

Condition Assessment of Masonry Buildings From the Contractor's Perspective

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When making an assessment of an existing building façade, there are several elements that are critical to understanding failure mechanisms.

Appropriate repairs or restoration methods can be prescribed only after the root causes of material failures are recognized and documented.

These critical elements include

- Types of failures
- Deterioration vs. Time
- Levels of Intervention
- Classifying Repairs
- Sources of Information
- Minimum Inspection Requirements
- Inspection Methodology

Note, buildings and structures all have life spans, not unlike the human body. The building envelope is designed to protect the skeletal framework. The ultimate penalty for not maintaining the “health” of the building façade is failure, and failure is often unpredictable.

Types of Failures –
Construction failures
Service failures
Maintenance failures

Some typical examples of construction failures are improper anchoring systems, incompatible material systems or inappropriate material applications.

Service failures usually result from conditions that change the performance

curve of the building façade. Typical examples might include the use of inferior materials added to the façade for aesthetic reasons, temporary repairs that become permanent or the absence of essential systems such as drainage systems.

The third type of failure results from improper maintenance decisions, an example of which might be caulking cracks in masonry joints rather than tuckpointing. Other types of maintenance failures include the use of incompatible repair materials such as high cement content mortars used for the repair of historic masonry. And finally, repairs that conceal failure such as painting over deteriorated components.

Deterioration vs. Time

If we are to compare the amount of deterioration a building suffers against the life of the building, there is a point at which the façade or structure is no longer functional. The longer proper maintenance is deferred, the faster deterioration compounds with the ultimate result being total failure.

However, the effect of timely and frequently spaced maintenance interventions can minimize the aggregate amount of deterioration and prolong the life span of the façade.

Levels of Intervention

The basic levels of intervention can be summarized as follows:

- Demolition
- Stabilization
- Rehabilitation
- Restoration

Obviously demolition is the single most final solution to structural concerns, while stabilization can arrest concerns of public health and safety until more permanent repairs can be made. Rehabilitation is regarded as the next level of intervention but it's important to note that rehabilitation does not necessarily mean restoration. Often restoration requires meeting specified standards for materials, aesthetics and methodology.

Classification of Repairs

Classifying repairs does not have to be rocket science and may be identified as follows:

Class I – Potential Structural failure

Class II – Inability of the façade to remain weatherproof

Class III – Aesthetic

Class I failures represent a hazard to public health and safety such as loose components on the façade or broken structural components and clearly need to receive the highest consideration. This may be immediate removal of the hazard, or immediate protection and repair.

While not necessarily critical to building performance, class II repairs represent the intrusion of moisture into the building envelope. Unchecked, leaking roofs, flashings, caulk joints or masonry joints can rapidly accelerate the deterioration curve and if not adequately addressed can result in far more expensive repairs in the future.

Class III repairs are issues of failure that compromise the appearance of the building or façade such as broken, damaged or missing building components.

Sources of Information

When making a comprehensive assessment of building conditions, all qualified sources of information should be considered and researched. These sources may include historic photographs, original plans and specifications, site records or as-built drawings, maintenance records, personal interviews and most important – field inspection and documentation.

Minimum Inspection Requirements

In addition to understanding and adhering to formal municipal façade inspection requirements, particular attention should be directed at:

Water - Areas providing entry points for moisture, visible stains or discoloration or changes in material condition.

Flashings – No end dams, missing flashing or inferior flashing materials.

Masonry weeps – Not present, not properly functioning, not properly located.

Sealants and coatings – Evidence of movement, deteriorated material, material not present, incompatible materials.

Cracks – Structural, static or dynamic cracks?

Documentation – Cause, type, resulting failure.

Mortar – Deteriorated, missing, incorrect repairs, aesthetics.

Masonry – Deteriorated, cracked units, spalled units.

Walls – Out of plumb, dampness, efflorescence, embedded items, interior failures, stains

Inspection Methodology

When conducting a condition assessment it is essential to clearly disseminate the goals and objectives to the inspection team. This directive must provide the following:

- Reasonable , sensitive guidelines
- Define levels of intervention
- Develop a reasonable opinion of costs
- Prioritize repairs and costs
- Specifically identify and delineate areas to be repaired
- Create and inspection checklist
- Create a field data log
- Provide a summary schedule of repairs

The Specialized Inspection Team

- Architect
- Engineer
- Architectural Historian
- Building Owner / Manager
- The Restoration Contractor

While not all inspection initiatives may require all of the proposed team members, it is essential to include an owner's representative and an eminently qualified restoration contractor that can demonstrate a minimum of ten to fifteen years of experience.