

SENS HOUSE TOUR

Welcome to the Sustainability and Environmental Studies (SENS) House. Four residential SENS Directors live in the house. One of the first things you might notice about this house is the strawbale wall. This was a project of former SENS directors. In building this wall Kelly invited the community to help so they could learn about natural building and she could actually have enough help to finish the wall. The plaster on the left is a limestone based plaster with mosaic, and the plaster on the right was done with natural pigments, flour, and sand. The strawbale wall is more sustainable than conventional building because it utilizes local straw and other materials. Also, it insulates twice as well as the other walls in the house (R value of 40-50 vs. R value of 20-30). It isn't waterproof but rather it breathes as the plasters wick away moisture like a clay pot would. The roof is made of structurally insulated panels (SIPs) to provide added insulation. The original plan was for the house to be constructed out of strawbale entirely, but that fell through because we only had one labor student who specialized in natural building and it was not feasible to ask one student to build a house, so we settled for one wall. Then the plan was to make the remaining walls out of SIPs, but that fell through due to budget constraints so we settled for walls that are 8 inches thick instead of the standard 4-6. Notice the post and beam construction, it is loblolly pine from the college forest that was replanted after it was harvested.

Another unique thing about the house construction is our concrete floor. No, this is not under construction. The floor serves as thermal mass so during the day the south facing windows let in sun that heats the concrete and at night the concrete releases this heat. This is known as passive solar heat. The awnings also work with this because they are out just far enough to block the sun in the summer when it is high in the sky at noon and in far enough to let the winter midday sun in. In addition to the passive solar heat, the house has a wood stove and small super efficient natural gas heaters in the bedrooms and bathrooms. The counters and cabinets in this room were selected because they are made from wood shavings and resin and do not off-gas any formaldehyde. Are there any questions about anything in this room?

Let's move into the other end of the house. The first bathroom has a low-flow dual flush toilet. The small flush uses .8 gallons of water and the full flush uses 1.6 gallons of water. The water in this toilet is treated by the Ecological Machine, the green house just on the other side of the kiosk (the strawbale structure with informational displays). All of the sewage in the new part of the EcoVillage is treated by the EM. First water enters the large, decorated septic tank where anaerobic bacteria begin to break down the sewage. Then the water flows to through two closed aerobic tanks, open tanks with tropical plants that provide a home for bacteria on their roots, and to a clarifier, where any remaining solid material settles. After the EM, water is sent to the sub-surface wetland which concludes the water purification process. This water is then stored in a vault and goes to a lift station where it is pumped back into the toilets of the EcoVillage. The EM saves approximately 350 gallons of water a day by flushing toilets with recycled water. The water from the sinks and showers in both of these bathrooms is treated by our attached grey water treatment green house. The second bathroom takes water conservation to another level. This bathroom has a composting toilet. The toilet works like this: see these tiles tilting it slightly back? There's a drum inside that has vents in the back. So all of the liquids drain from the drum and go into the evaporation chamber below the drawer. The small 12 volt fan that you hear

draws air past this chamber and the liquids are evaporated off. The solids remain in the drum. After a number 2, you add a cup of sawdust to this drum. When this drum is full, it gets emptied into the drawer in the bottom where it is left untouched for three weeks to break down. After three weeks they can be removed and thrown away (to meet safety regulations). Any questions about the composting toilet?

This end of the house helps us meet water conservation goals. This is important because the house gets its water from rainwater catchment. It is stored in a cistern and filtered by a UV filter. We use a solar water heater to pre-heat our water. We also have an in-line on demand natural gas heater to boost the temperature up if needed, so we can have warm showers even on cloudy days. (Show them our "report card" board with our house usage) To meet energy conservation goals the house uses compact florescent light bulbs and light tubes. One of the energy conservation goals of the SENS house is to meet its electricity needs by the photovoltaic panel. When the panel is tracking the sun it gets about 8-11 kWh's per day. The reason it hasn't been getting that is because it was struck by lightening and the tracking device was broken. Here's how we are doing compared to the average Berea citizen.