

NIST Data Disproves Collapse Theories Based on Fire

Frank Legge (Ph D)
Logical Systems Consulting
Perth, Western Australia.
flegge@iinet.net.au

Abstract

An argument is presented that all theories of progressive collapse of the Twin Towers fail because the initiating event could not have occurred. The NIST report appears to be unsatisfactory in that it fails to deal with certain observations.

The NIST report of the tragic events of 9/11 includes a study of the factors which led to the Twin Towers being 'poised for collapse'. The report did not go on to address the mechanism of the actual collapse of the towers. Readers are left with the assumption that, from that moment, collapse was inevitable.¹ The report has been rightly criticized on the grounds that NIST, in omitting reference to the collapse mechanism, failed to perform the fundamental task it had been given.²

There has been much speculation about the mechanism of collapse and various hypotheses have emerged. There is the 'pancake' theory which has been augmented by addition of the 'pile driver' concept. In this theory collapse is initiated by the sudden disintegration of one storey. This allows the top of the building to fall through the gap and the resulting impact causes the storey below to collapse. The mass of this collapsed storey adds to the mass of the falling block. This then falls on the storey below, which in turn is dislodged. A chain reaction thus develops in which all lower storeys collapse and the entire building is destroyed.

There is also the 'global collapse' theory.³ This appears to be no more than a name as it lacks an explanation. It requires that heat-damaged connections and columns fail, but how this could progress from one floor to the next where there has been no fire appears to be causing a problem. NIST let a contract in 2003 to a firm of consultants seeking their explanation for the global collapse of building 7.⁴ No response has yet been published. The pile driver theory at least provides a superficially plausible explanation for progress by suggesting that the mass of the falling block will be sufficient to destroy the supports in the unheated region below.

The pile driver theory has been elaborated to include calculations involving momentum and kinetic energy. Greening has provided a paper intended to show that the collapse, once initiated, would be sustained.⁵ Ross has provided calculations in refutation of this claim. His paper shows that the impact from the falling block would be absorbed by the structures above and below the impact area and would not be sufficient to result in a progressive collapse.⁶ A comprehensive paper showing the falsity of the official explanation has been given by Ryan.⁷

There have been many attempts, both official and unofficial, to explain the collapses, several of which are contradictory. Wikipedia provides a convenient list.⁸ The essential point to note is that all authors supporting the official view accept that the damage due to plane impact was not sufficient by itself to cause collapse and that the ultimate cause was the high temperature experienced by the steel structure due to fire, facilitated by the loss of fireproofing caused by plane impact.

This brief paper takes a different approach from those which attack the assertion that the collapse could 'progress' and simply refutes all such theories on the grounds that at the moment of collapse, at least for WTC 1, the building was in fact not 'poised for collapse' and could not have produced the initiating event.

The conclusion of the NIST report is that fire and aircraft damage caused the initiating event that brought down the towers. Within the body of their report however is the statement that no steel was found which had been heated above 600°C.⁹ This arouses suspicion as such temperatures should not be sufficient to bring about collapse.⁹

The NIST report provides diagrams depicting plane damage and data derived from their fire and temperature simulations. The report asserts that the simulations correspond to a satisfactory degree with the observed fires as recorded in videos and photographs. From these it appears that the initial collapse in WTC 1, if it had occurred, would have been at storey 95 or 96. That is the region where the building was most damaged by plane impact. There is little damage shown for storey 97.¹⁰ There is at least one video showing collapse starting at storey 96.¹¹

Study of the NIST diagrams shows that at the time of collapse the perimeter columns were not hot enough to place the building at risk. Most significantly the diagrams also show that the core areas of all storeys listed, from 92 to 99, spanning the plane damaged region, had cooled down substantially prior to collapse. The core area was hottest at the 30 and 45 minute readings but collapse did not occur until 102 minutes had elapsed, by which time the environment of the core had dropped to be mainly in the range 100 to 600°C.¹² Roughly half the area is shown in shades of blue, indicating temperatures no higher than 150°C. Videos show that the core started to collapse before the perimeter.¹³

Bearing in mind the substantial heat sink properties of the columns there are three possibilities to consider: the temperature of the steel columns of the core at the moment of collapse might have been (a) rising toward the environment temperature, (b) steady or (c) falling. In case (a) or (b) collapse would clearly have been impossible as half the columns would be below 150°C and nearly all the rest between 150 and 600°C.

Case (c), with column temperature falling, remains to be examined. Regardless of the final steel temperature, the core could not now collapse as it had already survived a higher temperature without collapsing and must have gained strength as it cooled.

The NIST report states that sagging floors pulled the central portion of one wall inward, causing it to lose strength. Sagging of the core was said to transfer load to the weakened wall which then failed. This is not reasonable however because there were three remaining walls, including four undamaged corners, which provided a rigid structure holding the core vertical by means of the hat truss. Collapse, if it were to occur, must therefore have been vertical, involving all core columns and the perimeter columns simultaneously. We have already seen that the core could not have failed due to heat. Initiation of collapse was therefore impossible. In the absence of initiation there could be no progressive collapse. An alternative mechanism for the collapse is therefore required: the use of explosives in a controlled demolition fits all observations.¹⁴

It appears reasonable to believe that the NIST report stops short of dealing with the mechanism of collapse precisely because their early modeling showed collapse due to fire and plane damage to be impossible. As the conclusion of their report is not in accord with their own data it appears that the report was written under duress. Investigation of this possibility is urgently required.

End Notes

1. NIST NCSTAR 1-3. Executive Summary of Mechanical and Metalurgical Analysis of Structural Steel.

<http://wtc.nist.gov/pubs/NCSTAR1ExecutiveSummary.pdf>

2. NIST fails to address its basic task.

<http://911review.com/coverup/nist.html>

<http://www.911review.com/coverup/wtcinquiry.html>

3. Progressive Collapse – Global Collapse

<http://911review.com/coverup/fantasy/progressive.html>

4. NIST lets a contract for the study of global collapse of WTC 7.

http://wtc.nist.gov/solicitations/wtc_awardQ0186.htm

5. Greening, F. R., “Energy Transfer in the WTC Collapse.”

<http://www.911myths.com/WTCREPORT.pdf>

6. Ross, G., “Momentum Transfer Analysis of the Collapse of the Upper Storeys of WTC 1”, *Journal of 9/11 Studies*, (June, 2006).

<http://journalof911studies.com/>

7. Ryan, K., “What is 9/11 Truth? – The First Steps”. *Journal of 9/11 Studies*, (August, 2006). Professional knowledge of the steel used in the towers gives this paper added significance.

<http://journalof911studies.com/>

8. Wikipedia provides a convenient summary of numerous authors who have attempted to describe, or have avoided describing, the mechanism of collapse.

http://en.wikipedia.org/wiki/Collapse_of_the_World_Trade_Center

9. NIST NCSTAR 1-3. See page xli for upper temperature limit. Note that this test shows only that no steel was found which had exceeded 600 °C. The steel could have reached any temperature below this. They also state that little steel was found which had exceeded 250 °C.

See page 111 for Temperature / Yield graph. This shows the steel at 600 °C would have been at about half of its cold strength. As the lowest reported safety factor is 2.2 this should have been strong enough, especially as at any time the columns would have been at a range of temperatures depending on the progress of the fires, some considerably colder. Also the hat truss, in conjunction with the walls, would have prevented any leaning

towards the weakest portion: all columns would therefore have had to give way simultaneously, regardless of temperature.

<http://wtc.nist.gov/NISTNCSTAR1-3.pdf>

10. NIST NCSTAR 1-5. See pages 148 to 153 for structural damage.

<http://wtc.nist.gov/NISTNCSTAR1-5.pdf>

11. Careful study of this video shows collapse starting at storey 96 where a line of dust is appearing. The rate of collapse of this storey however does not appear to be as fast as the downward motion of the roof, showing that at least one other storey must have started collapsing close to the same time. A clue to where this might be located is given by the appearance of another line of dust a few storeys higher. This would be an improbable coincidence, if the official theory is accepted, as it would require two initiations. This finding is much more readily explained as being due to explosives.

http://www.911research.com/wtc/evidence/videos/docs/north_tower_collapse.mpeg

12. NIST NCSTAR 1-5. See pages 112 to 127 temperature charts.

The charts refer to “upper layer temperatures” (see sample below). This is in recognition of the fact that convection moves hotter gases upward. The model assumed that there was some obstruction preventing hot gases from escaping too easily from each storey and that a hot layer would be trapped there. Presumably this was to allow time for the hot gas to transfer some of its heat to the columns.

13. It should have been impossible for the core and the perimeter to collapse separately due to the presence of the very strong hat truss connecting them. This video shows that the antenna, mounted over the core, started to move 0.4 seconds before the edge of the roof. In this time the core would have dropped about 2.5 feet. This suggests explosives were planted in the hat truss and were fired at the initiation of the collapse sequence. Severing of the core must have occurred at the same time or shortly before.

http://www.911research.com/wtc/evidence/videos/docs/n_tower_1st24.mpg

14. Legge, F., “9/11 – Evidence for Controlled Demolition: a Short List of Observations”, *Journal of 9/11 Studies*, (June, 2006).

<http://journalof911studies.com/>

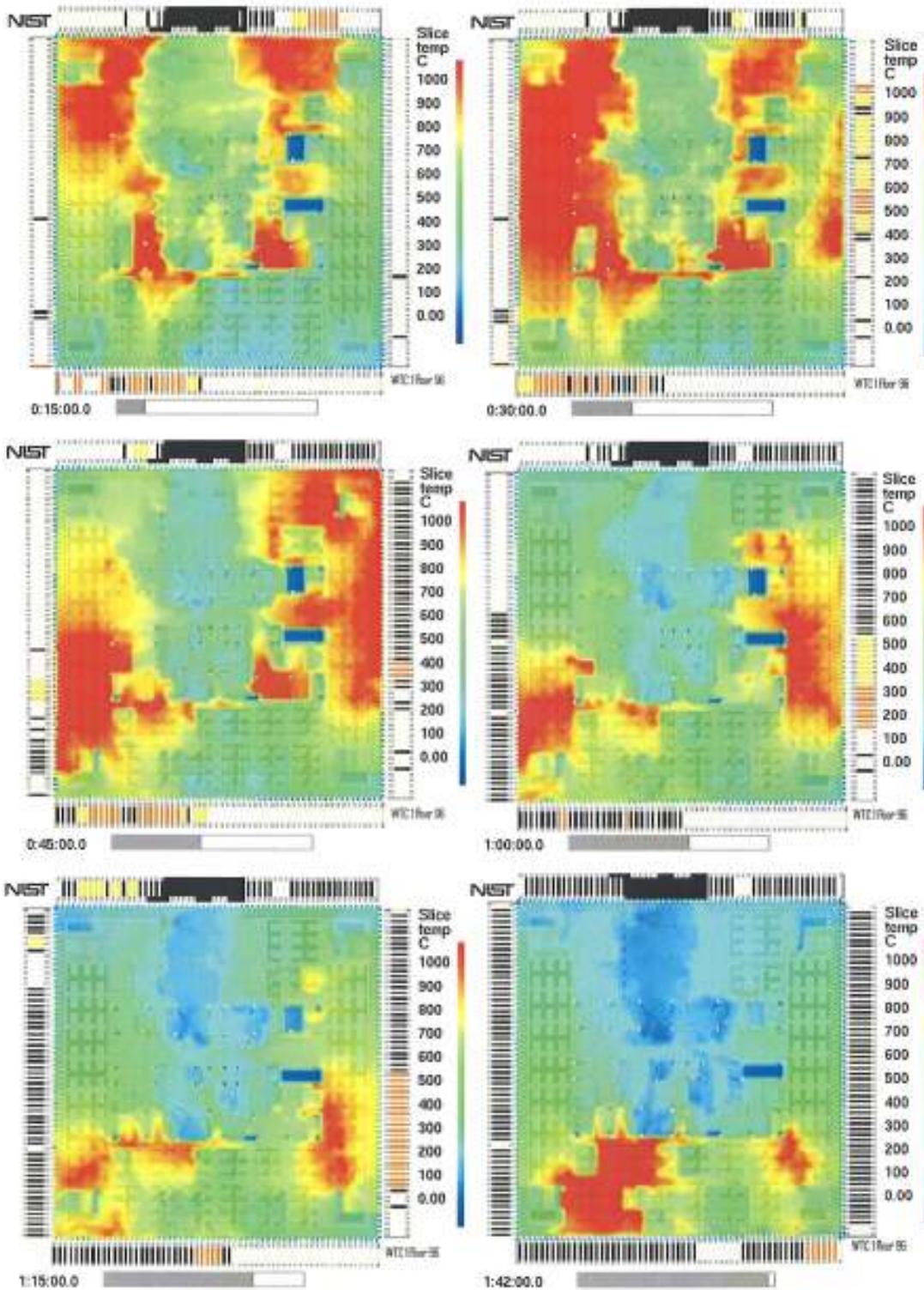


Figure 6-10. Simulated upper layer temperatures on floor 96 of WTC 1, Case B.