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Lighting || Electrical
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Denver, CO
October 21, 2014
Building Statistics, Part II

PRIMARY ENGINEERING SYSTEMS

Lighting
The Denver Police Crime Lab is primarily lit with fluorescent fixtures. Direct/indirect pendant luminaires light the laboratories and open offices, while recessed, narrow luminaires are common in the hallways, and troffers in small, enclosed offices. Compact fluorescent downlights serve as support for rooms and corridors. The lighting is controlled through passive infrared and dual technology occupancy sensors, and dual-level switching. Daylight is largely used to light the lobby and atrium, as well as give the building a more "natural" feel in the lab and corridor spaces.

Electrical
The primary service enters the crime lab through a transformer vault in the basement. From here, it is stepped down to 480/277V and distributed by a 2500A switchboard throughout the building. There are transformers located on all levels to bring the voltage down to 208/120V for lighting, receptacles, and small equipment. There is a diesel generator on the western exterior of the building that will turn on via the use of automatic transfer switches. A UPS on the third floor backs-up security, telecommunications, and data within the building.

Mechanical
Air distribution throughout the building is performed by two air-handling units located in the penthouse. These units supply a total of 90,000 CFM to the lab. The laboratories are equipped with exhaust fans that bring any contaminants up to the penthouse. There is also an exhaust energy recovery system that serves the laboratory ductwork. These systems are all variable air volume.

Structural
The lab is composed of a moment resisting frame system with a slab-on-grade foundation. Columns, beams, and girders are structural steel while the flooring is concrete. The wide flange columns that support the building are 12-0" deep or 14-0" deep. The majority of steel beams supporting the floors are W27X94. Girders are typically W24x62 and W37x84. The floor slabs are mainly 4-1/2" normal weight concrete on 2-0" deep 16 gage composite floor deck. The mechanical yard, which exists in the penthouse, contains a slab of 6-0" normal weight concrete on 2-0" deep 20 gage composite deck. Roof deck is 1-1/2" deep 20 gage type B deck. Balconies have depressed slabs.

Construction
The project delivery method that was used was CM at-risk, and construction was performed by JE Dunn. The lab was constructed from March 2011 to July 2012. Upon completion, the building came to $28 million obtained LEED Gold.

ADDITIONAL ENGINEERING SUPPORT SYSTEMS

Fire Protection

The type of construction for the lab is IIB, which entails that the building is constructed of non-combustible materials that have little to no fire resistance. The crime lab is equipped with automatic sprinklers. Enclosed stairwells and elevators are protected by 1 and 2-hour assemblies. In addition, the transformer vault has a 3-hour rated assembly.

Transportation

There are two elevators, and three stairways that provide vertical circulation within the crime lab. Elevator A serves as the main elevator and is located in the lobby. The elevator makes three stops on the main floors and is rated for 3000 pounds. Elevator B travels between the basement and penthouse, making five stops, and is rated for 5000 pounds. Stairs A and B are located adjacent to the lobby and in the west end of the lab, respectively. Stair C is an exposed stairway that leads employees from the lobby to the second floor.

Telecommunications

Voice and data outlets are built into the furniture, as well as into the walls of the laboratory. Telecommunication lines enter the building through the basement and then are distributed from the telecom rooms that are stacked above the basement entrance.

Special Systems

Security is implemented through CCTV cameras, access control, and alarmed delay recess doors. Audio/Visual equipment can be seen throughout the building, located in conference rooms and the multipurpose room. This equipment ranges from projectors to televisions and display panels.