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INSIDE THE NEW LIBRARY

AN ENGINEERING CHALLENGE

The building's vast open spaces and cantilevered platforms were made possible through the innovative use of vertical and sloped columns, trusses, and a steel diamond-shaped outer grid.

VERTICAL FORCES: GRAVITY AND WEIGHT

Because of its unconventional design and the "floating" nature of cantilevered floors, engineers minimized the use of true vertical columns (there are only 20 in the entire structure) and introduced a series of sloped columns on its perimeter to help support the building's weight.

THE ANCHOR

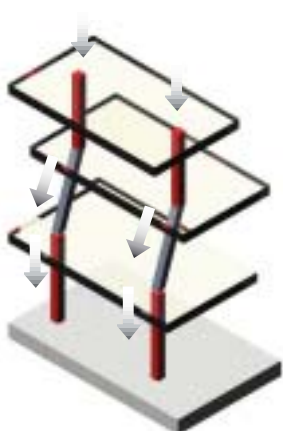
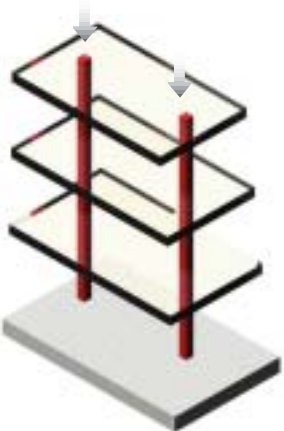
The floors that make up the Books Spiral and Reading Room (floors 6-10) use sloped columns to support not only the weight of all that area, but they also support the floors directly above and below. The trusses directly support each of the floors within "The Anchor" and transfer its weight from sloping column to sloping column.

True vertical columns

These columns are typically spaced 30 to 36 feet apart in a grid determined by the column layout of the underground parking and extend the entire height of the building.

Sloped columns

These unconventional columns are angled to create open spaces while supporting platforms that are not in straight vertical alignment. They are as strong but typically bigger and longer than true vertical columns.



Vertical forces

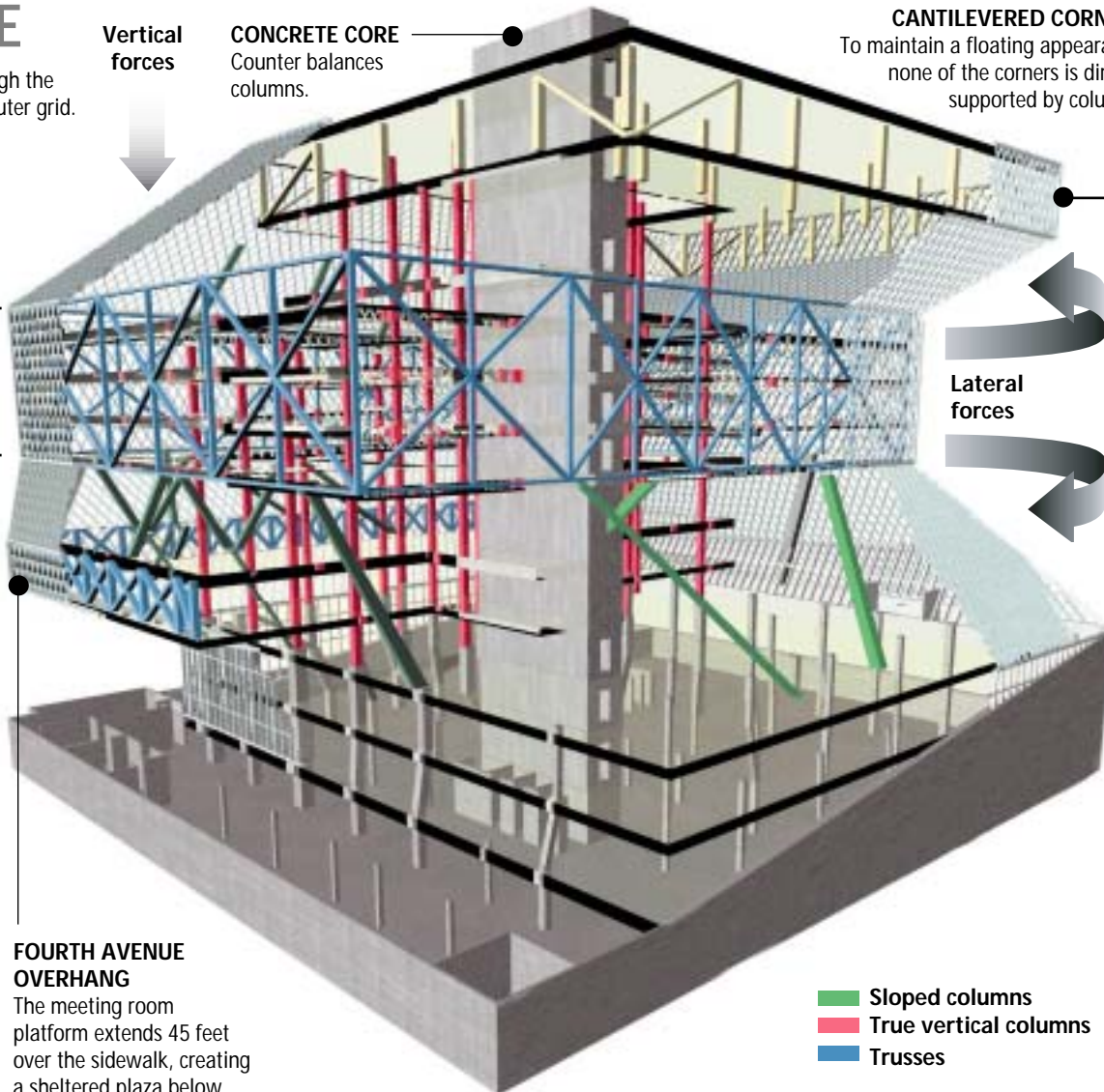
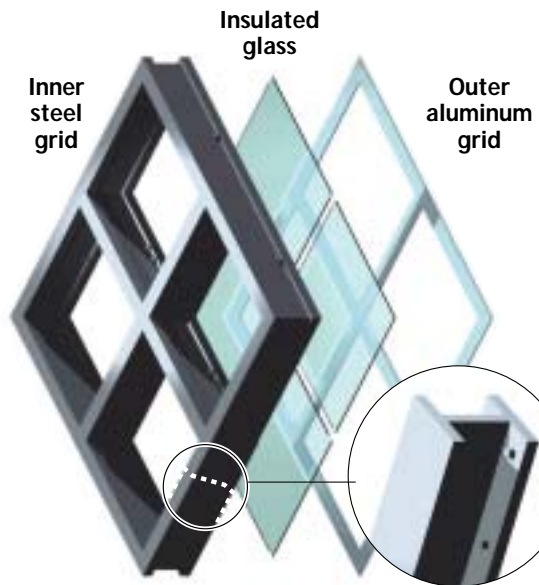
CONCRETE CORE
Counter balances columns.

CANTILEVERED CORNERS
To maintain a floating appearance, none of the corners is directly supported by columns.

Lateral forces

LATERAL FORCES: WIND AND EARTHQUAKES

The diamond-shaped steel grid that encloses the building not only provides resistance to wind and earthquake forces but also helps hold the building's glass system, or curtain wall, in place. Conventional buildings require separate seismic and curtain wall support systems but in this case the steel grid serves both functions. The grids collect wind and earthquake forces and transfer them down to the next platform until they are absorbed by the concrete base.



FOURTH AVENUE OVERHANG
The meeting room platform extends 45 feet over the sidewalk, creating a sheltered plaza below.

- Sloped columns
- True vertical columns
- Trusses

CLEANING ALL THAT GLASS

Taking into consideration Seattle's love of the outdoors and plethora of rock-climbers, the architects installed metal carabiner clips around the building for daring window washers to traverse the building.