

GROUND SWELL

A R C H I T E C T S

Groundswell Architects supports both our enduring use of the earth as an integral design element of all building projects and the ground swell of public interest in higher environmental and ecological thinking.

Our buildings are designed from the heart to touch and inspire the human spirit. We strive to make our projects structurally and thermally efficient. We use materials and methods consistent with good ecological practices and seek socially responsible attitudes in choices of contractors and subcontractors.

In our twenty years of business, we have designed and planned over 2,500,000 square feet of new and renovated building space at an estimated construction value of \$125 million.

Design innovations are our hallmark. Our office work has been featured on the Discovery Health Channel, the New England Cable News Network, in "Creating The Not So Big House Book", the New York Times, House Beautiful, Natural Home, Solar Age, Country Journal, and Yankee magazines.

We have been energy consultants for the American Institute of Architects Research Corporation in Washington, D.C., and for the Environmental Conservation Board #5, State of Vermont.

Currently, we are designing and marketing an innovative affordable housing scheme known as Green Ribbon Living. It raises the environmental and ecological bar for the mass housing market and we are optimistic that it will set a fresh trend in how shelter is conceived and constructed.

Groundswell Architects
477 Ten Stones Circle
Charlotte, Vermont 05445
802-425-7717 Office/Fax
www.groundswellarchitects.com
ted@groundswellarchitects.com



Community Health Center of Burlington, Vermont

ARCHITECTURE DESIGNED FROM THE HEART
TO TOUCH AND INSPIRE THE HUMAN SPIRIT

Introduction

We believe that the earth is a fundamental design element. How a building meets the ground is key to the comfort and visual success of the design. Our research and understanding of Living Roofs contributes to our projects in energy savings and aesthetic direction.

We also believe in a current groundswell of public awareness of emerging environmental and ecological thinking. Education is part of our design process, both for ourselves and our clients. We understand that materials, techniques and building systems change constantly and that marked improvements in chemistry and resources are to be noted for inclusion in our work.

We ask tough questions of our clients and work hard to solve budget challenges, especially when looking for alternatives to “business-as-usual” solutions.

Programming

We believe that it is the unique desires, experiences, sites and budgets of our clients that allow us to design the most distinctive and fitting places for them to live and work.

We use a questionnaire to help record and translate the owner’s lifestyle, dreams, and eccentricities into useful information for design purposes. With this information, an accurate program of spaces and their respective characteristics is described. We welcome visual materials, photos, and paraphernalia as necessary to explain ideas.



We also conduct group workshops to explore the Goals, Activities and Places that are key to the successful programming of a residential or commercial facility.

When working with a large group of individuals to build an intentional community, workshops are focused on:

- overall economic, spiritual and architectural goals
- site layout and design
- spaces, equipment and relationships found in a Community Building.

The Family Creative Workshop

This is a specialized workshop for those families wishing to include all members in the design process.

• Programming/ Talking and writing

An activity involving the architect and family members. We brainstorm about Goals (what do we want from this house - nice place to come home to, warm and inviting to visitors, etc.), Activities (what do we need to accommodate - eating, sleeping, music playing, etc.) and Places (rooms and spaces for these activities). Other topics covered: materials and colors, appearance, and noteworthy places we have experienced that might influence the design.

• Modeling/ Drawing and constructing

Using information based on the programming event, this family gathering is used to draw and/or build model rooms, spaces and ideas. This activity is a very broad one useful for getting a feel for the style, shape and delights of the house and site. Cardboard, crayons, pencils and tracing paper are our tools.

• Virtual space tours

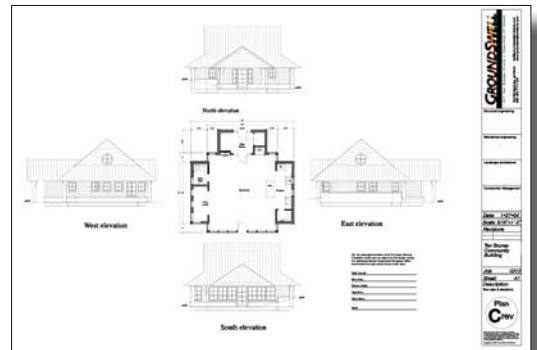
On a 7 foot wide screen projection of the virtual building, we maneuver through rooms and spaces in real time to review and evaluate what works and doesn’t work in the design. Some changes to furnishings, texture, color and shape can be made on the spot.

Design Development

We believe that a significant conceptual direction emerges from programming and creative conversations. With this concept in hand, we begin the design, also using programming, site information, and budget constrains. Our tools are cardboard, tracing paper and virtual modeling. We explore structure, building materials, energy sources, heating, cooling and ventilation during this phase. A first look at a Probable Cost of Construction is determined, to be refined as the project moves along.

Construction Documents (Plans & Specifications)

When the design meets with approval, we complete the construction documents (plans and specifications). We are careful to maintain the conceptual direction during the time these documents are created from the design drawings.



As architects with extensive hands-on building experience, we understand the translation from a CAD document to reality. Our construction documents are known to be accurate, complete and based on practical experience of how things go together in the field.

We enjoy working with contractors and local craftspeople and believe in a team approach to building. The construction can be the most enjoyable part of the work when expectations of the owner, architect and builder are all met.

Services Offered

- Architectural design
- Construction documents & specifications
- Construction project administration
- Pre-design feasibility studies
- Site analysis & land planning
- Facilities programming & review
- Interior design & space planning
- Passive solar engineering
- Energy conservation analysis
- Educational presentations
- Promotional materials preparation
- Desktop publications & graphics

Energy

We believe in using the sun and wind to power our buildings. The future is here and we are still dependent on oil.

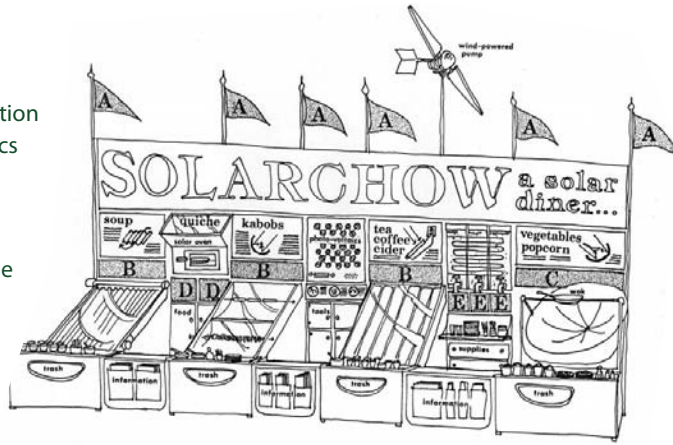
We feel that children (and adults) can benefit from being included in the designing of a home. Understanding how the sun and wind powers their home might be fodder for a science project that monitors and records how well these systems are performing.

Our projects are thermally optimized by careful detailing of the building envelope, incorporating energy conservation techniques and by passive solar engineering.

We encourage commercial clients to enroll in the LEED program for certification of a project as a high level environmental commitment. We encourage residential customers to enroll in the Vermont Built Green Program for certification and to have an energy audit performed by Efficiency Vermont, to assess overall building performance and rating.

Environment & Materials

Our buildings can sit lightly with the earth, surrounded by nature and natural materials and perhaps carbon neutral - meaning that the structure does not add to the global CO₂ problem, exhausts air cleaner than it intakes and produces no long term toxins.



While it is both easy and timely to be "green", our office takes a critical look beneath product claims and company profiles that we do business with. We generally discourage the use of products containing PVC, petroleum and other known chemicals which are either dangerous to life, difficult or impossible to safely dispose of, or do not recycle easily.

We review new "green" products carefully before recommending them for use. Materials and methods consistent with good ecological practices are used while seeking socially responsible contractors, subcontractors and craftspeople to perform work. We understand that affordable, durable alternatives to certain materials are still being developed and benign solutions may not always be affordable or available. We encourage the use of regional, easily

Costs of Construction

To assure a goal of budget responsibility, we generate an Estimate of Probable Cost of Construction once an initial design is complete. This estimate is refined two or three times before construction begins. Keeping costs in line is a constant challenge during the design process and we believe in responsible vigilance.

Contractors

The two most popular approaches to construction of most buildings are by using either a General Contractor or a Construction Manager. We are comfortable with either a bidding or direct selection process.

The General Contractor takes most of the risk, generally billing the owner for all work on the project. The GC then pays the sub contractors and suppliers.

The Construction Manager works directly for the owner. The owner takes most of the risk, paying sub contractors and suppliers directly.

A direct selection process at the beginning of the project greatly simplifies and benefits the cost control. Whereas a bidding process may result in lower pricing, it will require more extensive information to produce equitable results. We are happy to discuss at length the differences in these approaches.

Fees

Each job and client differs in time and scope of work desired. We review the tasks and break down our contract time in a spreadsheet for review by the client.

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Today's buildings should be flagships of responsible reduction of water, power and fuel consumption.

We enthusiastically specify the following types of systems:

- **Active solar hot water heating** using evacuated tube panels to heat domestic and commercial hot water.
- **Passive solar heating** using building design & window layout to provide supplemental space heating.
- **Photo Voltaic electrical generation** using panels and regulation equipment to provide electricity.



- **Wind electrical generation** using a turbine and regulation equipment to provide electricity. Sizing the equipment to the available wind source is key to economic viability.
- **Ground Water Source Heat Pumps** harvest available energy in water for space heating. Current design & engineering in the NE region has proved cost effective for some applications.
- **Air-to-air Heat Pumps** harvest available energy in ambient air for space heating. Current popular models from Nyle claim to be efficient down to 0° F.



Artgate Competition, Fall 2005

It seemed like a great challenge - a design competition for individual architects to create an artists' center on a strategic site where the City of Burlington was already planning for a six hundred car parking garage. The site is a peculiar blend of natural wooded land to the south and very unsightly parking, railroad tracks and streets on the other sides. It is next to the old Lakeside neighborhood.

We designers were asked to keep the six hundred cars on site while adding some sixty-seven thousand additional square feet of program space for a theoretical artist's center. These two activities cast as intimate neighbors seemed a bit daunting at first thought. What exactly do automobiles and

creative souls have in common? I suppose there is some sort of symbiotic relationship - artists need to get places and cars need to be restyled on a regular basis - sort of a fashion statement thing. Would I use the car as an icon, a symbol of the technological times? Maybe my personal favorite, the '63 Pontiac Grand Prix, could be installed over the entrance.

Being enamored with anything green on a roof, I started seeing a solution taking shape as a gentle hillside extension of the wooded land adjacent and south of the site. A living building has all kinds of interesting things it can do that should help secure our species' future on this planet. It can be a planting bed for grasses, sedums, herbs, vegetables, flowers, small shrubs and lichens that produce oxygen necessary for

all life and a home for the very small critters that live in soil. There are bacteria, insects and worms that biologists are discovering are very necessary for the health of the big ecological picture.

The rooftops of the studios and gallery are used to treat wastewater generated by the human activity. Each roof is an engineered wetland, with iris and cattails growing in a carefully blended gravel media. Rather than sending everything to the city sewers, this simple system uses the gray water to provide nutrients for growing plants and lets evaporation play a part in disposal. Roughly one half of the annual rainfall in our Vermont climate can be absorbed by a mere 4" thick soil before it needs additional drainage. This is the kind of news that public works officials love to hear on a Monday morning. Other benefits are fire protection, cooler interior temperatures in the summer, and much longer life for the roofing membranes.

The hilltop is the organizing element for the building. Once that concept was established, the artists studios, restaurant, galleries, and workshops all spill out in several levels from the innards of the sloping earth shape, becoming a village in and of the hill. Exterior colors are pastel and earth tones, and over time mosses add to the patina. Exterior stairways connect the sidewalks to the outdoor gallery above and allow access to the interior circulation at several points. I did not want to have the automobile separating the southern wooded area from this garden I was creating, so I planned for a drive under emergency access to the Lakeside



neighborhood. This way, the sidewalk was safer and more like a walk through a park.

While the autos were hibernating below, out of sight and out of mind, I covered them with a living building that cleans the air; produces at least as much energy as it uses, and celebrates the look and feel of technology. Planted hardwoods and photovoltaic grasses share the available solar exposures on the hillside. These techno grasses absorb photons to make electricity as they swing and sway, working their crystalline magic. They also support a gossamer canopy over patrons at the commuter rail station on the west side of the project. As a commuter returns home at night, he or she will be illuminated by the daytime electrical production of the grasses. An educational component with digital readouts of current and daily performance will be part of the schedule board.

A row of wind turbines bordering the northern boundary catch the Lake Champlain breezes. They quietly and efficiently use the natural on-site wind energy that otherwise would be lost. The turbines and grasses provide the majority of the power needs for the artists' center. Claims for alternate energy production always look great on paper, but I believe that wind and photovoltaic technologies are now mature enough so that annual performance figures can be trusted.

The future Southern Connector bypass will create noisy, animated activity along the east elevation. To ease the building's appearance, the entire east and north

four storey undulating walls are equipped with hundreds of hanging pockets of soil that provide a growing medium for air cleaning vines. On the roof and coupled to the parking garage are two biological air filters. These greenhouses are planted and equipped with selected biology for the expressed purpose of cleaning the garage air. This idea was part of a competition I entered several years ago for a new Burlington Public Works building, just a hundred yards away. I conferred with my friend and biologist John Todd, who is a master at using plants to clean up our air and water.

I developed a photovoltaic totem-firepit-sundial concoction for another project and decided to use it on the hilltop, since it could add a bit of community activity outdoors. Sitting on top of the hill, this hybrid folly provides 250 watts of power, a place for banners and flags, and a fire pit with seating for dozens. On a sunny day, the totem casts a shadow on the sundial seating ring with the correct astrological time. This as a very kid friendly delight that demonstrates the importance of our sun by generating solar electricity, showing the correct time, and providing a meeting place around a most ancient ritual, a simple fire. It can also be a lesson in structure and mechanical design by raising and lowering the pole to the most solar efficient angle for the photovoltaic cells.

While this idea was incubating, I was also revisiting my procrastination skills. The deadline had been extended by two weeks. Three days before the entry was due, I sat down and asked myself how much fun

I thought I could have without setting my trusty mouse on fire. Well, fun I had. In sixteen hours I had bashed together what appeared to be a building ready for rendering on my Mac. I decided that I would submit perspective pictures of the finished building and little else. I knew there was a floor plan in there somewhere, but time and my interest were of the essence and I put my energy into establishing the best sun position and camera settings for the radiosity engine in my software instead of producing floors and elevations. I did manage to cut a section thru the virtual building to clarify some of the innards.

Murphy's law ruled as the deadline approached and my wide bed printer decided to choke partway through the printing queue, refusing to produce the last high resolution drawing. Typical. I used an earlier draft version of the aerial view, knowing that I would be the only one to notice the difference. I was out of nice clean foamcore, so I chopped up some old scraps and taped them together to fabricate a pair of the required two by three foot boards for submission. I made it to the Firehouse Gallery with five minutes to spare.

I certainly feel our society needs architectural and ecological visions based on sound design and engineering. I think the next generation, particularly our children in primary schools, should have regular exposure to responsible ecological solutions, especially at a time when our natural resources are increasingly tapped and stressed. I hope this solution represents one of the possibilities.

> ••• Ted Montgomery RA, February 6, 2006



A walk in the garden of a living building that cleans the air and water using an undulating green garden roof and green wall. Photovoltaic grasses catch the sun. Earth integrated studios, galleries, workshops, and performance spaces are the village in the hill.

C O M M E R C I A L

GROUNDWELL

i thank you god for most this amazing day: for the leaping greenly
spirits of trees, and a true blue dream of sky; and for everything which
is natural, which is yes
- e e cummings

Program Overview

A studio for the architect's wife's graphic design business.

The building is portable, sitting on a gravel foundation with frost protection.

Design Features

Construction is wood framed, with a frost protected floor sitting on a gravel base. The roof is in the shape of a Tulip tree leaf, and covered in copper clad shingles. The flooring is bamboo and desktops are cork. Exterior walls are MDO plywood with bamboo planting rods. The e e cummings poem (above) is mounted on 144 letters under the roof soffit.

Project costs: \$15,000 construction



Design and Construction: Groundswell Architects (Ted Montgomery). Client: Sarah Montgomery Design



South view of the Community Health Center of Burlington, VT

Project Data

Cost: \$ 2,500,000 construction & equipment
 Design Team: Indiana Architecture & Design,
 Landworks, Landworks, Champlain Consulting
 Engineers, Salem Engineering
 Construction Managers: Neagley & Chase
 Client: Community Health Center of Burlington, Joe
 Arioli, Executive Director, 860-4318

Program Overview

Comprehensive alterations and additions to an existing building in the north end of Burlington. A seven chair dental facility, an adult educational service and a medical resource program have been added to an extended 17 exam room out patient clinic. Open planning, friendly and informal atmosphere, and easy circulation were key challenges.

Design features

Extensive use of natural lighting and many interior windows and glass doors create an extremely light feeling and easy visual connections throughout the building. Use of low VOC paints, cellulose insulation, metal roofing, air-to-air heat exchange and compact fluorescent lighting are logical choices for high indoor air quality. A new exterior band and canopy with extensive earth berming, coupled with an active solar energy band are functional and aesthetic elements anchoring the end of North Winooski Avenue.





Project Data

Location: San Remo Drive, South Burlington, VT
 Client: Four Boys venture, Bill Michaud and Mike Dee
 Construction: Currently finishing site work, sidewalks, plantings

Program Overview

An addition to an existing metal building providing first floor physical therapy and second floor apartments. This is a pivotable structure in the rezoned South Burlington City Center, meeting the new criteria for streetside development. It anchors the north end of the main street of the future town civic activity.

Design Challenges

A green roof graces the top of the building, providing permeable surfaces for rain water, natural cooling, generation of oxygen and a quiet place for residents and clients to relax. The building uses steel framing with an outriggered thermal envelope.





Program Overview

A renovation of an existing Naval facility, and an extensive study of a new 40,000 sf facility for the Burlington, Vermont regional area. The study of Lake Champlain (sixth largest fresh water lake in the U.S.) is the main theme of this multiuse building.

Project Data

Design Team: Anderson • Indiana (Indiana Architecture & Design and John Anderson, architect)

Client: Lake Champlain Basin Science Center, City of Burlington, University of Vermont



Ted with U.S. Senator Patrick Leahy at a fund raising event for the LCBSC in 1994

Design Concepts

Building as Energy producer

- Cogeneration of electricity
- Passive & Active solar
- Photovoltaic panels

Building as Sustainable exhibit

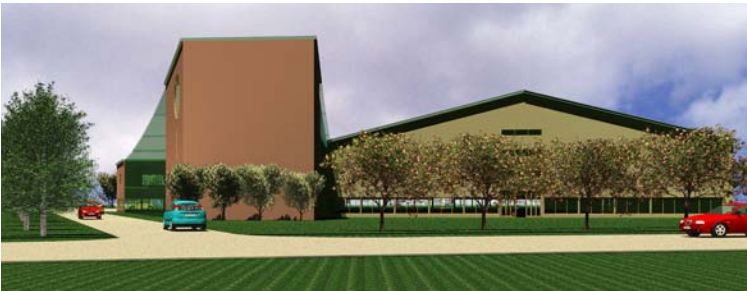
- Sustainable materials
- Energy conscious materials
- Regional materials
- Systems Exhibit
- Recycled demolition
- Water & Air treatment
- Permeable surfaces





Project Description

A computer modeled study of a new tennis and golf facility for Shelburne, Vermont. The driving range is a unique indoor/outdoor design that derives the cold weather space heating from a combination of geothermal ground coupling and radiant heating. The intention is to maintain the ball collection areas at conditions that would allow a year round turf at minimal temperatures above freezing, while providing occupant comfort in the immediate driving pad areas.





Project Description

A start-up microbrewery in an existing warehouse. Planning and code requirements were challenging and were uniquely solved by working closely with the City of Burlington and the Owners.

Project Data

Client: Magic Hat, Alan Newman, 658-2739



Project Description

A store for products from a long-established local meat packing facility. The design borrows from the existing (railroad station) administrative building, the packing facility and the company truck cabs forms.



Typical installation on Main Street, Burlington, Vermont. The sign is 15' tall. The sign is 3' wide and 15' tall. The sign is 3' wide and 15' tall.

Program Overview

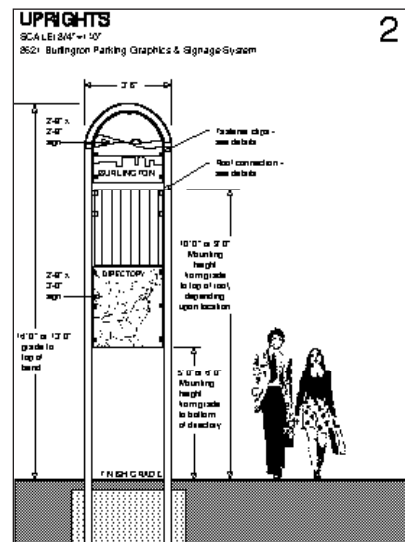
Development of a design manual with complete specifications for the construction of a comprehensive signage system.

Project Data

Cost: \$2,000+ per installation
 Design Team: Indiana Architecture & Design, LANDWORKS (Middlebury, VT)
 Client: City of Burlington

Design features

The system has been designed from the start to be extremely vandal-resistant. All parts are metal and all graphics are replaceable silk-screened decals. A logo was also created for the City of Burlington by Sarah Montgomery Design.



I N S T I T U T I O N A L



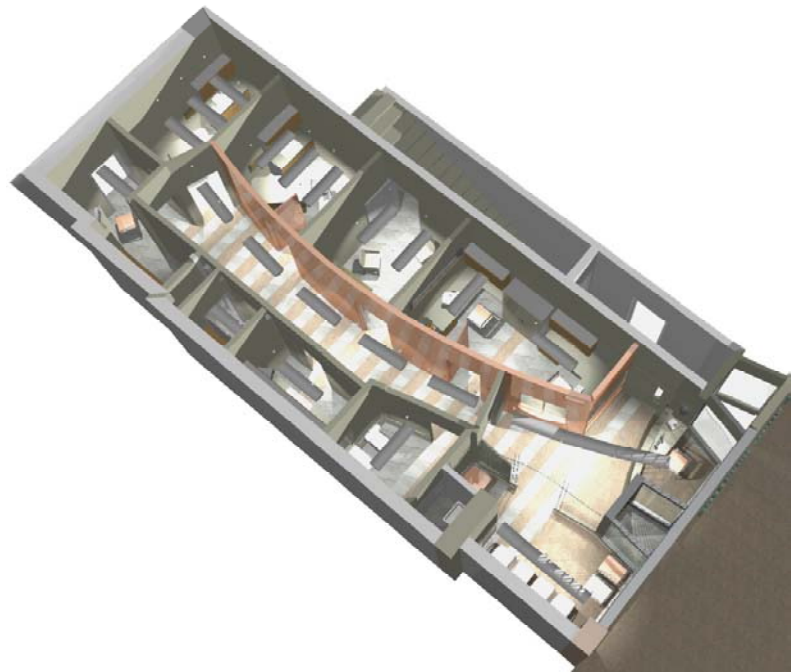
Program Overview

A conversion of an existing storefront in an historic building in downtown Burlington, Vermont, into a unique walk-in clinic for teenagers. Key objectives were to provide a facility with an inviting and informal atmosphere that would encourage troubled young people to stop in for services.

Design features

Curved shapes in polycarbonate plastic panels behind the storefront windows both attract attention and provide a screened waiting area. A copper painted curved wall acts as an organizing element.

Use of low VOC paints, air-to-air heat exchange and compact fluorescent lighting were budget and healthy indoor air quality choices.





Administration Offices of Howard Community Services Flynn Avenue, Burlington, VT

Program Overview

An extensive renovation of a headquarters & treatment facility for an active mental health business. In-depth programming with client produced significant floor plan changes.

Project Data

Cost: \$475,000 + furnishings
 Gross area: 23,000 sf

Design features

The exterior work include new windows, a new entry area and walkway. Interior improvements feature a new reception area, custom lighting fixtures throughout, repainting and refinishing of many surfaces. Radical floor plan changes have dramatically improved circulation and patient control points.

Design challenges

New air conditioning for 11,000 square feet was installed in less than one foot of ceiling plenum space. Major existing fire code violations were readily solved by upgrading alarm systems and separation doors & walls.





Program Overview

A new 6 bedroom home plus a separate apartment for a group of five Downs Syndrome women and their live-in advisor. Financing through a HUD program.

Project Data

Cost: \$245,000 + furnishings

Gross area: 2900 sf

General Contractor: Engleberth Construction

Client: Howard Community Services, Bill Pence,
Business Mgr. 658-1914

Design features

Exterior materials are wood, stained with water-based coatings. Interior finishes use non-VOC paints, non-4PC carpeting, fully ADA compliance counter heights, bathrooms and controls. Living areas face southeast for maximum street "presence" and gentle solar warming. Air-to-air heating exchange ventilation improves winter/fall air quality.

Design challenges

Using the context (an old north end Burlington neighborhood) as a guide, the architecture borrows, compliments, and seeks to become a "good neighbor" visually. The intent of the project includes establishing good relations with the neighborhood. And in fact, during construction, many local neighbors walked thru the home (and often brought donuts!).





West elevation of the Bellwether School and Family Resource Center, Williston, VT



Project Data

Cost: \$ 250,000 construction + acquisition & fees
 Design Team: Indiana Architecture & Design, Landworks, Krebs & Lansing, Landworks, Servidio Engineering
 General Contractor: Ashline Construction
 Client: Resource Center for Redesigning Education

Program Overview

Comprehensive alterations and additions to an existing raised ranch style home in Williston, Vermont for use as an alternative school offering preschool, kindergarten thru second grade classes. Open planning, nature, environment, friendly and informal atmosphere, and nontraditional aesthetics were key program challenges.

Design features

Extensive use of natural lighting and many interior windows and glass doors create an extremely light feeling and easy visual connections throughout the building. Use of low VOC paints, cellulose insulation, wood siding, metal roofing, air-to-air heat exchange, radiant flooring and compact fluorescent lighting were logical choices for highest quality human comfort levels. Exterior graphics recalling trees and fields are accomplished with clapboards, shingles and MDO plywood.





Program Overview

A grand, turn-of-the-century home carefully converted into two apartments and a staff office, for use by a privately run out-patient program of the Vermont State Hospital.

Project Data

Area: 3500 sf

Cost: \$165,000 renovations

Client: Washington County Mental Health, Montpelier, VT, Roger Strauss, Exec. Dir. (retired) 496-3895

Completion: 1982

Design features

Energy use has been diminished by the use of insulating window shades, triple-glazed replacement windows, full wall and roof insulation, foundation insulation, and water reducing shower heads, faucets, and toilet units. Traditional interior casework and trim has been re-used and supplemented by exact matching millwork as required. A five color painting scheme is used on the exterior to create an appearance consistent with the time of original construction.



Program overview

New facilities for a growing culinary school, accomplished by a top-to-bottom renovation of an existing 1922 orphanage. In-depth conversations and facility programming with owners determined spatial relationships to accommodate banquet space for 100 patrons, an elaborate training kitchen for 7 students & 2 instructors, administrative office space for 12 staff members, and dormitory rooms for 45 students.

Project Data

Client: New England Culinary Institute, Montpelier VT
 Area: 9500 sf existing + 1500 sf new construction = 11,000 sf project space
 Cost: \$350,000 general construction + \$150,000 furnishings & equipment
 Completion: 1982

Design Features

This project provided the first mixed use facility and permanent headquarters for this young organization. Through continuous communication between the two owners, key staff people and architect, we were able to produce a very functional building at \$33/sf.

New space added to both the existing second and third floors with new hipped roofs. Conversion of first floor space into column free banquet room through use of steel beams. Comprehensive interior refurbishing including all mechanical systems, finishes, insulation, and lighting.

Design Challenges

The challenge of the work has been to architecturally tie together a non-descript structure and produce a good neighbor aesthetically in a very traditional Victorian neighborhood.

Natural lighting for instructional and administrative spaces received high priority, with state-of-the-art full spectrum shielded fluorescent lighting as back-up system. Heat recovery of exhausted kitchen hood air is to be implemented in the first year of operation.



Program Overview

A complete renovation of an historic building (on the National Register of Historic Places) into a childcare facility for the Medical Center Hospital of Vermont, and offices for the University of Vermont.

Project Data

Client: Visiting Nurses Association/UVM, Burlington VT
 Cost: \$275,000 + furnishings
 Gross area: 7,500 sf
 Structural engineering: Mel Doherty, Dubois & King, South Burlington, VT

Design features

The exterior work included handicapped access ramping, repairs to the building skin, a new rear porch, and site improvements. The interior work included complete floor plan revisions to provide for stringent childcare regulations, new mechanical systems, and a two floor elevator.

Design challenges

The exterior and interior work was done in cooperation with the State of Vermont Division for Historic Preservation. Portions of an interior stairwell were preserved.



Opening day in May of 1989, as then Governor Madeleine Kunin of the State of Vermont and Mayor Peter Clavelle of the City of Burlington cut the ribbon to the new facility.



Charlotte Little League Field, Charlotte VT

Program Overview

Custom dugouts for two different baseball programs. Each design used utility, simple materials and unique roof forms for distinctive and recognizable images at the two schools. The CVU program included design work in the Senior Challenge Program by Rick Nold, a talented starting pitcher for the team.

Design Features

Both sets of dugouts were built by volunteer labor and contributed materials. Plywood, wood studs, and floating concrete slabs were material choices. Ventilation, spikes and mud were all considerations in the detailing. The architect helped to build both projects (and his son was on both teams!).



Champlain Valley Union High School Baseball field, Hinesburg VT



Program Overview

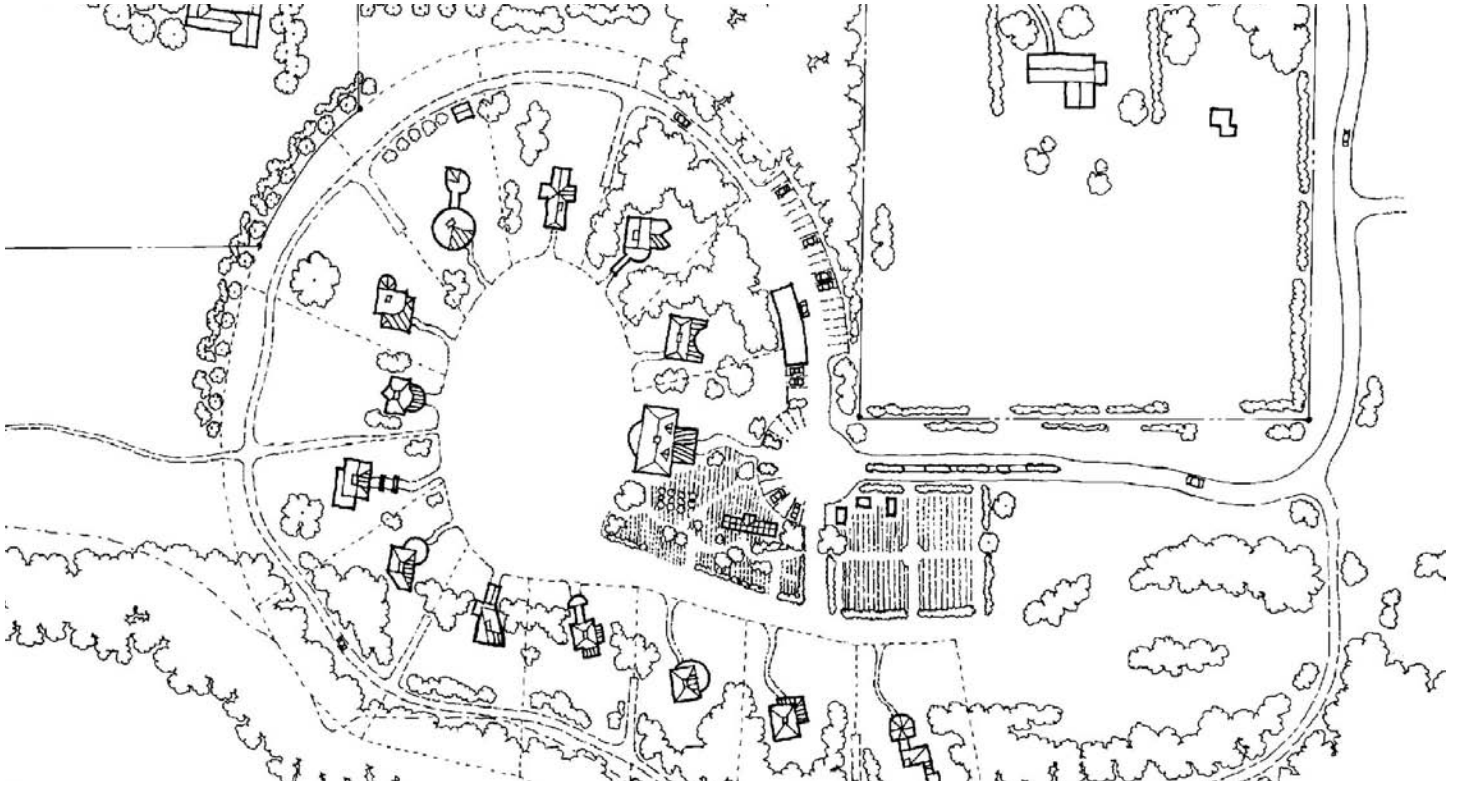
A display designed and produced for Shelburne Farms for use in their Farm Barn learning and educational installation. The display spent six months as an installation in the ECHO Science Center in Burlington, Vermont.

Design Features

All visible wood is from harvested lumber within Shelburne Farms. Each of the five "roots" is an interactive children's play area. Actual bark, rough sawn lumber and "tree cookies" (trunk sections) were part of six species (ash, red oak, maple, white pine, cherry and butternut) that comprised the sides of the "trunk". Three take apart benches in the form of a fox, rabbit and deer have been a big hit with the children.

The display in the ECHO Science Center in Burlington VT





Program Overview

An intentional community in Charlotte, Vermont, begun in 1990. Planned to accommodate 16 families in a clustered formation around a common green. Process of design strictly by group consensus. All members own, manage, and determine direction of community.

Project Data

Cost: \$3,500,000

Design Team: Indiana Architecture & Design, community members

Client: Ten Stones Community, Charlotte, VT



Design features

Individual homes are designed from Design Criteria developed by the Building Committee. The criteria stresses energy efficiency, sustainability, and appropriate aesthetics.

Planned community gardens, meditation areas, preserved woodlands and meadows, common parking areas, use of gravel roadways/paths, and walking paths are prime program items. An engineered wetland supplements the wastewater system.





View from the north

Program Overview

A community building (common house) for the Ten Stones Intentional Community, built by community members and a general contractor.

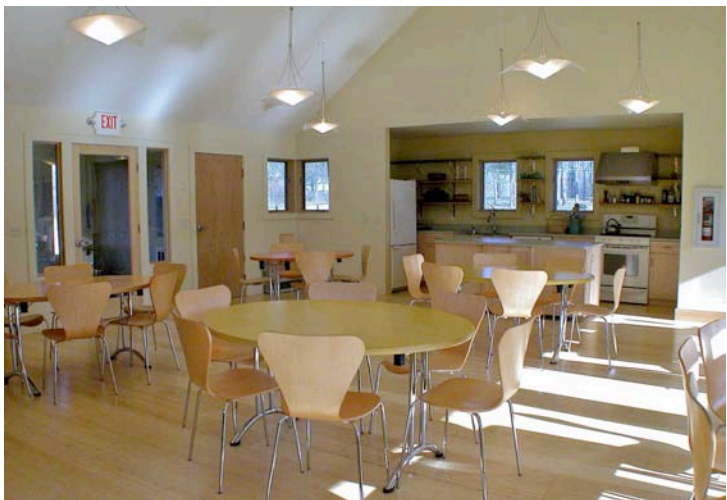
Project Data

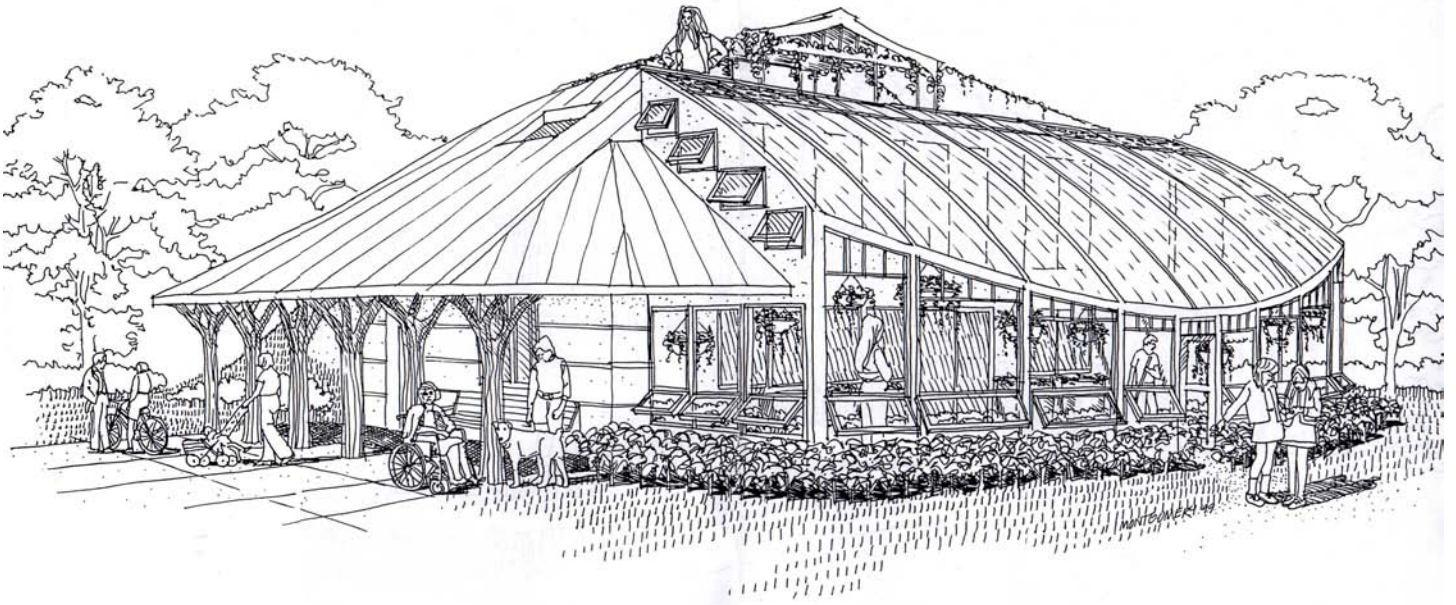
Design Team: GroundSwell Architects, community members
 Client: Ten Stones Community, Charlotte, VT

Design features

The structure is wood framed and uses a frost protected floating concrete slab foundation. Interior layout is simple, allowing for set ups for dining, yoga, workshops, meetings, childrens play, and dance.

The architect and his son designed and built the folding tables and pendant lighting.





Project Data

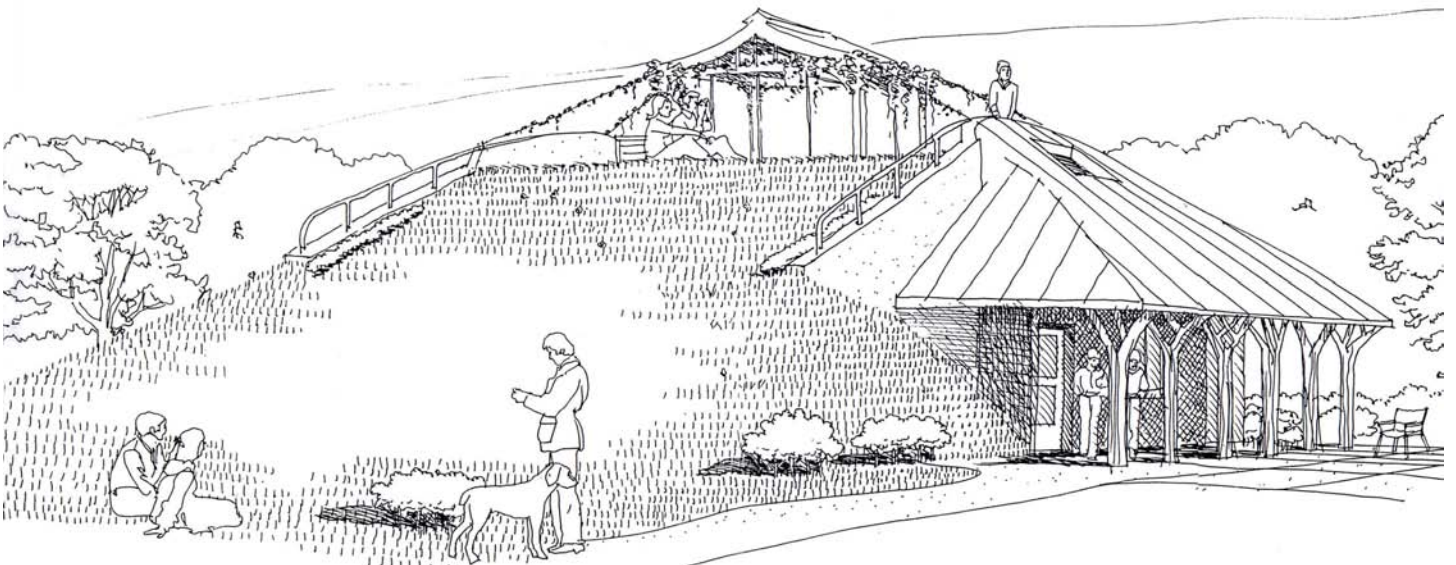
Cost: \$ 250,000 construction
 Design Team: Indiana Architecture & Design
 Client: Ten Stones Community, Charlotte, VT

Program Overview

A new facility providing for various community activities such as dining, meeting, playing, performing, spiritual practice, food and fish production and storage and other events. Included is an icehouse, root cellars, greenhouse, Russian stove/oven, passive and active solar systems, photovoltaic and wind electric systems, high level healthy materials usage, recycled timbers and other construction materials.

Design features

A large north earth berm encloses a year round fruit and root cellars and creates a sledding and recreation grassy slope with a meditation cupola on top. Site harvested tree trunks provide porch and canopy support, with live edge sawn siding. Stained concrete radiant flooring coupled with wood and solar heating provides an even interior environment. Ventilation is handled in each of the three zones by air-to-air heat recovery equipment supplemented by reheat coils when necessary.





Project Data

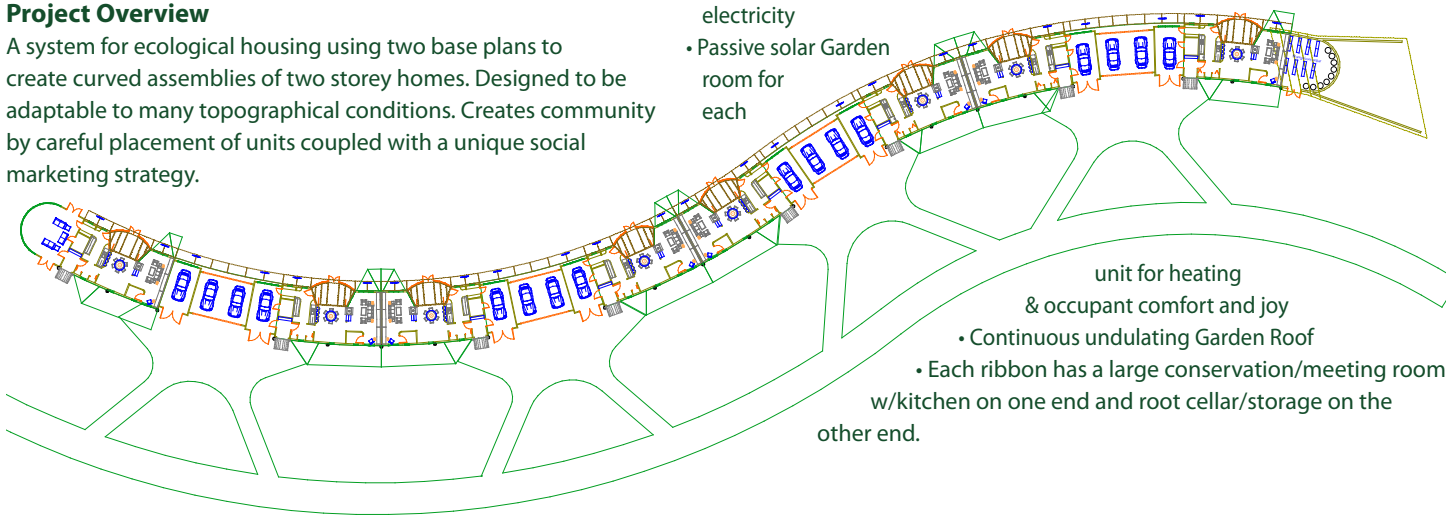
Cost: To be determined as per site
 Design Team: Groundswell Architects
 Client: Green Ribbon Living

Project Overview

A system for ecological housing using two base plans to create curved assemblies of two storey homes. Designed to be adaptable to many topographical conditions. Creates community by careful placement of units coupled with a unique social marketing strategy.

Design Features

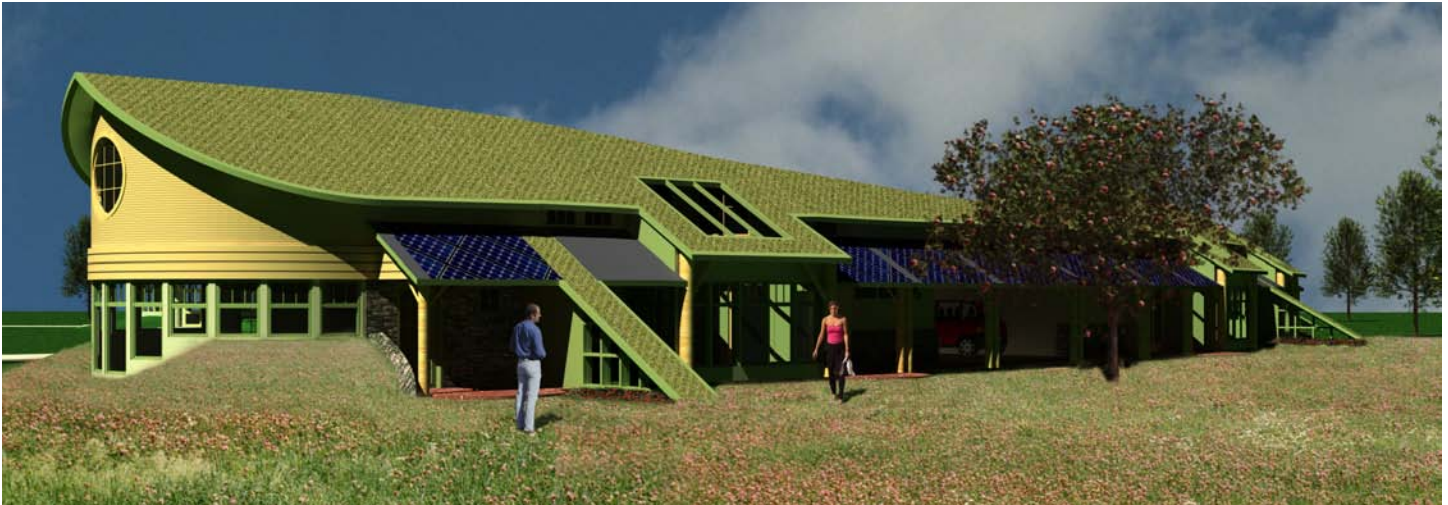
- Follows local contours and site shapes
- Provides community layouts
- Resource mapping to locate and identify regional materials
- Continuous photovoltaic strip w/wind turbines) to supply and export electricity
- Passive solar Garden room for each



unit for heating & occupant comfort and joy

- Continuous undulating Garden Roof
- Each ribbon has a large conservation/meeting room w/kitchen on one end and root cellar/storage on the other end.





Project Data

A ten unit townhouse community with affordable units.
 Eight 3BR units at 1290 net sf
 Two 1BR studios at 727 net sf
 Eight garages at 265 net sf

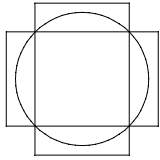
Design Features

Configured as a crescent, this ecological housing solution offers solar generated water and electricity, wind generated electricity and geothermal heating. Construction is frost protected slab on grade, with modular walls and roofs.
 The entire roof is a living, planted system, protecting, fire proofing and maintaining a permeable surface on site.



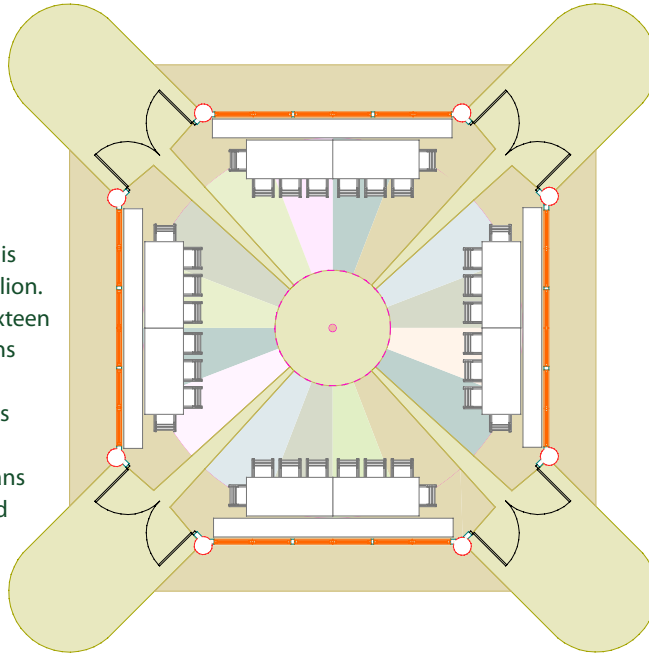
Project Concepts

This is an eco friendly structure built from locally harvested wood and designed with sacred geometry aligned to the four directions. As a year round meeting place for all ages, it has been designed to evoke joy and reverence.



The structure begins with an insulated floating slab. Sitting on this are eight tree columns, each representing a different indigenous specie. They form the eight points of an unequal octagon. These eight points describe two intersecting equal rectangles with the golden mean as their proportion. Each long wall is also proportioned according to the golden mean, using the tree columns, ground and supporting beam as the boundary.

At the four intersections of the rectangles, a circle is defined. This circle forms the basis of a medallion. This medallion is divided into sixteen segments plus the four directions created from the entries. Each segment of the medallion invites decoration by family members. Hand and feet prints from humans and pets are encouraged around the edge of a smaller, inner meditation circle. A 50 year time capsule is located in the exact middle of the building.



Activities

Furnishings include 8 tables, 8 benches, and 28 chairs. Dining easily accommodates 60. By rearranging benches and chairs and creating a stage from the tables, a small theater can be created either in the middle or to one side. Visual presentations of movies, slide shows or video uses one long wall to hold a portable screen. Other events may use rafters for suspending banners, objects, pinatas, and lights.

Project Materials

- Slab concrete/stones/tiles
- Main columns Eight tree segments
- Walls Wood framed
- Siding Live edge/eight trees
- Roof 50 year cedar shingles
- Roof rafters Heavy timber/LVL beams
- Skylight Glass/steel assembly

Mechanical systems

The pavilion is wired with both lighting and power outlets. It may contain a wood stove and masonry wall to replace the north entry. The masonry unit can be expanded to include a Rumford fireplace, a Russian stove and a baking oven.



Project Overview

This is an affordable, family oriented eco-village in a rural setting in Charlotte, Vermont. Homeowners will be fully responsible for managing their built environment and will own and share a community building.

Project Data

- Single family
 - 3 bdrm, 2 bath, 1700 sf home \$119,000 plus lot
 - 2 bdrm, 1-1/2 bath, 1200 sf home \$85,000 plus lot
- Duplexes
 - 1 bdrm, 1 bath, 800 sf \$60,000 plus lot (each unit)
- Senior housing
 - 1 bdrm, 1 bath, 600-900 sf apartments sale or rent
- Common house
 - Meeting & dining rm, guest rooms, bath, kitchen, play rooms, storage, 2800 sf \$168,000

Design Features

- Homes clustered around a Village Green in the New England tradition
- Community setting where interested buyers meet all the neighbors before purchase
- Selective use of benign materials to build healthy homes
- Carefully planned public/private separations for each home
- Low utility costs through super insulation & passive solar heating
- Community ownership of a Common House (laundry, dining/meeting, guest rooms, playrooms) and common land (meadows, woodlot, trails)
- Design compliance w/ LifeSpan Home/Universal Design standards

Energy:

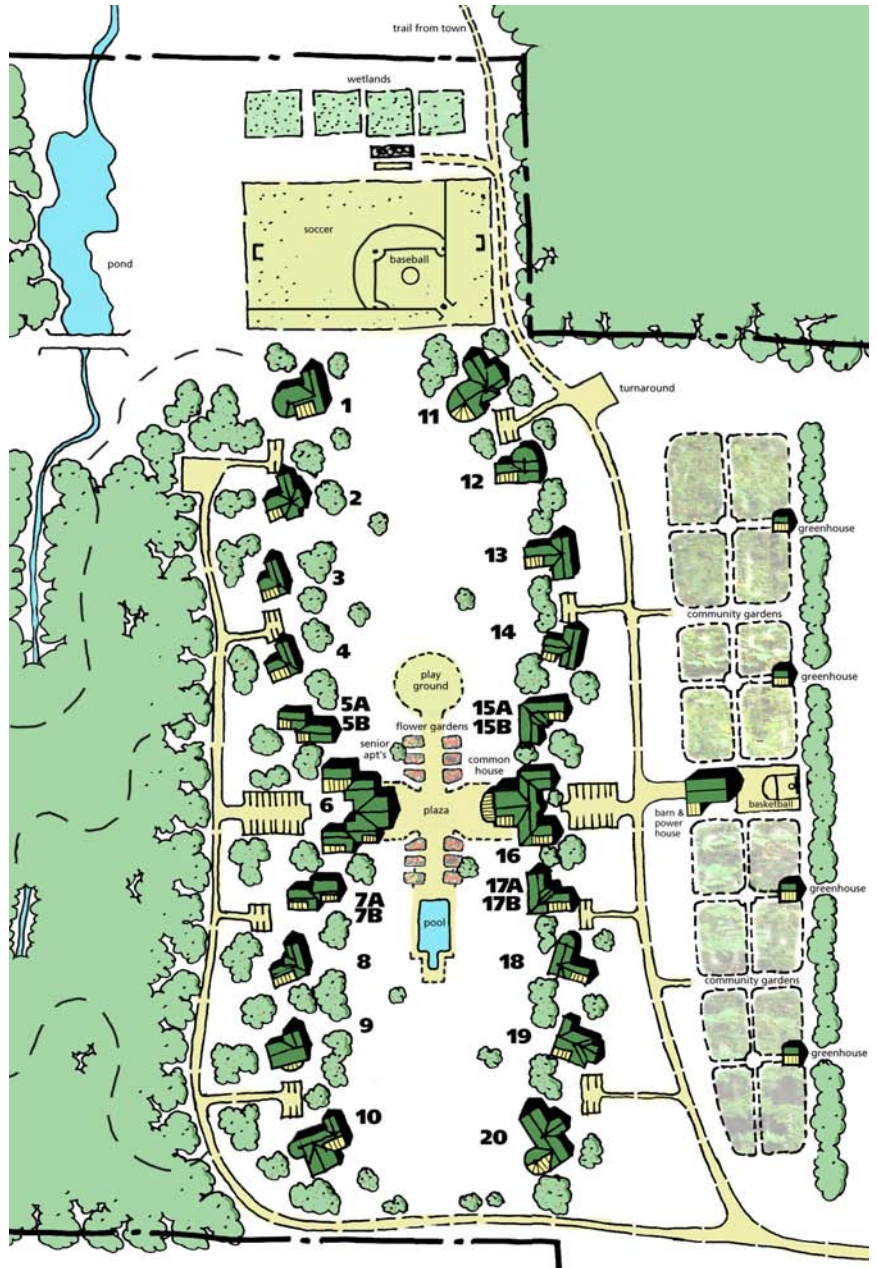
- Vermont Residential Energy Code
- Five Star rated construction/insulation

Heating:

- Radiant heated concrete with set-back thermostats
- Garden rooms for passive solar heating
- Active solar hot water heating option
- Woodstove w/ central hot water jacket
- Gas central hot water/steam

Ventilation:

- Air-to-air heat exchangers
- Natural flow-through natural ventilation



Electricity:

- Wind generation co-operative
- Emergency gas powered generation system
- Rooftop photo voltaic system option
- "Smart homes" computer controlled systems option

Lighting:

- Extensive use of natural daylighting
- Compact/electronic fluorescent indirect lighting

Building materials:

- Double stud wood framing system
- 30 yr metal roofing
- Soft edged corners throughout
- Chemically benign paints, sealants, caulking, fastenings
- Cellulose insulation
- Stained concrete floors
- Site sawn hardwood finishes



Project Description

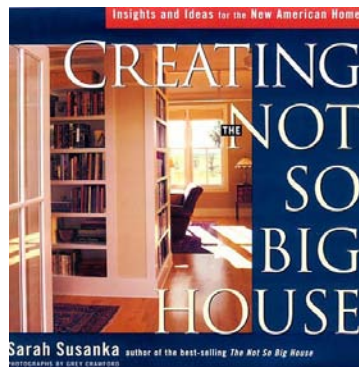
A computer modeled study of a new city center for South Burlington. The study evaluated the look and feel of several streetscapes.

Project Data

Client: Landworks, Middlebury VT



R E S I D E N T I A L



Project Data

Cost: \$200,000 w/lot, 3000sf @ \$43/sf

Project Overview

A private residence in an intentional community, handbuilt by an architect. All lighting, siding, furnishings are custom built.

Site issues

- Care & concern for mature trees
- Least disturbance of root systems
- Screening from community green
- Handicap accessibility
- Low cutoff exterior lighting

Materials & sustainability

- Wood products from replenishable trees
- Cellulose insulation
- Metal roofing
- Recycled windows in garden room & studio
- Stained concrete floors

Foundation system

- Shallow dig: Protection of nearby tree root systems
- Frost protected floating slab in studio
- Full insulation of all concrete walls & slab

Architectural features

- Hand painted “marbled” plywood siding
- View deck with seasonal canvas canopy
- Radiant heated floors on 1st & 2nd levels
- Site cut ash logs used for interior trim
- Wheelchair roll-in shower
- Custom lighting fixtures & furniture

Roof features

- 30 year metal standing seam
- Seasonal canvas entry shelter
- Slide down escape from 2nd floor bdrm
- Summer trellis shading
- SodStairs™ planted garage roof
- Curved plastic glazing in garden room

Garden Room features

- Live 85’ white ash tree growing through roof
- Passive solar heat gains with night insulation
- Phase-change thermal storage
- Earth coupled planting beds
- Thermostat controlled ventilation
- 3 season livability

Energy Features

- East, West and North earth berming
- Electronic ballasted high color fluorescent lighting
- Solar domestic hot water preheating
- Air-to-air heat exchange ventilation system
- Programmed setback thermostats on all heating zones

Certifications

VT Energy Investment Corp/ Efficiency VT Rated 91.8 / 5 Star Plus ENERGY STAR Home 4th highest rating of over 2200 rated homes VT Residential Energy Code

Design and Construction: Groundswell Architects (Ted Montgomery). Client: Sarah, Skye, Rose and Ted Montgomery





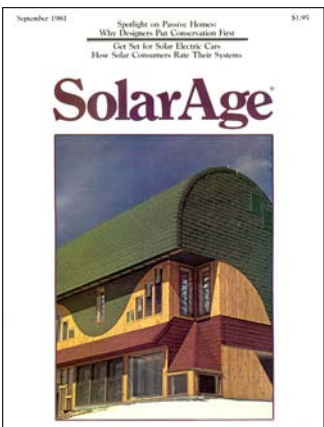
Program Overview

A structure in central Vermont using solar storage, super insulation, passive solar collection, curving forms and whimsy to create a home for family of five. The house has been remodeled twice over a twenty year period, each time advancing the environmental and energy conserving features.



Project Data

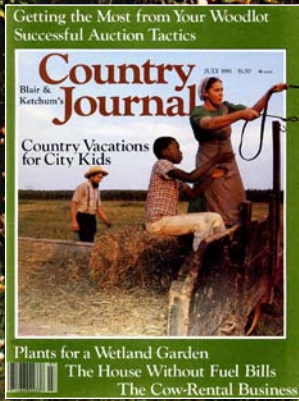
Cost: \$800,000 total Completed: Fall 1998
 Builders: Circus Studios, Hoover Austin



Design Features

Set into a hill on the north, the structure uses a curved roof form to facilitate an improved ventilation system by creating a low pressure zone on the north side of the roof. A studio to the east and bedroom to the west on the second floor use the rounded forms, which become dining and music spaces on the first floor.





Program Overview

A super-insulated, passive solar addition to an existing one bedroom home overlooking a four acre private pond in Central Vermont.

Project Data

Cost: \$162,500 w/o land
 Gross Area: 1200 sf
 General Contractor: Alpha Design & Construction
 Spiral stairs: Peter Domenicala
 Solar Hot Water: Vermont Energy
 Library built-in: Union Woodworks
 Landscape: Barbara Weedon

Solar features

The southwest corner of the new construction has been extensively glazed with a low "E" insulated glass to encourage a passive gain. The concrete foundation is coupled to the heated space indirectly. Liquid cooled hot water panels have been added to the south roof to provide the majority of domestic hot water.



Design features

The addition uses the existing exterior "graphics" and shapes to as a genesis for the spirit of the architecture. The old box is expanded and articulated to produce the spatial dynamics found in the new, expansive living area, off which everything revolves. The centerpieces of the new 26' high space are: 1) an all wood spiral staircase, custom built by laminating pieces of butternut together; 2) a built-in library unit, featuring inlaid brass and ebony.

Featured in the July 1981 issue of Country Journal.





Program Overview

A super-insulated, passive solar, three bedroom home overlooking Central Vermont.

Project Data

Cost: \$110,000 w/o land
Gross Area: 1600 sf + 225 sf garage
Builder: Alpha Design & Const.

Design features

The home uses a massing concept of two recognizable styles - a rather traditional Greek revival w/clapboarding, and a banded graphic wrap-around package including a pop-out round bedroom deck.

Solar features

A solar "mouth" on the southeast/southwest corner "drinks" in the sun, providing enough annual gain to require less than two cords of hardwood for auxiliary heating.





Program Overview

A home for a family of four with three bedrooms, guest room, den, library, play loft, living/solarium, dining and kitchen spaces.

Design Features

Inspired by the view to Camel's Hump (where the couple hiked to become engaged!), the master bedroom, kitchen and dining room celebrate this familiar profile, as does the stone retaining wall. An HRV unit coupled with radiant floor heating provides high levels of human comfort.

Solar features

An active solar system provides up to 50% of annual space heating loads. Photovoltaic panels are to be added in the future, providing 60% of annual electrical requirements.





Project Data

Location: Central Vermont
Construction: completed 2002
Materials: Cedar clapboards & shingles,
26ga metal roofing, Marvin Windows

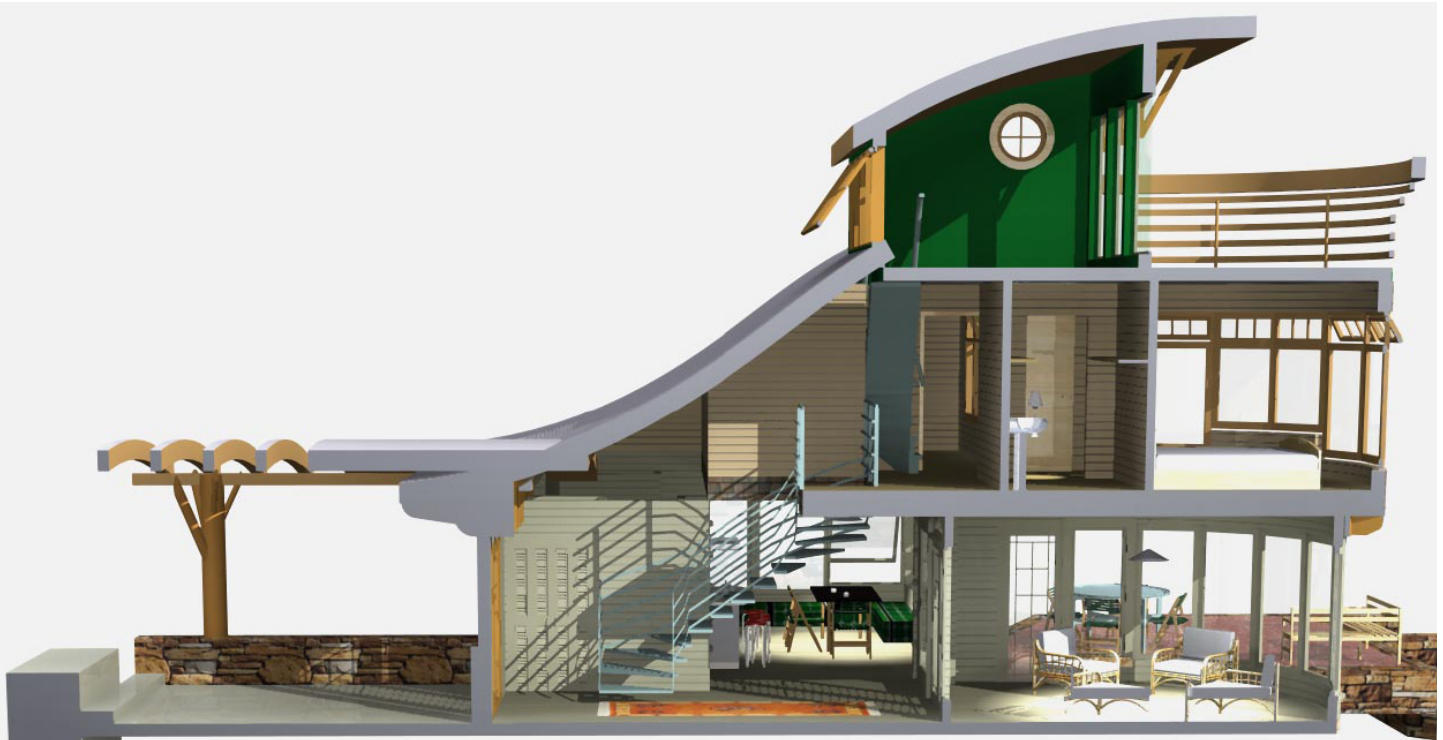
Program Overview

A unique passive solar home that uses a floor storage system of concrete blocks to create a air loop for distribution throughout the home.

Design Features

The custom stair railing shown below was computer generated for review by the owners. Construction documents were then created for fabrication.





Program Overview

A rebuilt camp on Lake Champlain for a family of four. It features three bedrooms, an Away room, kitchen/dining, three season porch, widow's balcony and an entertainment patio. The floor plan is open and inviting. The owners landscaping plan includes extensive flowering shrubs.

Design Features

The overall gesture is that of a bird in flight, floating on lake borne breezes. The structure is naturally cooled, using thermal chimneys and cross ventilation. It is earth coupled for thermal heating and cooling. Materials are cedar, natural stone, copper roofing and concrete floors.





Project Data

Location: Charlotte VT
Materials: Copper cladding, Hardie cement singles, Vermont slate, metal roofing

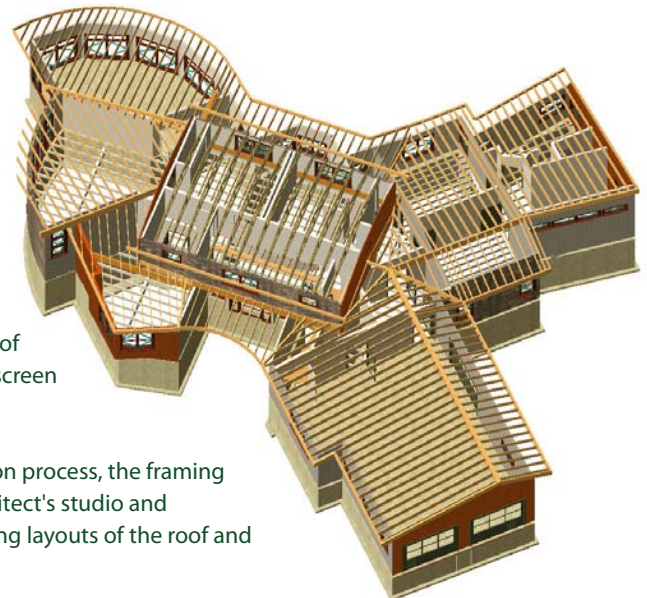
Program Overview

A new home for a family of four, perched on an elevated site overlooking Lake Champlain.
Total heating space: 2700 net sf plus basement and garage.

Design Features

Extensive virtual modeling was used throughout the schematic design process. Regular meetings with the clients were held as an interactive process of reviewing various on-screen options.

During the construction process, the framing crew came to the architect's studio and reviewed virtual framing layouts of the roof and flooring systems.





Project Data

Location: Burlington VT
Materials: Hardie cement siding, Cultured Stone®, metal roofing

Program Overview

A new home for a family of two, on a waterfront site overlooking Lake Champlain.
Total heated space: 3400 net sf plus garage.

Solar Systems

An active solar space heating system and extensive passive solar gains account for 75% of annual heating requirements. Careful and thorough cross ventilation was integrated into the design.

Design Features

A nautical theme provides all major rooms with lake views. Regular workshops with the clients used virtual imagery plus an interactive process to review and modify design options in real time.

Full contextual modeling was presented to the planning commission of Burlington as part of the permitting process.

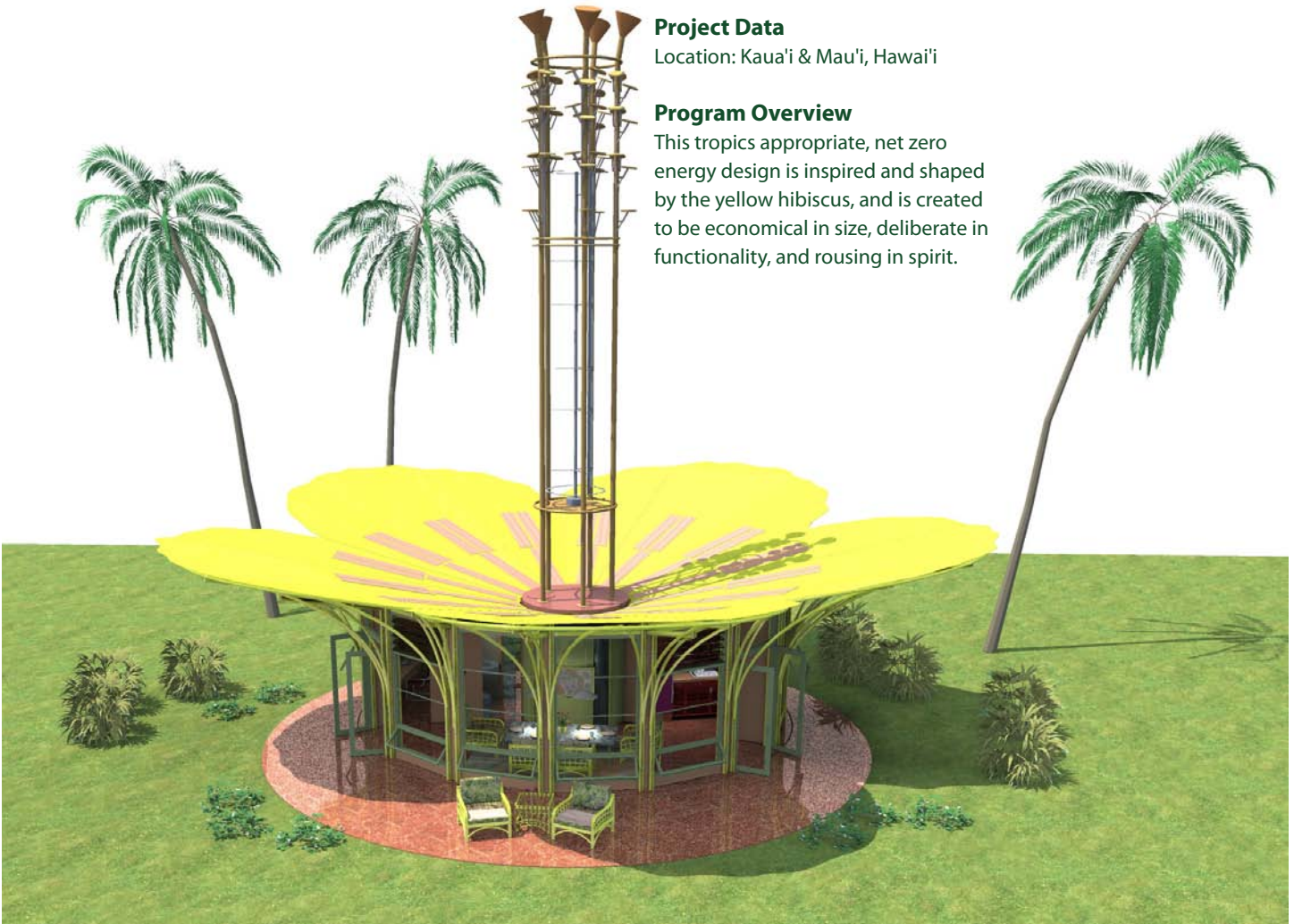


Project Data

Location: Kaua'i & Mau'i, Hawai'i

Program Overview

This tropics appropriate, net zero energy design is inspired and shaped by the yellow hibiscus, and is created to be economical in size, deliberate in functionality, and rousing in spirit.



Design Features

Using native materials this building brings a new strategy for climate responsive, conscientious, responsible housing for the state of Hawai'i.

The main goal of this project has been to craft a beautiful, inspiring building that lives lightly on the land and requires no off site power, fuel, or water sources.

A new icon of island independence.

Net Zero Energy Building

As a stand alone, off grid solution to living, the Hale Hibiscus requires no external energy sources. The stamen is represented as the energy tower.

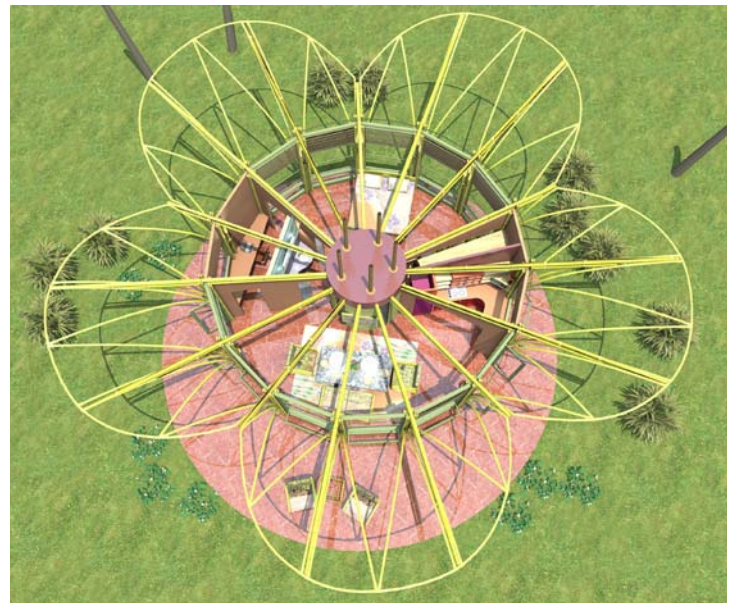
The "stigmas" are communication dishes & vent ports for batteries & toilet

The "anthers" are flat plates for heating domestic hot water:

For generating electrical power, equipment includes a vertical wind turbine and thin film photovoltaic cells (part of fabric petal).

Water Resource

The five fabric petals are sloped to harvest rain water into a common manifold system feeding eight translucent tubes in the middle of the building. These tubes define a shower room and hold over 720 gallons of water, enough for a month of careful and conservative use.



E C O L O G I C A L



Ethel M Chocolates Living Machine (M&M Mars Candy), Henderson, Nevada, Project with Living Technologies 1994

Program Overview

The Ethel M Chocolates project is sited in Henderson, Nevada and requires strict attention to a harsh desert climate. The facility treats water used in the manufacturing process, rendering it suitable for irrigation purposes. An educational display has been installed under the canopy. The project have been working well in its four years of service and requires moderate maintenance.

Project Data

Cost: \$1,100,000

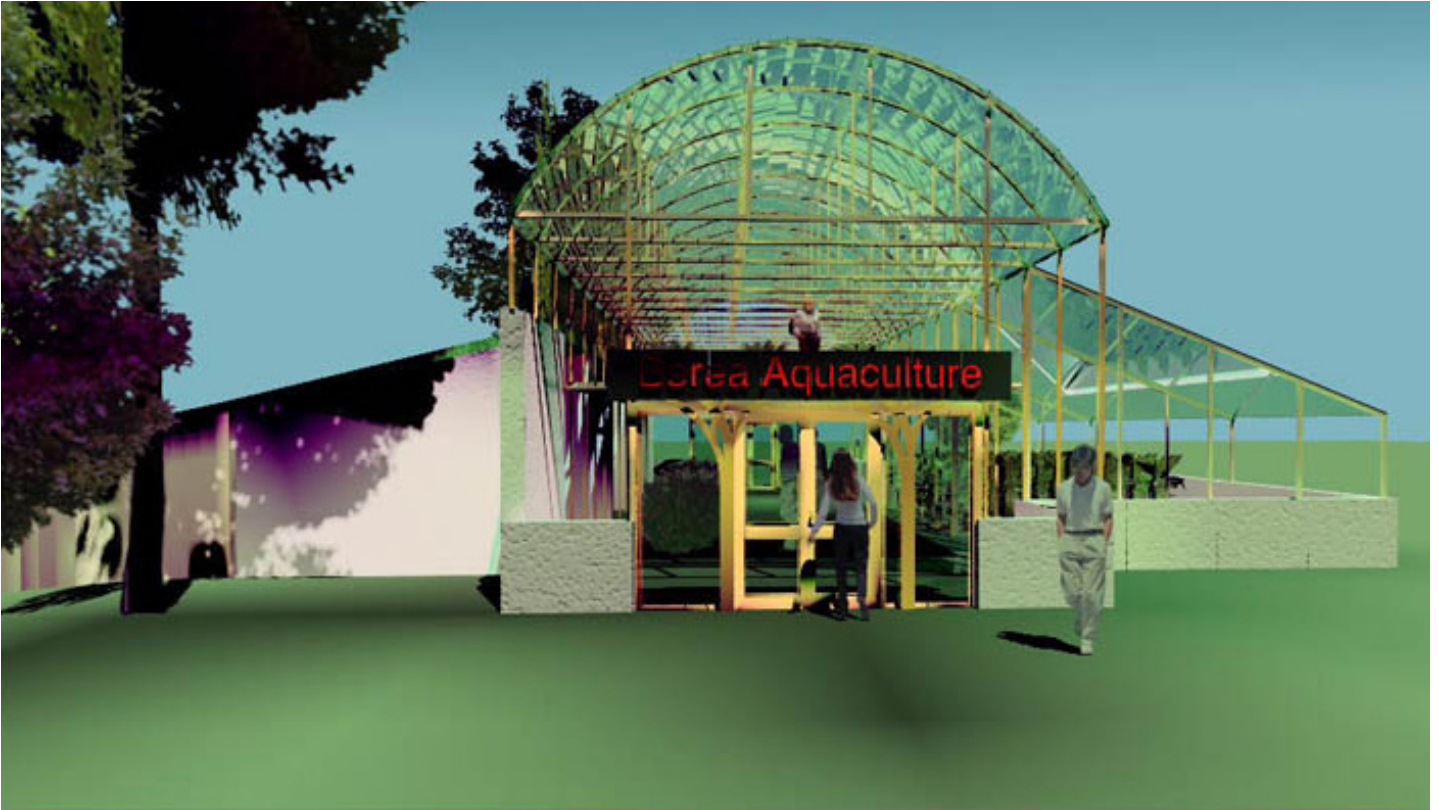
Client: Ethel M Chocolates/M&M Mars Candy Company, Henderson, Nevada

Design team: Indiana Architecture & Design, Living Technologies, Servidio Engineering, H.B.Daugherty (Whitehouse, OH)

Design Features

Organization of various storage tanks, retractable shading, walkways into user friendly "living machine". Design of full time canopy to withstand Nevada climate and winds.





Project Data

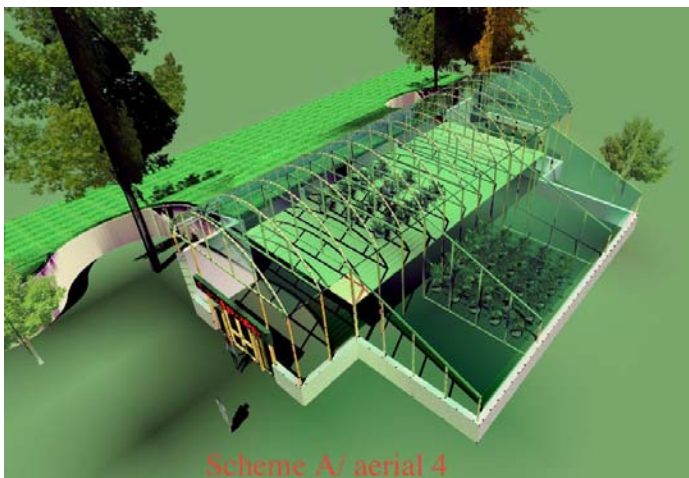
Cost: \$ 200,000 construction
 Design Team: Indiana Architecture & Design, Salem Engineering
 Client: Berea College, Berea, Kentucky

Program Overview

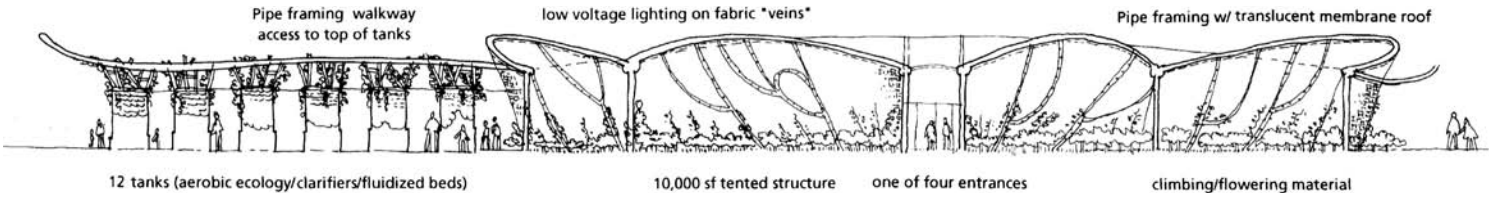
A new bioshelter facility providing an environment for student design and construction of aquaculture, greenhouse and other year round agriculture activities.

Design features

Construction uses off the shelf commercial greenhouse components, coupled with an energy efficient earth bermed concrete bunker from rigid foam forming system. An upper walkway with metal grating provides a shaded growing area below. Year round heating will be primarily passive and active solar with a large thermal mass of water and gravel for storage.



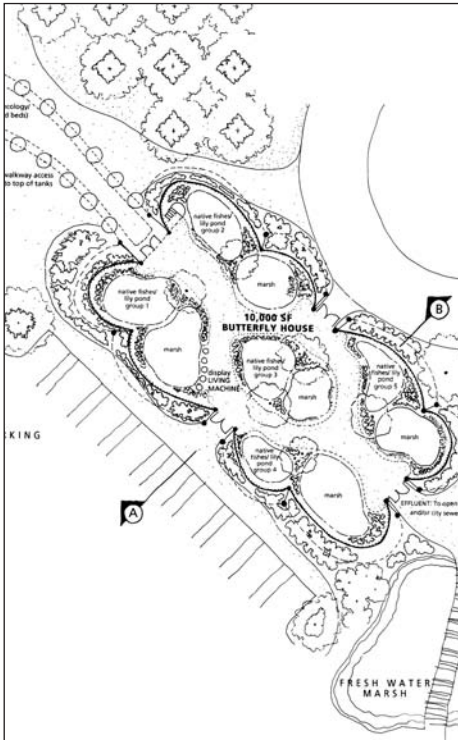
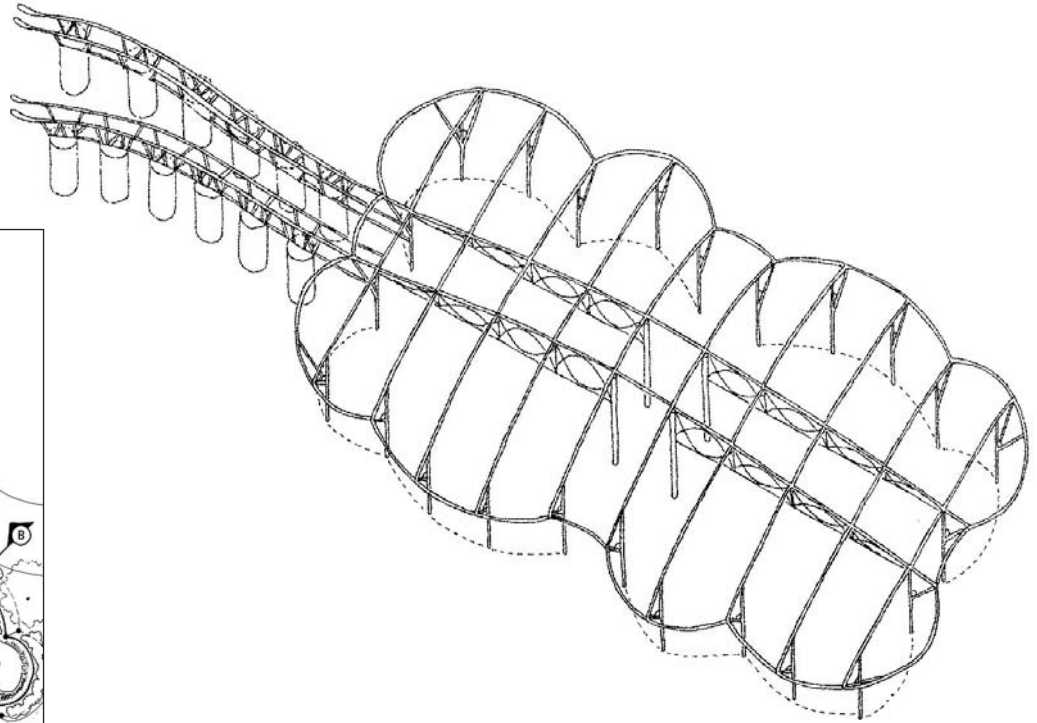
M O S I B U T T E R F L Y H O U S E



Program Overview

Project Description

A water treatment facility for a newly remodeled museum using lily ponds, marshes and planted landscaping to support an ongoing community of butterflies of many species.

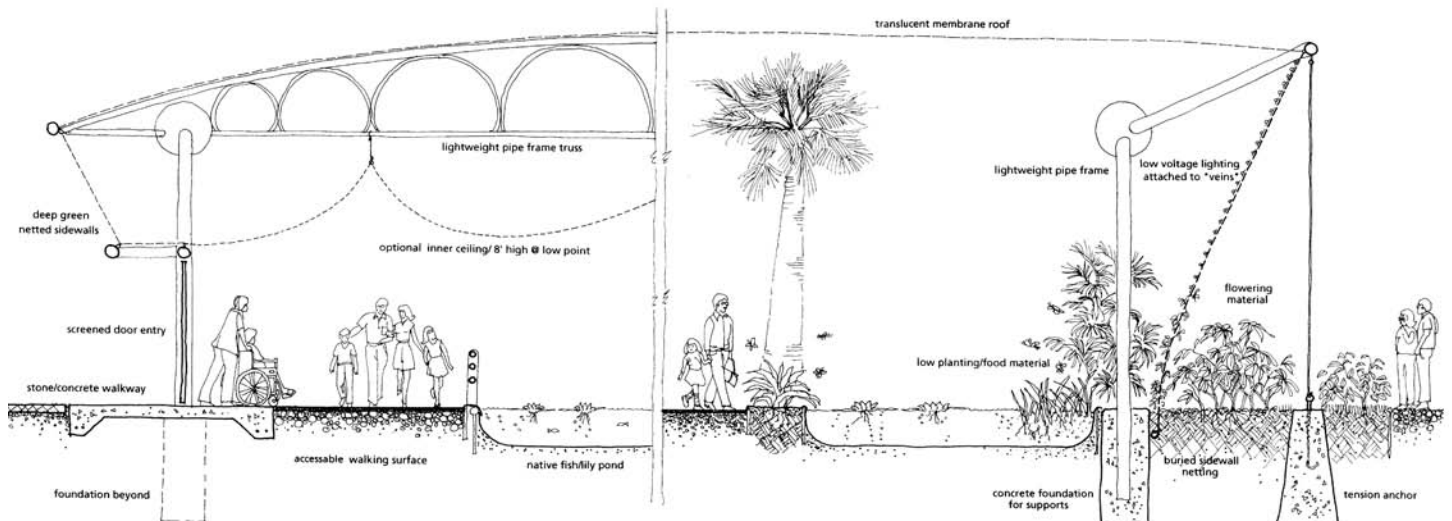


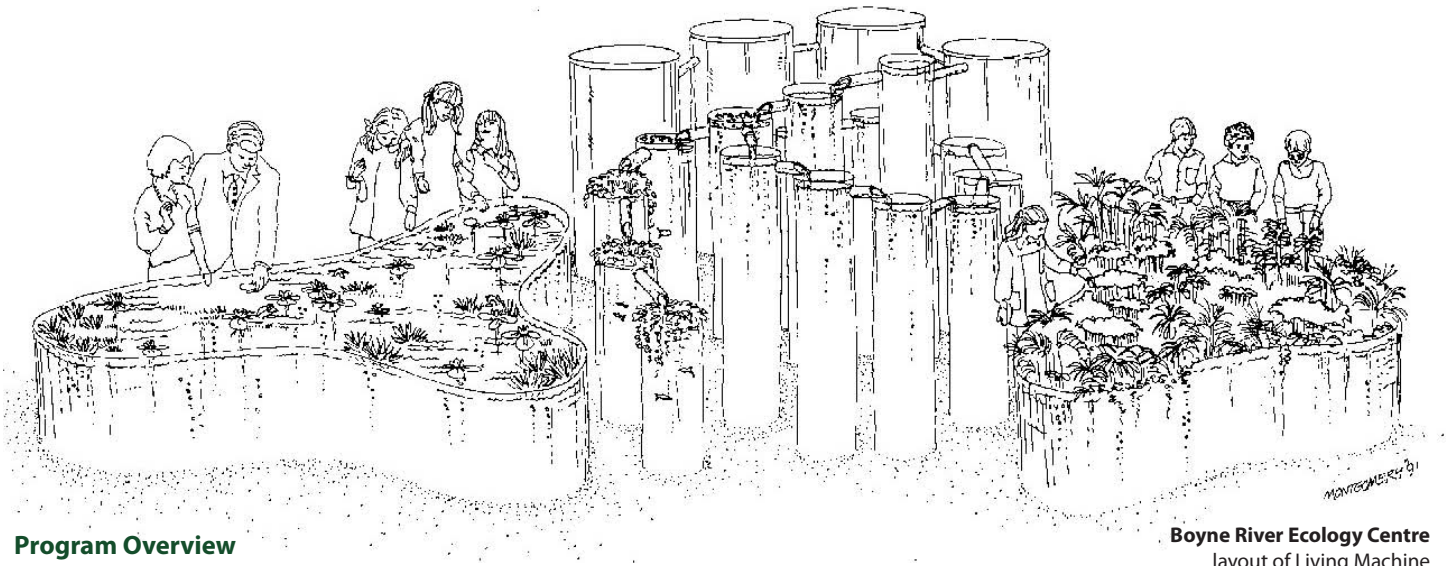
Project Data

Cost: \$1,200,000 est.
 Client: Museum of Science & Industry, Tampa, Florida
 Design team: Indiana Architecture & Design, Living Technologies, and John Todd Research and Design

Design Features

The project is the shape of a butterfly, using custom pipe frame trusses, a translucent membrane roof, netting, water tanks, lighting, marshes, ponds, walkways, and landscaping to provide the effect. The butterflies are raised nearby and live year round within the enclosure.



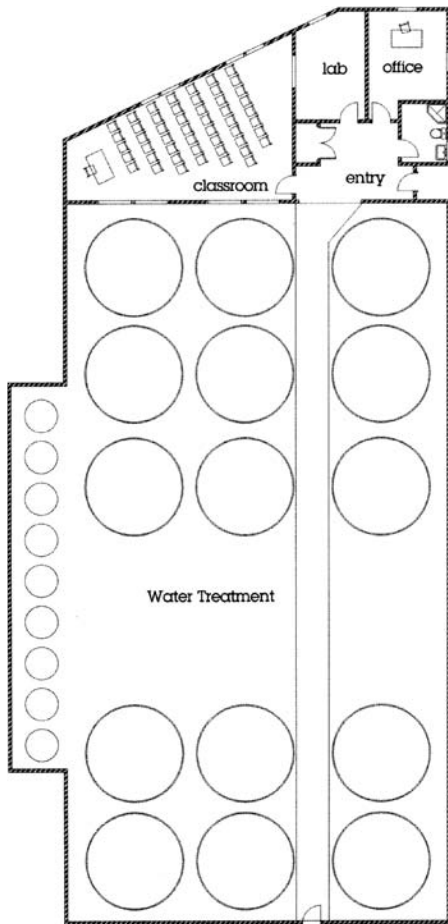


Program Overview

Living Machines are sustainable wastewater systems that treat sewage and industrial waste by natural methods to re-use quality and do so in a cost effective, aesthetically beautiful manner.

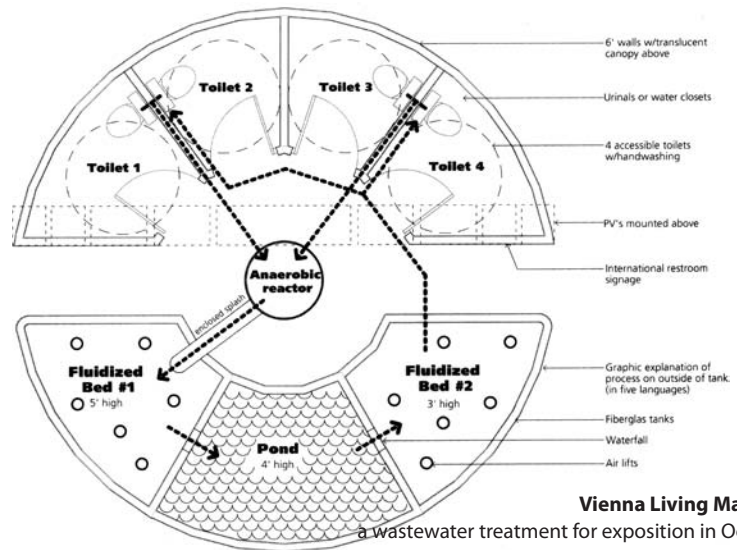
Boyne River Ecology Centre

layout of Living Machine
Project with John Todd & Living Technologies
1993



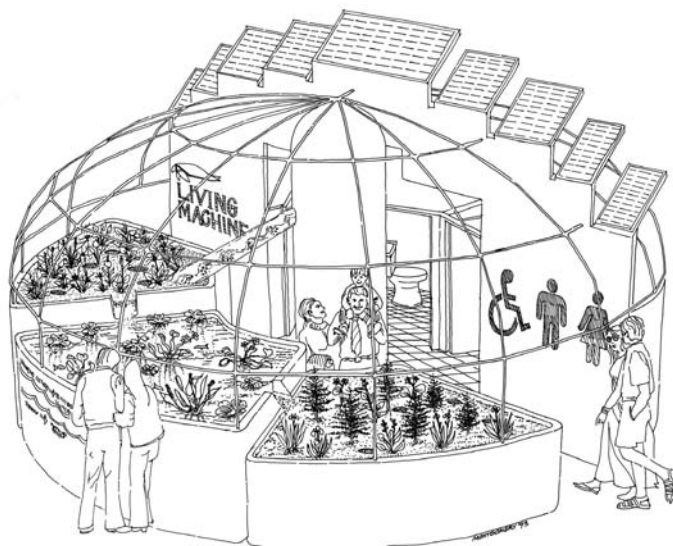
South Burlington Living Machine

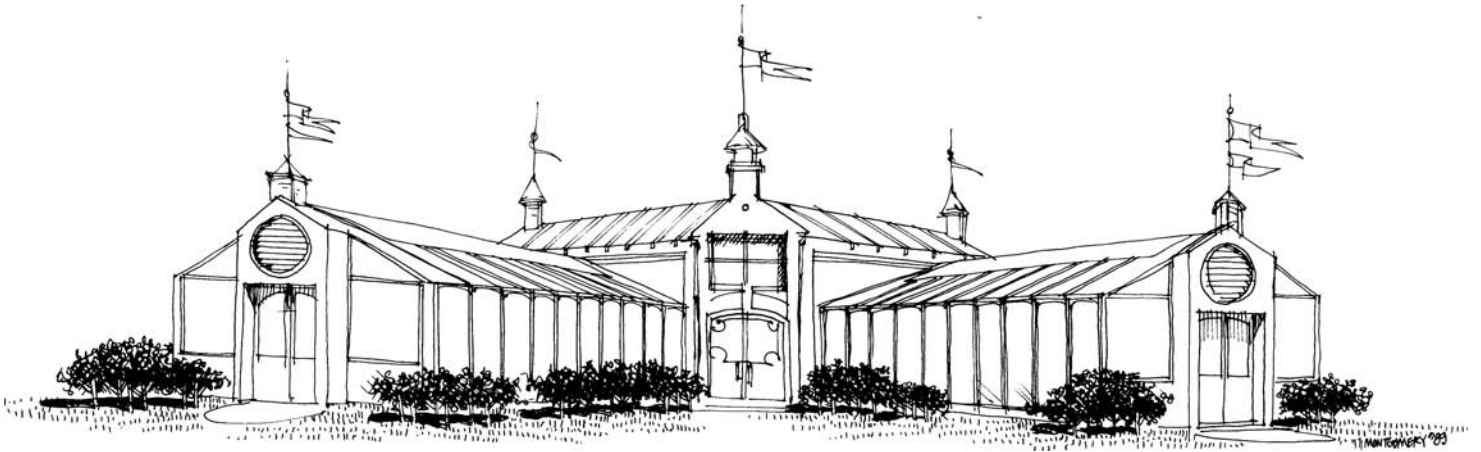
Study for alterations & conversion of existing wastewater treatment plant
Project with Living Technologies, 1994



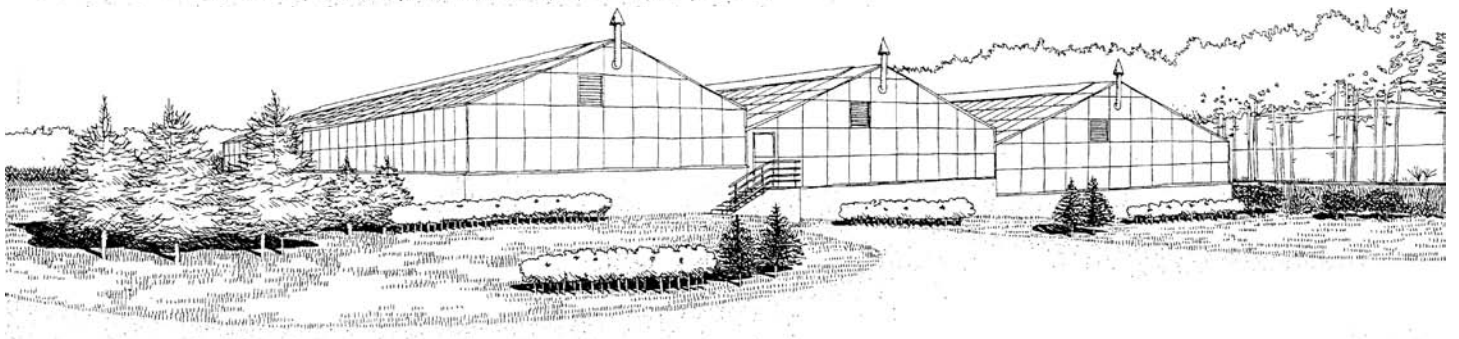
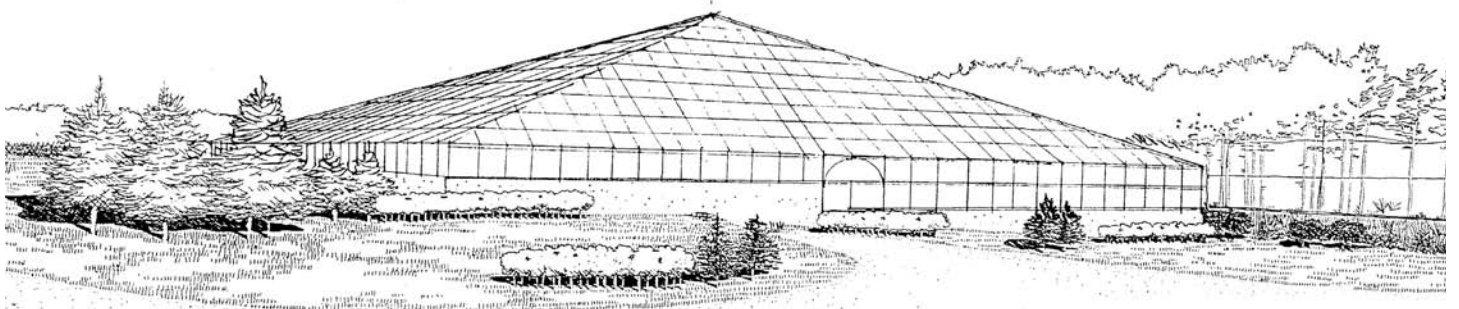
Vienna Living Machine

a wastewater treatment for exposition in October 1994 in Vienna, Austria
Project with John Todd/ Ocean Arks International

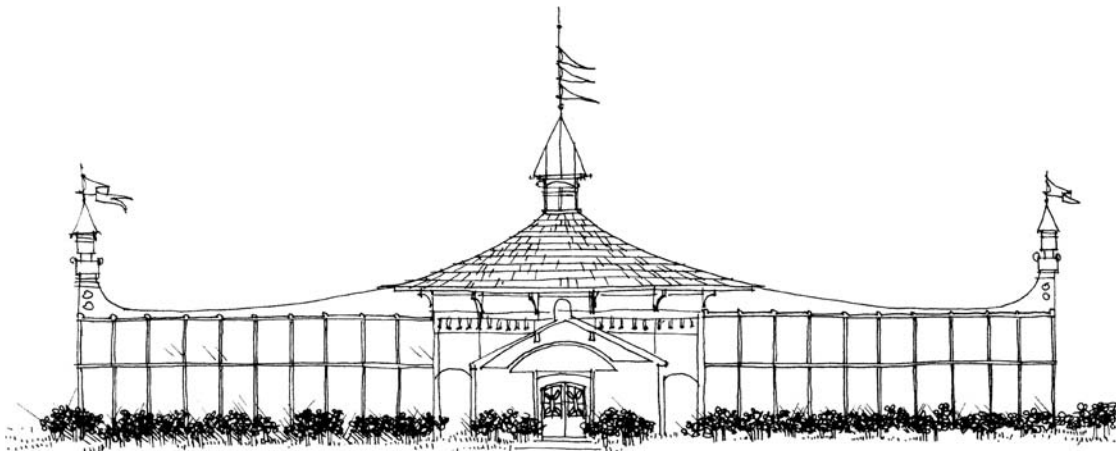




Prototype Design for Greenhouse Living Machine, Harwich, MA
Project with Advanced Greenhouse Systems (former name of Living Technologies) 1989



Two Designs for Town of Shelburne Treatment Plant on Harbor Road
Project with Advanced Greenhouse Systems, 1989



Prototype Design for Greenhouse Living Machine, Harwich, MA
Project with Advanced Greenhouse Systems (former name of Living Technologies) 1989

P R O D U C T S



Flying handkerchief



Wizard's hat with frisbee diffuser



TS hanging lamp



Gossamer Maple Lamp

Program Overview

Custom designed and produced lighting for private homes, commercial dining and manufacturing.

Project Data

Materials: Polycarbonate, plywood, copper tubing and sheets, laminated paper, bronze wire and washers.

Lamps: compact fluorescent, halogen, candle

Design features

Each fixture is hand built. The architect built ten lighting fixtures for the Ten Stones Community Building project, while working with Conant Custom Brass in Burlington for UL labeling.

The latest fixture, the Gossamer Maple Lamp, uses leaf patterns from the Shelburne Farms "From Forest to Furniture" project. Each lamp is composed of four autumn maple leaves.

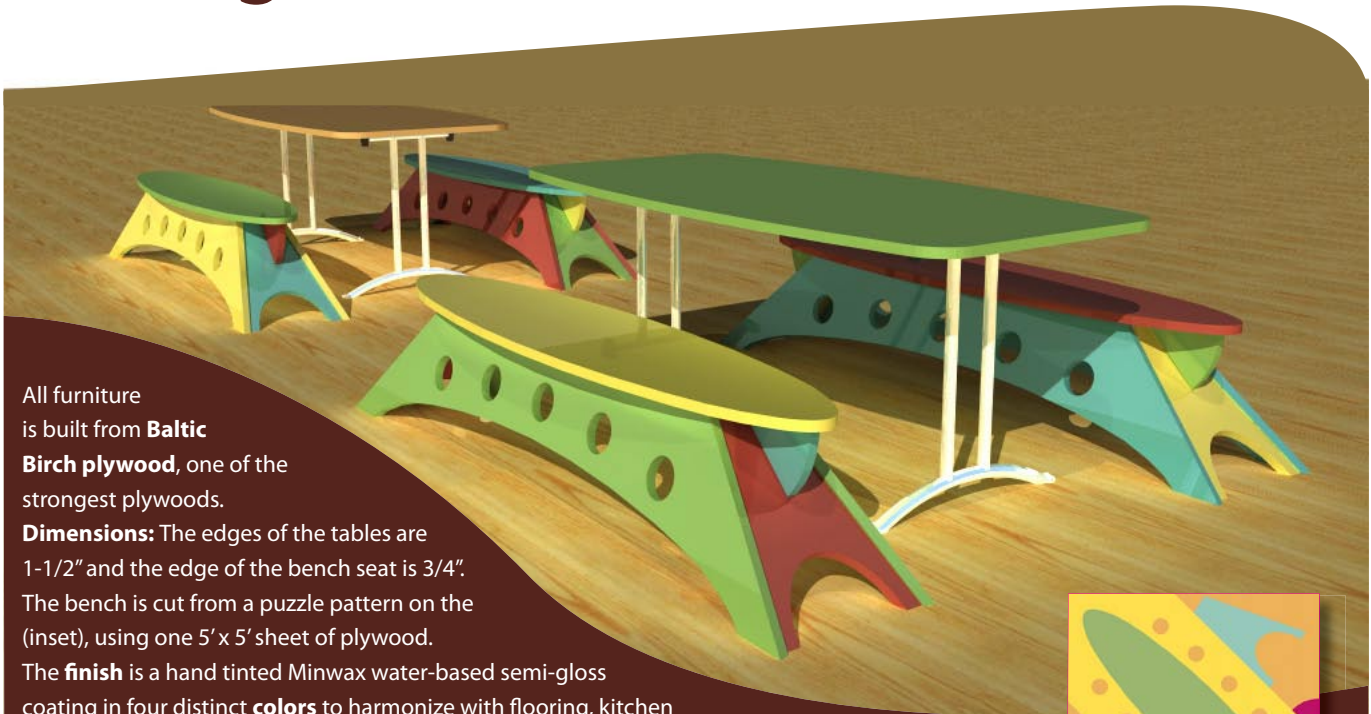


Flying handkerchiefs in the Ten Stones CH



Copper Chandelier with halogen, candles and compact fluorescents

Dining Tables & Benches



All furniture is built from **Baltic Birch plywood**, one of the strongest plywoods.

Dimensions: The edges of the tables are 1-1/2" and the edge of the bench seat is 3/4". The bench is cut from a puzzle pattern on the (inset), using one 5' x 5' sheet of plywood.

The **finish** is a hand tinted Minwax water-based semi-gloss coating in four distinct **colors** to harmonize with flooring, kitchen cabinets, countertops and cozy corner fabrics.

The tables use a **folding leg** from Hafele hardware, available in a silver or a chrome finish. They are sturdy, pick up the curve of the cabinet pulls, and are easy to fold.



Plywood cut out pattern



Kidney table



Oval table



The architect and his son Skye built six custom tables for the Ten Stones Community Building project.

Ted Montgomery

Born: Richmond, Indiana, 1947
 Owner: GroundSwell Architects
 Education: Graduated from University of Cincinnati 1972
 Architectural Registration: State of Vermont 1976

Recent Experience

Indiana Architecture & Design, 1985-2002
Owner, project architect
 Local Star, Ltd., Northfield, VT, 1981-1985 *Owner, project architect*
 Circus Studios, Ltd., Waitsfield, VT, 1976-1981
Founding partner, project architect

Positions Held

Housing Supply Goals Task Force, *Chittenden County Regional Planning Commission, 2003*
 Board Member, Shelburne Historic Preservation & Review Commission, *Shelburne, VT, 1989-1991*
 Squad Member (EMT Cert.), Shelburne Rescue, *Shelburne, VT, 1989-2001*
 Board Member, Moretown Elementary School, *Moretown, VT 1982-83, 1985*
 Member, Mayor's Task Force on the Waterfront, *Burlington, VT 1981*
 Member, Load Management Committee, Dept. of Public Service, *State of Vermont 1981-82*
 Partner, SOLARCHOW Education Project, *Waitsfield, VT 1978-83*

Professional Activities

Co-winner, Artgate design competition, AIA VT, Fall 2005
 Adjunct Professor, ArchiCAD software, University of Vermont, 2004 to present
 Instructor, Design & Construction, Yestermorrow Building School, Warren, VT, Summer 2003
 Home & Office Openhouse/Montgomery Home, National Tour of Solar Homes, sponsored by NESEA (Northeast Sustainable Energy Association) and ASES (American Solar Energy Society, October 1997 and October 1998.
 Guest Speaker, "Career Day", Champlain Valley Union High School, Hinesburg, Vermont, February 1999.
 Guest Speaker, "Ten Stones Community Experience", Unitarian Church (Rev. Gary Kalwolsky), Burlington, VT, April 1998
 Guest Speaker, "Ten Stones Community Design", Living/Learning Center (Tom Hudspeth, Professor), University of Vermont, Burlington, VT, April 1998



Instructor, "Advanced CAD Presentation Graphics", ECA Florida Architectural Licensing Seminars, Los Vegas, New York, Columbus, Killington, West Palm Beach, 1996-97
 Community Workshop, "Straw Bale Tool Shed", Ten Stones Community, 1997
 Guest Speaker, "Community Design", George Aiken Center University of Vermont, Burlington, VT, 1995
 Guest Juror, "Senior Challenge Projects", Champlain Valley Union High School, Hinesburg, VT, May 1995
 Guest Panelist, "Earth Matters", Channel 17 Local Access, Burlington, Vermont, March 1995
 Guest Instructor, "Ten Stones Community Design", Living/Learning Center, University of Vermont, Burlington, VT, February 1995
 Guest Instructor, "The Ten Stones Story", Ten Stones Community, Charlotte, VT, April 1994
 Video Presentation, "Walk-thru's of the Lake Champlain Basin Science Center", Burlington Boat House, Burlington, VT, November 1994

Interview, "The Wave", Channel 5 WPTZ Evening News, 1991
 Guest Panelist, "Profit With Good Design", The Governor's Conference on Design and the Built Environment, Montpelier, VT, 1989
 Visiting Instructor, The Governor's Institute, Castleton State College, 1989
 Exhibition of Work, "Riverside Avenue", The Metropolitan Gallery, City Hall, Burlington, VT, 1988
 Exhibition of Work, "Main Street Study", The Community Planning Fair, Church Street, Burlington, VT, 1988
 Visiting Instructor, Design & Planning, University of Vermont, 1988
 Exhibition of Work, "The Webb Residence", ArtSource, Burlington, VT, 1988
 Guest Speaker, "Architectural Hearthrobs", Yestermorrow Lecture Series, Warren, Vermont, 1988
 Guest Speaker, "Recent Solar Work", Yestermorrow Building School, Warren, VT, 1987
 Guest Speaker, "Recent Projects", The Architecture Club, University of Vermont, Burlington, VT, 1987
 Instructor, Design & Construction, Yestermorrow Building School, Warren, VT, Summers of 1983 thru 1985
 Visiting Lecturer & Instructor, Yestermorrow Building School, Warren, VT, 1984
 Guest Speaker, "A Solar Home We Could Build on Mars & Other Projects", Yestermorrow Lecture Series, Waitsfield, VT, 1983
 Exhibition of Work, "Shelter: Models of Native Ingenuity", The Katonah Gallery, Katonah, NY, 1982
 Guest Speaker, "Lunchline" program, Ball State University, Muncie, IN, 1982
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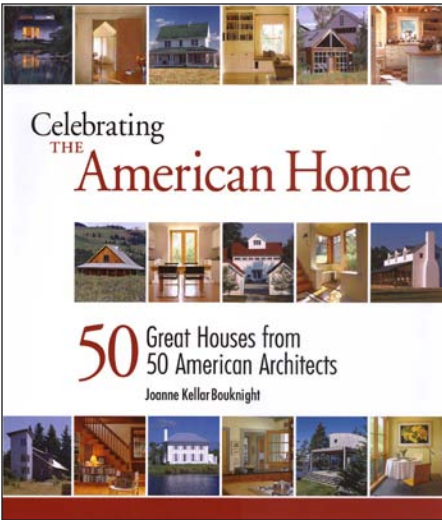


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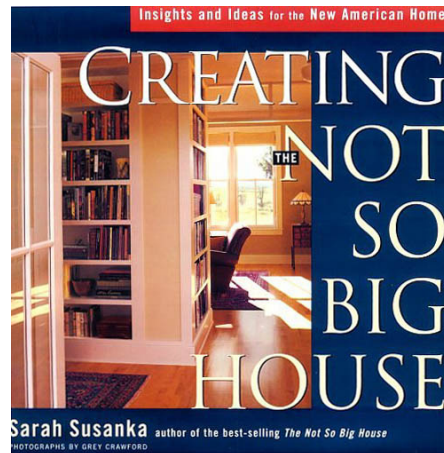
Structural Engineering & Testing
SERVIDIO ENGINEERING
Dick Servidio, Owner
135 College Street, Burlington VT
802-860-0400

CIVIL ENGINEERING ASSOCIATES
Steve Vock, Partner
Shelburne VT
802-985-2323

Mechanical & Electrical Engineering
SALEM ENGINEERING
Tom Reilly, Owner
Jelly Mill Common, Shelburne VT
802-985-8722

Civil Engineering & Surveying
KREBS & LANSING
Mike Burke, Owner
10 Main Street, Colchester VT
802-878-0375

Planning & Landscape Architecture
LANDWORKS
David Raphael, Owner
211 Maple St., Middlebury VT
802-388-3011



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Mark Redmond, Executive Director
SPECTRUM YOUTH & FAMILY SERVICES
31 Elmwood Ave., Burlington VT 05401
802-864-7423

Joe Arioli, Executive Director
COMMUNITY HEALTH CENTER
617 Riverside Ave, Burlington VT 05401
860-4318

Ron Miller, Owner
RESOURCE CENTER FOR REDESIGNING
EDUCATION
158 McNeil Cove Road, Charlotte, VT 05445
802-425-5153

Alan Newman, President
MAGIC HAT BREWERY
180 Flynn Ave, Burlington, VT 05401
802-658-2739



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