urban ecology center
MENOMONEE VALLEY

collaborative project **MIAD/UWM**

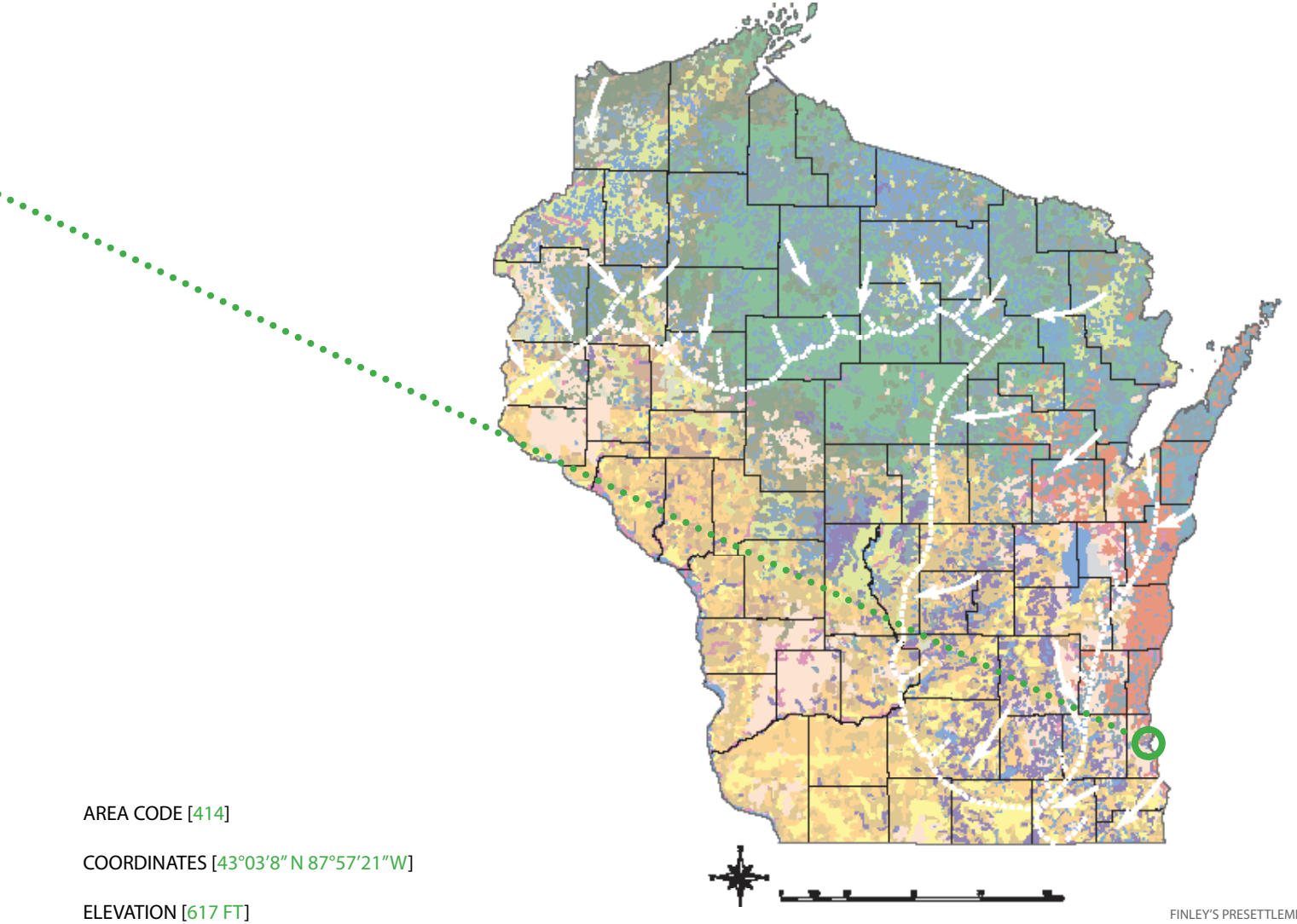
project **INTRODUCTION**

LOCATION

Milwaukee, Wisconsin

The Urban Ecology Center (UEC) is an environmental education organization. They strive to teach people about the natural environment. They work with schools, teachers, families, kids – people of all ages. Often such organizations are located far from city centers – close to wilderness areas. UEC made a concerted decision to be in an urban area and to provide educational and recreational services to people in the city of Milwaukee. They have chosen to move into neighborhoods with difficult social conditions, to be a partner in improving those communities. They strive to provide centers with all manner of fun activities year round and currently have two locations. People from the surrounding neighborhoods take full advantage of the recreational resources. One center (the main branch) is in Riverside Park along the Milwaukee River and the other is in Washington Park – both parks were originally designed by Frederick Law Olmsted. These Milwaukee County parks, which the UEC prefers to call "outdoor classrooms", have a range of activities and acres of natural areas. At the Riverside Park location, visitors and members can go snowshoeing or climb the rock wall. At Washington Park there is canoeing and fishing in the lagoon, among other activities. They engage local students in hands-on learning about science, nature and sustainable living. The UEC uses the parks as "outdoor laboratories". When they arrived at Riverside Park, it was considered a dangerous area and they actively participated in the long-term reclamation of the park by the community. UEC is dedicated to both ecological and communal recovery – restoring natural habitats and neighborhood.

Urban Ecology Center. 2010. http://www.urbanecologycenter.org (accessed January 7, 2010).



AREA CODE [414]

COORDINATES [43°03’8” N 87°57’21”W]

ELEVATION [617 FT]

FINLEY’S PRESETTLEMENT VEGETATION
Data created by Robert W. Finley - 1976, Professor of Geography Emeritus, UW. Digital data prepared by Maribeth Milner and Steve Ventura, UW. Wis Transverse Merse Mercator NAD83(91) map created by Nina Janicki.
Added extent of most recent glaciation, after Lawrence Martin., The Physical Geography of Wisconsin

The UEC always embraced the idea of multiple locations. It was always part of how they thought of themselves and was in keeping with their desire to be close to the communities they served. In Riverside Park, the UEC's headquarters are a living and working demonstration of how a building can be responsive to the environment. The building, dedicated in 2004, replaced a temporary trailer that had been in use for years. While still operating out of that trailer, the UEC had started looking at branches in different parts of the city – in the western part of the city and somewhere in the South Side. That led to the Washington Park location, in a space belonging to the Milwaukee County Parks. It does not have the same qualities as the Riverside location, but the UEC has modified the building somewhat to make it work. In both locations, the UEC actively participated in improving the conditions and atmosphere of the surrounding neighborhoods. In considering expansion to the South Side, the leadership at the UEC wished to expand in a way that continues or improves upon the themes developed at Riverside – a building that is both welcoming to the community within which it is located and meets the stated mission and goals of the UEC:

The Urban Ecology Center fosters ecological understanding as inspiration for change, neighborhood by neighborhood.

- Provide outdoor science education for urban youth.
- Protect and use public natural areas, making them safe, accessible and vibrant.
- Preserve and enhance these natural areas and their surrounding waters.
- Promote community by offering resources that support learning, volunteerism, stewardship, recreation, and camaraderie.
- Practice and model environmentally responsible behaviors

Thus the search for an ideal location for the South Side UEC ensued.

Image from Menomonee Valley Partners

Meanwhile, a major revitalization project was underway in the Menomonee River Valley. The city, various environmental groups and several state agencies were contemplating a restoration of the ecology of the Menomonee River Valley in concert with economic revitalization. The area between the Mitchell Park Domes and Miller Park had remained a scene of devastation after a hundred years of intensive industrial activity and a few decades of neglect. Efforts were underway to reclaim the land surrounding the river for commercial ventures, with some acreage set aside for recreation and ecological restoration. Many members, staff and volunteers at the UEC are active proponents for the environment and are generally active in the civic and economic life of Milwaukee. The UEC viewed such an undertaking to be in line with their mission and jumped at the opportunity to participate in this unprecedented recovery.

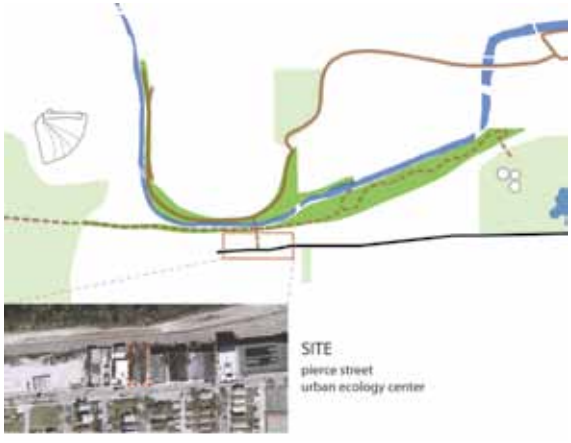
Encouraged by one of the area's most prominent environmentalists, the UEC leadership applied for and secured a grant from the Sierra Club. They performed a feasibility study for a possible center on the South Side, where there are many schools with little or no environmental education. That was in 2005-2006, as the Menomonee Valley River Partners were in the early stages of implementing their valley master plan. The feasibility study was conducted clarifying the merits of the idea. Now donors needed persuading and a site needed locating.

site of investigation + future restoration

As the idea gained momentum, it garnered more support from the larger community, bringing in fresh perspectives. The Layton Boulevard West Neighborhood Association invited UEC to several meetings to share their input. It was during one of these meetings that the idea of rehabilitating an existing building first came up. Once the thought was broached, it seemed to make sense for ecological reasons. There was also a desire to introduce urban nature centers in other cities. It was thought that perhaps the process of creating the centers in Milwaukee could help develop and define the building type of "urban ecology center".

The idea of developing a building type transformed into developing a framework that could help explain the process of creating an urban ecology center. The construction process for the Riverside site had been very instructive. It was a challenging journey to create a new building type and remains unique – and the building continues to furnish new lessons. Although the Washington Park venue provides many wonderful amenities and it is slated for expansion with the UWM's Solar Decathlon entry, the building itself does not have the same educational ability. Hence, it was during a visit to that location by a strong supporter (donor) of the center with UEC executive director Ken Leinbach and director of education programs Beth Fetterley, that the idea of a design competition was born. This donor had recently read an article about the Solar Decathlon competition held in Washington DC biennially by the US department of Energy. This competition featured solar powered buildings from around the world designed and built by university students.

The donor read about the Solar Decathlon: Pogue, David. *New York Times.* Novemeber 1, 2007. http://pogue.blogs.nytimes.com/2007/11/01/the-future-of-solar-powered-homes/?scp=1&sq=pogue%20Solr520Decathlon&st=cse (accessed January 7, 2010).



[right]
existing site conditions
looking south

Several sites were initially considered for this project. Sites near the domes at Mitchell Park had been entertained, as well as in the Menomonee Valley, along both sides of the river. Due to this confluence of events, by the fall of 2007 two buildings at W. Pierce and 37th Streets on the south side of the Menomonee River, separated only by the railroad from planned green spaces, became likely candidates - because there is a tunnel opposite 37th Street. The tunnel had long been sealed and had degraded, but its location held potential for redesigning and reopening a pedestrian connection from the south side neighborhoods to the river, first crossing underneath the railroad tracks, and then continuing across the river. Along the river and under the 35th Street Bridge are the Hank Aaron State Trail, including 50 acres slated for ecological restoration and a proposed community park. The UEC's feasibility study had also determined that there are many schools in the area with little or no environmental education. The long site selection process that began in 2005, culminated in December 2008.

The UEC and their partners, the Wisconsin Department of Natural Resources (DNR), Menomonee Valley Partners (MVP), and the City of Milwaukee, chose a decommissioned tavern in the century-old building at 3700 W. Pierce Street, as the most feasible location. This for a few reasons: the DNR will manage adjacent land along the river that will become a restored natural area and adjacency was critical. After complicated negotiations and with the additional support of the Wisconsin Department of Transportation, the property was finally acquired by the DNR for use by the UEC.

Discussions with area universities commenced. The UEC asked each university what kind of resources and expertise they could bring to bear on such a project. Meetings held in early 2009 brought the UEC leadership together with faculty from several area universities and colleges. The idea of students from several schools working collaboratively within teams looked daunting to many of those assembled but they were not deterred. The building, they decided, would be a center where "process is as important as the end product." The Urban Ecology Center was adamant that the design should assume a didactic presence: to educate rather than showcase. The students would be exposed to a real design process with a real client, real budget, and a real site. The summer session, a pre-design phase, was run mostly by the students, with the instructors, clients and others available as advisors.

The students interviewed UEC staffers and leadership, spent time as volunteers, and observed the client at the Riverside building, as well as its operations. Using Christopher Alexander's Pattern Language (Alexander, et al. 1977), they produced a set of patterns that spoke to the aspirations of the UEC, beyond the usual list of required spaces. They had also investigated the Pierce Street site and performed a detailed study of the climatic conditions. They produced a computer model of the existing building and learned the prerequisites of the Living Building Challenge – a way of approaching construction that attempted to have no ecologically harmful impact on the site. At the start of the fall semester, armed with these more ecologically sensitive attitudes about design and complex analyses, the students began to work as multidisciplinary teams. Three research students investigated three aspects of the building's systems: solar energy for electricity and heating; building component heat loss cataloguing; and management of the use and disposal of water and waste. They embarked on the journey to fashion several approaches to a building which, while complying with the relevant building codes, aspired to the mission of the UEC. Such a center, they felt, had to embody the UEC ethic as an active, good neighbor in its community and within the environment. All the buildings designed by the various teams, in their various ways, tried to meet this challenge. They are at turns playful, welcoming, engaging and educational, while providing an adequate and comfortable workspace. They are indeed laboratories for investigation, but each building, in its own way, is positioned to usher its visitors into the nearby outdoors, where the UEC and its partners will lead an effort to reclaim the river edge – a veritable "imaginative, habitat-themed playground."

01:**SPRING**_2009

As the snow melted, in the early days of 2009, the seeds that had been sown of a new satellite branch for the Urban Ecology Center began to sprout. Ten years in the making: ideas had, studies conducted, support drummed, several minds met to push idea into action. After the successful process of building the main center at Riverside Park with the Kubala Washatko Architects, a local firm based in Cedarburg, and branching out to Washington Park, the UEC asked, "what next?" Along with UEC's Ken Leinbach and Beth Fetterley, a donor with a long-standing relationship to the organization had visited the Washington Park Location soon after its inauguration.

In an attempt to extend the UEC mission as expressed at both locations, the three thought that their dream to expand into the South Side could be brought into reality in a way that was educational. They wished to involve area universities and encouraged by the Solar Decathlon, they decided to initiate a design competition. An emphasis on cross-disciplinary collaboration was desirable. The spring meetings forged a strong fellowship with a common vision.

The collaboration among universities offered a conceptual framework for the experiment to grow. The idea of a competition would offer excitement and was considered an added draw. Competition was not defined in the common understanding: the act of competing; rivalry for supremacy, but as the Late Latin derivative.

[Late Latin]

competere

"to strive together"

[Latin]

to coincide, be suitable: com-, com- + petere

to seek

The UEC's goal was to expose a group of students to the thinking process and values of their organization while having fun designing a building for a real world client. The most important element: practical learning to yield a viable design for the UEC in the Menomonee Valley. The students were to introduce the client to what is out there, what is possible, and what is imaginable.

The universities remained optimistic when meeting. These early discussions attempted to draw out each institutional participant's strength and the unique perspective they would bring to the project. However, reluctantly, three schools; Marquette University, Milwaukee Area Technical College and the Milwaukee School of Engineering were unable to participate. This left the Milwaukee Institute of Art and Design and University of Wisconsin – Milwaukee in the project. At this point faculty started to recruit students. The meetings in the late spring were well attended by prospective students, who seemed enthusiastic and indicated strong interest in the project.

The UEC hoped this exercise would provide them with a framework of building system, like a menu, with which to construct an ideal urban nature center. The building would be branded to the community at large as an ideal combination of program providing knowledge of their unique local ecosystem: culturally and environmentally. This recombinant system also serves to define a new building type: the urban nature center. A basic prototype could be abstracted to present a prototypical urban ecology center anywhere.

As the great experiment prepared to usher in the change of the season, core ideals were asserted. The building is to be didactic: a tool for education. It should also represent the culture of the UEC. It will be welcoming and provide connections and introductions to the natural ecology of the Menomonee Valley.

The mantra for all involving parties: "Process is as important as product." Collaboration of this scale forges into new frontier. No one could predict what would happen.

"PROCESS IS

02:**SUMMER**_2009

Three students from the University of Wisconsin Milwaukee chose to officially participate in a summer course. However, this didn't stop a number of other students from joining in on meetings, site visits, and strategizing for the upcoming fall semester. Doctoral candidate NJ Unaka oversaw the summer process and outlined the deliverables, while encouraging the students to take initiative. Seizing the opportunity, students had greater freedom to explore, learn, experience, and develop an ongoing conversation with the UEC. The overall goal for the summer course hoped for a realistic setup so that student work would be directly applicable to designing and building the new facility. The summer objectives were three-fold.

AS IMPORTANT AS PRODUCT"

The first goal: Using Christopher Alexander's Pattern language, to develop and define the program as a set of patterns that attempted to express the essence of the UEC. Joel Krueger from the Kubala Washatko Architects met with students, helping outline and focus the patterns. He offered his insight from working with the UEC during the Riverside design process. These patterns were meant to capture the essence of the UEC's use and occupation: how they operate and project their image into the public realm. They built a list of patterns by conducting interviews. The questions derived from visceral images when considering the UEC vision, mission, and organizational patterns. For example, in promoting a more sustainably committed lifestyle, we observed people stewarding the park landscapes, experiencing natural air flow, the half-flush toilets, watching rain collection, participating in vermicomposting - tying those visceral images with the lifestyle concept gave us the pattern: increased user interaction. Participation with one's surroundings promotes the intrinsic sense of positive contribution. For example, the UEC favors low tech, user engaged technologies over high tech inconspicuous systems. These deeply internalized values are the essential characteristics defining the UEC organization. We were attempting to filter these values into explicit language.

Client interviews happened on site at the Riverside UEC. The patterns were reinforced during a visit to the Aldo Leopold Nature Center later - in October. We were inclusive and transparent by assuming the vocabulary of the client when building the list of patterns. For example we learned the subtle differences of the word "program." Architectural "program" defines a list of dimensions and uses. However, UEC "program" describes a group of educational curricula offered. Covering topics from the macro to the micro, these patterns capture the essence of the urban ecology center in common language. We grouped them under three broad headings: connection to the community, connection to the site, and building components.

THE PATTERNS DEVELOPED AS FOLLOWS:

[CONNECTION TO COMMUNITY]

1 Community Defined Space

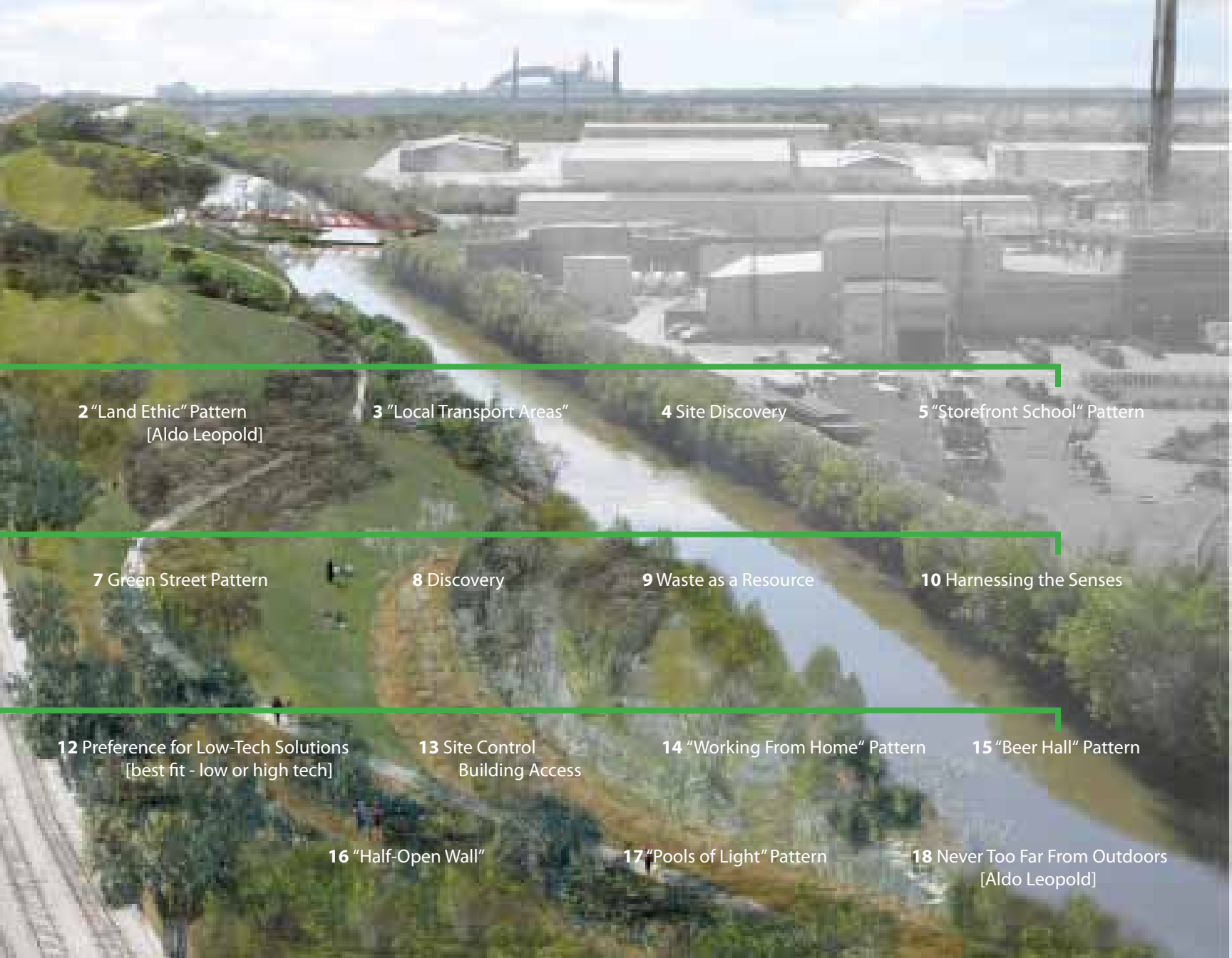
[CONNECTION TO SITE]

6 Restoration of Building and Land Bioremediation

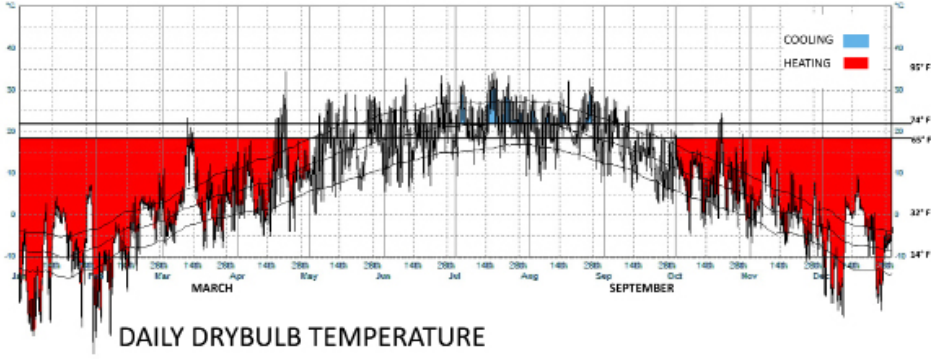
[BUILDING COMPONENTS]

11 Building as Exhibition Center Interactive Tool

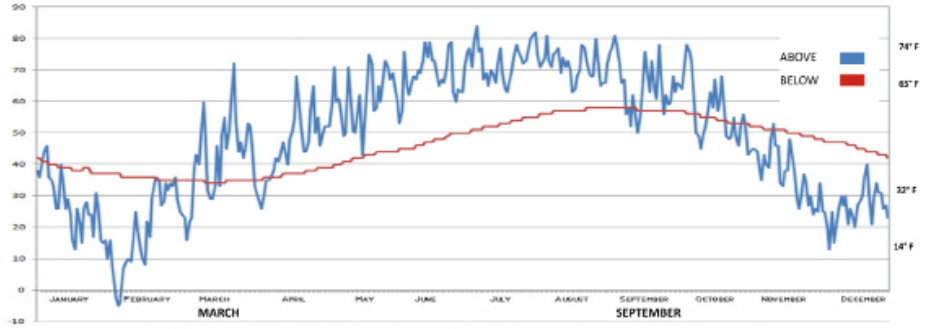
Alexander, Christopher, Sara Ishikawa, Murray Silverstein, Max Jacobson, Ingrid Fiksdahl-King, and Shlomo Angel. *A Pattern Language: Towns, Buildings, Construction.* New York: Oxford University Press, 1977.
Image from Menomonee Valley Partners.


2 "Land Ethic" Pattern
[Aldo Leopold]
3 "Local Transport Areas"
4 Site Discovery
5 "Storefront School" Pattern
7 Green Street Pattern
8 Discovery
9 Waste as a Resource
10 Harnessing the Senses
12 Preference for Low-Tech Solutions
[best fit - low or high tech]
13 Site Control
Building Access
14 "Working From Home" Pattern
15 "Beer Hall" Pattern
16 "Half-Open Wall"
17 "Pools of Light" Pattern
18 Never Too Far From Outdoors
[Aldo Leopold]

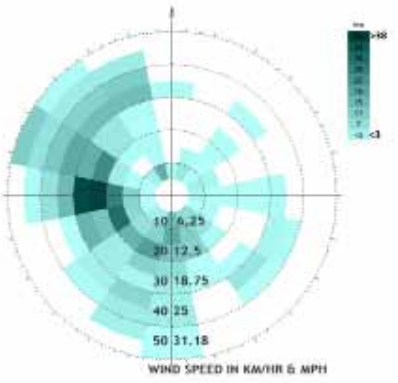
A second objective involved analyses of the climate and the general area surrounding the site. It included analyzing and presenting local climatic data. Students' study focused on temperature and solar data. However, precipitation, wind, and plant development data were also investigated.



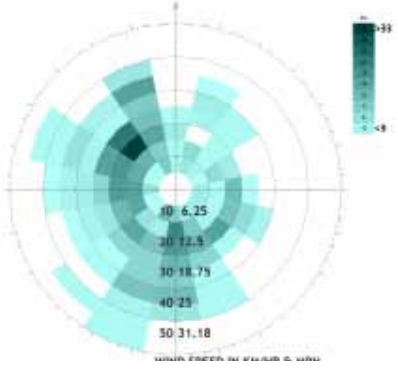
DAILY DRYBULB TEMPERATURE



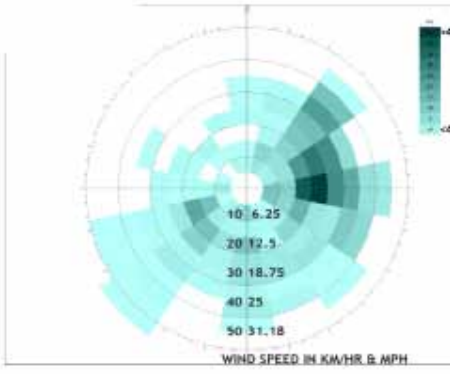
ABOVE GROUND VS. BELOW GROUND TEMPERATURE



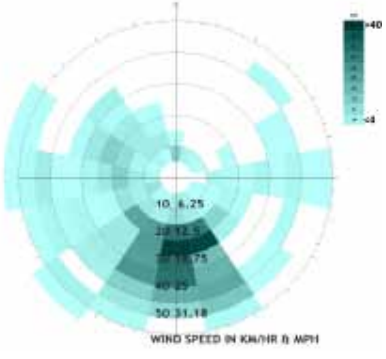
HEATING: JANUARY

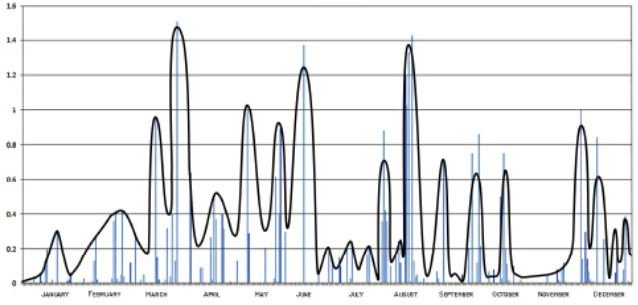


The analyses were critical to understanding how buildings interact with their immediate context. It showed in hard data, the design consequences of climate, and showed how passive systems contribute to the health and vitality of a building and the comfort of its occupants. The data and graphs were generated with the help of programs like Ecotect and Climate Consultant. Presented at the end of the summer session, they provided the basic climactic information for use by all the team members coming on in the fall. Additionally, it provided an introduction for the fall semester. The information served to jump-start thinking about local ecology based design.

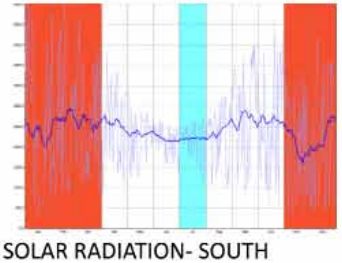


SWING: MAY

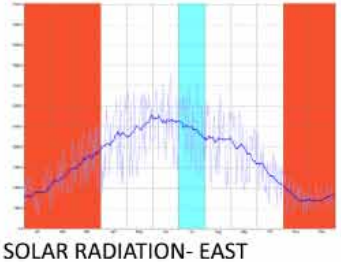




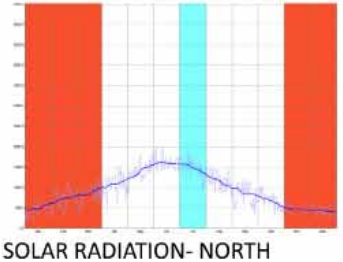
These charts illustrated seasonal variations in the weather, as well as the direct and indirect effects of climate on building design. The students learned how these variations have implications for using natural daylight strategies and the provision of passive heating or cooling energy from the sun. The data confirmed that solar radiation (heat gain) is strongest from the south, suggesting the need for shading. The use of deciduous trees and shrubs on the south, east, and west respond to the changing seasons. Coniferous trees could provide effective winter wind protection from the north and west.



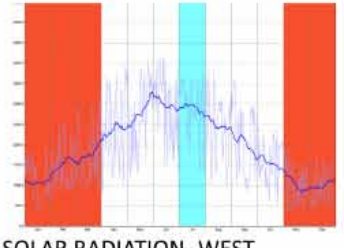
SOLAR RADIATION- SOUTH



SOLAR RADIATION- EAST

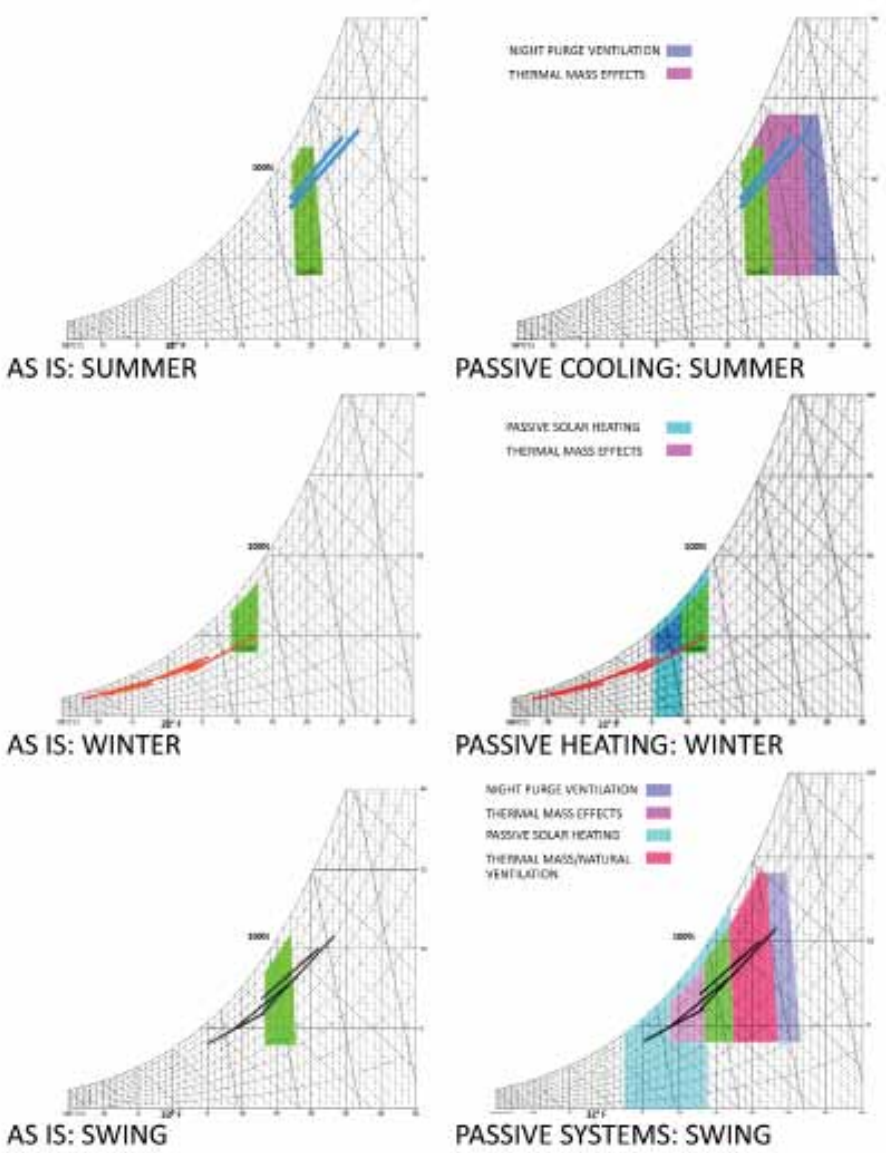


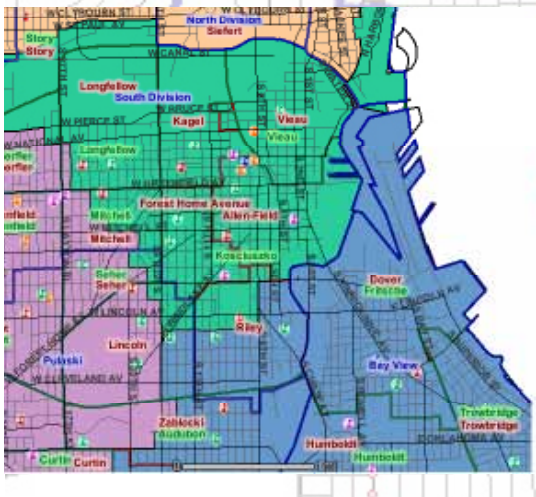
SOLAR RADIATION- NORTH



SOLAR RADIATION- WEST

A Bioclimatic Chart was used as a reference for students to analyze human comfort. The comfort zones were compared with average seasonal temperature and humidity to suggest natural ventilation and thermal massing effects. During summer months, night purge ventilation and thermal massing strategies provided the theoretical means for maintaining within the human comfort zone. Winter months suggest the use of passive solar heating and thermal massing strategies as means to offset traditional mechanical systems. Night purge ventilation and natural ventilation possibilities were also considered during swing seasons – spring and fall.





Various maps of the surrounding area were also produced to illustrate the location, frequency and distribution of different social amenities in the surrounding community. These included schools, parks and other neighborhood and public services. The map that showed the distribution of vegetation showed how much of an edge condition the site was – between the residential neighborhood to the south and the riparian zone on the north. This highlighted the mediating role the proposed building is to play. Some of the maps also helped to understand the transport links in the area. These range from Interstate Highway 94 to National Avenue, the numbered streets that run north to south from the 27th Street bridge near the Mitchell Park Domes to the 35th Street bridge and on to Route 41 near Miller Park; from Pierce Street to the Hank Aaron Trail, which the proposed bike path is meant to connect. Important public transportation nodes such as the #18 bus along National Avenue, #35 along 35th Street, and #17 along Canal Street are nearby. These maps provided a better understanding of the context.

Maps retrieved from or based on maps from the City of Milwaukee's GIS, Maps Milwaukee: http://www.ci.mil.wi.us/MapMilwaukee3480.htm.
As well as from Google Maps:
http://maps.google.com/maps?source=ig&hl=en&rlz=1G1SNNT_ENUS366&q=milwaukee%20city%20maps&oq=&um=1&ie=UTF-8&sa=N&tab=wl

The final goal included surveying the building and site. Students took careful measurements of everything in, on, and around the building. From the on-site analyses a digital model was constructed. It served as a starting point for the design teams in the fall. This model was made using Revit for its accuracy and cataloguing its components. Twice over the summer a substantial group of students met with tape measurers, cameras, hard hats, pencils and paper in hand. Enthusiastic and energized from the bright summer sun, students split into multiple groups. The group sizes allowed us to collaboratively measure and notate the tavern while building new relationships. These site visits enhanced our understanding of the existing structure while helping to ideate and visualize the spaces that were to become the UEC's new home. We were familiarized with the material palette and the topographical conditions of the site as well as the surrounding neighborhood and environmental context. Returning to school, notes were compared and the process of creating a digital model began. Care was given to critical pieces of information; structure, apertures, and roof pitch demanded the most precision. We hoped this preliminary model would serve our needs for spatial planning.

Near the end of the summer it was understood that UWM would be heading up the spatial organization of the structure, with MIAD bringing the interior spaces to life through material, and experiential solutions, and MSOE (very soon to withdraw) were to contribute their knowledge of systems integration. This "specialized" knowledge was to aid in the collaborative process. The objective was design integration, not design and fit, or design and skin. Synergistic contribution was the aim, not a division of labor. All teams were highly encouraged to research environmental aspects pertaining to the living building challenge, aided by the summer investigations. However, these roles were to change at the start of the fall semester and a new synergy would evolve.

03: **FALL**_2009

2 schools
21 students
3 design teams
1 research team
1 semester

Projects of this nature are uncommon in academia. Theoretical clients and scenarios, made-up programs, and a general glossing over of reality are how most architecture classes and studios are run. It gives students background information and practice necessary for dealing with the basics of design, but does not provide the opportunity to discover the working relationship between client and designer. The real limitations of budget, existing conditions, and logistics are minimized in favor of the opportunity to creatively explore one's own design interpretation and aesthetics.

Therefore, when the opportunity presented itself to develop a studio-based design course for a real client, with real needs and goals that had to be accomplished within real restraints and restrictions, the value of this learning experience was not lost on anyone. The more realistic nature of the project provided multi-disciplinary, multi-school collaboration, as well as opportunities for teamwork and problem solving, similar to an architecture firm environment. From the early phases in the Spring of 2009 to the preliminary research done in the summer, and finally to the studio that took place in the fall, those involved could not help but feel that it was a privilege to have such an opportunity.

course **structure**

An early component to the planning of the studio was to determine the course structure. Elements of this structure included clarification of the roles of each participating school as well as the expectations, commitments and outcomes. For MIAD students the course was a 3-credit design elective, but was offered as a directed research course for UWM students. Students were recruited based on their academic track record, their ability to work well in a group, and their passion and interest in sustainable design. After careful consideration by the professors, the recruitment of the students was staggered throughout the preliminary stages in the spring of 2009, through the summer, and into the final weeks before the fall semester started.

As planned by Professors Eric Vogel and Mike Utzinger, MIAD's Interior Architecture and Design students were responsible for space layout and planning, circulation, interior materials, and day lighting with a contribution to the form of the building. UWM's students in turn were responsible for the system integration, general form of the building, including exterior materials and fenestration, and the structure of the building. The design outcomes by the end of the fall semester were expected to have computer simulations run to determine the performance of the building, and to give the UEC as much information as possible to aid in the selection of a "winner". However, this selection process and expectations of a single winner were kept vague by the UEC, as they did not know what to expect from the students. As the course evolved this structure was challenged over the duration of the semester due to time and scheduling constraints and mismanagement of roles and responsibilities.

The students were formed into three design teams.

Each team was comprised of three students from MIAD and three from UWM, with two students leaders, one from each school. Team leaders were responsible for keeping their team on track and interfacing with the professors on design direction and system integration, mirroring the hierarchy present in an architecture firm. The MIAD students were distributed among the teams based upon an even distribution of individual skills: computer program efficiency, system knowledge, experience in sustainable design, and discovery of similarities in individual design approaches. The UWM students were divided out to make sure each team had members who had equivalent experience from the summer course. Individual design approaches were presented in an early fall charrette, and were grouped into three different categories that ranged from extreme, moderate, and minimal alteration to the existing building. This range was supported by the professors and dictated the direction taken by each of the three teams in order to provide the UEC with a variety of outcomes: one extreme of tearing the existing building down and completely restructuring; the more moderate approach to saving what materials and structure could be saved, but pushing outside the boundaries of the existing building; to the third concept of minimally altering the existing building as little as possible.

To begin designing the branch the students had to understand the Urban Ecology Center's mission and its needs as a client. Students volunteered at the Riverside location, working with children and seeing first hand how the building and its surrounding environment fostered an appreciation and awareness of nature. The values of the UEC's strong community presence and approach to hands on learning were absorbed. All aspects of the Riverside Branch, designed by Kubala Washatko Architects of Cedarburg, were studied. These included circulation; location and size of the various classrooms; entry sequence of guests, students, and staff; office space and functionality; all the way down to placement of the coffee maker and how it was used as guests entered the front door. The program was analyzed to ensure that the space requirements for each aspect of the program would adequately meet the needs of the users, and to see how it could be readapted to the smaller South Side Branch. The students were invited to drop by whenever they had questions or concerns, or if they simply wanted to sit by the wood-burning stove to reflect upon the atmosphere and interactions at the Riverside Branch. The mission of the UEC became clear to all participants, and the students were able to apply their understanding and experience from the Riverside location to the South Side Branch in a tangible and holistic way.

Each team then integrated their awareness into their design approach.


Urban Ecology Center - Riverside Park

team **SYTHESIS**

UWM Steve Wollner, Samuel Brannon, Joseph Buccini
MIAD Josette Katcha, Liz Kutschke, Ben McGinley

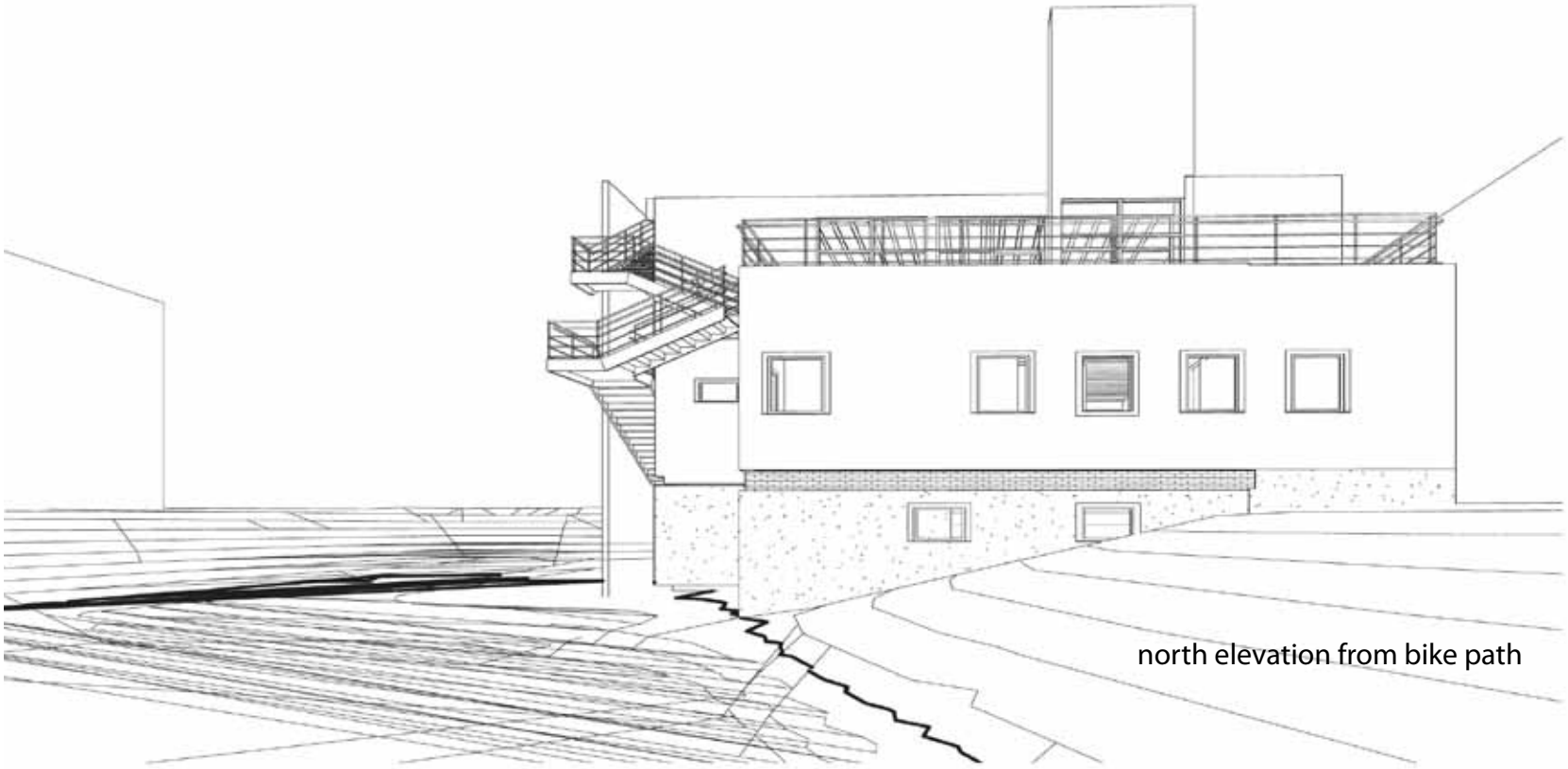
Team Synthesis' design approach involved radically altering and restructuring the existing building. Their initial response left only the load-bearing masonry walls of the basement intact, and completely restructured the ground and second floors. Since the existing structure would not be used, the form could be manipulated and designed from scratch. The second floor was rotated 90 degrees and cantilevered over the adjacent plaza allowing for the building to directly engage the bike path and look north to the park. The ground floor was also pulled away from the street to allow for a front yard and more welcoming approach from the neighborhood.

From this initial idea that transformed the existing building and pushed the boundaries of creativity as well as budget, the team was forced to reconsider their scheme and find ways to make it less dramatic, and more realistic.

Although the initial concept of the cantilever was scrapped, much was learned in the process of the design, such as the idea of green space in the front on the building and terraced porches, that could be repurposed as the program necessitated.

design **development**

As with all collaborations, there are moments of doubt and disconnection. Once Team Synthesis needed to reassess their concept into a more feasible design, contention arose on how far back steps needed to be taken. Half of the team saw the initial idea still able to be reworked on a less grand scale, while the other half felt a much more minimalistic approach was needed. In what was an amicable split, Team Synthesis went their separate ways for one week to explore their own design desires. After this week of separation the team realized they were stronger together, and a compromise was reached.

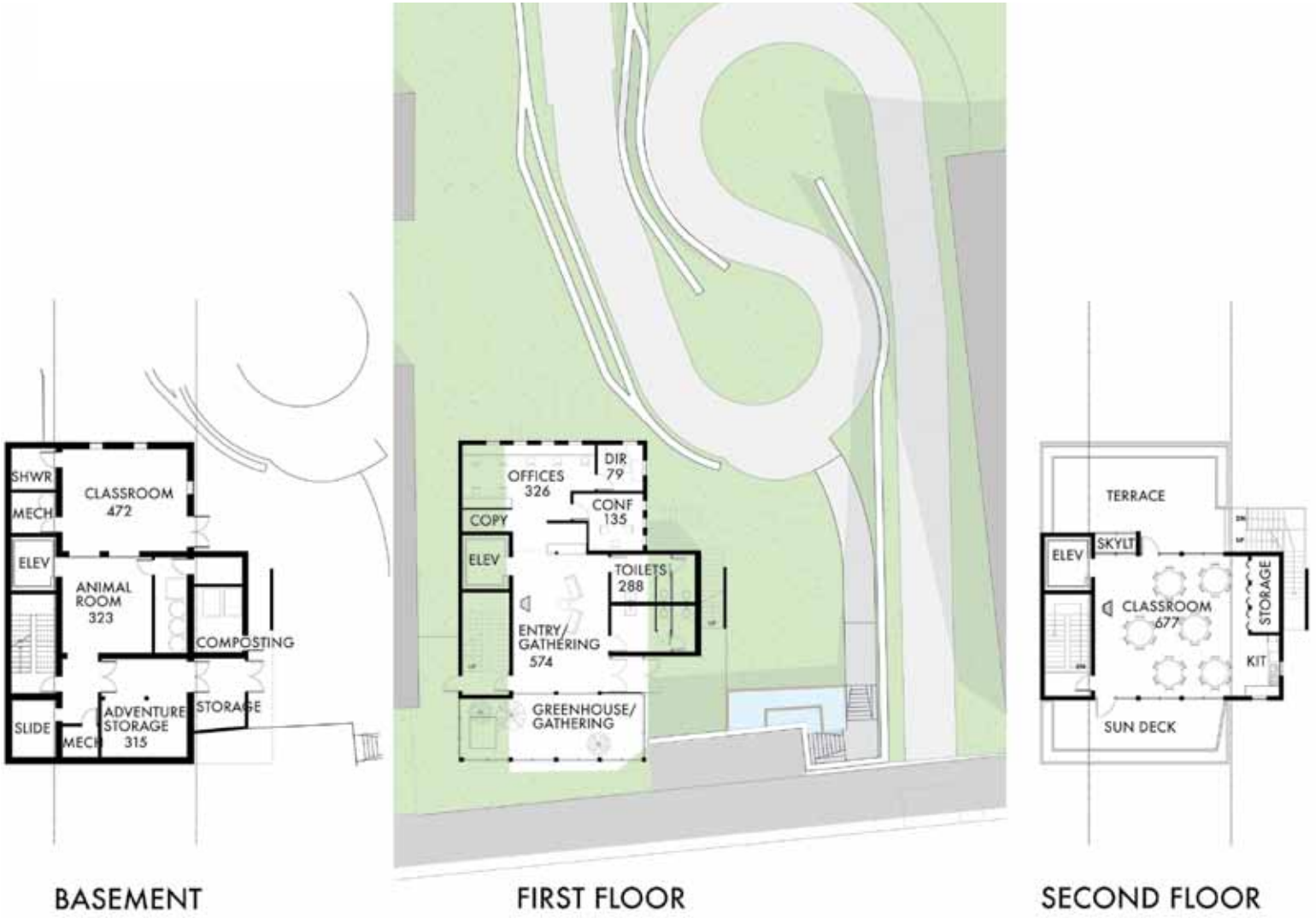


north elevation from bike path

south elevation

final **design**

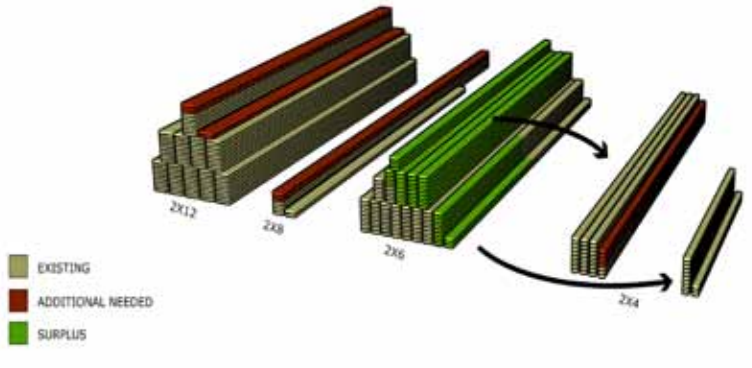
Synthesis' final design drew inspiration from the metaphor of a tree. The ground floor acted as circulation as well as the core location of the offices and infrastructure, the top floor community room would "branch out" to views of the city and neighborhood, and basement level would be for reconnecting and engaging with the land through education and activity. The design utilized a concise plan that was able to stay as close as possible to the 6000 square foot maximum by using hallways sparingly, and instead creating an open and adaptable floor plan. However, while keeping the total square footage low, the building expanded almost ten feet to the west, which caused the driveway to become too narrow for vehicle access to the backyard.


SHWR
CLASSROOM
472
MECH
ELEV
ANIMAL
ROOM
323
COMPOSTING
SLIDE
MECH
ADVENTURE
STORAGE
315
STORAGE
OFFICES
326
DIR
79
CONF
135
COPY
ELEV
TOILETS
288
ENTRY/
GATHERING
574
GREENHOUSE/
GATHERING
TERRACE
ELEV
SKYLT
CLASSROOM
677
STORAGE
KIT
SUN DECK
BASEMENT
FIRST FLOOR
SECOND FLOOR
0
10
20
SCALE, FEET

The front yard from the initial concept was re-adapted into a southern green house that provided a series of functions for the building, including a passive solar porch that when paired with the building's stack vent would naturally ventilate the building, pulling heated air in the green house through the building in the winter, and allowing for cooling breezes to blow through in the summer. It also acted as advertisement for the UEC's mission as the green plants were the most prominent aspect of the street façade, and created a classroom space that could be used to grow seedlings and teach children about different plants found in the Menomonee River Valley.

view from greenhouse into reception

While planning on completely re-structuring the building, the existing structure would not be wasted, as the team created a detailed inventory of the existing structural timber that could be re-purposed in the new building.

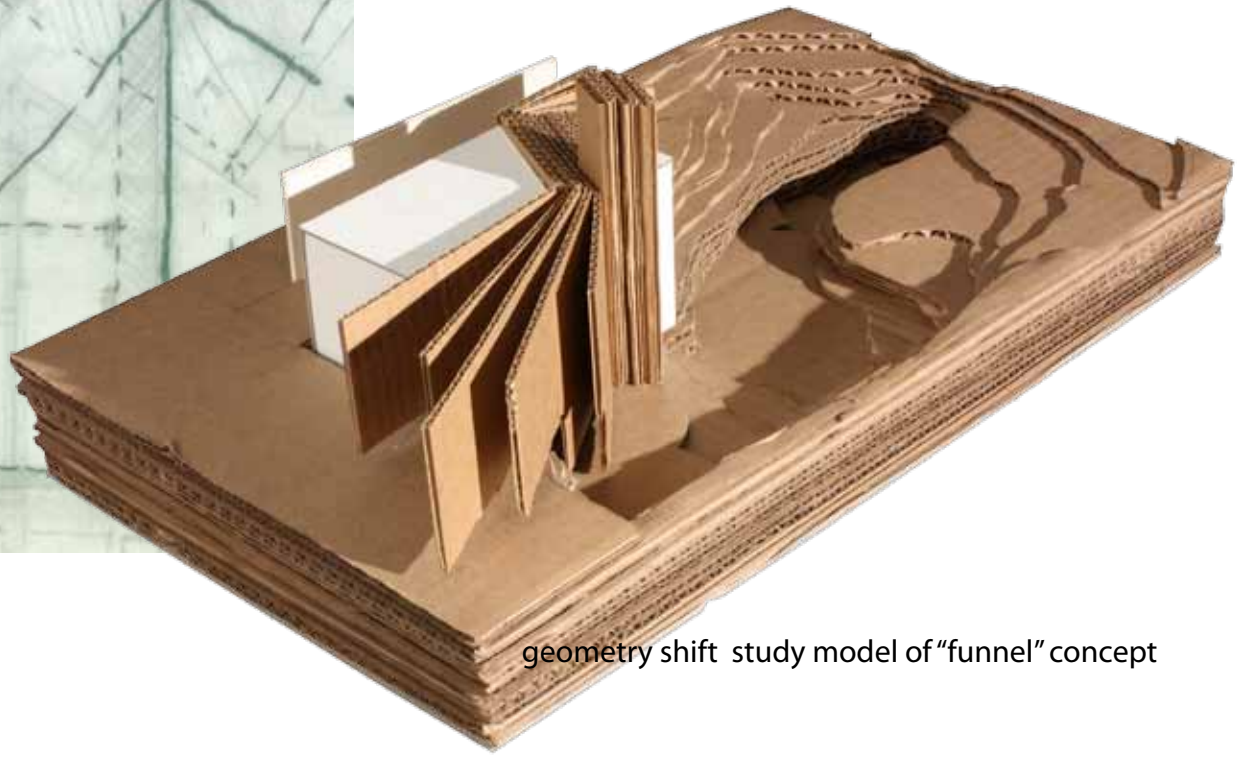


team **SAVE WHAT YOU CAN**

UWM Nick Reiter, Lee Eckert, Olumide Adeyemo
MIAD Alison Kolster, Ben Husnick, Rudy Mendina

Considering themselves "the happy medium," this team felt that some of the building would have to come down, but not all – to repurpose but not completely preserve since the building had major structural issues in places, but salvageable material.

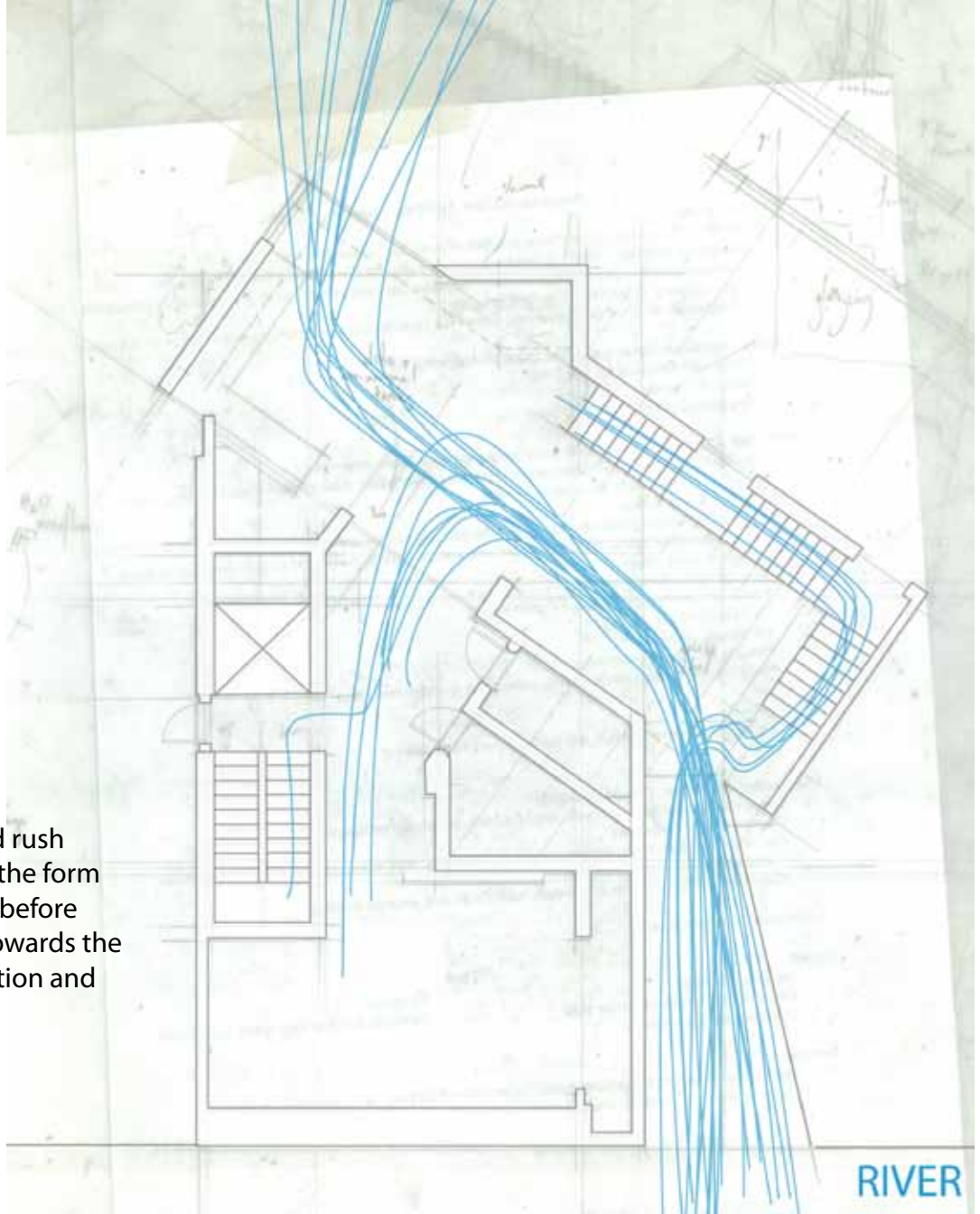
The initial design concept developed a southeastern approach and path that would create a funnel from the neighborhood to the park. This would allow people to engage with the building before entering it, by walking along the length of the building overlooking the "activity zone" of the plaza complete with a rock-climbing wall. This concept of a pathway and gateway provided the inspiration for the main design component of the building: a shift in the rectilinear axis of the existing building to allow for a diagonal movement from the eastern entrance through the community gathering space and out the northwestern corner to directly engage the land and bike path. The team committed to the shift in geometries early in the design process as it "injected energy" in the rigidity of the existing building and provided a more engaging circulation through the building and into the landscape.

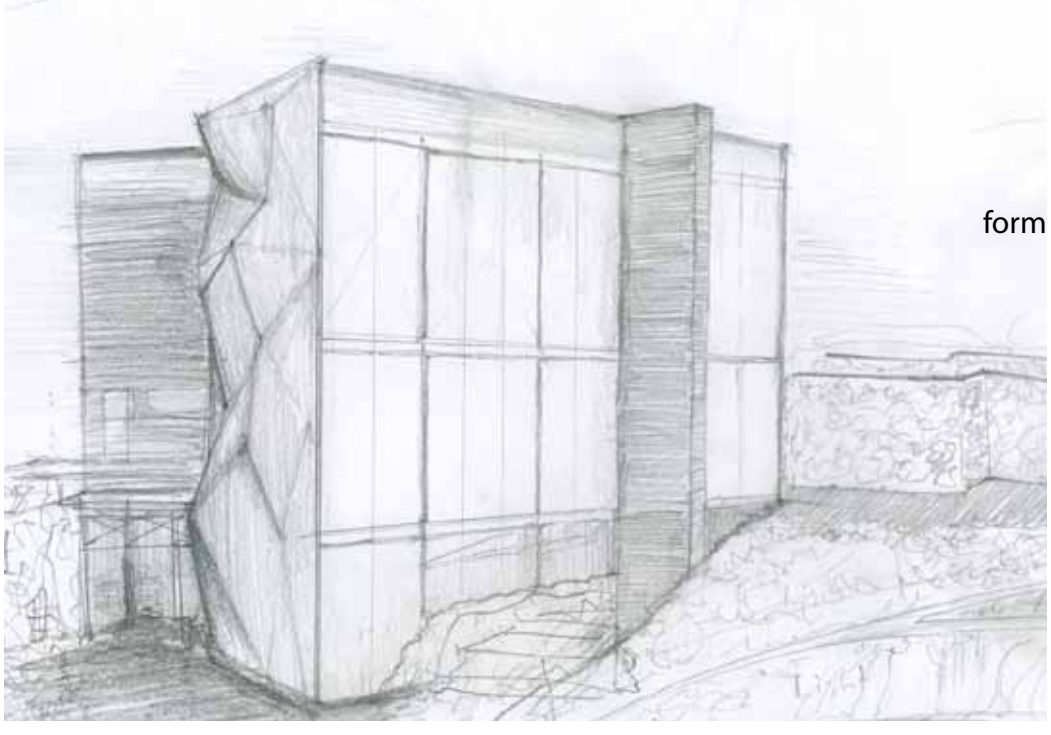


geometry shift study model of "funnel" concept

design **development**

The metaphor of a river that would rush along the eastern façade, eroding the form and carving out the interior space before flowing back out of the building towards the park was used to direct the circulation and exterior form.





form study of northeast elevation

By committing to this more unique form, the team found themselves in a game of rearranging the different program components within the geometric framework. Once a 6000 square foot maximum was given to the teams, this proved to be a challenge as the geometry allowed for little room for manipulation to the building's form. Bathroom sizes and fire stairs began to drive the layout, much to the dismay of the group. While initially excited about the prospect of a unique and dynamic form, the team began to realize the true logistical problems inherent in the size restrictions, and the design became stuck in a schematic phase.

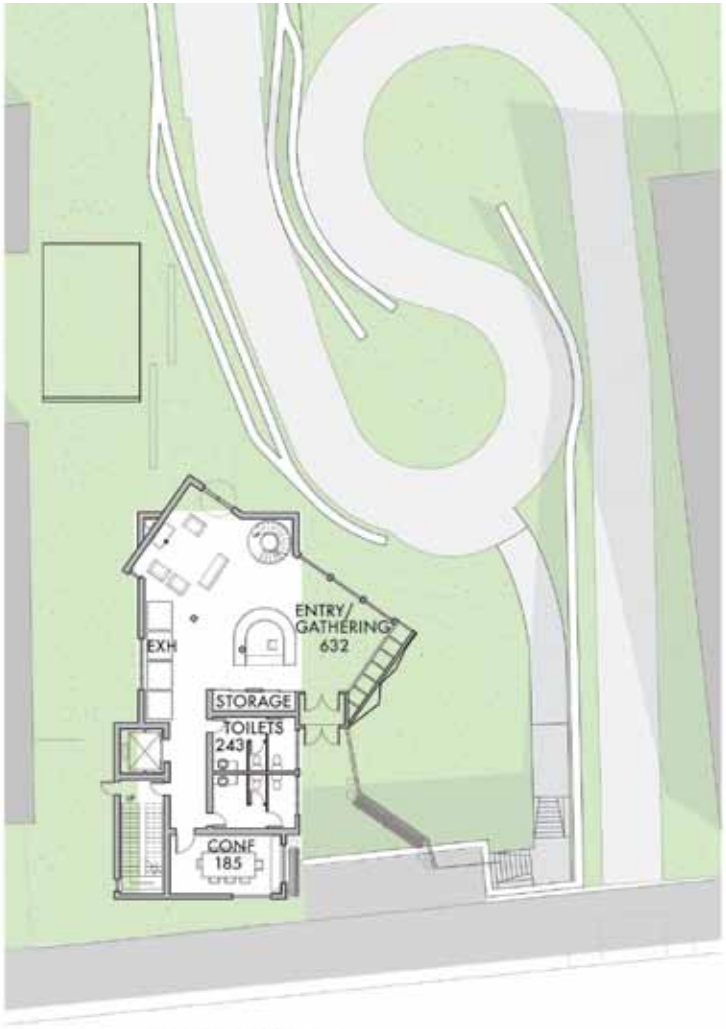
The team weakened after these setbacks, as a consensus could not be met on what to do with the design. The team wondered if they should have opted for a simpler and more rectilinear form that could allow for an easier manipulation of spaces, but too much time had been spent trying to get the pieces of their initial building to fit the program, and the team was unable to take steps back. With little time left in the semester the team resolved to make the most of where they were in the design, and to end the semester with a building they were proud of and that would meet the needs of the UEC.

final **design**

The team concentrated the programmatic areas with higher activity levels, such as the rock climbing wall and grand gathering space, in the northern rotated section of the building to capitalize on the views and access to the park, bike path, and plaza.

southeast elevation -
note: second windows not shown

BASEMENT



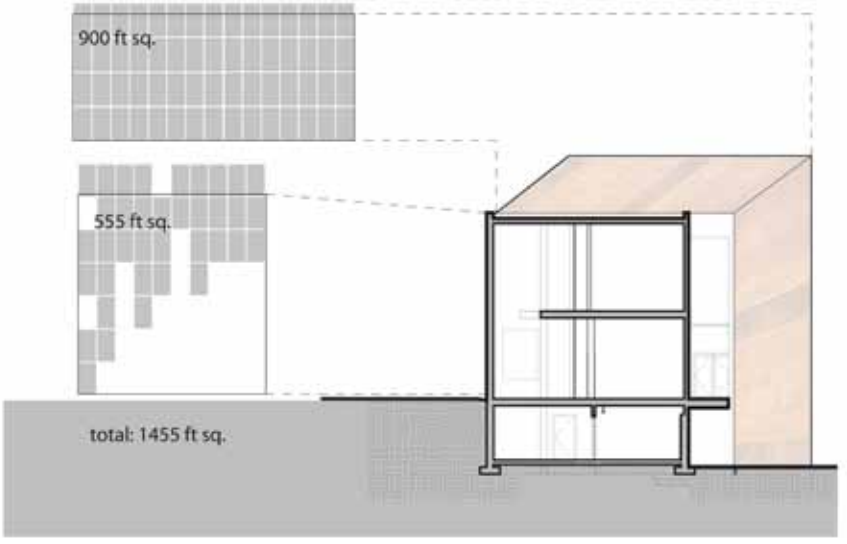
FIRST FLOOR

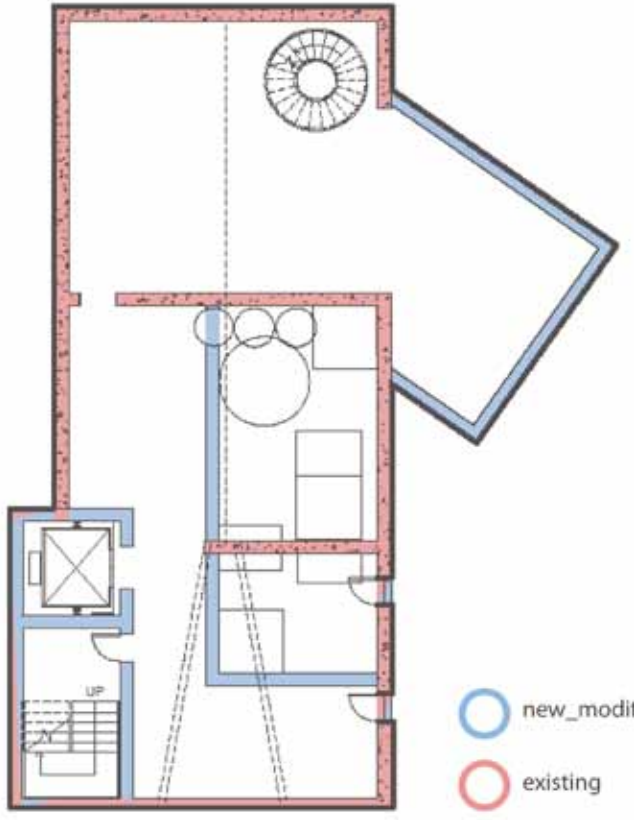
SECOND FLOOR

0 10 20
SCALE, FEET

northeast elevation depicting rock climbing wall and "crow's nest" on the roof

A composition of PV panels were arranged on the southern façade to serve as a didactic tool, as well as aesthetic and functional component. The roof of the rotated section was also tilted 30 degrees to maximize solar orientation for the building's remaining energy needs.



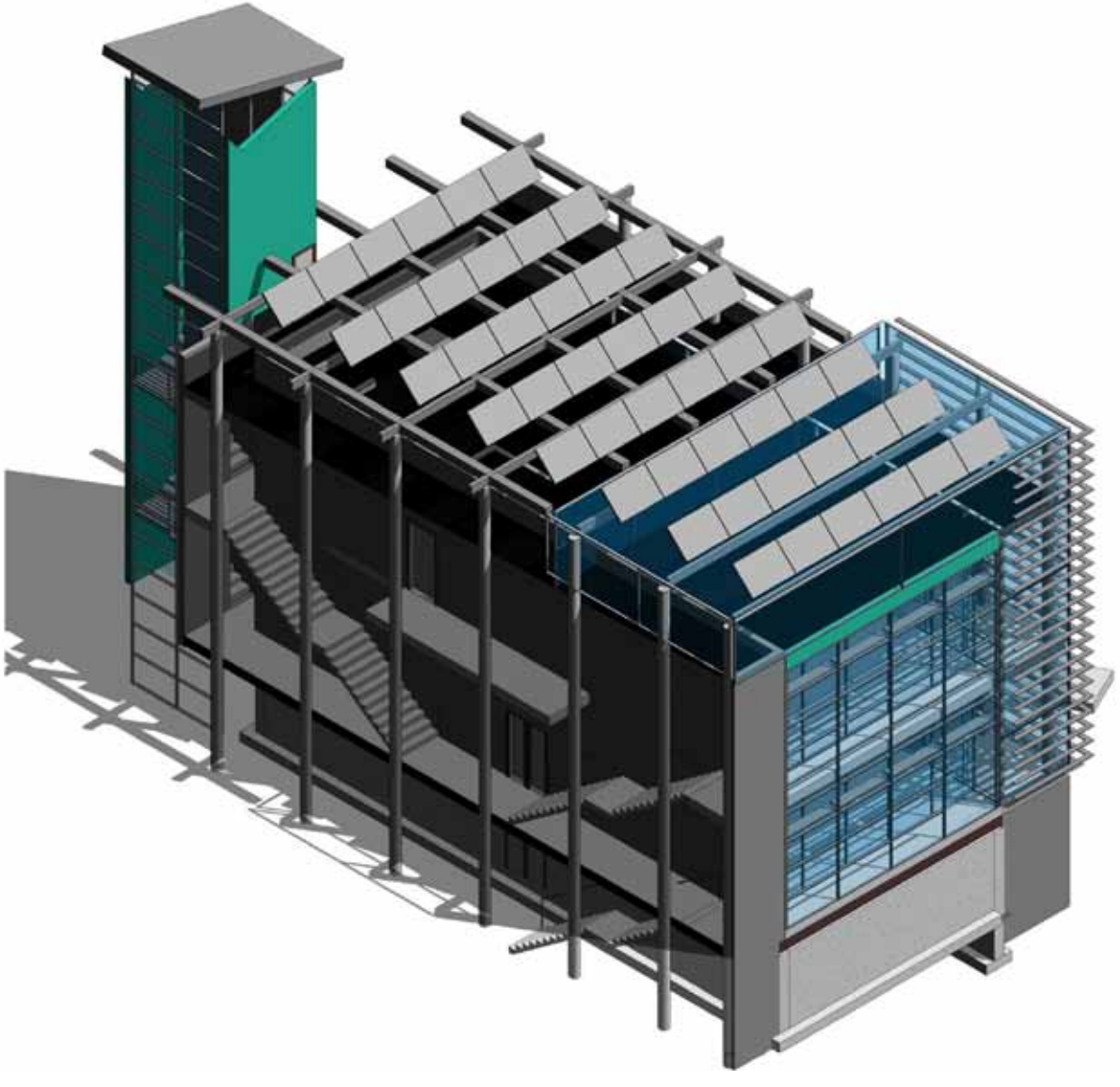


photovoltaic and foundation studies

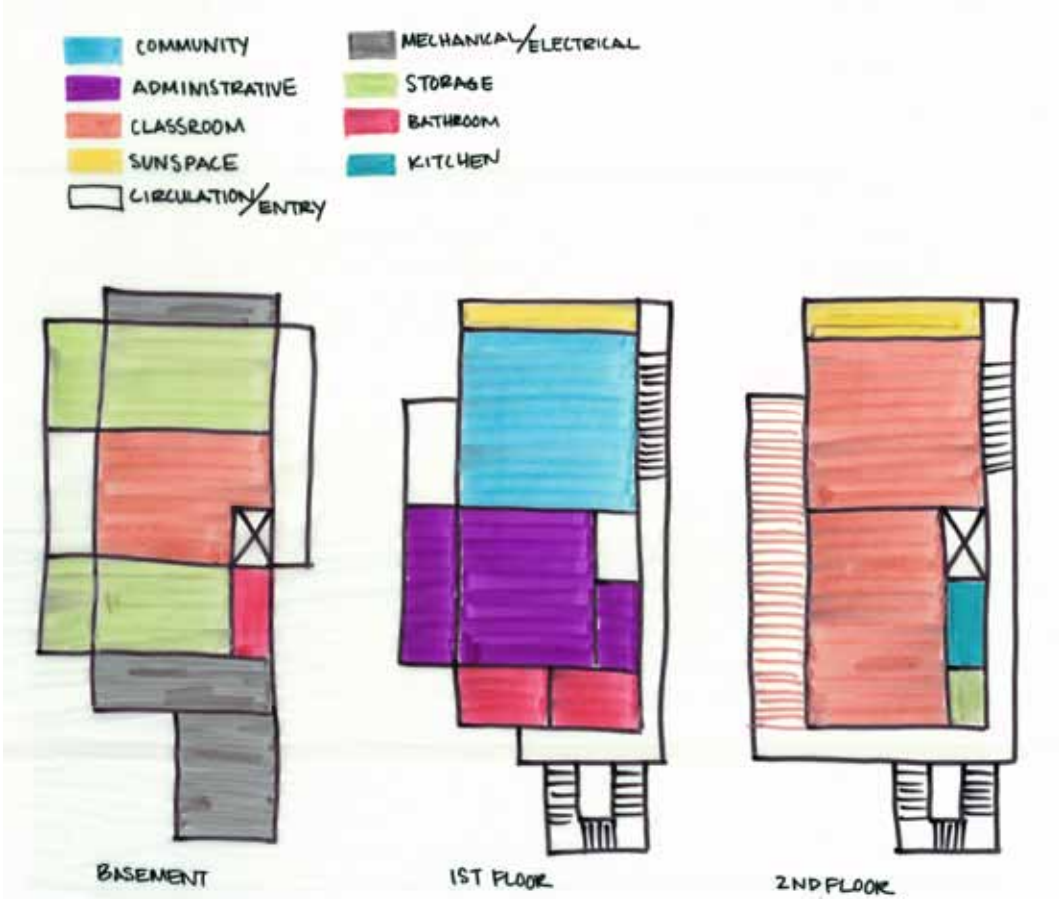
team **MINIMAL / CONSERVE**

UWM Payman Sadeghi, Ashleigh Fischer, Adam Spoerri (conserve)
MIAD Amanda Schmidt, Becky Dimsey, Paen Rochanakom (minimal)

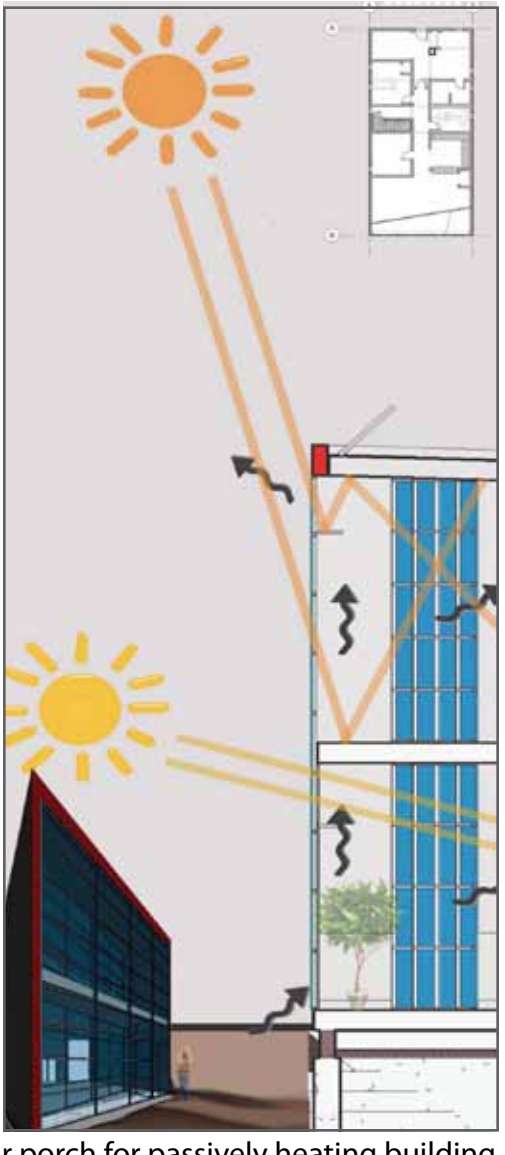
The most minimal design approach, the team resolved early to maintain the existing building, and wrap the circulation around it. This outer shell created a double envelope around the existing building that would contain a solar porch and the building's circulation, freeing up the internal space for the program elements. This led to a design strongly driven by the building's systems. Paired with the building's northern stack vent, the solar porch on the south facade would passively heat, cool, and ventilate the building. The entire roof would be dedicated to photovoltaic panels to meet much of the building's energy demand. However, as with the other groups, once a 6,000 square foot maximum was given the group found themselves at close to 7,200, with most of this space being the circulation core that wrapped the building. The team had to reconsider the notion of a double envelope, and find a way to make the system integration work on a smaller scale.



design **development**



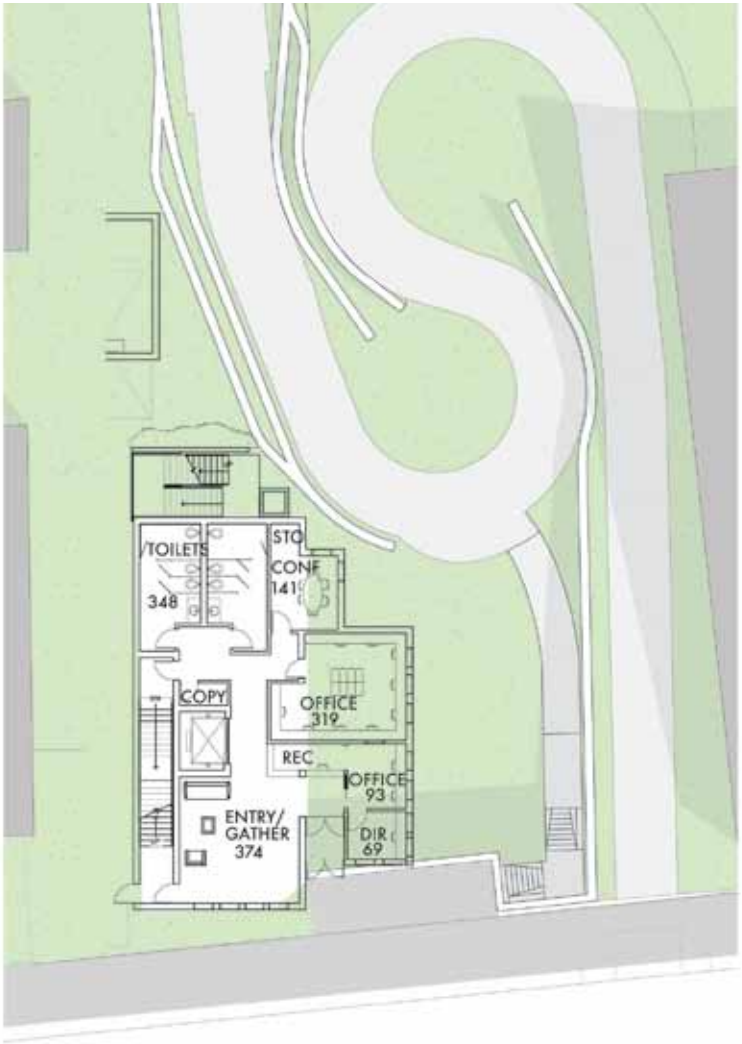
Unfortunately, miscommunication and difficulty scheduling meetings all team members could attend created a rift within the group. Maintaining consensus in design direction became difficult. Differences over plan layout, and the relative importance of systems integration, exacerbated individual differences. As such their design ideas were not blended into a cohesive building. Two weeks before the final presentation the group split. The MIAD students became team Minimal and UWM students became team Conserve. Both the MIAD and UWM students felt that their project would have been stronger if the collaboration had continued. However, there was value in both designs presented, and gave the UEC additional ideas to consider.



exploration of solar porch for passively heating building

final **design minimal**

Team Minimal's exterior aesthetics reflect the industrial neighborhood context on the southwest corner that transitions to a more natural façade, named the "tree house" on the eastern side, reflecting the shift towards the park. This dialectic speaks to the UEC's mission of "inserting" their program into the existing building and acknowledges the neighborhood's industrial past while transforming the area through a reconnection with the land.



BASEMENT

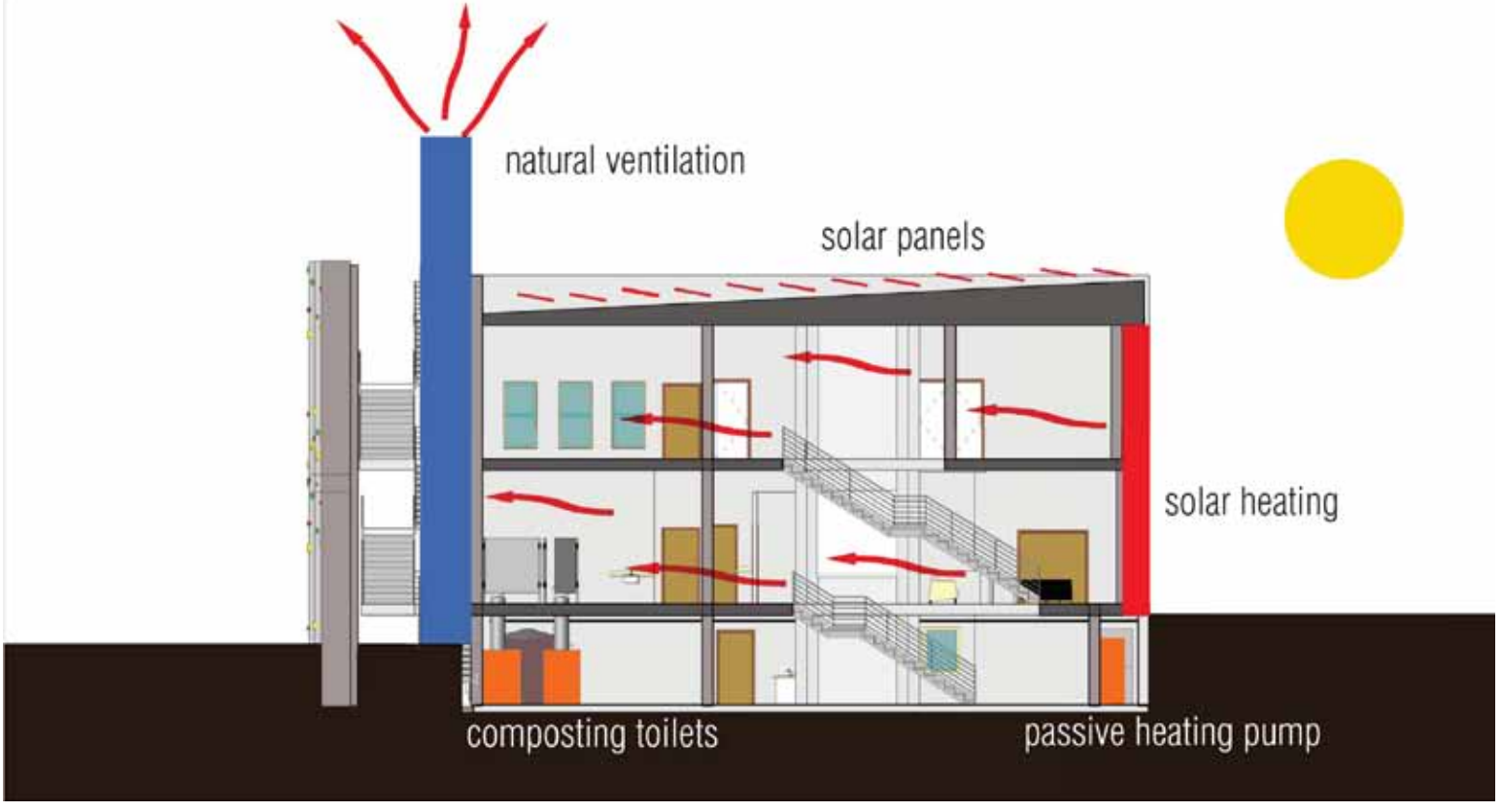
FIRST FLOOR

SECOND FLOOR

0 10 20
SCALE, FEET

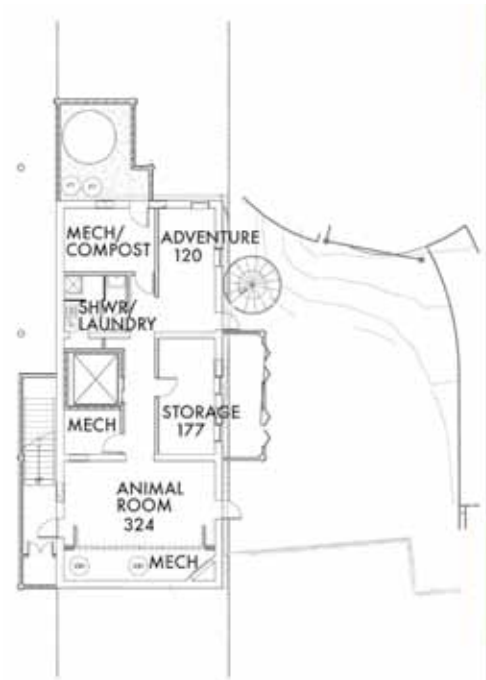
The smaller scale of the "tree house" creates a more welcoming facade and breaks up the mass of existing building. While code restrictions and cost factors discouraged complete access to the roof of the main building, Team Minimal instead created one on top of the "tree house".

The second floor community room and classroom open onto the green roof, which would function as an outdoor classroom.


natural ventilation
solar panels
solar heating
composting toilets
passive heating pump

final **design conserve**

Team Conserve strove to alter the existing building minimally. They kept costs low, and made a concerted attempt to meet the standards of the Living Building Challenge. The building footprint was kept narrow, expanding only to the west and to the north to incorporate the circulation core and stack vent. A large porch on the east side of the building provides a much-needed off-street gathering area, with a spiral staircase, which leads to the plaza, engaging the bike path. Two classrooms on the second floor are flexible and allow for opening them up into one space to accommodate larger gatherings. While the building adhered closest to the Living Building Challenge more than any other group, the team recognized that the aesthetics and plan functionality needed more work.



BASEMENT

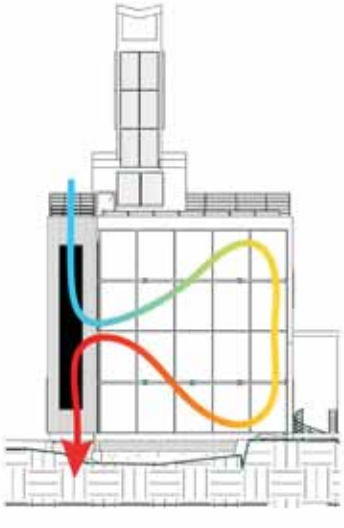
FIRST FLOOR

SECOND FLOOR

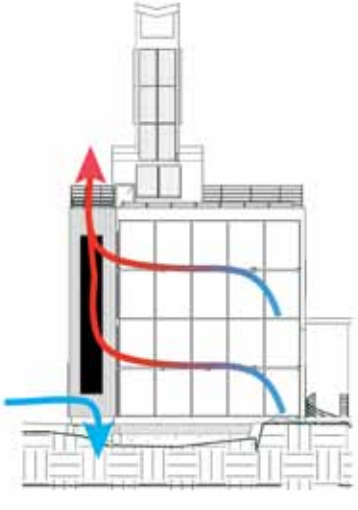
A stair tower wraps around the building's vent stack, providing more direct visual and physical contact, allowing it to become a pedagogical tool for teaching about air movement and passive systems. The stack becomes a neighborhood focal point in addition to its functional role in naturally ventilating the building. Team Conserve was also the only team to make the water collection and cistern a teaching tool by integrating it with the stair tower.

Ample natural light is provided for the offices to prevent the need for additional task lighting, thereby reducing the building's energy demands.

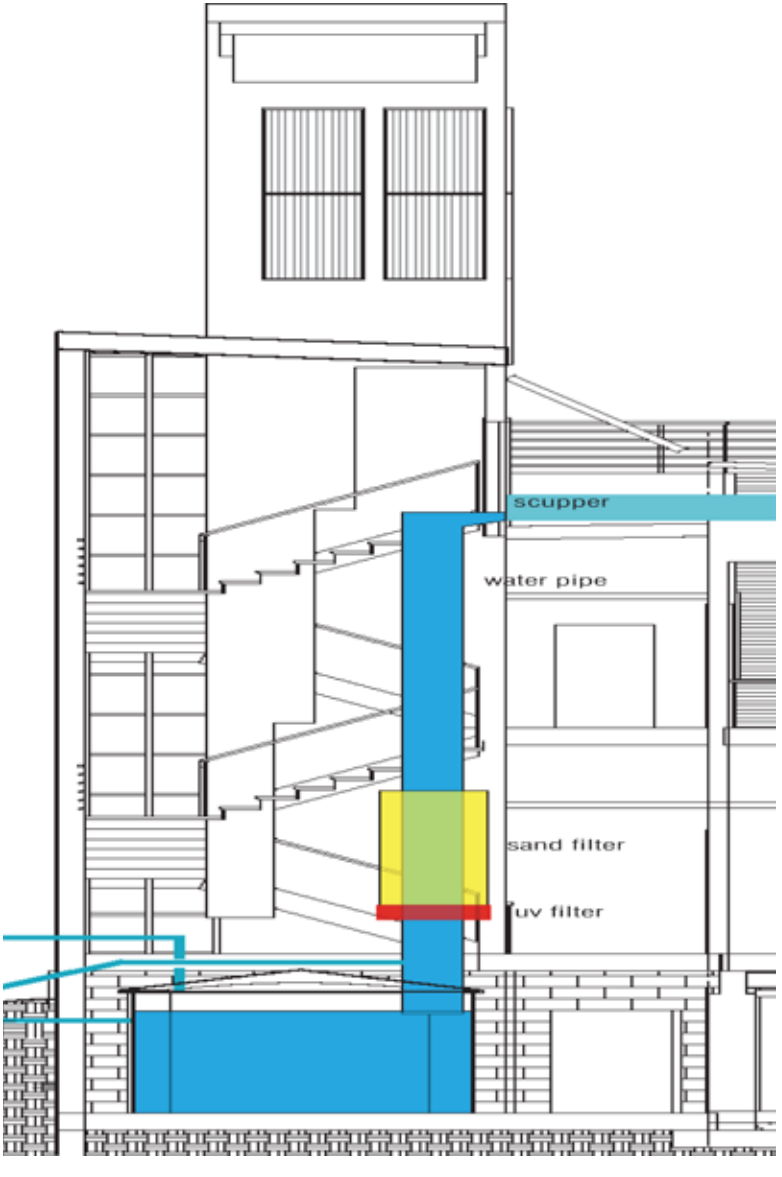
system integration



winter ventilation



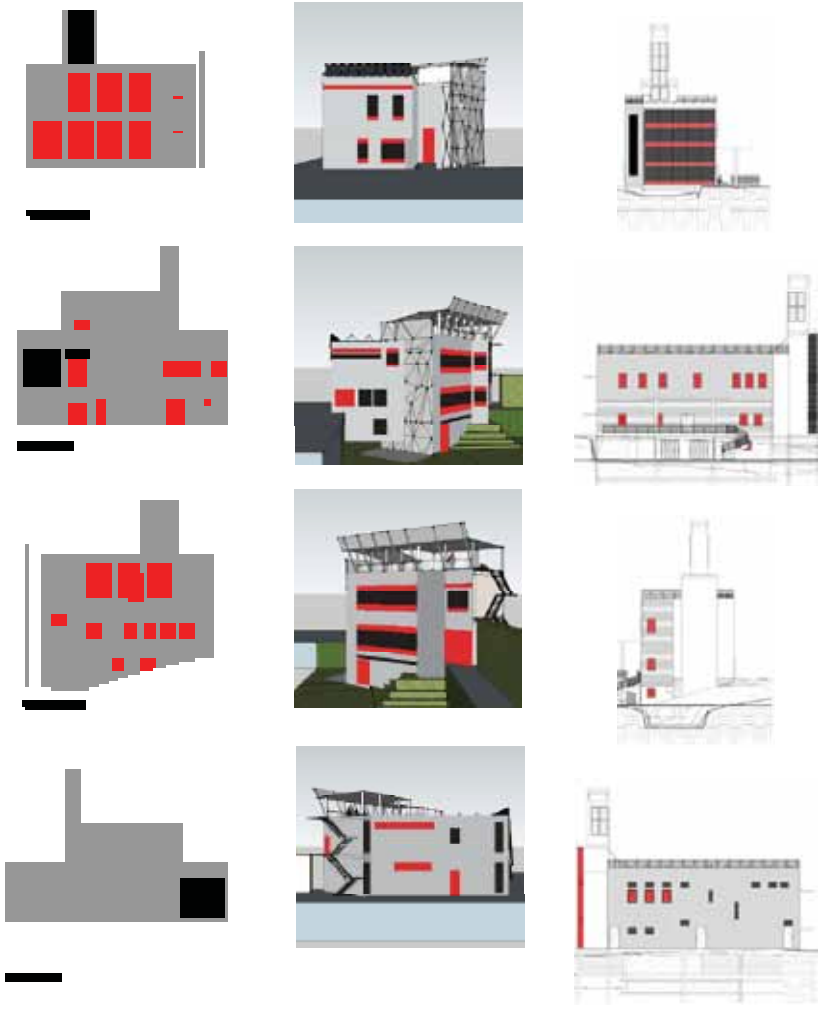
summer ventilation



team **RESEARCH**

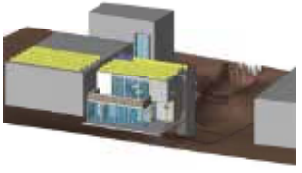
Allison Mastel, Ben Mather, Nick Mather

This group was comprised of three honors students in their junior year at University of Wisconsin-Milwaukee (UWM). They were under the direct supervision of Professor Mike Utzinger. These three students investigated three major aspects of the building's systems. These include: solar energy for electricity and heating; materials cataloguing and embodied energy; and management of the use and disposal of water and waste. These were based on biophysical analyses of the resource flows in buildings. This analysis is based on the prerequisites of the Living Building Challenge (LBC). Research conducted by the Cascadia Regional United States Green Building Council (USGBC), indicates that there are substantial cost savings after 6 to 11 years for schools and mid-rise renovations, and after 16 to 21 years low-rise office buildings. The savings can range from 17% to nearly half the costs. Thus buildings that attempt to meet the Living Building Challenge are financially cheaper in the long run because they are holistically designed and as such more cost-effective to operate. Given their mission, the Urban Ecology Center (UEC) was also committed to the LBC to help mitigate the ecological costs of building construction. To provide good guidance on how each team could attempt to meet these stringent requirements, the researchers investigated the impact of each team's building at different points in the design process. They researched various available technologies and performed cost-benefit analyses for each option.



Allison Mastel looked at heat loss from the buildings, performing an analysis of the building components: walls, floors, roofs and windows. She prepared an inventory of those components that compared the schemes of Team Synthesis, Save and Conserve, which illustrates how the building envelope determines heat loss. Her research focused on heat loss due to fenestration. While Conserve has greater overall area, much of it is the existing building. Synthesis is small but most of its area is completely new and it has more glazing. Even though it was conceived as retaining much of the existing building, Conserve still required some new wall construction. This was to meet building code requirements for fire rating and to help provide properly insulated walls. The inventory of windows determined which were operable or fixed, and the degree of fenestration on each face. The researcher illustrated how the openings of the different building designs performed differently. She demonstrated how Save's northern window wall lost a lot of heat, although it provided a lot of daylight potential. Conserve and Synthesis, on the other hand, made good use of their southern façades for solar gain.

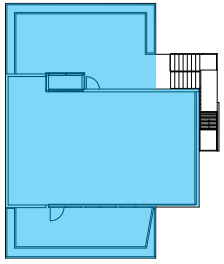
Ben Mather performed energy audits, to determine the potential for generation of on-site solar energy to meet electricity demands and hot water needs. Based on the occupancy, it was assumed that each building would have an expected energy use of 25,000 kWh. To achieve as much of this as possible with solar energy, he compared two commercial solar panels. One panel was larger, with higher power capacity, while the smaller model could make for more panels potentially supplying greater aggregate power. Using the two PV models, he created several configurations for each design, which were compared with the expected energy consumption of the building. Like water use, the energy consumption rate was determined by the expected occupancy. This helped to ascertain how close each came to achieving the net-zero energy prerequisites of the Living Building Challenge. Schemes Synthesis, Save and Conserve were all designed to allow high levels of daylight, saving electricity. Save with its large skylights, as well as a lot of glazing on the north face (for the purpose of views to the park beyond), exposes itself to high heat loss on that face and low solar gains in the south. Synthesis' small size limited its solar energy production capacity but this team explored the possibility of using the surfaces of neighboring buildings. The analysis also looked at solar thermal panels, for providing hot water. It was determined that given the small size of the buildings, there was not enough surface area to use solar thermal systems for heating. Hence the teams focused on minimizing their energy use.



Nick Mather evaluated how each building dealt with its water use and potential waste production. To achieve complete self-sufficiency in water and waste, the water use has to be minimized, while supplying all the water needed on-site. The expected water use was determined as a function of the use at the Riverside Park center and the occupancy. This means efficient harvesting of rainwater, a provision of adequate storage, effective filtration and purification, and delivery with minimal energy use. At the same time, all the waste produced on-site must be dealt with on-site. The amount of water harvested is a function of the roof area. The researcher provided comparisons between the four schemes. All schemes use limestone ballast on the roofs as pre-filters and schemes Synthesis, Minimal and Save also have substantial roof gardens. To cut their water use in half, all but scheme Save, provide for the use of composting toilets. They concluded that the UEC could dispose of the dried waste at the adjacent park, where the UEC is restoring the native ecology. Each scheme installed a cistern to store the water. Scheme Synthesis hid their tank under the basement slab to save space, while Conserve installed it under the main stair with views from the stair and outside so it can be a teaching tool. Save achieved 56% sufficiency, since they used conventional toilets. Synthesis rated 85% and Conserve had 96% efficiency. The researcher speculated that Minimal would probably achieve 90%.

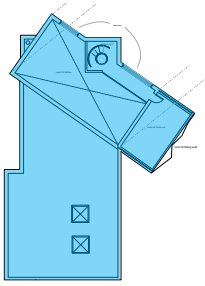
These three researchers helped the teams make design choices that enhanced their buildings while optimizing their resources use.

Team A



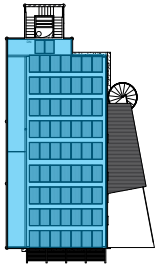
Catchment Area: 2512 sqft
Cistern Size: 2020 gal
Efficiency: 93%
(Compost Toilets)

Team B



Catchment Area: 2060 sqft
Cistern Size: 3000 gal
Efficiency: 56%
(Conventional Toilet)

Team C



Catchment Area: 2105 sqft
Cistern Size: 2971 gal
Efficiency: 96%
(Compost Toilets)

client **ASSESSMENTS**

A - Synthesis	B - Save What You Can	C_MIAD - Minimal	C_UWM - Conserve
7844 .75 sf with UA 593.4 BTU/F/Hr	8882 sf with UA 664 BTU/F/Hr		8048 sf with UA 482.9 BTU/F/Hr = lowest heat xfer
50% of PV on our roof - 10,802 KWH - 43%	PV yield 21,681 KWH - 87% of net zero	PVs on roof	PVs yield 16,204 KWH - 65% of net zero
72% of hot water needs met by solar thermal	54% of hot water needs met by solar thermal		60% of hot water needs met by solar thermal
93% water efficiency with 2020 gal cistern	56% water efficiency with 3000 gal cistern		96% water efficiency with 3000 gal cistern

All the teams worked hard to address the UEC's mission as an active partner in the community, working in harmony with the environment. For their part, the client was impressed by the level of the commitment and the quality of the designs proposed by the students. In their assessment of the designs, the jury remarked on the strengths of each scheme. They also remarked on some weaknesses, but found those weaknesses to be instructive. The Jury was made up of the donor, the architect for the actual project, various members and staff of the UEC, as well as volunteers and interested parties. Faculty from both UEC and MIAD were present to clarify technical issues.

The criteria were as follows:

1. **UEC mission and goals**
   a. Does the design support environmental education?
   b. Does the building "feel" like a community center, warm, welcoming etc?
   c. Are people of all ages and abilities fully considered?
   d. Does the design model environmentally responsible choices?
   e. Is it fun as well as functional?
   f. Is it affordable?

2. **Living Building Challenge, resources and material prerequisites**
   a. Does the building produce as much energy as it uses?
   b. Does the design re-use existing materials and structures?
   c. How is waste managed?
   d. Does the building engage natural systems (air flow, passive solar, etc)?

3. **Responsiveness to site**
   a. Does the building fit the neighborhood?
   b. Is a visitor drawn from the neighborhood to the park?
   c. Is a visitor drawn through the building, discovering elements as they go?

4. **Functionality**
   a. Does the building offer classrooms (four small teaching spaces)?
   b. Is there sufficient office and storage space?
   c. Is there space to welcome people or for a large gathering?
   d. Will the building be safe and secure?
   e. Adaptability: does design offer future roof access, photovoltaic panels, climbing wall, air conditioning if needed?
   f. Will trail users conveniently find amenities such as bathrooms, bike storage etc?

The remarks of the jury were as follows (in alphabetical order of teams):

Conserve had the best passive solar response and the greatest potential for saving energy. It was seen as the most affordable approach with the possibility for expansion. The team was penalized for being a splinter group and their design's poor aesthetics. However, they were praised for how well they integrated the passive and mechanical systems that promoted educational connections to those systems.

Minimal was seen as the most responsive to the owners' needs. It was seen as somewhat affordable with the possibility for expansion as well. The team was also penalized for being a splinter group as well as for inadequate ancillary support spaces. However, this scheme met most of the other programmatic requirements and was seen as a good neighborhood center that bridges the community to the river. It was also deemed to have a great visitor experience and the aesthetic qualities.

Save with its pivoting axis was seen as a great gateway to the park. Although it was chided for having the least energy efficiency, its spiral stair and nicely planned wood burning stove made its entry a great space to look out to the park and it won praise for its bold creativity.

Synthesis was commended for their fun design and a great visitor experience. It won praise for its greenhouse and its interaction with the landscape. The jury found its functionality unsatisfactory, with poor circulation and the complete removal of the west driveway leaving an inadequate space for off-loading supplies. Their presentation was stellar, with each team member playing a part.

lessons **LEARNED**

It is clear that the students all worked hard and produced building designs that addressed the UEC's desire to be an active, good neighbor in their community in harmony with the environment. The students really took the UEC mission to heart. In their presentations, the students strove to show their imaginative designs by focusing on many aspects of the UEC's commitment to education and to the preservation of important habitat ecosystems. The students have generally confirmed that it was a great learning experience, with both positive experiences and missed opportunities which could serve as lessons for future projects.

There was a lot of planning in the spring of 2009 with the schools but many things were not properly worked out. Many involved believed that the project would have benefited from a longer time frame with more lead time upfront, to increase the ability of other institutions to participate. However, others felt that working with two schools was challenging enough – at least for this first attempt. There could have been better and earlier definition and refinement of the requirements. The class was not well integrated into the curriculum of either school. It was a design class for MIAD students but was billed as directed research for UWM students. The two schools met at different times. MIAD students were not able to interact directly with the Honors students during the semester as well as the UWM students. In neither case was it their main design studio work. As such the students professed disappointment at not being able to devote more time to the project. It also meant that they were not assigned a dedicated workspace. It limited the time for experimenting with their design ideas and strained their ability to develop camaraderie and mutual cooperation. Based on the prominence of collaboration in UEC operations, the students would have benefited from attending UEC training sessions with collaboration exercises to help foster cooperation. All involved felt that there should have been more time set aside by UEC to meet and interact with students and provide more extensive review of ideas. Although they were very excited about the project and participated in the reviews, UEC could not allocate enough time for feedback. Of particular concern for the students was the UEC's inability to dedicate time for interaction with each team and to field questions. Thus it was difficult for students to ascertain if and to what extent they were meeting design goals.

Perhaps, long-time members and volunteers, who took a strong interest in the process and attended the design presentations, could have been encouraged to be more involved if they wished so as to lighten the burden on UEC staffers. It also was suggested that an additional instructor, perhaps from the UEC, would have been helpful to maintain the lines of communication – making sure that the design needs remained clear.

The transition between the summer and fall sessions was not seamless. The MIAD Professor came on at the beginning of the fall, without the benefit of the summer discussions and had to quickly get up to speed. He dove right in and immersed himself in the process. However, the summer's strong emphasis on the two conceptual frameworks for the design process, the Living Building Challenge and Pattern Language, was significantly relinquished in the fall. During the summer meetings, Christopher Alexander's Pattern Language (PL) had been used to developed patterns, to aid communication between the design teams and the UEC. The students used it to discuss several issues with the UEC, helping some at the UEC to better understand the relationship between the mission and activities to the layout and interactions of the spaces – inside and outside the building. The patterns began to encompass the UEC's space requirements in their ideal program as well as the UEC mission, desires and aspirations. These included their goals, the tasks they engage in daily, as well as the way they relate to the environment and their neighborhood. Although all the teams developed their designs with these themes in mind, only team Save developed a set of complex patterns for their building.

The prerequisites of the Living Building Challenge (LBC) were to form the framework for inculcating elements of the patterns into the building. During the summer, foundations for the LBC analysis had been laid, with site/structure and climate assessments and implications for energy and water balances. The donor suggested the use of the LBC but stated that it was not intended to define explicit prerequisites for this project. Rather, the petals of the LBC were to provide guidance on minimizing resource use, waste production and toxic materials in building components. It is unclear how the students understood this more nuanced stance. Ultimately, some groups took these LBC issues more to heart than others, and the LBC guidelines proved to be more challenging than anticipated. Minimizing these two conceptual frameworks during the fall diminished the potential learning experience for the client. And the full measure of the design difficulties encountered by the students, particularly in attempts to understand LBC performance of their designs, was not fully spelled out to the UEC. On the other hand, the ability of the students to "get" the UEC, to intuitively express UEC patterns in their designs even without a more directed framework, was impressive.

The greatest difficulty was the structure and interaction between the instructors from the two schools. At the beginning of the fall semester, the professors divided the students' responsibilities, assigning their duties along school lines. This diluted the efforts to foster a spirit of cooperation within the teams. Both schools are strong design-focused schools, and while MIAD may be stronger on building interiors and UWM may have some advantage on the building envelope, their areas of expertise overlap. Both programs tend to attract students with diverse experiences, and this division of work by presumed school expertise also diluted the potential for individual student strengths to shine and expand, as a broadly collaborative process might allow. To make matters worse, the instructors revisited this line and it shifted over the course of the semester, causing some confusion among the students. In spite of the logistical difficulties and questions of overlapping expertise, the involvement of several universities was still perceived as positive since it exposed the students to collaboration and how difficult working in teams can be. Hopefully, having experienced these challenges, it will inspire the students to frame a more collaborative and effective process in their professional careers.

While both instructors were committed to meeting the UEC program, they had different views about what the "integrative" design process is and how it should be taught. Professor Vogel emphasized an approach which worked out the space planning and materials choices in order to strongly project the client's mission. Once worked out, it served as a basis for determining the most effective and efficient building systems to support the spaces. Professor Utzinger preferred that all design decision were made with an eye to minimizing the building's ecological footprint, with progressive building simulations. The simulation would provide repeated feedback allowing the development of effective passive design approaches first, before determining any necessary supplemental mechanical systems. These differences, particularly in combination with the division of work along school lines, led to a lessened potential of both learning and design. This disjuncture is most starkly illustrated by the differences between Minimal and Conserve. Minimal met the spatial program requirements but lacked sufficient ancillary spaces to support its program. Conserve seemed to address all the functional space requirements but did not provide an aesthetic that would be welcoming to its neighbors. Thus, the originally intended learning experience, with regard to integration and collaboration, was weakened – as were the teams' designs. These disagreements may mirror those of contemporary design profession at large. They raise questions of how integrative the design process can be, and which considerations should lead the process. Also of importance are the what, where and when of goal assessment and the points of interaction with stakeholders.

Although the students paid attention to the budget and the space requirements, they were not stressed early enough. As such, when a limitation of 6,000 square feet was imposed several weeks into the process, it led to a few weeks of reworking the various schemes. This was a valuable lesson for the students about the way parameters for a project could change in the middle of a project. The reality of budgetary constraints forced the students to think creatively about design. Teams Synthesis and Save, for instance, discussed the possibility of engaging volunteers in non-specialized labor to ameliorate the costs of construction. Minimal proposed fashioning the metal panels for their façade from salvaged metal in the area, while Conserve called for bricks that could be obtained from torn down industrial buildings. All attempted different approaches to reusing the building's materials as much as possible.

In spite of all these seemingly insurmountable odds, four designs were put forward that the architect of the proposed center thinks will inform the eventual real building. Both instructors believed that a longer time frame – up to a year, would have been useful to hash out many outstanding issues. Both continued to work on the project: Professor Vogel, working with some of the MIAD students intended to focus on designing a more sustainable building envelop and landscape design, using LEED as a framework. Professor Utzinger opted to take the designs and perform more complex analyses of their performance, with an eye to determining how well they met the LBC prerequisites. All the students reported difficulties and frustrations with aspects of the project but still found it an invaluable experience. They have taken the ecological issues to heart in a much stronger way than before. Each of the teams used nature and natural systems as metaphors for their designs and the process; hence they had names like Synthesis and Conserve, and described their design concepts as Tree House or River. The exercise reinforced the strongly held belief at the UEC that the process is as important as the product. Ken Leinbach opined that he saw it as a fun way of designing a building for the UEC. He always has in his subconscious that any endeavor they embark on at the UEC may not be "useful," but he believes that it is often a risk worth taking since it may bear fruit. Besides, the learning experience is invaluable. In this particular case, even though at the end of the project, it remained unclear how useful it would be, he maintained that each design scheme captured some essential things about UEC, and they would gladly do it again.

ACKNOWLEDGEMENTS

Milwaukee Institute of Art and Design

Becky Dimsey, Ben Husnick, Josette Katcha,
Alison Kolster, Liz Kutschke, Ben McGinley,
Rudy Mendina, Paen Rochanakom,
Amanda Schmidt, Eric Vogel

University of Wisconsin - Milwaukee

Olumide Adeyemo, Samuel Brannon,
Joseph Buccini, Lee Eckert, Ashleigh Fischer,
Allison Mastel, Benjamin Mather, Nicholas Mather,
Nicholas Reiter, Payman Sadeghi, Adam Spoerri,
Steve Wollner, N J Unaka, Mike Utzinger

Urban Ecology Center and Friends

Nancy Aten, Chris Binder, Laura Bray,
Monique Charlier, Dan Collins, Ginger Duiven,
Beth Fetterley, Kevin Forseth, Pieter Godfrey,
Dennis Grzezinski, Andor Horvath, Ray Isaacs,
Judy Krause, Ken Kaszubowski, Joel Krueger,
Mike Larson, Ken Leinbach, Robert Lynch,
Eric Manders, David Martin, Sarah Rohe,
David Uihlein, Jim Wasley, Troy Wohlt,
Corey Zetts, Joey Zocher








Book by
Alison Kolster
Nick Reiter
N J Unaka