

# Outsulation® Case Study



**A green demonstration project in Las Vegas shows the nuts and bolts of a green retro fit.**

**The team preserved the integrity of the existing structure while bringing it to net-zero energy.**



**Aiming for and achieving the energy efficiency levels needed to reach net-zero-energy performance in a home requires first that the building's thermal envelope be designed and built to minimize the capacity and energy requirements of heating and cooling equipment.** Super insulated walls with outstanding air-sealing and weather-resistive capabilities are key. When applying these requirements to a home retrofit, the task

becomes even more difficult as far fewer options exist within the context of an existing building. In the case of the ReVision House, we add yet another obstacle; the desire to improve the thermal envelope from the exterior, leaving the interior finish substantially intact.

Before reviewing options for potential wall insulation solutions, the project team used EnergyGauge USA modeling software to determine the range of optimal insulation values needed to reach our performance goal. Once the needed R-values were identified, the insulation choices became clearer. With only a 3-1/2" space to work with in the 2 x 4 walls the amount of potential cavity fill insulation is limited. The limited cavity space and the requirement for excellent air-sealing led the team to select open-cell spray polyurethane foam which yields a nominal R-value of 13.6. As this R-value is lower than our modeled optimal value, additional supplemental insulation is needed, and since it can't be placed toward the interior of the wall assembly (where interior finishes are to remain), an exterior insulated solution was chosen: in this case Dryvit's exterior insulation and finish system (EIFS), the Outsulation® RMD System.

Dryvit Outsulation RMD is an ideal product for this application for multiple reasons. The ReVision Home, originally sided in traditional cement stucco, is iconic in design and is intended by the project team to maintain the original appearance following the deep-energy retrofit. The Dryvit system uses a multi-layer

application process culminating with an acrylic-based finish coat with the appearance of traditional stucco. There are numerous other textures and colors available with a Dryvit system, but we wanted the ReVision House to mimic the original removed stucco. Applied over 2" of expanded polystyrene insulation (EPS), the Dryvit system provides an additional



R-8 to the wall assembly (for a total R-value of 21.6). Since the Dryvit system is applied over all of the opaque vertical wall surfaces, a continuous thermal break between the exterior weather and the cavity-insulated wall assembly is achieved. The Dryvit product is installed over structural sheathing (Las Vegas is in a high-risk seismic zone). A water resistive barrier and drainage plane (Tyvek® StuccoWrap®) is then installed, followed by the two-inch EPS insulation. A reinforced base coat is applied over the EPS, and finally the finish is applied. The result is a thermally efficient exterior wall with the performance level needed to meet our ZEH goal, and true stucco appearance compatible with our iconic home.

Another Dryvit product was also used for one more task at the ReVision house. In a strategy to reduce the cooling load, windows that did not provide the needed day-lighting or views to the exterior was eliminated.



This includes the front (west facing) clerestory glass in the master bedroom. Since the trapezoidal clerestory glass is critical to the overall appearance of the home, a solution was needed which would hold true to the home's original form, but provide substantially better thermal performance

than the removed windows. The solution? Dryvit's Reflectit™ pearlescent coating. Applied to a finely textured surface, Reflectit provides a smooth, glossy, polished surface. At the removed windows, the voids were infilled to match the adjacent walls (including insulation) and finished with contrasting panels of Reflectit in the same pattern as the removed glass.

For more information about Outsulation, or any of the systems and products sold by Dryvit Systems, Inc., call Dryvit Technical Services at 1-800-556-7752 or visit us on the web at [www.dryvit.com](http://www.dryvit.com).

