

## **9/11 – A Letter to a Die-Hard Supporter of the Official Explanation**

Dr. Frank Legge

This is a letter to a person who has had all the arguments explained to him showing that weakening of the steel supports by fire could not account for the observed manner of collapse of the WTC buildings on 9/11, nor for the material found in the debris, but has not been convinced. The person has asserted that the arguments used must misrepresent the facts as leaders could not perform or assist such an attack and that people who promote the theory that explosives were used are driven by emotional commitment to a political position and not by science.

---

Dear friend, let's not talk about the details of our previous discussions. Instead let's start from the beginning and consider emotions, and move from there to a brief summary of the case. You already have the observations, calculations and conclusions in the papers in front of you, from the Journal of 9/11 Studies. These will not be repeated, but the essential thread of the argument relating to WTC 7 will be carefully spelled out as an example of how the case for explosives may be made.

Please believe that I approach this topic with fear and trembling. I do not want to believe that explosives were used at the WTC. I tried for a long time to argue against it. I am aware of the scale of the consequences to the people of America, and indeed the world, if the idea that explosives were used becomes widely accepted. I am however also aware of the fact that failure to recognize the use of explosives, if they were used, also has grave consequences. As a scientist I accept a duty to investigate this question, doing my best to set all pre-existing beliefs aside.

Extreme difficulty is encountered in examining the case as strenuous efforts were made by the authorities to hide and destroy evidence. Some forms of evidence still exist however: eye witness reports, seismic records, analysis of debris, photos and videos. Among these the videos are unique in that they are in the hands of the public and allow the events to be reviewed. When I first heard that the buildings fell at near free fall speed it occurred to me that I could check this myself and thus would not have to depend on others for interpretation of the information. My first exploration of this astonishing assertion was to study the downward acceleration of the roof of WTC 7. I found that it did in fact commence to descend at near free fall speed.

This argument depends on an understanding of the behaviour of steel. We all know that when a material melts it can longer resist any force as it becomes, by definition, a liquid. Ordinary fires cannot raise the temperature of steel anywhere near its melting point, which is well above white heat, but can certainly cause it to lose strength. Steel which is hot enough to glow still has remarkable toughness. It has to be bright red hot to be readily workable.

If a source of heat is applied to steel it increases in temperature slowly and loses strength slowly. It does not pass from strong to weak in an instant or at a particular temperature, provided the temperature remains below the melting point. You will agree with that from your knowledge of specific heat and graphs of yield strength versus temperature. I knew it from experience from days spent long ago shoeing horses and from working with steel, repairing farm machinery. Knowing something about steel, and learning that the buildings had fallen at near free fall speed, I was immediately suspicious and open to the idea that something more than fire was involved.

Others had studied the fall time of WTC 7 from start to finish, reporting times of 6.5 to 7 seconds. I was not satisfied with that so obtained software to enable frame-by-frame study of the video. I was thus able to plot the fall in terms of distance over time. It is not necessary to follow the fall all the way to the ground. To attempt to do so is to invite error as the dust cloud eventually obscures vision and the debris pile at some point will interfere with free fall.

If you think about the nature of the collapse, supposedly due to fire weakening the steel, you will agree that it would only be necessary to follow the early stages of the collapse to determine its character. If heat is the cause, the steel will weaken gradually and will start to sag in the region where the fire is most intense. At that moment the steel will have almost enough strength to hold up the weight of the building, but not quite. So we have the force of gravity acting downwards, trying to produce an acceleration of 32 feet per second per second, and the force of the hot steel pushing upwards, a force a bit less than that of gravity. Let us say we are looking at it at the moment when the strength has declined to the point where the steel is capable of pushing upwards with 90% of the force required to hold the building up against gravity. There would thus be a net downward force of 10% of gravity. Now acceleration is proportional to force and we have a net force of 10% of gravity so we would see an acceleration downwards of 3.2 feet per second per second.

When you graph the data you find that the fall did not start with a motion which could be ascribed to a small net force of that order. The downward acceleration of the roof was very close to free fall right from the start, 30 feet per second per second, and continued at that rate until out of sight. There is no hint of a slow start. **This tells us that the steel supports went from adequate strength to virtually no strength in an instant.** For reasons stated above this is absolutely impossible if the loss of strength is due to the application of heat.

The observed acceleration, if maintained, would bring the roof to the ground in 6.2 seconds. A brick dropped from the roof would take 6.0 seconds. These numbers are so close together that only something which destroys the supports in an instant can account for it.

Similarly for the question of the direction of collapse: what happened in the late stages is of no consequence as the mechanism is revealed early. The official story is that the fire is severe but we can see little fire on the north side, and there is evidence of cooling on the north, so this severe fire must be on the south side. Also, falling debris weakened only the south side. The first columns to weaken to the point where they can no longer support the weight must therefore be on the south side. Thus the building must lean toward the south.

To fully appreciate what happens after the lean commences we must follow through. The building is now leaning and is therefore off-centre so the centre of gravity has moved to the south. Thus the weight on the south supports has increased and on the north supports it has decreased. The south supports have already given way and now have even more weight upon them so must continue to give way. The north supports survived the previous full weight and now have less weight so must continue to survive. The centre of gravity must therefore move further south.

What effect does this have? As the centre of gravity moves further south the downward force on the south supports must increase, so the speed of lean must increase. We see therefore that the lean cannot merely continue, it must accelerate. There is no escape from this natural physical process once it commences. The only possible outcome is that the building will topple over. However, it did not. It came straight down. Not only the south supports, but also the north supports, must have failed in an instant, and the north supports were not hot.

Although seemingly highly improbable, both the rate of downward acceleration, and also the direction of motion, provide proof that something other than fire brought down this building.

If you are still not convinced I urge you to repeat the experiment with the video of WTC 7 yourself. With so much at stake is it not worth the effort? You will find sources of information about the building here: <http://journalof911studies.com/volume/200611/911-Acceleration-Study-Proves-Explosive-Demolition.pdf>

You can keep in touch with developments by going to the Journal of 9/11 Studies, <http://journalof911studies.com/>, as new peer reviewed papers regularly appear there.

Regards

Frank Legge, [flegge@iinet.net.au](mailto:flegge@iinet.net.au), 30 October 2007