

**National Institute of Standards and Technology
National Construction Safety Team Investigation of the June 24, 2021
Champlain Towers South (CTS) Condominium Partial Collapse in Surfside, FL
INTERVIEW GUIDE COMPONENT 4: CTS STRUCTURES SPECIALIST**

**OMB Control #0693-0078
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[PENDING OMB APPROVAL]**

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Do you have any questions for us? May we proceed with the interview?

1.1. INTERVIEWEE BACKGROUND AND SECTION ASSIGNMENT

We'd like to begin the interview with a few quick questions to understand your experience with the collapse of Champlain Tower South.

1.1.1. Please tell us about your professional background.

1.1.2. What USAR task force did you work in?

1.1.3. Please describe your role at the collapse site.

1.1.4. What dates were you on the site (e.g., from month/day/year to month/day/year)?

Ask Question 1.1.5 if we do not have a copy of the interviewer's logs of dates/times/activities

Skip to Question 1.1.6 if we do have a copy of the interviewer's logs of dates/times/activities

1.1.5. Did you keep logs of your dates/times/activities at the site?

If YES, ask for a copy of the logs.

If NO, skip to Question 1.1.6.

1.1.6. Please describe to the best of your ability the portions of the collapse pile you personally worked upon at the site [*show the collapse pile visual here*].

1.1.7. Did you have a chance to observe/participate in NIST's physical evidence identification, tagging, and/or collection efforts at the CTS site?

Use the table below for assigning sections to the USAR Structures Specialist

<i>Stakeholder Status</i>	<i>Relevant Sections</i>
Those who participated in NIST's physical evidence collection	1.2, 1.3, 1.4, 1.5
Those who did not participate in NIST's physical evidence collection	1.2, 1.4, 1.5

1.2. CTS BUILDING CONDITION (POST-COLLAPSE)

Thank you for providing this information. Now, we will move into a more in-depth conversation your observations at the CTS collapse site. Please keep in mind that we are here mainly to listen to you. Feel free to tell us what happened, without waiting for us to ask questions. Please report everything, even if it seems irrelevant. We understand that it may be difficult to remember some details, but we will be working together to help you recall them. If you cannot remember specifics, that is fine too. You can let us know that "you don't recall" or "you are not sure."

- 1.2.1. Please try to put yourself back in the same frame of mind as when you saw the collapse site. Take your time and think about your surroundings. Think about your initial thoughts of seeing Champlain Towers South.... Think about any later thoughts....Now tell us in as much detail as possible everything you remember about your experience of being at the collapse site.
- 1.2.2. Please tell us about what you think is important for us to know about the collapsed section of the building.
- 1.2.3. How about the still standing (alpha) section? What do you think is important for us to know about that section of the building?
- 1.2.4. Prior to the implosion of the still standing section, were you involved in monitoring the plumbness of the alpha section?

IF YES, continue.

If NO, skip to Question 1.2.5.

- 1.2.4.1. How did you perform that monitoring (e.g., using a theodolite or similar instrument or some other method)?

IF YES, continue.

If NO, skip to Question 1.2.5.

- 1.2.4.1.1. What did you observe and/or record about the condition of the alpha section, including its plumbness? Please explain.

- 1.2.5. Please tell us about what stood out to you as surprising, unusual or that did not look right about either the collapsed or the still standing (alpha) section of the building.

- 1.2.6. Was there any piece of evidence that stood out to you as notable while working at the collapse site?

If YES, continue.

If NO, skip to Question 1.2.7.

- 1.2.6.1. Please tell us more about this piece of evidence.

- 1.2.6.2. Let's mark the location of this piece of evidence [*the interviewer shows the relevant map*].

- 1.2.7. Have you observed any differences between the building's design drawings and the as-built conditions?

If YES, continue.

If NO, skip to Question 1.2.8.

- 1.2.7.1. What were the differences you observed with respect to the dimensions and detailing of columns, beams, and slabs?

- 1.2.7.2. What were the differences you observed with respect to the plaza/pool deck slab?

1.2.7.3. What were the differences you observed with respect to the collapsed portion of the tower?

1.2.7.4. How about the underground parking garage? Did you observe any differences there?

Next, we would like to hear about what you observed in terms of the construction and the condition of the building and the concrete.

1.2.8. While working at the collapse site, did you notice anything unusual about the condition of the building?

If YES, continue.

If NO, skip to Question 1.2.9.

1.2.8.1. Please tell us what you noticed in as much detail as possible.

1.2.9. Did you notice anything unusual about the construction of the building?

If YES, continue.

If NO, skip to Question 1.2.10.

1.2.9.1. Please tell us what you noticed in as much detail as possible.

1.2.10. While at the collapse site, what were your observations with respect to concrete quality? Please explain in as much detail as possible.

1.2.11. Were there places where the concrete composition and strength seemed normal to you and other places where it might have been weak, friable, or damaged?

If YES, continue.

If NO, skip to Question 1.2.12.

1.2.11.1. Let's start with your first observation. Please be as specific as possible as you describe what you observed in terms of the concrete composition and strength.

1.2.11.2. What type of element (beam, column, slab, etc.) did you make this observation on?

1.2.11.3. Please tell us what you remember about the location of your observation at the collapse site [*the interviewer uses the relevant visual here and asks the interviewee to refer to column grid lines*]?

1.2.11.4. Where in the depth of the collapse pile was the structural element for which you made this observation (e.g., floor level of the tower)?

1.2.11.4.1. If this element had collapse pile on top of it, please describe the pile on top of it.

1.2.11.4.2. If this element was excavated prior to your observation, please tell us what you remember about the excavation.

1.2.11.5. Do you recall any blue specimen number marking on the element?

If YES, continue.

If NO, skip to Question 1.2.11.6.

1.2.11.5.1. Did you make any notes or take photos or videos on your observations?

If YES, tell the interviewee that "We would appreciate if you could share those notes, photos, or videos with us."

If NO, continue.

1.2.11.6. Can you please elaborate more on your observation? What aspects of your observation led you to that impression of the condition of the concrete (e.g., the visual condition of the concrete, holding or attempting to crush the concrete in hand, coring, sawing, lifting or moving a specimen)?

1.2.11.7. What type of equipment was used for lifting and moving the specimen?

The interviewer moves on to the next observation, if any, after finishing discussing the first observation and repeats questions 1.2.11.1-1.2.11.7 for each observation on concrete quality

1.2.12. What were others' overall impressions of the condition of the concrete at the collapse site?

We also would like to have a discussion on signs of distress, damage, and/or deterioration.

1.2.13. What were your observations with respect to any corrosion of reinforcing steel at the collapse site?

1.2.13.1. Did you observe any spalled concrete with corroded rebars?

IF YES, continue.

If NO, skip to Question 1.2.14.

1.2.13.1.1. Where did you observe spalled concrete with corroded rebars?

1.2.13.1.2. In which collapse pile elements (e.g., slabs, columns, beams) did you observe spalled concrete with corroded rebars?

1.2.13.1.3. Describe your corrosion observations in each pile element.

1.2.13.1.4. In which column, slab or beam rebars did you notice significant corrosion?

1.2.14. While at the collapse site, did you observe any cracking (restraint, flexural, shear) in structural elements?

IF YES, continue.

If NO, skip to Question 1.2.15.

- 1.2.14.1. Please describe the cracks you observed.
- 1.2.14.2. Where did you observe significant cracking?
- 1.2.14.3. In which building collapse pile elements (e.g., slabs, columns, beams) did you observe significant cracking?
- 1.2.15. What were your observations on efflorescence or other signs of water penetrations?

Now we would like to talk about your observations of the failure modes in the pool deck area and into the southern portion of the building.

- 1.2.16. What were your observations on failure mode(s) in the pool deck?
- 1.2.17. What did you observe about the behavior of the pool deck slab, especially around the underground garage columns?
- 1.2.18. Please share your observations about any rebar fractures in the pool deck slab.
- 1.2.19. What were your observations on the connection of the pool-deck slab-to-southern basement wall connection?

Next, we focus on the area between Line 11.1 and Line 8 [the interviewer points out to the structural drawing].

- 1.2.20. Are you familiar with this area?

If YES, continue.

If NO, skip to Question 1.2.27.

- 1.2.20.1. Please tell us what you remember about the structural elements in this area (e.g., columns, beams, slabs).
- 1.2.21. Did you see any signs or portions of columns I-11.1, J-11.1, K-11.1, L-11.1, M-11.1 or N-11.1 while you were at the site?

If YES, continue.

If NO, skip to Question 1.2.22.

- 1.2.21.1. Please tell us about your observations.
- 1.2.22. Did you see any signs or portions of Beams A and drop beams between Lines 11.1 and 9.1 [the interviewer points out to the structural drawing]?

If YES, continue.

If NO, skip to Question 1.2.23.

- 1.2.22.1. What were your observations?
- 1.2.23. How about the slab near Beams A? Please share your observations on the slab near Beams A.

1.2.24. Did you see any signs or portions of basement and first floor columns on Line 9.1 or Line 8 [*the interviewer points to the structural drawing*]?

If YES, continue.

If NO, skip to Question 1.2.25.

1.2.24.1. Please explain what you observed (crushed concrete, buckled visible rebars, positions of rebar cages, etc.).

1.2.24.2. Were any of the columns tilted in this area?

If YES, continue.

If NO, skip to Question 1.2.25.

1.2.24.2.1. Please describe these columns.

1.2.25. Did you have a chance to observe column K.9.1?

If YES, continue.

If NO, skip to Question 1.2.26.

1.2.25.1. Please describe your observations on this column.

1.2.25.2. Was column K.9.1 tilted?

Next, we focus on the basement columns under the portion of the tower that collapsed [the interviewer points out to the structural drawing].

1.2.26. Did you observe any of the columns in this region?

If YES, continue.

If NO, Skip to Question 1.2.27.

1.2.26.1. Please tell us about your observations on the columns in this region.

1.2.26.2. Please describe the reinforcement details you noticed in this region (unusual reinforcement, deterioration, position of rebar cages).

1.2.26.3. What were your observations regarding the reinforcing steel and concrete?

1.2.26.4. What were your observations regarding the materials used?

1.2.26.5. How about your observations regarding consolidation (e.g., poor consolidation)?

1.2.26.6. What were your observations regarding the failure modes for these columns (e.g., concrete crushing, the appearance of longitudinal reinforcement after failure, etc.)?

We will now talk about the signs of distress, damage, and/or deterioration you may have noticed on or around the basement/foundation slab and/or basement wall.

1.2.27. Tell us about your observations on the condition of the basement slab.

1.2.28. Did you notice extensive or unusual cracking in the basement slab?

If YES, continue.

If NO, skip to Question 12.1.29.

1.2.28.1. Please explain where you noticed extensive or unusual cracking in the basement slab.

1.2.29. Did you notice punching failure for the columns, through the foundation slab or through the basement roof slab?

If YES, continue.

If NO, skip to Question 1.2.30.

1.2.29.1. Where did you notice punching failure?

1.2.30. What was the condition of the column-to-basement slab connections?

1.2.31. What were your observations on spalled concrete or corrosion at the base of columns in the basement?

1.2.32. Did you notice any potential instabilities in the collapse pile that represented a safety concern for the first responders?

If YES, continue.

If NO, skip to Question 1.2.33.

1.2.32.1. Please describe your observations about these potential instabilities in detail.

1.2.33. Please describe the water level you observed in the basement area.

1.2.33.1. What was the water level (e.g., above the bottom of the pool, above the bottom portion of the garage, above the columns)?

1.2.33.2. What was the approximate elevation of the water on the columns?

1.2.33.3. How did these observations of water level change with time and location in the basement area?

1.2.34. In the parking garage, did you notice any differences in the integrity of concrete above and below the elevation of the water on the columns?

If YES, continue.

If NO, skip to Question 1.2.35.

1.2.34.1. Please describe what you noticed in as much detail as possible.

1.2.35. Please share with us your observations on the condition of the basement wall.

1.2.35.1. Have you noticed any differences along the north, east, west of south walls?

If YES, continue.

If NO, skip to Question 1.2.36.

1.2.35.2. Please explain what you noticed.

1.2.36. What were your observations about water on the basement slab or basement walls?

1.2.37. Did you observe any water leaking through the basement slab or basement walls?

If YES, continue.

If NO, skip to Question 1.2.38.

1.2.37.1. Please share your detailed observations (e.g., where).

1.2.38. Did you see any sand flowing in with water at any locations at the site (e.g., through basement slab or basement walls, along plaza pavers)?

If YES, continue.

If NO, skip to Question 1.2.39.

1.2.38.1. Please share your observations on this.

1.2.39. Did you observe any exposed portion of the basement wall that provided insights into the building's construction method?

If YES, continue.

If NO, skip to Question 1.2.40.

1.2.39.1. Please share your observations on this portion of the basement wall.

1.2.40. Were you privy to any indications of any stray electric current present at any point when you were at in the basement of the collapse site?

If YES, continue.

If NO, skip to Question 1.2.41.

1.2.40.1. How did you identify it?

1.2.40.2. What did you learn about the stray electric current present there?

- 1.2.40.3. Are you aware of any efforts to mitigate stray electric current?

Next, we would like to ask about the superimposed dead loads in-place at the time of collapse, the amount of concrete fill at various locations in the plaza/pool deck slab, and anything found among the debris that might have applied (live) load to the plaza/pool deck slab.

- 1.2.41. Please share your observations on the superimposed loads at the pool deck.
- 1.2.42. Did you observe any exceptional superimposed loads at the pool deck?

If YES, continue.

If NO, skip to Question 1.2.43.

- 1.2.42.1. Please tell us more about what these exceptional superimposed loads were.
- 1.2.42.2. Let's mark the location of what you observed here [the interviewer uses relevant visuals here].
- 1.2.43. Were you able to observe the make-up of the layers of the plaza/pool deck slab (e.g., structural slab --> concrete fill --> waterproofing --> concrete fill --> sand --> pavers)?

If YES, continue.

If NO, skip to Question 1.2.44.

- 1.2.43.1. What materials did you see at the plaza/pool deck slab, in layers from bottom to the top?
- 1.2.43.2. What was the average thickness of concrete fill you observed on the plaza/pool deck slab?
- 1.2.43.3. How about the maximum thickness of concrete fill you observed?
- 1.2.43.4. What was the average thickness of sand you observed in the bedding for the pavers on top of the plaza/pool deck slab?
- 1.2.43.5. How about the maximum thickness of sand you observed?
- 1.2.43.6. Did you make measurements or take photographs of the thickness of the various layers?

If YES, continue.

If NO, skip to Question 1.2.43.7.

- 1.2.43.6.1. Please describe or refer to any notes and/or photographs you may have made.

Ask if the interviewee can share these notes and/or photographs with us.

1.2.43.7. Was there anything in the layers of plaza/pool deck slab that seemed out of place (e.g., re-roofing materials)?

If YES, continue.

If NO, skip to Question 1.2.44.

1.2.43.7.1. Please explain what seemed out of place in as much detail as possible.

1.2.43.7.2. Let's mark the location of what you observed here [*the interviewer uses relevant visuals here*].

1.2.44. Did you make any other similar observations on the make-up of the layers of the plaza/pool deck slab?

If YES, repeat Questions 1.2.43.1-1.2.43.7.2.

If NO, continue.

1.2.45. Please share your observations on the planters on the top of the plaza/pool deck slab.

Next, we'd like to ask about superimposed dead loads at other parts of the building (other than the plaza/pool deck).

1.2.46. Can you provide any details of the walls, interior slabs and fill, and interface with toppings?

1.2.47. What were your observations of superimposed dead loads placed on roof slabs (insulation, roof membrane, gravel, mechanical equipment, etc.)?

1.2.47.1. What were your observations of interior finishes at the CTS building?

1.2.47.2. Did you observe any multi-layer interior finishes (e.g., tile on top of tile on top of linoleum)?

1.2.48. What were your general observations on the following?

- The main floor of the common area on the first floor
- In-unit interior floors (What was more common? What were the exceptions?)
- Balconies
- Drives and first level parking areas.

Next, we would like to talk about your impressions of how the building failure might have initiated and spread into the building. If you are not sure, that is perfectly fine. Just let us know.

1.2.49. Based on your experiences at the collapse site, where do you think the collapse may have initiated?

1.2.50. Can you please elaborate on how you formed this impression on collapse initiation?

1.2.51. Did you have any thoughts about how the collapse may have spread after initiating there?

If YES, continue.

If NO, skip to Question 1.2.52.

- 1.2.51.1. Please tell us about how you think the collapse may have spread after initiating there.
- 1.2.51.2. Can you please elaborate on how you formed this impression on collapse progression?
- 1.2.52. Do you have any thoughts about what might have caused or contributed to the failure of the building?

If YES, continue.

If NO, skip to Questions 1.2.53.

- 1.2.52.1. Please share these thoughts with us in as much detail as possible.
- 1.2.52.2. Please elaborate on how you formed this impression on factors that caused and/or contributed to the collapse.
- 1.2.53. Do you recall your conversations with others at the site about how the collapse initiated and spread into the building?

IF YES, continue.

If NO, skip to the next section.

- 1.2.53.1. Please tell us about these conversations in as much detail as possible.
- 1.2.53.2. Where did they think the collapse initiated?
- 1.2.53.3. What were their impressions of how the collapse progressed?

1.3. PHYSICAL EVIDENCE IDENTIFICATION, TAGGING AND COLLECTION EFFORTS

We now would like to have a conversation about the physical evidence collection processes at the site.

- 1.3.1. Please share your overall reflections on working with NIST on evidence identification, tagging, and collection efforts.
 - 1.3.1.1. What aspects of evidence identification, tagging, and collecting evidence worked well?
 - 1.3.1.2. What were the main challenges faced in identifying, tagging and collecting evidence?
 - 1.3.1.3. What would be your recommendations for enhancing physical evidence identification, tagging, and collection efforts in building collapse sites?

1.3.2. Were you at the collapse site during the demolition of the still standing section of the building?

If YES, continue.

If NO, skip to Question 1.3.3.

1.3.2.1. In what ways, if any, do you think the demolition of the still standing section impacted the evidence identification, tagging, and collection efforts?

1.3.2.2. Was the tarp/cover effective in protecting evidence during the demolition of the still standing section?

1.3.2.3. What were the measures taken to prevent mis-categorization of alpha specimens as collapse-side specimens or vice versa?

1.3.2.4. Do you think despite these measures, some specimens from the still standing section were miscategorized as collapse-side specimens? Please explain.

1.3.3. Please let us know if you have any suggestions on how NIST can improve its interactions with those who were at the collapse site while identifying, tagging and collecting evidence.

1.4. STAKEHOLDER FEEDBACK ON THE GOVERNMENT'S RESPONSE TO THE COLLAPSE

We now would like to hear from you on the government's role in responding to and preventing calamities like the collapse of the CTS building.

1.4.1. We would love to hear your perspectives on the government's response to the collapse of the CTS building.

1.4.1.1. What aspects of the government's response to the collapse of the CTS building worked well?

1.4.1.2. What were the main challenges faced during the response to the collapse of the CTS building?

1.4.1.3. What might be helpful in terms of addressing the challenges faced during response to a building failure of a similar nature?

Depending on the interviewee's background/experience, ask about different aspects of response such as evacuation, search and rescue.

1.4.2. What are your recommendations for federal, state and local governments on how to respond to events of this nature in the future?

1.4.3. In your opinion, how can the government (at federal, state and local levels) help prevent future calamities such as the one witnessed in Surfside?

1.4.4. Is there anything else that you think we should study further? Or any other questions we should be focusing on?

1.5. WRAP UP & FUTURE STEPS

1.5.1. Is there anything we have not yet discussed but is important for us to know about?

1.5.2. We welcome submissions of data including photos, video and other documentation associated with the collapse of CTS. Do you have any additional photos, videos, or other information (e.g., field notes) that you would like to share with us?

1.5.3. Do you have _____ about the following [*the interviewer may ask about specific materials*]?

If YES, continue.

If NO, wrap up the interview.

1.5.3.1. Would you be able to share these with us? Y/N

Those are all the questions we have. The valuable information you provided will help our engineers and scientists improve building safety. Thank you so much for taking the time to talk with us.

After the formal interview ends, you may remember new details or notice new things about the issues we discussed today. Please feel free to reach out back to us to share that information. We are eager to continue this conversation with you.