

Case Study ID

98-0014



ENERGY OFFICE

Case Study Series

Washtenaw Affordable Housing Corporation Energy Efficient Home Tom Snyder Builder

Description

This energy efficient home in Ypsilanti is owned by the Washtenaw Affordable Housing Corporation, a non-profit corporation that provides affordable homes and apartments for low income families in the Ann Arbor and Ypsilanti region. The home was assembled from two 14 by 52 foot modules that were prefabricated at the General Housing Corporation plant in Bay City. The modules were placed over a full basement. The basement walls are constructed of reinforced concrete that was poured into insulated concrete forms. This provides high insulation values for the basement walls. A 2 kW photovoltaic system, in the form of 'solar shingles' on the roof, provides electricity for the home. A battery bank in the basement provides for electricity storage.

This home is one of five residences which received a Five Star Home Grant from the Energy Office in 1998. Funding for the grants came from the U.S. Department of Energy. Home energy ratings indicate the energy efficiency of a home by modeling the home's energy performance against an ideal. This home achieved a five star rating on the Home Energy Rating Scale.

Specifications

The following features help keep energy consumption for this home low:

- R-5 foam board insulation under basement concrete slab
- R-32 overall insulation value (per manufacturers literature) for the concrete foundation walls including foam block insulation as form work • 2 x 6" exterior walls with R-19 fiberglass insulation and 7/16" OSB sheathing with vinyl siding.
- R-41 fiberglass ceiling insulation
- R-3 Low-E argon glazing, wood clad windows. Windows have adjustable, pleated fabric shading devices on all windows to avoid solar overheating and to provide additional insulation in winter
- Efficient, natural-gas fired, tankless boiler with baseboard radiant heating system
- Low air infiltration rate (0.39 air changes per hour, blower door tested)
- 2 kW maximum output photovoltaic system, as 'solar shingles' on the roof with battery bank for electricity storage in the basement
 - Other energy efficient features:
- All interior lighting with fluorescent lamps
- Energy efficient refrigerator

Energy Savings

The home was just recently completed, so energy consumption data is not yet available. Based upon the Home Energy Rating conducted for the house, it is predicted that the annual cost of heating the home will be \$183. It is predicted that the photovoltaic system in combination with the conservation features in lighting and refrigeration will result in an estimated reduction in annual electrical energy consumption as compared with a comparably sized home. The house will be monitored throughout the year for electrical consumption. This will provide hard data to assist in the promotion of photovoltaic solar shingles in Michigan



The house viewed from the south. The photovoltaic solar shingle system is visible on the roof.

To find out more about straw bale structures or to volunteer on this project, contact:

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Feel free to contact us if you have any ideas for case studies or other questions :

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