



Understanding The Potential Causes Of The Florida Building Collapse

NPR's Leila Fadel asks structural engineer and University of Central Florida professor Necati Catbas about the building collapse in Surfside, Fla.

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LEILA FADEL, HOST:

Crews are continuing to work at the site of the collapse in Surfside. That's the town in Florida just north of Miami Beach where half of a condominium block collapsed before dawn on Thursday. Champlain Towers South was completed in 1981, 12 stories of structural concrete on top of pilings. Necati Catbas is a structural engineering professor at the University of Central Florida. He studies structural failures and joins us now from Orlando. Welcome.

NECATI CATBAS: Thank you very much for hosting me.

FADEL: So what does the way this building fell tell you about what may have caused this?

CATBAS: Yeah, I suspect something to do with the foundation because of the type of failure that we see, which we call pancake failure. This is really a progressive failure of all these stories on top of each other.

FADEL: Right. So in the video, it actually does look like a pancake the way it fell.

CATBAS: Yes, yes.

FADEL: Have methods or requirements changed much since 1981 when it comes to building structures?

CATBAS: I wouldn't say the age is a very, very big factor. But, of course, our technologies have evolved. Now we have much better computational power, data for the material that we are using.

FADEL: Now, there's been a lot of attention paid to settling. A study published last year found parts of the Miami Beach area subsiding a few millimeters a year mainly where there had been wetlands. There's a 58-story building in San Francisco, the Millennium Tower, that sunk 18 inches since it was completed in 2008. So how concerned are you about big buildings like this settling after they're completed?

CATBAS: It's not something new. And it becomes more of a problem with shorelines. And when you build high-rise buildings, you have to support them with special foundations. You have to excavate a lot of soil. But not only are you excavating that area. You're also affecting the nearby areas. But, you know, soil is one of the structural elements that have the highest uncertainties.

FADEL: How likely is it that we might see something like this happen again?

CATBAS: To mitigate these type of failures, we have to basically classify which buildings pose these type of risks in terms of their location, age, the type of construction. You have much more advanced technologies not only for the design of the structures but also for the assessment of the structures. Maybe we should utilize these technologies more to help the engineers.

FADEL: So possibly, assessing buildings could prevent something like this?

CATBAS: Yes, yes. And if you use technologies, you can proactively track and monitor these structures. And if there is, for example, a settlement, you don't have to wait for the next inspection but continuously gives us information, so we can make decisions in a more informed manner.

FADEL: What are the steps that engineers go through when investigating structural failures? And how long do you think this investigation will take?

CATBAS: It's not going to be an overnight completion. So it will take weeks, maybe to months because the forensic engineers - they'll go to the site, and they'll start collecting evidence. And these will include the design documents of the structures, all the inspection reports, data from nearby buildings. In addition to those, they will collect evidence from the site, the material samples from concrete. And they will also look at the foundations. Once they collect all the data, all the evidence, they will probably use this in computer simulations. We are kind of trying to replicate the same failure with different parameters that we are playing with. And once we can replicate the same type of failure in the computer environment, then we know which parameters are causing this type of failure.

FADEL: That's Necati Catbas. He's a structural engineering professor at the University of Central Florida. Thank you so much.

CATBAS: Thank you for hosting me.

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