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Structural  
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October 15, 2007  
Building Statistics Part II

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## Building Statistics – Part II

### Overview/Architecture

The building is located in Manassas, Virginia and will serve as the Prince William County School Administrative Building. The program contains flexible office space for 500 County School Employees, as well as a School Board meeting room and other meeting/training rooms for school personnel. The size of the building is just under 150,000 square feet. The design includes several parts including a one-story wing and two three-story wings. The building has a very open, flexible, and light filled atmosphere through the use of several curtain walls, a three-story atrium, and multiple skylights. The primary materials are steel, glass, and masonry.

### Construction

The project delivery method for this building is Design-Bid-Build. The building was designed by Moseley Architects and was put out for public bid in September, 2006. Bids were due late October, 2006. The contract was awarded to V.F. Pavone via Lump Sum Contract. Construction began in late Winter, 2007. The contractual substantial completion date for the project is set for October 1, 2008. The cost of the project is \$32,639,800.

### Structural

The main structural system in the building is steel space moment frame. Nearly all connections are moment-resisting connections. All columns in the structural system are steel. In the one-story building, some typical interior columns include W12x79 and W10x68. Exterior columns are often HSS shapes. Typical shapes include HSS8x6x1/4 in the one-story wing and W14x68 and W14x82 for the interior and HSS12.75x0.375 for the exterior in the three-story wing. Built up W21 shapes with HSS2½ (TOP) are typically used for beams while W24 are used for girders. The size of the bays are generally 24' wide and span 30'. Steel joists are used to span inside the bays. 28K8 joists are the most common joist in the framing. Typical spacing is approximately 4' on center. The one-story "floor" (mezzanine) joists are 26K9 spanning 30' in one part of this platform and 24K3/26K4 spanning 16'/19' respectively. Roof joists in the one-story portion are typically 28K10. Foundations consist of spread footings and strip wall footings at (-2'-0") from grade on soil with a bearing capacity of 3000 psf. Typical column spread footings range in size from 4'-0"x4'-0" to 11'-0"x11'-0". The strip wall footings are typically 2'-0" wide and 1'-0" deep. The slab-on-grade is 4" deep.

## **Mechanical**

The air distribution system utilizes variable air volume controlled locally or remotely by a direct digital system. The Heating, Ventilation, Air Conditioning system utilizes a waterside/airside system which uses chilled water and hot water for cooling and heating, respectively. The hot water system uses high-efficiency, condensing-type, gas-fired boilers with centrifugal pumps. The hot water serves the preheat coil at the AHU and reheat coils at the VAV box terminals. The chilled water system uses two dual-circuit, air-cooled chillers with centrifugal pumps. The chilled water is provided to the cooling coils in the AHU. The building has six Roof Top Units (RTU); three dedicated to each three-story wing. These units supply 5600-6800 CFM each with 2800-4150 CFM outdoor air and 2800-4150 CFM return air.. Four

AHU serve the atrium (two), the boardroom (one-dedicated), and the remaining meeting rooms (one). These AHU make operate with return/exhaust heat recovery systems.

### **Electrical**

The primary electrical service is provided through 480/277V, 3 $\Phi$ , 4-wire underground service. The switchboard has 4000 amp bussing with 3000A main circuit breaker. The voltage is dropped to 277V for lighting and dropped to 120V for receptacles. There is a 200kW emergency electrical generator attached to the system.

### **Lighting**

Much of the lighting is provided through ample daylighting. The fully glass entrance and atrium, as well as vast curtain walls and skylighting provides a great deal of lighting for the building. In addition, the offices are fitted with indirect linear fluorescent lighting consisting of (2) 28 watt 32T5 pendant lamps per luminaire. The conference rooms, meeting spaces, and premium areas are typically fitted with direct lighting. A typical premium space will have 9" 26 watt compact fluorescent recessed round downlights with open reflectors.

### **Life Safety**

The atrium is equipped with a smoke control system for life safety purposes directed by code requirements. In the event where smoke control becomes an issue, air vacates through exhaust grilles located on either side of the atrium. There are six smoke purge fans that are capable of exhausting 174720 CFM (29120 CFM per fan). Make-up air is provided through automatic door openers at each entrance. These systems are all controlled the fire control panel and power provided by the emergency generator.

## **Building Traffic**

The building is very flexible through its design and has many open, flexible areas. There is a very open atrium which serves as the main entryway and contains an open stairway and two elevator shafts for access to upper levels of the atrium. The building spaces are accessed through the atrium corridors.