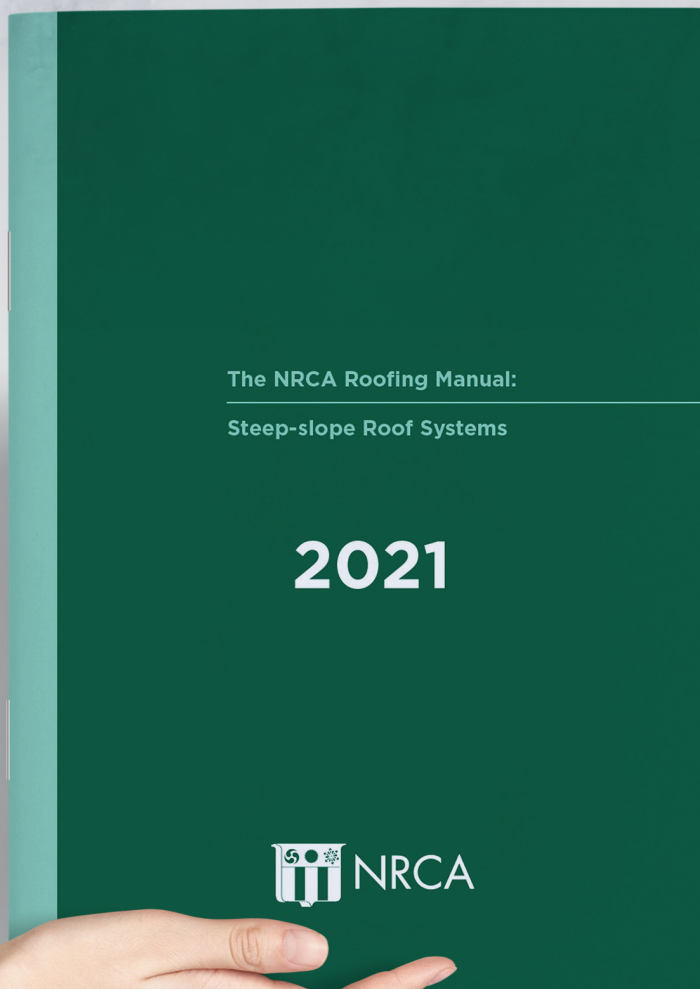


ESTEEMED GUIDANCE

NRCA updates its steep-slope manual
for the roofing industry

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Earlier this year, NRCA published *The NRCA Roofing Manual: Steep-slope Roof Systems—2021*. The manual provides best practices and technical information related to the design, materials and installation techniques applicable to steep-slope roof systems. It is the most recent volume of *The NRCA Roofing Manual*, a four-volume set providing time-tested roof system guidelines collected from knowledgeable, practicing roofing contractors and manufacturers across North America.

The three companion volumes in the set include *The NRCA Roofing Manual: Metal Panel and SPF Roof Systems—2020*; *The NRCA Roofing Manual: Membrane Roof Systems—2019*; and *The NRCA Roofing Manual: Architectural Metal Flashing and Condensation and Air Leakage Control—2018*.

The NRCA Roofing Manual: Steep-slope Roof Systems—2021 supersedes the previous edition published in 2017. Following is an overview of changes.

Updating the manual

When updating *The NRCA Roofing Manual: Steep-slope Roof Systems—2021*, an emphasis was placed on a thorough review of the clay and concrete tile section to better align the recommendations of NRCA and the tile roofing industry. To accomplish this, NRCA formed a Tile Task Force consisting of roofing contractors and tile manufacturers and suppliers. During the course of a year, task force members met virtually on multiple occasions and three times in person to revise the 2017 tile roof guidelines, including text and construction details.

The recommendations from the Tile Task Force were forwarded to the NRCA Manual Update Committee that met separately throughout the year to review the other four sections of the steep-slope manual. Following the NRCA Manual Update Committee review, the recommended revisions were sent to NRCA's Executive Committee and Technical Operations Committee for input and guidance.

The 2021 manual

The NRCA Roofing Manual: Steep-slope Roof Systems—2021 is divided into five primary sections: Asphalt Shingle Roof Systems; Clay and Concrete Tile Roof Systems; Metal Shingle Roof Systems; Slate Roof Systems; and Wood Shake and Wood Shingle Roof Systems. Each of these sections is further divided into seven chapters: Chapter 1—Roof Assembly Configurations (titled Roof System Configurations in previous editions); Chapter 2—Roof Decks; Chapter 3—Underlayments; Chapter 4—Primary Roof Covering(s); Chapter 5—Roof Accessories; Chapter 6—Reroofing; and Chapter 7—Construction Details.

Each primary roof covering section now includes an appendix that contains building code information previously found in the reroofing chapters of each section. In addition, the manual contains a revised appendix.

Chapter 1—Roof Assembly Configurations has been updated and reformatted for each primary roof covering. The chapter contains descriptions of roof assembly configurations and their related

components. Each configuration provides general information regarding items such as roof slope, deck type, underlayment, drip edge metal, primary roof covering, flashings, etc.

Additionally, users are directed to the specific chapter that contains detailed information for a roof assembly component. For example, the roof slope limitations paragraph for an Asphalt Shingle Roof Assembly, Single Layer of Mechanically Attached Underlayment configuration directs users to Chapter 2—Roof Decks, Asphalt Shingle Roof Systems for additional guidelines specific to that roof system type and configuration.

Also, the roof assembly configurations are divided into new construction or roof replacement and roof re-cover. The new construction or roof replacement configurations describe and illustrate assemblies that have not had materials installed on the roof deck or the existing roof covering has been removed down to the roof deck.

The roof re-cover configurations describe and illustrate assemblies where the existing roof covering is left in place and a new roof covering is installed over it. Because re-covers are not permitted by the building code for slate and clay and concrete roof tile, configurations are not provided for these roof assemblies. NRCA recognizes a roof re-cover is a viable solution for wood shake and wood shingle roof systems but does not currently provide configurations for this option.

There are minimal changes to Chapter 2—Roof Decks. For Chapter 3—Underlayments, NRCA recognizes the increased popularity and use of synthetic sheet underlayment. However, caution should be exercised if a synthetic underlayment is specified and used in a steep-slope roof assembly.

Because of the relatively low permeance rating of synthetic sheet underlayment, the underlayment could perform as an unintended vapor retarder. Synthetic sheet underlayment currently is not referenced as an underlayment in the 2018 International Building Code® and International Residential Code.® In December 2020, ASTM International's Committee D08 on Roofing and Waterproofing approved a new synthetic underlayment standard that will be incorporated into

The NRCA Roofing Manual: Steep-slope Roof Systems—2021 via an interim update.

There are minimal changes to Chapter 4—Primary Roof Covering(s). Appendix 1—Roof Accessories from the 2017 manual now is relocated and subdivided for each primary roof covering material in Chapter 5—Roof Accessories.

As with previous manuals, IBC references have been updated. Although the International Code Council® is set to publish the 2021 I-Codes, at the time of printing of *The NRCA Roofing Manual: Steep-slope Roof Systems—2021*, the new codes had not been made available to the public. Therefore, references to IBC and IRC have been updated to the 2018 versions of those codes. Similarly, where applicable, updates have been made to reference ASCE 7-16, “Minimum Design Loads and Associated Criteria for Buildings and Other Structures,” and the most recent ASTM standards. When the 2021 I-Codes are available to the public, NRCA’s manual will be amended using interim updates.

In the previous NRCA steep-slope roofing manual, a majority of building code information typically was located in Chapter 6—Reroofing. However, for the 2021 manual, most building code information has been moved to the appendix of each primary roof covering section. Now, code requirements can be more easily found without searching other specific primary roof covering chapters.

Other changes

The “How to Use” information previously found near the beginning of each section has been consolidated and relocated to the beginning of the manual.

Additionally, with the relocation of the Roof Accessories appendix, the 2021 appendixes have been reduced from five to four and reorganized. The appendixes for Reference Organizations and Unit Conversions have been replaced with Appendix 2—Synthetic Roof Covering Products and Appendix 3—Wind Design. The other two appendixes are Appendix 1—Radiant Barriers and Appendix 4—Interim Updates.

Information regarding impact ratings such as hail resistance has been added to the Asphalt Shingle Roof Systems, Metal Shingle Roof Systems, Slate Roof Systems, and Wood Shake and Wood Shingle Roof Systems sections. Ratings typically are based on UL 2218, “Impact Resistance of Prepared Roof Covering Materials,” that provides four classifications, 1-4. A map of the continental U.S. based on information from the National Oceanic and Atmospheric

Administration’s Storm Prediction Center is included that identifies the mean hail days per year for areas of the U.S.

In addition to impact resistance, new information regarding algae resistance is provided in the roof covering sections. A map of the continental U.S. adopted from 3M’s Industrial Mineral Products Division is provided that identifies regions of three risk levels—low, medium and high—of potential algae growth.

The Asphalt Shingle Roof Systems section continues to provide descriptions of four primary roof assembly configurations for new construction, roof replacement and roof re-cover. However, the illustrations for various configurations of shingle style and underlayment material have been consolidated from 16 to four basic figures that now classify underlayment as mechanically attached or self-adhering.

In addition, roof slope information has been expanded, and new information about roof decks has been added. The roof assembly descriptions for water and ice protection membrane, shingle attachment, roof flashing sealant and weatherproof flashing membrane have been removed.

Technical information about water and ice protection membrane can be found in Chapter 3—Underlayments. Chapter 3 includes a new caution from NRCA when specifying asphalt felt underlayment for asphalt shingles. It remains common to refer to or specify organic asphalt felt underlayment using ASTM D226, “Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing,” designations (No. 15 or No. 30) or designations originally derived from the applied product weight (15 pounds or 30 pounds) for steep-slope roof systems.

However, NRCA has concerns when a heavier underlayment wrinkles, the wrinkles will telegraph through asphalt shingles. Therefore, NRCA recommends asphalt felt underlayment used in an asphalt shingle roof system comply with ASTM D4869, “Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing,” Type II (organic) or ASTM D6757, “Standard Specification for Underlayment Felt Containing Inorganic Fibers Used in Steep-Slope Roofing,” (inorganic).

Information about shingle attachment, roof flashing sealant and weatherproof flashing membrane is in Chapter 4—Primary Roof Covering(s), Asphalt Shingles Roof Systems section. A new construction detail for equipment curbs is in Chapter 7—Construction Details.

The most significant changes to *The NRCA Roofing Manual: Steep-slope Roof Systems—2021* occur in the Clay and Concrete Tile Roof Systems section. The six roof assemblies described in the previous edition have been expanded to 14. These 14 assemblies are grouped into two basic applications: batten and stringers and nonbatten. The batten and stringer applications include lug-hung tile, high-profile tile and low-profile (flat) tile. These 14 assemblies are illustrated with varying underlayment configurations for a total of 55 combinations of tile and underlayment applications. Information and illustrations of asphalt and adhesive attachment of underlayment have been removed as they no longer are used in the industry.

NRCA continues to recommend the installation of roof tile on roof slopes of 4:12 and greater. However, in Chapter 2—Roof Decks, Clay and Concrete Tile Roof Systems section, NRCA recognizes that in regions that receive minimal annual rainfall, the installation of roof tile on roof slopes of 2½:12 through 4:12 can perform adequately. The caution for roof slopes less than 4:12 is with certain roof tile profiles, where water can flow backward on the tile's top surface.

NRCA also continues to recommend roof deck thickness for roof tiles be ⅝ of an inch for support spacings of 16 inches on center and ¾ of an inch for support spacings of 24 inches on center. Similar to installing roof tile on roof slopes less than 4:12, NRCA also recognizes building codes and the roof tile industry commonly use roof decks of a nominal thickness of ½ of an inch. New information regarding raised or elevated battens has been added, but the use of these battens may require approval from the authority having jurisdiction.

In recognition of installing roof tiles on slopes less than 4:12, in Chapter 3—Underlayments, NRCA now recommends installing, as a minimum, a layer of self-adhering polymer-modified bitumen that complies with ASTM D1970, "Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection." Also in Chapter 3, information about adhesive set tile has been relocated to the end of subchapter 3.2.

In Chapter 4—Primary Roof Covering(s), Clay and Concrete Tile Roof Systems section, the technical information regarding mortar-set tile has been removed, and the information regarding adhesive-set tile has been updated. New valley sheet-metal profiles also have been added in Chapter 4. Similar to the installation of roof tile

on slopes less than 4:12 and roof decks ½ of an inch thick, NRCA now recognizes the use of 26-gauge sheet-metal valley flashing while still recommending a minimum 24-gauge sheet metal thickness in regions that experience severe weather.

In Chapter 7—Construction Details, Clay and Concrete Tile Roof Systems section, 19 new details have been added. These include additional details for ridges, hips, sidewall flashing, vent pipe penetrations, equipment curb and steep- to low-slope transitions.

The configurations in Chapter 1—Roof Assembly Configurations, Metal Shingle Roof Systems section have been reduced from 15 to nine. The illustrations have been combined into shingle-style and two underlayment applications: mechanically attached and self-adhering. New information also has been added to include zinc-coated copper for natural weathering metals in Chapter 4—Primary Roof Covering(s), Metal Shingle Roof Systems. A new detail has been added in Chapter 7—Construction Details.

In Chapter 1—Roof Assembly Configurations, Slate Roof Systems section, the number of configurations has increased from five to nine. No other notable updates or changes have been made to the slate section.

In the Wood Shake and Wood Shingle Roof Systems section, the primary roof assembly configuration descriptions have been expanded from three to five and divided into wood shake and wood shingle. The illustrations for the various configurations have been consolidated from 10 to six basic figures that now classify underlayment as mechanically attached or self-adhering in addition to including interlayment over spaced sheathing for wood shakes. Four new details also have been added specifically to Chapter 7—Construction Details.

Stay in the know

When designing and installing steep-slope roof systems, be sure you're incorporating the most up-to-date best practices gathered from roofing professionals across the industry. NRCA members receive free access to electronic versions of *The NRCA Roofing Manual, including The NRCA Roofing Manual: Steep-slope Roof Systems—2021*. Members can download the entire manual series as PDF documents at shop.nrca.net. Hard-copy versions of all NRCA manuals also are available for purchase at shop.nrca.net. 📄🔍

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