A primary design challenge for the new $3 million University of Nevada Las Vegas’ Fine Arts Building addition was keeping the sounds originating from the second floor Music Department from disturbing students and teachers in rooms below.

Finding an affordable, workable solution to the challenge required coordination between architect and acoustical consultant, and knowledge of specialized sound isolating building techniques.

“Part of our job was to design a building that would eliminate the sounds of bass drums, pianos, cellos and many other instruments on the second floor from filtering down into the Theater and Dance Departments on the first floor,” explained Jonathan Rappel, architect with Tate & Snyder, Las Vegas, NV.

The Alta Ham Fine Arts Building is a 23,000-square-foot, two-story, multi-purpose addition to the university’s fine arts college. The facility incorporates a 99-seat theater, theater rehearsal room, 4,000 square foot dance studio, four music classrooms, percussion and piano studio, music teaching studios and practice rooms along with additional faculty and administrative offices. The new building emulates the architectural forms of the existing college building.

Isolating sound on the second floor centered on two primary areas—the floor system and walls.

“Sounds needing to be isolated were impact noise from the instruments resting on the floor, such as pianos and bass drums, and air-
Sound control matting creates a “floating floor” that not only breaks the sound transmission path through the floor-ceiling assembly but also prevents lateral transmission through the floor-wall contact area. —Photo credit AKZO Industrial Systems.

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borne noise,” said Dave Walsh, president of Walsh, Norris and Associates, Inc., San Francisco, CA. Specializing in performing arts facilities, the firm has provided acoustical expertise for similar additions, such as for the University of California at Berkeley and the University of Nevada, Reno.

“The first alternative for sound isolation was a double slab system separating the first and second floors,” Walsh said. “But it was rejected due to weight considerations.”
“The second floor music studios required a span about 60 feet long across a dance floor on the building’s first floor,” Rappelsaid. “We would then have had to install extremely deep beams over the dance studio to support the weight of the double slab. That was unacceptable.”

To eliminate the weight concerns and at the same time address the problems with sound isolation, Enkasonic® sound control matting, manufactured by Akzo Industrial Systems Company, Asheville, NC, was installed to isolate the impact noise in the floor system, eliminating the second concrete slab.

The lightweight matting creates a “floating floor” that not only breaks the sound transmission path through the floor-ceiling assembly but also prevents lateral transmission through the floor-wall contact area.

Enkasonic® is a 0.4-inch thick composite of extruded nylon filaments which form a three-dimensional geomatrix. The geomatrix has a nonwoven fabric heat bonded to the upper surface. The durable yet pliable construction of the matting obstructs the transmission of sound.

Its thin cross-section makes the matting suitable for new construction and retrofit, and costs less than a “built-up” floor to achieve the same sound ratings. The matting, installed fabric side up, is ideal for use under carpet and pad, hardwood, ceramic tile, marble, native stone, vinyl tile and parquet.

More than 7,500 square feet of the sound control matting was installed on the UNLV building second floor, including four classrooms, seven teaching studios, four practice rooms, a percussion studio and a piano teaching room.

The floor system composite contains a concrete subfloor, a fiberglass isolation barrier installed around the perimeter of the rooms, the sound-control matting, a concrete and gypsum-based overlay and a combination of tile, carpet and pad.

The matting was laid fabric side up on top of the Music Department’s six-inch subfloor. The wallboard was already in place, so it was necessary to install a barrier between the floor surface and the walls.

That was accomplished by adhering a fiberglass isolation barrier from the matting to the wall. The isolation barrier prevents the impact sound from travelling across the floor, down the wall and into rooms and studios below.

The perimeter connecting the sound-control matting, isolation barrier and the seams of the matting were sealed with duct tape to pre-
vent any of the cement gypsum-based overlay, poured to a thickness of 1½ inches, from leaking down and establishing a hard column through which noise could travel. After the overlay dried, a combination of either tile or carpet and pad was laid for the walking surfaces for the second floor.

For the project architect and acoustical consultant, a knowledge of sound isolation products proved helpful in designing the second floor’s flooring and wall systems. “Some of the faculty were concerned noise from the music rooms would pass through the walls and into the teaching studios,” Walsh said. “It was important to design a system that would prevent the disruption of classes.”

Walsh’s design included a double-stud wall system consisting of two rows of studs to keep noise from the teaching studios out of practice rooms. “The wall system is about 12 inches thick,” Walsh said. “In each of the stud systems, we had a blanket of building insulation. The metal studs were isolated from the concrete with a resilient pad.”

“We used metal studs because they provide a higher degree of isolation than wood studs. Sealant was used to close up joints between the walls and floors. Even the electrical boxes were sealed with a sealant pad,” Walsh added.

By using a lightweight sound control matting in the flooring system and a double stud wall system, architects were able to keep the sounds of musical instruments from interfering with teaching studios throughout the two-story building.