

CANADIAN EDITION

How to Minimize Buckling of Asphalt Composition Shingles



Of all the residential roofs in Canada, 95 percent are sheathed with wood structural panels. This is because the panels are easy to install and form an excellent substrate for finished roofing, such as organic and fiberglass/asphalt shingles. Proper installation is important, however, to ensure optimum performance of the shingle roofing and reduce roof callbacks and complaints.

Roof coverings, such as asphalt composition shingles, may buckle when moisture conditions cause the roof covering or deck substrate to move. To prevent buckling, follow these simple guidelines:

1 VENTILATE ATTICS.

Energy-efficient building designs call for construction features that prevent moisture buildup in attics. Significant amounts of moisture vapour introduced into living spaces (e.g., showers, dishwashers, humidifiers, clothes dryers, etc.) must not be ducted into attics. Vent bath and kitchen exhaust fans through the roof to outside air.

The most effective attic ventilation system is a combination of both eave and ridge vents. The National Building Code of Canada requires that the minimum net free ventilation area be 1/300th of the insulated ceiling area. Vents shall be distributed uniformly on opposite sides of the building with not less than 25 percent of the required openings located at either the top or the bottom of the space. Where the roof slope is less than 1 in 6 or in roofs that are constructed with roof joists, the unobstructed vent area shall not be less than 1/150th of the insulated ceiling area. It is important that ceiling insulation be installed in a manner that will not restrict the free flow of air through the roof vents. Common practice is to insert preformed baffles at the junction of sloped roofs and the exterior wall to contain the insulation in a manner to provide an unobstructed air space, between the insulation and the underside of the roof sheathing. Note: *A word of caution on ventilating area: The “net free ventilating area” is a fraction of the overall size of a vent. Depending on ventilator design, it may be one-third to one-half of the gross ventilator area. Make sure the ventilator is sized on a net free area basis.*

2 INSTALL A VAPOUR RETARDER.

In cold climates, a vapour retarder on the warm side of the ceiling minimizes the amount of water vapour entering the attic. Vapour retarders should be installed to protect the entire surface of thermally insulated walls, ceiling and floor assemblies. Openings in the ceiling created for electrical fixtures and plumbing stacks should be sealed so there is no air leakage between the living area and the attic space.

3 STORE PANELS ON STRINGERS OR SUPPORTS.

It is good practice to acclimate panels prior to installation, whenever possible. Prior to installation, the sheathing should be protected against direct exposure to inclement weather.

Panel bundles should be stored on level 89 x 89mm (4x4) stringers or other supports, so they are not in direct contact with the ground. At least three stringers should be used to support 2440mm (8 foot) panels – one centered and the

SUGGESTIONS FOR REPAIR OF ROOF SHINGLE BUCKLING.

Where the problem is not severe, it may be possible to lift the shingle tabs and flatten the distorted shingles with additional fasteners of recommended types. When that is not feasible, it may be necessary to remove the distorted shingles and trim them 3 to 6mm (1/8 to 1/4 inch) in length, flatten, then refasten and reseal with roof-shingle cement.

other two approximately 300 to 400mm (12 to 16 inches) from the ends. Even though the weather will not affect the structural integrity of APA Rated Sheathing, it should be covered when stored outside to keep it clean and to prevent uneven accumulation of moisture. Cut banding on panel bundles to prevent edge damage. If plastic sheets or tarps are used, keep them open and provide ample space on top and all sides to ensure good air circulation around the panels.

4 SPACE PANELS 3mm (1/8 INCH).

Due to the manufacturing process, sheathing may be very low in moisture content when produced. Because panels will increase in length and width as they absorb moisture from humid air or from rain, it is recommended that panels be spaced 3mm (1/8 inch) at ends and sides when fastened to framing at the time of installation. A word of caution: The NBCC requires that a gap of not less than 2mm be left between wood structural panels.

Fasten panels up to 20mm (3/4 inch) thick to framing with two 51mm (2 inch) common nails. For panels over 20mm thick minimum length of the fastener required is 57mm (2-1/4 inch). Space nails 150mm (6 inches) o.c. along panel ends, 300mm (12 inches) o.c. along intermediate framing. Staples may be used in accordance with code approvals for size and spacing. Note: *Thicker panels are less prone to buckling.*

5 STAND OVER RAFTERS OR TRUSS CHORDS WHEN INSTALLING PANELS.

Standing between supports may bend a panel noticeably. Fastening it while bent can “lock” the bent shape into the panel. Although the roof is not harmed structurally, these depressions between the supports can telegraph through the finish roofing and cause callbacks when noticed. Note: *It is important that framing be properly aligned to avoid telegraphing of panel end joints through the shingles.*

6 STORE SHINGLES IN 1.2-METRE (4-FOOT) STACKS.

Follow manufacturer's recommendations.

7 INSTALL SHINGLE UNDERLAYMENT OVER DRY SHEATHING.

Shingle manufacturers often specify the use of an underlayment as part of their warranty. The underlayment protects the panel deck from moisture until the shingles are applied. It also provides a secondary layer of protection should water migrate under the shingles. Either condition could result in movement of the roof deck, resulting in buckling of the asphalt shingles, panel deck or both. Buckling can also occur when the underlayment felt is improperly installed. When used beneath shingles, underlayment should be installed parallel to the eaves with head and end lap of not less than 50mm. The top edge of each strip of underlay should be fastened with sufficient roofing nails to hold it in place until the shingles are applied. The underlayment should overlap the eave protection by not less than 100mm. Where special circumstances exist, such as in areas subject to high winds, or where there has been a history of ice dam formation, consult the appropriate building codes for installation guidelines. Underlayment should conform to CSA 123.3-M-No. 15, ASTM D226 Type 1 or CAN 2-51.32 Breather Type Sheathing Paper. Note: *Felt can wrinkle if it is not stretched and applied in a flat manner, resulting in buckling of the shingles.*

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Form No. K310CN

Issued March 2009

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