An Active Farmstead:
The Resuscitation of a Cultural Artifact

Zionsville, Indiana

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The state of most midwest vernacular architecture today is one of picturesque decay. As a sea of mediocre residential architecture pours over the landscape, historic barns will offer a rare backward glimpse into our past.

But is it a backward glimpse? Or a stepping stone forward to a better future? The lessons of time-tested construction methods and materials, energy saving concepts of living with the seasons and the diversity of crops grown before WWII have been lost to today's agricultural society. Farms are bigger. Machinery is bigger. Animal operations are bigger still. Buildings are manufactured. Homes are equipped to battle the elements. Crops are grown in large abundancies of very limited variety.

The farmstead, based on age-old philosophies and existing simultaneously with today’s suburban sprawl, can offer many rich cultural and educational experiences. Adaptation of the Kiser Barn at 4101 West 116th Street to a contemporary marketplace and herb barn will provide an opportunity for vernacular architecture to be integrated back into its diminishing context. Designed for social interaction and education, the marketplace and surrounding buildings will demonstrate environmentally sound ideas such as recycling buildings, solar heating, composting waste, and producing locally. The farmstead will also be a manifestation of the potential for new construction to learn from the old, while maintaining its own unique character. By experiencing the farmstead, visitors will gain a new respect and understanding for their agronomous cultural heritage.
The active adaptation and maintenance of local vernacular architecture will generate a renewed interest in our midwestern agronomic heritage.
The black ground broke open to their plows like a pile of ashes. There was never anything like it --that black humus, built up under thousands of years of forests. There it was, dark as shadows under the trees, abundant and deep, waiting to be opened, as beautiful as its idea. Surely no dirt was ever more responsive or more alive. You could believe, for once, that the earth might give back to a man more than it took from him. It welcomed him. It made marriage with him everywhere he put down his hand or his foot or his seed. It had advanced through milleniums to break itself open on the coulter of his plow; he couldn't have helped but feel that contact and jointure and breaking in every nerve.

--Wendell Berry, A Place On Earth

From the time of this first plowing to present day, man has worked the earth, reaping its bountiful harvests in good years, suffering along with it in years of drought or heavy frost, and slowly wearing down its soil. Indeed, the earth gave man more than it took from him. Through the following research presented here, it shall become evident that the time has come for man to give back.

* * *

Defining the Problem:

Conventional agricultural systems are creating fragile ecosystems (Ferguson). Though it's easy to think that the present has gone astray and that things must have been better in the past, it's important to realize that this statement has held true since the time of the settlers' first plowing. The settlers farmed by breaking up a piece of prairie, planting wheat, maybe oats or corn, until the nutrients were mined out, after which they would then go break up a new piece of prairie (Klinkenborg, 1995). A better way of farming than today's industrial agriculture? Only if land is so easily replaceable.

During the war effort in the 1940s, farmers ran out of new prairie. At the same
time, commercial fertilizers became available, making it possible to stay in one place and go on farming the tired land year after year. After World War II, production became the sole measure of a progressive farmer, an inevitable progression given that people believed (and continue to believe) that the duty of U.S. farmers is to feed the world (Klinkenberg, 1995). The objectives of farming had broadened vastly. While in 1910, farming families composed nearly 35 percent of the population, today fewer than 2 percent of American families farm. Yet the acreage in agricultural production has increased (Klinkenberg, 1995). This restructuring from the operation of self-sustaining family farms to the operation of industrial-sized production-driven farms has had both positive and negative consequences. The better yields and greater success attainable with the present industrial system of agriculture is one positive result. Because of the introduction of chemical fertilizer, pesticides, and machine power, hybrid varieties of corn now produce three and four times the yield a 1930s farmer had in a good year (Klinkenberg, 1995).

But that is equating success with "monetary profit", foresaking any other standard of measure. Our culture allows this because we lack any other standard of measure. In agriculture, a growth economy would mean sacrificing everything but money value, and counting that sacrifice as no loss (Berry, 1981). Therefore, can we really continue to believe that better yields necessarily mean greater success?

"...to get these yields, farming had to change almost beyond recognition." (Klinkenberg, 1995) Where farmers once harvested next year's seed from the cream of their crop, seeds are now patented hybrids from national seed companies --purchased anew every year because every year there is a 'new improvement' and because hybrid corn will not develop properly from the planting of a previous year's kernels (Klinkenberg, 1995). Farming has come "...to rely less on the skills of farmers and more on a chemical arsenal to suppress weeds and insects and to replace the
diminishing fertility of the soil.” (Klinkenberg, 1995)

The diminishing fertility of the soil. Speaking in economic terms, what other "costs" or losses might be entailed to obtain better crop yields? These costs include the high use of nonrenewable fossil fuels; the possibility of unsafe ground water; and the social well-being of rural communities?

Rural communities are diminishing as steadily as fossil fuels and soil fertility. Of this rapid decline, Verlyn Klinkenborg of National Geographic magazine reports:

There has been a string of bad years in farm towns across the Midwest. The number of farm families has diminished. Those that remain are not numerous enough to support the business life of a small town. The schools are gone. So are the car and farm-implement dealerships, the clothing and furniture stores. This is often explained as an economic fact of life, a natural consequence of industrial agriculture, in which farmers either seek to increase the amount of land they cultivate or stop farming, sell out, and move away.

As people take flight to urban and suburban areas, they lose connection to the land; they become alienated. And it is said that "...where there is alienation, stewardship has no chance." (Berry, 1981)

While small towns are being abandoned, large towns and cities are extending their limits, constantly encroaching upon prime farmland. Author/photographer Charles Klamkin writes that this population shift from farms to suburban housing developments followed the change from an agricultural economy to an industrial one:

As towns and cities grew, more and more farmland was appropriated for housing and factories... The growth of suburban towns converted thousands of farms into building lots, and now shopping centers and highways occupy the remainder of this formerly rural real estate. Remaining farms are unable to provide a reasonable livelihood for their owners -- most of these will be gone in the next generation.

Exemplifying this problem is the state of California, one of the richest food-producing areas in the world, where farmland is continuing to be eaten up by real estate development (Klinkenberg, 1995). Residents there "...have taken an active stand to protect
the farmland..., alerting neighbors to oppose a housing development that would de-
stroy thousands of acres of agricultural land." (Klinkenborg, 1995)

The protection of such prime farmland is a complicated matter. Suburban and
exurban farmland, if protected, can be extremely beneficial for the production of truck
and specialty crops, as well as for the provision of certain public benefits (flood ab-
sorption, air cleansing, and water filtration) and open-space (Nelson, 1992). Yet sadly,
farmland near urban areas is likely to be undervalued for agricultural use and over-
valued for urban uses (Nelson, 1992). In many cases this leads to the eventual conver-
sion of farmland to urban sprawl. In the remaining cases, where farmland coexists
with urban development, the farmland continues to de-value due to "spillover effects",
according to the findings of Georgia Institute of Technology planning professor, Arthur
Nelson. To further explain the effects of spillovers, below are five common spillovers
that urban development imposes.

1) Regulation of farming activities deemed to be nuisances by nonfarm
   residents in rural areas, including restrictions on fertilizers,
   manure disposal, smells, and slow-moving farm vehicles on
   commuter roads; limitations on use of pesticides and herbicides;
   restrictions on farm noises and hours of operation; restrictions on
dust and glare; limitations on irrigation; and restrictions on other
activities that may upset the lifestyle of suburban residents.
2) Increased property taxation to pay for schools, roads, services, and
facilities intended to serve new residents.
3) Air pollution damage to crops caused by automobiles, industrial activ-
ity, and even residential space heating.
4) Destruction of crops or equipment or harassment of farm animals by
residents of developments in rural areas, and theft of tree crops,
berries, and vegetables.
5) Use of eminent domain to acquire at relatively low cost farmland for
public uses serving primarily new residential development.
   (Nelson, 1992)

Any combination of these spillovers reduce the productivity of farmland, thereby mak-
ing it less valuable for farming and more attractive for real estate speculation and
eventual conversion to development. The closer the farmland falls to urban and other
nonfarm development, the less productive it becomes.

3.4
Another factor involved in the low productivity of near-urban farmland is the "impermanence syndrome",

...characterized by the belief among farmers that agriculture in their area has limited or no future and that urbanization will absorb the farm in the not-too-distant future. It is manifested by disinvestment in farming inputs, sale of farmland tracts for hobby farm or acreage development, and shifting crops from those requiring labor or capital intensity, such as berries and orchards, to those requiring little labor or investment, such as pasture or annual crops. The result can be vast areas of underutilized and idled land near and between urban areas. (Nelson, 1992)

This dismal outlook on the future of remaining suburban farmland in the face of urban sprawl has a harsh negative effect on productivity. It seems that for every acre of prime farmland that is urbanized, one or more acres become idled due to the impermanence syndrome (Nelson, 1992).

While a shift in psychological thinking, values, or beliefs might be the most beneficial, more tangible means of solving the problem of preserving prime farmland exist. These include right-to-farm laws, exclusive agricultural zoning districts, rural residential zoning districts, urban growth boundaries, farm use tax deferrals, and development regulation. Until these solutions are implemented, "...vast areas of underutilized and idled land" (Nelson, 1992) will continue to lie in waste near urban areas. It is an inherent human tendency to cherish what one has little of; therefore, as long as land is plentiful, we can seemingly afford to waste (Berry, 1981). However, if developments continue to take over farmland at their current rate, and the remaining farmland is rendered infertile by current farming methods, we shall eventually feel the inevitable consequences of our wastefulness.

Another loss that can be associated with both the industrialization of agriculture and the urbanization of farmland is the depletion of vernacular farm buildings from the rural landscape. As urban and suburban developments take over agricultural land, regional barns are left to drown in their wake. The barns that are disappearing
were built by men who cleared the rocks and trees from their land and then built their barns with the same native materials. Their barns were products of their own needs, industry, and imagination. Nowhere in American architecture is there a better example of function governing the form of a building (Klamkin, 1979). The result is an architecture possessing an essential rightness, a true sense of harmony.

It is arguable that many contemporary buildings are also a direct response to needs, yet these buildings do not demonstrate the same philosophies of cohesiveness and efficiency found in vernacular farm architecture. While advanced technology has brought us many benefits, it has also allowed us to be impractical, with the knowledge that artificial means are available to overcome inefficiency (Taylor, 1983). The knowledge that our resources are not infinite should force us to recognize that practicality must be an essential element in contemporary architecture. In this respect, vernacular barn architecture can teach us a great deal and should be valued accordingly.

The problem remains that the purposes for which historic barns were originally built are now obsolete in today’s economy and technology (Klamkin, 1979). The needs of today’s commercial farming result in a very different building type, more industrial than agricultural. The individuality, handicraftsmanship, and native materials are giving way to pre-engineered pole construction clad in vertical aluminum siding. To recognize the value of original barn structures, perhaps a new use can be prescribed to extend the life of these vernacular artifacts.

Devising the Solution:

In order for the value of barn structures, prime farmland, rural communities, and soil fertility to be recognized, a new belief system must be generally accepted: alternative farming methods can bring about an economically viable, environmentally sound, and socially acceptable agriculture. Some farmers are already working their
land according to this belief, aware that the enormous yields of conventional farming have come at a high environmental and social cost (Klinkenborg, 1995). "A broad effort has emerged on farms and at research institutions to discover which farming approaches are truly viable, sound and acceptable," these efforts have given rise to a movement known as sustainable agriculture (Klinkenborg, 1995). There are many definitions of and approaches to sustainability, but all have in common greater cooperation with nature, greater economic independence from banks and government-subsidy programs, and diminished reliance on chemicals and petroleum (Klinkenborg, 1995).

In agriculture, as in nature and culture, the more complex the system or structure, the more sound and durable it is likely to be (Berry, 1981). A large industrial farm does not possess that complexity, as it is likely to specialize in only one or two crops, to have no animals, and to depend on chemicals, purchased supplies and credit. Therefore, small-scale farms are better examples of "good agriculture", as they promote diversity and the use of biological resources and management (Berry, 1981), key components in sustainable agriculture. "Diversity of plant types is one of the hallmarks of ecosystem stability and health in nature," writes Landscape Architecture professor David Ferguson in his research on Alternative Profit Potentials for Rural Indiana. Diversity includes such practices as patterned crop rotation, companion-planting, and growing unique crops outside of the basic agri-business market. With a crop rotation pattern, each crop uses different nutrients from the soil, and each gives back something different, resulting in healthier soil. For example, an alfalfa crop is cut, leaving the roots to enhance the soil, which is then cultivated to corn. This rotation also takes advantage of full productivity through each season, as rye is planted for a winter cover after the corn harvest. The pattern may change over a five year span, increasing the soil's "tilth", its texture, nutrients, and ability to hold moisture -- and thus its fertility (Klinkenborg, 1995).
In companion-planting, plants that benefit each other are planted adjacently. The benefits can result from the natural abilities of plants, such as the ability of herbs and other aromatic plants like tomatoes, marigolds and onions to ward off insects, or the ability of certain bright colored plants, like orange nasturtium and marigolds, to repel some harmful flying insects (Clegg, 1978). Benefits can also result from the differing physical structure of complementary plants. For example, a vine plant like melon or cucumber can provide dense shade for the roots of corn, while the corn in turn provides a windbreak and some shade for the vines below (Clegg, 1978). Other benefits occur when a plant's roots exude chemical changes in the soil (Clegg, 1978). Demonstrating this is a vineyard owner in California’s Napa Valley, John Williams, who grows clover, peas, oats and vetch between his grapevine trellises. As well as reducing erosion, these cover crops naturally supply an essential nutrient, nitrogen, to the soil. They also provide habitat for beneficial insects that prey on destructive bugs, and hinder the emergence of competitive weeds (Klinkenborg, 1995).

Diversity can also refer to growing a rare or unusual crop, such as the mail-order company Paradise Farms’ organic backpacking foods -- instant falafel, hummus, tabbouleh, dried turtle beans, lentils, and split peas. While these crops are more labor-intensive than traditional crops, the advantage lies in their marketing. By creating a new market for “Backcountry Eco-cuisine”, Paradise Farms’ profits are high (Klinkenborg, 1995).

Combining these practices of diversification with other biological resource management (use of animal manures, legumes, green manures, mechanical cultivation, mineral-bearing rocks, …) provides the solid foundation of a sustainable farm system (Ferguson). These same farming approaches that can be beneficial environmentally can also be beneficial socially. As the discipline of farming presently has a low public standing and is rarely valued as the high accomplishment that it necessarily must be (Berry, 1981), sustainable agriculture can afford the opportunity to rely more
on the skills of farmers and less on chemicals and nonrenewable sources of energy. This will help establish new respect for farmers.

If we can learn to farm in concert with nature by using a farmer’s knowledge and skills instead of purchasing fertilizers and pesticides, we can help the environment, but we can also carve out a bigger share of the food dollar for the farmer, and we can create a role for more people in agriculture. (Klinkenborg, 1995)

Not only may this increase the farmer’s social standing, but also his profits, and on a broader scale, his community. Demonstrating community involvement, a community supported agriculture program in Kimberton, Pennsylvania, sells shares and then, based on yields, allots a certain amount of fresh produce to resident-members every week. A second example is found at the aforementioned Paradise Farms, which employs local residents to package their foods, and pays them well. Afterall, if agriculture is worthy of being called sustainable, it needs to sustain community and provide decent economic opportunities for people (Klinkenborg, 1995).

Should the shift from conventional agriculture to sustainable agriculture occur widely, more acreage will turn into more farms, which are smaller and more carefully managed (Klinkenborg, 1995). With the coming of new farmers to the land, a much needed rural revitalization will occur. This revitalization might include the resuscitation of centuries-old barns, re-establishing their presence once again in the functioning of an active farm. This is currently happening with the assistance of the National Trust for Historic Preservation’s program to preserve historic farm buildings, named Barn Again! Acting in true character of the original builders, farmers are now retrofitting their versatile barns to meet today’s practical needs efficiently. In some cases this means transforming an old barn into a state-of-the-art livestock facility; in others, it means simply repairing existing materials enough to provide an inexpensive shelter for animals or equipment. Still others have found their barns to be useful buildings for diverse projects, from selling Christmas trees or antique furniture to growing mushrooms (Humstone, 1988).
The National Trust believes, "that the sturdy old barns...built by generations before us are important, both as practical facilities for day-to-day farming, and as proud symbols of our agricultural past..." (Humstone, 1988). While these structures can take on new practical functions, their significance lies in their symbolic role in re-establishing the identity of the farming community. "...they tell the story of a farm in ways that words cannot." (Humstone, 1988) The Washburn-Norlands estate farm in Maine allows the original vernacular farm structures to tell its story through utilitarian preservation (Nickens, 1992). Norlands reports its success, stating that, "Visitors here leave impressed with the architectural legacy left behind, but take with them other, more personal impressions: the pull of Percherons against a plow, the smell of hay freshly cut by their own hand, the muffled cadence of a butter churn." (Nickens, 1992)

Barns and small farms exemplifying sustainable practices can be excellent resources for educating the sometimes disconnected urban and suburban residents, particularly if the small farms and suburban residents co-exist on reclaimed prime farmland. Their relationship can be a cooperative one: while the nonfarm residents benefit environmentally, aesthetically, and socially from the farms, the farms may benefit from the potential market of employees and consumers readily at hand.

Soil conservation, sustainable agriculture, rehabilitated barns and communities of involved people, the combination of any or all of these elements hold tremendous potential for the future of a currently plagued agriculture; for "...an ecologically and culturally responsible agriculture is possible." (Berry, 1981)

The farm must be made a form,
endlessly bringing together
heaven and earth, light
and rain building, dissolving,
building back again
the shapes and actions of the ground.

--Wendell Berry, Clearing
References Cited:

Berry, Wendell (1967). *A Place On Earth*.


Ferguson, David and Leslie Smith. *Alternative Profit Potentials for Rural Indiana*. College of Architecture and Planning, Department of Landscape Architecture, Ball State University.


Due to the lack of existing architectural projects similar to the type I am proposing, I chose to study any related project-types that sparked my interest. This proved to be a great source for inspiration; it helped to begin to think about the materials, spaces, philosophies and techniques involved in this project, where before I had been thinking of program, program, program. The following are idea sketches of those related preceding designs which left a vivid impression in my mind.
Arts Centre

North Wales
Patel Taylor Architects

corversion
old is old
new is new

inside to outside
connection
defined entrance

layering
old, rough
new, smooth

Stacey's and Michael's
Treehouse

Bethesda, Maryland
Glenn + Williams
architects

ttranslucent siding
timber frame
illuminates

level variation
closure variation

nature thrives
order rules
**An Active Farmstead**

**Place Barn**

Wilmington
East Sussex

- original threshing floor entrance
- stacked functions
  level defined spaces
  hayloft reference
- views east and west
  through barn door openings
  original fabric unviolated

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**Precedents Research**

**Greenhouse**

Design
Concepts

- summer sun angles
- shading methods
- deciduous trees
  shading in summer
  admit winter sunlight
- timber slats
  across projecting rafters
  partial shade when needed
- vines provide
  natural shade in summer
  empty vines
  admit light in winter
Herb Garden
Design Typology

formal
year round beauty

direct path
routine glorified

informal
natural variation

Herb Garden
Knot Design

three popular
formal designs

interlacing ring
knot

sixteenth century
three border knot

interlacing square
knot
Program Demands:

<table>
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<tr>
<th>Facility</th>
<th>Area</th>
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<tbody>
<tr>
<td>Produce Market Place</td>
<td>2000 sf</td>
</tr>
<tr>
<td>Herb Market</td>
<td>2000 sf</td>
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<tr>
<td>Demonstration Garden</td>
<td>900 sf</td>
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<tr>
<td>Permanent Greenhouse</td>
<td>1200 sf</td>
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<tr>
<td>Temporary Greenhouses</td>
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<tr>
<td>Cafe</td>
<td>900 sf</td>
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<tr>
<td>Kitchen</td>
<td>800 sf</td>
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<tr>
<td>Cannery</td>
<td>800 sf</td>
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<tr>
<td>Public Toilets</td>
<td>500 sf</td>
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<tr>
<td>Root Cellar</td>
<td>500 sf</td>
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<tr>
<td>Business Office</td>
<td>1000 sf</td>
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<tr>
<td>Visitor Parking</td>
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<td>Vendor Parking</td>
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<td>Signage</td>
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<td>Equipment Storage</td>
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<td>Personal Storage</td>
<td>1000 sf</td>
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<tr>
<td>Animal Housing and Pasture</td>
<td>7000 sf</td>
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<tr>
<td>Compost Collectors</td>
<td>300 sf</td>
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<tr>
<td>Owner's Residence</td>
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<tr>
<td>Total Architectural</td>
<td>55,950 sf</td>
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+ Growing Plots              165,000 sf

Total                         220,950 sf
An Active Farmstead

Produce Market Place

Activities: Vendors displaying fresh produce; consumers inspecting the produce; the resulting barter and exchange. Curious neighbors browsing and visiting with one another.

Users: Local residents / community members and occasional city dwellers
Visiting vendors and sales clerks

Time of Use: Seasonal (summer-fall)
9am to 7pm Wednesdays and Weekends

Adjacencies: Herb Market
Demonstration Garden
Permanent Greenhouse
Cafe
Storage
Parking for Visitors
Parking for Vendors

Square feet: 20sf/person x 200 people
= 4000 sf (combined indoor and outdoor markets)

Furnishings and Equipment: Booths, shelves, racks, cashier station

Lighting: Shaded/Natural light

Thermal: Cooled by shade and naturally ventilated

Acoustics: Open air, no isolation

Third Dimension: Ground level only
Flow from indoor herb market to outdoor produce market
An Active Farmstead

Program

Herb Market

Activities: Displaying of herb plants and fresh cut herbs for sale; shopping, browsing and visiting among customers

Users: Local residents / community members and occasional city dwellers / Amateur gardeners seeking herb plants, inspiration and advise / Sales clerks

Time of Use: 9am to 7pm Wednesdays and Weekends

Adjacencies: Produce Market Place
- Demonstration Garden
- Permanent Greenhouse
- Parking for Visitors
- Parking for Vendors

Square feet: 20sf/ person x 200 people = 40,000 sf (combined indoor and outdoor markets)

Furnishings and Equipment: Crates, shelves, racks for flats, cashier station

Lighting: Even, ambient light

Thermal: Spring and Summer - cooled by shade and naturally ventilated through original large openings
Fall and Winter - heated and insulated to standard 68-73 degrees

Acoustics: Reflectivity of materials gives an electrified atmosphere

Third Dimension: Ground level only, with open ceiling to hay lofts
Openings to outdoor market and greenhouse

5.3
Growing Plots

Activities: Preparing and maintaining the soil.
Grafting and reproducing herb plants to young starter plants for sale.
Planting and nurturing young seedlings into ripe produce for sale.

Users: Owner/operator
Employed gardeners
Interested individuals

Time of Use: Seasonal (spring-fall)
Dawn to Dusk

Adjacencies: Compost Collectors
Temporary Greenhouses
Demonstration Garden
Permanent Greenhouse
Root Cellar
Business Office
Equipment Storage

Square feet: 165,000 sf or 3.75 acres

Equipment: Irrigation drip-line system

Lighting: Varying from full sun to shade as specified by plant type

Thermal: Protection from frost in spring and fall (temporary greenhouses)

Circulation: Access for small tractors and equipment, sprayers, tillers, and produce carts

Third Dimension: Plant types strategically arranged to vary heights and permit sunlight or shade (as needed) to low ground cover crops

“Patchwork Quilt” concept neat, orderly cultivated crops

“Organic” or Natural Planting – follows lands contours

Both have potential to implement COMPANION PLANTING of mutually beneficial plant types.
Demonstration Garden

Activities: Gardeners exploring the demo. garden, learning planting techniques and desiring to buy more herb plants.
Visitors sharing a conversation, eating lunch, reading or resting.

Users: Local residents / community members and occasional city dwellers
Amateur gardeners seeking herb plants, inspiration and advise

Time of Use: Seasonal (summer)
12pm to 6pm Weekdays
9am to 7pm Saturdays

Adjacencies: Market Place
Permanent Greenhouse
Cafe
Land Plots
Parking for Visitors

Square feet: 30' x 30' square = 900 sf

Lighting: Sunlight

Circulation: Effective entrance into or exit from the market place

Third Dimension: Ground plants and pavers set against the barn for backdrop
### Permanent Greenhouse

**Activities:** Growing year-round: preparing seedlings and young plants for transplant to the plots. Growing herb plants for year-round sales. Researching diseased plants and new varieties.

Workers eating lunch, taking breaks. Interested visitors exploring.

**Users:** Owner/operator
Employed gardeners
Occasional customers

**Time of Use:** Dawn to Dusk

**Adjacencies:** Market Place
Land Plots
Compost Collectors
Demonstration Garden
Business Office

**Square feet:** 1000 - 1200 sf

**Furnishings and Equipment:** Beds and shelves,

**Lighting:** Full sunlight
Shades for long, intense days and cool nights (to retain heat)
Lights to supplement short days

**Thermal:** Collect heat from sun and store in water containers or thermal mass
Apply heat to soil as needed
50 to 60 degrees for older plants
65 to 70 degrees for younger plants
60% relative humidity
Ventilation to replenish CO2 level

**Circulation:** Narrow access to maximize space

**Third Dimension:** Steep slopes to shed condensation

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Richard Britz
The Edible City
(See bibliography)
Temporary Greenhouses

Activities: Constructing the temporary shelters; extending the growing season; warming the soil, planting seeds in early spring; defying the frost; harvesting produce in late fall.

Users: Owner/operator
Employed gardeners
Interested individuals

Time of Use: Dawn to Dusk

Adjacencies: Land Plots
Permanent Greenhouse

Square feet: As needed to cover land plots

Lighting: By sun

Thermal: Collection of heat by sun, may need aid of fueled heating equipment if temperatures demand

Third Dimension: Possibility of constructing large enclosed spaces similar to a greenhouse or enveloping individual rows of plants with plastic material
Cafe

Activities: Serving three meals a day, six days a week

Interaction between customers and cooks, as the food is visibly prepared

Annual events to celebrate the seasons: making berry preserves, canning produce, pressing cider,

Users: Local residents / community members and occasional city dwellers

Servers

Time of Use: Weekdays and Weekends
6am to 9pm summer
8am to 9pm winter

Adjacencies: Kitchen
Parking for Visitors
Demonstration Garden

Square feet: 15 sf/person x 60 seats = 900 sf

Furnishings and Equipment: Tables, chairs, central counter, cashier, wait-station

Lighting: Ambient light

Thermal: Standard 68-73 degrees
Standard 45-55% relative humidity

Acoustics: Isolation from the kitchen area
Some absorbency needed to soften the reverberation

Third Dimension: Best if located in the barn for added character

Early Bird Breakfast:
Hot bagels and daily specialties

Lunch:
Garden salads; baked potatoes with choice of fresh herb toppings; specialty garden vegetable dishes and soups daily served with bread

Dinner:
Garden Vegetable stir-fry and homestyle entrees
**Program**

**Kitchen**

**Activities:** Visibly preparing daily menu items; cutting, chopping, stewing, baking, cleaning up...

**Users:** Kitchen employees and servers

**Time of Use:** 9am to 5pm daily

**Adjacencies:** Cafe
- Storage
- Compost Collectors
- Root Cellar

**Square feet:** 800 sf

**Furnishings and Equipment:** Worktops, industrial size preparation equipment, dry storage, cool storage, freezer storage

**Lighting:** Florescent and task lighting

**Thermal:** 60 to 68 degrees
- Cooler than normal to accommodate heat gain from equipment

**Acoustics:** Sound absorption for noisy clatter

**Third Dimension:** Single level open to dining area

*Initial ideas for kitchen/workspace - later changed/developed.
Cannery

Activities: Celebrating the seasons through preserving, canning, and other small-scale processing

Selling preserves and other seasonal processed items

Accommodating workshops for organized groups

Users: Regular visitors with their children
Cannery employees
Owner/operator
Group organizations

Time of Use: Seasonal as needed

Adjacencies: Kitchen
Market Place

Square feet: 1200sf of permanent workspace
1200sf of viewing space (or temporary set-up space)

Equipment: Ample counter space, stovetops, dry and cold storage

Lighting: Natural and task lighting

Thermal: Cool and ventilated

Circulation: Open on all sides for visibility

Third Dimension: Single level, screened space
<table>
<thead>
<tr>
<th>Activities:</th>
<th>All the usual bathroom activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Users:</td>
<td>Local residents / community members / occasional city dwellers and Employees</td>
</tr>
<tr>
<td>Time of Use:</td>
<td>Dawn to Dusk</td>
</tr>
<tr>
<td>Adjacencies: Market Place</td>
<td></td>
</tr>
<tr>
<td>Cafe</td>
<td></td>
</tr>
<tr>
<td>Demonstration Garden</td>
<td></td>
</tr>
<tr>
<td>Permanent Greenhouse</td>
<td></td>
</tr>
<tr>
<td>Land plots</td>
<td></td>
</tr>
<tr>
<td>Compost Collectors</td>
<td></td>
</tr>
<tr>
<td>Square feet:</td>
<td>1 W.C./ 15 people</td>
</tr>
<tr>
<td>Cafe @ 80 people = 6 total</td>
<td></td>
</tr>
<tr>
<td>Market @ 200 people (2/3 women)</td>
<td></td>
</tr>
<tr>
<td>= 9 for women and 5 for men</td>
<td></td>
</tr>
<tr>
<td>25 sf/ person x 20 = 500 sf</td>
<td></td>
</tr>
<tr>
<td>Equipment:</td>
<td>Water closets, partitions, mirrors, lavatories, paper towel dispensers and waste receptacles</td>
</tr>
<tr>
<td>Lighting:</td>
<td>Florescent</td>
</tr>
<tr>
<td>Thermal:</td>
<td>Standard 68-73 degrees</td>
</tr>
<tr>
<td>Acoustics:</td>
<td>Sound isolation from cafe and market to avoid embarassment</td>
</tr>
<tr>
<td>Circulation:</td>
<td>Accessible from interior and exterior spaces</td>
</tr>
<tr>
<td>Third Dimension:</td>
<td>Opportunity to use a compost mulch system (i.e. Clivus Multrum) for conservation of resources and beneficial use of on-site resources</td>
</tr>
<tr>
<td>Outdoor toilets may be open-roof buildings for a unique environmental discovery</td>
<td></td>
</tr>
</tbody>
</table>

5.11
An Active Farmstead

Root Cellar

Activities: Storing root vegetables for extended periods of time

Accommodating garden explorers

Users: Owner/operator, garden and kitchen employees and occasional interested visitors

Time of Use: year-round

Adjacencies: Land Plots
Market Place
Kitchen

Square feet: 500 sf

Equipment: Dry off-the-ground shelving

Lighting: Dim, light by hand-held instrument

Thermal: Cool and dry

Circulation: Easy access to wagon/truck bed

Third Dimension: Underground

Eric Sloane
An Age of Barns
(see bibliography)
### Program

**Business Office**

**Activities:**
- Filing, ordering, recording sales, management and marketing tasks
- Overseeing the operation of the entire facility from a bird's eye perspective

**Users:**
- Secretary, Owner/operator, employees

**Time of Use:**
- 8am to 4pm standard hours
- after hours as needed

**Adjacencies:**
- Permanent Greenhouse
- Land Plots
- Storage
- Cafe
- Kitchen

**Square feet:** 1000 sf

**Furnishings and Equipment:**
- Desks, chairs, computers, phones, file cabinets, employee restrooms

**Lighting:**
- Ambient and task lighting

**Thermal:**
- Standard 68-73 degrees
- Standard 45-55% relative humidity

**Acoustics:**
- Isolation from noisy market place and outdoor equipment

**Circulation:**
- Zoned private; no public access

**Third Dimension:**
- Second story of barn for privacy, view and isolation
Parking for Visitors

Activities:
- Introduction to the Farmstead, providing a transition from 116th street
- Stepping out of cars onto crunchy gravel or grassy pavers
- Approaching the Market Place and Cafe, easily identifying these main spaces
- Children feasting on berries that define the edges of the space
- Parking space for 100 cars

Users:
- Shoppers, diners, and visitors

Time of Use:
- 9am to 7pm Wednesdays and Weekends
- 11am to 4pm Weekdays

Adjacencies:
- Market Place
- Cafe
- Animal Housing
- Demonstration Garden

Square feet:
- 300 sf/car x 100 cars = 30,000 sf

Circulation:
- Single point access to 116th Street

Third Dimension:
- Enclosure on all sides to identify this as an entry space
Parking for Vendors

Activities: Unloading crates and boxes

Parking for 10 trucks or vans

Users: Local growers

Time of Use: 9am to 7pm Wednesdays and Weekends

Adjacencies: Market Place

Square feet: 300sf/car x 10 cars = 3,000 sf

Circulation: Shared single point access to 116th Street with Visitor parking (functioning simultaneously due to scheduling: deliveries and vendors arrive early, customers later and vice versa in the evening)
An Active Farmstead

Signage/Gatehouse

Activities: Identifying the Market Place and Cafe for passing traffic and advertising upcoming events at the Farmstead

Collecting admission fees on special occasions

Users: Vehicular traffic on 116th Street

Time of Use: Daylight hours

Adjacencies: Parking for Visitors
Market Place
Cafe

Square feet: 50 sf

Third Dimension: Must be a symbol or icon that lies within the vehicular cone of vision

Eric Sloan
An Age of Barns
An Active Farmstead

Equipment Storage

Activities: Storing and working on farm implement equipment including:
small tractors; tillers; wagons;
sprayers; mulchers; ...

Users: Owner/operator and employees

Time of Use: Year round storage
Active use spring-fall
Dawn to Dusk

Adjacencies: Land Plots
Market Place

Square feet: 4000 sf

Equipment: Work bench/maintenance area

Circulation: Zoned private; no public access

Eric Sloane
*see also P.W. Brunskill's
Illustrated Handbook of Vernacular Architecture
An Active Farmstead

Personal Storage

Activities: Storing items presently housed in the barn, including a 20' speed boat, lawn tractor, leaf vacuum, antique tractor, and miscellaneous scrap

Users: Owner/operator family

Time of Use: Year round storage
Active use spring-fall
Dawn to Dusk

Adjacencies: Private yard

Square feet: 1000 sf

Equipment: Work bench/maintenance area

Circulation: Zoned private; no public access
Animal Housing and Pasture

Activities: Sheltering and feeding sheep, a goat, chickens and pet pigs
Children feeding the animals

Users: Owner/operator family
Young children and parents

Time of Use: Year round housing
Pasture active spring-fall

Adjacencies: Compost Collectors
Land Plots
Market Place
Parking for Visitors

Square feet: 1000 sf housing
6000 sf pasture

Equipment: Stalls, bedding, feed storage, water access

Eric Sloane
An Age of Barns

Richard Britz
The Edible City

*see also R.W. Brindill's Illustrated Handbook... (see bib)
An Active Farmstead

Compost Collectors

Activities: Making soil from organic waste

Users: Owner/operator and employees
Curious individuals

Time of Use: Year round
More active use spring-fall

Adjacencies: Public Toilets
Animal Housing
Land Plots
Permanent Greenhouse

Square feet: 300 sf

Equipment: Pitchfork and earthworms

Circulation: Zoned private; no public access

Manure Worm Bed

Organic Shredder

Richard Britz
The Edible City
<table>
<thead>
<tr>
<th>Activities:</th>
<th>Family life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Users:</td>
<td>Owner/operator family</td>
</tr>
<tr>
<td>Time of Use:</td>
<td>Year round</td>
</tr>
<tr>
<td>Adjacencies:</td>
<td>Personal Storage</td>
</tr>
<tr>
<td></td>
<td>Private Yard</td>
</tr>
<tr>
<td></td>
<td>Private Drive</td>
</tr>
<tr>
<td>Square feet:</td>
<td>As existing</td>
</tr>
</tbody>
</table>
In this endeavor, site selection actually occurred before the program had been identified. The project really began through personal contact with the owners, my brother and sister-in-law, Kevin and Pam Kiser. Over the course of seven months living on site, I became enamored with their old barn. The barn's initial state of disrepair worsened during my time there. I became more aware of other local barns suffering similar ailments. Daydreaming of ways to rehabilitate these old survivors and extend their lives well into the next generation, I discovered more interconnected issues that captivated my interest: alternative agriculture, vernacular design, and suburbanization, to name a few. These thoughts became the foundation of my thesis, the barn being the driving force.
The site is located in the heart of the midwest prairie, central Indiana. Thirty minutes north of downtown Indianapolis, the site has the potential to attract urban and suburban dwellers from the city to the farm. While contrasting the character of the city, the site would complement the outlying communities of Zionsville and Carmel. To the west, the small city of Zionsville offers a unique historic appeal, with many antique shops and a selection of specialty restaurants. To the east, the city of Carmel continues to grow both residentially and commercially. Situated along heavily traveled West 116th street, the straightest path between the two communities (and also the only direct path, other than Interstate bypass 465, between I69 and I65), the site is a provides an excellent location for marketing not only residents of the communities, but also the many visitors. As well as profiting from the busy market of consumers, the site will offer many benefits to the communities in return, including: community interaction, adding local character, attraction of visitors, hands-on public education, and the list goes on...
1. View from the west, looking east at the house and barn

2. View from the barn, looking west
3. View from the barn, looking south

4. View from the barn, looking southeast
5. View from the east, looking west at the garden, pasture, and south end of barn

6. View from the garden, looking south
7. View from the driveway, looking north
Existing Site Conditions

1. Barn
2. Garden
3. House
4. Pasture
5. West 116th Street
6. Apple Trees
7. Neighbor's Pasture
8. Neighbor's Drive
9. Field Beyond
10. Drainage Ditch
The design process began with initial thoughts on master planning and building relationships: functions, proximities, adjacencies, massing, zoning and sequence. The northeast corner of the site was to remain private, presenting issues of the coexistence of private and public functions. The site was examined for its limitations and potentials. Low lying land, unsuitable for planting due to its frost vulnerabilities, became prime parking space. Character of the proposed farmstead was examined, natural groves and planting vs. orderly cultivated plots of produce. Icons and visibility were considered also, as well as many other thoughts and issues...
The master plan concept shown below, amazingly endured largely unaltered through the length of the project. This fact supports the logic of my personal work habits: when time is spent to do something well the first time, there need not be a second time.

The yellow signifies educational or recreational components, such as: the outdoor parking area, animal shelters, greenhouse, and equipment shed. The red signifies the commercial components, the demonstration garden, herb market, produce market, and cannery. The commercial sequence was narrowed in on for further development at a larger scale.
Questioning my initial decisions, an examination of alternatives ensued. The open-air market pavilions were the object in question, and various layouts were experimented with. A market square concept vs. a street market vs. a skewed grid market which created a path to the cannery. The long street concept created nice boundary, but made shopping complicated, while the density of the square layout proved most logical. An initial objective was for the community of farm buildings to create a small village-like atmosphere, with natural relationships. My original four-square pavilion layout best kept this theme.
An Active Farmstead

Design Process

Main Entrance: Hero Market

Lower Level: Café
An Active Farmstead

Main Level: Herb Market
1/10/96

Design 1

7.6
The greenhouse design process involved the generation and disposal of many ideas. I began with the philosophy that the new should be obviously new, having respect for the obviously old. My resultant design was very contemporary, but had little respect for the old.

In search of a more sympathetic form, I looked toward traditional greenhouse design and found the round-house idea. Better, but now I was satisfying an English greenhouse tradition, for what purpose?

Combining the circular termination with the barn's own pitch and mass. I found that my previous thinking was limiting my design. The greenhouse addition needed to show its own unique identity while participating in a mutually beneficial relationship with the barn. The two have a strong contrast of enclosure, helping to give them independent identities. Materials also give identity. Form, then, may be the consistent factor, rather than the character-defining element. The barn's interior cathedral-like verticality and pitch were strengths to draw from, and the greenhouse naturally took shape.
An Active Farmstead

Design Process

[Sketches of various farmstead designs, including greenhouses and barns, with annotations on structural elements and design considerations.

Design Story Greenhouse

[Annotation: build its own weight & glass of maple shingles]
Benefits of Old Scheme:
Bruce likes it.
Linear path

Objectives/Advantages
Transition between
Separation of
Openness Space - Defining
Sight Lines, etc.