

5.5 DAMAGE ESTIMATES FOR WTC 7 DUE TO DEBRIS IMPACT FROM WTC 2 AND WTC 1 COLLAPSES

5.5.1 Damage Resulting from the Collapse of WTC 2

WTC 2 began to collapse at 9:58:59 a.m. It took roughly 11.5 s for the first large debris to reach the ground. Videos and photographs taken from a variety of directions show that most of the heavy debris came down around WTC 2 and did not reach out as far as WTC 7, which was located 210 m (675 ft) from the north face of the tower. An indication of the relative distance between WTC 2 and WTC 7 can be seen in Figure 5–33, which shows the collapsing WTC 2, WTC 1 to its left, and WTC 7 near the left edge. Heavy debris can be seen falling around the base of WTC 2 that is far removed from WTC 7. Additional supporting evidence that large and heavy debris did not reach WTC 7 from the collapse of WTC 2 is that the roofs of WTC 5 and WTC 6, which were in between WTC 2 and WTC 7 did not sustain substantial damage based on review of photographs and videos taken from above these buildings after the collapse of WTC 2, but prior to the collapse of WTC 1. Note that a large section of WTC 4, which was located to the south of WTC 5 and was immediately to the east of WTC 2, was collapsed by debris falling from WTC 2.

The large dust cloud generated by the collapse of WTC 2 was described earlier and can be seen in Figure 5–27. This dust cloud was pushed out rapidly from the base of WTC 2. A long distance video shot from the west indicates that the first part of the cloud reached the south face of WTC 7 about 12.5 s after the collapse of WTC 2 started. The dust cloud can be seen pushing up against WTC 7 in Figure 5–34, which was taken about 16 s after WTC 2 started to collapse. The dust cloud visible between WTC 7 and the building to the west of WTC 1 (World Financial Center 2) obscures the lower 15 floors of WTC 7. The dust cloud, visible as a reflection from the south face of the building, is roughly 40 stories high.

Another view of the dust cloud is shown in Figure 5–35, which was taken looking up Fulton Street from just east of Broadway. The building visible below the dust cloud is WTC 5. The Verizon Building is just visible beyond WTC 7.

For several minutes following the collapse of WTC 7, NIST found no images showing the south face of WTC 7. However, after the dust had cleared and several minutes prior to the collapse of WTC 1, a camera crew turned the corner at West and Vesey Street, proceeded east on Vesey Street to one of the ground floor entrances, entered the ground floor lobby, and proceeded up an escalator to the 3rd floor main lobby, before retracing their steps and leaving the area. Much of their progress was taped.

A frame taken from this video is reproduced in Figure 5–18. Even though the street is passable, a large amount of dust and small debris, such as paper, has been deposited on the street. The trees on the Promenade are upright and appear unharmed. Windows on several floors above the Promenade appear to be intact.

Another frame from this video taken closer to WTC 7 is shown in Figure 5–36. The amount of dust and debris is greater than seen further west on Vesey Street. It appears to be several inches deep. Most of the debris appears to be paper. A portion of the south face of WTC 7 is visible to the left. Numerous plate glass windows at the ground floor are broken out between Column 24 and Column 26. There appears to be some light façade damage higher up near the Pedestrian Bridge. There is no indication of any structural damage on WTC 7. The covering on the Pedestrian Bridge appears to be intact following the collapse of WTC 2. There are no indications of fire in the image.