. Start nailing from the end nearest the previously installed shingle

and proceed across. This will help prevent buckling. To help prevent distortion, do not attempt to realign a shingle by shifting the free end after more than one nail is in place.

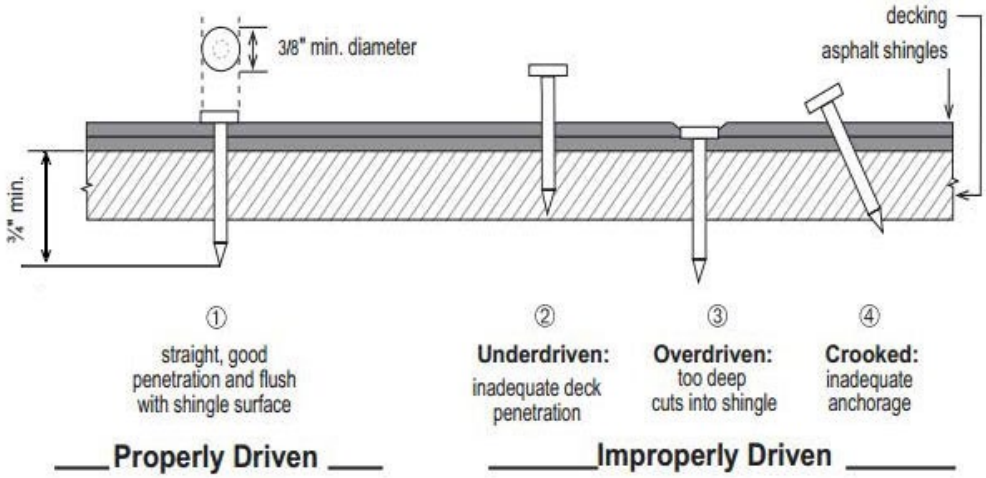
Critical aspects of nail placement include:

- Never place nails where they will be fully or partially visible after the roof is complete.
- For most shingles with sealant on the top surface, place nails below the sealant strip but above the area that will be visible after the roof is complete.
- Shingles with sealant on the back surface often have a line or lines to indicate the location where the nails are to be placed on the shingle surface.
- For multi-layered laminated shingles, manufacturers may require the nails to be positioned so they penetrate both/all shingle layers. Consult manufacturer's instructions for specific nailing placement/pattern.
- No nail head should be less than 1" (25 mm) from either end of the shingle. The manufacturer's installation instructions typically include specific recommendations for positioning the nails across the shingle.
- Do not drive nails into knot holes, cracks, or spaces in the roof deck.
- Nails are to be applied so the entire head bears tightly against the shingle.

Nails are not to be underdriven, overdriven (to break or cut into the shingle), or driven crookedly. See Figure 1 for examples of properly and improperly driven nails.

Repair incorrectly applied nails immediately. Underdriven nails can be tapped down. Remove overdriven or crooked nails, repair the hole with asphalt roof cement complying with ASTM D4586, and place another nail nearby. If this is not practical, replace the entire shingle.

Figure 1: Application of Nails



Consult the ARMA Residential Asphalt Roofing Manual for additional information regarding application of asphalt shingles.