ARCHITECTS & ENGINEERS for 9/11 TRUTH

April 15, 2020

Catherine Fletcher
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National Institute of Standards and Technology
100 Bureau Drive, Mail Stop 3220
Gaithersburg, MD 20899-3220

Re: Request for Correction Under the Data Quality Act to NIST's Final Report on the Collapse of World Trade Center Building 7

Dear Ms. Fletcher:

This petition is a request for correction of information disseminated by the National Institute of Standards and Technology ("NIST"). This Request for Correction (the "Request") is being submitted by 10 family members of people killed on September 11, 2001, by 88 architects and structural engineers, and by the organization Architects & Engineers for 9/11 Truth, Inc. (referred to herein collectively as "Requesters"). It is being submitted under Section 515 of Public Law 106-554 (commonly known as the Data Quality Act or Information Quality Act; herein referred to as the "DQA"), the Office of Management and Budget's ("OMB's") government-wide Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies (the "OMB Guidelines"), and NIST's "Guidelines, Information Quality Standards, and Administrative Mechanism" (the "NIST IQS").

This Request is being submitted as a single document signed by multiple Requesters in order to avoid submitting duplicative Requests. However, each Requester reserves the right to appeal the outcome of NIST's determination of the merits of this Request either jointly or severally, in each Requester's sole discretion. Requesters prefer to be contacted via email through the designated representative of Architects & Engineers for 9/11 Truth whenever possible. Requesters also request that NIST not distribute the Requesters' contact information listed below to anyone not officially involved in addressing this Request. If this Request is published on NIST's website or elsewhere, a redacted version should be published omitting the Requesters' contact information.

The information that is the subject of this Request is NIST's *Final Report on the Collapse of the World Trade Center Building 7* (NCSTAR 1A) and NIST's *Fire Response and Probable Collapse Sequence of World Trade Center Building 7* (NCSTAR 1-9), collectively referred to herein as the "NIST WTC 7 Report." Secondarily, NIST's webpage titled *FAQs – NIST WTC 7 Investigation* (referred to herein as the "NIST WTC 7 FAQs") is also the subject of this Request. The NIST WTC 7 Report can be found at the following NIST webpage: https://www.nist.gov/el/final-reports-nist-world-trade-center-disaster-investigation (last visited April 14, 2020). The NIST WTC 7 FAQs can be found at the following NIST webpage: https://www.nist.gov/topics/disaster-failure-studies/faqs-nist-wtc-7-investigation (last visited April 14, 2020).

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As described more fully below, the NIST WTC 7 Report and the NIST WTC 7 FAQs contain information that clearly violates the DQA, the OMB Guidelines, and the NIST IQS, and such violations significantly and adversely affect Requesters. The items of information that fail to comply with the DQA, the OMB Guidelines, and the NIST IQS, presented in Section V of this Request in two parts, are as follows (at the pages of this Request referenced):

Part 1: NIST's Computer Simulations

A. Column 79 Side Plate (page 8)
B. Thermal Expansion of Beam K3004 (page 15)
C. Girder A2001 Web Stiffeners (page 18)
D. Reported Cascade of Floor Failures (page 22)
E. NIST's Global Collapse Analyses (page 26)

Part 2: NIST's Omission and Distortion of Evidence of Explosions and Incendiaries

F. Seismogram Data (page 49)
G. Eyewitness and Audio Evidence of Explosions (page 55)
H. Severely Eroded Steel from WTC 7 (page 80)

I. THE NIST WTC 7 REPORT AND THE NIST WTC 7 FAQs CONTAIN INFORMATION UNDER THE NIST IQS

The NIST IQS defines information as follows (*see* NIST IQS, Part I, Definitions):

> Information means any communication or representation of knowledge such as facts or data, in any medium or form, including textual, numerical, graphic, cartographic, narrative, or audiovisual forms. This definition includes information that an agency disseminates from a Web page but does not include the provision of hyperlinks to information that others disseminate. This definition does not include opinions, where the agency's presentation makes it clear that what is being offered is someone's opinion rather than fact or the agency's views.

Information contained in the NIST WTC 7 Report and the NIST WTC 7 FAQs falls under the definition of information because it is a communication of facts and data. Information contained in the NIST WTC 7 FAQs specifically falls under the definition of information because it is information disseminated from a webpage. Furthermore, nowhere within the NIST WTC 7 Report or the NIST WTC 7 FAQs does NIST "make it clear that what is being offered is someone's opinion rather than fact or the agency's views." NIST states that, although it consulted an outside advisory committee, "The content of the reports and recommendations . . . are solely the responsibility of NIST." (*See* NCSTAR 1A, p. xxx.) NIST, through the National Construction Safety Team Act (Pub. Law 107-231, 15 U.S.C. § 7301 *et seq*.) (the "NCST Act") is required by law to generate such information. (*See* 15 U.S.C. § 7301 *et seq.*) Thus, the NIST WTC 7 Report and the NIST WTC 7 FAQs contain information that is covered by the DQA and the NIST IQS.

II. THE NIST WTC 7 REPORT AND THE NIST WTC 7 FAQs WERE DISSEMINATED BY NIST

The NIST IQS defines dissemination as follows (*see* NIST IQS, Part I, Definitions):

> Dissemination means agency initiated or sponsored distribution of information to the public. Dissemination does not include distribution limited to government employees or agency contractors or grantees; intra- or inter-agency use or sharing of government information; and responses to requests for agency records under the Freedom of Information Act, the Privacy Act, the Federal Advisory Committee Act or other similar law. This definition also does not include distribution limited to correspondence with individuals or persons, press releases, archival records, public filings, subpoenas or adjudicative processes.

The NIST WTC 7 Report and the NIST WTC 7 FAQs were clearly disseminated by NIST. Specifically, NIST was required by law to generate the NIST WTC 7 Report under the NCST Act and did in fact generate the NIST WTC 7 Report in November 2008. (*See* 15 U.S.C. § 7307 mandating the issuance of a final public report following the investigation.) The NIST WTC 7 Report was disseminated by NIST via the following webpage: https://www.nist.gov/el/final-reports-nist-world-trade-center-disaster-investigation. The NIST WTC 7 FAQs were disseminated by NIST via the following webpage: https://www.nist.gov/topics/disaster-failure-studies/faqs-nist-wtc-7-investigation. Thus, the NIST WTC 7 Report and the NIST WTC 7 FAQs were disseminated by NIST.

III. CORRECTION OF THE NIST WTC 7 REPORT AND THE NIST WTC 7 FAQs WOULD SERVE A USEFUL PURPOSE

Under the NIST IQS, no initial request for correction will be considered concerning "disseminated information the correction of which would serve no useful purpose." (*See* NIST IQS, Part III(B)(3).)

This exception clearly does not apply to this Request. The horrendous attacks of September 11, 2001, were the worst attacks on American soil since Pearl Harbor, and perhaps the worst such attacks in the history of the United States. Nearly 3,000 people died on 9/11, and the vast majority of them died in the World Trade Center. Just as many or more have died after 9/11 as a result of exposure to the toxic and corrosive materials that contaminated the air following the collapse of WTC 7, WTC 1, and WTC 2.

NIST was statutorily tasked with telling the 9/11 victims' families, the building and fire safety industries, the American people, and the U.S. government how and why WTC 7 collapsed. If NIST, through the NIST WTC 7 Report and the NIST WTC 7 FAQs, has disseminated inaccurate, unreliable, or biased information about the collapse of the WTC 7, the implications would stretch across the entire architectural and political landscape.

First, the dissemination by NIST of inaccurate, unreliable, or biased information concerning the collapse of WTC 7 may lead to (and may have already led to) the adoption of unnecessary and improper changes to building codes, standards, and practices. These changes to building codes, standards, and practices could, in turn, lead to needless deaths and injuries if such codes and standards are too lenient or to unnecessary expenses if they are too strict.

Second, immense political and policy ramifications would flow from the correction of inaccurate, unreliable, or biased information disseminated by NIST concerning the collapse of WTC 7. Specifically, should the correction of such information render a finding that the collapse of WTC 7 was caused not by fires but by a controlled demolition, it would instantly cast extreme doubt on NIST's finding that the total destruction of the WTC Towers was caused by the airplane impacts and ensuing fires and would most likely lead to congressional and criminal investigations to identify those responsible for the destruction of all three buildings. The process and outcome of such investigations would most likely fundamentally reshape the American people's understanding of the 9/11 attacks and have broad and profound influence on the policies of the U.S. government.

Thus, the degree to which the correction of information contained in the NIST WTC 7 Report and the NIST WTC 7 FAQs would serve a useful purpose cannot be overstated.

IV. APPLICABLE INFORMATION QUALITY STANDARDS SUMMARY

A. Information Quality Standards Summary for All Information

Under the OMB Guidelines and the NIST IQS, information quality comprises three elements: utility, integrity, and objectivity. (*See* NIST IQS, Part II.) This Request will address several distinct items of information contained within the NIST WTC 7 Report and the NIST WTC 7 FAQs. For each item of information so addressed, this Request will describe in detail how such information fails to comply with at least one of these three elements of information quality. The standards for each of the three information quality elements are summarized below.

"Utility" under the NIST IQS means that the information is "useful to its intended users." (*See id.)* The term "useful," in turn, means that the information is "helpful, beneficial, or serviceable to its intended users." (*See id.*) The NIST IQS further provides that "Where the usefulness of information will be enhanced by greater transparency, care is taken that sufficient background and detail are available, either with the disseminated information or through other means, to maximize the usefulness of the information. The level of such background and detail is commensurate with the importance of the particular information, balanced against the resources required, and is appropriate to the nature and timeliness of the information to be disseminated." (*See id.*)

"Integrity" under the NIST IQS means that before information is disseminated by NIST, it is "safeguarded from improper access, modification, or destruction." (*See id.*) Furthermore, the

integrity of information is protected "to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information." (*See id.*)

"Objectivity" under the NIST IQS means that the information is "accurate, reliable, and unbiased." (*See id.*) Moreover, "objective" information is "presented in an accurate, clear, complete, and unbiased manner." In the case of scientific information, "the original and supporting data are generated, and the analytic results are developed, using sound statistical and research methods." (*See id.*)

B. Information Quality Standards Background for Influential Information

The OMB Guidelines and the NIST IQS apply stricter quality standards to the dissemination of information that is considered "influential." (*See* 67 F.R. 8455; NIST IQS, Part II.) The OMB Guidelines define as "influential" information that "will have or does have a clear and substantial impact on important public policies or important private sector decisions." (*See id*.) The NIST IQS defines "influential" similarly. (*See* NIST IQS, Part II.)

In regards to influential scientific information and analytic results related thereto, the OMB Guidelines dictate that "agency guidelines shall generally require sufficient transparency about data and methods that an independent reanalysis could be undertaken by a qualified member of the public." (*See* 67 F.R. 8460.) Citing OMB Guidelines, the NIST IQS states that "agency guidelines shall include a high degree of transparency about data and methods to facilitate the reproducibility of such information by qualified third parties." (*See* NIST IQS, Part II.)

"Reproducibility" under the NIST IQS means that the information is "capable of being substantially reproduced, subject to an acceptable degree of imprecision. For information judged to have more (less) important impacts, the degree of imprecision that is tolerated is reduced (increased)." The NIST IQS states that "With respect to analytic results, 'capable of being substantially reproduced' means that independent analysis of the original or supporting data using identical methods would generate similar analytic results, subject to an acceptable degree of imprecision or error." (*See id.*) In other words, if independent analysis of the original or supporting data using identical methods does not generate similar analytic results, the disseminated information does not meet the reproducibility standard imposed on "influential" information.

C. The NIST WTC 7 Report Contains "Influential" Scientific Information

As stated previously, the NIST WTC 7 Report was mandated by the NCST Act. (*See* 15 U.S.C. § 7307.) However, the NCST Act mandate went even further than simply requiring the dissemination of a final report on NIST's findings. The NCST Act also required NIST to "recommend, as necessary, specific improvements to building standards, codes and practices," and recommend "actions needed to improve the structural safety of buildings, and improve evacuation and emergency response procedures." (*See* 15 U.S.C. § 7301(a)(2)(C), (D).)

It is clear that the NIST WTC 7 Report has had (and will continue to have) a "clear and substantial impact on important public policies" because it has impacted "building standards, codes and practices." It is also clear that the NIST WTC 7 Report has had (and will continue to have) a clear and substantial impact on "important private sector decisions" because it has impacted structural requirements for the construction of buildings and evacuation and emergency response procedures, as well as the costs builders incur in constructing steel-framed high-rise structures. Moreover, in the same way that immense political and policy ramifications would flow from the correction of inaccurate, unreliable, or biased information disseminated by NIST concerning the collapse of WTC 7, so have immense political and policy ramifications flowed from (and will continue to flow from) NIST's finding that the collapse of WTC 7 was caused by fires and not by a controlled demolition. For all of these reasons, the NIST WTC 7 Report clearly qualifies as "influential" scientific information under the OMB Guidelines and the NIST IQS.

V. INFORMATION IN THE NIST WTC 7 REPORT AND THE NIST WTC 7 FAQs VIOLATES THE OMB GUIDELINES AND NIST INFORMATION QUALITY STANDARDS

This section describes several distinct items of information contained within the NIST WTC 7 Report and the NIST WTC 7 FAQs that fail to comply with the DQA, the OMB Guidelines, and the NIST IQS.

The only way that each of these information quality violations can ultimately be addressed is for NIST to develop a new "Probable Collapse Sequence" that is both physically possible and consistent with the data presented herein.

Part 1: NIST's Computer Simulations

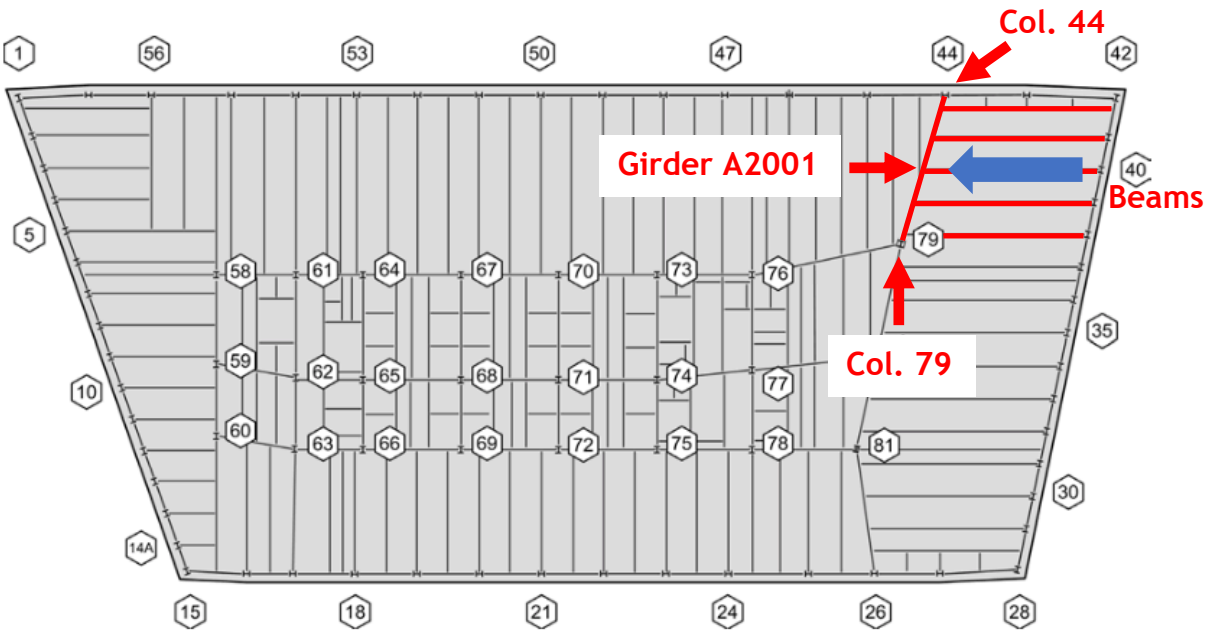
The first four items of information described in Part 1 relate to the initiating local failure that NIST claims began the Probable Collapse Sequence. The NIST WTC 7 Report summarizes the initiating local failure as follows, with the bolded text highlighting the three items of information to be addressed (*see* NCSTAR 1A, p. 21-22):

> The initiating local failure that began the probable WTC 7 collapse sequence was the buckling of Column 79. This buckling arose from a process that occurred at temperatures at or below approximately 400 °C (750 °F), which are well below the temperatures considered in current practice for determining fire resistance ratings associated with significant loss of steel strength. When steel (or any other metal) is heated, it expands. If thermal expansion in steel beams is resisted by columns or other steel members, forces develop in the structural members that can result in buckling of beams or failures of connections.
>
> Fire-induced thermal expansion of the floor system surrounding Column 79 led to the collapse of Floor 13, which triggered a cascade of floor failures. **In this**

case, the floor beams on the east side of the building expanded enough that they pushed the girder spanning between Columns 79 and 44 to the west on the 13th floor. (See Figure 1–5 for column numbering and the locations of girders and beams.) This movement was enough for the girder to walk off of its support at Column 79.

The unsupported girder and other local fire-induced damage caused Floor 13 to collapse, beginning a cascade of floor failures down to the 5th floor (which, as noted in Section 1.2.3, was much thicker and stronger). Many of these floors had already been at least partially weakened by the fires in the vicinity of Column 79. This left Column 79 with insufficient lateral support, and as a consequence, the column buckled eastward, becoming the initial local failure for collapse initiation.

The structural elements mentioned above are shown below in Figure 1.5 of NCSTAR 1A. The blue arrow indicates the westward direction in which, according to NIST, the floor beams thermally expanded and caused the girder (Girder A2001) to walk off its support at Column 79.



Based on structural drawings (Cantor 1985)

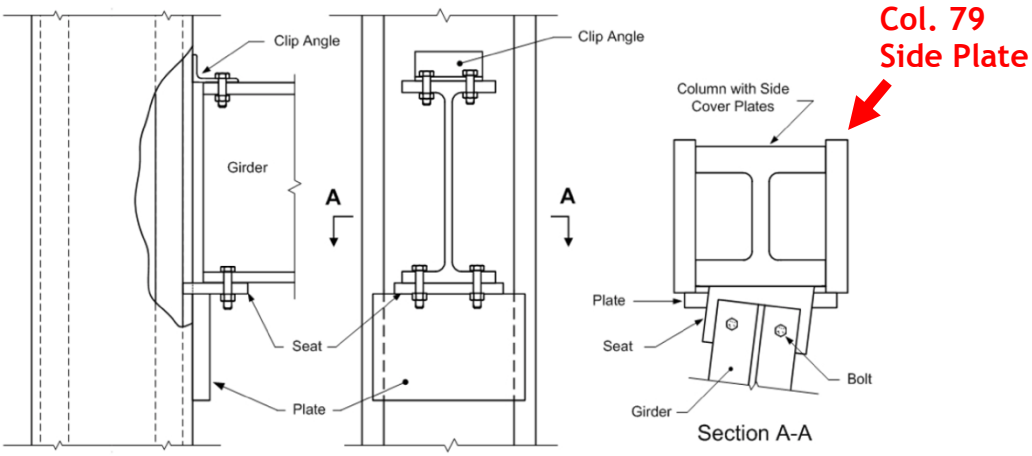
Figure 1–5. Typical WTC 7 floor showing locations of the columns, girders, and beams.

The four items of information presented below that relate to the initiating local failure involve (A) the Column 79 side plate, (B) the thermal expansion of beam K3004, (C) the Girder A2001 web stiffeners, and (D) the reported cascade of floor failures from Floor 13 down to Floor 5. As demonstrated below, correction of any one of these violations leads to the conclusion that NIST's Probable Collapse Sequence was physically impossible and must be discarded.

A. COLUMN 79 SIDE PLATE

1. NIST's 16-Story ANSYS Model Ignored the Effect that Column 79's Side Plate Would Have Had in Preventing the Walk-Off of Girder A2001, Thus Violating the OMB Guidelines and NIST IQS

Column 79 was a W14 x 730 standard structural shape column with 2" x 26" built-up side plates welded to its flanges at Floor 13. Column 79 and its side plates are pictured in Figures 8-21 and 8-23 of NCSTAR 1-9, shown below, with the western side plate pointed out. The dimensions of the side plates are given in the fabrication shop drawings. (*See* Frankel Steel Limited, Drawing 1091.)



Based on fabrication shop drawings (Frankel 1985)

Figure 8–21. Seat connection at Column 79.

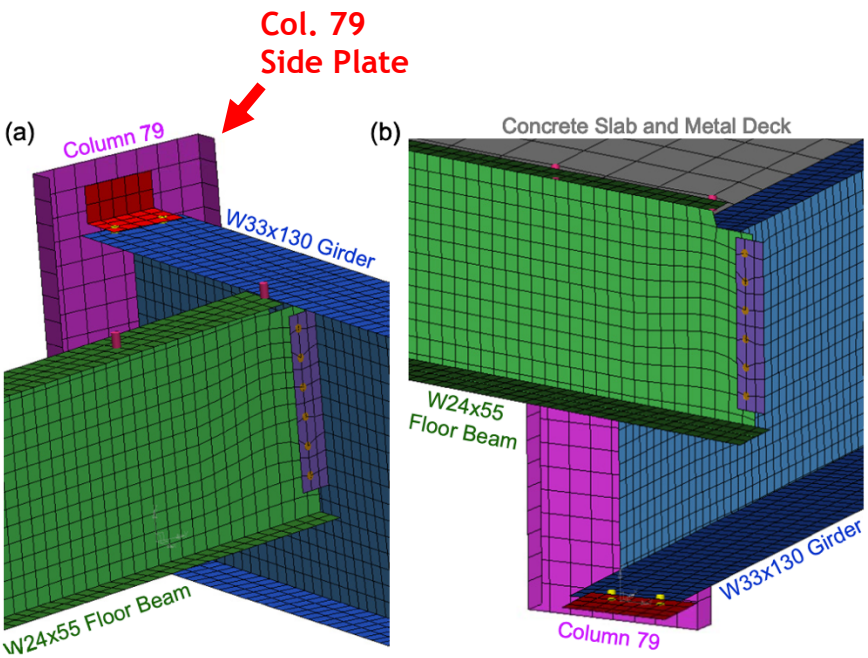


Figure 8–23. Views from northeast showing seat connection at Column 79 and bolted shear plate connection of floor beam to girder.

Preliminary analysis conducted by NIST using LS-DYNA software, presented in Section 8.8 of NCSTAR 1-9, as well as analysis conducted at the University of Alaska Fairbanks (UAF) using ABAQUS software, demonstrates that when Girder A2001 and the adjoining floor beams are heated according to NIST's assumptions (to 500 °C and 600 °C, respectively), Girder A2001 expands and becomes trapped behind the side plate on the western side of Column 79 as it is pushed to the west by the thermally expanding floor beams. The NIST WTC 7 Report states the following (*see* NCSTAR 1-9, p. 349-353):

> A finite element analysis of the northeast corner floor system was conducted to evaluate its response to elevated temperatures and to confirm which failure modes needed to be accounted for in the 16-story ANSYS model. A finite element model of the northeast corner was developed using the LS-DYNA software that included the design details described in the previous section such as shear studs on the beams and seat connections at the girder ends and exterior ends of the beams.
>
> . . . For Column 79, the flange on the north face and the extending portions of the side cover plates were modeled to allow for contact with the girder. . . .
>
> . . . Continued axial expansion of the floor beams pushed the girder laterally at Column 79, as shown in Figure 8–26, in which failed shear studs and bolts were evident. . . . **Continued axial expansion of the girder caused it to bear against the face of Column 79**, generating large axial forces that led to failure of the bolts connecting the girder to Column 44. (Emphasis added.)

The trapping of Girder A2001 behind the Column 79 side plate in NIST's preliminary LS-DYNA analysis is illustrated graphically in Figure 8-26 of Section 8.8 shown below. Juxtaposing Figure 8.23 (left) with Figure 8.26 (right) illustrates the westward travel of Girder A2001.

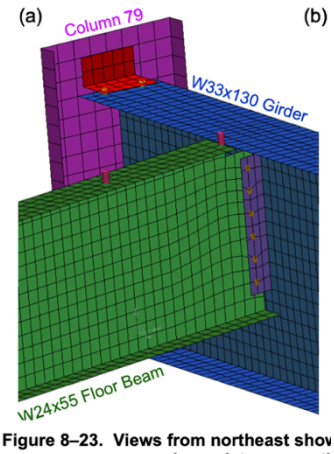


Figure 8–23. Views from northeast shov shear plate connecti

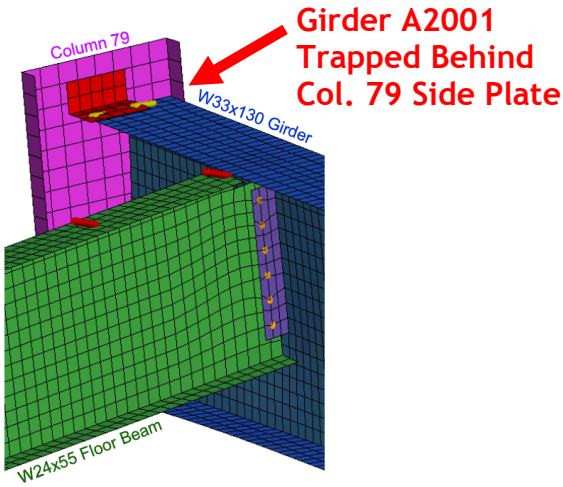


Figure 8–26. Lateral displacement of girder due to thermal expansion of floor beam.
Note: failed bolts and shear studs

The analysis conducted at UAF produced identical findings to NIST's preliminary LS-DYNA analysis in terms of Girder A2001 becoming trapped behind the Column 79 side plate. The UAF team's report, *A Structural Reevaluation of World Trade Center 7* (referred to hereafter as "UAF Report"), states (*see* UAF Report, p. 77-79):

> First, we found that when girder A2001 is heated, it expands such that it becomes trapped behind the side plate on the western side of Column 79 as it is pushed to the west by thermally expanded beams K3004, C3004, B3004, A3004, and G3005 (see Figure 3.4). . . .

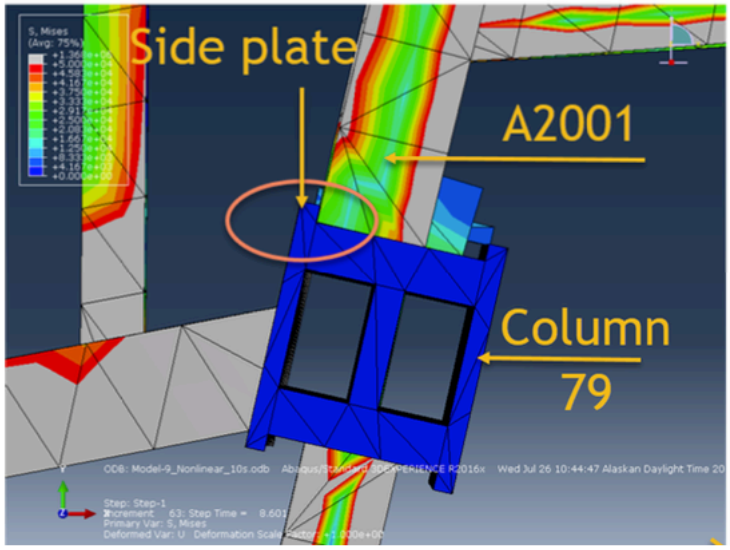


Figure 3.4 Plan view showing girder A2001 trapped by the Column 79 side plate.

> . . . Figure 3.5 [shown below] shows the girder bearing seat at Column 79 is 12 inches wide. The flange width for W33 x 130 girder A2001 is 11.510 inches wide and centered on the seat; its web is 0.580 inches thick. **This would require a lateral travel distance of 6.290 inches for the web to be beyond the seat.** However, the distance between the column side plates is 17.89 inches. **The girder and bearing seat are slightly off center to the east, with just 3.678 inches between the girder's western edge and Column 79's western side plate. Thus, the side plate prevents the girder's web from traveling beyond the bearing seat.** (Emphasis added.)

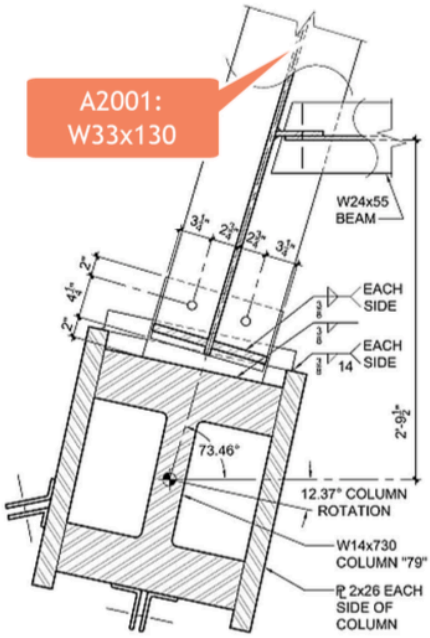


Figure 3.5 Plan View for Floor 13 at Column 79 and girder A2001 seat connection (Data from Frankel Steel Limited, 1985, Drawing 9114; figure prepared by Brookman, 2012).

Contradicting the finding of its preliminary LS-DYNA analysis that Girder A2001 would become trapped behind the side plate on the western side of Column 79 — a finding corroborated by the UAF analysis — NIST somehow ultimately concludes that "the floor beams on the east side of the building expanded enough that they pushed the girder spanning between Columns 79 and 44 **to the west on the 13th floor. . . . This movement was enough for the girder to walk off of its support at Column 79.**" (*See* NCSTAR 1A, p. 22. Emphasis added.)

The NIST WTC 7 Report provides no analysis, calculations, or figures explaining how Girder A2001 moved westward past the Column 79 side plate enough for it to walk off of its support at Column 79 in its 16-story ANSYS model. The NIST WTC 7 Report merely states in general terms (*see* NCSTAR 1-9, p. 527):

> A girder was considered to have lost vertical support when its web was no longer supported by the bearing seat. The bearing seat at Column 79 was 11 in. wide. Thus, when the girder end at Column 79 had been pushed laterally at least 5.5 in., it was no longer supported by the bearing seat.[1]

The only place where NIST addresses the discrepancies between its preliminary LS-DYNA analysis and its 16-story ANSYS model is in FAQ #35 of the NIST WTC 7 FAQs, where it states:

> Differences between the results of the partial floor model and the 16-story model are to be expected. Reasons for these differences include:

[1] Independent researchers later discovered that the bearing seat at Column 79 was actually 12 inches wide. In response, NIST issued an erratum in June 2012 that adjusted the distance needed for walk-off to 6.25 inches.

1. While the partial floor model used a simplified thermal loading scenario, in which the beam and girder temperatures were uniform and were increased monotonically (see Figure 8-25 of NCSTAR 1-9), the 16-story ANSYS model used computed temperatures based on fire dynamics and thermal calculations. [Note: Figure 8-25 is mentioned in FAQ #35 but not included in this Request because it is not necessary to show.]

2. While the columns in the partial floor model were fixed against lateral displacements, the columns in the 16-story model were allowed to move laterally based on the response of the structural system.

3. While the partial floor model applied rotational and in-plane translational constraints along the west and south boundaries of the floor slab, the 16-story model represented the entire slab for all floors.

The above-stated reasons for discrepancies between the results of the preliminary LS-DYNA analysis and the 16-story ANSYS model fall well short of explaining to an acceptable degree of scientific precision why Girder A2001 became trapped behind the Column 79 side plate in the preliminary LS-DYNA analysis but not in the 16-story ANSYS model.

Regarding the first reason stated in NIST WTC 7 FAQ #35, since NIST does not specify how the computed temperatures produced different results from the simplified thermal loading scenario, we are left to assume that the computed temperatures may have heated the floor beams first and caused Girder A2001 to be pushed at least 3.678 inches to the west *before* it expanded enough to become trapped behind the Column 79 side plate. However, calculations regarding the thermal expansion potential of Girder A2001 shown below demonstrate that it needed to be heated only to 70 °C to move within the envelope of the Column 79 side plate if unrestrained.

Temperature (°C)	Difference from Room Temperature of 21 °C	Coefficient of Thermal Expansion of Steel per NIST (in/in-°C)	Expansion of 540-inch-long Girder A2001 (in.)	Elongation toward Column 79 (= ½ of total expansion in inches)	Distance of Western Corner of Girder A2001 from Column 79 Side Plate Protrusion (in)
21	0	1.40E-05	0	0	0.158
30	9	1.40E-05	0.06804	0.03402	0.12398
40	19	1.40E-05	0.14364	0.07182	0.08618
50	29	1.40E-05	0.21924	0.10962	0.04838
60	39	1.40E-05	0.29484	0.14742	0.01058
70	49	1.40E-05	0.37044	0.18522	-0.02722
80	59	1.40E-05	0.44604	0.22302	-0.06502
90	69	1.40E-05	0.52164	0.26082	-0.10282
100	79	1.40E-05	0.59724	0.29862	-0.14062
110	89	1.40E-05	0.67284	0.33642	-0.17842
120	99	1.40E-05	0.74844	0.37422	-0.21622
130	109	1.40E-05	0.82404	0.41202	-0.25402
140	119	1.40E-05	0.89964	0.44982	-0.29182
150	129	1.40E-05	0.97524	0.48762	-0.32962
160	139	1.40E-05	1.05084	0.52542	-0.36742
170	149	1.40E-05	1.12644	0.56322	-0.40522

Reinforcing these calculations, NIST's own preliminary LS-DYNA analysis results shown below demonstrate that at 131 °C, there was sufficient expansion of Girder A2001 to cause the seat bolts at Column 79 to fail. At 164 °C, there was sufficient expansion of Girder A2001 to cause both top clip bolts at Column 79 to fail. The NIST WTC 7 Report states (*see* NCSTAR 1-9, p. 352-353):

> The predicted response of the system is summarized in Table 8–2. The first failures observed were of the shear studs, which were produced by axial expansion of the floor beams, and which began to occur at fairly low beam temperature of 103 °C. **Axial expansion of the girder then led to shear failure of the bolts at the connection to Column 79; and, at a girder temperature of 164 °C, all four erection bolts had failed**, leaving that end of the girder essentially unrestrained against rotation. (Emphasis added.)

Table 8–2 Progression of observed failures.

Time (s)	Temperature (°C)		Event
	Beam	Girder	
1.44	103	89	First shear stud failure
1.54	154	131	Both seat bolts of girder to Column 79 had failed
1.62	194	164	Both top clip bolts of girder to Column 79 had failed
1.83	300	252	All but three shear studs had failed
2.04	406	339	Both seat bolts of girder to Column 44 had failed
2.10	436	364	Northmost floor beam began to buckle laterally
2.18	476	398	Both top plate bolts of girder to Column 44 had failed
2.90	600	500	All floor beams began to buckle

(Yellow highlighting added.)

Once unrestrained due to these connection failures and exceeding 160 °C, Girder A2001 would move at least .36742 inches within the envelope of the Column 79 side plate.

The Case B floor temperatures used in NIST's 16-story ANSYS model are somewhat difficult to decipher in Figure 10-39 below. (The Case B floor temperatures are the computed worst-case scenario temperatures, which NIST then used in its global collapse analyses.) Nevertheless, careful review indicates that the temperatures of Girder A2001 and the floor beams to its east were approximately the same until at least 3:30 PM, and that Girder A2001 reached temperatures 164 °C (enough for it to move within the envelope of the Column 79 side plate) long before the floor beams to its east were heated sufficiently to push Girder A2001 to the west at least 3.678 inches. Focusing on beam K3004, which was the closest beam to Column 79 framing into Girder A2001, and thus dictated the extent of westward displacement of Girder A2001 at Column 79, the thermal expansion from room temperature length would be only 2.527 inches at 300 °C and would not reach 3.700 inches until 430 °C (based on NIST's Coefficient of Thermal Expansion (CTE) value for steel of 1.4×10^{-5} in/in-°C, and the room temperature (20 °C) length of beam K3004 of 644-11/16 inches).

Girder A2001 Is Heated to at Least 164˚C Long Before Floor Beams Are Sufficiently Heated to Push It 3.678 Inches to the West

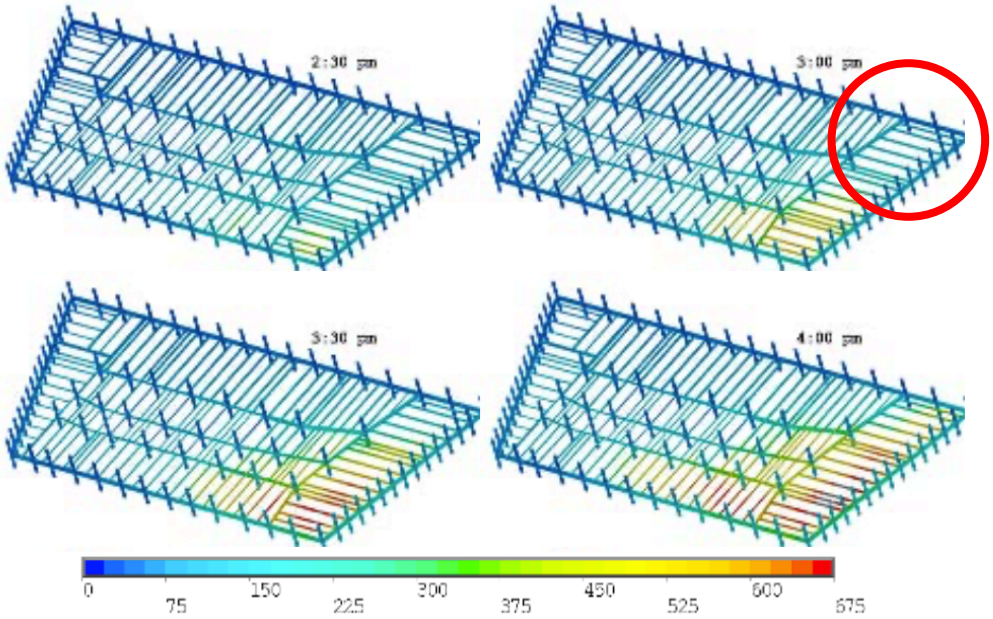


Figure 10–39. Computed temperature distribution (ºC) on the floor beams of Floor 13 at 12 different instants in time (Case B, floor slabs removed).

Regarding the second reason stated in NIST WTC 7 FAQ #35 for discrepancies between the preliminary LS-DYNA analysis and the 16-story ANSYS model, neither the NIST WTC 7 Report nor the NIST WTC 7 FAQs provide any narrative description, let alone supporting analysis, indicating that Column 79 experienced any displacement that would have facilitated the walk-off of Girder A2001. While NIST offers only a vague mention of the possibility of column displacement, the UAF analysis finds that Column 79 would have been pushed to the east 1.8 to 1.915 inches and to the north .7293 to .94 inches when heated according to NIST's assumptions, but that the westward displacement of Girder A2001 relative to Column 79 would be less than 1 inch. (*See* UAF Report, p. 66, p. 71.) In other words, Girder A2001 would also be pushed east due to the relative lack of stiffness of the eastern exterior, resulting in less relative displacement between Girder A2001 and Column 79 than the total eastward displacement of Column 79.

Meanwhile, the third reason stated in NIST WTC 7 FAQ #35 for discrepancies between the preliminary LS-DYNA analysis and the 16-story ANSYS model does not apply to the question of whether Girder A2001 would become trapped behind the Column 79 side plate.

In summary, NIST's preliminary LS-DYNA analysis and the UAF analysis demonstrate that Girder A2001 would have become trapped behind the Column 79 side plate when heated according to NIST's assumptions. Thus, the first major step leading to the initiating local failure in NIST's Probable Collapse Sequence — the walk-off of Girder A2001 — was physically impossible. Furthermore, the NIST WTC 7 Report does not provide any analyses, calculations, or figures sufficient to demonstrate that Girder A2001 could have moved past the Column 79 side plate enough to walk off its support at Column 79. Thus, we deduce that NIST's 16-story ANSYS model ignored the effect that Column 79's side plate would have had in preventing the walk-off of Girder A2001.

As a result, NIST's claim that Girder A2001 moved past the Column 79 side plate fails to comply with the OMB Guidelines and NIST IQS because it lacks objectivity, utility, transparency, and reproducibility.

First, NIST's claim is inaccurate, unreliable, and apparently biased because it contradicts the valid findings of its own analysis and those of the UAF analysis, thus violating the objectivity element of information quality under the OMB Guidelines and NIST IQS. NIST's claim also violates the objectivity element of information quality because it is not presented in a complete manner. Second, NIST's claim violates the utility element of information quality because care was not taken to make sufficient background and detail available regarding its claim, even though greater transparency would have enhanced the usefulness of the information disseminated. NIST merely provides a brief summary of its analysis results and a superficial FAQ that falls well short of explaining the discrepancies in its analyses to an acceptable degree of scientific precision. Third, NIST's claim violates the transparency standard imposed upon influential information because NIST did not practice a degree of transparency sufficient to facilitate reproducibility. Finally, NIST's claim violates the reproducibility standard imposed upon influential information because — to the extent that independent analysis of the original data using identical methods could be performed — contradictory analytic results were generated.

2. Corrections Sought:

a) Revise the NIST WTC 7 Report to Reflect that the Column 79 Side Plate Would Have Prevented Girder A2001 from Moving Westward Enough to Walk Off Its Support at Column 79

First, NIST must revise the NIST WTC 7 Report to reflect that the Column 79 side plate would have prevented Girder A2001 from moving westward enough to walk off its support at Column 79. Alternatively, if NIST maintains that Girder A2001 was able to move past the Column 79 side plate, it must amend the NIST WTC 7 Report to include analysis that satisfies the objectivity, utility, transparency, and reproducibility standards of information quality.

b) Discard the Probable Collapse Sequence and Develop a New Probable Collapse Sequence that Is Physically Possible

Second, assuming that NIST revises the NIST WTC 7 Report to reflect that the Column 79 side plate would have prevented Girder A2001 from moving westward enough to walk off its support at Column 79, NIST must discard its Probable Collapse Sequence and develop a new Probable Collapse Sequence that is physically possible.

B. THERMAL EXPANSION OF BEAM K3004

1. NIST Ignored the Limit of How Far Beam K3004 Could Thermally Expand and Its Resulting Inability to Cause the Walk-Off of Girder A2001, Thus Violating the OMB Guidelines and NIST IQS

As noted above, beam K3004 was the closest beam to Column 79 framing into Girder A2001 from the east. Therefore, the thermal expansion of beam K3004 dictated the extent of westward displacement of Girder A2001 at Column 79. Beam K3004 is indicated in Figures 1-5 and 8-21 of NCSTAR 1-9 below.

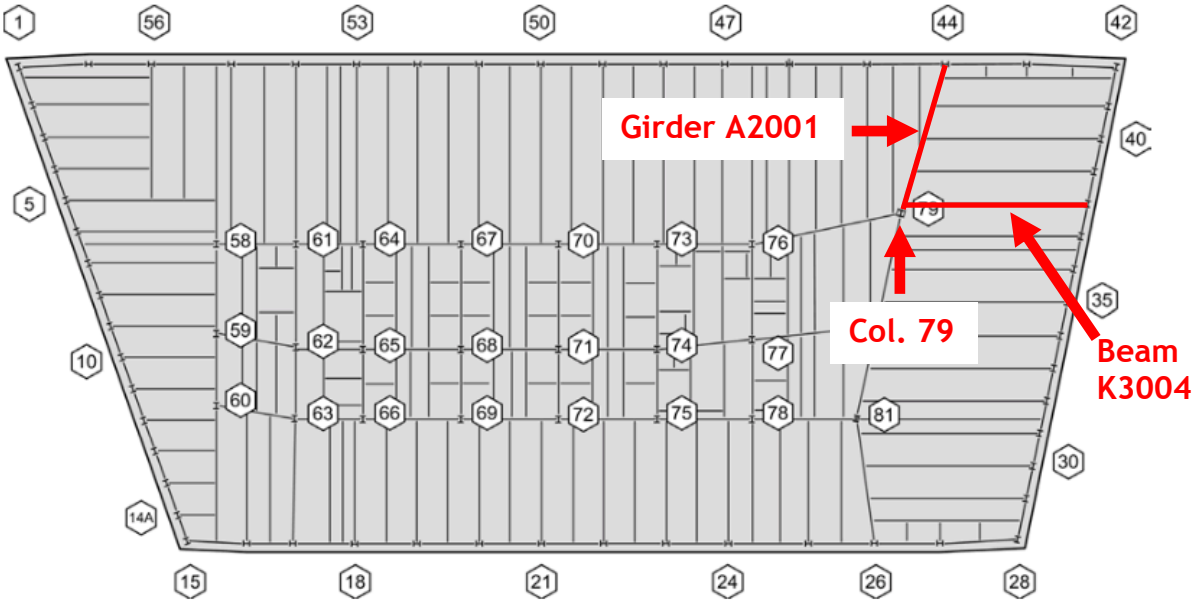


Figure 1–5. Typical WTC 7 floor showing locations of the columns, girders, and beams.

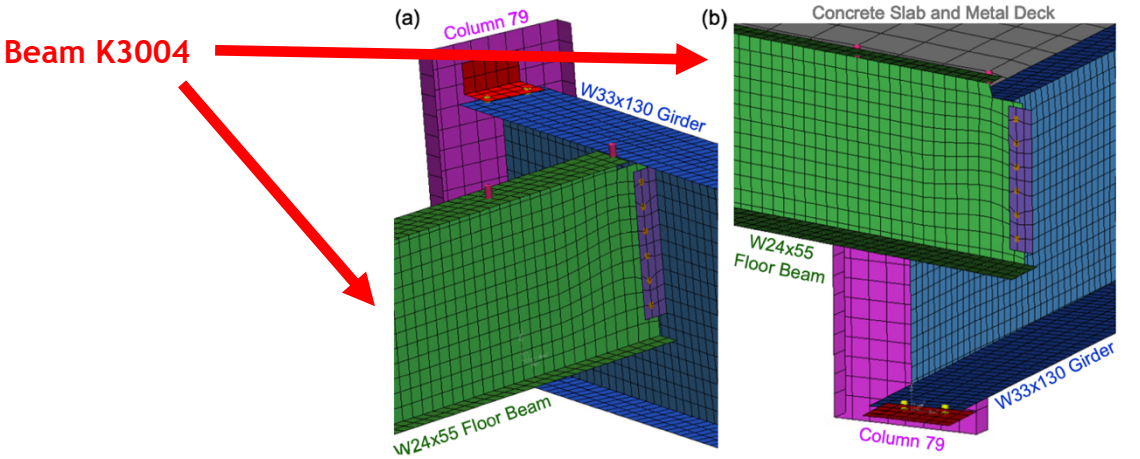


Figure 8–23. Views from northeast showing seat connection at Column 79 and bolted shear plate connection of floor beam to girder.

Initially, the NIST WTC 7 Report stated that the amount of westward displacement required to make Girder A2001 walk off its support at Column 79 was 5.5 inches, based on the bearing seat having a width of 11 inches (*see* NCSTAR 1-9, p. 527):

> A girder was considered to have lost vertical support when its web was no longer supported by the bearing seat. **The bearing seat at Column 79 was 11 in. wide. Thus, when the girder end at Column 79 had been pushed laterally at least 5.5 in., it was no longer supported by the bearing seat.**

Subsequently, independent researchers discovered that the bearing seat at Column 79 was actually 12 inches wide and informed NIST of the error. In response, NIST issued an erratum in June 2012 that adjusted the bearing seat width to 12 inches and the distance needed for walk-off to 6.25 inches. In its erratum, NIST claimed that the errors were merely typographical and that "[t]he dimensions and lateral displacements used in the analyses were correct. (*See* Errata for NIST NCSTAR 1A, NIST NCSTAR 1-9, and NIST NCSTAR 1-9A, p. 2.)

However, the correction from 5.5 inches to 6.25 inches in fact made the walk-off of Girder A2001 under NIST's Probable Collapse Sequence physically impossible for a second reason. As shown in the Exhibit D spreadsheet calculating the thermal expansion of beam K3004 at different temperatures, the maximum net thermal expansion of beam K3004 is 5.728 inches, which occurs at 654 °C. It is at this temperature that the marginal increase in shortening due to heat-induced sagging begins to exceed the marginal increase in heat-induced expansion. Beam K3004 thus becomes progressively shorter as it is heated to higher temperatures. Therefore, it was physically impossible for beam K3004 to push Girder A2001 westward at least 6.25 inches, because the furthest beam K3004 could expand was 5.728 inches.

As in the case of NIST ignoring the effect that the Column 79 side plate would have had in preventing the walk-off of Girder A2001, the NIST WTC 7 Report provides no analysis, calculations, or figures explaining how beam K3004 expanded sufficiently to make Girder A2001 walk off of its support at Column 79 in its 16-story ANSYS model.

In summary, straightforward analysis of how far beam K3004 could thermally expand demonstrates that the first major step leading to the initiating local failure in NIST's Probable Collapse Sequence is physically impossible for a second reason. Even if Girder A2001 had *not* become trapped behind the Column 79 side plate, it would not have walked off its support at Column 79 because the maximum thermal expansion of beam K3004 was less than the 6.25 inches needed to push the web of Girder A2001 past the edge of its bearing seat.

As a result, NIST's claim that beam K3004 expanded enough that it caused Girder A2001 to walk off of its support at Column 79 fails to comply with the OMB Guidelines and NIST IQS because it lacks objectivity, utility, transparency, and reproducibility.

First, NIST's claim is inaccurate, unreliable, and apparently biased because it is inconsistent with the limit of how far beam K3004 could thermally expand. Second, NIST's failure to show how far beam K3004 expanded in its 16-story ANSYS model violates the objectivity element of information quality because NIST's claim is not presented in a complete manner. If the analyses indicated that Girder A2001 was pushed laterally at least 6.25 inches, as NIST claimed in its June 2012 erratum, NIST should specify how far beam K3004 expanded. NIST's failure to show how far beam K3004 expanded also violates the utility element of information quality because care was not taken to make sufficient background and detail

available regarding its claim, even though greater transparency would have enhanced the usefulness of the information disseminated. Third, NIST's claim violates the transparency standard imposed upon influential information because NIST did not practice a degree of transparency sufficient to facilitate reproducibility. Finally, NIST's claim violates the reproducibility standard imposed upon influential information because — to the extent that independent analysis of the original data could be performed — contradictory analytic results were generated.

2. Corrections Sought:

a) Revise the NIST WTC 7 Report to Reflect that Beam K3004 Could Not Thermally Expand Enough to Cause the Walk-Off of Girder A2001

First, NIST must revise the NIST WTC 7 Report to reflect that beam K3004 could not thermally expand enough to cause the walk-off of Girder A2001. Alternatively, if NIST maintains that beam K3004 was able to thermally expand enough to cause the walk-off of Girder A2001, it must amend the NIST WTC 7 Report to include analysis that satisfies the objectivity, utility, transparency, and reproducibility standards of information quality.

b) Discard the Probable Collapse Sequence and Develop a New Probable Collapse Sequence that Is Physically Possible

Second, assuming that NIST revises the NIST WTC 7 Report to reflect that beam K3004 could not thermally expand enough to cause the walk-off of Girder A2001, NIST must discard its Probable Collapse Sequence and develop a new Probable Collapse Sequence that is physically possible.

C. GIRDER A2001 WEB STIFFENERS

1. NIST Omitted the Presence of Web Stiffeners on Girder A2001 That Would Have Prevented the Flange Failure and Walk-Off of Girder A2001, Thus Violating the OMB Guidelines and NIST IQS

Girder A2001 had partial height web stiffeners measuring 3/4 inches thick x 5.5 inches wide x 18 inches high, as indicated in fabrication shop drawing Frankel 9114. (*See* Frankel Steel Limited.) These web stiffeners are drawn to scale in Figure 2 of Ronald Brookman's 2012 paper, "A Discussion of 'Analysis of Structural Response of WTC 7 to Fire and Sequential Failures Leading to Collapse'," shown below. (*See* Brookman 2012, p. 8.)

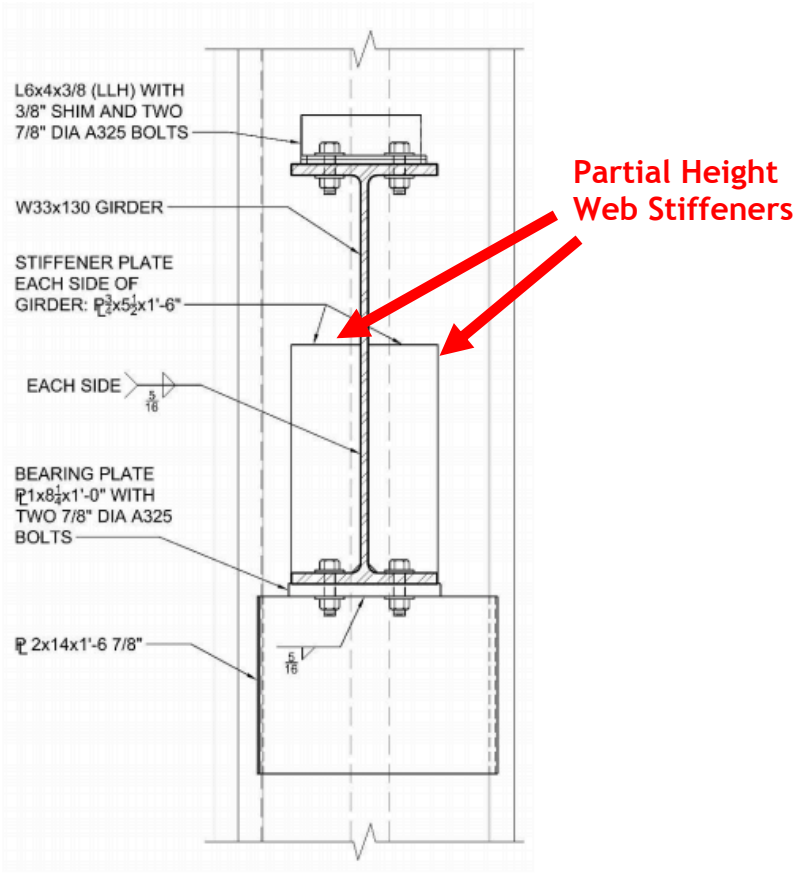


Figure 2: Section View at Floor 13, Column 79 Seated-Beam Connection
(Data from Frankel Steel Limited, 1985b)

NIST, however, omitted these web stiffeners from its analyses. The omission of these web stiffeners is evident in Figure 8-21 of NCSTAR 1-9 (shown in the previous section) and was also confirmed via email on October 25, 2013, by NIST public affairs officer Michael Newman, who wrote (*see* Exhibit C):

> The web stiffeners shown at the end of the girder in Frankel drawing #9114 prevent web crippling. The structural analyses of WTC 7 did not show any web crippling failures. **Therefore, the web crippling plates did not need to be included in the models/analyses.** (Emphasis added.)

NIST's stated reason for omitting the web stiffeners from its analyses is fundamentally unsound. As noted in the UAF Report, "In addition to stiffening the web, these stiffeners significantly increase the bending resistance of the flange and would have prevented it from failing due to flexure (assuming the girder were somehow able to bypass the column side plate)." (*See* UAF Report, p. 81.) As illustrated in Figure 3.8 of the UAF Report, shown below, the stresses in the girder flange and stiffener are not sufficient to cause the flange to fail, and thus Girder A2001 would not have walked off its support at Column 79 when pushed westward 6.25 inches. (*See* UAF Report, p. 82.)

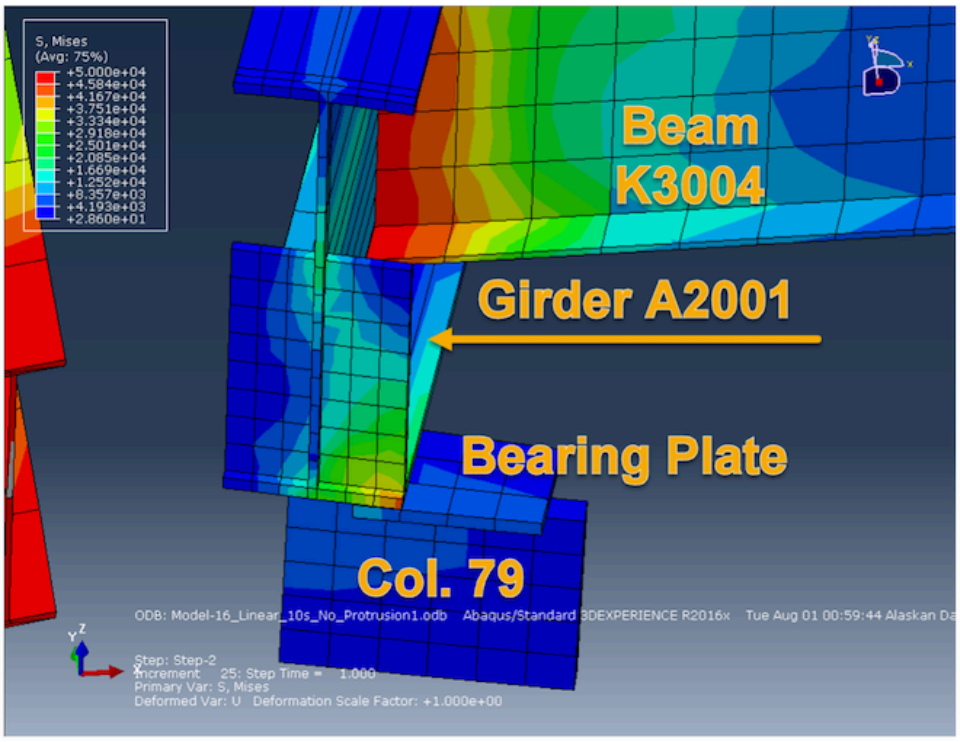


Figure 3.8 Analysis showing girder web A2001 pushed laterally past the bearing seat at Column 79. The column is removed for clarity.

As in the cases of NIST ignoring the effect of the Column 79 side plate and the thermal expansion limit of beam K3004, the NIST WTC 7 Report provides no analysis, calculations, or figures explaining how Girder A2001 actually walked off of its support at Column 79 in its 16-story ANSYS model. As noted in the previous section, the NIST WTC 7 Report merely states in general terms (*see* NCSTAR 1-9, p. 527):

> A girder was considered to have lost vertical support when its web was no longer supported by the bearing seat. The bearing seat at Column 79 was 11 in. wide. Thus, when the girder end at Column 79 had been pushed laterally at least 5.5 in., it was no longer supported by the bearing seat.[2]

Moreover, NIST does not address the omission of the Girder A2001 web stiffeners either in the NIST WTC 7 Report or in the NIST WTC 7 FAQs.

In summary, NIST omitted from its structural analyses the presence of web stiffeners that significantly increased the bending resistance of the Girder A2001 flange and would have prevented Girder A2001 from failing due to flexure, thus preventing it from walking off its support at Column 79. When the web stiffeners that NIST omitted from its analyses are included, the first major step leading to the initiating local failure in NIST's Probable Collapse Sequence is shown, for a third reason, to be physically impossible. Even if Girder A2001 had *not* become trapped behind the Column 79 side plate and beam K3004 *could* thermally expand at least 6.25

[2] As noted above, NIST issued an erratum in June 2012 that adjusted the distance needed for walk-off to 6.25 inches.

inches, Girder A2001 would not have walked off its support at Column 79 due to the presence of the web stiffeners.

As a result, NIST's claim that Girder A2001 walked off its support at Column 79 fails to comply with the OMB Guidelines and NIST IQS because it lacks objectivity, utility, transparency, and reproducibility.

First, NIST's claim is inaccurate, unreliable, and apparently biased because it is based on the intentional omission of a known structural feature that materially affects the result of the analysis, thus violating the objectivity element of information quality under the OMB Guidelines and NIST IQS. NIST's claim also violates the objectivity element of information quality because it is not presented in a complete manner. Second, NIST's claim violates the utility element of information quality because care was not taken to make sufficient background and detail available regarding its claim, even though greater transparency would have enhanced the usefulness of the information disseminated. NIST merely provides a brief summary of its analysis results and provides no statement regarding the omission of a known structural feature. Third, NIST's claim violates the transparency standard imposed upon influential information because NIST did not practice a degree of transparency sufficient to facilitate reproducibility. Finally, NIST's claim violates the reproducibility standard imposed upon influential information because — to the extent that independent analysis of the original data using identical methods could be performed — contradictory analytic results were generated.

2. Corrections Sought:

a. Perform New Analyses that Includes the Web Stiffeners on Girder A2001 and Revise the NIST WTC 7 Report to Reflect that Girder A2001 Would Not Have Walked Off Its Support at Column 79

First, NIST must perform new analyses that include the partial height web stiffeners on Girder A2001. There is no reasonable basis for not performing these new analyses since NIST has acknowledged it omitted the web stiffeners from its analyses, and this omission has been shown to have materially affected the results of NIST's analyses. NIST must then revise the NIST WTC 7 Report to reflect that Girder A2001 would not have walked off its support at Column 79. Alternatively, if NIST maintains that Girder A2001 was able to walk off its support at Column 79 despite the presence of the web stiffeners, it must amend the NIST WTC 7 Report to include analysis that satisfies the objectivity, utility, transparency, and reproducibility standards of information quality.

b. Discard the Probable Collapse Sequence and Develop a New Probable Collapse Sequence that Is Physically Possible

Second, assuming that NIST revises the NIST WTC 7 report to reflect that Girder A2001 would not have walked off its support at Column 79, NIST must discard its Probable Collapse Sequence and develop a new Probable Collapse Sequence that is physically possible.

D. REPORTED CASCADE OF FLOOR FAILURES

1. NIST Erroneously Concluded that the Impact Load of Floor 13 Falling onto Floor 12 Would Be Sufficient to Cause Floor 12 to Fail and Initiate a Cascade of Floor Failures Down to Floor 5, Thus Violating OMB Guidelines and NIST IQS

The NIST WTC 7 Report claims that after Girder A2001 walked off its support at Column 79, "[t]he unsupported girder and other local fire-induced damage caused Floor 13 to collapse, beginning a cascade of floor failures down to the 5th floor." (*See* NCSTAR 1A, p. 22.)

NIST notes in Chapter 11 of NCSTAR 1-9 that "The impact of a floor section falling on the floor below was not analyzed in the 16 story ANSYS model, but was simulated in the 47 story LS-DYNA model (Chapter 12)." (*See* NCSTAR 1-9, p. 505.) Chapter 12 of NCSTAR 1-9, which presents the results of NIST's 47-story LS-DYNA analysis, states the following (*see* NCSTAR 1-9, p. 572-573):

> The LS-DYNA analysis calculated the dynamic response of the structure to the floor failures and resulting debris impact loads on the surrounding structure. **The thermally weakened floors below Floors 13 and 14 could not withstand the impact from the collapsing floors, resulting in sequential floor collapses.** The floor systems progressively failed down to Floor 5, where the debris accumulated, as shown in Figure 12–43.
>
> . . . Column 79 was laterally unsupported in the east-west and south directions between Floors 5 and 14. There was still some lateral support in the north direction at Floors 8 to 12 and Floor 14, as the erection bolts in the seated connections had all failed at these girder ends, but the girders had not walked off the bearing seats. (Emphasis added.)

Aside from the brief summary of the 47-story LS-DYNA analysis results cited above, the NIST WTC 7 Report provides no other description, analysis, or calculations to support the claim that the collapse of Floor 13 began a cascade of floor failures down to the 5th floor, thus making NIST's claim difficult to independently scrutinize. In fact, the NIST WTC 7 Report even neglects to specify which girder connections on Floor 12 were broken by the collapse of Floor 13. One might assume that the girder directly beneath Floor 13's Girder A2001 (i.e., Floor 12's Girder A2001) would be impacted and have its connections broken. But that assumption is contradicted by NIST's claim that "[t]here was still some lateral support in the north direction at Floors 8 to 12 and Floor 14, as the erection bolts in the seated connections had all failed at these girder ends, but the girders had not walked off the bearing seats." (*See* NCSTAR 1-9, p. 573.) Thus, instead, we are left to assume that the walk-off of Girder A2001, which framed into Column 79 from the north, somehow broke the girder connections of Girder A2015, which framed into Column 79 from the west, or of Girder A2002, which framed into Column 79 from the south. Adding to the difficulty of independently scrutinizing NIST's claim, NIST has declined to disclose the results files of its LS-DYNA analysis on the grounds that releasing this

data "might jeopardize public safety." (*See* Finding Regarding Public Safety Information, NIST Director Patrick Gallagher, July 2009.)

Nevertheless, calculations demonstrate unequivocally that the impact of Floor 13 falling onto Floor 12 would be greatly insufficient to shear the girder connections of any of the girders framing into Column 79 on Floor 12. Critiquing a similar hypothesis for the collapse of WTC 7 put forward by Guy Nordenson and Associates in a lawsuit between Con Edison and Silverstein Properties, the UAF Report provides the analysis shown below. (*See* UAF Report, p. 88-90.) This analysis focuses on the force required to shear the girder connection for Girder A2001, but it is also applicable to calculating the force required to shear the girder connections for Girder A2015 and Girder A2002.

> Nordenson correctly shows that it would take a 632,000 lb. load to shear the welds of the 2" thick x 14" high x 18" wide support plate under the bearing seat of girder A2001 at Column 79. Nordenson also correctly determines the stiffness of girder A2001 on the 12th floor at a point 10 inches from its support at Column 79 to be K = 7,627 kips/inch using the equation K = (3*E* I* L)/ (1 kip * a2 b2) with "a" and "b" being the distances to the impact point from opposite sides of the girder, which was considered to be 547 inches long.
>
> However, there was an error in Nordenson's calculation of the impact force of 4,133 kips, which resulted from considering the above girder as a point load, thus implying it had an infinite stiffness and no deflection. . . .
>
> To determine the stiffness of the falling Floor 13 beam and girder assembly, a finite element modal analysis was performed with the assembly constrained at the north and east exterior walls and the girder sitting on its bearing seat at Column 44 with the bolts at the girder seat broken there. The results are shown in Figure 3.15. The first mode of 22 Hz involved only the beams moving in a transverse direction and was not relevant. The second mode of 0.52 Hz involved the participation of the entire beam and girder assembly in the vertical direction and was relevant.

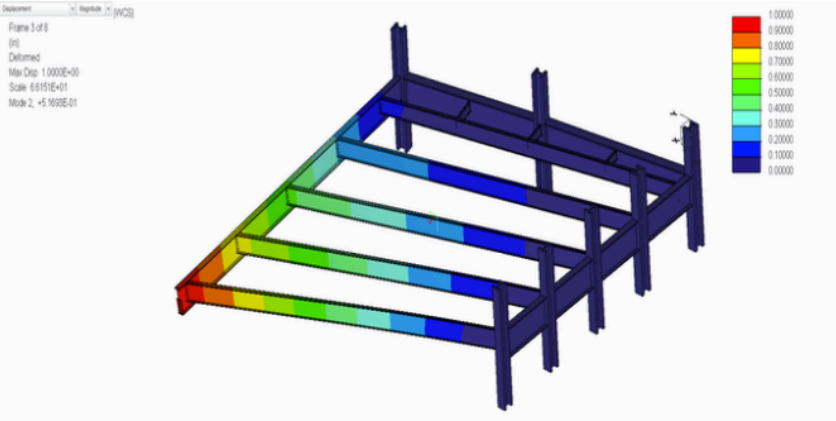


Figure 3.15 The relevant 0.52 Hz mode of the falling beam and girder assembly.

The analysis shown in this figure and related text below was originally performed by mechanical engineer Anthony Szamboti and is reproduced here with permission

The natural frequency of mode 2 in the vertical direction is 0.52 Hz. The weight of the beam and girder assembly is approximately 20,000 lbs. The concrete was not considered by Nordenson to act with the steel during the impact to amplify the load. This would be appropriate as the shear studs were broken and the welded wire fabric in the slab and the floor pans would keep it suspended to some degree. Knowing the natural frequency of the beam and girder assembly (fn), along with its weight, the following equation

$$f_n = \frac{1}{2\pi}\sqrt{\frac{Kg_c}{W}}$$

can be used to find the stiffness (K) of the falling beam and girder assembly where

$K = (f_n \times 2\pi)^2 \times W/g_c$

$K = (0.52 \text{ Hz} \times 2\pi)^2 \times (20{,}000 \text{ lbs.})/(386.4 \text{ in/s}^2) = 552.53 \text{ lbs./inch}$

The stiffness that is used in the impact calculations is the combined stiffness of both the falling beam and girder assembly (K1) and that of the girder on Floor 12 below at 10 inches from its support at Column 79 (K2). It is

$$\frac{1}{K_t} = \frac{1}{K_1} + \frac{1}{K_2} = \left(\frac{1}{552.53}\right) + \left(\frac{1}{7{,}627{,}000}\right) = 0.00181$$

Thus,

$$K_t = (1 / 0.00181) = 552.48 \text{ lbs/in}$$

Using Nordenson's potential energy (P.E.) of 3,473,000 in-lbs. and the calculated stiffness, in the same standard equation he uses to find deflection (D)

$$P.E. = \frac{K_t D^2}{2}$$

$$D = \sqrt{\frac{2\,P.E.}{K_t}} = 112.13 \text{ in}$$

and finally using the standard equation Nordenson uses to find force (F)

$$F = K_t D = (552.48 \text{ lb/in})(112.13 \text{ in}) = 61{,}950 \text{ lbs}$$

This 61,950 lb. impact force is less than 10% of the 632,000 lb. force required to shear the girder bearing seat support welds and is thus quite insufficient

to do so. This analysis was performed at room temperature; higher temperatures would soften the girders, causing even lower impact forces.

Thus, the impact force of Floor 13 at room temperature falling onto Floor 12 is calculated to be 61,950 lb., and the impact force would be less at higher temperatures as the stiffness of Girder A2001 is reduced. This analysis can be applied to Girder A2015 and Girder A2002 by calculating the force required to shear their connections to Column 79. The 3/8" thick knife brackets used to mount Girder A2015 and Girder A2002 to Column 79 were 24.5" and 15.5" long, respectively. They were both welded to Column 79 with 5/16" fillet welds on one side of each bracket. The weld area of the two sets of brackets is 10.83 in^2 and 6.84 in^2, respectively. Per Frankel drawing 1091, the weld metal was E70, which is the same as that used for 3/8" x 14" long fillet welds used for the support plate and the 3/8" x 12" long fillet weld of the bearing seat under Girder A2001 at Column 79. The weld area there was 10.61 in^2, and the shear load was determined to be 632,000 lbs. Thus, for the 10.83 in^2 weld area of the knife brackets of Girder A2015 the shear load would be 645,000 lbs., and for the 6.84 in^2 weld area of the knife brackets of Girder A2002 the shear load would be 407,000 lbs. Therefore, the impact force of Floor 13 falling onto Floor 12 is insufficient to shear the girder connection of Girder A2015 by a factor of more than 10 and is insufficient to shear the girder connection of Girder A2002 by a factor of more than 6.

In summary, the analysis presented above demonstrates that the second major step leading to the initiating local failure in NIST's Probable Collapse Sequence — the cascade of floor failures from Floor 13 down to Floor 5 — was physically impossible. Furthermore, aside from briefly summarizing the results of its 47-story LS-DYNA analysis, the NIST WTC 7 Report provides no other description, analysis, or calculations to support this claim, even neglecting to specify which girder connections on Floor 12 were broken by the collapse of Floor 13. Thus, we deduce that NIST had no valid basis for its conclusion that the impact load of Floor 13 falling onto Floor 12 would be sufficient to cause Floor 12 to fail and initiate a cascade of floor failures down to Floor 5.

As a result, NIST's claim that the collapse of Floor 13 would have begun a cascade of floor failures down to the 5th floor fails to comply with the OMB Guidelines and NIST IQS because it lacks objectivity, utility, transparency, and reproducibility.

First, NIST's claim is inaccurate, unreliable, and apparently biased because it severely overestimates the ability of Floor 13 falling onto Floor 12 to cause Floor 12 to fail, thus violating the objectivity element of information quality under the OMB Guidelines and NIST IQS. NIST's claim also violates the objectivity element of information quality because it is not presented in a complete manner, failing to even specify which girder connections on Floor 12 were broken by the collapse of Floor 13. Second, NIST's claim violates the utility element of information quality because care was not taken to make sufficient background and detail available regarding its claim, even though greater transparency would have enhanced the usefulness of the information disseminated. NIST merely provides a brief summary of its analysis results and has declined to disclose the results files of its LS-DYNA analysis on the grounds that releasing this data "might jeopardize public safety." Third, NIST's claim violates the transparency standard imposed upon influential information because NIST did not practice a degree of transparency sufficient to

facilitate reproducibility. Finally, NIST's claim violates the reproducibility standard imposed upon influential information because — to the extent that independent analysis of the original data could be performed — contradictory analytic results were generated.

2. Corrections Sought:

a. Revise the NIST WTC 7 Report to Include Calculations that Demonstrate that the Impact Load of Floor 13 Falling onto Floor 12 Would Be Insufficient to Cause Floor 12 to Fail

First, NIST must revise the NIST WTC 7 Report to include calculations that demonstrate that the impact load of Floor 13 falling onto Floor 12 would be insufficient to cause Floor 12 to fail. Alternatively, if NIST maintains that the impact load of Floor 13 falling onto Floor 12 was sufficient to cause Floor 12 to fail, it must amend the NIST WTC 7 Report to include analysis that satisfies the objectivity, utility, transparency, and reproducibility standards of information quality.

b. Discard the Probable Collapse Sequence and Develop a New Probable Collapse Sequence That Is Physically Possible

Second, assuming that NIST revises the NIST WTC 7 Report to include calculations that demonstrate the impact load of Floor 13 falling onto Floor 12 would be insufficient to cause Floor 12 to fail, NIST must discard its Probable Collapse Sequence and develop a new Probable Collapse Sequence that is physically possible.

E. NIST'S GLOBAL COLLAPSE ANALYSES

The fifth and final item of information described in Part 1 relates to the stages of NIST's Probable Collapse Sequence that occurred *after* the initiating local failure and culminated in the global collapse of WTC 7. The NIST WTC 7 Report summarizes the latter stages of the Probable Collapse Sequence as follows (*see* NCSTAR 1A, p. 22-23):

> Due to the buckling of Column 79 between Floors 5 and 14, the upper section of Column 79 began to descend. The downward movement of Column 79 led to the observed kink in the east penthouse, and its subsequent descent. The cascading failures of the lower floors surrounding Column 79 led to increased unsupported length in, falling debris impact on, and loads being re-distributed to adjacent columns; and Column 80 and then Column 81 buckled as well. All the floor connections to these three columns, as well as to the exterior columns, failed, and the floors fell on the east side of the building. The exterior façade on the east quarter of the building was just a hollow shell.
>
> The failure of the interior columns then proceeded toward the west. Truss 2 (Figure 1–6) failed, hit by the debris from the falling floors. This caused Column 77 and Column 78 to fail, followed shortly by Column 76. Each north-south line of

> three core columns then buckled in succession from east to west, due to loss of lateral support from floor system failures, to the forces exerted by falling debris, which tended to push the columns westward, and to the loads redistributed to them from the buckled columns. Within seconds, the entire building core was buckling.
>
> The global collapse of WTC 7 was underway. The shell of exterior columns buckled between the 7th and 14th floors, as loads were redistributed to these columns due to the downward movement of the building core and the floors. The entire building above the buckled-column region then moved downward as a single unit, completing the global collapse sequence.

The NIST WTC 7 Report states that the latter stages of its Probable Collapse Sequence were based on the results of its global collapse analyses (*see* NCSTAR 1A, p. 38-39):

> A global finite element model of the WTC 7 building was developed in LS-DYNA to study its structural response to an initial failure event due to fire and to determine the sequence of events that led to collapse propagation and, ultimately, global collapse.

1. Contrary to NIST's Assertion, NIST's Global Collapse Analyses Do Not Match the Observed Behavior Reasonably Well and Do Not Confirm NIST's Leading Collapse Hypothesis, Thus Violating OMB Guidelines and NIST IQS

In the section of the NIST WTC 7 Report titled "Accuracy of the Probable Collapse Sequence," NIST states the following (*see* NCSTAR 1A, p. 44):

> Given the complexity of the modeled behavior, **the global collapse analyses matched the observed behavior reasonably well**. The close similarity of the timing and the nature of the events up to the initiation of global collapse is strong confirmation of the extent and nature of the structural failures in the interior of the building and the accuracy of the four-step simulation process. The overall simulation of the collapsing building with damage better matched the video observations of the global collapse. **The global collapse analysis confirmed the leading collapse hypothesis, which was based on the available evidence**. (Emphasis added.)

Contrary to the above assertions, NIST's global collapse analyses do not match the observed behavior reasonably well and do not confirm NIST's leading collapse hypothesis. Rather, NIST's global collapse analyses fail to match most of the observed behavior — predicting fundamentally different structural behavior from what was observed — and therefore they actually disconfirm NIST's leading collapse hypothesis.

From this point forward, all discussion of NIST's global collapse analyses will focus on NIST's simulation *with* debris impact damage, which NIST claims "better matched the video observations of the global collapse." (*See* NCSTAR 1A, p. 44.)

Deformation, Tipping, and Lack of Free Fall in NIST's Global Collapse Analysis

First and most apparent, NIST's global collapse analysis predicts significant deformation of the upper exterior walls both before and after the initiation of global collapse. **Yet, per NIST's own observations, there is no observed deformation or displacement of the upper exterior corners as late as 7.5 seconds after the initiation of the east penthouse collapse (which is .6 seconds *after* NIST claims that global collapse initiated).** Figures 5-199, 5-200, and 5-201 from NCSTAR 1-9, which compare the position of WTC 7's exterior at 5.0 seconds and 7.5 seconds after the initiation of the east penthouse collapse, demonstrate the **total absence** of deformation or displacement in the upper exterior corners, with NIST actually commenting: "Interestingly, little movement of the northeast and northwest corners of the building is indicated." (*See* NCSTAR 1-9, p. 274.)

Figure 5–199. Cropped frames from the Camera 2 video clip in Figure 5–185 and the Camera 3 video clip in Figure 5–186, showing the north face of WTC 7 5.0 s ± 0.1 s after the east penthouse began to move downward.
The intensities have been adjusted.

Figure 5–200. Cropped frames from the Camera 2 video clip in Figure 5–185 and the Camera 3 video clip in Figure 5–186, showing the north face of WTC 7 7.5 s ± 0.1 s after the east penthouse began to move downward.
The intensities have been adjusted.

Figure 5–201. Cropped difference frame at 7.5 s ± 0.1 s after the east penthouse began to move, created by subtracting the frame reproduced in Figure 5–199 from the Camera 3 video clip shown in Figure 5–200.
The intensity levels were adjusted.

Meanwhile, as noted above, the NIST global collapse analysis predicts significant deformation of the upper exterior walls *both before and after the initiation of global collapse*. The four figures below illustrate the increasing deformation of the upper exterior walls predicted in NIST's global collapse analysis at four different points in time by overlaying each animation frame on top of the animation frame just before the initiation of the east penthouse collapse (which is at 16 seconds in NIST's global collapse analysis animation). 2.5 seconds is where the first deformation of the exterior appears; 6.3 seconds is the time that NIST identifies as the initiation of global collapse in its global collapse analysis; 7.5 seconds is the time examined in the figures above, when the upper exterior corners had still experienced no deformation or displacement; 8.1 seconds is the final frame in the global collapse analysis. NIST claims in NIST WTC 7 FAQ #35 that "**Only in the later stages of the animation, after the initiation of global collapse,** do the upper exterior wall deformations from the NIST analysis differ from the video images." (Emphasis added.) That claim is false, as shown in the first two figures below.

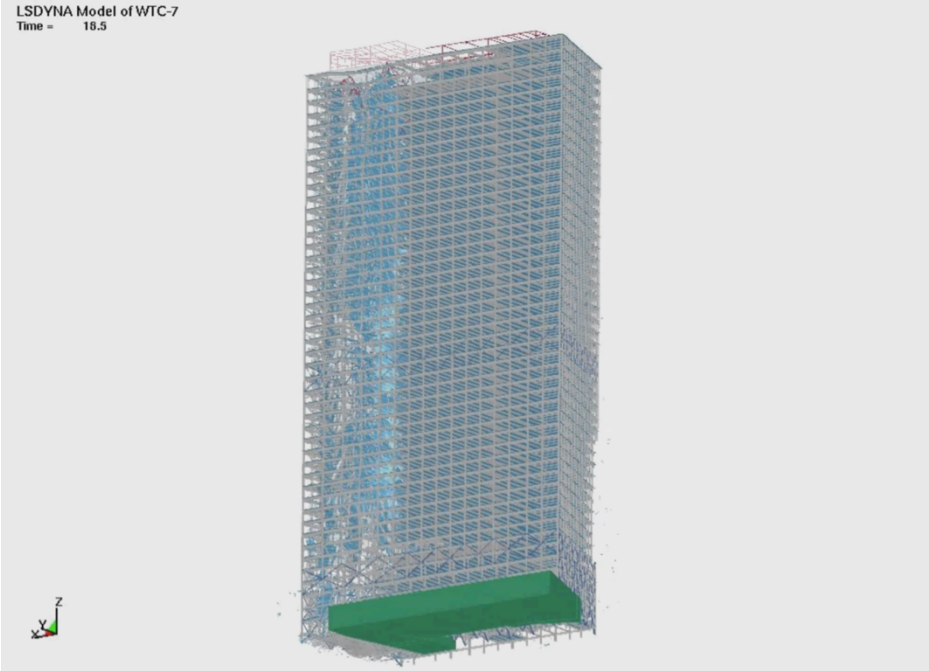


Figure 1: NIST's global collapse analysis at 2.5 seconds after the initiation of the east penthouse collapse laid over .1 seconds before the east penthouse collapse initiation.

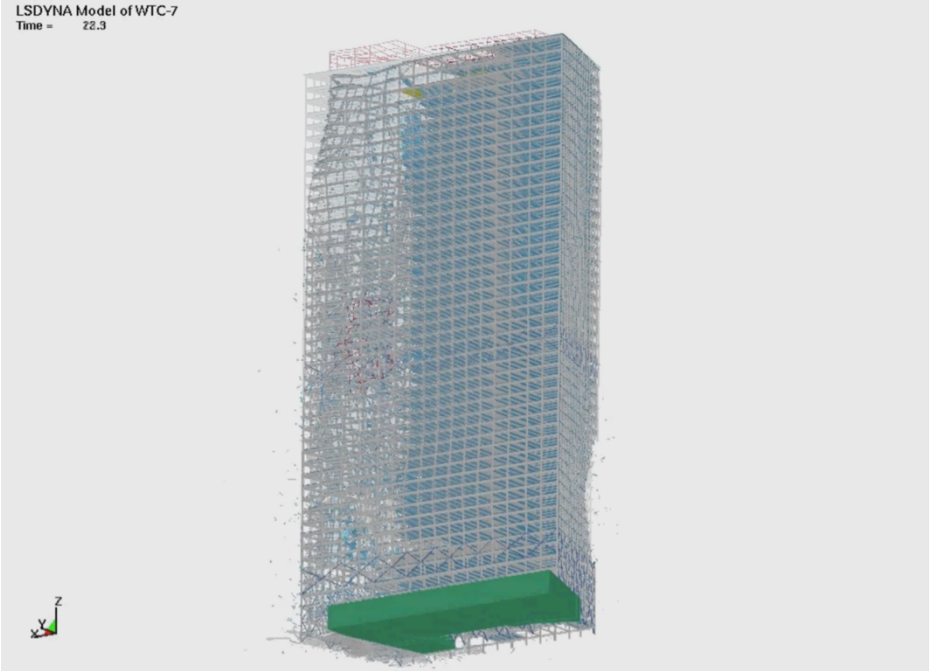


Figure 2: NIST's global collapse analysis at 6.3 seconds after the initiation of the east penthouse collapse laid over .1 seconds before the east penthouse collapse initiation. 6.3 seconds is the time that NIST identifies as the initiation of global collapse in its model. Therefore, substantial deformation of the upper exterior walls occurred prior to the initiation of global collapse in NIST's global collapse analysis.

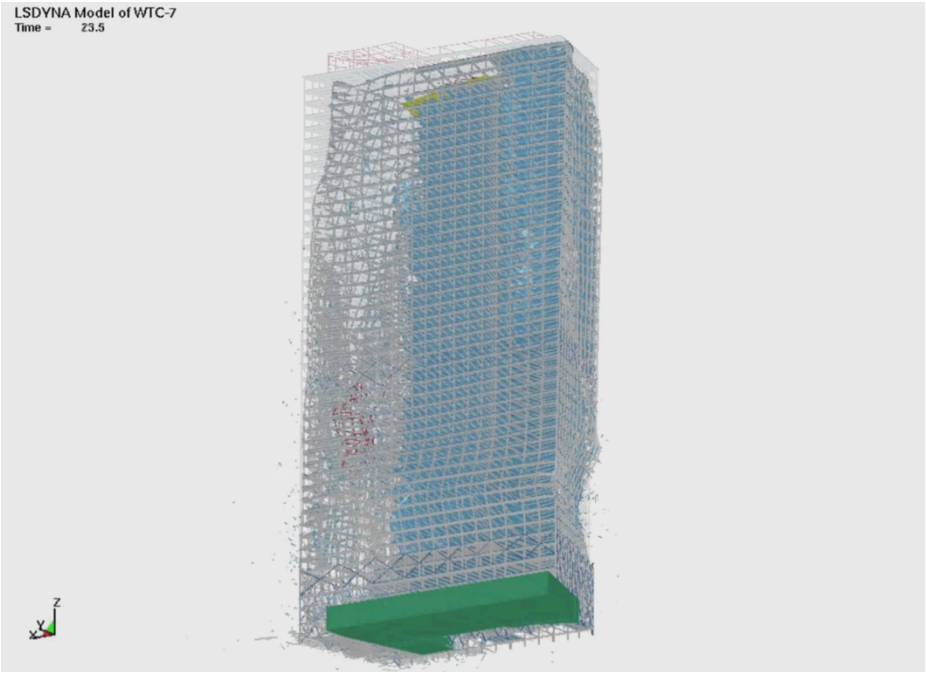


Figure 3: NIST's global collapse analysis at 7.5 seconds after the initiation of the east penthouse collapse laid over .1 seconds before the east penthouse collapse initiation. This is the time when, in the video, the upper exterior corners had still experienced no deformation or displacement.

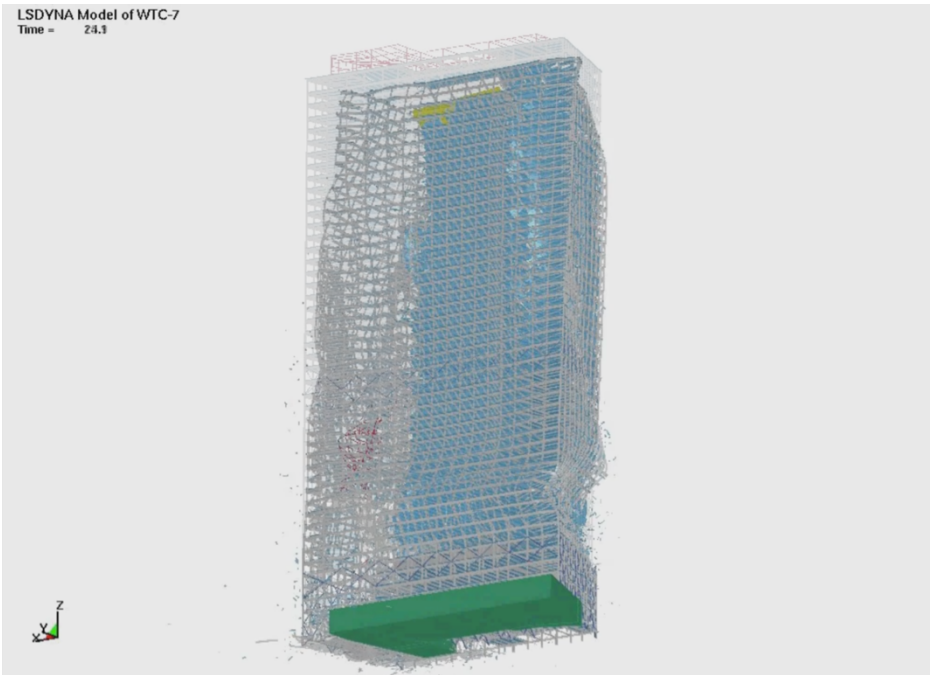


Figure 4: NIST's global collapse analysis at 8.1 seconds after the initiation of the east penthouse collapse laid over .1 seconds before the east penthouse collapse initiation.

The next three figures juxtapose video of the collapse with NIST's global collapse analysis at 5 seconds, 7.5 seconds, and 8.1 seconds after the initiation of the east penthouse

collapse. The video stills are taken from Figures 5-199, 5-200, and 5-202 of NCSTAR 1-9. The global collapse analysis animation frames are cropped and scaled to approximate the scale of the video stills, and their timing aligns perfectly with the timing of the video stills.

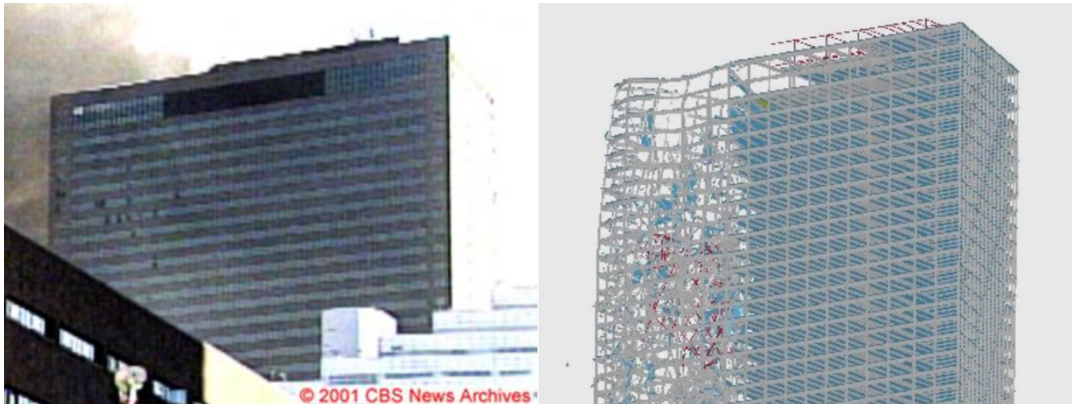


Figure 5: Video and analysis animation at 5 seconds after initiation of east penthouse collapse.

Figure 6: Video and analysis animation at 7.5 seconds after initiation of east penthouse collapse.

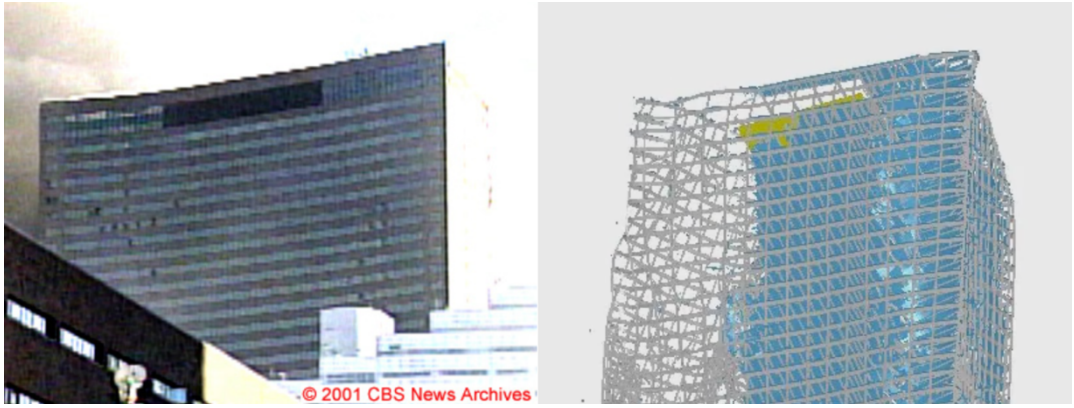


Figure 7: Video and analysis animation at 8.1 seconds after initiation of east penthouse collapse.

In addition to the global collapse analysis animation shown above, Figure 12-62 from NCSTAR 1-9, shown below, illustrates the significant deformation of the exterior predicted in NIST's global collapse analysis, with the upper eastern exterior folding inward to the south dramatically, as acknowledged by NIST: "In both analyses, the eastern exterior wall deflected inward at the roof level as the structure became unsupported after the vertical collapse event." (*See* NCSTAR 1A, p. 44.) However, this behavior was not observed in any videos of the collapse.

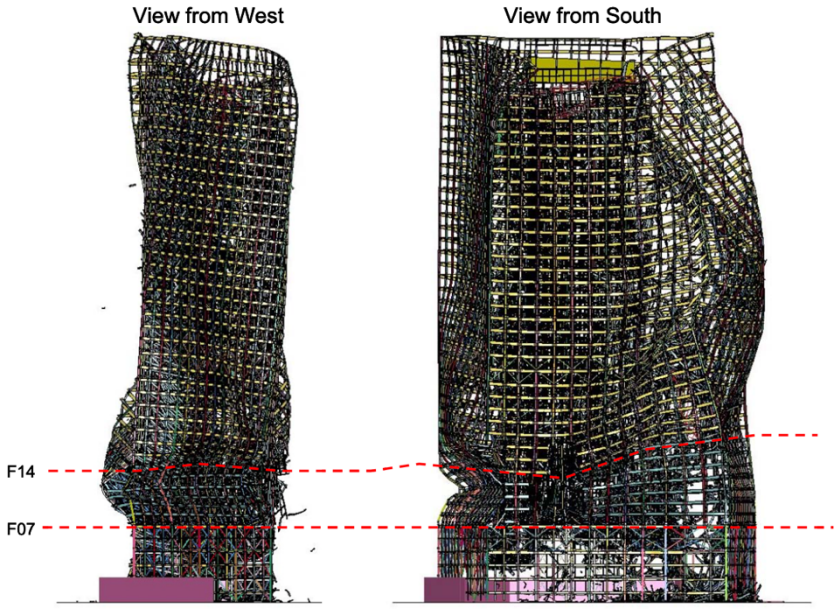


Figure 12–62. Exterior column buckling after initiation of global collapse with debris impact and fire-induced damage (slabs removed from view).

The second way that NIST's global collapse analysis fails to match most of the observed behavior is in the direction of the collapse. As illustrated in Figure 5-205 of NCSTAR 1-9 shown below, the northwest edge of WTC 7 descended nearly symmetrically during the first 4 seconds of the global collapse. Analyzing Figure 5-205, NIST states (*see* NCSTAR 1-9, p. 277):

> In this sequence of images, **both the northeast and northwest edges began to tilt toward the north shortly after the building began to move downward.** The northeast edge tilt continued to increase until the edge was obscured by dust and smoke. **The northwest edge initially tilted in a similar manner, but then settled back to its original line and fell nearly vertically** (or directly toward or away from the camera). (Emphasis added.)

In contrast, NIST's global collapse analysis predicts both the northeast and northwest edges of WTC 7 tipping to the south — not to the north — in a manner that appears they would not have tilted back to the north and, in the case of the northwest edge, that it would not have settled back to its original line. The southward tipping predicted in NIST's global collapse analysis is shown below in the western view from Figure 12-62 of NCSTAR 1-9 (left) and in the overlay of the final frame from NIST's global collapse analysis animation on top of the frame just before the initiation of the east penthouse collapse (right).

It should be noted that the illustration and animation of NIST's global collapse analysis shown in Figure 8 below correspond approximately to the position of WTC 7 at 8.3 seconds in the video, at which point there is no tipping or tilting of the building (see "8.3 s"). It is apparent that at the rate of tipping shown in the global collapse analysis, approximately 3 seconds later the model would have shown the building tipping southward dramatically far from its original position.

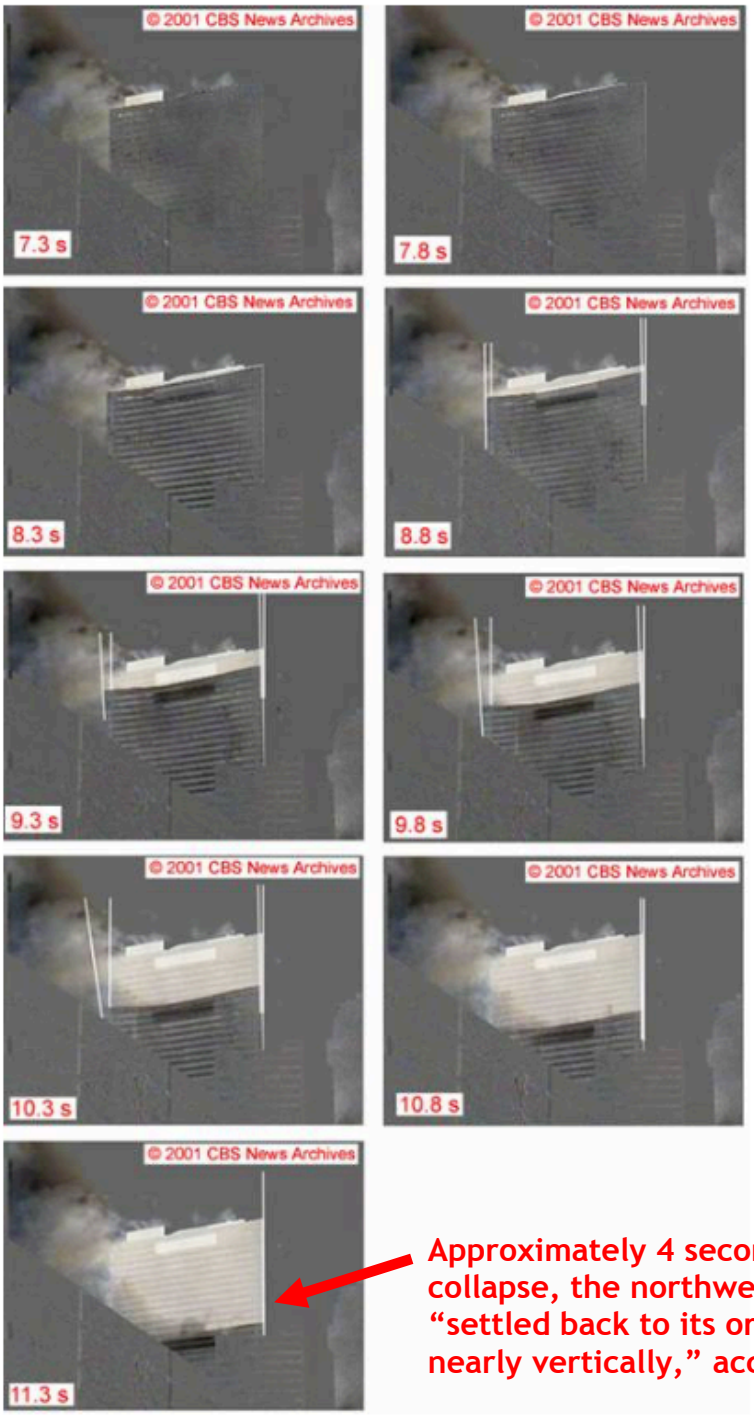


Figure 5–205. Difference images from the Camera 3 video clip showing the rotation of the northeast edge of WTC 7 during the global collapse. Times are referenced to the time the east penthouse began to descend into the building.

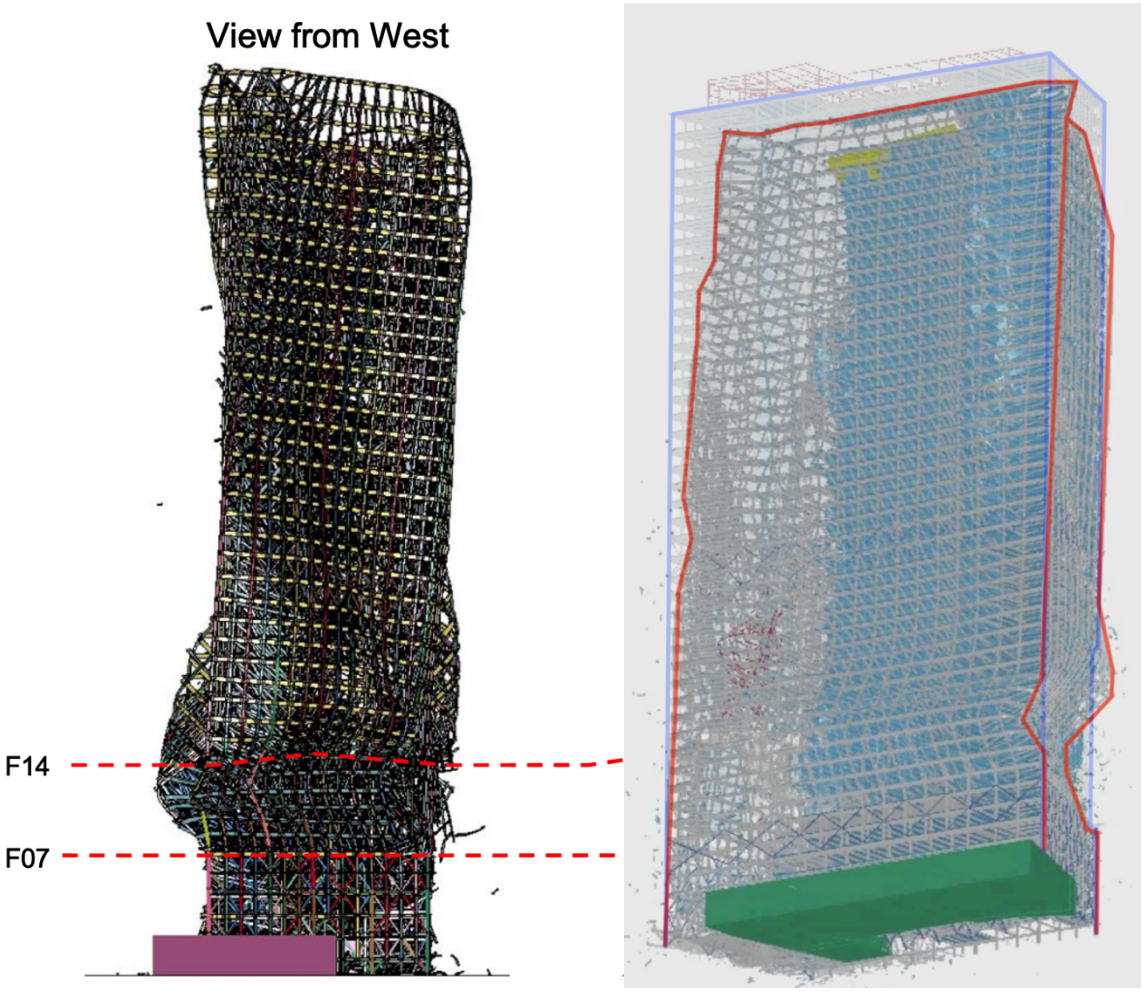


Figure 8: NCSTAR 1-9 Figure 12-62 View from West (left); NIST's global collapse analysis at 8.1 seconds after east penthouse collapse initiation laid over .1 seconds before the east penthouse collapse initiation (right).

The third way that NIST's global collapse analysis fails to match most of the observed behavior is by its failure to a predict the observed rate of downward motion from the initiation of global collapse through to the end of free fall. This downward motion is characterized by a sudden transition from stasis to free fall followed by a period of free fall lasting approximately 2.5 seconds, during which WTC 7 fell downward approximately 8 stories without encountering any resistance. (*See* NCSTAR 1A, p. 45; Chandler, *NIST Finally Admits Free Fall*.)

Before examining the failure of NIST's global collapse analysis to predict the sudden transition to free fall, we must first examine NIST's mischaracterization of this transition. The NIST WTC 7 Report defines three stages of downward motion as follows (*see* NCSTAR 1A, p. 45):

- **In Stage 1, the descent was slow and the acceleration was less than that of gravity.** This stage corresponds to the initial buckling of the exterior

columns in the lower stories of the north face. **By 1.75 s, the north face had descended approximately 2.2 m (7 ft).**

- **In Stage 2, the north face descended at gravitational acceleration**, as the buckled columns provided negligible support to the upper portion of the north face. **This free fall drop continued for approximately 8 stories or 32.0 m (105 ft), the distance traveled between times *t* = 1.75 s and *t* = 4.0 s.**

- In Stage 3, the acceleration decreased somewhat as the upper portion of the north face encountered increased resistance from the collapsed structure and the debris pile below. Between 4.0 s and 5.4 s, the north face corner fell an additional 39.6 m (130 ft). (Emphasis added.)

NIST's measurements of the downward motion are based on the video that NIST labeled as Camera 3, which is the camera to the northwest of WTC 7 that looks upward at the building from street level, shown in the figures above. The strong parallax of this camera angle makes it difficult to disambiguate horizontal and vertical motion, rendering it a poor video for determining the time of onset or the amount of vertical motion. Nevertheless, NIST used it to characterize the downward motion. The NIST WTC 7 Report states (NCSTAR 1-9, p. 601-602):

> To obtain a better understanding of the vertical motion of the building in the first several seconds of descent, the motion of the north face was studied in more detail by **tracking the vertical position of a point near the center of the roofline using the same video [Camera 3].** In the following discussion, the time at which motion of the roofline was first perceived (6.9 s) is taken as time zero.
>
> Figure 12–76 presents a plot of the downward displacement data shown as solid circles. . . . The fitted displacement function was differentiated to estimate the downward velocity as a function of time, shown as a solid curve in Figure 12–77. . . . The slope of the straight line, which represents a constant acceleration, was found to be 32.2 ft/s^2 (with a coefficient of regression R2 = 0.991), equivalent to the acceleration of gravity g. (Emphasis added.)

Figures 12-76 and 12-77 from NCSTAR 1-9, referenced above, are shown below:

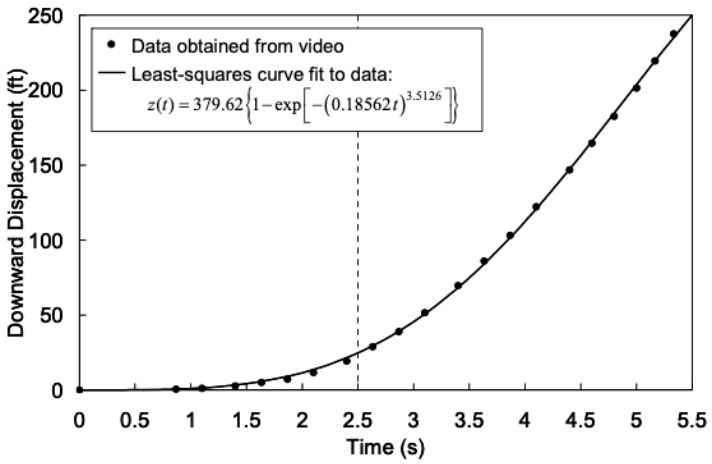


Figure 12–76
Downward displacement of north face roofline as WTC 7 began to collapse.

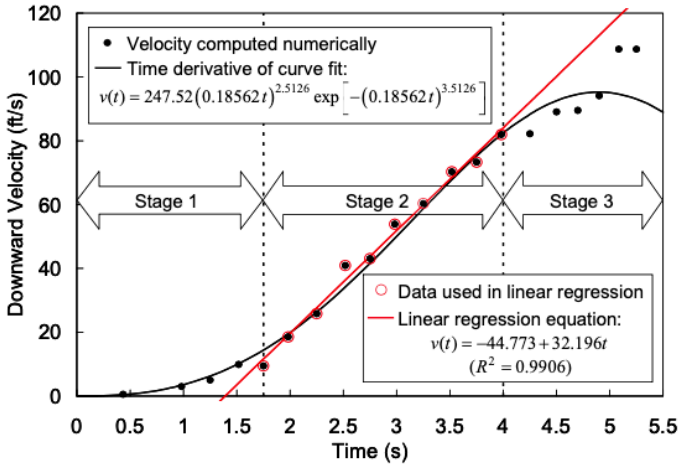


Figure 12–77
Downward velocity of north face roofline as WTC 7 began to collapse.

Upon closer examination, we find that NIST's method of measuring the building's downward motion by tracking the vertical position of a single point "near the center of the roofline" oversimplifies and misrepresents the actual downward motion of the entire roofline.

Careful measurement by physicist and researcher David Chandler using the video that NIST labeled as Camera 2, which has a line of sight approximately level with the roofline, shows that a point near the center of the roofline did indeed begin to move downward at about 6.9 seconds after the east penthouse collapse initiation, but that the northeast and northwest corners of the roofline did not begin to move downward until about 8.2 seconds after the east penthouse collapse initiation. Chandler's measurement is corroborated by Figure 5-201 of NCSTAR 1-9 above, which shows a slight displacement at the middle of the roofline and zero displacement of the upper exterior corners 7.5 seconds after the east penthouse collapse initiation. Figure 9 below presents the downward displacement and downward velocity of the north face roofline versus time at the northwest corner, middle, and northeast corner of the roofline. In the time axis, zero represents NIST's initiation of global collapse, which is 6.9 seconds after the east penthouse collapse initiation.

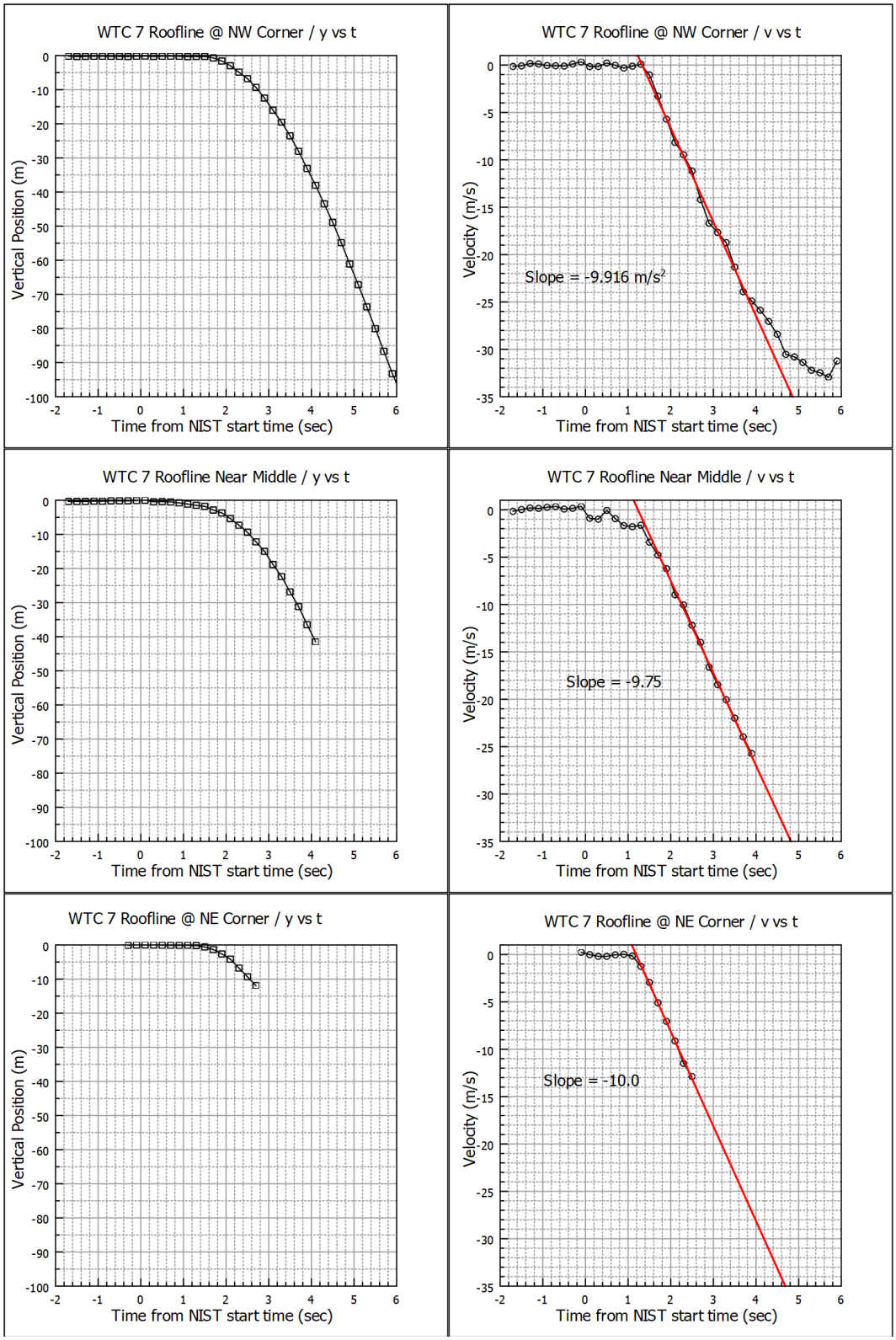


Figure 9: Left: Displacement versus time of north face roofline at northwest corner, middle, and northeast corner. Right: Velocity versus time of north face roofline at northwest corner, middle, and northeast corner.

According to Chandler's measurements, between 6.9 seconds and 8.2 seconds, the point near the center of the roofline dropped approximately half a meter, then stopped, and then dropped approximately 1 meter further, while the northeast and northwest corners remained stationary. **Then, at 8.2 seconds, within a tenth of a second, all three points along the roofline suddenly began descending uniformly in free fall. While the northeast corner became difficult to track partway into the descent because of smoke, the measurements indicate that the middle of the roofline and the northwest corner stayed in free fall for approximately 2.5 seconds.**

Therefore, NIST's "Stage 1" mischaracterizes the downward motion in three important ways: (1) It overstates by approximately half a second the period of time that the middle of the roofline experienced a "slow descent" before entering free fall, claiming that this period lasted 1.75 seconds when it was closer to 1.3 seconds; (2) It wrongly portrays the displacement of the middle of roofline during this 1.3 seconds as a smooth transition to free fall, when in fact it dropped approximately half a meter, stopped, and then dropped approximately 1 meter, before suddenly entering free fall; (3) Most importantly, it generalizes the downward motion of the middle of the roofline to represent the downward motion of the entire roofline, when in fact the northeast and northwest corners did not descend at all from 6.9 seconds to 8.2 seconds, and their transition from stasis to free fall was instantaneous and simultaneous — an observation that is inconsistent with NIST's claim that "[t]he south and west exterior columns buckled first, followed by the north and east face columns." (*See* NCSTAR 1-9, p. 586.) NIST's generalization of the entire roofline's behavior is exemplified in Figure 8-5 of NCSTAR 1-9, shown below, in which NIST states, "**Entire roofline** of north façade beginning to drop" "**about seven seconds** after the onset of collapse of the east penthouse" (emphasis added) (*see* NCSTAR 1-9, p. 327):

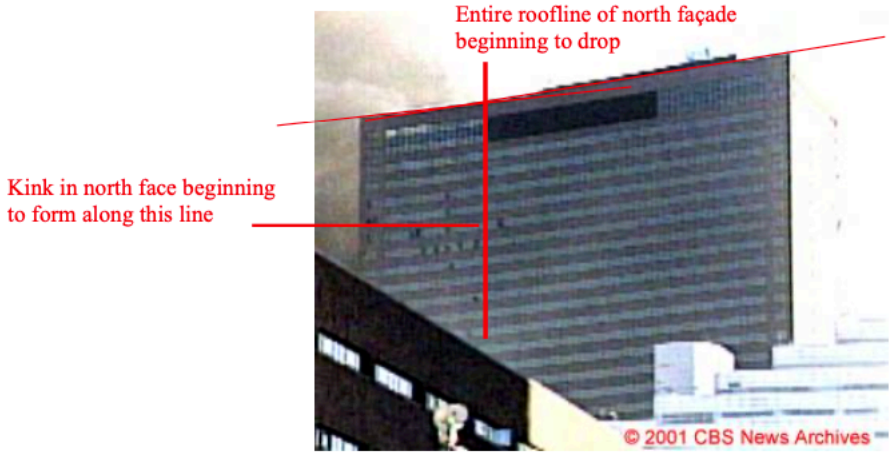


Figure 8–5. Global collapse of WTC 7 begins about seven seconds after the onset of collapse of the east penthouse.

Thus, the downward motion of WTC 7's north face roofline at the onset of global collapse is more accurately characterized as a sudden transition to free fall. Prior to the initiation of the entire roofline's free fall, the middle of the roofline dropped approximately half a meter, then stopped, and then dropped approximately 1 meter further, before entering into free fall along with the entire roofline.

NIST's mischaracterization of the sudden transition to free fall is significant not only because it misrepresents the nature of the observed behavior so as to make it seem more consistent with a natural, progressive collapse, but also because it helped NIST claim that its global collapse analysis "matched the observed behavior reasonably well." The NIST WTC 7 Report makes this claim when it asserts: "The three stages of collapse progression described above are consistent with the results of the global collapse analyses discussed in Chapter 12 of NIST NCSTAR 1-9." (*See* NCSTAR 1A, p. 45.)

In fact, the animation of NIST's global collapse analysis shows neither a 1.75-second period in which the north face descended approximately 2.2 meters (NIST's inaccurate observation), nor a 1.2-second period in which the middle of the roofline descended approximately 1.5 meters (Chandler's observation), nor the sudden transition to free fall of the entire roofline (Chandler's observation). Rather, as shown in Figure 10 below, NIST's model shows a highly deformed roofline descending approximately one and a half stories (approximately 6 meters) during the 1.8 seconds from the initiation of global collapse (6.3 seconds after the east penthouse collapse initiation in NIST's global collapse analysis) to the termination of the model (8.1 seconds after the east penthouse collapse initiation). This amount of displacement is significantly greater than the initial displacement observed by both NIST and Chandler just prior to the onset of free fall.

Figure 10: Roofline in NIST's global collapse analysis descends ~1.5 stories (~6 meters) in 1.8 seconds.

In addition to failing to predict the sudden transition to free fall, NIST's global collapse analysis fails to predict the observed period of free fall itself. Because NIST terminates the animation of the global collapse analysis 8.1 seconds after the initiation of the east penthouse collapse, the model effectively cuts off just as it might have been expected to show the observed period of free fall. This is derived by noting the time of global collapse initiation in NIST's

global collapse analysis, which is 6.3 seconds after the initiation of the east penthouse collapse, and adding the period of 1.75 seconds of slow descent alleged by NIST, which places the theoretical start of free fall at 8.05 seconds after the east penthouse collapse initiation. This is .05 seconds before NIST terminated the animation of the global collapse analysis. As a result, NIST's global collapse analysis ends before showing the observed period of free fall.

The NIST WTC 7 Report states the following about the global collapse analysis in a subsection titled "Aspects following the Global Collapse Initiation" (*see* NCSTAR 1A, p. 44):

> Once simulation of the global collapse of WTC 7 was underway, **there was a great increase in the uncertainty in the progression of the collapse sequence**, due to the random nature of the interaction, break up, disintegration, and falling debris. The uncertainties deriving from these random processes increasingly influenced the deterministic physics-based collapse process, and **the details of the progression of the horizontal failure and final global collapse were increasingly less precise.** (Emphasis added.)

But because free fall means that there is no interaction between the falling top section of the building and the structure below it, it should have been easier for NIST's global collapse analysis to simulate the observed period of free fall, not more difficult. NIST should not have needed to terminate the global collapse analysis due to increasing uncertainty and less precision just as the model might have been expected to show the observed period of free fall.

It is reasonable to deduce that NIST may have terminated its global collapse analysis 8.1 seconds after the east penthouse collapse initiation because the model had failed to match most of the observed behavior up until that point, and the model's ability to match the observed behavior only worsened after that point, as noted by NIST. Significant deformation and tipping were underway and likely to increase, and there was no indication that the building was about to enter vertical free fall.

In any case, NIST's claim that "the three stages of collapse progression . . . are consistent with the results of the global collapse analyses discussed in Chapter 12 of NIST NCSTAR 1-9" is unambiguously false for a second reason: The second stage, which NIST characterizes as 2.25 seconds of free fall, is not shown in NIST's global collapse analysis. Furthermore, NIST's admission that there was increasing uncertainty and less precision in the model following global collapse initiation suggests that it would not have shown the observed period of free fall if it had continued.

Because NIST's global collapse analysis fails to match most of the observed behavior — predicting fundamentally different structural behavior from what was observed — NIST should have interpreted its global collapse analysis as disconfirming its leading collapse hypothesis.

Matching Certain Observables Does Not Amount to Matching the Observed Behavior

NIST's claim that its global collapse analysis "matched the observed behavior reasonably well" and therefore "confirmed the leading collapse hypothesis" rests on the notion that

reproducing certain observed events was sufficient to match the observed behavior and confirm the leading collapse hypothesis, even though fundamental aspects of the structural behavior — lack of deformation, vertical descent, and free fall — were not predicted in the model.

In the section of NCSTAR 1A titled "Accuracy of the Probable Collapse Sequence," and in the section of NCSTAR 1-9 titled "Comparisons of Simulations with Observables," and in FAQ #29 of the NIST WTC 7 FAQs, NIST offers six observables that it claims either were accurately predicted in the global collapse analysis or that corresponded temporally to a simulated failure in the global collapse analysis. These include:

1. An east-west vibration of the building ± 2 inches about 6 seconds before the initiation of the east penthouse collapse, which NIST claims started at nearly the same time as the alleged cascade of floor failures.

2. A seismic signal approximately 10 seconds prior to the initiation of global collapse, which NIST claims was likely due to the falling of debris from the cascade of floor failures. (This seismic signal is discussed in Part 2 below.)

3. The formation of a kink in the roofline of the east penthouse approximately one second after Column 79 was found to buckle.

4. Window breakage on the east side of the north face as the buckling of Column 79 precipitated the failure of upper floors.

5. The collapse of the east penthouse (both the time of its initiation and the time at which the penthouse descended below the roofline).

6. The initiation of global collapse, which NIST claims occurred within approximately one-half second of the time predicted in the global collapse analysis.

The fundamental flaw in NIST's claim that its global collapse analysis "matched the observed behavior reasonably well" and therefore "confirmed the leading collapse hypothesis" is as follows: All of the observables listed above are also consistent with the hypothesis of controlled demolition, if not more consistent. Furthermore, as discussed further below, the hypothesis of controlled demolition readily explains the other fundamental aspects of WTC 7's structural behavior that NIST's global collapse analysis fails to predict (lack of deformation, vertical descent, and free fall). Therefore, it is scientifically unsound for NIST to conclude that its global collapse analysis confirmed its leading collapse hypothesis.

UAF Analysis Matches All of the Observed Behavior

The UAF study cited above performed a number of simulations using SAP2000 software to determine what types of local failures and their locations may have caused the total collapse of WTC 7 to occur as observed.

First, the UAF team found that the collapse of the east penthouse was most accurately predicted by simulating the failure of Columns 79, 80, and 81 from the 45th floor up to the penthouse. This failure mechanism caused the east penthouse to collapse into the building while also causing minimal movement of the exterior. In contrast, the UAF team found that as the failure of Columns 79, 80, and 81 was simulated progressively lower in the building, the east penthouse was *less likely* to collapse into the building, because the intact portions of Columns 79, 80, and 81 above where the columns failed would still support the penthouse. At the same time, there would be greater movement of the exterior the further down the column failures were simulated. Figures 4.2 and 4.7 of the UAF Report below illustrate these phenomena. Specifically, Figure 4.2 shows the results of removing Columns 79, 80, 81 from Floor 6 to Floor 13, which is approximately where these columns buckled in NIST's Probable Collapse Sequence. (*See* UAF Report, p. 96, p. 99.)

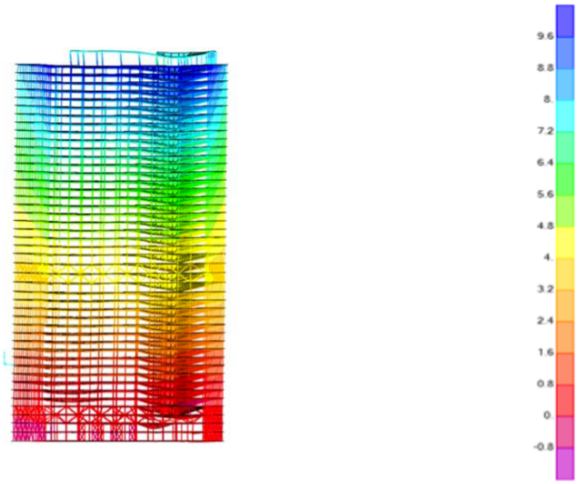


Figure 4.2 Columns 79, 80, and 81 are removed from Floor 6 to Floor 13. The key to the right is expressed in inches of movement. The building tilts to the east almost 10 inches. The penthouse does not collapse.

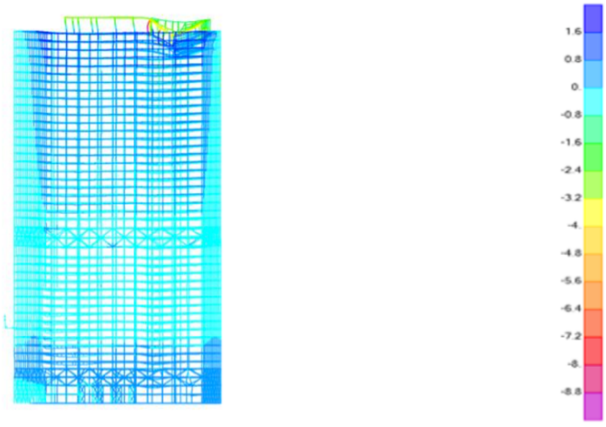
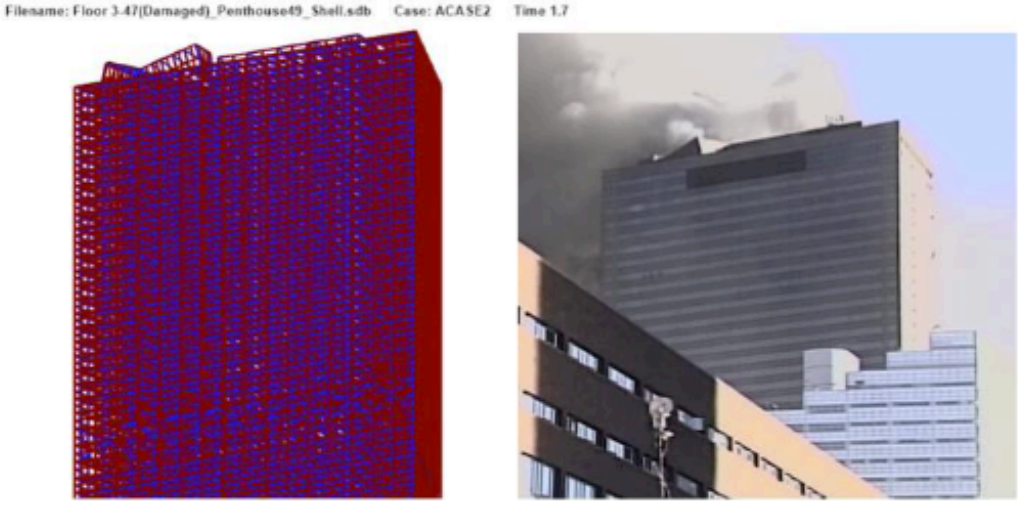


Figure 4.7 Columns 79, 80, and 81 are removed from Floor 45 to the penthouse. Tilting of the building is now negligible. The penthouse now collapses, as demonstrated from the significant amount of deflection given in the figure.

Second, the UAF team found that the failure of Columns 79, 80, and 81 would not have initiated an east-to-west progression of core column failures, as claimed by NIST (see the latter stages of NIST's Probable Collapse Sequence on page 23 above). Therefore, the UAF team considered the possibility that the local failures that caused the global collapse were not actually a result of the earlier local failures that caused the collapse of the east penthouse. Thus, the UAF team simulated the simultaneous failure of all core columns over 8 stories followed 1.3 seconds later by the simultaneous failure of all exterior columns over 8 stories. The UAF team found that "the simultaneous failure of all core columns followed by the simultaneous failure of all exterior columns produces almost exactly the behavior observed in videos of the collapse." (*See* UAF Report, p. 106.) Figure 4.17 of the UAF Report shows the UAF team's global collapse analysis from two separate angles alongside corresponding video of the collapse.



(a) Perspective 1

(b) Perspective 2

Figure 4.17 (a) Comparison of simulated collapse to perspective 1; (b) comparison of simulated collapse to perspective 2.

Figure 11 below illustrates how the collapse progressed in the UAF global collapse analysis by overlaying the last frame of the animation on the first frame the animation. As is apparent, the UAF global collapse analysis predicts minimal deformation of the exterior and a clean vertical descent, as observed in videos of the collapse.

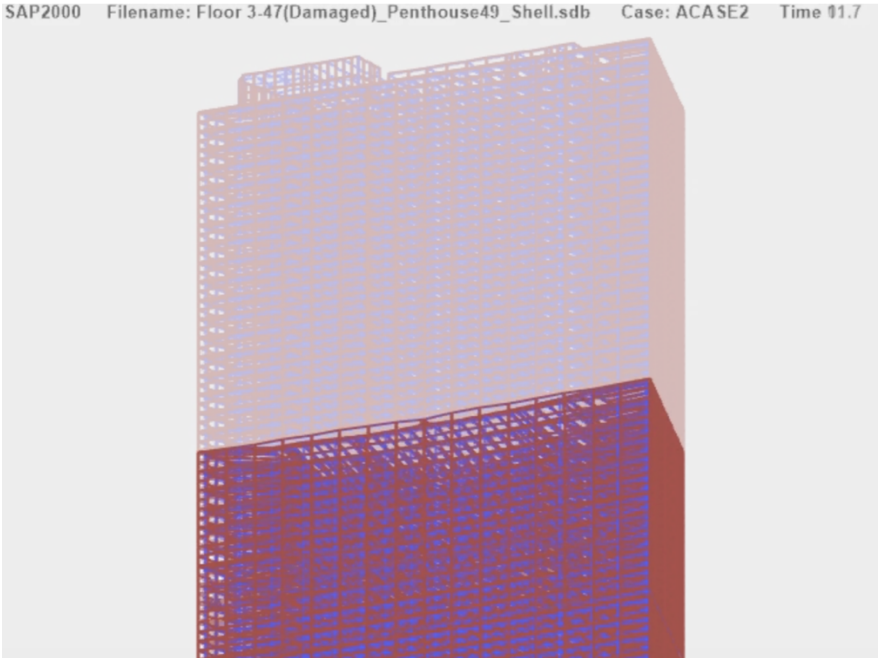


Figure 11: The last frame of the UAF global collapse analysis overlaid on the first frame.

The UAF team also found that the simultaneous failure of all core columns over 8 stories followed 1.3 seconds later by the simultaneous failure of all exterior columns over 8 stories resulted in a downward velocity and acceleration that matched almost exactly with the observed 2.5 seconds of free fall, as illustrated below in Figure 4.20 from the UAF Report.

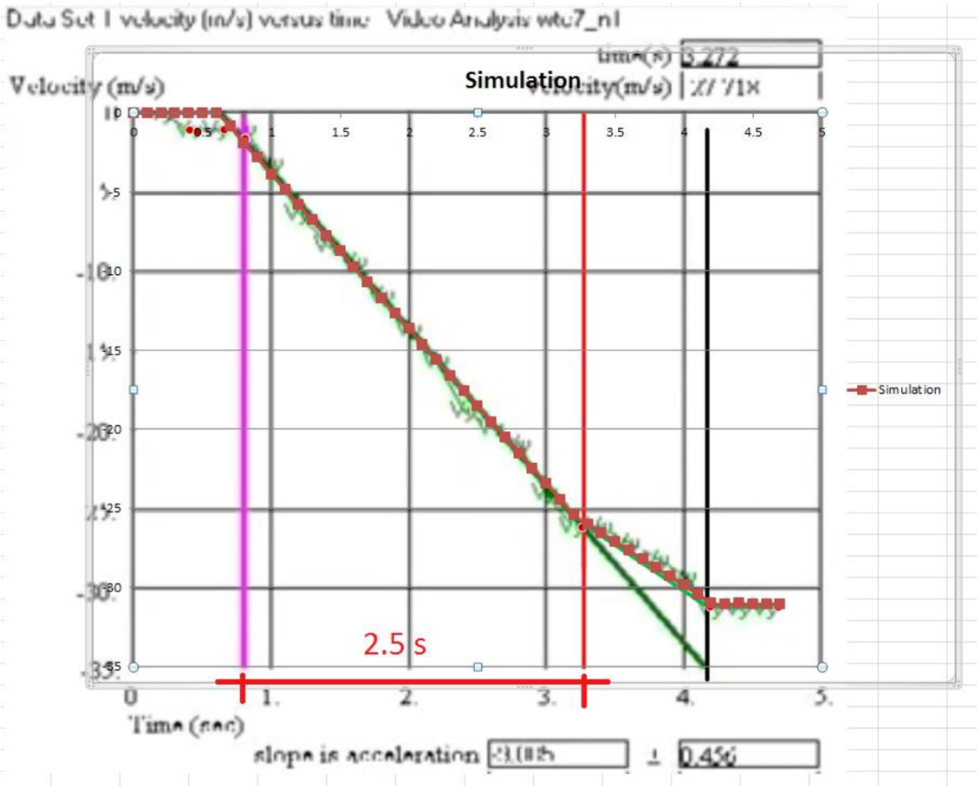


Figure 4.20 Velocity comparison between Chandler measurement (green plotted line) and UAF simulation (red plotted line). Bold green trend line illustrates free fall.

In summary, the UAF global collapse analysis predicted all of the structural behavior that that NIST's global collapse analysis failed to predict. The lack of exterior deformation, vertical descent, and free fall were all captured in the UAF global collapse analysis by simulating the failure of Columns 79, 80, and 81 from the 45th floor up to the penthouse and then — as a separate and distinct event not resulting from the local failure of Columns 79, 80, and 81 — simulating the simultaneous failure of all core columns over 8 stories followed 1.3 seconds later by the simultaneous failure of all exterior columns over 8 stories. Although the UAF Report does not speculate on the causes of these separate sets of failures (it only concludes that fires could not have caused them), the simulated scenario is effectively a controlled demolition, where the east penthouse was made to collapse into the building first, apparently in order to prevent it from falling outside the building's footprint, and then the entire building was brought down through the synchronized removal of the columns lower in the building.

Furthermore, as mentioned above, all of the observables that NIST claims were accurately predicted in its global collapse analysis, or corresponded temporally to a simulated failure in its global collapse analysis, are also consistent with the hypothesis of controlled demolition, if not more consistent. The east-west vibration of the building ± 2 inches about 6 seconds before the initiation of the east penthouse collapse could have been caused by explosive and/or incendiary devices that were used to bring down the east penthouse or destroy other parts of the building. The seismic signal approximately 10 seconds prior to the initiation of global collapse is much better explained by a subaerial explosion that occurred in the process of

bringing down the east penthouse, as discussed further in Part 2. The formation of a kink in the roofline of the east penthouse could have been caused by the removal of Columns 79, 80, and 81 high up in the building. Window breakage on the east side of the north face is better explained by the failure of Columns 79, 80, and 81 high up in the building and a shockwave propagating downward from the collapse of the east penthouse into the building. This is especially apparent because the window breakage propagated from the roof down and was limited to approximately the upper 15 floors. Any window breakage caused by the failure of Column 79 low in the building would be expected to occur from the bottom up along much of the height of the building, not just the upper 15 floors. Finally, the collapse of the east penthouse and the global collapse of the building are the intended result of a controlled demolition scenario.

Failure to Comply with Objectivity, Utility, Transparency, and Reproducibility Standards

Based on all of the information presented above, NIST's claim that its global collapse analysis matched the observed behavior reasonably well and confirmed its leading collapse hypothesis fails to comply with the OMB Guidelines and NIST IQS because it lacks objectivity, utility, transparency, and reproducibility.

First, NIST's claim that its global collapse analysis matched the observed behavior reasonably well is inaccurate, unreliable, and apparently biased because NIST's global collapse analysis fails to match most of the observed behavior, actually predicting fundamentally different structural behavior from what was observed, thus violating the objectivity element of information quality under the OMB Guidelines and NIST IQS. In addition, NIST's claim that there was 1.75-second period of slow descent prior to free fall, which helped NIST claim that its global collapse analysis matched the observed behavior reasonably well, is inaccurate, unreliable, and apparently biased because careful measurement shows a sudden transition to free fall.

Second, NIST's claim that its global collapse analysis confirmed its leading collapse hypothesis is inaccurate, unreliable, and apparently biased because it matched only *some* of the observables, while the hypothesis of controlled demolition also explains those observables in addition to explaining the fundamental aspects of WTC 7's structural behavior that NIST's global collapse analysis failed to predict (lack of deformation, vertical descent, and free fall).

Third, NIST's termination of its global collapse analysis 8.1 seconds after the east penthouse collapse initiation violates the utility element of information quality because care was not taken to make sufficient background and detail available regarding its claim. Similarly, NIST's termination of its global collapse analysis 8.1 seconds after the east penthouse collapse initiation also violates the transparency standard imposed upon influential information because NIST did not practice a degree of transparency sufficient to facilitate reproducibility. Specifically, even despite the increase in uncertainty and decrease in precision — or precisely because of it — NIST should have terminated its global collapse analysis later in order to increase the usefulness of the information and to better allow members of the public to evaluate whether the global collapse analysis matched the observed behavior well.

Fourth, NIST's claim that its global collapse analysis matched the observed behavior reasonably well violates the reproducibility standard imposed upon influential information because — to the extent that independent analysis of the original data using identical methods could be performed — contradictory analytic results were generated. Namely, the UAF analysis found that simulating the failure of Columns 79, 80, and 81 from the Floor 6 to Floor 13 did not cause the east penthouse to collapse into the building.

Fifth, NIST's claim that its global collapse analysis confirmed its leading collapse hypothesis violates the reproducibility standard imposed upon influential information because the UAF analysis found that simulating what is effectively a controlled demolition scenario matches the observed behavior far better than NIST's global collapse analysis does.

2. Corrections Sought:

a) Revise the NIST WTC 7 Report to Reflect that the North Face Roofline Underwent a Sudden Transition to Free Fall

First, NIST must revise the NIST WTC 7 Report to reflect that, based on new measurement of video footage that is level with the roofline, the north face roofline of WTC 7 underwent a sudden transition to free fall, with the middle of the roofline dropping approximately half a meter, then stopping, and then dropping approximately 1 meter further, before entering into free fall along with the entire roofline.

b) Perform a New Global Collapse Analysis that Both Is Physically Possible (i.e., Does Not Involve the Walk-Off of Girder A2001 at Its Column 79 Support Nor a Cascade of Floor Failures from Floor 13 to Floor 5) and Matches the Observed Behavior Well (e.g., the Scenario Simulated in the UAF Analysis)

Second, NIST must perform a new global collapse analysis that both is physically possible and matches the observed behavior well. This means that the new global collapse analysis must not involve the walk-off of Girder A2001 at its Column 79 support nor a cascade of floor failures from Floor 13 down to Floor 5. Secondly, this means that the new global collapse analysis must match the observed behavior well. In order to best match the observed behavior, NIST should simulate the failure of Columns 79, 80, and 81 high in the building, followed by the near-simultaneous failure of all columns lower in the building over 8 stories. This is the scenario simulated in the UAF global collapse analysis.

c) Discard the Probable Collapse Sequence and Adopt a New Probable Collapse Sequence that Both Is Physically Possible and Better Matches the Observed Behavior

Third, assuming that this new global collapse analysis matches the observed behavior well, NIST must discard its Probable Collapse Sequence and adopt a new Probable Collapse Sequence based on and consistent with this new global collapse analysis.

Part 2: NIST's Omission and Distortion of Evidence of Explosions and Incendiaries

The three items of information described in Part 2 relate to evidence indicating the use of explosives and incendiaries that the NIST WTC 7 Report either omitted or distorted. These three items of information are (F) seismogram data generated during the collapse of WTC 7, (G) eyewitness and audio evidence of explosions before and during the collapse of WTC 7, and (H) physical evidence of incendiaries found in the debris of WTC 7. As demonstrated below, correction of any one of these violations leads to the conclusion that NIST's Probable Collapse Sequence is inconsistent with the available evidence and must be discarded.

F. SEISMOGRAM DATA

1. NIST Erroneously Attributed the Two Seismic Signals Generated During the Collapse of WTC 7 to the Alleged Cascade of Floor Failures and to the Initiation of Global Collapse Instead of to the Occurrence of Two Subaerial Explosions, Thus Violating OMB Guidelines and NIST IQS

Two seismic events with Richter magnitudes of .6 occurred at approximately 5:20:42 PM and 5:20:50 PM on September 11, 2001, which is the approximate time of WTC 7's collapse. The seismic signals emitted from these events were recorded on seismometers at the Lamont-Doherty Earth Observatory of Columba University (LDEO) in Palisades, New York, about 34 kilometers away from Lower Manhattan. Appendix B of NCSTAR 1-9 documents the occurrence of these seismic events and analyzes their possible source. Figure 12 on page 53 below presents a seismogram from LDEO showing these seismic signals.

As shown in Table B-4 from Appendix B below (which has been abridged for the purposes of this Request to exclude other seismic signals recorded that day), and as discussed in Appendix B, the NIST WTC 7 Report attributes the first seismic signal at approximately 5:20:42 PM to the alleged cascade of floor failures in its Probable Collapse Sequence, which allegedly led to the buckling of Column 79 and the collapse of the east penthouse. It then attributes the second seismic signal at approximately 5:20:50 to the initiation of global collapse. Although the NIST WTC 7 Report does not explicitly claim that the second signal corresponded to the initiation of global collapse, it is implied by the second signal being generated approximately 7 to 8 seconds after the first seismic signal (the initiation of the east penthouse collapse and the initiation of global collapse were approximately 7 to 8 seconds apart).

Table B-4. Summary of seismic events recorded 8:46 to 17:21 on Sept. 11, 2001.

Origin Time, EDT (hh:mm:sec)	Event ID	Latitude (°N)	Longitude (°E)	Depth (km)	Magnitude (M_L)	Event Type
17:20:42	5	40.71	-74.01	0	0.6	WTC 7 collapse initiation
17:20:50	5'	40.71	-74.01	0	0.6	WTC 7 perimeter wall collapse

NIST states the following in Appendix B (*see* NCSTAR 1-9, p. 667, 670):

> The WTC 7 building collapse was observed to have two distinct phases. First, an internal structural failure occurred which led to the observed east penthouse movement, when it sank below the roofline. Second, the entire building began to collapse about 7 s later, when the roofline and building exterior were observed to start moving downward. **The first phase resulted in interior debris falling to the lower floors of WTC 7 on the east side, which transmitted impact loads to the foundation.** The debris fell over several seconds, but the exact time duration is unknown, as is the timing relative to the observed east penthouse movement. **The first phase triggered other interior structural failures which led to the observed global collapse initiation about 7 s after the east penthouse moved downward.**" (Emphasis added.)

NIST then repeats this description later in Appendix B (*see* NCSTAR 1-9, p. 675):

> As discussed further in Chapter 12, there were two phases in the probable WTC 7 collapse sequence that could have resulted in seismic signals.
>
> - The first comprised the initial local failure and the vertical progression of failure. These began prior to the descent of the east penthouse (as suggested by the increasingly larger magnitudes of vibration of the building as described in Appendix C) and involved a cascade of floor failures within the east side of the building. **The interior debris falling onto the lower floors of WTC 7 on the east side transmitted impact loads to the foundation. This impact would have coincided roughly with or slightly preceded the initial descent of the east penthouse, about 7 s prior to the visible initiation of global collapse.** This time estimate is within the uncertainty in collapse time determined by NIST from the video record as listed in Table 5-1.
>
> - The second seismic phase comprised the global collapse of the building, as seen in the videos (Section 5.7). **Here, the entire building above the fire-damaged and buckled floors moved downward as a single unit, transmitting impact loads to the foundation. One would have expected seismic signals from this second phase of collapse to be generated over this entire episode (which lasted approximately 14 s) since debris was continuously impacting the ground either unobserved within the core or externally as seen from the videos of the perimeter walls.** However, because the total energy dissipated by the impact was distributed over a long period of time, the strength of the signal at any given time was small and difficult to interpret. (Emphasis added.)

Even though NIST characterizes the seismic activity as two separate events in Table B-4, NIST tries to downplay the idea of two separate events in an apparent attempt to construe the seismic activity as being consistent with its Probable Collapse Sequence, which would involve a

sustained period of debris impact inside and outside the building. Specifically, NIST states (*see* NCSTAR 1-9, p. 667, 670):

> **The event origin time, based on the arrival of the Rayleigh type of shear wave *Rg* on the BHE component, was estimated to occur at 17:20:42 EDT with an uncertainty of ±4 s. Notice that the seismic signal strengthens at about 21.5 s, following the initial *Rg* wave arrival at 14.5 s. . . .**
>
> **While this qualitative sequence of events is consistent with what might be construed as two arrivals in the PAL BHE traces shown in Figures B-5 and B-6, caution is required when interpreting signals that are small.** For example, the signals in Figures B-3 and B-4 all recorded the same event, the collapse of WTC 1. Even so, signal amplitude and duration vary depending upon the location of signal arrival. The signal variations may be due to differences in the geological features along the signal path as well as local differences in construction. For instance, WTC 1 and WTC 2 were both located inside the foundation bathtub structure and had multi-story basements while WTC 7 was located north of the bathtub structure and had no basement. It is not known how these construction features may have affected signal transmission. (Emphasis added.)

Putting aside for a moment whether the observed seismic activity can be accurately characterized as two separate seismic events, the fundamental flaw in NIST's interpretation of the seismogram data is that debris impact, whether inside the building or directly against the ground, simply does not produce a force sufficient to create seismic waves that will travel further than several hundred meters. This fact is attested to in the enclosed declaration by André Rousseau, a retired geophysicist who previously worked at the National Center of Scientific Research in Bordeaux, France, for 35 years and published 50 papers on the relationship between the characteristics of progressive mechanical waves and geology. Rousseau states in the enclosed declaration:

> Seismic waves can only propagate in the ground when they are produced from a fracture (earthquake, explosion) or from a percussion on a solid ground by a solid mass (great lumps of solid rocks falling from a mountain, meteorites) or from the technique used in applied geophysics of "weight dropping," which consists of letting a heavy mass such as a three-ton weight fall to earth, or by using vibrators attached to the ground. But the energy of the waves developed in the ground by the latter three methods is too low for the waves to go further than several hundred meters. As a result, only explosions can explain the seismic waves that correspond to the collapse of WTC 7.

Rousseau further attests in the enclosed declaration:

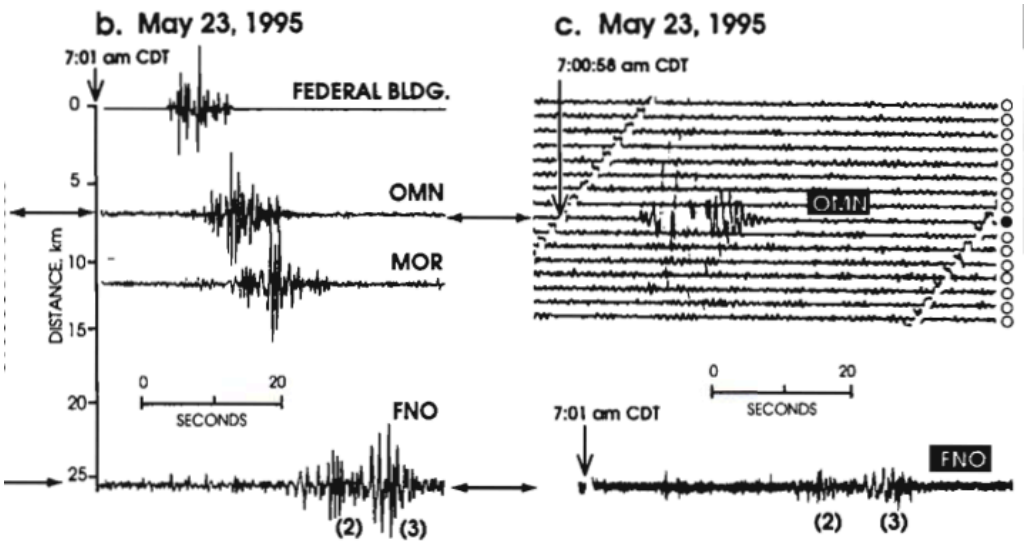
> The recording of Rayleigh waves in the LDEO seismogram [shown below] unaccompanied by a pressure (P) wave and a shear (S) wave indicates the occurrence of subaerial explosions taking place close to the ground, where the emitted energy splits into sound waves, mostly in the air, and surface waves in the

ground. [As discussed in the next section, the occurrence of a subaerial explosion where some of the energy is emitted as sound waves is consistent with eyewitness evidence indicating an audible explosion at the onset of the east penthouse collapse.]

In the enclosed declaration, Rousseau cites the controlled demolition of the remaining portion of the bomb-ravaged Alfred P. Murrah Federal Building in Oklahoma City on May 23, 1995, as a real-world experiment showing the inability of falling debris to create seismic waves that travel further than several hundred meters.

> The example of the Alfred P. Murrah Federal Building demolition involved a powerful subaerial explosion and the emission of Rayleigh waves. While Rayleigh waves were recorded on seismometers approximately 7 km and 26 km from the Federal Building, the falling of debris had no seismic consequences, even at distances much less than the 34 km distance between Lower Manhattan and Palisades, NY. Only the seismic equipment situated close to the source during the Federal Building demolition was able to record the seismic energy created by the collapse of the building.

The seismogram data generated during the demolition of the Alfred P. Murrah Federal Building is shown below. (*See* Holzer et al.) The data represented under "b" are seismograms of vertical velocity recorded by portable digital seismographs at the Federal Building and at three other locations 7 km, 12 km, and 26 km, respectively, from the Federal Building. The data represented under "c" are seismograms recorded at the two permanent seismometers (OMN and FNO) 7 km and 26 km away from the Federal Building, respectively.



Furthermore, as Rousseau states in his declaration, "the recorded frequency of about 1 Hertz (1 Hz, or one cycle per second) is consistent with the frequency of waves generated by explosions, whereas the frequencies of waves generated by percussion are above 10 Hz and often

around 100 Hz." Furthermore, Rousseau attests, "the bell-like form in the LDEO seismogram points to an impulsive source of energy, not percussion on the ground due to the fall of debris."

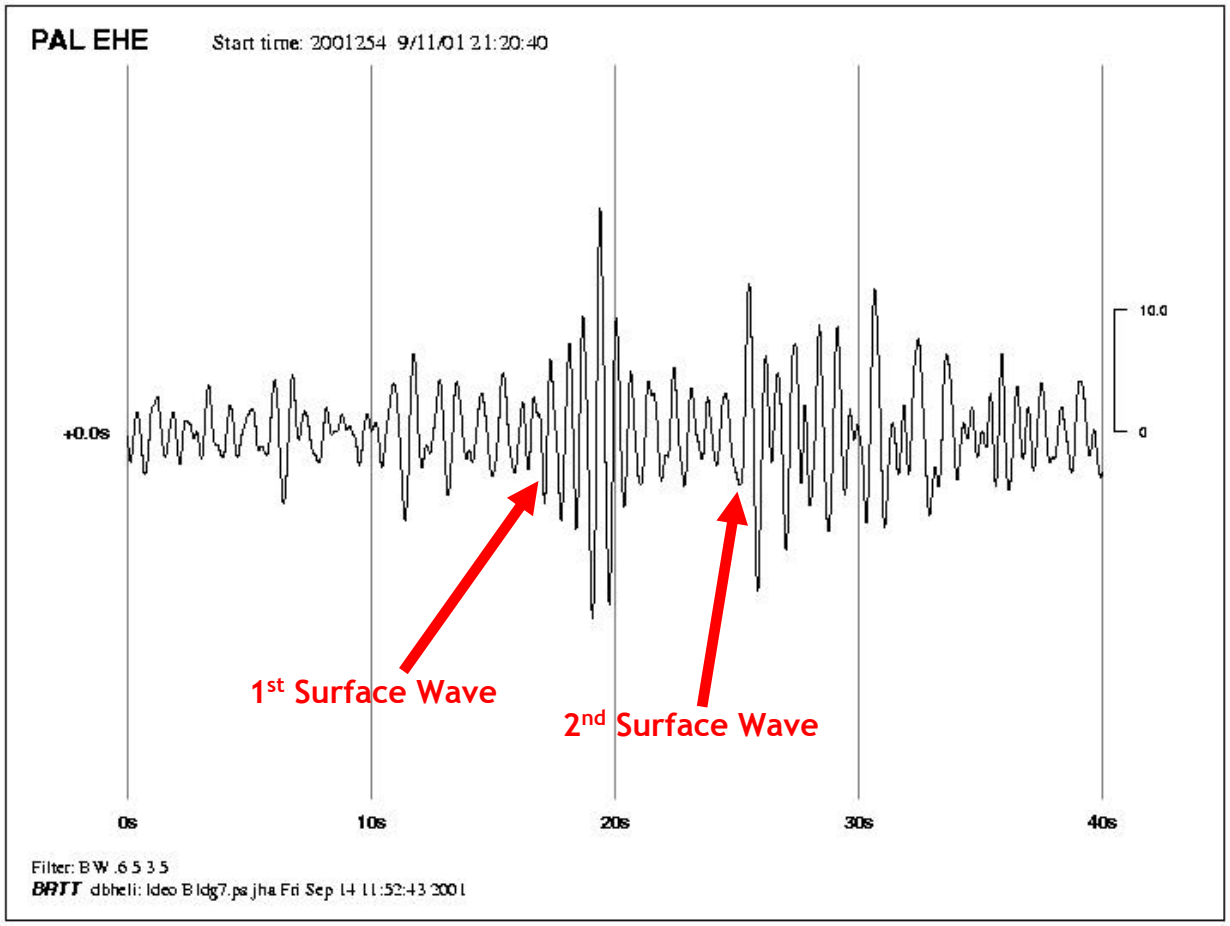


Figure 12: LDEO seismogram shows .6 Hz to 5 Hz waves. "PAL" refers to Palisades. In "EHE," E: short periods, H: high gain, and E: east-west component. Rousseau cites this seismogram in his analysis. The NIST WTC 7 Report includes a different set of broadband seismograms.

NIST's claim that the first seismic signal was generated by "interior debris falling onto the lower floors of WTC 7" is especially implausible. As Rousseau attests, "even if there were tremendous percussion caused by the impact of several floors [Floor 14 to Floor 6] in the northeastern corner of the building falling onto a lower, stronger floor [Floor 5], any seismic wave created in the adjoining steel columns would hit the ground only in the form of seismic noise. Further, because the passage from metal to rock is a refraction that absorbs energy, there would be insufficient energy left to propagate in the ground."

NIST's overall Probable Collapse Sequence is also totally incompatible with the observed seismic activity. As Rousseau states in his declaration, firstly, "[t]here is no reason that the initial cascade of floor failures in NIST's Probable Collapse Sequence would be expected to create a larger seismic signal than the subsequent sustained, widespread debris impact occurring inside the building." Second, "[t]here is no reason why the initiation of global collapse under

NIST's Probable Collapse Sequence would be expected to generate a second seismic signal. The major mechanism for the initiation of global collapse was the buckling of exterior columns, which does not involve debris impact." (Emphasis added.) Third, "[t]he initiation of global collapse was quickly followed by the observed period of free fall, during which the top section of the building descended downward approximately 8 stories for 2.25 to 2.5 seconds without encountering any resistance. By definition, the top section of the building was exerting no force whatsoever on the lower section during this period." (Emphasis added.)

Finally, Rousseau states, "[t]he part of the collapse that would be most expected to generate seismic energy — the top section falling onto the lower section after free-falling for 8 stories, and then directly impacting the ground — did not generate a unique seismic signal." In other words, NIST's claim implies that the collapse of several floor sections onto one floor in one corner of the building somehow generated a stronger seismic signal than the impact load caused by the entire top section free-falling for 105 feet.

In contrast, as attested to by Rousseau, "[t]he hypothesis of controlled demolition involving two subaerial explosions is perfectly consistent with the recorded seismic activity." First, Rousseau attests, "[e]xplosions caused by demolition charges can create seismic waves that will travel further than several hundred meters." Second, "explosions caused by demolition charges create seismic waves with frequencies around 1 Hz." Third, "[t]he bell-like form in the LDEO seismogram is consistent with an impulsive source of energy such as that generated by an explosion." Fourth, "[t]he occurrence of two seismic signals approximately 7 seconds apart, occurring just before the initiation of the east penthouse collapse initiation and just before the initiation of global collapse, is readily explained by the detonation of demolition charges."

In summary, the NIST WTC 7 Report erroneously attributes the first seismic signal during the collapse of WTC 7 to the alleged cascade of floor failures in its Probable Collapse Sequence, and it erroneously attributes the second seismic signal to the initiation of global collapse. Debris impact simply does not produce a force sufficient to create seismic waves that will travel further than several hundred meters, while explosions caused by demolition charges do. The two seismic signals recorded during the collapse of WTC 7 were clearly caused by explosions and are readily explained by the detonation of demolition charges just before the initiation of the east penthouse collapse and just before the initiation of global collapse.

As a result, NIST's claim that the two seismic signals were created by a cascade of floor failures and the initiation of global collapse, respectively, fails to comply with the OMB Guidelines and NIST IQS because it lacks objectivity. NIST's claim is inaccurate, unreliable, and biased because it contradicts the straightforward and indisputable interpretation of the seismogram data indicating that the seismic signals were created by explosions.

2. Corrections Sought:

a) Revise the NIST WTC 7 Report to Reflect that Subaerial Explosions, as Opposed to the Alleged Cascade of Floor Failures and the Initiation of Global Collapse, Were the Actual Source of the Seismic Signals Generated During the Collapse of WTC 7

First, NIST must revise the NIST WTC 7 Report to reflect that subaerial explosions, as opposed to the alleged cascade of floor failures and the initiation of global collapse, were the actual source of the seismic signals generated during the collapse of WTC 7.

b) Discard the Probable Collapse Sequence and Develop a New Probable Collapse Sequence that Is Consistent with the Occurrence of a Subaerial Explosion at the Onset of the East Penthouse Collapse and a Subaerial Explosion at the Onset of Global Collapse

Second, NIST must discard its Probable Collapse Sequence and develop a new Probable Collapse Sequence that is consistent with the occurrence of a subaerial explosion at the onset of the east penthouse collapse and a subaerial explosion at the onset of global collapse. This would be accomplished by simulating the failure of Columns 79, 80, and 81 high in the building, followed by the near-simultaneous failure of all columns lower in the building over 8 stories, as requested above.

G. EYEWITNESS AND AUDIO EVIDENCE OF EXPLOSIONS

According to NIST, "Considerable effort was expended to compile evidence and to determine whether intentionally set explosives might have caused the collapse of WTC 7." (*See* NCSTAR 1A, p. 26.) NIST's analysis of "Hypothetical Blast Scenarios," described in Appendix D of NCSTAR 1-9, consisted of determining the lowest mass of explosive needed to sever a critical structural member (Column 79 was chosen) and performing blast modeling to determine the amount of window breakage and noise that would result. Working with contractors from Loizeaux Group International and Applied Research Associates, NIST determined the lowest mass of explosive needed to sever Column 79 was 4 kg (9 lb) of RDX explosives in linear shaped charges, and that detonating this amount of RDX explosives would result in a sound level of approximately 130 to 140 decibels 1 km away for locations where sound propagation was unobstructed. However, NIST and its contractors assumed no attempts at noise abatement and dismissed the possibility of much quieter thermite-based devices being used, despite the fact that steel recovered from WTC 7 exhibited severe erosion indicative of a thermate reaction (discussed in the next section).

1. NIST Ignored and Distorted Eyewitness Reports and Audio Recordings Indicative of Explosions at the Onset of and During the Collapse of WTC 7, Thus Violating OMB Guidelines and NIST IQS

Using the strawman premise that a noise of 130 to 140 decibels would need to have been emitted from WTC 7 if the building had been destroyed with explosives, NIST ignored and distorted eyewitness reports and audio recordings indicative of explosions occurring at the onset of and during WTC 7's collapse. The NIST WTC 7 Report states (*see* NCSTAR 1A, p. 49):

> Blast from the smallest charge capable of failing a critical column (i.e., Column 79) would have resulted in a sound level of 130 dB to 140 dB at a distance

> of at least half a mile if unobstructed by surrounding buildings (such as along Greenwich Street or West Broadway). This sound level is consistent with standing next to a jet plane engine and more than 10 times louder than being in front of the speakers at a rock concert. **There were no witness reports of such a loud noise, nor was such a noise heard on the audio tracks of video recordings of the WTC 7 collapse.** (Emphasis added.)

However, there are in fact a number of eyewitness reports and audio recordings of noises that indicate the occurrence of explosions at the onset of and during WTC 7's collapse. Far more important than whether the observed noises reached NIST's strawman decibel level (based on the flawed premise that RDX was used to sever a column) is whether these noises could have been caused by structural failures and/or the impact of falling debris. Careful review of the eyewitness reports and audio recordings suggests the noises could not have been caused by structural failures or the impact of falling debris, leaving explosions as the only remaining explanation. The eyewitness reports and audio recordings are as follows:

a) <u>NYU medical student named Darrell, interviewed twice on 1010 WINS Radio within minutes after the collapse:</u>

<u>First Interview</u>[3]

Reporter: "I'm here with an emergency worker. He's a first-year NYU medical student. He was down there. He was trying to help people. His name is Darrell."

Darrell: "Yeah, so I was just standing there. We were watching the building actually because it was on fire. The bottom floors of the building were on fire. And, you know, **we heard this sound that sounded like a clap of thunder.** Turned around. We were shocked to see that the building was — well, **it looked like there was a shockwave ripping through the building, and the windows all busted out.** It was horrifying. Then, you know, **about a second later the bottom floor caved out. And the building followed after. We saw the building crash down all the way to the ground.** We were in shock. And then the worst part about it, we saw the smoke, and the plumes of smoke coming after us, and we had to run. We had to run north actually on that street. We just ran north to escape from the smoke. And luckily we weren't hurt, but it was certainly very, very scary. That was about it."

<u>Second Interview</u>[4]

Reporter: "And then suddenly 7 went down. The crowd started running north again, trying to escape the dust cloud and the falling debris. Among them was Darrell. He was a worker trying to help with the injured."

Darrell: "We were just standing there. **All of a sudden, out of nowhere, you hear this clap, sounds like thunder. The building had shockwaves going through it.**

[3] https://youtu.be/Iz-xGZ6apLY
[4] https://youtu.be/K3rzOLac7zI

> **You could see a shockwave go up the — the windows blast out.** You know, I thought I was watching a movie. I mean, I can't believe this is happening. It's really ridiculous. But, you know, **it came down floor by floor. The structure stayed intact until it all hit the ground.**"

In summary, Darrell heard what sounded like a sudden clap of thunder, followed by what looked like a shockwave ripping through the building and blasting out the windows, followed by the bottom floor caving out and the building crashing down to the ground, with the structure remaining intact until it hit the ground. It is clear from the amount of time elapsed in the sequence of events described by Darrell that the "clap of thunder" he heard corresponded to the collapse of the east penthouse approximately 7 to 9 seconds before the initiation of global collapse. Darrell's observation of a "clap of thunder" is far more consistent with the detonation of explosives bringing down the east penthouse than with a successive cascade of floor failures. This interpretation is corroborated by the seismic signals recorded at LDEO. Moreover, all of the other phenomena described in Darrell's account — especially the perceived shockwave blasting out the windows — are also consistent with the controlled demolition scenario described above.

AE911Truth is in contact with Darrell and will provide his contact information to NIST so that he can be interviewed.

b) <u>Video clip of MSNBC's Ashleigh Banfield interviewing a Lower Manhattan resident at the onset of WTC 7's collapse:</u>

This video clip, shown below in Figure 13, was the third clip reviewed by NIST in its study of the audio signature associated with the collapse of WTC 7.[5] The NIST WTC 7 Report describes this clip as follows (*see* NCSTAR 1-9, p. 289):

> The third video clip reviewed was a second street interview being conducted at West Broadway and Leonard Street. This camera was located near the Camera 4 location, **roughly 650 m (2100 ft) from WTC 7.** This clip does not show WTC 7 collapsing, but, by comparing events in the clip with those seen in the Camera 4 clip, it was possible to place the two videos on a common timeline. Review of the interview clip showed that people in the video responded to the WTC 7 collapse 1.4 s before the clip from Camera 4 started, or 1.3 s after the east penthouse began to descend into the building. **Allowing 2 s for sound to reach the camera location, this is very close to the time that the east penthouse began to descend. People at this location were able to hear the collapse of the east penthouse,** while observers on West Street did not hear loud noises until the global collapse started. (Emphasis added.)

[5] https://youtu.be/cocmNAfjC7I

Figure 13: Ashleigh Banfield and Lower Manhattan resident turn toward WTC 7 roughly 650 meters to the south.

As noted by NIST, the people at this location — namely, MSNBC's Ashleigh Banfield, the woman she was interviewing, and a crowd of people near them — heard a noise that was created "very close to the time that the east penthouse began to descend," although NIST's observations and estimate actually place the creation of this noise at .7 seconds before the east penthouse began to descend. Given the timing of this noise, this appears to be the noise Darrell heard that he described as sounding like "a clap of thunder." Based on the behavior of Banfield, the woman, and many people near them, it is clear that the sound they heard was a sharp sound, because it caused them to quickly and involuntarily turn toward WTC 7. Banfield then exclaimed, "Oh my god. Look behind us. Please pan in this way. Be careful of your baby. This is it!" As noted by NIST, the sound was heard from 650 meters away (more than 7 football fields). It appears highly doubtful that the cascade of floor failures alleged by NIST or structural failures and debris impact higher up in the building — all of which would have taken place inside the building — could have caused the noise heard by Banfield and others.

It is important to note that just 20 seconds before Banfield heard the noise from WTC 7, she had the following exchange with MSNBC's Brian Williams:

> Williams: "Monica, I have to go to Ashleigh Banfield. We might have had something on the ground. Ashleigh?"
>
> Banfield: "Well, at first we had thought, Brian, **that we'd heard another explosion,** but I think it was just another truck that was headed down to the south [the direction of WTC 7]."

When Banfield says the words "another explosion," she is referencing the many explosions that she heard or felt in the vicinity of the World Trade Center earlier in the day. For example, at approximately 10:54 AM (26 minutes after the destruction of the second tower), she

reported, **"Well, we just heard another explosion go off a couple minutes ago,** Chris, and saw a bunch more people sort of running this way." At approximately 11:12 AM, Banfield reported, **"There's just been another explosion. As happened with the last two, it may be a car bomb.** That's what we were hearing from passing police officers. The last two were thought to be car bombs." At approximately 11:19 AM, she reported, **"What's so frightening at this time is that we've heard three explosions since both towers collapsed."** And, at approximately 11:28 AM, on NBC, she reported, "We're obviously having a bit of trouble right now maintaining our location, **because we just heard one more explosion. That's about the fourth one we've heard.** The police are telling us they're either car bombs or they are simply cars that have overheated so much that they're exploding."[6]

Banfield's initial suspicion of another explosion going off shortly before the collapse of WTC 7 (before she dismissed it as a truck) is corroborated by CBS's Scotty Pelley. Reporting the collapse of WTC 7 minutes after it occurred, Pelley said to CBS's Dan Rather: "When you're down there, Dan, you hear smaller secondary explosions going off every 15 or 20 minutes."[7]

In addition, in a CNN video that appears to have been shot from Greenwich Street and Warren Street, approximately 700 feet from WTC 7, a noise is heard in the distance.[8] Workers in the foreground hear the noise and turn in the direction of WTC 7, while a person off camera says, "You hear that? Keep your eye on that building. It'll be coming down soon." The cameraman for CNN then says, "The building is about to blow up. Move it back."

Thus, Banfield's and Pelley's perception of explosions going off in the vicinity prior to WTC 7's collapse, as well as the noise and reactions captured in the CNN video, add weight to the interpretation that the noise Banfield and others heard at the onset of the east penthouse collapse was indeed an explosion. Of course, this interpretation is also supported by Darrell's account and by the seismic signals recorded at LDEO.

In addition to the eyewitness evidence contained in the MSNBC clip, physicist and researcher David Chandler has analyzed the audio track from the clip and concluded that nine blasts were captured. In the video *WTC 7: Sound Evidence for Explosions*, Chandler states:

> A few blocks up West Broadway, looking toward the World Trade Center in the distance, Ashleigh Banfield was conducting an interview for MSNBC. The mic was set to pick up speech a few inches away. From the involuntary, startled response, we know explosions are being heard.
>
> However, listening closely we discover that the microphone did indeed pick up the sounds of explosions, but very faintly. Turn up the volume. Listen for a low rumble in the background. [Chandler plays video.] This time the sound has been filtered to emphasize low frequencies. Listen for booms like a base drum in the

[6] A video compilation that includes Banfield's statements is at: https://youtu.be/kG2LK85WPWg. The time of each report was determined by researchers Graeme MacQueen and Ted Walter. Their analysis will be presented in a forthcoming paper. Although that paper is not available now, the reports were clearly made after 10:28 AM.
[7] https://youtu.be/uno40piMWH8
[8] https://youtu.be/3LUC2QaZ9kQ

> distance. [Chandler plays video.] Here's a different version filtered to emphasize the mid-range sounds. The base drum is gone. I would describe the blast sound like a train on a bumpy track. [Chandler plays video.] If you didn't hear the blasts, back up, use earphones, turn up the volume, and listen again. There were two blasts followed by seven more, regularly spaced all in two and a half seconds. Craig Bartmer's testimony may come to mind [Chandler plays Craig Bartmer's testimony, which is discussed in the next subsection]:
>
> Bartmer: "And the whole time you're hearing thoom-thoom-thoom-thoom-thoom. I think I know an explosion when I hear it."
>
> When we hear the sharp, regular series of sounds in the background, the building has not yet started to fall. When we hear the reporter say, "This is it," the building has not yet started to fall. The fall of the building corresponds to the crescendo in the crowd response. . . . Therefore, the blasts we heard occurred seconds before the building started to fall.

Therefore, in summary, the MSNBC clip contains both eyewitness evidence and audio evidence indicating explosions at the onset of WTC 7's collapse.

c) Other Witness Behavior and Audio Evidence Captured on Video:

Two other videos recorded during the collapse of WTC 7 contain additional evidence indicating an explosion at the onset of the east penthouse collapse.

The first video was recorded near 84 William Street, which is in the Financial District of Lower Manhattan a little over 2,000 feet from where WTC 7 stood.[9] This is approximately the same distance as Ashleigh Banfield from WTC 7 but to the southeast instead of the north. However, unlike Banfield, who was positioned on West Broadway and had an unobstructed path to WTC 7, this camera had several buildings in between it and WTC 7, including a building to its immediate left, i.e., the direction of WTC 7. Figure 14 below shows the distance from the approximate location to WTC 7 (left) and a still from the video (right).

The woman in the video was a reporter with the Connecticut Post. She was interviewing the man in the foreground, who was a fire safety director for a nearby building. The still from the video captures the moment in which an audible sound can be heard in the distance and the reporter is physically jolted by the sound, jumping to her left slightly and looking up and behind her as if to find where the sound came from. Moments later the cameraman walks north and turns to the west, and someone in background says "World Trade 7 is gone."

[9] https://youtu.be/7sqhpLrRaUo

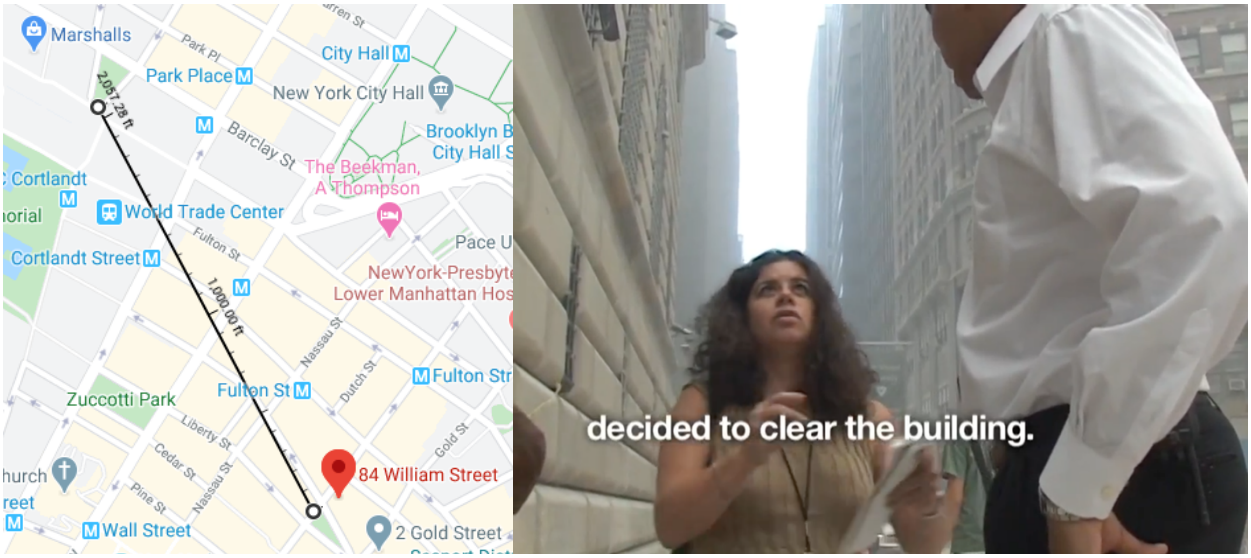


Figure 14: Map showing the distance from 84 William Street to WTC 7 (left); still from a video showing a reporter near 84 William Street hear what appears to be an explosion in the distance (right).

Given the apparent volume and suddenness of the noise, which are indicated by the reporter's reaction and can be heard in the audio track despite the loud sound of a nearby siren, it appears highly doubtful that structural failures or debris impact inside the building caused the noise, especially when we consider the obstructed path between WTC 7 and the camera. One might suspect that the reporter is hearing the latter stages of the collapse of the building, i.e., the top section impacting the lower structure and the ground. However, this is not consistent with the sharpness of the noise heard by the reporter. Furthermore, we know from the seismic signals and other eyewitness reports that the loudest noise appears to have been generated at the onset of collapse, when, according to NIST's Probable Collapse Sequence, all of the structural failures and debris impact were occurring inside the building.

The second video was recorded on the west side of West Street, near Harrison Street.[10] This video was the first video clip reviewed by NIST in its study of the audio signature associated with the collapse of WTC 7. The NIST WTC 7 Report describes this clip as follows (*see* NCSTAR 1-9, p. 289):

> The most usable soundtrack was recorded by Camera 3, with its West Street location. This video ran for many minutes prior to and during the collapse. Even though sound was recorded by the camera, no interviews or commentary were recorded, and the microphone tended to pick up low level street sounds, such as sirens, traffic, and distant conversations. Occasionally, the camera operators located nearby were recorded at a much louder level. Since the collapse was recorded on the video, it was possible to coordinate the sound recording with the actual WTC 7 collapse.

[10] https://youtu.be/L2SvQAICrmM

> **A careful review of the audio clip did not reveal any sounds that could be associated with WTC 7 until the global collapse began.** A low-level audio analysis was performed by creating a video showing the waveform for the audio signal using Aftereffects software. This video also did not reveal any features that could be associated with the collapse until after the global collapse began. In the analysis, the roughly 2 s delay in sound transmission between WTC 7 and the camera was accounted for. The amplitude of the sound signal increased while the global collapse was taking place, but there were no loud, explosive sounds when the collapse began. (Emphasis added.)

Contrary to NIST's assessment of the video clip, careful review reveals a sudden, muffled, low-pitch sound approximately two seconds before the east penthouse begins to collapse. Accounting for the 2-second delay in sound transmission between WTC 7 and the camera, this sound was apparently generated approximately 4 seconds prior to the initiation of the east penthouse collapse. This sound is not conclusive by itself, but is consistent with the seismic signals, eyewitness evidence, and other audio evidence indicating the occurrence of an explosion at the onset of WTC 7's collapse.

d) NYPD officer Craig Bartmer:

In September 2006, about five years after 9/11, former NYPD officer Craig Bartmer gave a video interview to filmmaker Dylan Avery in which he described witnessing what he perceived as explosions going off during the collapse of WTC 7. This interview was widely circulated on the Internet. Because NIST's WTC 7 investigation was active until 2008, NIST should have interviewed Bartmer. However, there is no indication that NIST did.

Bartmer's eyewitness account of the collapse of WTC 7 was as follows: [11]

> I was real close to Building 7 when it fell down. . . . All of a sudden, the radios exploded and everybody started screaming, "Get away, get away, get away from it!" And, I was like a deer in the headlights. And I look up, and I think I remember pretty clearly two guys that I knew were on the transit radio. I don't know if those tapes are out there, but I can try and look for them and show you exactly what I'm talking about. But it was that moment, "Get away." And I looked up, and it was nothing I would ever imagine seeing in my life. You know, the thing started peeling in on itself and, I mean, there was an umbrella of crap seven feet over my head that I just stared at. Somebody grabbed my shoulder and I started running, and the shit's hitting the ground behind me. **And the whole time you're hearing, 'THOOM! THOOM! THOOM! THOOM! THOOM!' So, I, I think I know an explosion when I hear it, you know?**

As David Chandler notes in *WTC 7: Sound Evidence for Explosions*, Bartmer's description of a series of explosions is consistent with the audio track of the MSNBC video clip, which, according to Chandler, captured "two blasts followed by seven more, regularly spaced all in two and a half seconds."

[11] Part 1: https://youtu.be/6O3E9Upe8e0, Part 2: https://youtu.be/2MnyABqkqtU

In summary, using the strawman premise that a noise of 130 to 140 decibels would need to have been emitted from WTC 7 if the building had been destroyed with explosives, NIST ignored and distorted a number of eyewitness reports and audio recordings indicative of explosions occurring at the onset of and during WTC 7's collapse. Review of these eyewitness reports and audio recordings reveals that they are far more consistent with the detonation of explosives than with structural failures and debris impact, corroborating the seismogram data discussed above.

As a result, NIST's claim that "there were no witness reports of such a loud noise, nor was such a noise heard on the audio tracks of video recordings of the WTC 7 collapse" fails to comply with the OMB Guidelines and NIST IQS because it lacks objectivity. NIST's claim is inaccurate, unreliable, and biased because it ignores and distorts a number of eyewitness reports and audio recordings indicative of explosions, in part based on the strawman premise that a noise of 130 to 140 decibels would need to have been emitted from WTC 7 if the building had been destroyed with explosives.

2. NIST Distorted Eyewitness Reports of an Explosion Occurring Inside WTC 7 on the Morning of 9/11, Thus Violating OMB Guidelines and NIST IQS

The NIST WTC 7 Report also distorts eyewitness reports of an explosion occurring inside WTC 7 on the morning of 9/11. These eyewitness reports were first given on television on September 11, 2001, by Michael Hess, the New York City corporation counsel, and Barry Jennings, deputy director of the Emergency Services Department for the New York City Housing Authority, after the two men had been trapped together inside WTC 7 for at least 90 minutes. Both men were also interviewed by NIST in the spring of 2004. Jennings then gave two more videotaped interviews in subsequent years, before his untimely death in 2008, and Hess gave one more videotaped interview.

Based on the interviews NIST conducted with Hess and Jennings, the NIST WTC 7 Report provides the following account (*see* NCSTAR 1-9, p. 298):

> As all of the emergency responder restructuring operations were underway, three people became temporarily trapped inside WTC 7. Two New York City employees had gone to the OEM Center on the 23rd floor and found no one there. **As they went to get into an elevator to go downstairs, the lights inside WTC 7 flickered as WTC 2 collapsed. At that point, the elevator they were attempting to catch no longer worked, so they started down the staircase. When they got to the 6th floor, WTC 1 collapsed, the lights went out in the staircase, the sprinklers (at an unspecified location) came on briefly, and the staircase filled with smoke and debris.** The two men went back to the 8th floor, broke out two windows, and called for help. Fire fighters on the ground saw them and went up the stairs.
>
> . . . As the firefighters went up, they vented the stairway and cleared some of the smoke. They first met the security officer on the 7th floor, and fire fighters

> escorted him down the stairs. Other fire fighters from the group continued up the stairs, shined their flashlights through the staircase smoke and called out. The two trapped men on the 8th floor saw the flashlight beams, heard the firefighters calling, and went down the stairway. The firefighters took the men outside and directed them away from the building. (Emphasis added.)

First, NIST's account of Hess and Jennings' experience in WTC 7 is striking for the fact that it omits the most notable aspect of what Jennings, and initially Hess, described witnessing as they reached the 6th floor: a big explosion occurring inside the building, which, according to Jennings, caused the landing they were standing on to give way. Hess and Jennings each described the occurrence of this explosion independently on television soon after being rescued from the building. (They both initially described the explosion occurring when they reached the 8th floor, but both of them clarified in later interviews that they reached the 6th floor before going back up to the 8th floor, which is reflected in NIST's account.) Their accounts on the day of 9/11 were as follows:

> Michael Hess on UPN 9 News: I was up in the emergency management center on the 23rd floor. And when all the power went out in the building, another gentleman and I walked down to the 8th floor where **there was an explosion**. And we've been trapped on the 8th floor with smoke, thick smoke, all around us, for about an hour and a half. But the New York Fire Department, as terrific as they are, just came and got us out.[12]

> Barry Jennings on WABC-TV: Well, me and Mr. Hess, the corporation counsel, were on the 23rd floor. I told him, "We gotta get out of here." We started walking down the stairs. We made it to the 8th floor. **Big explosion. Blew us back into the 8th floor.** And I turned to Hess, I said, "This is it. We're dead. We're not going to make it out of here." I took a fire extinguisher, and I bust the window out. That's when this gentleman here heard my cries for help, this gentleman right here. And he kept saying, "Stand by. Somebody's coming to get you." They couldn't get to us for an hour because they couldn't find us.[13]

Although Hess later changed his account to the narrative put forward by NIST — according to which the event that Hess and Jennings experienced was actually debris from the collapse of WTC 1 impacting WTC 7 at 10:28 AM — Jennings continued to maintain that he had witnessed an explosion. The first videotaped interview Jennings gave after 9/11 was in late 2007 to filmmaker Dylan Avery. The second videotaped interview Jennings gave after 9/11 was to the BBC for its July 2008 documentary *9/11: The Third Tower*. Hess gave his only videotaped interview to the BBC for a second edition of *9/11: The Third Tower* that aired in late 2008, after Jennings' untimely death. Excerpts from Jennings' 2007 interview with Avery are presented below, followed by the relevant portions of the edited BBC interviews:

[12] https://youtu.be/CMr9y3PtBng
[13] https://youtu.be/OQctq0UkCQU

Barry Jennings Interview with Dylan Avery[14]

Jennings: I was on my way to work. Traffic was excellent. I received a call that a small Cessna had hit the World Trade Center. I was asked to go man the Office of Emergency Management at the World Trade Center 7 on the 23rd floor. As I arrived there, there were police all in the lobby. They showed me the way to the elevator. We got up to the 23rd floor. Me and Mr. Hess, who I didn't know was Mr. Hess at the time, we got to the 23rd floor. We couldn't get in. We had to go back down. Then security and police took us to the freight elevators, where they took us back up, and we did get in. Upon arriving into the OEM EOC, we noticed that everybody was gone. I saw coffee that was on the desks, smoke was still coming off the coffee. I saw half eaten sandwiches. Only me and Mr. Hess was up there. After I called several individuals, one individual told me to leave and leave right away. Mr. Hess came running back in, he said, "We're the only ones up here, we gotta get out of here." He found the stairwell. So we went to the stairwell and we're going down the stairs. **When we reached the 6th floor, the landing we were standing on gave way. There was an explosion, and the landing gave way. I was left there hanging. I had to climb back up, and I had to walk back up to the 8th floor.** After getting to the 8th floor, everything was dark. It was dark, and it was very, very hot — very hot. I asked Mr. Hess to test the phones as I took a fire extinguisher and broke out the windows. Once I broke out the windows, I could see outside below me. I saw police cars on fire, buses on fire. I looked one way, the building was there. I looked the other way it was gone. I was trapped in there for several hours. **I was trapped in there when both buildings came down.** The firefighters came, they came to the window, because I was going to come out on the firehose. I didn't want to stay there any longer. It was too hot. I was going to come out on the firehose. They came to the window. They started yelling, "Do not do that. It won't hold you." **And then they ran away. See I didn't know what was going on. That's when the first tower fell. When they started running, the first tower was coming down. I had no way of knowing that. Then I saw them come back. Now, I saw them come back with more concern on their faces. Then they ran away again. The second tower fell. So, as they turned and ran the second time, they guy said, "Don't worry. We'll be back for you."** And they did come back. This time they came back with 10 firefighters. And they kept asking, "Where are you? We don't know where you are." I said, "I'm on the north side of the building." Because when I was on the stairs I saw "north side." **All this time, I'm hearing all types of explosions. All this time I'm hearing explosions. I'm thinking that maybe it's the buses around me that were on fire, the cars on fire, I don't see now — you know. But I'm still hearing these explosions.**

Jennings: **The 6th floor is where we got down to. . . . That's when the explosion happened.**

[14] https://youtu.be/Z_v6pDb1CnU

Avery: Now, where did that originate from? Did the explosion come from under you?

Jennings: **Under us. Definitely under us. It was definitely under us.**

Avery: Now, did it like lift you up?

Jennings: **Yeah, it blew us back. And then I find myself — I thought I was on the stair landing, but I wasn't. I found myself hanging on.** So you want me to go into that?

Avery: If you could. If you could please elaborate on that.

Jennings: Sure. **When I made it to the 6th floor, and there was an explosion. The explosion was beneath me. Keep in mind now, it's pitch black in there. All the lights went out. So when the explosion happened, it blew us back. I'm thinking I'm standing on the landing. I'm actually holding onto a pole above us. And I had to climb back up.** Because Hess is yelling, "What do we do now?!" I said, "There's only one thing we can do. And it's go back up." So that's when we went back up to the 8th floor, and I busted out that window."

Jennings: I received a call shortly after the first plane hit — which we thought, everyone thought was a Cessna. That's what I was told, a small Cessna lost its way and hit the tower [sic]. I had to be inside on the 23rd floor when the second plane hit. I was inside when the second plane hit. I was already in the — World Trade Center 7 — when the second plane hit.

Avery: You didn't hear that after that the fact? Or did you hear that when it happened — the second plane when it hit?

Jennings: I couldn't tell you because I was inside, and I was closed off from everything. Keep in mind, now, OEM, that big center, they had big, gigantic TV screens. And at that point none of them were working. So I didn't know what was going on in the outside.

Avery: So the building was essentially deserted when you and Mr. Hess — well, the command center was deserted when you and Mr. Hess got up there?

Jennings: Yes.

Avery: Was that normal?

Jennings: No, no, no, not at all. The word we got was they had to take the mayor and evacuate.

Second Interviewer: Did they say that the mayor was in World Trade Center 7 that day?

Jennings: Yes.

Second Interviewer: He was there earlier in the day and then evacuated?

Jennings: Yes. . . . I didn't actually see him, but that's what I was told. That's why Hess was there. He was there to meet with Giuliani.

Second Interviewer: Did you ever talk to people from the 9/11 Commission, the congressional report, FBI, NIST, anybody? You did speak with them — who'd you speak with?

Jennings: Yes. They called me down.

Second Interviewer: Which ones?

Jennings: **I think it was part of the 9/11 Commission.**

Second Interviewer: Was it the hearings at the New School?

Jennings: No. No. I can't tell you where it was because — **but they called me down there, and they asked me the same questions you guys are asking me.** And, at that point, they said, "Okay. Thank you. And they sent me on my way."

Avery: **And you told them pretty much everything you just told us? That you were in the building, got rocked by an explosion, all that?**

Jennings: **Yes.**

Jennings: What happened was, when we made it back to the 8th floor, as I told you earlier, both buildings were still standing, because I looked two — I looked one way, looked the other way, now there's nothing there. **When I got to the 6th floor, before all this — when I got to the 6th floor, there was an explosion. That's what forced us back to the 8th floor. Both buildings were still standing. Keep in mind, I told you the fire department came and ran. They came twice. Why? Because Tower 1 fell, then Tower 2 fell.**

Barry Jennings Interview with the BBC

Jennings: I wanted to get out of that building in a hurry. **So I started, instead of taking one step at a time, I'm jumping landings.** When I reach down to the 6th floor, there's this eerie sound, the whole building went dark, and staircase that I was standing on just gave way.

Jennings: **When we got to the 8th floor, I started walking to one side of the building. That side of the building was gone.**

BBC Narrator: And he heard sounds that unnerved him.

Jennings: The first explosion I heard when I was on the stairwell landing, when we made it down to the 6th floor. **Then we made it back to the 8th floor, I heard some more explosions.**

BBC Interviewer: What sort of sound?

Jennings: Like a boom. Like an explosion.

BBC Interviewer: And more than one?

Jennings: Yes.

Michael Hess Interview with the BBC[15]

Hess: And we got exactly to 6, all of a sudden, at the same instant, five different things happened. The first was the lights went out, the emergency lights went out, so we were in total darkness. Second, the stairwell filled up with a tremendous amount of smoke and dirt and soot, much more than it had been before. Previously, you could breathe for about three flights down. But at that point you couldn't breathe at all. So, the second thing was the soot. The third thing was the sprinklers went on. So, all of a sudden we were in the dark, no emergency lights, and the water was pouring down on top of us. At the same instant — and the last two things were the scariest — **the building began to shake, and it was as if you were in an earthquake.** I've never really been in an earthquake, but that's what it felt like. The whole building was shaking. And then the last thing was the stairway ran into a wall. All of a sudden, as you were going down on the 6th floor, you hit a wall. So, there I am, and I'm saying "What the heck is happening?" And I said to Barry — while it's shaking we just stood there, and after, I don't know, it was 5 seconds or 10 seconds, but the building stopped shaking. **And in my mind I assumed there had been an explosion in the basement. I don't know that hit me that way.** But

[15] https://youtu.be/3VVfMxjErbo

> we couldn't go anywhere, the wall was blocking it, it was pitch dark. [Interview cuts.] I was nervous, but once the building stopped shaking, then I calmed down. I figured, "Yes, there was an explosion in the basement, maybe." But it stopped.
>
> BBC Interviewer: And what had you heard at that stage? Had you heard any sounds like explosions or big sounds?
>
> Hess: No. Nothing. Two things: You heard tremendous wind, and you heard a tremendous number of sirens. And I look out the window, and number one, this ash is flying around, on papers, computer papers are flying around. And again, I was looking north and west. And the World Trade Center towers were south. So, I couldn't see in that direction. And in my mind they were just still on fire. [Interview cuts.] **My position — and I'm quite firm on it — there were no explosions. Did I feel the building shake? Absolutely.**

Jennings stated in his interview with Dylan Avery that he gave exactly the same account in a previous interview with government investigators, though he is uncertain whether it was to the 9/11 Commission or another agency. Based on the narrative in the NIST WTC 7 Report and footnotes in the report citing interviews with the two individuals, it is clear that NIST interviewed Jennings.[16] Thus, the interview he recalls was with NIST, and if he gave an interview to another agency it was a separate interview.

Unfortunately, it is impossible to review Jennings' interview with NIST because NIST declined a 2009 FOIA request for the full text of Jennings' and Hess' interviews "on the basis of a provision allowing for exemption from FOIA disclosure if the information is 'not directly related to the building failure.'"[17] Of course, it defies reason to assert that the testimony of Hess and Jennings is "not directly related to the building failure." Even if we assume NIST's Probable Collapse Sequence to be true, the event they witnessed from inside the building — the impact of debris and the ignition of fires in WTC 7 — is the event that ultimately led to the collapse of WTC 7. To assert that their testimony is "not directly related to the building failure" is thus preposterous.

In any case, assuming that Jennings provided the same account to NIST that he did in every other interview he gave, the NIST WTC 7 Report ignores and distorts the vast majority of his account. Without even mentioning Jennings' interpretation of what he witnessed, the NIST WTC 7 Report claims that the event he witnessed was actually caused by debris from the collapse of WTC 1 impacting WTC 7 at 10:28 AM.

However, NIST's account is untenable for the simple reason that Hess and Jennings must have reached the 6th floor well before 10:28 AM.

[16] These interviews are cited on page 298 of NCSTAR 1-9 as WTC 7 Interviews 2041604 and 1041704.
[17] Letter of August 12, 2009, from Catherine S. Fletcher, NIST, to a FOIA request of August 8, 2009, from Ms. Susan Peabody, for "[t]he complete texts of NIST's 2004 interviews of Michael Hess and Barry Jennings."

As Jennings noted in his 2007 interview with Dylan Avery, he recalls reaching the 6th floor before the collapse of WTC 2 at 9:59 AM. His account is based on his recollection of being called to WTC 7 shortly after the first airplane strike at 8:46 AM, reaching the 23rd the floor around the time of the second airplane strike at 9:03 AM, and leaving the 23rd floor with Hess after finding the emergency operations center (EOC) already evacuated. Also, Jennings distinctly remembers, after busting out the 8th floor window and calling for help, watching firefighters come to their aid and then run away twice — the first time following the collapse of WTC 2 at 9:59 AM and the second time following the collapse of WTC 1 at 10:28 AM.

Contrary to Jennings' account, the NIST WTC 7 Report states that Hess and Jennings began to leave the 23rd floor at 9:59 AM. **But even if we accept that Hess and Jennings began to leave the 23rd floor at 9:59 AM, it is inconceivable that it would take them 29 minutes to descend 17 floors, which would mean an average of 1 minute and 42 seconds per floor.** As noted above, Jennings said in his interview with the BBC, "I wanted to get out of that building in a hurry. So I started, instead of taking one step at a time, I'm jumping landings." Given the speed at which Hess and Jennings were probably descending the staircase, even a conservative estimate of 20 seconds per floor means that it would have taken them about 6 minutes to reach the 6th floor. Add 1 minute for the amount of time it might have taken them to find the stairwell starting at 9:59 AM (although NIST's account suggests no delay in finding the stairwell), and they would still reach the 6th floor by 10:06 AM, which is 22 minutes before the collapse of WTC 1. It is also virtually impossible that their departure from the 23rd floor was any later than the 9:59 AM time given by NIST, because, according to NIST, the third and final evacuation order was issued at 9:44 AM, and thus it is unlikely that police and security would have escorted them to the 23rd floor much later than 9:44 AM. **Therefore, based on this analysis alone, it is inconceivable that the phenomena they witnessed on the 6th floor of the stairwell was caused by the collapse of WTC 1 at 10:28 AM.**

Given that it must have taken Hess and Jennings no more than 7 minutes to descend from the 23rd floor to the 6th floor, it is entirely plausible that they reached the 6th floor and then made their way up to the 8th floor before the collapse of WTC 2 at 9:59 AM, as reported by Jennings. If we add 3 minutes for the amount of time it might have taken them to go back to the 8th floor and bust open the window — which means a total of 10 minutes from the moment they started to leave the 23rd floor to the moment Jennings busted open the window on the 8th floor — this would require them to have reached the EOC by 9:49 AM. According to NIST, this is 5 minutes after Deputy OEM Commissioner Richard Sheirer verbally ordered the complete evacuation of WTC 7, including the EOC. Thus, even if Hess and Jennings did not arrive at the EOC when Jennings recalls (by 9:03 AM), an arrival as late as 9:49 AM would explain why they found the EOC evacuated and would still allow them ample time to reach the 8th floor and bust open the window by 9:59 AM.

However, there is reason to suspect that the EOC was actually fully evacuated much earlier than 9:44 AM, meaning that Hess and Jennings might have arrived at the EOC and found it empty much earlier. According to Deputy OEM Commissioner Richard Sheirer in his statement to the 9/11 Commission, which NIST cites as its source for the 9:44 AM evacuation order:[18]

[18] https://www.9-11commission.gov/hearings/hearing11/sheirer_statement.pdf

> **Almost instantly after the South Tower had been hit [9:03 AM],** I contacted the EOC to confirm that air support was on its way to New York. At that time, the EOC informed me that that there were still planes unaccounted for that may have been heading for New York. I relayed this information to the command post in the North Tower lobby. **At the same time, OEM evacuated the EOC. The rest of 7 World Trade Center had been evacuated earlier, but after the report of a possible third plane, we had to get our people out of the building.**

In contrast, the NIST WTC 7 report states the following (*see* NCSTAR 1-9, p. 296):

> At approximately 9:32 a.m., after a report of a third aircraft heading into the city, a second order was given in the OEM office to evacuate the WTC 7 facility. A number of personnel stayed in the OEM office and continued to work. Again, at approximately 9:44 a.m., following the news that the Pentagon had been attacked, a Deputy OEM Commissioner verbally ordered the complete evacuation of WTC 7 (Sheirer 2004). This order included the evacuation of the OEM operations center on the 23rd floor.

As indicated in Sheirer's statement, the exchange of information about unaccounted for planes and the decision to evacuate the EOC happened shortly after WTC 2 was hit at 9:03 AM. However, citing Sheirer's statement and no other source, the NIST WTC 7 Report gives an entirely different account, asserting a first evacuation order at 9:32 AM and a second one at 9:44 AM. Nowhere in Sheirer's statement are two separate evacuation orders mentioned, nor is the Pentagon attack, nor is NIST's claim that personnel stayed in the OEM after the first evacuation order at 9:32 AM.

Thus, it is entirely plausible that Hess and Jennings reached the EOC and found it empty much earlier than 9:44 AM, consistent with Jennings' account. **But, as stated above, even if Hess and Jennings reached the EOC closer to 9:59 AM, it is inconceivable, based on the time that NIST gave for their departure from the EOC, that it would have taken them until 10:28 AM to reach the 6th floor.**

It is also inconceivable that debris impacting the south face of WTC 7 could cause a landing in a stairwell on the northern side of the building's core to give way or at least make the stairwell impassable. (*See* Figure 3-2 of NCSTAR 1-9 below, which shows the stairwell on the northern side of the building's core.) Apparently recognizing this issue, the NIST WTC 7 Report makes no mention of the landing giving way or any other structural damage to the stairwell. Instead, the NIST WTC 7 Report implies that Hess and Jennings retreated to the 8th floor because the staircase "filled with smoke and debris." The NIST WTC 7 Report does not explain how debris impacting the south face of WTC 7 could cause a stairwell on the northern side of the building's core to fill with debris. Nor does it attempt to account for the damage described by Jennings.

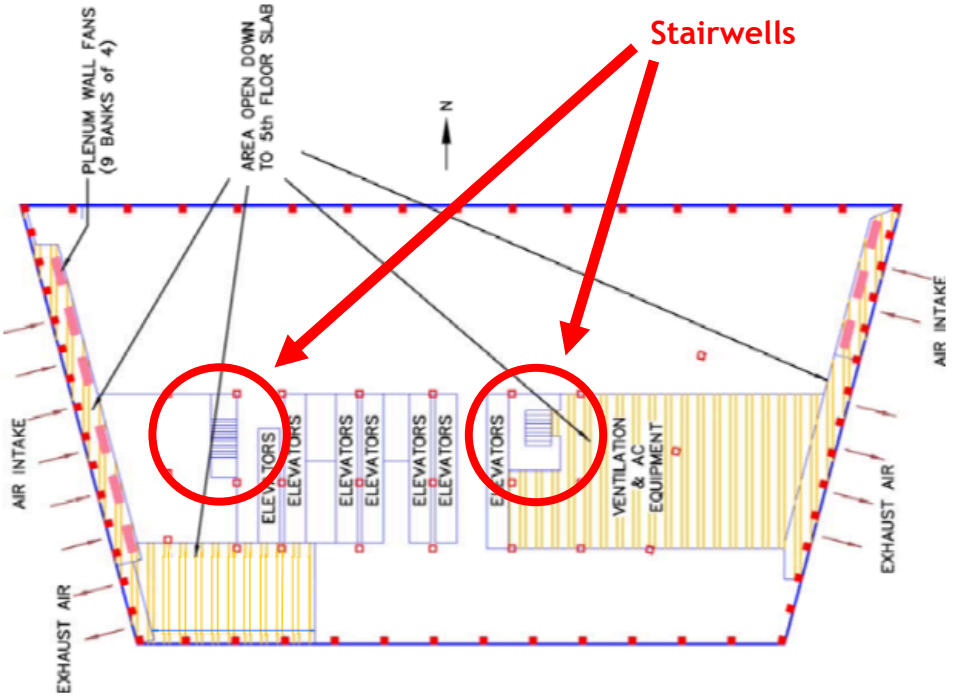


Figure 3–2. Schematic of Floor 6.[1]

Furthermore, Jennings' account of an explosion occurring inside WTC 7 before the collapse of WTC 1 at 10:28 AM and continuing to hear explosions until he was rescued is consistent with video footage recorded at the intersection of West Broadway and Murray Street, two blocks (approximately 470 feet) north of WTC 7.[19] This video footage, which was featured in the documentary *9/11 Stories from the City*, captures the unmistakable sound of a large explosion coming from the direction of WTC 7. The documentary places the footage chronologically after 10:15 AM and before 10:28 AM. Although the explosion captured on this video is likely to be a different explosion from the one witnessed by Hess and Jennings because it appears to happen later (although it is possibly the same explosion), the occurrence of this explosion so close to WTC 7 lends further credence to Jennings' interpretation that he and Hess witnessed an explosion inside WTC 7. It is also highly consistent with Jennings' account of continuing to hear explosions after the initial explosion he witnessed.

In the video, the two men at a telephone booth hear a loud explosion and turn in the direction of WTC 7 (the camera also turns in the direction of WTC 7). They are then approached by two firefighters, one of whom says to the other, "They gotta get back from here! They gotta get back! The city's exploding!" Figure 15 below shows four stills from the video and two Google Street View shots confirming the West Broadway and Murray Street location.

[19] https://youtu.be/1nqX40at2-M

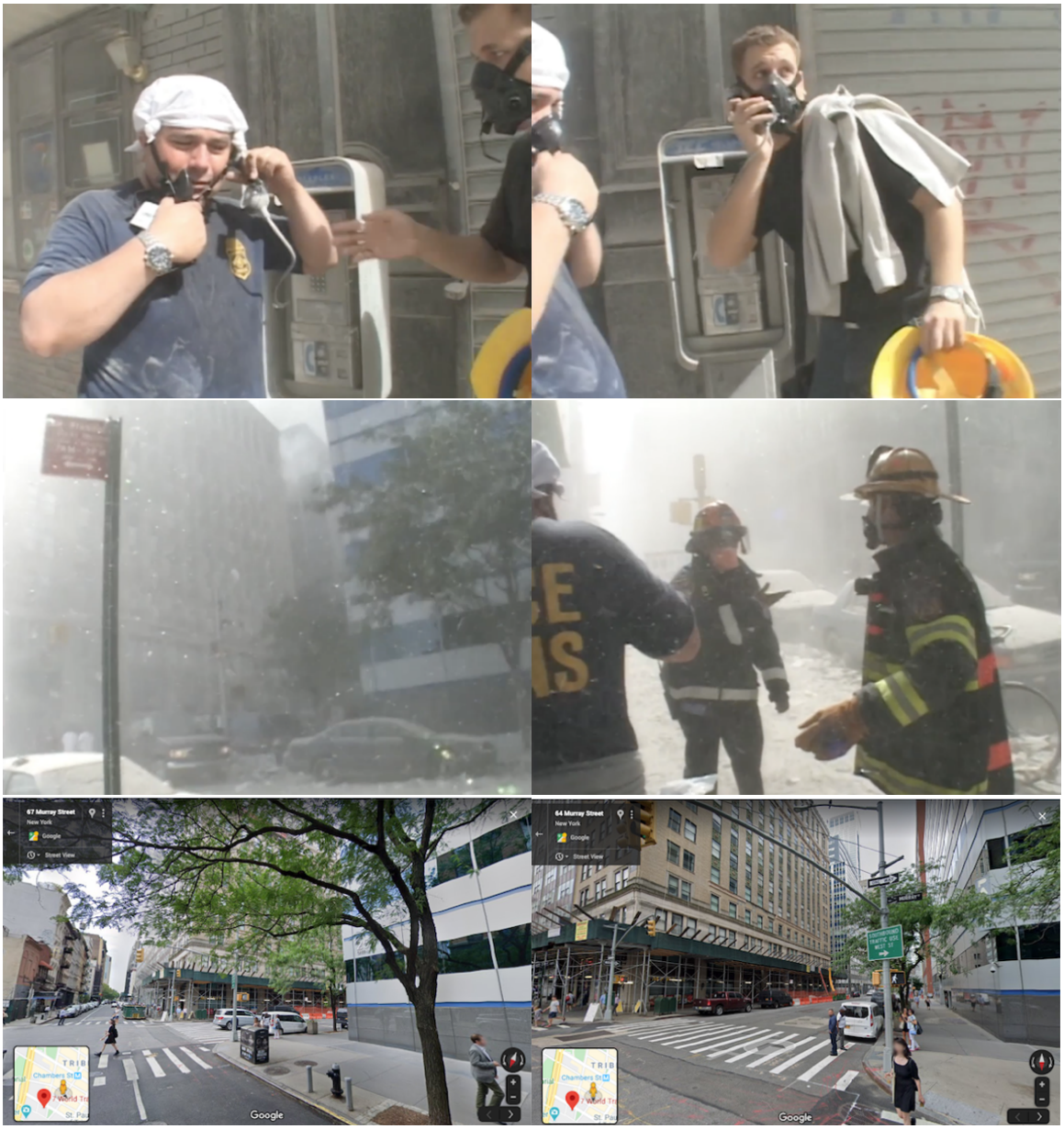


Figure 15: Four stills from *9/11 Stories from the City*; two Google Street View shots at 67 Murray St.

Therefore, based on Jennings' consistent account of an explosion in WTC 7 and the impossibility that the event he and Hess witnessed was caused by the collapse of WTC 1 at 10:28 AM, as well as the video footage described above that is consistent with Jennings' account, it is evident that he and Hess were witness to an explosion inside WTC 7 on the morning of 9/11. Under this scenario, the process of destroying WTC 7 that culminated in the building's total collapse at 5:20 PM began amidst the chaotic events of that morning.

As for why the destruction may have begun in the morning but was not completed until 5:20 PM, it is not unreasonable to consider that whoever was responsible for the destruction of WTC 7 under this scenario intended to bring it down earlier in the day, but either botched the attempt or decided to delay bringing it down. A botched or delayed plan to bring down WTC 7

earlier in the day may explain the numerous explosions reported between 10:38 AM and approximately 12:00 PM in the vicinity of the World Trade Center (which are also consistent with Jennings' account of hearing numerous explosions before he was rescued from WTC 7). Some of those reports are presented below in chronological order. The first 11 clips are news clips featuring anchors and on-the-ground reporters.[20] The final clip comprises excerpts of footage shot from an elevated position looking south toward the WTC site, in which the person filming narrates what he is observing.[21] Although there is no clear-cut evidence of the location of the observed explosions in the clips, the person shooting from the elevated position tends to direct the camera toward WTC 7 after hearing explosions. Furthermore, especially in regard to the last explosion he observed, new smoke is seen emanating from around the base of WTC 7 on the eastern side, as shown in Figure 16 below.

- **Dan Rather, CBS, 10:38 AM:**

  "There's been a fourth explosion at the World Trade Center, just reported.

- **Lisa Hill and Michael Palmer, WCBS, 10:38 AM:**

  Hill: "Rose, we hate to interrupt you. Rose, we have interrupt you. We've just been told . . ."

  Palmer: "A fourth explosion."

  Hill: ". . . of a fourth explosion, at the World Trade Center."

  Palmer: "Now in the area of the World Trade Center. Obviously, neither tower still standing. We don't know the source of this fourth explosion."

- **Kristen Shaughnessy, New York 1, 10:42 AM and 10:45 AM:**

  "Good morning again, Pat. I am actually just across from City Hall. . . . It's unbelievable because you hear these explosions. In fact, I just heard another one — I don't know if it was like an aftereffect or what not — just while you were on the phone talking about the school closings. It wasn't as big, obviously, as the other ones. But it still sent a tremor all the way over here, and I'm obviously on the other side of the World Trade Center, on the other side of the city. And it's just unbelievable."

  Shaughnessy: "I'm hearing another explosion, just so you know. I'm hearing another rumble. It's not as bad as the other ones were. But, I don't know if you have pictures."

[20] A video compilation of these reporters' accounts is at: https://youtu.be/kG2LK85WPWg. The time of each report was determined by researchers Graeme MacQueen and Ted Walter. Their analysis will be presented in a forthcoming paper. Although that paper is not available now, the reports were clearly made after 10:28 AM.
[21] https://youtu.be/-R2rY69BBIg

Sharon Dizenhuz: "We have a picture and we don't see anything beyond the enormous billows of smoke that have been there. But no additional bursts from our vantage point."

Shaughnessy: "Okay, didn't mean to interrupt, Sharon. What you can feel when these tremors come is that it literally comes up under your feet. That's what it feels like. That's the best way I know to describe it."

- **Rose Arce, CNN, 10:50 AM:**

"It looks like a large chunk of that debris has hit a building very close by, about two blocks away next to an elementary school, causing another explosion. . . . So as people are coming up the street running from the scene of this new explosion you can see them slipping on the ash and literally having to drag each other up the street."

- **Ashleigh Banfield, MSNBC, 10:54 AM:**

"Well, we just heard another explosion go off a couple minutes ago, Chris, and saw a bunch more people sort of running this way. A woman on her bike was screaming as it went off. And there was a New York City officer who was plain-clothed walking by with a radio. I tried to stop him to ask what happened. And all he said was 'car bomb, car bomb.'"

- **Carol Marin, CBS reporter appearing on WCBS, 10:59 AM:**

Marin: "After the second tower went down, I was trying to make my way to a CBS crew or to try to help CBS crews if I could. And then, I don't know what it was, John. But another explosion, a rolling blast of fire, a rolling column of fire towards us. My respect for fire and police already knew no bounds given the danger, it now exceeds what it could, because a firefighter threw me into the wall of a building, covered me with his body as the flames approached us. . . . The personnel, the police and the fire working in there are doing so against really dangerous odds. And they still don't know if there's something left to explode, John."

John Slattery: "Where were you at the time?

Marin: "I was — not being a New Yorker, you'll have to help me here. I came around Stuyvesant High School, and that street at the north end. And I came up and asked if anyone had seen a CBS crew. And I was directed by a firefighter who said, 'Walk down the middle of the road, because you don't know what's going to come down.' At which point, we heard a rumble like I've never heard before, and a firefighter ran towards me. We ran as fast as we could. I lost my

shoes. I fell down. He picked me up and slammed me into a wall and covered me with him until we could make it more to safety."

Slattery: "Was this from the first rolling blast or the second?"

Marin: "John, I looked at my watch. It was about 10:44, is what my watch said. So it was after the second tower, I think the second tower explosion."

- **Alan Dodds Frank, CNN, 11:07 AM:**

"Aaron, just two or three minutes ago there was yet another collapse or explosion. . . . But at a quarter to 11:00 there was another collapse or explosion following the 10:30 collapse of the second Tower. And a firefighter who rushed by us estimated that 50 stories went down. [Note: The firefighter may have been referring to the 47-story WTC 7 being damaged by an explosion.] The street filled with smoke. It was like a forest fire roaring down a canyon."

- **Ashleigh Banfield, MSNBC, 11:12 AM and 11:19 AM:**

"There's just been another explosion. As happened with the last two, it may be a car bomb. That's what we were hearing from passing police officers. The last two were thought to be car bombs. This third one I haven't had any confirmation on it yet. But, I mean the plumes of smoke have been so thick anyway."

"What's so frightening at this time is that we've heard three explosions since both towers collapsed."

- **Rick Sanchez, MSNBC, 11:25 AM:**

"Yeah, Lester. There have been about four explosions here since about 11:00, the most recent about two minutes ago that seemed to shake the ground that we're on. We're about a block and a half away from what used to be the World Trade Center."

- **Ashleigh Banfield, on NBC, 11:28 AM:**

"We're obviously having a bit of trouble right now maintaining our location, because we just heard one more explosion. That's about the fourth one we've heard. The police are telling us they're either car bombs or they are simply cars that have overheated so much that they're exploding."

- **Rick Sanchez, MSNBC, 12:09 PM:**

"This is why it's so difficult for them in this area where we are. Imagine, they came here originally to deal with a crisis. They set up some command centers, and they had many of their chiefs and many of their supervisors in the area of the building. The second and third explosions literally have wreaked havoc on those forces and those command centers. So they've had to back up. And now they're trying to see how they can approach it again."

- **Man Filming from Elevated Position between 10:28 AM and 12:00 PM:**

"That last explosion was something, because now there's a lot of police activity and sirens. More smoke rising from the ground, new smoke, so there was some kind of additional explosion. But I don't know what it was. Definitely. Smoke is rising from the ground. Maybe it was a federal building or something like that."

"It's now 11 o'clock. You still hear continuing explosions. But I don't know what it is. A lot of smoke."

"That's another explosion. [Smoke rises up from around the base of WTC 7.]

"It's now a little bit after 12:00."

Figure 16: Smoke rises from around the base of WTC 7 on its eastern side after man filming hears explosion.

In summary, the NIST WTC 7 Report distorts eyewitness reports of an explosion occurring inside WTC 7 on the morning of 9/11. Michael Hess and Barry Jennings each described the occurrence of an explosion independently on television soon after being rescued from WTC 7. Although Hess later changed his account to the narrative put forward by NIST, Jennings continued to maintain that he had witnessed an explosion. NIST's explanation that the event witnessed by Hess and Jennings was caused by the collapse of WTC 1 at 10:28 AM is untenable based on the fact that they must have reached the 6th floor well before 10:28 AM. In an apparent attempt to make the timeline fit with its explanation, NIST reported that the final evacuation order from the EOC was given at 9:44 AM, but this time is unsupported, and in fact contradicted, by the evidence provided by NIST. Furthermore, Jennings' account of an explosion occurring inside WTC 7 before the collapse of WTC 1 at 10:28 AM and continuing to hear explosions until he was rescued is consistent with video footage recorded two blocks north of WTC 7 that captured the unmistakable sound of an explosion between 10:15 AM and 10:28 AM.

As a result, NIST's claim that the event witnessed by Hess and Jennings was caused by the collapse of WTC 1 at 10:28 AM fails to comply with the OMB Guidelines and NIST IQS because it lacks objectivity. First, NIST's claim is inaccurate, unreliable, and biased because it distorts the initial reports of Hess and Jennings and the account that Jennings continued to stand by in subsequent interviews. Second, NIST's claim is inaccurate, unreliable, and biased because it relies on the untenable assertion that it took Hess and Jennings approximately 29 minutes to descend 17 stories despite the fact that they were rushing to evacuate the building. Third, NIST's claim is inaccurate, unreliable, and biased because it does not explain how debris impacting the south face of WTC 7 could cause a stairwell on the northern side of the building's core to fill with debris, nor does it attempt to account for the damage described by Jennings. Fourth, NIST's claim is inaccurate, unreliable, and biased because it ignores other video and eyewitness evidence that is consistent with Jennings' account.

In addition, NIST's claim violates the utility element of information quality because care was not taken to make sufficient background and detail available regarding its claim, even though greater transparency would have enhanced the usefulness of the information disseminated. Given the obvious importance of Hess' and Jennings' interviews, NIST should have published all, or at least portions of, these interviews. Similarly, NIST's claim violates the transparency standard imposed upon influential information because NIST did not practice a degree of transparency sufficient to facilitate reproducibility. NIST's claim, which is based on its interviews with Hess and Jennings, cannot be validated or invalidated because the public has not been given access to NIST's interviews with Hess and Jennings.

3. <u>Corrections Sought:</u>

a) <u>Revise the NIST WTC 7 Report to Reflect that There Are Eyewitness Reports and Audio Recordings Indicative of Explosions at the Onset of and During the Collapse of WTC 7</u>

First, NIST must revise the NIST WTC 7 Report to reflect that there are eyewitness report and audio recordings indicative of explosions at the onset of and during the collapse of WTC 7. As part of revising the NIST WTC 7 Report, NIST should attempt to interview Darrell

(his contact information will be provided by AE911Truth), Ashleigh Banfield, the Connecticut Post reporter, and Craig Bartmer, among others, and include their interviews in a new appendix. In addition, NIST should commission a more in-depth audio analysis of the three videos cited above (MSNBC, 84 Williams Street, and West Street).

Alternatively, if NIST maintains that the overall body of eyewitness and audio evidence does not indicate the occurrence of explosions at the onset of and during the collapse of WTC 7, in order to satisfy the objectivity, utility, and transparency standards of information quality, NIST must publish a new appendix to the NIST WTC 7 Report containing all interviews that indicate explosions did not occur at that time (the names of individuals can be redacted).

b) Revise Section 6.5.2 of NCSTAR 1-9 to Faithfully Reflect the Account of Barry Jennings, According to Which There Was a Big Explosion Inside WTC 7 Before 10:28 AM that Caused the 6th Floor Landing He and Michael Hess Were Standing on to Give Way

Second, NIST must revise Section 6.5.2 of NCSTAR 1-9 to faithfully reflect the account of Barry Jennings, according to which there was a big explosion inside WTC 7 before 10:28 AM that caused the 6th floor landing he and Michael Hess were standing on to give way. Furthermore, NIST must revise its account of the EOC evacuation orders or, alternatively, amend the NIST WTC 7 Report to include evidence supporting its account of the evacuation orders.

If NIST still maintains, even after revising Section 6.5.2 of NCSTAR 1-9 to faithfully reflect the account of Barry Jennings, that the event Hess and Jennings witnessed was caused by the collapse of WTC 1 at 10:28 AM, in order to satisfy the objectivity, utility, and transparency standards of information quality, NIST must publish its interviews with Hess and Jennings in a new appendix to the NIST WTC 7 Report. NIST's assertion that the testimony of Hess and Jennings is "not directly related to the building failure" defies reason, and therefore their interviews are not exempt from disclosure. Furthermore, if NIST still maintains that the event Hess and Jennings witnessed was caused by the collapse of WTC 1 at 10:28 AM, NIST must explain how, based on documented or experimental evidence, it took Hess and Jennings approximately 29 minutes to descend 17 floors (an average of 1 minute and 42 seconds per floor).

c) Discard the Probable Collapse Sequence and Develop a New Probable Collapse Sequence that Is Consistent with the Eyewitness and Audio Evidence of Explosions

Third, NIST must discard its Probable Collapse Sequence and develop a new Probable Collapse Sequence that is consistent with the occurrence of an explosion at the onset of the east penthouse collapse as well as explosions later in the collapse sequence and explosions earlier in the day. This would be accomplished by simulating the failure of Columns 79, 80, and 81 high in the building, followed by the near-simultaneous failure of all columns lower in the building over 8 stories, as requested above.

H. SEVERELY ERODED STEEL FROM WTC 7

The third and final item of information described in Part 2 relates to evidence of incendiaries being used in the destruction of WTC 7 that is omitted from the NIST WTC 7 Report.

1. Despite the Discovery of "Severe Erosion in Several Beams" from the World Trade Center, NIST Neglected to Perform Tests to Determine the Cause of the Erosion in One Such Beam Recovered from WTC 7, and Then Falsely Stated that No Identifiable Steel Was Recovered from WTC 7, Thus Violating OMB Guidelines and NIST IQA

As documented in Appendix C of the FEMA *World Trade Center Building Performance Study* (referred to herein as the "FEMA Report"), published in May 2002, a metallurgical examination was conducted on samples taken from two structural members found in the World Trade Center debris. The three authors of Appendix C — Jonathan Barnett, Ronald R. Biederman, and R. D. Sisson, Jr., who were all professors at the Worcester Polytechnic Institute (WPI) — conducted the metallurgical examination. One of the samples they examined was taken from a beam that appeared to be from WTC 7. The second sample was taken from a beam that appeared to be from WTC 1 or WTC 2. Although the exact location of the beam in the WTC 7 structure could not be determined, the authors noted that **"the severe erosion found in several beams warranted further consideration."** (Emphasis added.)

Appendix C of the FEMA Report provided the following analysis of the sample taken from WTC 7 (*see* FEMA Report, p. C-1 to C-2):

> Evidence of a severe high temperature corrosion attack on the steel, including oxidation and sulfidation with subsequent intergranular melting, was readily visible in the near-surface microstructure. A liquid eutectic mixture containing primarily iron, oxygen, and sulfur formed during this hot corrosion attack on the steel. This sulfur-rich liquid penetrated preferentially down grain boundaries of the steel, severely weakening the beam and making it susceptible to erosion. **The eutectic temperature for this mixture strongly suggests that the temperatures in this region of the steel beam approached 1,000 °C (1,800 °F), which is substantially lower than would be expected for melting this steel.** (Emphasis added.)

The concluding section of Appendix C, entitled "Suggestions for Future Research," stated 7 (*see* FEMA Report, p. C-13):

> **The severe corrosion and subsequent erosion of Samples 1 and 2 are a very unusual event. No clear explanation for the source of the sulfur has been identified.** The rate of corrosion is also unknown. It is possible that this is the result of long-term heating in the ground following the collapse of the buildings. **It is also possible that the phenomenon started prior to collapse and accelerated the**

> **weakening of the steel structure. A detailed study into the mechanisms of this phenomenon is needed to determine what risk, if any, is presented to existing steel structures exposed to severe and long-burning fires.** (Emphasis added.)

To be clear, the observed erosion of the steel was such an unusual event that *The New York Times* published a story in February 2002 calling it "perhaps the deepest mystery uncovered in the investigation."[22] *Transformations*, a publication at WPI, published an article entitled "The 'Deep Mystery' of Melted Steel,"[23] which described the eroded steel as follows:

> [S]teel — which has a melting point of 2,800 degrees Fahrenheit — may weaken and bend, but does not melt during an ordinary office fire. Yet metallurgical studies on WTC steel brought back to WPI reveal that a novel phenomenon — called a eutectic reaction — occurred at the surface, causing intergranular melting capable of turning a solid steel girder into Swiss cheese. . . . *The New York Times* called these findings "perhaps the deepest mystery uncovered in the investigation." The significance of the work on a sample from Building 7 and a structural column from one of twin towers becomes apparent only when one sees these heavy chunks of damaged metal. A one-inch column has been reduced to half-inch thickness. Its edges — which are curled like a paper scroll — have been thinned to almost razor sharpness. Gaping holes — some larger than a silver dollar — let light shine through a formerly solid steel flange. This Swiss cheese appearance shocked all of the fire-wise professors, who expected to see distortion and bending — but not holes.

But despite the fact that "several beams" from the World Trade Center exhibited "severe erosion," and preliminary examination of two samples found the phenomenon to be a "very unusual event" with "no clear explanation for the source of sulfur" and called for "a detailed study into the mechanisms of this phenomenon," NIST did not seek to perform tests on recovered steel from WTC 7 to determine the cause of the severe erosion. This was also despite the fact that NIST Director Arden Bement said that NIST would address "all major recommendations contained in the [FEMA] report,"[24] and that NIST's representative on the FEMA investigation, John Gross, was present for the documentation and preservation of the severely eroded steel from WTC 7, as shown in the Figure 17 photo below, released by NIST in 2012. NIST's lack of interest in examining the steel member to determine the cause of the severe erosion and how it may have contributed to the collapse of WTC 7 is difficult to comprehend or justify.

[22] Glanz, James and Lipton, Eric: "A Search for Clues in the Towers' Collapse," *The New York Times* (Feb 2, 2002).
[23] Killough-Miller, Joan: "The Deep Mystery of Melted Steel," WPI Transformations (Spring 2002)
[24] Dr. Arden Bement: Testimony before the House Science Committee Hearing on "The Investigation of the World Trade Center Collapse," May 1, 2002.

Figure 17: NIST's John Gross next to the severely eroded WTC 7 steel member during the FEMA investigation.

At a technical briefing on August 26, 2008, for the release of NIST's WTC 7 draft report, NIST's lead investigator Dr. Shyam Sunder was asked if NIST had tested "any WTC 7 debris for explosive or incendiary chemical residues." Dr. Sunder gave the following response:

> With regard to the issue of residue, there is reference often made to a piece of steel from Building 7 that is documented in the earlier FEMA report that deals with some kind of a residue that was found, sulfur-oriented residue. And, in fact, that was found by a professor who was then at the Worcester Polytechnic Institute, Professor Jonathan Barnett. **But that piece of steel has been subsequently analyzed by Professor Barnett and by Professor Rick Sisson, who is also from the Worcester Polytechnic Institute, and they reported in a BBC interview that aired on July 6 that there was no evidence that any of the residue in that steel, in that piece of steel, had any relationship to an undue fire event in the building or any other kind of incendiary device in the building.**

Again, NIST's failure to conduct its own tests on the steel — or at least work with the WPI professors as outside contractors and include their findings in the NIST WTC 7 Report, just as NIST did for the seismogram data and the analysis of hypothetical blast scenarios — is difficult to comprehend or justify. Indeed, it is baffling that this data was not included in the NIST WTC 7 Report and that it would be relegated to an afterthought meriting no more than a verbal reference to a television interview.

Not only does the NIST WTC 7 Report omit any mention of the severely eroded steel from WTC 7, the NIST WTC 7 FAQs go as far as claiming that no identifiable steel from WTC 7 was recovered. FAQ #27 states:

> **27. Why didn't the investigators look at actual steel samples from WTC 7?**
>
> Steel samples were removed from the site before the NIST investigation began. In the immediate aftermath of Sept. 11, 2001, debris was removed rapidly from the site to aid in recovery efforts and to facilitate emergency responders' efforts to work around the site. **Once it was removed from the scene, the steel from WTC 7 could not be clearly identified.** Unlike the pieces of steel from WTC 1 and WTC 2, which were painted red and contained distinguishing markings, WTC 7 steel did not contain such identifying characteristics. (Emphasis added.)

While Appendix C of the FEMA Report does state that the first sample "appeared" to be from WTC 7, there is no doubt expressed throughout the rest of the appendix, nor in a prior paper co-authored by the WPI professors in the *JOM* journal (*see* Barnett et al., Dec. 2001) nor in a follow-up 2006 paper co-authored by Sisson and Biederman (discussed below), that the beam was from WTC 7. In the BBC documentary *9/11: The Third Tower* referenced by Dr. Sunder in the 2008 technical briefing, Jonathan Barnett explains how his team was able to determine that the steel member was from WTC 7: "This was the size of steel that they used in the construction of Tower 7. They didn't use this particular kind of steel in Towers 1 or Towers 2. So that's why we know its pedigree. It was a surprise to me because it was so eroded and deformed, and so we took it for analysis in the lab." Thus, unless NIST had significant reason to doubt that the beam was from WTC 7, which should be stated, NIST's answer for why investigators didn't examine actual steel samples from WTC 7 is false.

Furthermore, Appendix D of the FEMA Report, which documents the steel data collection efforts undertaken at the WTC site and nearby salvage yards, indicates that several pieces of recovered steel were identified as being from WTC 7 (*see* FEMA Report, p. D-1, D-10, and D-13):

> WTC steel data collection efforts were undertaken by the Building Performance Study (BPS) Team and the Structural Engineers Association of New York (SEAoNY) to identify significant steel pieces from WTC 1, 2, 5, and 7 for further study. The methods used to identify and document steel pieces are presented, as well as a spreadsheet that documents the data for steel pieces inspected at various sites from October 2001 through March 2002.
>
> . . . Pieces that were searched for and inspected include perimeter or core columns near the impact area of WTC 1 or WTC 2, **burnt pieces from WTC 7**, and connection pieces from WTC 5. . . .
>
> **. . . The National Institute of Standards and Technology (NIST) is currently conducting environmental tests, abating asbestos as necessary, and**

> **shipping available pieces to its Gaithersburg, MD, facility for storage and further study. As of May 2002, a total of 41 steel pieces had been shipped to NIST.** (Emphasis added.)

In addition, the spreadsheet documenting the inspected steel includes 4 entries that are explicitly regarding steel from WTC 7 (*see* page 2 of 13 in the Steel Data Collection Summary of Appendix D) as well as several references to "burnt" and "fire-damaged" steel members, which may have been identified as being from WTC 7 but not noted as such in the spreadsheet. (It is not clear whether the beam examined at WPI is included in the Appendix D spreadsheet.) Furthermore, Appendix D includes two photos of columns identified as being from WTC 7, shown below.

Figure D-14 WTC 7 W14 column tree with beams attached to two floors.

Figure D-17 Seat connection in fire-damaged W14 column from WTC 7.

Appendix D does note that not all of the documented pieces of steel were kept for further study. This was because "some pieces were later determined not to be relevant to understanding building damage" or because "pieces were accidentally processed in salvage yard operations before they were removed from the yards for further study." **However, investigation documents released by NIST, shown in Exhibit E, do indicate that steel thought to be from WTC 7 was in fact shipped to NIST.**

If the steel members identified as being from WTC 7 were not in fact shipped to NIST for either of the reasons given by FEMA, these reasons should have been noted in FAQ #27 or elsewhere. If NIST had reason to doubt the inspectors' determination that the steel members were from WTC 7, NIST should have noted that in FAQ #27 or elsewhere. Similarly, as stated above, if NIST doubted that the beam examined at WPI was from WTC 7, NIST should have noted that in FAQ #27. Absent such clarifications, NIST's claim that "the steel from WTC 7 could not be clearly identified" is false.

Regarding Sisson's statement in the BBC documentary *9/11: The Third Tower*, which Dr. Sunder referenced in the 2008 technical briefing, we see that Sisson essentially performed an about-face from being "shocked" in 2001, to not finding the severe erosion of the steel "very mysterious at all" in 2008. Sisson stated the following in *9/11: The Third Tower*:

> Sisson: Well, it was attacked by what we determined was a liquid slag. When we did the analysis, we actually identified it as a liquid containing iron, sulfur, and oxygen. You can see what it does is it attacks the grain boundaries, and this bit would eventually have fallen out, and it would continue the attack.
>
> Narrator: Professor Sisson says it didn't melt. It eroded. The cause were those very hot fires in the debris after 9/11 that cooked the steel over weeks. The sulfur came from masses of gypsum wallboard that was pulverized and burnt in the fires.
>
> Sisson: I don't find it very mysterious at all, that if I have steel in this sort of a high-temperature atmosphere that's rich in oxygen and sulfur, this would be the kind of result I would expect.

However, closer scrutiny of the 2006 follow-up paper that Sisson co-authored with Biederman reveals that they were unable to reproduce the observed erosion through experiments. Sisson and Biederman state in the paper (*see* Sisson, Jr, R.D. and R.R. Biederman, 2006):

> Based on these metallurgical observations, can the temperature, time, and environment that this beam was exposed to be determined?
>
> The microstructural changes in the steel must have occurred at temperatures between 550 and 850 °C. These changes would require times on the order of hours.
>
> The microstructure of the slag with the eutectic structure and the primary FeO indicates temperatures in this region above 940 °C and maybe up to 1,100 °C, as indicated by the phase diagram.
>
> The metal removal rates from A36 steel by this liquid slag are not known and may be highly dependent on impurity content as well as oxygen and sulfur partial pressures in the atmosphere of the fire. **However, preliminary experiments at 1,100 °C with mixtures of FeS and FeO placed on the steel surface and heated in air indicated that the reaction was not fast and dissolved little metal in 24 h. This observation indicates that the liquid slag attack probably took place during the prolonged exposure to the fire in the rubble.**
>
> Another frequently asked question concerns the source of the sulfur. Some of the sulfur may have come from the fuel on the airplanes or the fuel that was stored in Building 7. However, this source would have been short-lived in the fires. Sulfuric acid in acid rain or SO_2 or SO_3 in the atmosphere could also contribute sulfur to the slag. **A more probable source of sulfur is the materials in the building, such as gypsum (hydrated calcium sulfate) board or other construction materials.**

In other words, despite placing mixtures of iron sulfide (FeS) and iron oxide (FeO) directly on the steel surface and heating the environment to 1,100 °C for 24 hours, "the reaction was not fast and dissolved little metal." But rather than questioning their hypothesis that this

mechanism produced the observed severe erosion, Sisson and Biederman jumped straight to assuming that it was merely a matter of exposing the steel to these conditions for a longer period of time. Instead of providing clear conclusions backed by experimental evidence (for example, subjecting the steel to the same conditions for several days and reproducing the severe erosion), Sisson and Biederman offered weak, speculative assertions such as **"the liquid slag attack probably took place during the prolonged exposure to the fire in the rubble"** and **"a more probable source of sulfur is the materials in the building."**

Civil engineer Jonathan Cole conducted a similar but more real-world experiment, which he documented in the video *9/11 Experiments: The Mysterious Eutectic Steel*. Cole used a wide flange beam packed with crushed gypsum board, crushed concrete, aluminum scraps, steel scraps, and diesel fuel, and he burned it for 24 hours, continually adding fuel such as brush, furniture, floor panels, and wood logs. At the end of his experiment he reported, "**The aluminum, concrete, drywall, diesel fuel, and building materials did not cause any intergranular melting.** So, if [these materials] did not cause the intergranular melting and sulfidation, then some uncommon substance that is not normally found in buildings must have caused it."

Besides Sisson and Biederman failing to provide evidence of sustained temperatures between 940 °C and 1,100 °C in the WTC 7 debris pile, their hypothesis is fatally flawed for the simple reason that iron does not react with gypsum, which is composed of calcium sulfate. In chemical terms, iron is not electropositive enough to reduce sulfate. Gypsum wallboard is commonly used for fire protection for the fundamental reason that it cannot burn. The notion of gypsum wallboard burning for a sustained period of time and forming a liquid eutectic with iron is illogical on its face.

In any case, if one still wishes to hypothesize that gypsum caused the sulfidation and erosion of steel in WTC 7, the next step would be to reproduce the hypothesized mechanism experimentally. Failing to reproduce the observed phenomena and then asserting that the chemical reaction probably just required more time to occur does not suffice as confirmation of the hypothesis. Rather, the experiments conducted to date only cast doubt on the hypothesis.

The Thermate Hypothesis

A simple and straightforward competing hypothesis has been put forward that readily explains the oxidation, sulfidation, and severe erosion of steel in WTC 7: the use of thermate. This hypothesis was first posited by retired BYU physics professor Steven Jones in the paper "Revisiting 9/11/2001 — Applying the Scientific Method," which, in addition to being published in *The Journal of 9/11 Studies*, is archived on NIST's website.[25]

"Thermate" is made by adding sulfur to thermite, which is a well-known incendiary consisting of a mixture of powdered aluminum and iron oxide. According to Jones, thermate "combines aluminum powder and iron or other metal oxides with sulfur. The thermate reaction proceeds rapidly and is in general faster than basic thermite in cutting through steel due to the presence of sulfur. (Elemental sulfur forms a low-melting-temperature eutectic with iron)." Jones

[25] https://www.nist.gov/system/files/documents/2017/05/09/JonesWTC911SciMethod.pdf

notes that, in addition to explaining the observed eutectic reaction, thermate also explains the observed oxidation and sulfidation: "When you put sulfur into thermite it makes the steel melt at a much lower temperature, so instead of melting at about 1538 °C it melts at approximately 988 °C, and you get sulfidation and oxidation in the attacked steel . . ." (*See* Jones, 2007.)

In the NIST WTC 7 FAQs, NIST dismisses the use of thermite and thermate as a hypothesis for the destruction of WTC 7. NIST's reasons for ruling out thermite and thermate are provided in FAQ #14, which states:

> **14. Is it possible that thermite or thermate contributed to the collapse of WTC 7?**
>
> NIST has looked at the application and use of thermite and has determined that it was highly unlikely that it could have been used to sever columns in WTC 7 on Sept. 11, 2001.
>
> Thermite is a combination of aluminum powder and a metal oxide that releases a tremendous amount of heat when ignited. It is typically used to weld railroad rails together by melting a small quantity of steel and pouring the melted steel into a form between the two rails. Thermate also contains sulfur and sometimes barium nitrate, both of which increase the compound's thermal effect, create flame in burning, and significantly reduce the ignition temperature.
>
> To apply thermite to a large steel column, approximately 0.13 lb. of thermite would be needed to heat and melt each pound of steel. For a steel column that weighs approximately 1,000 lbs. per foot, at least 100 lbs. of thermite would need to be placed around the column, ignited, and remain in contact with the vertical steel surface as the thermite reaction took place. This is for one column; presumably, more than one column would have been prepared with thermite, if this approach were to be used.
>
> It is unlikely that 100 lbs. of thermite, or more, could have been carried into WTC 7 and placed around columns without being detected, either prior to Sept. 11, 2001, or during that day.
>
> Given the fires that were observed that day, and the demonstrated structural response to the fires, NIST does not believe that thermite or thermate was used to fail any columns in WTC 7.
>
> Analysis of the WTC steel for the elements in thermite/thermate would not necessarily have been conclusive. The metal compounds also would have been present in the construction materials making up the WTC buildings, and sulfur is present in the gypsum wallboard used for interior partitions.

NIST essentially offers three reasons for dismissing the use of thermite/thermate: (1) the amount needed and the impracticality of applying it, (2) that the observed fires have been shown to explain WTC 7's collapse, and (3) that testing for thermite and thermate would not necessarily have been conclusive. Each reason is discussed below.

With respect to the amount of thermite/thermate needed and the impracticality of applying it, NIST's answer totally ignores the possible use of thermite cutter charges capable of directing molten iron from the thermite/thermate reaction toward a steel member so as to rapidly and efficiently cut through the steel member. This technology was well developed prior to 9/11. For example, the patent for a "cutting torched and associated methods" granted on February 6, 2001, states the following (*See* Patent No. US 6,183,569 B1):

> 1. Field of Invention
>
> The present invention generally relates to an apparatus and method for cutting target material. The present invention more particularly relates to an apparatus and method for cutting target material of substantial thickness using a thermite-based charge.
>
> 2. Description of the Prior Art
>
> A number of devices for cutting materials of a substantial thickness are known in the art. Many of these devices employ explosive shaped charged which deliver energy to the surface of a material in the form of a high pressure, high velocity shock front. The conical or "V" shaped charge, for example, explodes and focuses cutting emergency onto the surface of the material to be cut. A primary disadvantage of explosive shaped charges is that they generate excessive noise and debris upon detonation. This noise and debris can pose potentially serious health and safety hazards to someone using a cutting device which employs conventional shaped explosives.
>
> Thermite-based cutting devices which employ a cutting flame produce virtually no extended shock wave and generate relatively little over pressure. Thermite-based cutting devices do not present the same health and safety hazards which are attendant upon explosive shape charge cutting devices.
>
> . . . What has not been disclosed in the prior art, however, is use of a thermite-based apparatus for directing or focusing a cutting flamed derived from the activation of a thermite charge for the purpose of cutting substantially thick material such as steel plates and bars, for example. In addition, the prior art has not provided a practical solution for effecting an extended, linear cut in a piece of material. The prior art also has not sufficient addressed concerns related to the health and safety of a user using an explosive shape charge apparatus to create high velocity explosions to cut material. As a result, the prior art has also not adequately considered use of a thermite-based cutting apparatus to alleviate hazards associated

with debris, nose and pressure waves generated by from using explosive charges to cut material having a substantial thickness.

In spite of the foregoing known apparatus and methods for cutting material, there remains a real and substantial needs for an apparatus for cutting material which employs a thermite-based charge to ensure a safe and efficient cutting action.

SUMMARY OF THE INVENTION

The apparatus for cutting material of the present invention includes at least one housing having an inner cavity and an elongated nozzle extending from the inner cavity to the exterior of the housing. An energetic material, such as a thermite charge, is contained within the inner cavity to provide the apparatus with a source for a cutting flame, or high temperature, high velocity jet. An activating device, such as an igniter, is couple to the thermite charge to develop a cutting flame from the inner cavity when desired by a user. In addition, more than one such cutting apparatus may be joined or "ganged" together to form a unitary cutting apparatus which is capable of performing an extended, linear cutting action on a target material.

In another aspect of the present invention, opposed cutting apparatus are provided for cutting differently shaped material, such as steel bars and bar stock, of various diameters. In this embodiment, the opposing cutting apparatus provide opposing cutting flames which act against at least two sides or portions of a target material. In addition, improved efficiency is achieved by providing better control of burn rate to match the absorption and ablation properties of the target material. Total cutting time is also decreased. Energy losses which normally occur due to thermal conduction of energy from the cutting zone of the target material to other portions of the target material are reduced.

Therefore, the first reason NIST gives for dismissing the use of thermite/thermate in FAQ #14 of the NIST WTC 7 FAQs is arbitrary, misleading, and totally insufficient as a grounds for dismissing the thermate hypothesis.

Second, with respect to NIST's claim that the observed fires have been demonstrated to explain WTC 7's collapse, Part 1 of Section V of this Request makes it clear that the observed fires have *not* been demonstrated to explain the collapse. As described in detail above, NIST's Probable Collapse Sequence both is physically impossible and fails to explain the observed structural behavior. Thus, NIST cannot use the alleged viability of its demonstrably unviable hypothesis to dismiss a competing hypothesis. To the contrary, because NIST's Probable Collapse Sequence is physically impossible and fails to explain the observed structural behavior, more attention and weight should be given to the competing hypothesis.

Third, with respect to NIST's claim that "analysis of the WTC steel for the elements in thermite/thermate would not necessarily have been conclusive," the *possibility* of a scientific

analysis not being conclusive is never a basis for not conducting that analysis. In fact, it is absolutely normal, even expected, for a single analysis not to be conclusive. Furthermore, there is a host of testing and experimentation that could be conducted for the purpose confirming or disconfirming the thermite/thermate hypothesis. "Analysis of the WTC steel for the elements in thermite/thermate" is just one analysis among many that can and should be conducted.

In summary, despite the discovery of "severe erosion in several beams" from the World Trade, NIST neglected to perform tests to determine the cause of the erosion in one such beam recovered from WTC 7, and then not only omitted that data from the NIST WTC 7 Report, but falsely stated that no identifiable steel was recovered from WTC 7. Furthermore, the statement by Professor Sisson in the BBC's documentary *9/11: The Third* Tower, referenced by NIST's lead investigator Dr. Shyam Sunder in the August 2008 technical briefing, was based on experiments that did not actually reproduce the observed erosion and therefore did not confirm the gypsum wallboard hypothesis for the sulfidation and erosion of steel recovered from WTC 7. A simple and straightforward competing hypothesis has been put forward that readily explains the oxidation, sulfidation, and severe erosion of steel in WTC 7, namely the use of thermate. However, NIST has arbitrarily dismissed that hypothesis on invalid grounds, ignoring the possible use of thermite cutter charges as well as citing its own nonviable hypothesis as sufficient to explain the collapse and claiming unscientifically that analysis of the WTC steel for the elements in thermite/thermate would not necessarily have been conclusive.

As a result, NIST's omission of the severely eroded WTC 7 steel members from the NIST WTC 7 Report — and its omission of analysis that adequately explains the severe erosion — fails to comply with the OMB Guidelines and NIST IQS because it lacks objectivity. These omissions are biased, and therefore lack objectivity, because there is no rational basis for omitting such data from the NIST WTC 7 Report. As noted above, preliminary examination found the phenomenon to be a "very unusual event" with "no clear explanation for the source of sulfur" and called for "a detailed study into the mechanisms of this phenomenon." Verbal reference in a technical briefing to a television interview with a researcher outside of NIST in which he vaguely stated the conclusions of his non-conclusive analysis does not provide a rational basis for these omissions.

In addition, NIST's claim that no identifiable steel was recovered from WTC 7 also fails to comply with the OMB Guidelines and NIST IQS because it lacks objectivity. This claim is inaccurate, unreliable, and biased, and therefore lacks objectivity, because the FEMA Report, two peer-reviewed published papers, and statements by the individual researchers involved in the analysis all indicate that identifiable steel was recovered from WTC 7.

2. <u>Corrections Sought:</u>

a) <u>Obtain the WTC 7 Steel Sample from the Worcester Polytechnic Institute and Conduct Analyses to Determine the Cause of the Severe Erosion</u>

First, NIST must obtain the WTC 7 sample from WPI and conduct analyses for the purpose of determining the cause of the severe erosion, even if such analyses may not necessarily be conclusive.

b) Conduct Further Experiments to Reproduce the Observed Severe Erosion and Determine the Viability of Gypsum Wallboard Hypothesis Versus the Viability of the Thermate/Nano-Thermite Hypothesis

Second, NIST must conduct experiments to attempt to reproduce the severe erosion observed in the WTC 7 steel and determine the viability of the gypsum wallboard hypothesis versus the viability of the thermate hypothesis. NIST should be able to repeat the experiment documented in Sisson and Biederman's 2006 paper, but instead subject the steel to the same conditions for days or weeks, as opposed to 24 hours. NIST should be able to conduct a similar experiment using thermate.

c) Revise FAQ #27 in the NIST WTC 7 FAQs to Reflect that Identifiable Steel Was Recovered from WTC 7

Third, NIST must revise FAQ #27 in the NIST WTC 7 FAQs to reflect that identifiable steel was recovered from WTC 7 and to explain why it did not examine the available steel samples from WTC 7.

d) Discard the Probable Collapse Sequence and Develop a New Probable Collapse Sequence that Is Consistent with Physical Evidence of Incendiaries Being Used in the Destruction of WTC 7

Fourth, assuming that — as the research so far suggests — thermate is found to explain the observed severe erosion of WTC 7 steel far more readily than gypsum wallboard, NIST must discard its Probable Collapse Sequence and develop a new Probable Collapse Sequence that is consistent with the use of thermate to destroy the structure.

VI. REQUESTERS ARE AFFECTED BY NIST'S INFORMATION QUALITY STANDARDS VIOLATIONS

A. Family Members of 9/11 Victims

Among the first group of Requesters submitting this Request are 10 family members of 9/11 victims, all of whom died in the World Trade Center. Each of these family members has intensely grieved the loss of their loved one and has been searching for answers ever since 9/11.

Under the NCST Act, NIST was statutorily tasked with giving these family members some of the answers they have been seeking. As stated previously, should the correction of information contained in the NIST WTC 7 Report render a finding that the collapse of WTC 7

was caused not by fires but by a controlled demolition, it would instantly cast extreme doubt on NIST's finding that the total destruction of the WTC Towers was caused by the airplane impacts and ensuing fires and would most likely lead to congressional and criminal investigations to identify those responsible. Thus, by giving an accurate, reliable, and unbiased explanation for the collapse of WTC 7, these family members would move closer to answering the most important question of all: Who murdered their loved ones?

Therefore, it is particularly imperative that NIST fulfill its statutory duty to scientifically explain the collapse of WTC 7 in accordance with all applicable information quality standards in order for the family members of those that were killed in the World Trade Center to find closure. The NIST WTC 7 Report injures all of the family members of those killed in the World Trade Center in such an acute and palpable way that NIST has a solemn duty to correct the NIST WTC 7 Report as set forth in this Request.

B. Architects and Structural Engineers

Among the second group of Requesters submitting this Request are 88 architects and structural engineers. Each of these architects and structural engineers is or has been licensed to practice in at least one U.S. state. Many of them specialize in designing steel-frame structures and all have been involved in the design of structures using steel.

These architects and structural engineers are affected by the inaccurate, unreliable, and biased information contained in the NIST WTC 7 Report by way of the unnecessary and improper changes to building codes, standards, and practices that NIST has recommended based on the NIST WTC 7 Report. The increase in the cost associated with designing and building steel-framed and high-rise structures may have already resulted in (and may continue to result in) a reduced volume of business for these architects and structural engineers. NIST must correct the NIST WTC 7 Report in accordance with the requests stated herein before it can adequately justify increasing the cost of designing and constructing buildings. In so doing, NIST can redress the injury to the business of these architects and structural engineers.

Furthermore, these architects and engineers, along with their professional colleagues, suffered, and continue to suffer, damage to their professional reputation due the inaccurate, unreliable, and biased information contained in the NIST WTC 7 Report, which claims that WTC 7 collapsed under design load conditions, leading to the perception that members of their profession were incompetent in the design of the building and thus endangered the public safety.

Finally, many of these architects and structural engineers also suffer an informational injury because they have devoted considerable time, energy, and resources to studying the cause of the collapse of WTC 7 and educating their colleagues about their findings. Their legitimate research into the collapse of WTC 7 has been hindered by NIST's dissemination of the inaccurate, unreliable, and biased information in the NIST WTC 7 Report. Correction of the NIST WTC 7 Report as set forth herein is the only way their informational injury can be rectified.

C. Architects & Engineers for 9/11 Truth, Inc.

Architects & Engineers for 9/11 Truth, Inc., (AE911Truth) is a 501(c)(3) non-profit organization of architects, engineers, and affiliates dedicated to establishing the truth about the events of September 11, 2001. It pursues its mission by conducting research and educating the public about the scientific evidence related to the destruction of the three World Trade Center towers and by working with victims' families and other concerned citizens and groups to advocate for a new investigation. Today, AE911Truth represents 3,280 architects and engineers who have signed its petition calling upon the U.S. Congress to open a new investigation. AE911Truth, through its thousands of donors, is responsible for funding the recently completed University of Alaska Fairbanks computer modeling study of WTC 7 that is cited throughout this Request and attached hereto.

AE911Truth is affected by the NIST WTC 7 Report because its mission of establishing the truth about the events of September 11, 2001, has been severely hindered by the inaccurate, unreliable, and biased information contained in the NIST WTC 7 Report. AE911Truth has been further injured by the NIST WTC 7 Report because NIST had access to virtually all of the available evidence during its investigation, much of which was withheld from the public or otherwise not available in the public domain. Therefore, AE911Truth has been forced to rely heavily on NIST and the NIST WTC 7 Report for information and analysis of evidence to which it has no access, such as the WTC 7 steel currently in the possession of the Worcester Polytechnic Institute, which NIST neglected to examine. Finally, AE911Truth and many of the architects and engineers it represents have been injured in the form of the reputational damage caused by the NIST WTC 7 Report rendering them "skeptics" or "conspiracy theorists" for expressing legitimate scientific doubt about the findings of the NIST WTC 7 Report (*see* "Fires, Not Explosives, Felled 3rd Tower on 9/11, Report Says," *The New York Times*, 8/21/08). Correction of the NIST WTC 7 Report as set forth herein is the only way the injuries done to AE911Truth and the many architects and engineers it represents can be rectified.

VII. CONCLUSION

For all of the foregoing reasons, we, the undersigned Requesters, respectfully request that NIST correct the NIST WTC 7 Report and the NIST WTC 7 FAQs in accordance with the requests contained herein. NIST is hereby reminded that if it does not take corrective action on one or more requests made herein, it must provide a "point-by-point response to any relevant data quality arguments contained in the request." (*See* NIST IQS, Part III(C)(3).) If no such point-by-point response is given to Requesters, NIST will have denied this Request in an arbitrary and capricious manner. Furthermore, Requesters again remind NIST that it has a statutory duty to explain the cause of the collapse of WTC 7. Please honor the names of those who perished in the World Trade Center on 9/11 and heed this reasonable request for the NIST WTC 7 Report to comply with the DQA, the OMB Guidelines, and the NIST IQS.

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ENCLOSURES

Exhibit A

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Exhibit B

Declaration of André Rousseau, Applied Geophysicist

André Rousseau CV

Exhibit C

Email from NIST public affairs officer Michael Newman to David Cole dated October 25, 2013

Exhibit D

Table: Expansion of Beam K3004 vs. Temperature

Exhibit E

Documentation Indicating WTC 7 Steel Shipped to NIST

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