IMPROVING BUILDING VALUE THROUGH FAÇADE WEATHERPROOFING

1.0 Intro

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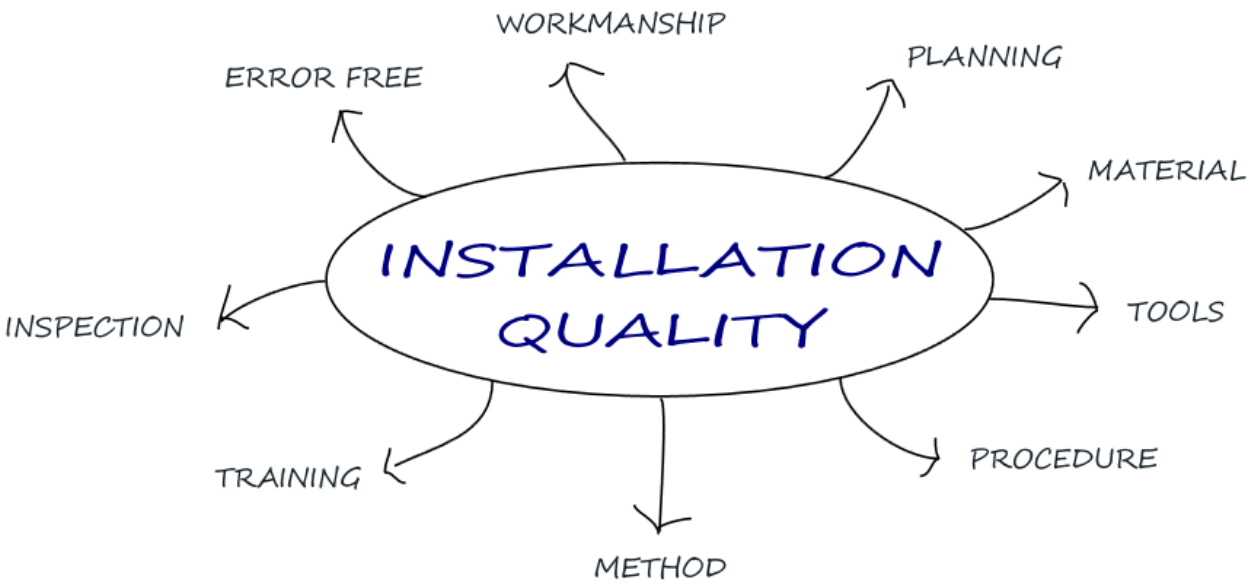

1.5 Sealing façade connections - Assuring flawless installation

Quality of a system installation is becoming an increasingly important concern for project managers. Defects or failures during installation represent increased costs and delays, as well as reduced quality of the final product. Even with minor defects, re-construction may be required and facility operations impaired.

Tender specifications, codes of practice and work instructions, sampling and testing procedures, inspection procedures, requirements for storage of raw materials and assuring proper training to the workforce are examples of areas that have to be taken into consideration in order to assure quality of the installation of any solution for sealing façade connections.

On this Ebook chapter we will discuss some of the these dimensions.

A – Initial design and specification

Successful project managers try to ensure that the job is done right the first time and that no major errors may occur during installation of any construction system. In order to assure that installation is perfect, the most important decisions, as we have seen on previous chapters, are made during the design and planning stages rather than during construction. It is during these preliminary stages that component configurations, material specifications, installation methods and functional performance are decided. Quality control during installation consists largely of insuring conformance to these original design and planning decisions.

Design details and specifications should be made clear to all parties in the project, with clear language and without possibilities of misunderstanding.

Quality requirements should also be clearly defined at this stage and should be easily verifiable. Defining monitoring and inspection procedures, and creating a schedule for these tasks, is necessary, in order to guarantee that work is done according to the project's requirements. While the multitude of participants involved in the construction process require the services of inspectors, it cannot be emphasized too strongly that inspectors are only a formal check on quality control. Quality control should be a primary concern for all the members of a project's team.

B – Testing, samples and mock-ups

Samples and mock-ups have become more common requirements on construction projects and specially on sealing solutions as the number and complexity of goods and materials that are available and that are required for a single project has increased.

These are specially useful to understand if specifications are correctly done, to confirm the solution adequacy to the project, to allow review of appearance and for testing to be carried out, in order to confirm if the solution works properly under certain actions. Samples and mock-ups might also be important so that one can verify the supplier's ability to produce a product that is aligned with the required specifications. Material suppliers should also be present at the development of solution mock-ups because their contribute will improve possibilities of success at all levels.

The benefits of requiring samples or mock-ups include:

- Knowledge obtained from failures discovered through the tests that are performed.
- Potential issues and causes of failures can be taken into consideration and mitigated against.
- The process of testing and approval can improve the durability and longevity of the finished building.
- They can help test the way installed materials interact.
- They provide assurance that the specified materials will function as required under a variety of conditions.
- They can help understand the boundaries between trades.
- They can help improve installation techniques prior to actual work beginning.
- They can be useful to obtain approval from stakeholders who may find it difficult to understand drawings and specifications.

Mock-ups can be built and tested either on site, as part of the building itself, at the manufacturer's premises, or in a third-party testing facility such as a laboratory.

It is most important to use information obtained with these samples / mock-ups in order to complete or redefine all specifications / solution details and its installation methods.

C – Design review and final specification

After mock-ups and samples have been approved it is most important to review the final design and complete final specifications. All information obtained with any performed mock-up should be used in order to ensure that installation is flawless.

D – Planning

As well as for all other project activities, the installation of solutions for sealing façade connections should be carefully planned. The following aspects, among others, are key in order to assure quality of the installation:

- Definition of activity schedule / timetable
- Definition of strategy for achieving defined objectives
- Assure availability of the necessary amount of resources (labor and materials)
- Clear definition of specification requirements
- Availability of detailed installation manuals on the job site – made available to all project players, at all times
- Availability of material product data sheets and material safety datasheets, at all times
- Definition of inspections plans, responsibilities and schedules – all necessary documents should be defined (ex: inspection reports)
- Definition of acceptance procedures
- Identification of the difficulties that might arise during the installation – for example weather constraints - and definition of a backup plan in these scenarios (e.g. Keep in stock a primer that allows the installation to continue in very low ambient temperatures, with high moisture levels on substrates and in other unexpected situations)
- Definition of repair procedures

E – Material stock management

As previously mentioned it is crucial to ensure the availability of materials in accordance with timetable requirements. This will allow the installation work to occur without constraints due to lack of materials on the job site.

All materials should be kept in a warehouse that assure that materials are stored according to their storage requirements (e.g. temperature, humidity rate, protection from UV light). Many times a sealant or adhesive that is not stored at proper temperatures might not work properly.

Installation manuals should always be available together with all materials, permitting the workforce's access at all times.

F – Training

Finding qualified workers with the right skill sets is an increasingly challenging. Currently minimal quantities of specialized labor are available at the job site. This forces designers to have to focus their attention on detailing and specification writing, guided by numerous national standards, regulations and procedures for certification.

It is equally important is that project managers take responsibility for improving qualifications of the workforce. Employee participation in the control of installation quality should be sought and rewarded, including the introduction of new ideas. By suggesting new work methods, by avoiding rework, and by avoiding long term problems, good quality control can pay for itself.

Proper training of the final installer is essential in order to assure quality of the installation. The installer has to understand in detail the installation method, materials characteristics, including its limitations, as well as understanding the importance of the work that is being done and the impact of installation defects.

Training should be provided by project managers in collaboration with solution suppliers. It is important that specifications and technical details are fully understood by the installer.

Training is not only important for the installer, but also for all project players. Inspectors, for example, need to have all this knowledge about the specified solution and preconized installation method, otherwise their capacity to perform a capable inspection will be very restricted.

G – Monitoring / Work inspection

Controlling quality of the installation work of any solution for sealing facade connections should always include inspection or verification of finished installation. These allow one to filter any defects before they reach the client, so that work that is non-compliant with the project's requirements can be discarded or repaired.

This control is usually carried out by people who were not involved in the production activities – independent inspectors.

Regular inspection is a crucial part of ensuring that the works progress as intended, both in terms of quality and compliance. However, the solo dependence on independent inspections might only mean higher risks, as defects will be identified at later stages of a project, as these inspections don't happen every day.

Project manager should define an internal inspection plan in order to avoid these risks. Nominating a team member to inspect work done at the end of each working day is a good step. All defects should be clearly identified in order to be properly rectified during the next working day. This will allow defects to be identified at an early stage when their correction is much simpler and with lower costs.

A clear inspection template should be defined identifying all key points that should be inspected, such us:

- Minimum bonding surfaces
- Quantity of applied sealants / adhesives
- Bonding quality
- Proper use of system accessories (ex: use of primers when necessary)
- Corners
- Penetrations / connections / interfaces
- Materials under stress
- Cuts / perforation

H – Work revisions

Work revisions should be made according with previously defined repair procedures. If any non-standard repair has to made the solution supplier should be consulted before any work is done.

I – Maintenance plan

After installation is concluded it is very important that a maintenance plan is made available.

J – The role of solution suppliers

The contribute of solution suppliers for installation success is crucial. Project managers should work closely with project managers in order to identify and preconize ways of promoting installation quality. Bellow there's a summary of the contributes that solution suppliers might bring to the project:

- Simplification of installation procedures or development of more logical installation methodologies
- Development of pre-fabricated solutions for details where installation will be more complex and more dependent on the installer's skills (corners, perforations, overlaps, etc.)
- Customized solutions with increased efficiency with regards to specific project requirements and lower error possibilities
- Solutions that do not require difficult to use accessories or complex tools
- Detailing of interfacings with other façade systems
- Compatibility tests
- Support on the developments of samples and mock-ups
- Continuous training, including training on site
- Development of supporting material such as project customized installation manuals
- On site inspections
- Maintenance plans
- Continuous technical support at all project phases