PROJECT PROFILE

Rhode Island State House

Leak Investigation and Temperature Monitoring | Providence, RI

Brewster Thornton Group Architects teamed with WJE to assist in a leak investigation to determine the source(s) of water infiltration below the small corner domes (tourelles) of the Rhode Island State House. WJE was also asked to provide repair recommendations.

CLIENT

Brewster Thornton Group Architects, LLP

BACKGROUND

The Rhode Island State House was constructed from 1895 to 1904 and designed by the architectural firm of McKim, Mead & White. The structure boasts the fourth-largest self-supporting marble dome in the world. In preparation for the bicentennial in 1976, the marble was cleaned, which included sandblasting. During the 1990s, the State House underwent renovation that included an application of a liquid roofing membrane. The iconic landmark is included in the National Register of Historic Places.

SOLUTION

WJE worked with Brewster Thornton Group Architects (BTGA) to diagnose and treat moisture issues within the marble tourelles at the four corners of the dome of the Rhode Island State House. WJE performed a document review, a survey of the interior and exterior, inspection openings, water testing, and testing of select materials. Research and investigations revealed several deficiencies in energy retrofits, cleaning efforts, aged materials, and inappropriate material applications throughout the tourelle construction. Investigative findings were presented and exterior repairs were designed and implemented in association with BTGA.

In an effort to measure the effectiveness of the repairs, WJE designed the layout and installed wireless electronic sensors designed to measure air temperature, relative humidity, and the moisture content of the material to which they were attached. These monitors would help determine if condensation was occurring within the unconditioned interstitial spaces or attics. This yearlong effort concluded that walls were slowly drying and that condensation or further water infiltration did not occur. Sensor data will be collected for another year as part of WJE's agreement with BTGA and the State of Rhode Island. The data will continue to be available through the commercially obtainable web-based data management system.

WJE ENGINEERS ARCHITECTS MATERIALS SCIENTISTS