

# Building Façade Inspections and Condition Assessments

Late 1800s vintage school buildings often incorporated terra cotta and brick in their façades as a value engineering alternative to limestone. Iron or steel wire ties were used to anchor the terra cotta to the building framework. Embedded iron or steel shapes such as angles, channels, or beams with protruding cover plates, were used to support the weight of these wall components over openings at windows and doors.

Terra cotta is generally durable because of the excellent weathering properties and the hard surface of the glaze, but environmental exposure over time will alter its durability. Of all the environmental agents, moisture is the most important and single most damaging element to terra cotta. Brick masonry construction is likewise extremely durable, outlasting other building systems by decades. However, brick durability is a function of initial manufacturing, particularly firing, and like terra cotta, moisture can



reduce masonry service life. Diminution of these materials shares many common elements in that freeze-thaw cycles, corrosion of embedded ferrous anchors and structural supports, uncontrolled expansion and contraction, and lack of maintenance or poor maintenance practices can increase their rate of deterioration, if gone unchecked. Corrosion by products (rust) of embedded anchors cause masonry cracking to a point of total loss of support, leaving loose brick and terra cotta precariously dangling from walls and a clear and present danger to pedestrians below.



### Unsafe Conditions

Condition assessment of building façades becomes important for structures in this age group. Aging buildings belonging to owners who notoriously lack funds to maintain them can create these sorts of safety concerns. The late Clayford T. Grimm observed that "masonry falls off a building façade somewhere in the United States about every three weeks. Over the past few years in the United States, at least 49 such masonry failures have killed 30 persons and injured 81" (March 2000, published in *The Construction Specifier*). Such statistics stress the need for periodic façade inspections to identify potential dangers to the public. Façade inspections are now mandatory in some major cities such as New York and Chicago. To that end, a number of standards have been developed by industry groups such as ASTM and ASCE which provide a rational approach to performing these inspections.

### Renovations

Façade safety, notwithstanding building maintenance and renovation, also requires inspections as part of an overall plan to maintain design life of façades and to accommodate building changes. Referred to as condition assessments, these studies delve into the as-constructed status of all the materials which comprise the façade,

including those that provide structural support. The end result is an accurate understanding of how the façade is assembled, the distress it is in (if any), and what caused the distress. Inspections are critical part of this process which begins with visual inspections at ground level sometimes aided by binoculars. Non-destructive evaluations (boroscope, infrared photography, radar to name a few examples) usually follow and culminate with dismantling very small portions of the façade (probes) to reveal concealed conditions. Detailed observations are recorded for future analysis as part of the condition assessment.

The only way to claim success in such an endeavor is to perform the inspection and condition assessment in such a way that a complete understanding of the constructed façade emerges, which when clearly communicated to the repair contractor, safety and serviceability are restored at fixed cost. And only then is effective maintenance, repair or renovation accomplished.



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