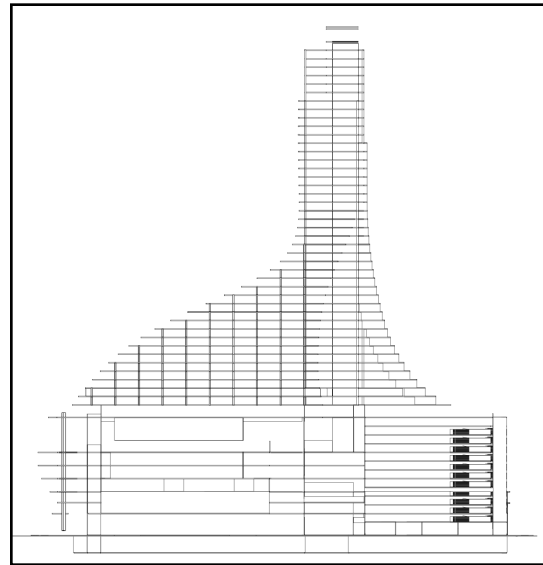
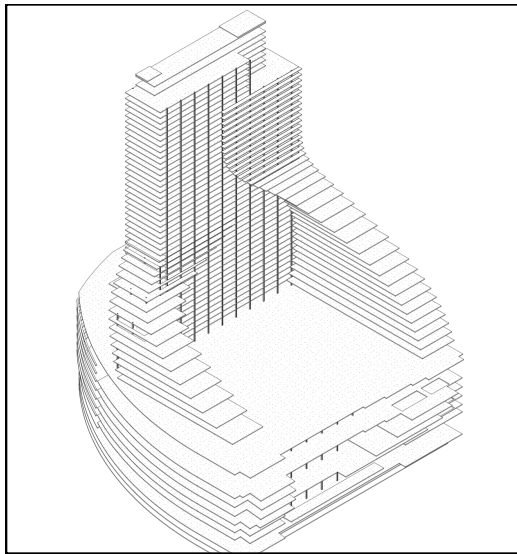


The Miami Marriott World Convention Center is a 54 story concrete and steel structure comprised of four main parts: a west wing, a north wing, a south wing, and a large 190,000 square foot public area featuring conference rooms, exhibition halls, and meeting rooms on the first four levels. Atop this large public area is an open deck featuring a pool, gym, spa, and kitchen. This open deck acts as the base for the north, south, and west wings. The floor perimeters of these wings deviate slightly causing a sweeping motion as they begin to elevate and merge into each other. For analytical purposes, the structural challenges will be discussed on a part by part basis.

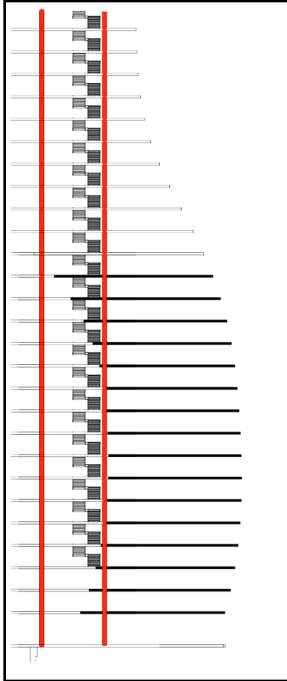


NORTH WING AND SOUTH WING

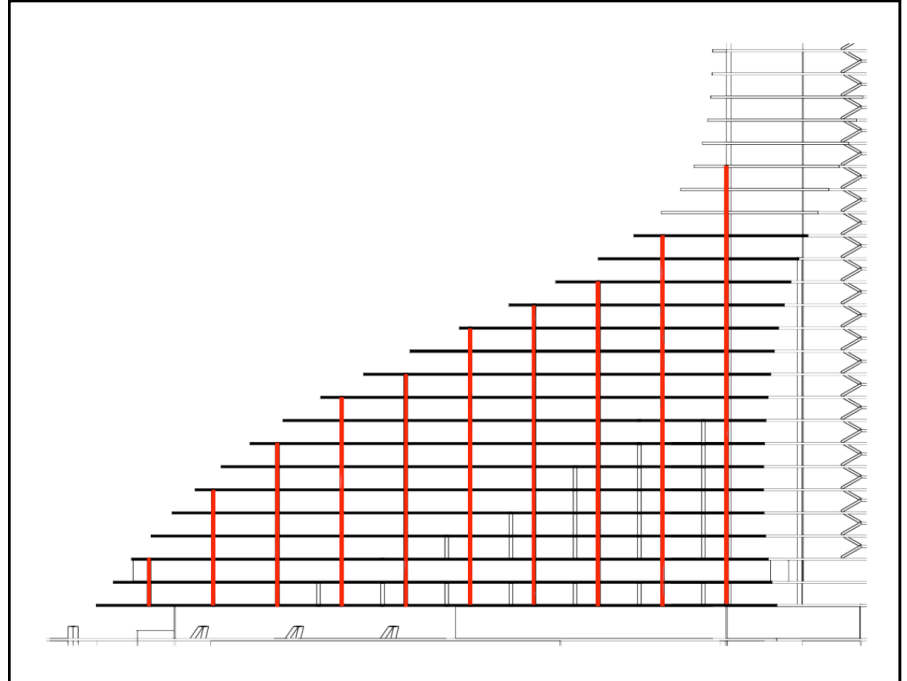
The north wing and the south wing both feature slabs that cantilever in the left and right direction with a maximum length of 11 feet and step back towards the West wing. Although the stepping back is physically sound, as it causes a reduce in mass towards the top of the structure and more mass at the bottom of the structure, the cantilever left and right is not. The cantilever action to the left and right of the structure is an engineering challenge as it translates more mass away from the support points of the building. In the north and south wing of the building, this is resolved by the placement of approximately nine concrete shear walls in the left and right direction. These shear walls provide lateral stability for the building as well as gravity stability. Columns are also utilized at points encompassing the entire elevation of the wing when possible. Due to the geometry and shift of the floor plates, the use of continuous columns is limited. The use of columns that extend in elevation only several stories may be required, as the cantilever condition is trying to be limited to 10 feet for design purposes. A portion of the stability of the north and south wing rely on the larger west wing with which they attach as the building moves up.

NORTH WING

Front - Section - Columns

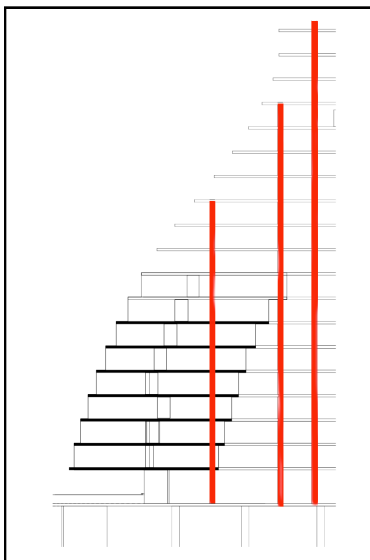


Side - Section - Walls

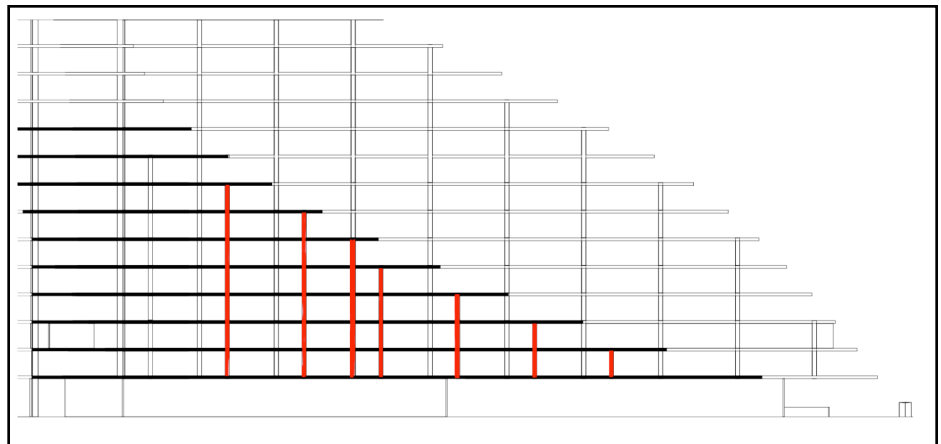


SOUTH WING

Front - Section - Columns



Side - Section - Walls

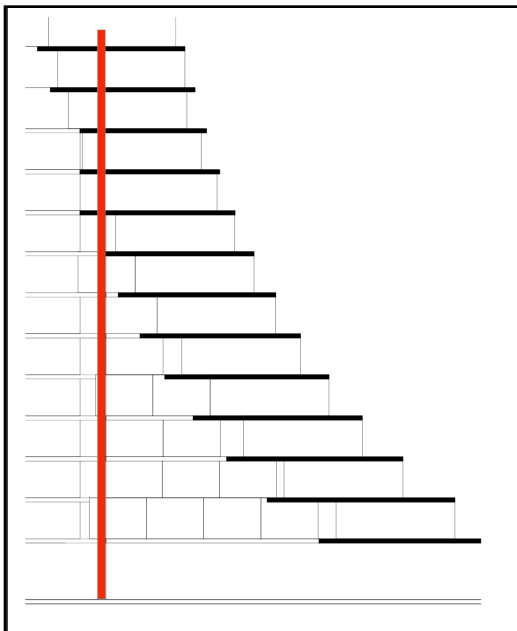


WEST WING

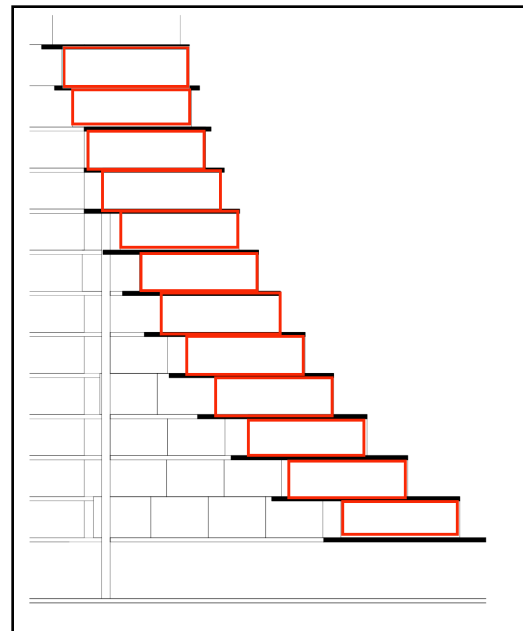
The west wing encompasses the core of the building and has a back portion which slowly steps in to the main core area. A rigid elevator shaft helps provide lateral stability and runs straight through the west wing. Approximately 20 columns lines also run straight through the west wing. One of the difficulties of engineering the west wing is not due to the west wing in isolation, but due to the north and south wing slowly merging in to it around the 14th floor. It is around this floor that the building begins to function as one unified whole instead of a few distinct parts. The aforementioned cantilevers from the north and south wing begin to frame into the west wing and rely on it to provide stability for some of the unsupported load.

The difficulties encountered by the stepping back portion of the west wing is not visible from the exterior of the building, as it appears to reduce in mass as it goes up in height. The interior of this portion of the building reveals a different challenge; A large hollow atrium cavity within the structure turns these steps into cantilevers on the reverse side. This hollow atrium cavity spans from the ground floor to the 13th floor and brings some of the exterior aesthetic qualities of the building to the interior. A system of either concrete shear walls or a curved truss system will be utilized for lateral stability in this region and a limited number of long, continuous columns will be utilized for gravity stability.

Side - Section - Column - Gravity



Side - Section - Concrete - Lateral



PUBLIC AREA (BASE)

The public area at the base includes several floors of the same perimeter which terminate on a large open deck area which the north, south, and west wing sits upon. Although this area may not seem very structural intense, it features a lot of open exhibition halls and meeting rooms, which limit the number of columns that can be used for support. This is problematic because this area of the structure will be taking the most load from the mass above. Along the front facade of the area is a system of palm-tree looking sloping, angled columns which connect to form a truss. this architectural feature will be utilized as structure to provide some lateral stability for this portion.

Front - Elevation - Sloped Columns/Truss - Lateral

