



PROJECT PROFILE

Washington National Cathedral

Post-Earthquake Assessment and Stabilization and Repair Design | Washington, D.C.



CLIENT

Washington National Cathedral

BACKGROUND

Construction of the Washington National Cathedral began on September 29, 1907 when the foundation stone was laid and continued until the final west tower was completed on September 29, 1990. Constructed in the Gothic Revival style of architecture, the Cathedral includes tall, vaulted interior spaces, which are supported by massive stone buttresses. The exterior is composed of Indiana limestone configured with tall, slender turrets with ornamental pinnacles, finials, and related elements characteristic of the architectural style.

On August 23, 2011 a 5.8Mw earthquake struck the northern Virginia area, causing damage to the Washington National Cathedral. To ascertain the extent of damage and to identify immediate issues of public safety, the Cathedral commissioned a comprehensive post-earthquake study of the structure and its ornamental limestone facade. Of primary importance were recommendations to stabilize and repair impacted structural and architectural elements.

SOLUTION

WJE seismic and stone engineering experts arrived at the Cathedral within 24 hours of the earthquake to begin assessments and make-safe operations. Using a variety of techniques including rope access methods, WJE experts gained arms-length access to interior and ornate exterior surfaces to facilitate inspections and direct critical make-safe constructions, including installation of netting, fencing, and protection scaffolding.

WJE engineers collected detailed post-earthquake survey data using iPads and other means to characterize the extent and location of damage. Overall, the Cathedral performed well during the earthquake, despite suffering substantial damage to the more ornamental elements of the exterior. WJE engineers developed repair recommendations and cost estimates for the work.

WJE's proposed reconstruction program balances the necessity of repairs and safety to the public with the challenges of accessibility to the Cathedral exterior, while continuing the mission of the Cathedral and the realities of a funding stream for a monumental non-profit religious institution.

