

John Pillar
Structural Option
Hampton Inn & Suites
National Harbor, MD
Building Statistics – Part Two

Construction

The construction method is design-build with Herman/Stewart Construction as the main contractor. Construction has just begun on this project with excavation being carried out for the foundation.

Electrical

The main energy service provider for this project is PEPCO. Electrical power levels of 277/480 and 120/208 enter the hotel through 15-way underground electric conduits into the main electric and generator room. The 277/480 branch travels to its 1200A main switchboard and powers the mechanical equipment for both elevators. It also supplies power to the rooftop mechanical units as well as a jockey and fire pump. The 120/208 branch travels to its associated 30500A switchboard and supplies power to the rooms of the building through electrical closets located on every floor. It also powers individual water source heat pumps for each room.

Mechanical

The heating of each room is provided by heat pumps powered by a one phase 208 volt electrical current. The water source comes in through an 8" (772.5 gpm) pipe and distributes to eighteen vertical risers which carry the water to the heat pumps. The water is heated through two boilers, which use natural gas, located on the basement level. Exhaust from individual bathroom units is collected through a 6"x4" duct that expands as it reaches the roof to 10"x10". It is then ejected through a 40"x20" exhaust vent on the roof. Two powerful stair pressurization fans also rest on the roof, providing 18,000 cfm to a 94"x18" stairwell duct. Sanitary risers are typically 4" pipe which flow into an 8" sanitary service (1062 dfu).

Structural

The hotel utilizes a traditional cast in place concrete flat plate floor system. Columns are 12"x24" with chamfered edges, where exposed. The overall building height is 130' and columns are made with 5000 psi concrete from the third floor to the roof. The floor slabs are 10-1/2" thick when not near columns. At each column there is a 2-1/2" drop panel to combine for a 13" slab thickness. The slabs on this project are considered to act as two way slabs, meaning that they carry load in both lateral directions. The three largest bays have dimensions of 29'x26'-10". There are no beams spanning between columns in this case. In the largest bay, the drop panels cover roughly 6 feet of the span, or 20.7%. The lateral components of this building are comprised of twelve shear walls of varying length. Each shear wall is one foot thick and is vertically reinforced with number 5 bars at 18" on center. They are each tied into the foundation by rebar that matches vertical reinforcing called out in the plans. All rebar is to have class B splices and extend one foot into the foundation with 90° hooks.

Building Codes

This hotel was designed structurally under the 2003 IBC code. Similarly, the mechanical system was designed using IMC 2003, and the electric under 2002 NEC. The accessibility code is ADAAG and ICC/ANSI 117.1 and the fire and life safety code follows the 2003 Life Safety Code.

Transportation

Vertical transportation is achieved through two elevators which travel to all eleven floors. Two pressurized stair wells are located on both ends of the building, and they are joined by a long corridor which passes through the middle of the hotel. The layout is typical of many hotels due to its convenience and simplicity.