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Lessons of Form and Function for a Large Door

Hufcor Premier ™ Door Emulates Hangar Environment, Carries out Building Design

According to the chief facilities officer at the Massachusetts Institute of Technology, when it comes to the buildings on its campus, “it’s all about ideas.”

The buildings at the world-renowned MIT are not just for containing students and faculty but are expected to do their part to support innovation, experimentation and rigorous thought.

As an example, the recent 6,000 sq. ft., three-story Robert C Seamans Jr. Addition to the 50,000 sq. ft. MIT Daniel Guggenheim Aeronautical Building provides an open, flexible, creative space. For this building a large door was needed to accommodate the sizable projects that are worked on in the classroom.

To provide reliable service and yet carry out the ideas behind this building, the project’s architect, Cambridge Seven Associates (C7a), specified a Hufcor Premier ™ vertical bi-fold door featuring 6061-T6 aircraft aluminum construction. This door is 23’7” wide by 16’8” high and when open, has a clear height of 13’8”.

Hufcor has considerable experience manufacturing movable walls and partitions. And part of their glasswall product lineup provided the functionality and look C7a was after. As Hufcors consultant pointed out, “we work regularly with the architectural community to push the envelope on commercial, municipal and residential projects.”

Designing, building and testing a new aircraft, spacecraft or satellite within this teaching space should emulate the industries in which these students would eventually work. The classroom area on the second floor is above ground level hangar space. In effect, a project that starts out in the design classroom moves just 15 to 20 feet over to be fabricated and then the mock-up goes into another area for testing.

Like working aircraft facilities, metal was a natural choice for the building’s important elements. Stainless steel batten seam roofing provides cover for the barrel-vaulted hangar space and the idea of using a vertical bi-fold door on the addition seemed to be a natural conclusion.

According to Steve Imrich, the project architect with C7a, “we had considered other kinds of doors.” They checked out fully cantilevering, single leaf doors and counterbalanced single leaf doors that did not fold overhead but pivoted. They also weighed going with the traditional slider hangar door but did not have the room. The decision came down to the doorway seal. The vertical bi-fold design delivered classroom comfort and energy conservation.

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C7a was looking for a door that would not stand out against the overall theme of the building but merge into it. Provisions were made for a Kawneer 1600 Curtain Wall System to be fitted on its frame. The system holds blue tinted windows, such as those on all three sides of the building. The steel used in the building frame would create too much weight, so C7a chose Hufcor's Premier door partly for its aluminum frame.

We've procured dies to match the tubing that was part of the building structure. Door engineers were aware that a door this large and with this much weight could amplify any twisting in the frame that might occur during operation. This action would cause the glass inserts to pop out of the door. Mathematical models enabled the engineers to calculate the right size frame members to achieve proper rigidity and also ran computer desktop wind load tests.

The door's 6061-T6 aircraft structural tubing was jig welded in alignment with the Kawneer Curtain wall System. One inch windows (two 1/4" laminated glass panels with an energy-saving 1/2" air space in between) on both the curtain window and the door cuts both noise and UV rays going into the building to enhance the learning environment. The Premier door has modular construction, so installation was quick, easy and economical.

C7a was brought onto this project off of a portfolio of buildings, which reflected the advanced thinking that went into Seamans Laboratory Addition. As this is not strictly just a lab or classroom facility, it required the design firm to "think out of the box" and merge ideas. "Our firm has done quite a bit of work in museums and academic settings as well as transportation and hospitality where the whole project is a blend of features that commonly would not be seen together," assesses Imrich.

According to Lucas, "Along with a fully functioning door, we brought a willingness to explore design possibilities that would mirror the overall mission of the building."

Premier ™ Door at a Glance

Architectural aluminum tubing is used in the construction of the door. While tubing can be painted, most customers choose raw, mill finish for a clean, crisp look.

For the door's skin the sky's the limit. One of the appealing aspects of the Premier door is that Hufcor does not provide the skin. Just the frame. The architect, end-user or contractor can think outside-the-box. Hufcor has manufactured doors to accept glass, translucent plastic, brushed aluminum, stucco, wood facades, and composite concrete. Hufcor can also facilitate coordination of the finishing trades or include this in their proposal.

Attention to detail. With aesthetics playing a predominant role, Hufcor attends to every facet of the door to ensure a sharp, refined look. Special door kick-outs are fabricated and special locking mechanisms employed.

Top-mounted motor and drive mechanism. In many Premier applications there is the interest in "masking" the drive mechanism. Whether the reason is to hide the motor or strict adherence to aesthetic criteria, Hufcor's ability to mount the drive mechanism on the building header conveniently and efficiently addresses this requirement.

What kind of controls do you like? Remote push-button? Keyed entry? Number pad? Swipe card? Hufcor can do it all.

Variable-speed AC-Drive. Each door is driven by Hufcor's Ascent ™ variable-speed AC-Drive smoothly opening and closing the door for quiet and efficient operation.

Installation is as easy as 1-2-3. If the door panels have to be spliced, simple bolted together, modular construction allows for quick and easy installation. Hufcor's trucks deliver the doors with TLC insuring the product arrives without damage. Installation is also available.