

5.5.3 Summary of Debris Damage to WTC 7 Based on Visual Data

WTC 7 suffered structural damage to its southwest quadrant due to heavy debris falling from WTC 1 during its collapse. Most of the damage was on the south face. It is possible that some additional interior damage occurred, since portions of the face were hidden by smoke or nearby buildings. Damage to the west face primarily occurred along the southern edge. The north and east faces apparently did not sustain damage that could be detected visually.

The damage estimates were based on the observed exterior damage to the south and west faces of the building from the visual evidence discussed above (Figures 5-83 and 5-89).¹ In addition, interview accounts by individuals who were in or around WTC 7, documented damage to the building at 130 Liberty Street (Figure 2-32), and engineering judgment were used to develop estimates of interior structural damage between the exterior walls and the core.

Figure 5-92 and Figure 5-93 show elevation views of the estimated interior damage below Floor 18 in the southwest region, looking from the south and the west directions, respectively. Figure 5-94 through Figure 5-101 show schematics of the damage estimates for each floor, from Floors 5 to 17, and Floor 44 to the roof.

Along the south face, the interior damage was estimated to extend from the south exterior wall toward the core, with increasing interior damage of the south tenant floor between the south face and the core, from Floor 17 down to Floor 7. The core columns and girders were assumed to be structurally undamaged. The following floor damage was estimated at the locations where the exterior columns were damaged:

- For Floors 15 through 17, a small portion of the floor span between the south face and the core.
- For Floors 12 through 14, half of the floor span between the south face and the core.
- For Floors 7 through 11, the full floor span between the south face and the core.
- For Floors 5 and 6, the full floor span between the south face and the core between exterior Columns 19 and 20.

For Columns 14A, 15, and 16 at the southwest corner, the following floor damage was estimated:

- For Floor 6 and Floors 10 through 17, a small portion of the floor span between the exterior and the core.
- For Floors 8 and 9, the full floor span between the south and west faces and the core.

Global structural response analyses are presented in Chapter 12 to simulate the collapse of WTC 7 following the damage due to debris impact and fires. These analyses included the damage estimates to the southwest quadrant of the building due to debris impact presented in Figures 5-92 through 5-101.

¹ Note that Figures 5-92 through 5-99 were developed based on a preliminary estimate of Figures 5-83 and 5-89. As such, there are minor discrepancies between the two sets of figures. Such discrepancies did not have any significant effect on the results of the structural collapse analyses in Chapter 12.