

and fire zone was not able to absorb the tremendous energy of the falling building section and global collapse ensued.

6.14.4 Events Following Collapse Initiation

Failure of the south wall in WTC 1 and east wall in WTC 2 caused the portion of the building above to tilt in the direction of the failed wall. The tilting was accompanied by a downward movement. The story immediately below the stories in which the columns failed was not able to arrest this initial movement as evidenced by videos from several vantage points.

The structure below the level of collapse initiation offered minimal resistance to the falling building mass at and above the impact zone. The potential energy released by the downward movement of the large building mass far exceeded the capacity of the intact structure below to absorb that through energy of deformation.

Since the stories below the level of collapse initiation provided little resistance to the tremendous energy released by the falling building mass, the building section above came down essentially in free fall, as seen in videos. As the stories below sequentially failed, the falling mass increased, further increasing the demand on the floors below, which were unable to arrest the moving mass.

The falling mass of the building compressed the air ahead of it, much like the action of a piston, forcing material, such as smoke and debris, out the windows as seen in several videos.

NIST found no corroborating evidence for alternative hypotheses suggesting that the WTC towers were brought down by controlled demolition using explosives planted prior to September 11, 2001. NIST also did not find any evidence that missiles were fired at or hit the towers. Instead, photographs and videos from several angles clearly show that the collapse initiated at the fire and impact floors and that the collapse progressed from the initiating floors downward, until the dust clouds obscured the view.

6.14.5 Structural Response of the WTC Towers to Fire without Impact or Thermal Insulation Damage

To complete the assessment of the relative roles of aircraft impact and ensuing fires, NIST examined whether an intense, but conventional, fire, occurring without the aircraft impact, could have led to the collapse of a WTC tower, were the tower in the same condition as it was on September 10, 2001. NIST used the observations, information, and analyses developed during the Investigation to enable the formulation of probable limits to the damage from such a fire. Since a complete analysis beyond the actual collapse times of the towers was not conducted, the findings in this section represent NIST's best technical judgment based on the available observations, information, and analyses:

- Ignition on a single floor by a small bomb or other explosion. If arson were involved, there might have been multiple small fires ignited on a few floors.
- Air supply determined by the building ventilation system.
- Moderate fire growth rate. In the case of arson, several gallons of an accelerant might have been applied to the building combustibles, igniting the equivalent of several workstations.