RETURN TO WORCESTER UNION STATION

Owner: Worcester Redevelopment Authority
Restoration Architect: Nault Architects, Inc.
Restoration Contractor: Kronenberger & Sons Restoration

Twenty years after its original restoration from a near-ruin condition, Worcester Union Station was again in need of a major intervention. Having participated extensively in the original 1998 project, Edison Coatings was more than a little interested in observing what had worked well and what had gone wrong and in contributing our knowledge and experience to the goal of achieving a more successful second campaign.

Figure 1. Worcester Union Station, 1997, described by the terra cotta consultant as in "near-ruin" condition

Widely praised for the successful turn-around from an extreme level of deterioration, the 1998 restoration involved a staged, two-year process. Careful sequencing of the work was planned, starting with installation of a new roof and general envelope stabilization, to provide the maximum opportunity for the building to dry out prior to installing masonry repair and coating systems. The drying plan also included installation and firing up of a new heating system early on in the restoration process, well in advance of other interior work.

Figure 2. Section at the top of the North elevation, before and after repair in 1998.

A detailed moisture study was performed during an intentional pause in the work, to assure that repair mortars and coatings would perform and endure. Loose glaze was scaled aggressively. Thousands of holes were drilled upward into overhanging terra cotta units to prevent accumulation of water within the cavities. 100% repointing was performed. Skyward-facing joints were addressed by installing backer rod and sealant, followed by lead caps being hammered into the surface of the joints.

When completed, the project was something of which the entire restoration team could be proud. Papers were written and presentations were given.

What went wrong?

The first problem indications, just a couple of years after completion, were observations initially mistaken for being blisters in the Elastowall 351 coating. Closer examination revealed that

there were perhaps several hundred small glaze spalls, areas where remaining original glaze had delaminated from the terra cotta clay body, being kept from falling to the ground by the Elastowall coating. Because removal of loose glaze had been aggressive during preparation for coating, the new spalls were not attributed to workmanship deficiencies. Rather, it was recognized that the previously saturated building was continuing to dry out and that additional glaze spalling was likely to be a consequence of volume changes associated with drying. A touch-up campaign was performed in 2003 at relatively modest expense.

Figure 3. 2003, North elevation. Five years after restoration and at the conclusion of a modest touch-up campaign, building esthetics remained excellent.

No formal follow-ups were performed following this initial touch-up campaign. In 2009, Edison Coatings visited the building to perform a visual inspection from ground-level, 10 years after the original project's completion. Overall, the project appeared to be performing very well, with just a few new terra cotta glaze delaminations observed at the top of the west elevation.

In 2018, Edison Coatings was contacted by the project architects for a new major restoration campaign, seeking background information on the Elastowall 351 coating we had furnished for the original 1998 work. We requested and were granted an opportunity to visit the site.

20 YEARS AFTER

Figure 4. January 2019, a second major restoration in progress

It was disconcerting, to say the least, to find the building staged for another major campaign just 20 years after the original effort. As we climbed the scaffolding on the north elevation, our initial observations were that the 20-year-old Elastowall 351 coating was generally in remarkably good condition, and there were no apparent failures of Custom System 45 TC repairs. As we approached the roof level, however, a very different set of conditions became evident.

Figure 5. Widespread glaze spalling, just below the roof level, north facade, 2018

Damage to the original terra cotta was very extensive, including large areas of new glaze spalls, cracking in the terra cotta alongside some of the lead-capped joints, algae and vegetation growing in wet masonry units and mortar joint delamination. The consultants pointed to roofing defects as the primary cause of the observed problems.

Figure 6. Glaze spalls reveal biological growth in wet masonry on north elevation parapet.

The initial restoration concept was that selective reapplication of Elastowall 351, after proper cleaning and preparation, would preserve the maximum possible amount of the remaining original glaze. As the work advanced, however, it became increasingly evident that overall glaze bond was poor and that much more extensive and aggressive removal of original glaze was necessary.

Product selection included Custom System 45 TC for repairs, Spec Joint 46N with ICE -9RL admixture for repointing and a two-coat glaze consisting of Elastowall 351 base coat and Aquathane UA210E topcoat.

Throughout the project, Edison technical service personnel provided on-site support, helping to resolve a range of issues as they developed and participating in various mockup and test applications. At one point in the work an unidentified exudate began to sporadically bleed through the coating system in some areas. Edison Coatings worked with the owners, architects and contractors to identify the likely cause of the issue – the biocide treatment applied as part of the cleaning process – and to determine the most efficient and effective means of addressing it.

In the end, the station's magnificence was again restored. It will continue to serve as both a transportation hub and a landmark for many years to come and will continue to merit the title of "the city's most beautiful building".