

- The water supplies for Floors 21 through 47 included large capacity storage tanks and direct connections to the NYC water distribution system. These supplies provided redundant sources of water for the standpipe and sprinkler system infrastructures. The storage tanks provided adequate duration of supply for normally expected fire exposures to allow the fire department to respond and supplement the demand.
- Water for Floors 1 through 20 was supplied directly from the NYC water distribution system through two service lines from the street main on Washington Street. An automatic fire pump was used to supply the water to the combined sprinkler and standpipe risers. The water supply tanks located in the upper part of the building did not service the lower floors. Therefore, there was no source of water for controlling fires on the lowest 20 floors when the NYC system became inoperable following the collapse of WTC 1.
- The suppression systems in WTC 7 required manual operation of the electric fire pumps in order to provide secondary water. An automatic supplemental water supply is required by NFPA 14 and represents current best practice. Whether or not the building maintenance staff performed this task on September 11, 2001 could not be confirmed.
- Based upon the documents examined, the sprinkler systems installed in WTC 7 were appropriately designed, with calculated water spray densities considerably greater than typically provided for high-rise office buildings. The sprinkler systems met or exceeded the applicable installation requirements in the NYCBC and NFPA 13.
- Calculations showed that the capacity of the automatic sprinkler system was sufficient to control fires involving about four clusters of cubicles. This might explain why some fires on and above Floor 20 did not spread into the afternoon.
- Documentation indicated that the standpipe pre-connected hose system installations were consistent with the applicable requirements in the NYCBC. They were not consistent with the flows and durations required in the 2003 version of NFPA 14. Since the water supply was interrupted, and since there were no people in the building to use the hoses, these inconsistencies would not have affected the outcome of the fires.
- No information was found that indicated that the generator/fuel day-tank enclosures in WTC 7 on Floors 5 and 7 were protected by automatic sprinklers or other special hazard suppression systems; the NYCBC does not require a suppression system for this application. However, the generator rooms on the 8th and 9th floors were protected with sprinklers.
- A 24 m³ (6,000 gal) fuel oil storage tank on the first floor was protected with an Inergen clean agent system. Its role on September 11, 2001, could not be determined due to the absence of any information regarding the system's performance.

4.6 FIRE BARRIERS

The characteristics of office walls, masonry walls for mechanical spaces, and reinforced concrete for transformer vaults and floors were described in Chapter 2. Depending on the information available, this included the specified or selected fire ratings.