Guidelines provide bases for quality assurance

Roofing industry publishes quality-control documents for SPF-based and thermoset single-ply roofing applications

by **Mark S. Graham**

Two documents have been published that will provide roofing professionals with industry-recognized guidelines for assessing the application quality of sprayed polyurethane foam- (SPF-) based and thermoset single-ply roof systems.

Quality Control Guidelines for the Application of Sprayed Polyurethane Foam Roofing recently was issued by NRCA and The Society of the Plastics Industry Inc., Spray Polyurethane Foam Division. This document represents an agreement among contractors and material/equipment manufacturers on the essential elements needed to appraise the application quality of SPF-based roof systems.

In addition, *Quality Control Guidelines for the Application of Thermoset Single-Ply Roof Membranes* was published by NRCA and SPRI. This document represents a consensus among contractors, sheet-membrane manufacturers and related component suppliers on the vital criteria needed to assess the application quality of thermoset single-ply (e.g., EPDM, PVC, CSPE) roof systems.

These two add to the industry's already-established list of complementary quality-control documents for assessing roof system applications. *Quality Control Guidelines for the Application of Built-Up Roofing* and *Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing* are recognized as the bases for assessing these roof system applications. They were published by NRCA and the Asphalt Roofing Manufacturers Association.

Background

The origin of the quality-control documents' concepts can be traced to 1976, when the U.S. Air Force's Strategic Air Command Sector began to develop its own guidelines for, among other things, installation tolerances for roof assemblies. In September 1980, the Air Force guidelines, titled AFM 91-36, first were published.

Roofing professionals unfamiliar with the overly restrictive guidelines included in AFM 91-36 suddenly were held liable for "improper" applications. In some instances, complete, new roof systems were torn off because of a single test cut's findings.

In response to these reports, NRCA assigned a task force to review AFM 91-36's criteria. The task force's recommendations, specifically the concept of assessing quality control and developing specific application tolerances, became the bases for NRCA's first quality-control documents.

Quality assessment

Roof system application involves the skillful arrangement of multiple components in a specified process. Workmanship quality during application is critical to roof system performance. System performance also is determined by other factors, including building design; project specifications and details; material quality and suitability for the specific application; and maintenance.

Roof system application is not an exact science. It is a craft involving people who handle a broad range of materials, designs, practices and techniques, climates and changing weather conditions. For this reason, workmanship quality during application is best measured by application and inspection criteria, taking into consideration reasonable variances.

Visual examination

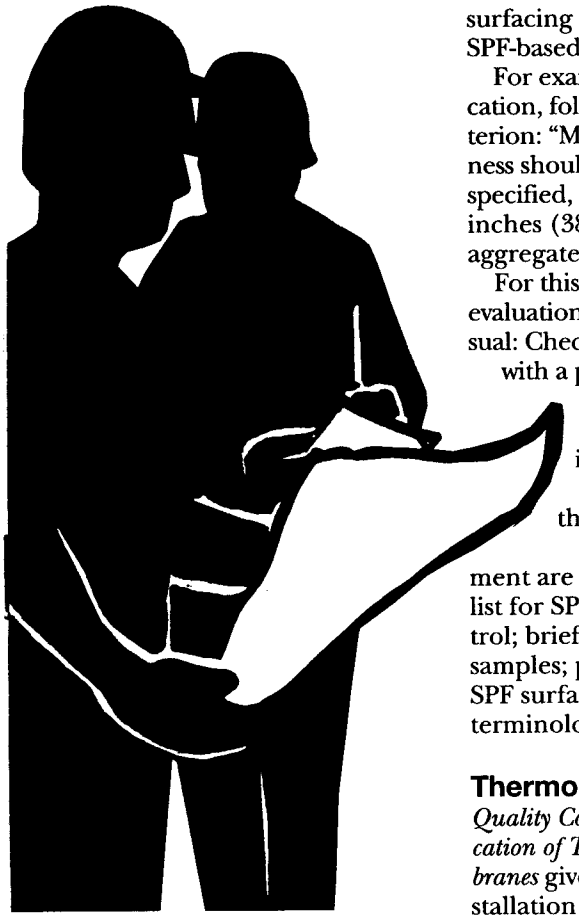
The most effective means of evaluating roof system application quality is by thorough, continuous visual inspection and evaluation at the time of roof system installation. The visual inspection should be conducted by a person knowledgeable about roofing technology and good workmanship practices.

Quality control, assurance

Quality control and assurance are essential elements of roof system construction. However, the parties who implement these two concepts differ.

A roofing contractor performs quality control. He designates an individual (e.g., a foreman) to be onsite during the application process. This individual must understand the specific roof system being installed and has the authority to correct noncompliant work.

When quality assurance is performed, it is the responsibility of the



building owner's representative (e.g., architect, engineer, roof consultant) or roofing material manufacturer/supplier representative. The person performing quality assurance also must understand the roof system being installed and its application methods. The quality-assurance person must notify the roofing contractor *immediately* if noncompliant work is observed so necessary corrective action can be taken.

SPF-based systems

Quality Control Guidelines for the Application of Sprayed Polyurethane Foam Roofing provides information about the installation of specific roof system components above the structural roof deck. The guidelines describe the criteria; evaluation; and, if appropriate, corrective action for applying primers, vapor retarders, cover board insulation and base sheets, fasteners, SPF, surface coatings, aggregate surfacing and metal flashings used in SPF-based roof systems.

For example, relating to SPF application, following is one established criterion: "Minimum overall SPF thickness should be 1 inch (25 mm), or as specified, for coated systems and 1½ inches (38 mm), or as specified, for aggregate-covered systems."

For this particular criterion, the evaluation method is indicated as: "Visual: Check foam thickness regularly with a probe. Fill probe openings."

Corrective action, if necessary, for this criterion is: "Adjust work practices. Apply additional SPF over the thin area."

Also included in the document are four appendices: a checklist for SPF application quality control; brief discussion of slit and core samples; photographs of standard SPF surface textures; and SPF terminology.

Thermoset single plies

Quality Control Guidelines for the Application of Thermoset Single-Ply Roof Membranes gives information about the installation of specific roof system components above the structural roof deck. The guidelines describe the evaluation and, if appropriate, corrective action for applying vapor retarders, insulation, fasteners, primers and adhesives, membranes and surfacing used in thermoset single-ply membrane roof systems.

For example, relating to the application of a mechanically fastened membrane, following is one established criterion: "End laps and side laps meet minimum required dimensions."

The corrective action, if necessary, for this criterion is: "Adjust sheet layout to bring end lap and side lap dimensions into compliance. Sheets that are already installed with end laps and side laps that do not meet requirements should be stripped in with an additional membrane stripping ply, properly seamed. Additional fasteners may be required prior to installation of the additional stripping ply per the suppliers' recommendations."

Also included in the document are three appendices: a checklist for thermoset single-ply roof application quality control; brief discussion of test cuts and seam samples; and terminology applicable to the document.

Roof decks

A roof deck—the substrate to which a roof system is applied—is an area of frequent dispute in conventional quality-control situations.

Quality control for roof decks is beyond most roofing professionals' expertise and, therefore, not considered part of quality control for roof system application. However, there are important roof deck considerations that affect a roof assembly's final performance, including structural load capabilities, slope and drainage, expansion joints and construction details.

The building owner, designer and roof deck manufacturer/installer (not the roofing contractor) are responsible for quality roof decks. Roofing contractors only inspect and accept roof deck surfaces to schedule roof system application and determine deck surface dryness and cleanliness.

Closing comments

Roofing contractors and manufacturers/suppliers of SPF-based and thermoset single-ply materials agree on the essential elements needed to appraise the application quality of certain roof systems, which are found in the new quality-control documents.

Roofing professionals and building owners can look forward to these documents gaining the same widespread acceptance and usage as similar roofing industry quality-control documents. PR

Editor's note: *The quality-control documents discussed in this article can be purchased from NRCA's Marketing Services Department; telephone (800) 323-9545 or (847) 299-9070.*

Mark S. Graham is NRCA's associate executive director of technical services.