

the four generators in the northeast quadrant. Column 80, Truss 1, and Truss 2 were located in the Ventilation and AC Equipment space, which was enclosed with masonry walls. Column 81 was located within the transfer corridor. Thus, of these critical structural components, only Column 79 could have been exposed to heating from a diesel fuel fire on Floor 5.

As presented in Chapter 5 of this report, there was no visual evidence of a fire in this space. However, as presented in Section 3.3.2, louvers and blocked windows would have obscured views of a fire on the 5th floor from the north, east, and west. A fire on the north or west side of the core on the 6th floor would have been visible through the 6th floor windows; the two story louvers that extended up from the 5th floor would have obscured a fire on the 6th floor viewed from the east. Had a large, sustained fire occurred on the 5th floor, the partitions separating the exhaust and air intake plenums could have been breached, discharging visible smoke through the louvers to the west, east or north.

Chapter 8 suggests that the initial effect of a fire weakening the building structure would have occurred on the east side of the building. The interior columns that might have been affected were Columns 79, 80, and/or 81. Figure 9–3 shows the developing thermal conditions for these heavy columns, insulated with 9/16 in. of thermal insulation³, when exposed to a uniform temperature of 1100 °C. It would have required a continuous, fully developed fire at the location of a column for approximately 7 h for a 50 percent reduction in its strength to occur (Section 4.1.2, NIST NCSTAR 1-6).

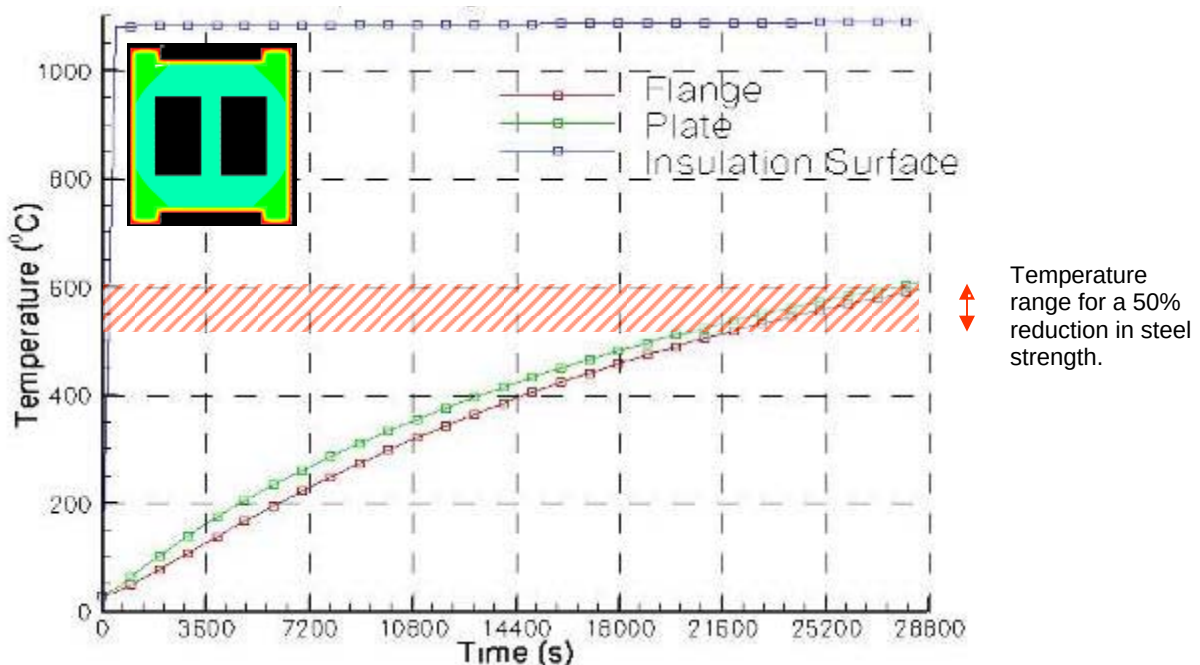


Figure 9–3. Minimum heating of reinforced heavy columns to initiate global collapse.
The column modeled is a W14x730 with 9/16 in. of thermal insulation.

There was very little in the way of solid combustibles on the 5th and 6th floors. Therefore, any sizable fires would have involved the diesel fuel that could have been delivered to the floor by fuel pumps

³ The nominal column insulation thickness for columns larger than a W14x228 was nominally 7/8 in. (Chapter 2). As part of determining the rate of heating in Column 79, a reduced thickness was evaluated.