AmLand Development

The New American Home 2003 – Las Vegas, Nevada

Building America helps 2003 New American Home Earn Energy Score of 90 in Sunny Nevada

AmLand Development faced some stiff challenges when it agreed to build the New American Home® 2003 (the display home for the National Association of Home Builders International Builders' Show). AmLand wanted to capture the killer views of the Lake Las Vegas resort location without being done in by the solar gain of Nevada's 300-plus sunshine days per year.

AmLand Development got help from Building America to build the New American Home® 2003, the display home for the National Association of Home Builders International Builders' Show, a complex of three luxury townhouses, with large view windows of Lake Las Vegas that still managed to achieve a HERS score of 90.

The building team wanted to produce three townhouses ranging from 2,775 to 3,151 square feet that provide maximum window exposure—with one window 28 feet tall and 20% to 25% wall area—to showcase the beautiful lake setting. At the same time, AmLand Development committed to building homes at least 50% more energy efficient than their conventional counterparts of the same plan by reaching a Home Energy Rating System (HERS) score of 90. And they had committed to all of this at a site where average daily summer temperatures reach a scorching 102 degrees while average winter temperatures dip below freezing.

To help AmLand reach this goal, Building America's IBACOS Consortium provided engineering, design, inspection, and testing services.

"It is always challenging, to build in any economical and energy-efficient systems in a house where at the same time you are trying to provide maximum view exposure in a climate where we have over 300 days of sunshine."

Chet Nichols, Executive Vice President of AmLand Development

Another challenge involved the building complexity. For the first time ever in 2003, the New American Home contained three attached multi-family townhouses, targeting the needs of different lifestyles: the single executive, the empty nester/active retiree, and the second/third home buyer.

"The first model (at 2,950 square feet) has two stories with the master suite on the second level, and above that an unconditioned star gazing room, which towers over Lake Las Vegas," says Nichols. "The second unit has three levels (at 3,151 square feet). It has an upper and lower master suite and an elevator. This is an ultra-luxury home. We have buyers who buy this home as a second, third, or fourth home, and adopt the upper or lower suite as their home and entertain in the second master. The third unit (at 2,775 square feet) is the smallest square footage even though it is three levels. It is a stacked townhouse, and a lot of people compare it

to what they see in San Francisco. With three levels, the main level is for entertaining, with a guest bedroom downstairs and a master suite upstairs."

Innovations

The New American Home is built to showcase the latest products, technologies, and design ideas (through sponsorship from the National Council of the Housing Industry, *Builder Magazine*, and Home Planners, LCC). And Chet Nichols knows that new products, technologies, and design ideas made a difference in meeting his energy-efficient goals. Building America helped Nichols see the house as a system, and the system components that made the difference for him were the insulation, the windows, the zoning of the mechanical systems, and the use of higher-efficiency HVAC and water heaters.

The team used Icynene® insulation, which is a water-based spray foam polyicynene insulation. "The Icynene insulation is fabulous because it serves as the ultimate air stop. It is an expanding foam." The R-20 insulation was applied directly to the underside of the roof sheathing to create an air and thermal barrier. By eliminating venting into the attic and sealing all external penetrations, the attic space is not subject to temperature extremes. R-20 insulation also filled the 2 by 6 studded exterior walls.

Cost is the one downside to Icynene insulation. "It is very expensive," says Nichols. At $13,000 to install for each town home, this is about $10,000 more than if fiberglass batt insulation is used exclusively.

Windows proved another challenge. "We had an exceptional amount of glass on the exteriors," says Nichols. 'The primary heating and cooling loss within a home is not directly through the walls. You can insulate every wall, and you can plug every gap. It is the quality and quantity of the windows that is the biggest factor in energy efficiency."

The New American Home 2003 used low-emissivity glazing Weather Shield® ProShield® LowE^2 line with a U value of 0.33 and a solar heat gain coefficient of 0.35 for fixed windows. Typically builders use windows that have a U value of 0.75 and a solar heat gain coefficient of 0.68. "The Weather Shield® ProShield® line of windows is a fabulous product. I have them in my new home, and I attribute my own energy savings to these windows," says Nichols. Because of the windows, the project did meet the energy efficiency score of 90. Testing by Building America's IBACOS Consortium on townhouse A showed that if the builder would have used standard windows instead, the HERS score would have dropped to 86, if all other factors remained the same.

Comfort, Durability, and Health

Zoning proved a key to comfort. "It is almost mandatory that you zone in three-level homes because it is very hard to get air from one area to another with ductwork," says Nichols. Townhouse A (2,950 square feet) contains two HVAC systems serving four different zones. Three manufacturers (Lennox, Carrier, and Trane) provided equipment for one town home, and Lennox provided the equipment for model A. Lennox's Signature™ gas furnace with two-stage heating, a variable-speed motor, and a 94% AFUE provides heating and air distribution. The Lennox Harmony II zone control system allows for independent temperature control in multiple zones. Each air-handling

BUILDER PROFILE

AmLand Development

Where:
Las Vegas, Nevada

Founded:
1991

Employees:
Approximately 40 employees

Development:
Lake Las Vegas Resort in Henderson, Nevada

Size:
221 homes including The New American Home 2003 (three townhouses)

Square footage:
Townhouse A is 2,950 sq.ft.
Townhouse B is 3,151 sq.ft.
Townhouse C is 2,775 sq.ft.

Price range:
Originally sold for $880,000 to $1.2 million

Key Features:

- Water-based spray foam polyicynene insulation (Icynene® Insulation)
- Weather Shield® ProShield® low-e windows with a U-factor of 0.33 and solar heat gain coefficient of 0.35
- Multi-Air™ filtered fresh air supply distribution system
- Heat recovery ventilator
- Heat-pump water heater
- Mechanical systems in conditioned spaces
- Controlled mechanical ventilation

unit serves two zones. In addition, a Lennox heat recovery ventilator provides balanced mechanical ventilation that allows for tempering of outdoor air before being distributed through two air-handling units.

In townhouse B (3,151 square feet) Carrier supplied the WeatherMaker™ Infinity furnace. It was installed in three locations to provide two-stage heating, up to 96% AFUE in a variable-capacity design. One air-handling unit serves each floor.

Both townhouses A and B contain a heat pump water heater, which uses heat in the air surrounding the unit to heat the water inside the tank. With an energy factor rating of 2.4, the heat pump water heater is nearly three times as efficient as the most efficient electric water heater.

In townhouse C (2,775 square feet) Trane provided two-stage heating, variable-speed capacity, and 93% AFUE. For mechanical ventilation, townhouses C and B contain positive-pressure multiport supply air systems. The system continuously draws outside air into the unit where the air is filtered and distributed through four ducts to individual room locations. The fan unit is a Multi-Air™ filtered fresh air supply distribution system.

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The Bottom Line

"When people think of energy consumption and efficiency, it is always geared toward the automobile industry. It would be easy to cut the energy consumption of the average home in half," says Nichols. "I am a big advocate for higher standards and better education of consumers and industry professionals in our industry. In fact, I think the ENERGY STAR standards and Building America [principles] should be much higher."