

Ecologically Sound

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Planned and constructed for sustainability, new music facilities earn LEED certification as well as acclaim.



WHEN CHUCK SURACK started Sweetwater Sound in 1979, it was a recording studio based out of his house with a portable four-track recording rig in a Volkswagen bus. As technology advanced, he began doing very creative things with sound mixing. Clients quickly became interested in his programming skills and knowledge of music technology, which coupled with the company's commitment to the highest levels of customer service led to continued growth and success. In early 2006, Surack realized the company needed significantly larger facilities and commissioned MSKTD & Associates to design and master plan a new 44-acre corporate campus.

Sweetwater's new headquarters today includes an office, a distribution center with warehouse, a high-tech auditorium and training center, as well as a spacious retail store. In addition to the auditorium, a new multi-room professional recording studio features an acoustical and technical design that is on par with the world's finest recording studios. This \$35 million, 150,000-sq.-ft facility was completed in January 2008.

Sweetwater Sound's drive for innovation played a major role in shaping the holistic building scheme; the design focused on integrating all of the required systems with an emphasis on creating a healthy indoor environment and achieving LEED Platinum certification.

Meeting Design Needs with Steel

The site had an existing 38,000-sq.-ft, single-story conventional steel-frame office building, a simple rectangular shape with a ribbon window around the perimeter. Early in the design phase, the decision was made to modify and reuse the existing building and integrate into the overall campus, which was clearly in line with the design team's sustainable design strategy of limiting unnecessary new development.

One key to creating a successful LEED Platinum project was using a process where one step was decided before moving to the next, which was facilitated by adopting a design-build approach. Sweetwater Sound selected Auburn, Ind.-based Corporate Construction as its general contractor, and the project got under way.

Weekly team meetings were scheduled in order for the design team to present to the owner and the contractor different options for gaining LEED points as the design progressed so the design team could get valuable feedback and help the owner decide what features to employ. One of the early decisions was to recycle all of the existing concrete from an existing building on the site and reuse it for the upcoming construction. The contractor set up a system to demo the existing building, sort the materials, and store them on site until they were used. This reduction in the use of new materials reduced the project's overall embodied energy and was one of many contributions to LEED points.

The existing building retrofit was straightforward compared to the rest of the project scope. Because the general contractor already had been selected as a design-build contractor, the retrofit construction was easily designed in Phase I of the project

◀ Large skylights were installed in the existing roof structure to bring more natural light into the interior of the building. Extra joist bridging was added to brace the top chords of the existing joists where the roof diaphragm was removed.

◀ **inset:** Sweetwater Sound's success over the years led to the need for larger facilities. Now five buildings on a 44-acre campus provide an environmental showpiece as well as a highly functional new headquarters.



▲ Using non-orthogonal angles throughout the structures adds visual interest as well as helping to manage the sound.



▲ Retrofitting an existing steel-framed building on the campus in the first phase of construction permitted its use while the rest of the construction continued. It also contributed to the LEED certification effort.



▲ Designed to harness the spirit of the recording industry, the mall serves as a common area, connecting each entity and also housing the dining and recreation areas and features architecturally exposed structural steel, clerestory windows, and an unusual 7° angle that was used throughout the building.

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◀▲ The dining area, which is part of the central mall area, includes architecturally exposed structural steel, cantilevering roofs, balconies and canopies, curtain walls and clerestory windows.

along with the product/shipping warehouse, which is a separate stand-alone building. That allowed the architect team to continue designing the mall area, the studios, and the auditorium that was to connect the newly retrofitted office building to the warehouse. The greatest benefit to retrofitting this building as part of an earlier phase was that Sweetwater would be able to occupy the newly retrofitted facility while the remaining mall, auditorium and studio buildings construction continued.

With LEED and healthy indoor living in mind, one of the project goals was to bring in natural light to 80-90% of the entire building. Because this building was conventional steel construction, it was easily modified for the new project needs. To bring more natural light into the interior of the building, five large aluminum skylights were installed in the existing roof structure. Each skylight covered several joist spaces where the roof diaphragm was removed, so extra joist bridging was added to brace the top chords of the existing joists.

Further modifications were made to the building's existing structure to prepare for the attachment of the new mall area on two adjacent sides. A new conference room was to be located under

the existing roof and open up to the mall. To accommodate this, an existing perimeter column was removed and the building's roof shored with a new 60-ft-long W36×135 girder that spans two existing bays. Also, because the new adjacent mall structure was to be taller than the existing building, it was necessary to add steel joists to account for the new snow drift condition that will occur against the mall perimeter. Each new joist was brought into the building in two pieces, hoisted into place, and spliced at mid-span to fit into the existing roof framing.

After the design of the existing building retrofit was complete, the next phase was to design the mall area, studios and auditorium. The mall was to serve as a common area that would connect each entity and also house the dining and recreation areas. To appeal to Sweetwater Sound's primary clientele—music artists—the mall, studios and auditorium were designed to harness the spirit of the recording industry. This building features architecturally exposed structural steel, cantilevering roofs, balconies and canopies, curtain walls and clerestory windows to let in natural light, and an unusual 7° angle that was used throughout the building.

This 7° angle was also a valuable functional feature due to the nature of sound reverberation within an enclosed space. Parallel walls inside a theater or sound studio are undesirable because sound bounces back and forth between them. Non-parallel walls help dissipate the sound more quickly. In addition, acoustic deck was used in the mall area to help absorb sound and reduce noise reverberation everywhere the metal deck was exposed, including the long-span metal roof deck.

Due to the sensitivity of the recording equipment in the studios and the theater it was desirable to minimize sound transmission from the outside and from the mall area. This was done by surrounding the area with as much mass as possible, using concrete on metal deck roof above the studios and auditorium and heavy stone for the exterior walls.

To break up the monotony of long and tall stone walls, the stone over the entryways is supported with sloped beams. Also, angled cantilevers on the exterior walls create an angled and sloping soffit, forcing an upper section of the stone wall to jut out over a lower section of wall to create more appeal.

The mall area has clerestory windows above the studio/theater wing and the newly retrofitted office wing. One goal was to reduce the mall roof height to reduce the volume of space that needed to be conditioned by mechanical equipment to save heating and cooling costs, yet maximize the clerestory height. Conventional joists and deck would have required a depth that would either clutter the clerestory windows or require more volume for the mechanical units to condition. The design team's solution was to use a long-span metal roof deck that allowed lowering the thermal line of the roof to just above the clerestory window elevation without obstructions. This reduced the long-term costs for the owner as well as reducing the environmental impact and being a very attractive alternative to conventional joist and deck.

Because of the openness desired in the clerestories and the use of the long-span metal roof deck, a lateral bracing system could not be used at the roof elevation. Also, x-bracing was not an option due to the openness required for doors and windows below. Therefore, a moment frame system was implemented by lowering the frame beams from the roof elevation to below the clerestory windows, and allowing the columns to cantilever above the moment frame beams to support the roof structure.

One challenge that the long-span metal roof deck presented was that there was not a convenient place for mechanical ductwork. All of the roof structure in the mall is exposed, so adding chases and bulkheads would look out of place. The next best option was to place the ductwork underground. Consequently, an underground structural ductwork system from the mechanical room serves all of the mall area. Overhead sprinkler lines were required so the sprinkler lines are concealed inside long span deck, and the sprinkler heads poke out of the bottom hat of the deck.



▲ Sweetwater Sound's new facilities include a gaming area complete with pinball machines, golf simulator and video games. A full-service kitchen, coffee shops, professional services, and other social/recreational opportunities are part of Sweetwater employees' daily lives.

Working Hard to Accommodate Success

Creating an environmental showpiece as well as a highly functional new headquarters relies on making conscious decisions throughout the project. "From the beginning we wanted a green, eco-friendly building," said Sweetwater Sound's founder and president Chuck Surack. "Working with the LEED program, our architectural firm MSKTD, and general contractor Corporate Construction, we implemented a variety of ways to make the Sweetwater campus save energy and reduce its overall impact on the environment."

With Sweetwater's desire for LEED Platinum certification for its new corporate campus established, early design discussions included design strategies for achieving LEED points. While working through the LEED design process, the design team did not lose focus on the purpose of the project: to create an environment that would promote the health and well-being of the individuals within.

The final product allows a work experience that goes beyond serving solely as a place of employment. Employee needs are brought to the workplace through a variety of amenities. There is a private health club that includes a racquetball court and personal trainers to encourage a healthy, active lifestyle. A gaming area is complete with pinball machines, golf simulator and video games. A full-service kitchen, coffee shops, professional services, and other social/recreational opportunities are part of Sweetwater employees' daily lives. An expandable convention hall hosts product conventions both for employee training and the local community, and an outdoor music terrace features live bands throughout the summer months, are ways the company gives back to its employees and the surrounding community.

"I hope that other businesses will examine what's happened here and think seriously of 'going green' as they plan new facilities," Surack said.

▼ Sweetwater Sound's new auditorium and multi-room professional recording studio feature an acoustical and technical design that is on par with the world's finest recording studios.





◀ The warehouse and shipping facility started as a stand-alone building in Phase 1 of the project. With completion of the mall, in Phase 2, it was connected with the other building components.



▲ To break up the monotony of long and tall stone walls, the stone over the entryways is supported with sloped beams.

throughout the construction site. Materials were sorted meticulously to identify items that could be sent back to the manufacturing process. In some cases opportunities were identified to redirect materials for reuse. Many containers of concrete, wood, glass, plastic, and steel were salvaged throughout the construction process, contributing overall to 19,026 tons of construction waste—98% of the total—being diverted from the landfill.

Careful consideration was given during the selection of materials to ensure that a certain percentage of recycled content would be maintained throughout the project. Carpet, fabric, steel and other miscellaneous metals are a few of the materials throughout the office space that contain recycled content contributing to an overall recycled content percentage of 31.4%. The new steel, a commonly recycled material, used in the project has a recycled content ranging from 25% to 83%. When it came time to total the project LEED points, the overall contribution of recycled steel accounted for a significant 8% of the total LEED points attained.

Materials and products that were extracted and manufactured within the region were chosen with the intent of supporting indigenous resources and reducing the environmental impacts resulting from transportation of building materials. Approximately 44% of the project's materials have been extracted, harvested, recovered, and manufactured within 500 miles of the project site including, but not limited to: structural steel, stone cladding, drywall, insulation, and doors.

A Ring of Success

Sweetwater's newly designed campus surrounds visitors with the nostalgia and history of the recording industry, combined with the excitement of what is yet to come. It provides a unique experience whether visiting to work, shop, play or be entertained. Industry leading high-tech equipment, recording studios, instruments and performing studios are available to the creative musicians, encased by the timeless architectural building. The new corporate campus exhibits a holistic design, focused on sustaining the health and well-being of individuals within, as well as being efficient and functional.

MSC

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Architect and Engineer

MSKTD & Associates, Inc., Fort Wayne, Ind.

Steel Fabricator

Almet Inc., New Haven, Ind. (AISC Member)

Design/Build Contractor

Corporate Construction, Inc., Auburn, Ind.

Acoustic Specialty Designer

Russ Berger Design Group, Addison, Texas

Structural Software

Cadvance (detailing), Ram Structural System, Ram Advance (now Elements), Enecalc

The long-span metal roof deck presented additional challenges because it is completely exposed to view, including its perimeter. The architects wanted a roof footprint that tapers, but placing a beam below the long-span metal deck on the tapered edge was out of the question to maintain the flat-plate look of the roof over the structural beams. Therefore, a unique beam was designed to fit within the depth of the long-span roof deck, support the unsupported tapered edge of the deck, bear on the structural beams below and be wrapped with brake metal at the fascia so that it is unseen.

Steel's Contribution to LEED

The versatility and flexibility of steel contributed to making this a successful LEED Platinum project. The open framing capabilities of steel construction allowed the building to achieve daylight and outdoor views for more than 80% of the building. The flexibility of steel construction allowed the existing building to be modified to be repurposed for the new owners and integrated into the overall campus plan. Steel's versatility allowed using a long-span metal deck to reduce the volume of interior space of the building, thus increasing mechanical efficiency.

Steel from the existing buildings was reclaimed and recycled to reduce embodied energy. Goals were established early in the construction process to divert construction waste from landfills, with specific recycling locations