



## Residential Steel Roofing Installation Considerations

One of the most common questions asked by homeowners about the installation of their steel roof is whether an underlayment is needed. The answer to this question is “yes” in most situations. The underlayment plays a critical role in controlling the migration of condensation that might develop on the underside of the steel sheet thereby preventing accumulated water entering the building resulting in costly damage.

Underlayment is a general term used to describe a membrane installed between the steel sheets and the sheathing (plywood or OSB) or roof framing. There are a variety of materials used to manufacture underlayments with the most common being an asphalt impregnated organic fibre (roofing felts). The minimum weight of roofing felt should be equivalent to a #30 (30 pound). There are also premium synthetic products available that provide improved performance where required or desired.

The underlayment also provides a valuable second layer of protection against water getting into your home whether from wind-driven rain or from any condensation that may still occur on the back of the steel sheets. The only situation where an underlayment may not be necessary is an un-heated building (e.g. garage or storage shed) that does not contain any source of moisture (e.g. livestock or humid materials) or materials that could be damaged from possible moisture.

Most building codes require eave protection extending at least 36 in (900mm) up the roof slope, and longer for lower slope roofs locations subject to high snow accumulations. The common product for this application is a “peel and stick” membrane. It is also recommended that this same membrane be installed 12 in (300mm) along gable edges, 36 in (900mm) on each side of valleys, 12 in (300mm) around skylights and chimneys, at the intersection of dormer peaks with the main roof and wherever there is an interruption in the roof slope.

In deciding on the installation of a steel roof the important fact to keep in mind is that vapour barriers are not perfect and warm, moist air will escape from the conditioned living areas into the attic or roof space. This moist air will condense on any cold surface (plywood sheathing, framing or steel sheets) if not properly ventilated to the outside. Residential building codes stipulate a minimum area of venting evenly distributed around the roof area to provide the needed air flow. Unfortunately, the amount of ventilation (volume of air flow) may be inadequate to remove the moisture before it can condense on a cold surface like the steel roof sheet in a Canadian winter. The underlayment becomes the key component in the roof assembly to separate the moist air from the steel sheet and allow it to be vented without condensing.

Cathedral ceilings are more prone to condensation problems than roofs with large attic spaces. The air space underneath the sheathing can be inadvertently reduced by improperly installed insulation that retards the air flow needed for venting. Building codes stipulate a minimum air space of 2-1/2 in (63mm) between the top of the ceiling insulation and the underside of the sheathing. If the rafter spaces are not all vented at eave and ridge, then cross members (minimum 2 x 2 wood) are needed on top of the rafters to connect all rafter spaces. Given the restricted air space in a cathedral ceiling, the underlayment becomes even more important.

Another common question from homeowners is the necessity of putting strapping (often 1x4 or 2x3 wood members) on the roof before the steel sheets. Strapping is recommended in three conditions:

- 1) When additional air space is needed to provide ventilation under the steel sheet as may be required for a cathedral ceiling or when the attic does not have adequate ventilation.
- 2) If there is no sheathing then strapping is necessary to support the roof sheets and provide the connection to the roof framing.

- 3) In a re-roofing application if the old shingles are not removed it is difficult to inspect the sheathing and replace any areas that have deteriorated. This is important since the steel roof sheet is screwed into the sheathing. If strapping is installed it is connected directly to the roof framing which then provides a strong connection for the steel roof sheets.

The size and spacing of strapping is dependent on the type of steel roofing product and the manufacturer must be consulted for their recommendations. When strapping is used it is also important to provide support along the full length of both edges of the vally flashing.

The choice of whether to install sheathing, underlayment and strapping, and the selection of which type, will affect the cost of the project. When comparing quotes it is not always the best strategy to accept the lowest bidder without first confirming the scope of work. A little extra money spent at the beginning may save a bigger bill later.

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