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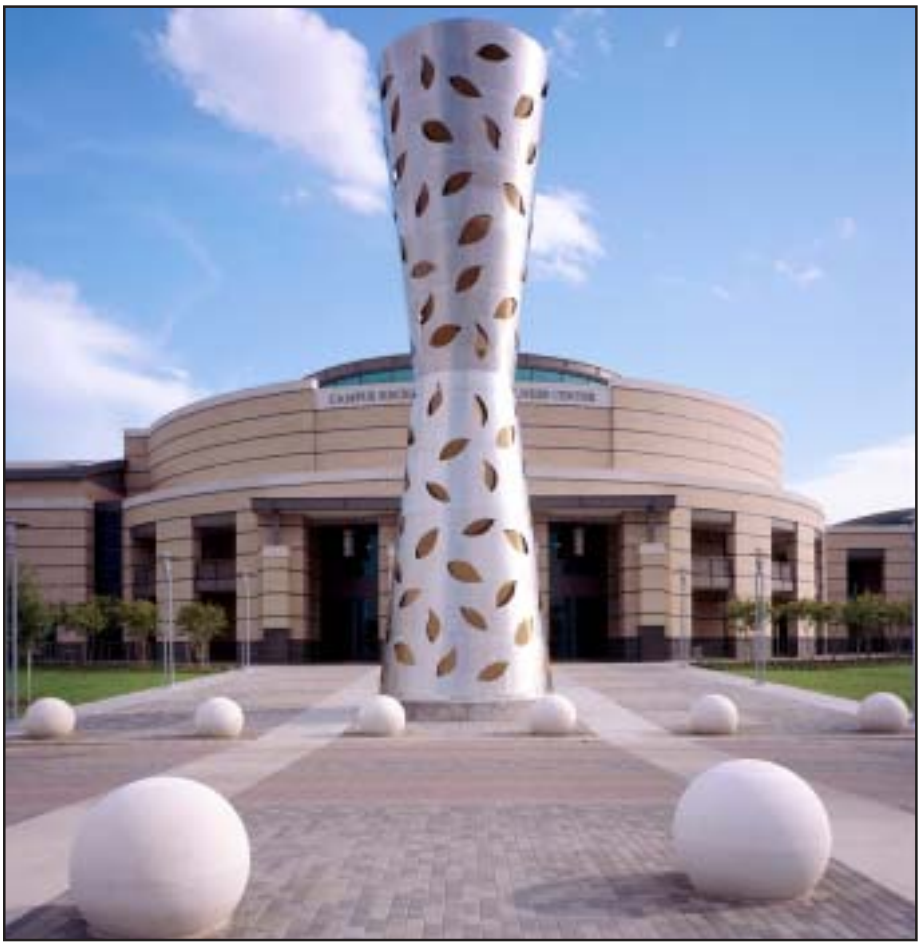
Houston Contractor Wins Over Skeptical Artist to Create a Campus Landmark



"HEALING NATURE" – UNIVERSITY OF HOUSTON RECREATION AND WELLNESS CENTER, HOUSTON, TEXAS

Artist: *Tim Glover*

Sheet Metal Contractor: *Blumenthal Sheet Metal, Houston, Texas*

Acting as a beacon to the campus community, "Healing Nature" is a two-part sculpture designed to enhance and complement the activities at the University of Houston Recreation and Wellness Center.

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Houston Contractor Wins Over Skeptical Artist to Create a Campus Landmark

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Crafted by artist Tim Glover, "Healing Nature, Leaf Column and Leaf Canopy," create a combined visual experience from outside to inside the building. "The leaf has been a central image and symbol in my work representing nature as a healing force," says Mr. Glover.

Commissioned in the spring of 2002, the design features two sculptures, one located outside the front entrance and the other suspended in the lobby. With the center scheduled to open the next spring, Mr. Glover needed a cohesive team and a fully-equipped facility to get the work done on a very tight schedule. Blumenthal Sheet Metal had assisted with the design and estimating phase of the project and was selected for the final fabrication. This was the first time Mr. Glover worked with a fabricator to build a sculpture outside of his own studio.

According to Mr. Glover, "Blumenthal proved to be an exception to the rule that an industry fabricator could not have the skill, sensitivity and commitment to build artwork. Being a 'hands-on' sculptor, with personal experience as a welder and fabricator, it was important for me to stay involved with the fabrication of the sculpture. Blumenthal opened their shop to my assistants and me, providing us space to polish and prep material before and after fabrication."

Standing 51 feet high, "Leaf Column" is a double-tapered stainless steel cone with an incised leaf pattern that functions as a beacon for the front of the building. The top and bottom diameter measure 14 feet across while the middle point measures 8 feet across.

Upon entering the lobby, "Leaf Canopy," a mobile of 76 aluminum leaves, lifts your gaze with its 40-foot diameter spreading across a clerestory rotunda. Each aluminum leaf, ranging from 3 to 4 ½ feet in length, hangs from stainless steel cable. The canopy floats in four-tiered concentric rings 42 feet above the floor. Each of the 76 leaves is balanced and rigged for subtle movement.

Shop foreman and project detailer, Robert Niles, outlines some of the work that Blumenthal did for the project: "A great deal of planning, forethought and man-hours went into this project, from receiving the materials to cutting, polishing, forming, fabrication, assembly and repolishing of the pieces – all of which had to be carefully done to the artist's desired specifications. Once the column was fully assembled and polished, we had to disassemble and wrap it with a protective covering in preparation for trucking to the final destination. On the day of installation, we had a crew at the shop loading the truck one section per load. At the installation site, we had two cranes set up to off-load and erect the sections of the column as they were delivered to the job site."

During the process, Mr. Glover worked closely with Blumenthal shop personnel to ensure the artistic integrity of his sculptures. "The Blumenthal shop staff was generous with their skill and experience," he says, adding, "we became like family working together for several months on this project. By the time we finished, everyone in the shop had some connection to my work."

In the rotunda, "Leaf Canopy" with its 76 aluminum leaves rigged for subtle movement offers visitors a peaceful respite from the facility's busy activities.

On the Cover

Standing 51 feet tall, "Leaf Column" represents a blending of the human form with nature.

For Blumenthal workers, there is an added value in doing an artistic sculpture like this. As Kevin Noack, estimator, points out, "Most of our work is in plants and factories and usually not available to be viewed by the general public. Working on a public piece like this gives our families and friends a chance to see, feel and enjoy some of the work that we do."

Spiraling to Precision

UNIVERSITY OF WASHINGTON SURGERY PAVILION, SEATTLE, WASH.

Architect: *NBBJ, Seattle, Wash.*

Sheet Metal Contractor: *Hanset Stainless Inc., Portland, Ore.*

Upon entering the University of Washington Medical Center's new Surgery Pavilion, visitors are mesmerized by the sleek two-story stainless steel staircase expertly fabricated and installed by the craftsmen of Hanset Stainless.

"The staircase is the dominant architectural feature in the building," comments Dale Morse, Hanset project manager. "I believe it says to the patients, families and staff, this is a modern, state-of-the-art facility and you are in good hands here."

Completed in October 2003, the 160,000 square-foot structure includes 11 operating rooms, accommodations for an array of medical services and an underground parking garage with 300 spaces.

Using Type 304 stainless steel and composite plastic, the crew fabricated the guardrail system, tread riser plates and stringer covers for the staircase. "At first our biggest challenge was working with the composite plastic and learning how to curve it to the specifications," explained Mr. Morse. "We experimented with several techniques and worked closely with the plastic manufacturer. This was the first time their product had been used in this manner."

Access to the facility is gained through the below-ground parking garage. In the garage lobbies, Hanset fabricated and installed 28-foot long aluminum benches as well as the backlit wall panel system.

The circular staircase revolves around a 10-foot radius with each step illuminated as you travel.

As the project progressed, the installation onsite proved to be a larger challenge. Due to imperfections in the construction of the staircase "skeleton" each curved stinger base cover was custom-fabricated to meet exact measurements to within 1/16 of an inch. "The staircase spine was installed by another contractor and as we began our work it was apparent that each step was a different size. Our crew needed to address those inconsistencies or the staircase would be compromised."

In addition, the Hanset team fabricated and installed aluminum benches in the parking garage lobbies as well as the backlit stainless steel wall panel system. The $560,000 project required more than 3,500 man-hours to complete.

Copper Shower Sculpture – Turning An Owner's Dream into Reality

Sheet Metal Contractor: *Vickers Metal Works Inc., Orlando, Fla.*

The craftsmen at Vickers Metal Works took this creative homeowner's rough sketch and delivered a beautiful, functional shower that accents the home's outdoor pool deck.

"The owner came to us with a vision of a shower feature he wanted," explained Tim Vickers, president. "He drew a rough sketch and we made it a reality. He tells me it turned out exactly as he had envisioned."

The custom fabrication of the shower required close to 70 man-hours to complete. The sub-frame of the shower was fabricated using Type 304 stainless steel angle framework. Using copper "tinners rivets," 48-ounce copper sheets were attached to the frame. The copper panels were polished and clear-coated prior to installation.

Delivered in one piece, the sculpture was fastened to a concrete pad through a ¼-inch stainless steel base plate. The existing paver stones were removed from the pool deck to allow installation of the base plate onto a specially constructed concrete pad. Once the sculpture was in place the pavers were carefully reinstalled.

The shower head and hardware are also copper to blend with the sculpture. The design allows for a removable front panel to access the plumbing.

Standing at close to seven feet tall, this striking copper shower adds to the beauty of a lushly landscaped yard. The clear-coated copper will retain its finish for up to three years and may be reapplied or left to develop a natural patina.

Review the "Tools of the Trade" – Century-Old Techniques Still Deliver

Are your journeymen forgetting about the tricks of the trade? Not using tools that are readily available to help save time and money as well as deliver a high-quality product?

"Tools of the Trade," the Architectural Sheet Metal Forum during SMACNA's annual convention, Oct. 24-28 in Maui, will offer contractors an opportunity to see how the use of presently available tools can save time and money on every project.

Members of the Architectural Sheet Metal Council will present hand-forming techniques used by architectural sheet metal contractors as well as methods to produce aesthetically pleasing, watertight ridge connections without soldering.

In the highly-competitive architectural sheet metal market, a project's profitability relies on the details to be aesthetically pleasing, watertight and completed in a timely manner within budget. Contractors can return to their firms and reintroduce their superintendents and foremen to these century-old techniques that still deliver and should not be left to gather dust.

For more information on the SMACNA annual convention visit, *www.smacna.org*. ■

Understanding the Popularity of Zinc

When viewing some of the more memorable projects across the United States and Canada in recent years one can appreciate the incredible growth zinc has experienced as building material.

That should come as no surprise to our colleagues in Europe. That's because, while it is a relative newcomer to North American construction market, zinc's use throughout the "Old World" dates back to the 1700s.

The same aesthetic and durable properties that continue to make zinc a building material in demand throughout Europe are becoming increasingly obvious to architects and builders here.

Zinc applications need little or no maintenance. Properly detailed and installed, zinc is extremely durable. It lasts 80 to 100 years as a roofing material and upwards of three centuries as a wall finish. It is important to keep in mind that the longevity applies to monolithic zinc, not surface-coated galvanizing.

The durability comes from the inherent ability of zinc to form a protective coating, as patina. The patina forms over several years, combining carbon dioxide from the air with water to create zinc carbonate or zinc chloride in a maritime environment. Condensate cannot be allowed to form between the metal and the substrate; it must be detailed and installed according to the manufacturer's requirements to ensure durability. Zinc needs "to breathe."

For use as a building material, pure zinc is alloyed to strict European standards. Alloying with small fractions of titanium and copper adjusts material properties, including expansion/contraction rates and color.

Zinc use is not specific to any geographic area. Though temperature may influence how a craftsman works with the material, it is as comfortable at high altitude in extremes of cold as it is in hot desert or wet maritime environments.

As a flexible material, zinc can be used in both traditional and cutting edge, modern signature solutions. In traditional buildings zinc is replacing lead for domes, copulas and flashing. It is easily formed into shingles, flatlocks or tiles.

The ability to profile zinc into corrugated, trapezoidal shapes makes the material an attractive option for industrial type applications. As modular panels, zinc is appropriate to rain screen technology employed on contemporary and high-rise structures.

Architects are specifying zinc out of environmental concerns. Zinc is available globally in large quantities. Finished goods have a low primary energy content. The material is UV and temperature resistant and non-combustible. In addition, it is easily recycled, consuming as little as five percent of its primary energy content.

As we look toward other reasons for the growth of zinc, we look to the evolving face of those working in the field.

There is a renaissance in the crafted metal trade. Trade schools and manufacturers are training craftsmen to work in zinc. Metalsmiths are discovering that their skills of working with copper can be directly applied to zinc, as the materials work similarly. Zinc, however, is stiffer than copper, requiring more strength to fold. Folds are characteristically softer and more rounded than other metal, and notching requires cutting to a punched hole to prevent stress build-up. Through their training and their work metalsmiths are learning the idiosyncrasies of zinc.

Above - full exterior: Completed in 1999, the David Geffen Foundation Building, in Beverly Hills, Calif., features 12,000 sq. ft. of RHEINZINK metal panels installed by SMACNA member, CMF Inc., of Orange, Calif. Left - close-up of panels.

There is a pleasant variability to zinc. Don't expect a painted reflective finish. The gloss on "pre-weathered" material diminishes to a matte 14.5 percent reflective blue-gray after a few months of weather. Each building elevation will weather differently in relation to the prevailing winds and develop its own distinct look and feel. Roof material will age differently than wall material providing another dimension to the architecture. ■

Courtesy of RHEINZINK® America Inc. (www.rheinzink.com), a leading manufacturer of titanium zinc roofing, cladding, and rainwater goods.

Oil Canning – It Bends Architects Out of Shape!

Oil canning is a perceived waviness across the flat areas of sheet metal panels. It is a naturally-occurring phenomenon that is inherent in all light-gage sheet metal. SMACNA's new "Architectural Sheet Metal Manual," 6th edition, provides methods from design to installation to mitigate its occurrence.

Oil canning is more apparent under shallow cross lighting so its presence is more discernible during certain seasons or times of day. Also, differing thermal forces can create waviness—either temporary or sustained—as the sun moves across the sky.

Oil canning is an aesthetic issue, not a structural problem or a defect. It is unrealistic to expect any architectural roof or similar wide-metal element to be totally free of some degree of oil canning.

While oil canning cannot be totally eliminated, adherence to industry accepted and recognized methods of design, metal specification, handling, fabrication, and installation can minimize its occurrence. Careful attention to the causes of oil canning within *all* the phases of design and construction is the most effective way to reduce its occurrence.

Design

Panel gages and widths scheduled must be selected to minimize oil canning with proper installation. SMACNA's "Architectural Sheet Metal Manual" provides metal gage recommendations based on several factors and those recommendations should be considered minimum gages and maximum widths.

Specifiers should use metal gages and limit panel widths that based on experience, either their own or that of experienced local sheet metal contractors, has shown as appropriate for a particular application and metal. The most current American Society for Testing and Materials (ASTM) standards should also be reviewed to gain insight into the standard tolerances to which various metals are manufactured.

Color and surface finishes also play a role in how oil canning is perceived. Wide, shiny, dark-colored, light-gage sheet metal panels will exhibit a degree of oil canning that is directly proportional to the width and inversely proportional to the thickness. Darker colors simply accentuate any oil canning that is present; the presence of oil canning can be made less obvious by the use of lighter, more neutral colors. Also, reflective surfaces will be more unforgiving in revealing oil canning while the use of non-reflective or textured finishes aids in masking waviness.

Movement of the primary support system or the structure itself can cause waviness that may become permanent or temporary during certain weather conditions. The fastener system should be designed so that the panels can "float" in response to thermal changes. In addition, the perimeter design is especially important. Ultimately, the magnitude of thermal stresses transferred from the structure to metal panels is carried through the fastener system. Stiffening ribs can be specified within wide panels to break up the panel and to reduce and make oil canning less apparent.

Metal Specifications

Generally, the heavier the gage the less oil canning will be visible. Oil canning can also be reduced by ordering tension-leveled coils and re-squared sheet stock. Tension leveling involves stretching the metal on coils past its yield strength which provides a flatter surface less subject to oil

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Sheet Metal Industry Week – Architectural Talents Turn Dreams into Reality

A special workshop session focusing on turning creative ideas into reality was hosted by SMACNA's Architectural Sheet Metal Council during Sheet Metal Industry Week, May 2-8 in Las Vegas. "Architectural Metal – Turning Dreams into Reality" used product samples to demonstrate installation principles and the importance of incorporating SMACNA's architectural sheet metal standards.

During this innovative session, professional contractors and tradesmen demonstrated up-to-date technology as well as conventional installation procedures. Participants discovered many new designs and methods for achieving desired results.

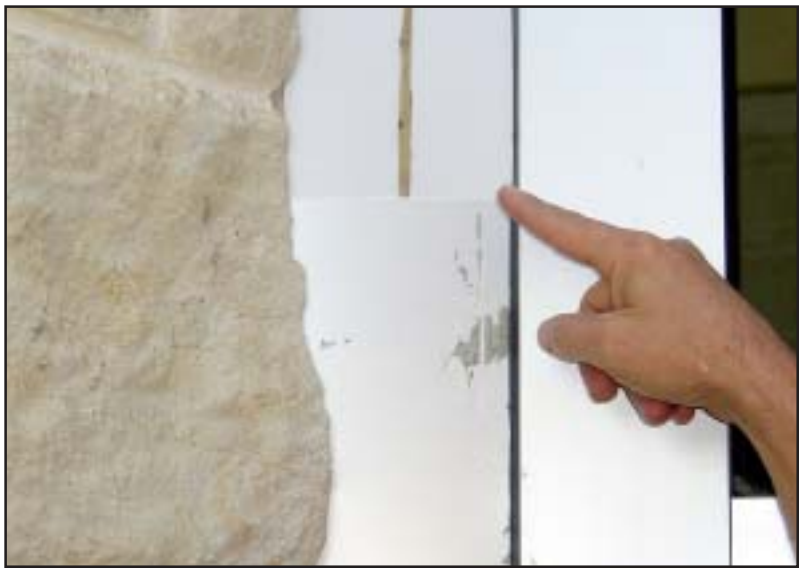
Using a cornice detail as a visual aid, the speakers demonstrated how installation principles work and discussed safety issues. The presenters showed step-by-step procedures on how to assemble the cornice and described the finer details of why the suggested methods work as well as the importance of incorporating architectural sheet metal standards. In addition, the session explored various issues related to water tightness and visual impact. Participants experienced first-hand the challenges associated with construction projects and learned efficient and effective methods of resolving such dilemmas. Discussion also included how to ensure a long-lasting, high-performing system as well as future maintenance issues. ■

Defects – Don't Be Guilty of These

Owners, engineers and designers need to be educated that the lowest bid does not guarantee the same quality craftsmanship and expertise that a SMACNA Contractor provides. A less qualified or less scrupulous contractor will gamble that omissions and defects will go undetected by the client and will under price the project.

Tim Moran, SMWIA Local 2 organizer in Kansas City, Mo., regularly presents independent evaluations of construction projects to owners, engineers and architects outlining construction defects and errors. His educational demonstrations prove that "you get what you pay for."

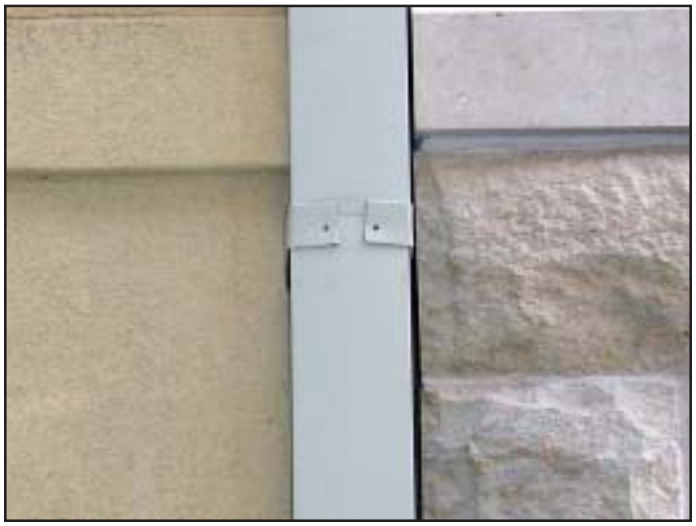
During a visit to a nearby university, Tim found several issues with a recently completed campus building. ■



Backwater lapped in this corner.

Coping is not clipped to strip.

Flashing is gapped.



Poor craftsmanship.

An angle support should be under the panels.

Oil Canning – It Bends Architects Out of Shape!

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canning. Re-squared metal simply assures that the metal's shape will be more amenable to roll or brake forming without generating unwanted surface tensions due to warped raw material or metal edges that are not truly parallel.

Handling

Proper handling needs to be addressed in every step of the process from production to final installation. For example, panels should not be carried "flat" or lifted by a single corner to remove one panel from a bundle. In some cases, especially with custom finishes, it may be beneficial to use clean gloves to handle and position metal panels. Appropriate shoes should be worn to avoid scuffing the finish.

Fabrication

Slitting panels from a coil releases and creates residual stress within the metal. Typically, slitting from wider coil stock is unavoidable due to the economic benefits of using wider coil stock. Residual stresses are also created by any forming operations required to develop flat metal into the desired shape. Metal forming equipment should be well adjusted, operated within its design limits, and operated by experienced sheet metal crafters to minimize stresses caused by fabrication.

Installation

The sheet metal's foundation—the substrate—is a very important element of any architectural metal system. For non-structural panels the substrate must be flat with any required felt/membrane or slip sheet, closely conforming to the supporting system. For structural panels, the resulting bearing surfaces must be properly aligned with the underlying roofing and one another, or the metal will "telegraph" the location of each support. Otherwise, stresses induced when the metal conforms to any contouring of the bearing system can create oil canning.

Placing panels too closely to one another at the "long" joints will not allow sufficient room for expansion and can generate waviness as daily and seasonally thermal stresses vary. Fasteners that are over driven or are of incorrect height can severely restrict movement—especially for long or wide panels. This rigidity can transfer stress to the panels through the daily and seasonal thermal variations and can create visible deformations.

Allowances must be made for thermal expansion in all directions; rigid retention methods that are too restrictive can cause oil canning and create stress cracks and tears in the metal, especially along the perimeter. The substrate must be of a material, or set of materials, that will not adhere to the underside of the metal and restrict its normal thermally-driven movements.

Oil canning is typically more visible on a new roof before the natural patina of raw metals or the paint weathers to its normal gloss. Using metals that weather to a natural finish as oxidation develops should be considered as one method to reduce the visual effects of oil canning.

To purchase a copy of SMACNA's "Architectural Sheet Metal Manual" visit *www.smacna.org/bookstore/* or call SMACNA's Publications Department at (703) 803-2989. The member price is $42 for the book, $50 for the CD-ROM and $42 for the PDF download. ■

Iowa Chapter Sponsors AIA Seminar

An information-packed one-day seminar provided members of the American Institute of Architects (AIA) Iowa chapter a look at the uses and potential of architectural metals.

Cosponsored by the Sheet Metal Contractors of Iowa, the first session "Custom Architectural Metals" offered an overview of the beauty and strength metal adds to a project. Led by Roger Reed, of the A. Zahner Co., the panel discussion featured metal samples and examples of their use. The popular "Top Ten Screw Ups" program was presented over lunch.

The seminar concluded with a computer-aided presentation, "From Virtual to Reality." Moderated by Robert Zahner, the presentation followed a project from concept to construction using 3-D computer animation.

In addition to continuing education credits, architects could purchase the newly-released sixth edition of SMACNA's "Architectural Sheet Metal Manual" at a discounted price. ■

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