

EXECUTIVE SUMMARY

ES.1. WORLD TRADE CENTER BUILDING 7 (WTC 7)

WTC 7 was a 47 story office building located immediately to the north of the main WTC Complex. It had been built on top of an existing Consolidated Edison of New York electric power substation, which was located on land owned by The Port Authority of New York and New Jersey. On September 11, 2001, WTC 7 endured fires for almost seven hours, from the time of the collapse of the north WTC tower (WTC 1) at 10:28:22 a.m. until 5:20:52 p.m., when it collapsed. This was the first known instance of the total collapse of a tall building¹ primarily due to fires.

WTC 7 was unlike the WTC towers in many respects. It was a more typical tall building in the design of its structural system. It was not struck by an airplane. The fires in WTC 7 were quite different from those in the towers. Since WTC 7 was not doused with thousands of gallons of jet fuel, large areas of any floor were not ignited simultaneously. Instead, the fires in WTC 7 were similar to those that have occurred in several tall buildings where the automatic sprinklers did not function or were not present. These other buildings did not collapse, while WTC 7 succumbed to its fires.

ES.2. THIS REPORT

This is the final report of the National Institute of Standards and Technology (NIST) investigation into the collapse of WTC 7, conducted under the National Construction Safety Team Act. The report is the result of an extensive, state-of-the-art reconstruction of the events that affected WTC 7 and eventually led to its collapse. Numerous facts and data were obtained, then combined with validated computer modeling to produce an account that captures the key features of what actually occurred. However, the reader should keep in mind that the building and the records kept within it were destroyed, and the remains of all the WTC buildings were disposed of before congressional action and funding was available for this Investigation to begin. As a result, there are some facts that could not be discerned and, thus, there are uncertainties in this accounting. Nonetheless, NIST was able to gather sufficient evidence and documentation to conduct a full investigation upon which to reach firm findings and recommendations.

This report summarizes how NIST reached its conclusions. NIST complemented in-house expertise with private sector technical experts; accumulated copious documents, photographs, and videos of the disaster; conducted first-person interviews of building occupants and emergency responders; analyzed the evacuation and emergency response operations in and around WTC 7; performed computer simulations of the behavior of WTC 7 on September 11, 2001; and combined the knowledge gained into a probable collapse sequence. Extensive details on the reconstruction effort for WTC 7, the uncertainties, the assumptions made, and the testing of these assumptions are documented in NIST NCSTAR 1-9 and NIST NCSTAR 1-9A.

¹ The term “tall building” is used by architects and structural engineers to indicate buildings that are taller than surrounding buildings, slender in their proportions, and/or require technologies such as wind bracing to carry loads, and are nominally taller than 15 to 20 stories. For fire protection engineers, the term “high-rise building” is used to indicate buildings that are nominally taller than 25 m (75 ft), and from which external rescue from fires is not possible. Both terms apply to WTC 7.