# 9/11 and the Twin Towers: Sudden Collapse Initiation was Impossible

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Numerous arguments have been presented that the Twin Towers at the World Trade Centre could not have collapsed in the observed manner due to the cause asserted in the NIST report, namely damage from plane impact and fire.[1] The bases of these arguments include the rapidity and symmetry of collapse,[2] the adequacy of the steel supports,[3] and the finding of incendiary residues in the dust.[4] It has also been argued that the initiating event in the official explanation, the sudden collapse of one storey,[1] could not have occurred because the steel was not hot enough.[5] This argument is based on data set out in the NIST report itself.

There is another argument, as will be described here, that is based simply on the behaviour of hot steel under load. No calculations are involved and no knowledge of the temperature of the steel is required.

In the official explanation the collapse occurs in two stages. In the first stage one storey, damaged by plane impact and fire, suddenly collapses. This allows the section of the tower above to fall freely down and hit the lower section. In the second stage the energy of this impact is said to be sufficient to cause the top of the lower section to disintegrate. This material adds to the falling mass and further impacts cause disintegration to continue in a rapid sequence all the way to the ground.[6]

Let us consider the situation just prior to the first stage. There are some damaged columns, some fire, and a claimed lack of fireproofing. Given the substantial safety factor in the building design, the number of damaged columns is far too few to put the buildings at risk without the fire. This is elaborated on in the NIST report and elsewhere.[1, 7] We will ignore the fact that according to the physical evidence data within the body of the NIST report, and contrary to its conclusion, the steel did not get very hot. We will assume the strongest case for the official theory: the fire was uniform over the whole area and very hot.

The fire has to heat the steel, which takes time. Eventually the steel gets hot enough that it cannot carry the load in the initiating storey. It starts to sag. At this point there has been no disruption of the columns, other than that caused by the plane impact, hence most of the columns are still attached to the floors above and below and are continuous, passing up and down into other storeys, giving the columns rigidity. The length of the columns between attachments is too short for buckling to occur.[8] Failure must therefore be by compression.

As the steel sags two things will happen: the columns, as they shorten, will become wider, which is obvious; and the inherent strength of the steel will increase, which is not obvious. It is well established however that the yield strength of steel increases as the degree of distortion increases. This tendency increases with rising temperature and is pronounced at the temperatures required for collapse, as can be seen in the graph below.[9] For both of these reasons the initial sag cannot be catastrophic but will be very slow and the rate will depend on the rate of heat input. A rising temperature will be needed to offset both the significant increase in yield strength and the slight increase in cross-section area, if collapse is to progress.

It is clear therefore that the upper section should only have moved down slowly and only continued to do so if additional heat was supplied. A slow, protracted, and sagging collapse was not observed however with either tower. As observed in videos of both tower collapses, the upper sections suddenly start to fall and disintegrate.[10] In the case of the south tower, initially a

lean of the upper section developed but within the first second this turned into a rapid collapse with upper section disintegration, just as was observed with the north tower.

**It appears therefore that the official concept of a free fall collapse of the upper portion through the initiation storey, due to heat effects from fire, is a fantasy. If the temperature did become high enough for collapse to occur it could not have happened in the observed manner.[9] In particular it could not have been sudden and thus could not have produced the velocity, and hence the momentum and kinetic energy, upon which the official story depends for the second stage of collapse. In contrast, all observations are in accord with the use of explosives in a timed sequence.**

The case that the NIST report must be corrected is confirmed. If this report is not corrected the suspicion will remain that its purpose was not so much to inform as to deceive.

**References:**


1. NIST Report: http://wtc.nist.gov/reports_october05.htm

2. Rapidity and symmetry of collapse: http://journalof911studies.com/articles/Journal_2_Evidence_for_demolition_20.pdf

3. G. Ross: http://journalof911studies.com/articles/Journal_5_PTransferRoss.pdf

4. Prof. S. Jones, Explosive residues: http://journalof911studies.com/volume/200704/JonesWTC911SciMethod.pdf

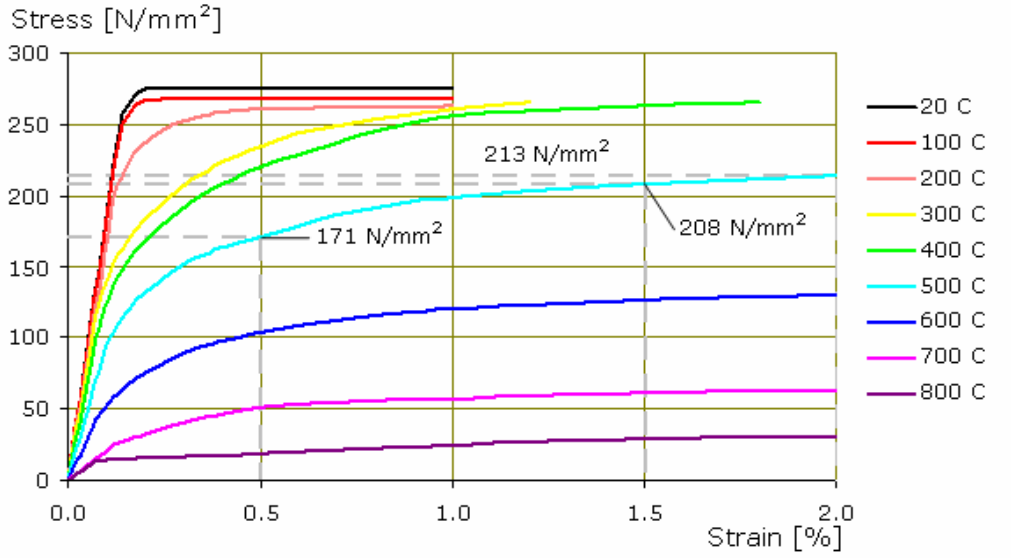
5. F. Legge, NIST shows steel was not hot enough for collapse initiation: http://journalof911studies.com/articles/Article_6_Pancake_theory_false_by_NIST_WorldTradeCenter.pdf

6. Z. Bazant and M. Verdure, Progressive collapse: http://www.nistreview.org/WTC-PROGRESSIVE-COLLAPSE-BAZANT.pdf

7. T. Szamboti, Safety factor: http://www.journalof911studies.com/volume/200704/SzambotiSustainabilityofControlledDemolitionHypothesisForDestructionofTwinTowers.pdf

8. G. Ross, minimum buckle length, p 43: http://journalof911studies.com/volume/200704/NISTandDrBazant-SimultaneousFailure-WTCCollapseAnalysis2.pdf

9. "The test results show that carbon steel begins to lose strength at temperatures above 300°C and reduces in strength at a steady rate up to 800°C. The well defined yield plateau at 20°C is replaced by a gradual increase of strength with increasing strain (or strain-hardening) at high temperatures."
http://www.mace.manchester.ac.uk/project/research/structures/strucfire/materialInFire/Steel/HotRolledCarbonSteel/mechanicalProperties.htm




**Stress-strain Data for Grade 43A Steel at Elevated Temperatures**

10. Collapse videos: http://www.youtube.com/watch?v=7_E4N5YIycI
http://9-11.meetup.com/332/files/