JEFFERY

HOLDREGE

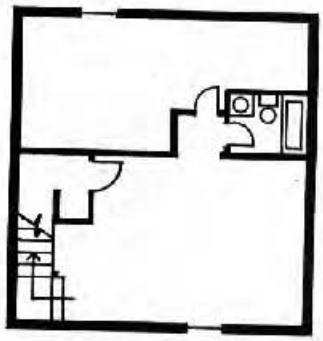
SUPERINSULATED

The Jeffrey home, a 2500 sq ft two-story superinsulated design with some direct gain passive solar features, marks a departure from the earth sheltered and passive solar heated homes for which Sunshine Construction of Kearney has become known.

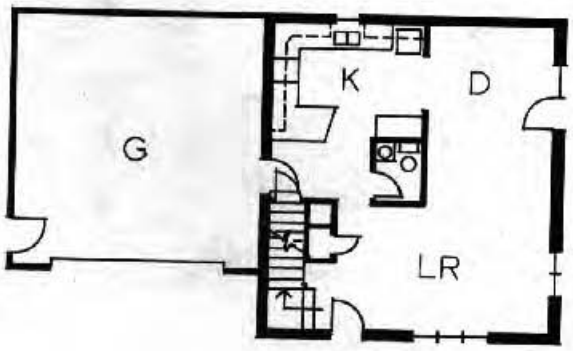
At first glance, there are few clues to indicate that this home is anything other than a typical, attractive suburban house. A closer examination reveals, however, that this is not any ordinary home. The relatively few windows are strategically located -- most of the windows face south or east -- only two windows face north (opposite). In addition, these triple-glazed windows are set in walls which are nearly one foot thick. The double 2x6 framed stud walls allow for insulation values of R-40 minimum.

The Jeffrey home is all electric. A water source heat pump is the principal auxiliary heat source, and the average monthly electric bill during the heating season, including the heat pump, lights, and appliances, was under $50.

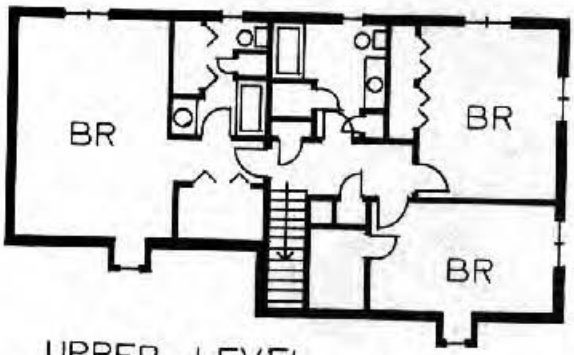
Among the problems associated with tightly sealed buildings, including superinsulated houses, are clinging odors and water condensation. The Jefferys, however, have not experienced either of these problems. In fact, the Jefferys have indicated they are so pleased with the design and performance of the house that were they to start over they would not change anything.



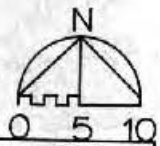
LOWER LEVEL

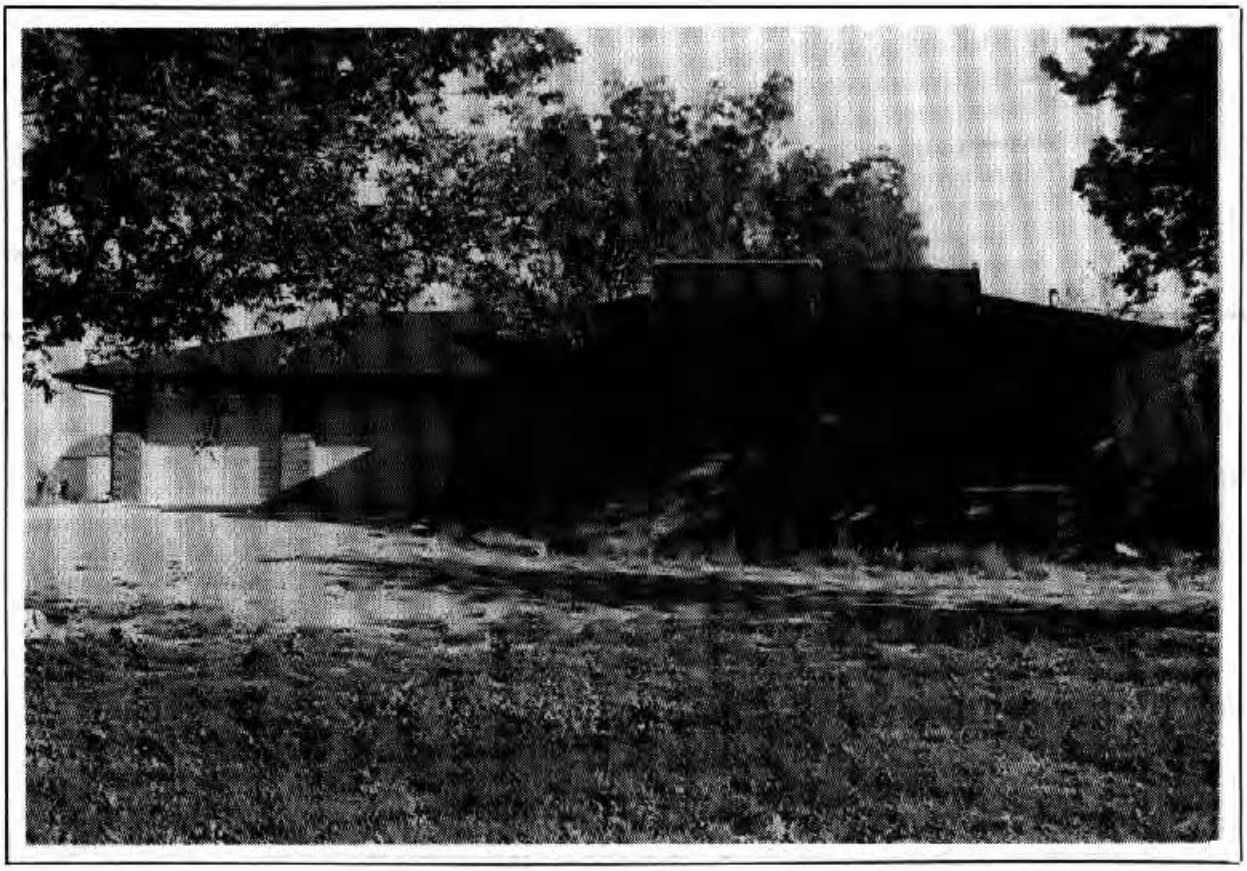


MAIN LEVEL



UPPER LEVEL

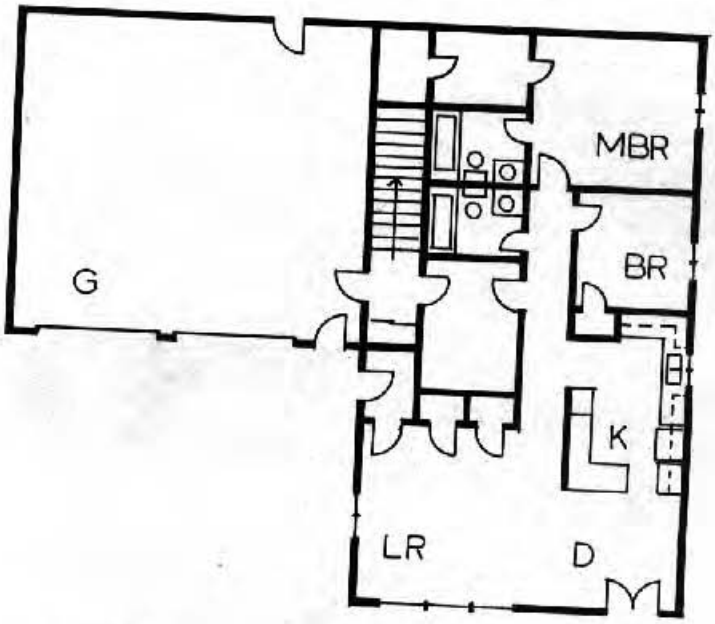




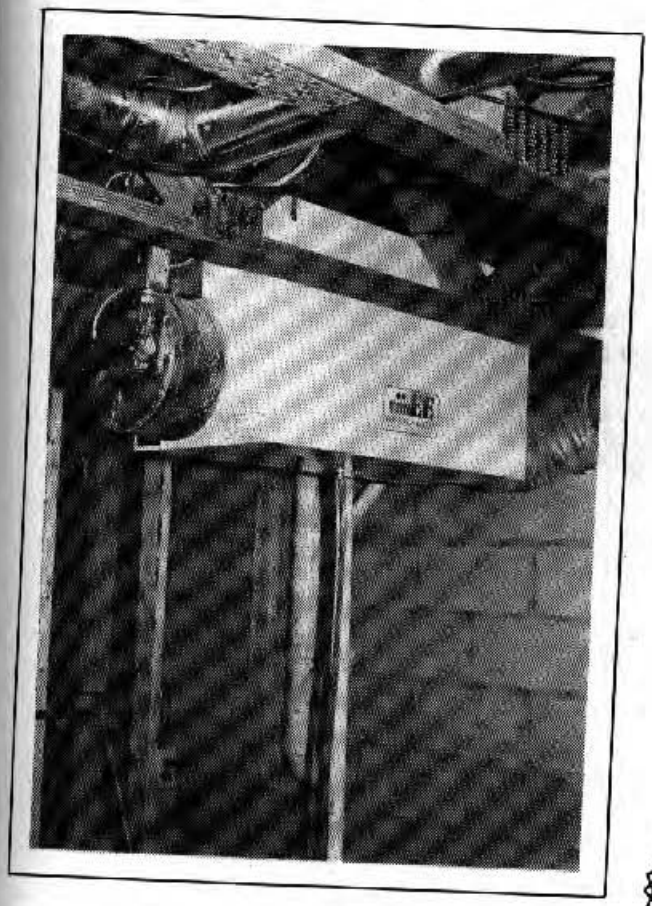
The superinsulated Kramer home was designed by the owner who relied on THE PATH TO PASSIVE: NEBRASKA's PASSIVE SOLAR PRIMER and other resource materials for ideas and guidance. Energy conservation features of the recently completed 1345 sq ft all brick dwelling include air lock entries, no windows on the north side, the garage positioned to block winter winds from the northwest, and a Van-EE, model R-200 air-to-air heat exchanger (opposite left) located in the basement. A superinsulation level of R-43 in the side walls is possible because the side wall framing is double 2x4 stud walls. At least 10" of blown insulation in the roof, gives it an insulation value of R-45.

Hot water for domestic use is provided by a site-built, two panel active solar collector liquid draindown system. The owner built the system after attending attended active solar domestic hot water workshops to gather information.

Some of the minimal heating load in the Kramer house is supplied by solar heat generated through approximately 60 sq ft of south facing direct gain glazing (opposite right). Warm air is circulated within the house by ceiling fans (opposite right), and the owners rely on an electric forced air furnace for backup heat. Energy performance should improve with the use of window insulation to reduce heat loss at night.



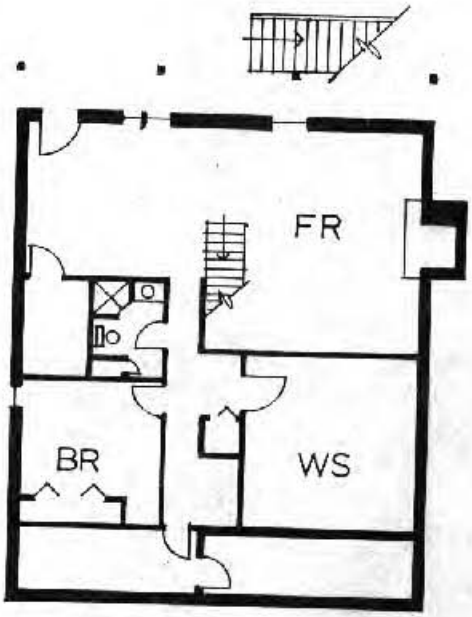
MAIN LEVEL

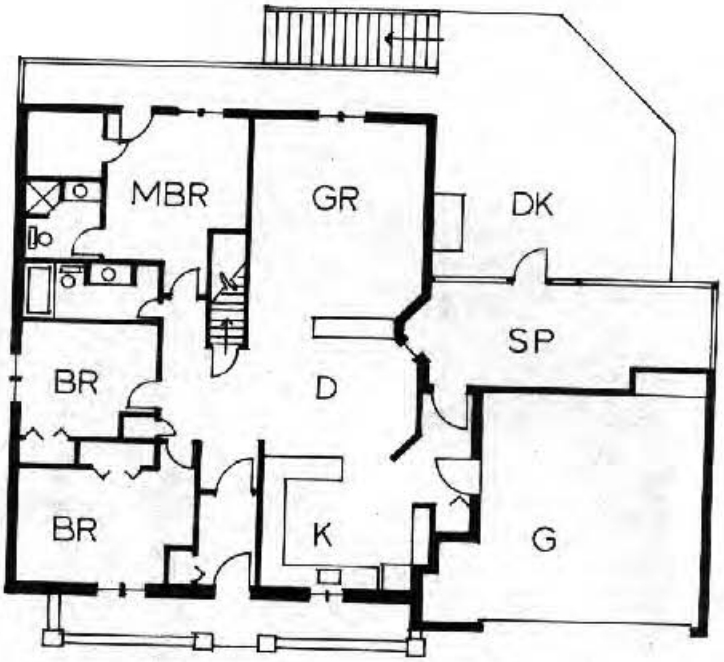


The MacFerrins moved into their superinsulated home in February of 1983. The owner, influenced by William Shurcliff's book on superinsulated design as well as periodicals such as Solar Age and New Shelter, designed the house and served as the general contractor during construction.

The MacFerrin house, which from the street (opposite) gives no indication of its energy efficiency, has 1550 sq ft of living space on the main level and approximately 1500 sq ft on the lower level. The superinsulation of the house is achieved by side walls with double 2x4 stud framing to create a 9" deep cavity for insulation and an attic with an insulation level of R-63. Although the principal heat source in the house is a Lennox heat pump, some direct gain solar heat is generated through the south facing Pella casement windows. A whole house ceiling fan helps ventilate the house during the cooling season.

Superinsulated houses are energy efficient not only because they are heavily insulated, but also because they have very low air infiltration rates, largely the result of a properly installed vapor barrier. Resulting stale air may require the use of an air-to-air exchanger, which, as the name suggests, exchanges stale air from the house for fresh air from the outdoors. The air-to-air exchanger also transfers heat from the outgoing air to the incoming air to make the process relatively thermal efficient. In the MacFerrin house, a Van-EE, model R-200 air-to-air heat exchanger is located in a closet near the central hallway to exhaust stale air drawn from the kitchen and bathrooms.





LOWER LEVEL

MAIN LEVEL

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