green acres

the new california academy of science's holistic approach to conservation and sustainability

by Martin Palicki

There are institutions that say they are green, and then there are those that shout GREEN from their rooftops. The new California Academy of Sciences, which celebrated its grand re-opening in September of 2008 in San Francisco's Golden Gate Park, is one of the latter. Literally. Its living roof includes 2-1/2 acres of native plants and vegetation. But the Academy's mission reaches beneath the topsoil. The museum developers knew from the very beginning that, according to exhibit executive producer Jonathan Katz, "if we were going to talk the talk, we were going to have to walk the walk." The building was designed for Platinum LEED status, but also the project as a whole – inside the building and out - was intended to be a model for sustainability as well as a mentor in helping visitors understand their own roles in curbing resource consumption.

The Academy was a recreation and unification of several structures and exhibits into a singular environment. Under one roof, the new Academy houses the Steinhart Aquarium, the Morrison Planetarium and the Kimball Museum of Natural History. The museum has a long history in the San Francisco Bay Area. It was founded in 1853 and moved to its current location in Golden Gate Park in 1916. The 1989 Loma Prieta earthquake caused significant damage to the building. Ground was broken for a new facility in September 2005, while exhibits were moved to a temporary location. The three-year project cost approximately $500 million, including the costs of moving and housing the collections. Executive director of the facility is Gregory Farrington.

Completely dedicated to effectively expressing the Academy's educational message, showcasing the work of its scientists and celebrating its collection was Jonathan Katz, CEO of Cinnabar Inc. Katz's company produced 35,000 square feet of exhibits for the Kimball Museum of Natural History - which occupies the main floor of the new Academy and brings to life the research expeditions, collections and discoveries of the Academy's dedicated team of scientists. Cinnabar, based in Los Angeles, is a producer and scenic fabricator serving the film and television community as well as museums and themed attractions.

Cinnabar's team worked with the Academy to design, produce, fabricate and install Islands of Evolution (10,000 sq. ft., on the Galápagos Islands, Madagascar and key principles of evolution), the media-driven Science in Action exhibits, the Altered State exhibits (10,000 sq. ft., about California and climate change), the recreation of Tusher African Hall (dioramas, specimens and interactive video), the Early Explorers Cove (educational play), the Naturalist Center (visitor research facility) and reinstallation of the Foucault Pendulum.

"We knew early on that sustainability was a major theme at CAS," explains Katz , "but also that we had to take a stand on issues surrounding sustainable practices." Katz isn't apologetic. What museums like the Academy are starting to understand, he claims, is that in their role as scientific authorities, visitors want them to provide guidance, rather than take a studiously neutral approach.

The exhibits inside *the California Academy of Sciences blend in with and complement the architecture . ALL PHOTOS COURTEDY OF JOE FLETCHER*

Katz even takes it a step further and says museums are obligated to take a stand. "Museums have to understand that they have a social responsibility to present information, such as on global warming or evolution, even when it may not be politically or socially popular," declares Katz. "For years museums have been very careful to remain neutral, but there are some important issues where they really have to take a stand."

Nowhere is the museum's message of conservation more evident than in the Altered State exhibits, one of Cinnabar's keystone projects for the Academy. The exhibit takes the issue of climate change, from water levels and temperature fluctuation to extinctions, and frames it within the context of California. The environment is set up for people to explore, and in the process become informed. Displays that educate about the various aspects of global warming and their consequences – in terms of the oceans, wildlife, vegetation, habitat, farming, pollution, health, recreation, quality of life, economic production.

"Oceans Are Rising" shows how human activity is altering the oceans with unprecedented consequences. "A Hotter World" explains how humans' use of fossil fuels changes seasonal weather patterns. "The Melting Point" shows damage to the world's glaciers, alpine regions and polar caps that results from use of fossil fuels, affecting water supplies and wildlife. "Mass Extinction" examines loss of species attributable to climate change and other human impacts, and what that loss means to the Golden State. "Impact Videos" are each tied to one of four exhibits. "Polar Ice: Critical Zone" is an interactive, big-screen simulation, produced for Cinnabar by Snibbe Interactive. People must use their bodies to block the rays of the Sun, stem the melting of ice floes and enable a baby polar bear to reach its mother. It's an up-to-the-minute example of how exhibit design and social networking can be integrated into the same environment.

The exhibits are complemented by displays that encourage the visitor to express an opinion and take action on an individual and community level. The "Your Two Cents" module presents visitors with a climate opinion question, and they "vote" for their choice by placing a penny in one of two plastic tubes. Perhaps it's an effect of an American Idol culture, but people want their opinions to be counted – so much so that visitors are stuffing paper money into the tubes designed for pennies.

At The Carbon Cafe, visitors can learn the carbon footprint of various foods, to see in very real terms what impact their own eating habits and consumption have on the environment. Carbon Balance is a hands-on scale with sliding weights that mechanically illustrates the carbon footprint of certain activities. And there is a call to action, whereby guests can enter their zip code and connect with their local California legislators, send them an email and get a response back from their representative or senator. "The museum had a responsibility to turn the understanding generated during the course of the exhibit and turn it into real potential for political action," said Katz.

Katz is no stranger to California politics, nor to the state's other cultural juggernaut: the entertainment industry. In the 1970's Katz went to work for then-California Gov. Jerry Brown, helping implement key Brown initiatives such as the Office of Appropriate Technology and the California Conservation Corps, programs which addressed alternative technologies and resource conservation. Returning to the world of design and production, Katz founded Cinnabar Inc. in Los Angeles in 1981. Since then, Cinnabar has earned a reputation by creating sets and props for television, motion pictures, theme parks, and museums.

Getting the Academy's message across to multiple generations and interest levels required a variety of methods. The museum exhibits are designed, according to Katz, to allow you to "spend two minutes, 20 minutes or two hours, depending on your interest, inclination and ability to absorb." Katz and his team advocated strongly for this "stratified" approach.

"If you follow the conventional wisdom that says to aim for an audience of fifth graders," says Katz, "you end up with exhibits targeted only to fifth-graders. We developed the exhibit strategy that we call stratified information so that exhibits can appeal to multiple audiences. Implementing it has a lot to do with the visual and graphic design, which function as the framing sys for the information much like you put a specimen into a case. Also important is the organization of spatial relationships that allow a visitor to acess images and headlines on one level if he or she just wants to see those, or to go down another strata and read background information or to facilitate periodically the visitor being able to really stop and read much more in depth, or to watch a whole video from start to finish, or to play an interactive game. You plan the basic structure of the information before you start putting the physical design together. We mapped it out for the Academy, explaining the sequence and the techniques." Appealing to a wide range of range of groups included designing interactive technology and media that would suit this approach. Cinnabar brought in media producer Mindi Lipschultz to develop a wide range of media for the exhibits.

"It's like Ken Burns on steroids," said Lipschultz. "He has two hours on PBS and people are sitting quietly in their living rooms focusing on his documentary. At the museum, the video has two minutes to tell a story and has to compete with all the other noise and distractions. It has to be incredibly interesting."

Lipschultz produced the Insect Collecting Game found in the Madagascar exhibits, in which players can chose one of four game expeditions where they must use various tools to collect insects within a specified amount of time. Viewing a large screen, players wave around a controller, which is tracked by an infrared camera. "It's sort of the museum version of a Nintendo Wii," explained Lipschultz. Indeed, kids seem drawn to the game as though it were the latest release, though adults appreciate the detail as well.

Lipschultz's other media installations show her facility for making the most of existing items from the Academy's collections and archives. Using archival stills and film footage of Academy scientists on expedition, Lipschultz created a series of mini-documentaries and interactive kiosks that appear throughout the museum.

Getting back to the concept of "layering," Lipschultz likens the visitor experience to having a cable TV selection of 200 channels. "You're walking through the museum and you're flipping the remote," she said. "A person might stay and watch for 45 seconds here and then move on for another 45 seconds and learn something different over there." Cinnabar's method of juxtaposing media, stills, text panels, specimens and in some cases live animals all in the same exhibit module provides a synergy and variety that keeps the visitor engaged and refreshed and allows them to choose what they wish to focus on. Environmental designer Volume, Inc., another member of Cinnabar's creative team, helped create a unified look across the exhibits' signage and media while using materials and colors and graphics to spark and hold visual interest.

In the interest of success, Katz advocated for close collaboration among the key players. Without everyone being on the same page, the museum's message would be muddled at best, or even lost. "Exhibits needed to be connected to the very fabric of the built environment and what it represented," said Katz, "and it needed to be done quickly and cost-effectively." To effectively accomplish that, what Katz calls a program of "integrated creative management" was implemented. It empowered Cinnabar to oversee the concept, content development & writing, development, design, media, interactive, production and installation. As Katz explained, this type of integrated process has more similarities to the entertainment, communications, or commercial development sectors than to traditional museum exhibit production.

This meant that Cinnabar would work closely with the architect, the Pritzker prizewinner Renzo Piano. Katz lobbied museum directors to bring architect and designer together. "It's rare that an exhibit designer actually works this intimately with the architect," said Katz, "but we were able to set this collaboration in place, and we feel that we have created a useful model for the future. Future exhibit builders will be able to take advantage of the shared perspectives this alliance created."

The architecture of the building is massive, with enormous open spaces - quite different than the typical black box a museum usually furnishes a designer. Piano's original concept envisioned objects suspended in space,

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hanging from cables, almost free floating. "The exhibits we were designing were far more complex than Renzo initially realized," explained Katz, "and having suspended exhibits would have put up some insurmountable roadblocks." Seismic issues, heavy specimen cases and access for the disabled all needed to be taken into consideration.

While concessions had to be made on each side, once each understood the others' goals and an atmosphere of mutual respect had been established, Renzo Piano Building Workshop and Cinnabar were able to move forward with a comprehensive plan. It was deemed extremely important to have exhibits that reflected the very materials the building was created from. Natural fibers, woods, and other sustainable materials are found in both the structure and exhibits. Moreover, the exhibits are built in modules that can be repurposed and "internally recycled" as exhibits are changed out or updated. The modules are known as a "kit of parts" that feature self-contained infrastructure, are fabricated of sustainable materials, and can be disassembled and reconfigured. The modules are freestanding, completely customizable, and can accommodate just about anything from the museum's wide collection. They are equipped with their own lighting, electrical, AV, climate control, life support and technical systems. Each modular kit of parts consists of approximately 30 to 40 components built primarily of powder-coated steel and plywood, and supports exhibit structures that are from 8- to 24-feet long, and as much as 15 feet high. The units are entirely stabilized against earthquakes and are self-contained. The modules and the building are interdependent – in fact, the building itself does not supply the infrastructure necessary to support the presentation and preservation of scientific specimens, and life support systems for the live animals on display.

"We looked at everything as being potentially reused again and again in the future," says Katz. In addition to furthering the museum's message, it also allowed the museum to be a giant exhibit in and of itself. Guests can see and touch recycled denim fiber insulation, and can journey to an observation deck on the museum's green roof to experience the native vegetation and learn of its benefits in building maintenance, including controlling heating and cooling costs.

Together, the building cohesiveness, the integrated technology, and the museum's commitment to its message help keep the organization honest to its own ideal of being an outspoken leader in the community.

And already it's working. Attendance in the first few months has been up 50% over projections. Katz attributes it to the projects' transparency and collaboration. "We really present solutions, but we also acknowledge that it isn't going to be easy. The end result is the exhibit comes off as honest. People really respect that." **ipm**

Cinnabar relied on a wide range of talented individuals and companies to bring the new California Academy of Sciences to life. In addition to those mentioned above, BBI Engineering and Edwards Technologies Inc. provided technical and AV systems design and Laser Exhibitor Service provided installation services. Other members of the production team include Cinnabar's Jeannie Lomma (project manager), Juan Corral (production manager) and Tom Mullaly (AV manager), along with Dante Thomas (interactive developer). Cinnabar's Andrea Whittier was art director for the Early Explorers Cove. Pixie Hearn oversaw specimen and content integration. For Exhibit Development, Darcie Fohrman led the Exhibit Development group and Tim Newman was the writer/director/producer for the Climate Change Impact media.

Katz assembled a world-class team of science writers to write the exhibit panels: Carolyn Collins Petersen, Jeremy Bloom, Sophie Katz, the Academy's own Aaron Pope, and Michael Rigsby.