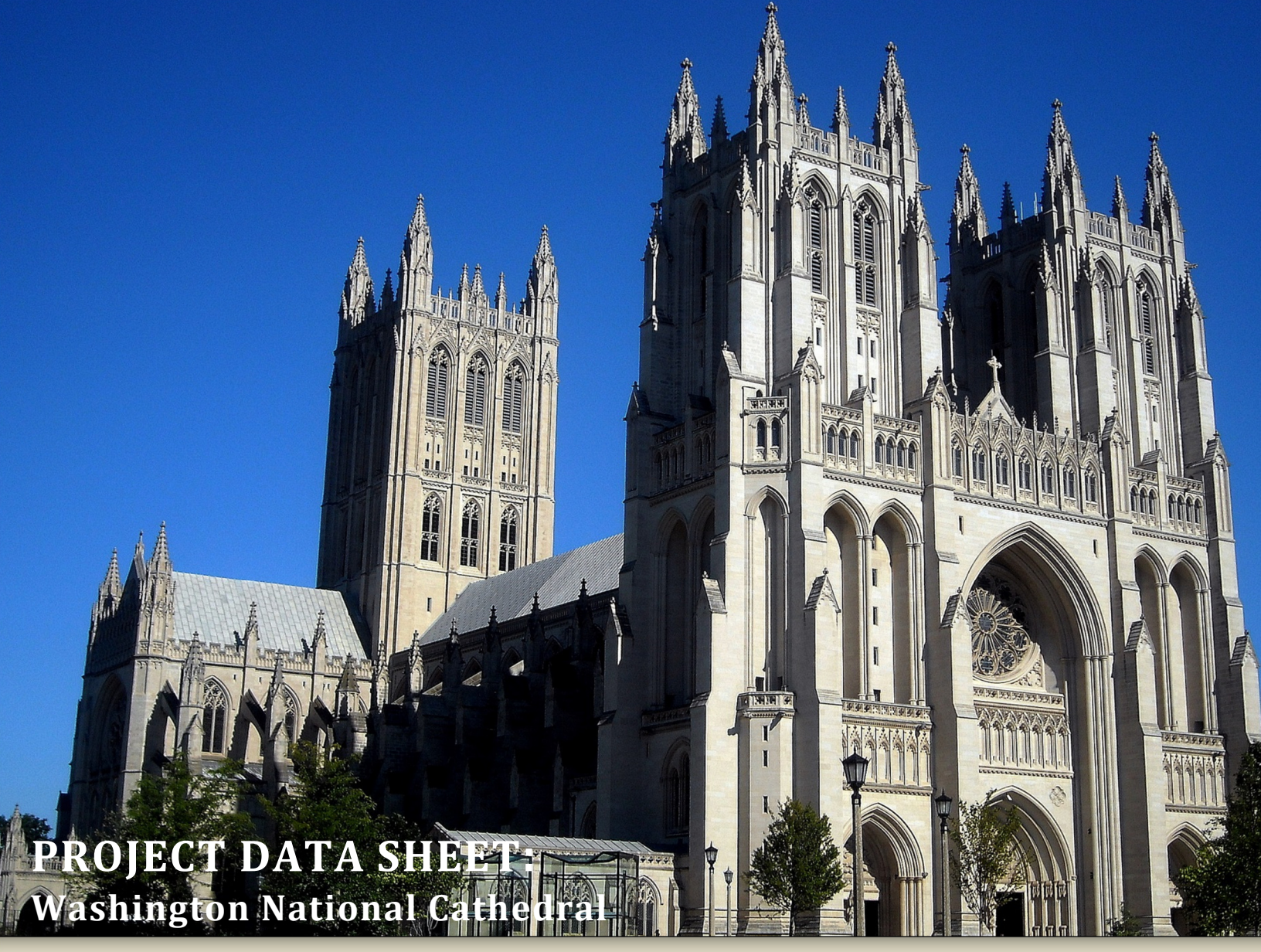


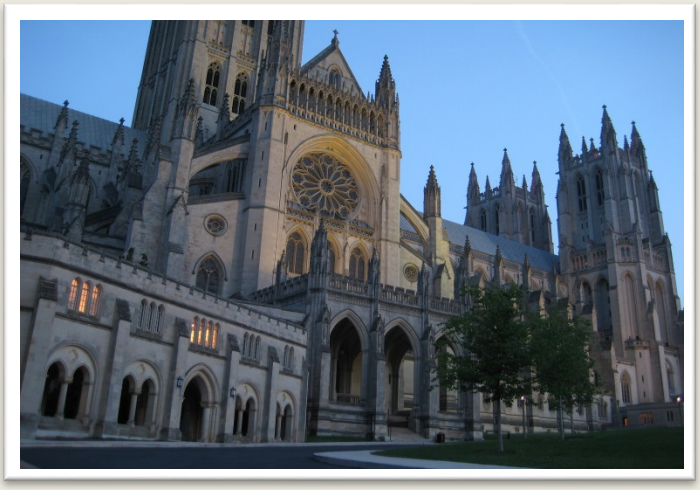
PROJECT DATA SHEET:
Washington National Cathedral

CRITICAL REHABILITATION FOR ONE OF DC'S MOST REVERED ICONS

Masonry Solutions International, Inc.

10815 Beaver Dam RD, Suite D
Cockeysville, MD 21030 USA
Tel: 877-815-7906 Fax: 410-771-1942

Repair and enhance
without changing the aesthetics.



Washington National Cathedral

Location: Washington, DC

Age: Construction began 1907

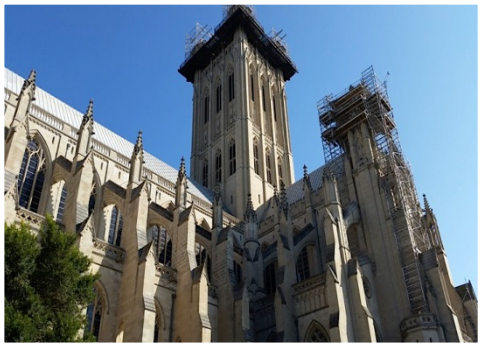
Key Topics: Long-bore dry coring, seismic retrofit, historic stabilization, CIF injection

Project Background:

- The Washington National Cathedral is the sixth largest cathedral in the world and second largest in the US
- A member of the National Register of Historic Places it was the site of funerals for Dwight Eisenhower, Ronald Reagan, and Gerald Ford
- The cathedral is designated as the 'National House of Prayer' by Congress and houses the remains of historical figures such as Helen Keller and Woodrow Wilson
- Ranked third on the List of America's Favorite Architecture by the American Institute of Architects

Challenges Presented:

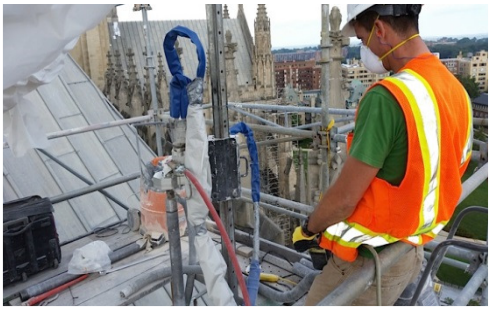
- The cathedral was badly damaged during the 2011 Virginia earthquake
- Project designers determined a systematic reinforcement of the cathedral's buttresses was critical. This would first require carefully dry coring into the historic limestone, a task many told the project team was impossible
- Additionally, the team needed to furnish a compatible material to bond with and mobilize anchors within the masonry substrate

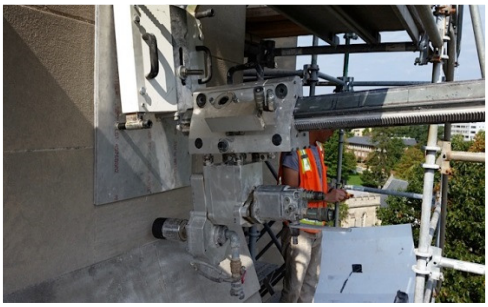


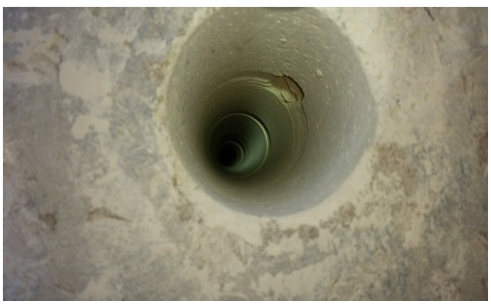
Repair and enhance
without changing the aesthetics.

Services and Solutions:

- Masonry Solutions International began by evaluating the limestone structure and developing a custom approach that included specially calibrated diamond composite drill segments
- Working with the project team, Masonry Solutions then determined the optimal layout for MSI's advanced ROMEO I coring equipment, which allows for long-bore coring without the use of water
- Several core locations required complex, precision angled drilling
- Masonry Solutions' drillers applied their extensive knowledge, providing dozens of lengthy, 3" diameter core holes with the utmost care for the continuing operations of this venerable institution
- MSI and its laboratory engineers then coordinated with the cathedral's design team to develop a custom Compatible Injected Fill (CIF) to mobilize the supplied anchors within the limestone, providing superior bond and enhanced structural performance
- This CIF was uniquely developed using white cement to match the limestone masonry and air entraining agents to provide the masonry with a longer lasting repair
- The National Cathedral's appearance was maintained and no service interruptions were experienced throughout Masonry Solutions' work
- Thanks to the extensive (yet principally invisible) intervention, this landmark is able to continue along its historic path unimpeded







Masonry Solutions International, Inc.

10815 Beaver Dam RD, Suite D
Cockeysville, MD 21030 USA
Tel: 877-815-7906 Fax: 410-771-1942

Masonry Solutions International has worked in the field of masonry preservation and enhancement for over 20 years. It has pioneered a number of advanced techniques, including compatible masonry injection and undercut fabric anchorage.