KEVIN D. RUSSELL

THE SCOTTSDALE APPROACH
WindRider Youth Camp & Activities Center

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THE SCOTTSDALE APPROACH
WindRider Youth Camp & Activities Center

Bachelor of Architecture Degree Program
Thesis Design

Thesis Design Committee

Uwe Koehler · Professor of Architecture · Thesis Studio Critic

Dan Woodfin · Professor of Architecture · Thesis Advisor

Dan L. Russell · WindRider Stables Owner/Operator (Client)

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"Reverence For, Rather Than Domination Of The EARTH"

Malcolm Wells
David Wann, in his book *Biologic*, states that "environmental deterioration is a lack of relevant information...[and that] poor design is responsible for many, if not most, of our environmental problems." It is difficult for an architect to add environmental considerations to the list of variables in the screening process for specifying, when access to that information to is virtually nonexistent. This difficulty is compounded by the laborious task of identifying and locating local products and services; these products, consequently, are not specified. The Scottsdale Approach builds upon an idea that Frank Lloyd Wright utilized at Taliesin West, where local resources, directly available to the architect and builder, are used to create a beautiful and ecologically sound building. Similarly, by identifying a specific area, researching the sustainable materials and services available within that area, and then collating that information into an easily-accessed form, the design professions will be enabled to make environmentally-conscious decisions. The Midwest is one of the areas in greatest need for this approach. The products, manufacturers and demand are all present, needing only to be made aware of each other, brought together in a tangible, comprehensible manner. This is what The Scottsdale Approach is designed to accomplish. The Scottsdale Approach begins to provide a balance of technical information and exposure to ecologically sensitive ideals and values. Thus, providing the "relevant information" that David Wann refers to, while also offering a beautiful and elegant example of how that information can be used to create an ecologically-sensitive design solution. This provides architects, designers and contractors with the information needed to make informed, educated and ecological decisions on local construction materials and services. This will be accomplished through two distinct phases. Phase I concentrating on building the Reference Guide of sustainable building materials and services; Phase II following up with a fully documented design solution that utilizes materials located in the Reference guide. Both phases are currently available via the World Wide Web. Thus, making the information instantly accessible to the local professional in need or as a start up model for someone in another locale. A fully functional, working model of the web site is located at: http://www.arch.bsu.edu/krussell/thesis. We must stop pretending that there are no consequences to our actions and look beyond immediate gratification. The profession of architecture must remove the hypocrisy. It has been said that, at the least, architecture is a profession of assembling materials to shelter humans. All too often materials are chosen based only on aesthetics, budget or code compliance with little or no regard for their impact on the environment. It is my responsibility as an architect, as a steward of the planet and as a future parent to seek out this knowledge in order to make highly sensitive structures that do not require reparation by future generations. The Scottsdale Approach will begin to provide myself, the profession and the state of Indiana with the information needed to make these sensitive decisions.
I Would Like To Dedicate This Thesis Book To:

My loving wife Lori,
who has given my life direction and meaning.

Dan Woodfin,
who has been a friend and mentor to me.

To all of the "Greenie-Weenies"
who hold sustainability above all else.
ACKNOWLEDGMENTS

Uwe Koehler; Thesis Studio Critic
Professor of Architecture
College of Architecture and Planning
Ball State University
I would like to thank Uwe for helping me to get my thesis pushed through the system and for giving me the space to do my own thing. I know that I was difficult to work with at times and for that I apologize.

Dan Woodfin; Thesis Advisor
Professor of Architecture
College of Architecture and Planning
Ball State University
There are no words strong enough to explain my indebtedness to this man. Dan has been both a friend and mentor to me throughout my five years here at CAP. Dan has continually exceeded his role as a leader and professor by providing guidance, advice and criticism that has made me a stronger architect and person. His undying dedication to his students is matched only by his role as a steward of the planet and leader in sustainable design. I look to Dan as a role model and I look forward to working with him in the future.

Dan L. Russell & Alane Haney Russell; Client
WindRider Stables Owner/Operator
Fort Wayne, IN 46788
I would like to take this opportunity to sincerely thank my clients for providing me with a wonderful project that pushed me to continually learn and strive for excellence. I learned a valuable lesson about myself as an architect, and for that I am eternally grateful. This was a dream project for me. The forging of your community outreach based program and environmental sensitivity was truly a breath of fresh air. I look forward to continuing our relationship, and helping you to take the design of the Activities Center through construction.

Bob Koester; Consultant
Director of CERES
College of Architecture and Planning
Ball State University
I would like to make a special note of thanks for my consultants. Bob was instrumental in solidifying the foundation of the Scottsdale Approach. His meticulous questioning and observations have driven me to strive beyond excellence. I firmly believe that Bob was critical in the design and progression of my thesis. I would like to thank Bob for his undying dedication and neverending commitment to helping me to achieve one of my life long goals.
ACKNOWLEDGMENTS

Patrick George; Consultant
Associate Professor of Architecture
College of Architecture and Planning
Ball State University
I would like to thank Patrick for his gracious support in the electronic realm. He has continually offered advice, technological assistance and guidance in the production of The Scottsdale Approach website, not to mention that he has provided the server space that houses the website. He is continually giving to the students. He is a vital and needed member of this faculty that has opened the floodgates of technology in this school. I am eternally thankful, as are many students.

Jeff Culp; Consultant
Director of CERES Resources
College of Architecture and Planning
Ball State University
Another individual worthy of a special mention. Jeff has been an invaluable resource for sustainable design ideas, methodologies, technologies and critique. He has continually made the time to meet with me for design crits and benchmarks. His tireless assistance and guidance is impossible to repay, I can only offer my sincerest “Thank You” for all that Jeff has done for me.

Lori Russell; Wife
Loving and patient spouse
My heart goes out to my wife, who has continually given me the space to pursue my dreams. She has supported me both financially and emotionally for the last six years. She has always been understanding and supportive of the long and torcherous nights of architecture school. She has continually made sacrifices that no man could ask of his spouse. I can not even begin to repay her for her undying dedication, love and support. She has helped me to achieve my life long goal of becoming an architect. My love for Lori is undying.

For All Those Unmentioned Individuals:
Existing Resources & Databases Of Sustainable Materials
Fellow Thesis Students
Faculty & Staff
Friends
I can not even begin to list all of the people that have helped me in developing, designing and cultivating The Scottsdale Approach. However, I would like to thank everyone for their support and guidance. I don’t know if I could have done it without them.
### TABLE OF CONTENTS

**INTRODUCTION**
- position 15
- client 21

**PROGRAM**
- scope 27
- design criteria 27
- spacial requirements 31
- site 35
- context 35

**DESIGN PROCESS**
- special note 37
- conceptual 37
- preliminary 39
- turning point 49
- design development 54

**FINAL DESIGN**
- foundation plan 69
- ground floor plan 72
- second floor plan 77
- west elevation 80
- south elevation 82
- north elevation 86
- east elevation 89
- wall section 92
- composting chamber 95
- building section 98
- monitor section 101

**ELECTRONIC**
- camera shots 103

**PHOTO GALLERY**
- final model 109

**BIBLIOGRAPHY** 129
INTRODUCTION

POSITION

A new consciousness is slowly emerging, environmental initiatives are gradually edging into the mainstream. Overall awareness of the natural environment is on the rise. Individuals, small business owners and large corporations are beginning to look for ways to protect the Earth by minimizing the negative impacts that we inflict upon her. One of the many areas of environmental concern falls within the fields of design and construction. As major players in the design community, architects are blessed with the ability to shape the built environment. This is a powerful sword to wield--a sword that we have not wielded wisely, I am afraid. David Wann, in his book *Bio Logic*, states that "environmental deterioration is a lack of relevant information...[and that] poor design is responsible for many, if not most, of our environmental problems." One of the most difficult and challenging aspects of environmentally-responsive design is locating and specifying suitable materials that help to sustain the Earth as well as human health. By specifying and using recycled and low-impact materials architects can and will have a profound impact on the availability of resources in the future, while minimizing the impact that the built environment has on the natural environment. This gives everyone in the design profession the opportunity and the responsibility to conserve resources. I believe that we as architects and stewards of the planet must take on that responsibility by practicing environmentally-responsive architecture.

In 1990, at the National Convention of the American Institute of Architects, held in St. Louis, Missouri, the AIA passed a resolution called "Critical Planet Rescue." This resolution called for the Institute to develop a practical resource guide for architects "to better enable them to educate and influence their clients, the public, and elected officials" on environmental issues relating to planning and design decisions. The AIA "Environmental Resource Guide" (ERG) is a direct result of that initiative. The ERG is one of a number of efforts that are setting the pace and providing a standard of excellence. The architecture profession, by initiating the ERG, is taking a positive "first step" in the quest to provide the information needed to make better informed decisions. However, the ERG, as with most unprecedented large scale projects, is slow in gaining momentum. Furthermore, it is currently geared toward a holistic and national approach. For example, the ERG is in the process of examining individual building products, and listing their environmental pros and cons. This "top down" approach overlooks many of the local products and manufacturers that need to be identified and utilized first. This initiative in itself is greatly needed; unfortunately, the AIA, by distributing the ERG as a national guide, does not allow for a more local evaluation of that information. It is difficult for an architect to add environmental considerations to the list of variables in the screening process for specifying, when access to that information is virtually nonexistent. This difficulty is compounded by the laborious task of identifying and locating local products and services; these products, consequently, are not specified. This is not addressed by the ERG, thereby limiting the effectiveness as an aid to local environmentally-responsive design.
The Scottsdale Approach builds upon an idea that Frank Lloyd Wright utilized at Taliesin West, where local resources, directly available to the architect and builder, are used to create a beautiful and ecologically sound building. Similarly, by identifying a specific area, researching the sustainable materials and services available within that area, and then collating that information into an easily-accessed form, architects, builders and laypersons will be enabled to make environmentally-conscious decisions. The Midwest is one of the areas in greatest need for this approach. The products, manufacturers, and demand are all present, needing only to be made aware of each other, brought together in a tangible, comprehensive manner. This is what the Scottsdale Approach is designed to accomplish.

Qualifications:

- Throughout my undergraduate architectural career I have consistently practiced a more environmentally-sensitive approach to design.
- I own an extensive library and also read sustainably-oriented periodicals and newsletters.
- I am currently a member of the Market Development Opportunities Workgroup, a subgroup of the Indiana Department of Environmental Management’s (IDEM) Construction and Demolition Focus Group.
- I have done extensive research on locally available sustainable building materials.

The Scottsdale Approach begins to provide a balance of technical information and exposure to ecologically sensitive ideals and values. Thus, providing the "relevant information" that David Wann refers to, while also offering a beautiful and elegant example of how that information can be used to create an ecologically-sensitive design solution. This provides architects, designers, contractors and layperson’s with the information needed to make informed, educated and ecological decisions on local construction materials and services.

The Scottsdale Approach will:

- lead to notable environmental gains
- provide local architects with the tools needed to augment a more sustainable environment through their designs and materials specifications
- bridge the gap between the AIA Environmental Resource Guide and the local architect
- begin to offer localized information that is to be used in conjunction with the ERG
- stimulate the local economy through the formation of local and regional environmental businesses
- help to reduce the pollution caused by the transportation of materials from distant sources
- increase the availability of low-impact materials and products
- stimulate the awareness of the origin of the materials and products used in construction
Map showing the target area. The "local" area is defined as the state of Indiana. The area referred to as "district" includes the bordering states of Illinois, Kentucky, Michigan and Ohio. "Region" refers to the Northern Great Lakes States, the Central Mississippi Valley States and the Southern Mississippi Valley States, as defined by the Sectional and Urban Area Index in the National Atlas of the United States of America.
This will be accomplished through two distinct phases. Phase I: concentrating on building the Reference Guide of sustainable materials and services. Phase II: following up with a fully documented design solution that utilizes materials located in the Reference Guide. Both phases of the Scottsdale Approach, as well as the Reference Guide are currently available via the internet and the World Wide Web. Thus, making the information instantly accessible to the local professional in need or as a start-up model to someone in another locale. A fully functional, working model of the web site is located at: http://www.arch.bsu.edu/krussell/thesis/index.html. However, it has come to my attention that this server will be shutdown May 20th, 1997. I am currently in the process of locating a new home for The Scottsdale Approach. If the website can not be reached at the above url, then please do a search for keywords such as: Scottsdale Approach, sustainable building materials, or Kevin D. Russell. It is my intention to continue to build this website as a tool for myself and other architects and designers to use in their practicing of environmentally conscious architecture.

**Phase I**

Phase one consists of researching, gathering and compiling information on sustainable building materials and services for a prioritized target area. The target areas are based on geographic location. The "local" area is defined as the state of Indiana. The area referred to as "district" includes the bordering states of Illinois, Kentucky, Michigan and Ohio. "Region" refers to the Northern Great Lakes States, the Central Mississippi Valley States and the Southern Mississippi Valley States, as defined by the Sectional and Urban Area Index in the National Atlas of the United States of America. Accompanying these geographic areas is a use priority system. This priority system targets local products, manufacturers and distributors for use first, then the district is second and the region is third.

Due to the predefined time allotments of the undergraduate thesis, I am unable to define my own set of criteria by which to evaluate prospective products and materials. Thus, I have researched and identified a list of credible sources from which I select the products and materials relevant to my target areas. Some of my sources include: The Sustainable Design Resource Guide, developed by the AIA Denver Environmental Committee and Architects Designers and Planners for Social Responsibility (ADPSR); The Harris Directory-Recycled Content Building Materials, developed by B.J. Harris; GREBE—Guide To Efficient Building Elements, 5th Edition, authored by the Center for Resourceful Building Technology and The Redi-96 Guide, an on-line database put out by OIKOS and IRIS Communications. These sources are similar in concept, and truly bountiful point sources for general information. However, these too are based on a national model or scope. Thus, limiting their effectiveness when applied at the local level. The Scottsdale Approach reverses this process by identifying and targeting local materials for use first, thereafter boosting the local economy while minimizing the pollutions and costs associated with transportation of materials from distant sources.

This thesis project is the just the beginning of a life-long project for me. If I am to practice architecture as I believe, architecture is to be practiced, here in the state of Indiana, then I am going to need the essential tools. I have learned the fundamentals of most of the tools that I will need. However, in order to truly practice environmentally-responsive architecture I will need to have easy access to the sustainable products and materials that are available within the state, district and region. I intend on continuing to build the Reference Guide regardless of what firm I join or what the particular design challenges of the office may be.
Magnavox employee treats city youths to camp out in the country with horse rides, hayrides and nature hikes

Dan L. Russell (in western hat) and youths from Fort Wayne's Harvest Word of Life Church prepare to take a hayride at Russell's Allen County stables on Saturday, August 3. Approximately 70 youths and 10 adults from the church stayed overnight at the stables and enjoyed hayrides, buggy rides, pony rides; a campfire and a nature walk. "Many of these young people had never spent a night in the country," says Russell, Human Resources Director/EEO/AAP. "This was an opportunity for them to take part in activities outside their normal city environment." Magnavox also donated chairs and tables for use during the weekend.
CLIENT
Dan & Alane Russell; Owner/Operator
WindRider Stables located at 22424 North County Line Road, Spencerville, IN 46788

Mission Statement: To provide a positive atmosphere to enhance self development through our horse clinics and youth camp. The program is designed to build confidence, discipline, judgement, self control, self-esteem, team work and work ethics. We encourage the importance of individual attitudes, determination, and respect for others.

WindRider Stables feels that our communities are lacking recreational and outreach programs that assist our youth in developing. They feel that by providing such programs they can assist some of the youth in a positive manner, by showing and teaching youth that there are different types of "quality of life". WindRider Stables provides the opportunity to experience life outside the city, a life that may alter their choices in a positive way. Through activities such as, hay rides, youth camp outs, bonfires and nature trails, WindRider Stables helps to develop team work and respect for one another, as well as, enhancing self image, self-esteem, work ethics and direction within themselves and toward others. WindRider Stables specializes in youth, to ensure continuous self development. With the fast pace of our society our youth continue to face constant pressures from parent(s), society, peer groups, drugs, gangs and pregnancies. WindRider Stables is an opportunity for youth to grow and develop in a positive direction. Most youth will develop a special bond with animals and many have dreamed about owning, riding or just being around horses. Through the clients thirty years of experience with horses and youth, Mr. and Mrs. Russell have found that horses really bring out those hard to reach developmental areas. He is able to reach these difficult areas through the horse clinics. Mr. Russell teaches and supervises each clinic to assist or guide each youth through their developmental process.

WindRider Stables specializes in good old-fashioned fun! Mr. Russell has been raising and training horses for over thirty years. He has been teaching kids basic horse and showmanship for many of those years. Some of the horse clinics and recreational activities that WindRider Stables provides are:

**Horse Drawn Rides**
- Hay Wagon Rides
- Sleigh Rides
- Buggy Rides

**Horse Clinics**
- Good Old Common Sense And Body Language
- How To Read Your Horse
  - Your Safety Around Horses
  - Major Points And Parts Of The Horse Body
  - How To Tell When Your Horse Is Having Problems
  - How To Correct Some Bad Habits
- Understanding How The Horse Thinks & Their Social Patterns
Horse Clinics Continued
Proper Care And Maintenance Of Your Horse
  Proper Grooming And Show Preparation
  Basic Hoof Care
  Proper Stall Maintenance
  Proper Feeding, Vitamins, And Fitness Program
    (based on your horses condition)
  Proper Worm Control Program
  Vaccinations And Proper Administration
  How To Manage And Care For New Born Colts

Harnessing Draft Horses
  Learning The Parts Of The Harness
  Proper Care And Maintenance Of The Harnesses
  How Does The Harness Work On The Horse
  How To Hitch A Team To A Wagon
  How To Drive A Single Or A Team Of Draft Horses
  Beginners Driving Classes For:
    Hay Wagon
    Sleighs
    Buggies
    Mud Boat

Diversity
  Tour Amish Draft Horse Farms
  Visit Amish Tack Shops (Horse Supplies)
  Attend Draft Horse Shows

Camp Site--Entry To The Youth Camp Is By Horse Drawn Wagons
  Fishing Pond
  Nature Trails
  Bon Fires For Cook Outs
  Hay Wagon Rides Through Seventeen Acres Of Woods
  Youth Fellowship
  Group Or Family Reunions
  Church Retreats/Reunions
  Women And Men Retreats
  Private Or Company Sponsored Activities Or Meetings
  R&R (Rest And Relaxation)
Seasonal

Summer
  Youth Activities
  Horse Clinics
  Church And Private Group Sponsored Activities
  Tours To See New Born Colts
  Nature Trails

Fall
  Horse Drawn Hay Wagon Rides
  Halloween And Private Parties
  Youth Campouts
  Reunions

Winter
  Bob Sleigh Rides Pulled By Belgian Draft Horses With Christmas Bells Ringing!

Currently, many of these activities are creatively utilizing the existing hay loft and barn on the WindRider Estate, as its main facility. The client feels that a separate activities building is needed; so that the outreach activities can take place simultaneously with daily routine of the stables.
SCOPE

The Activities Center will be utilized in all seasons and should provide a flexible, multiuse environment that accommodates sleeping, eating and an area for group activities. An indoor and outdoor area for small-scale food preparation is needed. Both interior and exterior spaces for gathering are desired. The Activities Center and WindRider Stables need to maintain their separate identities, without infringing upon one another, yet work in conjunction with one another. Entrances for the Activities Center and WindRider Stables need to be isolated from one another, to minimize encroachment upon one another and reduce unnecessary traffic. There should be a relationship between the Activities Center and the stables without being visually intrusive to the residence located on the WindRider Estate.

The client has expressed a desire for a strong link between the interior and the exterior spaces of the building. Most activities currently take place outdoors, deeply engrossed within nature. However, there is a need and desire to be able to continue these activities in the event of inclement weather.

The current outreach activities typically involve small groups of children ranging from toddlers to teenagers. These groups are usually under ten in number and are always accompanied by chaperones. The client has held a number of events for larger groups and would like to expand their activities at some point in the future. WindRider Stables would like to plan and design this Activities Center to allow for future growth.

Initial target square footage--3300 square feet.
Initial target group size--16

The client has asked that I pursue a pole-construction approach, as they are familiar with the functionalism, aesthetics and cost effectivness of this typology through their existing barn and arena.

DESIGN CRITERIA

WindRider Stables’ commitment to the development of children is matched only by their love and respect for the natural environment. When WindRider Stables hosts a group of kids, they try to teach respect for the natural environment through their actions, offering another positive role model. The stables currently use photovoltaic cells to collect and store energy from the sun, for use on the electric fence. They also practice natural fertilization through the reuse of horse manure, as well as, composting kitchen wastes and other biodegradable materials. All of these actions allow WindRider Stables to lead by example. The Activities Center will be an extension of these beliefs.
Specific interests include:
- The exploration of composting toilets to handle human wastes, rather than using conventional septic systems that could potentially contaminate ground water. The compost that is created would then be returned to the "loop" as fertilizer on gardens and landscaping that the kids have adopted and call their own.

- The possibilities of developing a grey water system that would handle all waste water from showers and sinks. This grey water would then be used in the gardens and landscaping on non-edible plants.

- The exploration of the benefits of straw bale construction combined with the cost-effectiveness of pole construction. This low technology construction method would allow groups to assist in the building process, cutting labor costs and helping to reinforce work ethics and a sense of place.

The Activities Center should continue to develop the rural context, that the WindRider Estate displays. The natural beauty of the site should only be accentuated by the Activities Center and any built form. Rustic forms and spaces that speak of the countryside and its simplicity should be in equilibrium with highly functional, inviting spaces.

An underlying connection between the interior and exterior is desired. Many of the activities that WindRider Stables currently offer, take place outdoors. However, a strong indoor and outdoor relationship in the eating and gathering spaces is desired. This could occur by utilizing adjacent spaces that could be opened up to be used as one large space, or as separate spaces connected by circulation or fenestration.

WindRider Stables would like to explore the possibilities that pole construction has to offer. They are familiar and comfortable with the functionalism, maintenance, aesthetics and cost effectiveness of this typology through their existing barn and arena. They would also like to investigate the possibilities of forging pole construction with an in-fill straw bale system. Straw bales are a readily available resource in this area and offer an R-value of up to 52.
SPACIAL REQUIREMENTS

The Activities Center should provide a flexible, multiuse space that is easily adapted to its multiple functions. At the same time, it should provide for a core group of activities that will remain constant. The spaces and their corresponding activities are as follows:

Ground Floor
Kitchen
The kitchen will be used for small scale food preparation. The guests or visiting group provides all food and utensils. The kitchen is primarily to reheat food and to act as a main serving point for indoor meals. Some small scale food preparation will occur, although kept to a minimum. The kitchen would act very much like a kitchen in a fellowship hall of a small church. Major components are:

- Two residential type refrigerator/freezers. These items could potentially be donated, or purchased from a used appliance center.
- A three bay sink, possibly integrated into the grey water system.
- Adequate counter space for food preparation and serving line.
- A residential type range and oven. These items could potentially be donated, or purchased from a used appliance center.
- Small scale cabinets, for short term storage.

Indoor Eating
The indoor eating space shall provide space for a group of twelve. This could be accomplished through folding cafeteria style picnic tables and/or bar seating that also can be used as the serving line for larger groups. This space should remain open, as to be able to be used in conjunction with other spaces, in the event that a larger space is needed. Also, this space should have a relationship to the outside and/or provide an area outside for eating.

Indoor Gathering
Indoor gathering should be flexible, in that it too could be opened up to be combined with other spaces to provide a larger space. This space should promote interaction of small and medium sized groups, much like a lodge or fire place environment. This would be an ideal place for a wood-burning stove to be located. Furniture should be flexible and moveable, as to accommodate larger groups and activities. The gathering space should have a direct relationship to the exterior, so that it may be opened up and used as an indoor/outdoor space in appropriate seasons.

Restrooms
Two restrooms at approximately 100 sq. ft. each, shall be provided. These washrooms should explore the use of both a composting toilet system and grey water reclamation system. One of the restrooms needs to promote use, by disabled guests. Restrooms shall include a shower, sink and room for changing.
Ground Floor Continued

*Circulation/Overflow*
Circulation should promote direct access throughout the building, while taking care not to sever the space. This space could also be used as overflow space in the event of a large scale activity or group.

*Small Scale Sleeping*
This space should provide adequate sleeping facilities for disabled guests, but could also be used for chaperones or other adult guests. This space should have a degree of privacy, in the event that it need be used by disabled guests. Major components are:
- Bed
- Small scale storage

Second Floor Balcony

*Sleeping*
The indoor sleeping areas should provide for an initial target group of 12. An open, almost dormitory type space is desired. This might be accomplished through the use of bunk-beds and an open plan. A split balcony system that would allow for easy separation of age groups and/or genders is desired. Also, space should be allotted for a chaperone. This balcony should remain open as to foster a visual link between the second and first floor, creating a larger volume of space. Spacing of beds should accommodate for small amounts of personal space.
SITE

WindRider Estate:

The Estate is located at 22424 North County Line Road Spencerville, IN. WindRider Stables is nestled into thirty-three acres of woods and pasture. The residence, arena, barn and front pasture occupy the northern third of the property. The middle slice is the back pasture, and the southern most third is the woods and existing trails. The Activities Center is to be cited in the clearing of the woods. The clearing currently exists, so there will be minimal displacement or loss of existing trees.

Currently all electrical power to the estate comes in along the western property line. The power poles currently enter the site from the north and then cross over establishing a base point at the southeastern corner of the barn and arena. It is the intention of the client to establish electrical power to the Activities Center, by continuing along the western edge of the property to the initial site. This demonstrates a need for the Activities Center to be located as close to the western edge of the site as possible, to minimize the costs of establishing power. WindRider Stables currently utilizes the natural and free benefits of the sun by implementing the use of photovoltaic panels for collecting and storing power for the electric fences around the perimeter of the pastures. They have expressed an interest in continuing and expanding this alternative source power, to possibly include providing partial power for the Activities Center. There are no other public utilities available to the estate. Fresh water is provided through a well system. All sanitary waste are handled through a septic tank and mound system located between the house and barn. The client has expressed a direct interest in identifying and implementing alternative forms of waste processing.

The entrance to the Activities Center, off of North County Line Road, is located along the western property line. This “service entrance” leads back to the clearing where the existing trails all convene. The nature trails consist of a network of paths that weave through the woods and across a stream that snakes through the site. The trails have been cleared and are maintained so that a hay wagon, bob sleigh or a walking/hiking group can easily and safely pass. The clearing is approximately 463'-'0" on the east-west axis and 300'-'0" on the north-south axis.

CONTEXT

WindRider Stables is located about ten miles east of Grabill, one of Indiana’s strong Amish Communities. When journeying to the site, it is quite possible that you may have to pass a horse drawn buggy or two. The immediate context escapes even the urbanity of Grabill. State highways and country roads lead you through the patchwork of fields and woods, and through adjacent fields being farmed by the technologies of two different eras. A John Deere tractor on one side of the road and a team of Belgians pulling a plow on the other, yet both wave and motion, Hello! The estate itself is nestled into thirty-three acres, one-third of which is wooded, the other two-thirds are occupied by the house, barn, arena and open pasture. The site for the Activities Building is a clearing within the woods, where the nature trails all convene. This rural countryside is in high contrast to the streets of the inner city. Relaxing, quiet, tranquil, refreshing--these are all qualities that the site invokes. Here in the subtle country is where WindRider Stables hopes to alter lives in a positive way by showing kids that there are different ways of life, ways of life that are equally as important.
NOTE:

For the purposes of the “required bound” thesis book I would like to concentrate on the final design. I have provided a few of the critical points in my design process, in order to show where the final design originated from. For a complete walk thru of my design process please see the accompanying cd-rom.

CONCEPTUAL

The initial design concept is very simple. The winter winds come from the northwest: I wanted to try to buffer the building from the cold winds. On the other hand the summer breezes come out of the southwest, and I wanted to maximize the use of natural ventilation. You can see in this diagram some initial thought on spaces and locations. Such as, the wagon turn-around, outside gathering and dining spaces etc. The red dashed lines are the existing circulation patterns or trails. One main entry, spreading out into smaller trails.
PRELIMINARY

This is the first design that I felt had potential. This is where I researched an optimum form. I found information in "Design With Climate", by Victor Olgyay, that suggested that the optimum form is a rectilinear shape with longest sides oriented on an east-west axis. Olgyay suggests a ratio of 1:1.6, with a maximum of 1:2.4. Some of the key issues that I was dealing with here were:

- Working with an open plan
- Addressing vertical circulation
- Efficient form
- Straw bale infill system

Open Plan
Through developing the program with the client, I found that the client had a desire for the facility to have a flexible and open floor plan. This would allow him to accommodate a host of functions and activities within the same space. In this design, I was juggling the open plan with weather-locks, gathering and eating spaces and the vertical circulation. This design allowed for the weather-lock system to open up in the summer time to facilitate natural ventilation.

Vertical Circulation
At this point in this design, I chose to change from a traditionally framed stair system to a manufactured spiral staircase. I came to this conclusion after a great deal of discussion with my thesis advisor, Dan Woodfin. Dan made some very insightful comments, that allowed me to make a more informed decision. We discussed how a traditionally framed staircase will typically consume a large amount of floor space or area, and at a substantial cost per square foot. Dan suggested that I consider using a spiral stair. By using a spiral stair I would reclaim my lost square footage, while adding an elegant visual element to the space. However, there were some concerns about emergency egress that I would have to confront.

Efficient Form
Originally, the floor plan was flipped. When the spaces were reversed, I had to deal with the kitchen being placed in an open ceiling situation. I chose to break from the optimum form slightly, by bumping the kitchen to the north. This kept it out of the main ceiling system and allowed me to help cool the kitchen in the summer time, through the use of high windows and the venturi effect.

Straw Bale
Notice the thick walls formed by the straw bales. I began working with the rich depth early on, trying to incorporate shelving and built-in seating. The interior of the facility would be finished with plaster, giving a strong sense of texture and character. This deep beauty is accompanied by thermal efficiency. Here, I was using a two-string straw bale with the rough dimensions of 14" high by 18" deep by 3'-0" long. This size bale can provide up to R-52, depending on orientation and finishing materials. In theory, this facility would not need a heat source. The body heat of its occupants, any appliances and/or cooking would release enough heat for the entire facility.
Diagrammatic Section
This section really begins to speak of how the form was manipulated, to assist with the natural cycles of air moving through the space, as it is heated or cooled. The building took full advantage of the rising hot air, by directing it up and into the path of the cross ventilation, that would draw it out through the clerestory windows. The kitchen also had windows up high, to facilitate natural ventilation and venting of hot air from the kitchen.

North Elevation
In this rendering, you can clearly see the clerestory windows at the peak of the facility, as well as, in the kitchen. This view also shows the relationship of the balconies with their bold overhangs. These were outside spaces for the second level that could be used as a balcony or semi-sheltered sleeping area and as a means of emergency egress.

South Elevation
In this elevation, you can see how the exterior sun spaces are directly adjacent the main gathering spaces on the interior, so that the two spaces can be opened up and used as one large space. On the right side of this rendering, you can see the exterior eating space that also housed a built-in grill for small scale cook outs.
Sketch Model
In this sketch model, you can see how I pushed the lower level back, causing the upper level to form an overhang. This was done to create a built-in sunshade for the windows and doors on the first floor. Given the amount of penetration on the first floor, I did not want the lower level to become overheated by the summer sun. You can also see the shadows that were formed by adding relief to this facade. Another prominent feature of this facade is the chimney, with its bold verticality. I was also looking at the chimney, housing some signage for the WindRider Youth Camp.

Sketch Model
One of the things that I learned from this design was that the concept of using the clerestory windows was right on track. However, I had them facing the winter winds which makes for a potential heat sink in the winter time, unless some sort of insulating panels could be used. So, I knew that I had some reworking to do regarding the clerestory windows. Also, I was not sold on the kitchen breaking away and jutting out like that. It just did not feel right; it feels awkward and applied.
Preliminary Site Plan

Note: This site plan has been rotated ninety degrees for the purposes of display. Please note correct orientation of north.

This sketch shows an initial design of the building site. The building shown here has changed, but the overall layout of the site has remained the same. The major components of the site are as follows.

Windbreak
The design has changed, in that, I have opted to use a natural windbreak, created by blending conifers with the existing stand of trees. This provides an excellent wind break throughout the year. I consulted with student colleagues from the Landscape Architecture program, to develop the best strategy for staging and arranging the species best suited both for rapid growth and a slower more substantial tree.

Entry
The entry to the site has remained along the western edge. All entry to the site is by horse drawn wagon. The wagons enter the clearing and begin to snake between the trees that make up the wind break, making their way to the covered drop-off area. This drop-off area was designed as a two story space, to facilitate an outdoor sleeping area on the second level. This structure is made of reclaimed timbers that the client has located from local Amish barns that have fallen.

Future Growth
To the west of the covered drop-off is the expansion site for future bunk houses. The client specifically asked that I plan for the future redefining of the Activities Center. At some point in the future the client anticipates building separate bunk houses to house all of the sleeping spaces for the facility. This will free up the spaces in the Activities Center for other functions and activities. The client also expressed that he would like to see these bunk houses take on a very “camp like” atmosphere. I chose to nestle the bunk houses into the existing woods, west of the drop-off point.

Fire Pit/Storytelling
As visitors arrive at the facility they will find themselves drawn through the fire pit and storytelling area, on their way to the main facility. This space is one of the most active spaces in the entire facility. Everyone loves to sit around a campfire and tell ghost stories. This space is also used as a main gathering space for lectures and guided tours through the nature trails, as well as, a staging point for hay wagon and sleigh rides. The seating for the circle is plastered straw bales; durable, cost effective and easily maintained and replaced.

Activities Center
After passing through the storytelling area, all visitors enter the west entrance to the Activities Center. The facility picks up on the axis that has been laid out both in its entrances and its interior spaces. Again, the building shown on this drawing is not the final, but the orientation remains the same. The facility also directs you through to the eastern edge where visitors would pass through a screened-in-porch, directly adjacent the playground.
Playground
Directly east of the Activities Center is the playground. This is not a formal space, but space clearly designated as open play area. The client asked that I provide areas for sand volleyball, horse shoe pits and space to play football or baseball. I also included a “jungle-jim” that has been made from 100% recycled plastic.

Gardens
Next on axis is the garden spaces. The gardens are a combination of vegetable and flower gardens and adopted plots. There are six 10'-0" by 10'-0" plots that can be adopted by youth groups, churches or other organizations. The intention of the garden spaces are to teach the youth responsibility and respect for the natural environment. The client feels that by allowing kids to grow and maintain their own gardens they will begin to become more responsible for their actions while having fun growing their own flowers and vegetables. Many of the kids who visit the facility do not have the opportunity to get involved on a personal level with nature and its true beauty.

Arena And Demonstration Areas
The arena was specifically designed to accommodate horseback riding lessons, horse shows and special riding events. The client asked that I keep this area enclosed for safety reasons. I chose to continue using a recycled rubber fencing material that the client uses on other parts of the estate. The demonstration area is a special area where the client can demonstrate many of the pieces of equipment that are used by the Amish and English farmers. Such as the plow and mud boat. These demonstrations begin to expose kids to alternative life styles and methods of doing things, in hopes that by exposing the kids to a variety of things, that they will help the kids to grow in a positive direction.

Corn Crib
Anchoring the end of the man-made spaces is the corn crib. This element is design as a vertical icon and anchor to the grounds. I chose to reuse a corn crib and turn it into a screened in seating area on the lower level and an observation point on the second level. The corn crib is situated between the arena and demonstration areas, so that some visitors could sit in the shade, while enjoying any of the events that might be going on. General seating for events taking place in the demonstration area or arena is through a grassy mound that encircles the corn crib.
This is where I took a major turn in my design process. And I owe it all to my thesis advisor Dan Woodfin. While finishing our weekly crit, Dan hit me with "You're not listening to your client!" I was taken by surprise, as he explained his comment. "If your client really wants to build in a pole-barn fashion, then you should try to address these leads and give him the best, most eco-sensitive pole barn that you can." We talked for a while longer and I came to the conclusion that I had to make a serious decision. Up to this point, I was approaching this project with a sort of Dr. Jeckyll and Mr. Hyde style. Where I was designing for thesis on one hand and designing for what the client wanted on the other. I quickly realized that the two were steadily moving in different directions. I have a great deal of respect and admire Dan for telling me the truth on that morning. It was one of those days when your entire design starts to unravel around you. (I know every architect and architecture student has had this fowl taste in their mouths at least once!) And you know, deep inside, that in order to do the right thing, you are going to have to seriously evaluate your design and see what you can salvage of it and then go back to the drawing table.

It was a difficult decision for me to make, but I chose to do the right thing and stop trying to forge my separate design ideas and what the client really wanted and needed. I chose to listen to my client and begin to sew these seeds into a holistic and eco-sensitive abstraction of a pole barn. I remember Dan saying, "If you really start listening to what your client is saying, there's a chance that your thesis project could actually get built". The thought of my thesis (or even a version of my thesis) getting built stirred my soul.

I will never forget the lesson that Dan taught me on this day. Dan did more than "rip" me in a desk crit, he helped me to learn something about myself as an architect.

Once I stepped back and re-evaluated my thought process, things really began to click. Fortunately, I had stayed with a post and beam structural system, that would be in-filled with straw bales. This allowed me easily to move into pole construction, keeping the overall design intent. The research that I had done earlier on proportion and optimal forms for efficiency came into play.

In the upcoming images, you will see many of the same concepts, in many of the same orientations. However, you will be able to see how this was a turning point in the design, that I think has strengthened it by twofold.
Composting Toilets
This is one of my most surprising and exciting moments of the entire design process. I had been working on a composting toilet system and I was getting ready to pitch it when the client brought up the issue of dealing with wastes. He went on to say that when they had built the house, the septic tank and mound system had cost them in excess of $7000. They were not interested in spending that much money on the waste system for the Activities Center. They had discussed using outhouses and port-o-potties, but disliked the odor and appearance of both. That is when I made my pitch. I was elated, I thought that this was going to be a hard sell. I went on to explain that I had found a system in a book called, "The Toilet Papers", by Sim Van der Ryn. This composting system would allow us to turn the wastes into compost, for use on non-edible plants, with very little maintenance. The client was way beyond interested! He loved the idea. In fact, when we were discussing the turning of the compost and maintenance schedule he said "Hell, I shovel horse manure every day, stirring a little compost will be nothing!". He went on to say, "I will just put it in the manure spreader with the rest of the fertilizer". Our main concern was, could we do this for less than $7000. If not, then it would hardly be worth it, except for the educational aspects of showing the kids alternative ways of dealing with wastes.

Designing For Accessibility
In this design proposal I added a few more items to my plate. The noteworthy points of this design are the incorporation of the composting toilets and the designing for equal access.

The composting toilet system requires a 40" chamber below the "seat". This meant that I had to raise the floor of the restrooms to 40" above the finished floor. Obviously, this brought serious design ramifications. It was about this time when Dan and I were discussing making the Activities Center accessible. In short, I have to provide equal accommodations for disabled visitors. This meant that I needed to make the restrooms accessible, as well as, provide accessible sleeping in lieu of the balcony sleeping quarters. You can see the "demon" ramp that I was working with, and the accessible sleeping. This layout quickly grew out of scale and started altering the design intentions. I also questioned which would be more cost effective, framing the entire restroom and accessible sleeping at 40" AFF or dropping the compost chamber below grade?

I was still fighting with the idea of the traditionally framed staircase verses spiral stairs and implementing weatherlocks. Both consume a great deal of area. However, I felt strongly about utilizing the weatherlocks to avoid cold drafts and losing heat in the winter time.
DESIGN DEVELOPMENT

This is where the design really began to come together as an entity. There are still a great deal of details to be worked out, but I finally found the niche that I was looking for. Now I just had to refine it!

You can see many of the same concepts beginning to come to fruition. I have been relatively successful in working out many of the problems I was having with the weather locks, composting toilets and vertical circulation.

*Spiral Stairs*

I have decided to go to a spiral stair for a couple of reasons. One: it gives me the floor area back, that is greatly valued; and two: it is more cost effective. Dan and I discussed these issues and he believed that I could get a metal spiral staircase for about a thousand dollars. This will not only provide the needed circulation, while requiring minimal floor area, but it will add an elegant visual aesthetic to the interior.

U.B.C.

Dan walked me through the red tape of U.B.C. I found that circular stairs can be used for emergency egress (*contrary to belief in one of my bench marks*). However, the circular stair cannot be fed by more than 400 square feet. Since I have two separate balconies, each falls under the maximum capacity.

*Weather Locks*

This became a difficult issue. I felt rather strongly about keeping them for energy conservation reasons. However, I agreed that they were eating up valuable floor space. One of my consultants, Jeff Culp, suggested that I turn to the client and get a better handle on what activities were planned during inclement weather and what kind of traffic flow would result from these activities. So, that is what I did, and sure enough the problem began to become less intricate. The client intends on utilizing the facility during the winter months primarily for bob-sleigh rides. They felt that these events would not take place a great deal, typically occurring near the Christmas holiday. They also felt that traffic would be a minimum, with the entire group coming and going at the same time. I took this information and ran with it. I decided to utilize a single weatherlock on the eastern side, that doubled as a mud room. This would allow for the shedding of muddy boots and clothing throughout the year.
Composting Toilets
This issue worked out rather nicely. It was suggested by one of my colleagues (Mark Darrall), in one of my benchmarks, to look into an old root cellar format. By dropping the chamber below grade, I had to develop an access area that would be 40" below grade. A root cellar fit the context that I am working in, so I decided to take a closer look. I knew that I would need enough room, so that the client could open the access panels and stir or shovel the compost into the front end loader, that he would park adjacent to the access area.

Sketch Model
You can see the exterior “courtyard” that was created by the two wings. I was envisioning a trellis system that would be covered in vines. One of the deciding factors to move away from this design came from the cocky framing that would have to take place where the hip of the verandah met the exterior wall of the restroom and accessible sleeping.
Crows Nest
One other issue that came out of the dual balcony system was this idea of a "crows nest". Originally, I had designed the balcony as a connected space. However, code limitations for fire spread and occupancy loads specified that the balconies had to be two separate entities. The space that had joined them was intended to be for the chaperone, to act as a "gate keeper". One of the ideas that Dan and I discussed was the crows nest. Where the floor level would be dropped below the floor level of the balconies, directly atop the mud room. This area would be accessed via a ladder next to the spiral stairs. This would adhere to code and still give the chaperone visual access to all parts of both balconies. I took this idea to the client to see if they were interested in pursuing it. They loved the idea!

Straw Bale Details
Once I set a course for designing a eco-sensitive pole barn, I started looking at ways that I might be able to better insulate the thin exterior walls. This fell right in line with the straw bale ideas that I had been proposing earlier. I began to work on the pole construction with a bale in-fill. One of the dilemmas that I encountered was, how to get the facility built quickly so that the client could start using it? The client wanted to move in as soon as possible, and begin hosting groups from local churches and other youth groups, as well as, start generating revenue. I needed to be able to have the shell constructed and finished out and then be able to come back the following season and add the bale in-fill system. This would allow the client to utilize the facility soon after construction was complete and build up capital for the bale work to be done. This presented a interesting problem, in that the exterior of the bale wall is typically finished with a plaster. This would be virtually impossible without removing the exterior cladding system. So I consulted Dan on how this might be accomplished. Dan suggested using an air barrier such as Tyvek or Barricade. This would allow the bale to breathe and expel moisture that it may have or that is passing through. We looked at a system where Tyvek or Barricade could be stapled to the interior of the purlins and then secured to the floor and ceiling. The bale would then be placed directly adjacent the air barrier and could be finished as desired on the interior.
Straw Bale Details
Here Dan and I were discussing how I could secure the bale wall within the load bearing frame. I was proposing, using a similar system to what is used in load bearing bale walls. Where the bales are impaled on all-thread and the top and bottom plates are tensioned together.

I was proposing a top and bottom plate system where the wall would be penetrated at both the top and bottom bales and secured to the floor system and to the top of the structural wall system. When I stepped back and started thinking of the construction sequence, I realized that I would not be able to drive all thread through the upper courses, due to the roof system in place. Dan suggested that I use a bottom plate, so that I would have a nailing edge for any interior finish materials. On the top plate, we designed a system that accounted for any settling that might take place in the bales. Essentially, the top plate would have a piece of angle iron bolted to it, so that the vertical leg was parallel the 6" x 6" beam. This angle iron would then have slots cut into it and be bolted to the beam. This provided the lateral support needed while allowing for settling or bale compression. The bottom course of bales would still be impaled on threaded rod, that is bolted through the subfloor system. However, this rod would only extend into the first bale. The rest of the wall would be pinned with rebar (two per bale) that extended into the bale below.
Corn Crib
This is a sketch from one of my colleagues, Greg Miller. We were discussing using the corn crib as a vertical element and anchor at the eastern edge of the site. This is what he envisioned.

Corn Crib
Here is a sketch that I had done one afternoon during a slow lecture. My architectural desire ran away with me, but I would like to see something along these lines. In this design the lower level would be used as a screened in seating area, while the upper level is used as an observation deck. Atop the structure is a rainwater collection basin. This would provide irrigation for the garden areas, via gravity feed. This obviously is a bit grandiose. However, the client was thrilled about the overall design concept.
Ridgevents
Here I was working on how I could vent the hot summer air up and out of the structure. Originally, I drew on my framing experience and tried to develop a continuous ridgevent system. However, this was not going to work if I was going to use the recycled aluminum shingles that I had been considering. So Dan helped me to start developing a monitor system, where I could use the prevailing winds, to draw the heat out of the space. This monitor system is explained in more detail in the Final Design section.

Structural Model
These photos of a 1/2" =1'-0" Scale model that I built to explore and get a better understanding of pole construction methods. You can see in the uppermost image the 2" x 6" purlins that I was using to attach the exterior cladding, a typical detail. I also chose to keep the floor joists open and exposed. I felt that this lend itself to the context of rural forms and construction.

Structural Model
In the photo on the left, you can see how I am considering certain materials. Here I am exploring the use of corrugated aluminum cladding. There are a few factors leading to this selection. One: I have been unsuccessful in locating a sustainable metal cladding system for the Reference Guide. Two: I chose to use the corrugated aluminum based on aluminum's high recycled content and recyclability. Three: This type of cladding is widely used in rural forms such as silos, corn cribs and other farm outbuildings. The lumber for the facility will be coming from Menominee Tribal Industries, a Menominee Indian reservation, that operates a sustainable managed forest in Wisconsin. I found this resource while researching the Reference Guide.

The photo on the right shows an older roof design, where I was considering using trusses. At this time, I felt that trusses would be the most economical method of roofing the facility. However, I reflected upon my framing experience and realized that trusses are sometimes difficult to deal with, on a small scale project. Dan made a good point regarding the cost of having a crane on site. The cost of a crane might exceed the money saved by traditional rafter framing.
In the previous pages, I have established a base, from which the final design was transformed. Many of these concepts and details have remained the same, while others have undergone dramatic change. In the following pages, you will see how I have synthesized these concepts and details into a beautiful, functional and sustainable facility. I have gone to great lengths to keep this facility based in the realm of reality, rather than designing in “fantasy land”. I have continually met with my client, giving and receiving feedback, as well as, direction. I have drawn upon my construction experiences to help keep the design both “easy” to build and economically feasible. My consultants have continually offered design, economic, and sustainable information, that I have tried my best to utilize in the most appropriate manner.

When I first started this thesis, I knew in my heart, that designing a tool for architects and designers to access information on sustainable building materials was the right thing to do. I knew from my own experiences, that this was something that was badly needed in our area, our profession and in our society. It has been a long and difficult road, but I would like to share a few of the best moments of my career. All doubts and fears were left behind when I was approached by two different faculty, asking if I would present my thesis and the Reference Guide to their studios so that they could use it as a design tool. But, my deepest feeling of satisfaction came when I used the Reference Guide in my own design. As I have said before, I will continue to develop the Reference Guide throughout my career, so that myself and other architects and designers can begin to make more eco-sensitive decisions regarding building materials.

I am proud to say that Mr. and Mrs. Russell, have full intentions of building the WindRider Activities Center. Granted, this design is far from being complete and ready for construction, but then again, construction documents were never my goal. I was asked to provide direction, design expertise, and vision, to help design and implement a strong concept that materialized the clients programmatic needs and desires, in the built form, as well as environmentally.
Foundation Plan
This drawing is fairly straight forward. There are no fancy tricks or breathtaking renderings. However, this is a vital part of the design and the price you pay for designing in the realm of reality. I truly wanted to know how the foundations and footings were going to work. I have shown the location of all of the foundations, columns and footings, where the control joints are, and all necessary dimensions. I felt that it was my job as architect, to provide the client with as much detailed information as I possibly could. To me, the boring and tedious job of foundations, is well within that scope.

The interesting part was reducing the environmental impact, of this portion of the facility. I chose to use a resource, that is a waste product, from coal-fired power plants; fly ash. In standard practice fly ash can be used as a replacement for 15% to 35% of the cement, in the concrete mix by weight, depending on the type of fly ash and the application. Fly ash can also provide part of the fine aggregate needed in the concrete. Fly ash adds strength and durability to the final concrete product, and reduces material costs. Concrete containing fly ash cures more slowly than traditional concrete, but is easy to work with and provides a slightly smoother finish. In this case I not only increased the sustainability of concrete, but also diverted fly ash from our overburdened landfills.
I located a distributor called:
American Fly Ash Company
1250 E. Diehl Road
Naperville, IL 60563-9338
708-508-3060
708-505-0330 Fax
800-323-5949
Ground Floor Plan
The major revisions to the plan, include flipping the restrooms and the accessible sleeping areas to the west edge, and the addition of another mud room/weatherlock. The overall concept of keeping an open plan, has remained the same. This allows the client to utilize the facility in a variety of ways, accommodating both the small personal group, or a large party.

Restrooms
The able-bodied restroom is tight, yet functional, providing a composting toilet, sink and shower. The sink and shower are hooked directly into the grey water system. The accessible restroom provides a comfortable space, that can be used by visitors with a disability. Included are: roll-in shower, composting toilet and sink. Note the vent tubes that penetrate each space, allowing gasses to escape the composting chambers below. The composting system is a dry toilet system, that naturally processes human waste. The system is based on a model that Sym Van der Ryn uses in his book, The Toilet Papers. (See the section of compost chamber for more details.)

Kitchen
The kitchen was designed for small scale food preparation only. The client wanted to be able to provide space for groups to essentially, “heat and serve.” Small scale food preparation can take place to accommodate limited group sizes. However, the majority of the time, it would be used in a cafeteria serving line style. Very similar to how a kitchen in a church or fellowship hall might be used. Major components include: a three bay sink, range and oven, two residential scale refrigerators and limited cabinet space. The counter top that faces the interior space, doubles as a serving area and small “breakfast bar.” The appliances will be purchased or donated from local, used appliance dealers.

Mud Rooms/Weatherlocks
These spaces have essentially remained the same. With the exception of the addition of the eastern mudroom/weatherlock.

Accessible Sleeping
I chose to separate the accessible sleeping quarters to provide more privacy. The space can be utilized by two disabled guests or by a disabled guest and their caregiver.

Heating
The client specifically asked that I look into using a wood burning stove, as a possible source of heat. I chose to take that a step further, and utilize two pellet stoves. Pellet stoves look like wood stoves, but are far more efficient (81-85%) and the pellets are made from sawmill scrap. Also, pellet stoves reduce the emission of particulate pollution, released into the atmosphere per hour, to an average of 1 gram, as compared to the 5 grams per hour, of wood stoves. I am suggesting that two Quadra-Fire model 1000 Classic pellet stoves be used. The Model 1000 Classic has a capacity of 40.00 BTU’s, and heating area up to 2,500 sq. ft. This is a freestanding unit that has a fuel capacity of 60 pounds and a burn time of 15-16 hours. I also chose to use the flues, as both decorative elements and radiant heat sources.
Ground Floor Plan Continued

**Framing**
Notice, that I also included a framing plan, within the wall thicknesses. Again, this was done to gain a better understanding of how the building was actually going to be framed, as well as, to provide the client with all relevant information. The window and door bucks are something that I learned from one of my most vital resources, *The Straw Bale House*. I highly recommend this book for anyone interested in straw bale construction.

**Insulation**
The straw bale is only used as an in-fill system, between the frame of the pole construction. The restrooms and accessible sleeping quarters are traditional stick framing. The 2" x 4" walls consist of OSB sheathing, recycled cellulose insulation and Fiberbond gypsum wall board.

OSB and Fiberbond Gypsum are nationally recognized products manufactured by Louisiana-Pacific, and are widely available at local lumber companies. OSB is engineered lumber, made from the by-products, of dimensional lumber manufacturing. Fiberbond Wallboard is fabricated from gypsum recycled paper, (cellulose) fiber and perlite and are reinforced with wood fibers obtained from recycled newspaper.

**R-Pro Cellulose Insulation**
This cellulose insulation has over 75% recovered content, and is made primarily from locally-available materials. R-Pro is manufactured by:
GreenStone Industries
4401 New Haven Avenue
Fort Wayne, IN 46803
219-420-7600
219-420-2553 Fax
800-286-8012
http://www.ston.com

**Tile**
The tile in the kitchen, restrooms, accessible sleeping quarters, stairwells and stove basins is recycled glass tile. I specifically used Traffic Tile which has over 70% recycled glass.
The tile is manufactured by:
Stoneware Tile Company
1650 Progress Drive
Richmond, IN 47374
317-935-4760
317-935-3971 Fax
Second Floor Plan
Again, the overall concept has remained the same. The loft spaces are the interior sleeping spaces. Each loft will sleep eight guests for a total of sixteen guests, plus one in the Crows Nest. The lofts are open and overlook the interior spaces below. The role and use of the lofts are likely to change in time. The client intends on building separate bunk houses, at some point in the future, and then using this space for workshops or arts and crafts. It is for these reasons that I kept the lofts free from barriers and defined spaces. This affords the client the utmost freedom in the future.

Solar Assisted Water Heaters
In the mechanical space, located on the western wall, above the pellet stove, you can see the water heaters. The hot water for the facility is provided in part, by the sun. I implemented a solar assisted water system, that utilizes a roof mounted coil system. The sun heats up the water in the coils, which is then fed directly into the hot water heaters preheated, reducing the amount of energy required to keep the water hot. This room is accessible via a removable panel.

Bunks
The bunk beds are strategically placed so that the cool summer breeze passes directly over the guests, inducing evaporative cooling (natural air-conditioning).

Closet/Storage
The framed boxes that you see adjacent the stairs serve two purposes. The Crows Nest, is accessed by ladders adjacent each stair. I needed to gain headroom toward the top of the ladder, so I cut away the floor and framed it up. I then enclosed it and designed a closet/storage area for the lofts.

Changing Rooms
The circles that you see next to the stairs are changing areas. I did not want to limit the owners flexibility by enclosing a space for guests to change. So, I opted to provide a temporary, yet private space. I decided to hang a circular shower curtain rod from the rafters. This allowed guest to pull the curtain around them while changing, and the easy removal when the bunk houses are built.

Carpet
I decided to add a splash of luxury to the loft space, by carpeting the loft areas. Because everybody knows, that there is nothing worse than climbing out of a warm bed in the morning, only to put your toasty tootsies on a chilly floor! I chose to use a modular carpet system, that is made from 100% reused/re-manufactured carpet. Milliken Precycle modular carpets are reclaimed used carpet headed for the landfill. Milliken then cleans, retextures and restyles the carpet for distribution. Not only does this carpet reduce the burden on our landfills, but it also provides the client with the utmost flexibility, when the function of a space changes.

Crows Nest
The client expressed an interest in separating young guest by sex, while sleeping. This area was specifically designed for chaperones. The space is intended for a chaperone to sleep, so that they can keep an eye on the kids in both lofts.
West Elevation
This is primarily what the guests will see as they pass through the fire pit and storytelling area. You can see how I have manipulated and massaged the pole barn typology to offer a more exciting and pleasant facade. One of the ways that I accomplished this, is by using a metal cladding, that is more exciting and dramatic. I chose to use aluminum corrugated. The corrugation provides much more relief than typical cladding, causing the light and shadow to dance with excitement. This type of siding is not new to the rural context. However, it is new to the WindRider Estate. I believe that the corrugated will set the Activities Center off, from the Arena and Barn just enough to be recognized as something different and special. I was also interested in the corrugated aluminum, based on aluminums high recycled content and recyclability.

Compost Access Area
You can see on the left side of this drawing, hints of the compost access area. The front-end loader would be pulling up from the left, so that compost could be shoveled directly into the bucket.

Signage
The circle that you see above the entry, is the possible signage for the WindRider youth Camp & Activities Center. I am envisioning a recycled plastic, that is extruded, to look like chiseled wood. Possibly a horses head in the center with the words WindRider Youth Camp & Activities Center, circling the perimeter. I know that I have found manufacturers that make signage from recycled plastic, and I have seen examples of a similar style. However, I am unsure if they do custom work as well.

Verandah
On the right side of the drawing is the verandah. This outside space can be utilized as part of the interior space for large functions, or just be used to relax in the shade. It will also be used to shelter outside activities, when the weather turns sour.
South Elevation
The elevations have come a long way, especially this one. I really like the overall form and composition that I was able to create. I think it speaks to the rural context, without being, "just a barn."

Roofing
One of the things that I was working with, was keeping the scale of the roof down, or at least how it was perceived. Since the roof comes low enough to interact with people, I wanted its components to be at a human scale. I accomplished this, by using 4" x 4" columns and a recycled aluminum shingle that looks like cedar shakes. I used a brand called Rustic Shingle by Classic Products, Inc. Rustic Shingles are made from an alloy, which is 98% recycled aluminum, mostly beverage cans recovered from recycling. Classic Products also offers a confirmation of post consumer content from Reynolds Aluminum.

Classic Products, Inc.
8510 Industry Park Drive
P.O. Box 701
Piqua, OH 45656
513-773-9840
513-773-9261 Fax
800-543-8938

Monitor
Sitting atop the facility is the monitor. This is the system that I designed, to act as a ridgevent, by capturing the prevailing wind and using it to draw hot air out of the building. You can see the operable louvers, in the three bays. The roof of the monitor will house the solar assisted water heater coils and photovoltaics, to offset power consumption.

Skylights
I wanted to be able to let light into the loft spaces, to keep them from becoming dark and gloomy. I had to balance the roof penetrations with energy efficiency. So, I kept the size small, and used a series of high efficient skylights.

Screened Porch
On the right side of this drawing, you can see the screened-in porch, where leisurely naps could be taken shaded from the afternoon sun.

Windows
Originally, I had planned to use casement windows on the lower level. Casement windows allow for 100% of the opening to be used, to let the cool breezes in. However, I was concerned with small children being injured on the sharp corners of the open windows. So I opted to increase the size, and use a horizontal sliding window. The windows in the loft areas are hopper windows, that allow the breeze to pass directly over the occupants.
North Elevation
The north elevation is essentially the same as the south, with the exception of the compost access area. You can see the compost access area to the right of the drawing, under the verandah.

Compost Access Area
The client intends on using this area as a tool, or example, to teach visitors about the natural environment and its magnificent processes. The decking that you are seeing, is made from recycled plastic lumber. This decking is actually a “trap door” that is winched up to access the composting chambers. I ramped up to this area, so that any disabled guest would be able to get directly next the chamber, for any presentations or demonstrations. See the section of the compost access area for more detailed information.

Windows
The windows on the north and south facades are directly in line. This was done so that the prevailing summer breezes can pass through the facility unobstructed. This will help draw the hot air out, and cool the occupants. The small window is located in the kitchen.
East Elevation
This elevation is a very exciting facade, with the addition of the screened in porch and flanking verandah spaces.

Screened Porch
I designed this porch, so that when the client is hosting a group of young kids, the chaperones can sit in the comfort of the screened-in-porch, while watching the kids play on the playground. This space can also be to host activities during inclement weather.

Windows
The four windows located at the entry are designed to allow a “sneak peak”, into the facility. They were strategically placed at heights, that would accommodate adults and small children. The windows themselves resemble glass block, but are actually a Lexan resin (plastic). Loc Blocs were co-developed with GE, and are offered by Glass Alternatives Corporation. Loc Blocs are unique, in that they are a 50-50 blend of virgin material and recycled (in house) scrap, lightweight and easy to handle, 98% UV shielded, 25% better insulating and 200 times more impact resistant.

Glass Alternatives Corporation
65 Fochtman Industrial Drive
Petoskey, MI 49770
616-347-1135
616-347-1232 Fax
Wall Section
I have discussed many of the components of the wall section already, so I will concentrate on the materials that I have not covered.

Insulated Nail Board
Designing the roof system was one of my most difficult tasks on this project. I needed to reach a very high insulative value, in a very shallow space. I chose to design a system that utilized a conglomeration of products, to achieve an overall r-value of 47. The 4" NRG Insulated Nailboard was used directly on top of the roof sheathing. Nailboard is made of polyisocyanurate foam core, bonded to OSB, with an r-value of 27.3 for a 4" panel. I chose this product based on its high r-value to thickness ratio.

NRG Industries
1215 West Dewey
Bremen, IN 46506
219-546-4666
219-546-2982

Fiberglass Insulation
The FSK-25 Fiberglass Insulation was placed between the rafters to help build the desired r-value. FSK-25 is a batt insulation, made with a certified minimum 20% recycled glass (15% post-consumer remelted bottle glass; 5% pre-consumer glass). FSK-25 is manufactured by Manville Building Insulation.

Manville Building Insulation
P.O. Box 105545
Atlanta, GA 30348
404-449-3300
800-368-4430

Straw Bale Details
You can see the top and bottom plates that were discussed earlier in this book. The left over space, above the bales and along the band joist, will be filled with site cut bales, to create a continuous band of insulation.

Dimensional Lumber
All dimensional lumber is being purchased from a sustainably managed forest in Wisconsin. The forest is owned and operated by the Menominee Tribe and Indian Reservation. Exact address unavailable at this time.
Composting Section

Composting Toilets
The composting system that I developed, was based on a model, that Sim Van der Ryn presents in his book, The Toilet Papers. The system is a waterless toilet, that utilizes the natural decomposition and composting cycles of nature. Each toilet is a two chamber system, where fecal matter and urine, (and a small amount of saw dust) are deposited into a chamber, directly below the “seat”. This mixture begins to decompose and begins its natural composting cycle. Periodically, depending on use, the compost needs to be stirred and then moved to the adjacent chamber, to finish its cycle. The compost can then be used as a natural fertilizer, on any non-edible plants. The lid of the seat and access panel need to be securely sealed, to ensure that insects cannot penetrate.

The composting system is a low maintenance, cost effective and odorless way of dealing with human waste. Dan and I did a cost estimate, of this system, and found that it could be done for around $3,000, which is in stark contrast, to the $7,000 cost of a septic tank and mound system. I expect to run into a great deal of “red tape”, in getting this system past code. However, I have documented cases in the western United States, where similar systems have been approved by local and state officials. The client and I are also hoping, that we will be granted some latitude, based on the fact that the facility is being used as a teaching mechanism to educate and expose youths to alternative life styles and similarly that Amish residents in the area are utilizing natural systems. The access deck is made from recycled plastic lumber. CycleWood is manufactured by CycleMaster, Inc. and is made from 100% recycled plastic.

CycleMasters, Inc.
P.O. Box 467
Sweetser, IN 46987
765-384-4336
765-384-4346 Fax

Grey Water System
This system reclaim all of the grey water from the sinks and showers, and naturally filters it back into semi-potable water, that can be used for irrigation. This system is also based upon a model from, The Toilet Papers. In this system, water from all interior drains is fed into a main line, to the grey water filtering area, directly adjacent the compost access area. This sub-grade area, houses six fifty-five gallon drums, that are all “linked” together in a series. The incoming water passes through a filter, made of wire and loose straw, to collect any soaps, detergents and particulates. When the first drum reaches the overflow tube, it begins to spill into the next available drum, and so on. The system is designed to handle a load of 20 gallons per person, per day. I scaled the average water use per person back, since I did not have laundry facilities or water used in the toilets. The client then, can pump the water out of the drums and into a portable, “water buffalo” and redistribute it in the garden, on non-edible plants. By using the composting toilet and grey water systems, I was able to keep the client from having to install a costly septic system, while returning what our society considers waste, back to the natural cycle from which it came.
Building Section
This drawing is self explanatory. However, I will offer some of the issues and concerns that I was dealing with.

Spacial Issues
Early on, when the client and I were discussing the possibility of loft spaces, I was concerned about the space closing in on itself, with the addition of the balcony spaces. We discussed how there would be a need to keep the ceiling heights as high as we could afford, to ensure an open and airy feeling. I designed the Activities Center to have 12'-0" ceilings on the lower level and cathedral style ceilings above the lofts and atrium space. Originally, I had considered using trusses as the roof structure. I decided to open-up the space, by using a traditionally framed rafter system. I originally wanted the rafters to be exposed. However, when I began developing the roof system further, I had to close-in the rafter system, so that I could lay insulation between the members.

I line with the clients desire, to keep the space open and free from obstacles, I minimized the placement of any interior walls. I found that the column lines, defined the spaces quite well. The facility is based on a 10'-0" grid, with the exception of the restrooms and accessible sleeping quarters, which are a bay and a half.

I took full advantage of the deep straw bale walls, by implementing built in seating and shelving areas, that convey the sheer beauty of the construction method, while framing a view to the exterior.

Finishes
One of the major environmental concerns for finishes is the off-gassing of toxic gases. In response to these and other concerns, I chose to finish all exposed wood and concrete surfaces with Weather-Bos stains and paints. Weather-Bos is designed as a natural finish, that counteracts the deterioration process of interior and exterior wood and concrete. All stains and paints are made from premium blends of natural vegetable oils and resins.

Weather-Bos
(Arkansas)
501-624-0005
501-624-2460 Fax
Monitor Section
This monitor was designed in response to the need to vent the hot summer air, that will accumulate at the ceiling. Since I was considering using the recycled aluminum shingles, I had to develop a way to vent the ridge of the facility, to keep it from overheating in the summer time. The monitor system seemed to be the most logical solution. However, it also brought a few hidden problems along with it. Mainly, how do I keep the heat from rising up and out of the space in the winter time? I knew that I could not afford to use a custom mechanized closure system. With a little thought and ingenuity, I was able to design my own system, that was cost effective, user friendly and had an r-value of 48.31.

The monitor is framed in standard stick construction, and rests directly atop the ridge and supporting rafters. The sheathing and roofing materials were held back, so that air could be drawn from inside the Activities Center, into the monitor and vented. The monitor hosts a total of six louvered openings, three on each side. The center louvered panel, on the leeward side, is assisted by an exhaust fan.

The operable insulating panels are used to open or close the "vent". They are manually operated, via a winch system. One winch in each loft, controls the panels opening and closing. The panels are actually structural building panels, contain no CFC’s, and can be completely recycled. They are 12 1/4" thick and have an r-value of 48.31. They are manufactured by AFM Corporation, and run under the trade name R-Control Structural Building Panels.

The panels are on rollers, that are bolted to the sides of the panel. These wheels follow an angle iron track, that is bolted to the rafter above, creating a pocket.

AFM Corporation
Box 246
Excelsior, MN 55331
800-255-0176
612-474-0809
The following images are camera shots from a 3D model that was created in MicroStation V5 & 95. This model would not have been possible if it were not for my colleague and best friend, Todd Buchanan. His patience and electronic wisdom guided me through the construction of this model. Thank You Dog.

A few points of interest:

*Crows Nest:* Look at the relationship between the Crows Nest and the sleeping lofts, functional without being intrusive.

*Pellet Stoves:* Notice how I used the flues of the pellet stoves as decorative elements that gradually rise from the ends until penetrating the roof and vented up through the Monitor roof.

*Character of Space:* Note the warmth and openness of the space, in part from the plaster and naturally finished wood.
Camera shot from the Crows Nest

Camera shot from loft
Camera shot from the Accessible Sleeping Quarters

Camera shot from the kitchen
Activities Center
Activities Center
Crows Nest

Straw Bale Cut Away
Straw Bale Wall Detail

Perspective
Interior Perspective

Exterior Perspective
Exterior Perspective

Interior Perspective
West Entry

Framing Details & Verandah
Verandah & Screened-In-Porch
Sleeping Lofts
Framing Details

Sleeping Lofts

Buy Recycled! Directory of Ohio Vendors of Recycled Products. The Ohio Department of Natural Resources Division of Recycling and Litter Prevention 1996


Climatic Building Design. Watson Labs


Environmental Building News, West River Communications Inc. Brattleboro VT: 1995


Environment by Design Volume 1: Interiors, Environment by Design. Vancouver, BC.

The Harris Directory Recycled Content Building Materials, B.J. Harris. Santa Fe, NM. 1996


McRecycle USA, McDonald’s Corporation. Oak Brook, IL.

The Natural Choice Catalog, Eco Design Company. Santa Fe, NM.


The Straw Bale House, Athena Sventzell Steen; Bill Steen; David Bainbridge, Chelsea Green Publishing Company, White River junction, Vermont.


The Toilet Papers, Sim Van der Ryn, Ecological Design Press.
On-Line Resources


http://www.afsonl.com/, Architects First Source Online.