

Investigating the Mechanics of Destruction at the Twin Towers on 9/11: The Case for Propelled Demolition

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Abstract

This paper proposes a previously undiscussed method, as a hypothesis, for the destruction of the Twin Towers on September 11, 2001. While it is not possible to understand all the factors and mechanisms that were employed in the destruction of the Twin Towers, given the immense combination of possible methods that could have been employed, the hypothesized mechanism is in agreement with key observations.

In the years 2005 through 2008, reports covering the destruction of the Twin Towers (WTC 1 and WTC 2) and WTC 7 were prepared under the mandate of the National Construction Safety Team Act (NCSTAR). The National Institute of Standards and Technology (NIST) was tasked with the analysis. However, in spite of the mandate, Footnote 13 of NCSTAR 1¹ states that NIST's analysis would not attempt to explain the actual destruction of the Twin Towers. This footnote, according to preeminent professor of chemistry, Niels Haritt, is "one of the most important footnotes since World War II²:"

"The focus of the Investigation was on the sequence of events from the instant of aircraft impact to the initiation of collapse for each tower. For brevity in this report, this sequence is referred to as the "probable collapse sequence," although it does not actually include the structural behaviour of the tower after the conditions for collapse initiation were reached and collapse became inevitable."

With NIST's abdication of an official explanation for the structural behavior, much of the discussion over the last 19 years about the cause of the destruction of the Twin Towers has focused on the use of "explosive detonations." However, there is scant evidence in the audio record for the use of traditional molecular explosives (e.g., "high explosives") which are typically heard during the controlled demolition of structures. Furthermore, the remnants which consist of the intact parts of surviving structural elements – including steel beams, columns and connections – do not exhibit a widespread pattern of damage to support "explosive detonations" as a significant component of demolition process.

For much of the building's destruction, the observations show a highly energetic propelling force that was activated floor-by-floor – with the origin of this force centered at the building's core / elevator shafts and radiating outward in all four cardinal directions (north-south-east and west). This observed propelling force is hypothesized to be based on a nano-thermite material that was "tuned" to be more like a rocket fuel than either an explosive or an incendiary. This "rocket fuel" propellant impacted the outer perimeter columns with immense simultaneous outward forces which the building was not designed to withstand. This resulted in the separation of the floor trusses from the core columns at its weakest point. That weak point was the interior bolted connections where the floor trusses were tied to the solid steel channels along the outside of the core. These channels, themselves, were solidly bolted to the core. The outer perimeter wall sections were propelled outward and peeled downward and outward through most of the height of the towers. The hypothesized mechanism would have progressed down the structure at a relatively constant rate optimized by mechanically determined parameters using, and leveraging, gravitational forces.

¹ National Institute of Standards and Technology, World Trade Center Disaster Study, Gaithersburg, Maryland USA.
<http://www.nist.gov/el/disasterstudies/wtc>

² Niels Harrit - 9/11 Anniversary Conference - Zurich, Switzerland, Sept. 11, 2019, <https://youtu.be/IMTCds1kuyM> at 3:20

1 Introduction

Since the events of 9/11, an increasing number of people have questioned the official narrative of the complete destruction of the Twin Towers. The official explanation claims that the destruction of the entire height of the towers – including the 80 to 90 floors beneath the impact zones – resulted from structural trauma and weakening due to aircraft impacts and subsequent fires.

The ensuing widespread skepticism has resulted in the call for a new investigation into the destruction of the Twin Towers, citing the use of explosives. As of this date, over 3,200 degreed architects and engineers (verified degreed professionals) have signed the Architects and Engineers for 9/11 Truth (AE911Truth) petition calling for a new investigation into the destruction of the Twin Towers and Building 7, citing the need to consider explosives³. The AE911Truth petition states:

On Behalf of the People of the United States of America, the undersigned Architects and Engineers for 9/11 Truth and affiliates hereby petition for, and demand, a truly independent investigation with subpoena power in order to uncover the full truth surrounding the events of 9/11/01 — specifically the collapses of the World Trade Center Towers and Building 7. We believe there is sufficient doubt about the official story and therefore the 9/11 investigation must be re-opened and must include a full inquiry into the possible use of explosives that might have been the actual cause of the destruction of the World Trade Center Twin Towers and Building 7.

The search for confirming evidence of “explosive detonations” by the 9/11 research community has yielded very limited forensic evidence to support that specific hypothesis. As confirming evidence of “explosives”, only high speed ejections of materials and flashes of light were captured in the video record while the sounds of a certain few large detonations preceding the demolition were captured in the audio record⁴. Additionally, there were reports of explosions by many of the WTC witnesses. Many of these accounts have been compiled and analyzed.⁵

However, no significant, widespread damage has been documented in the debris that has been identified as confirming the use of forces consistent with “explosive detonations” to destroy connections – at least not “explosive detonations” in the traditional meaning of a chemical reaction that reacts very fast and which does work by means of pressure. As noted in the following definition explosion, as used in ordinary speech, is an imprecise word⁶:

Explosion – *A sudden and rapid combustion, causing violent expansion of the air, and accompanied by a report. The word “explosion” is variously used in ordinary speech, and is not one that admits of exact definition.*

As shown in Figure 1, high explosives forceful enough to cut steel would leave behind an unmistakable forensic trail⁷. Damage from this mechanism was not documented in the remnants of the bent, ripped, torn and otherwise deformed steel.

³ Architects and Engineers for 9/11 Truth petition, <http://www.ae911truth.org/signatures/#/AE/>

⁴ Two large ‘booms’ preceded the collapse of the North Tower as heard in <https://youtu.be/KaqT16p3lmA?t=167>, and <https://youtu.be/KaqT16p3lmA?t=169>. These booms were also analyzed in “9/11 Eyewitness,” <https://www.youtube.com/watch?v=IZTINRQwouo>. The ‘boom’ preceding the South Tower’s destruction is not nearly as distinct: <https://youtu.be/kXtTtRm87rA?t=205> and <https://youtu.be/6j8RSCDBQMQ?t=547>.

⁵ 118 Witnesses: The Firefighters’ Testimony to Explosions in the Twin Towers, Graeme MacQueen August 21, 2006, Journal of 9/11 Studies, http://www.journalof911studies.com/articles/Article_5_118Witnesses_WorldTradeCenter.pdf

⁶ The Law Dictionary Featuring Black’s Law Dictionary Free Online Legal Dictionary 2nd Ed., <https://thelawdictionary.org/explosion/>

⁷ Thurman, James T., Practical bomb scene investigation, CRC Press, 2006.

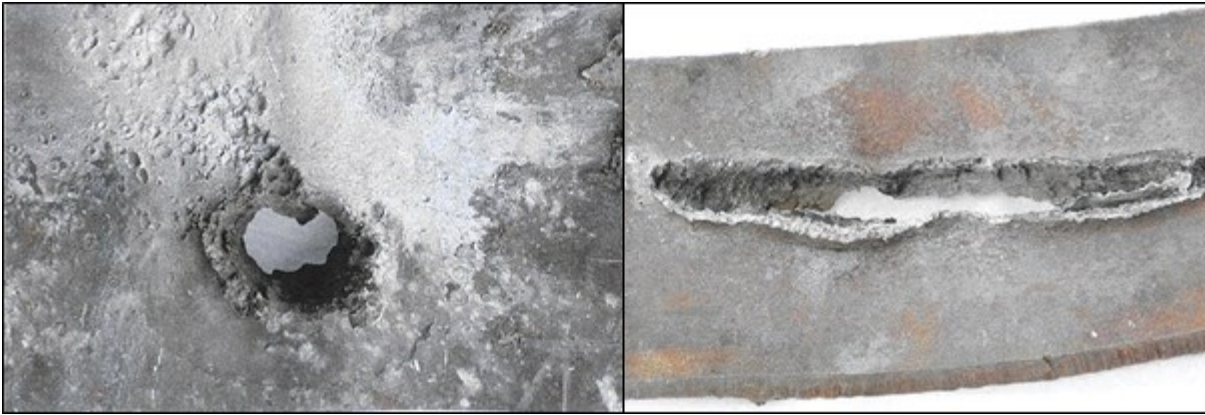


Figure 1: Holes punched through 1 inch steel plates from the explosive energy of shaped charges: Cone shaped charge (left); Linear shaped charge (right).

While there is scant evidence for traditional molecular explosives (“high explosives” / “detonation”) during the demolition phase (e.g., no loud bangs such as those captured in the audio record of known controlled demolitions), a huge amount of energy is on display which is seen dismembering the structure and hurling multi-ton structural components hundreds of feet away from the towers. Additionally, if explosive detonations were physically close to the perimeter columns – and sufficiently forceful to accelerate the perimeter columns to the observed high horizontal speeds– the blast would have crushed significant concave features into most, if not all, of the interior facing plates of the perimeter columns.

1.1 Hypothesis Validation

For this investigation, the criteria used for hypothesis development and validation of the method of destruction of 220 stories can be summarized as follows for observed evidence:

Once is curious, twice is suspicious, widespread and pervasive → validates.

With the limited documentation available, damage to every piece of evidence becomes a sub-hypothesis whose validity must be subject to an evolving understanding. Damage at a single location only tells an investigator where to look for similar damage in other samples. For example, Dr. Abolhassan Astaneh-Asl talks about his analysis of the twisted remains of the WTC in the “Learning Zone” documentary, “World Trade Center: Anatomy of the Collapse”. In this segment of the video⁸ he says:

[at 0:40] What you see is actually very critical. Very, very important. This is the most important piece I have found so far. This piece comes from, most likely, Tower 2 where the plane went in and exploded (NOTE: this piece, C-89⁹, is from floors 12-15 not the impact area). This is the inside face of the back of the columns [perimeter columns]. So plane went in and exploded right here -- and the explosion hit this surface. What you see first of all is a bend due to explosion. But most importantly here is a signature of an explosion. This has happened due to explosive material hitting the column and making the fault. So this is a floor where explosion happened. The window got blown away, everything got burned. Even fireproofing on this floor is burned and glazed to this piece.”

Because there are many perimeter columns that are documented, at some level, the pervasive use of “explosives” observed by Dr. Abolhassan Astaneh-Asl would have left similar damage on most, if not all, of the other perimeter columns.

⁸ Engineer discusses steel from WTC, <https://youtu.be/SyRw7gEKpBQ>

⁹ <https://travelforaircraft.wordpress.com/2011/09/11/9-11-01-memorial-plaza/>

During the demolition of each tower, the recorded sound is best described as a “roar” that is devoid of large distinct bangs which would be associated with traditional forms of an explosive detonation based controlled demolition. It is possible that there were an enormous number of small explosive charges that were detonated to destroy bolted and welded connections that occurred so quickly and pervasively – and, yet, not simultaneously – such that their audio record blended into a “roar” down most of the 110 stories in each tower. If there were significant explosive detonations, a frequency spectrum analysis of the audio record would reveal such a phenomenon, even if human ears could not distinguish the individual sounds.

However, such a scenario of innumerable small detonations would not have been energetic enough to sequentially dismember and then propel the tower structure outward in all directions. Furthermore, consistent damage patterns from explosive detonations used to break bolted connections and welds would have been observed throughout the structural debris. No such widespread and pervasive damage is documented in the FEMA, NIST or other reports. Additionally, photographs of debris during the clean-up¹⁰ do not suggest any pattern of explosive dismemberment of these bolted connections.

The lack of distinct sounds of detonations underscores the need for other hypotheses to explain the method of destruction – such as the possible use of thermitic cutter charges that would destroy by means of heat – instead of pressure. This mechanism of destruction has been suggested after the identification of active thermitic materials in the WTC dust¹¹. Under this hypothesis, the tower would have been weakened by high temperature incendiaries that attacked specific parts of the structure.

However, this hypothesis is not supported by observation of widespread melted structural members or specific melted connections across the nearly 110 floors in each of the towers. If such a thermal attack on bolted connections occurred, it would have left widespread evidence in the form of elongated and ripped bolt holes as the connections stretched like putty to the point of failure (viscoplastic deformation). Additionally, localized damage on various floors would be insufficient to rapidly dismember and then propel the towers in the manner observed. The use of thermitic cutter charges would leave widespread observable traces on the steel structures from most, if not all, floors in the debris pile.

A very small number of structural members show the presence of temperatures that were sufficiently high enough to melt steel. However, the quantity of steel pieces exhibiting melting or erosion is insufficient to explain the destruction of nearly 220 floors of the two towers in a matter of only a few seconds¹².

Of those pieces that have exhibited melting, it is not known whether exposure to high temperatures occurred preceding (or during) the destruction of the towers, or whether the observed erosion was the result of prolonged exposure in the debris pile. The purported presence of disassociated concrete in the debris pile (e.g., the so called “molten concrete”) suggests that the exposure to high temperature could have certainly occurred in the post-collapse debris pile¹³.

¹⁰ Category: Ground Zero (World Trade Center) in September 2001, Wikimedia Commons, [https://commons.wikimedia.org/wiki/Category:Ground_Zero_\(World_Trade_Center\)_in_September_2001](https://commons.wikimedia.org/wiki/Category:Ground_Zero_(World_Trade_Center)_in_September_2001)

and,

These unseen 9/11 photos were found at an estate sale, Jun 21, 2019, <https://petapixel.com/2019/06/21/these-unseen-9-11-photos-were-found-at-an-estate-sale/>

<https://www.flickr.com/photos/textfiles/albums/72157708997281912/>

¹¹ Harrit, N.H., Farrer, J., Jones, S.E., Ryan, K.R., Legge, F.M., Farnsworth, D., Roberts, G., Gourley, J.R. and Larsen, B.R., 2009. Active thermitic material discovered in dust from the 9/11 World Trade Center catastrophe. The Open Chemical Physics Journal, <https://benthamopen.com/ABSTRACT/TOCPJ-2-7>

¹² Limited Metallurgical Examination, FEMA 403, World Trade Center Building Performance Study, 2002, https://www.fema.gov/media-library-data/20130726-1512-20490-8452/403_apc.pdf

¹³ https://www.ae911truth.org/images/PDFs/High_Temps_Molten_Metal_FINAL_3_14_16_v2.pdf

Another consequence of not being able to put forth a credible hypothesis for the mechanism of destruction that fits the observations – is that it allows opportunities for numerous other speculative hypotheses to be proposed and take “center stage” by their unrelenting proponents and/or irascible critics of the 9/11 Truth community. This process has, in fact, happened and the 9/11 Truth community has only addressed those alternative hypotheses by offering contrary evidence to the speculative hypotheses. However, this approach has been ineffective in preventing the frequent regurgitation of refuted hypotheses.

A partial list of refuted hypotheses and observed contradictory evidence are provided below:

- Postulated Hypothesis: nuclear explosions on selected above-ground floors.
 - Observed contrary evidence: The audio record does not contain the required sounds of immense pressure waves needed to transmit nuclear-blast forces. Nuclear blast damage cannot be created by “silent” nuclear blasts. A review of radiation in dust samples showed that Alpha, Beta, and Gamma levels were effectively at background levels¹⁴.
- Postulated Hypothesis: Nuclear explosions underneath the core of the Twin Towers.
 - Observed contrary evidence: Core columns of the North Tower are seen standing after the Tower’s destruction – invalidating a massive subterranean detonation emanating underneath these core columns. Members of the NYFD survived in the fourth floor stairwell of the North Tower without suffering radiation injuries from the alleged energetic particles and blast waves that passed mere feet to their side.
- Postulated hypothesis: Steel columns were “dustified” by Directed Energy Weapons (DEW).
 - Observed contrary evidence: With the exception of a few samples of steel that appear to have been subjected to very high temperatures, and exhibited evidence of erosion, all the steel elements in the debris appear to be bent, broken at welds or torn. There are no photos of partially dustified steel elements. It must be assumed that partially “dustified” steel pieces would have a parallel to partially burned logs in a bonfire – where the outer end is unburned, the inner end is burned-up and a transition section from burned to unburned in the middle.
- Postulated hypothesis: Nano-thermite based energetic material was applied to the underside of the floor slabs and detonated – which destroyed the floor slabs and trusses.
 - Observed contrary evidence: Synchronized detonations of such a material applied along the underside of the horizontal floor surface around the Tower would be loud and create primary forces in the vertical direction resulting in most of the material falling within the perimeter columns. Large horizontal forces ejecting multi-ton perimeter columns outward cannot be accounted for if the primary vertical forces were somehow transitioned into secondary horizontal forces. Destruction in the ordinal directions would be as strong as in the cardinal directions. Additionally, with such an energetic geometry, the forces would primarily be in the vertical directions. These forces would propel, downward, onto the next lower floor below such that these forces would destroy not only that floor but also the preparations underneath it for that floor’s demolition. Disrupting the preparations on the lower floors would interrupt the progression – unless the demolition proceeded vertically downward at a synchronized “explosive” speed.

¹⁴ “We found only background levels of alpha radionuclide activity by liquid scintillation counter analysis of all three samples. Beta activity was slightly elevated, but not more than twice the background level. There were no levels of gamma activity > 1 Bq/g except for naturally occurring potassium-40.” Characterization of the Dust/Smoke Aerosol that Settled East of the World Trade Center (WTC) in Lower Manhattan after the Collapse of the WTC 11 September 2001, Environmental Health Perspectives, July 2002, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1240917/pdf/ehp0110-000703.pdf>

By not providing a plausible hypothesis for the destruction of the Twin Towers that fits the observations, the bar is lowered for those who are intent on conjuring up postulated hypotheses “as fact” regardless of whether the hypothesis is supported by a comprehensive review of the evidence (e.g., facilitates propagation of made-up-nonsense while ignoring contrary evidence).

While developing “wild” hypotheses is an integral part of the scientific method, once contrary evidence is encountered, the working hypothesis must be discarded or revised to accommodate the new information. In the absence of corroborating evidence, retaining an unsupported or contradicted hypothesis becomes a distraction. This distraction becomes an impediment to focusing efforts on identifying the most plausible mechanism of destruction.

Undoubtedly, the filings by the Lawyers Committee for 9/11 Inquiry¹⁵ are in a much weaker position because they do not put forth a hypothesis based on the available evidence for the mechanism of destruction. This leaves it up to the U.S. Attorney to develop a suitable hypothesis about the destruction on their own – making a potential straw-man hypothesis – that could leave a grand jury sufficiently bewildered and thus unable to move toward producing an indictment. It is unlikely that the U. S. Attorney would develop and present a convincing case if all the submitted testimony and exhibits refer to vaguely described “explosives” for which there is scant evidence.

1.3 Observations

A great many observations exist which provide information about the destruction of the Twin Towers. In this section, a number of those salient observations will be described. It is certain that the use of sufficiently large devices that were “explosive” would have created suspicions – thus the destruction required a novel, non-traditional mechanism for destruction. Additionally, observations suggest different modes of destruction were employed for different parts, or zones, of the structure. For this analysis, we will refer to “Zone 1” as the top block and “Zone 2” below it. A “Zone 3” is below “Zone 2” and encompasses the atrium and sub-basements. The zones “1” and “2” are shown in Figure 3.

¹⁵ <https://www.lawyerscommitteeform9-11inquiry.org/>

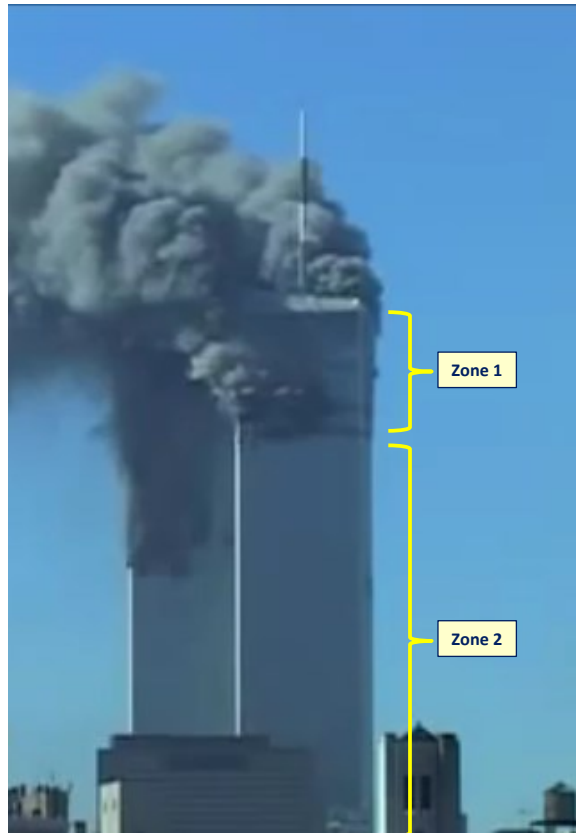


Figure 3: “Zone 1” is where the destruction appears to travel up the tower and “Zone 2” is where the destruction proceeds down the tower. “Zone 3” (not shown) encompasses the four story atrium at the plaza level and below.

The following section will review what we know and what we do not know about the destruction that needs to be explainable by the proposed hypotheses. Not all aspects of the towers destruction can be explained at this time. Additional analysis will need to identify those additional mechanisms.

1.4 What we know

With the hypothesis established, it is necessary to compare the expectations of the hypothesis with the observations.

- Towers were destroyed very rapidly and appeared to descend at a speed estimated at approximately 2/3 of what would be freefall acceleration. Unlike Building 7, during the destruction there is no intact roof line, or top block (e.g., “pile-driver”), from which a reliable speed of descent can be measured over any portion of the building’s demolition.
- Approximately 220 floors of similar construction were destroyed without an identifiable pattern of damage that would suggest that structural components experienced explosive separation. As used here, “explosives” means damage from forces acting so quickly that material adjacent to the force could not be accelerated as an intact unit – and thus would be subject to fracturing, severing or physically deforming the area adjacent to the applied “explosive” force. Widespread damage fitting this description has not been observed – either in photos of steel samples observed in near-surface layers of the rubble pile (e.g., untampered-with immediately post-demolition) or in NIST and FEMA published analysis.

- Widespread evidence of heat damaged parts (e.g., viscoplastic deformation, softened/stretched or melted) was not observed in the available photographic record among the near-surface layers of the rubble pile.
- No significant amount of the interior office contents was observed in the rubble pile, indicating that the destruction process shattered the material – either via physical forces and/or thermal disassociation within a very high temperature thermal stream of the activated propellant. These entrained remnants would then comprise the ejected debris cloud.
- Evidence exists for extremely high temperatures¹⁶ that melted molybdenum and volatilized lead (e.g., vaporized) which later cooled.
- Evidence exists for molten iron flowing out of the building from an opening in the northeast corner of the building.
- No steel beams are seen with patterns indicating flowing streams of molten iron in the paint or with cooled molten iron streams that would have suggested molten iron was flowing over them prior to collapse initiation.
- Videos of the destruction show very violent ejections of materials through the windows, indicating material was entrained in a very energetic flow of highly accelerated material simultaneously hitting the entire length of the perimeter column walls from the inside that would have exerted large, outwardly-directed, forces in all horizontal directions – but predominantly in the cardinal directions.
- Videos show isolated violent ejections many floors below the demolition front. These are commonly referred to as “squibs”.
- Perimeter columns are mostly pushed / ejected out of the footprint of the Twin Towers.
- Contiguous floor slab sections were not found within the footprint of either tower, suggesting that they followed the trajectory of the perimeter columns outside the footprint of the building.
- Widespread failures of bolted connections were observed across the debris field that had been connecting perimeter columns together and attaching floor trusses.
- Core columns of the North Tower are seen standing for approximately 20 seconds after the destruction of the surrounding exterior perimeter columns and floor structures. Core columns of the South Tower remained standing for a much shorter period of time. These core columns have been referred to as the “ghost spires”.
- Remnants of unreacted nano-thermite materials were found in the form of red-gray chips. In addition, a large amount of residue was found in the form of tiny iron spheres that is consistent with reacted nano-thermite.
- During the clean-up, no core columns were documented that exhibited damage due to explosives-related deformation in the lower basements. This includes oral histories of clean-up workers as well as photographic records¹⁷.
- Many floors, and parts of floors, were vacant where pre-weakening (by removal of selected floor truss to channel bolts or their replacement with weaker bolts) could have taken place without being observed by tenants.
- Large distinct explosions were heard immediately preceding the demolition, but no large explosions were heard during the demolition phase.

¹⁶ <http://www.journalof911studies.com/articles/WTCHighTemp2.pdf>

¹⁷ Angled cut column explained, <https://youtu.be/DlkWFDiYgig>

1.5 Conventional (Molecular) Explosives

Early discussions of nano-thermite centered on its ability to be a novel form of explosive that would not leave residues which are typically associated with conventional molecular explosives (“high explosives”). Additionally, the use of traditional high explosives would create an auditory signature that would have led to demands for an investigation based on their characteristic sounds.

The perpetrators of the destruction of the Twin Towers might have the ability to divert attention away from the mechanism of destruction, but such a diversion would have been much more difficult if there were widespread, identifiable, sounds of “explosions” in the auditory record.

1.6 A Curious Account

As a past attendee on many weekly conference calls organized by Architects and Engineers for 9/11 Truth (AE911Truth) many guests were invited onto the calls and sometimes they had interesting first or second hand accounts. One account was particularly interesting. Unfortunately, no independent corroborating information for this account is available, which means it can only be used to develop a hypothesis – which could then be used to search for supporting, or contrary, evidence.

Neither the date of this particular conference call nor the name of the guest can be recollected. Details of the story, likewise, are vague and subject to the vagaries of memory. However, the account was given somewhat as follows:

The guest recounted a story told by an acquaintance who had worked at the Twin Towers. As the story was told, this acquaintance had access credentials into, or had an escort, so that he was allowed to enter the area at the bottom of the elevator shafts. He said that he was surprised at how clean the area was and that the walls had been freshly painted. The acquaintance told the guest that *“he was surprised by the cleanliness, because interior areas of buildings like this are usually dirty and filled with cobwebs. It was unexpected for an organization to spend money to make these areas clean.”* The guest also recounted that his acquaintance had left the country after 9/11.

Whether the above account is true or not is irrelevant to the formation of a hypothesis. In this case, the hypothesis suggests that a material, possibly a propellant, was applied to the interior walls of the elevator shafts such that the final product resembled a freshly painted wall. It has been proposed that a sol-gel form of thermite material could have been applied using spray-coating technologies¹⁸. However, it is unknown if odor control would have been necessary, and if so, how that aspect of the application process could have been managed given that multiple layers appear to have been needed. It also is quite possible that the material could have been pre-manufactured as panels that would then have been installed on the inside walls of the core / elevator shafts.

From this hypothesis, we will investigate the potential mechanics of the destruction if this applied material was, in fact, a highly energetic nano-thermitic composite material that was “tuned” to be an energetic propellant (e.g., rocket fuel).

1.7 Propellants in a Nano-Technology World

During the conference “9/11 Perspectives-Public Master Class on The Events of September 11, 2001” held in Zürich, Switzerland on September 11, 2019 Niels Harrit presented a talk entitled, “The Chemistry of 9/11: A Consistent Collapse Model for the Twin Towers.”

In his presentation, he described the need to use energetic materials, like explosives and incendiaries, in the destruction of the Twin Towers and that they needed to be pre-placed in the buildings. Furthermore, he

¹⁸ https://911review.com/articles/ryan/nist_thermite_connection.html

explained the ambiguity caused by the unavailability of a precise vocabulary for describing the chemistry behind the destructive material employed in the demolition of these towers. For example, the term “energetic materials” has been used collectively for explosives, incendiaries and propellants (e.g. rocket fuel). He explained that explosives and propellants do physical work based on forces created by the production of gas, whereas energy from incendiaries is released only as heat.

Niels noted that the advent of nano-technology has allowed for the ‘tuning’ of energetic materials between the two extremes of incendiaries and explosives. Thus, the thermitic nano-material found in the World Trade Center dust does not necessarily fit into one or the other traditional categories.

So what we are dealing with here is not a propellant and it is not an explosive. Due to the advent of nanotechnology we are missing a term in between explosives and incendiaries.

It is more explosive than a propellant and not so explosive as [molecular] explosives¹⁹

Incendiaries	Propellants (Rocket fuel)	Explosives
Heat	Gas	Gas
No work	Work	Work
Slow	Semi-fast	Very fast
Thermite	Thermitic	Molecular
Nanothermite	Nanothermitic	Nanothermitic

ALL FAST!

Figure 4: When describing the physical observations at the World Trade Center, Niels Harrit describes the missing word in our vocabulary between propellants and explosives.

In the presentation he describes the physical manifestations of the hypothesized propellant using video clips prepared by David Chandler. He then concludes with the comment

Once you see it, it is obvious. This is what is going on. You may ask why they had to move all these things [outward] ... we may speculate why they had to do it this way, instead of just taking it down. I'll not go into that.

With this clarified theoretical understanding of propellants that are “tunable” between incendiaries and explosives, it is now possible to hypothesize the mechanism of destruction at the Twin Towers and explain the reasons for the “messy” method of their demolition – *instead of just taking it down.*

¹⁹ Niels Harrit - 9/11 Anniversary Conference - Zurich, Switzerland, Sept. 11, 2019, <https://youtu.be/IMTCds1kuyM>, [at 36:22]

2 Overview of the Propelled Demolition Scenario

The propelled demolition scenario rests on the hypothesis that the destruction of the Twin Towers began at the interface of “Zone 1” and “Zone 2.” While there are some clues about the initiation, it is not clear exactly what happened at this interface – especially regarding the extent of damage to the core. For example it is not clear whether a subset of column-rows were initially affected or whether there was comprehensive destruction of all column rows at the onset.

Once initiation began, the sequence proceeded upward in “Zone 1” and downward in “Zone 2.” Once the connections holding the perimeter columns at the interface between “Zone 1” and “Zone 2” were severed or pushed out of alignment – the process of propelling the floor structure and perimeter columns away from the core in “Zone 2” could proceed at a rate maximizing the synergy between gravity and the propellant induced forces.

The weak point of the structure appears to be the bolted connections between the floor trusses and the channel to which they were attached. This would have required the destruction of only 28 5/8 inch bolts on a short side and 60 5/8 inch bolts on the longer side (of which only 40 were bolted to the core via the channel and the others 20 bolts were attached to a transfer truss).

As shown by the red arrows in Figure 5, the propellant was assumed to be activated around each floor in all directions simultaneously. This way, the perimeter columns around the outside of each floor are all pushed outward simultaneously. In accordance with Newton's third law which states, “for every action, there is an equal and opposite reaction”, The propulsive force to push the exterior perimeter columns outward must be created by an equal “reactionary” force in the opposite direction – such as into the region of the core columns and then out through the opposite side.

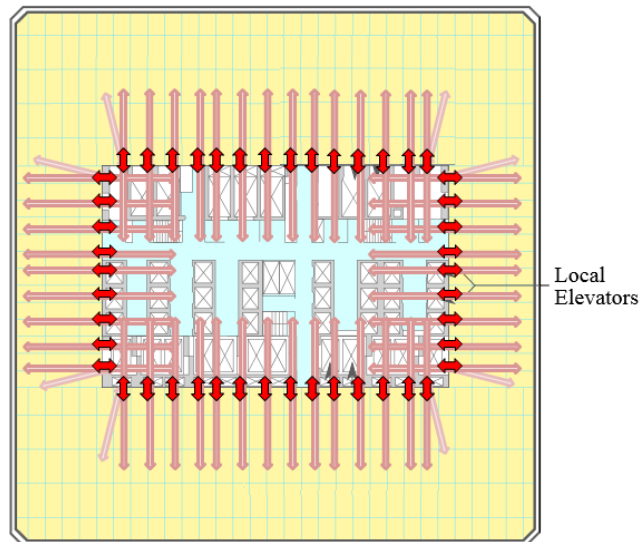


Figure 5: Ignition of propellant at each floor level pushes the perimeter columns outward and creates a reactionary force into the core columns and out through the opposite side.

Because columns within the core were subjected to opposing, and somewhat equalizing, reactionary forces, and because the core columns which were braced against compressive forces by interlocking beams and girders – they were able to withstand the propellant-generated forces and remain standing, precariously,

for about 20 seconds in the case of the North Tower and only moments for the South Tower²⁰. The “ghost spire,” reaching up to about the 70th floor of the North Tower, is seen in Figure 6 just before it collapses²¹. Figure 7 shows similar, but shorter, remnants of the South Tower core. This portion of the core remains standing for a much shorter period of time.



Figure 6: The "Ghost Spire" consisting of remaining core columns in the immediate aftermath of the destruction of the North Tower



Figure 7: Remnants of the South Tower core columns remain standing for moments after the surrounding office space is destroyed. (Composite of a pre and post photos by Aman Zafar)

²⁰ <http://911research.wtc7.net/wtc/evidence/photos/wtc2exp12.html> and <https://web.archive.org/web/20190827132321/http://www.amanzafar.com/WTC/>

²¹ 9/11: Enhanced WTC1 "spire" (NIST FOIA, ABC Dub3 #46), <https://youtu.be/EVxSJ2VLktU>

The proposed hypothesis of this paper suggests that once the propellant was activated, a very high temperature thermal stream impacted and accelerated the office furnishings and floor truss components toward the perimeter column sections with sufficient force to push the walls outward and possibly produce the glaze that Dr. Abolhassan Astaneh-Asl commented upon (“Even fireproofing on this floor is burned and glazed to this piece”).

The propellant also scoured and dislodged the floor truss cross-bracing, floor truss chords, and truss diagonals. These impacting forces then broke the bolted connections of the floor trusses to the channel (e.g., at the core columns) and accelerated the concrete floor outward and away from the core.

2.1 Floor Truss Construction

The connection of the floor trusses to the channel consisted of only two 5/8 inch bolts per truss. Figure 8 shows the floor truss connections between the perimeter columns on the left and the channel on the right (e.g., to the core column).

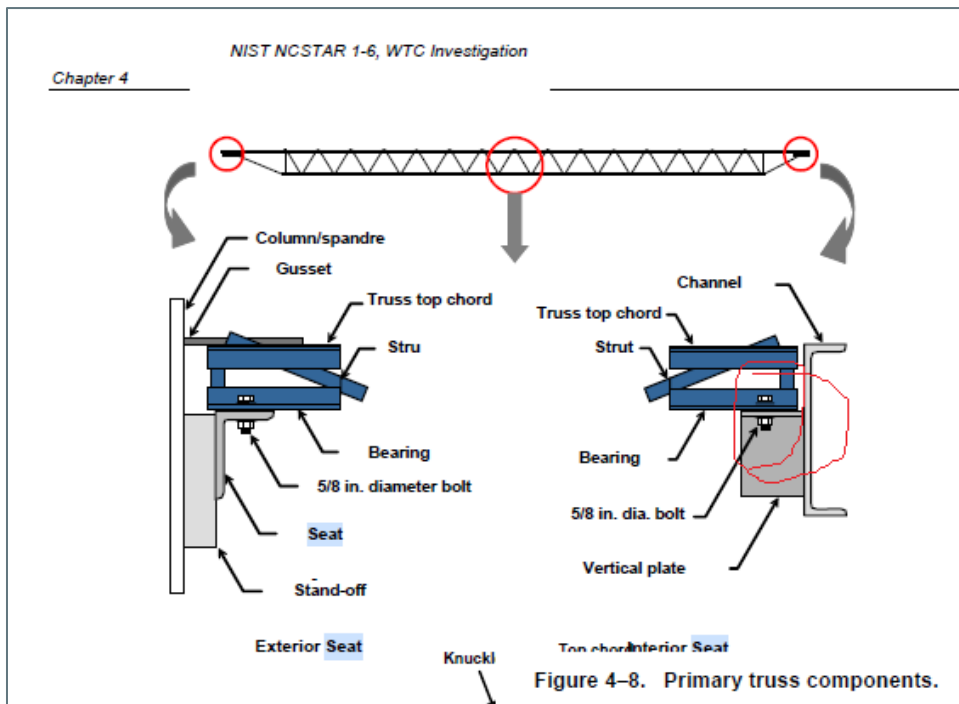


Figure 8: Comparison of floor truss connections to core and perimeter columns. Note the gusset plate weld to reinforce the truss to perimeter column seat connection.

While the connection of the floor truss to the interior channel consisted of only two bolts, the connection to the outer perimeter columns was more structurally substantial. As shown in Figure 9, in addition to the two 5/8 inch bolts, there was a gusset plate that was welded between the perimeter column and the trusses' upper chord. Additionally, there was a viscoelastic damper that connected the trusses' lower chord to the perimeter column. Then, two additional connections per truss went to both the left and the right side at about a 45 degree angle to provide additional horizontal stability.

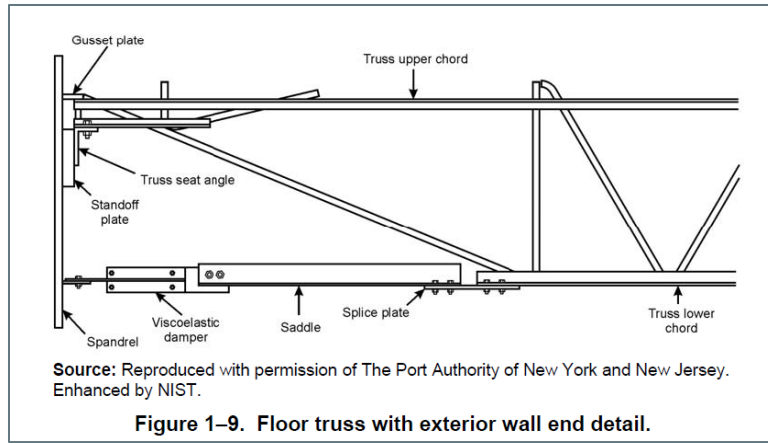


Figure 9: Perimeter connection to floor truss showing viscoelastic damper.

Consequently, the interior connection to the core channel with just two 5/8 inch bolts was much weaker than the exterior connection to the perimeter columns. It is therefore reasonable to hypothesize that this was the weak point of the structure that provided the perpetrators with the opportunity to destroy the Twin Towers with the “right-tool-for-the-job” if access to the elevator shafts could be obtained (e.g., nanothermite based propellant). The opportunity to exploit this fatal weakness, thus it appears, was the reason that the Twin Towers were destroyed in the manner of horizontal ejections.

Because of this fatal weakness, propelled demolition was used instead of a more traditional process that would have aligned with the easier to explain “Bazant’s pile driver” theory²².

The propelling process then progressed uniformly upward through “Zone 1” and downward through “Zone 2,” starting at the intersection of “Zone 1” and “Zone 2.” At this interface, the perimeter columns were no longer restrained from outward movement by the connections above them. The perimeter walls were then pushed outward by the momentum of the propellant and the accelerated office contents. After the initial perimeter columns were pushed outward, the outward force of those leaning-out-of-alignment columns would then augment the tensile forces at the bolted connections— with the channel connections being the weakest. This process could be described as “like an unzipping of the building” all the way down, similar to peeling a banana.

2.2 Zone 2 Destruction Mechanism

The sequence of the “banana peeling” mechanism is illustrated in the series of images from Figure 10 through Figure 15. Figure 10 illustrates a six-floor segment before the demolition begins. The floor trusses traverse the area from channel seats at the core (yellow columns) to the outside seats at the perimeter column (green). An interior core column and supporting cross members are also shown in Figure 10 (orange). The floors are identified as A through F for convenience.

²² <http://www-math.mit.edu/~bazant/WTC/WTC-asce.pdf> and <http://www.civil.northwestern.edu/people/bazant/PDFs/Papers/00%20WTC%20Collapse%20-%20What%20Did%20&%20Did%20Not%20Cause%20It.pdf>

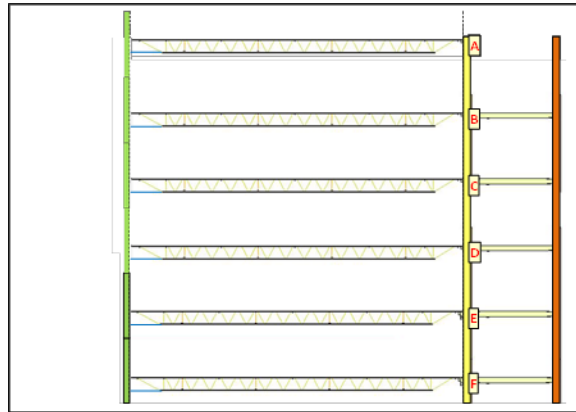


Figure 10: Structure showing floor trusses on six floors – from the perimeter columns to an interior core column.

In Figure 11, the propellant has been activated above floor “A” and is exerting outward pressure on perimeter columns. This puts tension on the bolted connections at both ends of the floor truss – at the channel seats and at the perimeter column seats. Then the propellant between floors “A” and “B” is activated. This propellant traverses the office area and is hot enough to contain molten iron that will later cool into iron spheres. The effect of the passage of such a high velocity/ high temperature stream on office contents, humans, and asbestos fireproofing would be to dissociate virtually everything encountered.

The timing of the activation on the next lower floor is critical because if the activation occurred with “too little” delay, the full outward leaning force of the perimeter columns would not be exerted on the interior channel seat connections. If the activation occurred with “too much” of a timing delay, debris from above might disrupt the preparations for the destruction of the next lower floor by impeding the propellant stream across the office area and prevent it from efficiently, effectively and forcefully reaching the perimeter columns.

As shown, some amount of propellant and associated debris would be ejected through the windows creating a debris cloud, such as was observed around each floor (when not obscured by falling debris from above).

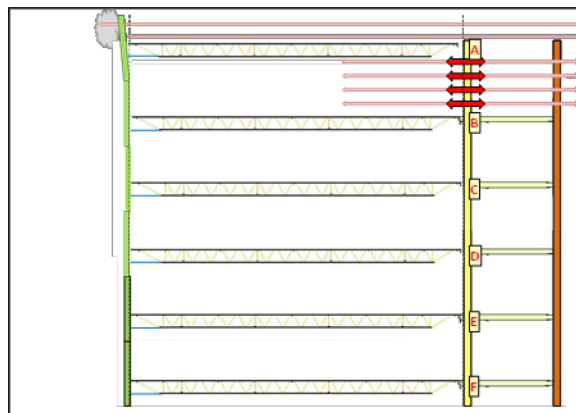


Figure 11: With channel connection at "A" separating due to tension from events on the floor above, high temperature propellant accelerates toward perimeter wall through the office contents and scouring the floor truss structure.

Figure 12 shows the continued activation of the propellant between floors “B” and “C.” At this stage the perimeter columns are leaning outward. With the seat connections at the perimeter columns intact, and in conjunction with other forces, such as the propellant impacting and stripping the floor truss sections, the

floor slabs will accelerate and move outward and away from the core as the channel to floor truss connections fail.

The cross-bracing perpendicular to the floor trusses would have presented a significant surface area for the propellant to push against while advancing across the office area. This could have helped dislodge the floor truss structure and accelerate the floor slab outward. The outward movement of this entire floor assembly would explain the large amount of concrete chunks that were in the debris pile at significant distances outside the Twin Towers.

With the hypothesized stripping away of the floor truss lower chords and pulling out of the truss-diagonal knuckles, this would have compromised the integrity of the concrete and resulted in the concrete breaking into smaller chunks as it began to fall.

As shown, the height of the debris cloud outside the windows increased vertically.

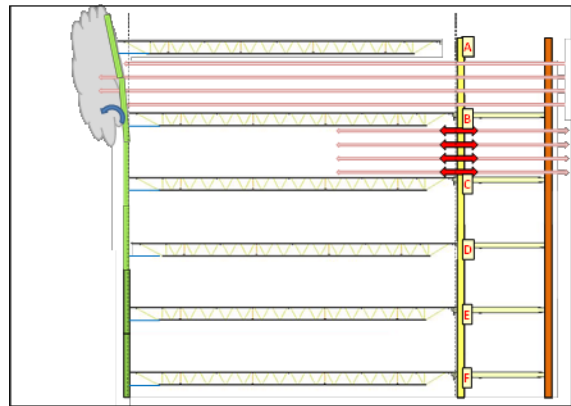


Figure 12: With connections at "A" and "B" separating due to the momentum impact of the propellant and accelerated office contents against the perimeter wall, the separation at connection "C" begins.

Figure 13 shows the progression down the building with the activation of the propellant between floors “C” and “D.” The outer perimeter columns continue to lean outward and will eventually separate and fall away with some outward horizontal velocity. The perimeter columns are three-story high sections that are staggered to provide multi-floor stability. Depending on where the perimeter column sections were joined, they could exert an enhanced outward force based on the principles of a cantilever (e.g., a rotational moment arm).

The rotational moment forces at the connections between the floor truss to perimeter columns would tend to bend the seat downward in “Zone 2.” In “Zone 1,” the rotational moment forces would bend the floor truss-to-perimeter column seats upward as the process progressed upwards and the lower part of a perimeter column was pushed outward before the upper part of the perimeter column.

With the bolted connection broken between the channel and the floor truss, Floor “A” near the core is unsupported and begins to fall towards Floor “B.”

Again, the visible debris cloud on the outside of the tower increases in height.

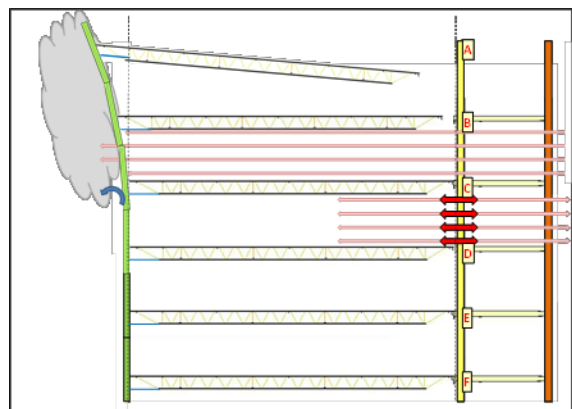


Figure 13: With connections at "A," "B" and "C" separating due to the momentum impact of the propellant and accelerated office contents against the perimeter wall, the separation at connection "D" begins.

Figure 14 shows the continued progression of the demolition down the building with the activation of the propellant between floors “D” and “E.” The interior of the core columns are subjected to compressive forces in the four cardinal directions. The structure was able to withstand these forces due to the beams and girders connecting the core columns at each floor.

With the bolted connection broken between the channel and the floor truss, Floor “B” near the core is unsupported and begins to fall towards Floor “C.”

Again, the visible debris cloud on the outside increases in height.

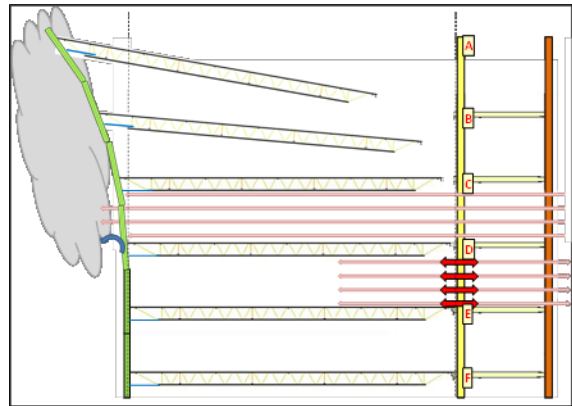


Figure 14: With connections at "A," "B," "C," and "D" separating due to the momentum impact of the propellant and accelerated office contents against the perimeter wall, the separation at connection "E" begins.

Figure 15 shows the same conditions as Figure 14 but also includes the opposite side of the tower to illustrate the reactionary forces. The orange arrows represent the reactive forces which are a necessary result of the propellant force. As shown in the top group of orange arrows, the propellant traversing across the core will not be constrained between upper and lower floors. In the areas where the floor slabs (or their remnants) are falling, the propellant will be directed upward as it continues outside the tower on the opposite side. This upward direction of the reactionary propellant would provide an observable feature during the destruction of the towers in the form of a “rooster-tail.” Additionally, as the reactionary propellant particles impacted the remaining concrete, the additional imparted energy would further churn and break-up (e.g., tend to “further pulverize”) the concrete.

These reactionary forces will also propel the falling floors, office contents and perimeter columns on the opposite side of the tower further outside of the footprint of the building.

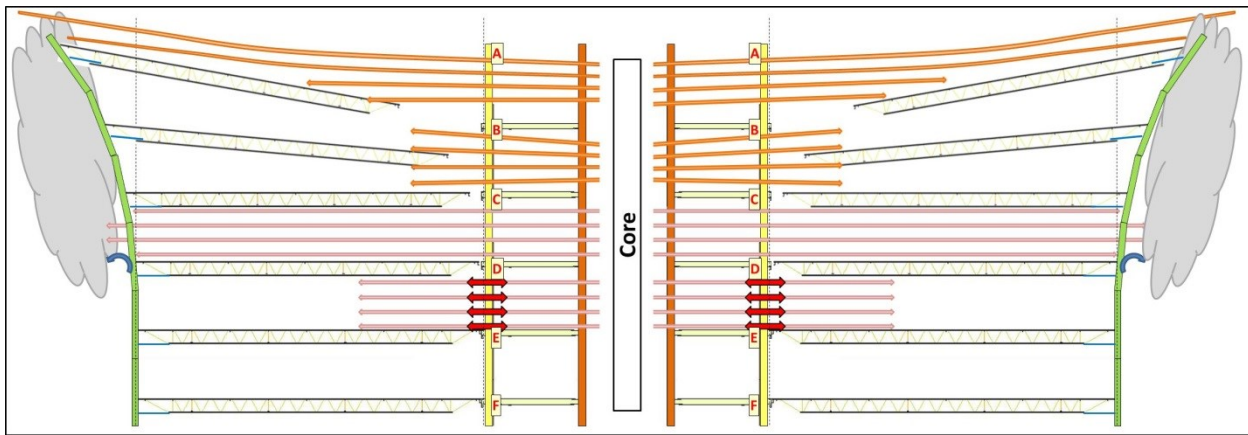


Figure 15: Newtonian reactionary forces (orange arrows) travel in the opposite direction across the core into, and above, the collapsing structure to create the observed "Rooster Tails"

2.3 Observed "Rooster Tail"

The directionality of the propulsive forces and "rooster-tail" hypothesized in this scenario match the observations captured in aerial photos of the destruction of the North Tower. It is unlikely that these "rooster tails" contained heavy steel components, but rather illustrate the movements of lighter materials. As shown in Figure 16, the propulsive forces operate in the cardinal directions of north-south and east-west (red arrows), which is consistent with the propellant being placed on the inside of the elevator shafts. As confirmed by the photograph, such a geometric arrangement would provide significantly less propulsive forces in the ordinal directions (orange arrows).

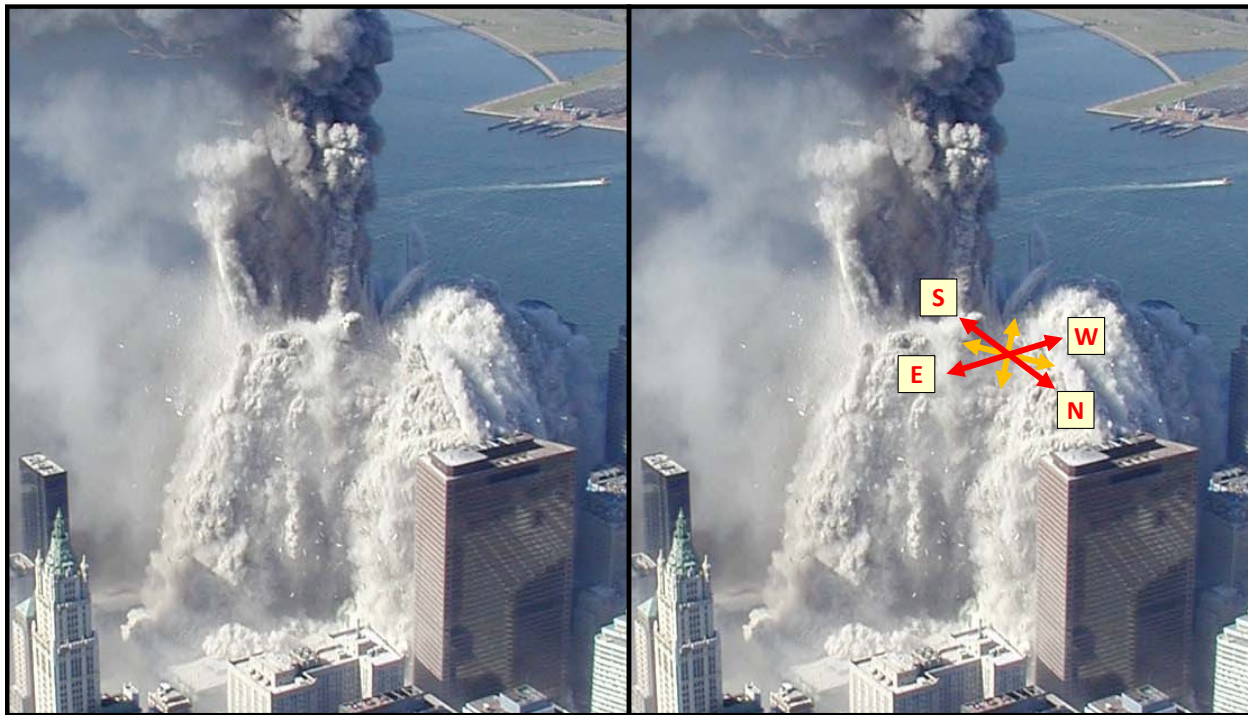


Figure 16: The majority of the propulsive forces in the cardinal directions creating "rooster tails" with significantly less propulsion in the ordinal directions. Photo by Detective Greg Semendinger/N.Y.P.D.

Figure 17 shows an upward-arching "Rooster Tail" that can only be explained by the reactionary force of the propellant and the geometry described above. Figure 18 shows the evolution of this "rooster-tail" by

tracing the leading edge of a fast moving debris cloud with red dots as place markers. While the leading edge of this debris cloud is seen rising, peaking and then descending, it should be noted that the debris cloud trailing behind the leading edge can be seen rising further above the red trace. This confirms the upwardly directed reactionary propulsive force expected according to the hypothesis.



Figure 17: Upward-arching "Rooster Tail" can only be explained by the reactionary force of the nano-thermite based propulsive forces.



Figure 18: Evolution of the upward-arching "Rooster Tail" with dots showing the leading edge of the entrained material. An upward billowing debris cloud can be seen above and behind the trace which further illustrates the reactionary propulsive force.

Another feature of the propellant that is observable because of the reactionary forces is the plume that erupts through the core area during the destruction phase. As multiple reactionary streams from the propellant collide in the core area, some portion will be forced upward. Figure 19 traces the upward movement of one section of this plume using red dots as place markers. The plume of debris is clearly rising against gravity and then it quickly begins to settle. If the plume were simply hot air containing micro particles it would continue rising, but instead it reverses direction and descends suggesting heavy macro-particulate loading.



Figure 19: Collision of opposing reactionary streams in the region of the core results in a vertically driven debris cloud plume.

3 Review of Steel Debris

A review of the channel-to-floor truss connections shows evidence of destruction by horizontal forces – not vertical forces. The steel pieces that were preserved and analyzed show that the forces were directed horizontally and do not exhibit evidence of significant vertical forces²³.

3.1 Floor Truss to Channel Connections

Figure 20 shows an installed steel channel that is solidly bolted to the core columns. The regularly spaced protrusions are the channel-to-floor truss seats described in Figure 8.



Figure 20: Photo showing a channel with floor truss seats. A floor truss connecting the channel to a perimeter column is shown at the far end of the construction zone.

Figure 21 shows a variety of post-demolition channel-to-floor truss connections. These show relatively intact seats with no significant downward bends. Figure 22 shows the three seats on the sample marked C-118. The seat at the top (see ‘a’) shows a horizontal rip of the bolt-hole in the seat with no evidence of a vertical component to the destructive force. The seat at the bottom (see ‘c’) shows one bolted connection with a stub of a floor- truss chord still attached. This suggests a large tensile force in the horizontal direction. Additionally, it suggests that the tensile strengths of the upper chord of the truss, the shear strength of the 5/8 inch bolt and the bolt hole in the seat were comparable on the basis of tensile/shear strength.

Later, in the discussion of “Zone 3” destruction, the damage in that region will be observed to have a strong vertical component (consistent with gravity), not a horizontal component (consistent with the propellant-based demolition hypothesis).

²³ Damage and Failure Modes of Structural Steel Components (Appendices A-G). Federal Building and Fire Safety Investigation of the World Trade Center Disaster (NIST NCSTAR 1-3C), December 1, 2005,

<https://www.nist.gov/el/final-reports-nist-world-trade-center-disaster-investigation>



Source: NIST.

Figure 4-6. Example of a recovered core channel. Arrows indicate seats used to attach the floor trusses to the channel (core columns).

Figure 21: Truss seats from "Zone1" and/or "Zone 2" do not exhibit the downward bending observed in "Zone 3."

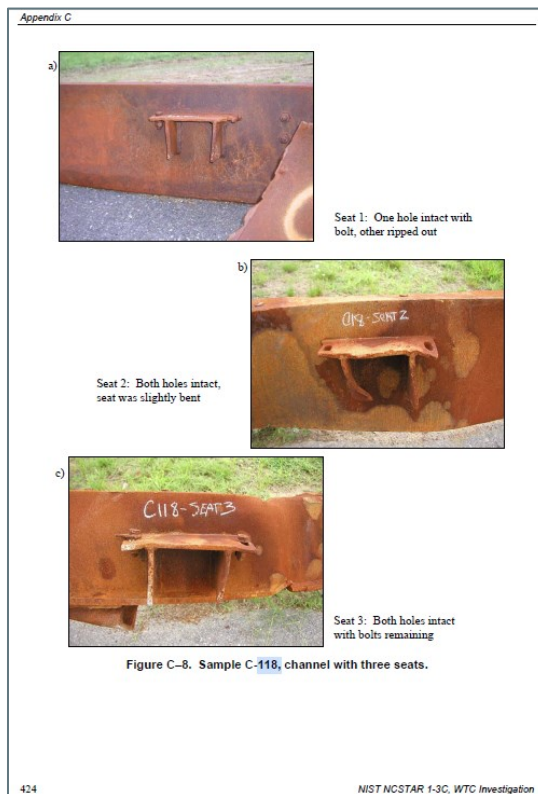


Figure 22: Truss seat connections on channel steel piece identified as NIST C-118, currently located at River Front Peace Park in Appleton, Newfoundland.

3.2 Floor Truss to Perimeter Column Connections

According to the hypothesis, the connections between the floor trusses and perimeter columns remained intact as the perimeter columns and floor assemblies accelerated outward. As shown in Figure 14, the sequential demolition would have created bending forces that would bend the seats, gusset plates and other connections downward in "Zone 2." In "Zone 1" as the demolition proceeded upwards, the bends would tend to be upward as the lower part of the perimeter columns were propelled out before the higher part of the perimeter column.

Figure 23 shows the resulting connections from a 94th floor "Zone 1" sample in the North Tower. The figure shows the welded gusset plate with the damper unit intact is bent upwards – consistent with the hypothesis.

Figure 24 shows the resulting connections from a 91st floor "Zone 1" sample in the South Tower. The welded gusset plate remains, but it is bent upwards – consistent with the hypothesis.



Figure 23: A perimeter column floor truss connection from floor 94 of the North Tower ("Zone 1") indicates upward acting forces that bend the seat upward as the destruction moves upward.



Figure 24: A perimeter column to floor truss connection from floor 91 of the South Tower ("Zone 1") indicates upward acting forces that bent the seat upward as the destruction moved upward.

Figure 25 shows the resulting connections from a "Zone 2" sample taken from the North Tower. In this figure, the seat remains with both bolt-holes intact – and is shown bent downward – consistent with the hypothesis.

Figure 26 shows the resulting connections from a "Zone 2" sample taken from the South Tower. In this figure, the gusset plate remains – and is shown bent downward – consistent with the hypothesis.

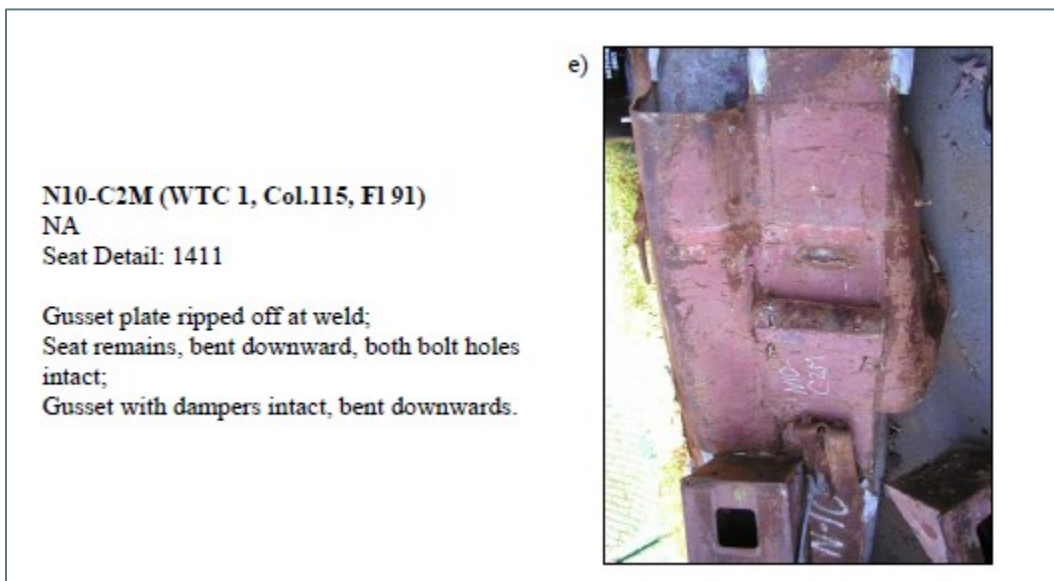


Figure 25: A perimeter column floor truss connection from floor 91 of the North Tower ("Zone 2") indicates downward acting forces that bend the gusset plate and seat downward based on the geometry of the destruction. (NIST NCSTAR 1-3C, p391)

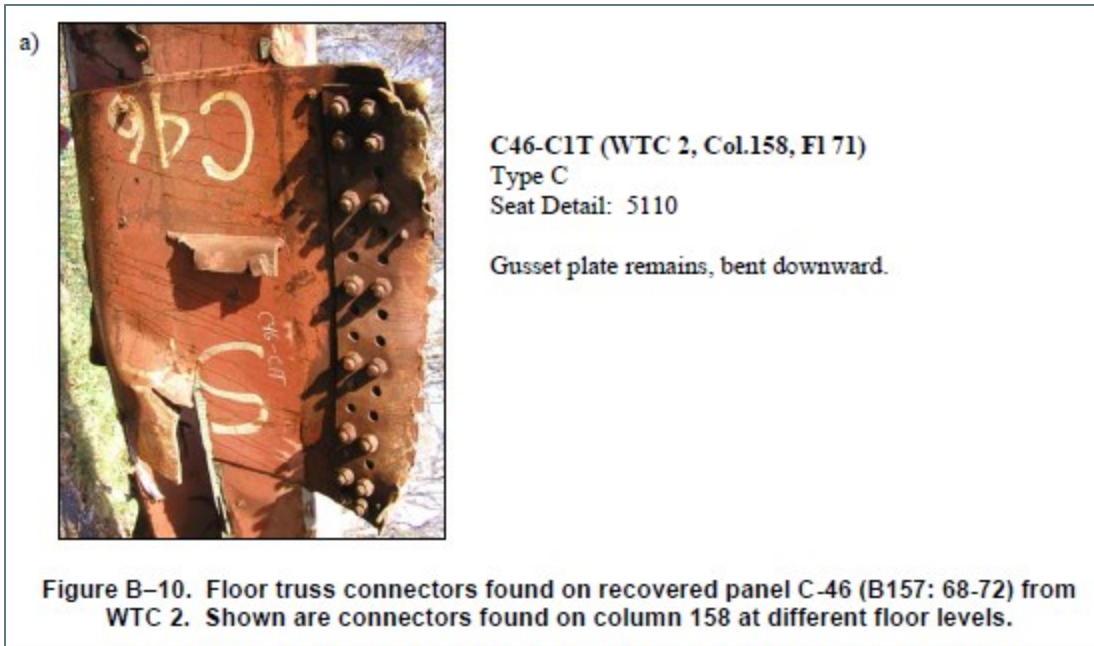


Figure 26: A perimeter column floor truss connection from floor 71 of the South Tower ("Zone 2") indicates downward acting forces that bend the gusset plate downward based on the geometry of the destruction.

3.3 Floor Slab Rebar Not Welded to the Steel Frame

A review of Figure 21 to Figure 26 does not show any remnants of stubs indicating welds between rebar in the floor slab and the perimeter columns / channels that would have been used to increase the structural connection between the slab and structure. The NIST report does not document this type of connection – which leaves only 40 5/8 inch bolts on the east / west facing sides and 28 5/8 inch bolts on the north/south facing sides to resist the propelling force described above.

3.4 Sequential Timing of Activation

If the physical leaning out of the perimeter columns – which provided useful tensile forces to the breaking of the bolted connections – was part of the demolition design, there would be a natural, optimum timing sequence to minimize the propulsion-energy required. Too fast and there would be little outward leaning force to exert tensile force on the bolted connections; too slow and the perimeter columns would either break away or begin rebounding inward.

An inefficient use of this tensile force would require more propellant. Therefore, an optimal timing would capture the synergies of the propellant forces and gravity to increase the margin to assure a successful demolition. Taking advantage of this optimum speed of destruction would provide a greater margin of error to ensure that the building would be destroyed and the demolition would not stall half-way down the structure. In other words, minimizing the energy needed would increase the probability of a successful demolition of the Towers.

The sequential floor-by-floor destruction of the towers can be seen in Figure 27 for the South Tower and Figure 28 for the North Tower. In both cases the rate of descent is approximately constant and appears to be proceeding slightly faster than freefall acceleration during the Zone 2 demolition²⁴. This observation about faster than freefall acceleration is because the ejected debris outside the tower from the higher floors (e.g., the debris is in free fall – including steel components) does not have time to fall and obscure the

²⁴ The phrase “faster than freefall acceleration” in this context is on a per-floor basis. Eventually, the canopy of debris that is in free-fall will, with cumulative acceleration by gravity, obscure the floor-by-floor ejections.

ejections at the next lower floor. A slower-than-free fall acceleration sequence would allow ejected material to quickly obscure the view of the demolition of the next lower floor(s). As the destruction continues at a constant rate down “Zone 2,” eventually the ejected material – that is in freefall outside the tower – will overtake, and obscure, the floor-by-floor destruction.

Also, a review of the recorded sequence of demolition for each tower shows that the greatest propulsive forces occurred in the middle of each face of the tower. This supports the placement of the propellant along the inside perimeter of the elevator shafts. As expected for this hypothesis, the propellant is not observed acting with significant force into the corners (ordinal directions).



Figure 27: Using the debris cloud to observe the sequential activation of propellant - South Tower

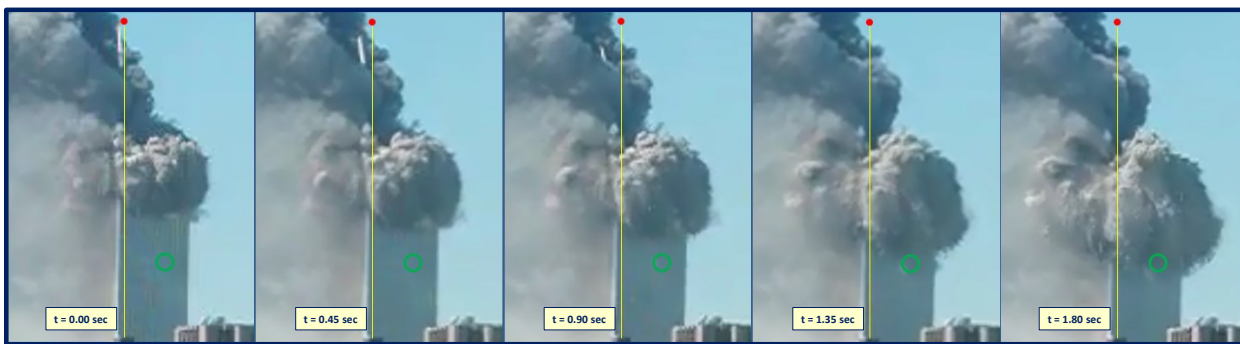


Figure 28: Using the debris cloud to observe the sequential activation of propellant - North Tower. Also note the antenna is both descending and falling to the left

3.5 Tilting of the “Zone 1: Blocks

In Figure 28, the antenna is observed to both descend and rotate-away. Figure 29 shows the antenna of the North Tower falling to the side of the tower. These two figures show that the top 15 stories of the North Tower tilted as a single entity, similar to the top 30 stories of the South Tower, before each was propelled into oblivion. Because of its smaller height, the top of the North Tower was more easily obscured by the propelled debris cloud. Figure 30 shows the top of the both towers when the tilt of the top block first becomes noticeable.

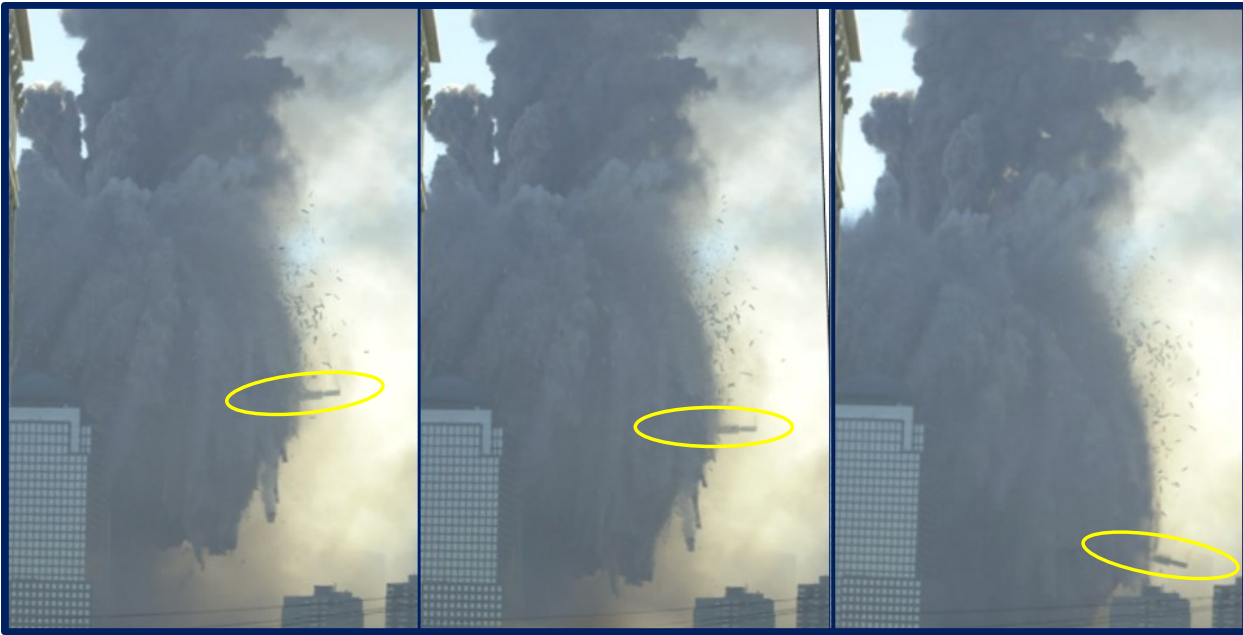


Figure 29: Tracing the descent of the North Tower antenna confirms the top 15 stories rotated as a single block and did not descend through the core of the tower (John O’Boyle /Star-Ledger).



Figure 30: South Tower starts to lean (left) and North Tower starts to lean (right)

3.6 Inward Bowing of Perimeter Columns at Time of Initiation

While there is little evidence to determine exactly what happened at the interface between “Zone 1” and “Zone 2” there are some clues. As shown in Figure 28, the antenna on the North Tower does not rotate away, but rather it falls away as it is descending. This can be observed in the figure by comparing the top of the antenna to the red dot marking its initial location and then observing the motion in the subsequent frames. This is suggestive of the core columns on one side remaining intact slightly longer than the other and acting as a moment arm for the rotating upper block (i.e., the arm acts like a hinge).

A similar movement is seen in the behavior of the South Tower²⁵. Figure 31 highlights the movement of the northeast corner of the tower as it falls away and descends. The last frame in the sequence (frame “h”) shows the emergence of a row of the core columns through the debris cloud (e.g., the “blue” circle). The movement of these core column ends might provide clues about the location of the lower end of the moment arm. If it is assumed that the core columns were all weakened at the same elevation then the location of the initiation can be hypothesized. If this motion could be verified, it may suggest destruction of the columns a dozen floors below the location of the aircraft impact. The movement of these top blocks indicates that columns were not severed simultaneously as in WTC Building 7.

Frames “a” and “b” of Figure 31 show a yellow vertical line alongside the northeast corner where the buckling of the corner structure will be seen in frames “c” and “d.” In frame “c,” this corner region appears to bend outward for about ten floors in height above the interface. This suggests that the weight of the top block has exceeded the capability of the structure – and it is giving way to create the observed deformation.

The more interesting observation in these figures is the effect that is shown in frame “b” by the two orange arrows. The upper orange arrow shows the movement of the block in the outwards leaning direction, while the lower orange arrow shows the inward movement due to the hinge effect – as the top block begins to tilt. This is the source of the “inward bowing” movement observed at the onset of destruction of the South Tower.

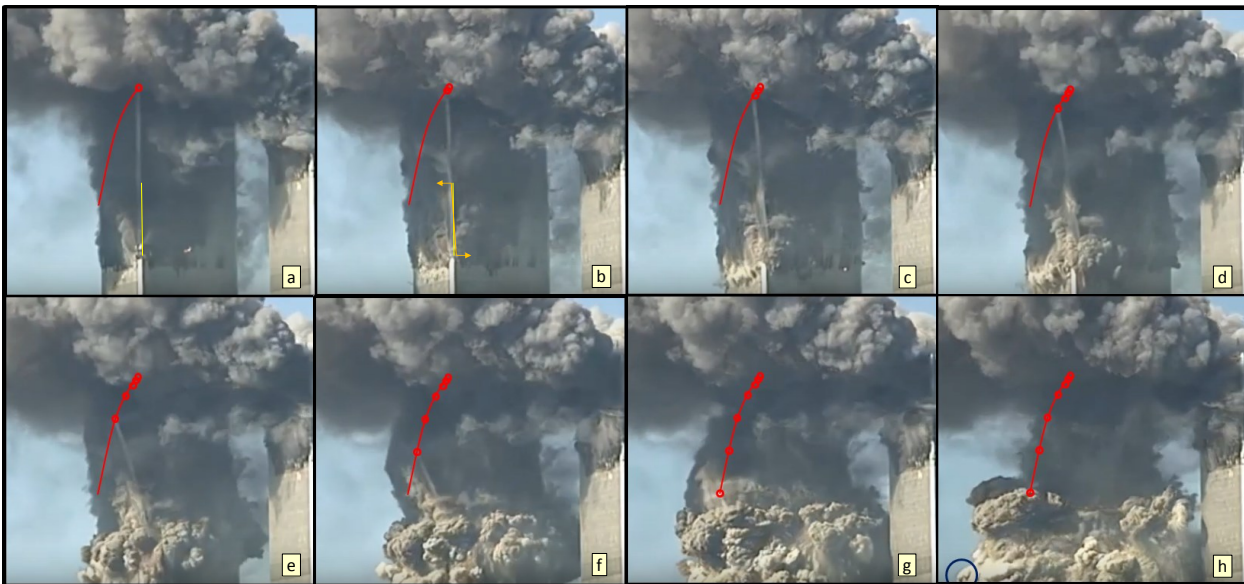


Figure 31: Rotational sequence of the South Tower showing the position of the northeast top corner during descent. Frame (h) shows the emergence of a row of core column.

By tracing the movement of the edge of the South Tower, Figure 32 shows the hinging action that provides the inward forces indicated by the lower orange arrow in frame “b” of Figure 31.

²⁵ 9/11 WTC 2 South Tower Collapse Compilation (For The 18th Anniversary), <https://youtu.be/4dV d-Wh Zw> at about 16:10

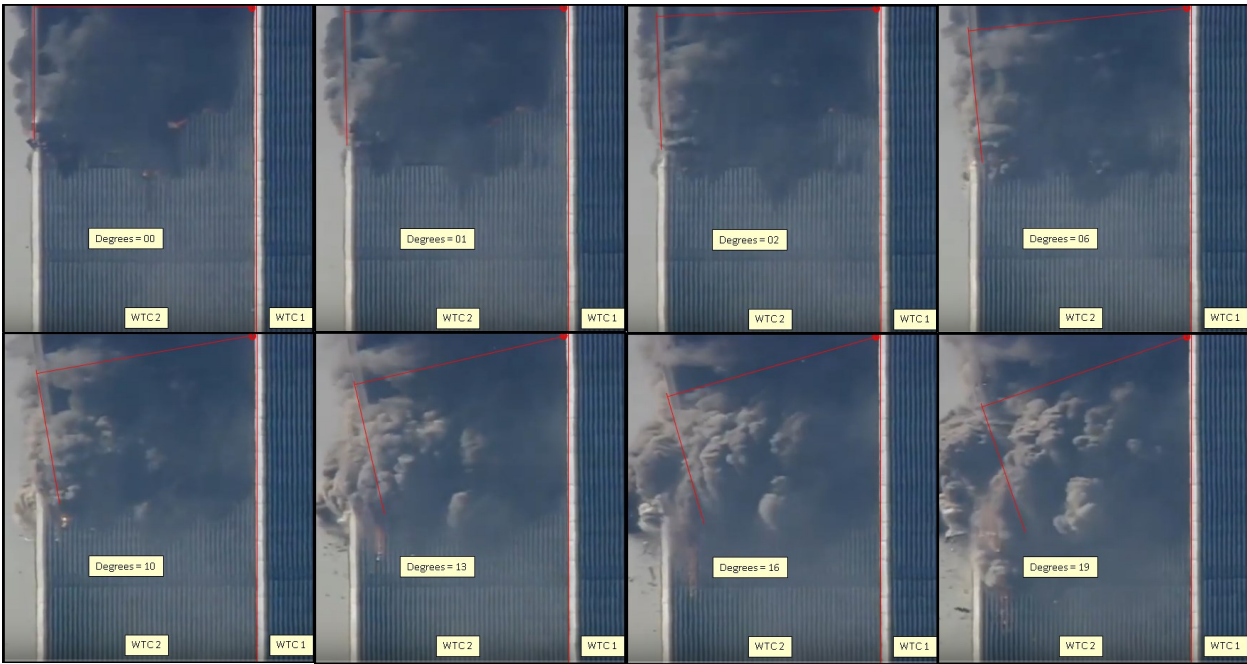


Figure 32: Rotation of the top block of the South Tower suggests a pivot point approximately marked at the circle.

A closer inspection of the inward bowing perimeter columns suggests that the core columns in this area have been compromised and are sagging. This sag would result in the floor trusses being pulled downward with a resulting tension exerted onto the perimeter columns which would then pull them inward. However, this inward force would not be strong enough to pull the existing perimeter column structure out of alignment – yet would be sufficient to constrain the perimeter columns from buckling outward under the increased vertical loading.

Figure 33 shows the interface between “Zone 1” and “Zone 2” where the inward bowing is observed. The image on the left shows the damage prior to the onset of destruction while the image on the right shows the increased inward bowing at the onset of the demolition. The inward bowing of the columns is much more pronounced and is suggestive of them being both pulled inward by tension from the floor trusses as well as being pushed inward by the hinging motion of the top block.



Figure 33: Push-in of the exterior perimeter columns by the hinged upper block as it begins pivoting/rotating.

If the perimeter columns could bear this increased share of the gravity load due to the compromised core columns, the connections at this damaged interface would remain intact and there would be no significant inward force from the hinging effect. However, if the yield strength of the perimeter column steel was

exceeded and the steel was “squashed” by a few inches, then the hinging effect would push the perimeter columns inward. The effect of this hinging motion is confirmed by the rebounding of the perimeter columns immediately before the demolition of the interface begins in earnest.

Figure 34 shows the rebound of the upper half of two of the bowed-in perimeter column sections after, it appears, the bolted connections snap along their tops and the butt-ends slide apart. This rebound can be observed by the sudden outward motion of the columns in the corresponding red and blue boxes²⁶.

If the observed inward motion was caused solely by the tension from the pull-in of the floor trusses, such a rebound would be more difficult to explain because the inward forces would affect a large number of floors – not just a single floor.

Additionally, it is inconceivable for sufficient pull-in force to be transmitted from the core columns via the two 5/8 inch bolts per floor truss with enough tension to pull-in the perimeter columns and break the butt-end connections. These butt-end connections consist of, on average, six 3/4 inch bolts²⁷ for each floor truss. It is not within the shear strength of two 5/8 inch bolts to bend a perimeter column segment at a bolted connection and it is certainly not possible for two 5/8 inch bolts to bend the columns at mid-length.



Figure 34: Rebound of the perimeter column sections after probable connecting bolt failure.

Figure 35 shows a conceptual explanation for the perimeter column rebound. In frame “a,” the columns are aligned vertically with their normal loadings immediately after the plane impact. Frame “b” shows the effect on some of the sagging core columns that resulted in perimeter column pull-in. The greatest amount of pull-in is where the perimeter columns were weakest (e.g., the floor where the plane passed into-and-out-of the Tower destroying some perimeter columns). Frame “c” shows the effect of the destruction of additional core columns where the additional load on the perimeter columns exceeds the yield strength of the perimeter column steel (e.g., yield strength means the steel is compressible by some amount). Here the lower perimeter column is compressed below the dotted line. With the increasing angle between butt-ends, the bolted connections begin snapping. Frame “d” shows the separation of the bolted connection and the rebound of the lower perimeter column. The upper perimeter column continues downward along a curved trajectory determined by the hypothesized moment arm and hinging effect once the rotation of the top block is no longer impeded.

²⁶ 9/11 WTC 2 South Tower Collapse Compilation (For The 18th Anniversary), https://www.youtube.com/watch?v=4dV_d-Wh_Zw at 17:30

²⁷ There are approximately two floor-trusses (four 5/8 inch bolts at the channel) per perimeter column section which have three butt-end bolted connections (four 3/4 inch bolts per connection or 12 bolts per perimeter column section).

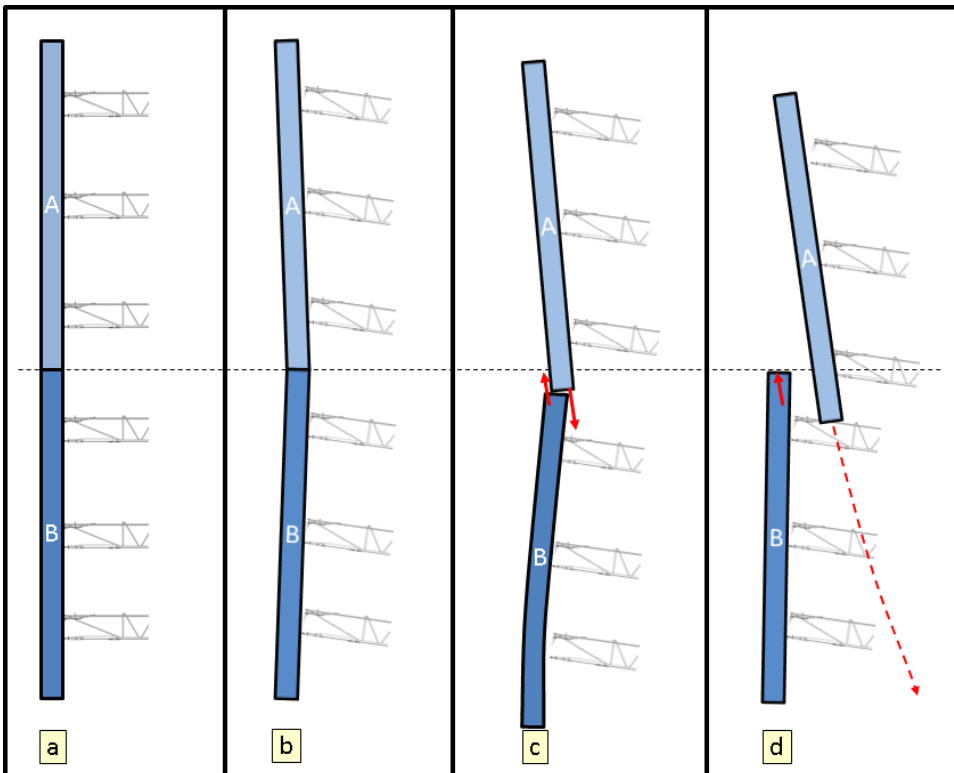


Figure 35: Conceptual explanation of perimeter column rebound: (a) post impact; (b) with core column sag; (c) additional weight squashes steel; (d) rebound begins after bolts break and rotation of top block is not impeded.

Widespread damage to the core columns consistent with the use of high explosives (e.g., see Figure 1) or melting via incendiaries²⁸ has not been observed. This does not mean that debris exhibiting such damage did not exist – it just means that it has not been identified among the saved pieces or captured in photographs during clean-up.

As shown in Figure 36, there are isolated pieces that have curious types of damage. This core column exhibits double concave bends in the top and bottom plates. While this is evidence of tremendous forces, it is not easy to visualize a pre-planned demolition process that would exert opposing forces onto a massive core column.

The mechanism destroying the core columns is an area for further investigation. Materials compiled about the core column damage by Gordon Ross²⁹ should provide useful information for such an analysis.

²⁸ The thermally eroded steel documented in FEMA's Appendix C is the "exception that proves the rule" about there not being widespread and pervasive evidence of thermal weakening of the steel.

²⁹ 9/11 Collapse Analysis by Gordon Ross (Parts 1, 2 and 3), <https://www.youtube.com/watch?v=m1FzABcQAvG>, <https://www.youtube.com/watch?v=BR6qaadPmyY>, <https://www.youtube.com/watch?v=A2mS4wTHaLU>



Figure 36: Core column with double concave bends in plates on opposite sides (Photo by Lane Johnson)

3.7 Remnants of the Floor Structures

The process of propelling the perimeter columns outward in all directions would have also provided an outward velocity to the (fractured or fracturing) floor slabs in the cardinal directions. This assumes the connections of the floor trusses to the outer perimeter column sections held longer than the weaker connections of the floor trusses to the channel seats. A combination of the propellant traveling from the elevator shaft walls toward the outer perimeter column would have exerted forces on the cross-bracing between floor trusses, the lower cord of the floor truss, and the truss-diagonals³⁰.

Figure 37 shows a prefabricated floor truss assembly. On the left, one of the cross-bracing structures is highlighted by a red oval. These cross-braces would have provided a small, but significant, cross-section for the propellant to impact as it traversed across the office area. The forces pushing the cross-bracing structures toward the perimeter columns would have the ability to not only dislodge the floor trusses from the concrete slab, but also yank them out and pull them along – thus fragmenting the concrete floor slab.

³⁰ Truss-diagonals are the rods that zig-zag from the lower chord of the truss into the concrete above the top chord to form a “knuckle” that acts as a shear stud.

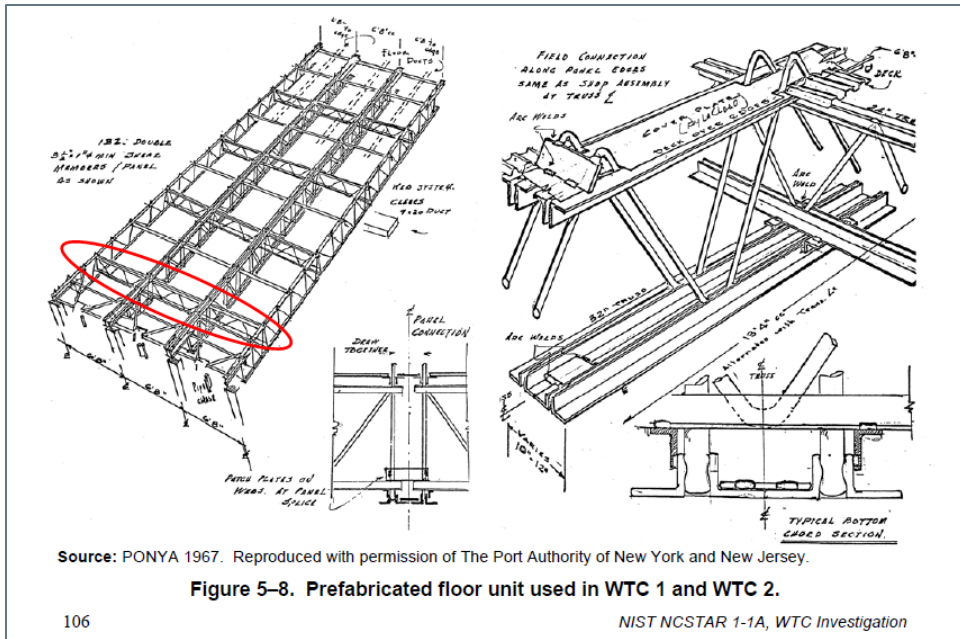


Figure 37: Floor truss assembly showing cross-bracing (red oval) that would have provided a significant cross-section for the propellant to impact as it traversed across the office area.

Of the steel pieces that were ejected outside the footprint of the tower, many have the dimensions of these trusses' components, but they are twisted, separated and distorted beyond recognition as an identifiable floor truss assembly. An example of recovered steel from the floor trusses is shown in Figure 38. It is as if the floor trusses were compressed like an accordion during the destruction.



Figure 38: Remnants of floor truss steel components.

In reviewing photos of the debris across all the devastation, only one assembly, shown in Figure 39, is identifiable as a floor truss. Such deformation of these floor truss assemblies into their unrecognizable

component pieces is supportive of the effects of a high speed, energetic propellant traversing from the core toward the perimeter columns and exerting forces on any object in its path.

Additionally, if these truss-diagonals were dislodged from the concrete by the propellant and yanked out of the concrete with such force that the debris could be hurled a great distance from the Tower, the concrete would have been largely shattered, initially in mid-air, by this mechanism. A subsequent mechanism that could have further destroyed the concrete, based on impacting reactionary propulsive forces, was discussed previously (see Figure 15).



Figure 39: The only identifiable floor truss observed in photographs of the WTC debris field

3.8 Pulverization of Concrete

A great deal of broken concrete was photographed in the debris around the Twin Towers. Many of the pieces captured in the photographs are small. Figure 40 and Figure 41 show significant amounts of broken concrete in the debris pile.



Figure 40: Showing Concrete chunks at the WTC. Source: FEMA_-_3945_-_Photograph_by_Michael_Rieger_taken_on_09-18-2001_in_New_York



Figure 41: New York, NY, September 20, 2001 -- Rescue workers from the Utah Task Force-1 Urban Search and Rescue team prepare debris to be cleared at the World Trade Center crash site. Photo by Mike Rieger/ FEMA News Photo

One of the longstanding characterizations of the destruction of the Twin Towers is that the concrete was “pulverized” in mid-air. The presence of an expanding white debris / dust cloud and analysis of the fine dust layer supports this description. An analysis of the layer of dust that blanketed lower Manhattan shows a significant amount of nonfiber (cement/carbon) material present in the samples taken to the east of the WTC³¹ and in the USGS analysis³².

³¹ Characterization of the Dust/Smoke Aerosol that Settled East of the World Trade Center (WTC) in Lower Manhattan after the Collapse of the WTC 11 September 2001, Environmental Health Perspectives, July 2002
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1240917/pdf/ehp0110-000703.pdf>

However, according to the nano-thermite based propellant hypothesis there are two intertwined mechanisms producing this dust cloud. The first is the reaction of nano-thermite, which produces aluminum oxide as a byproduct, which is characterized as a white smoke that eventually settles-out. The second is the dynamic breaking-up and rapid dispersion of the concrete in mid-air as the floor trusses' members and truss-diagonals are stripped away – followed by the reactionary forces that then create a violent churning within the falling debris to create smaller chunks and, apparently, some relatively fine concrete particles.

The observations about the debris cloud in the vicinity of the demolition (e.g., see the discussion above about the “Rooster Tails”) note that the debris cloud settled out quickly – unlike smoke from a fire where very light particulates from combustion could be carried up-and-away by the thermal plumes as smoke.

The white cloud that was observed during and following the destruction of the towers included aluminum oxide smoke from the reaction of the propellant. There are no surveys quantifying the amount of aluminum oxide in the debris because it was not considered significant. The key reason is that concrete is typically, 4 – 6 percent aluminum oxide and its presence would have been unremarkable. Figure 42 shows commercially available aluminum oxide which, if blown onto the streets of New York, would be indistinguishable from components in the white dust blanket that covered New York from river-to-river, as Governor Pataki said a few days after 9/11.



Figure 42: Aluminum Oxide powder is commercially available.

Figure 43 shows an aerial view of the dust deposits on the Manhattan landscape after the collapse of the North Tower, as well as the fine dust still entrained in the air. Chunks of concrete, and even large particles, would settle out near the WTC complex and would not travel from river-to-river.

³² Environmental Studies of the World Trade Center area after the September 11, 2001 attack, November 27, 2001, <https://pubs.usgs.gov/of/2001/ofr-01-0429>



Figure 43: A fine white dust covers much of lower Manhattan. Photo by Detective Greg Semendinger/N.Y.P.D.

3.9 Squibs

The “squibs” seen ejecting material many floors below the demolition front can be explained by propellant along the interior of the elevator shafts igniting from very high temperature embers emanating from activated propellant from the floors above. In an analysis of falling projectiles at the South Tower, David Chandler noted the presence of tower components descending faster than free-fall acceleration³³. He pointed out that the faster than free-fall acceleration of a piece of the tower indicates the presence of a propellant. In his video, Chandler describes the propellant as an explosive that could have been painted-on. But in keeping with the proposed hypothesis in this paper, a more appropriate explanation would be that a “clod” of propellant impacted the object – and the non-reacting end (away from the core) was impressed onto the object while the reacting end continued propelling.

According to the hypothesis in this paper, a high temperature ember propelled down the elevator shafts at faster than free-fall acceleration and landing on a nano-thermite propellant section – or its ignition system (magnesium ribbon, magnalium or some other technology³⁴) – could lead to the premature ignition of a specific panel. This would create forces perpendicular to the elevator shaft wall onto a (potentially) small portion of the exterior perimeter column section – possibly as small an area as one window. These localized “squibs” would suggest numerous small, independently activated propellant sections with a vertical dimension not exceeding one floor in height³⁵.

According to the hypothesis, the number of “squibs” should increase as the demolition proceeded because of an increasing number of potentially rogue embers – some propelled at greater than free-fall acceleration.

³³ Rockets at the World Trade Center, https://youtu.be/xvw0_i1rGns

³⁴ <https://pyrodata.com/PyroGuide/index.php%5Etitle=Thermite.htm>

³⁵ An unverified corollary to the squib hypothesis is that squibs should be observed in wall sections perpendicular to the elevator shafts and not in the corners.

3.10 Demolition of "Zone 3"

The demolition of "Zone 3," which consists of the 50 foot high atrium and basements, was very different from the demolition of "Zone 1" and "Zone 2." It appears that this happened because there were no floors in Zone 3 that needed to be propelled outward. The evidence shows that this area was crushed by falling debris and was not subjected to a propellant-based demolition. Figure 44 shows the area where 13 survivors³⁶ of the destruction of the North Tower were safely ensconced during the demolition. The north and west perimeter columns are shown standing with about four floors of core columns visible in the center of the devastation. Figure 45 shows a close-up of the survivor's stairwell during the debris removal phase of the clean-up.

Reactionary propellants traversing the core columns in "Zone 2" must have been safely above these "Zone 3" floors. Otherwise, the propellant would have been deadly to these survivors – so it is reasonable to assume that these floors were not subjected to the "Zone 2" mode of demolition.



Figure 44: Post demolition view of "Zone 3" with the North Tower (left) and South Tower (right) with the core columns protecting the survivors in the 4th floor stairwell identified by the red arrow.

³⁶ <https://www.911tap.org/557-news-releases/745-the-most-compelling-9-11-story>



Figure 45: Close-up of the survivor's stairwell during debris removal. The stairs can be seen along the inner wall of the elevator shaft / core area.

Inspection of the remaining “Zone 3” perimeter columns in Figure 46 shows that the floor truss connections are characterized by the remnants of the floor truss chords being pulled down and “pulled-apart” (e.g., using metallurgical jargon: necking caused by excessive force that resulted in ductile fracture). In this figure, the length of many remaining floor truss chords appears to be several feet long. The condition of these perimeter column floor truss seats is very different from the seats in “Zone 1” and “Zone 2” in which the bolted connections failed and any remnant of an attached floor truss chord is the exception. This suggests a very different mode of failure in “Zone 3”.



Figure 46: Inner perimeter columns in "Zone 3" of the North Tower showing hanging floor truss top chords.

An example of the pummeling the structure took from falling debris in this area is the account of what happened to Captain Kathy Mazza, PAPD³⁷. Captain Mazza, along with four others, was assisting a wheelchair-bound evacuee out of the North Tower when the building was destroyed. She and the rest of her group were crushed during the collapse and her body, along with the others, was found underground at what would have been the fifth basement level. The location of the victims was identified through large chunks of gray floor marble from what had been the North Tower lobby. Accounts from the survivors in the fourth floor stairwell that encountered this party said they would have been traveling down to the lobby where they could exit the Tower.

The "Last Column" which was taken from the area near where Kathy Mazza was found shows, like the "Zone 3" outer perimeter columns, that the seat was pushed-down and bent by falling debris.

This is in contrast to the destroyed bolted connections from "Zone 1" and "Zone 2," where the forces near the core were, according to this paper's hypothesis and the observed damage to the connections, largely horizontal – not vertical.

³⁷ <https://web.archive.org/web/20110212182404/https://www.nytimes.com/2002/02/11/nyregion/for-5-officers-apparent-last-heroic-act.html>



Figure 47: The "Last Column" was from the lowest level in the basement and shows the downward bend in a seat caused by falling debris that is characteristic of "Zone 3" damage.

4 Energy Balance

To provide support for the reasonableness of the propelled-demolition hypothesis, an estimate of the quantity of activated propellant observed during the demolition is useful. As shown in Figure 48, Jim Hoffman provided an estimate of the energy released based on the expansion of the dust cloud. He estimated that the energy released during the destruction of the North Tower would have been in the neighborhood of 1,500,000 kWh of energy (1.5e6 kWh or 5.4e12 Joules). The data shown on Figure 49 allows the energy density of nano-thermite (abbreviated as “NT” for these calculations) to be calculated. From the graph, the energy per gram is estimated to be 3,000 Joules/gram-NT. Along with the assumption that an “oxygen balanced iron thermitite” would have the density³⁸ of 4.175 g/cm³ yields 12,525 Joules/cm³-NT. With these assumptions, an estimated total 3.81e8 cm³-NT would need to be activated to produce the estimated 1.5e6 kWh of energy.

Assuming the propellant was applied uniformly onto the surface of the entire interior wall space of the core/elevator shafts (5.71e8 cm² based on interior dimensions of 420 m tower height, 27 m wide and 41 m long), the equal application of 3.81e8 cm³-NT would suggest an average application thickness of 0.755 cm-NT.

The estimated thickness of 0.755 cm is approximately 40 times larger than the 200 micron thickness of the red plus gray layers of the individual chips analyzed in the Harrit et al paper. A single 200 micron thick spray-on layer of the hypothesized NT-propellant would only provide 40,000 kWh of energy. This seems far too low and represents only 40 percent of the potential energy of each tower (e.g., effect of gravity, mass and height). This suggests that to produce the estimated 1.5e6 kWh of energy, the applied nano-thermite based propellant would need to consist of nearly 40 layers of the red-gray nano-thermite. This would likely necessitate installing pre-fabricated panels instead of spraying on 40 coats of alternating red-then-gray layers (if alternating layers of red and gray material are needed). Figure 50 shows an example of a multi-layered red-gray chip.

According to the analysis of rocket projectiles that David Chandler researched³⁹, activation of a relatively thick layer of nano-thermite propellant could, conceivably, propel clods of reacting propellant and/or un-activated layers onto structural components where they could produce the observed “rocket projectiles” motion.

³⁸ <https://en.wikipedia.org/wiki/Thermitite>

³⁹ Rockets at the World Trade Center, https://youtu.be/xvw0_i1rGns

Proofs: Dust Cloud Expansion


<< PREVIOUS

NEXT >>

Dust Cloud Expansion Energy Sink Vastly Exceeded Gravitational Energy Source

- Dust cloud of North Tower expanded to about 5 times building volume by 30 seconds from collapse start.
- Heat energy is required to produce expansion:
Ideal gas law: $PV = nRT$ where:
 P = pressure
 V = volume
 T = absolute temperature
- Heat required over 10X gravitational potential energy.
 - Energy required for 3.4X expansion is on the order of 1,500,000 kWh.
 - Gravitational energy was about 100,000 kWh.

[CNN video of North Tower collapse](#)



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Figure 48: According to Jim Hoffman, energy released during the demolition can be estimated by the thermal expansion of the dust cloud.

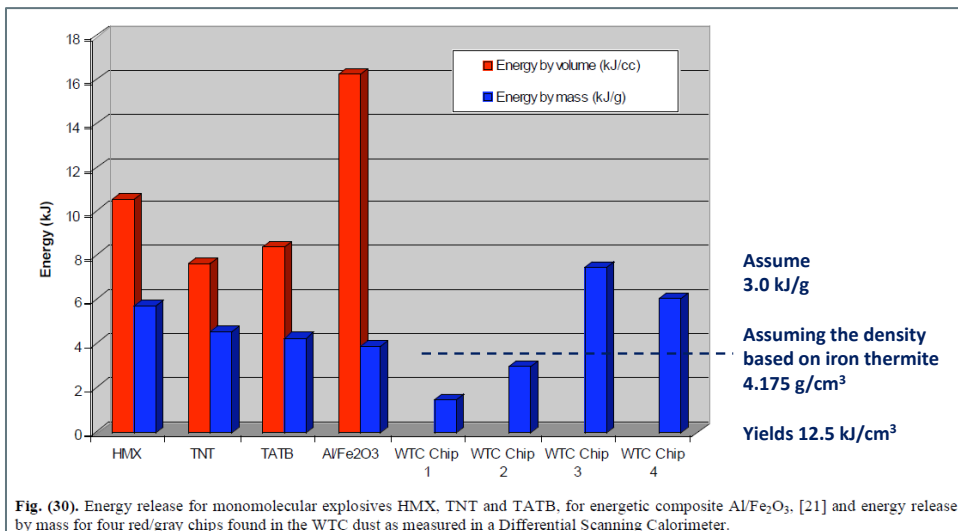


Figure 49: Annotated Figure 30 from Harrit et al showing basis for energy density

This amount of propellant would weigh approximately 1,900 tons and that amount of material would require approximately 90 truckloads, using standard tractor trailers. Delivery and storage might not be problem if the material was delivered labeled as 0.755 cm thick (0.3 inch thick) “paneling” or “flooring” material. Even watchful guards and bomb-sniffing dogs would not be suspicious of the delivery of such materials – especially if the delivery took place over the course of several months.

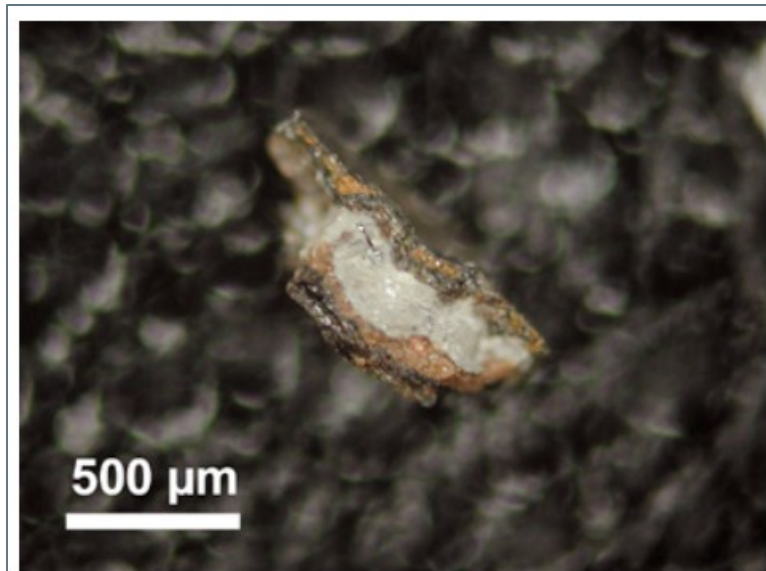


Fig. (31). Photomicrograph of a red/gray chip found in sample 3, showing multiple layers and an unusual light-gray layer between the red layers.

Figure 50: Example of multiple layers.

4.1 Displacement of Propellant Panels Due to Plane Impact

The presence of multi-layered propellant panels around the core (e.g. 0.755cm thick) provides a theoretical basis for the occurrence of some previously unexplainable observations. As illustrated in Figure 51, the impact of UA175 into and through the South Tower would have knocked down some of the hypothesized propellant panels across several floors. This illustration shows, conceptually, a number of panels knocked toward the northeast corner of the South Tower with some fragments propelled out of the building in a northeasterly direction.

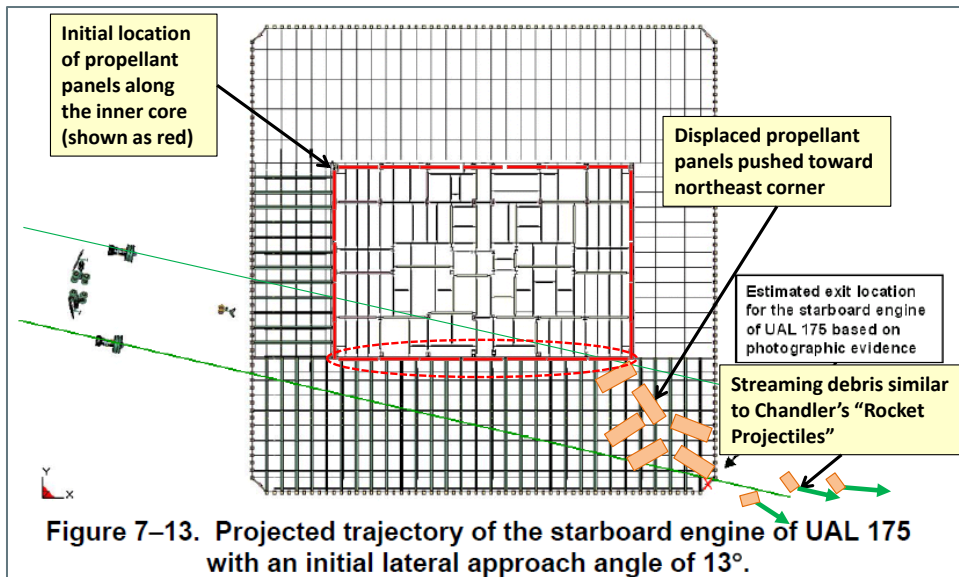


Figure 51: Displacement of propellant panels in South Tower upon impact may explain glowing debris and molten iron pouring from the building at this location.

Figure 52 shows three images— concurrent with UA175 impact – in which activated, propellant-driven objects are seen moving away from the tower at a very high rate of speed – while trailing white smoke. These projectiles are very similar in character to the “rocket projectiles” shown in Figure 53, which David Chandler discussed⁴⁰. It appears that some portion of the propellant was easily ignited during the energetic collision of the plane into the building structure⁴¹. It is quite possible that other projectiles may have been activated and flew in other directions, but were contained within the tower structure.

Additionally, it is quite possible that a portion of the spectacular fireball erupting outside the South Tower could be not just jet fuel, but also activated nano-thermite propellant. In the next section, the premature activation of propellant panels in the North Tower during the plane impact will be considered.



Figure 52: Three views of post-UA-175 projectiles at the South Tower exhibit trailing white smoke that is very similar to the “rocket projectiles” described by David Chandler.

⁴⁰ South Tower Smoking Guns (Follow-up), David Chandler, <https://youtu.be/cMX7qHGEODs>

⁴¹ Possible ignition sources could have included sparking from electric power cables. This could have activated some propellant panels and left others un-activated.



Figure 53 Projectile shown in “South Tower Smoking Guns” that changes direction due to propellant while trailing white smoke.

4.2 Premature North Tower Propellant Activation

While the video footage of the impact of AA11 into the North Tower is very limited, the photographic record supports the activation of the propellant as the plane passed through the building. Unlike the South Tower where the impact angle was at about 20 degrees, the plane passed through the North Tower core with just a slight angle toward the east⁴² and appears to have activated the propellant only on the east side of the elevator shafts. Activation on the east side could have occurred because the plane was further to the east and (potentially) radiative heat was more intense, or more opportunities were present for electrical sparking from power cables due to impact geometry.

Figure 54 shows two views of the propellant activation as AA 11 impacted the North Tower. The mushroom activation pattern in the east face is similar to the activation pattern that was observed during the demolition phase of both the North and South Towers, whereby the propellant force was directed outward – perpendicular to the core region and not seen in the corners. Figure 55 shows the propellant activation across several floors from a side view as captured by the Naudet brothers.

⁴² A slight angle toward the east is required for the landing gear to have landed at the corner of West and Rector Street.



Figure 54: Photograph of the North Tower impact by Wolfgang Stahle (left) that shows ejections from the east face of the North Tower which has the same characteristics as seen during the propelled demolition of the Towers. Another view captures the ejection from the east face.



Figure 55: Ejections from the east face of the North Tower captured by the Naudet Brothers

Because of the size and location of the entrance hole in the North Tower, the left wing could not have been the object performing the damage to the east facing perimeter columns. However, assuming there was an activation mechanism, the propellant hypothesis fits the observations. Figure 56 shows a relatively unobstructed view of the eviscerated perimeter columns in the area perpendicular to the core columns for about a half-dozen floors. This eviscerated area, extending over a half-dozen floors, is the same area as the mushroom activation pattern in the Wolfgang Stahle image (Figure 54). The perimeter columns are seen intact to both the left and right of the gaping hole in the east façade – while the perimeter columns and floors appear missing.



Figure 56: Relatively clear image of the eviscerated perimeter columns and missing floors in the area perpendicular to the core columns.

4.3 North Tower Lobby Explosion

It is even conceivable, if not probable, that the activation of a propellant panel dislodged by AA11 and falling down the elevator shaft was the source of the “explosion” in the lobby of the North Tower immediately after, or concurrent with, the plane impact. An explosion damaged the lobby area and killed Bobby Mcillvaine⁴³. If so, the mechanics of the panel movement and its ignition near the lobby level are unknown but makes a more credible hypothesis than jet fuel streaming down the elevator shaft to create a 1000 vertical foot air-fuel mixture that ignited and only created recorded damage at the lobby level.

Additionally, the falling and activating propellant panel makes a better hypothesis than intentionally placed explosives in the North Tower lobby. One reason this makes a better hypothesis is that no parallel explosive event happened in the South Tower lobby – suggesting North Tower was an a random event due to plane impact circumstances.

4.4 Molten Iron Flowing From the South Tower

In the few minutes prior to the collapse of the South Tower, molten iron was seen flowing out of the building near the location where plane parts exited in the northeast corner following its impact. This is the hypothesized location where propellant panels (or fragments of them) could have been pushed- as shown in Figure 51. Because of the impact angle, it is hypothesized that most of the panels were shattered and knocked-down without being ignited (Figure 52 shows examples of some debris ejected with properties characteristic of activated propellant). It is assumed that these propellant panels were eventually activated by the fires (and/or squibs) approximately 5 minutes before the onset of demolition, when the smoke flowing out of the east face of the South Tower became much more voluminous. Once this propellant debris began to be activated in this corner, high temperature fires ensued, which propagated the thermitic reaction – resulting in all the thermitic material being turned into AlO₃ smoke and molten iron. The resulting pool of molten iron eventually created a path that flowed outside of the building.

⁴³ A Father’s Search for Truth Reveals Clues to a Controlled Demolition, <https://www.ae911truth.org/news/276-news-media-events-a-father-s-search-for-truth-reveals-clues-to-a-controlled-demolition>

Consistent with the hypothesis of this paper, we can estimate a pool of approximately 589,559 cm³ (156 gallons) of molten iron available to flow out of the tower⁴⁴.



Figure 57: Molten iron streaming out of the South Tower shortly before the demolition began.

⁴⁴ 156 gallons of molten iron = 589,559 cm³ of molten iron = 381 Panel height (cm) x 4,100 Panel length (cm) x 0.755 propellant thickness (cm) x 0.500 (assumed half iron)

5 Conclusion

This paper has developed a “propelled demolition” hypothesis that suggests the interior of the elevator shafts were lined with panels of nano-thermite based propellant consisting of up to (possibly) 40 layers of red/gray material, providing a propulsive energy content of approximately 9.45 kJoules /cm². This material was activated floor-by-floor in all directions to eject the perimeter columns which then simultaneously severed the bolted connections between the floor trusses and the channels (attached to the core). This process created the outward ejection of debris, some of which had propellant impinged onto it as documented in David Chandler’s “Rocket Projectile” analyses.

The reactionary force (opposite to the forward direction of the propellant) then created the observable “rooster tail,” in which debris from the demolition travels upward at a shallow angle against gravity as it travels outward and away from the epicenter of the demolition. These observed “rooster tails” are inconsistent with a gravity-only collapse hypothesis and need a mechanism to create an upward trajectory.

Additionally, the propelled demolition hypothesis can explain the destruction of the east façade of the North Tower upon the impact by AA11, whereby the propellant was activated across a half-dozen floors. It is physically impossible for the plane itself to have created the observed damage to the east façade as it traveled through the center of the north side of the North Tower and exited out of the center of the south-side of the North Tower.

Furthermore, the impact of the plane into the South Tower created projectiles which are consistent with the plane dislodging and activating some amount of the propellant, which then traveled out of the opening in the northeast corner created by heavy plane parts.

The propelled demolition hypothesis is also able to explain the molten iron streaming out of the South Tower shortly before the tower’s destruction, as displaced panels of propellant eventually ignited creating molten iron in this location.

This paper shows the importance of reviewing the scene of an incident in an organized and comprehensive manner. The events at the World Trade Center on 9/11 left a plethora of evidence for investigators to evaluate. It is unfortunate that in the last 19 years more time has not been put into asking questions about failures of specific bolted connections and what could have caused the “rooster-tails” of debris in the four cardinal directions, among other features of the demolition discussed above.

5.1 Fallibility of Initial Hypotheses

Undoubtedly, the hypothesis presented here can be refined and the placement and description of the hypothesized propellant panels may eventually be superseded with more in depth analysis of the activation of the squibs and ejections of the perimeter columns. Careful investigation of all the available evidence can yield an understanding of what actually happened and how the physical damage was done.

5.2 Detailed Analysis of Available 9/11 Evidence is Critical – Even at the Pentagon

Even the controversy about what impacted the Pentagon has been resolved by a careful analysis of all the observations⁴⁵. Figure 58 describes some of the key observations that define the impacting object at the Pentagon, such as the pivot points for the left and right wing ends, which can only be explained by an object with the dimensions of a Boeing 757⁴⁶. Additionally, because of the timing separation between the two parking gate security cameras, a detailed analysis was able to estimate the impacting plane’s speed across

⁴⁵ Explanation of the Evidence at the Pentagon on 9/11, Created by Wayne Coste, narrated by David Chandler, <http://911speakout.org/wayne-coste/>

⁴⁶ Chapter 8: Plane Impact Analysis, <https://www.youtube.com/watch?v=fzF5smjFVxc>

the lawn at approximately 542 mph⁴⁷. Claims about the use of explosives at the Pentagon cannot withstand even cursory scrutiny of the physical damage and other forensic evidence⁴⁸.

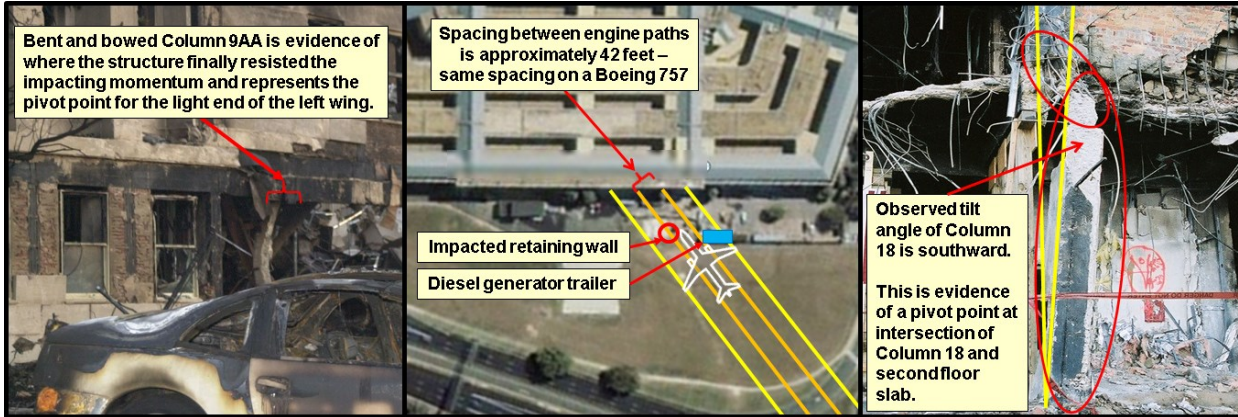


Figure 58: Review of the Pentagon damage reveals the pivot points for left (left) and right (right) wings where the building resisted the plane's impacting momentum. The pre-impact damage reveals a 42 foot separation between engines.

⁴⁷ Chapter 11: Pentagon Security Camera Analysis, <https://www.youtube.com/watch?v=SunhDlCMJlc>

⁴⁸ Peer Review of Barbara Honegger's Parallels Between the WTC and Pentagon Evidence and Why It Matters, <https://www.youtube.com/watch?v=7nxdThV4egA>

6 Acknowledgements

It is impossible to acknowledge all the 9/11 researchers that have contributed to the development of this hypothesis. Special mention will go to Jim Hoffman, David Cole, Niels Harrit, Steven Jones, Richard Gage and especially David Chandler for their efforts to document and analyze the events on 9/11 using rigorous scientific and engineering techniques. Even the irascible debunkers have had a role in the development of this paper by forcing a deeper understanding of the mechanism of destruction and the physical processes involved. A special shout-out goes to 'Erik' – without whose unrelenting nonsense⁴⁹ the concepts underlying this paper would not have crystalized.

[End]

⁴⁹ Nonsense, even though 'Erik' has a demonstrated competence with complex technical issues.

7 Appendix – Portion of Interview with Niels Harrit

The following is a transcript of a portion of an interview given by Niels Harrit to Andy Steele in May 2019⁵⁰:

[...]

Thermite is an old invention. The chemical reaction was published for the first time in 1893 by a German chemist named [Hans Goldschmidt](#), who discovered that when you mix aluminum powder and pulverized rust (let us call it that) you can make them react – and the reaction is extremely violent and can reach temperatures of 2,500 degrees centigrade (4,500 degrees F). It's about 1000 degrees centigrade beyond the melting point of iron and steel – and it produces molten iron in the process – at extreme high temperature. It's very useful reaction because it produces molten iron so that it could be used for welding. It was patented for this application by 1898.

But it can also be used for destruction.

But as an incendiary it acts by means of heat – while an explosive acts by means of force. An explosive knocks things apart, but incendiary burns it. It is not a fire, but it is very, very hot.

I said that the old time thermite, the Hans Goldschmidt thermite, is made by mixing the ingredients pulverized aluminum and pulverized rust as two powders. Then nano-technology came along in the 1980's (late eighty's; early ninety's) which is a completely different way of making materials. You do not make things from the top down – you make the materials from the bottom up. You trick the chemistry to make the materials “atom-by-atom” or “molecule-by-molecule.”

Bottom up. It's a fundamentally different way of making materials – nanotechnology. In this case, it means that the ingredients, the particles (which in this case are iron oxide/rust and aluminum) are much smaller and they are embedded in a plastic matrix which makes them much, much easier to handle.

But you still have the energy. Now I have to talk about energy because the thermite reaction has lots of energy, but it's very slow compared with explosives.

Many people think that explosives are very energetic, but they are not. Rather, they are extremely fast.

I mean you get more energy out of burning a log of wood – but it takes hours. But if you blow the same energy in microseconds, you get the explosive effect. So explosives are very, very fast. Old-time thermite is very slow, but has a lot of energy.

With nanotechnology, you could take advantage of the high energy content of the thermite reaction and gain the speed of the explosive because the ingredients, the particles, are so small. Nanotechnology puts you in a position where you can “tune” the material, which we now call energetic materials. You can tune it on a scale from incendiary to explosive – and in between you have something like rocket fuel.

Rocket fuel is also very energetic. It is faster than an incendiary but it's not as fast as an explosive. If it was faster, the rocket would blow up. A rocket fuel should release the gas with high speed but not too high of a speed (too fast and the rocket will explode). The gas that is released from the rocket fuel and explosives can do work. It can take things apart or it can lift the rocket.

⁵⁰ <https://www.911tap.org/557-news-releases/809-niels-harrit-discusses-nanothermite-and-activism>

So this is the situation in the 1990's when the military discovered this opportunity for using the energy in the thermite reaction to do work. You can make explosives from the thermite reaction, and you can make rocket fuel. You can "tune" the thing.

Many people have called the nano thermite we found called it militarily grade explosive. I disagree.

We don't know that it was a military grade explosive – and I don't believe it was.

[...]

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