

The floor connections to the west face columns had not failed above Floor 9 because no fires were observed on the west side of Floors 10 through 14. The intact floor framing pulled the exterior columns inward as the interior columns fell downward during the horizontal progression of failure stage and the floors pulled on the exterior columns. As the interior columns buckled across the building, the exterior columns were left laterally unsupported normal to the east, south, and north faces. Exterior column buckling spread from column to column, as loads were redistributed, until all the exterior columns had buckled between Floors 7 and 14 within approximately 2 s.

When all the exterior columns had buckled, as shown in Figure 12–62, the entire building above the buckled-column region moved downward as a single unit, resulting in the global collapse of WTC 7. Detailed views of the lower exterior column buckling are shown in Figure 12–63.

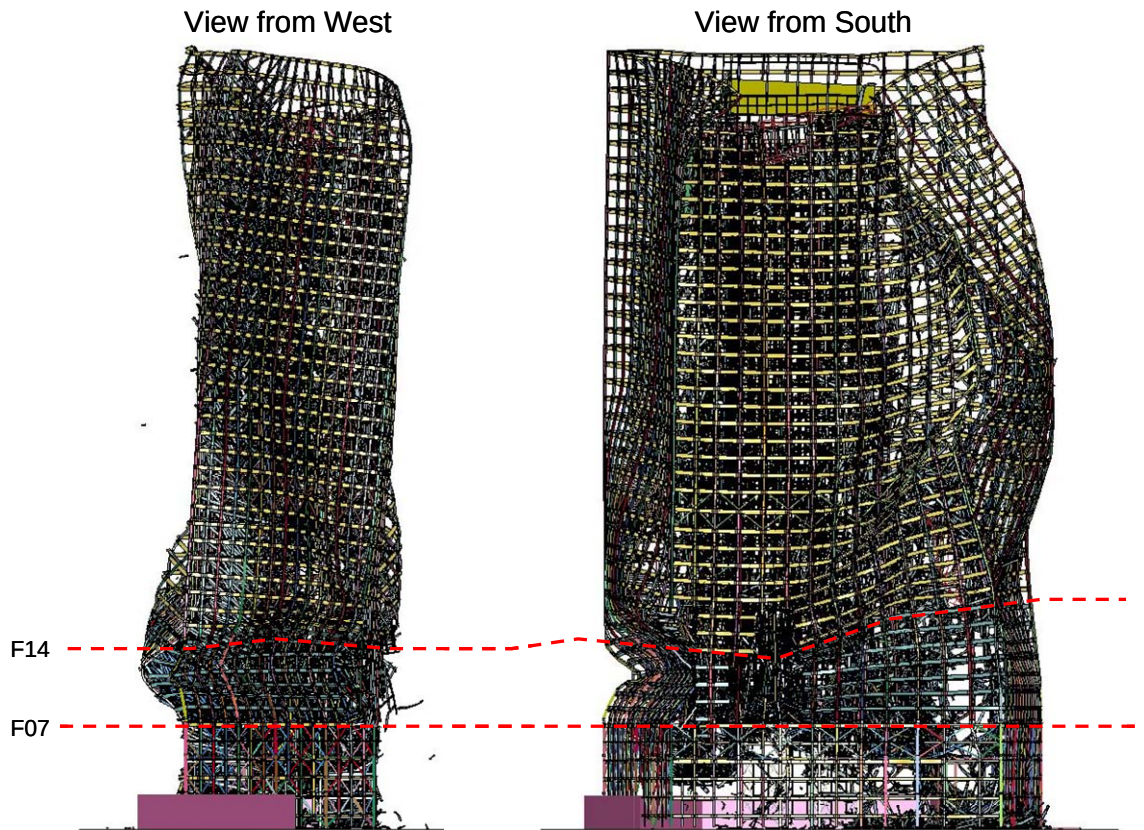


Figure 12–62. Exterior column buckling after initiation of global collapse with debris impact and fire-induced damage (slabs removed from view).