

The Engineering Behind The World's Thinnest Skyscraper: The Steinway Tower

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In this article, I'm going to talk about the construction of *Steinway Tower*, officially known as *111 West 57th Street (111W57)*, famous for being the world's thinnest skyscraper.



Credit: [Boss Hunting](#)

Standing 1,427 feet (435 meters) above the ground, with a height-to-width ratio of 24:1, the building stands out in the city just like a Victoria's Secret model.

Now, the main question that comes to mind is that,

How was this piece of art built and constructed? How does such a thin building stay stable?

Well, that question is so complex that nobody except the building's engineers can answer it, but I'm here to provide you with a simpler and more digestible answer.

How does Steinway Tower stay stable?

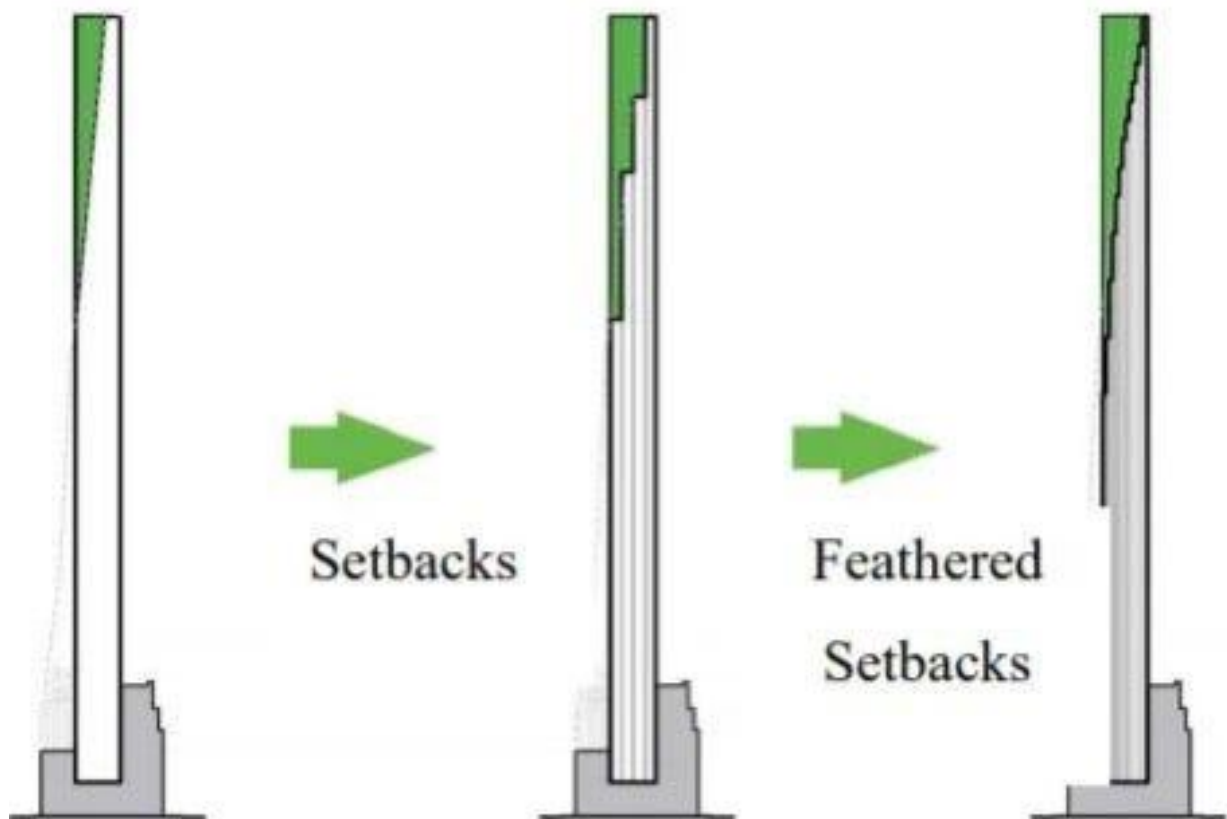
Generally, the building is stable due to its

1. Strong Foundation
2. High-Strength Materials
3. Aerodynamic Design

While the first two points may explain themselves, the third point, the aerodynamic design of the building, is what really stands out.

The aerodynamic design of the Steinway Tower incorporates several key features to ensure stability and reduce wind forces, which is crucial given its slender profile. Here are the main elements:

1. Shape and Tapering: The building tapers as it rises, which helps reduce wind load. The setbacks on the south side narrow with height, eventually disappearing into the sky.

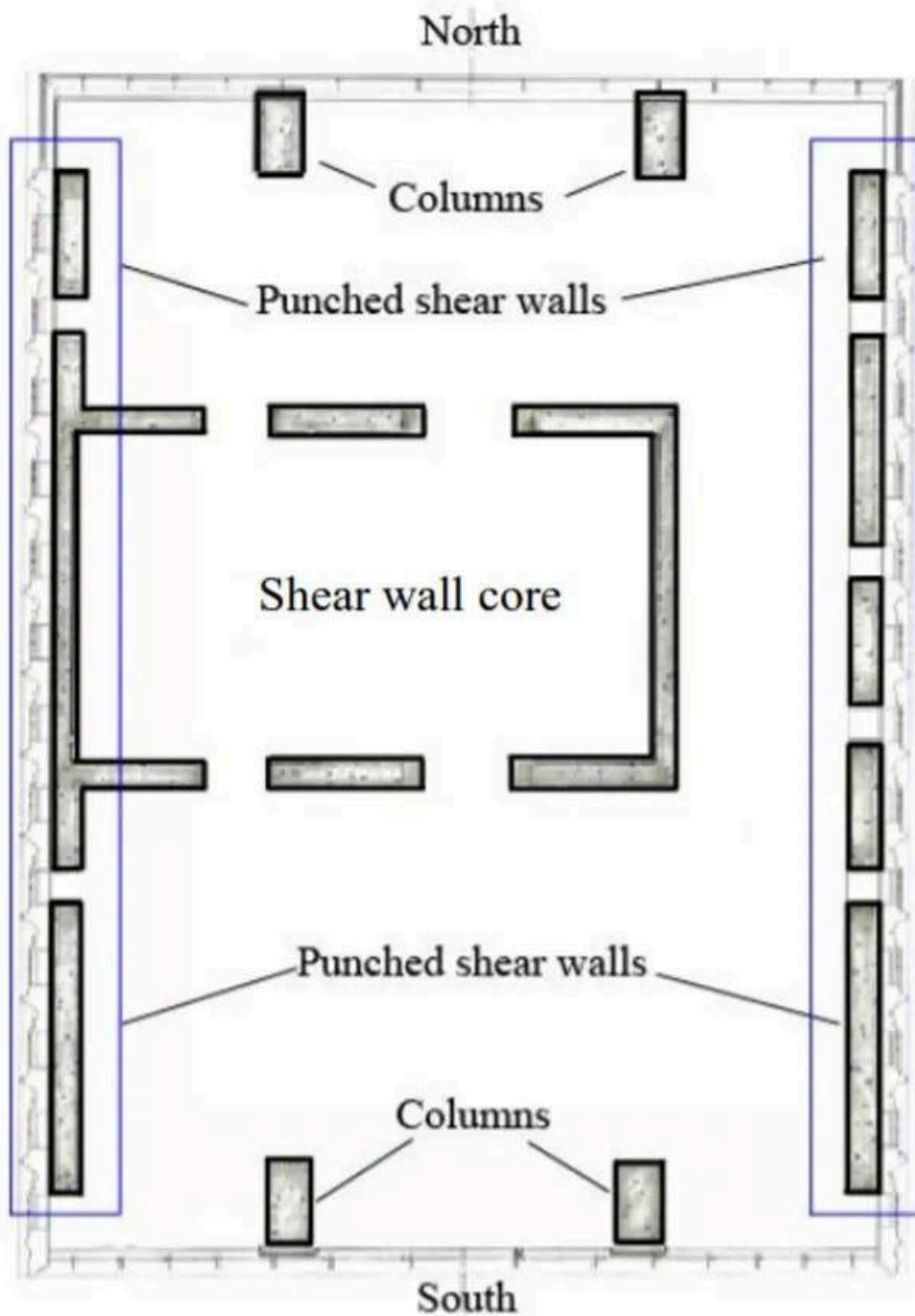


2. Terracotta Panels and Bronze Latticework: The east and west façades feature terracotta panels and bronze latticework that add structural depth and reduce wind pressure. These materials also provide aesthetic coherence by harmonizing with the historic Steinway Hall.



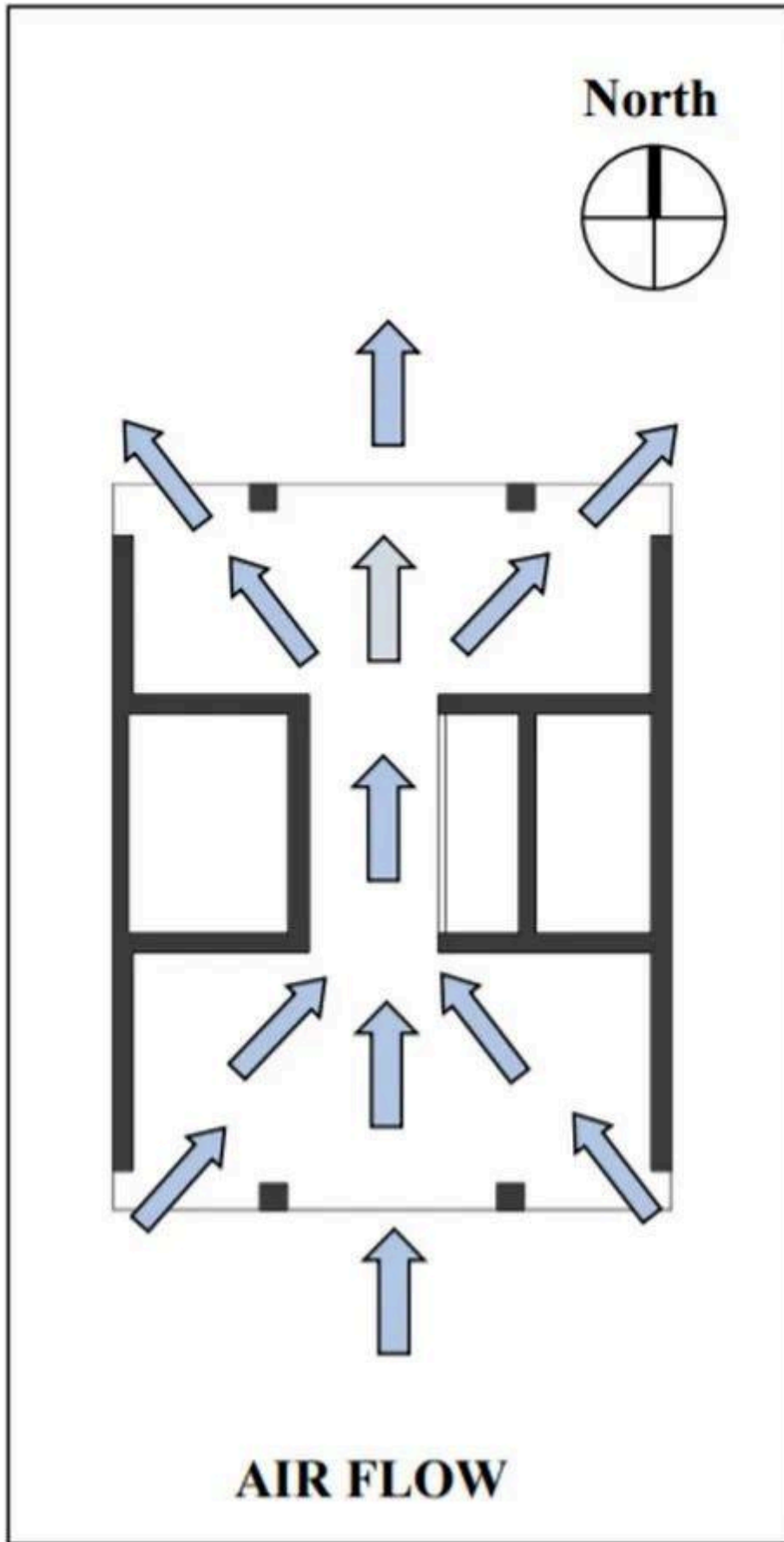
Design concept (Massing strategy) ©etd.lib.metu.edu.tr

3. Shear Walls and Columns: The structure includes two one-meter-thick shear walls on the east and west façades to resist lateral forces, while the north and south façades have columns that support panoramic views of Central Park. These shear walls are essential for the building's rigidity and stability.



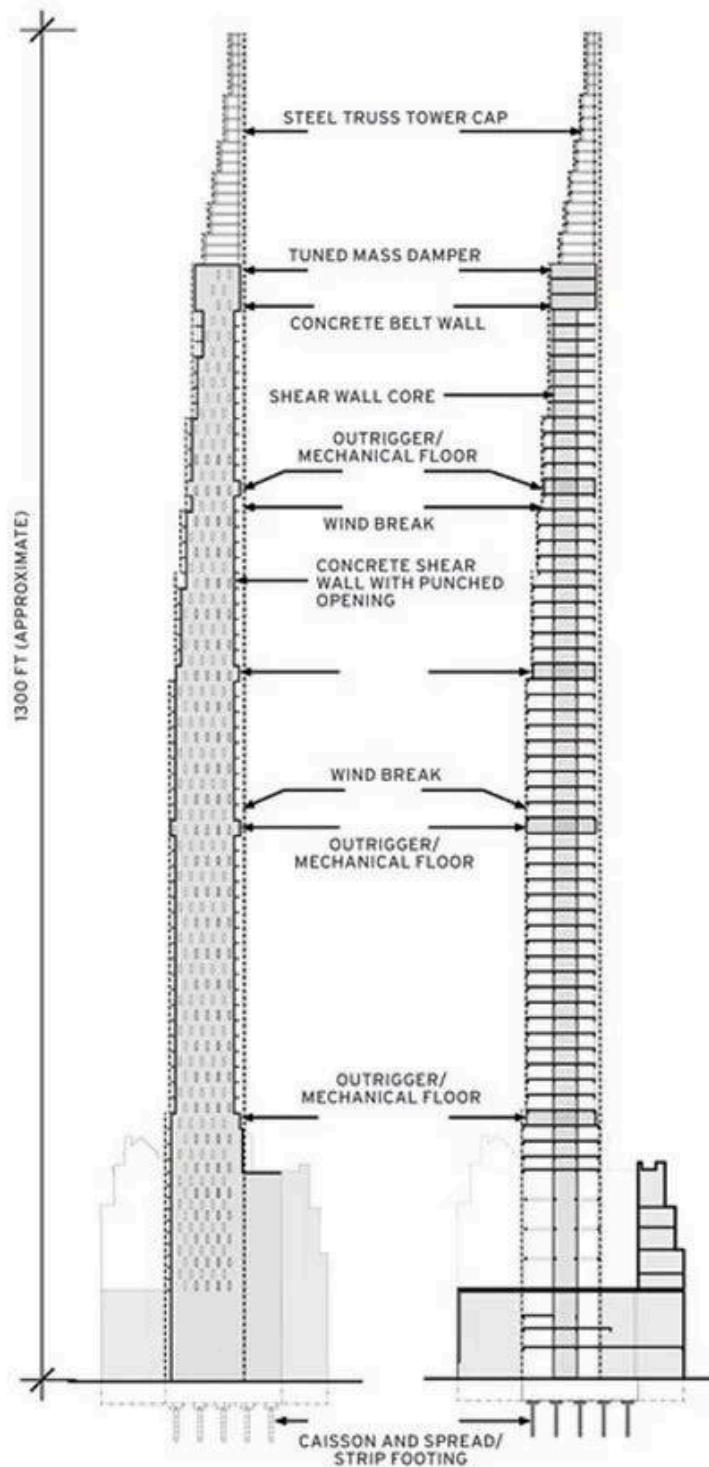
Structural plan from middle floors ©etd.lib.metu.edu.tr

4. Mechanical Floors and Outriggers: The tower incorporates four mechanical floors stiffened with outriggers. These levels allow air to flow through the building, minimizing wind-induced acceleration and enhancing stability.



Wind escape floors scheme on upper floor plan © etd.lib.metu.edu.tr

5. **Tuned Mass Damper:** An 800-ton tuned mass damper is installed at the top to counteract lateral movements, ensuring that the building remains steady even in strong winds ([RTF | Rethinking The Future](#)).



STRUCTURAL DIAGRAM
111 West 57th Street

Structure of Steinway tower ©newyorkyimby.com

These features collectively ensure that the Steinway Tower remains stable despite its extraordinary height and slenderness. The aerodynamic design, combined with advanced engineering, allows it to withstand the challenges posed by wind and seismic forces.

As time goes on, we see more and more instances of buildings that defy the laws of physics, thanks to the ingenious designs crafted by architects that both provide a sense of aesthetics, while ensuring structural stability, and this building is definitely one of them.



Steinway Tower : le gratte-ciel le plus fin du monde inauguré à New York, creapills.com