Due **Diligence**

A temporary art exhibition helps preserve rare Chinese calligraphy and serves as a model for sustainable exhibition design and construction.

BY TIM MCNEIL

Treasures through Six Generations: Chinese Painting and Calligraphy from the Weng Collection was a three-month, 3,000-sq.-ft. exhibition at The Huntington Library, Art Collections, and Botanical Gardens. In sync with The Huntington's mission to preserve rare art, the exhibition incorporated a variety of sustainable design features.

TREASURES THROUGH SIX GENERATIONS: CHINESE PAINTING AND CALLIGRAPHY FROM THE WENG COLLECTION

Client The Huntington Library, Art Collections, and Botanical Gardens

Location San Marino, Calif.

Exhibition Design Muniz/McNeil

Design Team Christopher Muniz (principal/lead designer), Tim McNeil (principal/design director) Leon Rodriquez (senior designer), Debi Van Zyl (designer)

Exhibit Fabrication G&G Design Associates

Consultants Associated Mountmaking (hanging and support systems)

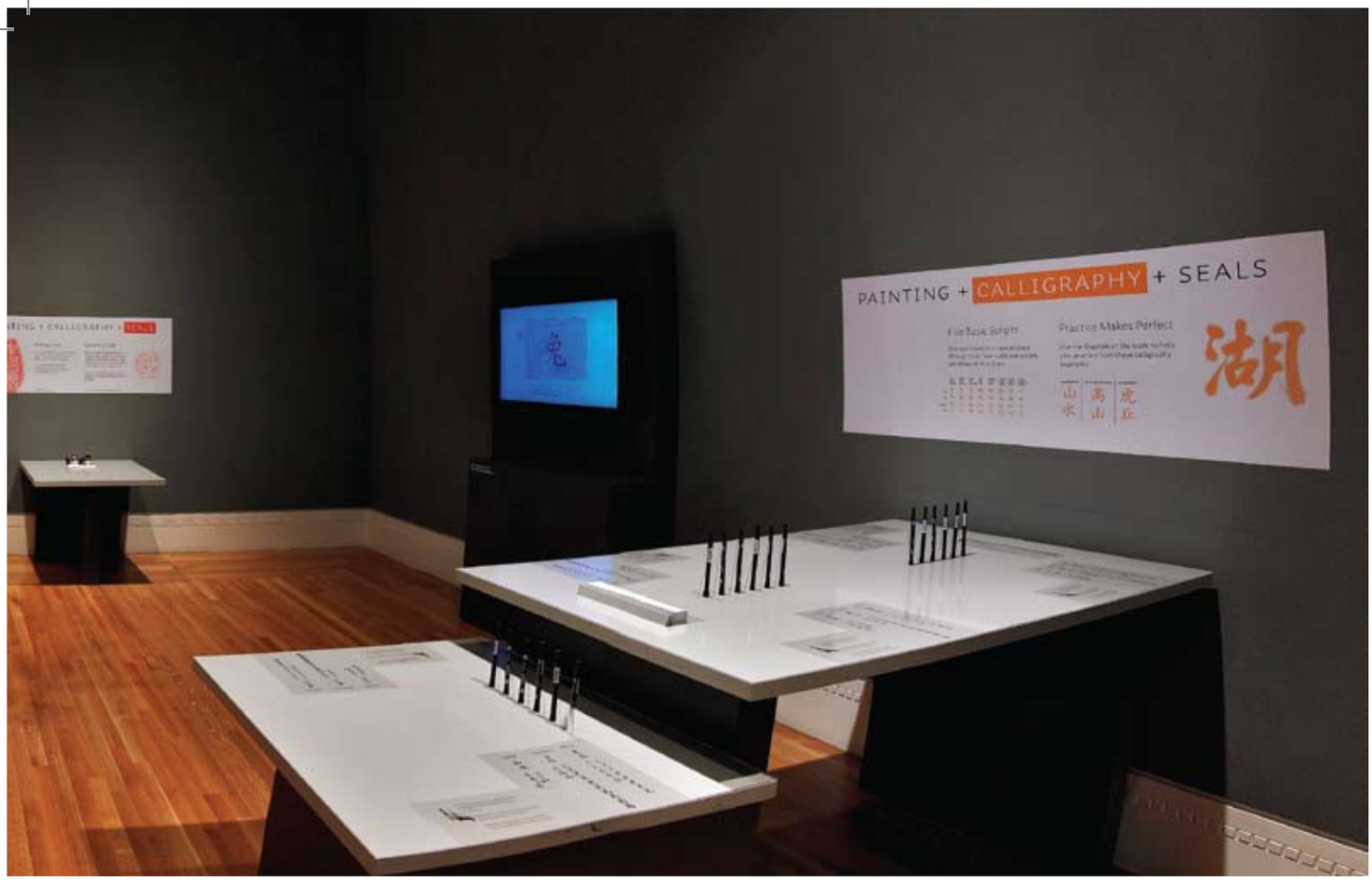
Photos Gerard Vuilleumier

The Huntington Library, Art Collections, and Botanical Gardens in San Marino, Calif., is committed to the preservation of rare books, artworks, and the natural beauty of its botanical gardens for all to enjoy. Hand in hand with this commitment is its connection with sustainability and raising environmental consciousness. So when The Huntington undertook an exhibition focused on the preservation of a collection of Chinese paintings and calligraphy for more than six generations, use of environmentally preferable materials and approaches in the exhibition design was imperative.

Exhibitions are one area where well-considered design and greener practices can make a big difference. Consequently, when we were commissioned to design the exhibition for *Treasures Through Six Generations: Chinese Painting and Calligraphy from the Weng Collection*, our philosophy was to pursue "greener" approaches that would not only reduce impacts to the environment, but would help guarantee the collections' well-being for future generations.

Building and installing a temporary exhibition uses large amounts of difficult-to-recycle construction materials and products that are potentially harmful to the environment. Maintaining a stable and safe object exhibition environment requires 24-hour-a-day climate control and complex lighting systems that use electricity sourced from burning fossil fuels, one of the chief causes of global warming and unhealthy air quality.

Because of these challenges, exhibitions can serve as a model for green initiatives and more sustainable design practices, including minimizing material use, reducing waste, considering indoor air quality, and maximizing energy efficiency. Along with our fabrication partner, G&G Design Associates, we invested months of research toward achieving those goals.



Waste reduction through modularity

The paintings and calligraphy on view in the 3,000 sq.-ft. exhibition are beautifully crafted, rare, and incredibly sensitive to touch and light. Many of the hanging and hand scrolls are more than 10 ft. long, and a stated goal of the exhibition was to unroll and display as much of the paintings as possible. Using a traditional exhibition design approach, this would require large five-sided protective acrylic vitrines to allow visitors close enough to view the paintings' exquisite details, as well as large pieces of display furniture and partition walls to subdivide the exhibition sections.

Acrylic is a tough, transparent plastic polymer that goes through an energy-intensive and chemically toxic manufacturing process that is considered environmentally harmful. Unlike other plastic products, it is difficult to recycle; however, large continuous sheets can be salvaged and repurposed. To reduce the need for temporary wall construction and minimize the quantity of acrylic used, we designed a modular casework system that created islands of freestanding, table-like furniture.

While museum casework can often be salvaged and re-used for future exhibitions, these cases were in all likelihood too large to be recycled in their entirety. So we focused on making them modular and easy to disassemble, using mechanical fasteners instead of glues and large sheets of acrylic that could be repurposed easily in other projects. Display case bases were made from MDF Lite, a non-toxic, lightweight MDF alternative manufactured by Columbia Forest Products. After the three-month exhibition, the acrylic sheets were unfastened and either reused or put into storage for future exhibitions. Some of the furniture was donated to other museums.

By embracing this "close-the-loop" approach, the majority of the exhibition components could be broken down and re-purposed or removed and reconfigured for future exhibitions—diverting much of the materials that couldn't be recycled away from the landfill. We estimate that our modular approach to the case design reduced materials needed for the exhibition environment by 40%.

Indoor air quality and no-VOC paints

Like most artworks, the Weng Collection paintings are susceptible to changes in temperature and humidity and the presence of chemical substances. Conservation standards require strict monitoring and control mechanisms that include a curing time of several days for all paints and finishes used in proximity to any artworks. While much of that is drying time, it is also off-gassing time, a chance for the chemical agents in the paint to dissipate. Environmental health concerns are linked with the chemicals used in many common paints, and even when dry, these products continue to release toxins that are trapped in an indoor environment—not good for the artworks, and certainly not good for visitors. We specified non-toxic, zero-VOC (volatile organic compound) Dunn Edwards EcoShield paint for the exhibition walls and furniture, creating a healthier environment for both the objects and the visitors.

Graphic panels produced for the exhibit were printed on BIOflex™, a biodegradable alternative to vinyl, with low-solvent and soy inks. Some of the graphics were applied to recycled-aluminum sheeting for rigidity.

Energy efficiency with LEDs

Effectively lighting the calligraphic masterpieces was a critical element of the exhibition design, and also created a huge opportunity for reducing energy consumption. We invested more than six months in researching lighting sources to fit the exhibit's unique needs, including extensive testing and mock-ups to explore color temperature, intensity, and spread of light.

Most electrical power is sourced from non-renewable energies such as coal. Coal power plants are responsible for emitting CO_2, a major factor in air pollution and global warming. Conserving energy is also a smart financial move, since the cost of energy continues to escalate. Exhibition environments are energy hogs due to the constant heating and cooling required to maintain a stable object environment, and the sophisticated incandescent lighting systems that safely and correctly illuminate the artworks.

The Weng Collection paintings demanded a very specific type of lighting that had to be dimmed to 5 foot-candles and controlled to meet conservation standards, as well as satisfy the specific warmer color-rendering properties that make the details on the paintings visible and look their best. Because most of the objects are installed inside of casework, it made sense to localize the light source and illuminate the cases internally rather than from the incandescent halogen ceiling track. This also significantly reduced the glare off the acrylic case front.

The most energy-efficient lighting sources available are LEDs, which use up to 80% less energy and last 15 times longer than incandescent light sources. They also offer tremendous advantages for art exhibition environments. LEDs can be dimmed and controlled for object needs, and produce negligible heat. However, LEDs are still catching up to the intensity and warm color temperature offered by their halogen cousins, the mainstay of most exhibition spaces.

Ultimately, we identified two LED products that fit the bill: for the upright cases, Panoptics Lighting's T5-style tubes (3000K warm white, 60-degree lens, high lumen for longer light throw), and for the long horizontal cases, Elemental LED's continuous flexible LED strip light (warm white, low lumen for short throw).

Once we found the right products, obtaining the quantity we needed meant buying every available unit in the country, simply because the demand is not there yet. We also learned that many LED resellers do not have a complete understanding of what they're importing; the lumens ratings for LEDs (and how to calculate them) were inconsistent across the industry. And while all the exhibition lighting required dimmers to evenly adjust light and lux levels for fugitive works, control devices were difficult to specify because many distributors did not know exactly which would allow for full-spectrum dimming as opposed to blunt level adjustment.

Traveling the green road

Introducing environmental sustainability into the exhibition design process has become far easier with the availability and decreasing costs of toxin-free, recycled, and renewable products. Efforts have so far focused primarily on introducing alternative options rather than improving what are essentially environmentally flawed products and design practices.

Ultimately, we can make the most impact by questioning and rethinking the design process, reducing energy consumption, and repurposing components and materials. Incorporating a high level of design research and product exploration into fast-tracked and budget-controlled projects is difficult. However, as the specifiers and manufacturers of products that take away from the natural resources around us, aren't we obligated to improve on what has gone before, for the sake of design progress and the environment? X

Tim McNeil is a principal of Muniz/McNeil (Los Angeles), associate professor of design at the University of California, Davis, and director of the UC Davis Design Museum. He is chair of the Green Museums Initiative and founder of the Green Museum Accord sponsored by the California Association of Museums (www.greenmuseums.info).

Project

Treasures Through Six Generations: Chinese Painting and Calligraphy from the Weng Collection Huntington Library, Art Collection and Botanical Gardens San Marino, Calif.

Green Strategy

Strategy Modular casework construction to minimize material use and reduce waste; no-VOC paints to reduce impacts on indoor air quality; energy- efficient LED lighting

Materials

Non-toxic, lightweight MDF Lite, BIOflex landfill-degradable pvc; Panoptics Lighting T5 LED tube lights; Elemental LED Flexible Strip Lights Finishes Zero-VOC Dunn Edwards EcoShield paint; low-solvent and soy inks

Production

Notes Extensive research and testing of energy-efficient LEDs, with emphasis on color temperature and light throw; casework constructed for easy disassembly and repurposing of components

Opposite The same modular casework elements were used for horizontal display cases as well as vertical cases and dividers to create traffic flow. Rather than rely on existing track lighting to illuminate the rare paintings, the design team specified energy-efficient LED T5 tube lighting and continuous light strips to light the works from inside display cases.

Left Above Graphic panels, including the illustrative wallcovering (left) and text panels (center) were printed on BIOflex, a landfill-degradable alternative to vinyl, with low-solvent and soy inks. Some of the graphics were applied to recycled-aluminum sheeting for rigidity.

Left The exhibit includes four Energy Star-rated LCD flat screens that allow visitors to explore the intricacies of the large scrolls and learn about the art of calligraphy. The case shown here displays nearly all of a 50-ft.-long scroll, requiring 3x12-ft. lengths of acrylic.