

In general, the SFRM was observed to be intact a few feet away from the area of structural damage. In some locations, SFRM had been removed and sampled for tests of contaminants in the building (e.g., square shape of removed area). There were also some areas where SFRM was missing from the bottom surface of the lower flanges of floor beams. It was not always clear whether the SFRM had fallen off due to an event unrelated to the sampling or if it had been dislodged while samples were being taken.

Based on these observations, NIST determined that there was no basis for assuming SFRM damage in WTC 7 caused by the debris impact, except in the immediate vicinity of the damage.

2.5.4 Firestopping

Firestopping is used to prevent the vertical spread of heat, flames, and smoke through openings and gaps to the floor above. Any penetration through the floor slab, such as those for plumbing and electrical conduits, or gaps between the floor slab and framing, such as that between a curtain wall and the floor slab, should be sealed with firestopping materials to provide the fire rating required by codes and standards. Firestopping materials are varied and may include mineral fibers, sealants, mortar, putties, or other materials or devices to achieve the desired fire rating.

The architectural drawings (Drawing A38) indicated a compressible thermafibre firestop on impaling pins was to be used between the floor slabs and the curtain walls (Roth 1985). The firestopping installation was inspected by Testwell Craig Laboratories, Inc. NIST obtained Firestopping Inspection reports⁸ for Floors 9, 10, and 11 that showed firestopping locations around the core area. The inspections checked firestopping installations at pipe penetrations, wall penetrations, fluted decks over rated walls, and curtain wall penetrations.

NIST located documents that indicated that firestopping material was specified.⁹ NIST obtained interim inspection reports¹⁰ of the firestopping dated 1986 (i.e., during the construction of WTC 7), but was unable to locate a final inspection report. NIST also obtained documents that indicated an inspection of the firestopping on Floor 23 in 1993 that found gaps¹¹, and a subsequent document that said that the application of firestopping material was satisfactory.¹² NIST was unable to locate documents that appraised the state of the firestopping on other floors.

For the purpose of the fire simulations, NIST assumed that the quality of the firestopping was such that no significant floor-to-floor spread occurred through any gaps that might have existed. The consequences of this assumption are discussed in Section 9.1.2.

2.6 SUMMARY OF FINDINGS

Review of the building codes, standards and information on the SFRM resulted in the following findings:

⁸ Firestopping Inspection reports prepared by Testwell Craig Laboratories Inc. for Silverstein Development Corporation, 7 World Trade Center, November 1986.

⁹ Facsimile from Skidmore, Owings, & Merrill to Solomon Brothers, 5 February 1993.

¹⁰ Firestopping Inspection Engineers Reports, prepared by Testwell Craig Laboratories Inc. for Silverstein Development Corporation, 7 World Trade Center, November 1986.

¹¹ Letter from SBLM Architects to Silverstein Properties, September 24, 1998.

¹² Letter from IDC Corporation to Silverstein Properties, August 12, 1997.