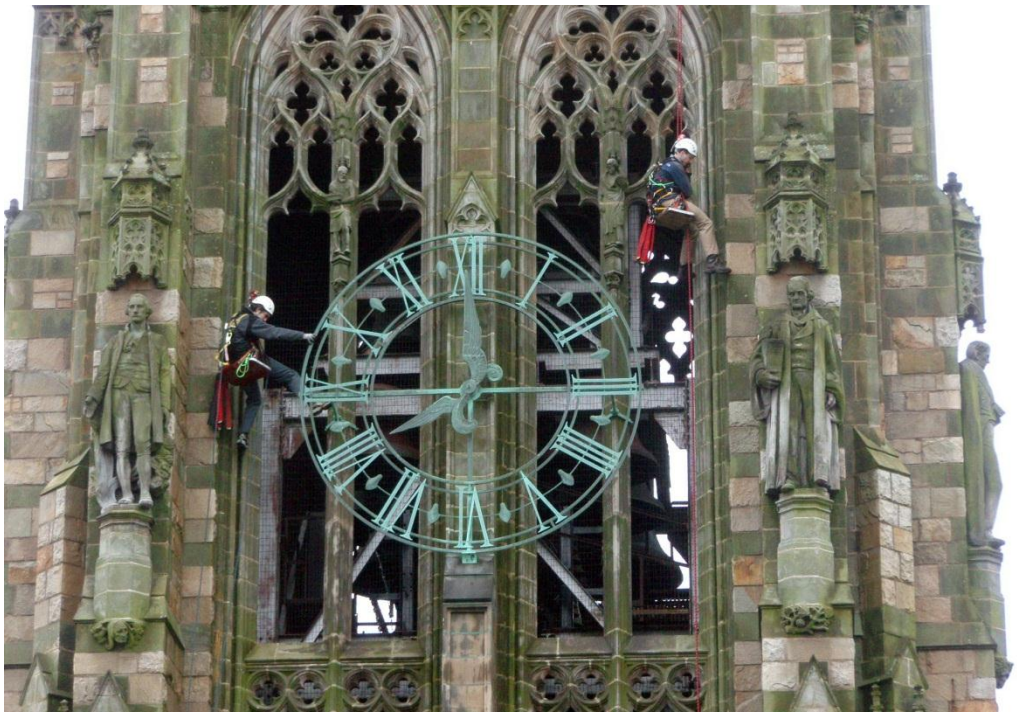
PROJECT PROFILE

Harkness Tower

Condition Assessment of Building Envelope | New Haven, CT



CLIENT

Yale University

BACKGROUND

Harkness Tower is a focal point on the campus of Yale University. Constructed from 1917 to 1921, James Gamble Rodgers based his design for this collegiate gothic structure on the fifteenth-century St. Botolph's Church in Boston, England. The tower rises 216 feet and is decorated with statues depicting famous Yale alumni as well as philosophers, allegorical figures, warriors, athletes, students, socialites, and poets. Its unreinforced masonry-bearing walls are faced with New England granite and Ohio brownstone backed by multiple withes of brick.

Exposure to over eighty-five years of harsh New England climate had resulted in severe masonry deterioration. Yale University retained WJE to provide a condition assessment, architectural/engineering design services, and construction administration services to address the deteriorated conditions.

SOLUTION

Utilizing the Difficult Access Team, WJE's investigation revealed extensive organic growth at the north side of the tower; erosion and spalling of the sandstone and brick; significant cracks in the granite at the tower's corner buttresses; loose, missing, and cracked mortar; spalling of concrete at roof and floor decks; steel corrosion at doors and windows; bowing of lead cames at the stained glass window; loose and missing clay tile at louvers; and loose quarry tile and failed mortar beds at the roof, balconies, and floors exposed to the exterior. WJE also observed that the lightning protection system was in disrepair.

WJE designed a comprehensive program of repairs to address the deterioration. Repairs included masonry cleaning and repointing; stone rehabilitation consisting of replacement units; dutchman repairs and repairs using patching mortar; replacement of damaged brick; flashing installation below the stone caps at corner buttresses; roofing and door replacement; restoration of steel windows; repairs of the stained glass windows, including new protective glazing panels; and replacement of the lightning protection system. Implementation of the repair program was completed over a ten-month period. Construction was completed prior to spring commencement at the University.

WJE ENGINEERS ARCHITECTS MATERIALS SCIENTISTS