

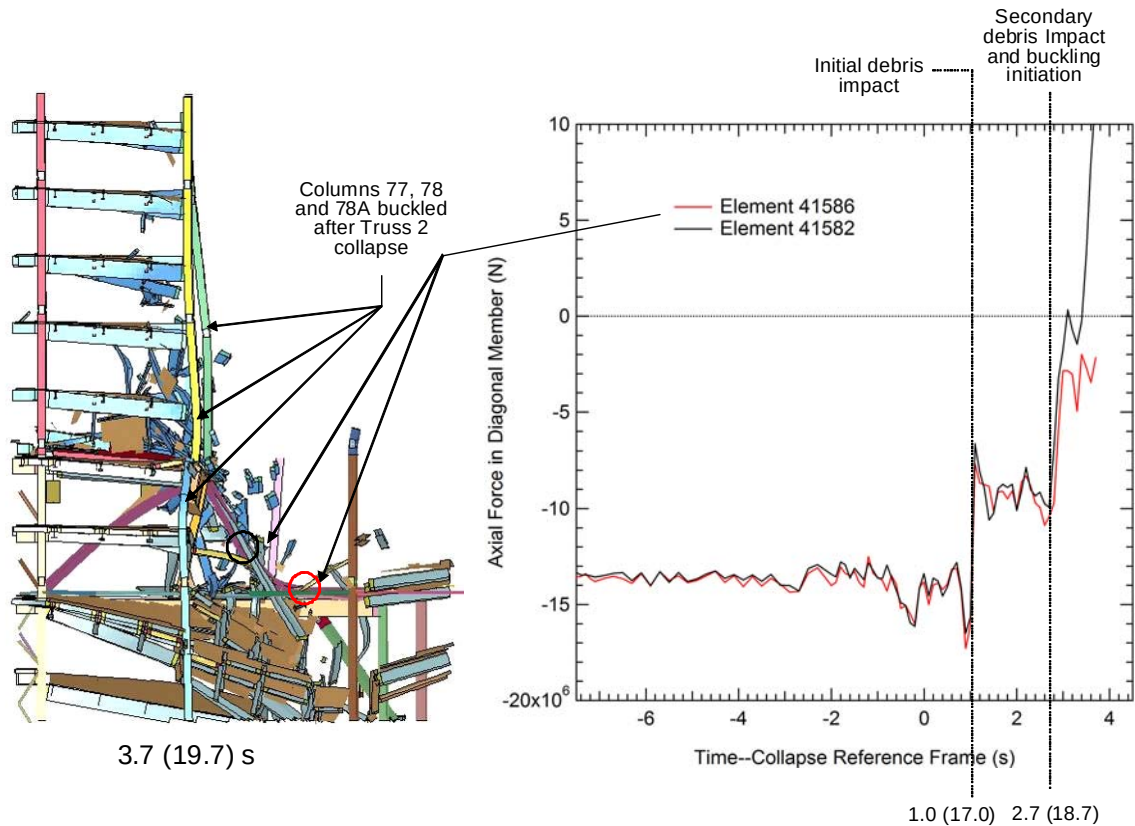


Figure 12–51. Truss 2 collapse. View from south (most of debris removed from view).

The failure of Truss 2 precipitated the buckling of Columns 77 and 78, as shown in Figure 12–52. The loss of the Truss 2 diagonal resulted in a loss of support for Column 77. When the Truss 2 diagonal member failed, support for the girder MG-23 at Column 77 was also lost, which subsequently led to loss of support for Columns 78.

Column 76 failed in the next second, as indicated in Figure 12–53, due to loss of lateral support as the floor connections failed, the impact of falling debris, and load redistribution from adjacent columns.

Columns 73 to 75 buckled in the next second, as shown in Figure 12–54, as the process continued where there were sequential failures of each north-south row of interior columns, due to loss of lateral support as floor connections failed, impact of falling debris, and load redistribution from adjacent failing columns.

Column buckling and floor failures continued to propagate from east to west across the core in the lower floors, until all the interior columns buckled between Floors 9 and 14. This occurred 6.5 s after the kink was observed in the east penthouse, and 6.7 s after Column 79 buckled, as indicated by Figure 12–55.

Figure 12–56 shows that west interior Columns 59, 62, 65, and 66, which had damaged floor connections after the debris impact by WTC 1 and by the fires, did not buckle until 4.7 s after the kink was observed in the east penthouse, or 6 s after Column 79 buckled. The west interior columns did not buckle until they were affected by the horizontal progression of failures. They also buckled due to loss of lateral support as floor connections failed, impact of falling debris, and the load redistribution from adjacent failing columns.