

Timber Frames Are Green



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Restoration Project

The restoration project of the old dairy farm and the building of a green home.



1. The site is 4 plus acres, partially wooded, with a 2' wide creek running through. It was partially open meadow. Part of an old dairy farm, there were invasive species of plants (privet hedge, multiflora rose, honeysuckle) and pest plants (poison oak, blackberries) which were so thick rabbits had trouble navigating. We used some onsite wood (knee braces, flooring, and trim of walnut and pear), all new framing timbers (they were required by NC law to be graded for structural integrity) and stone from the field, creek, and local roadwork for drystack retaining walls. Construction materials were used several times during building, such as 2x4 bracing for the timber frame during the raising, later used for toe boards, and then as part of interior walls.

2. Energy efficiency The 2800 sq. ft. timber frame house is powered by our local power grid. Passive solar gain comes from windows on east and south sides. Active solar heat for hot water and photovoltaic panels were feasible, but we elected not to use them at the time. Heating and cooling is from a heat pump with a propane backup furnace, which has never come on. There are no water conservation measures. Gutter outflow is carried underground to the protected banks of a creek 40 feet away. And there are French drains along two sides of the building which drain springs. Our well produces 65 gallons per minute, and has so far, even before Hurricane Fay and our current drought, never stopped giving us adequate water. We still are careful with water usage, and any irrigation for plants comes from the creek. Costs of heating and cooling and powering the house averages \$75 per month, year around. Insulation is structural insulated panels, or SIPS. Summer shade is provided by large sycamore and walnut trees to the east, south and west.

3. We expect the building to last at least 300 years, as many similar timber frame buildings in Europe and New England have done without the advantages of modern roofing, flashings, and foundations. The roof is painted steel, and exterior is painted cedar shiplap siding. The SIPS insulation should far outlast cellulose and fiberglass at least in efficiency, as the SIPS do not settle.

4. Air quality. We use no carpet. We have wooden floors and wool area rugs, and wainscoting of local logs rescued from sawmill firewood piles. The timber frame is local white pine for the living room and hemlock recycled from the adelgid infestation of New England hemlock forests for the remainder of the house. Finishes were Watco and water based polyurethane. Flooring is wood-walnut, spalted sycamore, spalted maple, heart pine. Low VOC paint was used on our sheetrock. Dehumidification is done by our heat pump. There is no need for air to air heat exchangers, and we have no air quality problems. Between Florida and Michigan, I believe there is no need for these machines.

5. Our house is beautiful, inside and out. It fits into its rural setting, and nestles along the creek and patio, mostly hidden from the road by large sycamores, Eastern red junipers, and poplars. Each time I enter the house, quiet and contentment wash over me and I am happy to sit quietly and enjoy the always intriguing structure of the timber frame. We plan to live here as long as we can.



6. The house is almost hidden in summer, with views of the Appalachian Trail ridges in the winter. We have planted many native trees, shrubs, and plants along the creek and road for privacy and for restoration of the native flora. The old dairy farm fields are much cleaner, we have removed most of the honeysuckle, privet hedge, multiflora rose and poison oak, and we still have visits from wild turkey flocks and herds of deer. We have seen as many as 14 of both species.

7. Our house was built before HERS was available. We recently had it blow tested and evaluated by an accredited professional. It was compared with the imaginary all electric reference house and was projected to use 86% of the energy of the reference house. When ACTUAL costs of heating, cooling and powering the house were compared with the reference house, our costs were 59% of the reference house. We are unable to get it certified because it was not inspected during building. However the bottom line speaks for itself.

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