

220 Central Park South – New York City, NY, U.S.

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Located directly in the heart of Manhattan is 220 Central Park South, a quiet yet beautiful feat of engineering that both redefined and stayed loyal to the world-renowned skyline of New York City. As part of Billionaire's row, 220 Central Park South serves both as a residential property building, as well as a glamorous sign of luxury and class. ²Like other skyscraper class buildings, 220 CPS was challenged to fight for structural integrity, standing at an extremely narrow 18:1 slenderness ratio, with dimensions of 53 feet wide, and 128 feet long, and 950 feet high. Despite that, its greatest challenge was meeting the criteria of a two-building structure, which forced it to take an unorthodox, but avant-garde approach.

Built recently in 2019², 220 Central Park South is actually two buildings, one of which is an 18-floor villa, which takes up the north side of the plot, and directly faces central park, and the other which is a 65-floor concrete-limestone behemoth that serves as stacked, city-style penthouse properties². Afraid properties on the lower floors of the building would have its views of central park blocked by the villa, properties were built in focus on upper floors, whereas the major mechanical systems were all placed on the lower floors, precisely the bottom 200 feet of the building⁵. The upper floors rested within a 750 feet tall band system, 200 feet above the grade beam. In order to accommodate for this unusual split, the lower floors were built with much stiffer materials, featuring a structural system that shared both shear walls and a moment frame. The upper floors instead, only relied on a moment frame, fearing that other elements would obstruct the luxurious penthouse experience the building was intended for. To further emphasize the importance of architectural aspects, the façade was built as a curtain wall. Using no louvres or mullions, the curtain wall, made of limestone, instead featured 'picture frame' like cuts as openings for the windows⁵.

220 CPS was also built with a purpose of legacy. In contrast to all the newly erected works of steel and glass in New York, and at that, the rest of the world, 220 CPS wanted to return to the older styles of architecture that once dominated the Manhattan skyline, and chose to use a concrete based structure, and was finished with Alabama silver shadow limestone⁵. Though that isn't to say that the building wasn't without its innovations. Hidden underneath the concrete is a dedicated beam system of spandrel beams that do in fact use structural steel, allowing the building to much more comfortably reach new heights, without taking away from the limestone and concrete face.

The hidden structural steel is but one of the innovations of the building. In order to better confront the increasing dangerous lateral forces that affect slender buildings, namely stronger winds at higher elevations, 220 CPS uses an 1100-ton mass damper system, in a 25-foot volume, to provide a damping of 6.5%⁵. Despite being met with major constraints, 220 Central Park South manages to fit a powerful dampening system, countless tons of concrete and limestone, and a deluxe work of architecture all within a two-part sky-high structure, invisible of any steel or glass.

Sources

- ¹ <https://www.skyscrapercenter.com/building/220-central-park-south/11182>
- ² <https://www.de-simone.com/projects/project/220-central-park-south/>
- ³ <https://www.emporis.com/buildings/267713/220-central-park-south-new-york-city-ny-usa>
- ⁴ <https://heintges.com/220-central-park-south/>
- ⁵ <https://global.ctbuh.org/resources/papers/download/2441-supertall-super-slender-tower-with-a-multitude-of-constraints-220-central-park-south.pdf>

