

Building Statistics Part 2

Primary engineering Systems

Construction

The method of construction was a modified design build with a budget of \$25 million. The design teams worked on the project through permit. Then the contractor took over control through construction documents with input from design teams. The construction started in 2010 and must be finished by August 2011 before the new school year started.

Structure

The existing structure was built in 1925 and is load bearing brick. A couple footings in the basement were added for additional support due to the change in use of the spaces above. The addition's structure is made of steel columns, composite slabs, and concrete foundation. The addition foundation is a 5" reinforced NW concrete slab with 12" reinforced concrete walls. The steel columns range from W10x33 to W10x77 and the steel beams range from W24x55 to W16x31. The floors are 3" composite deck with LW concrete and the roof is 3" metal deck with 4" rigid insulation. There are several lateral braces which are HSS 5x5x5/16 and HSS 5x5x3/8. The addition structure is attached to the existing structure with sliding connection.

The underground garage has a 36" NW concrete mat slab reinforced with #5 and #6 rebar at 12 inches. The walls of the garage are 12" reinforced concrete and the concrete columns are 24x18 and 18x24. The garage roof that supports useable grounds above is a 16" reinforced concrete slab with 4" and 8" slab drops.

Mechanical

Elementary School One mechanical system utilizes several different systems to serve the different space types. There are 7 roof top units (RTU) where 3 are designated outdoor air (DOAS) and the other four are packaged units. Most of the building is conditioned by an air-cooled VRF system. These spaces are ventilated by the 3 DOAS units that are controlled by a VAV box in each space. The DOAS units have heat recovery wheels that transfer heat from the exhaust to the ventilation air. The multipurpose room and the cafeteria are conditioned by the 4 packaged RTUs (2 per space). The administrative offices are served by its own AHU which allows the space to be cooled separately during the summer operation.

- RTU-1 and 2 serve cafeteria (5000cfm)
- RTU-3 and 4 serve the existing building (heat wheel) (9180cfm and 5600cfm)
- RTU-5 serve the addition (heat wheel) (8875cfm)
- RTU-6 and 7 serve the multipurpose room (5000cfm)

Electrical

Power comes into the building to a 2000A switchboard that serves 6 distribution panels and two standby switch panels at 480/277V. The building separated into east and west panels which are the existing and addition respectively. Most of the equipment runs on 480V and the lights and receptacles run on 120V. There is an outdoor gas generator on the roof that has a 60 gallon day tank which can serve the emergency systems if needed.

Lighting

Most lighting fixtures are recessed fluorescent in the school and compact fluorescent lamps are used in the multipurpose room. The lighting throughout the building is controlled by time switches, photoelectric switches, standalone daylight-harvesting switching controls and indoor occupancy sensors. These controls help save energy while meeting the lighting power density for the spaces.

Engineering Support Systems

Fire Protection

There is a sprinkler system throughout the whole building with wet and dry pipes depending on the space type. Smoke detectors and heat detectors are both used to detect the presents of a fire. There is an in-line fire pump on the lower level that will supply the standpipes and sprinkler system. Strobe light and speaker are used to alert occupants of a danger.

Transportation

There are two elevators in the building for transportation. One elevator is in the corridor separating the garage to the lower level of the addition. This elevator only goes one story from the garage sublevel to ground level. The other elevator is in the middle of the addition and runs from lower level to the 3rd level of the addition. This elevator serves both the addition and the existing building.

Telecommunications

There are two telecommunication rooms in the complex. One is on the lower level of the addition and one is on the second level of the existing building. These rooms serve the whole building with cable, phone, internet and the local network.