

Anthony Grab

Building Statistics Part II



Construction Management | Advisor: Raymond Sowers | Square 1400 Apartments |
Fairfax, VA | 9-21-2012 | Building Statistics Part II

Mechanical Systems

The mechanical system consisted mainly of 11 rooftop unit at 5,500 CFM each, two indoor heat pumps at 675 CFM and 850 CFM, respectively, and two outdoor heat pumps. The air distribution system utilizes series of duct risers that distribute air to each floor's corridor through branches. Each room had its own AHU that could be adjusted to the desired temperature. Because the project was striving for LEED Silver, all mechanical systems were to be protected during construction per required of section 01450, Indoor Air Quality Management.

Electrical System

The main electric duct bank service feeds twelve sets (4-60MCM in 4" C). A backup diesel fuel generator at 350 KW, 3 phase, 4W, 120/208V accommodated with a fuel tank of 693 gallons UL rating 142 and a weather proof enclosure provided emergency power.

Lighting

The primary light fixture for a typical apartment unit consist of three different types of 6 inch square down lights with one 32W CLF 3500K. Other common areas of the building include a variety of pendent fluorescent fixtures.

Masonry

In trying to keep up with the quickly growing city of Merrifield, the building was skinned with a modern styling of brick veneer, which alternated from rose brick face color to a tan color. Thin masonry brick of the same color was used on the parking structure to help with the aesthetics of the cast-in-place concrete.

The masonry wall was comprised of standard brick veneer, air cavity, ridged insulation, and a vapor/air barrier, as seen in Figure 3. The bricks are held on the wall with brick ties that were anchored to rigid board that was attached to cold-formed steel. At every level, a galvanized steel relief angle was bolted into the concrete to support the bricks. Fraco scaffolding was used around the building to set the bricks and cast stone.

Structure

Common to the area, the structure is primarily cast-in-place concrete with post-tension cables with the exception of the parking structure, which used a precast structure. The cast-in-place apartment building has eleven stories all of which are about 38,480 SF. Because of this large area, the floors were broken into three pours. This allowed the concrete to set up and give it room to expand and contract to prevent cracking. Pour strips were later filled in with concrete which was pumped in with a concrete pump truck. Three levels below, the pour floor had to be temporarily supported at all times. Once the slab was poured, the concrete columns followed and could be formed and poured the next day. Once the concrete reached design strength set by the structural engineer, the post tension cables could then be tightened. The building was constructed at a rate of one floor per two weeks

The nearby parking structure composed of precast concrete panels and was able to be erected in just three months. It was put together similar to a Lego set. Each piece would arrive on site on a flat bed and then be hoisted into place by a mobile crane.

Parking Garage

The precast parking structure was to be constructed and took only 183 to complete. The prefabricated panels played a large role in completing the parking structure in such short time. Unlike the cast-in-place apartment building, there is no cure time for the concrete; it already met its 28-day design strength off site.

Demolition

As mentioned earlier, the building site chosen for the project was the previous home to HITT Contracting. Therefore, demolition was required. On the north end of the site was the largest of the five buildings at about 40,204 SF. The building had an exterior façade primarily constructed of CMUs with a slab on grade, all of which had to be demolished. The remaining four smaller buildings, totaling 24,104 SF, had to be demolished as well. The last building to be demolished was the 110,860 SF asphalt parking lot.

Project Delivery System

The project delivery system for this project is usual in the sense that the owner of the project is Rushmark Developers, LLC which is owned by the HITT family. The delivery system chosen was design-build. The pre-construction sector at HITT Contracting worked with a local architect on the design one year prior to design. The design-build approach was chosen because HITT wanted to control the design as well as use an architect that worked on another MF builder project that the Brett Hitt wanted to mirror as much as possible. Because Brett Hitt was involved in the design at such an early stage, a large number of problems were eliminated and there was a potential savings in cost, change orders, and schedule duration.

All the contracts for the project were lump sum. This is typical for design-build projects, which is when the supplier agrees to provide a specific service for a specific price and the receiver agrees to pay upon the completion of work or in some cases to a negotiated schedule. In this case, because the developer/builder chose lump sum, it will estimate the cost of material and labor and add it to a standard amount for the desired amount of profit and overhead.

With the owner/developer being partially owned by the Hitt family, the General Contractor did not have to pull a bond, but had a requirement for all subcontractors for \$250,000 and above to be bonded. HITT as the General Contractor did have to pull builders risk policy for the project. All subcontractors have to be qualified by HITT's insurance department, carry the company minimum for insurance, and have an up-to-date certificate of insurance on file. It is also a requirement that they are approved by HITTs in house approval system.