Assessing Alternate Theories about the Twin-Tower Destructions

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Abstract

An assessment approach is presented and exercised with respect to the World Trade Center Twin-Tower Destructions on September 11, 2001. These destructions are unusually difficult to analyze because a large percentage of the evidence has been destroyed or is possibly being withheld from the public. The assessment approach includes a judgement of the quality of evidence as well as an evaluation of the consistency between the evidence and particular theories. For the example assessment, nine issues have been selected representing a sampling from an even larger list of perplexing issues associated with the Twin-Tower Destructions. On one end of this broad spectrum of issues are several that appear to convey the idea the towers were destroyed in a "surgical" manner. If this were in fact the case, the planners could well have had in depth knowledge of the structural details, and been skilled in the art of building demolition. On the other end of the spectrum is indirect evidence that for some parts, something much different from "surgical" may have been employed, rather more like the placement of tactical nuclear devices. To work through these nine issues in a realistic manner, four candidate theories are assessed. They are (1) Runaway Open Office Space Destructions (ROOSD) and Explosives, which is more generically called "progressive floor collapse," (2) Explosive Demolition, which is advocated by Architects & Engineers for 9/11 Truth (AE911Truth), (3) Directed Energy Weapons, and (4) Nuclear Devices. Although this example assessment strives only to address the Twin-Tower Destructions, some items of evidence may have been products of one or more other WTC building destructions. The two most notable evidence examples are from the chemical analysis of dust samples, which suggest the presence of radionuclides that would be products of fission, and significant traces of tritium found in the WTC sewer water.

Introduction

There is a need for an organized approach to assessing candidate theories applicable to the World Trade Center Twin-Tower Destructions on September 11, 2001. An approach is presented herein, and illustrated in the form of an example. The example considers four candidate theories, each of which possibly explain the destructions of the Twin Towers. The assessment approach employes a scoring system for addressing a number of pertinent issues. For this example application of the assessment method, nine issues are addressed.

The four candidate theories will serve to illustrate the method. Note that these four do not encompass what might be called the official theory. Actually, there is no official theory for the destruction itself, in that the 9/11 Commission did not attempt to explain anything beyond the initiation of collapse.

ASSESSMENT PROCEDURES

The initial step is selecting the candidate theories for consideration. Next is the selection of issues for consideration. Third, the scoring method and accompanying rating scale.

Candidate Theories

For this example, four candidate theories have been selected: (1) ROOSD & Explosives; (2) Explosive Demolition; (3) Directed Energy Weapon; and (4) Nuclear Devices.

ROOSD & Explosives (R&E)

Runaway Open Office Space Destructions (ROOSD) is applicable to Twin-Towers type architecture, where the open-office-space (OOS) floors are supported by two sets of columns; the perimeter outer set surrounding the structure, and the inner perimeter core columns.

An idealized explanation of the concept is, if the OOS portion of the originating floor is "separated" from the columns, it will drop unimpeded to the floor below. This separation could be by carefully placed cutter charges, or by a more dramatic displacement of the upper block of floors laterally, such that one side of the upper facade drops free of the row of columns below. This could "strip away" the first several floors below, serving the same effect of "separating" the floors from their supporting columns.

The floor below, not designed to arrest this fall, will join in a runaway cascade of OOS floors to the bottom, known technically as a progressive floor collapse. A process very similar to the ROOSD description of progressive floor collapse has been modeled mathematically by A.G. Vlassis, B.A. Izzuddin, A.Y. Elghazouli and D.A. Nethercot. The paper is titled, *Progressive Collapse of Multi-story Buildings Due to Failed Floor Impact*.[1]

The facades, in the form of perimeter panel sections, will peel away in sheets as their lateral support is removed. Core columns and interconnecting structure partially remain, at least for a short time in some instances.

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[1] http://spiral.imperial.ac.uk/bitstream/10044/1/1466/1/EngStr09%20-%20AGV_BAI_AYE_DAN.pdf

The ROOSD is explained on the Internet by an individual using the pseudonym "Major_Tom" on The 911 Forum. This is contained in "WTC Progressive Floor Collapse Model,"[2] a section within his web-basd book, *World Trade Center Evidence-Based Research: 9-11-01 Visual Evidence Archive*.[3]

For this assessment, I am assuming the separation of initiating OOS floor from columns is the indirect result of explosives of some kind. ("Major_Tom" does not claim to provide answers to what exactly initiated ROOSD, or if it was an intentionally applied force.)

Explosive Demolition (ED)

This theory of Twin Towers destruction is as described by AE911Truth.org[4] on their evidence card, EXPLOSIVE Evidence (Fig. 1). Richard Gage, AIA, and Founder of AE911Truth, emphasizes the ten points of evidence listed along the left-hand side.

These points of evidence are:

1. SUDDEN ONSET of Destruction at Location of Jet Impacts
2. STRAIGHT-DOWN, Symmetrical Progression Outside Footprint
3. 200 fps EJECTIONS of Bldg. Mat's AT LOWER FLOORS
4. 2/3 FREE FALL ACCELERATION thru Path of Greatest Resistance
5. Near TOTAL DESTRUCTION of Structural Steel Frame
6. LATERAL EJECTION of Structural Steel up to 600 feet at 60 mph
7. Patterned Sounds of EXPLOSIONS AND FLASHES of light
8. Enormous Pyroclastic-like Clouds of PULVERIZED CONCRETE
9. Pools of MOLTEN IRON & IRON MICROSPHERES in WTC Dust
10. Nano-thermite Composite EXPLOSIVES found in WTC Dust

As an added note related to high explosives, Gage allows for the possible use of high explosives, but does not emphasize this possibility.

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[2] http://www.sharpprintinginc.com/911/index.php?module=pagemaster&PAGE_user_op=view_page&PAGE_id=269&MMN_position=525:525

[3] http://www.sharpprintinginc.com/911/index.php?module=pagemaster&PAGE_user_op=view_page&PAGE_id=286&MMN_position=548:548

[4] http://www.ae911truth.org/en/evidence.html

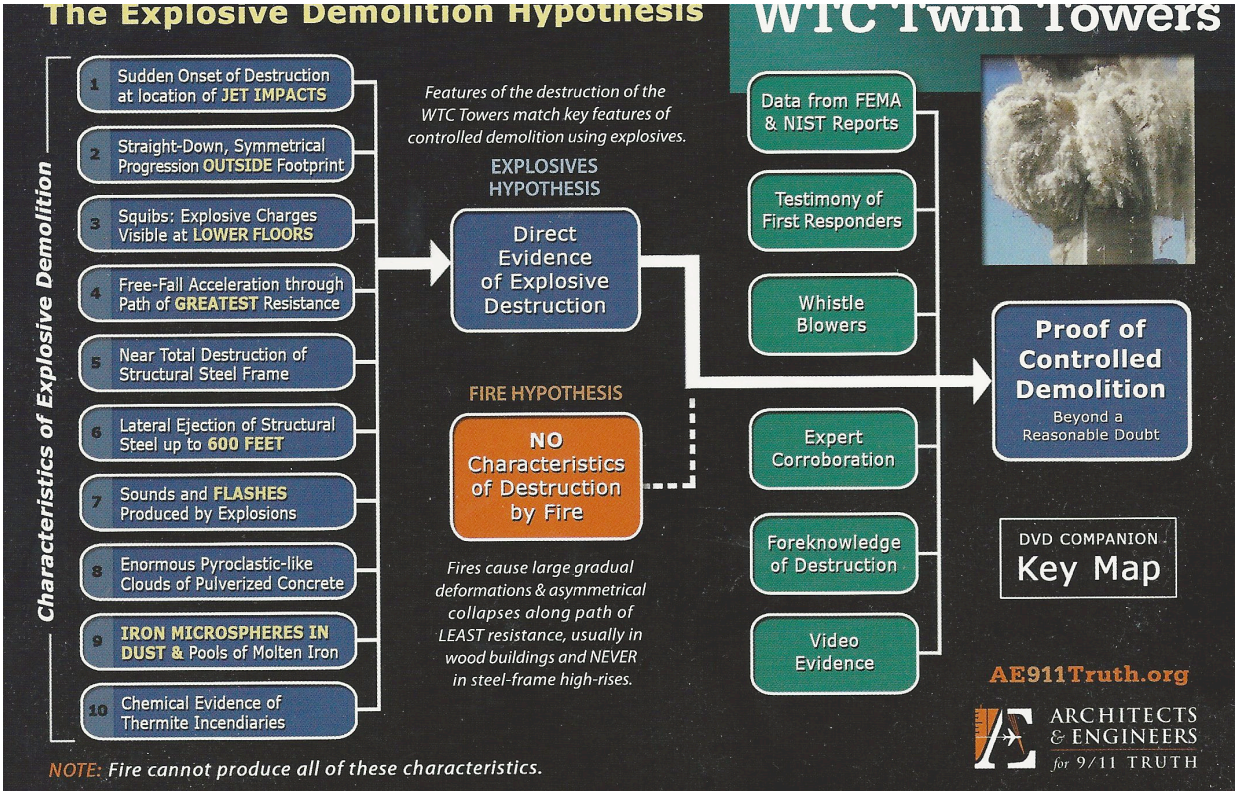

Fig. 1 - The Explosive Evidence Hypothesis related to the WTC Twin Towers

Directed Energy Weapons (DEW)

This third candidate theory is drawn from Dr. Judy Wood's book, *Where Did The Towers Go?: Evidence of Directed Free-Energy Technology on 9/11*.[5] I must note, Dr. Wood does not claim to have presented a theory in this book. Rather, it is a presentation of evidence that she describes as consistent with directed energy weapons, including directed free energy. Dr. Wood groups this evidence into four categories[6]:

1. Evidence of Directed Energy Weapons
2. Molecular Dissociation: from Dust to Dirt
3. Anomalies at the WTC and the Hutchison Effect
4. 9/11 Weather Anomalies and Field Effects

Among these four, the concept of "free energy" plays a role. For the issues considered in this example, free energy does not seem to be a necessary ingredient. Therefore, this assessment will not rely on any free-energy claims that otherwise might be connected to this theory.

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[5] Judy Wood, B.S., M.S., Ph.D., Where Did The Towers Go?: Evidence of Directed Free-Energy Technology on 9/11, (2010)

[6] http://www.drjudywood.com/

Nuclear Devices (ND)

For this assessment example, a generalized version of several nuclear device possibilities will be hypothesized. Some proponents of nukes argue for fission bombs, whereas others argue for fusion. Furthermore, no particular placement of devices will be assumed.

A good case for nukes at the WTC is made by Jeff Prager in a free online two-part e-book.

9/11: America Nuked (Part 1)[7]

9/11: America Nuked (Part 2)[8]

Perplexing Issues

There are many issues involving the Twin-Towers Destructions. For example, here are 16 perplexing issues in alphabetical order to show the breadth of possibilities:

1. Basement blasts
2. Crush rates
3. Debris patterns
4. Iron-rich spheres
5. Nano-thermite
6. Persistent heat
7. Pulverization
8. Radiation-type illnesses
9. Radionuclides
10. Rising dust cloud
11. Seismic response
12. Smoke and/or fumes
13. Squibs
14. Temperatures (immediate)
15. Tritium
16. Vehicle anomalies

There certainly are more issues. Even narrowing it down to 16 is too much to handle as an example. Any role the crashed airplanes may have played could be treated as an issue. That can be left as an exercise for the reader. Thus, I have picked just nine issues in order to package them into a little competition, similar to a baseball game.

Without any rationale for down selecting to just nine, consider it something like drawing out of a hat, that is, by chance. Here is a list of nine in the order they will be considered:

1. Crush rates
2. Debris patterns
3. Nano-thermite
4. Temperatures (immediate)
5. Persistent heat
6. Vehicle anomalies
7. Tritium
8. Basement blasts
9. Radionuclides

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[7] http://www.datafilehost.com/download-79644cfa.html

[8] http://www.datafilehost.com/download-51eec327.html

Scoring System

The scoring system is devised to provide some structure to the assessment process.

This particular scoring system is something devised by the author after considering other possibilities. In most other scoring systems, there is a need to establish weighting factors between the various issues. There also is the presumption all the important evidence can be obtained. In the case of the Twin-Towers Destructions situation, much of the evidence has been withheld from public access, or intentionally destroyed. Thus, the public only has access to a limited amount of evidence, and much of it is of questionable reliability.

Accordingly, the scoring system takes into account the problem that much of the evidence is of questionable reliability.

The scoring systems consists of a rating scale for evidence as it relates to each issue, and as it applies to each theory under consideration.

Fig. 2 is a rating scale that takes into account the reliability of the evidence, coupled with the consistency between the evidence and the theory. The ratings are decimal fractions between zero and one. Including the zero as the most unfavorable possibility means that, if some evidence judged to be of highest reliability is directly contradictory to a theory, multiplying by zero is a means by which that theory can be removed from further consideration.

RATING SCALE

Consistency \ Evidence Reliability	Low	Medium	High	Highest
High	0.5	0.7	0.8	1
Good	0.4	0.6	0.7	0.8
Intermediate	0.4	0.4	0.5	0.5
Doubtful	0.4	0.3	0.2	0.2
Contradictory	0.3	0.2	0.1	0

Fig. 2 - Rating Scale

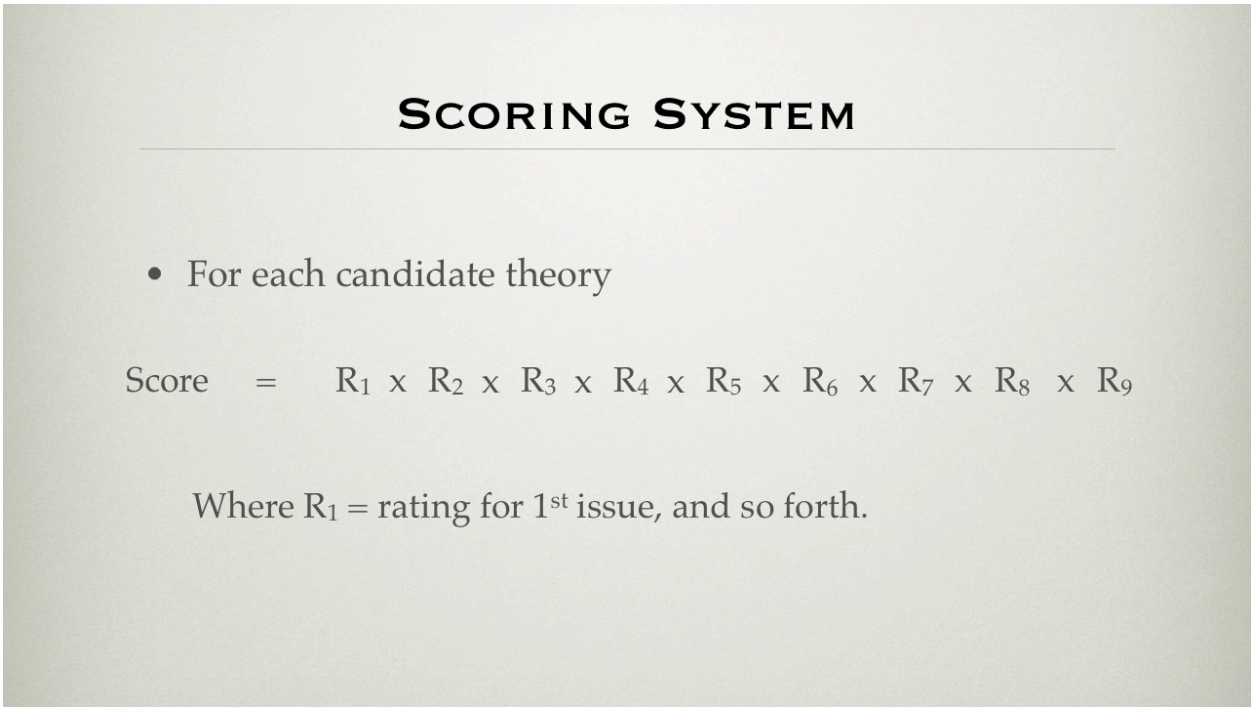

Fig. 3 - Scoring System

The score for a theory will be the product of the rating fractions for all nine issue, as shown in Fig. 3. As the issues are addressed, one by one, it will be similar to the innings in a baseball game. The final score comes after all nine “innings” have been played.

EXAMPLE ASSESSMENT

1. Crush Rates

Here is the first issue, Crush Rates. This is the wave of destruction down the faces of the Towers. The "WTC Progressive Floor Collapse Model" reference describes it as the "collapse front propagation rate."

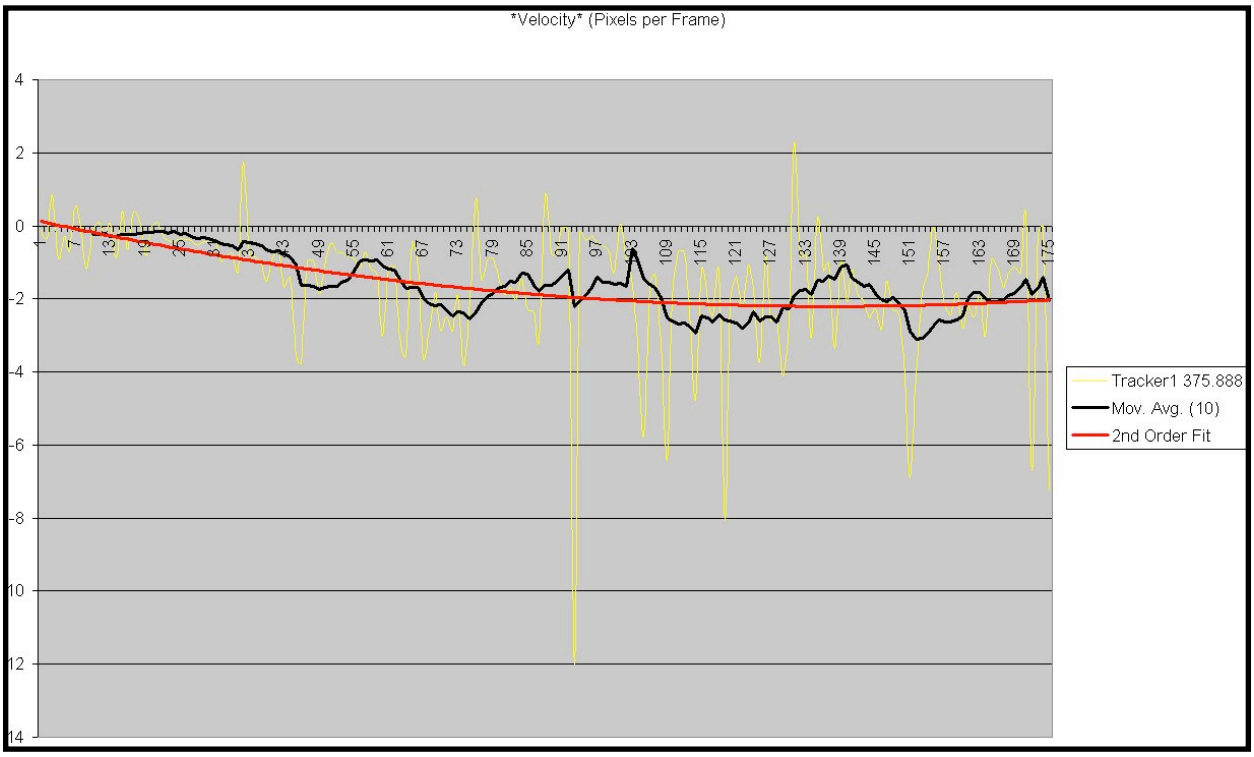

Fig. 4 - WTC 1 collapse front propagation rate measurement-based estimate

On the southwest corner of WTC 1, the downward velocity has been measured, with the red line in Fig. 4 showing the curve fit. It settles out at 8 stories/sec downward velocity. These measurements are documented in Appendix D - Collapse front propagation rate down WTC 1 southwest corner[9]. Also noted on the website, the south side leads the other sides, and the west side has a rate varying from south to north. Also noted, the rates correlate with the floor-load capacities and/or floor-truss lengths.

Fig. 5 is a typical floor diagram as contained in NIST NCSTAR 1-2A. Looking only at the OOS floors, the live loads design spec is different for the size and location of the different floor sections, 82.5, 55, and 70 PSF.

[9] http://www.sharpprintinginc.com/911/index.php?module=pagemaster&PAGE_user_op=view_page&PAGE_id=269&MMN_position=525:525

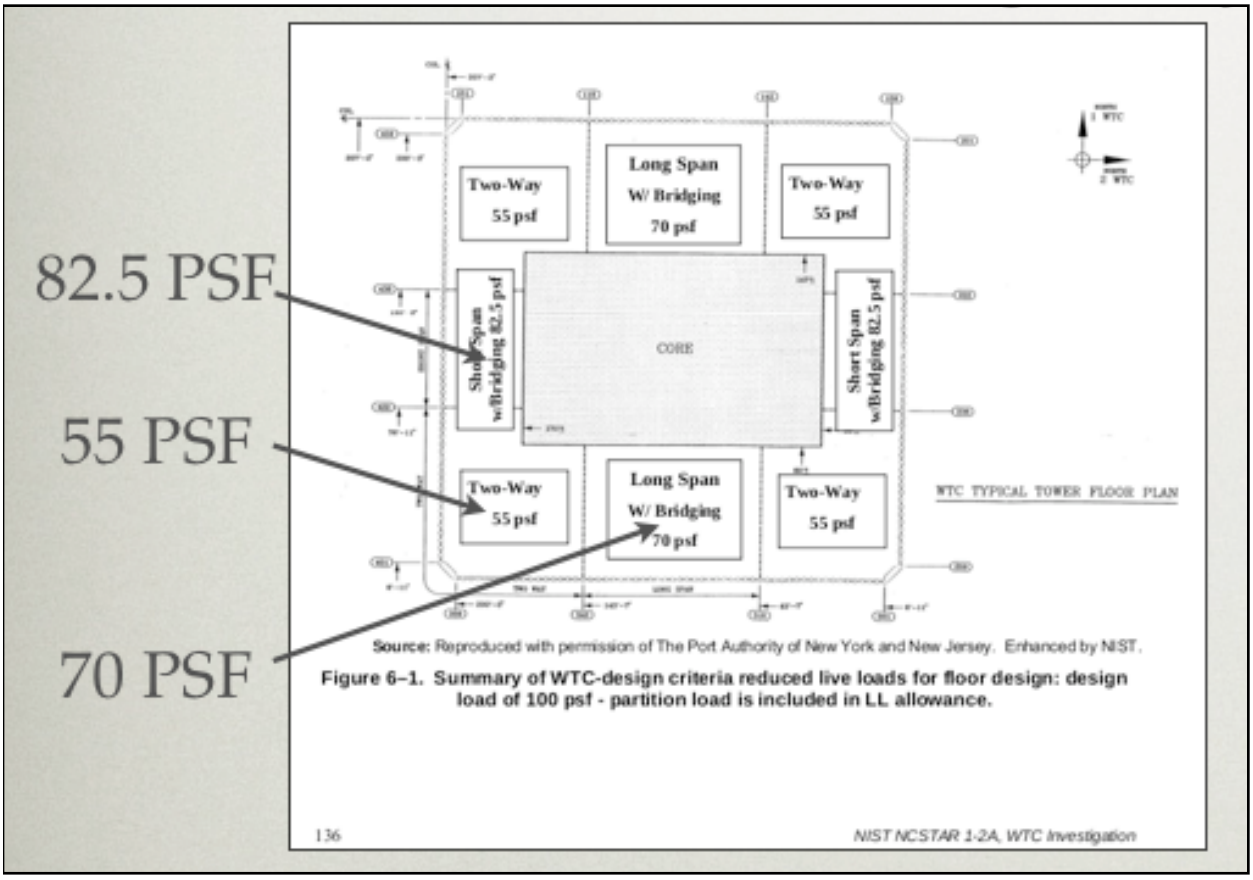

Fig. 5 - WTC TT standard floor layout

The crushing of the floors was without respect to the status of the columns, as they were all solidly in place. In the most extreme case, the northern part of WTC 1 core remained standing up to the 50th floor (what has become known as the "spire"). This core section remained standing for quite a few seconds after the OOS floors had collapsed, and even a few seconds after the perimeter facade had peeled away.

Table 1 summarizes the main explanations for the crush rates evidence for the four theories.

Table 1 - Crush rates alternate explanations

Theory	Alternate Explanations
R&E	Crush rates consistent with OOS floors cascading downward.
ED	PoE #4 doesn't consider crush rates.
DEW	No obvious role
ND	No obvious role

R&E has the most consistent explanation of the four. “Explosive Demolition” Point of Evidence (PoE) #4, claiming 2/3 free-fall acceleration, doesn’t look at the demolition wave, as such. Also, the phrase “thru Path of Greatest Resistance” is focused on the columns. That theory doesn’t consider the possibility that the crush front is the cascading OOS floors.

Table 2 shows how the ratings are determined based on the rating scale shown earlier. The evidence is of the highest reliability, as it has been measured carefully from video records. Explosive Demolition has been given a “good” consistency evaluation, as the careful application of cutter charges which that theory assumes, could have the results apparent in the evidence. The DEW and ND have doubtful consistency with this evidence.

Table 2 - Ratings - Crush Rates

	Consistency	Evidence	R*
R&E	High	Highest	1.0
ED	Good	Highest	0.8
DEW	Doubtful	Highest	0.2
ND	Doubtful	Highest	0.2

R* = Rating (and in subsequence tables)

Fig. 6 is the standard “end of the inning” display. The going in score is the blue line, that is, the score at the start of the inning. In this case, it is unity across the board. The height of each bar is the score. R&E is in the lead at the end of the first inning.

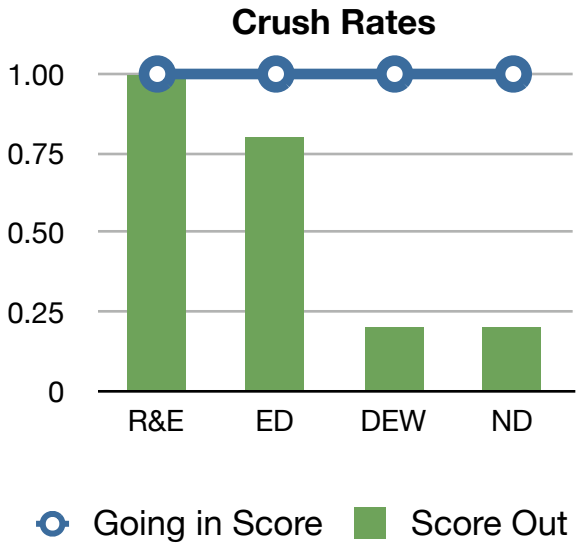

Fig. 6 - End of 1st inning score

2. Debris Patterns

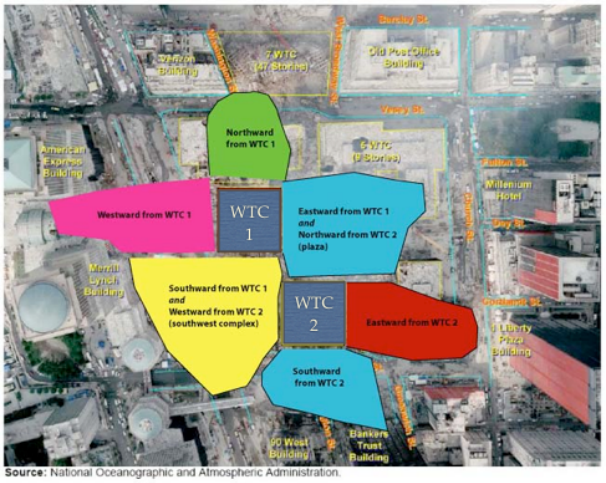

Fig. 7 - Debris patterns around Twin Towers (NOAA diagram)

The second issue is debris patterns. Fig. 7 shows the debris patterns reported by National Oceanic and Atmospheric Administration (NOAA). There are differences in patterns between the various faces of the two Towers. Close examination reveals a connection between debris patterns and certain OOS floor features.

"Major_Tom" and other regulars posting on The 9/11 Forum[10] have detected differences in crush rates (ROOSD fronts) associated with OSS span-truss lengths and a bias favoring one side. Fig. 8 provides a diagrammatic illustration showing the types of ROOSD fronts for each of the eight sides, and an indication of the nearest non-WTC buildings that represent objects the designers may have wished to avoid. In the case of Tower 1, the long-span trusses are on the north and south side, and the bias favors the south side. This produces a leading ROOSD front. Similarly, a leading ROOSD front for the east face of Tower 2.

The walls with lagging ROOSD fronts are the remaining long-span truss faces which are to the north of Tower 1, and the west of Tower 2.

All of the short-span truss faces have uneven ROOSD fronts, varying as much as 20 stories between one side and the other.

Why is all of this important? Because, there appears to be a degree of control and direction of the debris patterns depending on the bias.

Fig. 9 is a little different depiction of the eight tower walls. The yellow dots are the walls with leading ROOSD fronts (biased that way). The orange are lagging. Asterisks are walls with uneven ROOSD fronts.

It appears from the evidence that the droppings (LONG or SHORT) can be (or were) controlled by manipulating the stiffness of the bands at the MER (Mechanical Equipment Rooms) levels. For example, Tower 2 east wall (a leading ROOSD front), with a failure line just above the MER between the 74th and 78th floors had a single vertical break in both MER levels. Apparently, a single break resulted in the MER stiffness remaining intact. The result -- a LONG drop

In another example, Tower 2 west wall, a lagging ROOSD front, had three vertical breaks in the 74-78 MER band. Breaks included ejections of band sections still connected to floor sections. Presumedly, this destroyed the stiffness of the band, and affected the stiffness of the 30-story wall section. The result -- a SHORT drop.

A third example, Tower 1 west wall this time, and an uneven ROOSD front, and higher failure line. Because of the uneven front, the wall twisted before peeling away. The result -- a LONG drop, but a bit shorter because of the twist.

[10] http://the911forum.freeforums.org/portal.php

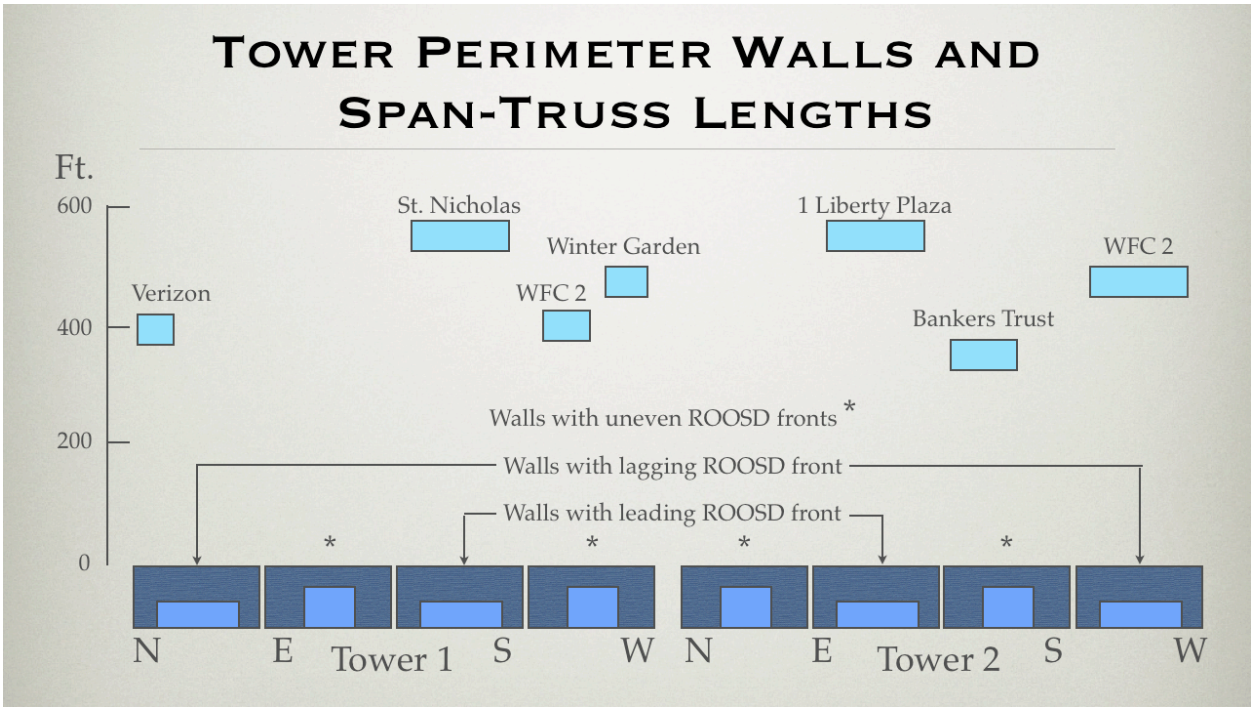

Fig. 8 - Diagram of Tower faces and ROOSD fronts information vs. nearby buildings

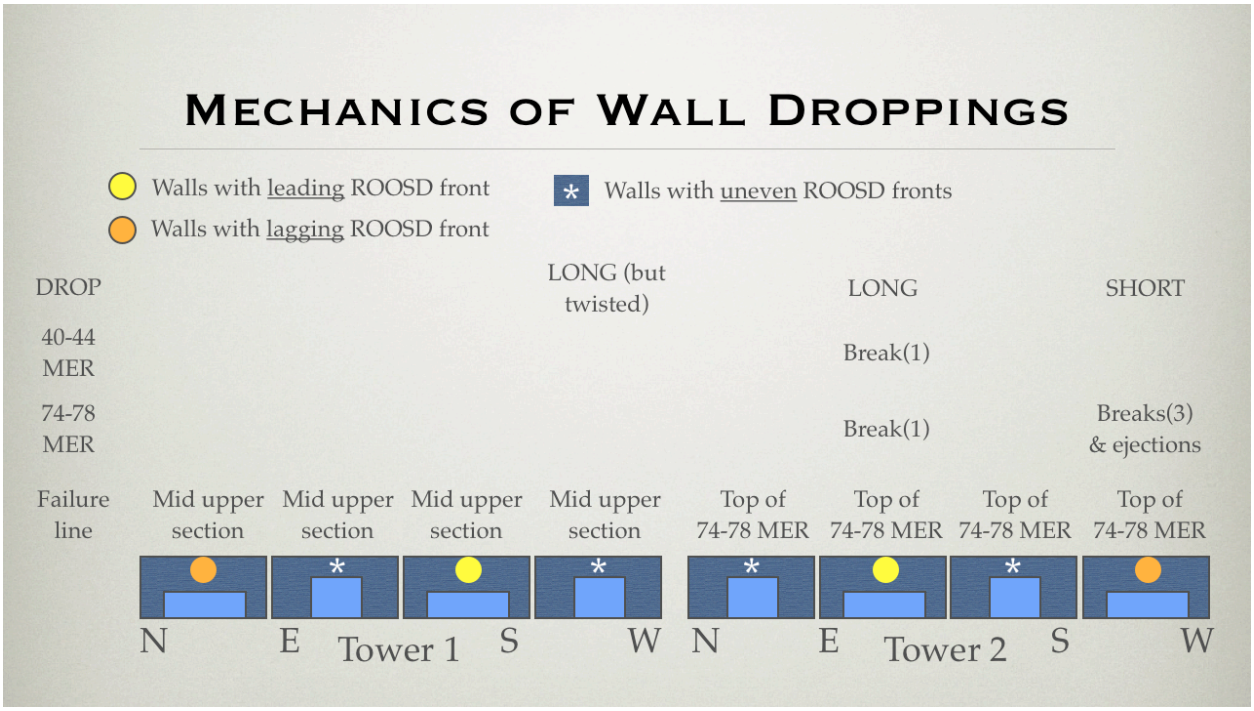

Fig. 9 - Diagram indicating mechanics of wall droppingsFig. 8 lays out schematically along the bottom the eight faces of the two towers. Also shown are the core orientations within each tower. For reference, the key neighboring buildings are shown, their faces at the proper distance from the nearest tower.

Fig. 10 shows the two LONG drop examples. The green bands indicate the increased stiffness with the MER bands. Two walls, the red from Tower 1, and the blue from Tower 2, and with different ROOSD front conditions, apparently could be made to drop LONG. The blue, twisted because of uneven ROOSD fronts, dropped a bit shorter. In both cases, the 74-78 MER band remained relatively intact.

A more detailed description of how the collapses of the various wall situations can be studied under the "Single Wall Collapse Model" section on the ROOSD website. A large collection of debris and collapse photos are available on the website to reinforce the model's consistency with the debris details.

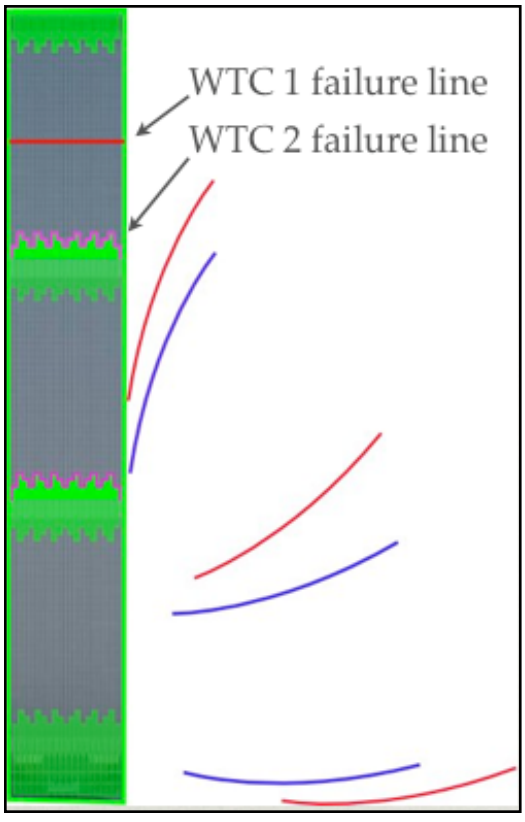

Fig. 10 - Dropping Long (Red from WTC 1; Blue from WTC 2)

Fig. 11 shows the debris patterns. The two leading patterns go with the biases. The short-span truss sides, such as Tower 2 south side, have the perimeter walls peeling away from the bias. Because of the twisting, the drop distance is further constrained.

This all may be evidence of demolition professionals at work, selecting initiating forces to minimize damage to certain neighboring buildings. If such demolitions were done, they appear to have been much more surgical than most CD advocates believe.

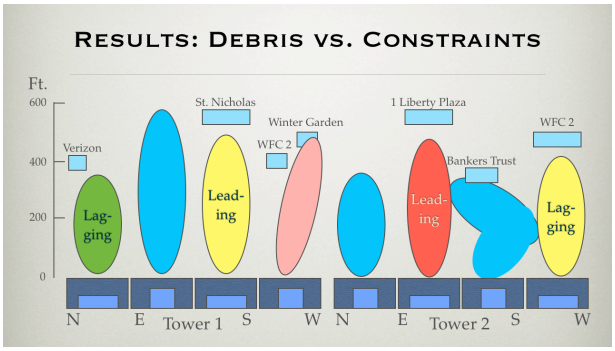

Fig. 11 - Debris distributions vs. constraints

Table 3 shows how the alternative theories relate. Explosive Demolition has PoE #2, straight-down, symmetrical progression. It fails to note the differences in detail between debris patterns about the eight sides. DEW and ND seem more brute force than to be worrying about debris control.

Table 3 - Debris Patterns Alternate Explanations

Theory	Alternate Explanations
R&E	“Single Wall Collapse Model” a guide for surgical cutter-charge placement
ED	PoE #2 doesn’t recognize debris pattern differences.
DEW	Doesn’t explain apparent effort to control debris pattern
ND	If used, may not have been related to debris control

Table 4. Ratings - Debris Patterns

	Consistency	Evidence	R*
R&E	Good	Highest	0.8
ED	Intermediate	Highest	0.5
DEW	Doubtful	Highest	0.2
ND	Doubtful	Highest	0.2

Fig. 12 is the standard “end of the inning” display with a slight variation. The going in score has been multiplied by 10, shown with the blue line. This is an arbitrary factor applied to the scores for all remaining theories, thereby getting rid of the very small decimal fractions. Again, the height of each bar is the score. R&E remains in the lead.

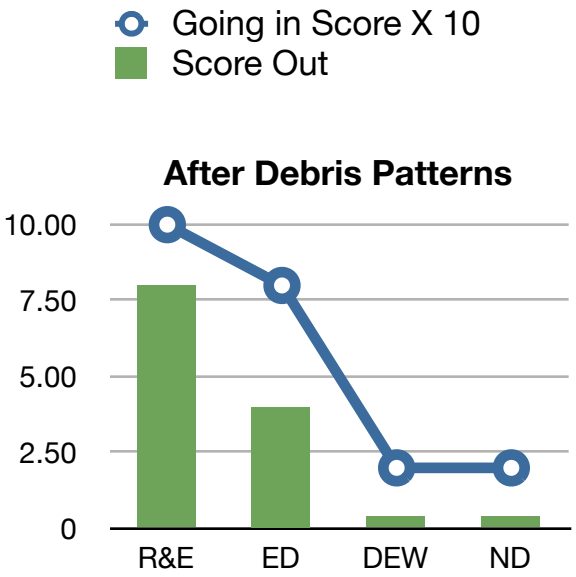

Fig. 12 - End of the 2nd inning score

3. Nano-thermite

Moving to the third inning, what is the role of nano-thermite? Among truthers, the most discussed pyrotechnic found in the WTC dust is nano-thermite. However, rarely is it called a pyrotechnic. Instead it is called either an incendiary or an explosive. To decide what to call it or surmise its possible role, knowing its burn rate is key. Or, to be more precise, the burn rate relative to the speed of sound in the material of interest. If the burn rate is greater than the speed of sound in the material, then the material is shattered, and the accelerant is a high explosive.

Professors Niels Harrit, Steven Jones, and the other authors of the Bentham Open Physical Chemistry Journal article[11], describe the nano-thermite compound they found in the WTC dust as an incendiary or explosive. Richard Gage promotes "explosive evidence," which is a way of being somewhat more general. Gage, however, has admitted in an email exchange that it isn't a high explosive.

T. Mark Hightower noted the maximum burn rate for nano-thermite in the open literature is 895 m/s. This was first presented in his two internet radio show interviews[12] of July 4 & 6, 2011, subsequent to his Nano-Thermite Challenge of May 1, 2011.

In this Nano-Thermite Challenge, Hightower offered a financial reward for any documented measurement in the open literature of nano-thermite above 1,000 m/s. $100 for each 1,000 m/s, with a maximum of $1,000.[13] No one responded to his challenge.

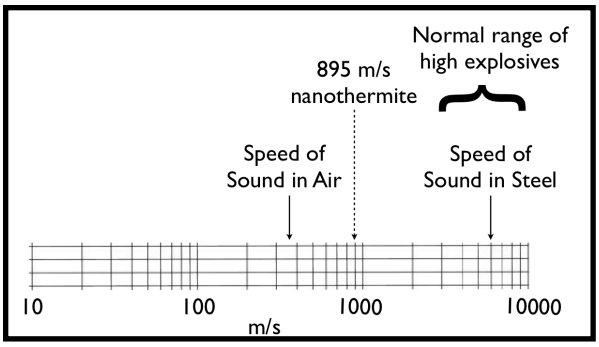

Fig. 13 - Deflagration or Detonation -- Nano-thermite burn rate in relation to high explosives

My contribution was the diagram of Fig. 13, which was used in the internet radio Hightower/Fetzer interview of July 4 and 6. If the burn rate is less than the speed of sound in the material where it is doing its work, it is called "deflagration." If it is above, it is called "detonation," and is by definition a high explosive. The horizontal axis is a log scale, where the nano-thermite is shown at 895 m/s. This is well below the normal range for high explosives. The speed of sound in steel, as a point of reference is about 6,000 m/s. Examples of high explosives are RDX and HMX.

Another concern pertains to energy by mass measurements. Fig. 14 is identical to Fig. 30 in the Harrit, Jones, et. al. Bentham Open Physical Chemistry Journal article. For this discussion, only the blue bars are of interest, the energy by mass. The three bars on the left are commercial high explosives, HMX, TNT, and TATB. The blue bar adjacent to the tallest red bar is a nano-structured energetic material (nano-thermite). The four bars on the right are four chips from the WTC dust samples. The most notable characteristic the four bars on the right convey is the wide variation between them. The energy by mass for these four chips was measured in what is known as Differential Scanning Calorimetry (DSC) tests. This wide variation raises some questions about these tests.

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[11] **Active Thermitic Material Discovered in Dust from the 9/11 World Trade Center Catastrophe,** by *Niels H. Harrit, Jeffrey Farrer, Steven E. Jones Kevin R. Ryan, Frank M. Legge, Daniel Farnsworth, Gregg Roberts, James R. Gourley and Bradley R. Larsen (2009)* http://www.benthamscience.com/open/tocpj/articles/V002/7TOCPJ.htm

[12] The Real Deal with Jim Fetzer; http://www.radio**fetzer**.blogspot.com/

[13] http://www.serendipity.li/wot/nanothermite_challenge.pdf

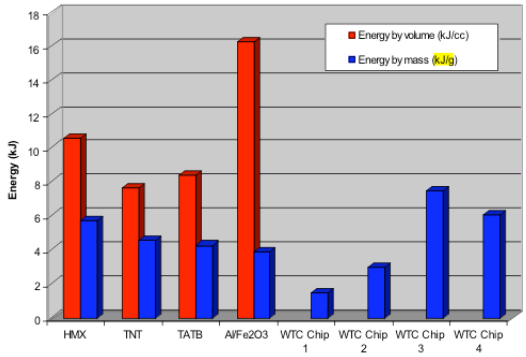


Fig. 14 (Fig. 30 from Bentham Open) - energy by mass for different compounds.

Hightower has also posted some comments on the uncertainty of the DSC results.[14] He notes that the average energy by mass across these four chips is 4.5 kJ/g, but with an uncertainty of +/- 100%! That is so large a variation that, really, no conclusions should be drawn.

Hightower also questions whether the chips came one from each dust sample. The question arises, because, earlier in the Bentham Open article (Fig. 19), also DSC results, two of the chips were from a single dust sample, and one dust sample had no chip tested. If that is the case for these energy-by-mass measurements, it means the variation might be among two chips within the same dust sample. The authors really need to clarify this matter.

The third area of concern raised by Hightower is that the tests were run in air. In that situation, extra oxygen was present to help liberate energy from any organics that might be present. This adds additional uncertainty to the results.

Table 5 - Nano-thermite alternative explanations

Theory	Alternate Explanations
R&E	R&E advocates critical of NT
ED	PoE #10 is misleading, in that it isn't a high explosive.
DEW	DEW advocates critical of NT
ND	ND advocates critical of NT

As for the alternative explanations, the three other than Explosive Demolition have been critical of the nano-thermite findings by Harrit, Jones, et. al. The Explosive Demolition has one of its points of evidence, #10, proclaiming the nanothermite composite as an EXPLOSIVE. This clearly is placing too much emphasis on a substance that has an uncertain role in the WTC destructions, and the "E" word should not be highlighted in all caps, as that will be taken as a high explosive by most in the general public.

Table 6 - Nano-thermite Ratings

	Consistency	Evidence	R*
R&E	Intermediate	High	0.5
ED	Doubtful	High	0.2
DEW	Intermediate	High	0.5
ND	Intermediate	High	0.5

[14] http://tmarkhightower.wordpress.com (posted 6/8/2012)

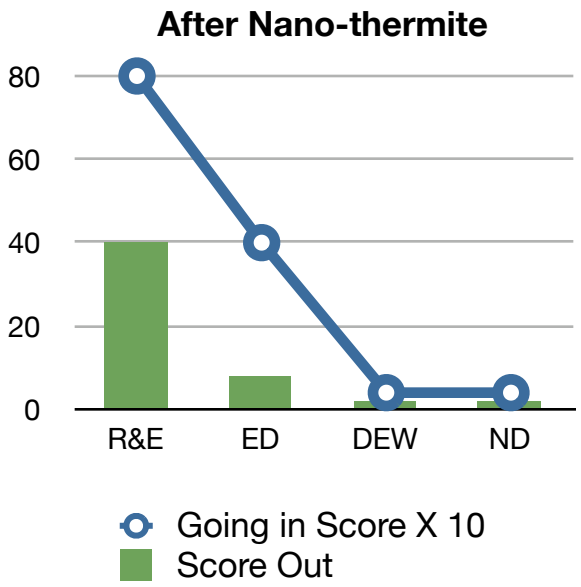


Fig. 15 - Score, end of 3rd inning

4. Temperatures (immediate)

The forth issue is temperatures (immediate), that is, on the day of 9/11/01 itself.

Determination of "day of the event" temperatures is by specimen examination and chemical analysis. The two conditions of concern, given the four theories in this assessment, are normal electromagnetic (EM) fields, and unusual EM fields that may have occurred because of DEW energy waves. Any unusual fields emanating from nuclear devices are assumed to fall in the "normal" range.

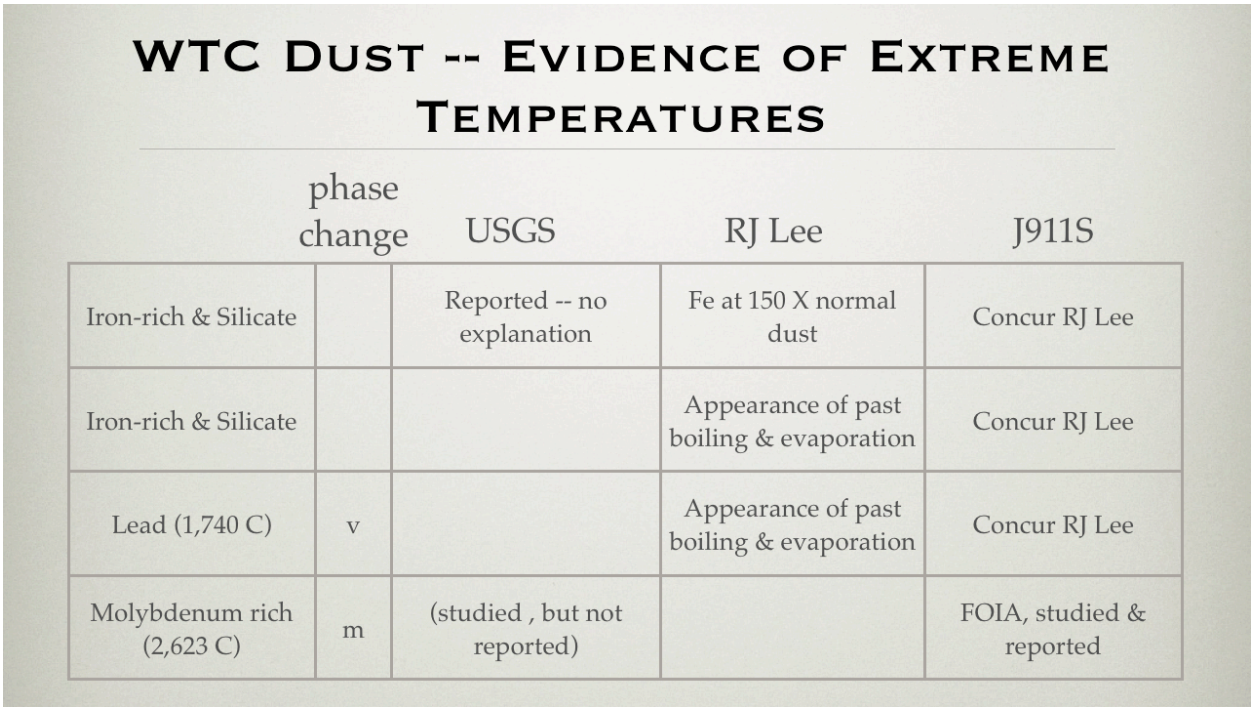
Phase-change temperatures for metallic elements in the presence of DEW EM fields, if different from normal EM fields, is available in the scientific literature, so will not be assessed.

The two types of evidence are (1) steel specimen recovered in the debris, and subjected to metallurgical examination, and (2) chemical analyses of dust samples.

The metallurgical examination of a steel specimen is reported in FEMA Appendix C (*Limited Metallurical Examination* by Jonathan Barnett, Ronald R. Biederman, and R.D. Sission, Jr.)[15] Although the specimen was from Building 7, it will be treated here as representative of the Twin Towers. (NIST takes the position the specific building from which it came could not be determined.) The authors reported it showing thinning that occurred by a high-temperature corrosion. Heating of the steel, approaching 1,000 C, resulted in a eutectic mixture of iron, oxygen, and sulfur that liquified the steel.

[15] http://www.fema.gov/pdf/library/fema403_apc.pdf

Table 7 - WTC Dust -- Evidence of Extreme Temperatures



WTC Dust -- Evidence of Extreme Temperatures

	phase change	USGS	RJ Lee	J911S
Iron-rich & Silicate		Reported -- no explanation	Fe at 150 X normal dust	Concur RJ Lee
Iron-rich & Silicate			Appearance of past boiling & evaporation	Concur RJ Lee
Lead (1,740 C)	v		Appearance of past boiling & evaporation	Concur RJ Lee
Molybdenum rich (2,623 C)	m	(studied , but not reported)		FOIA, studied & reported

RJ Lee = *WTC Dust Signature Report - Composition and Morphology* (12/2003)[16]

J911S = *Extremely high temperatures during the World Trade Center destruction*[17], by Steven E. Jones, Jeffrey Farrer, Gregory S. Jenkins, Frank Legge, James Gourley, Kevin Ryan, Daniel Farnsworth, and Crockett Grabbe

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In Table 7, minimum temperatures necessary for observed metallic phase changes are presented from three studies that did chemical analysis of the dust. These are: the USGS, RJ Lee, and the Journal of 911 Studies.

The highest temperature of the three was inferred from the melting of molybdenum, which melts in normal EM fields at 2,623 C. Note that this is evidence that temperatures were at least this high in some places. It doesn't provide information on the highest temperatures attained.

The possibility of nuclear devices from a temperature standpoint is very difficult to assess, for the temperatures can be as high as 10,000,000 deg, but only for a fraction of a microsecond.

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[16] http://911research.wtc7.net/essays/thermite/cache/nyenvirolaw_WTCDustSignatureCompositionAndMorphology.pdf

[17] http://journalof911studies.com/articles/WTCHighTemp.pdf

Table 8 - Temperatures (immediate) alternate explanations

	Alternate Explanations
R&E	Doesn't provide reasons high temperatures would be necessary or present
ED	Strong emphasis on molten metal, which melting iron requires 2795 F
DEW	Dr. Wood says temps not unusually high
ND	ND would produce extreme temps, possibly 1,000s of times higher

Table 9 - Temperatures (immediate) ratings

	Consistency	Evidence	R*
R&E	Intermediate	High	0.5
ED	High	High	0.8
DEW	Doubtful	High	0.2
ND	Intermediate	High	0.5

These standard critiques and rating formats in Tables 8 and 9 lead to the new scores at the end of the fourth inning.

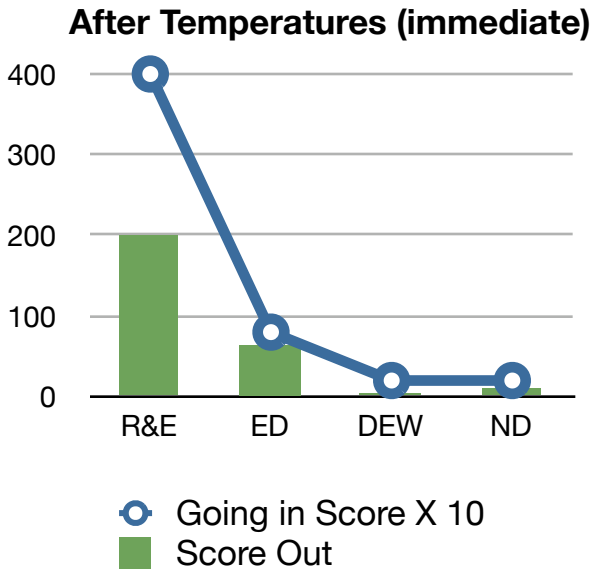

Fig. 16 - Score, end of 4th inning

5. Persistent Heat

Inning number five assesses Persistent Heat. The USGS[18] measured a number of WTC surface locations by means of NASA's AVIRIS (Airborne Visible/ Infrared Imaging Spectrometer) airplane. Two of these locations are of interest in this discussion. (Fig. 17)

Hotspot D, within the footprint of WTC 1, measured 962 F on 16 Sept. Hotspot F next to WTC 2 measured 801 F. Surprising, neither of the spots showed above normal temperatures on 23 Sept.

[18] http://pubs.usgs.gov/of/2001/ofr-01-0429/

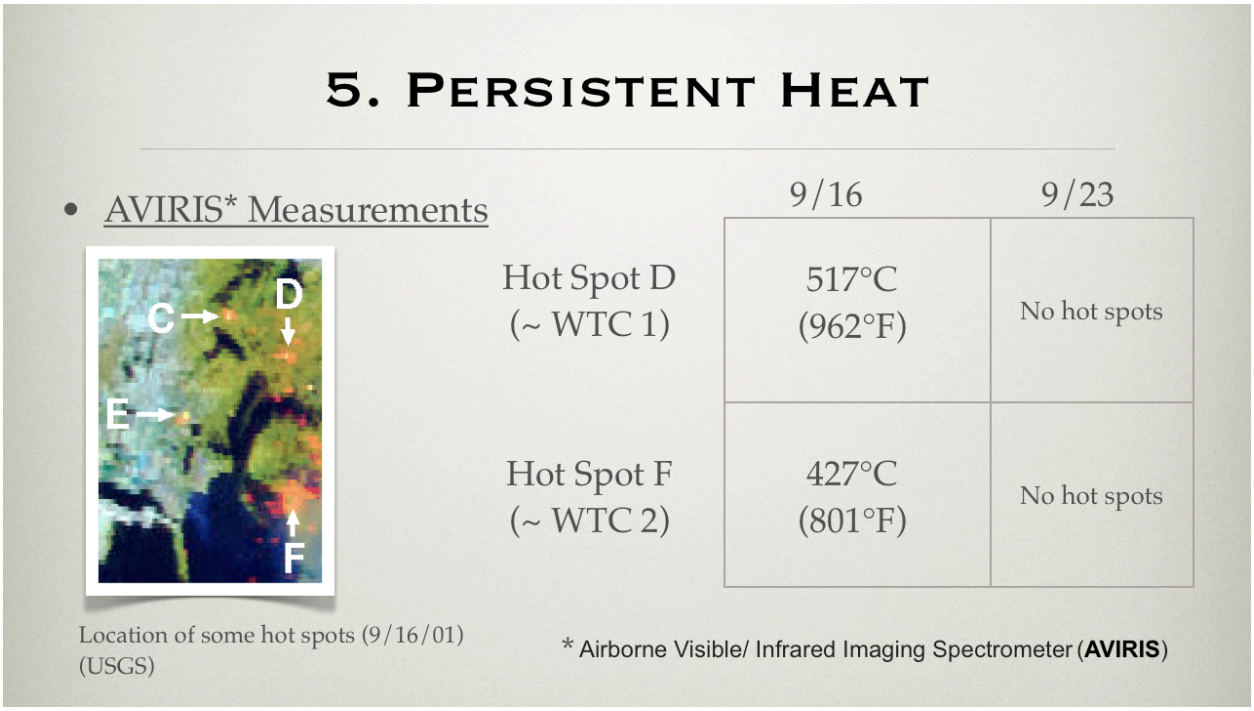

Fig. 17 - AVIRIS measurements at hot spots D and F on 9/16 and 9/23

Near Hotspot D is the location of this photo of a grappler (Fig. 18) picking up some yellow-hot metal. This photo is shown on AE911Truth website.[19] However, close analysis[20] of the background features on the left and right, suggests the authenticity of this photo is in question. There is no camera position for which the background features exist together in this relationship. Now, if the photo is valid, it is labeled with the date 9-27-01, which is after the AVIRIS measurements showed no unusual heat.

Fig. 18 - An excavating machine at Ground Zero lifts debris dripping with molten metal

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19 http://www.ae911truth.org/news/41-articles/347-high-temperatures-persistent-heat-a-molten-steel-at-wtc-site-challenge-official-story.html

20 http://www.sharpprintinginc.com/911/index.php?module=pagemaster&PAGE_user_op=view_page&PAGE_id=50&MMN_position=394:394

Fig. 19 is a photo of the other hotspot of interest, at Location F. Dr. Judy Wood has identified this hole, called Liberty St. Hole #2, as obviously not unusually hot. As she said, no reports of cooked workers. This photo was taken on 18 Sept., two days after the 801 deg temperature "nearby."

Fig. 19 - Liberty St. Hole #2, next to basement of WTC 2 (Sept. 18)

Fig. 20 - Google Earth image of Location F (red "X"). at 40.7113 N; 74.0130 W

This in Fig 20 is the precise location of Location F, using Google Earth taken in 2011. The red X shown to the side of WTC 2 footprint, is oriented relative to the hole in the next figure.

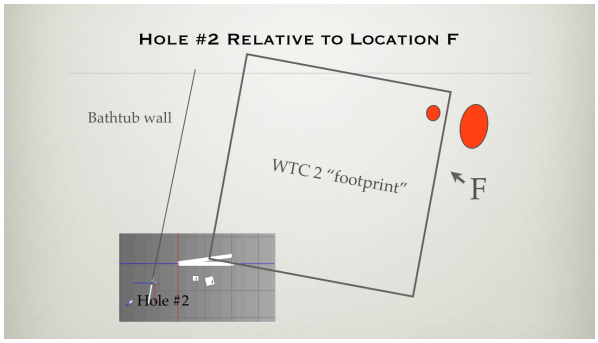

Fig. 21 - Hole #2 relative to Location F

Here, in Fig. 21, a 90 degree clockwise rotation from Fig. 20, Location F can be seen to be on the opposite side of the footprint from Hole #2 (gray rectangle in lower left). The "Bathtub wall," actually a slurry wall visible in the Hole #2 photo, was used partially for orientation. The red ovals are where the hot spots were shown in the AVIRIS images, slightly offset from Location F itself. That distance of more than 200 Ft. makes it plausible that the hotspot could be at 800 F, while the workers' environment could be cool enough for them to work.

Much of our evidence of persistent heat comes from eye witnesses. The most notable (Fig. 22) is Leslie Robertson. He described seeing molten steel still running 21 days later.

Bronx firefighter, Joe O'Toole described "dripping from the molten steel" six weeks later.

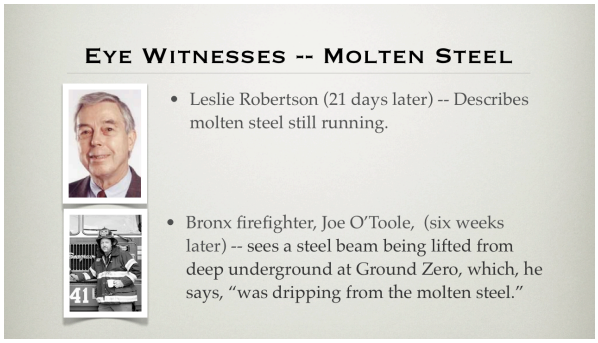

Fig. 22 - Leslie Robertson and Joe O'Toole attest to molten steel 3 and 6 weeks later.

Eight weeks afterwards, network TV interviewing several eye witnesses, saying molten metal, with the workers boots melting within a few hours. (2:45 sec in on "911 Mysteries - Demolitions CLIP 5")[21].

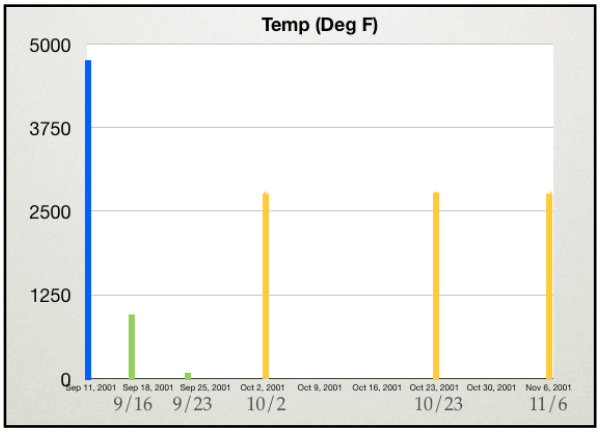

Fig. 23 - Temperatures at Ground Zero. Blue is minimum on 9/11; green is surface temperatures, and orange are eye witnesses

In Fig. 23, the surface measurements by overhead AVIRIS are presumed to record lower temperatures than hot spots beneath the surface. The measurement on 9/23, recording only ambient conditions, appears inconsistent with eye-witness accounts several weeks later. The eye witness accounts of viewing molten metal is recorded in the figure as the melting temperature for iron at 1536 C (2797 F).

Table 10 - Persistent heat ratings

	Consistency	Evidence	R*
R&E	Doubtful	Medium	0.3
ED	Intermediate	Medium	0.4
DEW	Doubtful	Medium	0.3
ND	Good	Medium	0.6

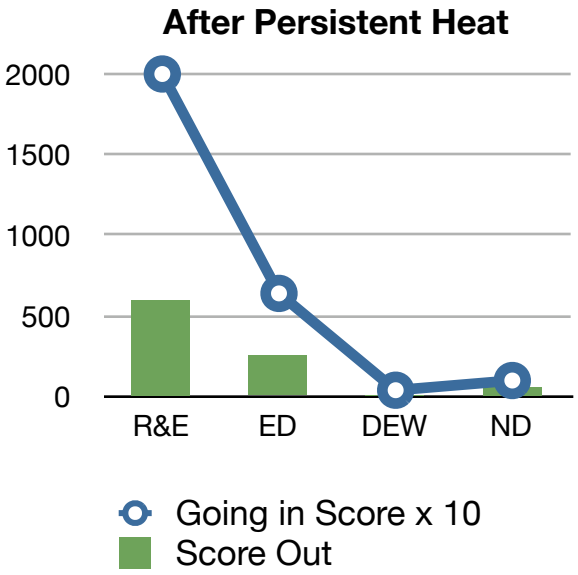

Fig. 24 - Score, end of the 5th inning.

6. Vehicle Anomalies

Inning six is vehicle anomalies. Hundreds of cars were damaged in unusual ways. Here, (Fig. 25) for example, is an abrupt boundary along the door line separating total destruction from no damage at all.

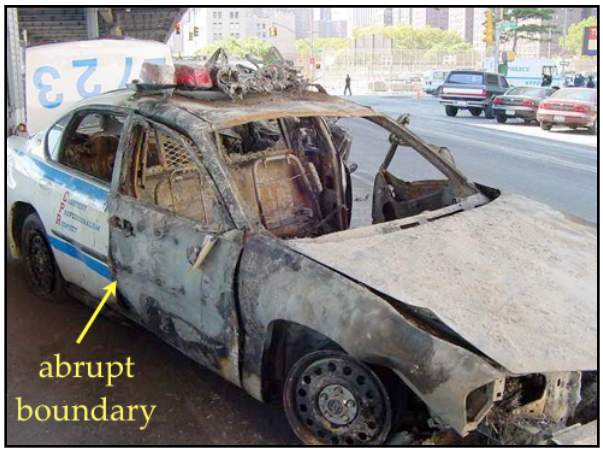

Fig. 25 - Police cruiser with unusual damage pattern.

[21] www.liveleak.com/view?i=6ee_1337863679&comments=1

Most of the damaged cars were in this car park northwest of WTC 1. Figure 26 is a photo showing severe damage to cars, probably within a few days of 9/11, prior to rust formulation.

Fig. 26 - Car park northwest of WTC 1, with damaged cars

Approximate location of the car park shown with red lines in figure 27. The cars were beneath the caustic dust cloud.

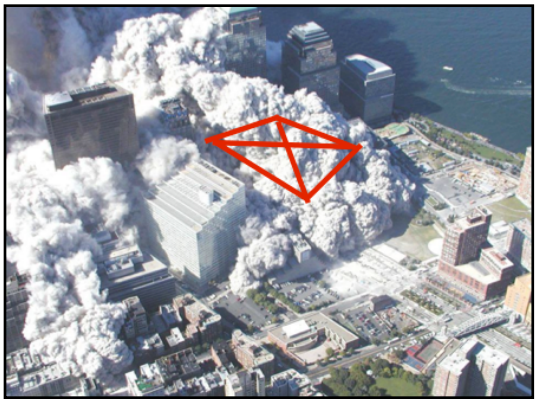

Fig. 27 - Car park beneath the caustic cloud northwest of WTC 1.

Table 11 - Vehicle anomalies alternate explanations

	Alternate Explanations
R&E	No explanation offered
ED	Unusual boundaries aren't significant. Widespread vehicle fires connected to dust clouds. Nano-thermite in dust primary cause.
DEW	Abrupt boundaries: Interference of energy waves with slightly different frequencies.
ND	Boundaries are along air gaps around doors: Likely an EMP (electro magnetic pulse) effect from gamma rays.

Alternate explanations from the perspective of the four theories are summarized in Table 11. A critique by ED proponents of "toasted" tops of vehicles is included among several other topics related to DEW[22]. The DEW perspective is available online, authored by Dr. Judy Wood and Dr. Morgan Reynolds[23] A commentary from an ND perspective authored by "The Anonymous Physicist" is contained in chapter 11 of this book[24].

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[22] http://www.ae911truth.org/news-section/41-articles/505-ae911truth-faq-6-whats-your-assessment-of-the-directed-energy-weapon-dew-hypothesis.html

[23] http://drjudywood.com/articles/DEW/StarWarsBeam5.html

[24] *The Nuclear Destruction of The World Trade Center and The China Syndrome Aftermath*, by The Anonymous Physicist, 2nd Edition, 2012.

Table 12 - Vehicle anomalies ratings

	Consistency	Evidence	R*
R&E	Doubtful	Medium	0.3
ED	Doubtful	Medium	0.3
DEW	Intermediate	Medium	0.4
ND	High	Medium	0.7

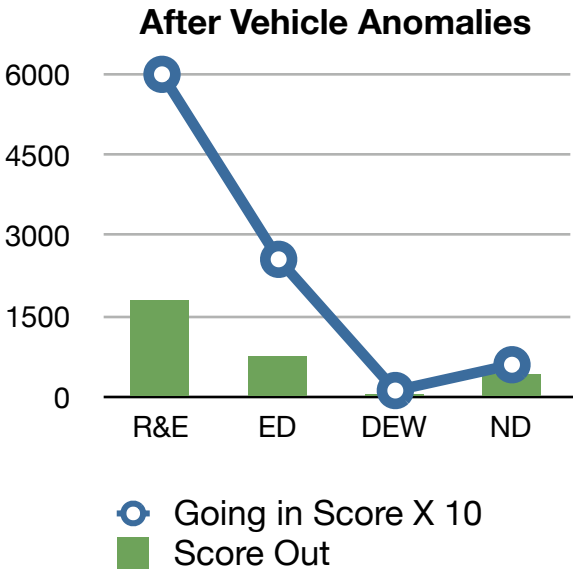

Fig. 28 - Score, at the end of the 6th inning.

7. Tritium

In 2002, DOE reported traces of Tritium in the WTC sewer water.[25] Their explanation that tritium in exit signs, watch faces, and weapon sights accounted for the the levels measured was totally inadequate.

Jeff Prager, in his online eMagazine, *911 Dust*[26] (2011), calculated the measurements to be 55 times what could reasonably be called "trace levels."

Inadequate attempts are made by the DOE authors to attribute tritium to EXIT signs and watch faces shows desperation to explain this away.

Table 13 - Tritium alternative explanations

	Alternate Explanations
R&E	No explanation offered
ED	Dr. Jones said neither nuclear activation nor residual 'fall-out' were observed in tests he performed.
DEW	Dr. Wood says "the site wasn't 'hot,' that is, radioactive."
ND	Use of deuterium-tritium nuclear devices a plausible explanation. However, devices could have been in other WTC buildings.

Not all the nuclear advocates agree on the deuterium-tritium possibilities. "The Anonymous Physicist," for example, considers the high tritium readings as intentionally false, as a distraction from other evidence pointing to fission.

As an aside, tritium could have come from nuclear devices detonated in one of the other WTC buildings, such as WTC 5 or 6. For this assessment on this issue, no attempt is being made to distinguish between a device detonated in the Towers vs. in one of these other buildings.

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[25] http://escholarship.org/uc/item/4xq88667

[26] www.scribd.com/doc/59702510/Jeff-Prager-911-Dust-2011

Table 14 - Tritium ratings

	Consistency	Evidence	R*
R&E	Doubtful	Medium	0.3
ED	Doubtful	Medium	0.3
DEW	Doubtful	Medium	0.3
ND	Good	Medium	0.6

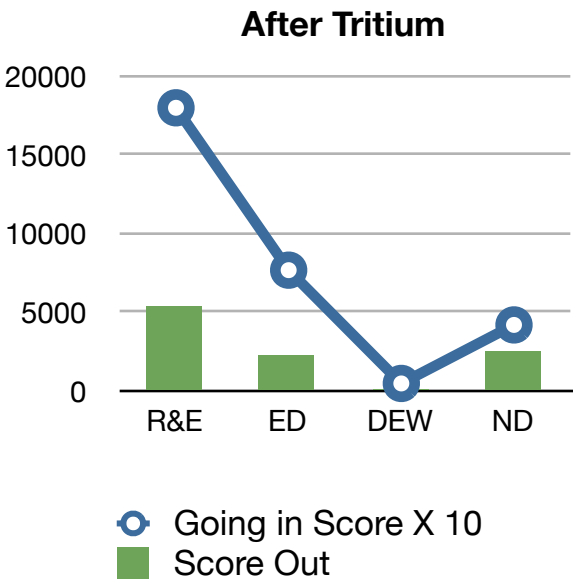

Fig. 29 - Score, after the end of the 7th inning

8. Basement Blasts

Fig. 30 - Mike Pecoraro, WTC Engineer

WTC Engineer Mike Pecoraro saw the disappearance of a steel press on sub-level 4, and a 300 pound concrete/steel door shriveled up like “aluminum foil.” The steel press is referred to as a “50-Ton” steel press. Some get the idea the press weighed 50 tons, but it means the hydraulic press had a frame capacity of 50-tons. The actual weight of such a press is around 500 pounds.

Jose Sanchez, WTC maintenance worker on sub-level 4, believed it was a bomb that blew up inside the building.

Table 15 - Basement blasts alternate explanations

	Alternate Explanations
R&E	Doesn't provide an explanation for bombs. Mostly identifies problems with aviation-fuel-in-elevators as explanation.
ED	ED advocates highlight the big booms, mostly as described by witnesses.
DEW	DE advocates argue that no big booms were heard or recorded from exploding bombs.
ND	Emphasizes witnesses such as Mike Pecoraro. However, arguing a slam-dunk case for nuclear is a stretch.

Table 16 - Basement blasts ratings

	Consistency	Evidence	R*
R&E	Intermediate	Medium	0.4
ED	Good	Medium	0.6
DEW	Contradictory	Medium	0.2
ND	Good	Medium	0.6

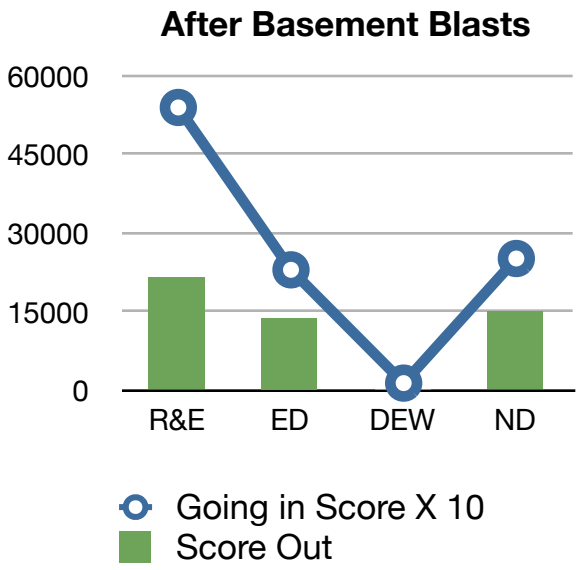

Fig. 31 - Score, at the end of the 8th inning

9. Radionuclides

Moving now to the last inning, the 9th -- Radionuclides. The measurements of barium and strontium concentrations from USGS are particularly noteworthy. William Tahil, in his book, *Ground Zero: The Nuclear Demolition of the World Trade Centre* (2006)[27] depicted the incriminating measurements in a figure, shown here as Fig. 32.

[27] http://nucleardemolition.com/GZero_Report.pdf, figure 5

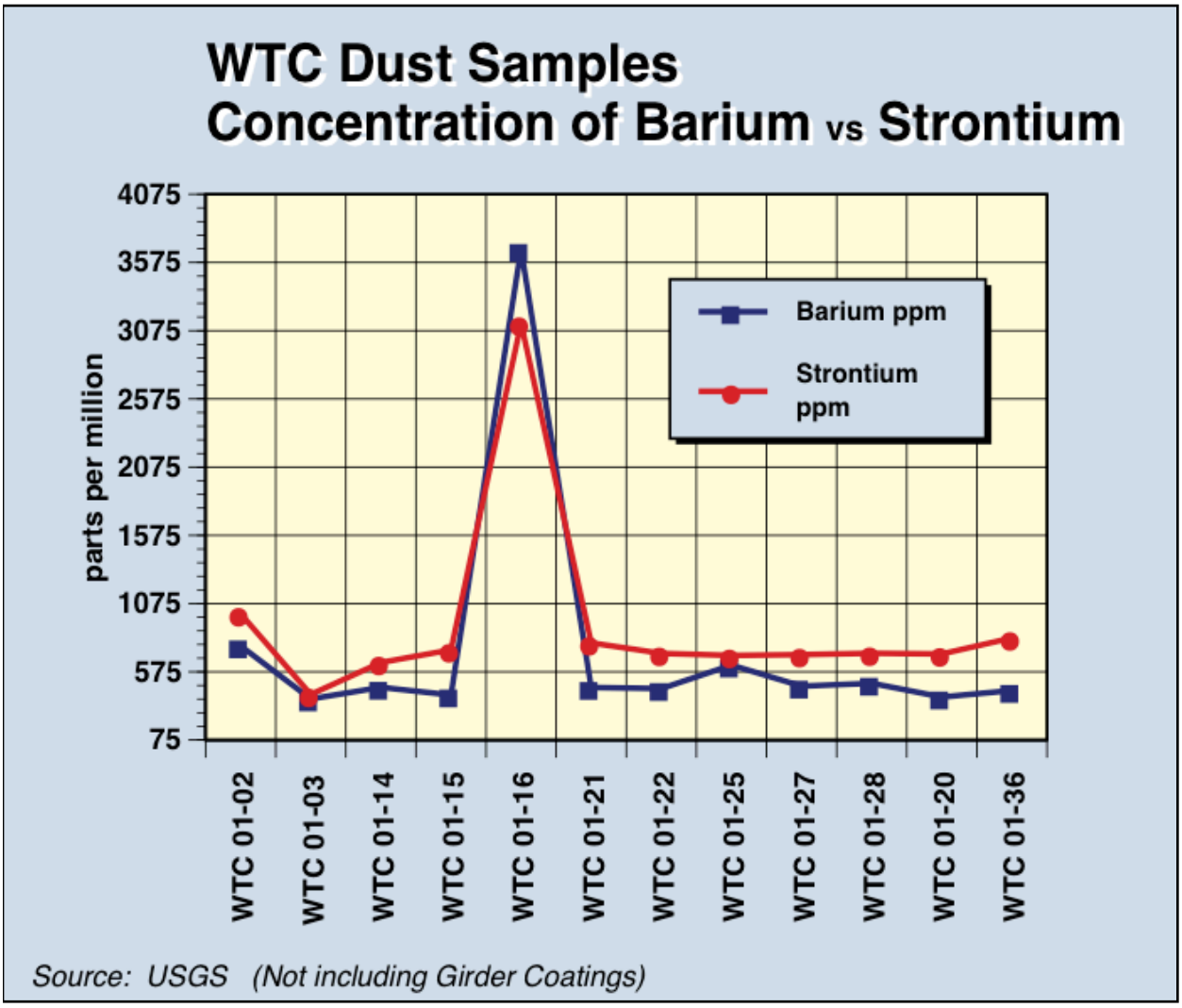

Fig. 32 - Concentration of Barium vs Strontium (WTC dust samples)

One key point is the two are in lock step, which they would be in this particular relationship if they were products of a fission process. The second key point is the dramatic peak at one of the dust sample locations, WTC 01-16 (across the street to the east from WTC 2). Although the USGS scientists did not provide a breakout of individual isotopes of the strontium, assuming fission as the only explanation for these two elements being in lock step, the tight relationship between the two implies the isotope of strontium is the radionuclide, SR-90.

Two other plots are of interest, lifted from Tahil's book. thorium vs. lithium[28] (Fig. 33 herein) and thorium vs. uranium[29] (fig. 34 herein). Prager's *911 Dust* eMagazine also displays these figures, and draws similar conclusions.

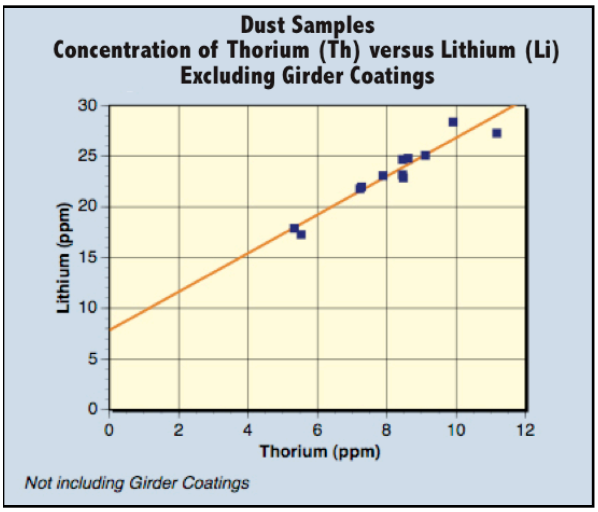

Fig. 33 - Concentration of Thorium vs. Lithium (excluding girder coatings)

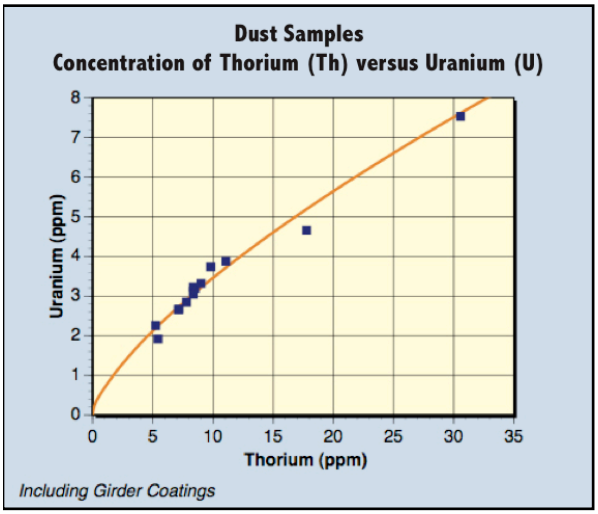

Fig. 34 - Concentration of thorium vs. uranium (including girder coatings)

These two relationships, particularly the thorium and uranium, both only exist in radioactive form. Thorium is one of the daughter products of uranium fission. Nothing other than fission explains this.

Two caveats need mentioning. (1) these strong correlations consistent with fission may have originated as fallout from Nevada above-ground tests in the 1960s. (2) As with thorium, the fissions may have been a result of nuclear devices placed in WTC 5 or 6. The evidence reliability has been rated as Medium because of this uncertainty as to which buildings may have been involved.

Table 17 - Radionuclides ratings

	Consistency	Evidence	R*
R&E	Doubtful	Medium	0.3
ED	Doubtful	Medium	0.3
DEW	Doubtful	Medium	0.3
ND	Good	Medium	0.6

[28] ibid., figure 34

[29] ibid., figure 33

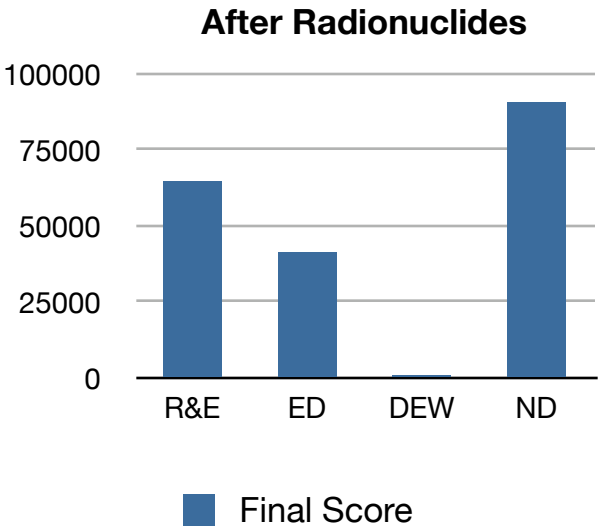

Fig. 35 - Final score, at the end of the 9th inning

For simplicity, the final score is displayed alone, rather than showing the "going in" score. The points have been multiplied by an arbitrary 10 each of the innings other than the first to get rid of what otherwise would be decimal fractions.

CONCLUDING COMMENTS

- Nuclear device(s) was the strongest theory considering the nine perplexing issues that happened to be chosen. A different set of nine may have produced a different "winner."

- An alternative theory grouping two or more of these theories would be a logical next step. Presumedly, some combination would be stronger than any theory considered alone.
- The scoring method makes it easier to assess overall effects of new pieces of information or assumptions.

APPENDIX A -- RESPONDING TO CRITICISM

9/11 Hearings Organizer, Dr. James Fetzer, expressed criticism for not accentuating the gross observable evidence of (a) the towers blowing apart in every direction from the top down, (b) the conversion of those 500,000-ton buildings into millions of cubic yards of very fine dust; and (c) that the towers were actually destroyed below ground level. In his judgement, the first two theories would be eliminated immediately. These three will be taken below in that order using the same assessment process.

A1. Blowing Apart in Every Direction From Top Down.

Figure A-1 -- An iconic photo of WTC Tower exploding

Although this looks to be in every direction, it may be mostly emanating outward, perpendicularly to the four faces. For example, very little of Tower 2 struct nearby Tower 1. Fig. 7 shown in the main text should be reviewed, as it presents NOAA's reporting of the debris patterns, which, once again, are mostly perpendicular to the tower faces.

One possible interpretation is that this explosion in every direction was completely symmetrical, but the debris turned to dust

before it could become debris spread across the ground.

Fig. A-2 -- Tower 1 West face debris

This photo shows major sections of facade face spread out on the ground with the tip slightly north of the Winter Gardens. The red lines mark the MER extra wide spandrels, so the marked column sections are identifiable as being from the 75-77th floor MER level[30].

This evidence is quite strong the buildings did not blow apart in every direction. Rather, large perimeter assemblies with column segments and spandrel cross-strapping pealed away explosively perpendicular to the faces.

A2. The Conversion of Those 500,000-Ton Buildings Into Millions of Cubic Yards of Very-Fine Dust.

Several questions must be answered. (1) What percentage of the buildings were converted to dust? (2) What volume of dust resulted from the building destructions?, and (3) what percentage of the dust was very fine or smaller?

Although the towers are frequently described as 500,000-Ton Buildings, the basis for that number is in question. Leslie E. Robertson Associates (LERA), the primary structural engineering firm involved in building the two towers, provided the NY Times with the total of 1,176,000 tons for both towers together[31]. Possibly, this total could have been referring to the entire WTC complex, and mistakenly interpreted as being only for the two towers. Gregory Urich has estimated the weight of a single tower at 253,000 metric tons[32]. If Urich's numbers are taken as a reasonable estimate, he lists 90,220 metric tons as structural steel.

With this lack of solid information on the total weight of the debris from the entire WTC Complex, it is nearly impossible to estimate what percent of the original mass was converted to dust.

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30 http://www.sharpprintinginc.com/911/index.php?module=pagemaster&PAGE_user_op=view_page&PAGE_id=106&MMN_position=422:422

31 http://www.nytimes.com/2001/10/09/nyregion/a-nation-challenged-the-site-from-torn-steel-cold-data-of-salvage.html?pagewanted=2

32 http://www.journalof911studies.com/letters/wtc_mass_and_energy.pdf

Likewise, for the second question. Estimating the volume of dust is even more difficult than estimating the weight of the buildings. Some dust became airborne, rose skyward in large plume, and dissipated into the upper atmosphere. Other portions settled to the ground, collecting in a broad-based cone, presumedly deeper near the WTC complex. Although there are anecdotal accountings of the deep layers of dust, there are no scientific measurements of this depth.

The third question pertains to the percentage of dust particles that were very fine or smaller. Paul J. Lioy measured 1-2% of the mass in the dust samples collected by a scientific team was in particles less than 2.5 microns in diameter[33]. The team of five scientists were eventually named the E-Team by the UMDNJ (University of Medicine & Dentistry of New Jersey) Magazine.

Taking the answers to the three questions together, there really is insufficient information to determine how much total energy would be necessary to reduce some of the debris to very fine particles such as these.

In my judgement, the evidence reliability is "low." By referring to the Rating Scale (Fig. 2), the assigned ratings are nearly the same for the range of consistencies. Anything between Good and Doubtful gets a 0.4. It isn't worth the effort to actually delve into the competing theories.

A3. The Level at Which Towers Were Destroyed.

As the criticism by Fetzer was stated more in the form of a claim, that is, -- "the towers were actually destroyed below ground level."

To the contrary, for both towers, portions of the cores remained standing for some time after the majority of the respective structures were destroyed.

WTC 1

A full-width remnant of the core, referred to by some as the "spire," remained for some period of time.

Fig A-3 .WTC 1 Core Remnant

[33] Lioy, Paul J.; *Dust: The Inside Story of Its Role in the September 11th Aftermath*; (2010) Rowman & Littlefield

Fig. A-3 is a cropped and reoriented version from one in a serious in NIST FOIA 10-202 release[34] -- Photographer: Lyle Owerko**.**

Discussion on The 9/11 Forum concludes a pair of columns could have reached floor 77[35].

WTC 2

A core remnant remained in place approximately 3-5 sec. beyond the nominal initial collapse. It was approximately half of the full width, although did not have a notable spire featured with WTC 1.

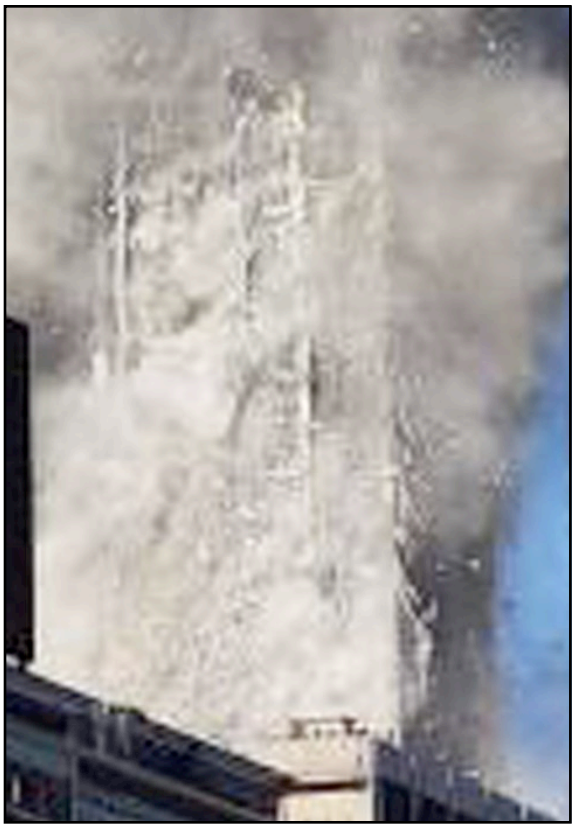

Fig. A-4 WTC 2 Core Remnant

Fig. A-4 is an enlarged and cropped image extracted by "achimspok" from a CBS News Video[36] posted on The 9/11 Forum.

Assessment

With this evidence, large sections of both cores remained standing until after the end of initial collapse, it seems to indicate the significant start of initial collapse was not below ground level.

This does not rule out weakening of core columns below ground level, or initiation of initial collapse on one side of each core column complex. However, that possibility seems unlikely.

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[34] http://img854.imageshack.us/img854/1158/wl645cr1e014.jpg

[35] http://the911forum.freeforums.org/viewtopic.php?t=185&p=14462

[36] http://the911forum.freeforums.org/wtc-2-core-remnant-motion-t191-15.html

REFLECTIONS ON JUDGING THEORIES

As one of the steps in this assessment process is judging the consistency of each theory to the evidence, here are some questions that come to mind:

1. When a primary advocate states they offer no theory, is it fair to attribute a theory to them, and then mark them down because "their theory" is contradictory to the evidence?
2. When the primary advocate denounces a main feature of third party's theory, should their theory be given more credit than another theory, who's primary advocate made no comment about this main feature of the same third party's theory?
3. When the primary advocate promotes one feature of their theory, but qualifies the matter by saying they don't know how the feature was used, should the theory be counted down when the evidence for that feature is weak?