

Specifying Service to Ensure Performance

By Mike Huber, PE

It's long been standard practice for the architects and facility managers of commercial and public properties to specify installation and service requirements when recommending capital investments in complex systems such as HVAC. Shouldn't you be taking that same precaution with your roofs?

A paper warranty is no substitute for precisely defined field service requirements. This article will introduce you to those aspects of roof installation and service most critical to ensuring that a roof meet or exceed its warranted service life.

Discover how specifying service can:

- Reduce exposure to liability
- Reduce or even eliminate change orders
- Prevent substitutions of inferior materials



Every roof, by its nature, is a unique and complex waterproofing system whose performance depends on three things:

- The appropriateness of the design
- The quality of the materials
- The craftsmanship of the installer

All three must be present for a roof to achieve its anticipated lifespan. As a construction activity, roofing requires the same high level of diligence as other construction trades, such as heating, ventilation, and air conditioning (HVAC).

Typically, an HVAC system specification includes a service portion that specifies requirements such as:

- Initialization of equipment
- Balancing of the system
- Training in its use and maintenance

Specifying the obligations of the manufacturer for field services in a roofing specification is equally if not more important, due to the critical waterproofing nature of roofs. Since many roof systems are constructed so that a significant portion of the work is not visible upon completion, inspections during construction are a prerequisite of success. By specifying requirements such as this, a building owner increases the likelihood that the roof purchased will meet or exceed its warranted service life.

Understanding Section 01 43 33

There is a specification section designed by The Construction Specification Institute (CSI) in their MasterFormat® to address the specific service requirements of manufacturers: Section 01 43 33, titled Manufacturer's Field Services. In creating this section, CSI

recognizes that the same painstaking care used in defining material specifications ought to be applied to the construction process itself since it is those field services, in part, that ultimately ensure the performance outcomes of complex systems. The field service specification acknowledges the responsibility that manufacturers have to help ensure the appropriate use and proper implementation of their products.

For roofing, a field service specification should minimally consider six factors:

- Initial Inspection and On-Going Monitoring
- Design Considerations
- Installer Qualifications
- Comprehensive Documentation
- Product Substitutions
- Construction Meetings

Initial Inspection and On-Going Monitoring

Since it is the manufacturer who warrants the installed system, it makes sense for a manufacturer's representative to be involved not only in an initial inspection of rooftop conditions, but in monitoring the construction process on an on-going basis. Only as an integral part of the installation process can the manufacturer validate that its materials have been installed as specified and that the warranty is therefore in good standing. Since so much of the roofing work is below the surface once the installation is complete, it is essential that timely inspections take place during construction. You may wish to specify the use of an inspection log to:

- Document weather conditions at the time of each inspection
- Photographically document daily progress of the work
- Photographically document the personnel working on the project

It is advisable to specify that progress inspection reports be made available in an online format so that they can be reviewed simultaneously by multiple parties in multiple locations when necessary.

Design Considerations

It is reasonable to stipulate in a service specification that the manufacturer validate its materials and recommended installation techniques are compliant with all:

- Relevant building codes
- Environmental regulations
- Any other project-specific health or safety requirements

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It is also the manufacturer's responsibility to validate the appropriateness of its solution to the architectural design proposed, thereby confirming that the performance outcomes anticipated by the architect and/or owner will be realized as designed. Such a stipulation should encompass all aspects of performance, including wind resistance, fire resistance, load, and drainage.

Comprehensive Documentation

Incorporating documentation requirements into your specification will ensure the transparency of your performance expectations, thereby facilitating their achievement. Prior to project commencement, you may wish to specify that the following documents be exchanged between all involved parties:

- A manufacturer's technical data sheet for every category of roofing product specified
- The manufacturer's installation instructions for same, including specific recommendations and precautions
- A list of all the warranty terms and conditions required by the manufacturer
- Manufacturer's certifications verifying roof system approvals by any relevant testing agencies, such as FM® , UL® , Warnock HerseyCM , UL Environment, and other third-party testing organizations
- Material Safety Data Sheets verifying the recommended handling procedures for all specified roofing products

Installer Qualifications

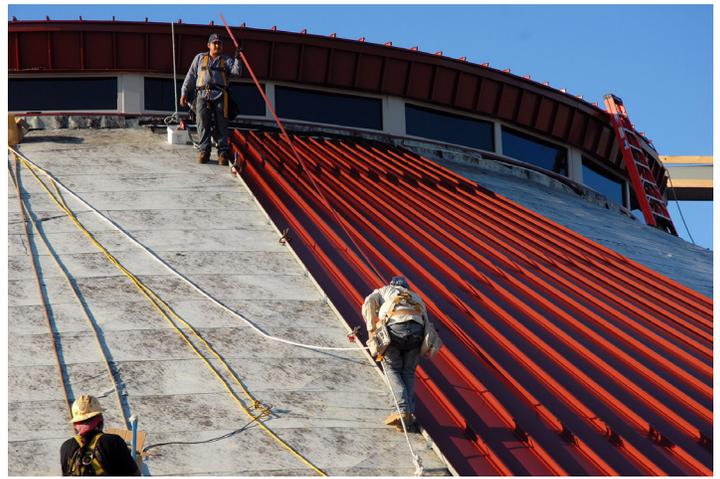
Minimally, a field service specification for roofing should indicate that the installer of the roof system has been certified by the manufacturer to install the specified roof system. It is not unreasonable to incorporate additional stipulations designed to protect the owner from financially unstable contractors, e.g., to incorporate specific bonding requirements, worker safety expectations, field supervision and staffing expectations, etc. into a service specification. You may also wish to require documentation of the contractor's experience with projects of a similar nature using the specified roof system.

Product Substitutions

Once a field service section has been incorporated into your roofing specification, it is important to verify that all products proposed as equal to those specified, be confirmed in Section 01 43 33 to be "as equal" in relation to both the material and service requirements specified. Proposed substitutions must be accompanied by a signed and sealed certification by a professional engineer (certified by the state in which the installation is to take place), verifying that the recommended substitutions are compliant with both the material and field service requirements of your roofing specification.

Coordination Meetings

There are specific milestones throughout a project that require precise communication and thorough documentation. A field service specification enables you to require those meeting-related processes



most likely to ensure effective project coordination and success.

- The preconstruction meeting is essential for communicating to all parties the goals of the roofing project and the procedures required to achieve them. Minimally, the preconstruction meeting should be attended by the roofing manufacturer's representative, the contractor(s), the owners' representatives, and the architect, engineer or design professional for any related materials essential to the project. It is reasonable to stipulate that the following items be reviewed and documented:

- Plans and specifications for the work to be performed
- Safety and mobilization plans and concerns
- All submittal material, inspection, and testing requirements
- General expectations of installation procedures

- The post-construction meeting is equally important. Its function is to validate the quality of the completed work. It is reasonable to specify that the warranty, owner's care and maintenance manual, and any other close-out documents be exchanged at this meeting.

- The final inspection/coordination meeting is the last opportunity to review the work that has been performed. Service specification requirements in regards to this critical meeting might include:

- Attendance by the contractor, roofing manufacturer's representative, design professional, and a representative of the building owner

- A mandatory walk of the roof to inspect the details of the building perimeter, flashings and roof penetrations, walls, curbs, and rooftop equipment

- Creation of a punch list of items requiring correction or completion, and a related report specifying action items, responsible parties, and deadlines

Clarifying meeting expectations via a field services specification will help to eliminate change orders due to miscommunication while minimizing liability through clearly articulated objectives and methodologies.

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Other Considerations

From time to time, other assurances of quality and workmanship may be necessary to achieve the goals of a building's architect and/or owner. For example, you may wish to require such things as:

- Certification that the materials being used are manufactured in the United States
- Certification that the materials have been tested to meet special conditions (e.g., chemical effluents or salt water environments) that the products will encounter on a specific roof.
- Certification that the materials have been manufactured in facilities using ISO 9001-2008 quality control protocols



Conclusion

Historically, unlike other mission-critical construction systems, the service requirements for roofing specifications have been integrated into the specification sections that define material requirements and installation methods. By opting to highlight specific service expectations under Section 01 43 33, architects and building owners will increase the likelihood of successful roofing projects that realize their long-term design and performance objectives.

With a background in structural, environmental, and geotechnical engineering, Mike Huber has been a professional engineer since 1994. As a member of the Garland Speakers Bureau and Garland's Director of Engineering, he is a popular presenter of an American Institute of Architects (AIA) accredited course on the engineering and design of metal roof systems. He holds a bachelor's degree in engineering physics from Miami University and a bachelor's degree in civil engineering from Purdue University.

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