

## Declaration of Ronald H. Brookman

1. My name is Ronald H. Brookman. I am a licensed Structural Engineer in the state of California. My education includes Bachelor of Science and Master of Science degrees in Civil/Structural Engineering from the University of California at Davis. My professional experience includes over 35 years of analysis, design, evaluation and rehabilitation of commercial buildings, including numerous steel structures.
2. I have studied the World Trade Center (WTC) tragedy extensively since 2007, with a primary focus on the structural aspects of WTC 7 since the final NIST reports NCSTAR 1A, 1-9 and 1-9A were released in 2008. NIST was responsible for establishing the likely cause of the building failure.
3. Licensed professional engineers are charged with safeguarding life, health, property and public welfare. I take this obligation seriously and have thus dedicated countless hours to understanding the failure of WTC 7. My study is strictly research-oriented and not speculative. I have no interest in simulating building collapses or devising ways to destroy buildings, a concern cited by NIST as the basis for its finding that disclosing certain data related to its WTC 7 investigation “might jeopardize public safety.” (Gallagher 2009)
4. I have made numerous attempts to communicate my technical questions and concerns with NIST. My inquiries include Freedom of Information Act (FOIA) requests 09-49, 09-50, 10-037, 11-209, 12-009, and 2014-001436 as well as correspondence with NIST Director Patrick Gallagher and Senior Communications Officer Michael Newman in 2010.
5. Several of my FOIA requests resulted in the release of original design and construction drawings of WTC 7. These drawings enabled me and others to independently review critical framing members and connections in the undamaged, pre-fire state. Independent verification is an integral part of science and is required to validate the complex NIST analysis.
6. FOIA request DOC-NIST-2014-001436 (attached) was submitted on 7/21/2014. My request for information regarding the omission of stiffeners in the NIST analysis was denied on 9/22/2014. I appealed on 10/1/2014. The appeal was denied on 6/25/2015. I have never received a statement from NIST regarding the omission of stiffeners.
7. Ethical standards require professional engineers to be objective and truthful in reports, statements and testimony; all relevant information shall be included in reports, statements and testimony. Significant omissions constitute a violation of these ethical standards.
8. Relevant information was omitted from NIST’s NCSTAR 1-9 report. This includes the bearing stiffeners shown on Frankel Steel drawing 9114 that were typical at floors eight through 21. These stiffeners were omitted from the analytical models of the seated-beam connection at floor 13 that was allegedly responsible for collapse initiation.
9. The most recent explanation from NIST for omitting the stiffeners was in NIST’s 8/28/2020 response, signed by Catherine Fletcher, to the 4/15/2020 request for correction,

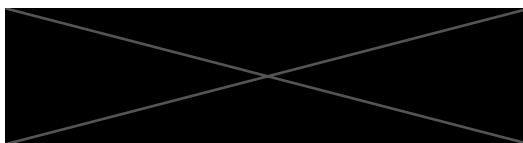
which I joined as a requester. Her letter to Mr. Ted Walter states “*Girder A2001 did not experience any deformation of its web or flange elements at the seated connection to Column 79 in the absence of web stiffeners [in NIST’s preliminary analysis of the northeast corner floor system]. Therefore, the web stiffener was not needed to prevent web or flange buckling or bending in the 16-story ANSYS model.*” I agree that web and flange buckling were not failure modes. Flange bending, however, provided justification for the loss of vertical support for girder A2001 at column 79. This was clearly stated in NCSTAR 1-9 on page 488: “... *when the web was no longer supported by the bearing seat, the beam was assumed to have lost support, as the flexural stiffness of the bottom flange was assumed to be insufficient for transferring the gravity loads.*” The same assumption was clearly stated on page 112 of the January 2012 Journal of Structural Engineering published by ASCE: “... *the flexural stiffness of the bottom flange was assumed to be insufficient to transfer the gravity loads.*” This statement implies a loss of vertical support for a critical girder and its tributary floor area was assumed based on the pretense of a bottom-flange bending failure even though the flange was stiffened to prevent such a failure. NIST’s omission of stiffeners still has not been justified, and the preceding statement by Ms. Fletcher is inconsistent with NCSTAR 1-9 and the ASCE technical paper (McAllister 2012).

10. I must conclude that the NIST authors cannot justify the assumption that collapse initiation resulted from the flange bending and lateral walk-off failure of girder A2001 at column 79. NIST has provided incomplete and misleading responses—or no responses—to serious technical inquiries regarding this failure mechanism.
11. Detailed independent analyses conducted and reported by researchers at the University of Alaska Fairbanks clarified many questions that NIST has refused to address. These comprehensive studies (Hulsey 2020) arrived at different conclusions from the NIST studies regarding the collapse initiation and the global collapse, including that the stiffeners would indeed prevent flange bending and lateral walk-off failure of girder A2001 at column 79.
12. My trust in the research and publishing institutions involved (NIST and ASCE) has significantly eroded as a result of what I consider unethical conduct surrounding obvious errors and omissions in the reports in question.

I, Ronald H. Brookman, hereby swear under penalty of perjury that the preceding statements are true and correct to the best of my knowledge.



Ronald H. Brookman, S.E.  
January 29, 2022



July 21, 2014

Catherine S. Fletcher, FOIA & Privacy Act Officer  
National Institute of Standards and Technology  
100 Bureau Drive, STOP 1710  
Gaithersburg, MD 20899-1710

Re: Freedom of Information Act Request, 5 U.S.C. § 552

Dear Ms. Fletcher:

On March 19, 2012 I requested all available public information under the control of NIST regarding ten questions related to the 7 World Trade Center (WTC 7) collapse initiation outlined in Chapters 8 and 11 of NIST NCSTAR 1-9.<sup>1</sup> You forwarded my request to the Engineering Lab for a response, and the request was not assigned a FOIA log number. Most of my questions were never answered.

I recently learned that others with similar questions have received responses from NIST to two or more of the questions that were not answered in June 2012 when the WTC Investigation Team updated the errata file and FAQs for WTC 7. Does this mean new information was found or developed by NIST in the last two years?

The recent responses originated from Michael Newman in the Public and Business Affairs Office<sup>2</sup> and from Jim Schufreider in the Congressional and Legislative Affairs Office.<sup>3</sup> These two responses are neither correct nor germane to the question of flange stiffness and strength—questions 4 and 9 in my letter dated 3/19/12, and they are invalid from the standpoint of a scientific inquiry into the collapse mechanism.

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<sup>1</sup> Therese P. McAllister et al., NIST NCSTAR 1-9, Structural Fire Response and Probable Collapse Sequence of World Trade Center Building 7, Washington: U.S. Government Printing Office, November 2008.

<sup>2</sup> Michael Newman, Public Affairs Officer. "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." October 25, 2013.

<sup>3</sup> Jim Schufreider, Director, Congressional and Legislative Affairs Office. "NIST detailed structural analysis of the girder in question indicated that web buckling did not occur under the combined effects of gravity loads and fire. Because there was no web buckling of Girder A2001, NIST did not consider the web stiffeners as a factor in the final NIST analyses." July 11, 2014.

The bearing stiffeners shown on Frankel Steel drawing 9114 prevent flange local bending as well as web local yielding, web local crippling, and web sidesway buckling. The lateral walk-off and removal of critical framing members from the ANSYS model was *assumed* based on the pretense of a girder flange local bending failure;<sup>4</sup> the stiffeners were therefore required to be included in the analysis.

I repeat my question and my request.

The ANSYS model for the seated-beam connection at column 79 shown in Figure 11-15<sup>5</sup> did not account for the presence of bearing stiffeners shown in Frankel Steel drawing 9114. A lateral displacement of 5 ½ inches<sup>6</sup> or 6 ¼ inches<sup>7</sup> would not cause a loss of vertical support with the stiffeners in place. NIST assumed that the girder flange would yield in flexure when the girder web moved past the edge of the bearing seat. Why were these stiffeners omitted from the 16-story ANSYS model when they obviously affect the bending stiffness and strength of the girder bottom flange?

I understand that you are not required to create a record that does not exist; I am requesting all available information in NIST's possession related to this question and the decisions that NIST has made in relation to it including written correspondence, meeting minutes, calculations, etc. If you decide to forward this to the Engineering Lab again, then I respectfully request a technical response signed by a licensed engineer qualified to address the question in a professional and scientific manner.

This inquiry is made for a scholarly purpose; it is not for any commercial use. Thank you for your consideration.

Sincerely,  
Ronald H. Brookman, SE

Cc: Dr. Willie E. May, Acting NIST Director  
Dr. Howard H. Harary, Acting Director, Engineering Laboratory

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<sup>4</sup> McAllister et al., p. 488. "Gravity shear loads in a beam were transferred to the bearing seat primarily in the proximity of the web on the bottom flange. Therefore, when the web was no longer supported by the bearing seat, the beam was assumed to have lost support, as the flexural stiffness of the bottom flange was assumed to be insufficient for transferring the gravity loads. Under such conditions, the beam was removed."

<sup>5</sup> McAllister et al., p. 483.

<sup>6</sup> McAllister et al., p. 482.

<sup>7</sup> McAllister, Therese P. (2009) Errata for NIST NCSTAR 1A, NIST NCSTAR 1-9, and NIST NCSTAR 1-9A, Federal Building and Fire Safety Investigation of the World Trade Center Disaster: Structural Fire Response and Probable Collapse Sequence of World Trade Center Building 7, January 30. Updated June 27, 2012.