Syracuse University Center of Excellence

Education

Hazardous Biofuels Laboratory Calls for RJA's High Level of Attention to Unique Fire and Life Safety Details

Challenge. By late 2008, researchers working within the Syracuse University Center of Excellence (CoE) in Environmental and Energy Systems will be able to continue their studies into biofuels and alternative energy sources in the CoE's new headquarters on the university campus in Syracuse, New York. The five-story, 55,000 square foot building, which is currently under construction, will house a high hazard biofuels laboratory on the first floor and numerous classrooms, learning labs and offices throughout the rest of the building.

Protecting this high hazard biofuels occupancy, in which researchers plan to work with large quantities of flammable liquids such as ethanol, presented unique challenges that Rolf Jensen & Associates (RJA) consultants needed to solve. Part of protecting this type of area entailed planning explosion venting, which is required by code when a building will contain certain classes of liquids and/or when vapors are likely to be released. Sustainable building designs also presented fire design challenges for the first floor, which is classified as a high hazard occupancy while the other floors will be deemed business occupancy.

Solution. To address code requirements for the explosion venting, RJA recommended explosion vent panels that would simply pop out when a maximum pressure point is reached. This would allow the overpressurized room to vent to the outside so that the building structure does not fail. RJA also specified a dedicated exhaust system that is separate from the rest of the building and is continuously ventilated at a steady rate to prevent buildup of flammable vapors or harmful noxious fumes.

Sustainability has also been a high priority for the design team, which is likely to seek LEED® certification. Some of the proposed green design elements, however, conflicted with the code in place at the time of the initial building review, as well as with the protective measures that are required for high hazard occupancies.

Result. The design team chose a green roof for the biofuels lab, for example, based on how it can reduce storm water runoff and reflected heat. The plan called for allowing access to the roof from the interior of the third floor and from a large ramp running up the side of the building. RJA had to evaluate this ramp in terms of it being a means of egress from the roof because it would be accessible by the public. Because the design didn't include a second approved means of egress, RJA noted that the roof would have to limit access to 50 occupants at a time.

Meeting code became an issue with another green building component, too. The design team contemplated the use of a curtainwall system, which would optimize the amount of daylight and use solar gain to keep the building cooler in the summer and warmer in the winter. The problem, though, was that the curtainwall needed to be fire rated due to the building lot separation distance. RJA was able to justify using this type of curtainwall product by translating how its manufacturer's testing applied to the testing referenced in the building code.

Sustainable building components, as well as the more pressing issues surrounding the biofuels laboratory, demonstrated RJA's ability to intelligently analyze available options and to work diligently to either meet code or convince local building officials that its specifications were worthy of approval for protecting the CoE's occupants.

Image Credit: Toshiko Mori Architect

- **Sustainable Design**
- **Code Consulting**

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