

# **A CRITICAL ANALYSIS OF THE COLLAPSE OF WTC TOWERS 1, 2 & 7 FROM AN EXPLOSIVES AND CONVENTIONAL DEMOLITION INDUSTRY VIEWPOINT**

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## **PURPOSE**

The purpose of this analysis is to explore the possibility of explosives or similar supplemental catalysts causing or contributing to the collapse of World Trade Center Towers 1, 2 and 7 in New York on September 11, 2001 through examination of known facts as they relate to scientific principles of gravity, explosives, and structural failure. To our knowledge, this is the first analysis conducted by experts in the field of explosive demolition, as well as the first with observations and commentary from personnel directly responsible for the removal of debris from Ground Zero.

Some topics that do *not* relate to such analysis – and thus receive no practical consideration here – include:

Who owned the buildings

Who insured the buildings

What types of documents were stored in the buildings

Motives for destroying the buildings

The significance of the above points (among countless others) can be debated forever, but none relate to the specific actions required to execute a successful explosive demolition.

Nor will we be rendering opinions on the NIST, FEMA or 9/11 Commission Reports, as they did not make specific comments regarding explosives.

It is further acknowledged that many family members of WTC victims have embraced – and in some cases aligned with – those who question the “official” version of events that occurred on 9/11. This report will not, nor is it intended to, address the much wider scope of unanswered questions regarding those events. Rather this is a reasoned, factual analysis of a single group of questions and allegations that fall within our specific area of expertise. To that end, we hope this report will be of benefit to all interested parties.

## **ABOUT THE AUTHORS**

This report is authored by Brent Blanchard, Senior Editor for Implosionworld.com and Director of Field Operations at Protec Documentation Services, Inc. ([www.protecservices.com](http://www.protecservices.com)), Rancocas, New Jersey. Additional contributions and research assistance was provided by Protec employees Earl Gardner, Gary McGeever, Michael Golden and John Golden.

Protec is one of the world's most knowledgeable independent authorities on explosive demolition, having performed engineering studies, structure analysis, vibration/air overpressure monitoring and photographic services on well over 1,000 structure blasting events in more than 30 countries. These include the current world record-holders for largest, tallest and most buildings demolished with explosives. Protec regularly documents the work of more than 20 explosives contractors who perform structure blasting as a primary source of revenue (including extensive experience with every American company) as well as dozens more who blast structures in a part-time capacity.

Beyond the above, Protec possesses several additional types of data and experience that place the firm in a unique position to analyze and comment on this event:

1. Protec technicians were operating portable field seismographs at several construction sites in Manhattan on 9/11. These seismographs recorded the events at Ground Zero, including the collapse of all three structures. These measurements, combined with seismic and airblast data recorded by other independent entities, provide an unfiltered, purely scientific view of each event.
2. In the weeks following 9/11, several Protec building inspectors and staff photographers, including this author, were contracted by demolition teams to document the deconstruction and debris removal processes at Ground Zero. These processes included the mechanical pull-down of the remains of the U.S. Customs Building (WTC 6) and various other activities occurring simultaneously throughout the site. Our teams took thousands of photographs and personally examined untold amounts of debris, including countless structural elements from WTC 1 and 2. While these photographs and video recordings were not originally intended to specifically prove or disprove evidence of explosive demolition, they do provide substantial visual evidence that relates directly to this analysis and place us in a position to speak first-hand of conditions on site rather than relying on outside testimony or hearsay.
3. Protec has been given access to thousands of personal photographs taken by laborers and site foremen employed by the demolition companies responsible for deconstructing the Ground Zero site. The companies include Tully Construction, D.H. Griffin Wrecking, Mazzocchi Wrecking, Yannuzzi Demolition, Gateway Demolition and Manafort Brothers. (Any other demolition company claiming to have worked on the Ground Zero site either worked under the supervision of one of these firms or is misrepresenting their participation.) In addition, Protec documented the only public discussion of the 9/11 clean-up attended by all of the demolition teams (National Demolition Association Convention, Orlando, Florida, 4/22/03). While the original intent of Protec's two-hour video was to archive the unprecedented challenges faced by these teams, various questions and commentary from the speakers are relevant to this analysis.
4. Because building implosions are often promoted as live news events, Protec's offices are equipped to record multiple television broadcasts at all times. Our company's archived recordings of original news broadcasts from the morning of 9/11 begin well prior to the collapse of the first tower and continue uninterrupted beyond the collapse of WTC 7. These original unedited recordings have allowed us to compare and scrutinize the collapse of all three structures free from any possibility of image tampering or modification. In addition, we have examined

dozens of freelance and amateur video recordings incorporated into various documentary programs chronicling 9/11 and studied countless ground-based and aerial images captured by private, press and government-contracted photographers.

Protec and its employees have not been paid or hired by anyone to analyze this event, nor do we possess any political affiliations or contribute to any political party or individuals. We have undertaken this endeavor entirely at our own expense, with the singular goal of facilitating constructive dialog and providing a factual voice of reason to our friends and associates who were affected by the attack.

A final note: Before releasing this report, we reviewed every paragraph and tried to simplify the verbiage and technical vernacular as much as possible. Our thinking is the more people who understand this analysis, the more benefit it might provide. It is given that each of the points below could (and likely will) be extrapolated upon in far greater detail by others, however the intent here is to offer our comments as succinctly and cohesively as possible.

#### **ASSERTION #1**

**“The towers’ collapse looked exactly like explosive demolitions.”**

**PROTEC COMMENT: No they didn’t. It’s the “where.”**

When discussing similarities between the towers’ collapse and an explosive demolition, many people overlook the single question most central to any objective investigation. It is not “how” or “when” the buildings failed, but “where” they failed. That answer holds the key to understanding almost everything that occurred at Ground Zero.

Since their inception in the late 1800s, blasting engineers have understood that building implosions work best when the forces of gravity are maximized. This is why blasters always concentrate their efforts on the lowest floors of a structure. While smaller supplemental charges can be placed on upper floors to facilitate breakage and maximize control as the structure collapses, every implosion ever performed has followed the basic model of obliterating structural supports on the bottom few floors first, “to get the structure moving.”

This was not the case with the collapse of Towers 1 and 2. Close examination of these events from every video and photographic angle available does not indicate failure originating from the lowest floors, rather clearly shows each building beginning to fail at precisely the point where the respective planes struck. That is, no floors above or below the impact points ever move until the structural elements within the impact zone begin to collapse (WTC 7 collapsed differently, which we will cover later).

Furthermore, there are no independent failures present while the structures are collapsing (we’re not talking dust plumes or debris, but actual structural failure). All lower floors remained completely intact until they were consumed by the collapse from above.

Because countless images confirm this assessment and none contradict it, we believe this fact to be visually indisputable.

Therefore, for explosives to be considered as a primary or supplemental catalyst, one would have to accept that either, a) dozens of charges were placed on those exact impact floors in advance and survived the violent initial explosions and 1100+ degree Fahrenheit fires, or b) while the fires were burning, charges were installed undetected throughout the impact floors and wired together, ostensibly by people hiding in the buildings with boxes of explosives. There is no third choice that could adequately explain explosives causing failure at the exact impact points.

The chemical properties of explosives and their reaction to heat render scenario A scientifically impossible and scenario B remarkably unlikely, as we know of no explosive compound that could withstand such force and/or heat without detaching from the columns or simply burning off prior to detonation.

There are other problems with both scenarios: Given the consistent weight distribution around the outer perimeter of each structure, one would have needed access to a prohibitively large quantity of load-bearing I-beam columns to allow “cutter charges” to initiate failure. Those columns would have needed extensive preparation, also known as “pre-burning”, to allow the explosives to perform their function. And in order to prepare the columns you first had to be able to see the columns, which means at least partially removing the outer-perimeter interior walls of all blast floors, including furniture, plumbing and conduit lines, insulation, etc.

All of this would have been performed within the 55 minutes between plane impact and collapse – working in an environment of unspeakable heat and destruction – or have been performed completely undetected, in advance, on multiple floors in both buildings, while suffering no adverse effects from the planes’ impact with these same areas.

This is impossible.

## **ASSERTION #2**

**“But they fell straight down into their own footprint.”**

**PROTEC COMMENT: They did not. They followed the path of least resistance, and there was a lot of resistance.**

Any discussion of how the towers fell on 9/11 requires a fundamental understanding of how buildings collapse and an examination of the damage inflicted upon adjacent structures that morning.

A tall office building cannot be made to tip over like a tree. Reinforced concrete smokestacks and industrial towers can, due to their small footprint and inherently monolithic properties. However, because typical human-inhabited buildings (and their supporting elements) are spread over a larger area and are not nearly as rigid, the laws of gravity cause them to begin collapsing downward upon being weakened or tipped off center to a certain point. Blasters are well aware of this and often rely on this principle in designing upper-floor charge patterns to maximize breakage and in predicting debris drop zones.

The collapse of towers 1 and 2 followed this principle exactly. When the impact floors of both towers eventually failed, the upper sections did not simply tumble over onto the street below, rather they tilted while simultaneously collapsing downward.

One primary difference between these two collapses and a typical building implosion was that the initial failures occurred very high up on the structures, which lead to an extended-duration “pancake” effect down to the ground. With the weight and mass of the upper sections forcing the floor trusses below rapidly downward, there was no way for outer perimeter walls to fall in, so they had to fall out. A review of all photographic images clearly show about 95% of falling debris being forced away from the footprint of the structure, creating a giant “mushroom” effect around its perimeter.

As we now know, significant amounts of heavy structural debris rained down for blocks around the site. Many of the closest WTC buildings were completely destroyed and others heavily damaged. Predictably, the north tower’s collapse caused slightly more ancillary damage than the south tower, as its impact point was higher and thus a larger volume of debris was projected farther from its footprint. Video of the north tower collapse clearly shows a roughly 50-story tall section of the building shearing away intact and laying out towards the west, heavily damaging the American Express Building and others on the adjacent block. Aerial photos taken just after both collapses show massive volumes of debris that impacted WTC 7 (and other buildings to the north), the effects of which were directly responsible for the intense fires within that structure.

These facts indicate that a relatively small amount of structural support debris actually landed straight down within the towers’ footprints, making this event notably dissimilar to a planned demolition event.

### **ASSERTION #3**

**“But explosive charges (aka plumes, squibs, etc.) can clearly be seen shooting from several floors just prior to collapse.”**

**PROTEC COMMENT: No, air and debris can be seen pushing violently outward, which is a natural and predictable effect of rapid structural collapse.**

Human-inhabited buildings are typically comprised of about 70% air and 30% structural elements and contents. During any rapid collapse that air must be displaced in some manner. Therefore when gravity makes a structure fall downward, the air within the structure is propelled horizontally through windows, doorframes, or any other path of least resistance.

In the case of WTC 1 and 2, it has been scientifically documented that the failures of interior floor trusses were occurring slightly ahead of exterior columns, which is why the columns fell outward and contributed to a “mushroom” effect. Another side effect of this unequal progression was that air – and various lightweight office contents – was forced out of windows well below the visible collapse mechanism. The amount of debris seen jettisoning from any given floor or window was likely dependent on the condition of the windows, obstructions or furniture blocking the windows, and the amount and weight of localized debris. The existence of vacant and non-occupied mechanical floors also likely affected the level or absence of expulsion in certain areas.

Again, it is important to note that neither building structurally failed at any location where plumes were visible...nor did they fail at any point in advance of the single gravitational collapse sequence. Which tells us that the “plume” phenomenon witnessed was a predictable effect that gravity dictates had to occur.

#### **ASSERTION #4**

**“Several credible eyewitnesses are adamant that they heard explosions in or near the towers.”**

**PROTEC COMMENT: Maybe they did hear loud noises that sounded to them like explosions, but such statements do nothing to refute scientific evidence that explosives were not used.**

Arguing over who heard explosion-like noises, when they heard them, how loud they were or from what direction they came is a pointless exercise. This is not to imply that any witness should be ridiculed or dismissed; however, such subjective, highly interpretive statements do nothing to prove or disprove the presence of explosives. Simply put, there are countless causes of sharp, loud noises that have no relation to explosives.

The only scientifically legitimate way to ascertain if explosives were used is to cross-reference the fundamental characteristics of an explosive detonation with independent ground vibration data recorded near Ground Zero on 9/11. Fortunately, several seismographs were recording ground vibration that morning, and perhaps more fortunately, all available data is consistent and paints a clear picture.

Seismographs at Columbia University's Lamont-Doherty Earth Observatory in Palisades, New York, recorded the collapses of WTC 1, 2 and 7. This data was later released to the public and currently appears on their website. Additionally, on 9/11 Protec field technicians were utilizing portable field seismographs to continuously record ground vibrations on several construction sites in Manhattan and Brooklyn for liability purposes.

In all cases, these recordings indicate single vibration events when the buildings collapsed. At no point during 9/11 were independent or secondary vibration events documented by any seismograph, and we are unaware of any entity possessing such data.

This evidence makes a compelling argument against explosive demolition. The laws of physics dictate that any detonation powerful enough to defeat steel columns would have transferred excess energy through those same columns into the ground, and would certainly have been detected by at least one of the monitors that were sensitive enough to record the structural collapses. However, a detailed analysis of all available data reveals no presence of any unusual or abnormal vibration events.

#### **ASSERTION #5**

**“An explosive other than conventional dynamite or RDX was used...a non-detonating compound such as thermite (aka thermate), which gets very hot upon initiation and can basically ‘melt’ steel. This can be proven by photographs of molten steel taken at Ground Zero, the temperature and duration of underground fires, and comments made by rescue workers.”**

**PROTEC COMMENT: We have come across no evidence to support this claim.**

This claim is actually a loose connection of unrelated individual assertions, therefore we must address them as such.

1. The vast majority of comments made by rescue workers, city officials or various others not involved in the actual demolition process at Ground Zero regarding the heat of underground fires or “molten anything” (steel, aluminum, tin, composites, etc.) are conjecture and have no practical value in determining what types of materials were actually burning and at what temperature. Most were simply never in a position to know, and those that were have acknowledged that they don’t know for sure.

2. Photographs that we have examined purporting to show demolition equipment extracting “molten steel” from the debris at Ground Zero are inconclusive at best, and most are inaccurate as described. Extracting various hot metallic compounds or debris is one thing, but “molten steel beams” is quite another. As a fundamental point, if an excavator or grapple ever dug into a pile of molten steel heated to excess of 2000 degrees Fahrenheit it would completely lose its ability to function. At a minimum the hydraulics would immediately fail and its moving parts would bond together or seize up. The heat would then quickly transfer through the steel components of the excavator and there would be concern for its operator. The photos we have reviewed on various websites do not show any of this, and if anything, indicate that the underground fires - while very hot – were not hot enough to melt steel.

3. In an effort to further research this assertion, we spoke directly with equipment operators and site foremen who personally extracted beams and debris from Ground Zero (several of whom have requested anonymity to prevent harassment). These men worked for independent companies in separate quadrants of the site, and many were chosen due to their extensive experience with debris removal following explosive demolition events. To a man, they do not recall encountering molten structural steel beams, nor do they recall seeing any evidence of pre-cutting or explosive severance of beams at any point during debris removal activities.

4. The assertion that thermite played a role in the towers’ collapse has been put forth by Stephen Jones, a Professor at Brigham Young University. This author spoke with Dr. Jones at length in February 2006, and we have corresponded via email a few times since. As he has explained it, metallurgic tests were conducted on two sections of steel beams that were saved for 9/11 memorials in the New York area. These beams apparently tested positive for thermite, which led Dr. Jones to conclude that thermite was used on 9/11 by unknown parties to compromise support beams in WTC 1, 2 and 7. Dr. Jones acknowledges that his investigation is still in the research phase and that questions regarding the viability of his theory remain unanswered. For example, it is unknown how thermite’s destructive process could have been applied and initiated simultaneously on so many beams – in several buildings – undetected and/or under such extreme conditions. It is also unusual that no demolition personnel at any level noticed telltale signs of thermite’s degenerative “fingerprint” on any beams during the eight months of debris removal. And a verifiable chain of possession needs to be established for the tested beams. Could they have been cut away from the debris pile with acetylene torches, shears, or other potentially contaminated equipment while on site? Could they have been exposed to trace amounts of thermite or other compounds while being handled, or in storage, or during the transfer processes from Ground Zero to the memorial sites? We do not know the answers, but these and many related questions should be addressed if this assertion continues to be pursued.

#### **ASSERTION #6**

**“Debris removed from Ground Zero – particularly the large steel columns from towers #1 and 2 – were quickly shipped overseas to prevent independent examination or scrutiny.”**

**PROTEC COMMENT: Not according to those who handled the steel.**

The large steel support members extracted from Ground Zero were handled differently than other debris, mostly because of their size and quantity (this type of initial separation increases jobsite efficiency and is not unusual on demolition projects).

Once the steel was extracted and/or cut away from other debris, it was piled in staging areas just outside the work zone. These piles were then loaded onto trucks that transported them a few blocks north to a secondary staging area on the Hudson River. Cranes transferred the steel from the trucks onto barges, which were shipped to Fresh Kills Landfill in Staten Island. At this point it transferred into the control of Yannuzzi Demolition, whose team was responsible for off-loading the barges and storing the steel in an area separate from general debris arriving on other barges. It was then examined and cataloged by a series of forensic investigators, city officials and site managers. Some time later (the timing varied due to logistical factors), the steel was shipped off site to China.

Our research team can personally verify the Lower Manhattan chain of possession, as we witnessed and documented this chain. We then reviewed activities that occurred at Fresh Kills by speaking with John Yannuzzi, President of Yannuzzi Demolition. Our team also reviewed commentary made by Dennis Dannenfelser, Yannuzzi’s Fresh Kills Site Supervisor, who oversaw the entire operation from start to finish and spoke candidly and extensively at the National Demolition Association’s annual Convention in March 2003. According to all parties, the steel went through the same series of steps as it would have on any other demolition project, albeit on a larger scale and with an increased presence of examiners. No one we spoke with perceived an attempt to “rush” or hide the process, and to the opposite, dozens if not hundreds of unrelated individuals – working for various entities and possessing various types of expertise – came in close contact with the steel over a period of months before it was eventually shipped overseas.

In consideration of these first-hand experiences and interviews, and absent any dissenting commentary, we can find nothing to support this assertion.

#### **ASSERTION #7**

**“WTC 7 was intentionally ‘pulled down’ with explosives. No airplane hit it, and the building owner himself was quoted as saying he made a decision to ‘pull it’.”**

**PROTEC COMMENT: This scenario is extremely unlikely for many reasons.**

The above assertion has taken several forms over the past few years and has developed into a major point of discussion amongst conspiracy theorists. Most recently, it was used as a cornerstone allegation on C-SPAN’S national broadcast of a 9/11 symposium hosted by Mr. Alex Jones, an author and radio personality who is highly critical of the government’s handling of 9/11.

However, from a demolition standpoint, several aspects of this claim are problematic.

1. A building owner would never be in a position to dictate to fire personnel or emergency workers whether his building should be “pulled” or demolished. We know of no case where command and control of a disaster scene has ever been transferred to a private third party, much less a disaster of such scope. This action would violate a number of ethical canons regarding the safety of emergency responders and the general public, not to mention exposing those who transferred and assumed such authority to substantial liability risks. Therefore, even if such a statement was made on 9/11, it is highly doubtful that the comment would have affected decisions at the scene.

2. We have never once heard the term “pull it” being used to refer to the explosive demolition of a building, and neither has any blast team we’ve spoken with. The term is used in conventional demolition circles, to describe the specific activity of attaching long cables to a pre-weakened building and maneuvering heavy equipment (excavators, bulldozers, etc.) to “pull” the frame of the structure over onto its side for further dismantlement. This author and our research team were on site when workers pulled over the six-story remains of WTC-6 in late fall 2001, however we can say with certainty that a similar operation would have been logistically impossible at Ground Zero on 9/11, physically impossible for a building the size of WTC 7, and the structure did not collapse in that manner anyway.

3. Any detonation of explosives within WTC 7 would have been detected by multiple seismographs monitoring ground vibration in the general area (see Assertion #4). No such telltale “spike” or vibratory anomaly was recorded by any monitoring instrument.

4. Saying, “No airplane hit it” implies the structure suffered minimal effects from the planes crashing into the adjacent towers. In fact, nothing could be further from the truth. Video and photographs of the north tower collapse clearly depict substantial upper sections of the building falling outward and impacting WTC buildings 6 and 7. This was not a glancing blow from extraneous material, rather thousands of tons of steel girders falling directly into the building from hundreds of feet above. WTC 7 sustained significant impact damage to its southwest corner up to the 18-20<sup>th</sup> floor, or a little less than halfway up the building. There was also significant damage to the building’s south face, although dense smoke present in most photos hinders an exact assessment. Other photos depict several lower floors fully involved in a large fire that either began upon impact or shortly thereafter, and most experts point to the large stockpile of diesel fuel stored in the basement as the likely catalyst. Regardless of the fire’s origin, these flames are clearly visible from all four sides of the structure. With most local firefighting equipment destroyed and the search for survivors being of primary concern, these intense fires were left to burn uncontrolled for more than six hours, further compromising the already badly damaged structure. Given these facts, any implication that WTC 7 was not substantially affected by the original plane crashes is not accurate.

5. Several demolition teams had reached Ground Zero by 3:00pm on 9/11, and these individuals witnessed the collapse of WTC 7 from within a few hundred feet of the event. We have spoken with several who possess extensive experience in explosive demolition, and all reported hearing or seeing nothing to indicate an explosive detonation precipitating the collapse. As one eyewitness told us, “We were all standing around helpless...we knew full well it was going to collapse. Everyone there knew. You gotta remember there was a lot of confusion and we didn’t know if another plane was coming...but I never heard explosions like demo charges. We knew with the damage to

that building and how hot the fire was, that building was gonna go, so we just waited, and a little later it went.”

6. Finally, we have not discovered or been presented with any physical evidence indicating explosives were used to fell the structure.

We do not know exactly how or why WTC 7 fell when it did, and we decline to hypothesize here. All we can offer is that, from a demolition and structural failure standpoint, available data does not rule out the possibility of the building collapsing as a direct result of the structural conditions detailed above.

#### **ASSERTION #8**

**“A steel-framed building has never collapsed due to fire, yet three steel buildings collapsed on one day...therefore explosives must have been responsible.”**

**PROTEC COMMENT: No, actually it means three steel buildings collapsed due to fire (and violent external forces) on one day.**

Many unprecedented things happened on 9/11. To draw any specific relationship between how many buildings were destroyed and the reason for their collapse runs counter to logic and common sense.

The fact is, many steel structures have collapsed due to fire. And as with those failures, the collapse of all three buildings on 9/11 involved specific structural conditions. Each failure displayed characteristics dissimilar to the other two, and in no case have we come across evidence of explosives being present or affecting any of those conditions.

#### **ASSERTION #9**

**“Anyone denying that explosives were used is intentionally ignoring or dismissing evidence that doesn’t suit their conclusion.”**

**PROTEC COMMENT: Please...if anyone knows of specific physical evidence relating to explosives being used in any manner on the Ground Zero site, bring it to our attention.**

As you have noticed, most of our comments relate to the differences between what people *actually* saw on 9/11 and what they *would have seen* had explosives been present. Absent any evidence of explosives use, that is all we can offer (well, that and noting how no evidence has surfaced during five years of furious independent web investigations and intense media hubbub).

It also bears repeating that the men and women who actually deconstructed and removed the debris from Ground Zero were not part of a clandestine cartel of government stooges working to obstruct justice. Rather this collection of several hundred workers represented some of the country’s most experienced and highly respected demolition veterans (recall the impressive fact that no one was killed during the clean-up). Most quickly became consumed by the project and worked on site from the first day to the last, stressing marriages and families to the breaking point. But their consistent presence – combined with their vast collection of past experiences working on explosive demolition projects – made them precisely the group of people who would

have been most likely to spot and call attention to abnormalities in the debris had there been any.

With all due respect to distinguished scholars and others alike, it matters little whether Alex Jones is drawing parallels to building implosions, Steven Jones is drawing conclusions from hot metal or Chuck Jones is drawing dynamite in the hands of Wile E. Coyote; for assertions to be credible they must eventually comply with the scientific principles of explosive initiation and of structural failure, realistic judgments of probability, and indisputable visual evidence.

Thus far, every assertion we have investigated scores a resounding 0 for 3.

Our team welcomes the opportunity to review additional data as it becomes available. However barring any additional evidence, those making allegations similar to the points above may do well to consider that sometimes “asking tough questions” isn’t the biggest challenge; It’s accepting the answers and decisively moving on to other areas that render their contributions productive and valuable.