FEBRUARY 2011

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Autodesk Revit MEP 2011 Improvements

Let's be honest, who wasn't skeptical about the future of Revit when it was first released? It has been a bumpy road but overall it is definitely headed in the right direction with the release of its latest version, Revit 2011. Although the improvements have been widespread throughout trades, this article will focus primarily on MEP.

The ability to take an architectural linked model and use the MEP fixtures placed within it would probably be the best new feature. Fixtures such as mechanical equipment, plumbing, lighting and air terminals can now be copied and monitored. These fixtures can then be mapped and changed to smart MEP content simply by using the Copy/Monitor tool. Using this tool in conjunction with the Coordination Settings tool, an engineer can now map any MEP fixture and schedule them accordingly.

Another new feature added in Revit 2011 is the ability to distinguish between a connected load and demand load on an electrical panel schedule. Revit 2011 has added a feature which allows the engineer to define their demand factor which then allows additional flexibility and speed of design.

An additional feature is the ability to add conduit and cable trays to a model. Revit 2011 has given the engineer the freedom of choosing between ladder, trough, channel, solid bottom and wire mesh cable trays along with the associated connectors and fittings. The engineer can also transition between conduit and cable trays as well as place junction boxes where required. The 'connect into face' feature also allows the engineer to terminate conduits on electrical equipment, such as distribution panels, switchboards and panelboards.

Lastly, the addition of flat oval duct into Revit 2011 has allowed the mechanical engineers more flexibility with their design. These additions have made the BIM environment more dynamic and flexible, as well as, and this is the most important aspect, a happier and more efficient engineer.

Greater Lawrence Family Health Center
150 Park Street – Addition and Renovation
Lawrence, Massachusetts
Architect: Caldarola Design Associates, PC

The scope of this project was to design HVAC and electrical systems for an addition of approximately 6,300 sf and a renovation of approximately 7,200 sf. The addition included exam rooms and associated support spaces. The renovation program included a retail pharmacy, an IT room, lab, exam rooms, provider's offices, and associated administrative space.

The design challenge was to provide cost effective HVAC and electrical systems that addressed the programmatic and regulatory needs of a community health center and the requirements of the newly renovated spaces, as well as re-using existing infrastructure where possible.

Our solution included packaged rooftop units for heating, cooling, and ventilation. Toilet exhaust was achieved using centrifugal rooftop exhausters. IT room cooling was supplied via a ductless split system local to the IT room. New low-velocity duct systems were provided for supply, return, and exhaust distribution.

Electrical design included a new electrical service brought in from the street via a pad mounted transformer. The existing electrical panels were re-fed from the new service. New electrical panels were provided for the addition. New power distribution and fire alarm systems were provided for the addition. Extension and reconfiguration of the existing building power distribution and fire alarm systems. New lighting systems were provided throughout to minimize lighting energy and achieve space lighting goals.

FITZEMEYER & TOCCI ASSOCIATES, INC.

Monthly Publication of **Fitzemeyer & Tocci Associates, Inc.**
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BASHO Restaurant
1330 Boylston Street
Boston, Massachusetts
Architect: Office DA

BASHO Restaurant is located at 1330 Boylston Street in Boston, MA. At about 8,000 sf, the space serves as a Japanese restaurant and Sushi Bar.

The major design challenge for the restaurant was to design a cost effective design that would coordinate well with the extremely modernistic design of the space. This meant that all exposed equipment such as lighting fixtures, sprinkler heads, emergency lights, diffusers etc. would require a simplistic touch so that the overall appearance of the space was contemporary in its entirety.

The HVAC system that was chosen for the project included a series of heat pumps fed from the buildings hot water system that would provide a comfortable environment. Since the owner wanted to open the doors of the façade during spring and summer hours, radiant heat panels were designed into the store front's plenum to maintain a balance of temperature from the exterior and interior.

The electrical distribution for the restaurant was large enough to power all of the HVAC equipment as well as the kitchen equipment. A state of the art lighting system was used in the space incorporating LED lighting throughout the space excluding the kitchen. State-of-the-art emergency lighting was used above the ceiling so that, during normal lighting conditions, the fixtures would not be seen. In emergency mode, the hinged doors pop open from the ceiling and the lights shine down to ensure that the path of egress is illuminated.

The plumbing and fire protection systems throughout the space also incorporated water conserving equipment to maintain the overall cost effective design.

The fire protection system uses concealed pendant sprinkler heads for a modernized design and all plumbing fixtures are cutting edge as well.

New Hampshire Community Technical College
Nashua, New Hampshire
Architect: Dennis Mires

The scope of work was to design the mechanical, electrical, plumbing and fire protection systems for the brand new learning facility. The three level, 50,000 square foot building consists of classrooms, laboratories, office spaces, an auditorium and support spaces.

The design challenge for this project was to evaluate cost effective HVAC, plumbing, electrical and fire protection systems for the multi-purpose building. Another part of the challenge was designing energy efficient systems for the building while following design guidelines for educational facilities.

Mechanically, our solution was to provide four draw through type air handling units paired with air-cooled condensing units to provide cooling for most of the building. The laboratory suite was served by a packaged heating and cooling energy recovery unit. The energy recovery unit provided 100% outside air to the space per the design requirement. This allowed for energy efficiency by using the exhaust air to temper the intake air through heat transfer via an energy wheel. Primary and secondary heating was provided by two (2) 1500 MBH packaged hot water boilers. The boilers were sized for N+1 redundancy. All air handling units served variable air volume boxes with terminal re-heat coils.

The new electrical service to the building for normal power was provided via the utility company pad-mounted 1500 kVA transformer located outside of the building. The facility also had emergency power through local battery units provided for all life safety and egress systems. The lighting system solution was a product of adhering to design guidelines and energy efficiency lighting controls.

The fire suppression solution is an automatic wet-type sprinkler system served by a new service from the street.

The plumbing design consisted of new cold, hot and re-circulated hot water supply systems. New sanitary and storm drain services were extended to existing site services. The new natural gas service supported the new hot water boilers, hot water heaters and all domestic hot water needs.