Ohio Valley Chapter
IBEC
International Institute of
Building Enclosure Consultants

Introduction to Roof Decks

The roof deck is the main component of the overall roof assembly required for the support and effectiveness of the roofing system. Any roof deck, regardless of material composition, should provide:

- Dimensionally stable structural support of the live and dead loads imposed on the building during its lifecycle. The deck should be designed to limit deflection to a maximum of 1/240th of the span.
- A substrate for secure attachment of the components of the roof assembly as well as roof-mounted equipment and accessories.
- Fire resistance to comply with requirements of authorities having jurisdiction.
- Slope and drainage to sustain the weather-resistance and water-shedding qualities of the roof system.
- Accommodation of building movement. See the Accommodating Movement sheet in this series.

Roof decks are either **combustible** (wood boards, planks or structural panels) or **non-combustible** (concrete or steel).

In addition, decks are either **nailable** or **non-nailable**. Because the term "nailable" can be misinterpreted easily, it bears some clarification:

> Nailable decks require that a base sheet or separation layer be fastened to it before insulation or a roof membrane can be installed over it. Nailable decks include wood boards and planks, wood structural panels, cementitious wood fiber, gypsum planks, and lightweight insulating concrete. Wood decks allow the use of nails and screws to fasten the separating layer. However, with cementitious wood fiber, gypsum plank, and lightweight insulating concrete, special fasteners must be used for such securement given the nature of these non-wood materials.
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> The separation layer 1) protects elements beneath the deck from adhesive or bitumen migration, and 2) provides a suitable surface for adhesion of the insulation or roof membrane.
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> Non-nailable decks, such as cast-in-place structural concrete or pre-tensioned and post-tensioned slabs, preclude the use of most fasteners. In most cases, all seams between panels are grouted and insulation or roofing membrane is directly adhered without the use of a fastened base sheet or separation layer.
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> Steel deck is somewhat of an outlier in this discussion. Steel deck is "mechanically-fasten-able" but a base sheet is not, under normal circumstances, fastened to it prior to installation of substrate board or insulation board. The first layer of insulation installed over a steel deck is mechanically fastened with screws and plates through the top flange.

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Sources:

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"Roof Decks A to Z: Part XI: Post-Tensioned Concrete," Lyle D. Hogan, *Interface Magazine*, July 2018, p. 14-20.

FM Global Property Loss Prevention Data Sheets 1-29 Roof Deck Securement and Above-Deck Roof Components

NRDCA Publications (Available free online at nrdca.org)

NRDCA 100 – Guideline for Field Application of Aggregate Insulating Concrete Roof Deck Systems

NRDCA 175 – Guideline for Field Application of Cellular Insulating Concrete Roof Deck Systems

NRDCA 600 – Guideline for Application of Cementitious Wood Fiber Roof Deck Systems

Technical Bulletin 1001: Venting LWIC Installed Over Structural Concrete and Other Non-Venting Substrates

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