

ABSTRACT

Title of Document: NATURE, CULTURE, CRAFT: Re-thinking the National Park Visitor Experience

Michele L. Rubenstein, Master of Architecture, 2012

Directed By: Associate Professor Ronit Eisenbach, Architecture

This thesis explores the role that architecture might play in the experience of wilderness. This case study focuses specifically on how architecture in the National Parks serves as a threshold to nature.

The National Park building tradition began in the 19th century with the grand lodges of the west sponsored by the railroad. With the advent of the automobile, the visitor center typology was developed and the architecture shifted to focus on personal visitor needs.

This project attempts to demonstrate how the architecture of an Interpretive Center can provide a destination and launching point into the National Parks. By combining ideas of a “traditional” visitor center with a science and research component, the program can become both educational and participatory.

This thesis proposes a design in Apgar Village in Glacier National Park. The design reaches beyond the confines of the Interpretive Center complex to create connections throughout the landscape helping to strengthen Apgar Village as a place.

NATURE, CULTURE, CRAFT:
RE-THINKING THE NATIONAL PARK VISITOR EXPERIENCE

By

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University of Maryland, College Park, in partial fulfillment
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Dedication

To the Montana moments — past, present, and future



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Chapter 1: Wilderness in American Psyche

The National Park is the physical manifestation of a uniquely American idea – the preservation of large tracts of land for “the benefit and enjoyment of the people”. Today, the nation, which grew up and out of the wilderness, surrounds the Parks making them ecological islands within civilization. The role of architecture in the Parks is to act as a gateway and threshold from civilization to the remaining wilderness. The denser and more expansive civilization becomes, the more and more wilderness and the National Parks should be appreciated and sought after both as physical and spiritual resources.

The notion of wilderness provokes an emotional tone. “On the one hand it is hospitable, alien, mysterious, and threatening; on the other, beautiful, friendly, and capable of elevating and delighting the beholder.”¹ Throughout American history, notions of wilderness have shifted as American culture has evolved from a pioneering nation to a superpower. In western thought, wilderness was, at the time of the frontier, a space to be conquered and today, a place to be preserved.

It is useful to this discussion to consider wilderness as an area “where man himself is a visitor who does not remain.” For some, the definition of wilderness might also include a quality in which the visitor would assign a specific feeling to a place whether that may be fear, delight, or a combination.² The experience of

¹ Nash, Roderick. *Wilderness and the American Mind*. New Haven: Yale UP, 1967. Print, In)

² Ibid. In.

wilderness can evoke the condition of the sublime, inducing a kind of spiritual quality or awe.

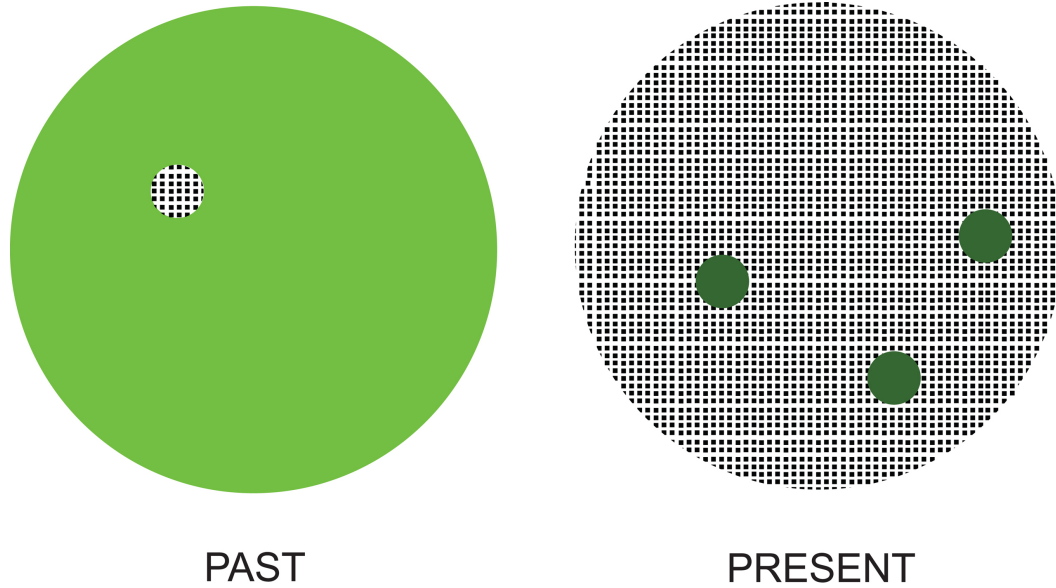


Figure 1: Wilderness: Then and Now. This diagram illustrates the condition in which civilization used to exist surrounded by wilderness. Today the reverse is true: wilderness exists surrounded by civilization. (Diagram by Michele Rubenstein, Idea of Peter Noonan)

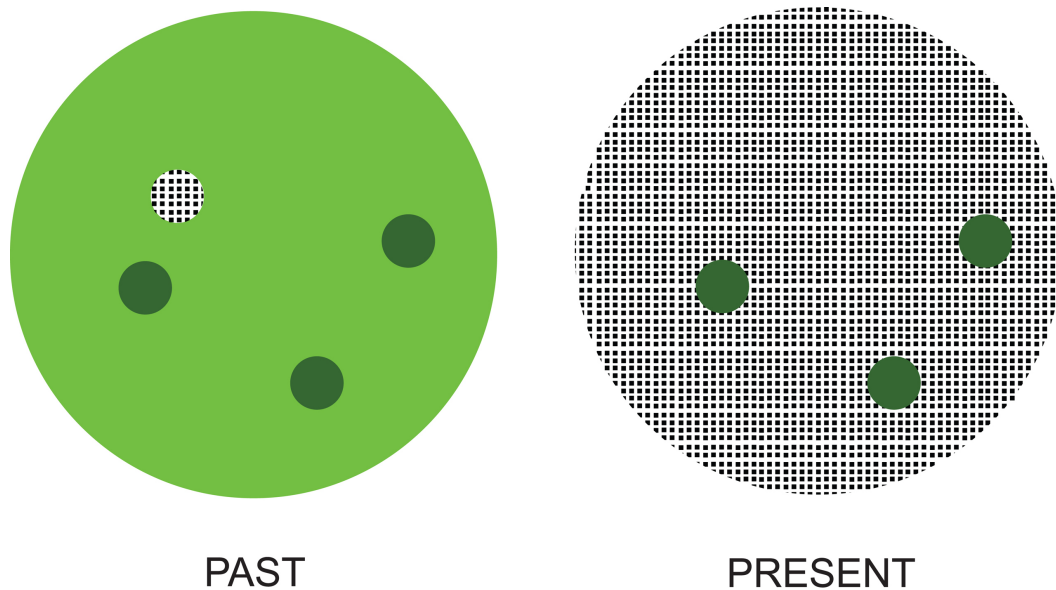


Figure 2: National Parks: Then and Now. This diagram illustrates the condition in which civilization was at the onset of the National Park Service. At the time, preservation of the Parks was a forward thinking idea and the land was set aside because of some special characteristic. Today, American's value these sublime wilderness preserves that are surrounded by civilization. (Diagram by Michele Rubenstein, Idea of Peter Noonan and Ronit Eisenbach)

Brief History of American Wilderness

Early European Americans saw the wilderness as potential civilization that was in contrast to the indigenous population who saw wilderness as survival. There was a sense of pride in the pioneering spirit that was aimed at conquering the unknown and creating a well-patterned society. It was not until the Enlightenment that an appreciation for the sublime qualities of nature began. European elevation of the picturesque emphasized the beauty of a natural scene and the unplanned qualities of wilderness.

America's greatest asset was the wilderness because the amount of untouched land was unmatched in Europe. The wilderness provided sublime images of natural landscape that helped establish a sense of nationalism and projected a kind of holiness.

In the early 19th century, the medium of painting and the Hudson River School idealized the great beauty of American wilderness and represented the shift of man's idea of our relationship with nature. The paintings initially depict man within the wilderness and then shift to representing the great awe of God's creation alone. Later the paintings reveal the intersection of civilization and nature. This blend of wilderness and civilization was viewed by Thomas Cole and Henry David Thoreau as the optimum American landscape condition.



Figure 3: Thomas Cole - View from Mount Holyoke, Northampton, Massachusetts, after a Thunderstorm - The Oxbow (1836) (Image source: http://en.wikipedia.org/wiki/The_Oxbow)

The romantic qualities of the picturesque are manifested in pastoral American landscapes where man had a hand in crafting a natural place. Frederick Law Olmsted was the master of constructing these picturesque landscapes. He also advocated for the importance of wilderness. Olmsted believed in the benefits of the personal experience of wilderness. For Olmsted, wilderness exists as a spectrum where “the power of scenery to affect men is, in a large way, proportionate to the degree of their civilization and the degree in which their taste has been cultivated.” (Wilderness in American mind 106)



Figure 4: Wilderness Spectrum - history, experience, scale

(Image Sources:

http://upload.wikimedia.org/wikipedia/commons/9/9e/Asher_Durand_Kindred_Spirits.jpg,

<http://timrohrer.com/blog/img/Wilderness.jpg>,

http://www.kevinhugo.co.uk/images/Stourhead_A2969.jpg,

<http://www.planning.org/greatplaces/neighborhoods/2010/gallery02/image04.jpg>,

http://4.bp.blogspot.com/_v88-

bCtro_c/SpUdAaLX34I/AAAAAAAAABiY/_DL63o6358c/s400/IMG_6800.JPG,

http://1.bp.blogspot.com/_Ymx9e66vrGc/SoToGjvEMGI/AAAAAAAAAKtM/jrBmB7n7Lis/s400/splice1-s.jpg)

As more and more people moved west, land was cleared at a large rate. In an attempt to preserve natural land and prevent it from becoming private property, the preservation movement began in California in 1865 with Yosemite State Park. In the same year, wilderness preservation continued in the Adirondack Mountains and was followed by Yellowstone in 1872. Yellowstone was the first large tract of land (two million acres) to be declared a National Park.

As frontier spirit started to die down, Americans began to see wilderness areas as a vacation destination. Wilderness became valued as a sanctuary and place for contemplation and improved psychological health, a place where stress is removed.

Today people continue to visit the National Parks and the wilderness they preserve to escape civilization. The Parks have become a haven for recreation, education, and self-renewal. They reflect our national heritage and give visitors a sense of their place in the American story by exposing people to the preserved wilderness condition of the past.

Preservation of Wilderness in the National Parks

The national park development began as a public/private relationship between the federal government and railroad companies. The government managed the land and the railroad companies provided access, amenities such as lodging, and publicity.

In 1872, Yellowstone Park was the first tract of land to be set aside. Initial motivation for the preservation of land was based on profit. There was a desire to protect both the known and undiscovered wonders of Yellowstone. A renewed appreciation of wilderness came from advocates like Henri David Thoreau, John Muir, and Frederick Law Olmsted. “Thoreau defended wilderness as a reservoir of intellectual nourishment for civilized men.”³

Olmsted believed that everyone could benefit from wilderness. “The enjoyment of scenery employs the mind without fatigue and yet exercises it; tranquilizes it and yet enlivens it; and thus, through the influence of the mind over the body, gives the effect of refreshing rest and reinvigoration to the whole system.”⁴

By 1916, for shifting reasons of profit and poetic scenery, fourteen National Parks were set aside by Woodrow Wilson when he created the National Park Service. This new federal bureau clarified the parks purpose and government’s role. The National Park Service states that the “purpose (of the National Parks) is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”⁵

³ Ibid. 102.

⁴ Ibid. 106.

⁵ *National Parks: Shaping the System*. Washington, DC: Division of Publications

While most of the country was suffering from the Great Depression, the National Parks were receiving a facelift, and the system continued to grow. To boost the economy and provide work during this difficult time, President Franklin D. Roosevelt instituted a series of projects to be undertaken by the Civilian Conservation Corps (CCC). The CCC created work for laborers and a wide range of professions including engineers, artists, architects, and archeologists. They built many of the roads within the National Parks marking a shift from railroad to vehicular transportation within the parks. The CCC created the experience that is associate with National Parks today—the ability to access wilderness via car.

The idea of leaving the Parks “unimpaired for the enjoyment of future generations” (Shaping the System 18) has allowed the parks to remain become islands. Current research and new understandings of issues like global warming challenge the Park’s boundaries. Today it is evident that ecosystems in National Parks are affected by the actions of man outside of the physical park boundaries. In order to preserve these highlights of American wilderness today, the National Park Service must think beyond their boundaries and inspire people to think about the consequences of their actions.

Current State of National Parks

The National Park system was created for “the enjoyment of the people”⁶ and in 2011, the Parks experienced 278,939,216 recreation visits. Statistics show that one third of American adults have visited a national park in the last two years and that the

National Park Service, 1985. Print, 18.

⁶ Ibid. 18.

parks receive a 95% approval rating from visitors. A major focus of park staff has always been on providing a safe visitor experience for both man and nature. This, however, has led to adverse effects on wilderness. For example, until research revealed the importance of forest fires to the natural cycle of particular species like the Lodgepole Pine, the National Park Service tried to limit forest fires for the safety of the visitor.

Accidental discoveries about nature and the effect of man's actions on natural cycles as a result of managing visitor safety helped bring about a realization of how little we know about man's influence. For this reason there is a growing fear that it may be impossible to preserve the parks in their natural state for future generations.

As a result, the National Park Service is beginning to broaden their focus from recreation and spiritual enjoyment to scientific research, community outreach, and sustainability action. Park land is now recognized as a vast resource that must be considered a part of a greater connected ecological and educational system.

In 2001, the National Park Service reexamined the role of the National Parks in the 21st century and focused attention on science in the parks. They instituted the Resource Challenge to help motivate parks to identify themselves as leaders in environmental research. The goal is to make public/private connections that help create a collaborative research environment. The first task was to catalogue wildlife, including flora and fauna, and extend this information to scientists to help track the condition of the environment.

Scientific research was recognized as a missed yet critical opportunity to the Parks' mission. To address this concern, the National Park Service published a report

titled “National Park Service Science in the 21st Century: Recommendations Concerning Future Direction for Science and Scientific Resource Management in the National Parks”. The premise of the report is “that public enjoyment and protection of the natural integrity of the park are far from being mutually exclusive; rather, they are mutually dependent.”⁷

The Nature Tourist

Visitor access shapes the experience of the National Parks. Historically, the park was only accessible via rail. This gave railroad companies the opportunity for great profit and they consequently worked with the government to establish a program of lodging and publicity. The nature tourist during this era was seeking an experience of the West that provided luxury amenities and promoted leisure.

⁷ United States. National Park System Advisory Board. Department of the Interior. *National Park Service Science in the 21st Century: A National Parks Science Committee Report to the National Park System Advisory Board*. By Sylvia A. Earle. Washington, DC: National Park System Advisory Board, U.S. Dept. of the Interior, 2009. Print.

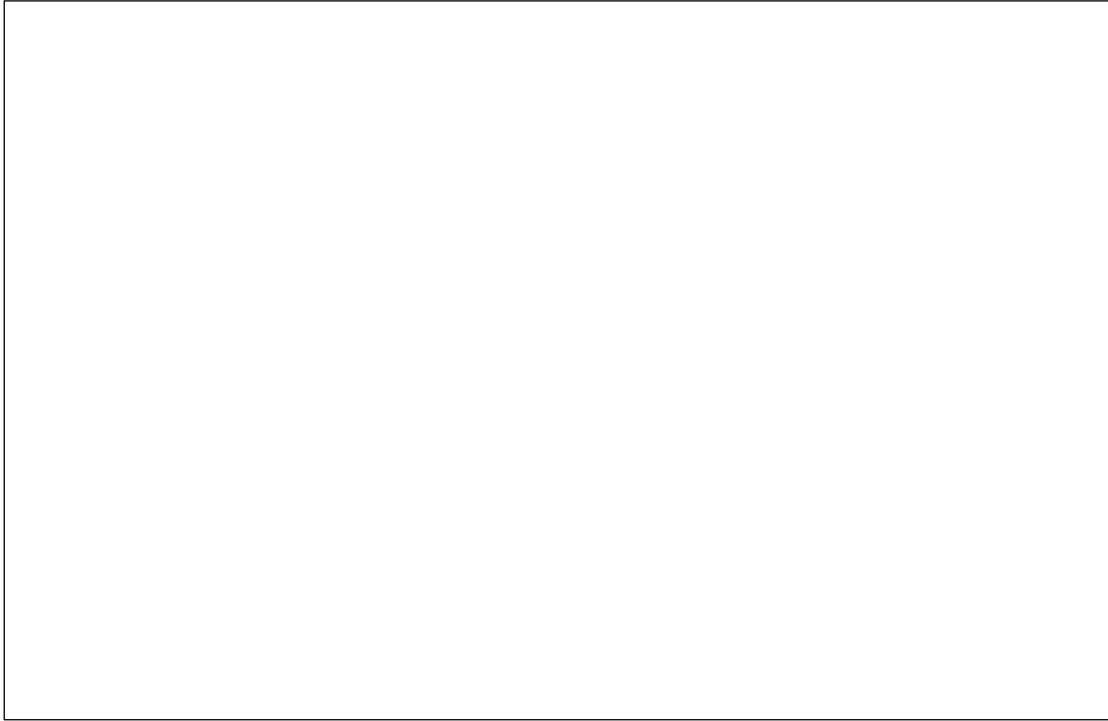


Figure 5: Old Faithful Inn at Yellowstone National Park (Source: <http://thenationalparksgallery.com>)

The “Old Faithful Inn” was the first building of this sort. It was crafted by Robert Reamer, an architect hired by the railroad. Reamer defined the architectural style of the parks with rusticity and fantasy.⁸ As the railroad expanded west, he continued to develop lodges associated with parks like Glacier National Park and Yellowstone National Park. He created the iconic architectural images associated with the National Parks today.

A transportation shift which occurred around the mid-20th century from railroad to car changed the way visitors accessed and experienced the Parks.⁹ The railroad generally crossed along the edge of a park and stopped in a small village

⁸ Macy, Christine, and Sarah Bonnemaïson. *Architecture and Nature: Creating the American Landscape*. London: Routledge, 2003. Print, 82.

⁹ Ibid.

allowing access to lodging. Visitors traveled through the parks on horseback and in stagecoaches. With the advent of the automobile and the CCC projects, roads were constructed through the parks and visitors could now travel around at their own convenience. With expanded access came the necessity for visitor service amenities to be spread throughout the park.

The railroad companies choreographed the visitor experience controlling travel, arrival, and lodging. The car introduced a new challenge on managing the park experience as it gave the visitor greater freedom. Access via car also influenced Parks' architecture in the form of entrance gates, visitor centers, and rest stops.

In the 1950's the National Parks were suffering from post-war effects. The Parks had been poorly maintained and the numbers of visitors were increasing. The Mission 66 program was established as an "effort at the Park Service to reinvent the agency, and the national park system, for the postwar world."¹⁰ A goal of Mission 66 was to build 109 visitor center facilities in the ten year period prior to the golden anniversary of the parks in 1966. This was the first introduction of a facility that would attempt to combine visitor needs and exhibit spaces for park education. The visitor center was considered as an ensemble where the Park Service took care to design the parking and exterior spaces along with the interiors. "National park visitor centers symbolized new attitudes towards resource conservation, visitor responsibility, and Park Service stewardship."¹¹ This program also marked the end of

¹⁰ Allaback, Sarah. *Mission 66 Visitor Centers: The History of a Building Type*. Washington, D.C.: National Park Service, 2000. Print, 22.

¹¹ Ibid. 34.

the picturesque Park Service Rustic style and the beginning of the simplistic Park Service Modern style.

Fifty years later, in 2012, attitudes about resource conservation, visitor responsibility, and Park Service stewardship are shifting again. There is a deeper understanding of the relationship of our actions to the natural environment and the parks as pockets of wilderness serve as a reminder of how majestic and fragile nature can be.

Also, today the visitor experience goes beyond physical access to the digital realm. Visitors come to the park much better informed about the place than they ever were in the past. Approaching these new challenges of visitor management with facilities that were established for a 1950's era relationship with nature is a problem that needs to be considered by the National Park Service.

Design Problem

Problem: Railroad access to National Parks allowed for directed and controlled access to wilderness. With the advent of the automobile, the Visitor Center typology was developed and access to the Parks was random and based on personal visitor needs/desires. The current visitor center typology reinforces car culture and utilization of wilderness as a commercial transitory experience. The architectural model provides a place to rest and then continue.

Solution: Use the Visitor Center as a destination and launching point into the National Parks and also a place to return to. Use architecture to reinforce ideas about the threshold and boundary to cause the visitor to think more broadly about their

actions. Consider program as educational and participatory. Consider the architectural form as regional, crafted, and invoking an emotional reaction.

The visitor center typology was implemented in the National Parks when the visitor relationship to the park was based on recreation and vehicular accessibility. The building program was centered on visitor management and included an information desk, restrooms, brochures, exhibits, and a bookstore. It was a welcoming that signified entrance to the park. The visitor center also provided information about where to go and what to see within the park. Their designs related to the federal government's larger vision to both standardize the look of the parks but also create architecture of the place.

The design of a visitor center is a wonderful opportunity to reconsider how to build in these islands of wilderness today. It has become clear that society's actions affect the environment and a building focusing only on visitor comfort misses an opportunity to educate and inspire about the critical relationship. Today, the visitor center has a chance to fulfill a much more dynamic role as part of the park experience. It has the potential to become a space that not only inspires rest and rejuvenation but also increase awareness of how our actions extend beyond the physical boundaries of civilization or ultimately can affect the wilderness condition.

The design of a visitor center might also engage the questions: What is the role of architecture in the experience of wilderness? How might places we build remind us of our scale and our relation to nature?

Architecture offers the National Park Service another vehicle to lead by example through physical expressions of sustainability and programmatic choices

related to education. As the National Park Service expands their vision to encompass scientific research within the parks, this opens up the opportunity to consider combining a visitor center component with these programs. This would give the tourist a chance to not only view the scenery but also become aware of the effect they have on the environment through the display of, or perhaps participation in, the research taking place within the park. “Visitor Center” would probably not be the appropriate name for such a place – perhaps “Interpretive Center” or “Discovery Center”.

The notion that a visitor center is a gateway is an important one. This type of building serves as a threshold to the park. It invites the visitor to consider their actions as they leave civilization and enter the sacred wilderness. The design of this procession from urbanity to wilderness is more than a single isolated building. The experience should be crafted to consider all elements, especially the landscape.

To root a building in its place, a visitor center should also consider regionalist design principles. The building should consider the local customs, craft, and available materials. It should address climactic and environmental concerns.

The building should help the visitor connect with the place and elicit an emotional reaction. It is possible to consider achieving this as a tectonic expression, a choreographed architectural experience, or a play with senses. The ability of architecture to become something more than a mere physical form that will contribute to a lasting impression on the visitor.

As the great lodges of the early years did, these new building should be crafted at multiple scales. A strategy for design is to emulate the natural environment

as a system of pieces working harmoniously towards a larger composition. All components of the building should be considered thoughtfully.

Ultimately, the goal of the building is not solely about the visitor experience. It is about leaving a physical mark that respects the goals of the national park to provide enjoyment for the people while simultaneously preserving the place in its natural state.

Chapter 2: The Site – Apgar Village in Glacier National Park

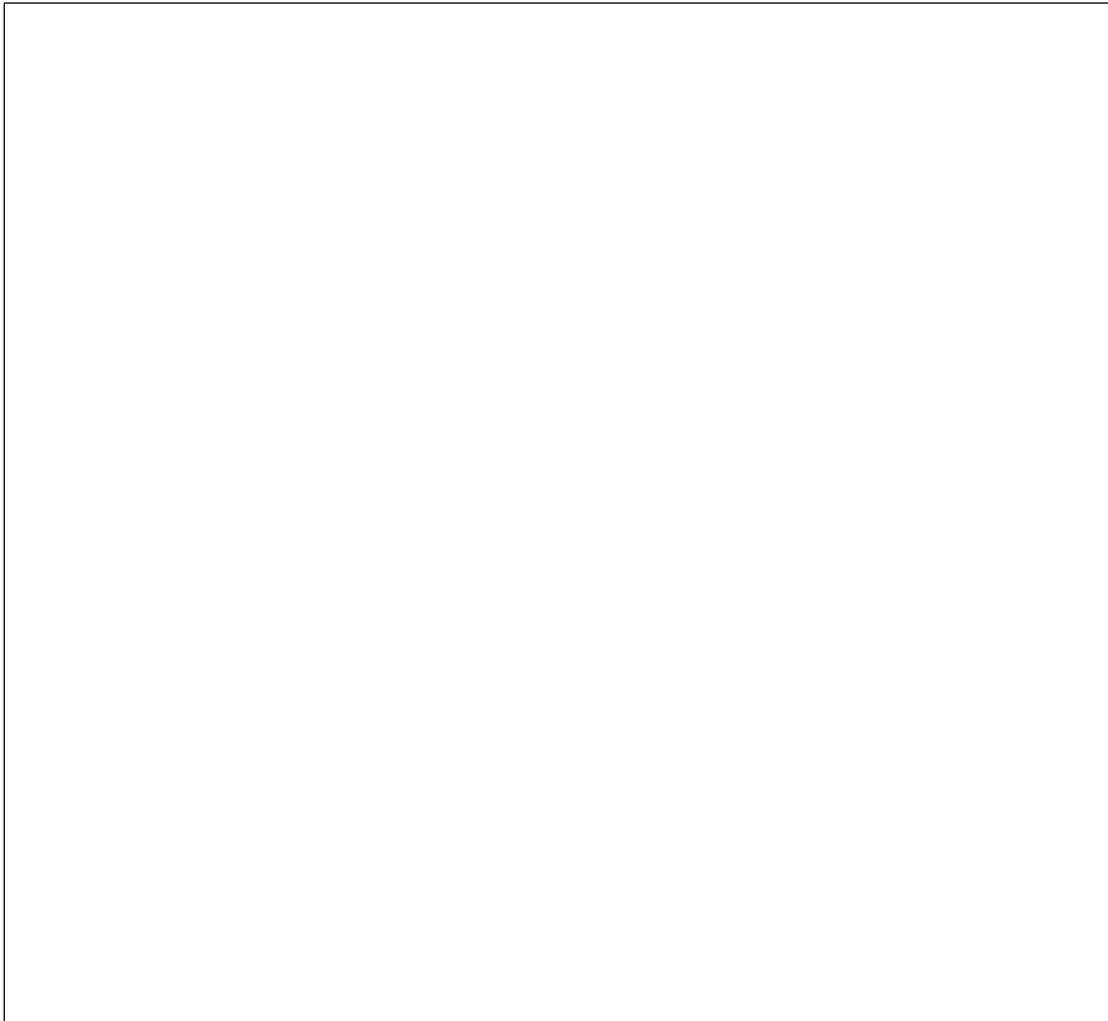


Figure 2.6: Location of Glacier National Park on a continental scale. (Map source: <http://petford.edublogs.org/2010/09/20/assignment-5-print-map/> Altered by: Michele Rubenstein)

Glacier National Park is located in the northwestern corner of Montana along the Canadian boarder. (Latitude $48^{\circ}41'47.72''N$ Longitude $113^{\circ}43'5.91''W$) In 2011, Glacier National Park was the tenth most visited National Park with a total of 1.85 million visitors. It is part of the Waterton-Glacier International Peace Park and the Crown of the Continent ecosystem. The Park is recognized as a Biosphere

Reserve and a UNESCO (United Nations Education, Scientific and Cultural Organization) designated World Heritage Site.

Glacier National Park exists at a triple divide where water flows to the Pacific, Atlantic, and Arctic Oceans. The Park encompasses 1,013,572.42 acres of preserved land along with 40 active glaciers. Going-to-the-Sun road carries visitors through the park, 52 miles across the Continental Divide and to Logan Pass capturing spectacular mountain views. There are 735 miles of hiking trails.

Due to the vast amount of open space and difficult terrain, much of Glacier has only been traveled on foot. This has allowed for the ecosystem to remain largely intact. The terrain boasts a variety of animals and plants with fauna ranging from grasslands to alpine vegetation. All native predators and most of their prey are still surviving in the wild including the endangered gray wolf, the threatened grizzly bear, and bald eagle.

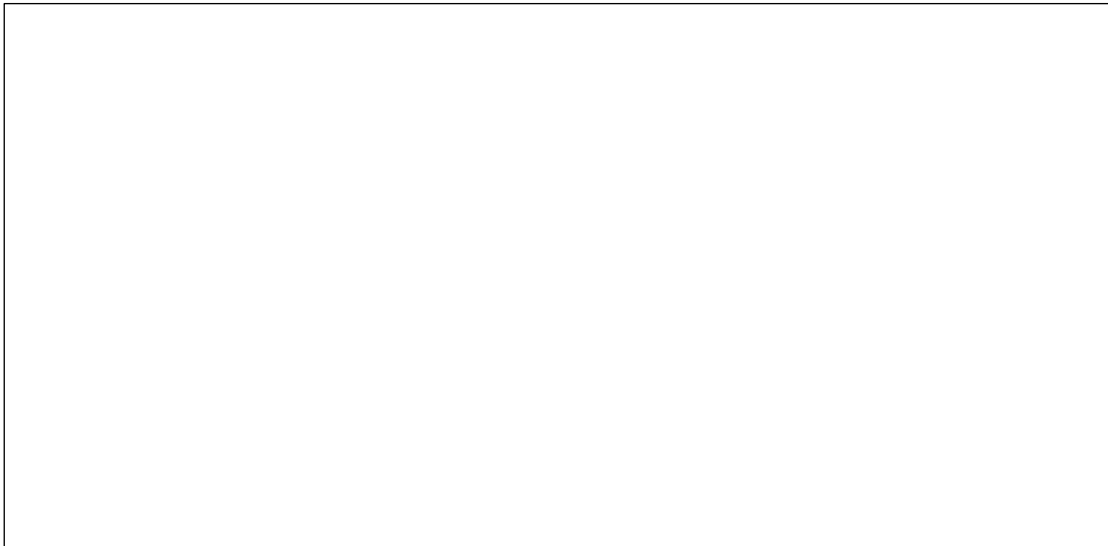


Figure 7: Climate Data for Glacier National Park (image source: www.gaisma.com)

The climate of Glacier National Park is characterized by diversity and extremes. Average yearly precipitation ranges from 23 inches in the lowlands to 100

inches in the mountains. The temperature can also shift dramatically. The all-time world record of temperature shift was recorded in 1916 when the temperature dropped 100 degrees in a 24-hour period within the Park. These extremes are caused and reinforced by the elevation that shifts from 3,000 to 10,000 feet above mean sea level (MSL).



Figure 8: Glacier National Park (Map source http://visitmt.com/national_parks/glacier/ altered by Michele Rubenstein)

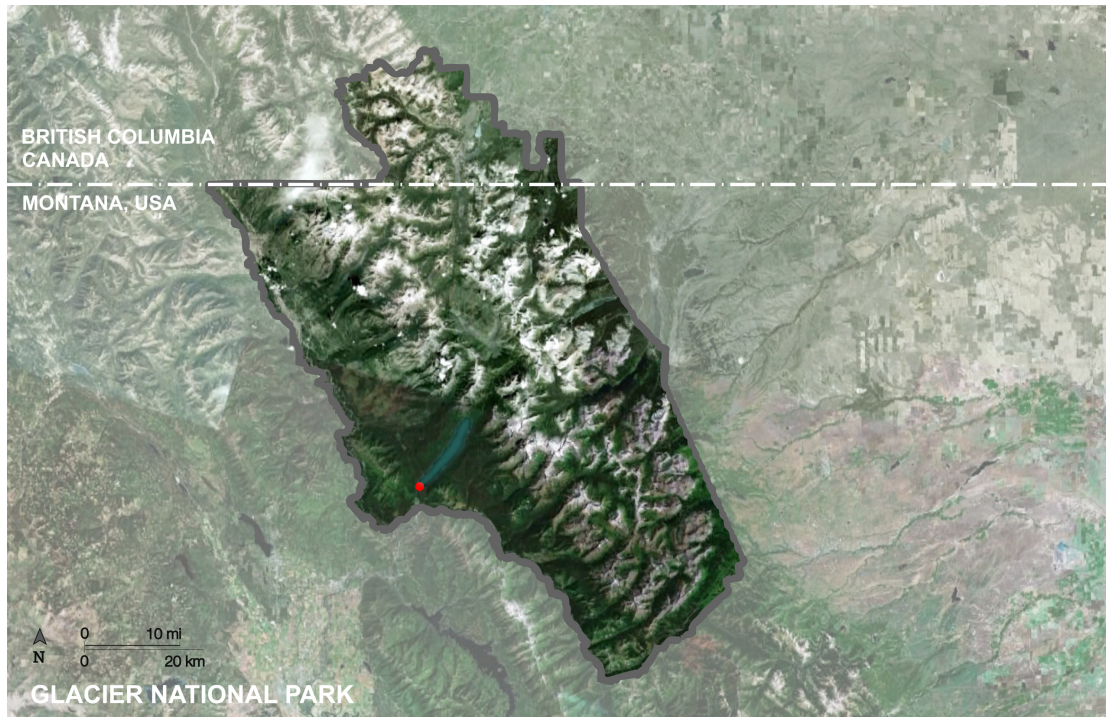


Figure 9: Glacier National Park (Image source: Google Earth underlay altered by Michele Rubenstein)

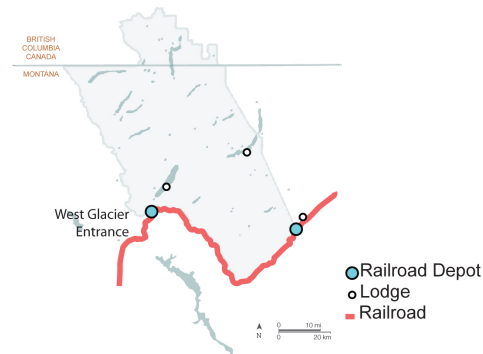
Brief History of Glacier National Park

Glacier National Park remained as a largely undeveloped wilderness because the rugged terrain prohibited settlers from crossing the continental divide. In the late 1800's, people became aware of the dramatic beauty of the place. At this time, George Grinnell, the publisher of *Field and Stream* magazine, and John J. Hill, builder of the Great Northern Railroad, began to advocate for the establishment of the park.

Hill was interested in building the Great Northern Railroad across Montana to Seattle. In 1883, the railroad was built over the mountains and along the southern boarder of what would become Glacier National Park. Louis Hill, John's son, continued the development of the park by building resort lodges as destinations for

railroad travelers. In 1910, President William Howard Taft signed the Glacier National Park Bill officially declaring this national park.

1916 - Railroad Access



1956 - Vehicular Access - Private



2012- Vehicular Access

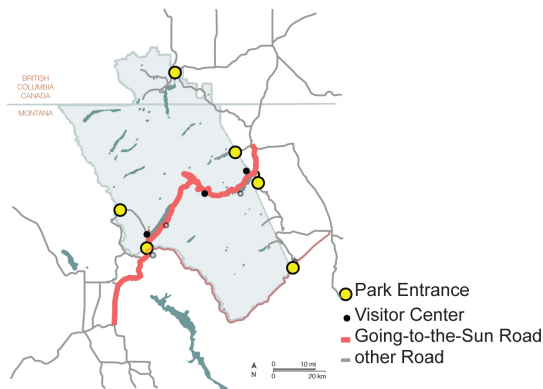


Figure 10: Diagram of Infrastructure Development in Glacier National Park (Glacier National Park map underlay source http://visitmt.com/national_parks/glacier/ altered by Michele Rubenstein)

Initially, the park was only accessible via the western entrance of West Glacier and the eastern entrance of East Glacier. Between 1918 and 1933, “Going-to-the-Sun Road” was constructed to serve as the connection between the two entrances. It was laid across and over the mountains. The road provided breathtaking and memorable views of lakes, meadows, waterfalls, and glaciers. It remains the quintessential park experience today.



Figure 11: Lake McDonald Lodge grand room (Source: <http://carnageandculture.blogspot.com>)

The park visitor of the 1900’s resided in a Grand Lodge or a backcountry Chalet. The Great Northern Railroad developed the architectural character of the park in the spirit of the “American Alps”. (Landmarks in the Landscape) Each lodge’s interior focused on a grand room and was designed to balance the scale of the large columns with carefully crafted railing and accessory details. Individual guest rooms were located on the perimeter of the building to capture the magnificent views. The goal of the lodge was to provide the visitor with modern amenities and a memorable stay as well as encourage more business for the railroads.

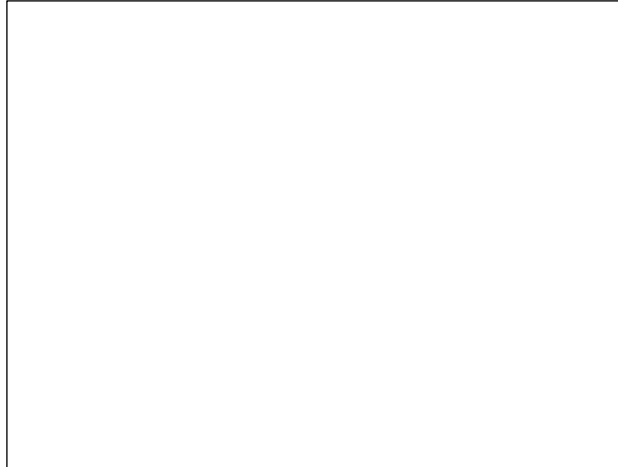


Figure 12: Logan Pass Mission 66 Visitor Center (Source: <http://crownroundtable.org>)

During the Mission 66 program, the Logan Pass and St Mary's Visitor Centers were constructed. They are Park Service Modern in style and simplistic architectural forms that sit in contrast to the majestic landscape without detracting from the views. Their ensemble includes a large parking lot, an approach that leads to restroom facilities accessed from the exterior, and additional outdoor terrace space that relates to and encourages access to the landscape beyond. Programmatically, they consist of administration spaces, exhibition space, and a bookstore at the interior.

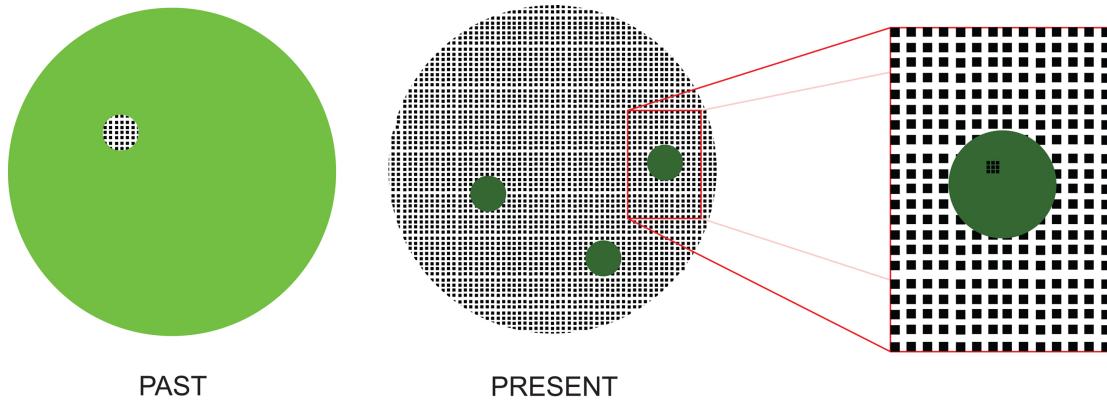
Introduction to the Apgar Area



Figure 13: Lake McDonald in Glacier National Park is 10 miles long and 1 mile wide. Apgar is highlighted with the red dot on the southern tip of the lake. (Image source: Google Earth altered by Michele Rubenstein)



Figure 14: Apgar in Glacier National Park. The red circle identifies Apgar Village, which is the site for this case study. (Image source: Google Earth altered by Michele Rubenstein)



PAST

PRESENT

Figure 15: Wilderness: Then and Now. Apgar represents the condition of development within a wilderness pocket.

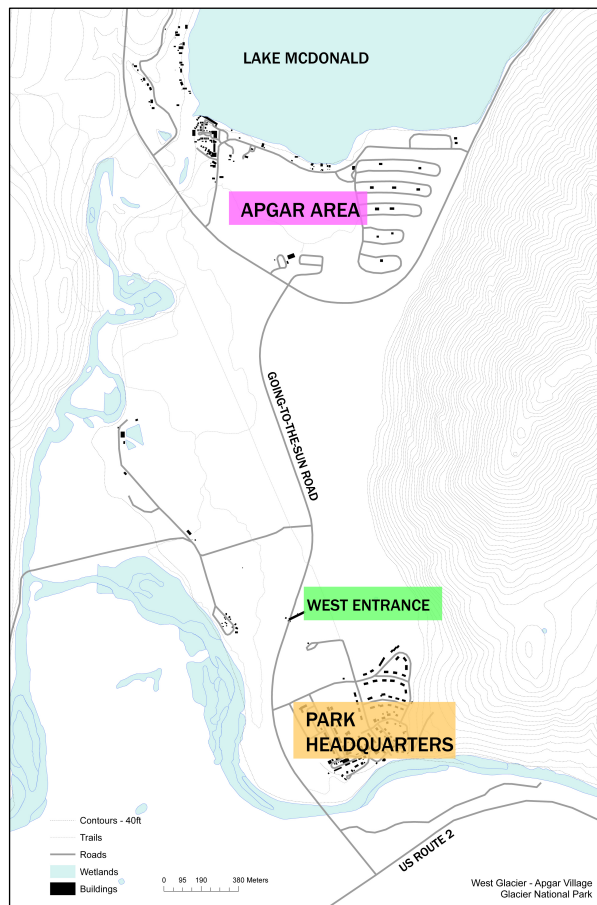


Figure 16: West Glacier - Apgar Area Map (Image source: USPS GIS Diagram by: Michele Rubenstein)

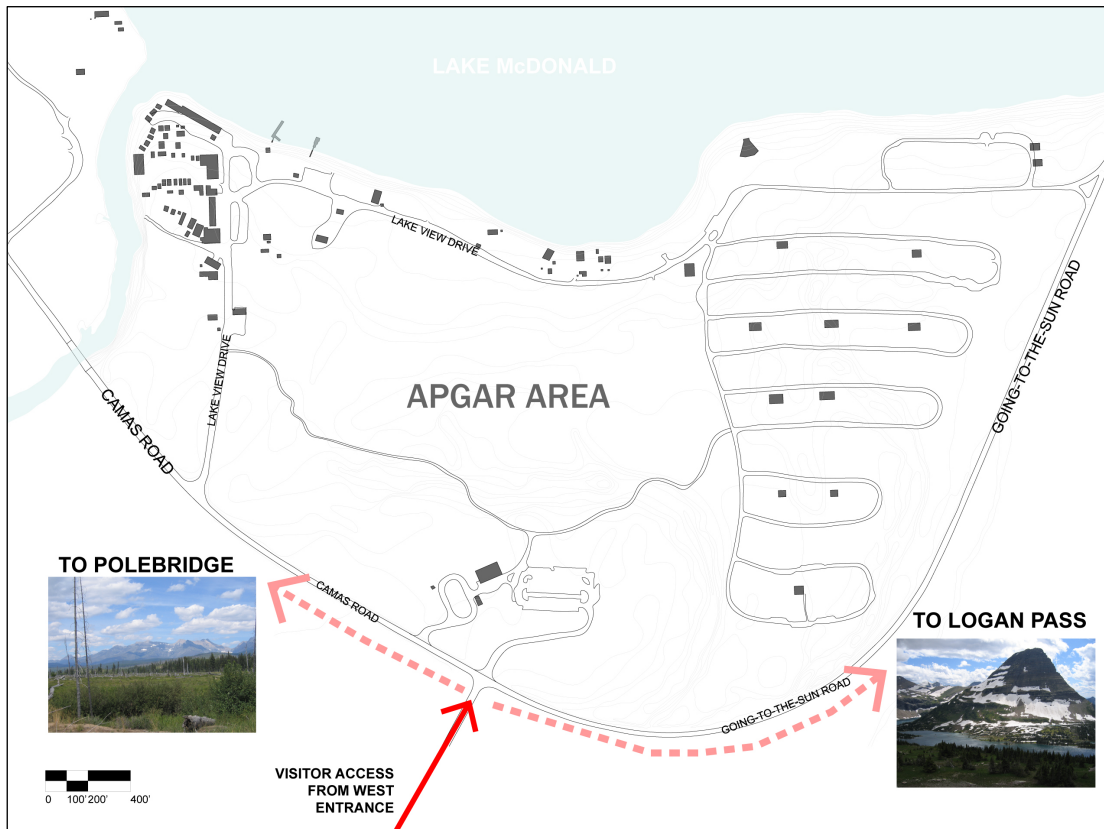


Figure 17: T-Intersection presents the visitor with a choice.

Visitors approach Apgar from the West Glacier Entrance. Going-to-the-Sun Road leads to a T-intersection where visitors are faced with a choice. The road toward the west leads in either the direction of Apgar Village and a small isolated town called Polebridge located about twenty-five miles northwest. The road to the east leads up the mountains to Logan Pass on Going-to-the-Sun Road.

In August 2011, 250,452 visitors entered through the West Entrance. Only 14,105 of those visitors traveled the direction and distance to Polebridge. This would indicate that the majority of people continue on Going-to-the-Sun Road to Logan Pass and through the park whereby they run the risk of not stopping in Apgar Village, the existing visitor center, or the southern tip of Lake McDonald.

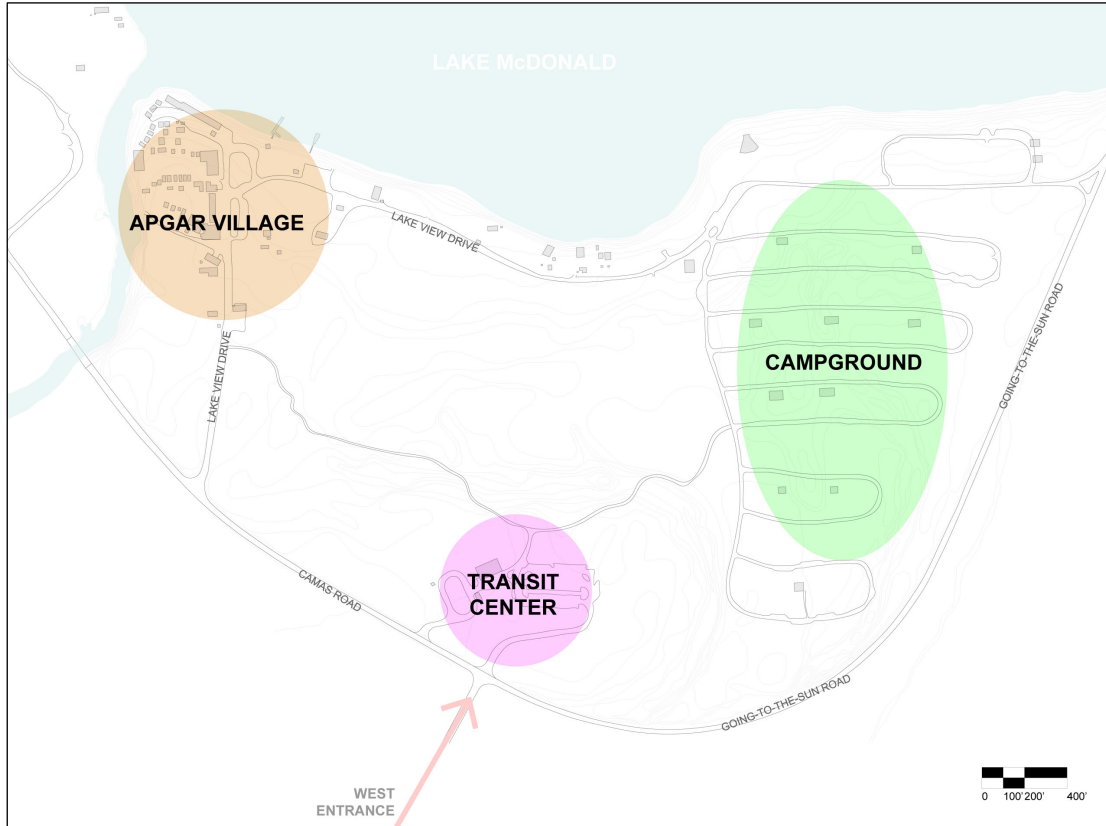


Figure 18: Area designation in Apgar

Apgar is comprised of three distinct areas: the Village, the Transit Center, and the Campground. The Village is home to the existing visitor center, a series of lodging options, a general store, a post office, the Discovery Cabin, and boat docks.

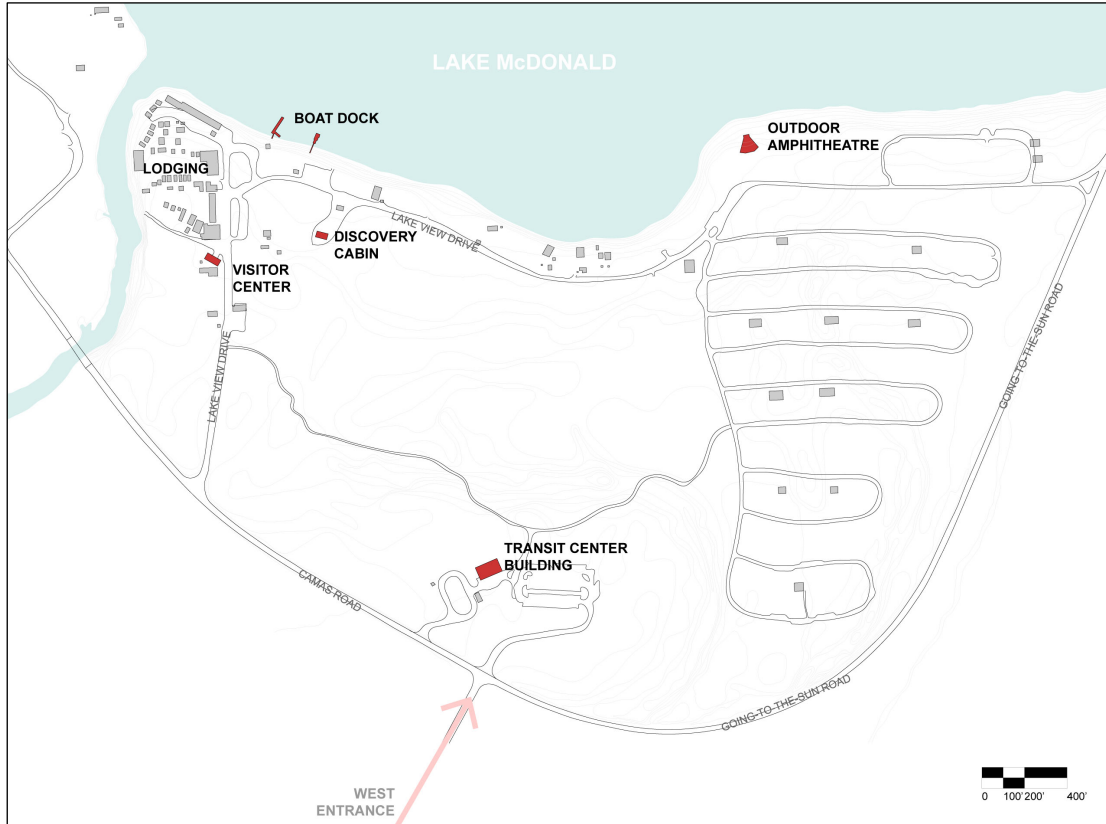


Figure 19: Notable Buildings in Apgar

The existing visitor center is an inadequately renovated Mission 66 house in desperate need of upgrade. The Discovery Cabin is a place for children to explore a historic cabin and have hands-on experiences with natural materials such as animal fur.

The Campground has 194 sites along with restrooms but does not have shower facilities. The Campground area also has an outdoor amphitheatre space that is located at the water's edge.



Figure 20: Zones of activity in Apgar

The Park Service has designated Apgar as a Visitor Service Zone. This is a place for visitor activity where factors such as the impact of development on the environment have been considered. This is a more desirable location for development than a Rustic Backcountry Zone where a new building would be considered invasive in the wilderness. In addition, there are utilities such as water and electricity currently serving Apgar that are available for new facilities.

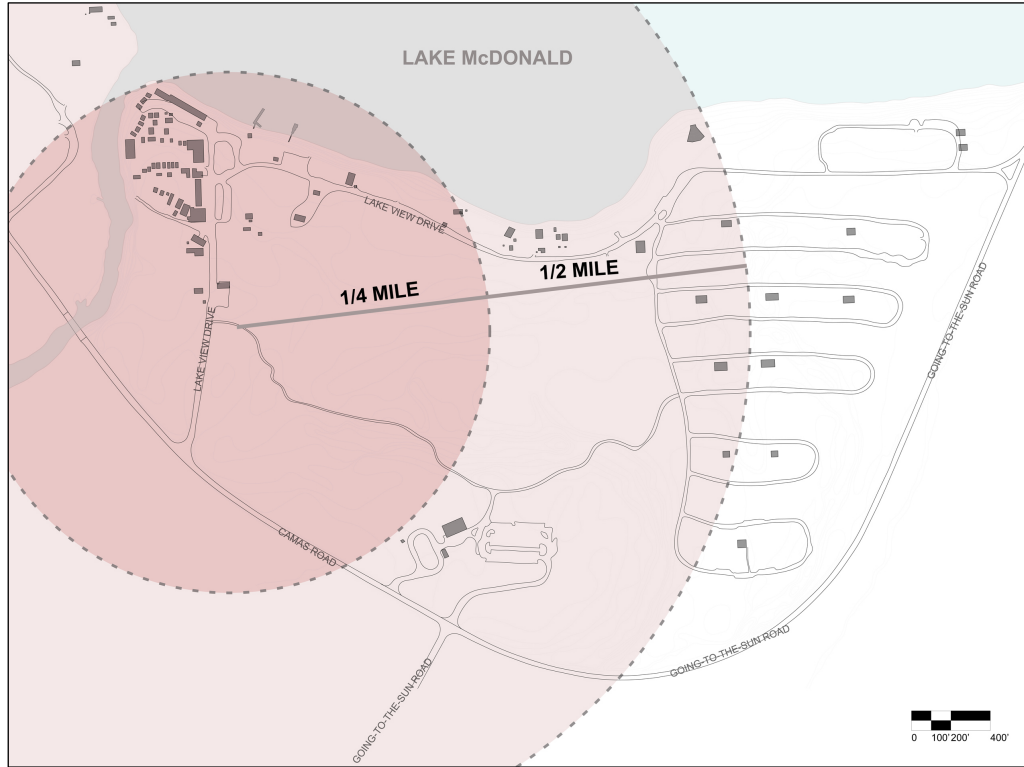


Figure 21: Walking Radius overlaid on Apgar

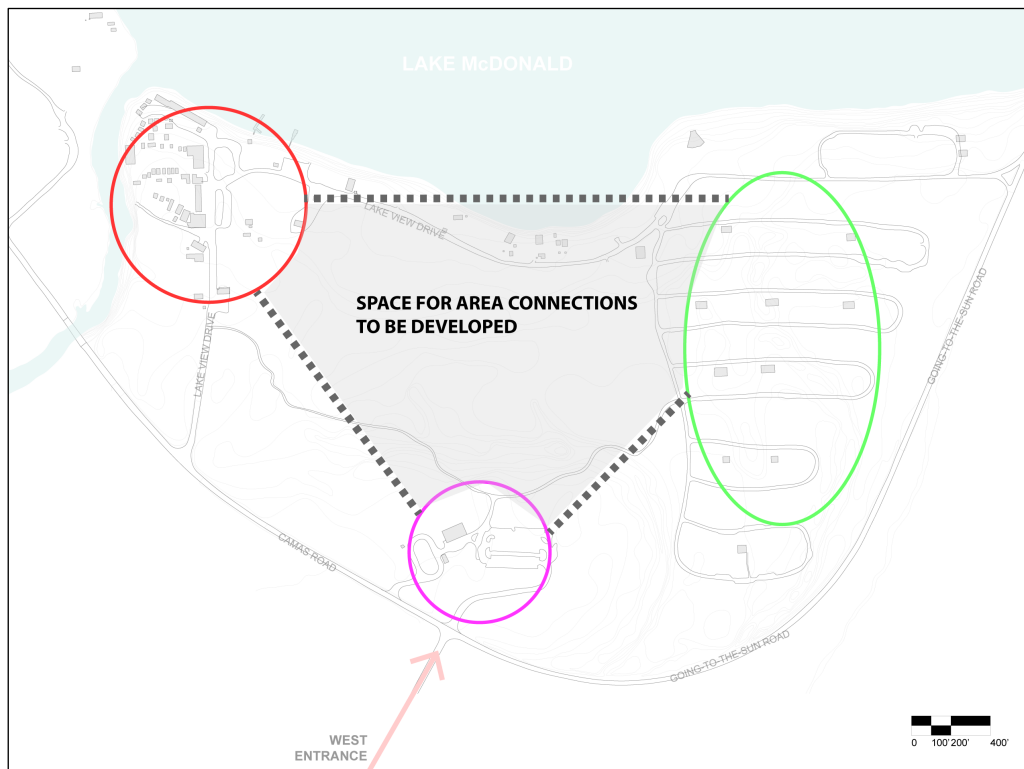


Figure 22: Space available to be developed and provide connections between designated areas

Although the proximity of developments in Apgar is walkable, there is not a strong connection between the three designated areas of Apgar. This could be because they are not interdependent. For example, the Transit Center attracts visitors away from the Visitor Center and therefore also away from Apgar Village. The space between the three areas could be developed in a way that forms supportive connections between the otherwise disparate elements.

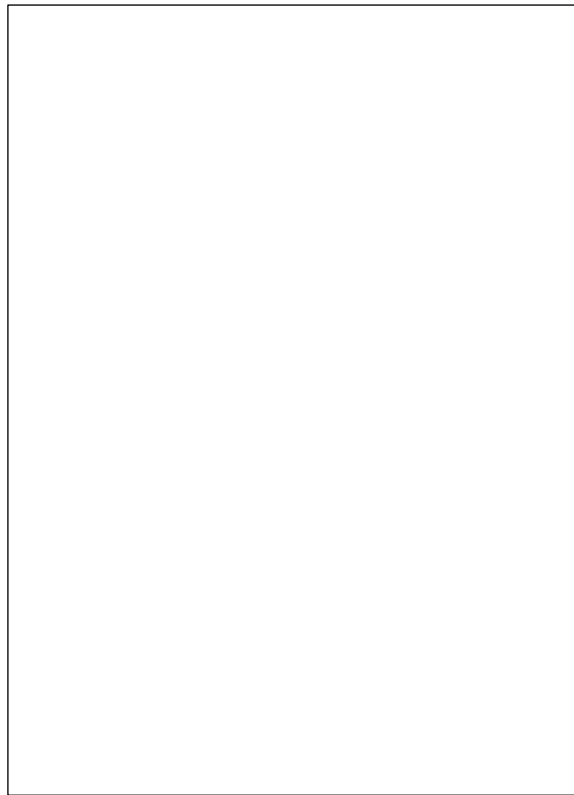


Figure 10: Preferred Location for Discover Center according to the Glacier National Park General Management Plan. (Source: Glacier National Park General Management Plan)

The development of the Apgar Area has been studied in the recent past prior to the construction of the Transit Center. In 1999, the General Management Plan for Glacier National Park published 20 years of research and planning regarding the location of a new Discovery Center. The site that was deemed the most viable was on

the West Side adjacent to Apgar Village. The development of this area, with this facility, could have provided a strong connection that enhanced the Apgar Area.

The primary goals of the Discovery Center according to the Plan would be to 1.) “connect visitors to the park and its resources, (2.) prepare visitors for an appropriate experience and (3.) provide the highest level of visitor service.”¹² The vision for the Center also includes being a “year-round facility that would offer information services, interpretive and educational programs, innovative exhibits, and environmental education space.”¹³

According to the General Management Plan, the current Visitor Center facility located in Apgar Village is “difficult to locate, lacks adequate parking, is too small to serve many more visitors, lacks adequate interpretive and museum exhibit space, and has limited facilities for school groups and their educational programs.”¹⁴ In addition, the General Management Plan points out that many visitors miss the existing visitor center and process through the park before receiving vital information about safety, education, and orientation. The next ranger-staffed facility that visitors would come in contact with is nearly halfway through the park at Logan Pass.

Since the General Management Plan has been published, the National Park Service decided not to proceed with the comprehensive design of a Discovery Center and built a Transit Center to solve the problems of accessibility. The newly built

¹² United States. National Park Service. Department of the Interior. *Glacier National Park, a Portion of Waterton-Glacier International Peace Park, Flathead and Glacier Counties, Montana General Management Plan*. [West Glacier, Mont.?]: U.S. Dept. of the Interior, National Park Service, 1999. Print, 76.

¹³ Ibid. 75.

¹⁴ Ibid. 75.

Transit Center was completed in 2009 and is located at the T-intersection of Going-to-the-Sun Road and Camas Creek Road. The primary goal of the facility is to alleviate traffic and provide a more environmentally friendly alternative to experiencing Going-to-the-Sun Road. The shuttle buses run in both directions and leave every 15 minutes carrying visitors to various stops throughout the park. Visitors are allowed to get on and off at their leisure.

This thesis will address the needs of the General Management Plan as it outlined the necessity of a Discovery Center facility that would “tell the park story” and “connect people to the park” at the West Side.¹⁵

Site Experience



Figure 23: View from waters edge in Apgar towards the Rocky Mountains. There are three mountain ranges that comprise Glacier National Park -- the Clark Range, Lewis Range, and Livingston Range with at about 150 named peaks over 8,000 feet. The highest peak in the Park is Mount Cleveland at el. 10,466 feet. (Image Source: National Park Service Webcam text added by Michele Rubenstein)

¹⁵ United States. National Park Service. Department of the Interior. *Glacier National Park, a Portion of Waterton-Glacier International Peace Park, Flathead and Glacier Counties, Montana General Management Plan*. [West Glacier, Mont.?]: U.S. Dept. of the Interior, National Park Service, 1999. Print.

The view from the shore of Apgar summarizes “what Glacier is all about...big glacially carved lakes, vast wild views of the high peaks along the Continental Divide, and the ever-changing forests that blanket much of the lower elevations.”¹⁶ The Apgar area allows the visitor a way of experiencing the vast sectional relationship of the park consisting of lowland forest, glacier carved lakes, and high peaks. It is majestic and awe-inspiring. This is one of the only places in the park where that experience is so clearly evident. The view and access to the water’s edge is what attracts visitors to Apgar.

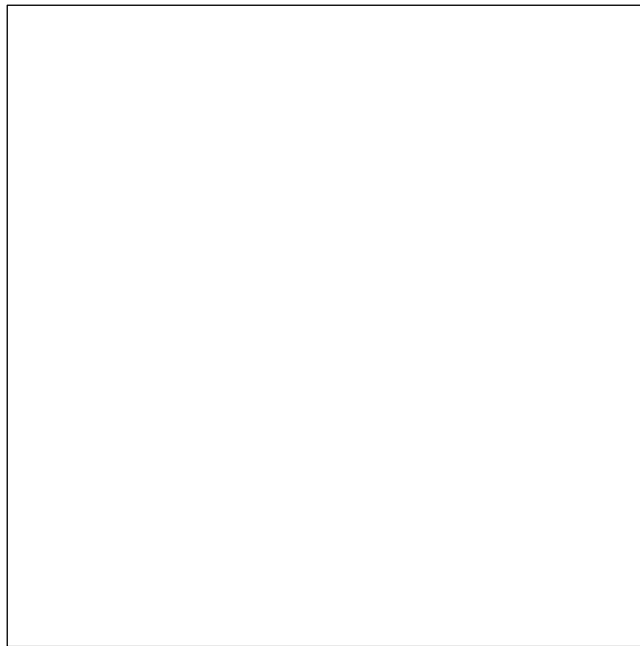


Figure 24: Sun Path Diagram for Glacier National Park. Today is represented as May 13, 2012. (Image source: www.gaisma.com)

¹⁶ Links. *National Parks Service*. National Parks Service, 15 May 2012. Web. 20 May 2012. <<http://www.nps.gov/glac/photosmultimedia/webcams.htm>>.

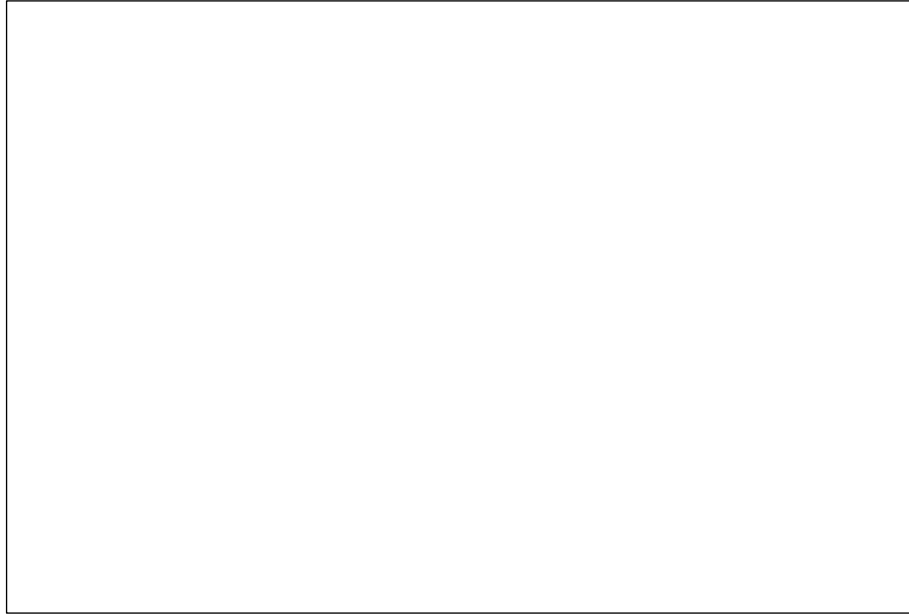


Figure 25: Daylight diagram (Image source: www.gaisma.com)

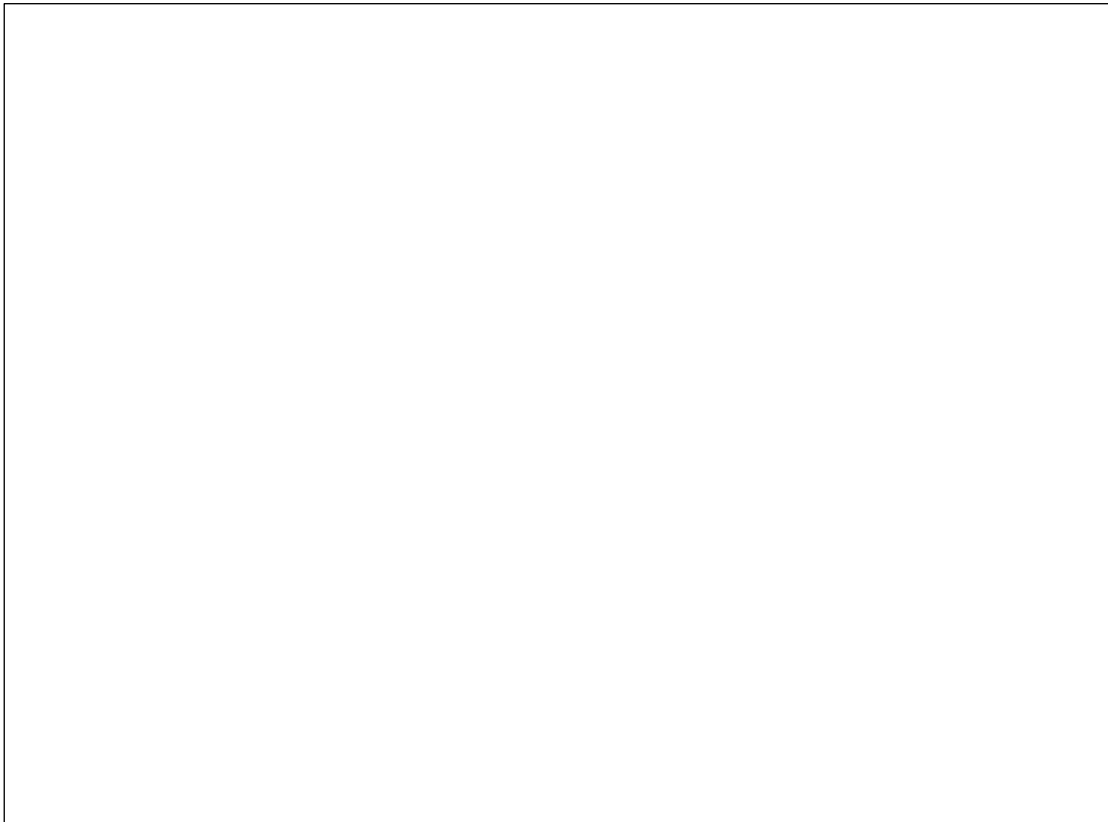


Figure 26: Sun path Diagram overlaid on Apgar

The sun path affects the quality of the view towards the lake. The amount and quality of daylight received at Apgar is illustrated in the sun path and daylight diagrams. During the summer months, the sunrise and sunset are visible to the east and west. Since the view is located at the southern edge of the lake, the visitor is not affected by glare of southern sun. At all times of day, the view is present.

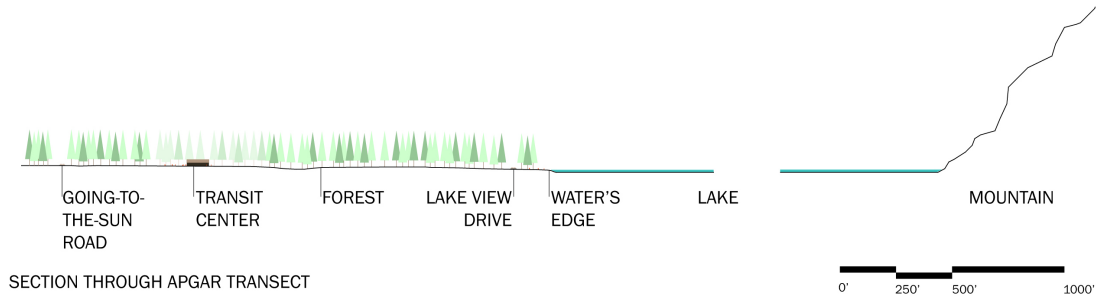


Figure 27: Section through Apgar Transect

The water’s edge experience is also an environmental transect that exists from the forest to the water’s edge, the lake, and then the mountains. Apgar is a fairly flat area of Glacier National Park. The land slopes gradually, through the forest, down to the water. The forest is made up of evergreens, which are mainly Lodgepole Pine trees.



Figure 28: Image of Apgar Campground and Lodgepole Pine Forest (Image source: <http://www.parkcamper.com/Glacier-National-Park/Glacier-National-Park-forest-Apgar-Campground.jpg>)

The Lodgepole Pine is a tall, thin tree that can create a dense forest. The height of the tree ranges between 130 to 160 feet. The species has adapted to fire. The trees develop in dense stands that self-thins, and the dead trees fall and feed forest fires. Fire then travels up the structure of the tree and jumps between trees at the crown. Fire is imperative to the life of the species because it is how the tree regenerates. The heat from the flames opens the cones and releases the seeds.



Figure 29: Lodgepole Pine forest regenerating after a fire in Yellowstone National Park in 1998. (Image Source: http://en.wikipedia.org/wiki/Lodgepole_Pine)

Spurred by fire, the Lodgepole Pine has a visible life cycle from birth to death and the rebirth. The dense forest tree trunks often continue to stand after a fire with a burned gray appearance. Symbolizing rebirth, a contrasting green growth begins at the ground and slowly climbs up around the gray trunks. What makes this cycle unique is that death is essential to rebirth.

Since the Lodgepole Pine is rigidly straight, it has been used historically in building construction. In Northwest Montana, forestry is a major industry. Of the twenty two million acres of forest in Montana, there is an average timber harvest of one million cubic meters. This is an annual value of \$750 million.

Construction methods in the area reflect this abundant forest industry. Building techniques that are prevalent include stick frame, timber frame, and log construction.

Construction in Northwest Montana must also consider climactic characteristics of the region. West Glacier is located at an elevation of 3154 feet. The ground snowload for this area is 99.8 psf (pounds per square foot). The structure and pitch of building roofs must carefully consider this weight.

Conclusions

By challenging the traditional sense of boundary, Glacier National Park makes strong connections in physical, political and ecological ways. A physical boundary line drawn on a map defines the Park, but ecological corridors extend beyond the man-made border. The park also bridges our nation's boundary by reaching across the border into Canada. The park joins together people of two nations and connects

across the continental divide and up and over the Rocky Mountains. This idea of a boundary being defined as a natural condition is strong at Glacier.

It is with these ideas of a strong relationship to the view, a play between boundary and connection, and the ability to experience the “transect” of the park that the architectural form takes inspiration.

Chapter 3: Program

To address the vision of the National Park Service to increase scientific awareness within the Parks, this thesis will combine the program of a visitor center with an education and research component to create an Interpretive Complex. The arrangement of roughly 30,000 square feet will also activate outdoor space that will be designed as areas of activity as well as repose. The outdoor spaces will also help facilitate sustainable teaching opportunities. Combining these two different programs allows for shared spaces and ultimately reduces the total built square footage. Ideally it will lead to visitor engagement with scientists and educators in new ways and vice-versa.

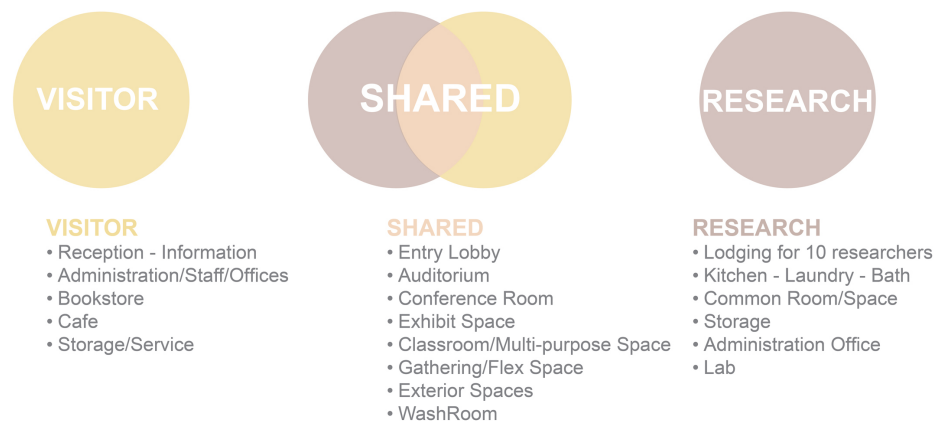
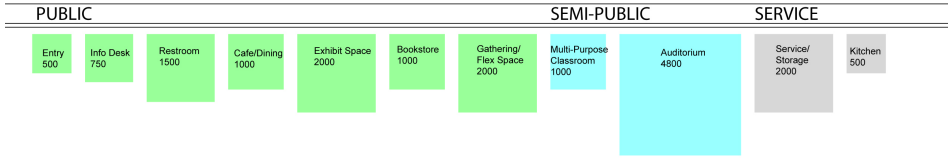


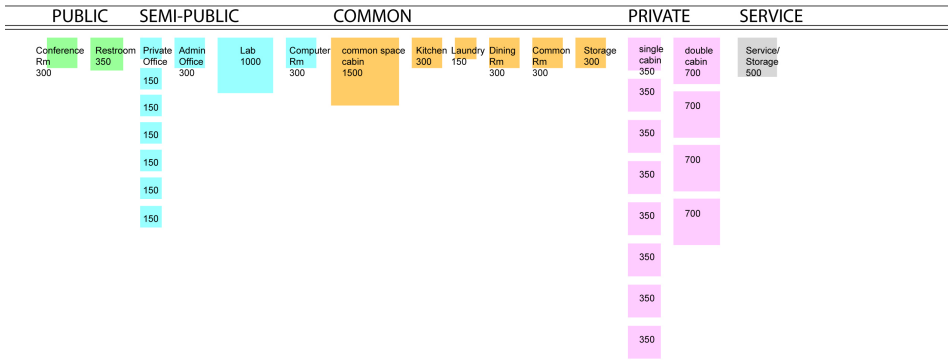
Figure 30: Program

PROGRAM PIECES

VISITOR PROGRAM

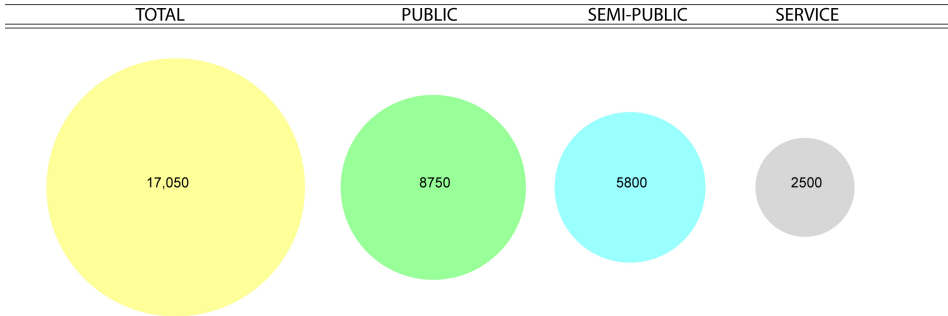


RESEARCH PROGRAM



PROGRAM TOTALS

VISITOR PROGRAM



RESEARCH PROGRAM

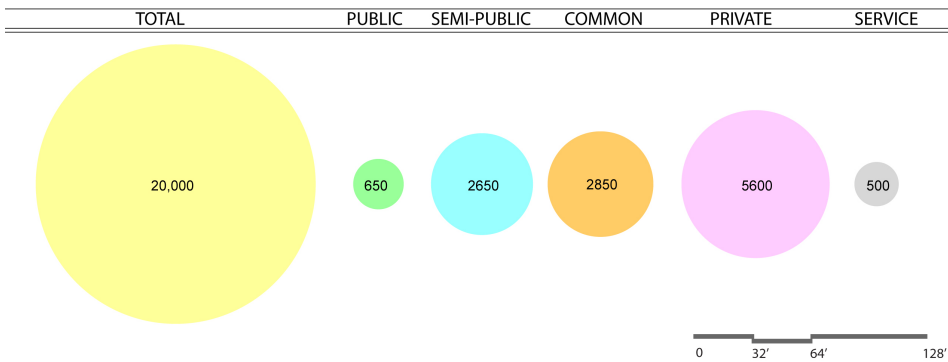


Figure 31: Program Components

Visitor Center

PROGRAM	SQUARE FOOTAGE
Entry/Lobby	500
Reception / Information	750
Auditorium (200 person capacity)	4800
Café / Dining Space	1000
Kitchen	500
Exhibit Space and Prep Area	2000
Bookstore	1000
Classroom / Multi-purpose Space	1000
Gathering / Flexible Space	2000
Storage / Service	2000
Restrooms	1500
Outdoor Gathering Space	varies
Total	17, 050

The primary goal of the Interpretive Center portion of the complex is to orient, inspire, and educate the visitor about the value of wilderness with a focus on Glacier National Park. It is the hope that the visitor will gain an understanding of man's relationship with nature and recognize their place within a delicate ecosystem.

The building must fulfill the basic needs of visitors by providing the necessary information for orientation, a location for rangers and visitors to interact, and provide necessary services for rejuvenation such as rest room and café.

The building should also have flexible use space that can be available for different types of visitors and differing activities at multiple scales. For example, the building should accommodate larger school groups visiting Glacier National Park and individual families who are looking for a more intimate experience.

Research and Learning Center

PROGRAM	SQUARE FOOTAGE
Lodging for 12 people	
Single Occupancy Cabin	350 SF each
Double Occupancy Cabin	700 SF each
Cabin with Common Spaces	1500
Kitchen	300
Laundry / Bath	150
Dining Room	300
Common Room / Space	300
Storage	300
Private Offices	150 SF each
Administration Offices	300
Wet Lab	1000
Conference Room	300
Computer Lab	300
Service and Storage	500
Restrooms	350
Outdoor Space	Varies
Total	Approx. 20,000

The primary goal of the Research and Learning component is to help promote engagement between visitors and scientists. More specifically, the complex will be designed to provide new facilities for the Crown of the Continent Research Learning Center that is located at Glacier National Park.

The mission of the Crown of the Continent Research Learning Center is to facilitate research to occur within the park and to communicate that research with the public. They do this in a number of ways. The Center helps with permitting and provides housing and facilities to scientists who are interested in researching a specific topic. Currently there is housing for eight researchers. They also provide

small fellowships to students and summer interns and run a program called Citizen Science.

Citizen Science provides different levels of opportunity for the public to participate in research. They train people to take inventory of flora and fauna within the park. This helps to promote stewardship by involving the public with the park's research.

The Research Learning Center issues 70-75 permits per year ranging in research topics such as Bears, Linx, Amphibians, Geomorphology, Forest Fire, Climate Change, Aquatic Insects, Golden Eagle Migration, etc. A researcher will stay at the park for an average of two to four weeks.

Shared Space

The Crown of the Continent Research Learning Center is already providing opportunities for the public to engage and participate with science. By providing new facilities and spaces like an Auditorium and Exhibition Hall, the program will be improved and able to expand.

By designing housing units for 10 researchers and summer interns, researchers will have the opportunity to stay within a community of scientists. Common spaces will allow for engagement with other researchers and ideally promote discussion about their work.

Semi-Private spaces such as the library and computer lab will be available for researchers and the public that participates in the Citizen Science programs. This would facilitate another level of interaction between scientists and the public.

Public spaces such as the Auditorium would be shared with the Visitor Center program and can be used for day and evening programs, research presentations, and Brown Bags. Exhibition space in the Visitor Center provides an opportunity to display research that is being conducted for the benefit of the general public.

Parking

The design intends to organize the parking in Apgar Village. By proposing one location at the edge of the village for a single large parking lot, visitors are directed to one place for parking. It is then possible to engage the visitor with the place and control the experience that they receive when moving from their car to the village. The design intends to provide a sidewalk condition that is lined with exhibit moments so that the visitor experience of Apgar and of Glacier National Park begins immediately after visitors leave their car.

Chapter 4: Precedents

“Human movement in space is marked by pause.”¹⁷ It is the moment of pause that helps create a memory of the place. The goal of the following precedents is to analyze what creates these moments of pause. An analysis of how relevant precedents are organized programmatically, experientially, and spatially will help create a catalog of characteristics that can be used to create a place.

I. Programmatic Organization

By comparing buildings with similar programmatic goals, it may be possible to gain understanding of different formal approaches to formal organization, visitor experience, relationship to the landscape and view, and building and site.

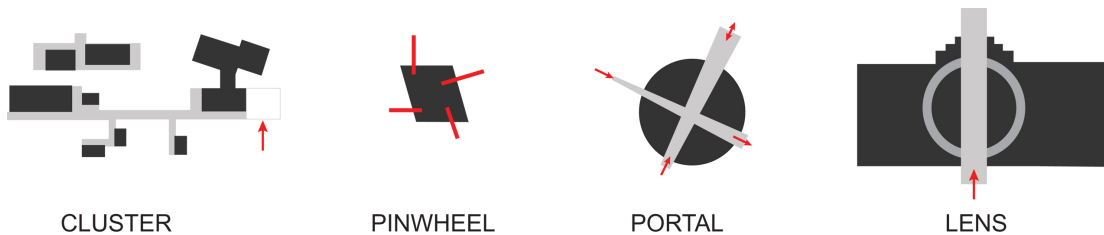


Figure 32: Multiple approaches to organizing program.

CLUSTER

Cedar River Watershed Education Center in Seattle, Washington, by Jones and Jones Architects. Constructed between 2000-2001.

¹⁷ Tuan, Yi-fu. *Space and Place: The Perspective of Experience*. Minneapolis: University of Minnesota, 1977. Print, 198.

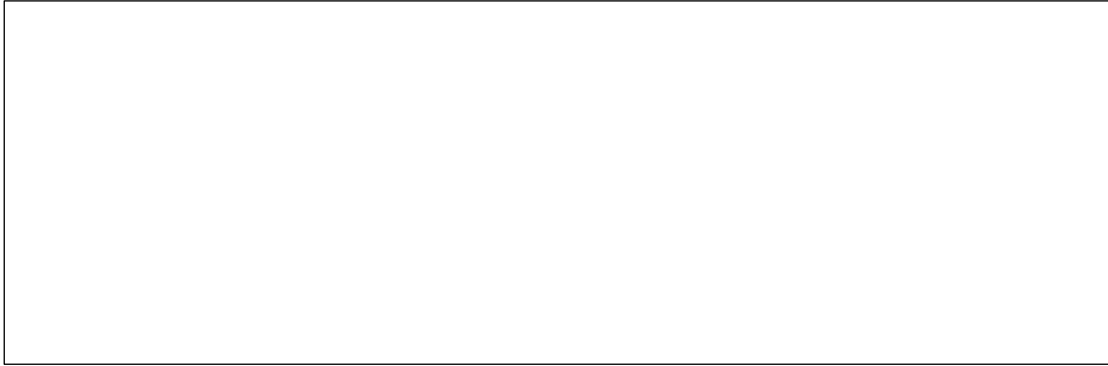


Figure 33: Cluster (Image Source: <http://land8.com/profiles/blogs/viacedar-river-watershed>)

Total Square Footage: 14,000

Program: Multi-Purpose Space, Library, Auditorium, Meeting Room, Janitor/Mechanical/Storage, Toilet x 2, Interpretive Area, Welcome Room, Rock Ledge Outdoor Amphitheatre

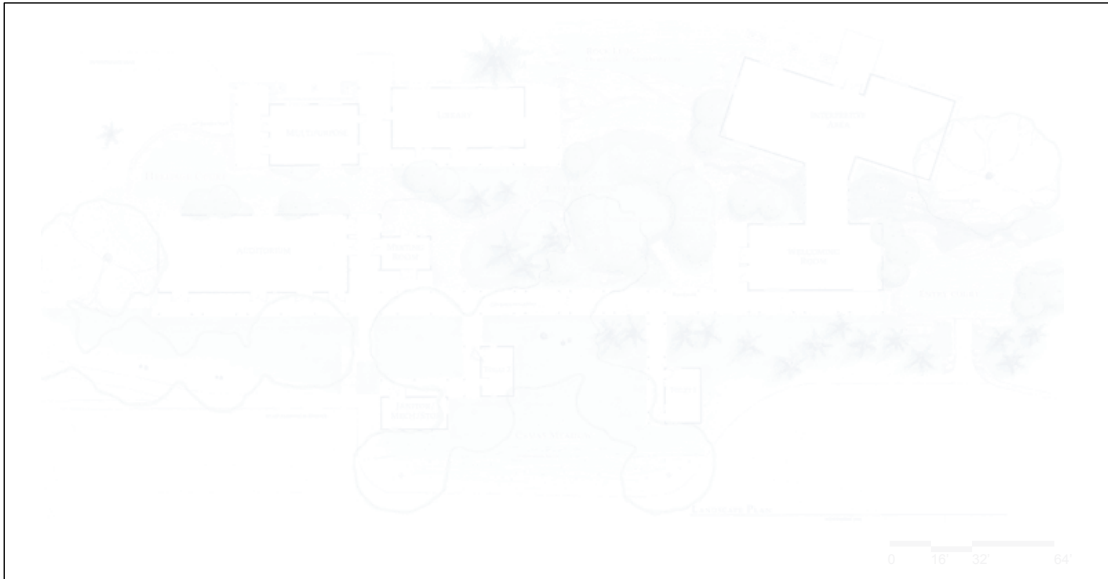


Figure 34: Cedar River Watershed Education Center Site Plan (Source: <http://land8.com/profiles/blogs/viacedar-river-watershed>)

The Cedar River Watershed Education Center places programs in separate buildings. This requires visitors to circular in the outdoors. The placement of separate buildings also creates outdoor rooms and landscaped spaces between the

buildings. The experience of the place is defined by the exterior space and how the visitor moves through the landscape.

From a practical standpoint, separate buildings can allow for clear programmatic distinction and flexibility. Multiple buildings prevent one activity from distracting another. In addition, by providing buildings with their own entries, there is flexible access. Specifically, there is a benefit to having the bathrooms in separate buildings, so they can be used when other buildings are closed.

PINWHEEL

Knut Hamsun Center in Hamarøy, Norway, by Steven Holl. Constructed between 1994-2009.

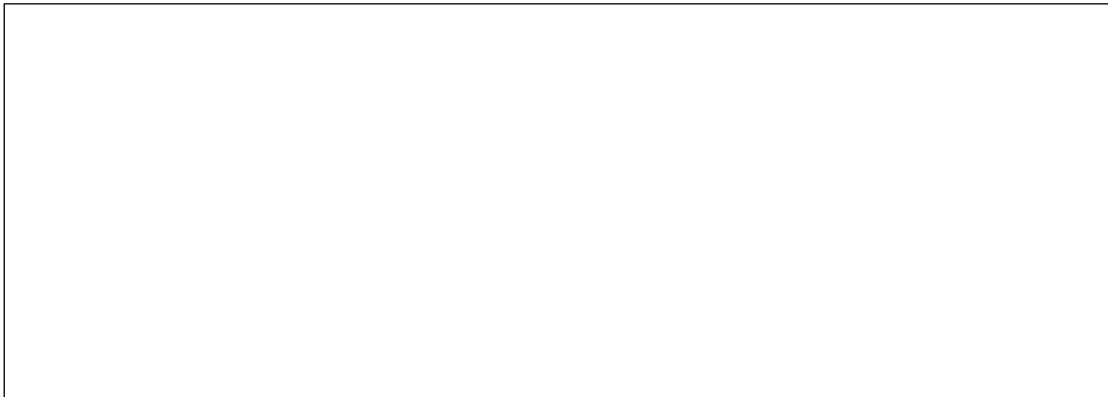


Figure 35: Knut Hamsun Center (Image source: <http://archrecord.construction.com>)

Total Square Footage: 24,445

Program: Entry, Lobby, Reception, Café, Kitchen, Auditorium, Offices, Exhibition, Balconies



Figure 36: Knut Hamsun Center Plan and Image (Source: http://archrecord.construction.com/projects/building_types_study/museums/2011/Knut-Hamsun-Center.asp)

The Knut Hamsun Center is designed so that the visitor experiences a circular procession as they move within the building. As the visitor follows the prescribed path, a series of balconies and windows capture and frame views in the landscape. An inhabitable roof also provides 360-degree views of the landscape.

The Center is separated into two buildings—a tower and a single story building. The Auditorium is located in the low building and the exhibition spaces are placed in the high rise. This decision reinforces experience of both the earth and sky.

PORTAL

Mesa Verde Visitor and Research Center in Mesa Verde National Park Cortez, Colorado, by AJC Architects. Constructed in 2012.

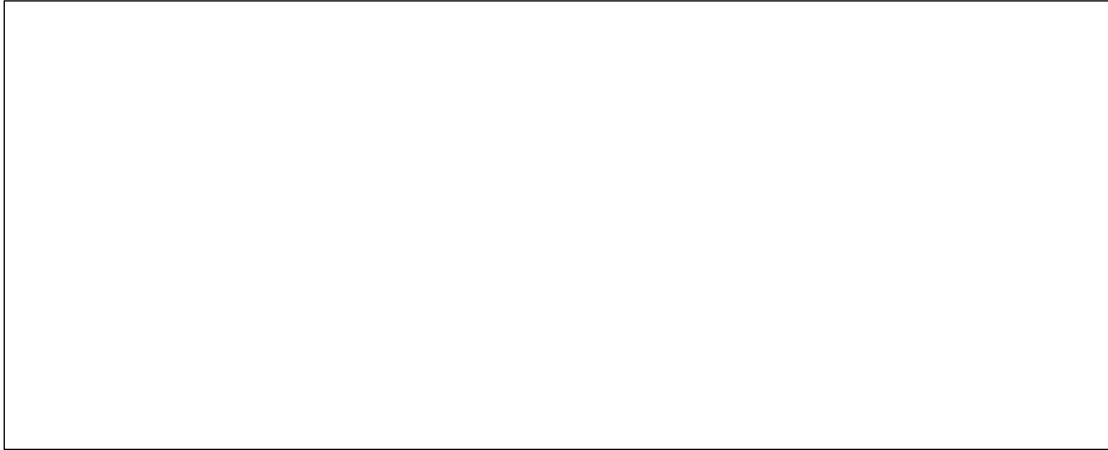


Figure 37: Mesa Verde Visitor and Research Center (Image Source: <http://www.mesaverdefoundation.org>)

Total Square Footage: 23,620

Research SF: 16,256

Visitor SF: 7,364

Program: Bookstore, Exhibit, Ticketing, First Aid, Lobby, Rotunda, Large Restrooms, Family Restrooms, Vending, Library, Conference Room, Staff Break Room, Mechanical, Receiving Room, Work Room, Repository, Natural History, IT, Archive Collection, Supplies and Files, Work Media Room, Archive & Library Research, Archaeology Research, Records Office, Research Office, Curator Offices, Janitor, Private Restroom, Shower, Warehouse, Receiving Room.



Figure 38: Mesa Verde Visitor and Research Center Floor Plan (Image Source: <http://www.mesaverdefoundation.org>)

The parti of the Mesa Verde Visitor and Research Center brings visitors in and through the building. At the same time, the building acts as a portal or threshold into the landscape. The architects located the rotunda at the center of the building where two linear paths intersect.

The perpendicular linear paths divide the building into four quadrants of which three are devoted to research and one to visitor needs. Restrooms are located at the exterior of the building so that access is provided when the larger building is closed.

LENS

Old Faithful Visitor Education Center in Yellowstone National Park, by CTA Architects Engineers. Constructed in 2010

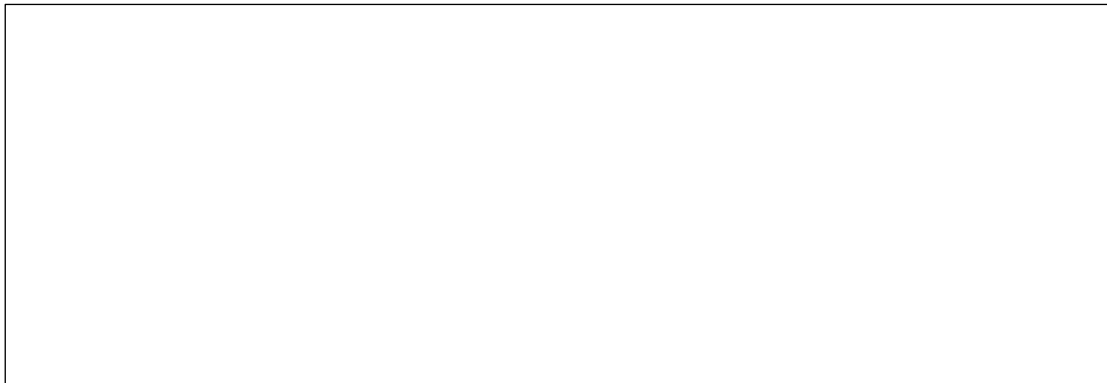


Figure 39: Old Faithful Visitor Education Center (Image source: www.ctagroup.com)

Total Square Footage: 25,600 distributed on 2 stories

Program: Lobby, Exhibit Halls, Resources, Bookstore, Administrative Offices, 215 seat Auditorium

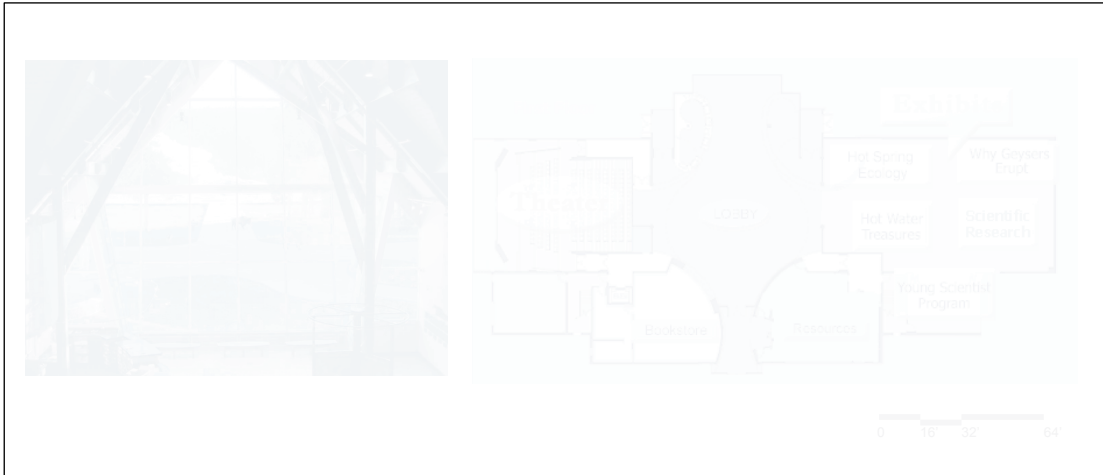


Figure 40: Old Faithful Visitor Education Center Plan and Image (Source: www.ctagroup.com)

The Old Faithful Visitor Education Center is organized around a large central lobby. The entrance brings the visitor directly into the lobby where there is a strong axial relationship with the majestic view beyond. This axial relationship does not allow physical access to nature in the same grand fashion as the portal part of the Mesa Verde Visitor and Research Center. The architecture acts as a lens to view and frame nature and also a barrier.



Figure 41: Relationship of Architecture to the view of Nature.

The new Old Faithful Visitor Center was built adjacent to the original Old Faithful Inn built in 1904. The architectural form of the new building was influenced by the historical style of the inn. The relationship to the view, however, is very different.

The Old Faithful Inn was built with its short end facing the view of the geyser so that the visitor was able to capture this view upon arrival before entering the building. The Old Faithful Visitor Center was built with the long side facing the geyser and designed so that the view of the geyser is only accessible by going through the building. This can be seen as a shift in the relationship of architecture to nature, which in effect represents a shift in the relationship of humans to nature. In the past nature was the dominant focus, and today the building becomes a gateway.

II. Experiential Precedents

The experience of a sublime condition in nature is often admired, replicated, and/or enhanced by man in different ways. The purpose of the experiential precedent is to explore how a memorable or sublime condition is created through design. In each precedent that follows, the subject matter considers a natural condition, an artistic interpretation, and an architectural expression of our relationship to landscape.

WALL

A wall can protect, divide, provide enclosure, and define boundary. It can act as a signifying moment of entrance or exit and capture space in order to provide privacy or frame views. A wall can direct a visitor or hide an unsightly condition. It can be stark and unsightly or poetic and playful.

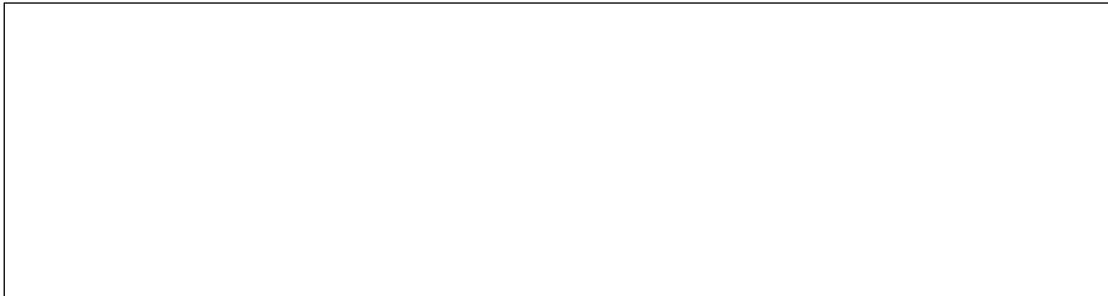


Figure 42: Examples of a Wall condition (Image sources: http://www.allglacier.com/images/content/4673_4827_Weeping_Wall_Glacier_National_Park_md.jpg, http://www.flickr.com/photos/julia_manzerova/3945917295/sizes/o/in/photostream/, <http://www.cen-zhang.com/?p=277>)

The Weeping Wall at Glacier National Park is a natural condition formed when snowmelt occurs on the side of a mountain. Similar to a waterfall, this specific site condition forms a “wall” of water as the result of this natural process. It is admired and enjoyed by visitors as an ephemeral experience. The Weeping Wall signifies a definable moment in the visitor’s journey through the park.

The Wall at Storm King by Andy Goldsworthy is an artist's playful expression of craft. The wall winds its way through the forest in a curvilinear fashion representing a kind of imaginative journey. The wall does not act as a divider and does not direct the visitor along a path. Instead it invites admirers to watch as the natural materials of the wall and around the wall change with time.

The wall at the Church by the Water by Tadao Ando creates privacy. The wall's architectural purpose is to defend the sacred space of the chapel from the resort at its back. The wall is linear and clearly intentional. It divides the site into public and sacred spaces and directs the visitor along its path to the entrance.

FRAME

The experience of a view in nature is a personal and cultural experience that can be defined and/or discovered. A frame can help define a view.



Figure 43: Frame (Image sources: http://homeguides.sfgate.com/DM-Resize/photos.demandstudios.com/getty/article/251/245/87646722.jpg?w=600&h=600&keep_ratio=1, http://4.bp.blogspot.com/_3wvd_uM90ts/TIJHkoOxuZI/AAAAAAAAAZA/AD1fuuX3xzY/s1600/momenti69h.jpg00.jpg, <http://www.inhabitat.com>)

The forest is made up of a collection of trunks that can act as a series of frames where one view can be exchanged for another as the viewer shifts their head.

The density of a forest can allow for curiosity and discovery.

In the Cattedrale Vegetale, the artist has used natural materials to create an architectural form—Cathedral. The nave of the natural cathedral forms an axial frame, like an allee of trees, directing the visitor down a path through the central portion of the structure. This is an example of an intentionally altered forest that directs the visitor both visually and physically through the forest.

The Great (Bamboo) Wall by Kengo Kuma uses repetitive bamboo pieces to simultaneously create an enclosure and frame a view of nature. The pieces come together in a structural and symbolic way. The lightness of the individual elements allows for the wall to be transparent yet still act as a clear architectural division between indoor and outdoor space.

REFLECTION

In nature, one can find reflections to be poetic, peaceful, and inspiring.



Figure 44: Reflection (Images sources: <http://www.nps.gov/glac/photosmultimedia/webcams.htm>, <http://www.robmulholland.co.uk>, <http://www.archdaily.com>)

The reflection of the mountains on to Lake McDonald is a relaxing and inspiring natural view. The view reminds the visitor of just how small they are in relation to the mountains beyond. The reflection of the mountains in the water reminds one of the cyclical connections between the two. The same glacier that carved the lake also created the mountains. The lake reflects the source of its water,

the great snow-covered peaks. The water changes seasonally by rising in the spring as the snow melts off of the mountains and receding in the winter as the clouds carry the water back up the mountains in the form of snow.

The landscape installation title *The Vestige* by Rob Mulholland represents the human presence in nature. The reflective surface shaped into the form of a human makes the case that the relationship is mutually dependent. Human actions reflect within nature, and similarly the existence and power of nature affects the human condition. Many argue that today there is no true wilderness, no space left untouched by man. In this installation, Mulholland is locating man within wilderness as a visitor reminding us to tread lightly on the earth for our actions in nature have consequences.

The Power Station by Stein Hamre Arkitektkontor AS expresses the hand of man in nature through architecture. This type of building program does not require transparency. Instead of installing windows, the architect chose to use reflective glass on the surface of the building. The building materials have a startling effect, reflecting the surroundings and therefore blending more elegantly into the natural setting. This stimulates the reflection about this relationship between architecture and wilderness.

III. Tectonic Precedents

This series of precedents looks at how architects have built in the natural environment.

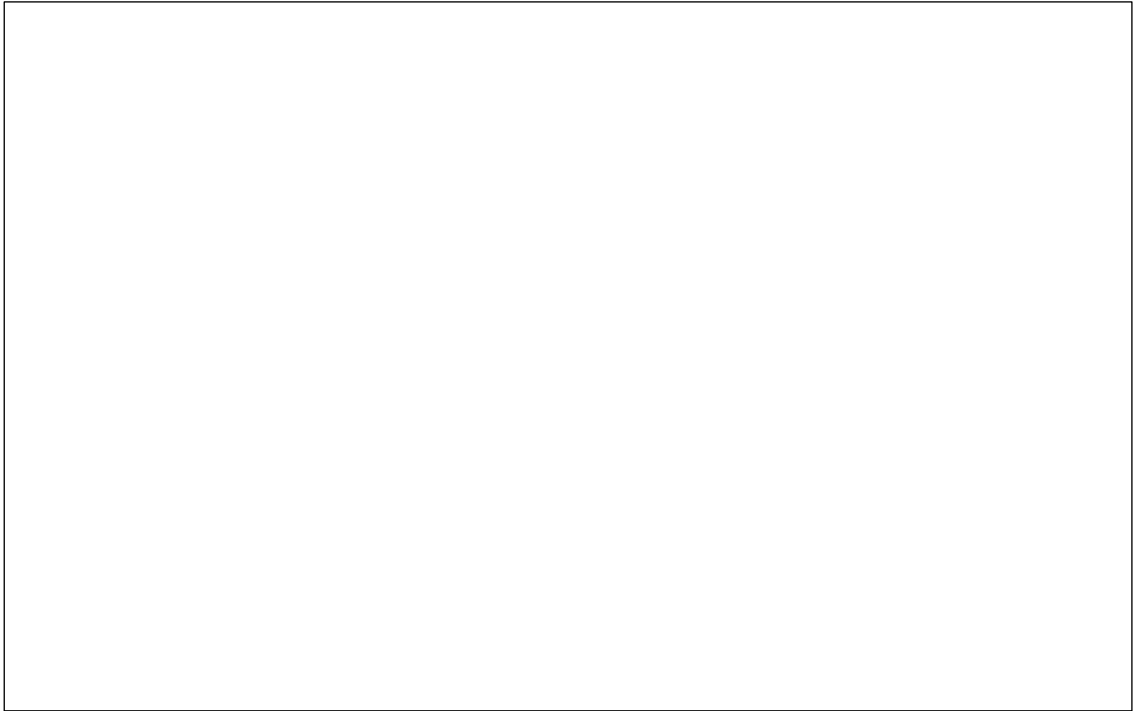


Figure 45: Monticello Visitor Center by Ayers Sain Gross in Charlottesville, VA built in 2008. (Diagram by Michele Rubenstein Image sources: <http://www.toolsofthetrade.net/industry-news.asp?sectionID=1006&articleID=549700>, <http://woodworks.org/award/commercial-wood-design-award-9/>, <http://www.architectmagazine.com/educational-projects/welcome-to-monticello.aspx>)

The Monticello Visitor Center addresses how to organize a series of programmatic elements around a courtyard. The Center deals with multiple points of entry and issues of parking and bus drop off. At Monticello, they use an exterior arcade to provide continuity to the space. All point of entry to the buildings occur off of the arcade.

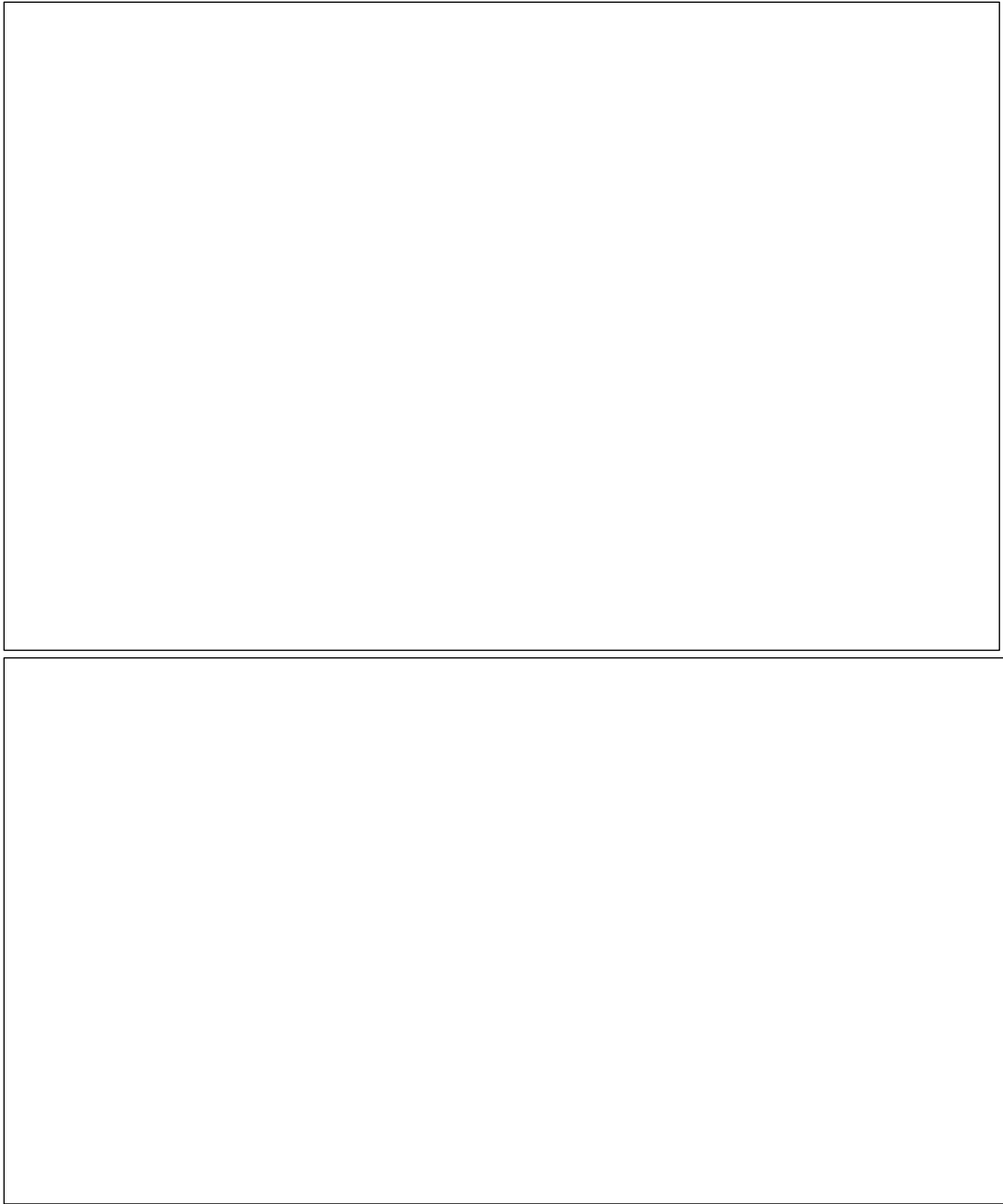


Figure 46: Ridge House by Bohlin Cywinski Jackson in rural Canada built in 2007. (Diagrams by Michele Rubenstein Images source: <http://www.archdaily.com/246058/ridge-house-bohlin-cywinski-jackson/>)

The Ridge House is a simple linear parti that organizes the main spaces of the building that are facing the view. The building also reaches out and extends into the landscape with a porch and fire pit located in the forest. The design uses masonry as a thermal mass.



Figure 47: Ledge House by Bohlin Cywinski Jackson in Catoctin Mountains, Maryland. (Images source: Riera, Ojeda Oscar., and Karl A. Backus. *Ledge House: Bohlin, Cywinski, Jackson*. Gloucester, MA: Rockport, 1999. Print.)

The Ledge House has a simple sloped roof but the structural expression at the interior is more complex. The architects created a tilted structure that frames spaces and reacts to the landscape. The Ledge House also juxtaposes a solid masonry wall with a wood frame wall. This helps to focus the view out into the landscape.

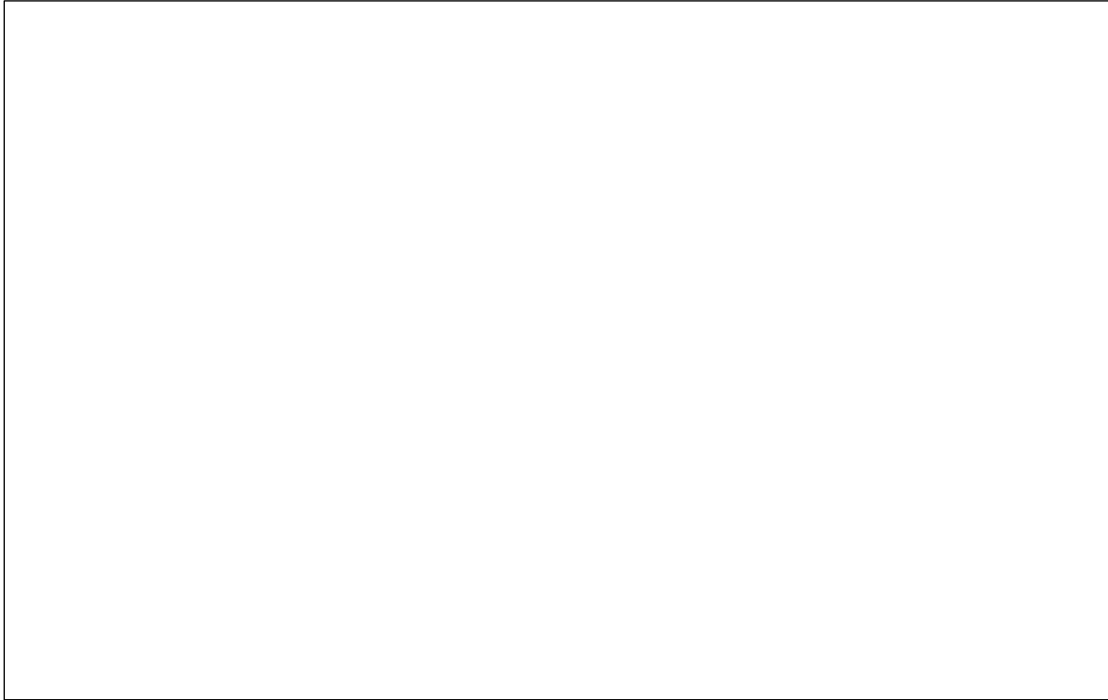


Figure 48: Aldo Leopold Center by The Kubala Washatko Architects in Barabook, Wisconsin (Images source: Guzowski, Mary *Towards Zero-energy Architecture: New Solar Design*. London, U.K.: Laurence King, 2010. Print.)

The Aldo Leopold Center is a zero-energy building that incorporates similar programmatic elements as the proposed Interpretive Center. The Aldo Leopold Center is built as a series of buildings that can be used for research and environmental engagement. The design uses passive design concepts for ventilation and day lighting.



Figure 49: Aalto University Dining Hall by Alvar Aalto (Images by Michele Rubenstein)

The Aalto University Dining Hall structure is made up of a series of structural pieces that come together as a whole. The solid brick wall gives a sense of shelter and enclosure and the framed window wall helps the space extend out onto the patio beyond. Windows located above the brick wall, contribute to the day lighting of the space.

Conclusions

The goal of this set of precedents was to look at the relationship between architecture in a formal, programmatic sense and also to explore relationships between architecture and nature. Architecture can highlight nature, blend with nature, and/or stand out from nature.

Chapter 5: Craft – Design Approaches

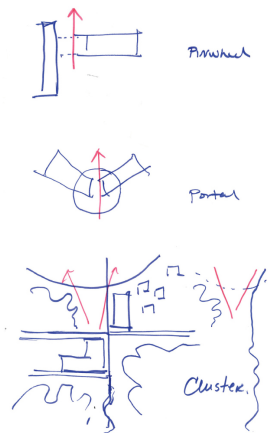


Figure 50: Design Approaches

The preceding designs create a complex of buildings rather than a single building. The site is along the waters edge of Lake McDonald, which allows the buildings to capture the quintessential view out across the water toward the mountains. The design approaches reference the organizational principles of the Programmatic Precedents that were discussed earlier. They also consider the public, private, and semi-public spatial relationships that emerge from the Visitor Center and Research Learning Center programs.

Pinwheel

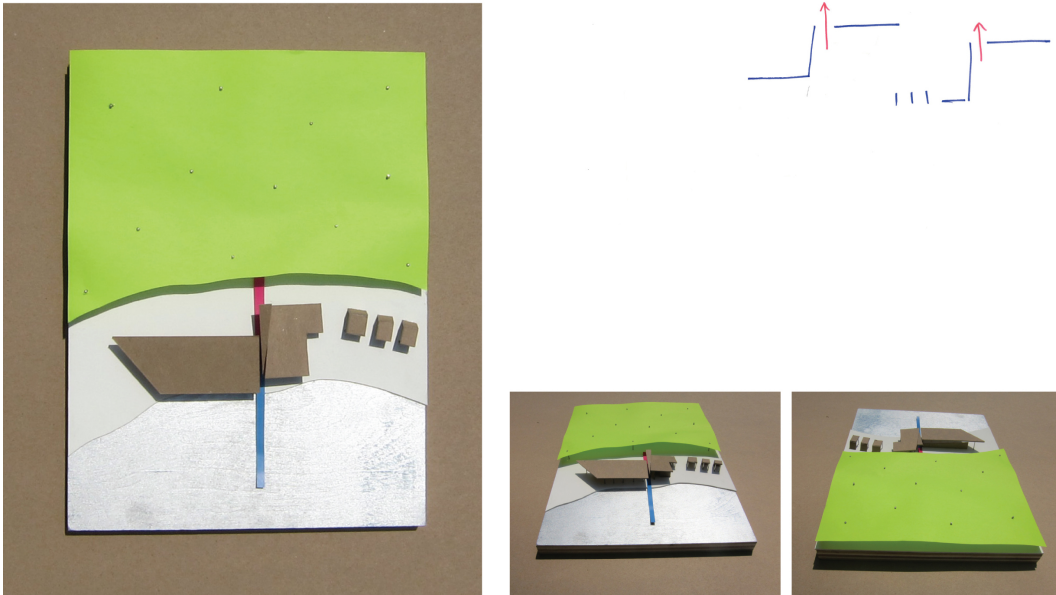


Figure 51: Pinwheel Design

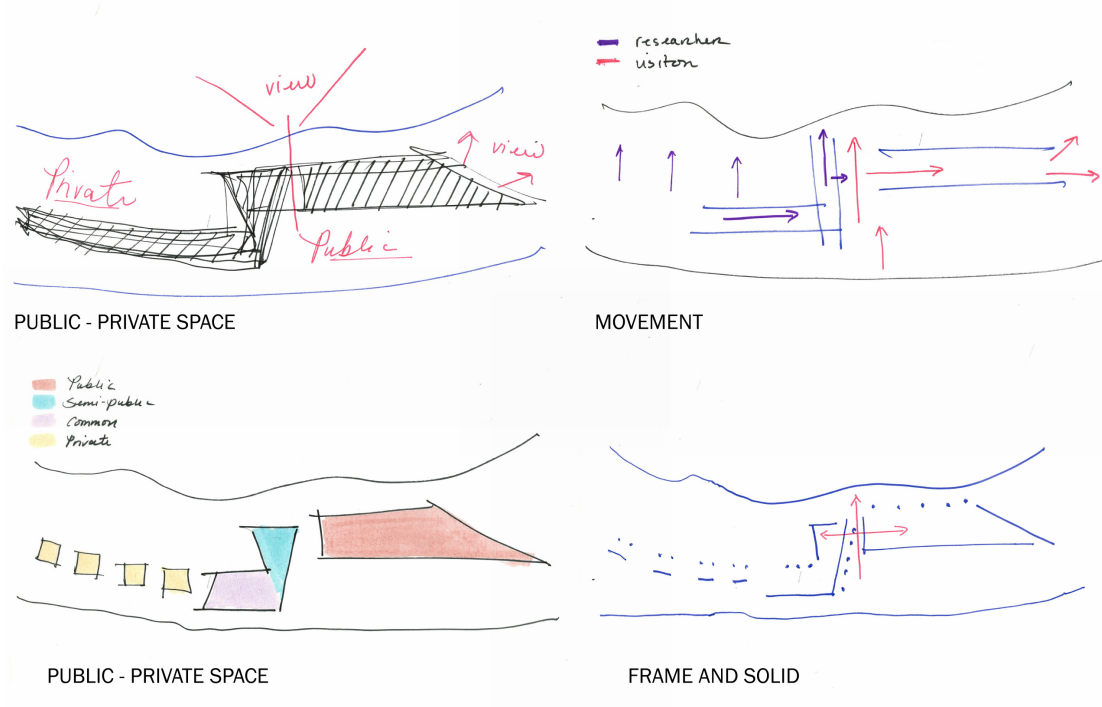


Figure 52: Pinwheel Design Diagrams

The Pinwheel Design separates the public and private components of the program. The two buildings form a gateway as the entrance. This threshold provides

a framed view of the lake and mountains. As the visitor enters and moves through the eastern building, there is a continuous view out toward the water. At the end of the space, there is a view of the site transect through the forest, water's edge, lake, and mountains beyond.

The Research Learning Program is located in the western building. The researcher enters through the same gateway as the visitor. The semi-private portions of the program are located at the entrance to the Research Learning Center. As the researcher proceeds through the space, the program becomes more and more private. Private cabins are located along the waters edge with a view out and across Lake McDonald.

Portal

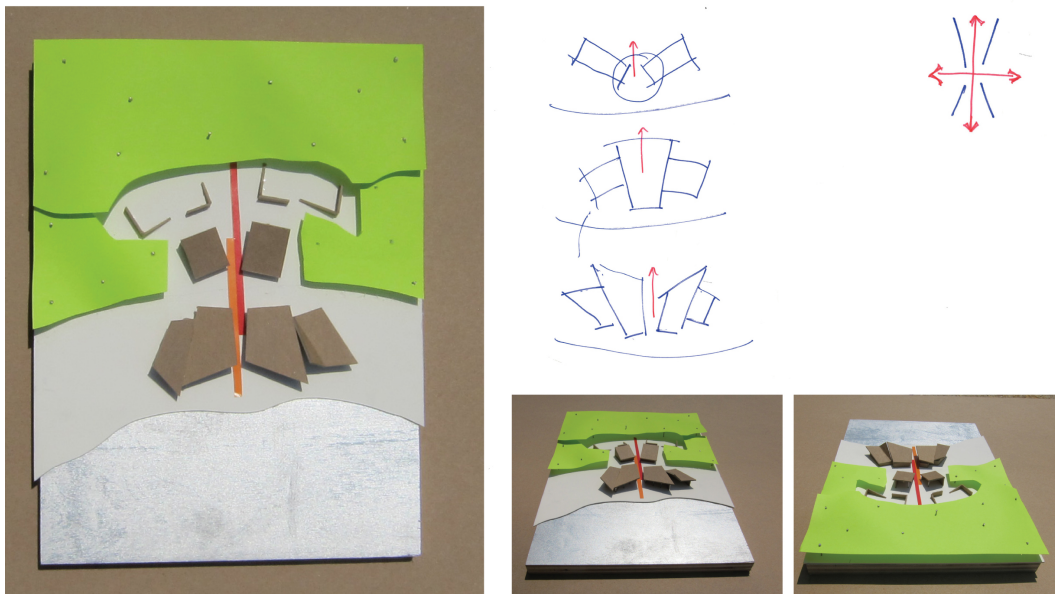


Figure 53: Portal Design

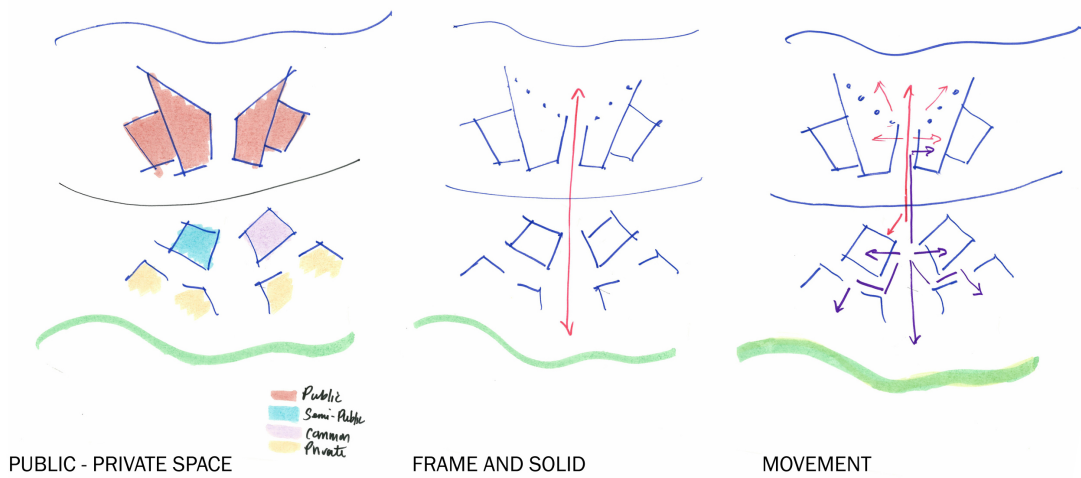


Figure 54: Portal Design Diagrams

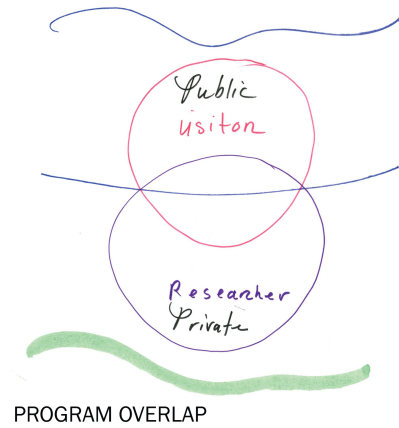


Figure 55: Portal Program Overlap Diagram

The Portal Design frames views toward the water and toward the forest. The program is separated and locates the researchers at the forest edge and the visitors at the water's edge. The shared space is located along Lake View Drive. This spatial relationship creates an overlapping diagram like a Venn diagram. The most public portions of the program are located at the waters edge and the most private portions are tucked back into the forest.

Cluster

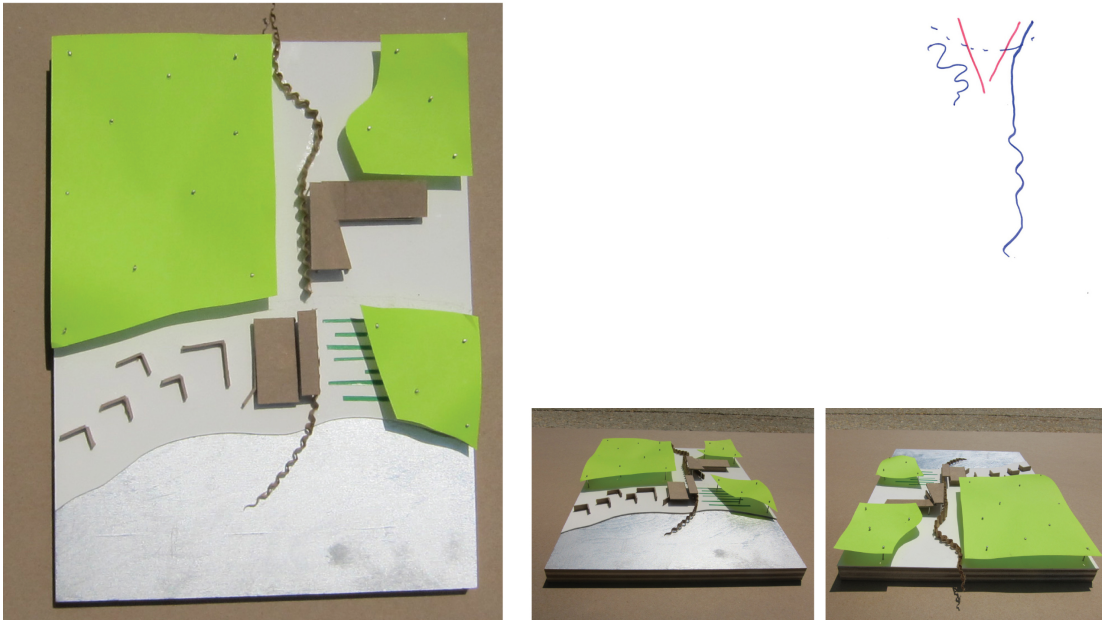


Figure 56: Cluster Design

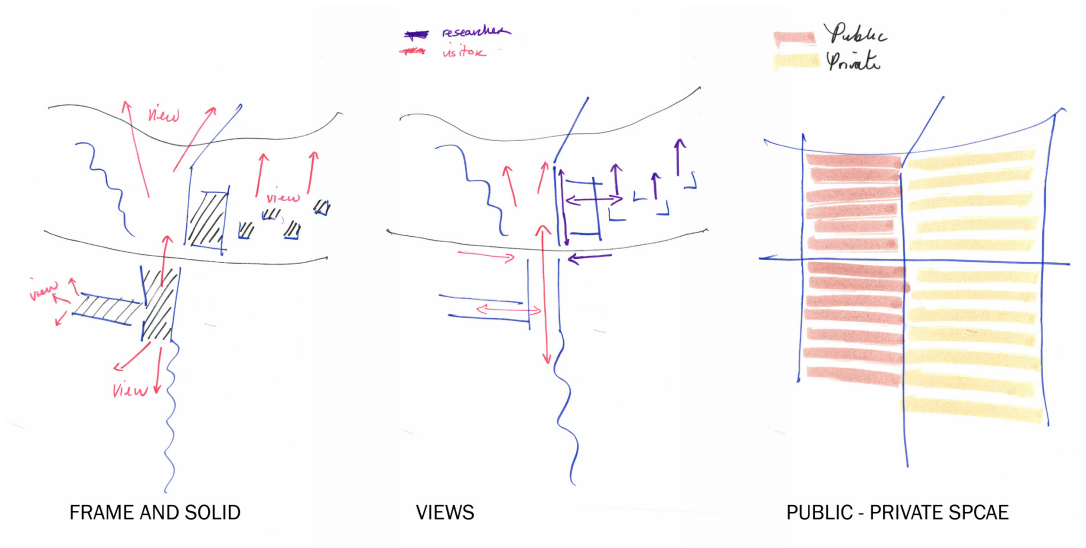


Figure 57: Cluster Design Diagrams

The Cluster Design uses a wall to separate the public and private programmatic elements. The visitor center program is on the western side, and the

research program is on the eastern side of the wall. The wall is also intended to lead the visitor from the Transit Center through the forest to the Interpretive Center Complex. The wall changes from a curved form to a straight wall as the visitor approaches the Interpretive Center. The wall engages and becomes part of the buildings. As the wall reaches the waters edge, it splays out to act as an edge that defines the view. Similarly, the landscape edge to the west of the wall splays to help define the view and also creates an amphitheatre space in the landscape at the waters edge.

Design Conclusions

The three alternatives to the Interpretive Center Complex each occupy the water's edge. They explore different ways of organizing the program to highlight the view and separate the public and private. Since these variations were all focused on the same location, they bring up questions about scope. It would be beneficial to zoom out and consider the desired connection or disconnection between the Park Entrance, the Transit Center, and the new Interpretive Center Complex.

Chapter 6: Final Design

Design Goals

The design goals of the early lodges were to introduce American's to wilderness, to provide a gateway to a sublime condition and to act as a destination. The design goals of the Mission 66 Visitor Centers were to manage visitors and improve the visitor experience by providing restrooms and information.

As the American relationship with wilderness has shifted to its current condition, the architecture design goals for the future should reflect that. An Interpretive Center should engage the visitor with the place and embrace and expand upon the building traditions through a sustainable and regional approach. The Center should also rekindle ideas of destination and gateway like the old grand lodges while also helping to raise awareness of science and research within the parks.

The proposed design attempts to address these design goals by building modestly, engaging the visitor with the place beginning at the parking lot, designing a gathering space, and framing the view both educationally and physically.



APGAR VILLAGE - PROPOSED



Figure 58: Proposed Site Plan of Apgar Village

Building Modestly



Figure 59: Existing and Proposed Site Plan



Figure 60: Existing and Proposed Parking Plan

The existing design of Apgar Village has a series of small rustic buildings and numerous parking lots. The proposed design inserts a figural green space, a Public

Green, that serves to organize the village and provide a sense of destination and place. As a reaction to the existing architecture, the Interpretive Center forms an edge to the Public Green and is designed as a series of small scale buildings as opposed to a large figural building. The parking is moved to the edge of the village and located in one place.

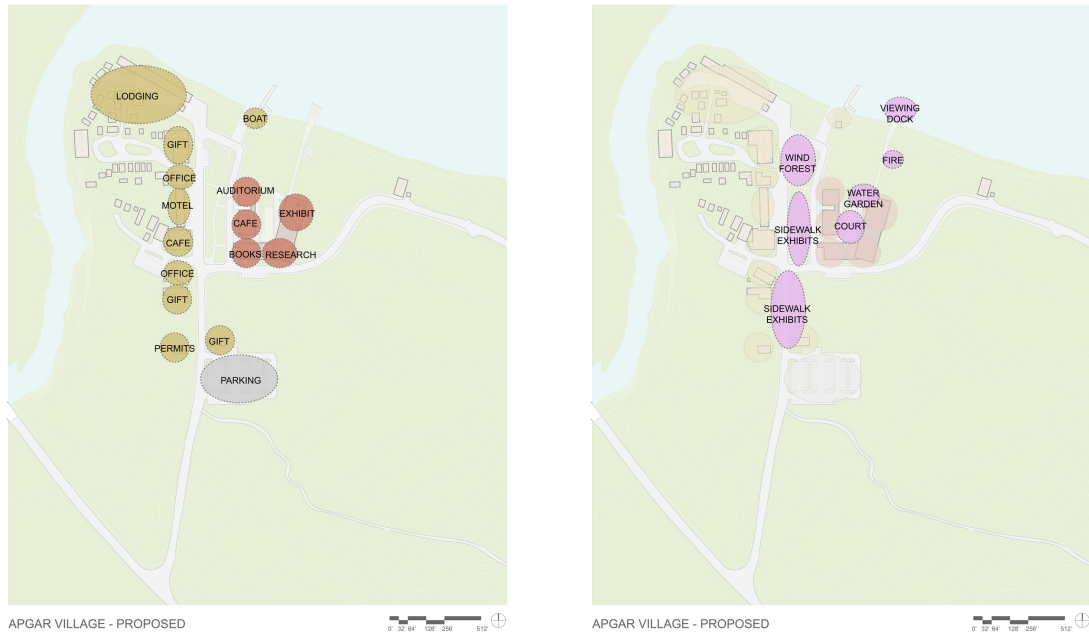


Figure 61: Proposed Building and Site Program

The new programmatic elements that line the edge of the green are public in nature. They include a multi-purpose auditorium, a café, and a bookstore.

The site is also programmed to enhance the visitor experience and provide sustainable teaching opportunities.

INTERPRETIVE CENTER PROGRAM

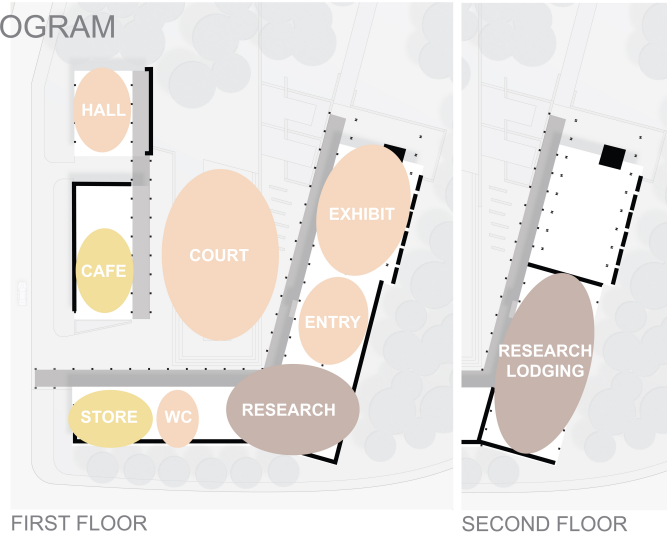


Figure 62: Interpretive Center Building Program

The programmatic elements located throughout the Interpretive Center Complex include research, visitor, and shared spaces. The ability to share spaces reduces the footprint that would need to be built to accommodate two separate programs. These spaces also provide opportunities for engagement between visitors and researchers.

Visitor Experience

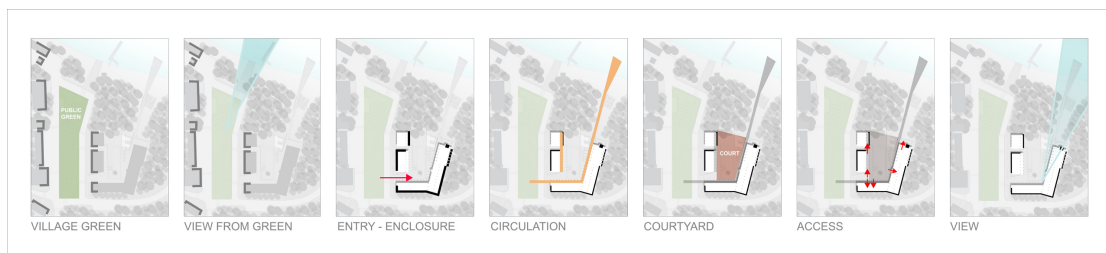


Figure 63: Experience Diagrams



Figure 64: Visitor approach from the parking lot.

In the proposed design, the visitor experience begins at the parking lot. The sidewalk leading to the Public Green is lined with exhibits to engage the visitor with the history of the place and its identifying ecological characteristics. The dense Lodgepole Pine forest begins to frame the view at the end of the Public Green looking out over the water to the mountains beyond.



Figure 65: Visitor experience from Public Green

As the visitors approach the corner of the green, they see the Interpretive Center and the edge of the arcade that reaches out beyond the complex to the edge of the sidewalk. This condition marks the main entrance to the Interpretive Center Complex.

Gathering Space



Figure 66: Threshold to courtyard

The complex of buildings forms a courtyard that is lined with an arcade that provides shelter. Research and visitor programs are organized around the courtyard and access to each building is located off of this arcade. The outdoor arcade leads to the main exhibit room and beyond through the forest to a floating dock on the lake.

The courtyard acts as a gathering space where visitors can meet and listen to ranger talks or sit and have a picnic. Since the forest surrounding the complex is Pine, there is a deciduous tree, a Mountain Maple, planted at the center of the courtyard to remind visitors of the seasonal changes.

Framing the View



Figure 67: View from the water's edge of Apgar Village. Color palette captures the ephemeral, seasonal condition of the view. (Image source: Glacier National Park Webcam text and color palette added by Michele Rubenstein)

The view that visitors experience from the water's edge in Apgar Village is an identifying characteristic of the place. The view represents the experience that visitors engage with at Glacier National Park when they drive Going-to-the-Sun Road up and over the Continental Divide. The proposed design physically frames this view at the end of the Public Green, at the edge of the courtyard, and from the exhibit room.



Figure 68: Exhibit entry



Figure 69: Exhibit room



Figure 70: Floor Plans

The proposed design also frames the view through education and information. The goal of the complex is to raise awareness of science and research through program integration, exhibitions, and sustainable teaching opportunities. The complex incorporates the Crown of the Continent Research Learning Program and

Citizen Science by providing space for private offices, public classrooms, labs, and conference rooms. On the second floor, the Interpretive Center provides private for 10 researchers to stay for an amount of time ranging from one week to one month. Amenities such as, a library, communal kitchen, common room, and washer/dryer, and storage are also provided for the researchers on the second floor.

Sustainable teaching opportunities are located throughout the site. The intention with the design is to expose visitors to elements of sustainability that would be possible to incorporate within their own lives. In order to build within the National Parks, the building is required to be LEED Certified but for the purpose of this exercise, the sustainable elements are intended to engage the visitor through exhibit.

The sustainable teaching opportunities focus on sun, wind, water, heating and ventilation, and regional materials.

SUN

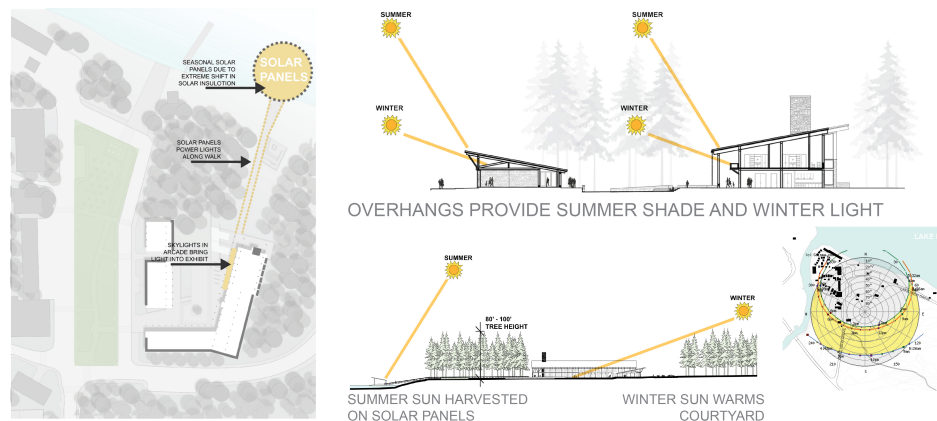


Figure 71: Sustainable Teaching Opportunity: Sun

The sun is a challenging characteristic of the site because the surrounding trees range from 100 to 150 feet tall and provide long shadows. The site also experiences extreme shifts in solar insolation. It is very sunny in the summer and much less so in the winter. The design incorporates the sun with overhangs that block summer sun and allow winter sun to enter the buildings. The slope of the roofs and location of the courtyard also help let winter sun into the courtyard.

The design proposes a temporary structure to be located over the dock that would harvest the sun on solar panels during the summer months. The energy that is collected would power lights along the walk.

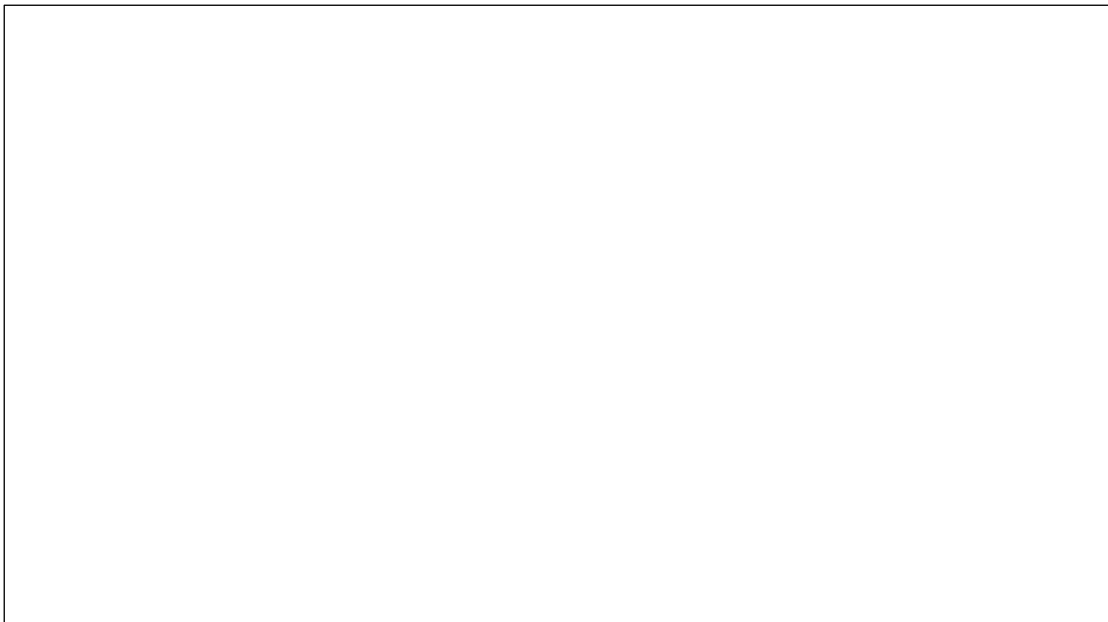


Figure 72: Sustainable Teaching Opportunity: Wind (Image source: www.windspireenergy.com)

The average wind speed on the site provides an ideal condition for wind turbines. The design proposes to locate a wind forest of Windspires at the end of the Public Green. Windspires are only 30 feet tall and can be located 10 feet apart from

one another.¹⁸ They are, therefore, more human in scale compared to larger wind turbines and it is economically feasible for a visitor to consider located one within their own backyard.

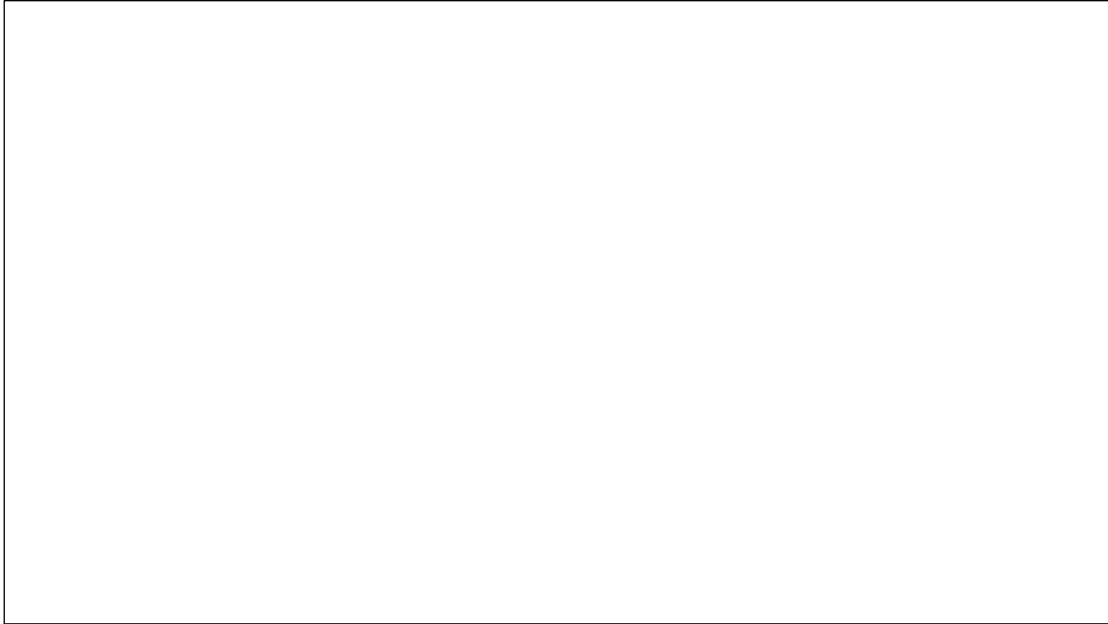


Figure 73: Sustainable Teaching Opportunity: Water
(Image source: http://en.wikipedia.org/wiki/File:Lake_McDonald_winter.jpg)

Water is designed to be collected in underground cisterns at the center of the courtyard. All of the roofs slope in to facilitate this collection. There is a Water Garden located at the edge of the courtyard to celebrate this water collection. Water runs off the roof, down a rain chain, and across colorful glacier rocks before going through a grate into the underground cistern. This creates a changing garden condition because the characteristic of the stones shifts as they become wet.

¹⁸ “Windspire” *Windspire Wind Turbines by Windspire Energy*. Web. <<http://www.windspireenergy.com>>. 18 Dec. 2012.



Figure 74: View from courtyard across the Water Garden to the lake and mountains beyond.

HEATING AND VENTILATION

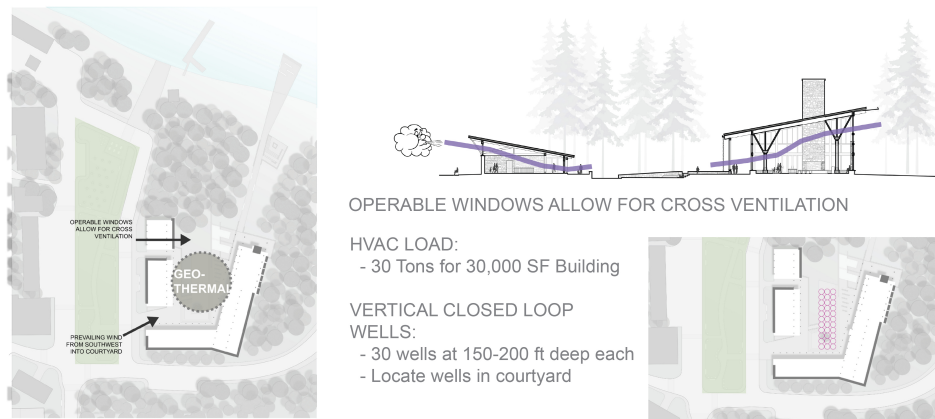


Figure 75: Sustainable Teaching Opportunity: Heating and Ventilation

The location of the Interpretive Center design on the site allows for cross ventilation into the courtyard and through the spaces. The prevailing winds blow from the southwest through the entrance and into the courtyard. Operable windows on the east and west sides of the buildings allow for cross ventilation.

Geo-thermal wells are proposed at the center of the courtyard to be used for ground source heating and cooling with a heat pump located in the mechanical rooms of each building.



Figure 76: Sustainable Teaching Opportunity: Regional Materials (Images sources: http://www.montanarockworks.com/stone_products.php, http://www.nytimes.com/2008/12/09/us/09timber.html?_r=0)

The Interpretive Center uses regional building materials such as lumber and stone in its design. Forestry is a large industry in Montana providing jobs and reducing risk of wildfire. The prevalence of lumber has also created a culture of craft, design, and construction throughout the region.

The structure of the Interpretive Center is designed with sawn lumber and masonry load bearing walls. The masonry walls are mainly concentrated on the exterior of the courtyard buildings giving a sense of enclosure. The tectonic condition at the courtyard is more of a frame condition. The arcade at the edge of the courtyard is made up of wood columns reinforcing this idea.

The particular stone that is used for the enclosure is a pink and gray granite quarried in the Northern Rockies.

Masonry is also used throughout the site to help define space. Masonry walls form edges and act as benches. The stone fireplace rises high above the roof acting as

a beacon directing the visitor to the exhibit space. The fireplace acts as a gathering place both at the interior and the exterior.



Figure 77: Courtyard during the day

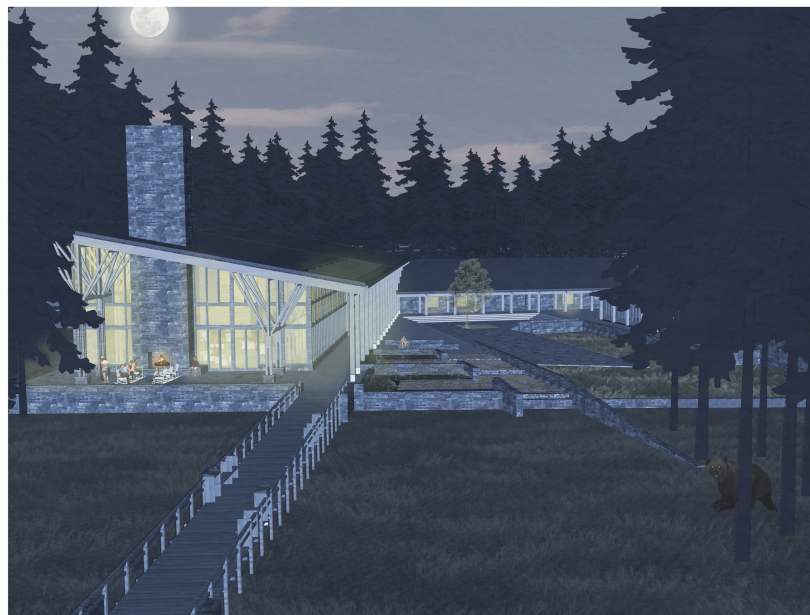


Figure 78: Courtyard at night

Building Tradition - Tectonics

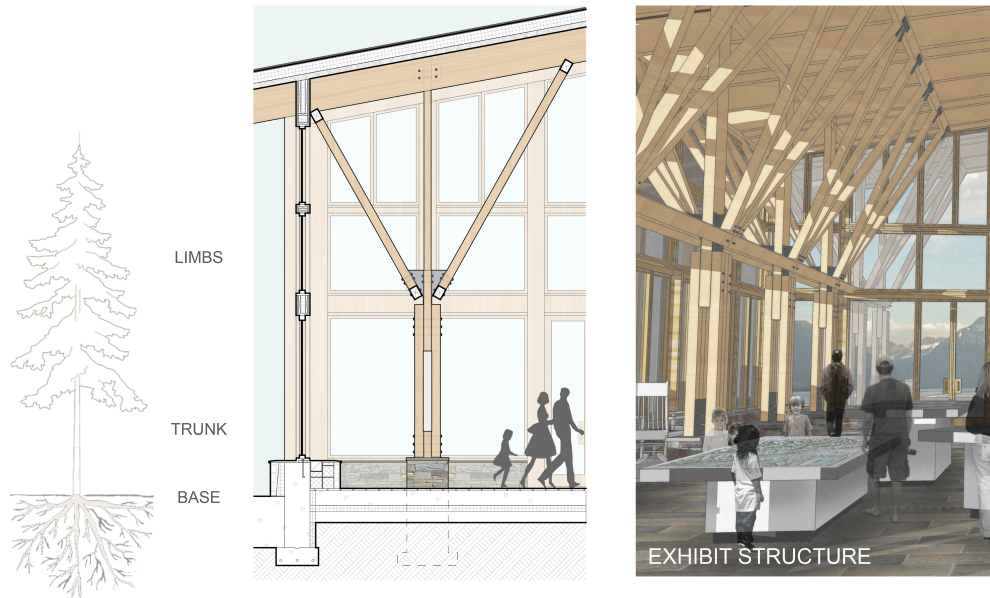


Figure 79: Building Tradition – Exhibit Structure

Similar to the trees that make up the Lodgepole Pine forest on the site, the structure of the Exhibit Room replicates a condition of base, trunk, and limbs. The wooden posts rise out of a stone base and then spread apart as smaller elements reaching out to provide lateral stability while also carrying the roof load.

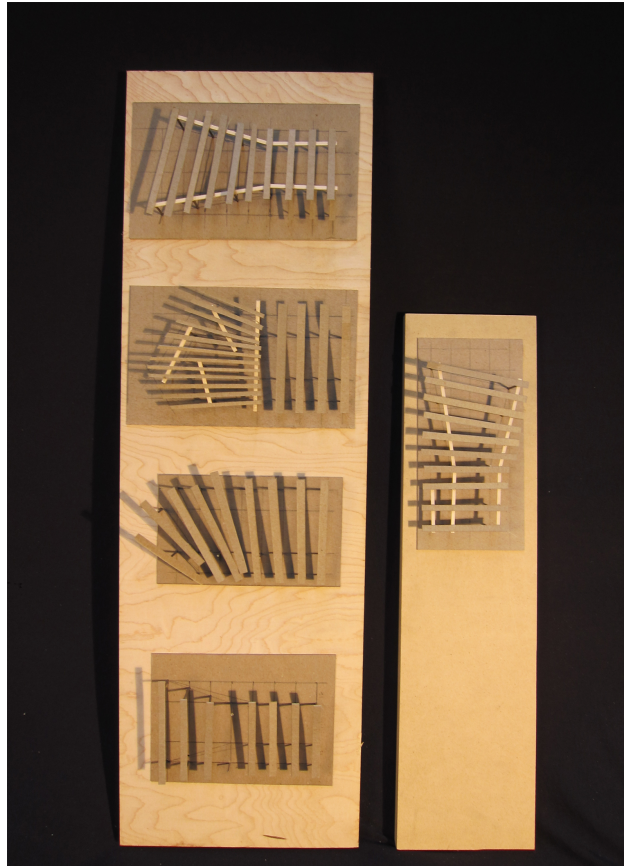


Figure 80: Process Models of Exhibit structure

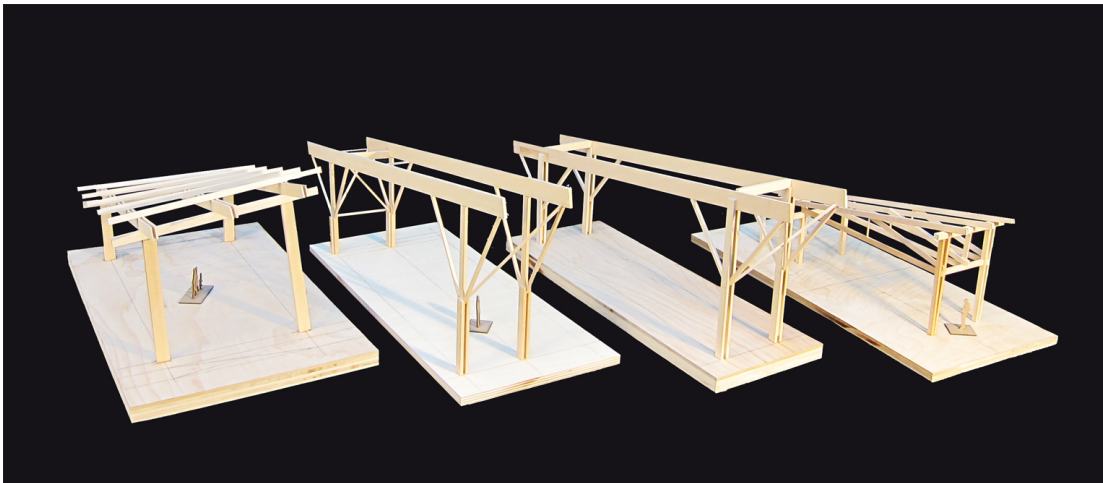


Figure 81: Process Models of structure

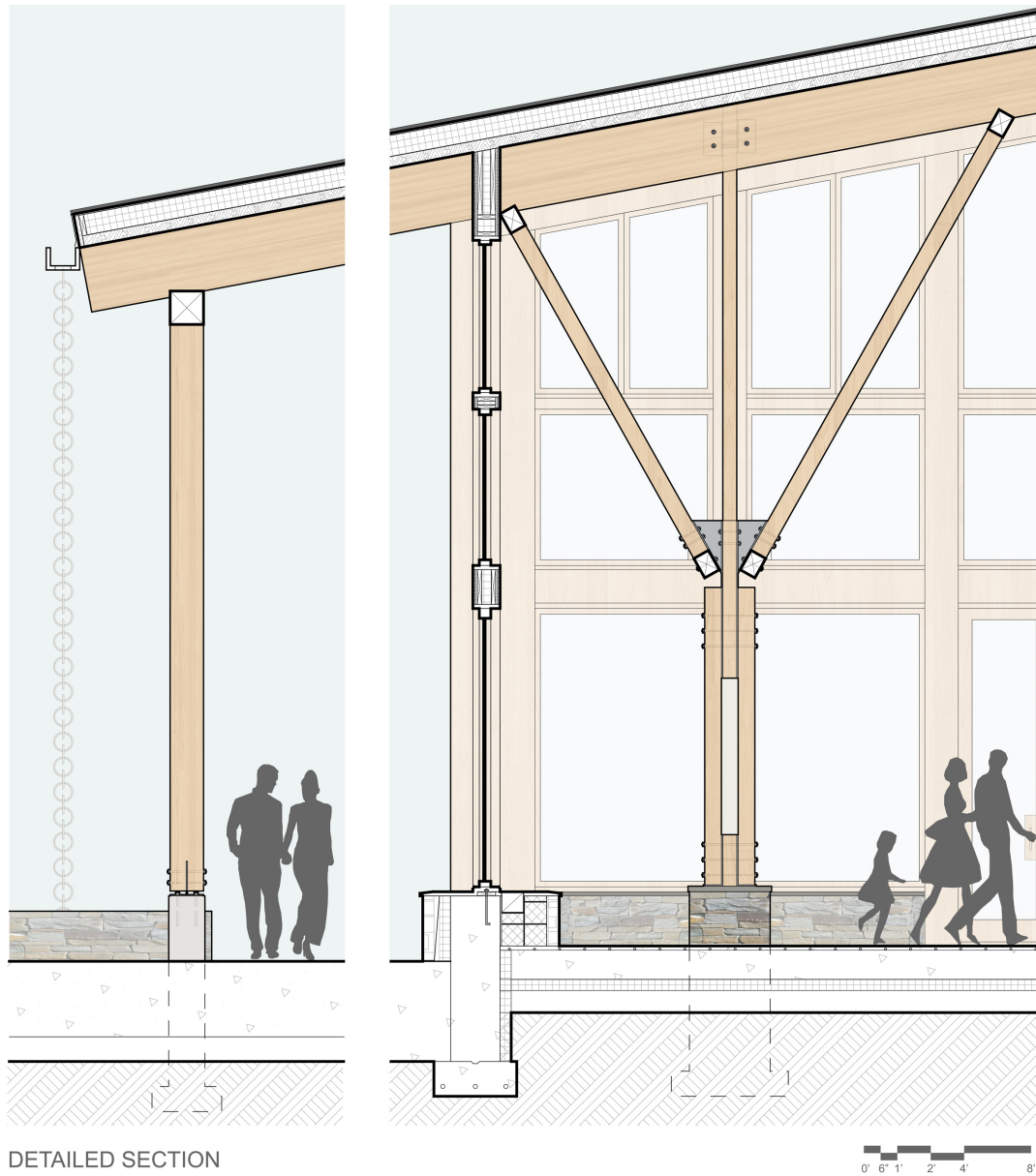


Figure 82: Section Detail showing structure and connections at the Exhibit (Design by Michele Rubenstein with the help of Assistant Professor Powell Draper, Ph.D and Professor of the Practice Peter Noonan)

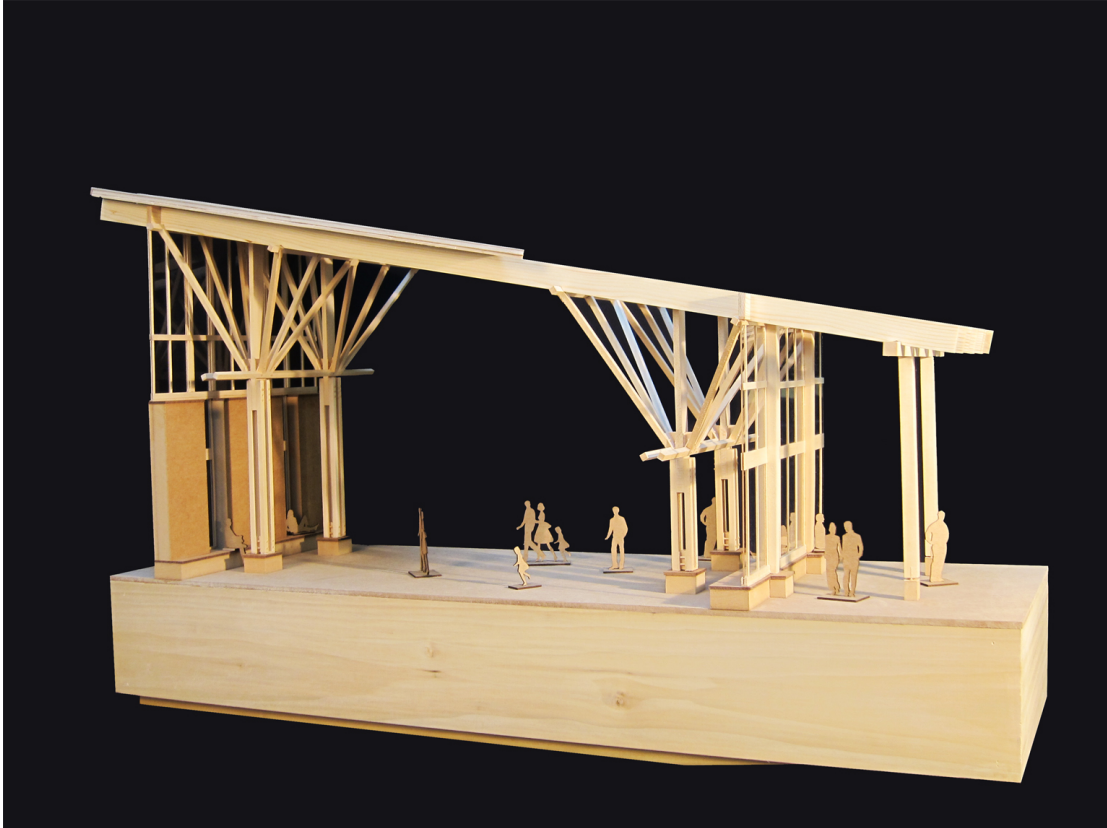


Figure 83: Final Sectional Model through Exhibit (Model constructed by David Ensor, Kristen Fox, Matt Miller, Paul Myers, Michele Rubenstein, and Tom Swift)

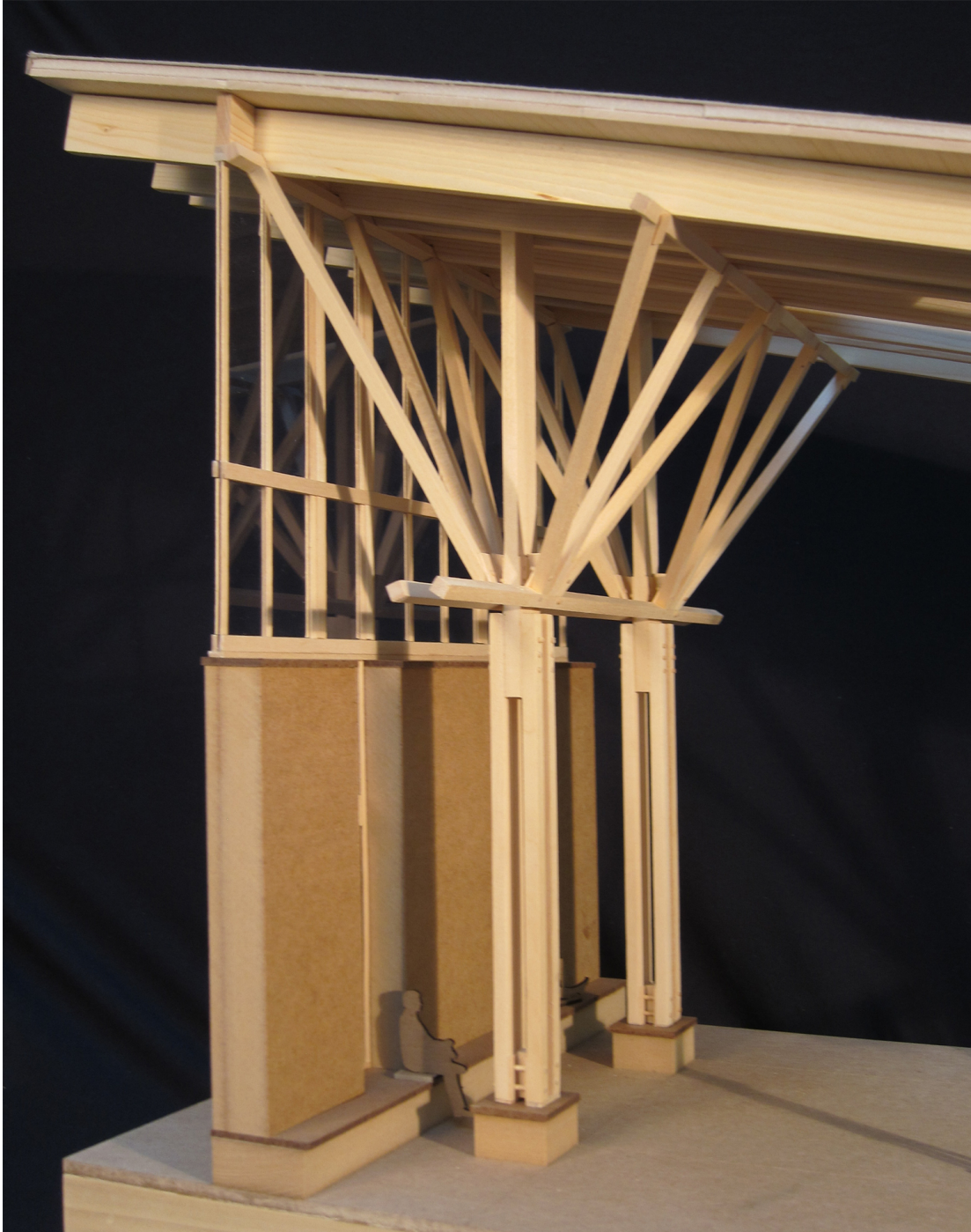


Figure 84: Final Tectonic Model (Model constructed by David Ensor, Kristen Fox, Matt Miller, Paul Myers, Michele Rubenstein, and Tom Swift)

The Exhibit structure represents a series of pieces coming together as an aesthetic and functional whole. The connections are detailed as simple yet unique steel plates with bolts allowing the “branches” to seemingly float above the posts.

The design intended to instill a sense of craft and scale that is often characterized with the great lodges of the west. But, in this case, the design used modern materials such as sawn lumber and steel to reflect out current building techniques.

Conclusions

This project began with the premise that architecture can serve as a threshold to wilderness. In the National Parks, architecture has developed throughout history with grand lodges and the visitor center typology. This study tried to develop a new architectural experience that reflected our current relationship with wilderness in the National Parks and tried to engage the visitor with the place to help promote stewardship. This new architectural experience is called an Interpretive Center. The program merges science and research with traditional visitor center elements to facilitate engagement between visitors and researchers.

The project design goals were to build modestly, improve the visitor experience, create a gathering space, and to frame the view both physically and with education and information. Throughout the process, the study of the building tectonics became the physical manifestation of those goals. The structure of the Interpretive Center reacted to the site conditions and the sense of craft that is embodied in the historic grand lodges.

The project tried to address and raise the questions: How might architecture play a role in the experience of wilderness? And how might our current wilderness condition influence our building decisions?

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