BARNITECTURE
College of Architecture and Planning
Design/Build Thesis 1994-95
Shideler Residence
Albany, Indiana

BARNITECTURE
Design/Build Thesis

Thesis by
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Department of Architecture
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Albany, Indiana

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Design/Build Thesis 1994-95

Bachelor of Architecture Degree Program
Thesis Design

Thesis Design Committee:

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To my parents whose love, support and dedication have made this all possible.
ACKNOWLEDGEMENTS

It is impossible to acknowledge all of the individuals who have participated in this project but I would like to take this opportunity to thank those individuals whose help is invaluable.

To Bruce Meyer, for having the courage to go above and beyond the call of duty,
To Tony and Suzanne Shideler, for their faith and trust,
( and for writing some whoppin' checks,)
To my fellow BARNITECTS, may your hammer always stay in your holster,
To Larry, you sure dig a mean hole,
To Tom, it can't be said enough that parts are parts until you don't have the right ones,
To John and Mark, if you weren't family already you sure would be now and to answer your question,
yes there is a thing as too much help,
To the sheep, thanks for the many small gifts.
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Traditionally the design and construction of the built environment were roles held by the same individual. The concept of master builder was held in high regard as their work was a reflection of their society. Today these two roles have been separated to where one individual designs for another to construct. This separation has led to the loss of understanding and integration of construction technologies and craftsmanship in the built environment.

It has become of interest among some in the design profession to return to the master builder concept in the hopes of creating a better integrated built environment. This interest has not limited itself to those already in the profession but to students as well. The lack of technical understanding felt by students has initiated this desire for a hands-on approach to education.

It is here where the concept of a design/build thesis was introduced to the faculty by students in the hope of gaining a hands-on experience. The greater level of understanding for building technologies gained during one's academic education the higher the integration level will become in the architecture profession.
INTRODUCTION

In the summer of 1994, then 4th year architecture students Sarah Marshall and Tim Macy, were throwing around the idea of a design/build thesis studio. There had been design/build projects previously in the college which had been quite successful. It was these prior studios which sparked their interest in such an endeavor for a thesis project. Their proposal encompassed all aspects of an actual project. The studio would be responsible for progressing a project through program, research, design, budgeting, materials selection, construction drawings and finally contraction.

Just prior to the start of the Fall 1994 semester Sarah and Tim brought the concept of a design/build thesis to the department. Sarah had located a low-income housing project for the studio with the help of Prof. Tony Costello. Funding for the project would be supplied by the Lilly endowment and the Muncie Home Owners Foundation. The concept was welcomed by the department the only obstacle was finding a thesis faculty advisor to lead the project.

From the four thesis advisors designated for this year only Dr. Bruce Meyer had participated in any prior class building projects. One day before classes began Sarah and Tim presented their idea of a design/build thesis to Bruce. With little hesitation he agreed to take on the studio.

The next step was to generate enough interest among the 5th year class to create a design/build studio. After studio selections there were 14 students interested in a design/build studio. Members of the studio were Jeff Bogle, Matt Douhan, Amanda Fritz, Jennifer Gilmer, Bob Harmeyer, Aaron Haschel, Jeannie Kemble, Tim Macy, Sarah Marshall, Phil Matton, Bruce Meyer, Troy Miller, Kelly Mulder, Roland Resurreccion, and Matt Woodruff.

With the last minute creation of the studio there were no guidelines for the organization of the studio. The group spent the first few days organizing the structure of the class. What was
discover was that each student had brought in his/her own agenda for such a thesis project. For myself the goal of this type of thesis exploration was to better understand the integration of structure, plumbing, HVAC, electricity, etc. as they relate to the total design. My hope being that through a hands on experience my understanding of these components would make me more aware and therefore more considerate in creating future designs for others to build.

After a great deal of discussion it was decided that even though this would be in large a group effort there would need to be individual stages of development as well. The organization of the studio was to be as follows:

**DESIGN**

**Research**

Individual and group research teams would be organized to study new technologies in residential construction. The focus would be on sustainable materials and methods of construction.

**Programming**

Simultaneously there would be a group program created based on meetings with the clients.

**Individual Designs**

Designs would be created from each person in the studio with their concept behind the design.

**Small Group Designs**

From the individual projects teams of two or three would be created to construct a second design. Form these designs there would be feedback from the client on each team design.

**Studio Design**

With consideration to the clients feedback there would emerge a total group design. Construction documents as well as a preliminary budget would be created for the clients review before any actual construction would begin.
CONSTRUCTION

During the construction phase of the project the goal was to allow every member the opportunity to be trained by a professional in their designated field. In some capacity every member of the project would be allowed to participate in each phase of the construction process. After initial training sessions had taken place there would be work teams formed to complete each of the designated tasks.

It was not the goal of the studio that each individual would become skilled at every phase of the project that everyone would be exposed to the basics of each phase.

Simultaneous to the organization of the studio Dr. Meyer had been scouting an alternative project for our studio. Bruce had a friend whose family had lost their farm house to an electrical fire in the Spring of 1994. There was little remaining of their home but left on the site was a one hundred forty year old post and beam barn which appeared to be in relatively good condition. It had been suggested to the Shideleys previously that they should consider converting this structure into their residence. Until the house fire this prospect had only been talk. Bruce resurfaced the idea of converting the barn into a home. He proceeded to tell them of the design/build studio and proposed to them that they allow the studio to take on the project.

There was immediate interest for the project when Bruce presented the endeavor to the studio. Bruce did present a few drawbacks to the project. One was that there were limited funds available for the project; secondly the client was very cautious and would require a great deal of pursuing to take on such an endeavor. If the studio agreed to pursue this project over the low-income housing project there was the risk that the project could progress through final design development and budget and the client could then decide to step away from the project. This would leave the studio without any design/build project and everyone would
then begin pursuing another thesis topic.

The studio was faced with two options:

1. Proceed with the assured low-income housing project which would be limited in design exploration or

2. Risk proceeding with the barn project knowing that the construction phase of the project may never take place.

The deciding factor was in the field trip to the site. After viewing the spectacular structure the entire studio was sold on pursuing the barn project. Our goal then became to present the Shidelers with such a phenomenal proposal that they could not say no.

And so barnitecture was born...
SITE DATA

The site is located approximately two miles east of Albany, Indiana at 13440 E. Edgewater Dr. Bordering on the Mississinewa River the 25 acre farm is accessed by a gravel drive set back from the road. In addition to the barn the site includes a grainery, a large storage shed, ruins of the original farm house, numerous pieces of abandoned farm equipment and a man-made pond.
PROGRAM

The master program for the Shideles was created through a combination of our background as designers and the Shideles wants and desires for their new home. Several meetings both individually and as a family were held in an effort to create an accurate program. The clients were encouraged to clip images from magazines, books, etc. which were of interest to them. Through these images we were better able to communicate with the Shideles about their tastes and styles. This use of image files was encouraged throughout the project to better help us create a final design.

Design Criteria

The integrity of the barn structure is key in creating a place with the character and charm which we were wanting to create. The ability to create additional structure without compromising the existing or the new is what is desired for the interior aesthetic. Careful attention to detail and materials will be critical in the success of the design. It is the challenge of this design/build studio to create within this elaborate framework new architecture which is complimentary and equally inspiring.

It is our desire that the site maintain its natural rustic texture. Odd pieces of farm machinery sporadically placed upon the site creates a scenic contrast to the serenity of the pond.

Additional excavating will be required to remove excess "doo" in the lower level of the structure as well as to create a new drive to the barn for vehicular access. Existing saplings will be replanted on the site to create additional weather barrier along the north.

The site must also be designed to accommodate outdoor activities along the south of the residence. Interaction with the pond for social gathering is a must.
Space Requirements - Basement Level

Garage/Storage

User: Family

Activity: Parking of family vehicles, storage of car accessories, storage of sporting equipment and lawn tools.

Time: Brief periods of use in the mornings, evenings and more extended use on the weekends

Equipment: Garage door openers
- Work counter
- Storage shelves, drawers
- Wall storage for gardening tools

Thermals: An unheated space. Exterior walls will be insulated with batt insulation

Acoustics: Acoustical needs are met by traditional means of construction

Lighting: Overhead lighting 10-20 footcandles
- Task lighting over work counters 30-40 footcandles
- Security lighting for the exterior of the garage
- Timed lighting to allow for travel time from the car to the door

Design Criteria: Ground level entry from the east. Adequate space must be given for two cars as well as storage space. Space must pay careful attention to fire code requirements since it is to be below living spaces. The space should be directly adjacent to vertical circulation and the workshop.
**Workshop**

**User:** Tony Shideler

**Activity:** Woodworking and tinkering

**Time:** Evenings and weekends

**Equipment:**
- Workbenches
- Table saw
- Planer
- Skill saw
- Storage for lumber

**Cabinets for storage**
- Drill press
- Band saw
- Chop saw
- Assortment of hand tools

**Thermals:** Temperature controlled 60-70 F

**Acoustics:** Isolate noise from machines through additional insulation

**Lighting:**
- Overall lighting of 15-20 footcandles
- Worktops to have additional lighting level of up to 750 footcandles

**Design Criteria:** This workspace is to be a utilitarian space with easily cleanable surfaces. A large, flexible space will be ideal for maneuvering projects as well as rearranging tools within the space. The space should be closely related to the garage, vertical circulation and have some means for natural ventilation.
Pantry

User: Family

Activity: Storage of the Shideler's canned goods
This would be the location for the new freezer

Time: Used occasionally when stored items are needed

Equipment: Built-in shelving Deep freezer

Thermals: Cool temperatures are desired however, access to a heat source will be needed to keep stored goods from freezing in extreme weather conditions.

Acoustics: Acoustical needs are met by traditional means of construction

Lighting: A central light source of 15-20 footcandles

Design Criteria: This is to be a root cellar type of space. A large walk-in pantry for the storage of canned goods the family produces during the summer months. The space should be easily accessible to both the kitchen and circulation path.
Recreation Room

User: Family and invited guests

Activity: Games- pool table, dart boards, etc.
Indoor space for gathering in inclimate weather
Small kitchenette to support outdoor cooking and seasonal canning

Time: Evenings and weekends

Equipment: Pool table
Small dining/ card playing table
Entertainment center for televisio, books, and displays

Thermals: Consistant with 60-70 F range

Acoustics: Acoustical needs met by traditional means of construction

Lighting: Overall lighting in the space to a level of 15-20 footcandles
Accent lighting for the pooltable as well as for wall displays

Design Criteria: Taking on the feel of the barn structure this space should be informal in nature. Direct access should be made with the exterior patio space along the south as well as access to a restroom.
Winter Garden

User: Family

Activity: Sitting and reading room

Time: Evenings and weekends

Equipment: Planters for a variety of plant materials
  Built-in seating
  Floor drain for cleaning up after watering
  Screening devise for south facing glass in the summer

Thermals: Interior temperature range from 65-75 F

Acoustics: The space will be open to interior living spaces and additional acoustic buffers are not needed

Lighting: Natural lighting will be used to illuminate the space during daylight hours.
  Accents lighting is desired for creating patterns of light in the evenings

Design Criteria: Located on the south wall to allow maximum light year round this space will serve as a greenhouse or solarium for the Shidelers to enjoy year round. This space is to be two stories in height with the floor material serving as a thermal mass in heating the space in the winter months
Space Requirements - Main Level

Entry

User: Guests and family

Activity: A formal entry for guests
An alternative entry for bringing in groceries, etc. to the main level

Time: Multiple time usages

Equipment: None

Thermals: This will be an unheated space. It will serve as an air lock to the living spaces on this level.

Acoustics: Acoustical needs are met by traditional means of construction

Lighting: Daylighting will be adequate for day hours while lighting for the evenings should be around 15-20 footcandles
The exterior should be illuminated as well to a minimum of 5 footcandles

Design Criteria: The entry should be a small gathering place before one is brought into the living spaces. It should have direct access to visitor parking without steps.
The space should be located in close proximity to the main social spaces
**Kitchen and Eating Nook**

**User:** Family and occasional guests

**Activity:** Preparing meals is an enjoyed activity for the family therefore there will be a great deal of cooking taking place. Daily meals will be prepared and eaten in this space. Socializing with small groups of people will also be a common activity in this space.

**Time:** Main hours of activity will be in the early mornings and in the early evenings. Other times for activities will be when entertaining.

**Equipment:** Full range of kitchen equipment including:
- commercial range/oven
- refrigerator
- double sink
- garbage disposal
- dishwasher
- microwave
- exhaust fan/hood
- kitchen cabinets
- pantry cabinet
- appliance garage
- small table and chairs for daily dining

**Thermals:** Consistent with the 60-70 F range

**Acoustics:** Acoustical needs are met by traditional means of construction

**Lighting:** Overall lighting of 15-20 footcandles
Task lighting of 75 footcandles should be on the countertops
Accent lighting in the eating nook for aesthetics

**Design Criteria:** The kitchen is a place for family and guest socialization. There is the need for manipulated visual access to the living room and dining room for functional purposes. There should be easy access to the main entry for bringing in supplies. There is also a desire to have this area near the utility room for ease in completing household tasks simultaneously.
Living Room

User: Family and guests

Activity: A formal living space for reading and sitting. It is a space for the family to enjoy the surrounding scenery. The space will also function as a gathering space for guests.

Time: Evenings and weekends will be the prime hours of use.

Equipment: The space will require furniture such as a sofa, coffee table, chairs etc. all of which will be selected by the owner. Built-in bookshelves are also required for this space.

Thermals: Consistent with the 60-70 F range.

Acoustics: General construction means will provide adequate acoustics.

Lighting: Lighting for this space will be limited to accent lighting for the highlighting of wall displays. Additional lighting will be provided by table or floor lamps.

Design Criteria: The living room is to be an open space directly related to the kitchen and dining areas for ease while entertaining. The location of the space is to be in the southwest to gain visual access to the pond during sunset.
**Dining**

**User:** Family and guests

**Activity:** Formal dining and socializing

**Time:** Evenings and special occasions

**Equipment:** Expandable table and chairs

**Thermals:** Consistant with the 60-70 F range

**Acoustics:** The space is part of an open floor plan making it necessary to provide noise buffers to limit the amount of noise transmission throughout the house

**Lighting:** Lighting shall be provided by an overhead chandelier which is controlled by a dimmer switch

**Design Criteria:** The dining area is to be visually and physically accessible to the kitchen and living areas. Access to southern views are desired. Located in a vertically open space there is a need for a dropped ceiling plane over this area to create a smaller more intimate feeling.
Master Suite

User: Tony and Suzanne Shideler

Activity: The master suite encompasses a variety of activities. The suite can be broken down into three smaller units - bedroom, dressing room, and bath. The bedroom will consist of a sleeping area as well as a small sitting space. The dressing room is composed of a walk-in closet, dressing area and make-up vanity. The master bath contains two sinks, a large whirlpool tub, shower and other standard fixtures.

Time: Preparing in the morning as well as in the evening before retiring

Equipment: Bathroom fixtures such as an exhaust fan, sinks, toilet, shower and whirlpool tub are needed. Additional hardware will be required for the organization of the closet. All bedroom furniture will be furnished by the owner.

Thermals: Consistant with the 60-70 F range

Acoustics: Audial privacy is a key issue in this area to prevent the transmission of noise both in and out of the space. Additional noise barriers shall be provided in the wall construction for this space.

Lighting: The bedroom will be illuminated mainly by floor and table lamps. The dressing area requires an illumination of 20 footcandles as well as the bathroom. Specialty lighting will be required in the vanity area to simulate natural lighting.

Design Criteria: The relationship of the spaces is critical in this area to aid in the useability of the space. Functionally this space should be physically separated from the major social spaces within the design. The owners have requested that the master suite be located on the east side of the home to allow morning sun into the space.

Diagram of the master suite layout.
Study

User: Tony and Suzanne Shideler

Activity: The study will be a place for paperwork, computer work and reading. This space will also function as a "guest room" on the occasions where there are 20 people staying with the Shidelers

Time: This space could be used at a variety of times but will primarily be occupied in the evenings and on weekends

Equipment: Built-in bookshelves as well as a desk will be needed

Thermals: Consistant with the 60-70 F range

Acoustics: Traditional means of construction will be adequate for this space

Lighting: An overall lighting level of 30 footcandles will be required for this space. Additional lighting will be required for illuminating the desk top for reading and paperwork.

Design Criteria: The study should be accessible from both the study and the living spaces within the home
Space requirements - Loft Level

Bedroom (2)

User: One of the bedrooms will be designated for T.J. while the other will serve as a guest room.

Activity: The bedrooms will function as sleeping quarters as well as individual spaces for privacy for reading, etc.

Time: The major times of use for these spaces will be during the holidays.

Equipment: Furniture for these spaces will be furnished by the owners.

Thermals: Consistant with the 60-70 F range.

Acoustics: Acoustic privacy is of high importance in these areas. Additional insulating methods shall be implemented to prevent noise transmission.

Lighting: Lamps will be the main light source for these spaces. Additional lighting may be required in the closets at an illumination level of 15-20 footcandles.

Design Criteria: The bedrooms must allow for both sleeping furniture and for small sitting spaces as well. The bedrooms should be directly related to a bath which services both spaces. The spaces should also be in close proximity to vertical circulation.
Sewing/ Craft room

User: Suzanne Shideler

Activity: A place for Suzanne to paint, sew, and complete other crafts

Time: Most activities will take place in the evenings and on weekends

Equipment:
- Along counter top
- Storage drawers
- Storage shelves

Thermals: Consistant with the 60-70 F range

Acoustics: Traditional means of construction will be adequate for this space

Lighting: Light levels for this space should be 75 footcandles

Additional task lighting may be required for certain projects

Design Criteria: This space is a private workshop. Its nature of being messy makes it a space that wants to be away from the view of the main living spaces. This is a "tree house" for Suzanne
**Sitting Space**

**User:** Family members and guests

**Activity:** A space for sitting and reading. Placed above the living spaces it serves as a second less formal living room. Will also serve as a sleeping space when there are large numbers of family present.

**Time:** May be used at any time

**Equipment:** Built-in bookshelves and seating

**Thermals:** Consistant with the 60-70 F range

**Acoustics:** Because of the space's open nature little acoustic provisions are to be made

**Lighting:** The space will be accessed by natural lighting in the day light hours and by reading lamps in the evenings

**Design Criteria:** This is to be an out of the way observatory. The space is to be located in a remote location with visual access to the social spaces below.
Space Summary

Ground Level:
Garage/Storage ........................................... 700 s.f.
Workshop .................................................. 200 s.f.
Pantry ......................................................... 160 s.f.
Recreation Room .......................................... 540 s.f.
Winter Garden ............................................. 300 s.f.
Full Bath .................................................... 54 s.f.
Mechanical .................................................. 108 s.f.
Circulation .................................................. 178 s.f.

Main Level:
Entry .......................................................... 140 s.f.
Kitchen/ Eating Nook ..................................... 214 s.f.
Living Room ............................................... 398 s.f.
Master Suite ............................................... 580 s.f.
Study ........................................................ 100 s.f.
Utility Room ............................................... 80 s.f.
Guest Bath .................................................. 50 s.f.
Circulation .................................................. 678 s.f.

Loft Level:
Bedroom (2) ............................................... 300 s.f.
Sewing/Craft Room ...................................... 100 s.f.
Sitting Space .............................................. 165 s.f.
Full Bath .................................................... 72 s.f.
Circulation .................................................. 85 s.f.
Total ....................................................... 4189 s.f.
Space Relationships

-Ground Level

Diagram showing the relationships between different spaces such as Recreation Room, Pantry, Vert. circ., Winter Garden, Mech., Storage, Garage, Workshop, View, and Access. Arrows indicate connections and flow between these spaces.
Space Relationships

- Main Level

Diagram showing the layout of the main level with rooms such as Entry, Utility core, Dining, Master suite, Kitchen, Living room, and Winter garden.
Space Relationships

-Loft Level

- Sitting Area
- Circ.
- Sewing/craft room
- Bath
- Bedrooms
- View
- Access
Cost Estimate

Building Costs: Total Sq. Footages x Price per Sq. Foot
2889 s.f. × 58.65/s.f.
+13.45/s.f. Basement Addition
+ .70/s.f. Cedar Roof Adjustment
+ 1.50/s.f. Heat Pump Adjustment
$74.30/s.f. = $214,652.70

Adjusted Total:

Building Cost: Additional Baths
2 Full @ $3627 = $7254
1 Half @ $2405 = $2405
Porch
50 s.f. @ $37.20/s.f. = $1860
Fireplace
1 @ $2710 = $2710
Garage
$1350
Miscellaneous
Kitchen cabinets = $5341
Bath Vanities = $1706
Sidewalks = $395
Total Adjusted Cost = $214,652.70 + 23,111 = $237,763

Insurance Exclusions
A) Footings, sitework, underground piping - 2.7% = $6,419
B) Architects Fees - 10% = $23,776

$207,567 without appliances or furnishings
INDIVIDUAL DESIGN

The initial designs were limited to design concepts and space relationships. In my design I looked at the two main issues involved with this project—zoning and massing.

In any residence there are two main zones—public and private. These zones are separated for reasons such as visual and auditory privacy. Conceptually my goal was to utilize the circulation core for the home as a dividing element between these two zones. The zones would then become public on the west and private on the east.

Within the structure of the barn there is an eight foot structural bay which would be well suited for this circulation core. Its location divides the entire structure asymmetrically allowing the opportunity to break up the massiveness of the barn's form. To further emphasize the importance of this circulation space the central core would begin to break from the original planes of the structure both horizontally and vertically. What emerges is a cross between a boardwalk and a tower.
SMALL GROUP DESIGNS

The small group design was a collaborative effort trying to take the best elements of our original designs. I worked with Sarah Marshall in this second stage of design. It was a first look at the struggles created when working with another person on a design but what evolved I feel was quite rewarding.

In contrast to both of our original designs we tried to work within the given framing structure. Limiting any variation from the original planes of the structure the form then became reliant on the patterns of fenestration and decks for breaking up the massive facades.

While the exterior is simple in form the interior is full of variation. Entering along the south through a glass atrium the visitor is then taken through a stair which dominates the living space by winding its way through the open plan. The stair is composed of several viewing and sitting platforms within the open interior. The main floor is composed of varying floor levels within the space. The living room then becomes the highest elevated area. This heightening in floor levels draws attention to the space and to the spectacular view which extends from the space.

The remaining spaces are organized by zones. The private zones are located to the east on both the main and second levels as a response to the Shidlers desire to gain morning sunlight in these spaces. The utility core is then created along the north of the structure both on the ground and main levels. Having these utilitarian spaces on the north is functional in that there wants to be limited fenestration of the north to limit infiltration during the winter months and these spaces require less fenestration than other spaces within the home. The creation of a utility core also makes plumbing and HVAC plans easier by keeping these services in one area of the home.
STUDIO DESIGN

Never before and possibly never again should anyone attempt to create one design with fourteen other individuals. It isn't that there was any name calling or fist fights but it becomes a tense situation when there are that many different opinions on the same topic. It must be noted that as challenging as our weekend final design charrette was few other groups could have worked as efficiently and productively as the BARNITECTS.

When creating the final design we began by sorting through the feedback given to us by the Shidelers. From the five group projects presented to them the Shidelers wrote comments about elements of the designs which they did and did not like.

One request was that the bedrooms stay on the east side of the structure. The study was to be directly linked to the master bedroom. Another design feature which they liked was the idea of an atrium. However they did express concern about the amount of glass present in some of the designs. Another consideration was to locate the kitchen in the north-west and still maintain views of the pond. The living room was to be in the south-west. Suzanne requested that her sewing room not be stuck in a corner that she should have a pleasant view. The key aesthetic comment was that they would like to see the timbers remain exposed in as many places as possible.

With those comments in mind the group set out its design journey.
BATH LEDGE (MARBLE 2) 47 1/2" x 30 1/2" H

SEAT BACK (MARBLE 1) 42 1/4" x 12 1/4" H

SEAT TOP (MARBLE 1) 62 1/2" x 6 3/4" H

SW SEAT (MARBLE 1) 42 1/2" x 22 1/2" H

W SEAT (MARBLE 1) 11 1/2" x 22 1/2" H

SIDE GRIP (MARBLE 1) 11 1/2" x 22 1/2" H

F PANEL (MARBLE 1) 108" x 34 1/2" H

UPPER FR PANEL (MARBLE 1) 34" x 24 1/2" H

NOTE: MARBLE 1 = MARBLE 2 =

NORTH SCALE: 1/2" = 1'-0"

60
GROUND LEVEL  the latest 10/10/94 7:16pm

Mechanical

Central heating/ oil cellar

Workshop

Recreation/ game room

Kitchen

Laundry

Stairs

Garage

Basement

Closets

Recessed ceiling lights

Climbing doors

Work area/ storage

Shedding doors

Closet

Stairs

Closet

Closet

Stairs

Shedding door

Shedding door
CONSTRUCTION

Demolition

At the onset of this project we understood that we would be faced with more issues than would a standard building project. In this project we had the opportunity to deal with demolition and significant amounts of excavation. The first week and a half of the project the entire studio spent cleaning out the barn including items such as old furniture, doors, windows, refrigerators, freezers, microwave ovens, scrap lumber, stored Mexican imports, deceased animals, hay, dirt, and last but not least tons of sheep manure as well as the sheep themselves.
Removal of Siding / Creation of New Floor Joist System

The next phase of the project was to remove the existing siding to expose the structure below. What we found was a relatively sound structure which would require a great deal of cleaning if people were to live within it. Once the siding had been removed we discovered that a new flooring structure needed to be created. The original floor joists in the barn's main level were anything but level. The remedy for this problem involved creating an entirely new floor joist system shimmed to a resemblance of level from the existing main structural members.

Simultaneous to these activities Tony, the owner, began connecting temporary power to the barn for us to be able to run machinery and temporary lights.
Floor Decking

Once the new floor joists were in place the decking began going into place. As one crew went through and cut and fit the sheets of o.s.b. another crew followed nailing the decking to the joists. What made this task so difficult was the fierce wind which blew up off of the pond. It was a cold fall.
Roof Removal and Clean-up

The next step was to begin removing the existing metal roofing and to replace it with a new roof deck and roofing material. The existing roof structure was able to be reused with additional structure added to the ends of the rafters to allow for an overhang. Our original choice for roofing material was to be metal. However the client chose an asphalt shingle and with that we proceeded.

It was a dangerous job being some thirty feet in the air with wind gusts of up to 20 mph. The job of roofing was therefore left to a few daring individuals. The remaining crew was given the task of pulling off the 20 plus foot sections of metal roof. Metal falling toward you from thirty feet in the air is a treacherous sight. The same crew was also responsible for picking up the debris thrown to the ground.
from the roofing crew above. Let it be noted that if I never have to pick up another shingle it will be too soon.
Exterior wall Construction/

Second Floor and Dormer Construction

The next two phases of construction were constructed in such a short time frame that it is difficult to distinguish which began first. The key thing is to know that they did happen.

Once the main level floor decking was in place it was then time to begin building the exterior walls. It was decided that the exterior walls would be built around the timber structure. The questions then were how to attach the walls to the frame. The main level floor system was designed to have a 3 1/2 inch cantilevered overhang on which the new exterior walls would sit. To reinforce the connection of the exterior walls to the frame the walls were toe-nailed to the barn structure as often as possible.
During the construction of the exterior walls there were numerous group meetings to decide the exact locations of windows. The concept of design/build becomes evident here were we were able to decide the locations and dimensions of windows once we were able to see how they might best fit the site. In many instances once we visualized what we had designed on paper we changed the design making better suited design decisions.

Simultaneous to the framing of exterior walls another crew had begun constructing the load bearing walls upon which the second floor would sit. The goal was to construct as much of the second floor as was initially necessary to construct the dormers in anticipation of completing the roof and getting cover from the weather.
Interior Wall Construction

The creation of the interior walls was a swift process which required the entire studios man-power. Following our original plans and making only a few minor adjustments all of the interior walls were soon completed. The only exception to this was in the design of the kitchen. There were numerous debates as to the layout of the kitchen. Finally the kitchen layout was left to the design of Sarah Marshall with help from myself and approval by Suzanne Shideler. With the final kitchen design the load bearing walls were constructed to replace the temporary support column holding up the loft overhead.
Enclosing the Structure

With it already being winter and the studio beginning to approach semester break it became increasingly important to enclose the structure to keep out the cold and snow.

As was part of our design to create higher R values than required by code the exterior was to be enclosed by 2" polystyrene. Placement of these sheets was much simpler to the north but on the other sides of the structure there was the need for 50' extension ladders. The lower level having not been framed already was temporarily covered with sheets of o.s.b. With the cold brisk winds blowing snow at 30 mph into your face and with fingers cold and brittle this was anything but an enjoyable experience.
You Want Me to Walk on That?

With the coming inclosure of the barn an the growing need to move materials and people to the second floor the stair began to become a reality. It was decided that it would be a nice design detail to construct the stairs from the walnut floor joists removed from the barn. In trying to protect the permanent stair treads temporary treads were put in place. For anyone afraid of heights the temporary open tread was a terrifying sight.
East Wall Excavation

Once winter broke the urgency of preparing the ground level became a priority. The first step was to excavate along the east wall to allow us to cut through the concrete and stone wall in order to create the openings for the garage doors. First, the openings where the supports were cut where columns were to remain for the east wall. These sections were then replaced by self-laminated wood columns. Then the sections of wall were attempted to be removed. After they had been sawn, chiselled, jackhammered, etc. finally we were finally able to remove the sections of wall by wrapping a chain around the sections and pulling them out with the truck.

Once the wall was removed the preparation of new footings was begun.
Formwork and Footings

The unpleasant job of digging ditches and building form work was done by all. However, both Kelly and Woody seemed to always be volunteering for the job— it is amazing what some people will do for a tan.

It was necessary to create new footings for all of the walls since there were none in existance. This process resulted in many days of concrete pours. The first day of pouring was nicely put—a disaster. In the first section of footings poured there was a major failure in the form work. But with quick thinking and a lot of work the pour was not a total loss.

The remainder of the east wall was reframed after the formwork could be pulled. New formwork was created in preparation to pour again.

With the east wall poured to the garage
floor level it was then possible to bring in a small front end loader to begin removing the bulk of dirt and debris still remaining in the lower level. The preparation of the sub-floor was first to allow the for the shoring of the existing structural supports in order to remove thier foundations of stone, wood and whatever else was handy at the time, and replace them with concrete piers. Once the piers were poured and cured the forms were pulled and then the remainder of the lower level was graded in preparation of the concrete slab.

Much to our dismay the front end loader operator dug too deep and was consequently fired. In order to fill in the places where the level was too low we used the bricks from the farm house as filler. One by one, brick by brick the holes were soon filled and the floor was ready for gravel.
After the gravel had been raked to the desired grades the gravel needed to be compacted. My father graciously loaned us the compactor as we hurried in preparation for the big pour.
The Big Day - Pouring the Concrete Slab

The day had finally come and everyone arrived early in anticipation for the next big step in the project. The entire slab was poured in a total of three segments. The first pour began at 8 am there was non-stop work until my Father and Uncle left the site at 8pm. This is what you call true dedication.
Preparing for the Drywall

After a long weekend, the concrete was ready to be worked upon. One team began constructing the walls in the ground level. What the other groups worked on was the completion of the many tasks required before the drywall could be hung. One task which needed to be completed was the hanging of the vapor barrier on all exterior walls. This proved to be no easy task in that each sheet of plastic had to be run between the structure and the new exterior walls. In many places there was not even enough space to get the small piece of plastic between the two. After the vapor barrier was in place the timbers in the entire structure had to be cleaned with a wire brush, air compressor and then sprayed with an environmentally friendly insecticide.

At the same time as the timbers were
being treated the plumber, Tom arrived to help instruct us on the
installation of the plumbing for the entire house. He was quite
helpful in explaining the principles behind what we were doing.

The only thing that still stood between us and drywalling
was -windows.
The Windows are coming,

the windows are coming...

The day finally came and the first shipment of windows arrived. There was a bit of confusion as to how our windows were to be installed since we had such unusual framing construction. Once that was figured out things went pretty smoothly from there on.
The Final Stage - Drywall

The final stage of the design which we were able to be a part of was the partial hanging of the drywall. Due to the missing extension jambs for the windows any drywall adjacent to the windows was unable to be hung. The drywall surrounding the plumbing and chase areas was left unhung as well.

We were pleased to see that the basic form of the design came together with the drywall that we were able to hang.
REFLECTIONS

I love the project but I can't say that I have always liked it. At the outset of the project there was enormous levels of enthusiasm surrounding the endeavor. But here at the end of the project there was a shared feeling of disappointment associated with the project. The level of completion of the project has been the source of disappointment for many. When we started there were such hopeful thoughts of completing the project before graduation. Unfortunately in our journey what we encountered was the real world. A place where weather always cooperates, materials always come in on time and budgets are higher than you would like to spend just doesn't exist. What I have learned is that good planning and communication can help in coming close to this fantasy experience. Unfortunately the method for learning these lessons was from the lack of these elements at times in this project.

There were two main areas of this project which got off to a poor start - planning and communication. In the beginning of the project there was a great deal of organization. Each person was responsible for gathering specific information and reporting back to the group. As the project progressed this idea of planning somehow got lost in the excitement of the construction. Materials lists weren't prepared and there would be down times while we waited for the arrival of materials.

Communication is critical in any endeavor however in a project of this magnitude with this many individuals involved communication is essential and unfortunately it often got muffled. It often felt as though we were playing a game of operator where the last person to get the message was totally lost as to content of the original message.

In these statements I don't wish to give the impression that the project was in a total state of disarray. If this had been the case the end product would not have been so successful. What I am saying is that all of this project has been a learning experience. I
have learned of the basic concepts of construction, scheduling, ordering, client meetings, etc., as well as the common problems of planning and communication.

It has been a long difficult journey and no matter where we wanted to be, where we are is a great accomplishment.
Beaming with pride

By NANCY MILLARD
Special Features Writer

Back in the 1840s when the sturdy barn was built on a gentle slope near the Miamisburg River, the farmer never dreamed that 12 architecture students would transform it into a contemporary house turned into a studio.

The stable old barn, built of black walnut that was probably sawn on the site, is taking on new vigor, despite being well into the second half of its second century.

Structurally sound, the hand-hewn beams and secondary supports are as sturdy as ever. But now they are highlighted as integral to the design of Tony and Suzanne Shideler's house near Albany.

The Barnitecture Project — conducted by Bruce Meyer's class of fifth-year students in Ball State's College of Architecture — began last fall when the Shidelers agreed to let the class convert their old barn into a house. Their nearby house was destroyed by fire a year ago.

The students designed and are doing most of the actual construction of the house except for cabinets, dry-wall finishing and plumbing. Tony Shideler is overseeing the wiring. No surprise, since he is in the director of a statewide Purdue University mechanical engineering technology program being taught at Ball State University.

One of the students, Sarah Marshall, met us at the make-shift front door in the barn's north wall.

"Each student drew up a house plan, and then the class looked at all the plans and discussed them," she said. "We formed five groups comprised of those who had done similar plans, and we refined them. We submitted the five plans to the Shidelers and worked with them to combine the plans into one set."

Stud framing and an open stairway suggest entry to a spacious hall, the core of the house that opens to original rafters above and to the lower level. The latter, where sheep bumbled on the day of our visit, will eventually be the winter garden.

Sarah led the way to the kitchen area in the northwest corner. She pointed out an informal eating area that looks out over fields and trees along the river. The Shidelers like to cook and entertain, so the kitchen opens partially into the living room.

Above the kitchen is a loft for reading or relaxing. It seems to be suspended over the eating area and the living room and has a view out those windows.

"We all had located the living room in the southwest corner overlooking the pond," said Matt Dohlan, who had stopped pounding nails to join us. "Broad windows face the pond and the fields. The room nooks to the rafters above."

"The sunsets are fantastic," added Marshall, explaining that rooms were geared to views south and west.

A spacious, open dining room fits neatly next to the kitchen and living room. One wall is strongly angled.

See BARN on Page 2B

Tony and Suzanne Shideler's barn near Albany (Top photo) is in the process of being turned into a house. The Barnitecture Project, which began last fall, is being done by Bruce Meyer's class of fifth-year students in Ball State's College of Architecture. Above, a student works on the inside of the barn.
Barn

Continued from Page 1B

In the center hall a horizontal half wall repeats the same acute angle, like an arrow, leading the eye to window views of the pond. An original ladder to the loft above was left significantly in place, harking back to the barn's initial function.

"The whole concept of the angle is to create a new symbol of home in place of the barn's 10 X 10-foot grid," Matt said.

"There really wasn't a square corner in the barn. Everything was slightly off, even the floors, which we had to level by about 6 inches. What we're building has to be squared for appliances and cabinets," Douhan said.

The master suite occupies the east side of the structure. "Master bedroom, dressing room, bath and sitting room," said Marshall, describing what the studs will enclose. Above these rooms there will be two bedrooms, a bath and sewing room that looks down from a balcony onto the center hall and through the stairway, providing glimpses of the winter garden.

"More than two-thirds of the house is open space," said Douhan, pointing up to the rafters. "The heat will flow upward and in a conduit across the center peak of the barn and back down. In summer it will be just the reverse with cool air."

While we explored the structure, other students scurried about, measuring, pounding, installing wiring. They appeared relieved that the weather had turned warmer.

"Not until Jan. 26 did we have the place closed in," Douhan said. "We had some really cold days in here. But November and December were warmer, so we got a lot of the outside work done."

"So far we're ahead of schedule," Marshall said. "Sometimes what we designed doesn't work, so we call a little meeting and say, 'Look guys, come up with a better way to do this.' This project is a learning situation, so when something doesn't work, we figure out another way to do it. It takes twice as long to build this way, probably. That's why we decided in the beginning not to charge for our labor."

The design/build project is quite unique, the students said. "While some architects actually design and build," Marshall said, "most have professional builders do the construction."

"This way we learn what works and what doesn't because we've tried it. I'd do it again, but not with 12 others."

The Barnitecture project should be finished by graduation, she added.

"We're going to have an open house so our parents and friends can come see what we've been talking about all year."