Earthquake Damage and Repairs Summary – Earthquake Background

All Smithsonian structures within the Washington, DC metro-area were affected by the August 23, 2011 earthquake.
Earthquake Damage and Repairs Summary – Smithsonian Castle

1855 - Construction of the Castle is completed
1865 - Fire destroys Upper Main Hall and Towers
1882 – Reconstruction and enlargement of East Wing and Range is completed
2011 – Mineral, VA Earthquake causes significant damage to Castle and other Smithsonian facilities

Factors contributing to Castle’s vulnerability:

• High, long, narrow shape of the building
• Tall, slender, and unbraced towers and chimneys
• Unreinforced masonry walls that are not tied to the floors and roofs

Earthquake Damage and Repairs:

• Chimneys and stone roof ornament at the east end of the building cracked and stones were dislodged. They were temporarily braced and then more permanent repairs were completed in 2012.

• Inside the building, plaster walls and ceilings cracked and plaster at windows in the East Wing fell from the brick beneath.

• Movement of unreinforced masonry partitions caused cracks in walls of the East Wing and north tower stairwells.

Major reconstruction, including construction of new shear walls and foundations, will be required to substantially improve seismic performance.
Immediate Actions Taken (pn 1124107):

- Immediate structural assessment by KCE Structural Engineers; 4 field reports with notes and photos submitted August 2011; $33k
- Immediate stabilization by Clark Construction, August – September 2010; $15k
Earthquake Damage and Repairs Summary – Smithsonian Castle

Interim Repairs (pn 1124108):

• Interior and Exterior Repairs; design by SmithGroup, December 2011 – June 2012; $72k

• Interior and Exterior Repairs; construction by CFM Group, July 2012 – March 2013; $519k
Next Steps / Future Requirements:

Major reconstruction, including construction of new shear walls and foundations, will be required to substantially improve seismic performance.

Planning:  South Mall Campus Master Plan (underway)
  •  Structural and Building Envelope Report
  •  SI Castle Seismic Feasibility Study
  •  Geotechnical Studies

Design:  FY16 and beyond