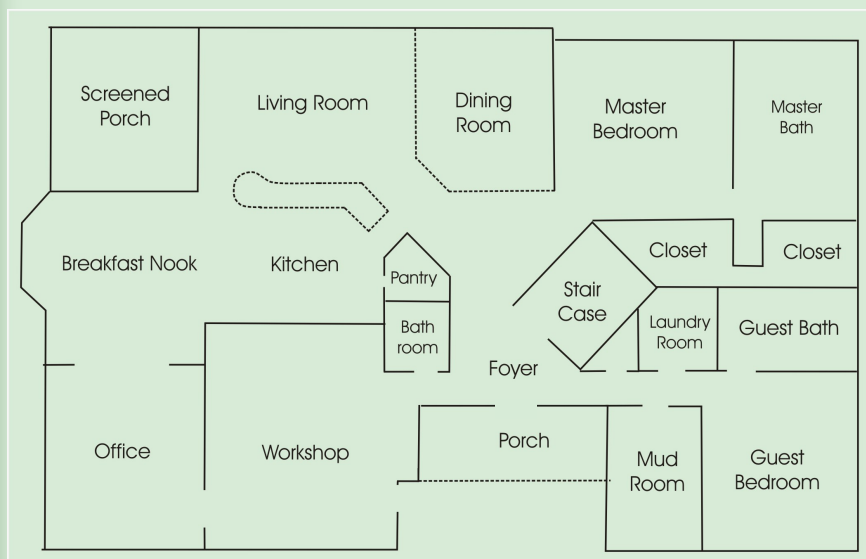


Spaulding House

Self Tour



Floorplan Design : LaVonne Kern

Architecture : Harv Koplo

Builder : John Lang

Interior Design : Annette Chinuge

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Foyer

When building Spaulding House we tried to use sustainable techniques whenever we could. Upon entering the foyer, the floor that extends through to the dining room and living room is made of Lyptus. Lyptus, a combination of eucalyptus and two other



trees by Weyerhaeuser, is harder than oak and is grown on plantations certified to Brazil's national sustainable forestry standard, CERFLOR. The eucalyptus trees grow quickly and can be harvested within 14 to 16 years of planting, unlike oak, which takes 50 years. They can plant Lyptus where the rain forest has been stripped, and a new rainforest can grow up under it and continue to grow once the Lyptus is harvested.

Open Design



The house has been designed as an open design. In fact there are 6 rooms that are all open (7 including the workshop, when it's doors are open), This allows passive solar heat from the large windows to be dispersed throughout the house, so that overheating problems common with older solar designed houses can be avoided. DC motors on the heat pump furnaces allow the fans to be left on at 35% power to help move the air around. The windows face Southeast and Southwest, bringing both morning and afternoon sun into the house. There is a

two foot roof overhang outside which shades the house and keeps the heat out during the summer months when the sun is higher in the sky. The many deciduous trees on the property also help shade the house in the summer but let sun through in the winter after the Autumn leaves have fallen off. The house has been designed to be energy efficient, with an extremely tight envelope, R32 insulation in the walls and R60 in the ceiling. Special trusses were used which add 6 inches more lift to the rafters so that more insulation could be blown into the eaves. Blown wet cellulose made of recycled newspaper was used for the 6 inch thick wall insulation, along with an extra outside layer of foam board. The ceilings have 18-24 inches of dry cellulose blown in.

Living Room



The Living Room, along with the adjoining kitchen, have a 12 foot high ceiling. There is an intake return placed at the peak in order to recirculate the hot air that rises to the ceiling back to the floor area. A chimney from the lower level, to be used for a lower level wood stove, passes through a corner wall and could be used later on for a fireplace if needed. There are extra data cables located in the wall that are connected to the wall-mounted LCD TV, which could be used as a computer monitor or monitor for other equipment.

Screened-in Porch



The porch has been designed to feel like the viewer is living in the trees, being so close to the Shag-Bark Hickory right next to the house. The bird feeders are on clothesline type devices and are designed to be filled from the deck instead of having to go down in rainy weather. The deck itself is a simulated wood made from recycled plastic soda bottles. The porch is one of eight rooms in the

house wired with speakers and connected to a whole-house audio system. Each room can listen to any of four sources channeled through the system.

Kitchen



The kitchen flooring, which extends into the breakfast nook area, is a rather new type. Although it looks like tile, it is called Duraceramic, and it is only 1/8 inch thick. Unlike tile, it can be glued down to inexpensive luan plywood. When placing one foot on tile and another on Duraceramic, one would notice how much warmer the Duraceramic is. The kitchen cabinets are made of natural cherry, which does darken up naturally over the years. The countertops are a brand of quartz called Cambria. It is a substance made of 97% crushed up quartz and 3% resin. Although around same price as granite, it does not require sealing every year like the porous granite does, and it does not crack when hot pans are placed upon it. From a sustainable aspect, at least it does not take huge slabs of granite out of the ground.

Breakfast Nook / Internet Café



The breakfast nook area looks out over a beautiful yard view and pond next door through a bump-out made of four windows. The nook has a leaf-patterned Formica countertop under the bump-out which extends all the way around to the office area in the next room. The countertop contains three or more com-

puters which are hooked to the house ethernet network system. The house is wired with 80 data cables that connect jacks in each room to a wiring rack in the lower level. These jacks can easily be switched between the phone, computer network or music systems by moving jumper cables around on the rack. Two of the computers in the internet café are presently used to connect internet radio stations to the household music system.

Office



The Formica countertop which extends from the breakfast nook area into the office is used for a desk and project countertop. The flooring is made of rubber-backed carpet squares composed from recycled plastic bags. Three eight foot pocket doors can be pulled out of the wall to close off the office from the breakfast nook for privacy. The middle door is a glass door

which allows light to come through and the views from the porch area and the breakfast nook windows are visible through it. The office has four speakers connected to the sound system for quadraphonic-like sound. The radio and CD changer which feed the sound system are installed in the office under the desk.

Workshop Area

The house was designed to incorporate Harv's business, Avrom Systems, in the home. Extra space was utilized as a workshop for repair of computers. It has a separate entrance and an outside loading dock. To make it easier on the body while standing up at workbenches, a rubber flooring was installed which is composed of recycled tires,



similar to flooring used in gyms and health clubs. So that light would not glare off of computer monitors, indirect T8 fluorescent lighting was used in the room. This room also has four speakers for a quadraphonic-like sound, as well as extra countertops for programmers and a shipping area. The workshop has a staircase going down to an inventory storage area which also houses the wiring rack and is used as a server room for the computer business. The rooms were designed so that eventually, the workshop, office and inventory area could be used as a separate apartment or "mother-in-law" quarters if needed.

Bathroom



The half bathroom does not have access to an outside wall or window. To bring daylight into the room, a SolaTube was installed which brings daylight in. This device is basically an 8" round ductwork with a mirror-like surface on the inside, which brings light down from the roof. The duct does not have to go straight up and can bend as much as necessary to get to an appropriate spot on the roof. The walls of the bathroom are painted in a "denim" paint, a two step process which creates a textured surface.

Hall / Laundry Room

Past the front door, to the right of the steps is a hallway leading to the Guest Bedroom. On the way is the laundry room, which has been located on the first floor so that laundry doesn't have to be carried up and down stairs from the lower level.



Mudroom



The Mudroom is also on the way to the Guest Bedroom. It is an area that leads from the garage into the house. It contains a freezer and fridge as well as a slop sink, so that items like large fruits and vegetables can be washed and placed in the fridge here rather than taking up room in the kitchen. Other items can be carried in from the car and left in the mudroom fridge.

Guest Bedroom / Project Room



The Guest Bedroom, also used for sewing projects, is a fairly large room. It and the mudroom were originally designed to be six feet shorter, however it the design was changed to allow for easier access to the south garage bay from the drive. There is a special jack for the audio system in this room

which allows an I-Pod or other device to plug in and supersede the four other whole-house sources that can play in this room.

Guest Bathroom

The Guest Bathroom is designed to be wheelchair accessible – there is a light switch down low as one enters the room, and the stool area has extra space and a grab bar. The wall to wall mirror above the vanity adds depth to the room and reflects light into the tub/shower unit.

Dining Room / Thermal Mass Wall

The Dining Room is part of the open design of the house. From there, one can see and communicate with anyone in the Living Room, Kitchen and Breakfast Nook.



The indirect lighting around the ceiling and the diagonal pattern in the Lyptus flooring help define the area.

The wall between the Dining Room and the Master Bedroom is a “thermal mass wall” made of 8 inch concrete blocks, designed to absorb the passive solar heat for later discharge. Although the technique was investigated, there is

no air movement through the blocks because of possible mold problems that have occurred in similar installations.

John D’Introno of Creative Concrete was retained to provide the unique finish for the wall. After coating it with colored concrete, Annette retrieved leaves from the yard which were rolled into the concrete and removed as it set up. John then scribed around the leaves and stained them a darker color.



Master Bedroom



The Master Bedroom lies on the other side of the thermal mass wall. The large windows in the room obtain afternoon sun which is absorbed by the wall. The room has a light and airy feel with a wonderful view of the yard.

Master Bath

The Master Bath also contains speakers tied to the household audio system. It is floored with a non-slick tile. The shower and tub units were tiled by Matt Oakley, a third generation tile artist. There is a door opening to the back yard to enable access from the vegetable garden or



back yard area. The vanity is custom made of tiger maple. The countertops are made of ShetkaStone, a recycled cardboard product. Neil Shetka, a university professor in Minnesota, invented a process that allows them to make countertops out of cardboard, paper, shredded money and even your wedding gift wrapping paper. A ShetkaStone recycled paper countertop that was shipped by mistake can be viewed in the guest bath on the lower level of the house.

Foyer Gallery, Stair Case & Quilt



The foyer contains two galleries to display Harv's photographs and various artwork. W.A.C. Monorail lighting is used for the displays. All lighting in the house except under-cabinet lights have been purchased online.

Wrought iron stair railing, created in the prairie style to match the glass over the front door, was designed and manufactured by third generation iron artist Lew Fehring of Fehring Ornamental Iron Works. Lew also produced the wrought iron climbing vines that support the kitchen cabinets hung from the ceiling and



the pedestal holding up the quartz counter on the kitchen "peninsula".

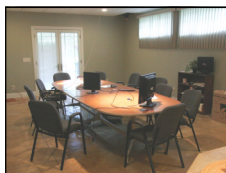


The quilt over the staircase was produced by Harv's sister Merryl. Over 200 hours of labor went into the creation of this housewarming present, which features garden vegetables around it's border.

Air Exchanger

In the past, houses designed with a very tight "envelope" had problems because the inside air would get stale. This was a potential health problem aside from the stale smell in the house. At Spaulding House, an air exchanger was installed which pulls air from the floor below the kitchen "peninsula" counter-top and replaces it with outside air. The goal is to turn over all stale inside air with fresh outside air every 2-3 hours. The exchanger conditions the incoming air with moisture and temperature from the outgoing air, so that the exchange doesn't put extra load on the heating and cooling systems of the house.

Lower Level Conference Center & Walk Out



Spaulding House has been designed with a conference center in the lower level of the house.

The flooring, which looks like expensive Italian tile, is actually another creation of Creative Concrete. A brown

cement was trowelled onto the unfinished concrete, and tape was laid down where the “grout lines” were to be. Then a lighter colored cement was trowelled over it and the tape was pulled up. After staining, laquering and waxing, the floor looks just like tile, for about 30% of the cost. The projector, mounted on the ceiling, is connected to a computer under the conference table so that items can be displayed during business meetings. A DVD player & VCR are connected as well, as is a 5 channel surround sound audio system with sub-woofer for viewing movies on the DVD.

Lower Level Kitchen



Much of the lower level furniture and fixtures are previously used items, from the couches and conference table to the stove, refrigerator, and dishwasher. A house that existed on the property was demolished to make way for the new one, and many items were salvaged from it including a complete bathroom, the cabi-

nets making up the bar and the china cabinet next to the refrigerator, and the door to the winecellar.



Lower Level Guest Bed & Bath Rooms



Before the foundation was poured, an egress window was designed into the plans so that a lower level guest bedroom could be created.



The bedroom flooring is from Shaw Carpeting, a company that utilizes sustainable techniques in the making of their carpet. The attached bathroom has utilized a non-groutable DuraCeramic flooring and a ShetkaStone recycled paper countertop.



Lower Level Bathroom

Across from the staircase, is the lower level bathroom. This room utilizes the recycled bathroom fixtures, vanity, mirror and lights salvaged out of the demolished house (with some restoration magic from Annette).

The flooring is a groutable DuraCeramic similar to the that used upstairs in the kitchen.

Lower Level Hologram Gallery



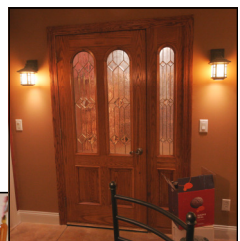
The holography gallery contains various holograms Harv has collected over the years. A hologram is made with a laser, by splitting the laser beam into two parts—one is bounced off of an object onto a piece of film, while the other goes straight to the film. It is an exact duplicate down to the molecular level—so a hologram of a glass of water, when viewed under a microscope, can show ameba in the water. The gallery leads to the “Bistro” area, an interesting space that was utilized to create a cozy area outside the wine cellar.

Bistro



The wine cellar is a passive design which uses the temperature & humidity of the earth to condition the super insulated room.

Wine Cellar Door



Wine Cellar



Renewable Energy



Spaulding House has made use of available renewable technology to help with energy efficiency. Although the central Illinois climate does not lend itself well for a complete solar/wind solution, there is enough to take advantage of.

Solar Hot Water Heater

The solar hot water heater at the house preheats water before sending it to a traditional water heater. The vacuum tubes bring heat up to the manifold at the top which contains an antifreeze solution that runs down to the basement. A heat exchange unit in the basement extracts the heat and stores it in a storage tank. This tank then feeds a regular hot water heater.



Heat Exchanger

Water Heater

Solar Storage Tank



The pump which moves the antifreeze back up to the solar collector on the roof is powered by its own photovoltaic panel on the roof. The more sun there is, the more heat is produced in the collectors and the more electricity is produced by the photovoltaic unit. This speeds up the pump so the antifreeze moves around quicker. This self-regulatory system needs no help to operate.

Energy From The Sun



The Springfield municipal utility, City Water Light & Power (CWLP) passed a resolution adopting the Purpa Standards which allow for interconnection of solar photovoltaic cells to the CWLP electric grid. Along with this, CWLP also adopted the policy of allowing net metering, - paying retail rate for electricity produced by individuals. Spaulding House was the first home in Springfield to make use of these new policies.

Solar Photovoltaic Panels



The ten photovoltaic panels on the roof are Sanyo 48 volt panels that produce a maximum of 2 kilowatts of electricity. They were chosen because of various reasons. They have an extra layer underneath the unit to capture sun reflecting back from the roof, which boosts power up to 10%. Also,

unlike many panels, the diodes in each row insure that shadowing (which begins to occur on this roof 3:30 or later depending on season) only affects the row being shadowed and doesn't shut down the whole set of panels.

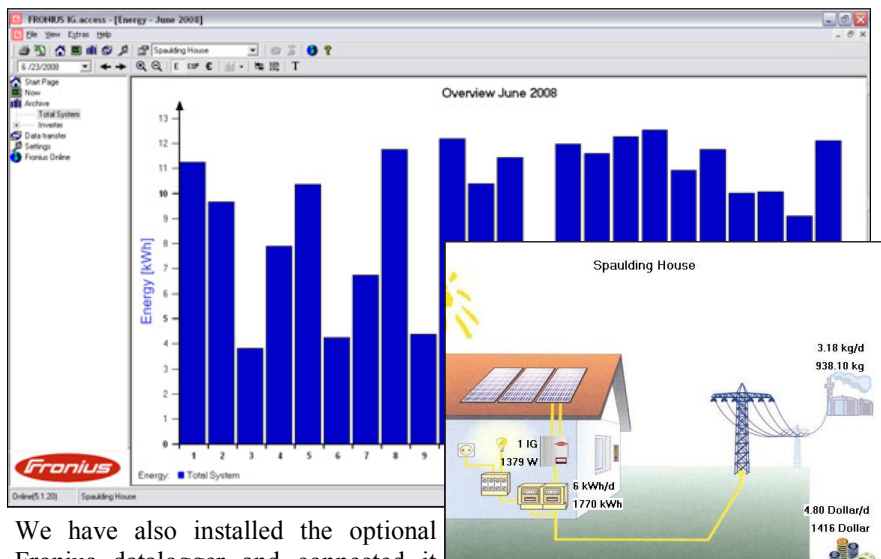
Fronius 2KW Inverter

The DC produced by the panels is sent to the inverter in the basement where it is transformed into 220 volt AC and routed to the circuit breaker box. The house uses this electricity first before obtaining more from the CWLP grid. Should it



produce more electricity than needed by the house, it feeds the CWLP grid through the electric meter, turning it backwards and crediting the account. A safety feature built into the unit only allows it to produce electricity if the grid is up. If the electricity on the grid goes down, the inverter automatically shuts down the system so that no lineman can get electrocuted accidentally while working on a line.

A graph of the electricity produced during the month of June, 2008



We have also installed the optional Fronius datalogger and connected it through the data cabling system to a computer in the office. In this way we can monitor the system in real time as well as through historical graphs. Data can be shown by day, month or year for the photovoltaic system.

Other Sustainable

Various other sustainable items were designed into the house. The outside foundation walls were insulated with two inch pink foamboard going down 2-3 feet. All inside foundation walls were insulated to R13. An attic fan was installed in the garage that allows air to be pulled throughout the house, without sacrificing insulation in the main house ceiling. The gutters and downspouts run rain water thru special filters and store the water in a 2800 gallon cistern for yard use. Low E casement windows help keep the heat (or cold) in, while allowing solar heat to enter in wintertime. Casement windows were used throughout because they seal better than doublehung windows. A recirculation pump runs hot water through insulated pipes around the house so that hot water is available instantly at faucets without wasting water. Task lighting was installed throughout the house, as are compact fluorescent bulbs. All appliances are "Energy Star" rated for energy efficiency, and household surge protection was installed in the circuit breaker boxes. The list goes on and on...



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