ASPI
Appalachia-Science in the Public Interest
50 Lair St., Mt. Vernon, KY 40456

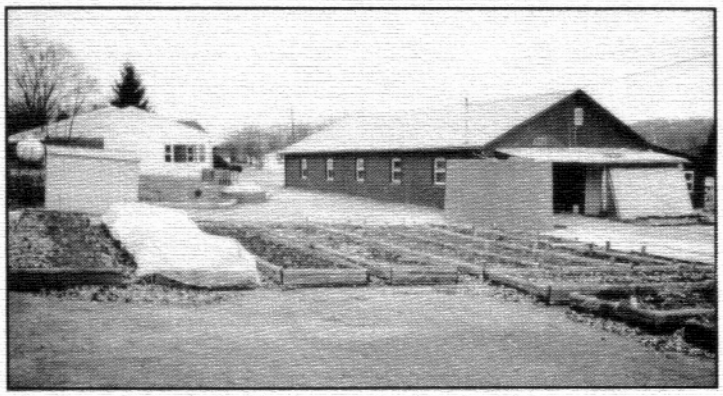
ASPI TECHNICAL SERIES TP 43

Small Town Appropriate Technology Demonstration Project

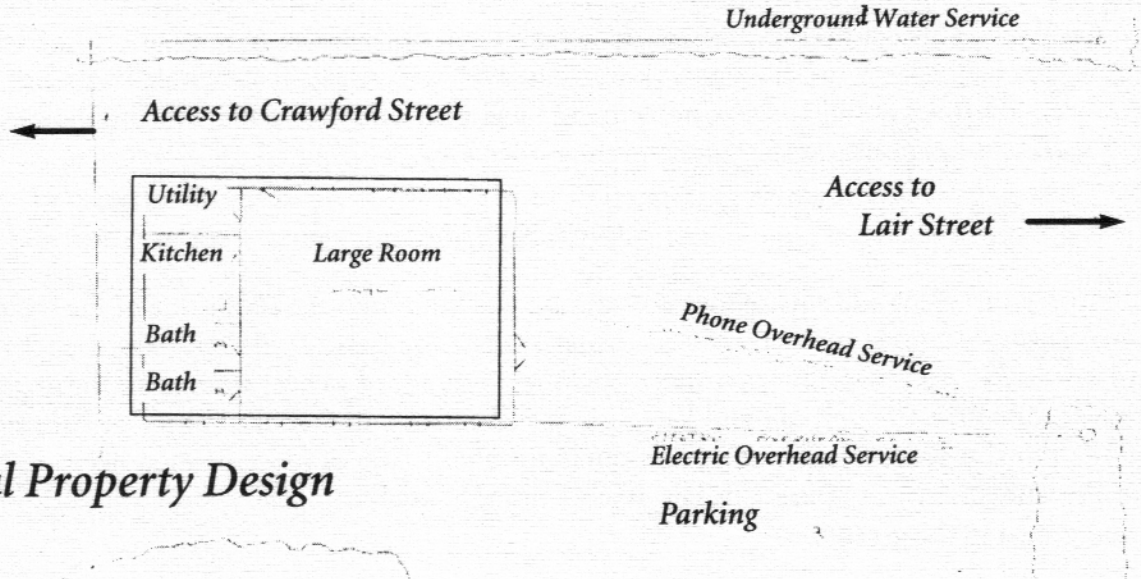
OVERVIEW

A great majority of rural Americans live in small towns and hamlets rather than isolated farms and homesteads. These small-sized urban counterparts have many of the advantages of urban life (more accessibility for larger numbers of people, better services, and more chance for social and cultural refinements). However, these micro-urban communities also suffer from having more blacktop and subsequently more summer heated surfaces, greater congestion, more air and visual pollution, and more noise. Thus a small town demonstration project affords an opportunity to meet more rural people and yet overcome small-scale urban problems.

Situation Our nearly one-acre tract in Mt. Vernon is now being reshaped to become a small town answer to rural appropriate technology challenges. In the illustration below we see the physical layout when ASPI acquired the property in October, 1995. At that time, it was two-thirds blacktop, one-sixth building and one-sixth greenspace. There were no trees immediately on the grounds though a large ash offers shade at the southwest corner of the property. Much of the so-called "greenspace" around the perimeter was limestone rock outcroppings with some Bermuda and wire grass cover. The 60 by 32 foot rectangular concrete block structure had little wall insulation, was in need of a new roof, painting and some siding repair along with interior redesign work. An added reality was the habitual use of the property as a shortcut and parking facility for a steady stream of parents to the large county grade school across the street. These trespassers travelled at high speeds to get to and from their destinations.



Mt. Vernon Small Town Appropriate Technology Center



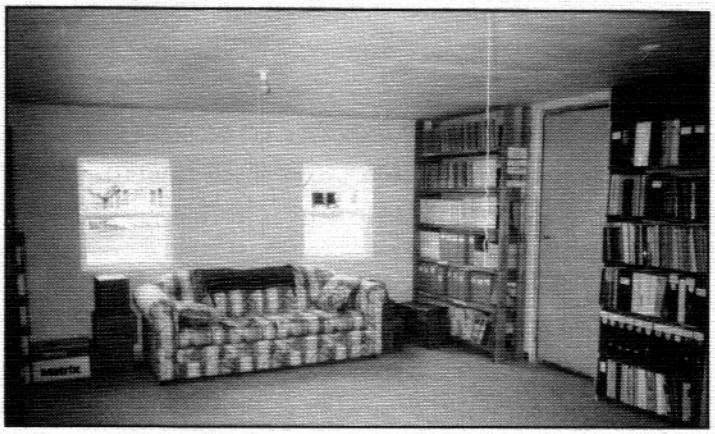
Original Property Design

The New Design

From our entry date in 1995 we intended to return this hot, heavily congested, overly trafficked unpleasant site into a cool, lightly trafficked, pleasant inviting ASPI office building for handling our resource assessment service and our ASPI publications. We wanted neighbors and visiting townspeople (being a major tourist site due to the nearby renowned Renfro Valley Music Center) to experience the transformation. The model used was the Knoxville 1982 World's Fair solar site of which ASPI contributed. We wanted the following environmental assets developed for physical facilities: superb south exposure for use of solar energy applications; new roof and sides with replacement of metal framed single pane windows with energy efficient double-pane ones; increasing space through a second floor storage area of about 1,200 square feet; a metal storage shed; a solar greenhouse on the south side; and a library annex on the east side to block one of the travel routes around the building. At the same time we envisioned working outdoors for grounds improvement: replacing blacktop with raised bed gardens; curbing pass-through traffic; return of greenspace to both edible landscape and ornamental wildscape; collecting rainwater in an 8,000 gallon cistern to replace chlorinated city water for watering plants; and using solar energy for electricity production and heating of water.

PHYSICAL FACILITIES

The only building on the grounds at the time of purchase was a parish hall which has not been highly used for some time. The Catholic parish was willing to subdivide their land and sell the 2,000 square foot lightly insulated building to ASPI. The facility has two bathrooms, central propane heating, storage space, a full kitchen and a large insulated but undeveloped 2000 sq. ft. attic.



Interior Development: ASPI divided the main hall of the building into walled partitions made from bookshelves standing next to each other. An office manager room was established near the back door entrance along with two moderate-sized offices and a large room for assembling published materials. Due to the dry nature of the building the 7,000 volume library was moved from Livingston during the late fall of 1996. A 350 square-foot annex for storage and display of periodicals was added on the east side during the summer of 1997.

Attic space was rearranged and two drop-down stairs were added at each end of the building. Flooring was placed on the exposed attic rafters to increase storage by 1,200 square feet. A new light colored asphalt roof was added during the fall of 1995 and the building was repainted dark green accompanied with an ASPI sign at the main entrance. Fourteen double-pane, double hung vinyl windows were added during the spring of 1997. At that time a metal storage shed was also added to the garden area.

Solar Greenhouse

In the late spring of 1996 a 120 square foot greenhouse was built onto the south side of the building next to the main door. *Lexan*, a double pane translucent material made by General Electric, was used for glazing on the south and east walls. An 800-gallon rain water catchment was added as heat storage for the greenhouse and this facility grew cantaloupe the first fall and kale, celery and collards during the winter months along with some flowers. The positive space heating effect accounted for about 10% of space heating needs in the first heating season of the attached greenhouse. In late winter tomato, kohlrabi, celery, broccoli and Swiss chard were planted and grown in the greenhouse.

Ventilation System Attic circulatory systems are only fully needed during hot weather. Hence a solar activated system proved ideal. When the sun shines on the solar panel, which is located on the south-facing greenhouse roof then the fan is activated and starts the movement of air through the attic. This in turns cools the interior of the building and saves on summer cooling bills. The inherent simplicity of this type of system is that batteries, which demand periodic maintenance, are not needed. When the sun shines the fan exhausts hot air from the attic. When the sun is not shining there is no need for the fan since hot air doesn't develop in the attic in the first place. The solar panel is a Carrizo SG remanufactured 12-volt, 35-watt module. The attic fan is a specialty 16-inch, 12-volt fan available through most AT catalogs.

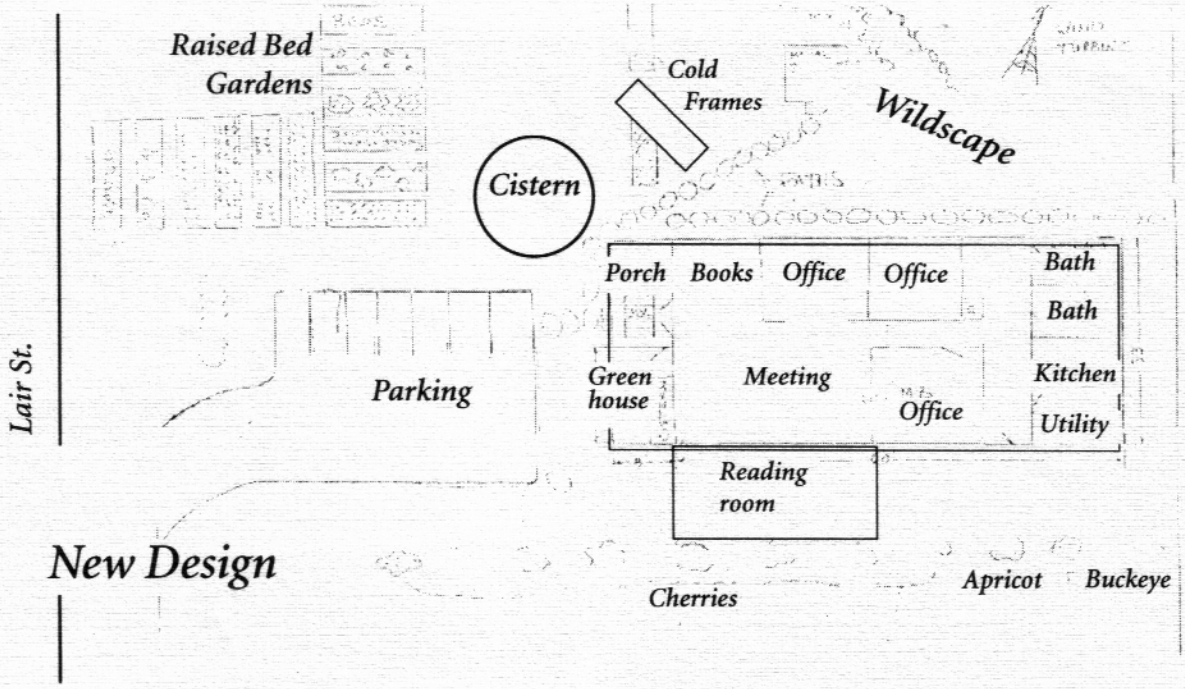
Cistern An 8,000 gallon cistern has been built from 4 inch concrete blocks according to specifications in TP 3 *Cisterns.* The roof was reinforced with rib bar and poured with three inches of concrete. A 2 by 2 foot block for entry was attached to a portion of the flat roof which is also to be used as a mounting platform for the solar photovoltaic panel. The cistern is 8 feet tall. About half the office roof space (1000 square feet) drains into the cistern. It is insulated on the outside with one inch styrofoam and that skin covered with cement as is the interior.

GROUNDS DEVELOPMENT

Raised Bed Garden The 2 inch cover of blacktop was cut out and removed and fifteen 4-by-25 foot (one hundred square foot each) beds were established on the southwest quadrant of the property with one and a half foot walkways. Also the design left parking space for local residents immediately under the large neighboring ash tree. The beds in some cases had a small amount of gravel but for the most part were bed rock that resembled the neighboring limestone quarry. About a truck load of partly composted cow manure was added to each bed. In the late winter of 1997 *Remay* was added as a wind protection for a large number of the beds. This saved many of the young crops.

Productivity Neighbors have been astounded by the productivity of our raised beds. We are now totally convinced by the power of good demonstration, especially in towns where the sites are easily accessible to large numbers of people. One neighbor was distracted by the looks of the pine slab siding on the raised beds and wondered whether we would have bushes to border it from view. However this same neighbor did seem to change tune as the produce developed and his household partook of it.

Yield The first year of the 15 raised beds along with a 16th in front of the solar greenhouse was very productive. We planted 31 types of vegetables and had yields of 1251 pounds of produce: tomatoes 675 lbs (mostly from our own seeds), kohlrabi 105 (from our own seed and plants), cabbage heads and leaves 60, mustard 50, Swiss chard 50, beet & beet greens 44, broccoli 35, peas 34, onions 33, corn 25, pole beans 24, radishes 20, green peppers 18, carrots 16, cucumbers 12, hot peppers 8, spinach 6, bush beans 6, pumpkins 6, lettuce 6, collards 5, endive 5, peanuts 5, celery 3, and less than one pound of kale, garlic, parsley, fennel, apple mint, lamb's quarters, and Jerusalem artichokes (unharvested). The beds were interplanted with a variety of marigolds to ward off pests. During the very rainy and unseasonably cool spring these beds prospered more than neighboring regular garden beds. We did, however, find it necessary to water the beds during the drier summer and fall months.



Edible Landscape & Wildscape

In the spring of 1996 ten Manchurian cherry and two apricots were planted on the east side border and in the fall of 1996 Notre Dame University volunteers assisted our grounds crew in planting five apple, five pear and one white walnut trees. Raspberry bushes were also added at this time. Grape vines and kiwis were planted in the autumn of 1997 so as to eventually form a trellis on the northeast entrance of the building. Also in the same autumn dirt was brought into the northwest portion of the property with the rock outcropping and sowed in order to form an ornamental wildscape in amongst the peach trees and raspberries.

Future Development

We intend to add the following to the grounds: a solar water heating system; greater variety of fruit trees; some shade trees on the southeast side; a new interior lighting system; and a solar sign in the front.

Text – **Al Fritsch, S.J.**

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