

January 30, 2008

Pouring of Concrete at High-Rise Sites Is Choreographed Like Ballet in Sky

By JOHN ELIGON

The trucks navigate a cumbersome stop-and-go route on the chaotic streets of New York. The workers — dozens of them simultaneously — move with precision, nailing wood, twisting metal reinforcements, smoothing cement and climbing narrow wooden frames on cue, hundreds of feet in the air, sometimes in the face of swirling winds. Neighboring high rises often sit a crane's whip away.

For decades, concrete workers in New York City have performed their jobs with a rugged grace.

"It's like watching a giant ballet performance," said Raymond McGuire, the managing director of the Contractors Association of Greater New York. "These guys just seem to know, by experience, where they have to be, where their fellow worker is going to be."

But the city's concrete operations have come under scrutiny recently.

After a worker fell 42 stories to his death during construction on the Trump SoHo hotel on Jan. 14, Patricia J. Lancaster, the commissioner of the Buildings Department, called concrete operations a "sore spot" for the city. Initial indications were that plywood forms holding wet concrete played a role in the accident, which is under investigation, Ms. Lancaster said.

It was the third death since 2006 related to concrete operations on a high-rise construction site in the city, according to Buildings Department data. Sixteen people have been injured during concrete operations over the past two years, according to the department. And 61 percent of the 41 instances in which material fell from high-rise construction sites last year occurred during concrete operations, Ms. Lancaster said.

Although the sheer volume of concrete construction in the city might have something to do with those figures, Ms. Lancaster said the issue was broader.

"If you couple the numbers up with the fact that the concrete operations are always taking place at the very top of high-rise buildings, with lots of loose pieces of stuff and the inability to

protect workers with guardrails at the top, it seems to be something that's worthy of some focus," Ms. Lancaster said.

On Feb. 4, the Buildings Department plans to release new safety recommendations and proposed laws to the concrete industry, Ms. Lancaster said. Though she would not give specifics, Ms. Lancaster called it "a hard-hitting package that will increase safety on concrete operations on high-rise buildings." She said it would include recommendations for new city laws that the department had been looking into even before the most recent incident at the Trump SoHo, where a stop-work order remains in place.

Several representatives of the city's concrete industry called the Trump SoHo accident a tragic aberration and said that the current system was safe. Some of them, however, were open to new safety measures.

"I would ask people to put into context that New York City contractors are still the safest in the world," said Louis J. Coletti, president of the Building Trades Employers Association. "We will clearly address issues that need to be addressed within the concrete phase of the job."

Concrete workers must be on guard against dangers, including loose materials — like wood, steel bars and wet cement — that can fall from a building, and the sometimes-tricky construction of the wooden forms in which the cement is poured.

Officials have discussed requiring engineers to inspect forms for complex floor designs before they are filled with concrete, Mr. McGuire said, because a carpenter or supervisor might not agree with a design and make modifications, he said, compromising the form's stability.

Buildings sitting close to one another pose another danger to the city's concrete workers: they must often dig under neighboring buildings and place concrete structures that connect to their own building's foundation, said Antonio Martins, the vice president for Long Island-based J&A Concrete Corporation.

But overall, people who work in the industry said, the system used for concrete construction in New York City was safe and efficient.

For more than 50 years, the city's concrete workers have been trained to follow a two-day cycle for pouring cement. It is a multifaceted process that allows for a new floor of concrete to be poured every other day, roughly twice as fast as is done in the rest of the country. The concrete typically contains chemical additives that make it dry faster. It allows the skeletons of 40-story towers to go up in less than three months.

The cycle typically starts at one of the city's roughly 40 concrete plants, all of which are outside Manhattan, before the sun comes up. After concrete is mixed and placed into a truck, it must be poured within about 90 minutes.

New York City traffic sometimes makes this deadline a nail-biter, but William Lyons, president of the Concrete Industry Board, said the batches almost always arrive on time.

As early as 7 a.m., the pouring at construction sites begins. Laborers shovel the cement out of buckets hoisted to the floor that the forms are on, and masons smooth it out. By afternoon, as the cement begins to set, carpenters and engineers are already able to stand on it, to map out and erect the wooden forms for the next level — sometimes while concrete is still being poured at another corner of that floor.

The next day, reinforcement bars, electrical conduits and plumbing pipes that will be encased in concrete are installed on that next level, and the forms are ready for the fresh batch of concrete scheduled to arrive the following morning. When bad weather does not slow things down, "It's quite an orchestra," said Robert A. Ledwith, the business manager for Metallic Lathers Local 46, the union whose membership includes people who install rebar.

But the process is not always perfect. In 1997, during construction of one the buildings at Trump Riverside South, a concrete subcontractor ignored an engineer's warning and poured concrete that was deemed too weak to support the floors above it. After a city inspector discovered the faulty concrete, workers had to replace concrete slabs above and below dozens of columns on one floor.

Joseph DePaola of DIC Concrete in New York created the two-day cycle in 1950, according to Concrete Construction Magazine. The cycle allowed buildings with concrete structures to go up faster than those made of steel, Mr. Ledwith said, and helped make concrete a common choice for many high-rise developers.

But the system is not universally accepted in the city. Mr. Martins said his company usually relies on a three-day cycle because the two-day cycle can leave cosmetic imperfections that must be corrected later.

"When you do a two-day cycle, you beat up the floors," he said, adding that some contractors execute the quick turnaround "very, very well."

Ms. Lancaster, the buildings commissioner, said that she did not think the two-day cycle compromised safety, but that the cycle might be a "contributing factor in locations where

there's difficult form work.”

The cycle requires a lot of skilled labor and coordination, which is a reason, experts said, that cities outside of New York usually do not use it. At times, 50 to 100 workers are performing separate jobs on a single floor, said Ronnie Richardson, a business agent with the Local 46.

“We’re constantly watching to make sure the people who are being brought on from the concrete contractors are adequately trained and there are experienced superintendents and foremen,” Mr. McGuire said. “That’s an effort when you have so many structures going up simultaneously.”

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