

## PHRC Report #43: The Energy Cost Optimized Modular House

**Date: November 1995**

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### BACKGROUND:

Current residential energy codes specify optimum levels of insulation and other energy conserving measures based on the assumed need of a heating, ventilating and air conditioning (HVAC) system. Research in passive solar homes has reduced the load on the HVAC system. If the HVAC system were to be eliminated a dramatic savings would result. This could pay for the additional energy conservation features required to achieve a higher level of efficiency.

### OBJECTIVES:

The purpose of this project is to prove or disprove the concept of super-insulation in practice. The detailed design, construction, and testing of a super-insulated modular home will be done. This study includes:

- a detailed literature review and study of residential and modular construction;
- assessment of energy conserving features by the researcher, owners, and manufacturers;
- a detailed cost estimate of all energy conserving features;
- life cycle costing to determine the optimum choice among energy conserving alternatives;
- detailed design of the house;
- actual construction of the energy conserving house;
- energy monitoring of the constructed house;
- assessment/adjustment of cost estimates;
- dissemination of results.

The project was started in the summer of 1994. The literature review and assessment of features has been completed. The estimation of costs has determined the optimum insulation levels. A detailed design has largely been completed and the construction of the house is waiting. Once the house is constructed the theory will be compared to practice. Reports regarding of the success or failure of the project will then be produced.

**WHAT IT MEANS TO YOU:**

This project will determine if super-insulated homes are practical and cost effective. If this prototype home proves to be successful the residential construction industry will have a new home that is much more competitive than current designs. Builders could have to adapt to produce this new product that would better serve their customers.

**WHAT'S NEXT?**

A long term study will be undertaken to monitor the home over an entire year of owner occupancy.