The Height of Ambition: Part Five

September 8, 2002
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he helicopter pilot was sounding a distress call. It was February 1970, a year and a half into the construction of the World Trade Center, and a tugboat strike, the longest in the city's history, was starving the project of steel. Stockpiles of the lightweight steel trusses that Robertson had ordered to hold up the floors of the twin towers were running low at the construction site, and Austin Tobin's men were flying trusses in from the New Jersey rail yards with a spiffy technological novelty, a freight helicopter called a Skycrane. But the pilots were discovering just how light and wispy the trusses were.

The harbor wind had caught one 35-foot section like a sail and was dragging the freight helicopter down. Thirty-one years and six months later, when fires broke out after the jetliners struck the twin towers, trusses like this one, the feathery branches of Robertson's exotic steel trees, would be among the first structural elements to give way and precipitate collapse. But for now, the pilot had more immediate problems. ''I'm having trouble! I'm having trouble!'' the pilot radioed, according to Jack Daly, the manager of the site for Karl Koch Erecting, whose cranes hoisted the steel into place in the towers. ''I can't control it -- I'm cutting it loose,'' the pilot said, and ditched it into the Kill Van Kull, a busy shipping channel, where it presumably still rests, somewhere deep in the silt and mud.

This wasn't the only time that high-tech innovations caused harrowing problems during construction. Fancy automated welding techniques, intended to speed up the job and save money, were an expensive failure for Koch Erecting, as they often failed to work on the huge steel legs at the very bases of the towers. Even those innovations that worked often did so only after near disasters. On the Australian-built cranes designed specially for the job -- called kangaroo cranes in part because they jacked themselves up as the towers rose -- booms crumpled, bolts anchoring the cranes to their supports blew out like musket shots and once, a 25-ton piece of steel plummeted 800 feet and tore through the basement like a meteor. The project's original budget of $280 million ballooned, eventually reaching more than $1 billion. The public pressure to keep costs down was considerable.

In the end, though, the cranes raised the towers so high that it seemed the sky would have to be torn out and lifted a smidge, like the ceiling in Yamasaki's offices in Michigan. ''We all thought it was like building the Pyramids,'' says Charles Maikish, a young Port Authority field engineer, who later directed trade-center operations. ''It was the eighth wonder of the world -- the scale of it, the size of it.'' About 3,500 construction workers labored on the project at any one time. When the twin towers were completed, they would contain almost 200,000 tons of steel, 44,000 windows and enough concrete to build a sidewalk from New York to Washington, D.C. When the job caught its stride, the buildings shot skyward, rising two or three floors every week. The steel in the central core always led the exterior walls by a few stories. The cranes, which stood in the core like praying mantises, hoisted themselves up, built another level of the steel skeleton below them and then lifted Robertson's perimeter columns into

place before linking core and exterior with the lightweight trusses.
Back when Robertson did his plane study, he overlooked the towers' resistance to fire. And now that construction was under way, the fireproofing that the Port Authority was using to protect the thin steel components only heightened the towers' vulnerability to fire. Instead of the heavy masonry that protects the steel of structures like the Empire State Building, the authority chose a newly invented lightweight, low-cost product called mineral wool, which is sprayed as a kind of slurry onto steel, where it dries and forms an insulating coating.
The idea of fireproofing is to protect a building's steel from becoming too hot and buckling if a fire breaks out. But even during construction, the spray-on material had problems staying attached to the steel of the World Trade Center. Rain would often wash the fireproofing off. When it was attached to steel that was rusty, it would flake off even without rain. The Port Authority still insists that its inspections caught the problems and that whenever fireproofing fell off, it was reapplied. But doubts about the product, which was just then coming into widespread use, never went away. It didn't help matters when it became known that the contractor charged with applying the fireproofing, Mario & DiBono Plastering, was connected to the Mafia. John Gotti was later caught on tape explaining that Louis DiBono, the company's president, had to die for the sin of disrespect. DiBono's body was found riddled with bullets in the basement parking garage of the trade center in 1990. (''He refused to come in when I called,'' Gotti explained on the tape.)
Port Authority officials have defended DiBono's work -- at least when it came to applying fireproofing. But decades later, in the mid-1990's, a Port Authority engineer named Frank Lombardi discovered that the thickness of the fireproofing on the trusses would have been inadequate to protect the steel even if it had been applied perfectly. It was only half as thick as it should have been. Whoever worked out the necessary thickness had, at best, been mistaken. Lombardi's best guess is that the faulty calculations were done by someone in the World Trade Department, a euphemism for employees who reported directly to Tozzoli. But Lombardi says that he does not know for sure.
When the north tower, the first to go up, was finally topped out on Dec. 23, 1970, it was foggy, and no one could see the view. But James Endler, the West Point grad and construction contractor who oversaw the entire job for the Port Authority, made a point of showing up at a celebration for the workers held on one of the skeletal upper floors -- the first open-air party ever to take place 1,300 feet above the street. There was a band, soda and sandwiches. But when the band played the Mexican hat dance, the construction workers started stomping in unison, and Endler -- standing next to Jack Kyle, the Port Authority's chief engineer -- began to feel odd vibrations in the structure. The floor did not seem steady. After all the wind-tunnel tests, the computer calculations, the structural innovations, had something been missed? Had the thousands upon thousands of steel parts been fitted together incorrectly?
''Jack, how do we stop that vibration?'' Endler asked.
Kyle turned to him, expressionless. ''Don't play that song anymore,'' he advised.
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