

Chapter 5

WTC 7 VISUAL EVIDENCE: DAMAGE ESTIMATES, FIRE TIMELINE, AND COLLAPSE TIMELINE

5.1 INTRODUCTION

This chapter documents the visual evidence used to guide the reconstruction of the fires and the global collapse analysis of WTC 7, as NIST NCSTAR 1-5A did for the World Trade Center towers. Many of the details concerning the general approaches to acquiring and cataloging the visual material, the timing of the photographs and videos, the development of fire time lines, and additional analyses of the visual material, were documented in that report. This Chapter is organized as follows:

- Section 5.2 provides specific details relevant to WTC 7 with regard to the visual material that was recorded on September 11, 2001 and approaches that were used to identify, collect, log, time, and catalog the material.
- Section 5.3 provides background information about the local geography and wind direction, relevant WTC 7 structural and architectural details, a numbering system for describing window locations on WTC 7, and some interior details needed to understand the observations of fires and damage.
- Section 5.4 presents how NIST identified the initial damage to WTC 7 and documented the time development of fires within the building. This section also provides details of the analysis and procedures employed to develop the time lines. The primary output is a series of numerical data sheets as a function of time that provide window-by-window assessments of whether or not a fire was present, and, if present, a measure of the local intensity, and whether or not glass was in place for a given window. The use of the data has been assisted by visualizing the contents using color façade maps.
- Section 5.5 reproduces multiple images showing the damage to WTC 7 by debris generated by the collapses of the two 110 story WTC towers, WTC 2 (South Tower) and WTC 1 (North Tower), at 9:58:59 a.m. and 10:28:22 a.m., respectively. The collapse of WTC 1, in particular, caused structural and façade damage to the WTC 7 south and west faces. Both the extent of the damage and the limitations of the imagery for assessing this damage are emphasized. The results of the visual analysis were used to develop color-coded damage maps for the south and west faces and for each floor of WTC 7.
- Shortly after the towers collapsed, fires began to appear at multiple locations in WTC 7. Section 5.6 first discusses possible ignition sources for these fires. Next, the visual evidence for the growth and spread of these fires until the building collapsed at 5:20:52 p.m. is presented and discussed. The descriptions of the fires at various times are then visualized using color-coded façade maps.