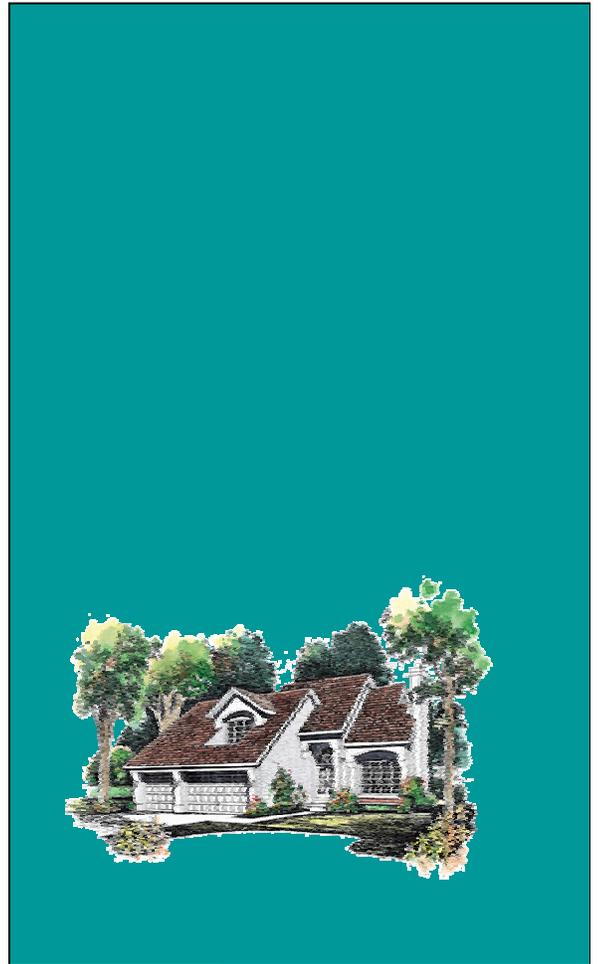
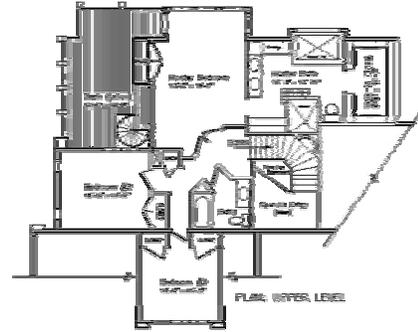
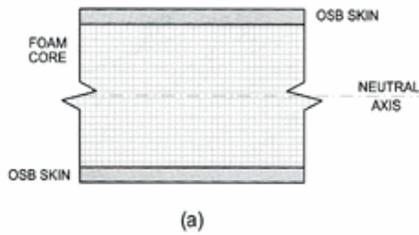


Demonstration houses in Kansas City, MO USA





The project

Four single family detached homes built by Envision Development Corporation, a private corporation, are located in Raintree Lake Estates, Lee's Summit Missouri, USA. These homes were built in the estate section of this community and were built to accommodate the infill lot cost and up-scale location.

These homes are speculative homes and are for sale. They have also served as successful models for prospective clients who desire building.

They range in size from 3600 to 6300 square feet of conditioned space with 2200 to 4750 square feet of finished area. The fourth home was finished in September 2003.

Currently "Vision Homes" is breaking ground on a 70 acre private forest preserve near Lawson, Missouri. This new construction is a direct result of using the existing homes as a demonstration or showcase for the builder.

Objectives - Goals

The goal of was to construct platinum level "Build Green" homes as defined by local Home Builders Association (KCHBA) utilizing Energy Star (US EPA) and Health House (American Lung Association) standards with universal design elements.

A whole systems approach looked at site, energy, materials, Indoor Air Quality (IAQ) and Recycling opportunities.

For these Missouri (USA) homes with about 5400 heating degree days we considered construction costs, longevity, remodeling ease, maintenance and energy usage.

Building construction

4" Structural Insulated Panels (SIPS) along with 1" EFIS (exterior finish insulation system) were selected for wall panels because they were less expensive to build and were 15% more energy efficient than standard stick built 2X 6 construction. Walls as constructed have a U value of .05 or R-22. ICFS with non heat conducting ties were used below grade with a standard 8" concrete wall thickness. 2nd generation SIPS with fiber concrete outer walls is being used on current and future build jobs to reduce labor costs

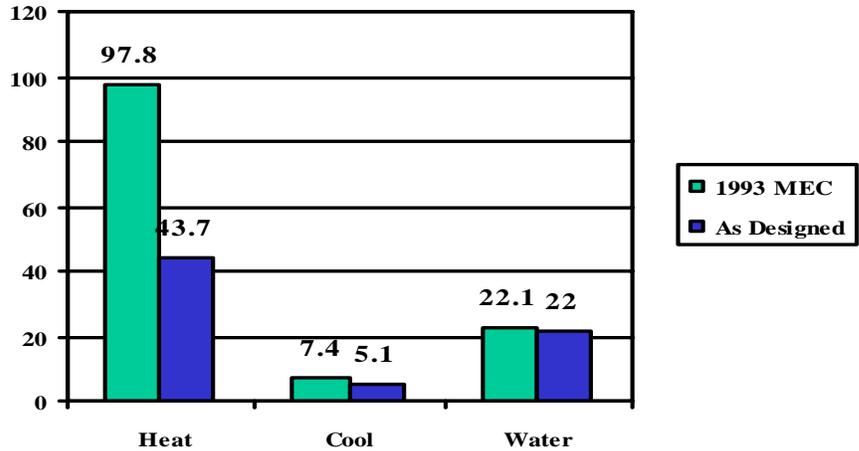
Basement insulation is 2-2" layers of R-Control EPS treated for termites with perform guard, R-value 3.85 per inch plus 8" concrete and ¼" air space and ½" gypsum board waterproofed with Platon for a total U value of .06 or R-17 (there is a capillary break between the foundation wall and the footing)

Roofs are of truss construction and insulated with 2.5" of icynene air tight spray-on insulation around perimeter and 10.5 inches (30.45cm) blow-in 85% recycled cellulose for a total U value of .02 or R-50.

Rim joists have 5" of icynene air tight spray-on insulation everywhere plus 3.5" of fiber-glass in unfinished areas for fire protection.

Windows are thermo-pane (2 panes), low-E, argon filled. U value ranges from .29 to .35, SHGC is .31 to .34 All windows were then sealed between the window and sill/jamb/head from the inside with 2.5" of icynene air tight spray-on insulation, R-3.85 per inch.

Savings in material usage was created from the use of engineered wood. We used OSB sheathed SIPS, OSB, fifty year warranted flooring, engineered floor joists, finger jointed studs, parallam beams and engineered roof trusses. the deck is a composite material made of recycled plastic and wood fiber and all of the carpet is PET recycled carpet.



Technical systems

Ventilation system, energy saving appliances, controls, energy supply system, solar energy utilization.

HVAC system is for 3608 sq. ft. of conditioned space on three floors, a heating load of 33,000 BTUs and a cooling load of 27,000 BTUs.

The heat source is a 66,000 BTU, 65 gallon gas fired sealed combustion, boiler rated, hot water heater with an 82 AFUE. This unit provides all domestic hot water and is also connected by pump to a coil heat exchanger in the air handler. Should it be desired this system could be attached directly to solar thermal panel. The fireplace (when used) is utilized for auxiliary heating.

Air ducts are installed in conditioned space. They are sealed with painted on water-based sealant.

The cooling units are typically 18 SEER 1 1/2 - 3 ton variable speed electric air conditioner. The fresh air is supplied by a energy recovery ventilator that operates continuously and is ducted from the kitchen, baths and laundry. The air handler has a variable speed fan which runs continuously supplying from 700 cfm to 1500 cfm.

As the return air enters the air handler it passes an ultraviolet air treatment system and enters an electronic air filter which removes particles down to .3 microns, This system is expected to have purified the air to 99.75% germ/mold/bacteria free and filtered out all particles down to .3 microns.

Energy performance

Energy performance for the Ward Road house is based on the 1993 Model Energy Code, Section 402 that is typically better than the average home and is shown above. This is a one-of-a-kind custom "site" designed home built to accommodate the view. Solar orientation was not feasible. Other models show energy results of 50% less usage because of proper orientations.

Annual energy consumption (MMBtu) and was verified as 5 Stars + with an energy rating point of 91.1

- Total energy demand/yr kWh/m-sq. = 78.64
 - Heating and ventilation used/yr kWh/m-sq. = 46.45
 - Natural gas and electricity
 - Domestic hot water used/yr kWh/m-sq. = 17.14
 - Natural gas
 - Fans and pumps-in above numbers
 - Lights and appliances used/yr kWh/m-sq. = 15.04
- This is from HERS calculations with defaults for appliances.

Costs

The construction costs for the Ward Road Home (not including land and sales fees are \$107 per sq ft or \$1151/ m². These homes are upscale homes with added costs for trim and décor'.

Planning Tools

REM DESIGN was used to develop our building envelope and REM RATE calculations were performed on six different plans before construction.

Air Ducts were tested tight with an air blaster and stage smoke and visible leaks were sealed during the test.



Market communications (MC) strategy

NeXus Environmental Consulting was retained in late 2003 to market the existing speculative homes as well as attract buyers for additional building throughout the greater Kansas City Region.

A Core Value Mosaic was developed along with consumer Benefit Ladders and SWOT analysis. Key demographic and psychographics sectors were identified. Most notably the growing influence of the emerging Cultural Creative (CC) consumer segment¹ was considered.

Competitive benefits and pinpointing branding opportunities has been the thrust of this campaign. An Integrated Market Communication strategy that uncovers these consumers is the focus of the execution strategy. It is primarily a relationship driven strategy.

The Execution Strategy:

Highly selective advertising aimed toward the local publications that the LOHAS^{1,2} consumer may read have been targeted. Advertisements have accompanied articles targeted to specific readership profiles. Advertisement in mainstream (Real Estate) publications are producing poor results.

Direct marketing has been limited (due to unavailability of appropriate lists for this segment), however, medical doctors, doctors of chiropractic as well as other "holistic" health care practitioners have been targeted for direct mail. Health clubs, gardening organizations and other selected affiliations are also being targeted.

Public relations programs include a series of articles in local publications along with local and national press release. Recent contacts from nationally syndicated TV shows and local newspapers have been forthcoming. The articles feature a small footer with contact points and web addresses have been successful.

Logo design is deemed extremely important to the Cultural Creative. Symbols are used to help brand the technical benefits of sustainable housing. Brand apostles among diverse CC companies have been recruited.

Current price points and floor plans were decided upon before NeXus was retained. There is a stronger demand toward the median price in the area. This is driven by demographics, but value based decisions are the primary reason customer contacts have been made for new construction.

As of this writing, trade presentations are planned. Cost sharing for publications will be among companies who supply materials as well as the builder and a local remodeled. After sale follow up consists of a newsletter periodically sent to homeowners.

References and Further Information

1. *A Compendium of Surveys in the US*, Guy Holt, November 2002 Update April 2004
2. The Natural Marketing Institute, *Understanding the LOHAS Consumer Group: A Focus on Green Building*

Project Team: David Roberts and Rich Hillman, Envision Development Corporation, www.envisionhomes.com
Project Coordinator: Rich Hillman
Marketing and Communication, NeXus Environmental Consulting, Guy Holt, guy@guyholt.com
Future Construction using these systems will be developed by Vision Homes.

Common text about Task 28