

Chandler's Data Support a Gravitational Collapse!

By Dave Thomas

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David Chandler is one of the top physicists of the 9/11 "Truth" movement, and is a respected member of Architects and Engineers for 9/11 Truth.



David Chandler, AE911Truth

In the Journal of 9/11 Studies article "Destruction of the World Trade Center North Tower and Fundamental Physics", Chandler presents his basic model of the towers' destruction.

Destruction of the World Trade Center North

Tower and Fundamental Physics

By David Chandler

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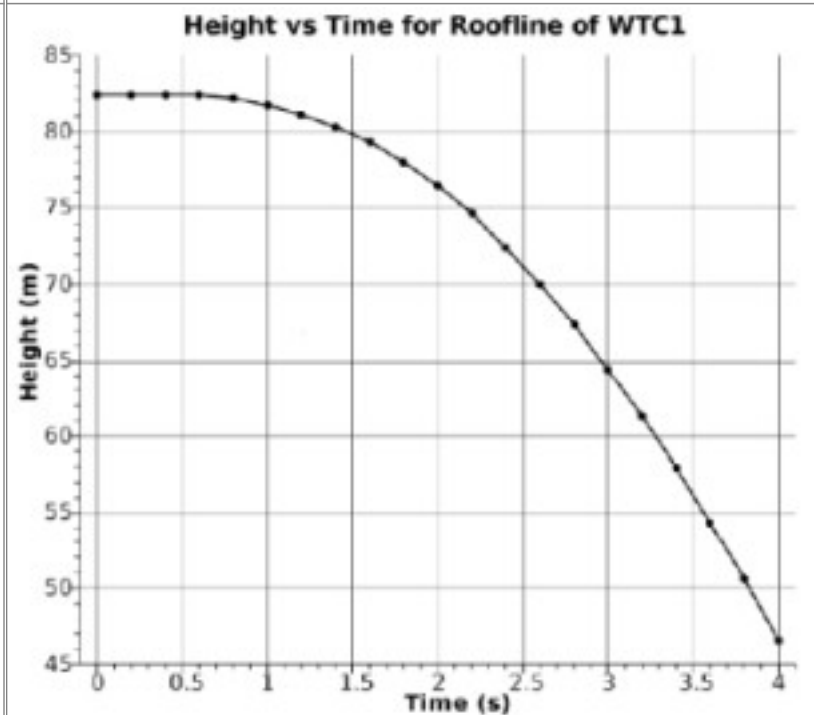
Running Title: Downward Acceleration of WTC 1

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Chandler took frames from the "Sauret video" of the collapse of Tower 1, and put them into the Tracker program, part of the Open Source Physics project. Chandler used the program to extract the position of the corner of WTC1 for about four seconds of collapse. He then used the position data, collected at five samples per second, to calculate velocity and acceleration of the falling tower.



This is Chandler's chart of position of the corner, at 0.20 seconds between samples.



Of the first four seconds of the collapse of WTC1, Chandler's Fig. 2 says *Velocity is here plotted as a function of time for the roof line of WTC1. The regression line is computed for the 6th computed velocity onward. The slope, in this context, is the acceleration: -6.31 m/s^2 with an R^2 value of 0.997.*

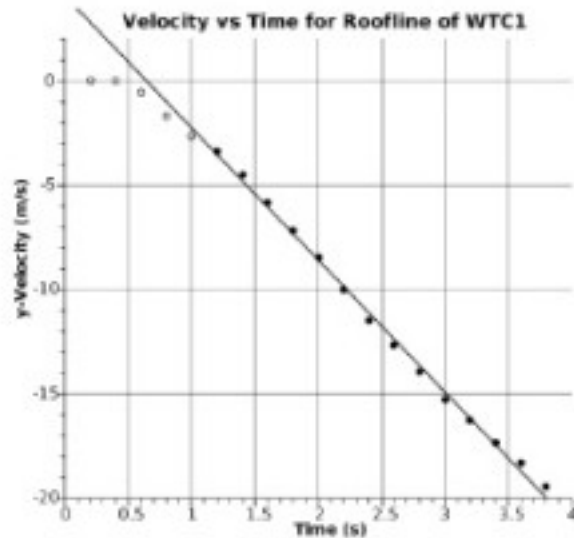
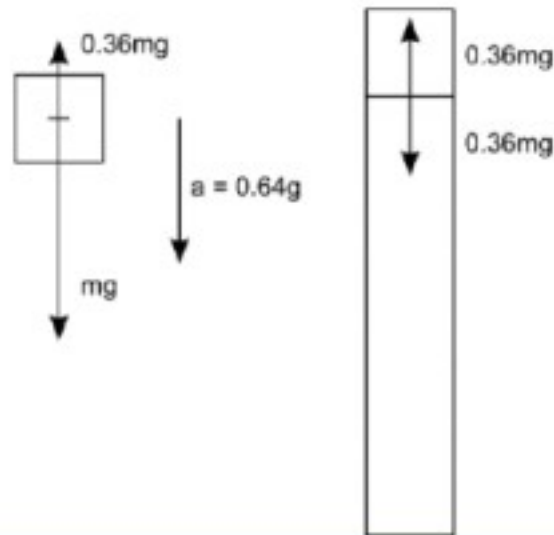


Figure 2: Velocity is here plotted as a function of time for the roof line of WTC1. The regression line is computed for the 6th computed velocity onward. The slope, in this context, is the acceleration: -6.31 m/s^2 with an R^2 value of 0.997.

Chandler writes "*Consider the upper section of the building to be a block of weight mg . Since the acceleration of the block is measured to be downward at $0.64g$, the net force acting on it must be $0.64mg$. The gravitational force is mg , so the upward normal force must be $0.36mg$. The upper and lower sections of the building exert equal but opposite forces on each other, so the load on the lower section of the building is 36% of the weight of the upper block.*"

Therefore the upward-acting normal force is 36% of the weight of the upper block, as illustrated in Figure 3.

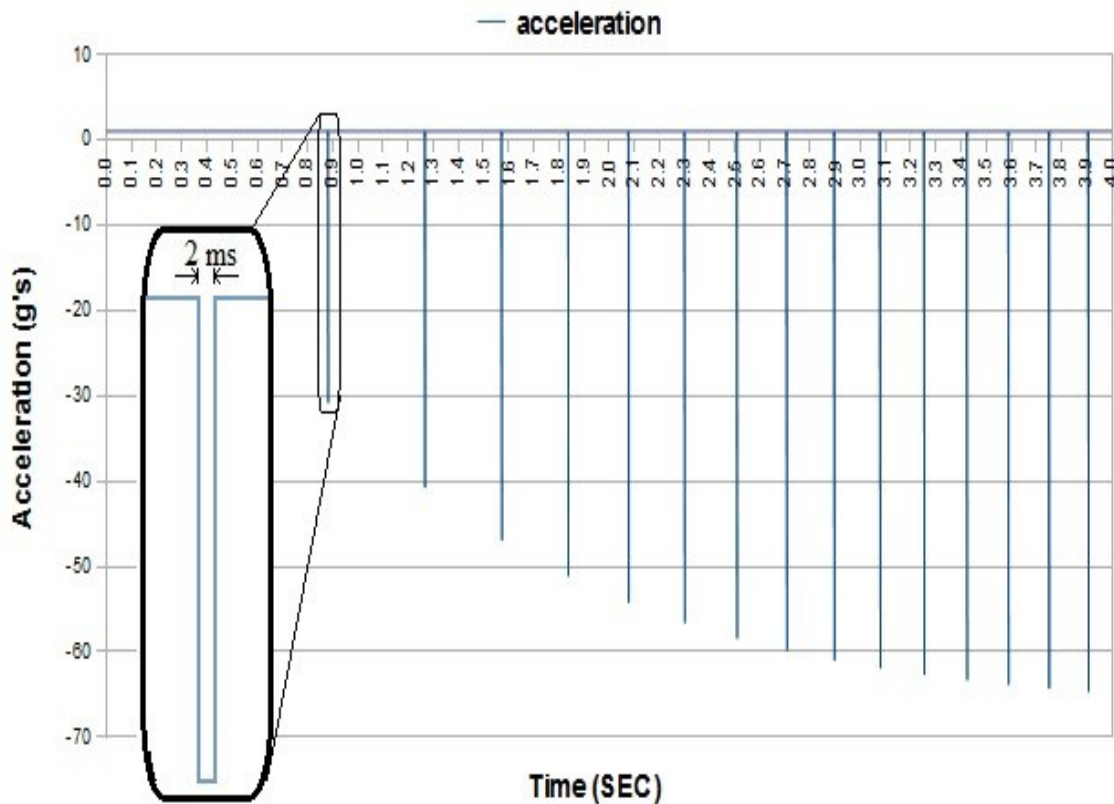


There is a Factor of 100 Error here, shown in red, in Chandler's measure of [Dynamic Force](#). This error is the "Smoking Gun" that proves the 9/11 "Truth" movement is scientifically bankrupt.

so the load on the lower section of the building is 36% of the weight of the upper block.

Figure 3: Consider the upper section of the building to be a block of weight mg . Since the acceleration of the block is measured to be downward at $0.64g$, the net force acting on it must be $0.64mg$. The gravitational force is mg , so the upward normal force must be $0.36mg$. The upper and lower sections of the building exert equal but opposite forces on each other, so the load on the lower section of the building is 36% of the weight of the upper block.

Here's why Chandler is wrong. He treats the actual process - a series of **free-falls** punctuated by brief but **violent** collisions - as if it was a *smoothly continuous* process. It was not. In this chart of the collapse of WTC 1 (North Tower), the results of the analyses of [dynamic impacts](#) and [momentum transfers](#) are used to find the actual "average acceleration" to be expected. The blue curve shows what really happened - 0.88 seconds of free-fall, then a brief 31 g **deceleration** lasting only 2 milliseconds, then another period of free-fall (but only for 0.38 seconds), another violent under-2-millisecond collision (41 g's), another period of free-fall (but only for 0.30 seconds), another violent under-2-millisecond collision (47 g's), and so on.



A simple calculation produces the average acceleration of the series of free-falls and collisions. Summing the products of accelerations with the corresponding time intervals, and dividing this sum by the sum of all the time intervals, yields the average acceleration for the first four seconds of the collapse of WTC1.

$$\begin{aligned}
 \text{Average Acceleration} &= \\
 &= \frac{g \cdot 0.881 \text{ s} - 30.8g \cdot 0.0019 \text{ s} + g \cdot 0.383 \text{ s} - 40.7g \cdot 0.0019 \text{ s} + \dots + g \cdot 0.146 \text{ s} - 65.2g \cdot 0.0014 \text{ s}}{0.881 + 0.0019 + 0.383 + 0.0019 + \dots + 0.146 + 0.0014 \text{ (s)}} \\
 &= 63\%g \approx 6.19 \frac{\text{m}}{\text{sec}^2}
 \end{aligned}$$

It is no coincidence that the *average acceleration* of the sequence of free-falls and impacts, 6.19 m/sec², is very close to what Chandler measured and calculated with the Tracker program, "6.31 m/s² with an R² value of 0.997."

Chandler is combining the effects of the *collisions* - 15 separate impacts over the first four seconds of collapse - with the effects of the freefall periods. The collisions ranged from 2 milliseconds to fractions of milliseconds, and occupied a total of only 27 milliseconds or so, or 0.03 seconds out of 4.00. That means that the towers were in freefall, accelerating at the full value of g, for 3.97 seconds of the first four seconds. For 0.03 seconds, 1/150th of the four seconds, the growing upper section experienced strong *decelerations* of 30 to 70 g's.

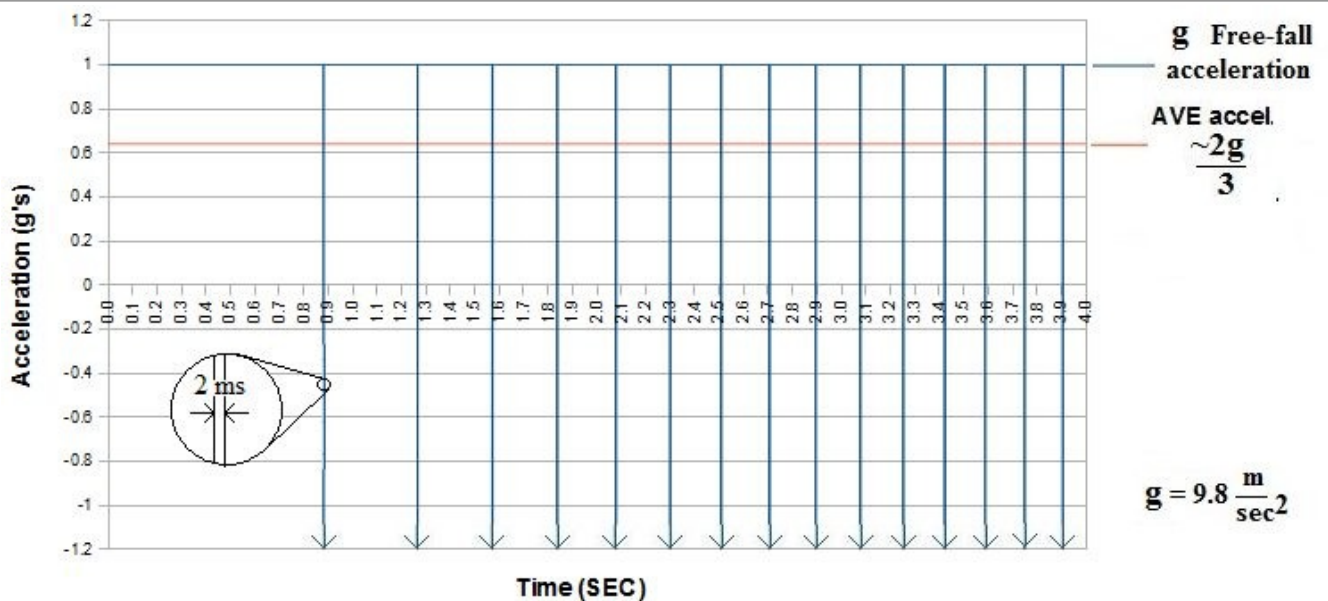
Because the collisions are so brief, their effect on the velocity is small - for example, the upper section slows from 19 mph to 18 mph upon the first collision, 26 mph to 25 mph upon the second collision, and so on. The resultant effects on *position* are even more smoothed out. And all this adds up to say that, in a gravitational collapse model, the position of the top of the tower, as plotted by Chandler, should look like something accelerating downward at the **averaged value** of the four seconds of free-falling, punctuated by 0.03 seconds of 30g to 70g decelerations. And that average value is about 2/3g, **as Chandler has confirmed.**

As an illustrative example, if the impacts were taken as 50g's each, the average acceleration over the 4-second interval would be 62% (about 2/3) of g.

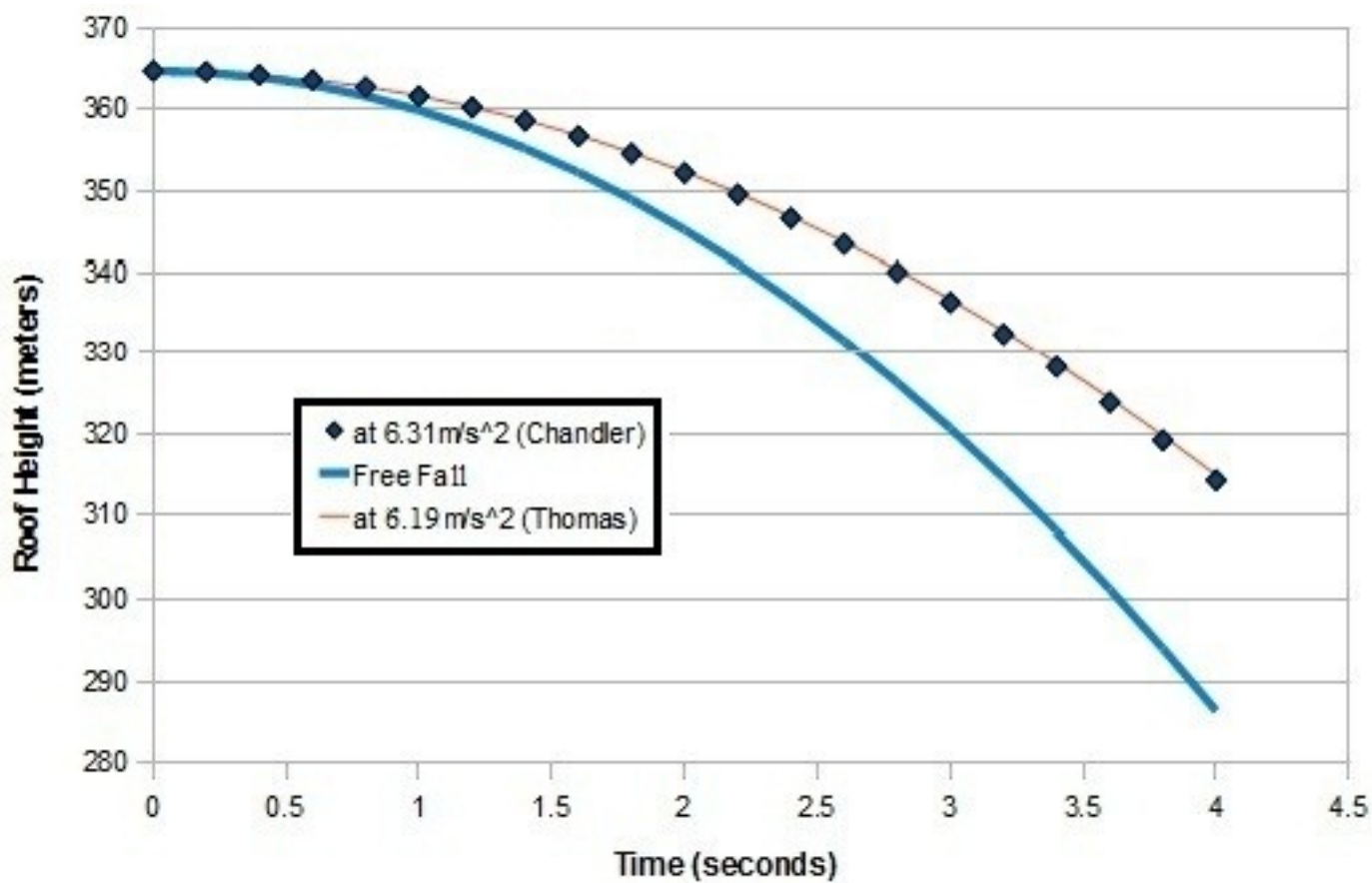
$$a_{\text{average}} = \frac{3.97\text{s} \times g - 0.03\text{s} \times 50 \times g}{3.97\text{s} + 0.03\text{s}}$$

$$= 6.05 \frac{\text{m}}{\text{sec}^2} \approx 0.62 \times g$$

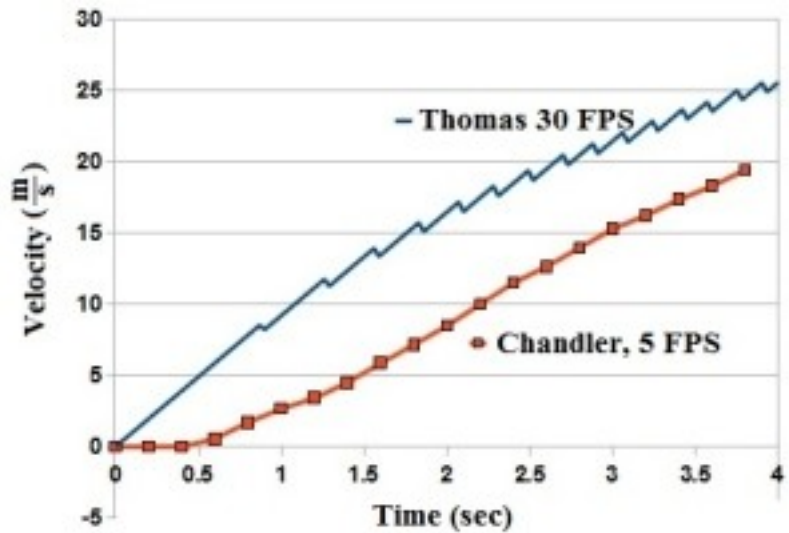
The moral of this story is worth repeating: **David Chandler's measurements validate the model discussed in these pages.**



This chart compares heights of the top corner of Chandler's calculated acceleration ($a = 6.31 \text{ m/s}^2$, blue diamonds), the unactuated-freefall model presented here ($a = 6.19 \text{ m/s}^2$, thin red curve), and pure free-fall (9.80 m/s^2 , thick blue curve). It's clear that Chandler's measurement of the downward acceleration of the tower is an excellent fit to the averaging of freefall periods with brief collisions.



In a paper called [*The Missing Jolt: A Simple Refutation of the NIST-Bazant Collapse Hypothesis*](#), Graeme MacQueen and Tony Szamboti argue that the "jolts" of the impact should be obvious on velocity charts like this one. But, just like Chandler with his 5 samples per second, MacQueen and Szamboti, using just 6 samples per second, have a big "[Mr. Magoo](#)" problem. Their time step is so large, they can't possibly see the jolts. By the end of the 4-second fall, the jolts are coming in more often than Chandler's or Szamboti's samples! In the gravitational collapse model (blue curve), the sample resolution of 30 frames per second is enough to see the jolts, one for each impact. While the ideal model shows jolts clearly, in real life, they will be much harder to observe, because of noise (atmospheric fluctuations, camera shaking, digitization noise), as well as having to take time derivatives of positions to extract velocity and acceleration.



In conclusion, **David Chandler's physics underestimates the dynamic impacts by a factor of 100.** If the first impact alone were represented by a 100-story skyscraper, Chandler's estimate of that force would be a one-story house. And it gets even worse for subsequent impacts.

The top "9/11 Truth Physicist" severely underestimates the forces of the actual impacts.

The most important calculation of "9/11 Truth Physics" is invalidated by a fundamental error that would earn a typical freshman physics student a failing grade.

But, it's important to realize that **David Chandler's careful measurements actually validate the gravitational-collapse model discussed in these pages.**

