

Sound Isolation Solutions for Commercial Roofing Systems

Test Reports Confirm an 11dB Improvement in STC Ratings When Using DensDeck® Roof Board



The FAA has continuously, consistently and actively encouraged a balanced approach to noise problems at our nation's airports. A reasonable approach to noise mitigation is important, in part, because new noise certification and abatement procedures have in many instances been extremely successful in reducing noise impacts at airports across the country without access restrictions.

The Aviation Safety and Noise Abatement Act lists the soundproofing of public buildings as a key step in most noise compatibility programs. In this regard, commercial roofing systems have proven to be worthwhile targets for sound remediation.

However, sound remediation solutions for low-slope roofing also need to consider good roofing practice and proper moisture control, as part of an environmentally friendly roof retrofit solution.

To achieve this, Georgia-Pacific Gypsum has developed and independently tested a roof system—not just a product—which consists of a high mass layer of DensDeck® roof board and 1" minimum porous fiberglass or fiber insulation board (non-batt). The independent test utilized a single-ply membrane, but other roofing membranes may achieve comparable results for sound remediation. When properly installed, the rock wool or fiber glass insulation below the DensDeck gypsum board serves as a ventilation layer to alleviate the common problem of moisture entrapment during roof retrofits. With sound remediation as the goal, these new layers of insulation can be installed while leaving the existing roof in place. This makes the entire project more sustainable, as the old roof will not present a costly disposal problem for the building owner.

In addition, should the architect, roofing contractor or building owner desire increased insulation R-value, additional insulation can be installed during the sound remediation process. Depending on climate, this can result in a dramatic improvement in energy savings as well.

Georgia-Pacific Gypsum recently received test reports from Architectural Testing Institute (ATI) in York, PA, which confirms the company's initial findings. The improvement in sound isolation with the new system is significant.

ATI discovered an 11dB improvement in STC rating when the system was applied to a typical metal deck roofing system, which basically reduces the sound level through the existing roof system by more than half.

The existing roof assembly without the DensDeck product was measured at 43dB STC, and the same assembly with a mineral fiber board and 5/8" DensDeck came in at 54dB STC. This performance also safely achieves the LEED® requirement for schools, which currently stands at an STC of at least 50dB.

Solving Sound, Moisture and Energy Problems

Because current lightweight construction techniques are relatively transparent to sound, the roofing system needs a high mass barrier like DensDeck to reduce sound intensities at or near airports. The fibrous insulation below the DensDeck also plays

a significant role by dampening sound through multiple layers of material—both high mass and soft—thus diminishing sound energy and letting the mass of the roof insulation system turn it into heat energy.

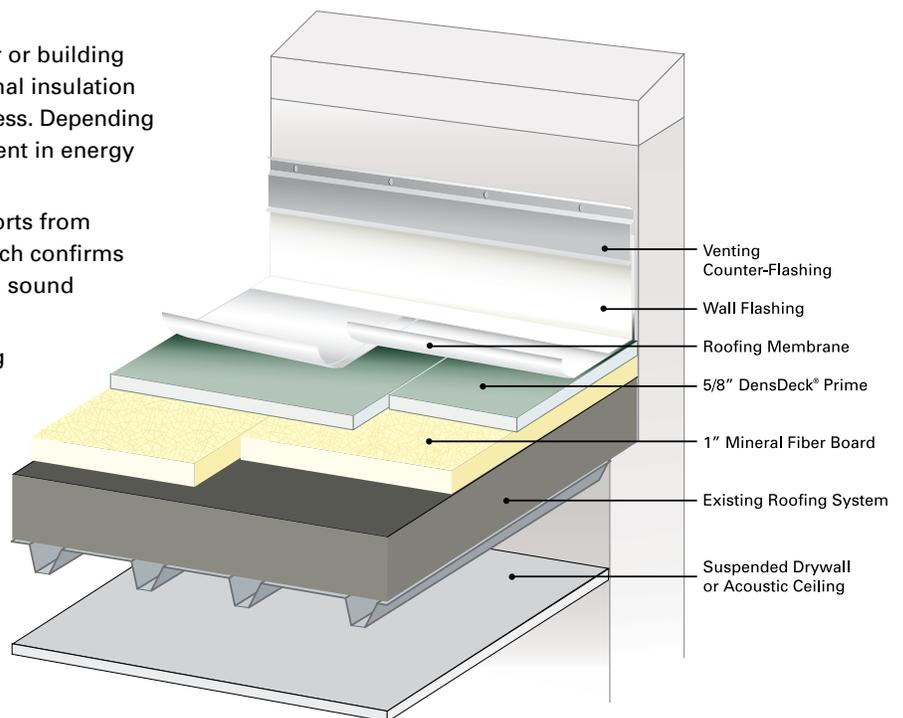
As mentioned earlier, a successful sound remediation system for roofing must also address the potential for moisture accumulation within the roof system. Instead of entrapping moisture, the mineral fiber insulation below the DensDeck allows moisture to travel to the roof edges, where metal edge systems use natural vapor pressure to vent this moisture to the outside.

This can be accomplished by relieving the vapor pressure through venting roof edges or venting wall caps, which are supplied by individual edge system manufacturers.

Besides the sound and moisture solutions, the building owner can easily add R-value on most roofs by using foam insulation to beef up the energy efficiency of the fibrous glass insulation layer.

A fourth benefit of the sound remediation system is it does not require a roof tear-off that would both disrupt building occupants and create a disposal problem.

Indeed, the FAA now has a proven and independently tested solution to offer those who are complaining about sound intrusion levels at or around airports. Whether the remedial work is subsidized by the FAA or not, the agency can suggest the system to building owners a solution to sound, moisture, energy and sustainability challenges.



Sound Remediation Assembly

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