National Institute of Standards and Technology

National Institute for Standards and Technology (NIST), er en institution i USA, der svarer til Teknologisk Institut i Danmark. Efter terrorangrebet den 11. september 2001 fik NIST til opgave at undersøge de bygninger i World Trade Center, der blev ødelagte som følge af angrebet. Formålet med undersøgelserne var at komme med forebyggende forslag og standarder til bygge- og anlægsbranchen, så ulykker kunne undgås i fremtiden og brandbekæmpelse kunne forbedres.

Konklusion

I forbindelse med undersøgelserne, der skulle fastslå årsagerne til at de syv bygninger i World Trade Center komplekset blev ødelagte, afdækkede NIST systematisk alt tilgængeligt materiale, herunder de mange videoer, der optog Bygning 7s kollaps. NIST kunne i 2007 konkludere, at Bygning 7 kollapsede progressivt, og at kollapset tog mindst 13.5 sekunder.

Det følgende er taget fra NISTs rapport, og besvarer centrale spørgsmål om bygningens kollaps.

Hvor lang tid tog det for WTC 7 at kollapse?

Table 5-3. Timeline for major WTC 7 collapse observations

Time(s)	Observations
- 3	Dust and/or smoke are observed being pushed across West Broadway from the east side of the building.
0	The east edge of the east penthouse starts to move downward; the east penthouse folds roughly 40 percent of the way across from the east edge; the two sections of the east penthouse appear to rotate into the roof, with the east section disappearing first.
0.6	Glass breaks in windows 40-44B and 40-44 D; additional windows open on this floor over the next couple of seconds.
1.3	The northeast corner of the east penthouse disappears from view; evidence suggests that the east section of the east penthouse had broken into two additional pieces along an east-west line.
1.6	The southern part of the eastern section of the east penthouse disappears from view, appearing to rotate into roof about an east-west line.
1.9	A small section at the east end of the north screenwall detaches and falls away; it may have fallen through the opening in the roof created by the descending east penthouse.
2.0	The western section of the east penthouse disappears from view; it appears to rotate into the roof about a north-south line; a tear-drop shaped light variation covering several floors on the building façade begins to propagate downward on the north face; a bright area in the windows on the east side of the 46th and 47th floors is attributed to sunlight shining through the open roof.
2.0	Additional windows start to open between Columns 43 and 45 on the 40th to 45th floors.
3.4	A small piece of debris falls away from an area at the eastern end of the screenwalls.
3.8	Earliest view of a small portion of the area at the base of WTC 7 indicates that a dust cloud has already formed.
~~ 5	The tear drop shaped light variation on the north façade moves out of sight near the 33rd floor.
6.9	The beginning of the global collapse of WTC 7 was detected on the north face; the roofline below the east penthouse location and the eastern end of the screenwall start dropping simultaneously; the eastern end of the north wall rotates northward and a kink develops near Column 47.
8.0	Windows open over multiple floors on the west side near Column 55; the amount of damage grows rapidly; dust flows from open windows.
8.3	A small object, likely part of the south wall, falls away from the east end of the screenwalls.
8.5	The east end of the screenwall disappears behind the north face parapet.
9.2	Dust begins to flow from open windows on the east side near the top of the building.
9.3	The west penthouse disappears from view below the north face parapet.
12.0	The upper portion of the building breaks up as it collapses.
13.5	The upper portion of WTC 7 disappears into a dust cloud created by the collapse.

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Hvilke skader fik WTC 7?

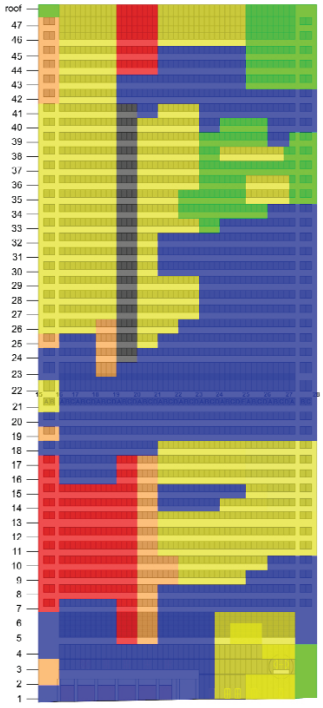

Figure 5–83. Observed damage on the south face of WTC 7 following the collapse of WTC 1.

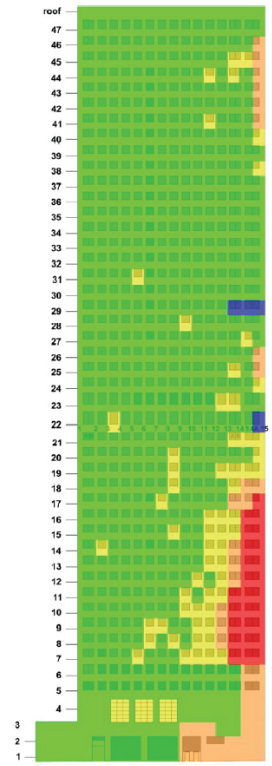

Figure 5–89. Observed damage on the west face of WTC 7 following the collapse of WTC 1 is shown.

Damage is color coded as follows: green (■)-- no visible damage, yellow (■) – window glass broken out, orange (■) – granite and underlying truss damage, and red (■) – damage to outer-perimeter structural steel, and blue (■) – not visible.

Er der grundlag for at tro, at WTC 7 blev ødelagt med sprængstoffer?

8.9.2 Hypothetical Blast Events

In summary, the minimum charge (lower bound) required to fail a critical column (i.e., Column 79) would have produced a pressure wave that would have broken windows on the north and east faces of the building near Column 79. The visual evidence did not show such a breakage pattern on any floor of WTC 7 as late as about 4:00 p.m. or above the 25th floor at the time of the building collapse initiation. Views of the northeast corner at the time of the collapse were obstructed by other buildings. The other scenarios considered would have required much more explosive material, which would have generated much more window breakage and a higher sound level, or were generally considered infeasible to carry out without detection.

Preparations for a blast scenario would have been almost impossible to carry out on any floor in the building without detection. While the selected blast scenario considered one column, demolition with explosive charges usually requires the preparation of many columns in a building. Preparations would have included removal of column enclosures or walls, use of weld torches to cut column sections, installation of charges, and placement of wires for detonation. Occupants, support staff, and visitors would have noticed evidence of such activities, particularly since they likely would have occurred around more than one column. It is highly doubtful that such activities would have not been detected.

Furthermore, for a shaped charge with an explosive weight equivalent to or higher than 9 lb (detonated in a single delay), the noise level at a distance of ½ mile would have been on the order of 130 dB to 140 dB, roughly equivalent to that of a thunderclap directly overhead or an adjacent jet engine. The sound blast in an urban setting would have propagated by being reflected and channeled down streets with minimum attenuation. The hard building exteriors would have acted as nearly perfect reflectors, with little to no absorption. The sound would have been attenuated behind buildings, but it would also generate multiple echoes. This could have extended the time period over which the sound could possibly have had an additive effect if multiple in-phase reflections met.

People on the street would have heard 9 lb of RDX go off a mile away in air (and even further away if the wind were blowing in their direction). There were no witness reports of such a loud noise, nor was such a noise heard on audio tracks of video tapes that recorded the WTC 7 collapse. Thus, from this study, NIST concluded that blast events could not have occurred and found no evidence of any blast events.
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