

Bam South

Fort Greene, Brooklyn, NY



Team

Owner:

Two Trees Management, Brooklyn, NY

Architect:

Ismael Leyva Architects, New York, NY

Design Architect:

Ten Arquitectos

Structural Engineer:

Rosenwasser/Grossman Consulting Engineers, P.C.

Concrete Contractor:

SBF Construction Inc., Hackensack, NJ

Construction/Program Manager:

Two Trees Management, Brooklyn, NY

Reinforcing Bar Fabricator:

Pacific Coast Steel, San Diego, CA

Total Project Size:

500,000 sq ft

Award:

2016 CRSI Award Winner –
Residential Building Category

The 32-story rental tower BAM South will have 379 apartments in all, 76 apartments (20%) of which will be affordable housing. The 500,000+ square-foot mixed-use building sits on a triangular plot of land (bordered by Ashland Place, Lafayette Avenue, and Flatbush Avenue) adjacent to Atlantic Terminal in Fort Greene, Brooklyn, New York. The building's base will give way to 50,000-square-feet of community and cultural space including a four screen BAM Cinemas, a dance studio for 651 Arts, a new branch of the Brooklyn Public Library, 43,000 square-feet of retail space and a 10,000-square-foot public plaza design by Grain Collective.

STRUCTURAL FRAMING SYSTEM

The ordinary concrete moment frame and shear wall interaction system is comprised of an outdoor multi-level plaza, joined with a 3-story podium that borders a uniquely faceted oblong 32-story tower standing just over 436' tall. Fully surrounded by underground transit structures at the perimeter, numerous design obstacles littered the "Support of Excavation" (S.O.E.) and foundation, thus dividing the base footprint into two areas regarding the zone of influence. In order to best accommodate the inherent site conditions, various foundation components were utilized, creating a hybrid conglomerate consisting of friction piles within the zone of influence, a 60" mass concrete mat to support the tower, and traditional spread footings integrated with an 8" slab on grade beneath the podium. Unable to utilize a traditional tie back system, the soldier pile wall was forced to rely on three levels of interior diagonal rakers integrated with soil supported concrete heel blocks staged with the excavation to mitigate lateral earth pressure deflection. To maximize efficiency, the concrete mat was constructed in two phases to coincide with the foundation schedule and S.O.E. design. Immediately after the first stage of soil removal, the mat area outside the zone of influence was constructed and designed to receive the temporary diagonal rakers. Poured in the dead heat of summer, engineering control of mass concrete proved necessary, as the peak internal core temperature of a test specimen was recorded at +190°F. With further modification to the concrete mix design and the addition of ice; temperatures of mass concrete were properly maintained.

UNIQUE STRUCTURAL AND/OR ARCHITECTURAL DESIGN FEATURES

The façade aesthetic of the 32-story slender tower is described as an articulation of a central circulation spine and two flanking volumes. Non-symmetrical starburst facets in the eastern and western faces caused completely unique floor plates at each story, which lead to a decision by the developer to utilize exterior sloping columns to maximize residential floor area. With a total of 46 tower columns, 18 are sloped to follow the cross sectional trapezoidal shape of the façade. Reaching slopes up to 7° in varying directions, the eccentric column geometry was not the only the design hurdle. The ingrained trapezoidal shapes caused lateral thrust at each column-floor joint, maximized at slope differentials that were resolved through the design of a hairpin reinforcing details. Made up of "U" bars integrated with continuous edge and flexural reinforcing, the "hairpin" detail mitigated lateral thrust and increased joint ductility. In addition to the analytical obstacles, construction tolerance and installation was a major concern for these columns.