

5.6 DEVELOPMENT AND SPREAD OF FIRES IN WTC 7

5.6.1 Introduction

Fires were observed on multiple floors of WTC 7 between the times when WTC 1 collapsed at 10:28:22 a.m. and WTC 7 collapsed at 5:20:52 p.m. It is important to consider whether the ignition of such a number of separate fires was to be expected, based on observations of fires in the towers and ignition behavior at other locations around the WTC site. This point will be discussed in Section, 5.6.2. In Section 5.6.3 observations concerning fire development and spread within WTC 7 will be discussed with an emphasis on the time behavior. In the final subsection, the fires in WTC 7 are characterized in terms of a number of fire maps designed to provide concise snapshots of the fires at particular times.

5.6.2 Ignition of Fires Following Collapse of the World Trade Center Towers

The time-dependent behavior of the fires that developed in the WTC towers was discussed extensively in NIST NCSTAR 1-5A. Particularly relevant to this discussion is the observed fire distributions at the times when the towers collapsed. At the time WTC 2 collapsed at 9:58:59 a.m., a large fire had developed along the west side of its south face on the 80th floor. Flames were pushed out of open windows in this area as the collapse began. Smaller fires were burning at multiple locations in WTC 2 on floors ranging from the 79th to the 83rd floors on the north face. At the time of collapse, fires on the east of WTC 2 face seemed to have died down with the exception of a long-burning fire in the northeast corner on the 81st floor. Fires had not appeared on the west face by the time of collapse.

Subsequent to the collapse of WTC 2, numerous fires were reported to the south and southwest of the WTC site. There is some ambiguity as to ignition sources, since some of these fires could have been ignited by burning materials released when WTC 1 collapsed 29 min later. Large fires grew in the ruins of WTC 3 (Marriott Hotel), which was adjacent to both WTC 1 and WTC 2. (See Figure 5–2.) WTC 4 was heavily damaged by debris from WTC 2, and the remaining structure subsequently burned. Fires also grew on multiple floors in buildings located one block south of WTC 2 at 90 West Street and 130 Cedar Lane. Fires apparently did not develop in the Bankers Trust Building located just to the east at 130 Liberty Street. Fires were reported at an apartment house located to the southwest of the WTC site on the corner of Liberty Street and South End Avenue. Numerous vehicles parked along West Street to the south of the WTC site were consumed by fire. The locations of all of these fires seem to be related to the locations of active fires in WTC 2 at the time of its collapse.

In Section 5.5.1, several images showing superficial damage to the south face of WTC 7 due to the collapse of WTC 2 were reproduced. It was also noted that a videographer entered the lobby of WTC 7 from the south and filmed inside. Even though glass panes were broken at several locations on the south face, there was no indication that fires had been ignited in the building immediately following the collapse of WTC 2.

The fires in WTC 1 were more widespread and intense at the time of its collapse than those in WTC 2. When WTC 1 collapsed, there were several large fires burning in the tower. The most extensive fire on the north face was located on the west side of the 92nd floor. Somewhat smaller fires were present immediately above on the 95th floor and on the east side of the 92nd floor. As the collapse of WTC 1 proceeded, it generated a pressure pulse that pushed flames from internally burning areas out of adjacent