Engineers Assess the Truth in AE911Truth

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Background

On this, the 20th anniversary of the terrorist attacks of 9/11/01, leading architects and engineers reflect back on the tragic events, the large-scale loss of life, and the lessons learned from those events. Like medical doctors, architects and engineers take seriously their primary charge to act in the best interest of and protect the public safety. We do this by designing buildings and structures so that they will safely protect life and property from the credible events they may experience. Our ability to do this is not perfect, and we reflect and learn each time a disaster, natural or human-induced, results in loss of life. The collapse of New York's World Trade Center (WTC) towers, and some adjacent structures is no exception. The government and architectural and engineering professions alike have extensively studied the collapses and conclude that they were the result of events exceeding the planned design envelope for the structures. In essence, the sad events of that day were not considered credible and the buildings were not designed for them. It is unfortunate that some, including some architects and engineers, have let their pain over the events that occurred drive them to unfounded conspiracy theories. This paper addresses some of the most common such theories and offers rational explanations as to why these theories do not stand up against thorough understanding of science and engineering.

About the Authors

David Scott is past chair of the Council on Tall Buildings and Urban Habitat (2006-2009), and a structural engineer who led the design of many tall buildings. He was part of the Structural Engineers Association of New York (SEAoNY) team based at Ground Zero, after the attacks. He is a fellow of the Royal Academy of Engineering.

Ronald Hamburger is a past president of the National Council of Structural Engineering Associations and the Structural Engineers Association of California and of Northern California, and a past chair of the Structural Engineering Certification Board. Since 2011 he has chaired the ASCE 7 Committee on Minimum Design Loads and Associated Criteria for Buildings and Other Structures. He was a lead author for the PEER Tall Building Design Guidelines and served on the FEMA/ASCE Building Performance Assessment Team following the World Trade Center collapse.

How to Read This Paper

The paper is organised around the most common claims and questions that conspiracy theorists use to promote the idea that the WTC buildings were destroyed through intentional controlled demolition. It is designed as a reference document so that each subject can be read separately. Each section addresses a specific conspiracy theory and the authors explain why most architects and engineers do not support the controlled demolition theories:

- Sagging Floor Trusses Can't Pull in Perimeter Columns
- Look at the Explosions
- What about the Massive Dust Cloud?
- A Small Section of Tower Cannot Crush a Larger Section
- Fires Have Never Destroyed a High-Rise Steel-Framed Building
- Towers Cannot Fail Straight Down
- Buildings Have Survived Much Longer in Fire
- What about the Eyewitness Accounts of Explosions?
- Normal Fires Can't Melt Steel
- NIST's Models Don't Look Anything Like the Collapse
- NIST Caught with Their Pants Down
- Thousands of Architects and Engineers Support Ae911truth
- What about the Experts that Support Ae911truth?
- A Question of Integrity
- Do You Support a New Congressional Enquiry?
- Conclusions
- References

Our comments are based on a critique of the three latest Ae911truth educational videos: the 2021 Architect's Guide series. These are essentially the same story that they have told for over a decade. A link to their videos is provided in the references below. We refer to those videos explicitly, e.g. "Ref 2-18:30" refers to Video 2, "An Architect's Guide - Part 2 - Twin Towers" at 18 minutes and 30 seconds.

Introduction

Skyscraper failures are fortunately, and by design, very rare, even when subjected to the most severe earthquakes, hurricanes, and typhoons. The only experience that most people have of seeing tall buildings fail is in movies and in controlled demolitions. It is not surprising that the initial reaction from some engineers, the public, and TV commentators was to consider the WTC failures as a controlled demolition. However, these is little evidence to support this hypothesis.

Like everyone, engineers and architects really wanted to understand how and why the failures occurred. Within days these professionals were creating models, sharing thoughts, writing papers, discussing ideas, organising conferences, preparing papers, assessing risks on other buildings, and debating and challenging each other with a view to finding out what happened. The controlled demolition theories were there at the beginning and as the industry understanding grew, they rapidly slipped into the background.

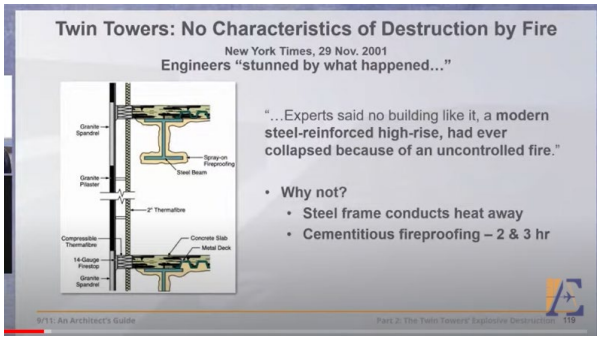
When the engineering community looked at the WTC 1 and 2 failures, it was not difficult to see how the failures looked to be completely consistent with the fires and the impact damage. However, the failure of WTC7 was more complex and therefore more difficult to explain. From about 2008 this became the focus of the controlled demolition conspiracy theory, proponents not caring that if WTC1 and 2 were failures caused by fire, that a controlled demolition on WTC7 made no sense. The industry typically ignores the conspiracy theorists, and they do not present any papers on controlled demolition to any engineering conferences.

Sagging Floor Trusses Can't Pull in Perimeter Columns

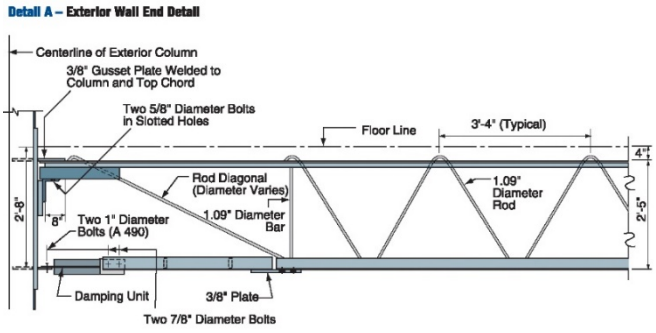
Ref 2-12:35 states, "Sagging floor trusses can't pull in perimeter columns," with no explanation provided. However, engineers understand that a major structural function of floor systems is to prevent columns from buckling like a straw under external compression. Floors do this by holding the columns in place, at the floor levels, so that they cannot bow inward or outward and become unstable. If these bracing forces become inward pulls, or outward pushes, they not only don't prevent buckling, they promote it, especially if this happens at multiple adjacent floor levels. Simple engineering calculations easily explain why the columns buckled as multiple floors sagged inward and pulled these columns with them.

When describing WTC 1 and 2 and why structures don't fail, Ref 2-27:30 shows floor beams and says:

- *"Steel is very dense. It conducts heat away from its source."*
- *"So, the steel beam rarely gets to its critical temperature, 1200 degrees Fahrenheit, at which it would lose half of its strength."*
- *"We put cementitious fire proofing on these, four to six times more than we ever need."*
- *"A robust connection to the perimeter frame."*



Ae911truth slide on WTC 1 & WTC 2



Floor Structure of WTC 1 & 2

Engineers and architects who know about the Twin Towers are quick to see that these statements are inaccurate and misleading. The floor system of the Twin Towers was a bar joist system, not a beam system. And bar joist floors are known to be particularly vulnerable to fire conditions:

- The steel in a bar joist has a very small area, so it has difficultly in conducting heat away from its source. Everyone will know that you can put a poker in a fire until it becomes red hot, and still hold the other end.
- Bar joists are very difficult to fire protect. It is difficult to spray a small round bar with a cementitious coat and this is made harder by the gaps between the member and corners at joints that tend to block the free flow of spray-applied protection.
- Bar joists are a truss, much like many common bridges. These structures are notoriously subject to failure if any member becomes compromised, which is why most governments require annual inspections of bridge condition to assure they are safe. If any one of the bars in a joist yields, the truss can no longer function and the bar joist sags into tension, much like a stretched cable. Because the joists in the WTC were tied together by the floor deck and transverse trusses, any loss of strength in one truss would start to overload adjacent trusses.

- In addition, the logic in the above claim appears to be that fires last 20 to 30 minutes, so 90 minutes of fire protection is four times longer than you need. In this, the authors are confusing the local burn time with the time the heat stays in the building, which can be much longer.
- The vulnerability to fire conditions had been a concern of the property owner and the National Institute of Standards and Technology (NIST) collected data on measurements of fire protection. Many pictures are available of some of the WTC trusses where the fire protection is missing due to inadvertent damage from electricians, plumbers, and others who worked in the space above the ceiling over the buildings' lives.
- There are many papers, published before and after 9/11, about poor behaviour of bar joist systems in fire and in 2004 they were banned by the New York Fire Department (NYFD) in high-rise construction.

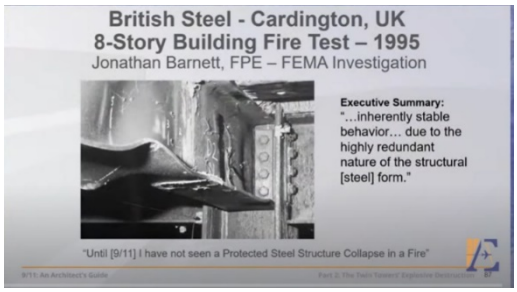
Images taken from NIST report

There are other factors that contributed to a fire/impact collapse of the Twin Towers:

1. The aircraft impacted and transited through the exterior wall. It disintegrated, creating a large debris cloud that abraded off fireproofing from many members.
2. We know the impact destroyed multiple core columns and multiple floor trusses. This caused massive overstress to some of the floor trusses above and below the impact, as well as very high stress to both the columns adjacent to the severed columns and the hat truss which was now supporting columns hanging below it.
3. We know that debris, including the failed floors, the weight of the planes, engines etc. will have overloaded some of the damaged floors.

Ref 2-12:04 describes the fire as follows, "*We have for over an hour, normal office fires and a few broken columns.*"

Commentary on fire test data is also misleading. Many architects and engineers are familiar with the Cardington Fire tests, as they are one of the building blocks of fire engineering as a discipline. Their inclusion in the description of the WTC 1 and 2 collapse is very misleading, Ref 2-20:17. The Cardington tests are on short span beams with robust connections, compared to the 60-foot spanning bar joists, that are connected to the perimeters by a connection that can only ever mobilize two small bolts.



The whole description of the Cardington tests in the context of the WTC 1&2 collapses is completely misleading.

But Look at the Explosions

Ref 2 articulates an explanation of where the explosions were placed in WTC 1 and 2:

- Just above the impact level, "*a band of explosions all the way around the building," Ref 2-49:30.* That's 830 feet and 244 perimeter columns of explosions undamaged by the fire below and coincidentally placed at the right level for the plane impact.
- *"In the South tower on the right side we see dozens of squibs or isolated explosive ejections"* Ref 2-59:38
- The top of the South tower is leaning over at 22 degrees, *"We have asymmetrical damage…. Why in the world do we have complete symmetry all the way down that tower?"* Ref 2-55:40 "*From another perspective in the lower right corner we see these explosions leading the way"* Ref 2-56:45. There are explosions at every level on the whole perimeter.
- "*In the leading quarter what do we see? Hundreds of explosions that's what I see."* Ref 2 -56.24. Clearly that author forgot he had just said the explosions were completely symmetrical for the South Tower. The figure shows a leading edge reflecting the damage angle, so not symmetrical or uniform. This is clearer in other videos of the collapse. The angle of the "explosions" mimics the angle of the top of the tower. Ref 2 -58:30
- He sees explosions *"20-stories below, up to 60 stories below the advancing collapse as they call it. We have all of these squibs. Are they mistimed explosions?" Ref 2-58:25*
- No explosions, in "*8 to 10 core columns remaining 1,000 feet in the air" Ref 2-48:15*
- In addition, on the North Tower that author sees an explosion at the very top of the building.

There are several major problems with this hypothesis. Firstly, it is patently absurd from a logistics, access, practical, and common-sense perspective. The suggestion is that thousands or tens of thousands of charges were used at every level at every column. And with thousands of explosives, surely there would be at least one picture of something that looked like a cutter charge that would be seen by the engineers that helped with the clear up?

Tall buildings are never demolished with explosives at every level. In controlled demolitions, explosives are used to create a zone of weakness and then the weight of the building above this weak zone is used to initiate and promulgate the collapse, much as the aircraft impact damage created a zone of weakness in the towers. Other differences include explosions rather than implosions and of course the lack of flashes. But probably the most compelling evidence is that the perimeter columns failed at the bolted joints. And because the bolted joints were staggered (Ref 2-4:20), it means that there was no line of explosions at any level. The columns themselves were for the most part not badly damaged. The connections failed. There was no evidence of cutter charges or explosions.

Tall buildings are never demolished with explosives at every level; why would they do it here? With thousands of explosives, surely there would be a high risk of one picture of a cutter charge. But there is a much simpler form of evidence that shows there was no line of explosives and that is the damage to the perimeter wall. The connections are much weaker than the columns and the wall failed at the connections. The connections are staggered in three-storey segments. So, there was no lines of damage. The segments are seen in the debris and in the collapse videos. The connections were studied extensively Ref 7.

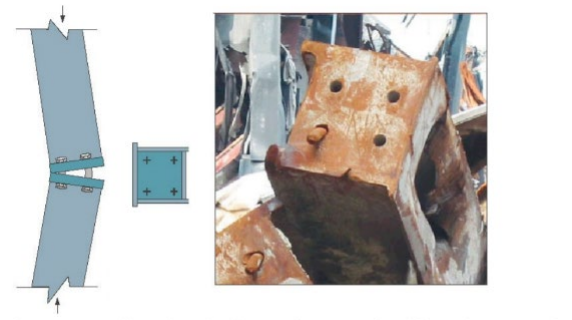
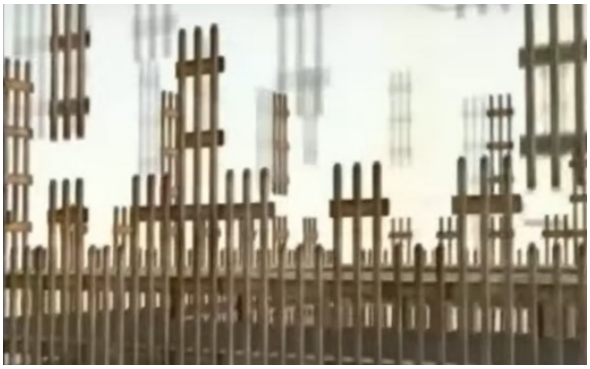


Figure 2-37 Illustration of column splice connection failure, due to out-of-plane bending, in the World Trade Center Towers [FEMA, 2002].



Another major problem with the hypothesis is that it doesn't take into account the air in the building. NIST has explained that there were massive volumes of air pushing out of the tower as a result of the progressing collapse. Fifty million cubic feet of air comes out of each tower in 14 seconds. The columns in the perimeter wall are at 40-inch centres and glass spanning 25 inches between them. The glass is many times stronger than normal high-rise windows. Where does the air go in the conspiracy hypothesis? And how does it not create the very ejections that conspiracy advocates see as explosions?

The air pressure also pushes the external walls out at some levels and contributes to the unpeeling. As we have seen the connection of the wall to the floors has only two bolts at each joist. The air pressure also causes the squibs and ejections, and they look natural from a progressive collapse perspective. The weakest windows break, releasing some pressure, and air and contents blast out. From the start of the collapse, the piston is pushing the walls out and pushing air out the building.

In summary, we note that there was little or no damage to the perimeter columns other than at the bolted joints or the ones severed by the aircraft impact. We know that many of the core columns were not damaged by blasts, "*8 to 10 core columns remaining 1,000 feet in the air," Ref 2-48:15.* We also know that there was no damage to columns at the base of the building, where the up to 20 stories of the frame survived, as well as the core columns at the base. Where were the thousands of missing explosions? It's absurd.

What about the Massive Dust Cloud?

If you look at any controlled demolition you get large dust clouds. It is a function of a vertical collapse. The clouds are thicker and denser at WTC 1 and 2, because:

- Unlike in controlled demolitions, the drywalls, floors, and ceiling were not removed prior to the collapse
- The height of the buildings were much taller
- The volume was much larger

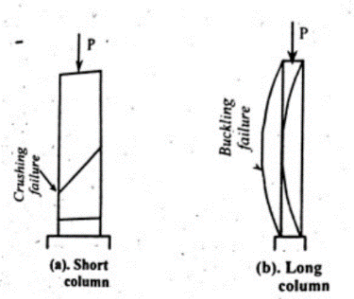
It is a function of the 50 million cubic feet of air that came out of the building in 14 seconds. It is not pyroclastic, and bystanders in close proximity seldom mentioned any heat.

An example of the volume of concrete dust caused by a low-rise steel and concrete flame explosion can be seen here; https://www.youtube.com/watch?v=X45yk3mkPgw.

A Small Section of Tower Cannot Crush a Larger Section

Another main hypothesis is that a small section of structure cannot crush a larger one. Conspiracy theorists use cardboard boxes, snowmen, trucks and 1000-foot crane analogies to reinforce this argument.

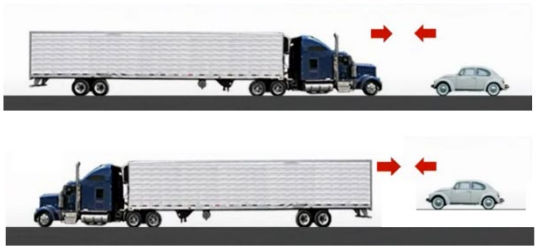
"Crushing" is a vague term in engineering. A crushing failure in engineering refers to a confined compression failure. Engineers use the diagram opposite to describe it. There were no crushing failures on 9/11; all the failures were buckling failures, tension failures, shear failures, or connection failures.

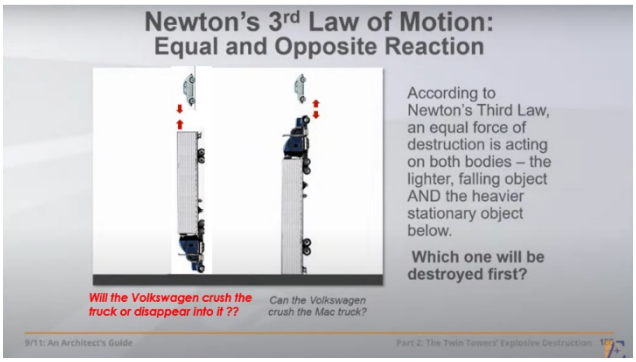


The debate about solid elements hitting each other is quite misleading, and a distraction as the towers were not solid. The towers were largely air: the floors have no vertical strength and you have a robust perimeter frame and a core of stacked steel columns. The core was 27 percent of the floor area.

Conspiracy theorists use the analogy of running a Volkswagen into a Mack truck to explain why a small body cannot crush a large body. Ref 2 – 43:30 states, "*The lightest one is going to be crushed, perhaps even before the radiator of the Mack truck is crushed. It doesn't even matter if we drop it on its side.*"

This is correct but is a misleading analogy. A better analogy of what happened on 9/11 is to turn the truck the other way round. The VW could then disappear into the trailer, much in the same way that the top section disappeared into the bottom. Taking that analogy further, the VW becomes a piston, helping to blow out the walls of the trailer.





Which image better describes the failures of WTC 1 and 2?

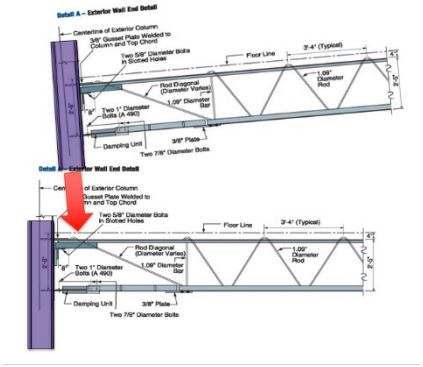
However, the top of the tower does appear to crush into the tower below which is where the term originates. Ref 1- 37 to 43 briefly describes buckling behaviour but does not mention that if the floors fail then the column capacity is reduced massively. He does not mention that the bolted connections on WTC 1 and 2 had a tiny percentage of the buckling capacity of the columns, explaining why most of the perimeter columns failed at their connections into straight 37-foot long segments; these sections are familiar to all the SEAoNY team who worked on the rescue/recovery but also to anyone who studied the videos.

Critics of the NIST and Bazant reports for their description of the progressive collapse do not explain why the failure would stop after a column buckles. Engineers will ask how can it? You have a

structure above landing on a bar joist. How would that be expected to stop the collapse? The question of the upper section crushing the section below is a misdirection and cannot be explained without describing the actual structural systems and how they would interact after an initiating event.

Ae911truth Presentation showing column buckling Ref 2 49:40

In descriptions of the explosives, theorists point out that the South Tower is leaning at an angle of 20 degrees as it descends into the section below. They then go on to explain how they see explosions at every level below that. But quite frankly what is the point of the explosives? The tower will continue to fall as the bar joists cannot resist the weight of the falling mass. And at each level below, the floor comes down, the air pushes everything out, causing the walls to unpeel and the collapse to continue. There is no need for explosives and the apparent explosions that are seen (from the air escaping), are what is expected.



Fire Have Never Destroyed a High-Rise Steel-Framed Building

At Ref 2 23:17 this statement is made, "*A modern steel frame high-rise has never collapsed due to uncontrolled fire.*" That is not true.

Uncontrolled fires in tall steel buildings are very rare. However, engineers and architects are aware of several partial collapses and two complete building collapses in the 20 years since 2001:

The Plasco tower in Iran, 2017: Total building collapse, similar to WTC7

São Paulo, Brazil, Wilton Paes de Almeida 2018: Total building collapse, similar to WTC7

When presentations ignore these buildings, it undermines their credibility. They don't mention these collapses because it doesn't fit with their controlled demolition theory.

Another example of sudden partial rapid vertical collapses of steel structures includes Windsor Tower and Delft University.

Towers Cannot Fail Straight Down

In fact, most buildings do not have sufficient integrity or strength to fall sideways.

The primary force causing collapse is gravity and that is straight down. Plasco and São Paul fell straight down, and the partial collapses of Windsor Tower and Delft were vertical.

An illuminating example is a 2018 Miami tower collapse, where a single column was accidentally removed from a tower, during its demolition, which led to a global progressive collapse. Conspiracy theorists say that you cannot cause a total progressive by the removal of a single column, and all columns need to be exploded simultaneously. The Miami tower also fell downwards, not sideways. The accelerations appear to be close to the 64 percent g, about the same as the WTC towers. The dust cloud was impressive, and again no explosives.
https://www.youtube.com/watch?v=GVGzzEMlCH4

Another example was the 300-meter Matla chimney demolition, another demolition where the flue was designed to fall over during demolition, but it fell straight down.

For buildings to fall to the side as they collapse, they need to be able to rotate about the outer columns. If the outer columns do not have adequate capacity, then they will fall down, not over. The taller the building, the more difficult it is for a tower to fall downwards. Again, most engineers understand this.

Buildings Have Survived Much Longer in Fire

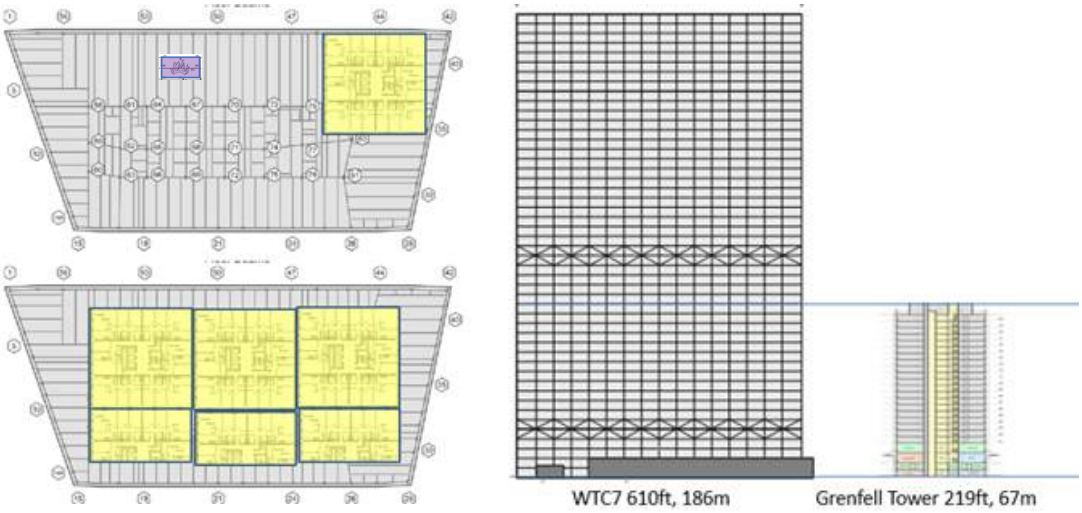
That's true, and it would not have been surprising if WTC 7 had survived. However, it is also not surprising that it collapsed, particularly when you understand the details and when you read the NIST reports and the reports from the four consultants that investigated independently (Nordenson/Arup and Weidlinger/Thomassetti) where they argued about failure mechanisms but not about the cause: the uncontrolled fires.

The authors don't find it suspicious that a steel building will totally or partially collapse after a long uncontrolled fire, especially if that fire is not fought by firefighters. Typical high-rise designs protect floor systems for two-hour resistance and columns for three hours. Once you get into extreme conditions, well beyond those designed for, then performance is very much influenced by local vulnerabilities. Detrimental effects come from the combination of normal loads, fire loads, built-in forces, combined with large thermal expansion and contraction stresses that can occur during various stages of a fire, combine with loss of strength due to heat.

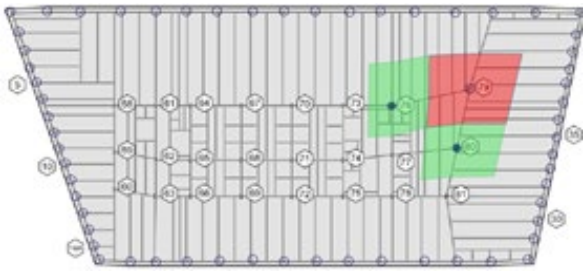
WTC 7 had two vulnerabilities of note:

- At the base of the tower multiple columns sat on a series of transfer trusses spanning across two electrical utility substations located in the base of the building. The transfer structures were points of potential weakness. Where you have beams and trusses supporting multiple columns, failure of one element can destroy multiple columns above leading to consecutive collapse.
- The profile metal deck slab sits on the top of the beams. The Nordenson/Arup report describes how fire protection over the beam was missing, which is a common problem with open rib-decking and this can result in the top flange getting exceptionally hot.

And we should not forget the scale. WTC7 was a massive building. The diagram below shows Greenfell Tower, which was a very large London fire, overlaid onto WTC7. And on WTC 7 we know what the fire was doing on the outside but not on the inside.



Plan and sections showing Grenfell (yellow) & Cardington Fire test floor grid (purple) overlaid on WTC7.



Plan showing loaded areas on Col 79 and adjacent columns

You can see that the load on Col 79 supports an area highlighted in red above, which is approximately the same size as the whole Grenfell tower.

Presentations comparing the WTC 7 failure with the controlled demolitions of buildings much smaller than the Grenfell tower, such as an implosion of a 15-story building, are misleading. The explosions needed to cut thick steel would be an order of magnitude larger than standard.

What about the Eyewitness Accounts of Explosions?

There are eyewitness accounts of explosions in every large building fire. Look at the video of the Windsor Tower fire, which shows what appears to be multiple large explosions. These were not investigated for explosives.
https://www.youtube.com/watch?v=eKvgD9NyIi4

The following tragic eyewitness account of explosions comes from the Grenfell tragedy:
Grenfell Fire London 2017, Guardian

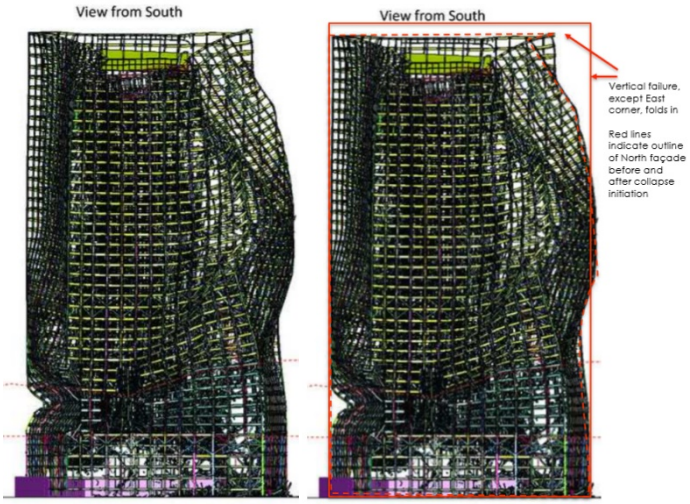
> "There were explosions everywhere," said Michael Paramasivan, 37, who escaped from the seventh floor with his partner and child. "About 13 floors up I saw three children waving at a window, and then there was just an explosion and they disappeared," he told the Press Association. "They were three kids, they were banging on the windows, you could see their silhouettes and then, bang, it just went up."

There were explosions but there were no explosives. Similarly at Ground Zero there were thousands of explosions, but no evidence of explosives. From a distance there was no evidence of the flashes associated with conventional demolition or thermite and from close up, during the rescue and recovery, there was no evidence of cutter charges and no evidence of the normal preparation that would be required for demolition.

The oral histories describe these explosions and the firefighters used the best words to describe what it felt like. Only 156 out of 500 mentioned explosives and a very small number of these suggested explosives. When the New Haven Coliseum was demolished, the explosion was said to have been heard 22 miles away. A link to a video of the Coliseum is described in the section about the dust cloud.

NIST'S models don't look anything like the collapse

Controlled demolition theorists frequently mock the NIST model and say it looks nothing like the WTC 7 controlled demolition. If you look at the model on the right the theorists appear to be correct; it doesn't look anything like the collapse. But architects and engineers are trained to read models like this. They know that the building isn't transparent, that you can't see through floors, and that the façade is much more solid than the steel frame. They know the model is a view taken from the south, and we are only interested in the top of the building and only interested in the north façade, because the south was covered in smoke from the fires.



If you look at the north façade it is remarkably rectangular. On the north-east corner of the north façade, NIST analysis shows a corner being folded south. This was not seen. The building behind is extensively damaged and is pulling down the north façade. Rather than educating the public on how to read the NIST report, theorists choses to mislead them by not pointing out to the similarities between the NIST analyses.

We should not forget that the failure initiated well below the line of visible structure. In the iconic video of WTC 7 only a very small part of the north-west façades can be seen, as shown below. There are other angles which show more of the north façade, up to 90 percent of the top 20 floors.

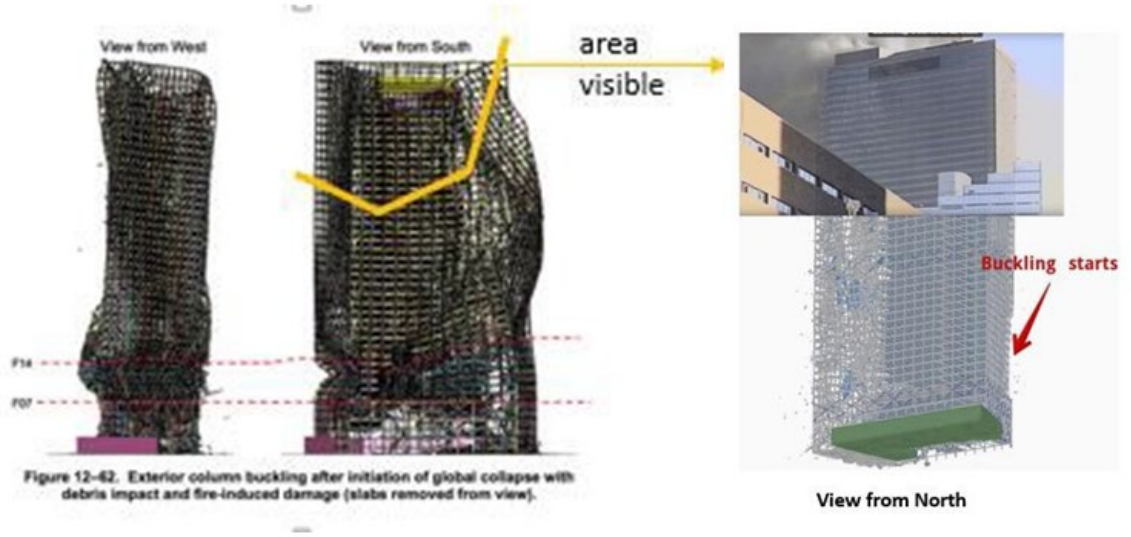


Figure 12–62. Exterior column buckling after initiation of global collapse with debris impact and fire-induced damage (slabs removed from view).

NIST could not get their simulation to match the failure, mainly because the north façade of the tower only starts moving after 18 seconds of the initiating event. NIST correlates the time to within fractions of a second. These models run in millisecond increments and every action affects all the subsequent actions, so there will be multimillion interactions captured in the NIST analysis. NIST explain this of course and those familiar with non-linear time history dynamic analysis will understand this challenge.

Engineers familiar with this type of analysis will consider that the NIST model is not very far away from what is seen in the videos. It is certainly much closer than conspiracy hypothesis which are explained later.

Normal Fires Can't Melt Steel

The image on the right is a recreation of an ancient Egyptian kiln. It achieves temperatures of 2100 degrees Fahrenheit/ 1150 degrees Celsius.

Now, imagine something like this but 100 times bigger, with firemen walking over the top, dousing the thick dust and concrete that insulated the fires below. That's what the WTC tower collapse piles were like, and every time a section of frame was pulled out there would be a little a local flare up. The expected temperatures would be extreme and the contents were incinerated. They were more than enough to melt aluminium and a lot of other metals and create the extreme temperatures that were measured at Ground Zero.

The high temperatures and the damage found at Ground Zero are completely consistent with the impact and subsequent collapses and have no need for explosives of any sort.

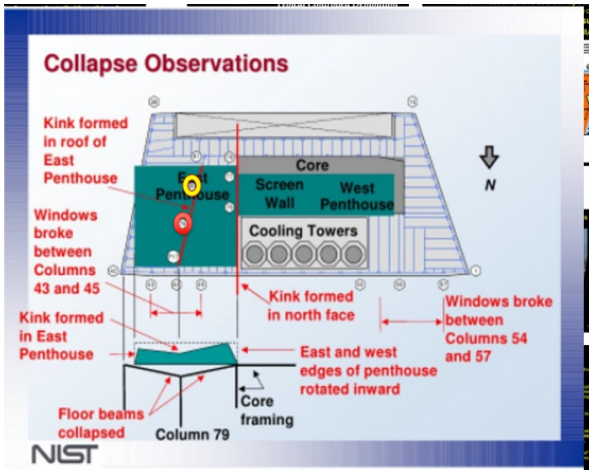
A furnace is simply an insulated fire with forced air. At WTC there were tons of dust and concrete insulation, thousands of tons of combustible material, and a well-ventilated and well-insulated fire, aerated by a jumble of thousands of steel elements.

Rather than educate the public about fires, conspiracy theorists chose to waste peoples time spreading misleading memes like “Fires Can’t Melt Steel – and Molten Metal was Everywhere.”

NIST Caught with Their Pants Down

Probably the biggest omission in the narrative is the failure to explain the importance of the evidence of the East Penthouse collapse. Since you can’t look inside the building, the main evidence for and against controlled demolition is the visual evidence.

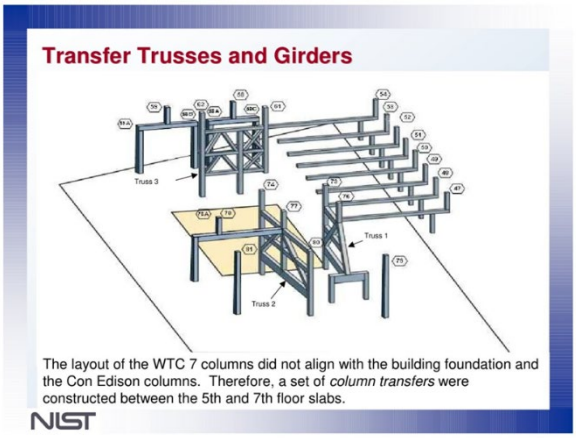
NIST time-matched their analysis to the failure times and observations, from the initial shuddering, indicating some local failures to the collapse. However, a key part of that evidence was the collapse of the East Penthouse which sank slowly into the building seven seconds before the more global collapse. For the East Penthouse to sink into WTC7 requires Column 79 to fail, which happens several seconds before the main collapse. Column 79, circled in red opposite.



It is very challenging to imagine how the building would stand up after column 79 failed. Not only is there a massive redistribution of load, but there would be the dynamic effects from the floors collapsing, as well as the potential for debris to impact or damage other columns and supports. And column 80, circled in yellow, is supported by a transfer structure, which in turn support four main columns.

Theorists ignore the East Penthouse and says that all the internal columns fail at the same time, implying explosives. Perhaps they believe the East Penthouse was accidentally destroyed by a mistimed explosive six seconds too early. They then say all 24 columns must have failed at once, ignoring any movement or vibration and ignoring the first 12 seconds of the NIST analysis.

NIST states that the collapse of WTC7 was due to the progressive collapse following failure of a single column.



NIST is saying that the failure of Col 79 leads to a total progressive collapse of WTC7. As shown above it is a large steel column with 4.9-inch 125-millimeter flanges, supporting a massive area. (They also looked at the minimum size of charges needed to take the column out, with pre-cutting.)

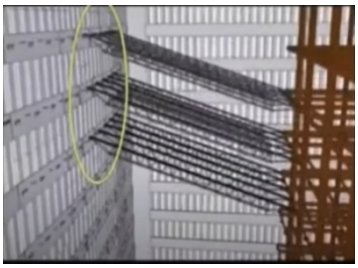
According to NIST, a controlled demolition taking out column 79 would create a complete progressive collapse, which NIST has proven through a comprehensive non-linear dynamic analysis.

Conspiracy theorists do not appear to disagree with that statement but summarily dismiss it and state that the videos prove all 24 core columns were "*removed"* at once Ref 1-32:24. They say that this proves *"NIST were caught with their pants down."* In saying this those authors are saying they would expect to be able to see through the façade. But there is no need for the scenario concocted by theorists and this would be the least likely way a structural engineer would destroy the tower.

Engineers will look at the WTC 7 plans and see that Col 79 supports a substantial area. Its removal would put a massive load on the adjacent columns, let alone the potential risk of the adjacent columns being damaged by debris. Engineers can see that there is a risk of the collapse progressing. Especially considering that adjacent columns Col 78, 77, and 80 are supported by transfer trusses which in turn support multiple columns. If these trusses were damaged by overloading or debris, then multiple core columns would fail and these in turn would immediately try to transfer their loads to adjacent columns.

Once the internal core columns fail the only thing that stops total collapse is that WTC7 was wrapped in a very strong and very stiff frame. The frame cannot fail locally because it is very good at redistributing load, and therefore it can only fail as a whole.

Engineers understand this hypothesis well, and Ref 2-48:13 shows an image of it, when describing the North Tower failure. The load of the interior transfers to the outside and global collapse follows. The figure on the far right is an extract from the Thornton Tomasetti analysis of the WTC7 collapse, Ref 7.



There is little change in the volume of a floor between the condition when the floor is flat and when it is inclined, so if the internal columns failed many floors below you would not see windows blown out violently. This is consistent with what happened at WTC7.

Thousands of Architects and Engineers Support Ae911truth

AE911truth claim to have support from 3,500 architects and engineers who have signed their petition. This is a small number when you consider it is worldwide, includes all types of engineering disciplines, and includes all types of architectural professionals. A summary of the ratio of petition signers to engineers and architects at large is shown below:

FAIA Members 7 no.	out of 3,200	
AIA Members 235 no.	out of 95,000	
PE's 98 no.	out of 800,000	https://civilengineeringacademy.com/many-pes/
Ney York PE's 6 no.	out of 31,000	http://www.op.nysed.gov/prof/pels/pecounts.htm

Fellows of the American Institute of Architects (FAIA) are leaders of the architectural building community. A few years ago, all FAIA members who had signed the petition, were contacted to understand their motives. At the time there were 19, but more than half said they did not support the petition. Examples of responses include:

"*I no longer support 911 truth*."

"*I do not recall formalizing my support. All I remember is asking one person what he was about. I have no clue about what they represent, and I have no interest in their cause."*

"I merely wanted more information and never imagined that my request for information would have transformed into support."

Ae911truth now appear to only have 7 FAIA members out of 3,200. This is approximately 0.2 percent of the membership, however three of the 7 FAIA members are deceased (Barnum, Cross, and Somin). Somewhat bizarrely, Somin appears to have been added to the petition two years after his death.

Ae911truth admits they do not have physical signatures, they do not try and verify current support, and they do not think it is appropriate to remove dead members from their list of petition signers. The petition is essentially a 20-year collection of unverified signatures.

However, they have an active membership of perhaps several hundred and they have an on-line profile well beyond their size.

What about the Experts that Support Ae911truth?

There are no tall building experts and no prominent structural engineers who support the controlled demolition conspiracy theories.

Conspiracy theorists do not believe the experts they quote. Danny Jowenka, the deceased international demolition expert features prominently in WTC 7 videos where he says, with conviction, that WTC 7 was a controlled demolition. What is not mentioned is that he said, with equal conviction, that WTC1 and WTC2 were definitely not a controlled demolition. Mr. Jowenka's statement on WTC7 even appears in the WTC 1 and 2 video Ref2 – 2.01.30. This is very misleading.

Conspiracy theorists take cherry picked statements from experts and use them to suggest they either support their view or once did. But, they don't: Mike Taylor, the head of the National Demolition Association; fire scientist James Quintiere; renowned structural engineers Matthys Levy and Ronald Hamburger; explosives expert Van Romero; all consider that conspiracy theorists have misrepresented their views and opinions.

A Question of Integrity

Architects and engineers place a high value on integrity. Any false and misleading statements will undermine an architect's or an engineer's arguments. Professionals also place a high value on respect.

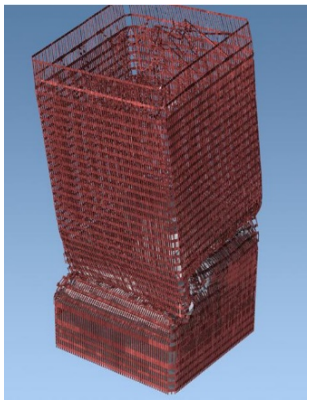
The proponents of the controlled demolition conspiracy claim that the NIST report is a fraud, that "*Experts agree that it is a Controlled Demolition, at least those experts without financial or political obligations that might sway their objective opinio*n." They even speculate that Professor Bazant had written his paper on the collapse before 9/11, Ref 2 - 45:10. While architects and engineers are used to passionate, rigorous debate about engineering design, philosophy, and failures, these are done with vigour but also with respect and dignity. These insulting claims distance the conspiracy theorists from building professionals, which in turn protects them and their theories from close scrutiny. The conspiracy theories have not been discussed at engineering conferences in the last decade.

Do You Support a New Congressional Enquiry?

Professionals have made up their mind, and there is not an institution that considers supporting the waste of time and funds associated with a new investigation.

There is no evidence of controlled demolition and all the evidence points in the other direction. There is not one recognised tall building expert that supports the controlled demolition theory. What type of investigation would you want that didn't involve experts?

Engineers understand that there has already been extensive analysis of the three towers, which is essentially ignored by the controlled demolition conspiracy theories. An example of the WTC 1 and 2 failure analysis is shown on the figure on the right (Ref 7) which shows the failure of the top of the South Tower.



However, the authors do think it would be good if NIST was tasked with producing some videos for the public that explain in simple terms what NIST looked at and why they didn't see a controlled demolition. It would help the public if NIST prepared these videos to target the public's understanding of the failures, rather than producing learned documents that target architects and engineers.

There is still some good learning to come from the collapses. It is a great opportunity for a movie, to show the public how easy it is for fake news to be created and to spread. When filmmakers tell a story they have great power to sculpt it to suit whatever they want to get across. Architects and engineers can do the same. Conspiracy theorists focus on creating a story for the masses, rather than engaging in discussion within the professional institutions, because the institutions essentially don't believe them.

Once that connection to the institutions has been lost and respectful debate is over, then institutions need to decide if these discussions are truthful and honest and how they reflect upon their profession. Conspiracy theorists undermine the confidence that the public has in the engineering and architectural professions around the world.

The authors of this note believe it is the power and the money that is created from the story of controlled demolition that makes it self-sustaining.

Conclusions

We hope this note helps to explain why most architects and engineers are not persuaded by the 9/11 conspiracy theories which contain many false and misleading statements; they are contradictory and do not provide evidence of a controlled demolition in any of the WTC buildings. We call on authors to remove the false and misleading claims in their presentations.

Architects and engineers care deeply about what happened on 9/11. Many hundreds of papers have been published on the collapses, on progressive collapse, fire performance, evacuation strategies, and structural robustness.

For those still in doubt we recommend you discuss your concerns further with an architect or engineer. If that does not satisfy you there is still a little bit of open debate in two discussion forums, Metabunk and International Sceptics, and links are given below.

References

Ref 1 9/11: An Architect's Guide | Part 1: World Trade Center 7 (5/6/21 webinar - R Gage) https://www.youtube.com/watch?v=9qbi3fokG6U&t

Ref 2 9/11: An Architect's Guide - Part 2 - Twin Towers' Explosive Destruction (8-12-21) Webinar – Gage) https://www.youtube.com/watch?v=Q_wqAPk7tOU&t=206s

Ref 3 9/11: An Architect's Guide - Part 3: The Twin Towers and Extreme Heat (3/18/21 Webinar – R Gage) https://www.youtube.com/watch?v=FpXGMcohR8A

Ref 4 AE911Truth's - Blueprint for Truth - The Architecture of Destruction 58min. version AE911Truth.org https://www.youtube.com/watch?v=Anp3KsuciEQ

Ref 5 NIST Response to Frequently asked Questions
https://www.nist.gov/disaster-failure-studies/faqs-nist-wtc-towers-investigation
https://www.nist.gov/topics/disaster-failure-studies/faqs-nist-wtc-7-investigation

Ref 6 Links to discussions forums, where truthers and debunkers debate
http://www.internationalskeptics.com/forums/forumdisplay.php?f=64
https://www.nist.gov/topics/disaster-failure-studies/faqs-nist-wtc-7-investigation

Ref 7 Links to an example of detail engineering analysis of WTC Collapses by Weidlinger/Thornton Tomasetti
World Trade Center Forensic Investigation | Thornton Tomasetti
World Trade Center 7 Collapse Investigation | Thornton Tomasetti