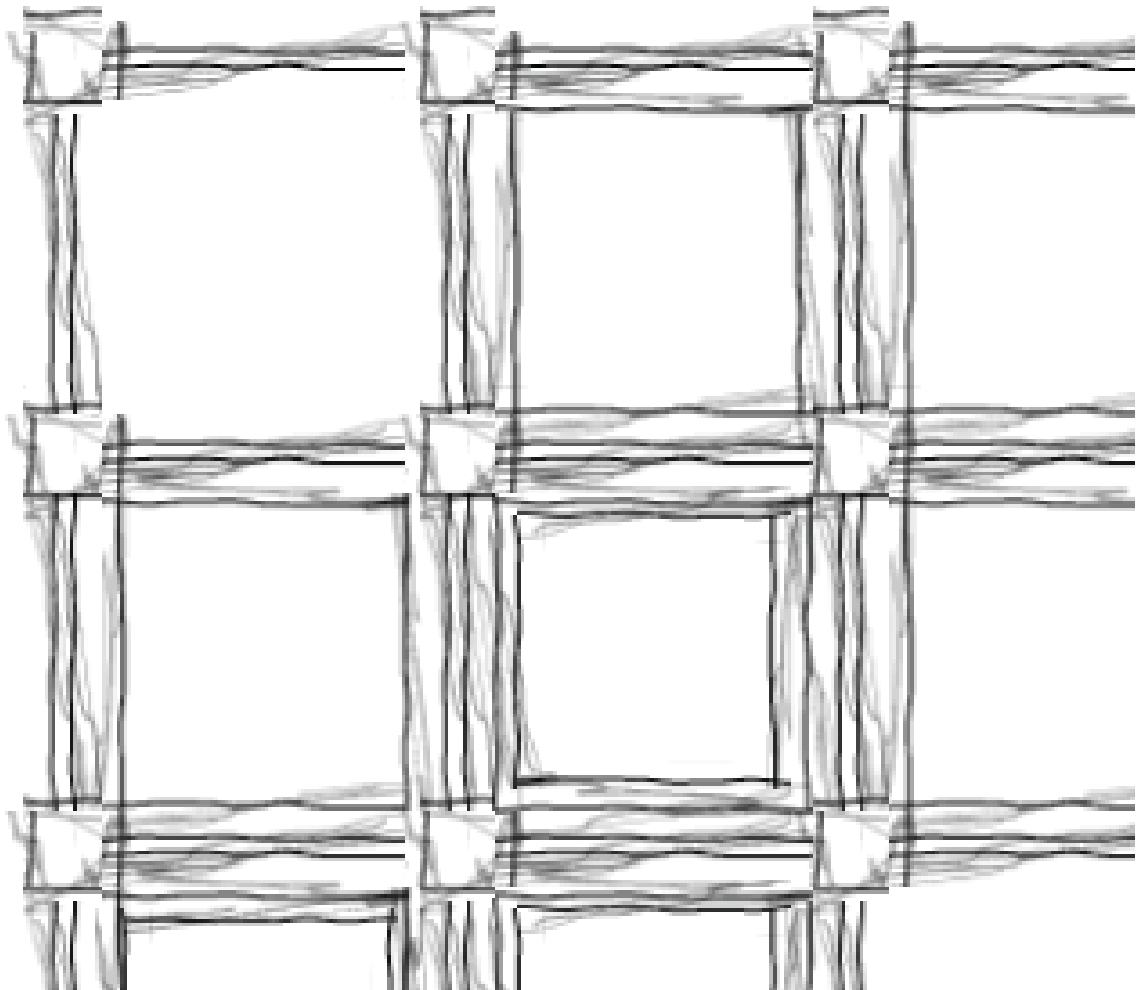
Arc 550 Regional Architecture Studio

Aaron Neal
Summer 2015

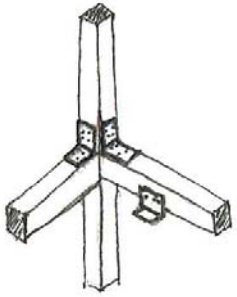


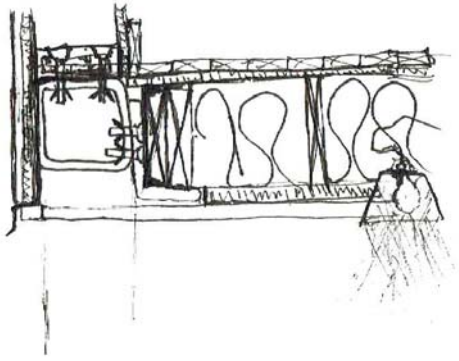
Abstract

The advancement of technology is always pushing industry to new limits. This can be seen in all industries from the computer field all the way to farming. Architecturally speaking, the construction industry has been adapting to these new technologies since the beginning of civilization. With new inventions, the time to construct has been drastically lessened. This can be traced all the way back to the beginning of civilization with people bringing in pre made bricks to construct shelters. As time progressed, people have been bringing in more sophisticated parts to the site to be assembled. Now in more present times, some recent architectural projects have taken this to an extreme with new building techniques. Prefabrication has been one such technique that has lessened the amount of on-site construction. By doing more work in a controlled environment, builders can produce a more accurate designed structure allowing for ease of construction. Other industries use such practices to increase their production. This process works by lowering the amount of parts that have to be assembled on site. In the automobile industry for instance, manufacturers creates parts by the millions that are then shipped to a final factory where they are assembled into the final product. Architecture firm KieranTimberlake, believes that this non-linear approach to design is the necessity for the construction industry to continue. The other industries that have adopted this method have been improving tremendously. They have a quicker build time, more accurate parts which leads to higher quality, and cheaper production costs. All of these factors are why this manufacturing model has become standard in most industries. Kieran and Timberlake's Refabricating Architecture presents the firm's research into this development and calls for a reevaluation of design and construction in the building industry. (1)

Prefabrication in the construction industry has been in place for quite a long time, but is either used in small quantities - such as reconstructed walls, precast concrete, and roof trusses - or viewed upon as cheaply made construction. There have been though recent improvements to existing and new methods for prefabrication that have led to high quality structures built economically. This museum will be a collection of such projects. Educating the public about the benefits of this new way of looking at the construction industry is the primary goal for this museum. For adequate change, we need not only designers that are willing to promote these new techniques, but clients that actually request these methods. These clients need to witness firsthand the level of quality and flexibility that prefabrication can offer them. Once the dialog starts between the public and the industry, only then can real tangible change occur in the construction field.

1: Stephen Kieran and James Timberlake, Loblolly House: Elements of a New Architecture (New York: Princeton Architectural Press, 2008), 14-15, 18-25.





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Reading Analysis

Frampton - Towards a Critical Regionalism
Kashikar Vishwanath - Modernity and Universalism: *Modernity as a timeless tradition*

The past versus the future; can society and architecture rely solely on one?[1] The past can be an influence in architecture in the form of tradition. How this tradition controls the way we step forward in a given society can easily be seen. In architecture one can easily see how the tradition of a culture is incorporated into designs such as in the structural systems used or the basic building form. The past sets in place a list of guidelines to adhere too when designing to the vernacular. Frampton, by quoting Hamilton Harwell Harris, alludes that by following the past can sometimes become restrictive.[2] It can be quite easy to see in our culture how the regional design standards become more of a set back then a guideline. In historic zones, design is very limited with the mindset to preserve the nature of that given district. In many ways I feel like this hampers the development of the city or culture. While I agree that respect should be given to these districts, I feel like if nothing new ever changes that area then it will eventually die.

Likewise, culture can look forward. The future always seems grand with its new technologies that promise to change life how we know it. Especially in present times when new inventions happen every day and the connected nature of culture seems to advance at an exponential rate. With these advancements, society has become accustomed to expecting the future to be incorporated in everything. This can be seen in architecture with the inclusion of green buildings. The top buildings people talk about are made smart so that they adapt and react to the environment. In some respects these inventions are a marvel and allow for design to develop and grow, but they can also become a hindrance to design as well. If technology allows for a building to take any form and have no consequence, then what shapes the design? Frampton refers to this method of design as "placelessness".[3] This issue is just one of many that can come from over reliance on modern ways.

What then could be the steps to rightly move forward in architecture and as a society? Both the past and the future are important, but by themselves lead to stilted growth. As noted by Kashikar, the key is to not stare into the past, nor to dream into the future.[4] Instead, we should be taking note of the present. This way of looking seems the most appropriate to me in my design work. One must research and respect the traditions in a given region or building typology, but they also need to be pushing forward with today's technology to most efficiently develop said region. By mixing both and dealing with what is in the present the designer allows for growth that is effective and relatable. Frampton agrees with this ideology by bringing up the Bagsvaerd Church. By mixing the new technologies and the feeling of the vaulted ceiling, the spaces is progressive while still being relatable.[5] While this is an older project, the notions can be carried through to today's architecture. New methods for building such as prefabrication can still make for regionalistic architecture. One such building, KieranTimberlake's Loblolly House, is a perfect example of how a building can use new technologies while still relating to the context and culture that it is located in. The prefabricated nature of the house is push towards the possibilities of the future, but the designers still treated the design as a normal project that responded to the surrounding Loblolly Trees and the bay on which it resides. In my mind that perfect example of how to combine the past and the future into a present day design. I hope that as a designer that I can do likewise with my designs to help push my community on an appropriate path.

1. Kashikar (2005) page 4
2. Frampton (1983) page 22
3. Frampton (1983) page 26
4. Kashikar (2005) page 8
5. Frampton (1983) page 22-23

Reading Analysis

Frampton - Rappel a l'Ordre
Carles Vallhonrat - **Tectonics Considered:** Between the Presence and the Absence of Artiface

Architecture to me is a very experiential form of art. Buildings are very real things, and are constructed by tangible materials. The building becomes more than a visual piece, and transcends into something that must be experienced by the user. Frampton makes note of this by comparing architecture to music or dance in which the order and rhythm found in human nature makes an appearance in the art.[1] I like to think that this rhythm is the heartbeat of a building which then resonates with the user's soul. Vallhonrat likens experiencing architecture to listening to music.[2] Both Frampton and Vallhonrat agree that we achieve this rhythm in our buildings through tectonic methods. The nature of construction becomes the notes used to explain the building to the user much like notes in a song work together to create a melody. Architecture like music has the power to reach the soul and become spiritual in nature. I believe it can do this because hidden deep within the human nature is the desire to create similar to how we have the desire to keep a beat. By highlighting the construction of the building, the user experiences how these materials were put together to create the space they are in. People can relate to these methods even if they have no actual skill of knowledge in construction practices. It then becomes the designer's role to take these individual notes – or building elements – and compose them in a manner that is orderly and intriguing. On their own, each material is only an object, but how these materials are connected together is what defines it as art. Frampton quotes Frascari by saying, "Architecture is an art because it is interested not only in the original need for shelter but also in putting together, spaces and materials, in a meaningful manner. This occurs through formal and actual joints."[3] These joints then become the central component of all architecture. This to me really shows the ingenuity behind the architect. The skill to take worthless individual pieces and combine them together to create a masterpiece is like a composer that takes individual noises to create a tune that can touch the soul.

As the nature of the joint is vital to architecture, Vallhonrat examines what materials are actually being joined. He goes through the basic elements commonly used in construction, - wood, steel, masonry, glass, and concrete.[4] It pretty easy to see how these different materials are joined together. In wood frame construction, the wooden elements are attached to the masonry or concrete foundation. Skyscrapers soar high with a framework of steel members welded and bolted together. These basic elements are common and efficient, but I feel like technology has progressed enough for new materials to be used and joined to these existing elements. In other industries other metals and frame designs have been used to create stronger, more lightweight skeletons. The advancements in composite or plastic materials are being used in consumer products, but fail to make their way into mainstream architecture. I feel like the cause of this failure is that these new technologies attempt to mimic the older materials. Stone behaves like stone because it is actually stone. A composite façade that appears like stone, is only a farce and ultimately falls short of the real thing. I think it would be real interesting if we used these new materials in the raw and make use of their unique properties. With the rise of material science, we should be getting new units to build our melodies with. By bringing in a whole new elements, a brand new door opens full of possibilities for the designer. Imagine the possibilities if a composer learned about another range of notes or a new instrument that they could incorporate in their music!

1. Frampton (?) page 4
2. Vallhonrat (1988) page 123
3. Frampton (?) page 6
4. Vallhonrat (1988) page 128

Building Collection Sets

To start my research for this regional studio, I started by exploring different types of building collections. I found five different types of sets that I thought would make for a good open air musuem. All of these choices would have been an excellent choice, as they would all work in a rural environment. Most of them would be educational in the process which would work well towards a musuem. Ultimately I chose to do prefabricated houses, but here is a small description of each of the potential candidates.

Open Air Chapels

This collection of buildings would comprise ovf small chapels that are open in nature. The idea behind this would to see how cultures around the world create small religious spaces for public use. These structures would make for a good exhibit for an open air museum given the similiar nature.

Lost Pines Chapel

http://www.pestructural.com/projects/buildings-institutional/lost-pines-outdoor-chapel.php

Prefabricated Houses

There are an abundance of Pre-Fabricated homes on the market now, and I would like to take a piece that explores each method of pre-fabrication. Research can be done to see how these houses are constructed in different parts of the world. The exhibits could be used to highlight the different aspects of each type of construction.

Loblolly House

http://kierantimberlake.com/pages/view/20/loblolly-house/parent:3
Photograph © Halkin Photography LLC

School Houses

Small rural school houses could lead to some major cultural research in how education and architecture played or plays a part in a society. I could look at the american midwest region to the small schools in third world countries. This collection would be more about the cultural research more than the actual architecture of the buildings.

Little red school, Cedar Falls, Iowa.

http://ejas.revues.org/9205
Photo. L Mydland 2007

Indigenous Portable Dwellings

A collective look at nomadic units used by indienous cultures, would be very interesting in terms of both architecture and culturally. Analysis could be made by looking at the construction methods used in each structure and how these relate back to the region in which they were used. The outdoor nature of this musuem leads itself well to exhibiting these pieces in a museum setting.

Yurt

http://www.ancient-origins.net/news-history-archaeology/europeans-share-more-language-and-genes-asia-previously-thought-002682

Off-the-Grid Houses

A collection of houses that are capable of generating their own source of power would fit well into the context of our site. By being in a rural location, being off the grid would be an excellent highlight to the designs of the buildings. My only concern would be the solar differences by taking these buildings out of their original geographical position.

Soleta zeroEnergy

http://flavorwire.com/393699/15-beautiful-off-grid-homes-wed-like-to-live-in/3

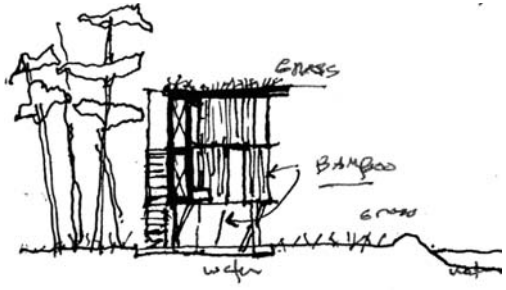
Building Analysis

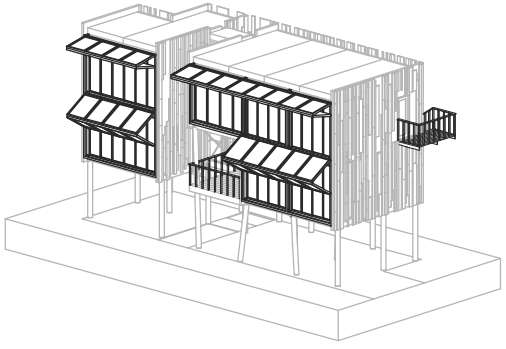
Loblolly House

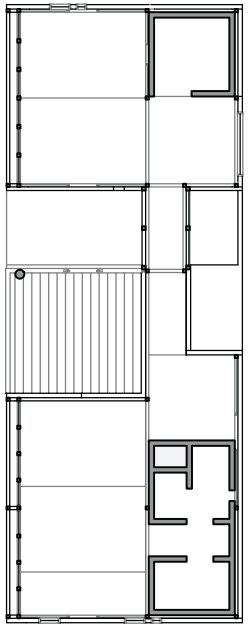
Architect: KieranTimberlake
Location: Maryland, USA

The Loblolly House is a vacation house designed as an experiment for KieranTimberlake as they explored new ways of construction. Influenced by the manufacturing industries of aviation and automobiles, this project was designed to fit together as an assembly. The prefabricated frame connects together by bolts that are ratcheted into place for a strong friction fit. This new form of assembly reduced the amount of time of on site construction. While being prefabricated, this building still responds to its surroundings. Hidden through a forest of loblolly pines, from which it gets its name, the house sits next to the shore line. The wooden facade blends into the treeline as you approach the site, while the other side opens up to the waterfront. This house is perfect example of how to push forward the methods of construction while still being a piece of architecture.

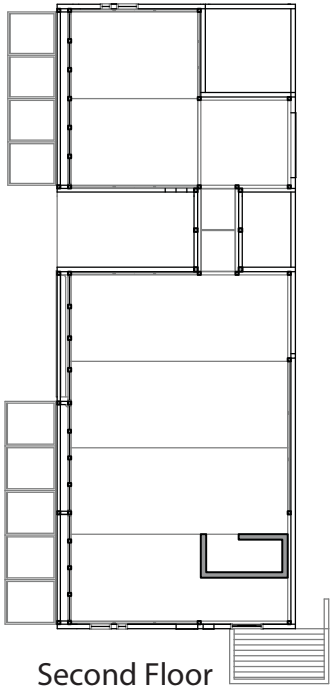
Photos & Research From: http://kierantimberlake.com/pages/view/20/loblolly-house/parent:3







First Floor

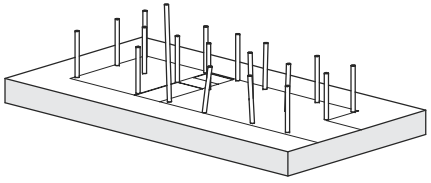


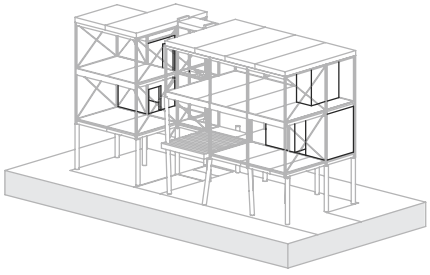
Second Floor

Building Analysis

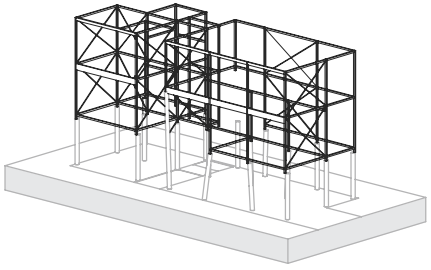
Loblolly House

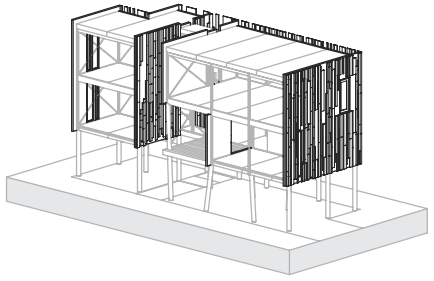
Architect: KieranTimberlake
Location: Maryland, USA

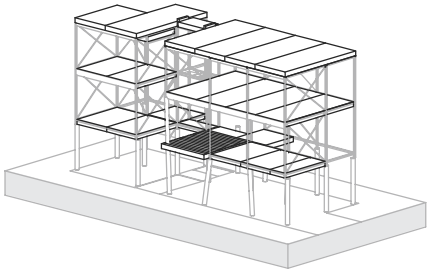


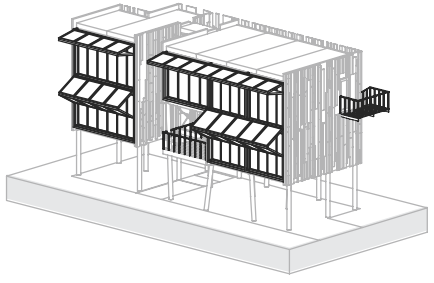


The Loblolly House can be broken down into six new architectural “elements”. The first being the wooden piles that act as the foundation for the house. Attached to these piles is the factory fabricated aluminum frame that serves as the skeleton. Floor cartridges are set in the frame and are bolted in place. Central cores containing rest room and utilities are placed into the frame next. The outer wall cartridges are hung in place. These walls are clad with wooden strips to help blend the building in with the forest behind it. Lastly the window, door, and other equipment are attached to fully enclose and complete the house.



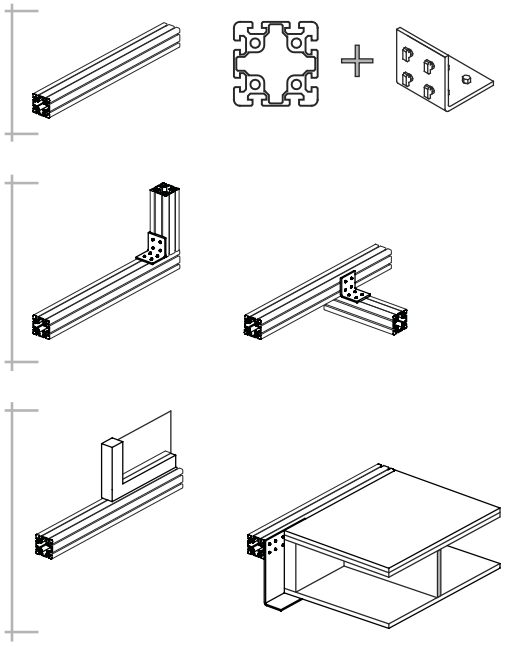




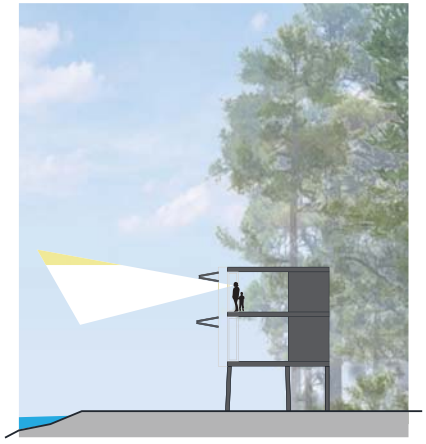


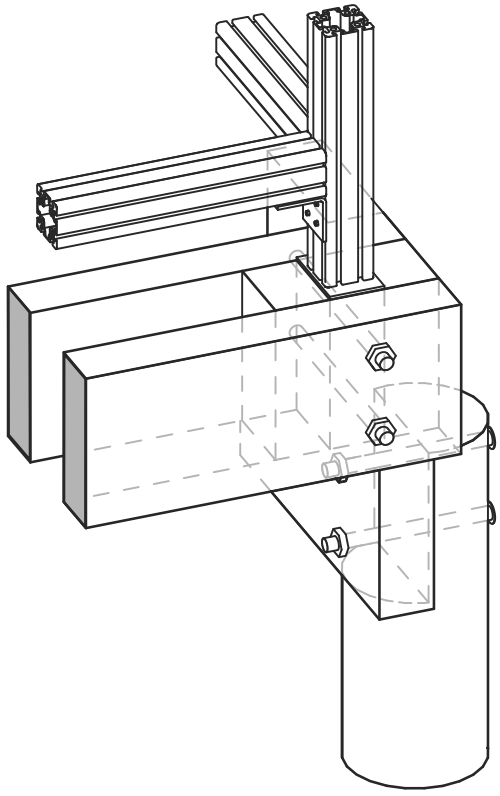
Anatomy Diagram

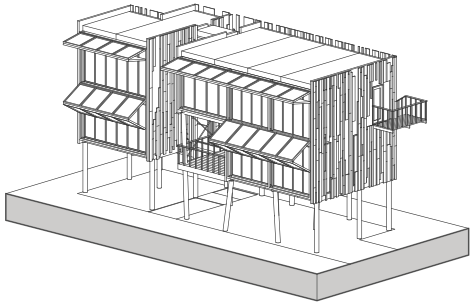
Photos & Research From: http://kierantimberlake.com/pages/view/20/loblolly-house/parent:3

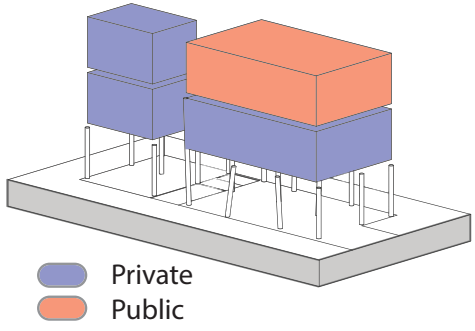


The aluminum frame is uniformly designed so that the joint may be used throughout the project in many different ways. It can be used to attach to similar frame members for the structure, or it can attach to wall and floor cartridges forming the enclosure. It can also be used for sliding doors and door frames.









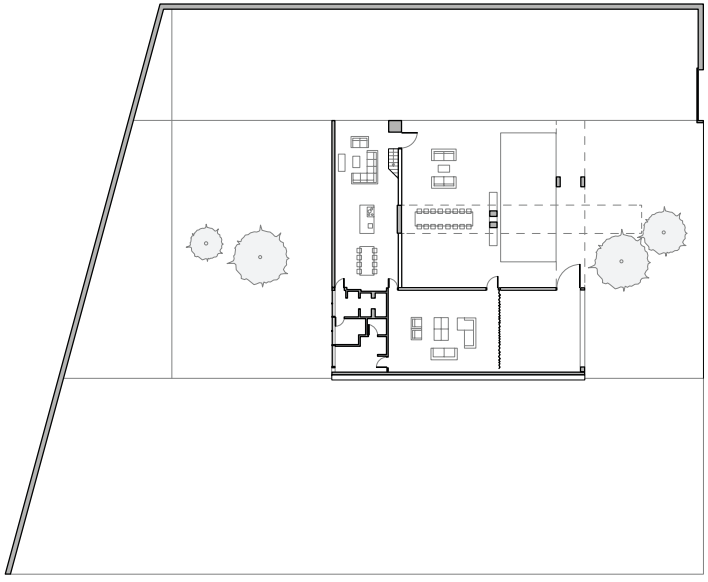
Building Analysis

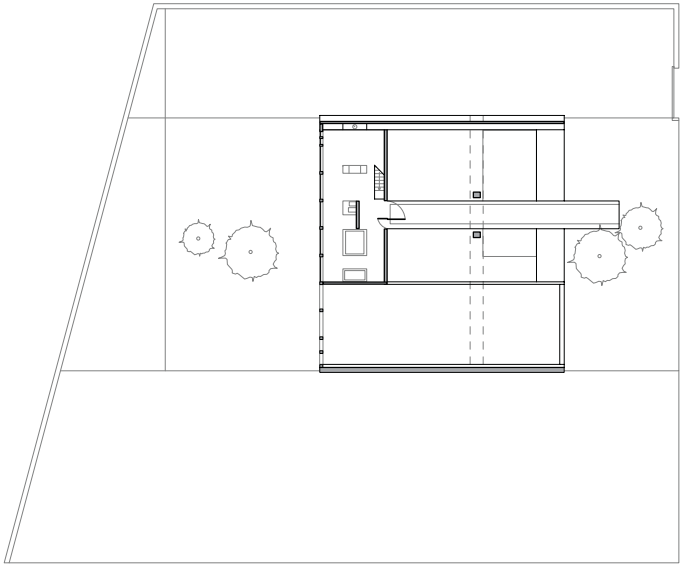
Hemeroscopium House

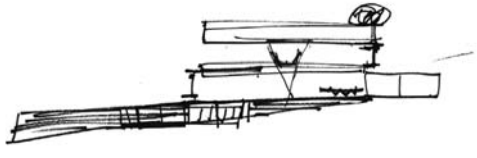
Architect: Ensemble Studio
Location: Madrid, Spain

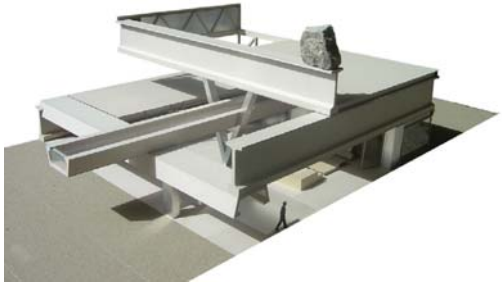
The beauty of this massive concrete house, is that it took only seven days to construct it. By prefabricating the massive concrete beams, they were able to set in place easily in a few days. The rest of the house is in filled with glass wall systems which also add to the speed of construction. Sitting on top of the structure is a massive rock that is the counterbalance to hold up those massive e beams. As you walk through the space, you can see the forces travel through the concrete like a massive balancing act.

Photos & Research From: http://www.archdaily.com/16598/hemeroscopium-house-ensamble-studio









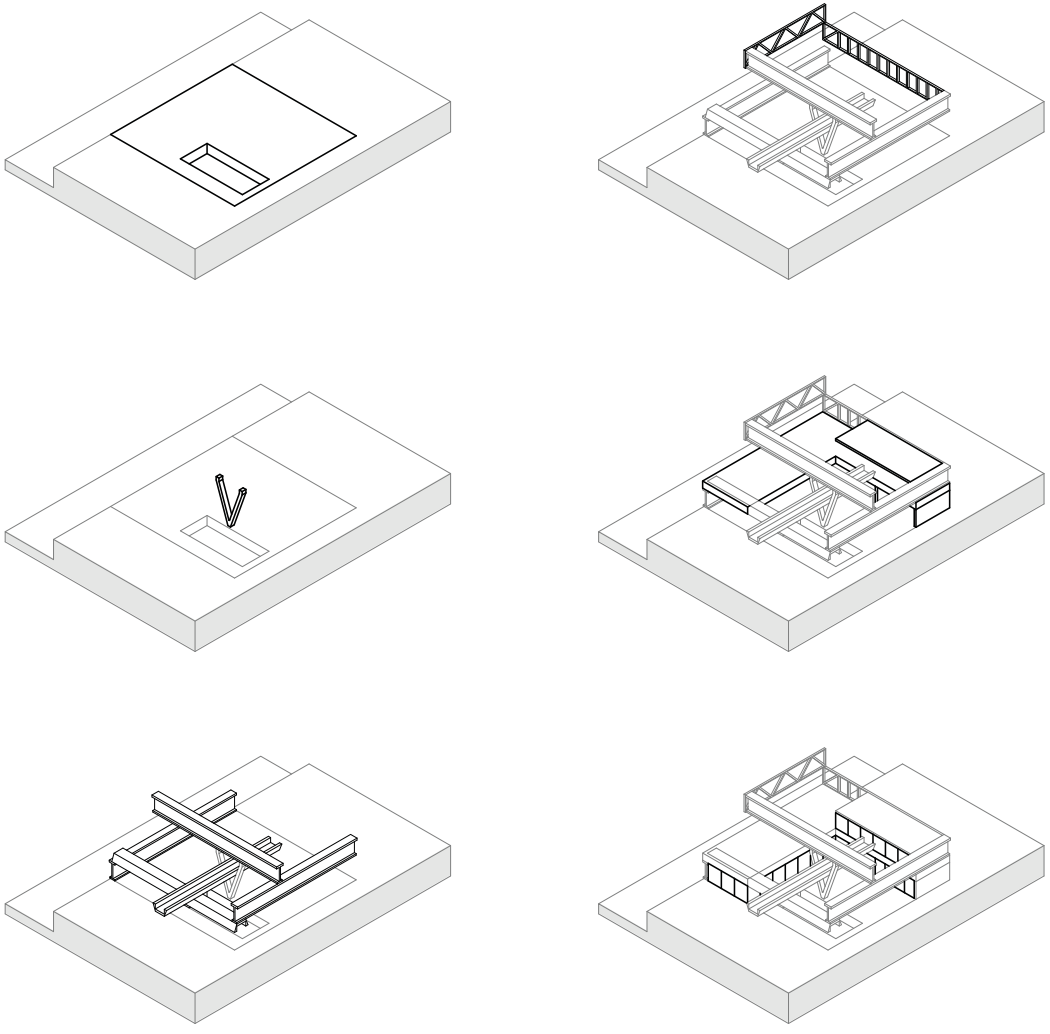
Building Analysis

Hemeroscopium House

Architect: Ensemble Studio

Location: Madrid, Spain

When broken down into its basic components, the Hemeorscopium House consists of the basement and foundation, the steel V, the concrete beams, the steel trusses, the walls and floors, and the Glass cladding. The foundation portion consists of the bottom floor slab, the pool and the subterranean pool machine room. The steel V acts as a main support for the whole concrete system. The Beams act as the main form driver and structural system. They are balanced in place showcasing the forces of gravity. The steel trusses add the last bit of structural stability while appearing lightweight compared to the concrete. The walls and floors set in place of the knot of concrete and steel to form the functional spaces of the house. Glass glazing is used to enclose most of the house stretching from floor to ceiling.



Anatomy Diagram

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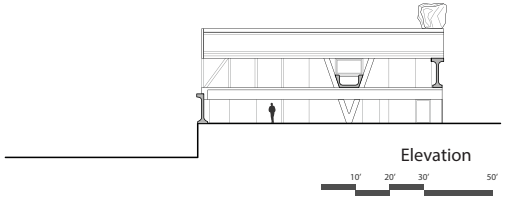
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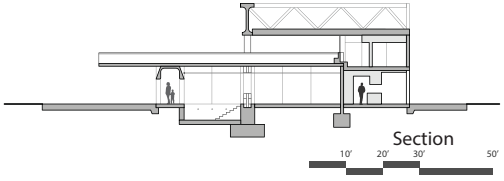
Section
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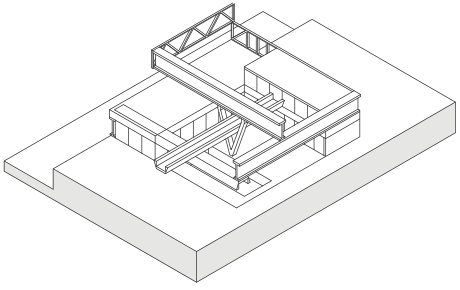
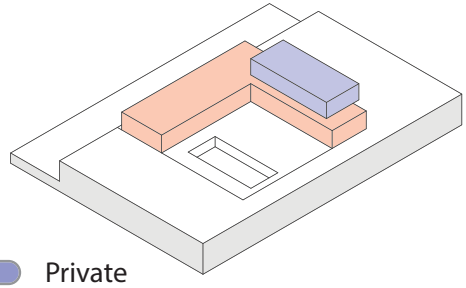
20'
30'
50'




Private
Public

Building Analysis

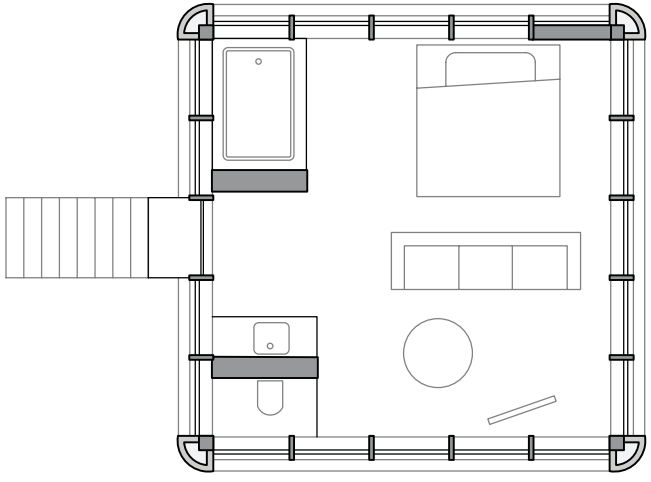
LoftCube

Architect: Studio Aissliger

Location: Varies

The Loftcube houses come in various sizes and layouts, but overall the concept is the same throughout - to create a home with strong panoramic views with the ability to be place practically anywhere. The structure consists of a fiberglass shell that is then in filled with high quality materials to create a space that is geared for living, relaxing, or sight seeing. These cubes can be a place of retreat or they can be placed together as modules to create a full sized living area. The Loftcubes are move in ready after only three days of on site construction which allows for these structures to be placed in many locations.

Photos & Research From: http://www.aisslinger.de/index.php?option=com_project&view=detail&pid=10&Itemid=1




10
30’

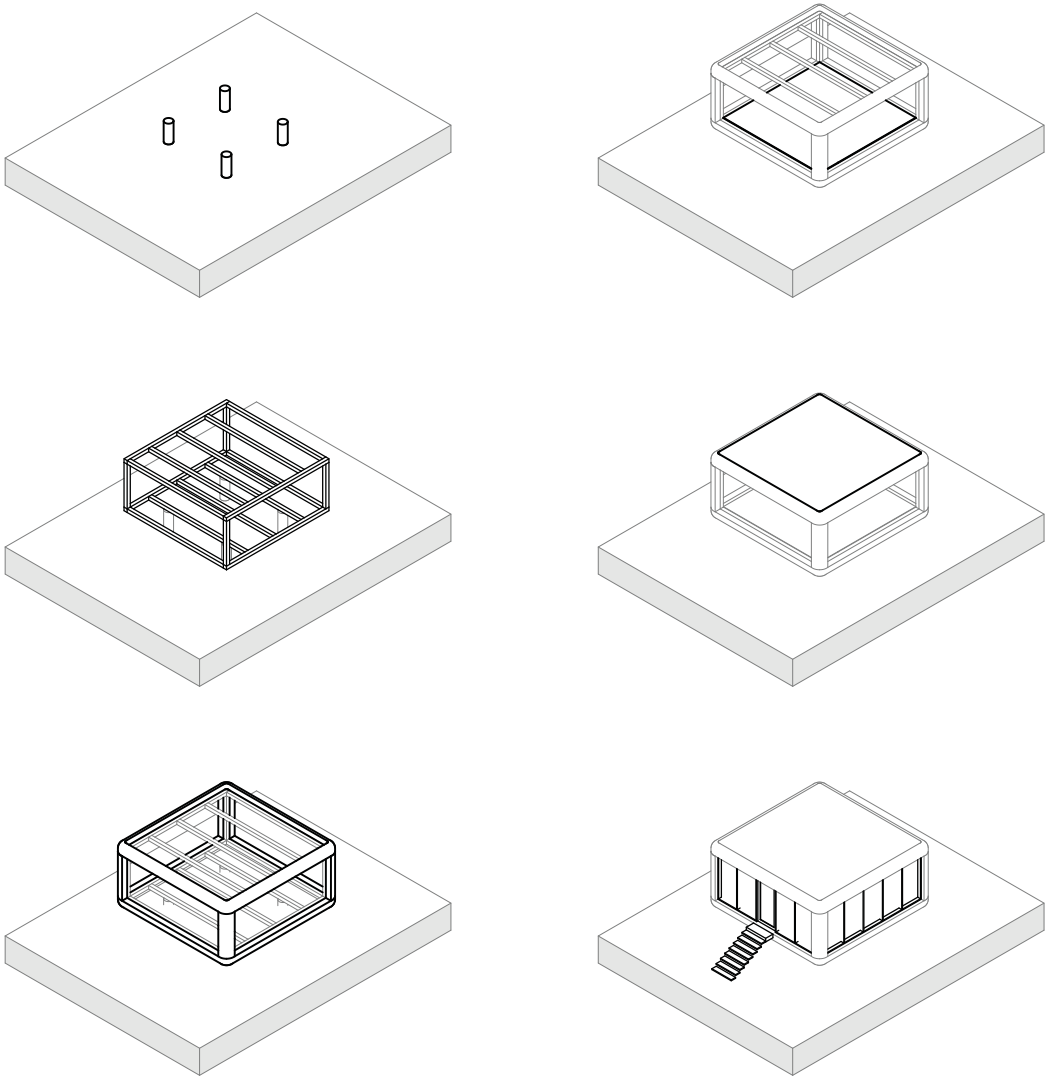
Building Analysis

LoftCube

Architect: Studio Aissliger

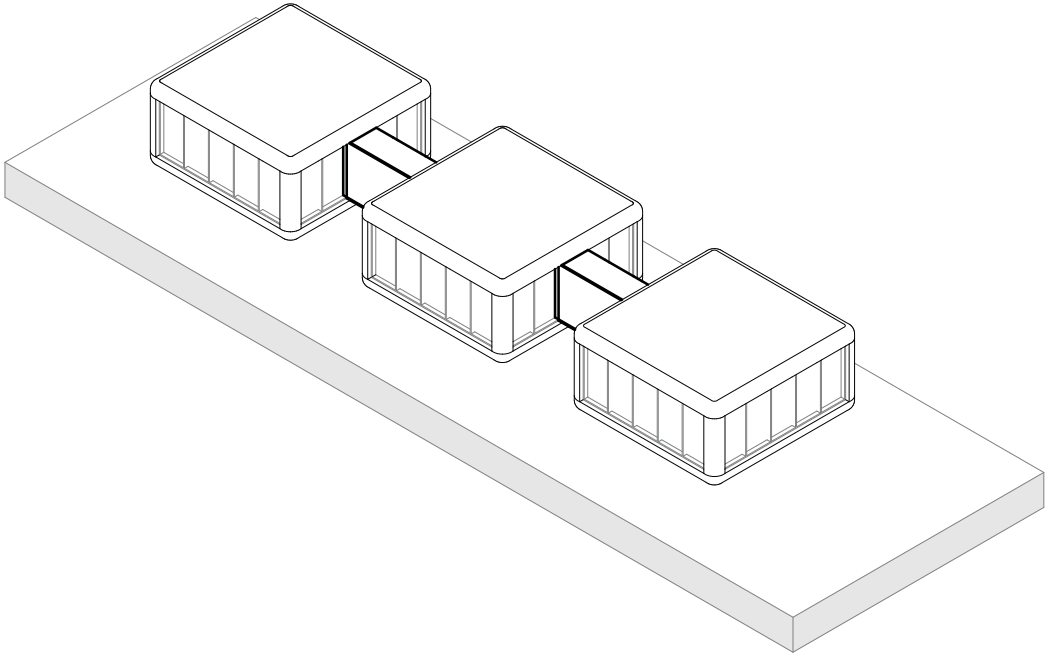
Location: Varies

The Loftcube is pretty simple, but can still be broken down into seperate working components. First are the pillars that act as the foundation system and allow for these dwellings to be place pretty much anywhere. Attached to these pillars is a steel frame that serves as the main structural element. Encasing this frame is a fiberglass shell that provides the modern sleek appearance of these cubes. Inset in the frame and shell is a simple floor system that allows for different surfaces pending on the need of the unit. The roof has a simple membrane style roof that matches the fiberglass frame. Finally the outside glazing encloses the dwelling.

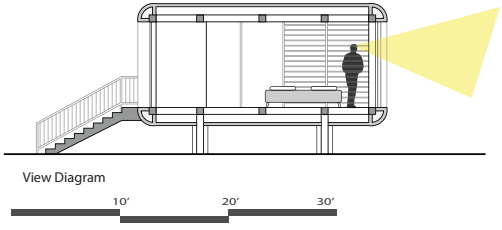


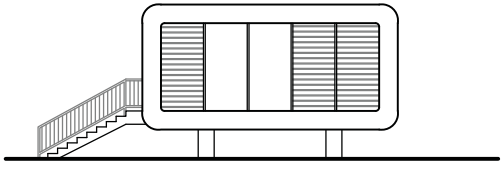
Anatomy Diagram

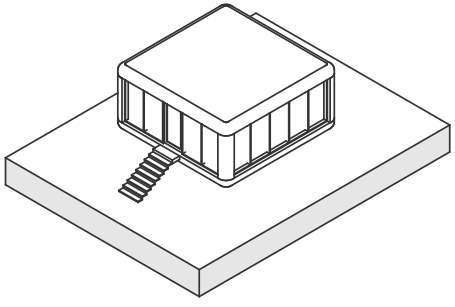
Photos & Research From: http://www.aisslinger.de/index.php?option=com_project&view=detail&pid=10&Itemid=1

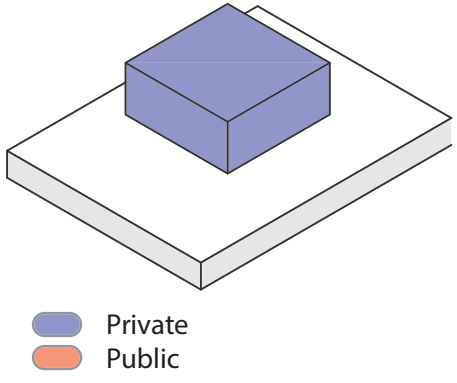


Module Linking Diagram









Building Analysis

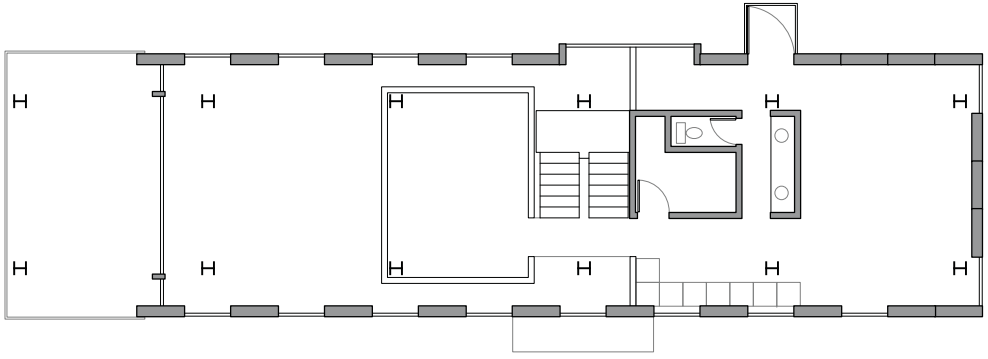
Cantilever House

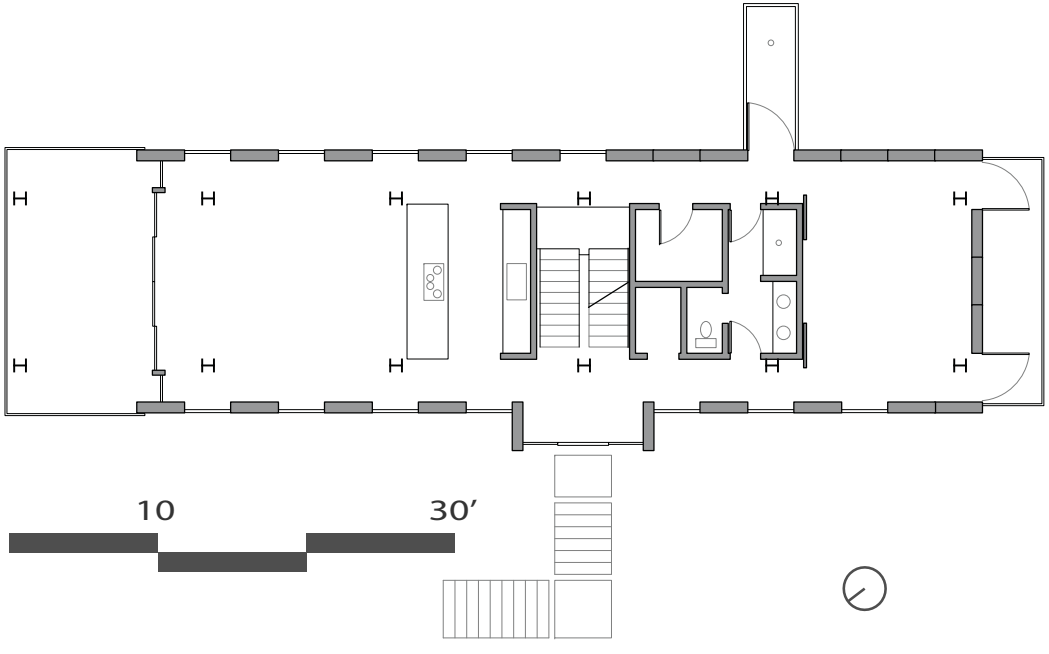
Architect: Anderson Anderson Architects

Location: Washington, USA

This house serves as a prototype of new ways of construction to lower building costs and environmental impact during construction. Two common systems are blended together in the house to create a system that can be assembled quickly and allow for adaptable designs for later projects. First, a prefabricated steel frame is placed on the site. This frame anchors down and can be craned into place. Secondly, Structural Insulated Panel System (SIPS) are used on all non glazing portions of the house. These panels allow for easy wall assembly and can be bolted into place fairly easily. This house shows that a site specific building can be built with these two systems working together.

Photos & Research From: http://www.archdaily.com/56853/cantilever-house-anderson-anderson-architecture



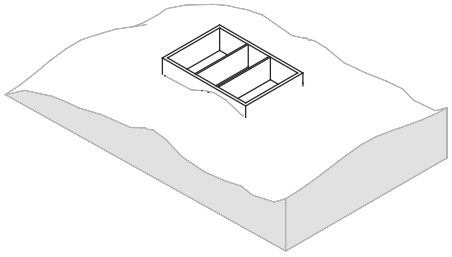

10
30’

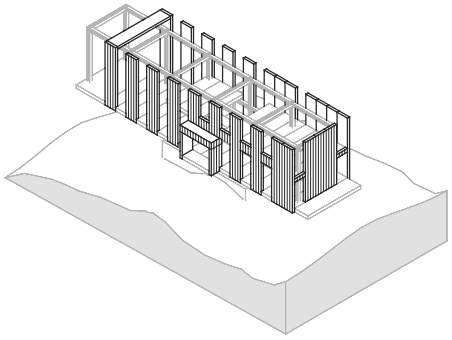
Building Analysis

Cantilever House

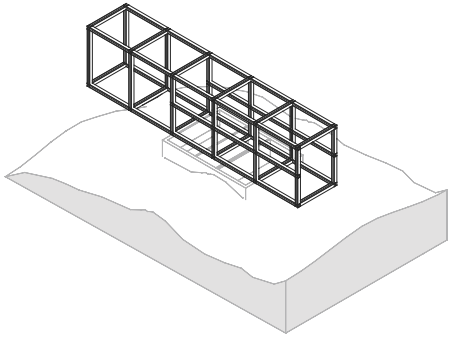
Architect: Anderson Anderson Architects

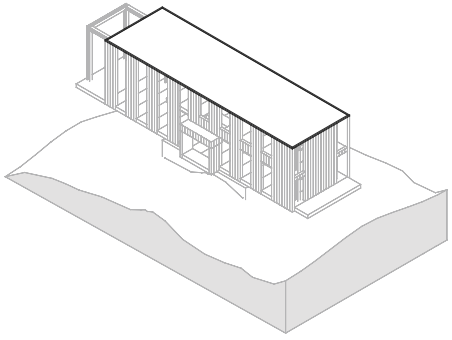
Location: Washington, USA

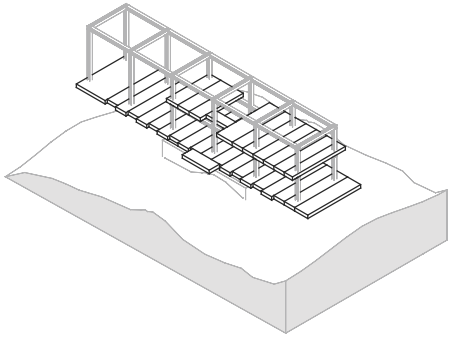


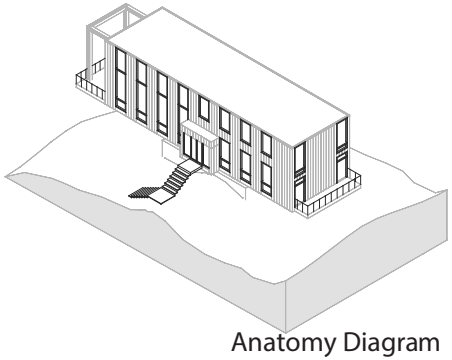


The Cantilever House is a prime example of a building that was built in components. The basement or the building is site built and serves as the connection between the prefabricated to the landscape. The steel frame attaches to the concrete to become the main load bearing member of the house. Floor panels attach over the lower portion of the steel members. SIP panels are then layered up to form all non glazed portions of the facade. An accessible roof rests upon the upper steel members and is fastened into place. Lastly, the windows and other building equipment are attached in place.



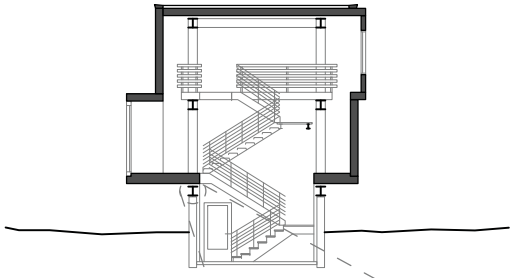




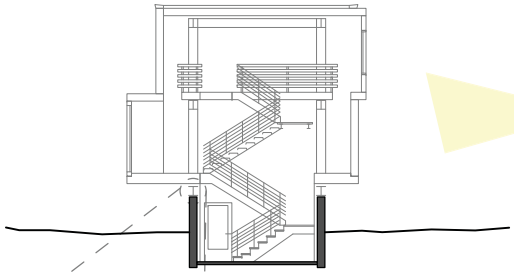


Anatomy Diagram

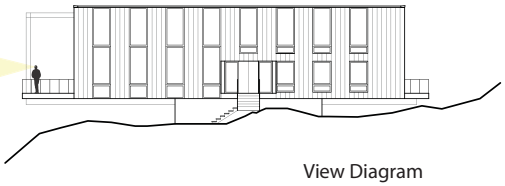
Photos & Research From: http://www.archdaily.com/56853/cantilever-house-anderson-anderson-architecture



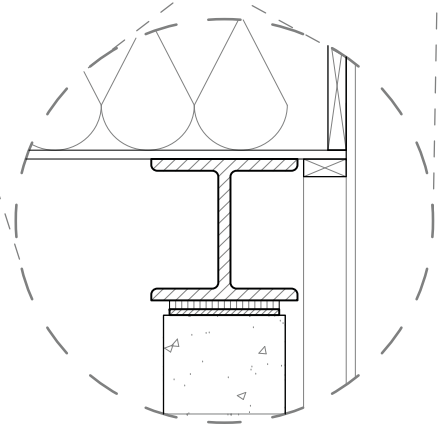
Factory Built

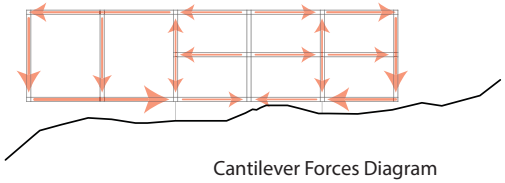


Site Built

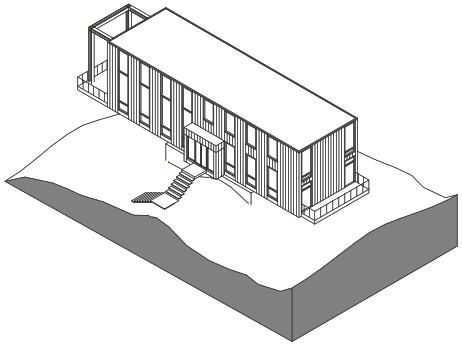


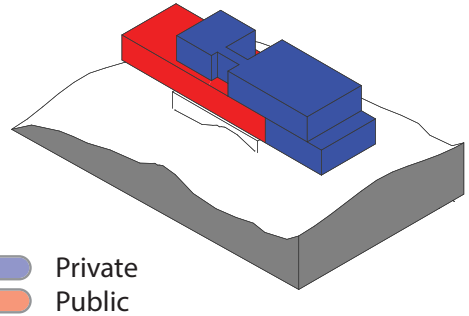
View Diagram





Cantilever Forces Diagram





Private
Public

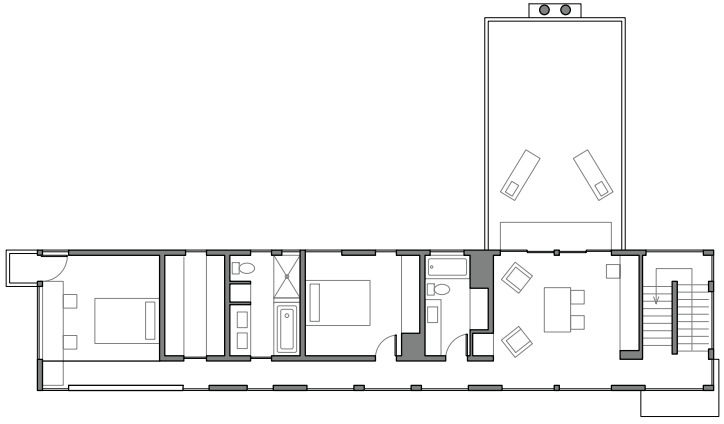
Building Analysis

Dwell Home

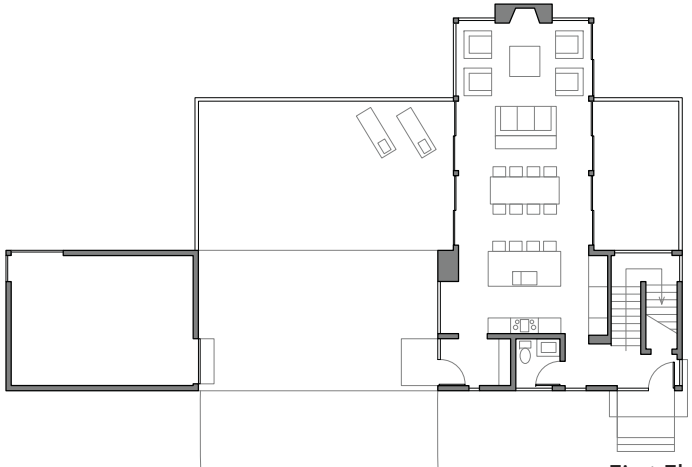
Architect: Resolution 4 Architects
Location: North Carolina, USA

Designed for the 2003 Dwell Home Design Invitational, this house is a showcase of what can be done with a modular approach to design. While being a competition, it was still a real project with a specific site. What this meant to RES4 was that, they had to design this project to relate and fit within the given context. The main form of the house consists of two rectangular bars. The lower bar is the public portion of the house, while the upper bar contains the private sections as requested by the client. Construction of this building went by quick with 80 percent of the actual construction taking place in an off site factory. Overall the house consists of 5 modular boxes along with the roof module.

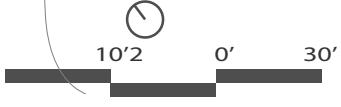
Photos & Research From: http://re4a.com/projects/dwell-home/



Second Floor



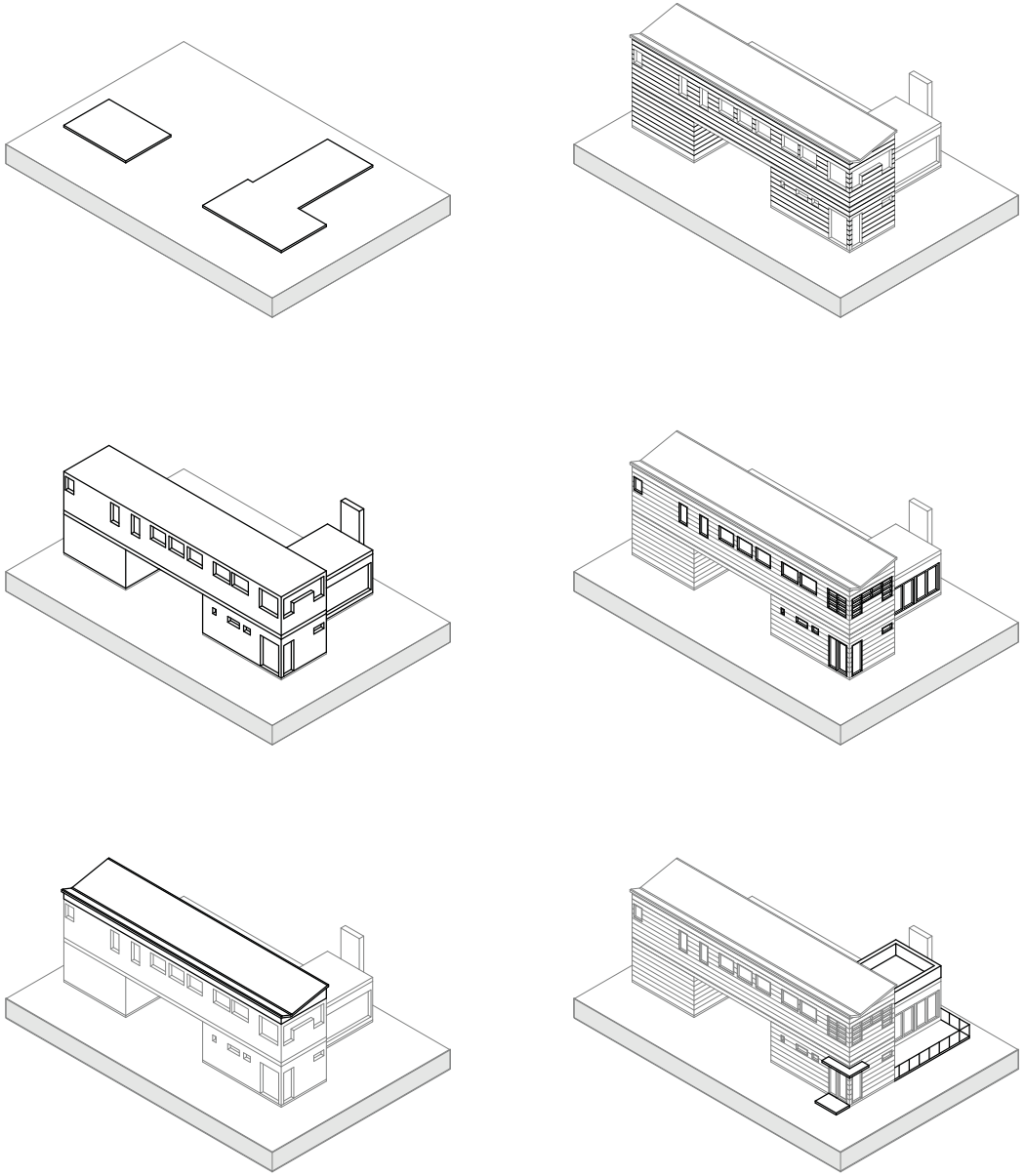
First Floor



Building Analysis

Dwell Home

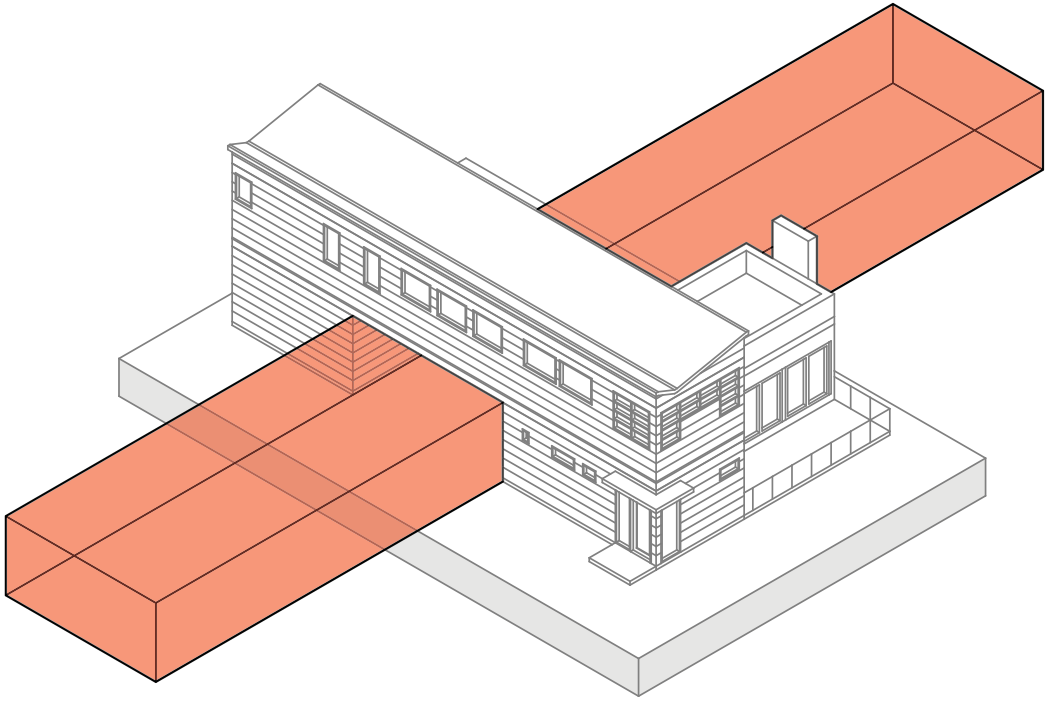
Architect: Resolution 4 Architects
Location: North Carolina, USA



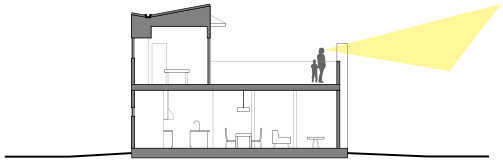
Anatomy Diagram

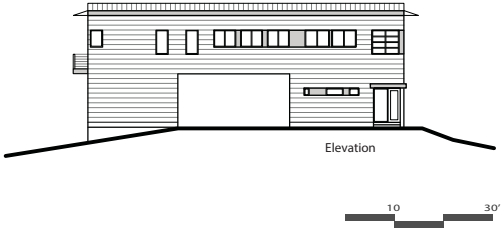
The dwell house's components are pretty basic compared to the other methods of prefabrication. There is a concrete pad, or plinth that the building sits on. The majority of the house is brought in as a series of modules that are craned into place. On top of these modules sits a roof module. This roof is sloped to collect rainwater. The house is then clad with the wood and cement panels. Windows compose the next element and fit into the modules. Finally, the rest of the house equipment such as overhangs, railings, and porches are included.

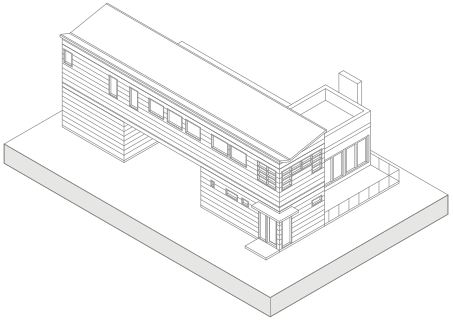
Photos & Research From: http://re4a.com/projects/dwell-home/



Public Entry Portal







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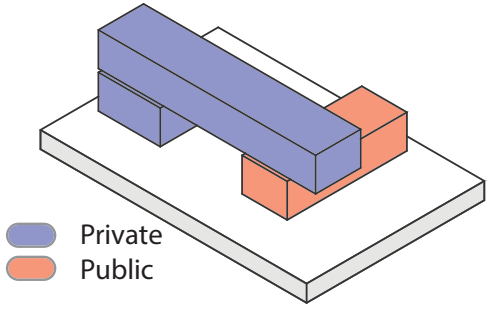
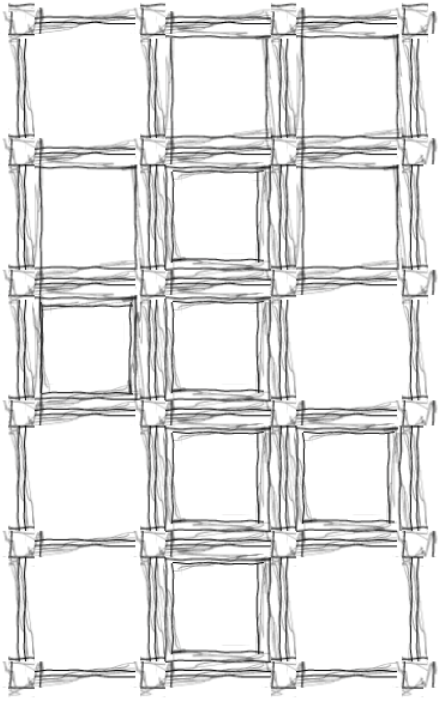
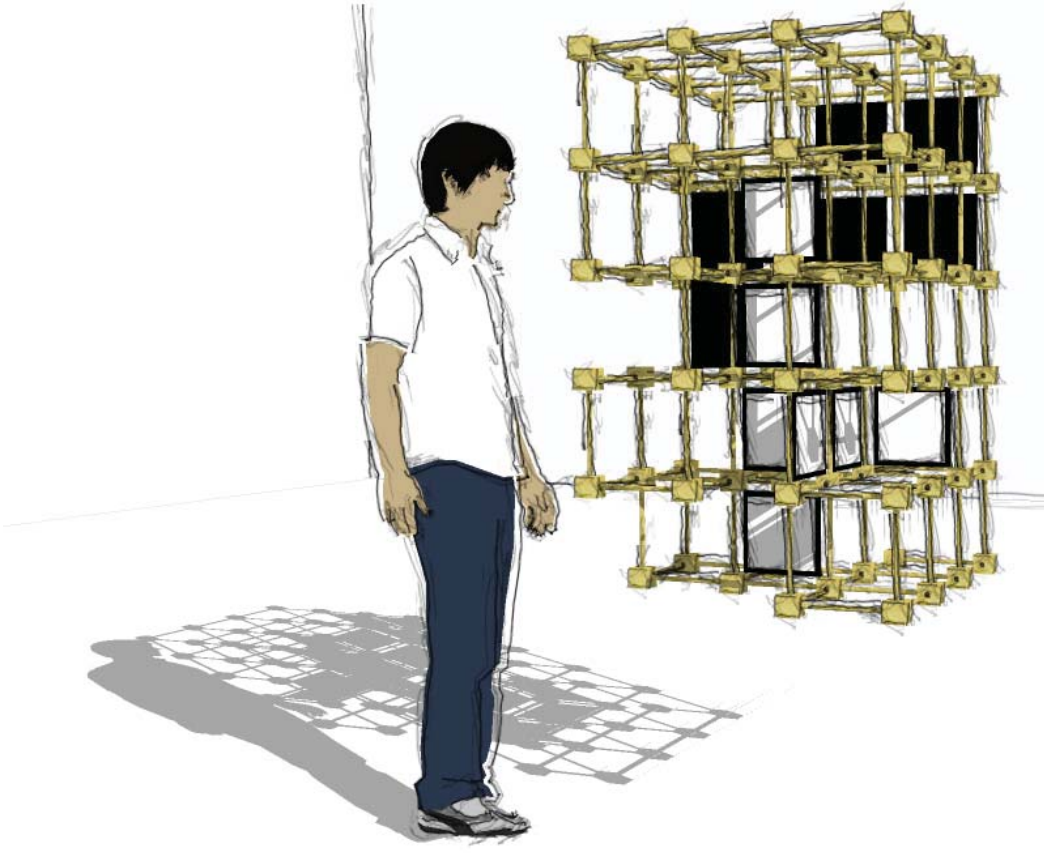


Building Analysis Exhibition

To display my research on prefabricated houses, I decided to create an exhibit that represented the nature of prefabrication itself. To do this I created a system that used simple modular parts that were all made the same, so that I could arrange them however I wanted. With this system I created a hanging structure that became an art piece in itself, in which housed the diagrams I created to showcase my research. The idea was to create a frame in which I could plug in drawings where I saw fit to best display my work.





The final piece was constructed out of wood blocks and dowel rods. The joints were held together using only the friction between the pieces which lets the frame be assembled and disasembled as needed. This ease of construction is where this piece resembles the essence of prefabrication. After the frame went together, the panels get clipped in using basic hardware. By using this sort of system, the whole exhibit can be dissabled back into all of its original parts, which makes this easy to store and reinstall, or just recycled into another project. This concept is something I feel architecture should work towards more.

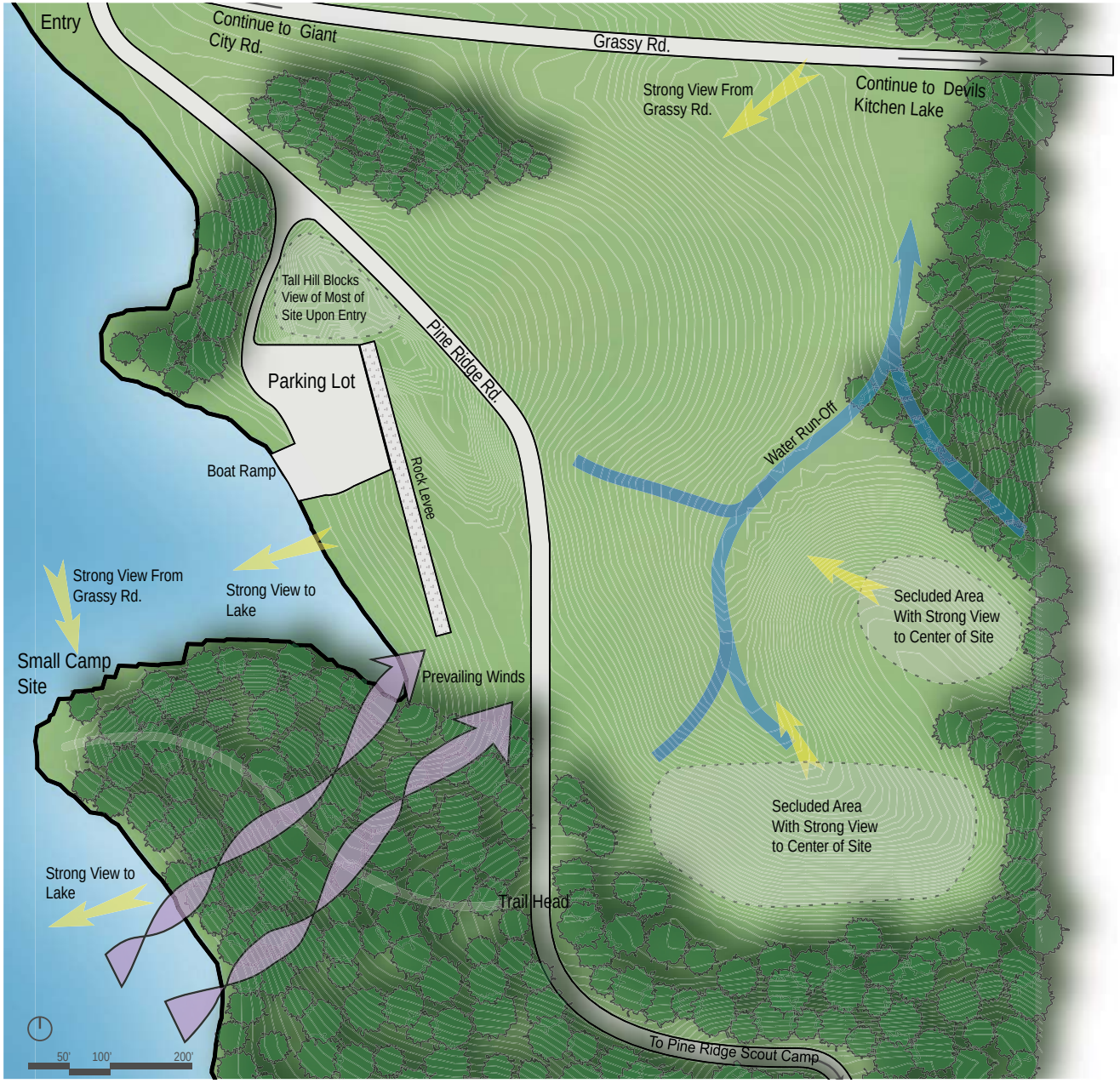
Site Analysis

Little Grassy Lake

Williamson County
Illinois, USA

The site is located in Williamson County, IL off of Little Grassy Lake. Just off of Grassy Rd., the site is pretty secluded from most of society. Located off of Little Grassy Road, the site opens up past some trees. There is an existing parking lot with a boat ramp located right at the entrance, with another road going further south to an active Boy Scouts of America camp and a few private residences. Besides a few trails leading through the woods toward the lake, the site is open and untouched leaving a great view of Southern Illinois' landscape. This site provides many opportunities for any architectural project with ample private and public spaces, while still having great views from different angles and locations.

Map From: http://app.idph.state.il.us/cecweb/images/IL_map.jpg


Entry
Continue to Giant City Rd.
Grassy Rd.
Strong View From Grassy Rd.
Continue to Devils Kitchen Lake
Tall Hill Blocks View of Most of Site Upon Entry
Pine Ridge Rd.
Parking Lot
Rock Levee
Boat Ramp
Water Run-Off
Strong View From Grassy Rd.
Strong View to Lake
Secluded Area With Strong View to Center of Site
Small Camp Site
Prevailing Winds
Secluded Area With Strong View to Center of Site
Strong View to Lake
Trail Head
To Pine Ridge Scout Camp
50'
100'
200'

Program Analysis

Prefabricated House Open Air Museum Entry Building

Codes: IBC 2015 & Illinois Plumbing Codes

Occupancy: A-3, Museum

Located just off Little Grassy Lake in Williamson County, IL a small collection of buildings will comprise an open air museum. Located at the start of this complex will be a welcoming center. This small building will house the maintenance and administration that is needed for the complex to run. Along with these spaces, the center will have a large lobby area to house events and seminars. It will also include a small dining area, that will serve mainly small sandwiches. The main space for this building though, will be a set of galleries. One that will be filled with interactive exhibits to educate guests on the construction techniques used in the prefabricated buildings on site. The other gallery will have a brief exhibit on the history of prefabrication. Guest traffic will go through the history gallery before they leave to tour the buildings, and then they will return into the interactive gallery to learn more about the buildings they just explored. To keep with the theme of prefabrication, this whole building will be composed of some sort of prefabricated frame, and this frame will be highlighted throughout the project.

Museum

Interactive Gallery-2000 ft^2

The main gallery space that comprises of a small interactive exhibit spaces that highlight the construction elements in each of the five buildings. This room will be located right off the lobby and will be the primary ending destination of the tour.

History Gallery-1000 ft^2

The main gallery space for the introduction to prefabrication. This room will be based off an history gallery, will images and text describing the history of prefabricated techniques used in construction. This will be the starting place for guests who start the tour of the open air museum.

Gallery Storage-500 ft^2

This storage room will be connected to the gallery to store equipment and exhibits for the main gallery space. This will mostly be more of multipurpose back of the house room to meet all of the small gallery's needs.

Lobby-2000 ft^2

This will be the main entrance room for the space. It will be mostly open to accommodate the potential use to be used to house events. This room should probably be mostly day lit as the gallery space will be mostly controlled light.

Recption-120 ft^2

A small reception desk/office should be located in or adjacent to the main lobby. Its main purpose is to welcome guests and answer any questions that may arise.

Security-150ft^2

This would be a security office that also doubles as a first aid station for guests. This space would be located adjacent to the lobby to be fully accessible by guests.

Toilets-350 ft^2

These toilets (2male/2female) should be located near the lobby and gallery space. They need to hold 4 fixtures and 3 lavatories for the female, and 2 fixtures, 2 urinal, and 3 lavatories for the male. This is in accordance with the Illinois Plumbing Code with an overall building population of 366 and building type as "public building".

Gift Shop

Retail Space-800 ft^2

This space would house the actual retail component of the gift shop. It would have an open floor plan to accommodate for any arrangement of shelving. This space should be adjacent to the lobby as well.

Gift Shop Storage-400 ft^2

This storage space is located near the back of the retail space and houses the inventory of the shop along with any supplies it might need.

Gift Shop Office-120 ft^2

A small office would be located off of the main storage for the gift shop administrator to house files and do business work. The shop would only employ a handful of people so only one office would be necessary.

Program Analysis

Food Services

Dining-1200 ft²

This area would include cafeteria style seating with an allotted area of 12 ft² for each person. This dining area should be located off of the main lobby, but away from the gallery as to not make much noise.

Kitchen-500 ft²

This kitchen space only needs to house equipment for a small deli. Along with the kitchen supplies, this space also takes into consideration the service area - such as ordering/cash register.

Cooler-100 ft²

A small cooler for kitchen supplies located off of kitchen.

Freezer-100 ft²

A small freezer for kitchen supplies located off of kitchen.

Dry Storage-100 ft²

A small storage space for dry food goods located off of kitchen.

Supply Closet-60 ft²

A small closet to hold cleaning equipment and other supplies that the kitchen might need.

Kitchen Office-120 ft²

A small office to handle administration of deli.

Offices

Administrator-200 ft²

A main office for the head administrator that oversees the whole complex. This room should be adjacent to the secretary for ease of communication.

Office Aid-120 ft²

A smaller office that could be filled by any position needed to help run the complex. This space should also be near the secretary.

Business Office-140 ft²

This office would house the main financial official for the complex. This room would also house the all the files. It should also be located next to the secretary.

Secretary-200 ft²

This room would have desk space for a secretary along with the equipment that goes along with an office - such as copier, printer, fax machine. This room would be centrally located in the office portion of the building.

Conference Room-200 ft²

This would be a small room for meetings with the administrators and potential guests. Would include media utilities for presentations.

Break Room-200 ft²

A break room located near the offices would be necessary. This room would include a kitchenette and seating area. This room would also house small storage cells for the employees.

Storage-60 ft²

A small supply closet to house all office related materials-such as paper, ink, toner, pens, clips, and other supplies. This closet should be centrally located and will be serviced by the secretary.

Toilets-60 ft²

Single fixture male and female toilets will be located off the break room for employees.

Custodial/Grounds keeping

Custodial Office-120 ft²

A small office for administrating all custodial needs. This office should be located back of house near the unloading.

Custodial Storage-200 ft²

This storage room will house the cleaning equipment such as buffers, vacuums, mops, and chemical supplies. This room should be located back of house too near the unloading, but with ease of access to the lobby.

Custodial Closet-40 ft²

Small closets that will house basic supplies on a cart. This room should also include a mop sink. This room should also include proper ventilation to keep fumes from escaping into the main areas. A closet should be placed in the main lobby, along with a closet being in the dining area.

Unloading-400 ft²

A small unloading area located back of house to receive office, cleaning, and food supplies for regular maintenance of the building. This space may or may not have a formal loading dock. This would depend of site location and possibility of going down into the landscape. If not, then unloading can happen in an enclosed space indoors.

Recycling/Waste-250 ft²

A small space located near unloading that houses waste and recycling dumpsters that are enclosed and gated off.

Grounds Keeper Office-200 ft²

A large office for the main grounds keeper and employees. This would house small storage units for employees and be located adjacent to the main equipment garage.

Equipment Garage-1200 ft²

A three bay garage that would house grounds equipment such as mower, tractor, and atv for general site maintenance.

Workshop-400 ft²

A small shop located in or adjacent to the equipment garage. It would include standard tools for machining to fix/repair the grounds equipment and other complex needs.

Toilet-60 ft²

A single unisex toilet for employees.

Totals

Museum-	**7170 ft²**
Gift Shop-	**1320 ft²**
Food Services-	**2180 ft²**
Offices-	**1240 ft²**
Custodial-	**2910 ft²**
Subtotal-	**13,820 ft²**
Efficiency Ratio	**25%**

(includes walls, hallways, circulation, and mechanical)

Total	**18,275 ft²**

Parking Requirements

(per Jackson County Ordinance)

Stalls-	**54**
Handicap Stalls-	**8**
Total	**58**

Occupancy

(per IBC & Illinois Plumbing Code)

Occupancy type	**A-3**

Museum

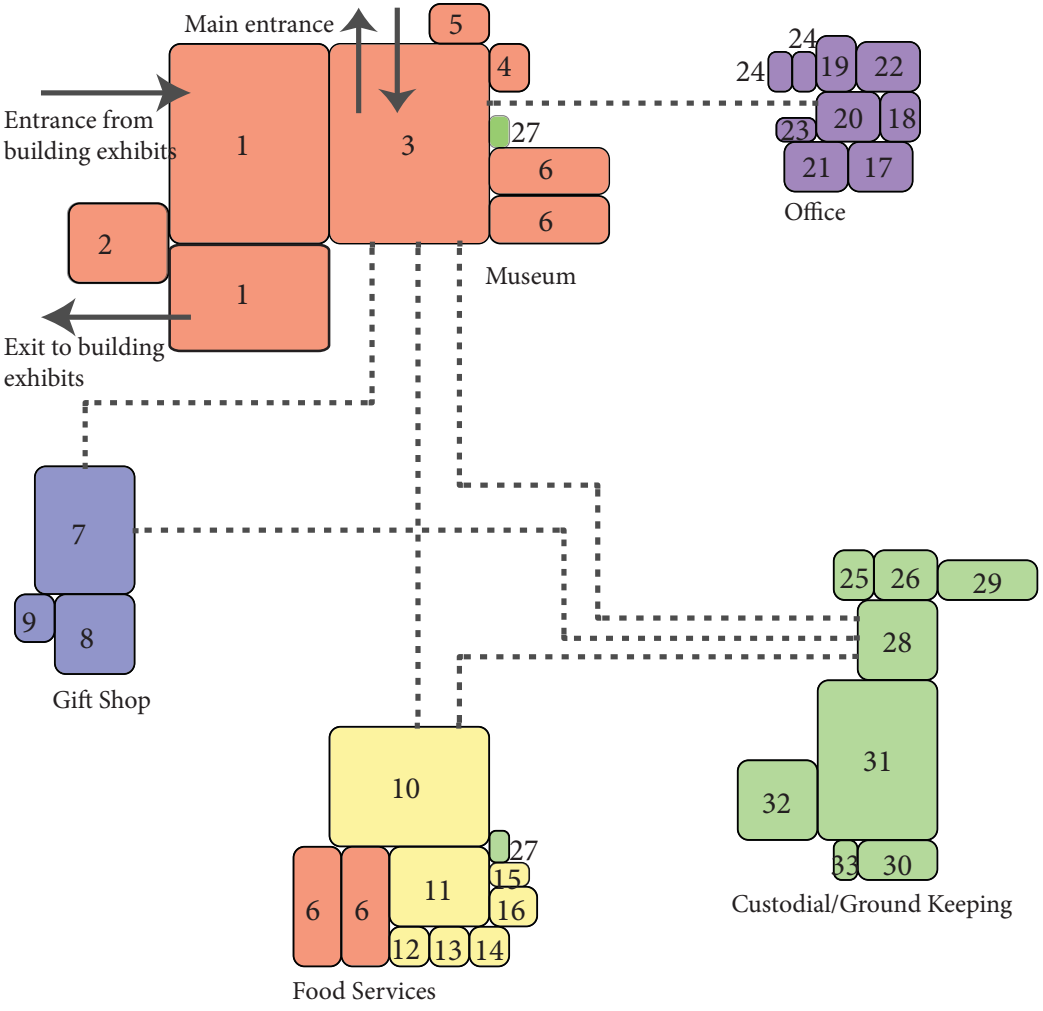
Total Sq. Ft.	**18,275 ft²**
Sq. Ft. per person	**50 ft²**
Occupancy	**366 People**

Toilets

(per Illinois Plumbing Code)

Men	**183**
Fixtures	**8**
Lavatories	**6**
Women	**183**
Fixtures	**8**
Lavatories	**6**

Program Analysis



Museum

1. Galleries
2. Gallery Storage
3. Lobby
4. Reception
5. Security
6. Toilet

Gift Shop

7. Retail Space
8. Gift Shop Storage
9. Gift Shop Office

Food Services

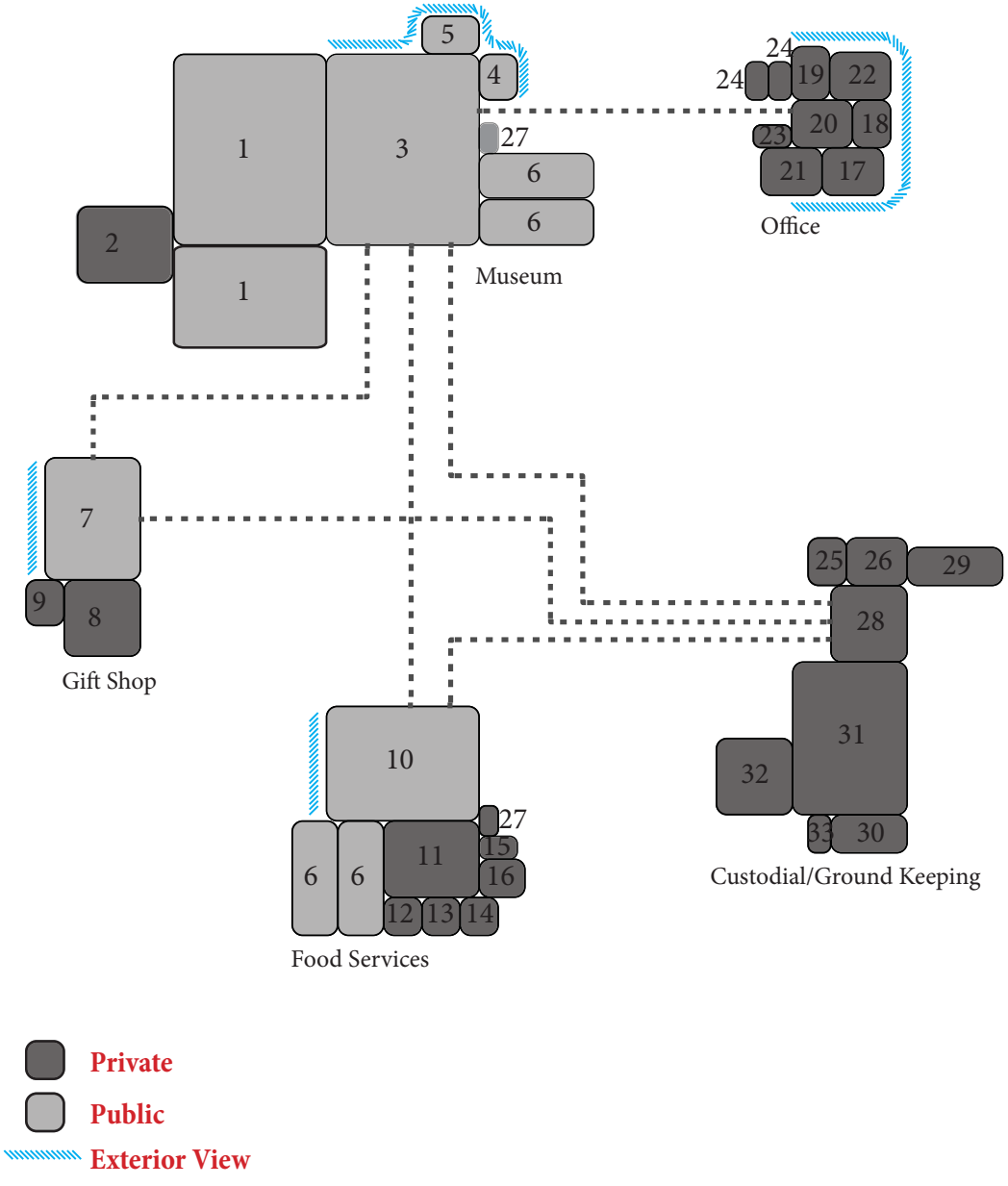
10. Dining
11. Kitchen
12. Cooler
13. Freezer
14. Dry Storage
15. Supply Closet
16. Kitchen Office

Offices

17. Administrator
18. Office Aid
19. Business Office
20. Secretary
21. Conference Room
22. Break Room
23. Storage
24. Toilet

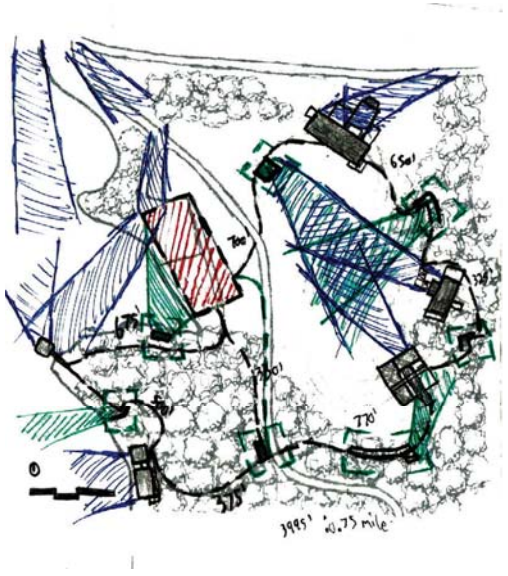
Custodial/Ground Keeping

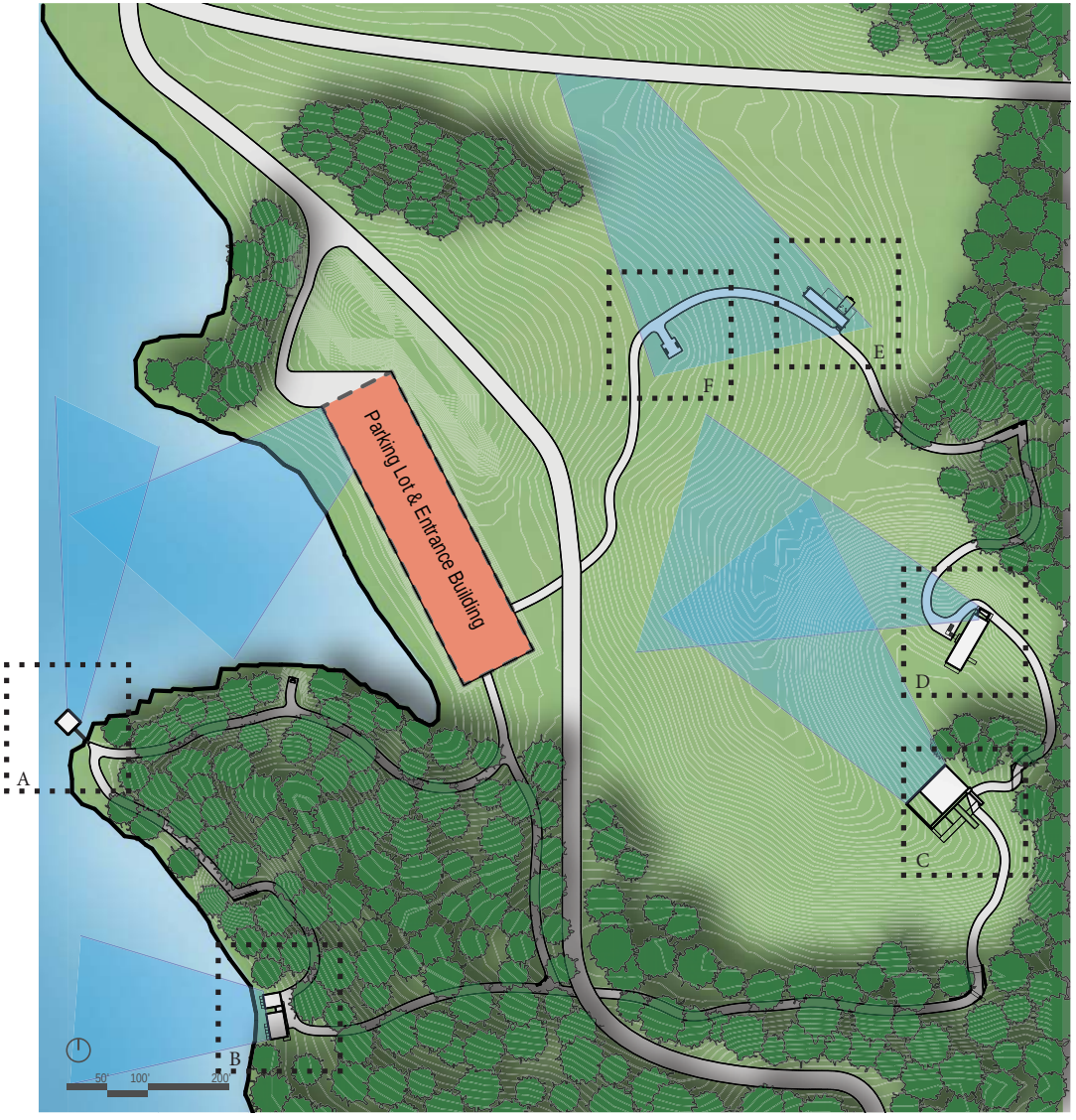
25. Custodial Office
26. Custodial Storage
27. Custodial Closet
28. Unloading
29. Recycling/Waste
30. Grounds Keeper
31. Equipment Garage
32. Workshop
33. Toilet


5
4
1
3
27
6
6
2
1
Museum
24
24
19
22
20
18
23
21
17
Office
7
9
8
Gift Shop
25
26
29
28
31
32
33
30
Custodial/Ground Keeping
10
27
15
6
6
11
16
12
13
14
Food Services
Private
Public
Exterior View

Site Design

The new site proposal is for an open air museum that will comprise of prefabricated houses that showcase the construction methods used to construct them. The site welcomes you with an entrance building that will house two galleries and the administration needed to run the complex. The museum itself is made up by a trail that goes through most of the perimeter of the site which ends up being about a 3/4 mile hike. Halfway through there is a cut back for those who feel like they can not continue on the trail, or of site workers. The trail loops back around to the entrance building thus completing the exhibit.



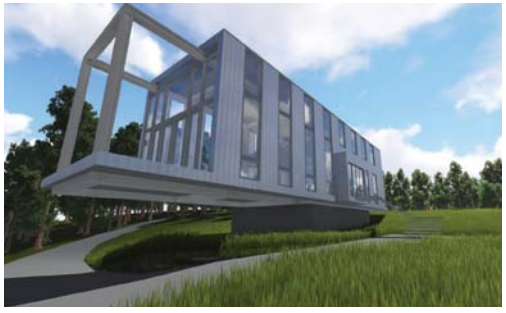


E

faces the Grassy Rd. so that its welcoming porch and portal can be seen as people drive by creating a reason for them to stop and visit the museum.

The LoftCube is the first building most people will see when they arrive to the site. It is placed out on the lake so that its visible from Grassy Rd. as you drive in. It acts as a teaser for the rest of the museum and therefore gets explored first.

A

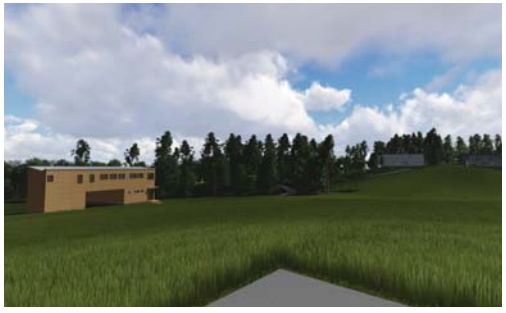


D

The Cantilever House is placed on the steepest hill to really show off the original cantilever design. To further showcase the structural system at play, the path goes directly under the overhang with the exposed steel frame.

The Loblolly House is the second house on the trail, and fits into the tree line just like it was originally designed. The facade opens up to take in the full lake view and catch the lake breeze.

B



F

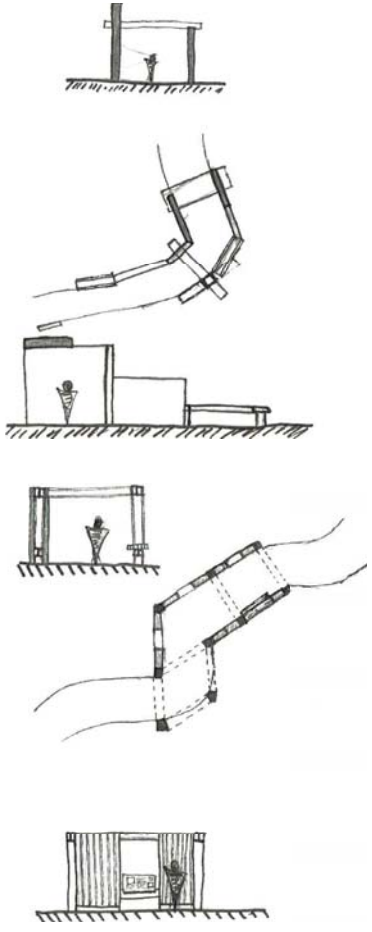
At the end of the trail, there is a lookout point where one can view the open field in the center of the museum. From this point one will be able to see the last three buildings on the trail along with the entry building.

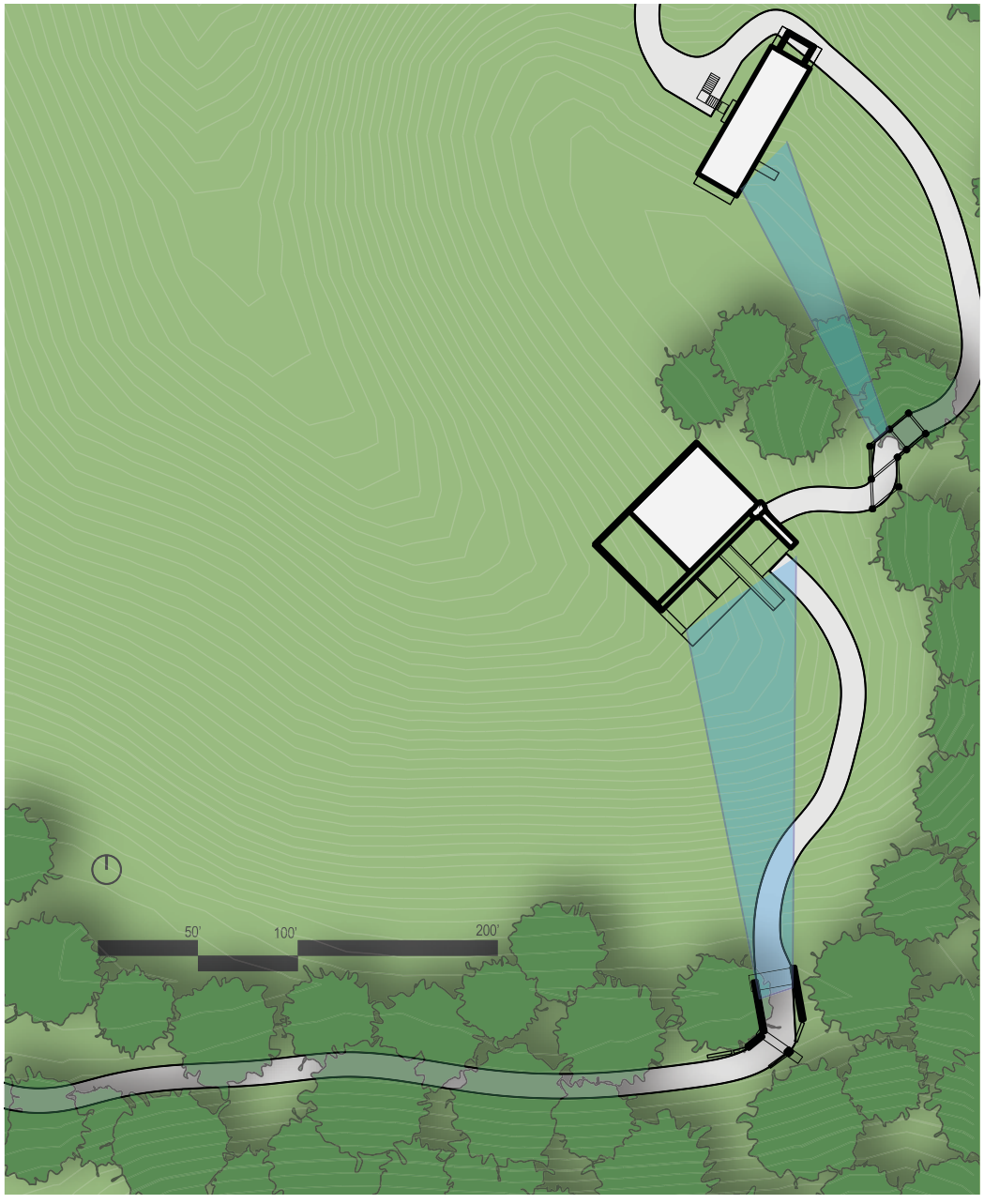
The Hemeroscopium House is the middle house and one of the most impressive in terms of structure. The way that you approach the building emphasizes the cantilevering forces at work.

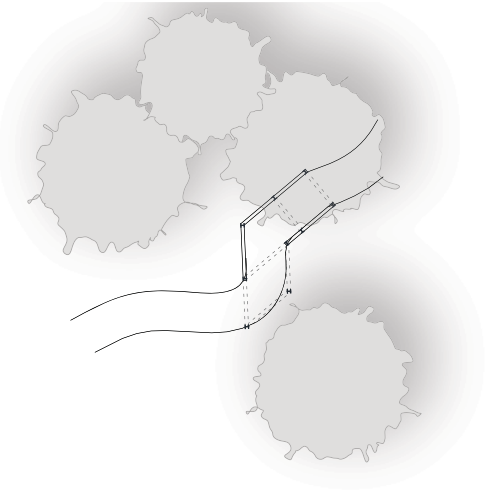
C

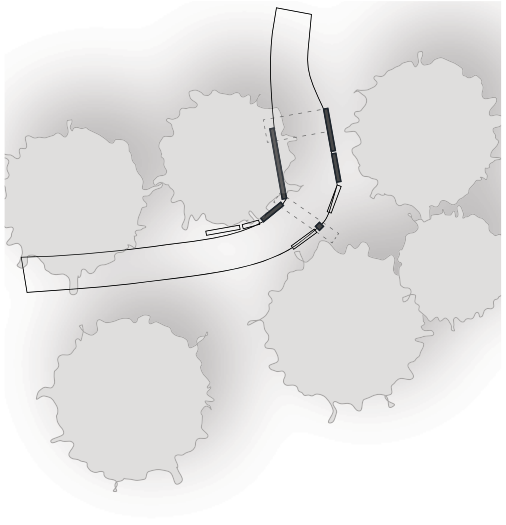
Site Connections

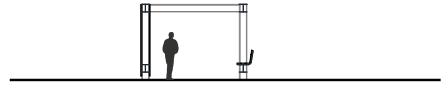
The path in between each building acts as a preparation for the next building. On each path is a node that serves as a place of rest. This node is also made using similar construction methods to the next houses a way to subconsciously prepare them for the next building.

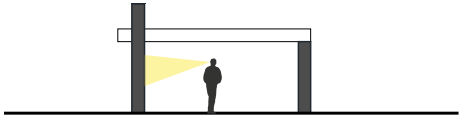


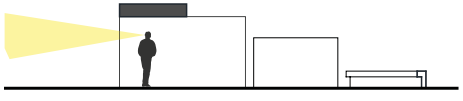


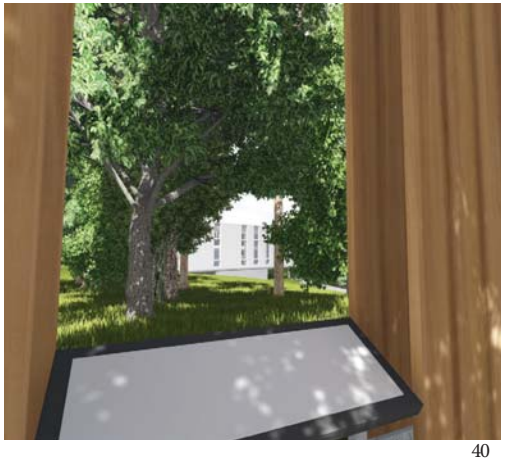






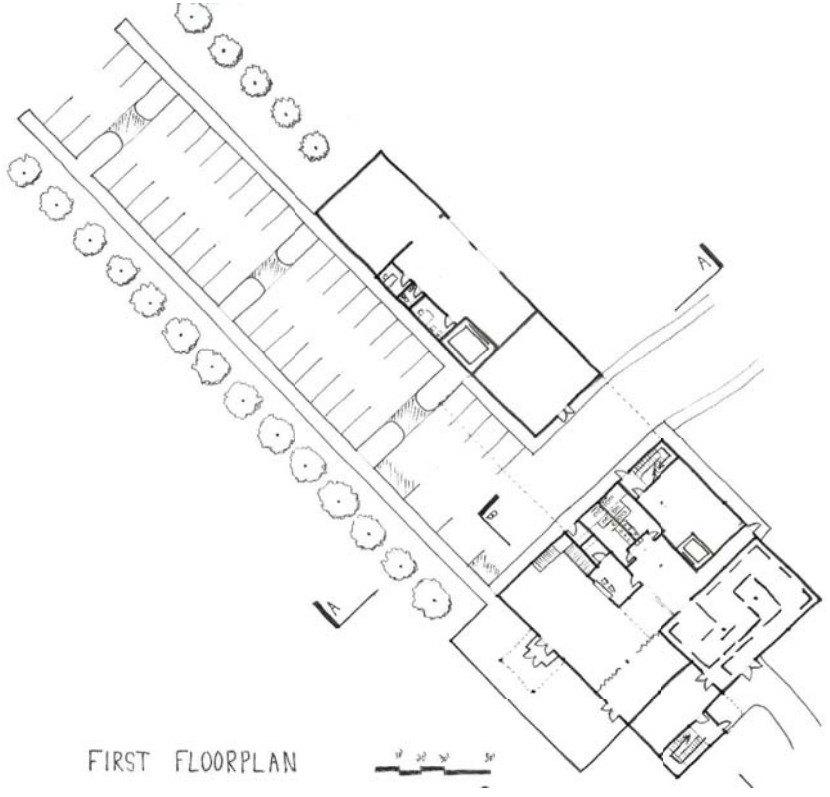


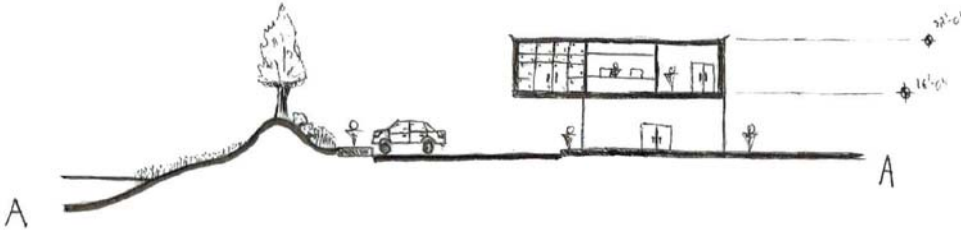


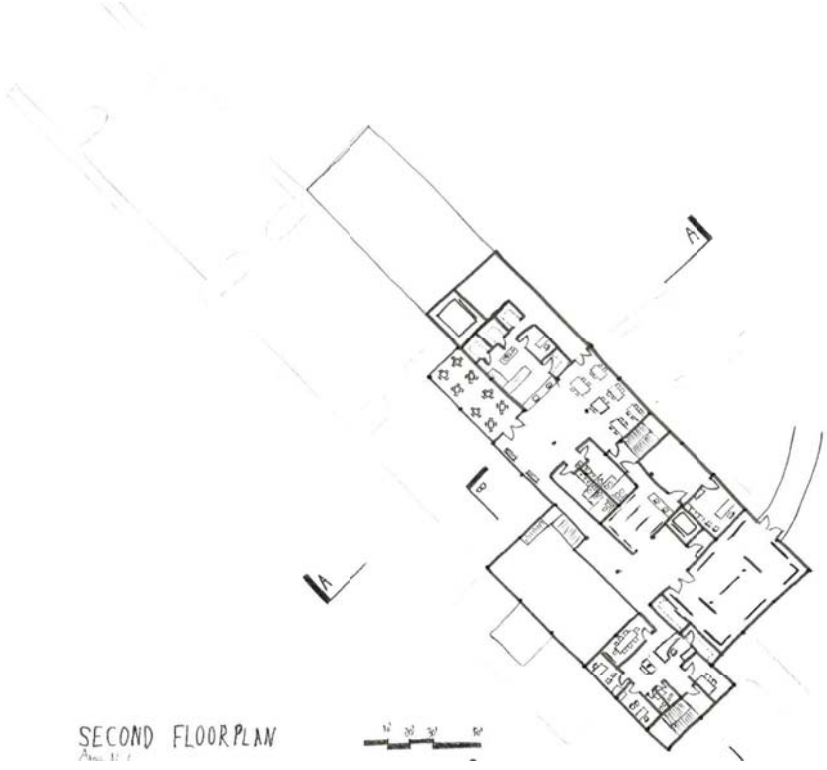


Schematic Design

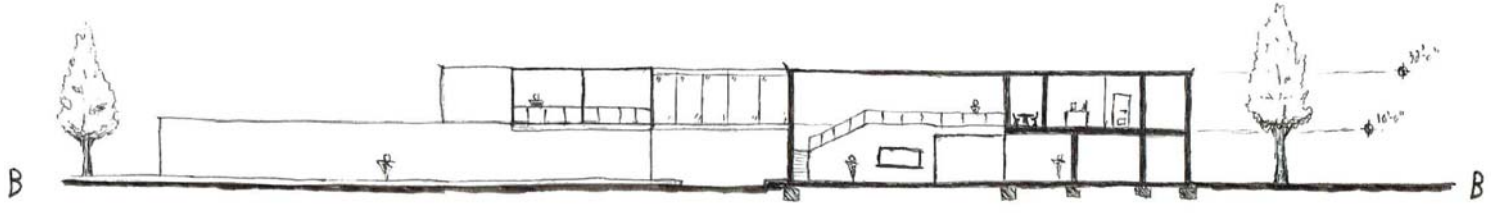
The museum will begin with an entry building that serves as a starting and endpoint on the trail. This building will consist of two galleries, a cafe, and the private functions of the complex necessary to make it run. Focus has given on the circulation of the floor plan to guide people on the path through the museum.





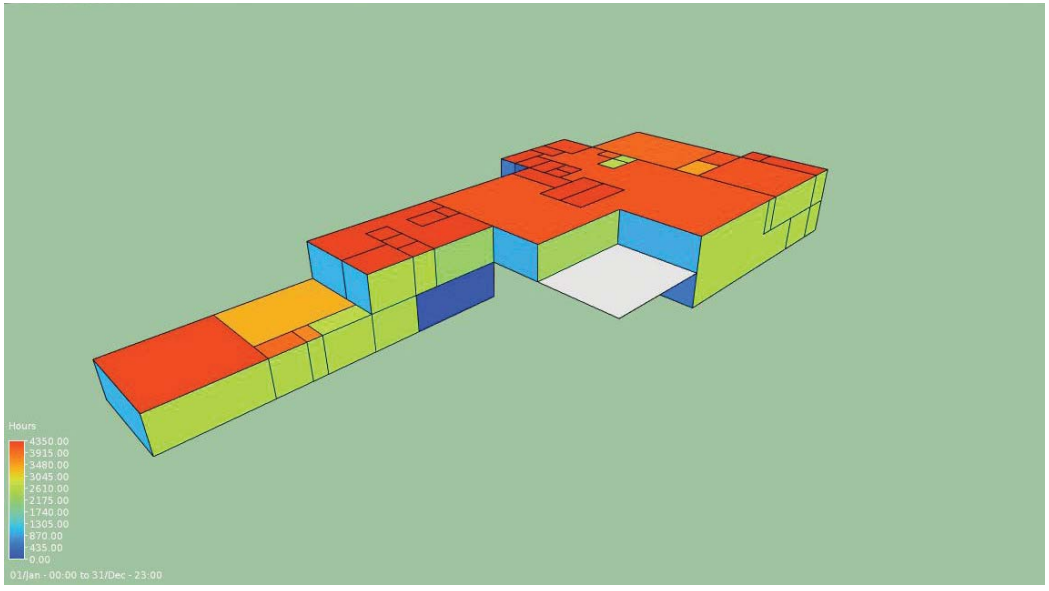


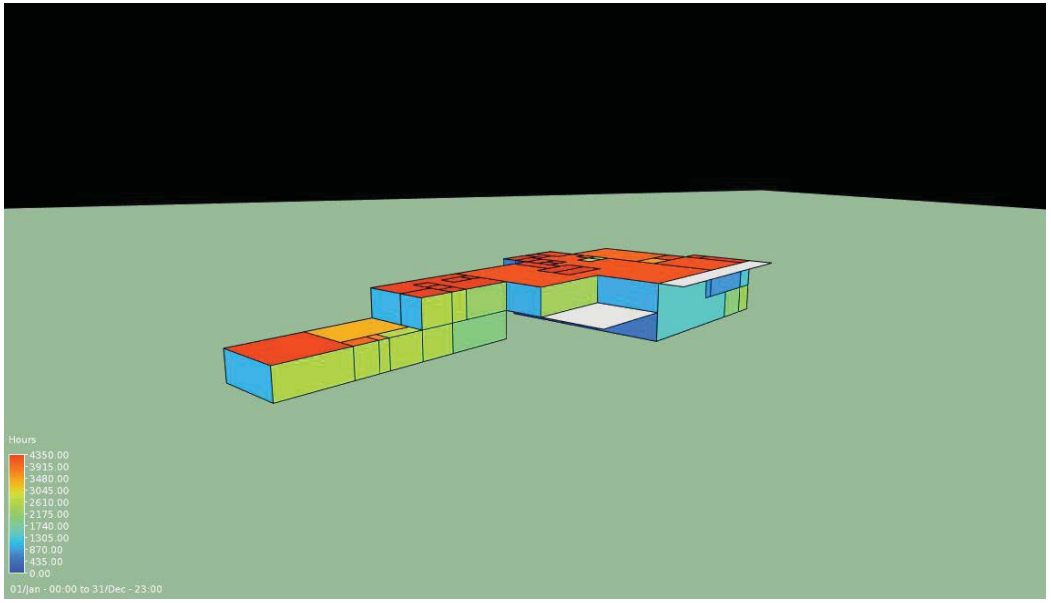
The second floor of the museum will include the gift shop and cafe areas. These have been placed here as sort of a reward for going through the trail. Right after you exit the second gallery, you are greeted by both to give you a bit of relaxation. The cafe area even has outdoor seating with a great view of the lake.



Solar Design

After planning out the basic programmatic spaces and form of the building, I performed a solar analysis on my design. Looking at mainly the solar gain on the facades, I noted the locations where I could add shaders to reduce solar gain. The shades of color represent the levels of heat on the particular surface with blue being the coolest, and red being the hottest.

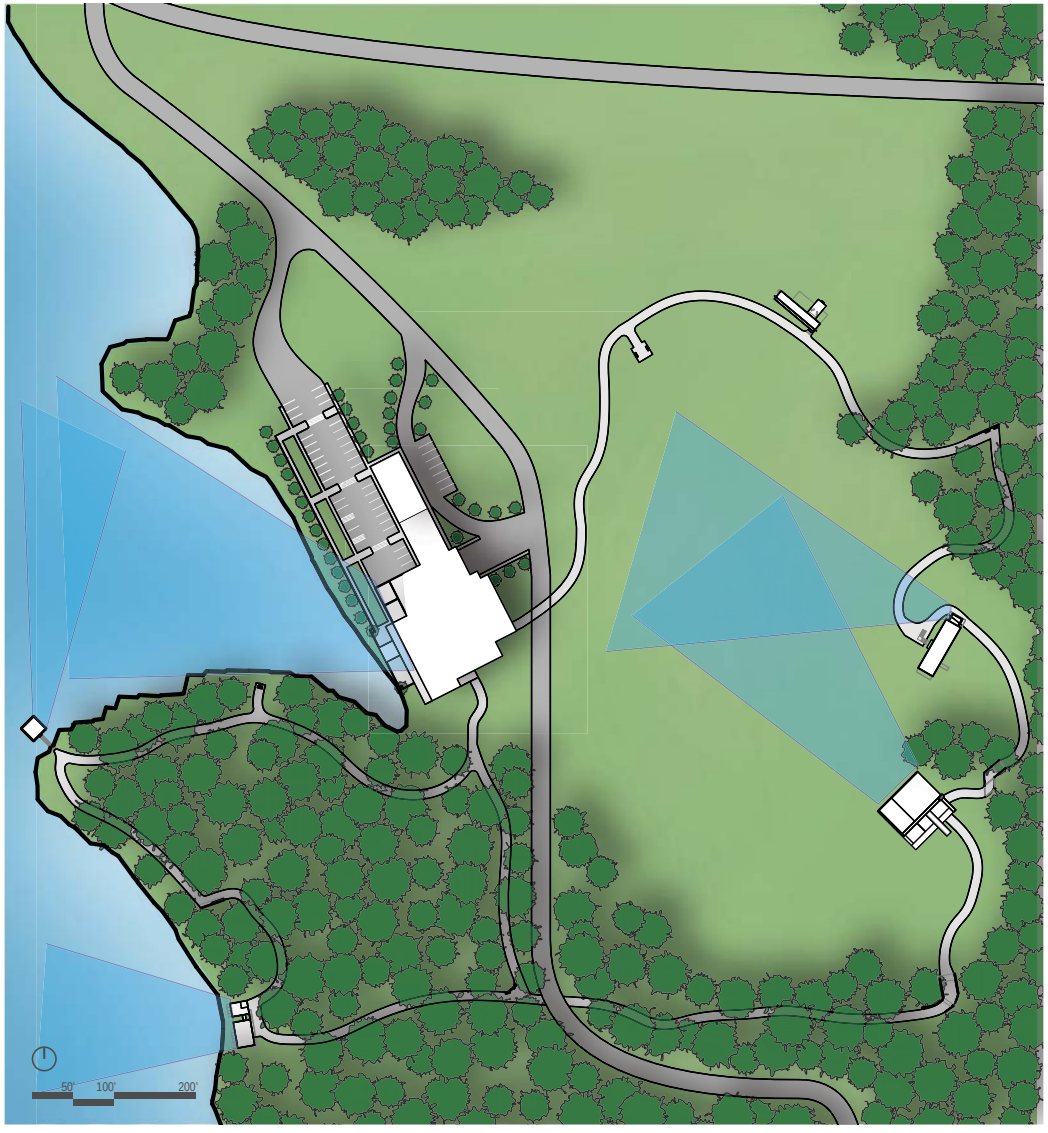




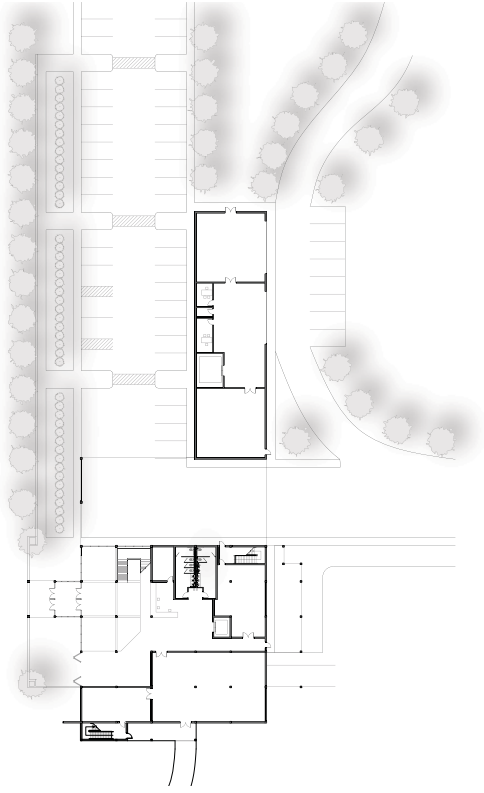
After adding some basic shading devices I noted the difference in heat levels on the southwestern facade. This wall is primarily glass, so it was crucial to reduce that solar gain as much as possible. To adequately shade the wall, I had to have fairly deep overhangs on the roof, and as you can see the bottom corner still receives the same amount of sunlight. To prevent this my next design included a wall extrusion to block off the light on that corner.

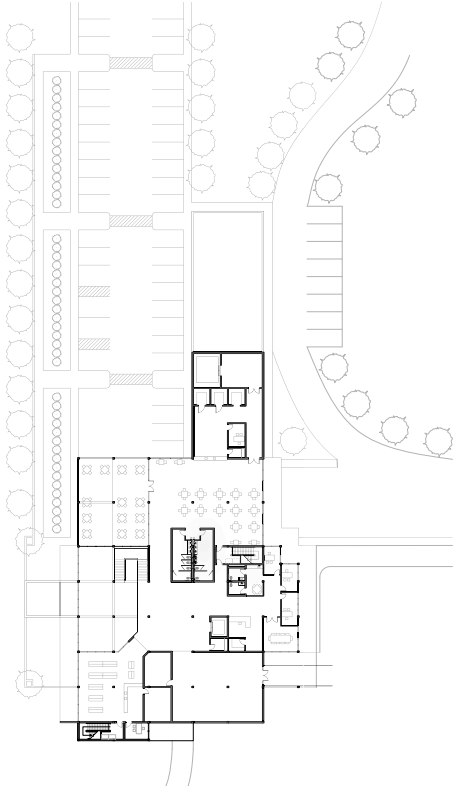
Final Building Design

The final design of the museum entrance turned into a showcase for prefabrication in itself. The project uses its own prefabricated frame system, and it displays it off. As visitors come to through the museum they will be introduced to prefabrication even before they enter the first exhibit. This will provide constant immersion from the time people arrive till they leave the complex.

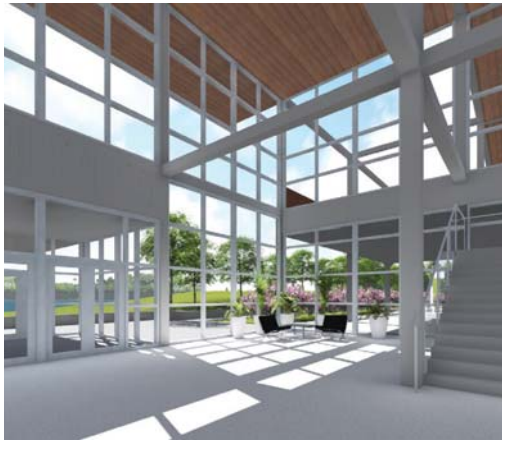


As people enter the site via their cars, they are guided into a walkway that is secluded by landscaping to provide a private path cut off from the parking lot. This pathway serves as a palette cleanser to prepare visitors for the museum complex.





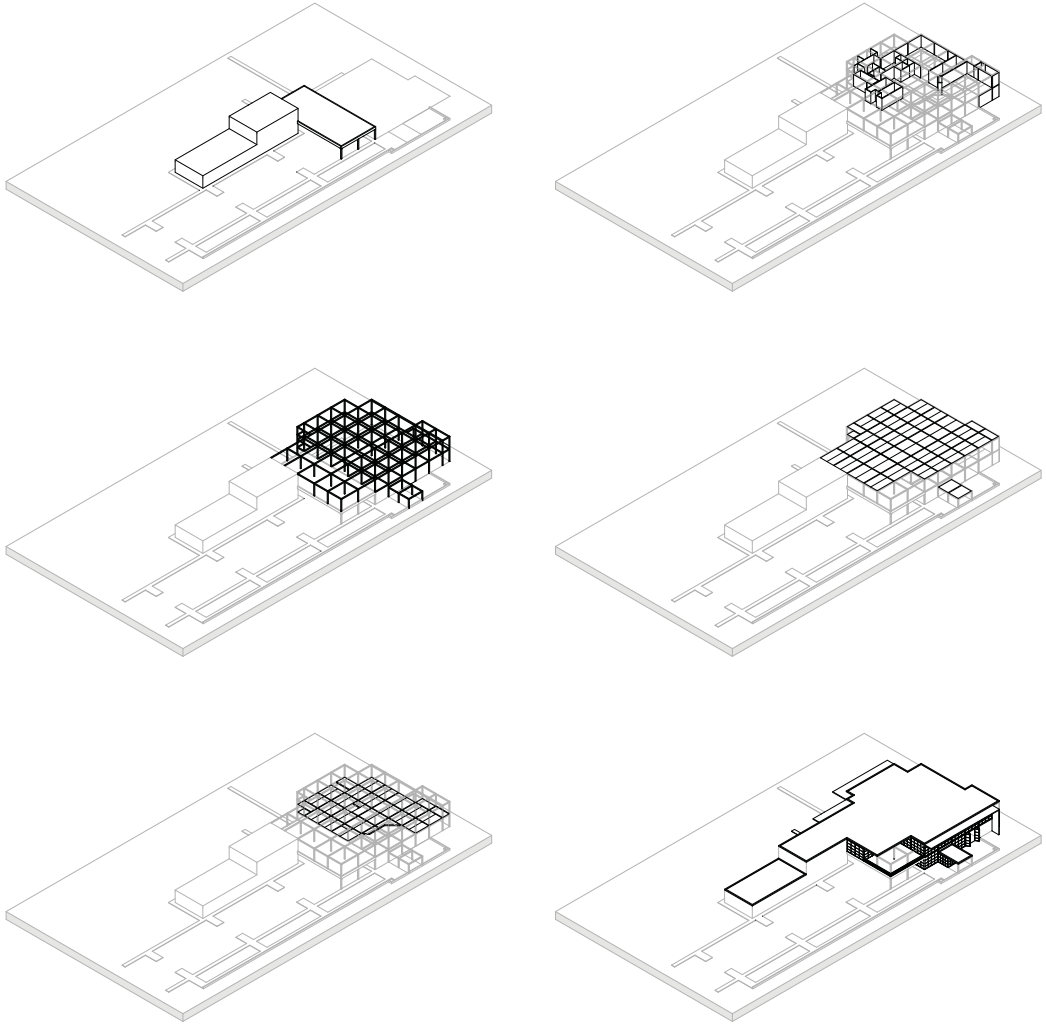
The main lobby and atrium leave the steel frame exposed so that visitors can admire the nature of the construction. This also provides some dynamic shadows across the floor as the days and seasons change.



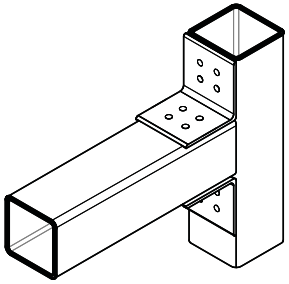
Final Building Design

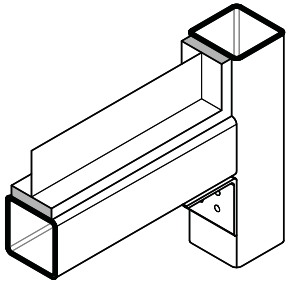
The main building is composed of structural systems. On the north side, the building is made of precast panels to create a solid anchor for the rest of the building. Spanning over the parking lane, precast double tees make up the floor construction. On top of these panels, is a sub floor to allow for mechanical chases beneath the floor. On the outside section this chases becomes the drainage system.

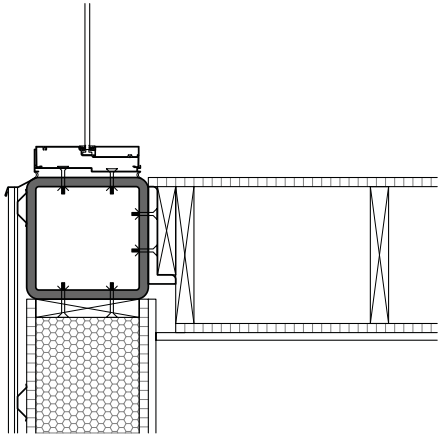
This span begins the mixture of the other structural system, the prefabricated steel frame. The frame is built in a modular method using universal joints for ease of construction. By using a system of HSS series steel, angles, and expansion bolts, one is able to create a versatile frame that allows for wall and floor panels to be inset with ease.

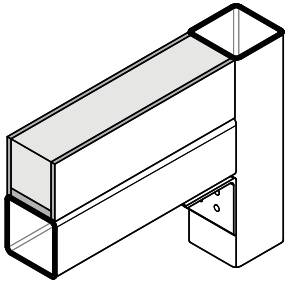


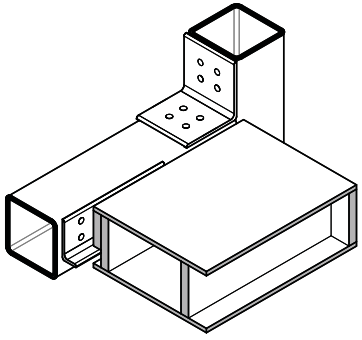
The framing system is the main design element in the building and is thus highlighted to showcase the fabrication techniques. Within this steel skeleton the rest of the building gets place and bolted quickly lowering the amount of time spent on the main construction. You can attach walls, curtain walls, and floor/roof panels to this frame.

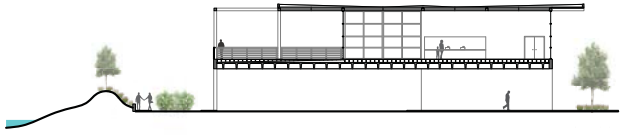


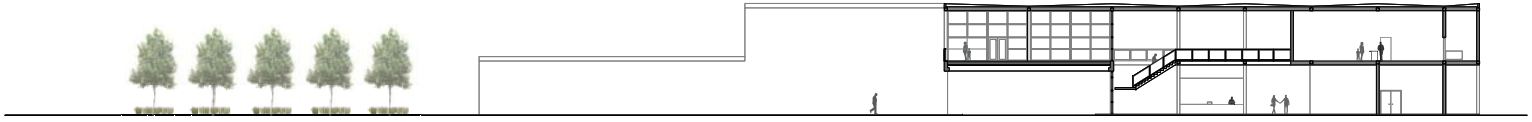






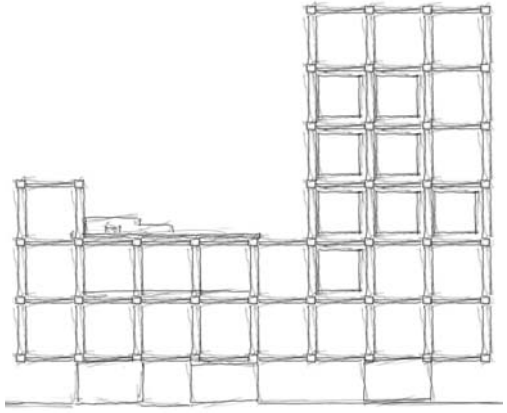


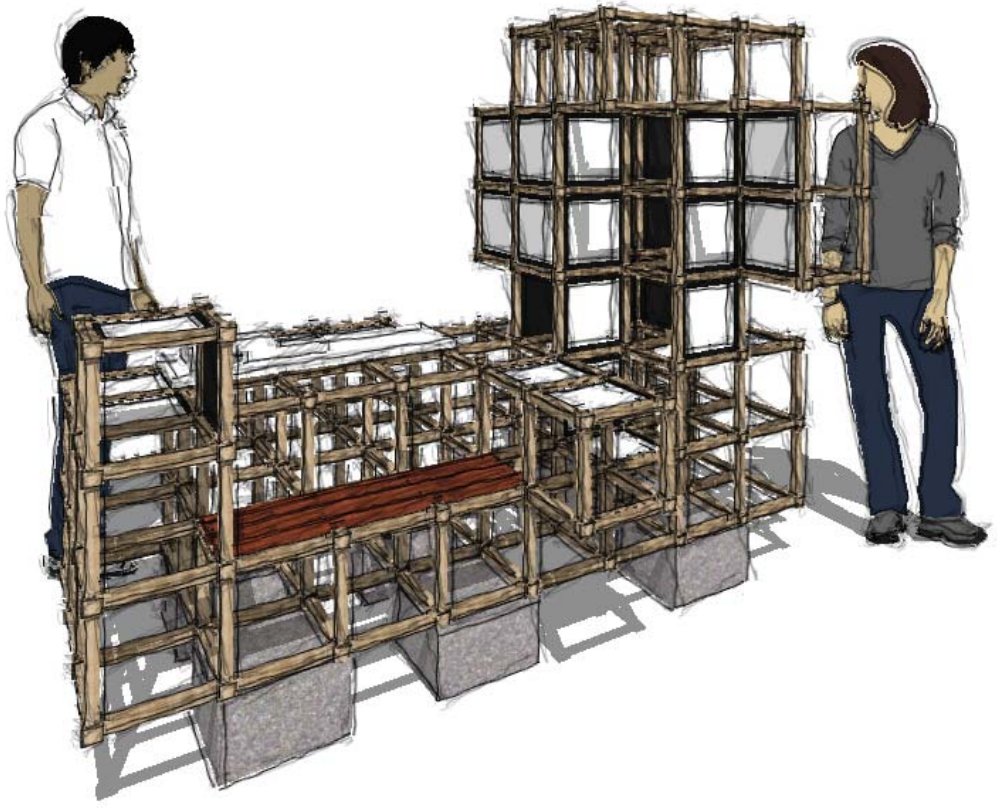


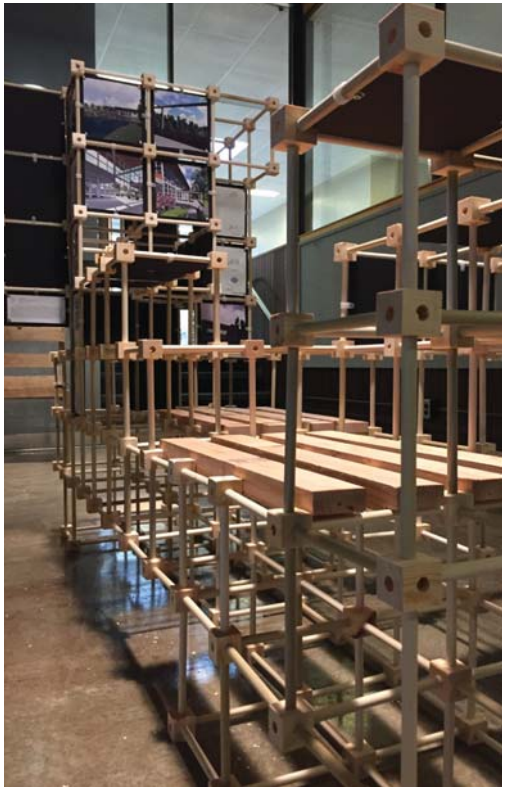


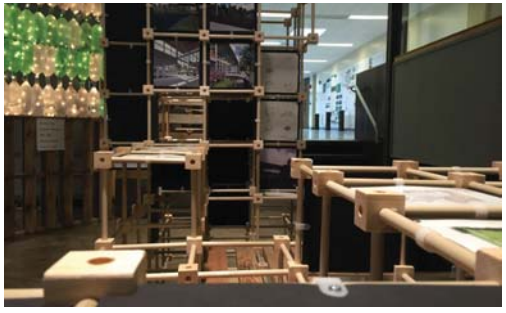
Final Exhibition

To display my final collection of design work, I used the same system as my previous exhibit. This time I decided to build down to the floor, and to build out to create a more extensive exhibit. By spreading off in one direction, I allowed myself to create a more interesting form, and make the exhibit more interactive by including a bench element. This new addition is to show the possibilities of my system. It can be used to create shelfs, art displays, or even become furniture.









The final piece had a few adjustments to the design. Concrete footings were scrapped, and I just dropped the whole frame to sit on the floor. This design choice made it easier to assemble and to move. I also brought the piece out farther to create two spots to sit. This made the exhibit approachable from both sides and encouraged people to sit and stay at my piece longer. One thing I noticed while the work was on display, was that people took the design and tried to make it their own. For instance, someone took the bench pieces and created armrests for the seats. This was possible due to the modular design of all the pieces. Seeing people take a system I created and using it as their own really intrigued me. This is a concept I want to delve into more deeply as I continue my studies and design career.