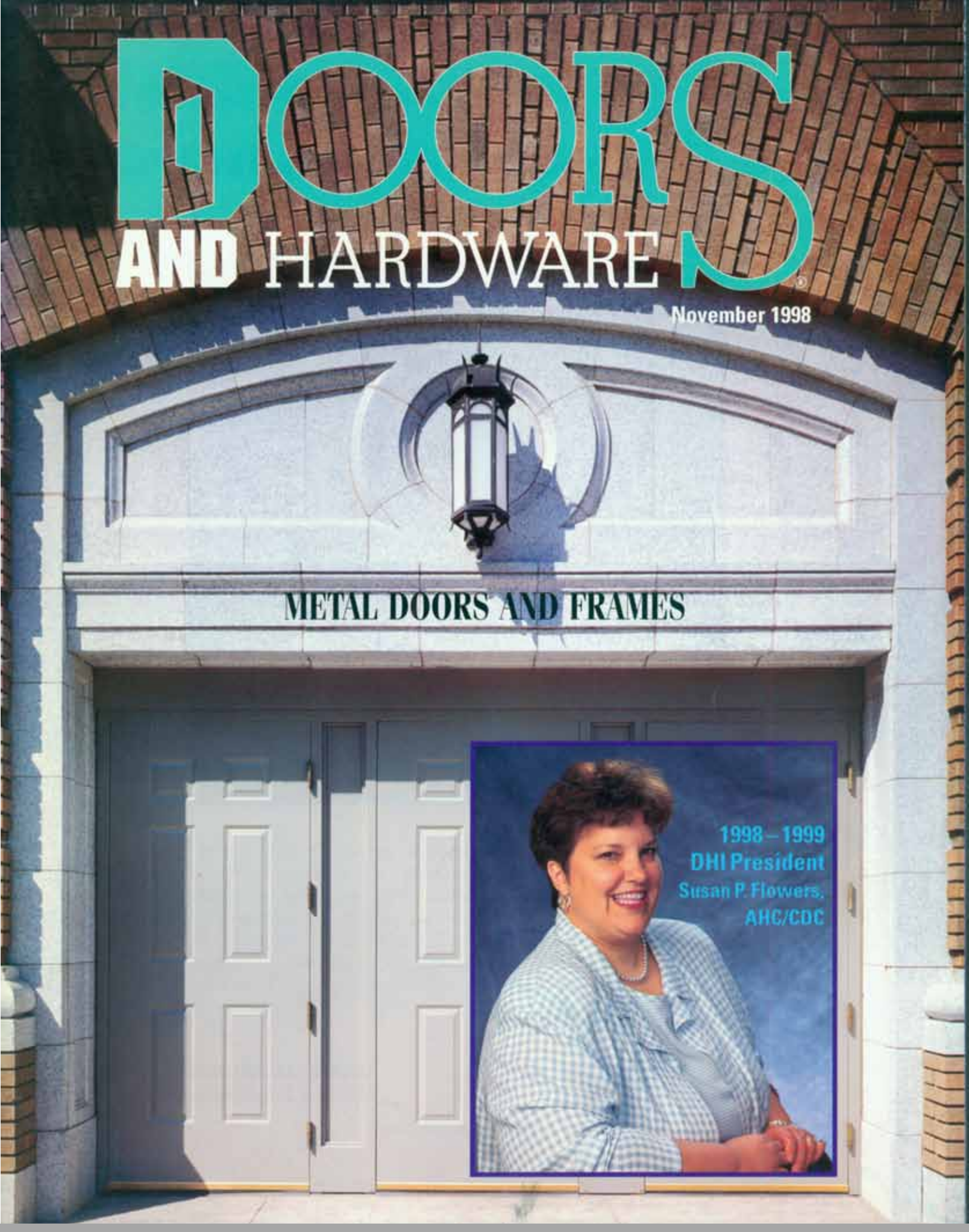
DOORS AND HARDWARE

November 1998



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CASE STUDY

Stainless Steel Doors at Baltimore -

The architects at the Baltimore-Washington International Airport (BWIA) wanted a special look, the kind of entrance that they hoped would be a signature welcome for passengers coming in and out of their terminal. They needed a design for their departure-arrival doors that made an instant visual impression on travelers, one that in a glance said clean, secure and meticulous. But they also needed the kind of strongly crafted product that was going to hold up to the usage demands that such an entrance goes through hour after hour and year after year.

Washington International Airport

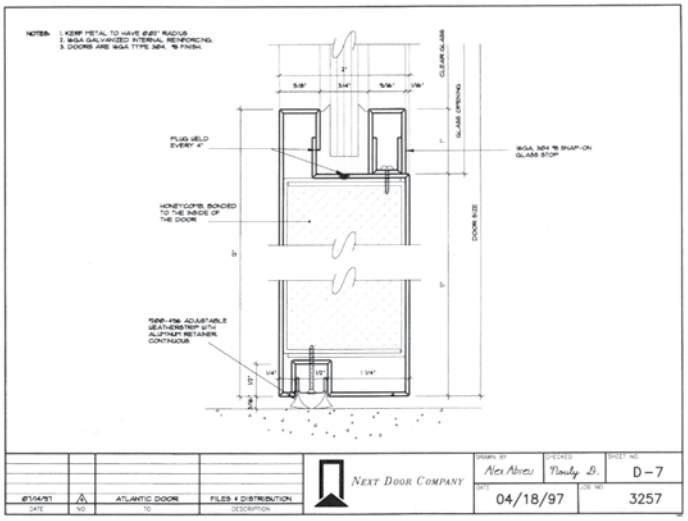
The answer was already on their boards: stainless steel. What other metal has its look? Strong. Smooth. Spotless. Stainless steel has always drawn people's eyes, and often their touch as they reach out to run a fingertip across its polished, cool surface.

Most people can probably guess the advantages of stainless steel: Its strength and resistance to corrosion make it a good material for a variety of commercial and industrial buildings, especially those facing the abrasives of salt air or other harsh environments. Its easy-to-maintain surface makes it a tantalizing option for public structures facing heavy traffic on a round-the-clock schedule.

Once Next Door Co. was contracted to handle the doors, Lee Hunt, AHC, was brought in from Architectural Resources Inc. to work with the BWIA architects. When we received the airport's atypical door and hardware specs, we created the specified .02 radius by back-cutting the metal and giving it a sharp bend. By doing so, we created internal moldings that kept the glass insert in place. This unique application created a totally seamless door including all the fixed glass stops as well as the channels on the top and bottom of the door — no seams, no exposed screws. All of the hardware and gaskets were built in.

That seamless, welded shut look is one way to make a top-quality stainless steel door. The unique qualities of stainless steel make the manufacturing process inherently customized. Manufacturers don't use the kinds of carbon steel tools and standard welding techniques used in comparable metal doors. The way a stainless steel door is designed and fitted brings out a quality that has to match the unforgiving and natural gifts of the metal. Quality control must be applied at every step of the manufacturing process, starting with the shop drawings. Every minute detail, including graining, has to be worked out and set down, so the end user will have absolutely no question about the unit when received.

For example, think of a detail like a surface closer reinforcement. In hollow metal work, its application is taken for granted, but in stainless steel doors, the way it is designed and applied is critical to the performance and appearance of the unit. The drawings can't leave any room for guesswork.



Shop drawing shows internal molding, glass stop and built-in gasketing.

Another difference between hollow metal doors and stainless steel doors is tooling. To make a quality stainless steel door, you can't use tools, bits or tooling that are also in contact with carbon steel. Even minor traces will be picked up by the stainless steel product and will eventually show as unacceptable rust spots. In addition, even if a stainless steel manufacturer could use the same tooling, they would have to use it differently since stainless steel work "hardens." It takes about twice the force needed to bend the same radius as a comparable gauge of regular steel, so it has to be handled differently all down the line.

When checking a stainless steel product, the welds should be ground and finished to the same surface characteristics as the face of the door. Then the door should be assembled and matched to the jamb. This type of assembly process prevents problems with fit and installation. If the door doesn't have welded seams all around, it should have mechanically interlocked edges — not an outer veneer of stainless steel fastened onto an existing door with exposed edges.

Welding is another area with great differences. Stainless steel is much more heat-conductive and reacts differently in welding, requiring special skills and experience as well as special equipment. A good manufacturer will also

insist on having welders who are stainless certified. These welders know that you can't have spot welding on an exposed surface — you have to engineer the doors and frames around that requirement.

Quality shines through

That kind of corner-to-corner stainless steel makes stainless steel doors stand apart. They won't warp or rust from the inside, offering some advantages over cladded wood doors made with stainless steel veneer or conventional galvanized steel entry doors.

Cladded doors are often specified, allowed and used quite frequently, but there's a misconception in the market about them. Many dealers and distributors believe you can take a door that's fire-rated, wrap it in a sheet of stainless steel and still have a fire-rated door. But it's just not true, according to UL. Unless a particular assembly is tested and rated, it has no fire label at all. Even the highest rated standard steel door loses its fire rating when modified, which can be a liability in some circumstances. Also, because a cladded door is laminated onto a substrate of different material, it's going to delaminate in time. It can also be subject to an unsightly condition called "oil-canning."

Contact between the stainless steel and carbon steel can also cause a serious corrosion problem from electrogalvanic action. In addition, clad doors usually have mechanical fasteners on their edges, such as rivets or screws. These are bound to work loose sooner or later. By definition, edges can't be seamless if they're clad, and they'll always have an unsightly exposed edge of metal.

A seamless, corrosion-free stainless steel door offers some advantages. The inside is even more important than the outer appearance. Every component has to be the same alloy of stainless steel as the outside, or you'll get corrosion. There are products on the market that allow carbon steel components, but the mixing sometimes leads to corrosion from the inside out, and that defeats its purpose.

The most common, and probably the most important, manufacturing option to select is the type of stainless steel alloy used in the door. But inside the door, there are several options, too, including honeycomb, solid polystyrene and steel-stiffened. Other performance ratings include acoustic sound-rated doors up to STC 51, fire-rated up to three hours, combination fire- and sound-ratings on the same door, hurricane windload rated doors and bullet-resistant doors.

For the airport project, we suggested an alternative to one of the BWIA project's specifications. Inside the door, the architects had specified a standard core with box channel reinforcements at the bottom. After we reviewed the usage of this door, we determined that the bottom of the door would not be able to sustain the typical airport abuse. Consequently, we presented a special $^1/_2$" "cell" plastic honeycomb core. This option gave them more long-term durability and thus a lower life cycle cost.

Because our doors are custom made, they can accommodate any type of hardware with ease, allowing customers the option of upgrading to advanced security systems to add peace of mind to their purchase.

One challenge we faced was creating interest in the doors, which are usually attractive but bland. To solve this problem, our company introduced a new decorative line targeted for upscale homes and image-conscious businesses. The line makes use of textures, custom patterns and embossments, a wide variety of finishes and a special line that blends stainless steel and decorative glass.

A good stainless steel manufacturer should read between the lines of quote requests and let the customer know his options through common-sense voluntary alternatives and bid notes. It's especially important to let a customer know when the quality specified may not be up to the task. In many cases, this can prevent a lot of trouble later. The goal is to deliver a door that meets the intended use and performance criteria.

Don't be afraid of unfamiliar territory. Some dealers and distributors shy away from bidding stainless steel doors because they're afraid of the unknown. In reality, stainless steel doors are a great high margin opportunity and a natural extension of current lines. It's a growing field, and customers are going to want more and more of these versatile doors. Stainless steel is like anything else — if you work closely with people you've come to trust, your experience can be hassle-free…and very profitable.

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