NEMA
Chicago, IL

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NEMA

CHICAGO, IL

Fig. 1—NEMA Chicago.

PROJECT BACKGROUND

Rising just south of downtown Chicago's Grant Park, NEMA Chicago will be one of the tallest unbonded post-tensioned towers in the United States upon completion (Fig. 1). The 76-story high-rise tower will have an architecture height of 887 ft (270.4 m).

BUILDING LOCATION

The building, located at 1200 South Indiana Ave., is situated within the Central Station district, which was an intercity passenger train terminal in Chicago until 1974. The building is also part of Museum Park, one of the largest real estate developments in Chicago. The project was proposed in September 2015 and construction started in early 2017. The residential building has an expected completion date of late 2019.

BY THE NUMBERS

NEMA Chicago will have over 1,100,000 gross square footage of developed area. The building will include 792 apartment units, 622 vehicular parking spaces, and 669 bicycle parking spaces.

According to the Council of Tall Buildings and Urban Habitat (CTBUH), NEMA Chicago will be the second-tallest *post-tensioned* building, as well as the eighth-tallest building in Chicago. It will hold the status of the 18th tallest *concrete* building, the 20th tallest *residential* building, and the 53rd tallest building in the United States.

FLOOR LAYOUTS

The bottom 15 stories will be a mixture of parking, office, and residential areas (Fig. 2). The amenity level on the 16th floor will have a fitness center, urban lodge, an indoor lap pool, hydrotherapy pools, and an outdoor pool deck for residents. The upper levels will comprise of luxury residences. Above the 76th floor are three floors of mechanical levels, which house a water storage tank that acts as a "tuned sloshing damper" according to the building's wind tunnel study. NEMA Chicago is designed to achieve LEED Silver certification.

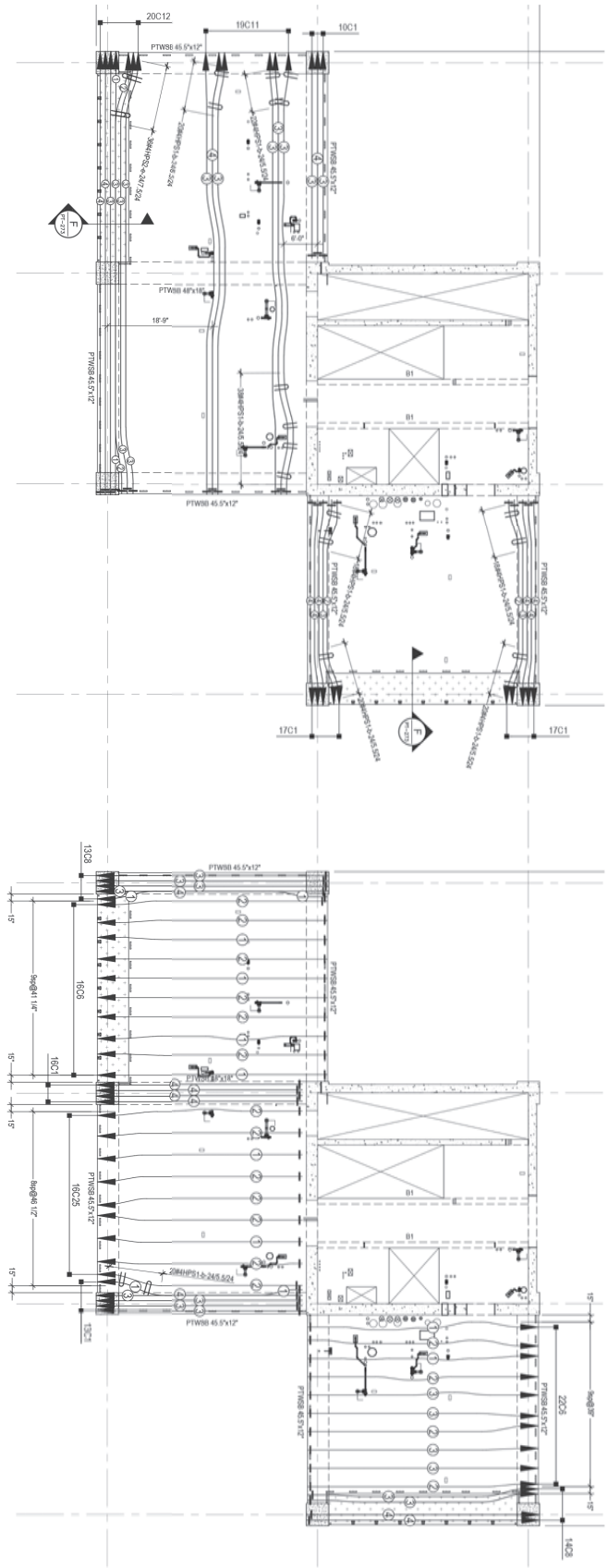

Fig. 2—Typical residential floor PT layout.

DESIGN

The structural design (for all levels) deviated from the norm of flat-plate post-tensioning in high-rise buildings. Instead, an 8.5 in. (216 mm) thick post-tensioned slab sits on top of an array of interior and exterior beams (Fig. 3). The beams range from 25.5 to 45.5 in. (647 to 1155 mm) wide by 12 to 15 in. (305 to 381 mm) deep. In the residential areas, a 40 lb/ft^2 (reducible) live loading and a 30 lb/ft^2 superimposed dead loading were used. The specified concrete strength is 6000 psi at 28 days and 3000 psi at stressing. Unbonded 0.5 in. (12.7 mm) post-tensioning tendons are used within the slabs and beams.

UNBONDED POST-TENSIONING

The structure will have roughly 2,250,000 ft (685,000 m) of 0.5 inch. unbonded post-tensioning tendons (Fig. 4). This is equivalent to roughly 585 tons

Fig. 3—Interior beam.

(531 tonnes) of nonprestressed reinforcement. Installation of the first post-tensioned deck on Level 2 started late-May 2017. As of August 8, 2018, the post-tensioning tendons were being installed on Level 56. The last post-tensioned Level 76 is expected to pour mid/late November 2018.

TEAM

Developer: Crescent Heights
Architect: Rafael Viñoly Architects
Structural Engineer: Magnusson Klemencic Associates
Main Contractor: James McHugh Construction Co.
Post-Tensioning Supplier: AMSYSCO, Inc.

Fig. 4—Unbonded post-tensioning tendons installed.