

**Federal Building and Fire Safety Investigation  
of the World Trade Center Disaster**

**National Construction Safety Team  
Advisory Committee Meeting**

**Response to Public Comments - Project 6**

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John L. Gross, Ph.D., P.E. and Therese McAllister, Ph.D., P.E.

**Building and Fire Research Laboratory  
National Institute of Standards and Technology  
U.S. Department of Commerce**

[John.Gross@nist.gov](mailto:John.Gross@nist.gov)

# Statistics

## Comments

## Submitter

65

Code, Trade, and Professional Organizations

105

Industry

18

Individuals

# Statistics

Comments received - 188

Report	Clarification	Technical	Editorial	Total
1	31	11	4	46
1-6	72	7	10	89
1-6A	9	1	3	13
1-6B	7	0	5	12
1-6C	6	0	0	6
1-6D	6	16	0	22
	131	35	22	<b>188</b>

# Nature of Comments

## Clarification

1. Wind measurements to support neglecting of wind in analyses
2. Factors other than debris that may have affected SFRM impact damage (primer, jet fuel, etc.)
3. Validation of creep models
4. Concrete slab role and models in composite floor behavior
5. Fires used for components and subsystem analyses
6. Basis for 10 min analysis intervals for structural response to fires
7. Major subsystem and global modeling approach for floor-exterior wall interaction
8. Description of events after collapse initiation
9. Role of thermal expansion and cooling phase in structural response to fires
10. Standard Fire Test floor assembly – use of AISC standards, concrete strength and weld design
11. Use of heat flux and temperature measurements in Standard Fire Tests

# Nature of Comments

## Technical Issues

- ❑ Comments provided with technical justification
  - Measured thickness of SFRM before 11 September 2001
- ❑ Comments that were general in nature
  - Extent of SFRM damage
  - SFRM damage was source of events leading to collapse
  - Extent of floor sagging with SFRM in place
  - Validity of collapse hypothesis
  - Alternative hypotheses with regard to blasts or controlled demolition

# Significant Changes to NCSTAR 1

- ❑ Explained/clarified role of thermal expansion in structural response
- ❑ Explained/clarified the use of SFRM thickness measurements in estimating the as installed and upgraded thicknesses
- ❑ Addressed sequence of events following collapse initiation
- ❑ Addressed alternative hypotheses (leading to the addition of a principal finding)

# Significant Changes to NCSTAR 1-6

- ❑ Added justification for neglecting wind effects based on NOAA wind speed data recorded at surrounding airports on 9/11
- ❑ Expanded discussion of extent of SFRM damage due to debris impact
- ❑ Referenced NCSTAR 1-3D for validation of creep model
- ❑ Explained/clarified modeling of concrete slabs
- ❑ Referenced NCSTAR 1-5G for basis of temperature data at 10 min intervals
- ❑ Explained/clarified approach for floor-exterior wall interaction for major subsystem and global analyses

# Clarification to Findings

- NIST found no corroborating evidence for alternative hypotheses suggesting that the WTC towers were brought down by controlled demolition using explosives planted prior to September 11, 2001. NIST also did not find any evidence that missiles were fired at or hit the towers. Instead, photos and videos from several angles clearly showed that the collapse initiated at the fire and impact floors and that the collapse progressed from the initiating floors downward, until the dust clouds obscured the view.

# Significant Changes to Technical Reports

## NCSTAR 1-6A

- ❑ Explained procedure for determining thickness of “as installed” SFRM
- ❑ Added new appendix with results of ballistic impact tests on SFRM coated steel members and gypsum board enclosures

## NCSTAR 1-6B

- ❑ Clarified procedure for designing MIG welds to duplicate strength of resistance welds used in original fabrication
- ❑ Clarified that “furnace temperature measurements” were “furnace control temperature measurements”
- ❑ Expanded discussion of radiation (heat flux) measurements, the observed differences in heat flux between furnaces, and the affect of this difference on reproducibility (added to list of “issues requiring further study”)