

Collapse Initiation

- The bowed south wall columns buckled and were unable to carry the gravity loads. Those loads shifted to the adjacent columns via the spandrels, but those columns quickly became overloaded as well. In rapid sequence, this instability spread all the way to the east and west walls.
- The section of the building above the impact zone (near the 98th floor), acting as a rigid block, tilted at least 8 degrees to the south.
- The downward movement of this structural block was more than the damaged structure could resist, and global collapse began.

6.14.7 Probable WTC 2 Collapse Sequence

Aircraft Impact Damage

- The aircraft impact severed a number of exterior columns on the south wall from the 78th floor to the 84th floor, and the wall section above the impact zone moved downward.
- After breaching the building's perimeter, the aircraft continued to penetrate into the building, severing floor framing and core columns at the southeast corner of the core. Insulation was damaged from the impact area through the east half of the core to the north and east perimeter walls. The floor truss seat connections over about one-fourth to one-half of the east side of the core were severed on the 80th and 81st floors and over about one-third of the east perimeter wall on the 83rd floor. The debris severed four columns near the east corner of the north wall between the 80th and 82nd floors.
- The impact damage to the perimeter walls and to the core resulted in redistribution of severed column loads, mostly to the columns adjacent to the impact zones. The impact damage to the core columns resulted in redistribution of severed column loads, mainly to other intact core columns and the east exterior wall. The hat truss resisted the downward movement of the south wall.
- As a result of the aircraft impact damage, the core carried about 6 percent less gravity load. The north wall carried about 10 percent less, the east face carried about 24 percent more, and the west and south faces carried about 3 percent and two percent more, respectively.
- The core was then leaning slightly toward the south and east perimeter walls. The perimeter walls restrained the tendency of the core to lean via the hat truss and the intact floors.

Thermal Weakening of the Structure

- Under the high temperatures and stresses in the core area, the remaining core columns with damaged insulation were thermally weakened and shortened, causing the columns on the floors above to move downward.