



# SHELTER ISLAND MASTER PLAN

Flathead Lake, Montana

DESIGN THESIS  
"Perfection Inspired Designing"

Prepared By:  
**BENJAMIN P. IWEN**  
May 12, 2005

# SHELTER ISLAND MASTER PLAN

PERFECTION INSPIRED DESIGNING



## SIGNATURES



SHELTER ISLAND MASTER PLAN  
“Perfection Inspired Master Planning”

A Design Thesis Submitted to the  
Department of Architecture and Landscape Architecture  
or North Dakota State University

BY:  
BENJAMIN P. IWEN

In Partial Fulfillment of the Requirements  
for the Degree of  
Bachelor of Landscape Architecture

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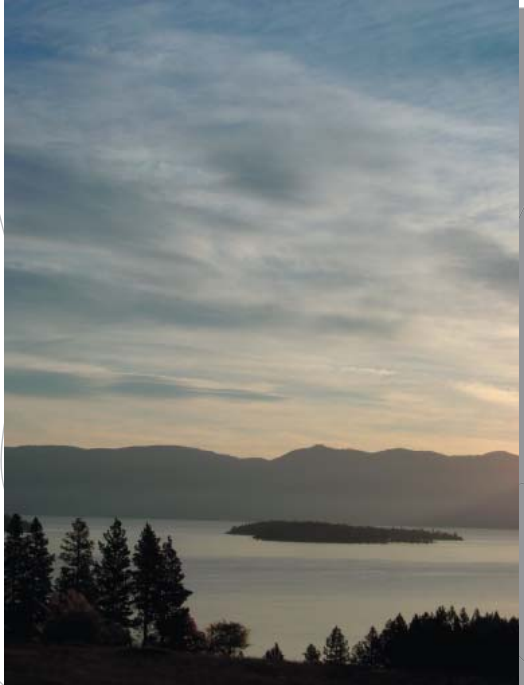
Department Chair

SIGNATURES

May 2005  
Fargo, North Dakota



TABLE OF CONTENTS



Morning view of Shelter Island from the East.

# TABLE OF CONTENTS

<b>Table Of Contents</b> .....	5
<b>Abstract</b> .....	6
<b>Project Introduction</b>	
• Project Introduction.....	7
• Design Methodology.....	7
<b>Project Description</b> .....	8-9
• Site Introduction.....	8
• User client description.....	8
• Project Accomplishments.....	9
• Major Project Elements.....	9
<b>Site History</b> .....	10-11
• Regional History.....	10
• Flathead Lake History.....	11
• Site History.....	11
<b>Site Inventory &amp; Information</b> .....	12-33
• Specific Location & Orientation.....	12
• Existing Structures.....	13
• Future Structures.....	14
• Materials.....	15
• Site Survey.....	16
• Zoning and Land use.....	16
• Economic Base.....	17
• Environmental Issues.....	18
• Transportation & Linkages.....	19
• Site Topography & Landforms.....	20-21
• Views.....	22
• Geology.....	23
• Soils.....	24
• Climate Data.....	25
• Site Hydrology.....	26
• Acoustic Environment.....	27
• Vegetation.....	28-29
• Wildlife/Habitat.....	30
• Cultural.....	31
• Landmarks & Activities.....	32-33
<b>Site Analysis</b> .....	34-35
• Opportunities and Constraints.....	34
• Site Potential.....	34
• Site Analysis Map.....	34
<b>Focused Analysis</b> .....	36-39
• Spatial Use/Separation.....	36
• Building Sites.....	36
• Building Orientation.....	37
• Dock Positioning.....	37
• Trail System.....	38
• Eagles Nest Considerations.....	38
• High Points.....	39
• Hardscape Orientation.....	39
<b>Project Emphasis</b> .....	40-41
<b>Programmatic Requirements</b> .....	42-43
<b>Case Studies</b> .....	44-47
• A Lakeshore Development.....	44
• Small Craft harbors.....	45
• The National Capital.....	46
• California Polytechnic Eng. Plaza.....	47
<b>General Research</b> .....	48-53
• Perfection of Greek Architecture.....	48-49
• Telling Time with the Stars.....	50
• Eagles Nest Habitat.....	51-52
• Designing for Security.....	53
<b>Design Development</b> .....	54-57
<b>Design Solution</b> .....	58-69
• Master Plan.....	58-61
• Plaza Design.....	62-65
• Design Details.....	66-69
<b>Final Presentation</b> .....	70-77
<b>Reference List</b> .....	78-89
<b>Appendix</b> .....	03
• Building Codes - Western Montana.....	80-81
• Flathead Indian Reservation.....	82
• Flathead Lake Erosion Control.....	83-84
• Statement of Intent.....	85
<b>Personal Identification</b> .....	87
<b>Digital Presentation</b> .....	89



ABSTRACT

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It's hard to say how a great designer achieves the perfect design, but it seems we all can recognize these perfect designs when we see them. What separates these great designs from the rest? What procedures in the designing process have brought about these perfect designs? There must be a certain balance and harmony to these design that draws us to these conclusions? I plan on studying these relationships to find out what makes and how to make the perfect design through the study of Greek Architecture. In Greek architecture there was a highly structured system of proportions that related each individual component to the whole building. The Greeks took architecture to a higher level when they built impressive symbols of their society, culture, and temples to their gods. They were influenced by mathematics and used it to create beauty and balance in their design. Many lessons can be learned through the study of Greek architecture and their search for perfection that can be used in the design of Shelter Island. These systems of mathematical proportions can be applied to planning and site detailing to achieve a harmonious Landscape Architectural design. The overall underlying premise of this project is that the principals of ancient Greek architecture can be applied today to yield Landscape Architecture of the highest order.



Fly-Over Photography

## PROJECT INTRODUCTION

**P**ROJECT INTRODUCTION:

There is an island in the middle of Flathead Lake, located deep in a Rocky Mountain ridge of Western Montana that's waiting to be developed. It is surrounded by picturesque views of mountains and crystal clear water. Donald Abbey of "The Abbey Company" has acquired the island and plans to construct a small scale community development to be built by his own employees. Including his own home, he intends to erect homes for those who seek the clean air, calm atmosphere, and the mountainous views of Montana's Flathead Valley, at a place that they can call home.

At the request of the owner, the project is to design the community master plan for the entire island with a concentrated Landscape Architectural plan of the Donald Abbey residence, all taking advantage of one of the countries most beautiful natural settings. The island is 20 acres of rocky forested land and rolling topography. Boats will be the only form of transportation because of the islands distance from the nearest shoreline. Therefore, the island circulation will consists mostly of exploratory walking paths. Each separate residence will have its own unique space in the residential master plan that makes the most of natural elements and land features of the island. A closer more detailed landscape plan of the Abbey residence will reflect the architecture of the building currently being constructed. The natural scenery being the essence of the design, the site will showcase its natural surroundings using all the modern amenities while still preserving its natural beauty.

**D**ESIGN METHODOLOGY:

A study of Greek architecture will help with the perfection of the design process. In their architecture the Greeks used a highly structured system of proportions that related each individual component of every design to the whole building. The Greeks proved that they had reached a higher level of design when they built impressive symbols of their society, culture, and temples to their gods, a lot of which still stand today. The influence mathematics had on them helped to create beauty and balance in their designs. With each new architectural project they overtook there designs became more complex and came a few steps closer to there ultimate goal of perfection. Greek architecture and their search for perfection will be studied so that many lessons can be learned and applied to modern designing today.

An understanding of the Greek method of architecture will bring this project to a higher level of design. Using their system of proportions in the design of the landscape, perfection will be sought in all aspects of the design, just as it was 3000 years ago. This understanding of Greek perfection in combination with the study of secluded small scale community planning will help with the creation of a tranquil sanctuary away from common day living.



## PROJECT DESCRIPTION

### SITE INTRODUCTION:

The site's ideal location is the building premise for the inspiration of the entire project. It has stirred a dream for the owner to build his own home along with the construction of several other homes so that he and others can enjoy this natural setting. All around there are picturesque views of the Montana skyline. These many views can be captured looking off the site; views of the lake and views of the great Rocky Mountain range in the distance. The site's natural setting and its seclusion are the main reasons for the inspiration of the project. The Island, located on the crystal clear waters of Flathead Lake, lays nestled among the green forested mountains of northwest Montana in the Rocky Mountains near Glacier National Park. With an area of 191.5 Sq miles, it is the biggest freshwater lake west of the Mississippi River. The island's dynamic topography and forested landscape create the perfect setting for a home.

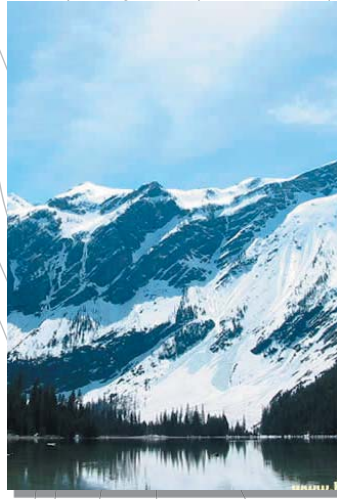
### USER CLIENT DESCRIPTION:

The client, Mr. Donald Abbey has requested a Landscape Architectural solution to the layout of his current construction project on Flathead Lake. The site has been planned to become a small scale community development. Mr. Abbey has already started construction on the site, with the completion of his personal boathouse and the pouring of the foundation for his personal residence. In addition to his own residence he wants a preplanned communal layout for family homes on the rest of the island. The homes will each be separate single family residences. Each separate residence will have its own unique space in the residential master plan that makes the most of natural elements and land features of the island. Even though he plans to sell the residential plots, he has a few clauses that must be followed by the buyers. Each buyer can design their own house but they must use the employees of the Donald Abbey to build their home and the home must be a multi million dollar project. The design of each family home has not been completed and won't be completed until a future date. Landscape Architect must create unique spaces for each home and plan where their general locations will be along with the connections between each home.



## PROJECT ACCOMPLISHMENTS:

The main project accomplishment for the Shelter Island Project is a landscape architectural solution of a community master plan of the entire island. A very small scale residential development is to be strategically laid out across the island making the most of the space and natural features of the island. There will be an addition of five more house plots to the already in progress personal residence of Mr. Abbey himself. A private and unique space will be created for each home making the most of the island's topography. An eagles nest needs to be taken into account for. Special consideration will be done to make sure the eagles will continue to nest here for years to come. Erosion control will be watched carefully especially when construction is in progress so that the water quality of the lake is not diminished. Also, different methods of landscape buffers will be studied so that the harsh evidence of development on the lake isn't as much of an eyesore. A trail system will go through the island making it more of a shared community. Even though each residence will have its own private space they still will have the opportunity to be a community through the use of a shared trail system and other shared spaces. There will also be an emphasis designing for security. Since the property is owned by such a high profile person a lot of security measures will need to be taken. Different methods will be looked at on the use of landscape security in order to keep people from trespassing and infringing on the residences privacy.



## MAJOR PROJECT ELEMENTS:

- Vistas of the Mountains and Lake
- Intimate Spaces
- Interconnecting Trail systems
- Docking & Boathouses facilities
- Landscape Planning
- Shoreline Preservation
- Boardwalks
- Plazas and Shared Spaces
- Forest Restoration for Recreational Use
- Possible Shared Docking
- Small Scale Residential Planning
- Design Details
- Viewing Structures or Towers
- Island Security Measures
- Eagles Nest Protection
- Natural Vegetation Restoration
- Preservation of History
- Site Interconnection Nodes
- Axial Relationships
- Enclosed Private Spaces

## REGIONAL HISTORY:

Indians were the first inhabitants of Montana. East of the Rockies lived three separate tribes, one of them being the Black Foot Nation whom occupied most of the area and drove most of the other tribes out with help from the rifles they traded from the white man. Fur trappers arrived in Montana after soon after Lewis and Clark explored the area in 1804-06. These traders explored, hunted, trapped, and traded into the 1860s. The fur traders introduced the first marketing economy into Montana through trading. Fur traders explored, mapped, and wrote descriptions of the territory. They brought a commercial relationship and dependency on manufactured goods. They also brought epidemic diseases that devastated some tribes and affected all. (Hamilton 1970)

With the discovery of gold in the 1860s gold seekers came from all over the west and eastern populations. Unlike most fur traders, the gold seekers and the business people who lived off them saw the Indians as obstacles. Montana's gold-rush influenced Congress to create Montana Territory in 1864. The arrival of the railroads to Montana in the late 19th century also made possible the rise of industrial mining. The Anaconda Power Company became the dominant corporate supremacy in Montana. The "Company" controlled Montana's economics, journalism, politics, and even the state legislature, well into the 1960s. (Hamilton 1970)

Oil, natural gas, and coal industries operated in central and eastern Montana. An energy crisis in the 1970s suddenly created a strong demand for Montana coal. In the last decades of this prosperous era, Montana's tourism industry emerged as the Treasure State's second most productive economic mainstay, right behind agriculture. Eventually a federal interstate highway system was built. In 1970 a new constitution expanded the governor's powers, modernized the legislature, and enabled voters to enact and repeal laws by initiative and referendum. (Spritzer 1999)

## SITE HISTORY



Early Fur traders of Montana



Oil, natural gas, and coal industries operated in Montana



Agriculture is still the largest part of the economy. Pictures Courtesy of Hamilton 1970

## FLATHEAD LAKE HISTORY:

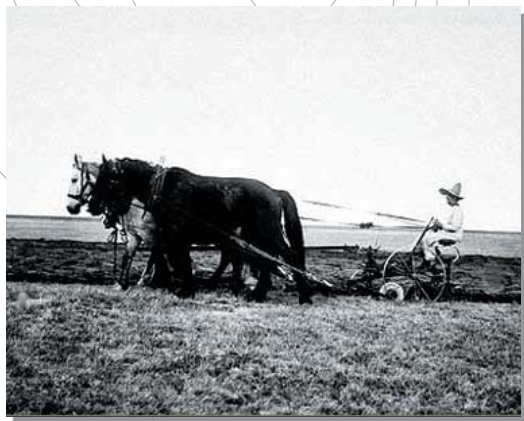
In the 1840s, Polson was the first settlement on Flathead Lake. The first wagon trail (1880's) from Polson to the north end of the Lake followed the west side of the lake and was steep and hazardous. At some places, wagons had to be lowered by ropes. In 1904 the Great Northern moves its main line from Kalispell to Whitefish to take advantage of a lower route down the Kootenai River that eliminated 165 curves in the track. In 1911, work started from the south end of the Lake to build an east shore road with the work primarily done by convict labor. It was not completed until September, 1946. In 1938 the Kerr Dam was built at Polson. The concrete structure is 204 feet high and controls the top 10 feet of Flathead Lake. In 1947 the Big Mountain is launched with and it grows into a resort boasting 3,600 acres of skiable terrain and 10 lifts. In 1988 Forest Fires sweep the West, including a 37, 500-acre fire on Glacier National Park's west edge. (Spritzer 1999)



First picture of the site from the early 1900

## SITE HISTORY:

The site encompasses the whole island of Shelter Island and there hasn't really been any history recorded on the island. In the early 1900 the island was logged and looked pretty scares for many years but eventually the trees cam back and filled the island back to its present condition. Most of the history has been passed by word of mouth. For the last hundred years it has been passed down through a family that first settled and still owes part of the island. Only in the last few years have parts of it been sold off to Donald Abbey to start construction. As of yet the family still owns the Northeastern corner of the island but soon plans to sell the rest of the island off the Mr. Abbey.



Early Farmers of Montana  
Pictures Courtesy of Hamilton 1970

# SITE INVENTORY & INFORMATION

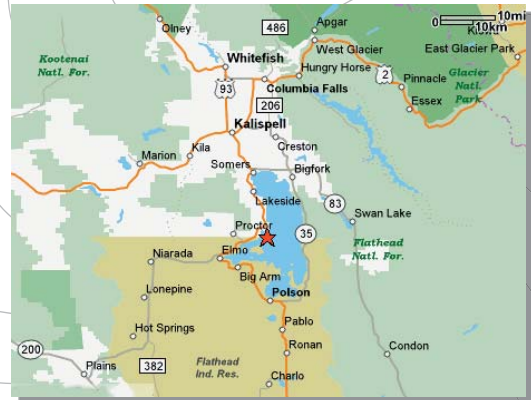
## SPECIFIC LOCATION & ORIENTATION:

The site, "Shelter Island", is located on the Western end of Montana in the mountains to the south of Glacier National Park. It's a 20 acre island close to the Eastern shore of Flathead Lake, North of Wild Horse Island. Another island is only a few hundred yards off to the East and is called Cedar Island. Another very small island is located between the two islands named Rock Island and basically that is all it is, a rock sticking out of the water with a few trees perched on it. The nearest mainland to the north is about .33 miles. The distance to the Main Land Boat House, which is off the West, is about 1.7 miles. Wild Horse Island is located about 3 miles off to the Southwest of the site. The largest area of open water is to the Southeast of the island where water reaches depths of 260 feet. The Abbey residence is located on the southern tip of the island and faces the open part of the lake to the south.

### STATE WIDE



### REGIONAL



### LOCAL



Pictures Courtesy of Mapquest.com

## EXISTING STRUCTURES:

Before the builders came in there was only one existing structure which still stands today. It is an old primitive cabin that is located on the North-eastern tip of the island. This structure has no power except for that which comes from a gas-powered generator. It is built from old cedar logs and is in pretty bad condition, showing signs of its age and primal building methods. The owner has already started construction on the site with the completion of a mainland boat house and a house converted into an office for the builders. A boathouse/guesthouse on the island has already been completed and is in use by the owner. Some docks have already been constructed and most of the footings for the owner's main residence have already been poured and that is all that has been finished up until this point on that building. Some grading has been done and a power station for a generator has been placed in the center of the island in case the power from the underwater hard line ever goes out.



Completed Island Guest/Boathouse



Power Station and control for the Island



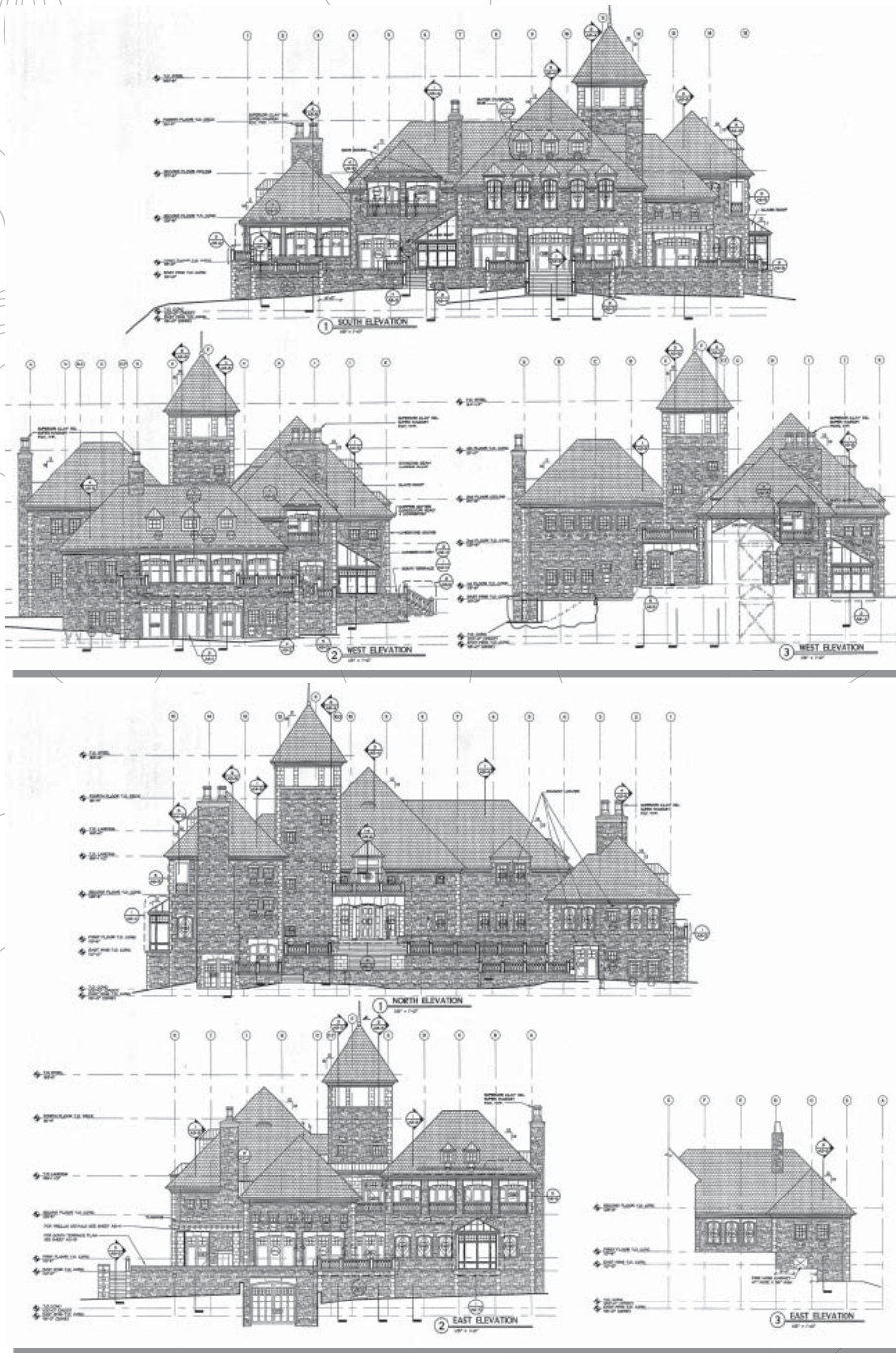
Completed Main Land Boat House



Completed Docking Facilities



Existing Primitive Cabin



Images from Construction Drawings of Abbey Residence.

### FUTURE STRUCTURES / PROJECTS:

The future projects on the site include the construction of the Abbey residence and surrounding support structures. Most of the footings and basements have been prepared for this project; however, further construction has stood idle for the past two years due to legal problems the owner has had with the contractor. The new buildings

are to reflect the same design and materials as the other existing built structures on the site. The same materials will be used in the overall construction. The residence is to be located on the southern tip of the island facing over the open water. When completed it will stand almost three stories tall and have stunning architecture that will compliment the areas surroundings.

### MATERIALS:

There are many different rocks and stones that are being used in the construction of the new buildings. Blue Stone is shipped in from the East coast and is the material used for the base of most of the walks, plazas, and patios. Edging on the buildings along with steps and banisters are carved out of limestone that comes from Indiana. The roofs on all the structures are made of slate which is shipped all the way from Virginia. There is also a native rock that has been used and is extensively used as the most abundant façade for the project. It is a native rock with a mossy edge that comes from a nearby quarry called Kelly Quarry which Mr. Abbey has bought the rights to. This way he will have no trouble getting the stone he needs when he needs it and doesn't have to worry about running out of this particular rock. Another feature that is prominent on each of the structures is the copper work of the gutters and flashing along with the use of Mahogany woodwork, which will continue to be a common theme throughout the structures.



Mossy Edged Native Rock from Kelly Quarry



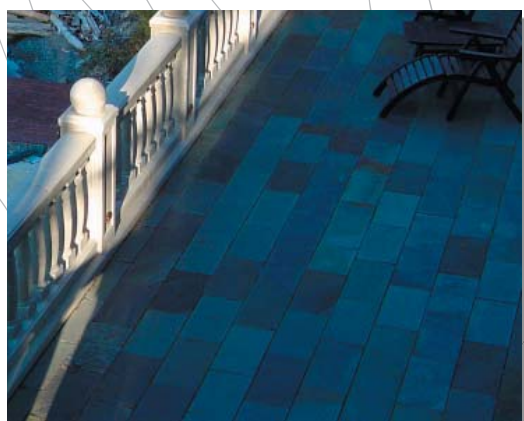
Limestone carvings from Indiana



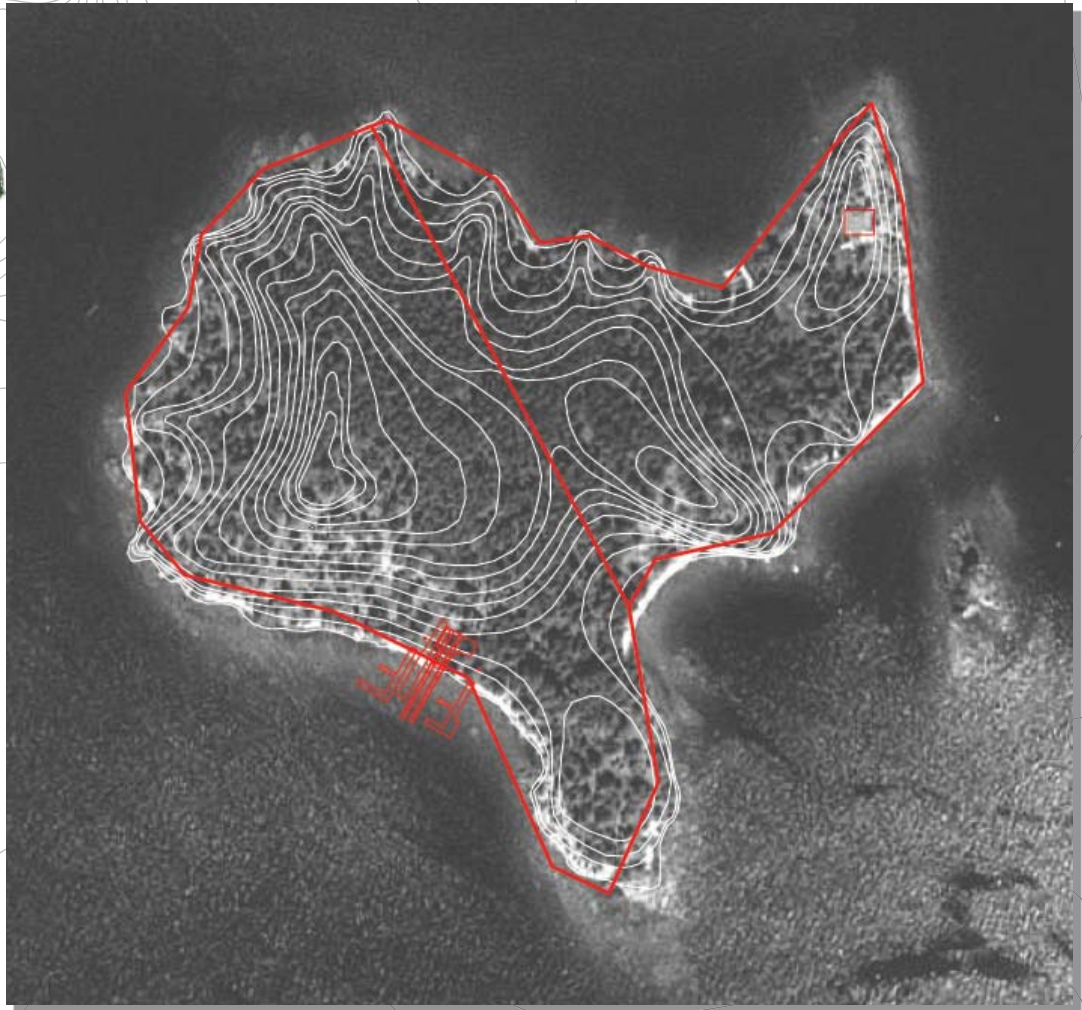
Mahogany Woodwork and Timbers



Copper accents of Gutters and Flashing



Blue Stone for Walks, Plazas, and Patios.



## SITE SURVEY:

Warren L. Hersman a land surveyor surveyed the land and stated his findings during the month of November 1974. He made a careful and accurate retracement survey of the tracts shown and that the Plate was in strict conformity to the said survey and the courses and distances were true and correct to the best of his knowledge and belief. The property corners were plotted from the field notes of the U.S. Government Survey of Shelter Island and the tract was closed on the bearing of N13degrees23'21"W. Shelter island is located in government Lot 3, Section 28, Township 25 North, Range 20 West, M.P.H., Lake Country Montana. The map above illustrates the survey lines in red.

## ZONING & LAND USE

The Flathead watershed is a special place with very extraordinary qualities that make it a magnet for population growth. The Flathead Watershed is one of the fastest growing areas in the state. From 1990 to 2000 Lake County and Flathead County grew by 26% while the state population as a whole grew by about 13%. The problems that are often associated with growth are emerging in the area such as degradation of water quality, air quality, wildlife habitat, and the loss of family farms and open spaces. The problems the communities in Flathead face are how to accommodate growth and provide economic opportunities while maintaining the quality of life residents now enjoy. Zoning and Land Use can help communities guide growth and development while protecting clean water and other important resources. (Flathead County Zoning Regulations 1993)



## ECONOMIC BASE:

The Flathead County has three incorporated cities; Kalispell, Whitefish, and Bigfork. Kalispell only a few miles from the site is one of America's top ten western towns. Whitefish is at the base of the Big Mountain Ski Resort and is the gateway to Glacier National Park. Bigfork is a wonderful town located on the shores of Flathead Lake. Each of these communities is thriving and has its own unique features but they all have encouraged new job creation. Flathead County has a population of 75,000 with a workforce of 39,000. During the 90's the county's population grew 24%. Public schools in the area are excellent. Test scores are consistently more than 25% above the national average producing bright workers with superb work ethic. The crime in the area ranks among the lowest in the nation. (Flathead County Overview 2004)

There are two hospitals in the area and Glacier International Airport offers flights out of Kalispell. Burlington Northern operates a busy rail yard in Whitefish along with Amtrak's Empire Builder, which runs from Chicago to Seattle. Telecommunications has been a key factor in the Valley's evolving business community. The use of state of the art infrastructure has attracted communications dependent companies to provide support to major players in the computer industry. The economic base in the in the Flathead area has most definitely been booming and will continue to do well. (Flathead County Overview 2004)

The on site economics are very simple. The owner, Mr. Abbey, is an independently wealthy man who had decided to spare no expense when it comes to the construction and design of this project that has been so important to him. The quality of materials and the construction are so far and will continue to be the best of the best. It doesn't really madder the cost of the Landscape Architectural design, the owner is willing to spend any amount in the completion of this project to ensure that it reaches perfection. The site is to be laid out into individualized spaces for multi million dollar homes. These new homes will fuel the Flathead Valley workforce creating jobs.



Glacier International Airport in Kalispell, MT.



Amtrak Passenger Trains stop in Whitefish. Pictures Courtesy of Amtrak



Big Mountain Ski Resort and is the gateway to Glacier National Park. Pictures Courtesy of Big Mountain.

## ENVIRONMENTAL ISSUES:

One of the Major Environmental issues for the project is that there is a Bald Eagle's nest located on the site. This has been a major issue influencing any future growth on the site. A few years ago when the project was started on Shelter Island an Eagle Observation Biologist had to be called in to observe the eagle during the construction. For a few seasons the nest was watched and the eagles habits were watched very closely to see if the construction on the site had any affect on the eagle. Some eagles are very picky and might be bothered by all of the movement on the island during the construction. But, other eagles don't mind the interaction with humans and that is why a biologist had to be called in, to see whether the eagle would be able to adapt to the new construction and closer interaction with humans. The eagles nest is located atop a high dead tree on the island and is visible from the North and the East looking on the island. The tree is so old that a few years ago supports had to be brought in to make sure the tree didn't come down. Steel cables now support the tree from all angles making sure it doesn't sway or fall. Each year the eagle has come back, even since the new construction. The Eagle Observation Biologist conducted her studies and over a few seasons concluded that the construction has had no effect on the habits of this particular eagle. It seems that the eagles nest is safe but careful consideration must be taken in the overall construction of the island to make sure it doesn't disturb the eagle's environment. Hopefully the eagle will come back for years to come after the completion of the island. Buffering will be done to make sure that this happens and the habits of the eagle will continue to be watched. There is also a possibility that the eagles nest can be moved and the eagle might be educed into relocating. This is something that will be considered in order to give the eagle a better location on the island with a sturdier foundation for the nest. (Beattie 1995) (Paige 2001)



On site Eagles nest atop dead tree.

There are a lot of water-quality issues on the lake. Most environmental issues are watched over by the Flathead Biological station, like the water quality. Water-quality advances have been noticed due to improvements of mining, forestry, agricultural-related activities, and the treatment of municipal and industrial wastes. Some water quality issues that are still a concern are: Toxic trace elements in surface water and ground water, Nutrients in surface water and ground water from point and non-point sources, degradation of surface water and ground water from urban areas and suburban development, sedimentation from timber harvesting and agriculture, and effects of these inputs on aquatic biological communities. There has been a lot of residential and commercial shoreline development and recreational use that could possibly hurt nutrient enrichment for Flathead Lake. Increased sediment loads from timber harvesting and continuous road building, and from agriculture may be responsible for declines in populations of native trout species. Water quality in these alluvial aquifers generally is good but some parts of these aquifers have been adversely affected by human activities. During construction on the site everything needs to be done to make sure that the water quality is not negatively affected. (Flathead Lake Biological Station 2004)

## TRANSPORTATION & LINKAGES:

The closest town to the site is Rollins, MT, about one mile to the North of the island on the western edge of the lake. The town consists of a Gas station, post office, and fire hall. There are few residents in the town because most people in the area live in the mountains in secluded areas and only come into town for supplies. For the most part the people who live in the area all have their own space and enjoy the seclusion of peaceful mountains. The closest city, about an hour away from the site, is Kalispell, MT which is on the way to Glacier National Park and has a population of about 12,000. There will be no vehicular transportation on the site since there is now way to drive a vehicle to the site. Future residents of the island will have to store there cars on shore in a Main Land Boat House and ride a boat or a barge to the island. Access to the shoreline is simple because there is a drive that goes along the lakeshore. Highway 93 follows the lakeshore all the way from Polson up through Somers and continues from the lake another seven miles into Kalispell and then on to Whitefish. Another important thing to note about access to the site is that driving across a frozen lake is not an option because of the immense size of the lake. It is not a common occurrence that the lake will freeze, it only happens about once ever ten years.



Docked boat in Main Land Boat House Garage



Service/Transportation Barges



Highway 93 Follows the shoreline through Rollins, MT  
Image Courtesy of Mapquest.



Rocky Beach Shores



Forested Coniferous Landscape



Rocky Rough Terrain



Rock Outcroppings that define the whole island

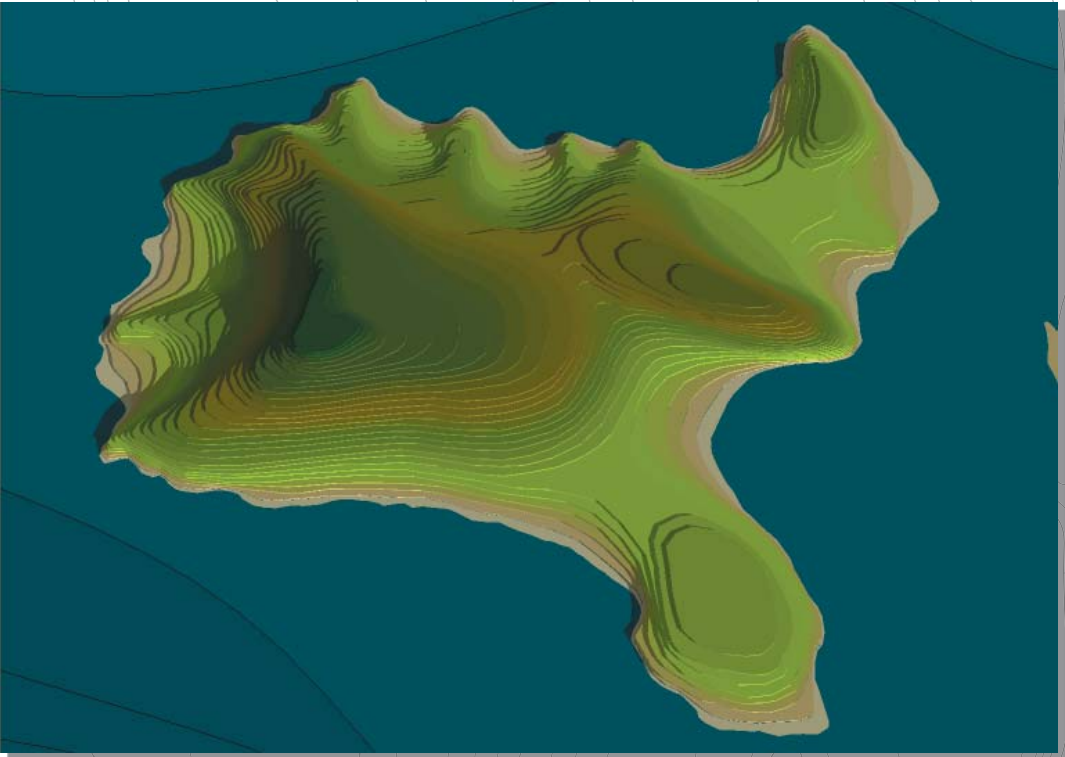


Cliffs along waters edge

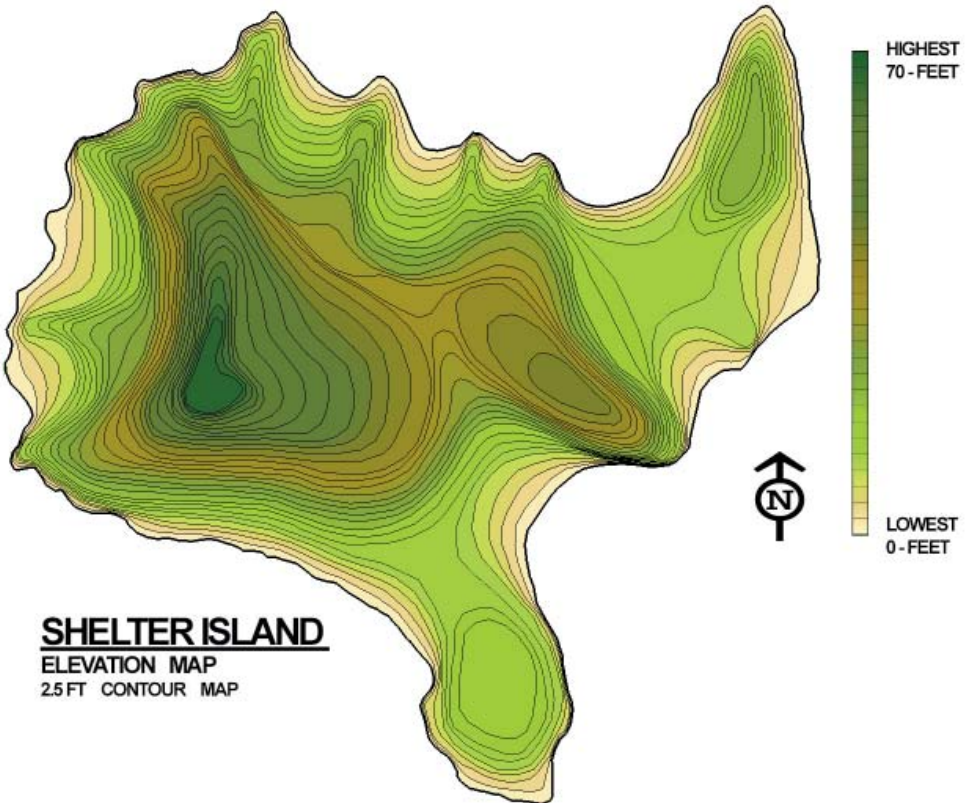
## SITE TOPOGRAPHY & LANDFORMS:

The site is blanketed with interesting topography. The rocky landscape and geology of the site create lots of cliffs and hills that generate unique features splitting the island up into separate spaces. These natural spaces will be perfect areas for housing and will create a natural separation between each residence. Even though the island is small there's only one location on the island where a person can stand and see the entire landscape without looking into a cliff or a hill, this being the highpoint near the center of the island. The shape of the island is also very remarkable in that there are nice coves away from the open lake and prominent points that protrude out into the lake. From a distance the island looks like a mound because on a macro scale

it is basically a rock protruding out of the water. Most of the shoreline is rocky and blasting has already been done for some of the previous construction and foundation work. The foundations will be very strong on the site because they will be poured almost directly on the solid rock below. The large trees on site also create interesting landforms and shape areas throughout the site.



3D Image of Elevation Contours.



Shelter Island Elevation Map.



View approaching the island from the East.

## SITE VIEWS:

There are fabulous views on and off site that captivate the viewers. In any direction there are views of mountain tops and hill tops reflecting off the crystal clear waters of Flathead Lake. The sun shines off the clear water lighting up the site. The large mountains are far enough away that they don't even cast shadows on the island and when the sun does peek up over the mountains in the morning it is a spectacular site on a clear day. Since the topography of the site is so diverse there are opportunities to create framed views looking off site over the lake. To the Southwest of the site there is wide open water that stretches miles. Across the lake 12 miles to the East there are snow capped mountains. Off to the Northeast there are vast rolling mountainous hills and off to the Southwest there are views of other islands in the large open waters. Views onto the site are magnificent also; the island is a prominent feature as it protrudes high above the water level of the lake with its thick forested ground cover.



View off the Southern Point of the island.



View of sailboats on the lake.



Views of snow covered mountains in the distance.

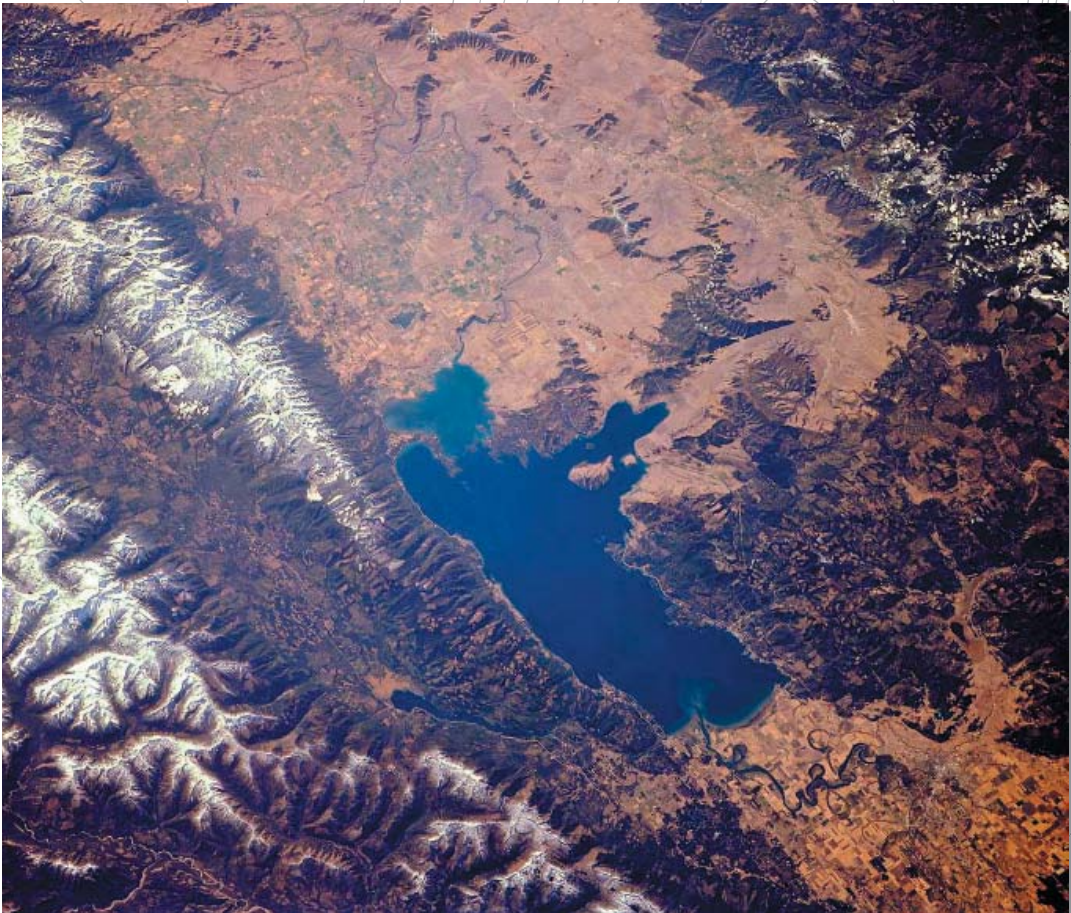


Mountains through the trees looking off site.

## GEOLOGY:

Flathead Lake was created by glacial movement with ice sheets that created dams which ended about 10,000 years ago. Many of the distinguishing features of the Ice Age Floods remain through the region today. The region is mostly underlain by rocks and much of the region is covered with various glacial deposits. During the last ice age an enormous glacier filled the Rocky Mountain trench. As the ice age continued a monstrous glacier slowly pushed south through the Flathead Valley. Polson is located on a moraine because it forms a prominent ridge across the valley. People driving north on Highway 93 get their first view of Flathead Lake just as they reach the crest of the Polson moraine. The large size of the Polson moraine suggests that the ice front must have remained at that position for quite a few years. During the summers of those years, glacial melt water washed loads of sand and gravel through old stream channels across that moraine and spread

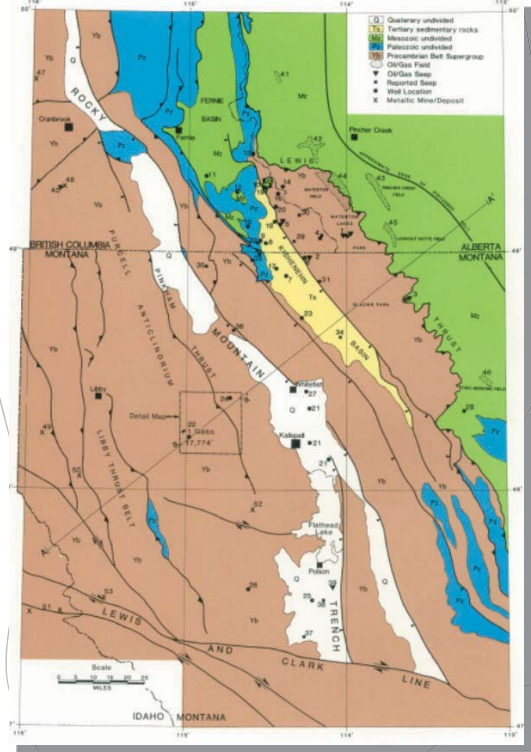
them across the valley floor to the south. There is abundant evidence that the great ice age glaciers melted very rapidly, probably within a couple thousand years. The glaciers thinned and began to shrivel and finally stopped moving becoming great sheets of stagnant ice lying upon the land. Flathead lake was created from the melt water of this vast stagnate glacier. Flathead Lake is partially drained and lake level must once have reached the crest of the Polson moraine which is proven by lake sediment. Over the years Flathead River broke through the marine at Polson and began rapidly eroding cutting down to the elevation of the buried hill. The hard bedrock slowed it down and so saved Flathead Lake. Since then the river has cut a narrow gorge through that buried bedrock hill and is now the site of Kerr Dam which now maintains the lakes levels. (Flathead Region Geology 2004) (Flathead Lake History 2002)



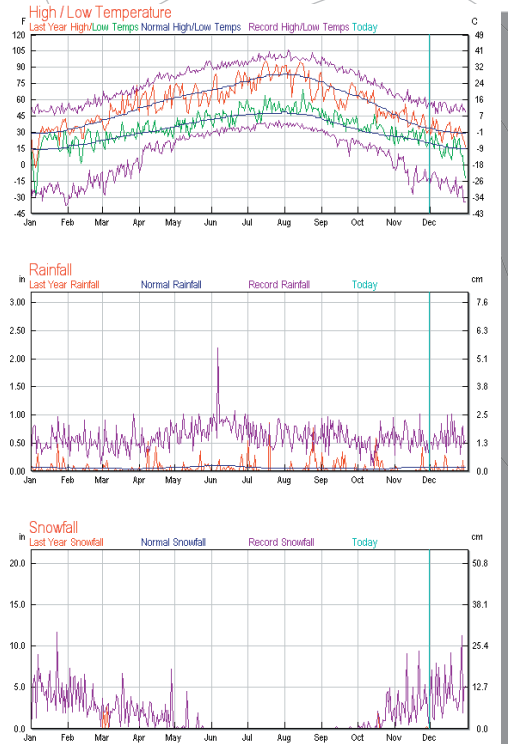
View from the Space Shuttle showing the scar the glacier when forming Flathead Valley.

## SOILS:

The area is mainly glaciated mountain slopes and moraines with numerous outcroppings throughout the site. The parent material is glacial till and netasedimentary rocks. The soil type is Typic Eutroboralf which are soils of minor extent at low elevations. The Glossic Cryoboralfs are soils of minor extent that have formed in till derived from weathered rocks or soft sedimentary rocks. The base saturation is 60 percent or more in the subsoil. Some pedons are mandated with loess that ranges from 1 to 6 inches thick. The loess has been influenced by volcanic ash. Dry bulk density ranges from 0.65 to 0.95 grams per cubic centimeter. The O horizon is 0 to 2 inches thick and is composed of decomposed needles with very fine roots. The B horizon is 0 to 4 inches thick and is composed of silt loam, many fine roots, few medium course roots, and very fine discontinuous interstitial pores. The E horizon is at 5 to 10 inches thick and its content of rock fragments ranges from 0 to 20 percent. These soil areas are mostly moist mixed forest. There is moderate susceptibility of surface layer and moderate soil to erosion in the lower layer. (United States Department of Agriculture 1988)



The region is largely underlain by rocks.



Average Temperature, Rainfall, and Snowfall.

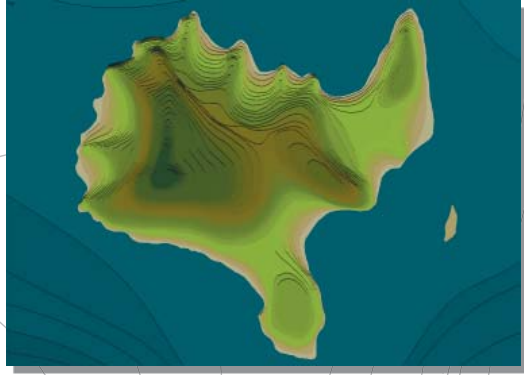


## CLIMATE DATA:

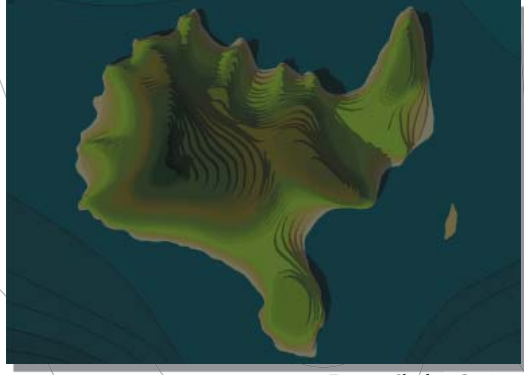
The weather in the Flathead Area is generally mild. Flathead's location on the western side of the continental divide has earned the Valley a reputation inside the state as the "banana belt." The area enjoys 4 distinct and spectacular seasons. There are very few places in the world where you can ski, golf and sail, occasionally on the same day. The average annual temperature is about 42.8 degrees with a winter average of well above freezing at 36 degrees and a pleasant average summer temperature of 78 degrees. There isn't much for annual precipitation in the area with only 18.51 inches of rainfall a year and an average of 55.2 inches of snowfall. The growing season is about 104-129 days and most of the county is at an elevation of about 3000-10,000 feet. Prevailing winds are usually out of the Southeast from the site. Due to its massive volume and normally active winds over the surface, Flathead Lake does not freeze over most winters, although the bays often have winter ice cover. The Lake did freeze over in the winters of 1978-79 (all winter), 1987-88 (all winter), 1988-89 (March only) and 1989-90 (January only). In its nurturing micro-climates the Valley grows a variety of crops that distinguish it from the grain and stock mainstays of central and eastern Montana. As you look around the lake you can find peppermint, Christmas trees, cherries, champagne grapes (stop in at Mission Mountain Winery), as well as barley, wheat, oats and potatoes. Flathead National Forest and the Flathead Indian Reservation encircle this patchwork agriculture. The trees and topography on site create many spaces for micro climates which are sheltered from the prevailing winds or shaded from the hot sun. (Western Regional Climate Center 2004) (Western Regional Climate Center 2004)



Morning Shadow Castings



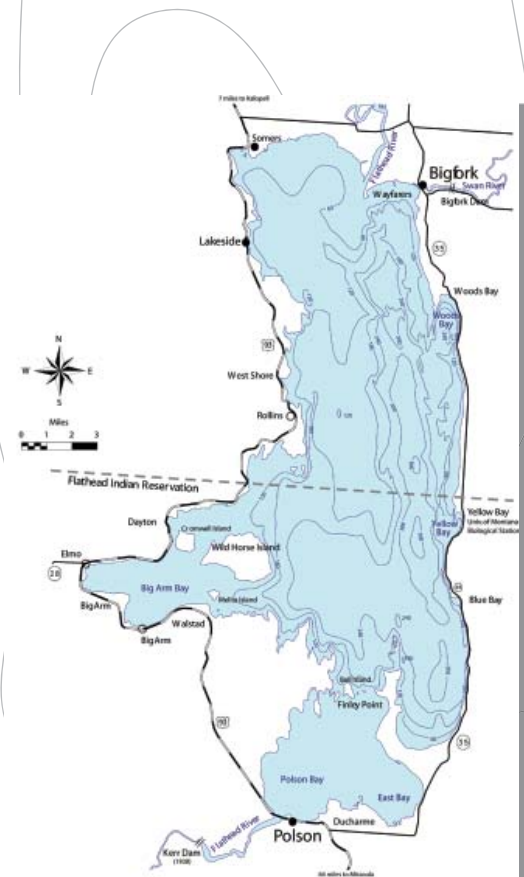
Noon Shadow Castings



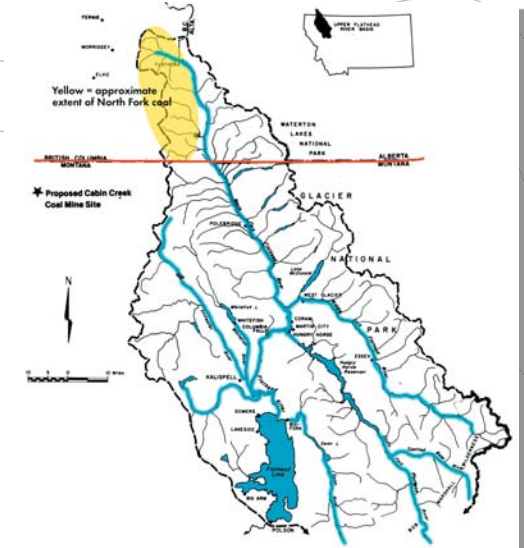
Evening Shadow Castings

## SITE HYDROLOGY:

Flathead Lake is one of the 300 largest natural lakes in the world and at 29 miles long and up to 15 miles wide reaching depths of 386 feet it is the largest natural freshwater lake in the western United States. Of those large lakes, Flathead is one of the cleanest. Studies at the Flathead Lake Biological Station show that water quality in Flathead Lake is among the best in the world. The Lake's major tributaries are the Flathead and Swan Rivers. Numerous small streams flow directly into the Lake at its shoreline, particularly on the wetter East Shore. Kerr Dam is located at the outlet of Flathead Lake in Polson, at the southern end. Regulation of outflow by the dam maintains the Lake's level between 2,883 and 2,893 feet above sea level. If runoff conditions in the mountains warrant flood threats, the Lake level is controlled by the dam fluctuating ten feet with its highest point in the summer and its lowest point in the winter. The low depth of the water protects the shores from any ice heaving in the winter. Maximum flow in Flathead River generally occurs during spring freshet between May 15 and June 10, creating a plume of sediment that covers the Lake surface. The average surface temperatures of the lake range from 2.3°C (36°F) in mid-January, to 13.5°C (56°F) in mid-June, to 20.3°C (68°F) in mid-August. In spite of its renowned purity, studies at the Bio Station show the water quality of Flathead Lake has declined over the last decade due to the combined effects of increased pollution from human sources, erosion of the shoreline caused by dam operations, and introduction of nonnative biota (flora and fauna). (About Flathead Lake 2004)



Flathead Lake Depth Map



Flathead Lake Watershed



Kerr Dam controls the top 10 Feet of the lake.

## ACOUSTIC ENVIRONMENT:

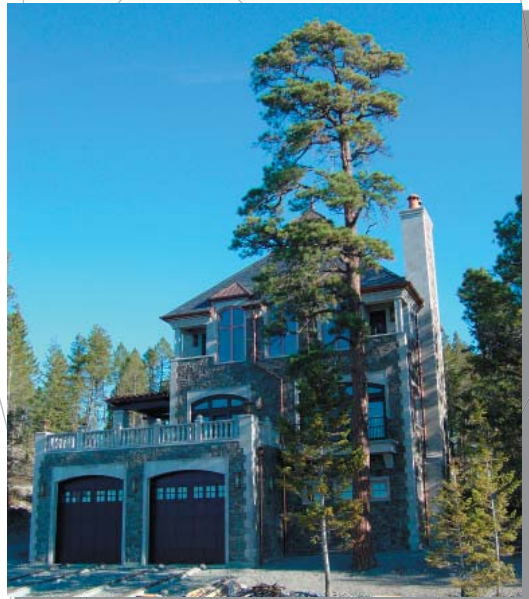
The acoustic environment on the site is one that has no real intrusions from the outside world other than the sounds of nature itself. It's seclusion from the worldly environment truly makes the island acoustically unique. The large timbers on the site brush together in the wind creating a calming background noise. There is the sound of small waves crashing on all the shores of the island and other sounds of waves rolling across the lake. Animals can also be heard as they move through the forested landscape. There are no sounds of cars wising by because there are no roads anywhere near the site. The closest thing to the sound of a motorized vehicle might be the rare occurrence that a boat may drive by over the water. All of the other sounds found in communities and cities are non existent on the site. Only the natural sounds of nature can be heard which makes the site quite uniquely peaceful.



Peaceful environment of the forest.

## VEGETATION:

One thing the owner plans on doing is restoring the natural vegetation by removing some trees and planting a tough grass mix recommended by a local forester to prevent erosion during and after construction. The island is mostly forested wooded area consisting of Ponderosa Pine, Douglas Fur, and Spruce Trees. The site has been logged recently to harness control over the recent "Missile Toe" problem with the Spruce Trees and open up the island for future growth. Missile Toe is a disease that spreads through Spruce and makes them grow in deformities and clumping. So, these trees needed to be logged out or eventually the whole island would have been taken over by the disease. The logging company cleared about half of the trees off the island in hopes that it will encourage healthier growth in the future. A few other common trees found in the area were Aspen and Western Larch, a conifer that loses it's needles in the winter. A previous landscape architect was used to find a landscape architectural design around the Main Land Boat House. He used a few native plants from around the area to create pleasant, low maintenance, vegetative plantings around the base of the building. This plants list included on the next page.



Gigantic Ponderosa Pine are scattered throughout the island.



The Wester Larch is common to the area.



A mix of Douglas Fur and Spruce trees.

# PLANT LIST

## TREES:

Apple Tree,  
 Pinus ponderosa,  
 Populus tremuloides,

Varieties selected by owner  
 Ponderosa Pine  
 Quaking Aspen

## SHRUBS:

Caryopteris clandonensis,  
 Cornus baileyi,  
 Cotoneaster apiculata,  
 Euonymus alatus compactus,  
 Mahonia repens,  
 Shrub Rose "Carefree Delight"  
 Rose "Dwarf Pavement"  
 Rose "Jens Munk"

Blue Mist Spiraea  
 Bailey's Redtwigged Dogwood  
 Cranberry Cotoneaster  
 Compact Winged Euonymus  
 Creeping Mahonia

## PERENNIALS:

Anemone hybrida "honorine jobert",  
 Arctostaphylos uva ursi  
 Calamagrostis acutiflora "K. Foerster"  
 Deschampsia caespitosa "Schottland"  
 Helictotrichon sempervirens  
 Lavandula angustifolia "hidcote"  
 Molinia litorialis "windspiel"  
 Pervoskia atriplicifolia  
 Salvia menorosa "May Night"

Fall Anemone "Honorine Jobert"  
 kinnkinnk  
 Reatherd Reed Grass "Karl Forester"  
 Tufted hairgrass "Schottland"  
 Blue Oat Grass  
 Lavender  
 Tall Purple Moor Grass "Windspel"  
 Russian Sage  
 May Night Meadow Sage



Plantings to the East of MLBH

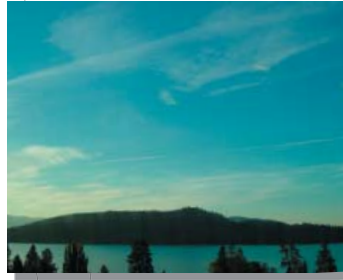


Plantings to the South of MLBH



## VILDLIFE/HABITAT:

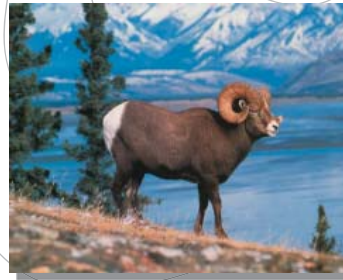
Open space on the shoreline of Flathead Lake includes the National Wildlife Refuge on the North Shore and State land managed by the Flathead Lake Biological Station as a refuge on the South Shore at Polson's Bay. Wildhorse Island, near Big Arm Bay, is the largest island in the lake, at 2,100 acres. It is managed by the Montana Department of Fish, Wildlife and Parks as a wildlife refuge. It is noted for its herd of Rocky Mountain Bighorn sheep and several wild horses. Native grasses and flowers are abundant. Bird Island near The Narrows is also State owned and is managed jointly by Montana Fish, Wildlife and Parks and the Flathead Lake Biological Station as a bird refuge. Geese, osprey, herons and eagles frequent the Bird Islands. Of the 25 fish species most commonly found in the Flathead River-Lake ecosystem, 10 species are native and 15 have been introduced. The native species include redbside shiner, peamouth minnow, squawfish minnow, largescale sucker, longnose sucker, sculpin, bull trout, cutthroat trout, pygmy whitefish and mountain whitefish. Lake trout, lake whitefish and yellow perch are the most common nonnatives and have increased in abundance since 1970, whereas native species have declined. (Montana Fish, Wildlife and Parks)



Wildhorse Island



Wild horses



Big horn sheep



Native Bull Trout



High Deer Population

Pictures Courtesy of AnimalKingdome.com

**CULTURAL:**

Half of the 161.4 miles of shoreline is reservation land. The southern half of Flathead Lake is located on the Flathead Indian Reservations, home of the Confederated Salish and Kootenai tribes. Shelter Island is not located on reservation land but has a great influence on the area because of its close proximity. There are approximately 6,800 enrolled tribal members and about 3,700 non tribal people who live on or near the reservation. The main sources of income for the tribe are the timber industry and the Kerr Dam which is located near Polson, MT. Native Americans have inhabited Montana for more than 14,000 years and artifacts have proved that these tribes have roots in the prehistory of the area. The affects of church played a major role in keeping western Montana peaceful during the wars with the Indians. Catholicism had major affects on the Salish tribe and these affects can still be seen today through old churches. (Flathead Indian Reservation 2004)



Image outlines the land in the Reservation. Image Courtesy of Mapquest.com



Pictures provided by gowest.coaliance.org



## LANDMARKS & ACTIVITIES:

The Flathead Valley in Northwest Montana is a destination of nationally protected recreational treasures. The gentle inclines, but sudden, towering slopes that provide a very definite sense of place for the townships below. Flathead Valley is the western gateway to Glacier National Park, one of the jewels in the crown of the national park system in the United States. The valley also lies adjacent to more than 1.7 million acres of federal wilderness in the form of the Great Bear - Bob Marshall Wilderness complex. Other nature highlights include the National Bison Range and the Jewel Basin Hiking Area.



The Valley boast many white water runs.



National Bison Range



Ski slopes at Big Mountain



Glacier National Park



There are many Art Galleries in Flathead County.  
Pictures Courtesy of DiscoverMontana.com



Many popular white water runs are located in the Middle Fork of the Flathead River near West Glacier, and the North Fork of the Flathead north of Columbia Falls. Big Mountain Ski Resort offers both summer and winter-time activities with some of the best skiing slopes in the world. The Valley boasts eight championship golf courses offering a season from April though October. The Valley is not just the domain of sport enthusiasts. Flathead has more than its share of creative types who have found in the Valley an environment and community conducive to creating works of art. Their work can be seen in studios, galleries and other outlets throughout the Valley, particularly in Bigfork and Kalispell. Other cultural highlights include Conrad Mansion, St Ignatius Mission and the Museum of the Plains Indians.

Locals know summer has arrived when a steady stream of traffic starts to build on the secondary roads. So in peak season expect to share the enjoyment of the Flathead Valley with many others, although the mountains still offer room to get-away if you are willing to exert yourself. People travel from across Montana and the Northwest to enjoy sailing, fishing, kayaking, and a collection of other activities on the lake, creating a valuable tourist economy for residents of the Flathead Valley. (About Flathead Lake 2004)



Attracts many water sports enthusiasts.



Popular Fishing Spot



Eight Champion Golf Courses.



Lakes size makes it perfect for sailing.  
Pictures Courtesy of DiscoverMontana.com



## OPPORTUNITIES:

- Spectacular views of mountains and lake
- Possibility of lakeside interaction
- Beautiful forest like natural landscape
- Interesting topography creates spaces
- Proximity to area attractions
- Historic building on site
- Economic building freedom
- Isolation of site from surroundings
- Proximity to local town
- Lake level is controlled by the dam
- Prominent local landmarks
- Mild climate of the Flathead Valley
- Peaceful sounds of the forested landscape

## CONSTRAINTS:

- Difficult building codes and regulations
- Eagle's nest considerations
- Scar of development on nature
- Lake water quality issues
- Transportation isolation from shore
- Distance to mainland boat house
- No automotive transportation on site
- Security issues on Island
- Confined to Aria within shoreline
- Prevailing Southeast Winds

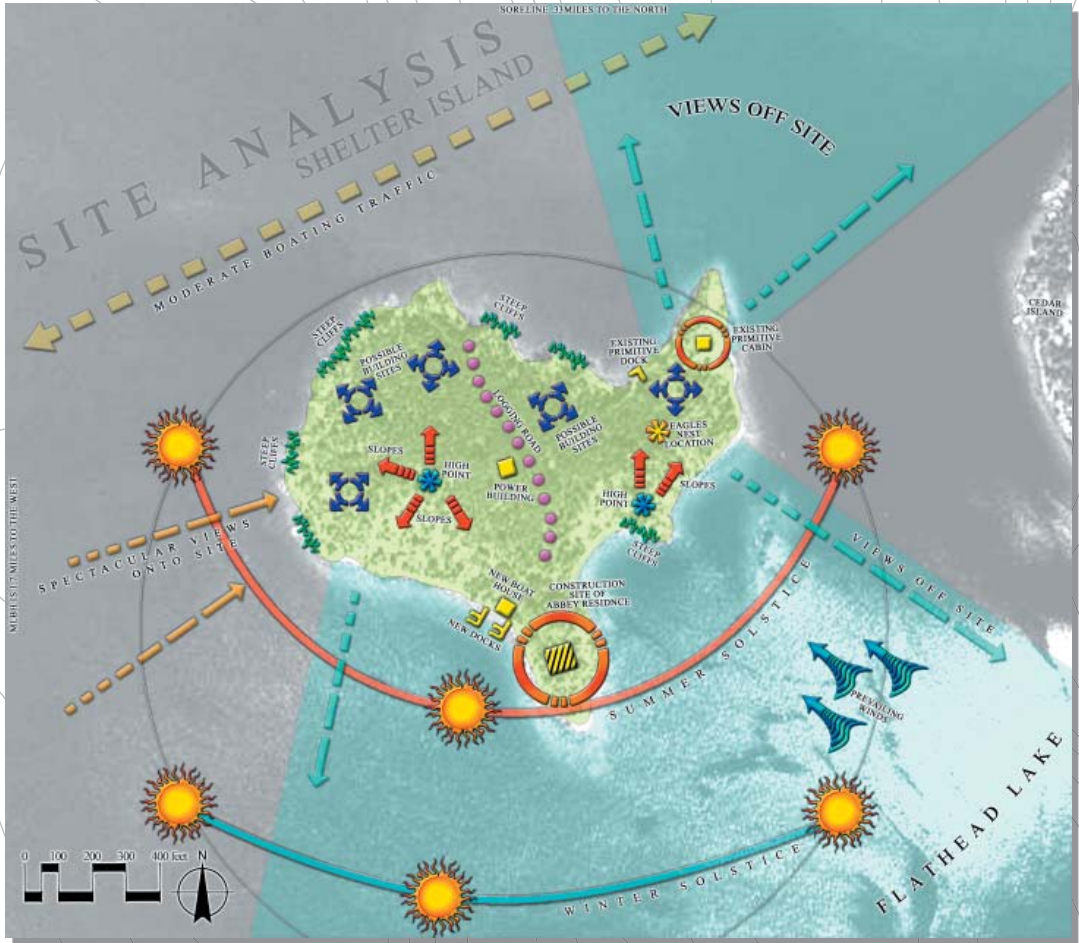
## SITE ANALYSIS

### SITE POTENTIAL:

The site has amazing potential being one of the few build able islands within the waters of Flathead Lake, MT. Its specific location within proximity to at least three major towns makes it the perfect place for a communal development. Picturesque views surround the site as snow covered mountains mirror off the clear waters. The lakes massive size makes it seem like it goes on forever. These views introduce the opportunity to create vistas off the site through organized site planning. The previous construction's Architect's style was quite impressive and blends into the rustic surroundings well. The materials being used were very aesthetic and will be appropriate for use in the landscape architectural design. The owner is willing to spend any amount to make the site perfect and this creates many opportunities in the design of the overall plan. It leaves a lot of possibilities when there is no concern for the cost of the overall project. The eagles nest on site will be difficult to incorporate into the design but in the end will yield a more accomplished design if the eagle's habitat is not disturbed. Open water is a feature that has always attracted people and that is one thing the site, being an island, has a lot of.

There is a potential to build four or more locations on the site for separate residences. The island topography naturally splits the site up into private spaces for each home giving each home its own shoreline and open space. The rolling topography also creates an opportunity for an interconnecting network of exploratory trails throughout the site. Shared community spaces will be placed on the site and nodes will break up the trail system. The nodes can be sculptures, spaces, viewpoints, gathering places, meditation points, or even a look-out tower. There are a few points on the site that would be perfect for lookout points. If a person were raised even a little above the trees they would have a spectacular 360 degree view of the whole lake. The residents who eventually live on the site will feel like they belong to a community and wont be isolated on there portion of the island. The site layout will encourage interaction and social cohesion of the members of its community.

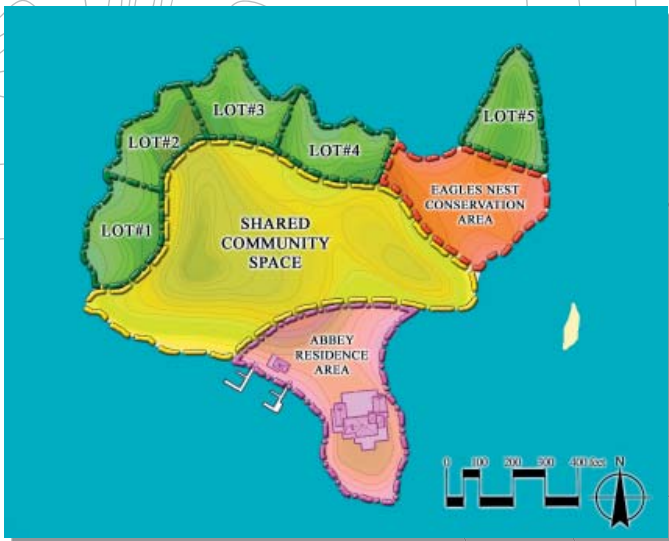
# SITE ANALYSIS MAP:



# FOCUSED ANALYSIS

## SPATIAL USE/SEPARATION:

FOCUSED ANALYSIS



This map shows the division of spaces on the site after careful consideration of the different needs on the island. The first space considered was needed to separate the Eagle's Nest from the built environment. The different lots were laid out using the natural contours of the site to find natural separate spaces for each of the future residences. The owner of the site has already started construction in his space on the site. The rest of the central portion of the island is to be used as a shared communal space for each of the islands inhabitants.

## BUILDING SITES:



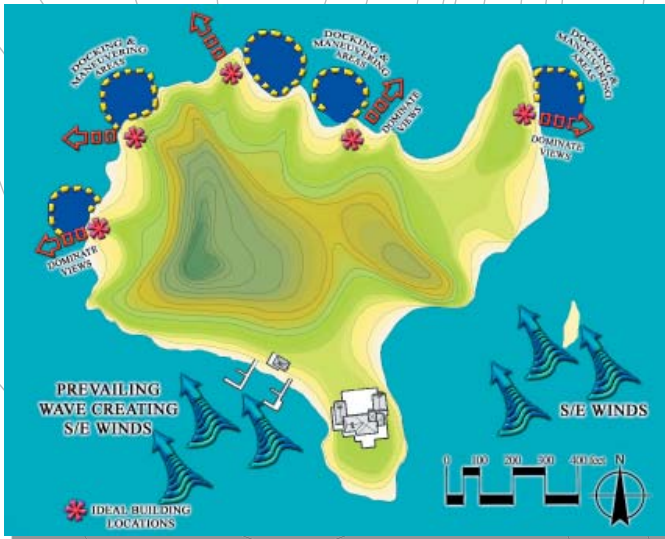
The actual building sites were laid out comparing different features of the site. First, the site needed to be separated in such a way that they could all have their own personal space within the community. Then sites were found where a firm foundation could be laid. Building locations are plotted so they are out of the path of site water flow and away from dominant swales. Each building is located on site high points but still close to the waters edge.

## BUILDING ORIENTATION:



After the actual building locations for each of the building sites were determined, the predominate orientation for each building needed to be developed. To figure this, different site features were taken into account. First, it was intended that none of the buildings would have a clear view of each other. Their views of each other would either be blocked by vegetation or by the natural site features. Each of the sites needed a clear view of the lake while having no views of the nearby residences and still making maximum use of sunlight and views of sunsets and sunrises. It also should be noted that in order to maintain the natural feel of the space, none of the buildings are to protrude any higher than 70 feet above the waters surface.

## DOCK POSITIONING:



Dock positioning was another important consideration in the layout of the residences. After finding out the predominate view for each building location there needed to be an area that each of these residences could have docking facilities. The docks are laid out so they do not intrude on any of the dominate views of each building's location. The docks also have enough space to encourage easy maneuverability when in a docking situation. Also in the construction of each dock, the direction of the prevailing winds needs to be considered. The docks must be facing away from the prevailing winds to protect the docks and the boats in each slip from large surface waves.

## TRAIL SYSTEMS:



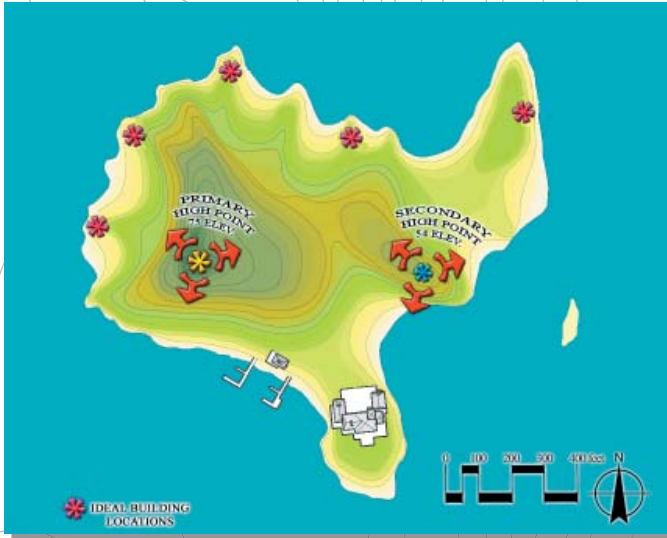
In order to create a community, a trail system would be an important design feature. A possible trail area has been noted that avoids extreme topography changes and connects all of the sites features on the island. The trail will be divided by nodes at intersecting points which connect the trail to each residence. The eagle's nest is considered one such node since it is an important feature of the site. The trail will also be used to enhance and create natural vistas of the lake and the mountains. Two obvious vistas will be present, one looking to the west at a mountain range and another looking to the southeast over the vast part of the lake.

## EAGLES NEST CONSIDERATIONS:



Since the eagle's nest on the site is such an important feature careful considerations need to be taken when designing around the nest. A zone with a radius of about 200 feet will be a no build zone around this area. This will insure that the nest is not disturbed by the construction. All the trails that cross underneath the nest will be crushed stone, so no actual built construction will take place. Vegetative buffers around the nest, consisting of tall pines, along with the natural site features, will block the view from the nest to any of the building locations on site.

## HIGH POINTS:



The high points on the site will create interesting design features. The highest point on the site, located on the western portion of the site, is 75 feet above the water level. This will be an ideal location for a look out to capture a 360 degree view of the entire lake. The second highest point on the site sits, at 54 feet above the water level, has a great view of the lake to the southeast. This point is also located closer to the waters edge with a drop-off in topography leading to the lake.

## PLAZA ORIENTATION:



In the shared community space on the site, the owner had expressed interest in constructing a plaza space where different activities could take place. An ideal location for this space has been considered by evaluating the various features of the area. This space is intended to be a linear space to create a vista. As a pivot point for one end of this space, the highest point will be used. The opposite direction of this space will be oriented through the two existing building locations. This orientation of linear space also ensures there will be a gradual slope along the natural contours. Another point of interest will be a flat space located at the base of the linear space.



## DESIGNING FOR PERFECTION:

Greek architecture and their obsession with perfection will be studied. Greeks were influenced by mathematics and used it to create beauty and balance in their designs. Their system of proportions will be used in all aspects of the design of the site to achieve a higher level of Landscape Architecture. These proportions can be used to help with the organization of spatial elements on site and also in the design of the elements themselves.

## MASTER PLANNING:

Small scale residential planning for private communities will be studied to find the most effective ways to arrange the communal homes. Careful Landscape planning will be used in the layout of the master plan, looking at all aspects of the site: Topography, special relationships, land features, use efficiency, nodes, and views. A final overall master plan will be organized in a functional manner, yet it will still possess all of the aesthetic qualities that will come from the design process.

## CONSTRUCTION DETAIL:

The Architectural Master plan of the owner's personal residence will require a closer look at construction detail. The rest of the island is overall master planning, but the individual details of each residence will reflect those designed for the Abbey residence. A study of modern construction procedures will educate and influence the final details of the design.

## PROJECT EMPHASIS

## EAGLE HABITAT PRESERVATION:

An Eagle has been nesting on the island for years. It is important that the habitat of the Eagle is not disturbed and that the eagle continues to nest at the site for years to come. Everything must be done to ensure that the eagle's habits don't change during or after the construction on the island. Studies of the laws protecting eagle habitats and the sensitive ways to ensure their continued nesting will be conducted.

## COMMUNITY DESIGN:

There will be a focus on creating a community within Shelter Island. Each residence will have its own private space but they will also share physical space building a social cohesion throughout the community. Walk paths can create circulation through the site and nodes will create points of interest. Many different principles of community design will be studied.

## PRINCIPLES OF DESIGN:

The principles of design will be studied: Unity and Variety of different parts of the design, Balance of special elements, Rhythm throughout the site, Emphasis on certain objects like points of interest, Proportion of comparative features, and Scale. The elements of design will be put to use like Line, Space, Shape, Form, Texture, and Color.



## LAND PRESERVATION:

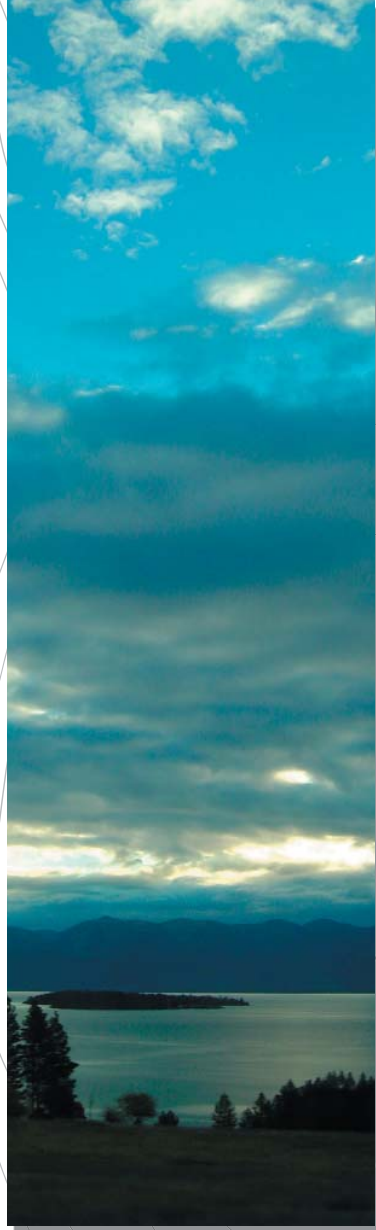
Because not much needs to be done to enhance the natural beauty of the landscape, the project will focus on land preservation. The design will make sure not to disrupt any natural land features or natural processes in the final plan. All of these things will be used to enhance the design and should not need to be changed in order to force a design upon the landscape. The influence that the landscape and natural features have on the site will be one of greatest pressures driving the overall design.

## LANDSCAPE SECURITY:

Because of the clients high profile an emphasis must be put on designing for security. Landscaping can be used to create a secure environment for those living on the island while letting trespassers know that they do not belong. Different methods can be used in landscape architecture to make a secure environment. These methods will be studied and used throughout the design to make a more secure environment for those living on the island.

## SCAR OF DEVELOPMENT:

There is need to find an affective way to buffer the scar development upon the lake. Many people feel that there has been too much development on the lake and that someday the whole lake will be overridden with housing and developments. That may be the case, but maybe something can be done to Buffer the scar of development. Strategic site layout and site planning can lessen these affects. Use of Landscaping can also be an affective way to block the harshness of development on the beautiful landscape.



# PROGRAMMATIC REQUIREMENTS



## SPACE ALLOCATION:

Number of Residences	6 Homes
Residences Max. Heights	75 Feet
Area of Island	20 acres
Foot Paths	4,603 Linear feet Withth of 5 Feet
Steps and Staircases	7 Sets
Plazas and Overlooks	<ul style="list-style-type: none"> <li>• One large Plaza</li> <li>• One Overlook</li> </ul>
Arbors	6 Separate
Shelter	1 Built shelter
Towers	1 Lookout
Node Points	5 Built Nodes
Private Lot Area	<ul style="list-style-type: none"> <li>• Lot One 1 acre</li> <li>• Lot Two 1 acre</li> <li>• Lot Three 1 acre</li> <li>• Lot Four 1 acre</li> <li>• Lot Five 1 acre</li> </ul>
Shared Space	10 acre
Docking	5 New Docks
Main Land Boat House	5000 Sq/feet
Slips	50 Separate
Bald Eagle Alocated Space	3 acre



Metalwork Style To be used.



Stonework Carving Style to Be used



Type of Docking Construction



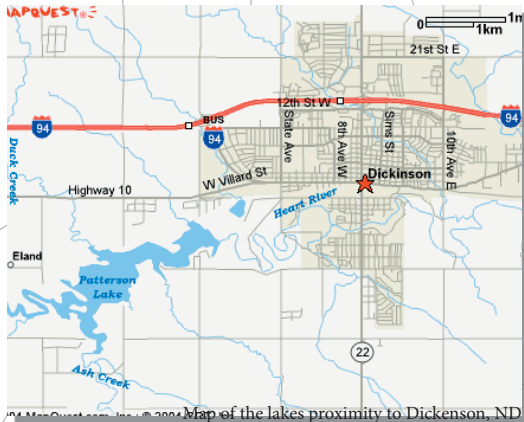
Wood work Style to be used



Rock wall Method to be Used

## MATERIALS NEEDED:

- Blue Stone from the East coast
- Limestone from Indiana.
- Slate from Virginia
- Native mossy edge rock
- Copper work
- Mahogany woodwork



Courtesy of mapquest.com

## CASE STUDIES

### A LAKESHORE DEVELOPMENT:

Dickenson, ND

Mark Schneider

This was a thesis proposal to develop the North Shore of Patterson Lake and make it a more attractive and enjoyable recreation area in both the summer and the winter. It was an interesting project to study because it showed the approach that was taken to deal with all of the problems that come with building a development near the lake shore. This project bears resemblance to the Shelter island Project in that it had to deal with a lot of the same problems. The designer in this project decided to take a more natural approach to the design to develop and image of the project that blends itself with nature using materials such as woods and native stones. Some of the projects design qualities that were of interest were on improved circulation, overlooks and turnarounds, adequate parking and docking facilities, recreational areas and housing. The project also concentrated on the fact that a lot of towns around the northern lakes areas are dead in the winter because there is nothing to do. The project intended to bring back the spirit of enthusiasm during the summer months so that it can still be seen in the winter months. The project also explored a lot of spatial organization. Like the spaces needed for parking and boat launches and studied the organization of boat docks and the layouts of slips, their orientation to the wind and the shoreline. A lot of diagrams were drawn out to show the functional relationships of buildings and spaces to one another. These same steps will be a helpful tool in the layout of the Shelter Island overall master Plan. For this project research was also done on the upgrading of the water conditions and wildlife management and refuge.

# SMALL CRAFT HARBORS:

Design, Construction, & Operation

Special Report No. 2 SR-2

Fort Belvoir, VA

James W. Dunham and Arnold A. Finn

This was information that was taken from a survey of average sized marinas around the United States. This information could be useful in the design of a communal docking area at a main land boat house or on the island itself in the construction of personal boathouses or shared system. The survey studied problems encountered with designing master plans, trade-offs between functional and aesthetic design, circulation, utilities, and winter conditions. All of these factors are very important in the design of the Shelter Island project. Most docks are not designed to be aesthetic they are only designed to be functional. It is very hard to design a docking system that is both aesthetic and functional at the same time. The parking and traffic circulation is vital to the mainland boathouse. Lots of different things need to be considered in the design of the overall circulation. There needs to be plenty of parking for peak times and there also needs to be parking for extended periods of time. There may be some vehicles that owners will need to keep in storage, so there needs to be a place to store them so that they won't be in the way or be and eye sore. The largest problem that was found in this case study was the ice formation in the cold climate. Since most of the docks are permanent they can not be removed year round like a lot of smaller lake homes do. Where ice formation is anticipated in a pile dock system the piles should be driven butt-down if practicable so that as the water level rises the ice sheet will slide off the pile taper rather than wedge to it and pull it out. Another way to combat the ice is using forced-convection or bubble systems to combat ice formation. Most marinas report that these methods of ice prevention are quite affective both for fixed and floating dock systems. This system has been known to fight off ice layer s up to 4 feet thick. The only compromise is that the system is quite expensive and requires many air compressors to keep the slips free of ice. The good thing about Shelter Island is that Kerr



Current docking foundation on concrete pylons.



Tracks for parking the boats in the garage.



Bubble system combats ice formation around.

dam controls the elevation of the lake and lowers it ten feet for the winter months. A close watch needs to be taken to make sure that non of the permanent docking structures are deeper then that ten foot level. That will prevent any problems with ice destruction. If the ice dose come in contact with the docks the bubble systems will be used to help prevent any ice damage.

# THE NATIONAL CAPITAL:

Urban Design and Security

Washington, DC

National Capital Planning Commission



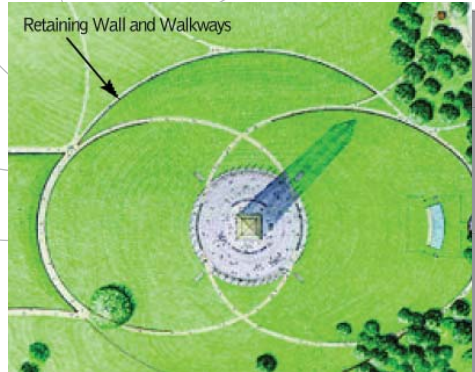
This case study can help influence the design of security on site. In this project the Nations Capital Planning Commission has prepared The National Capital Urban Design and Security Plan that proposes solutions to integrate the building perimeter security into the historic urban layout of Washington's Monumental Core. Not only dose this plan enhance security but it also creates a more aesthetic and pleasing Landscape Architectural solution, making it more welcoming. This plan helps show that good master planning design and good security can go hand in hand. The project is a little different and would take different approaches then those needed on Shelter Island but it really shows the different perspectives and different ways of thinking when trying to design for security. In the Washington DC plan, different types of Landscape Architectural approaches are used to enhance security around historic buildings like attractive street furnishing and landscape treatments that can provide curbside security. It really shows how elements can be applied in variety of ways to meet security and design needs of the particular downtown areas. The plan also called for an all new line of willow oaks along Pennsylvania Avenue. The Trunks of these trees will be used as buriers to prevent cars from drive through. Another method of security was at the Lincoln Memorial a low wall will be used to enclose the mound on which the memorial sits. This method could also be used to prevent trespassers from entering the site by creating a perimeter that isn't as welcoming that a person must climb over it to get into the site. Decorative fences were also used along with bollards and shrubberies along the West end of the White House. This case studied ended up being very influential.



Fence and Plantings Prevent Trespassers



landscape treatments that can provide curbside security



Low wall used to enclose area and create security.

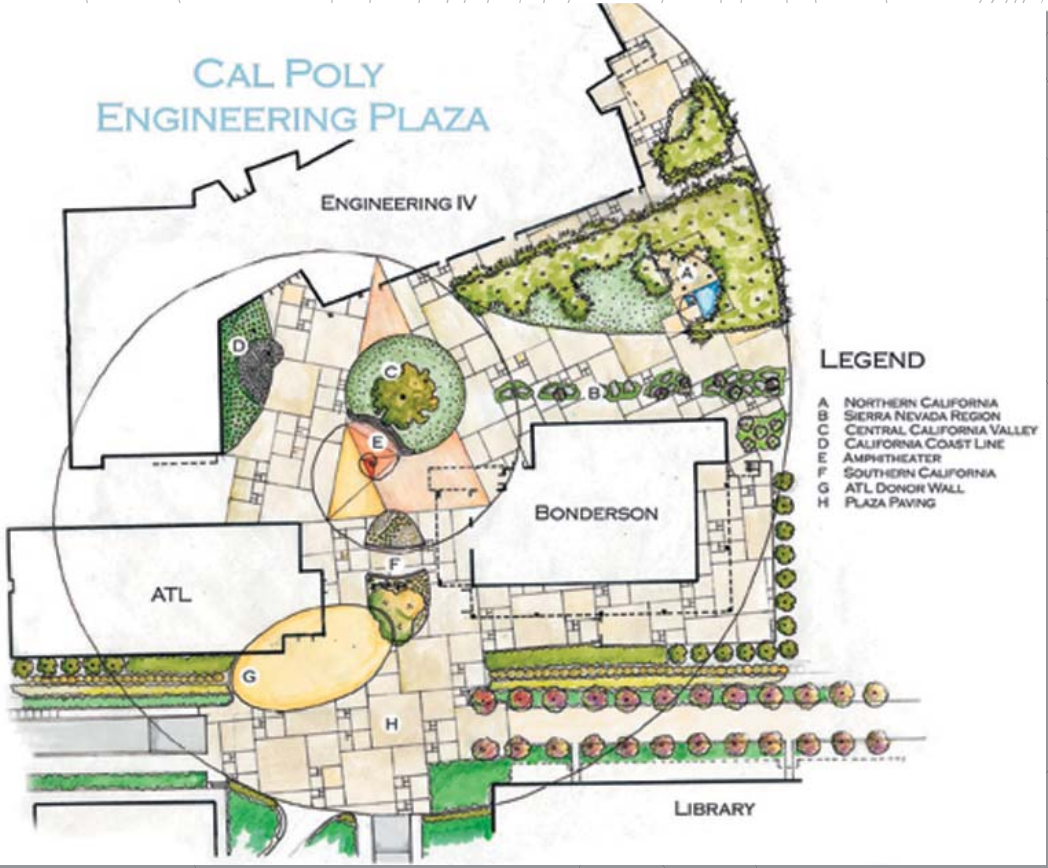


Low wall used enclose the mound on which Lincoln memorial sits.

# CALIFORNIA POLYTECHNIC ENGINEERING PLAZA

San Luis Obispo, Ca.  
Jeffery Gordon Smith

This case study was very interesting in that it is used the same underlining premise in its design that is planned to be used on the Master Plan of Shelter Island. The design was prepared a design based on the Fibonacci Sequence, a mathematical expression that describes a place of beginnings that spirals out infinitely. Under this concept, and with representations of Northern, Southern and Central California, the Engineering Plaza becomes a centralizing location of interaction. This was an ingenious design based on the mathematical proportions used by the Greeks that can be found in nature. This same spiraling design could also be affectively used in the layout of the overall island. It really helps bring the site together and created connections and relationships between different parts of the site that are seamless and flowing.

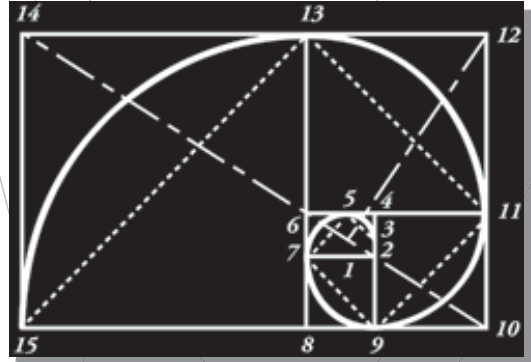


# GENERAL RESEARCH

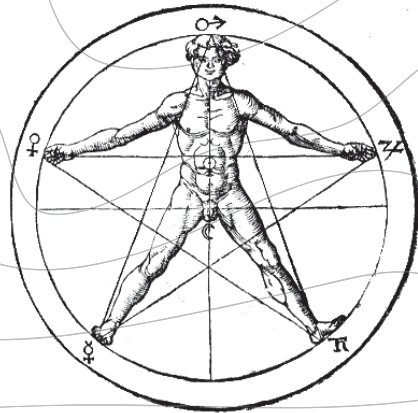
## PERFECTION OF GREEK ARCHITECTURE:

In Greek architecture there is a highly structured system of proportions that relate each individual component to the entire building. They are influenced by mathematics and used to create beauty and balance in the design. The building block of all design was a proportion known as the Golden Mean. While this proportion has always existed in mathematics and in the physical universe, it is unknown when it was first discovered and applied by mankind. It is reasonable to assume that it was discovered and rediscovered throughout history, which explains why it goes under several names. The natural proportions used in architecture date to the Egyptians and Greeks. Pi and phi were both used in the design of the great pyramids by the Egyptians. The Greeks used the proportion method and called it the Golden Section basing the entire design of the Parthenon on this proportion. Phidias, a Greek sculptor and mathematician, also studied the proportion method and applied it to the design of sculptures for the Parthenon.

In 1200 AD, the Fibonacci Series, which is the basis of the Golden Section, was discovered by Leonardo Fibonacci. He discovered the unusual properties of the numerical series that now bears his name, but it is still not certain that he even realized its connection to phi and the Golden Mean. This numerical series starts with 0 and 1, each new number in the series is simply the sum of the two before it. 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, . . . The ratio of each successive pair of numbers in the series approximates phi (1.618 . . .), as 5 divided by 3 is 1.666..., and 8 divided by 5 is 1.60. After the 40th number in the series, the ratio is accurate to 15 decimal places. 1.618033988749895 . . . Phi can be used to compute the nth number in the Fibonacci series (fn):  $f_n = \text{Phi}^n / 5^{1/2}$  It has long been known that the Golden Section or Divine Proportion appears in certain proportions of living organisms. The human face shows examples of these



Fibonacci Spiral



Divine Proportion in relation to the Human Body.



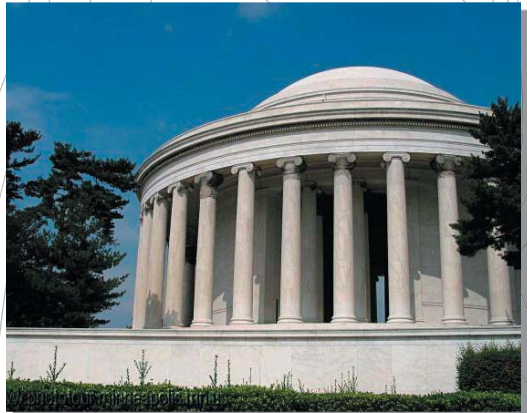
Docked boat in Main Land Boat House Garage



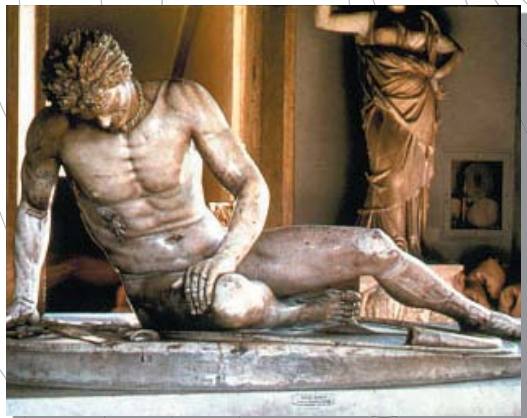
proportions. The head forms a golden rectangle with the eyes as the midpoint. The mouth and nose are each placed at golden sections of the distance between the eyes and the bottom of the chin. Even when viewed from the side, the human head illustrates the Divine Proportion through the definition of the position of the ear opening. The ear reflects the shape of a Fabonacci spiral. Dr. Stephen Marquardt has studied human beauty for years in his practice of oral and maxillofacial surgery. He performed cross-cultural surveys on beauty and found that all groups had the same perceptions of facial beauty. He also analyzed the human face from ancient times to the modern day. Through this research, was discovered that beauty is not only related to phi, but can also be defined for both genders and for all races, cultures and eras with the beauty mask which was developed and patented. This mask uses the pentagon and decagon as its foundation, which embody phi in all their dimensions. The Divine Proportion can also be found in the human body and hands and even the human heart beat reflects this proportion. The rhythm of the heart beat suggests that a heartbeat produces a phi relationship. There are thousands of other examples where this proportion can be found from nature, music, theology, cosmology, DNA, and even the stock market.



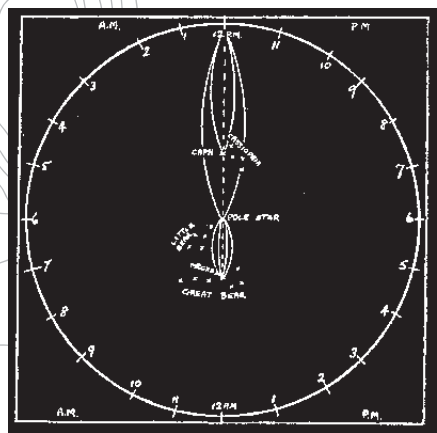
Greeks used Divine Proportion in the construction of the Parthenon



Greeks used it in different types of Architecture.



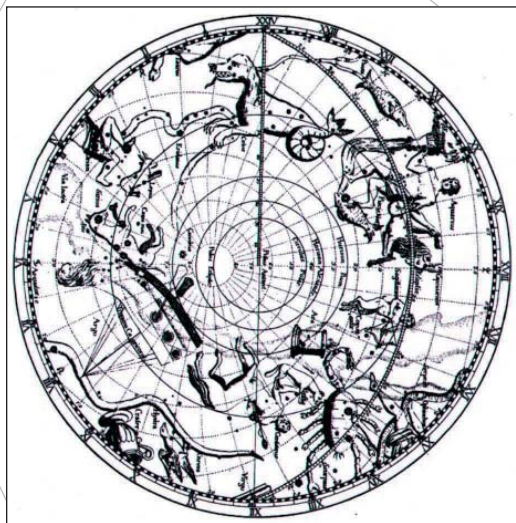
Greeks also use Divine Proportion in Sculpture and art.



Star Time Diagram



Little Bear and Big Bear constellations



Constellation Illustration

## TELLING TIME WITH THE STARS:

On the circle of sky overhead, imagine the hours written around the edge in a 24-hour clock, with 12 midnight at the north point, 12 noon due south, 6 A.M. to the west, and 6 P.M. to the east. All the A.M. hours are on the west or left side and all the P.M. hours are on the east or right. These hours are already marked above on the Trellis.

Now imagine there is one large hand moving round the face, but moving counter-clockwise, from 12 midnight towards 6 A.M. Remember just one zero and from that you can always calculate the time. Your zero is the date March 21st, because at midnight on that date the hand of your clock will always point to midnight on the imaginary star-clock which is due north.

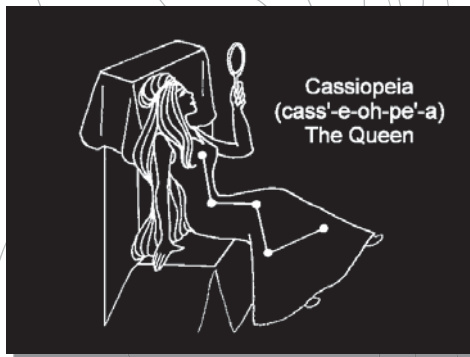
At zero, three particular stars are always in a straight line pointing north. One star is the Pole Star, which is the tail star of the Little Bear constellation. The second star is called Megrez in the Great Bear, or Plow, the star at the root of the Great Bear's tail. This star lies due south of the Pole Star on March 21st at midnight. The third star to complete your clock-hand lies above the Pole Star, between and your imaginary figure 12 midnight on the clock-face and the star called Caph. This star cluster is the most westerly star of the five that form the constellation, or group of stars, named Cassiopeia, sometimes called from its shape the Celestial Doubleyou (W). It is an easy group to spot in the sky, a slightly irregular W in formation. Those three stars are always in a straight line all the year round; but on March 21st, the zero straight line runs due north and south, or from 12 P.M. to 12 A.M. on the imaginary clock-face, when the time by a watch is exactly 12 midnight.

To tell the time on other nights of the year it must be remembered that the hand of the clock moves anti-clockwise at the rate of four minutes in every 24 hours, or about two hours a month. Spot what hour your pointer seems to indicate and calculate the number of date hours (at the rate of 2 hours per month and 4 minutes per day from March 21st), and move the pointer back that number of hours. The answer will be the right time. The star-clock gives true [Standard] time, but in the summer months Daylight Savings Time is considered. So between the second Sunday in April and the first Sunday in October one hour is added to find the actual working time of night. (Thomson 2005)

## HABITATS OF EAGLES:

The reasons for concern of the Bald Eagle population is that in the late 1960's and 1970's it was listed as a threatened species in the Rocky Mountain states. Over a third of the countries Bald Eagle population comes from the area with over 225 occupied nesting territories in 1999. There are detailed records of the Bald Eagle throughout most of the state. Breeding records have been taken on the western third of the state and eastward along the Yellowstone River. Bald Eagles are most comfortable and seem to prefer forests and shorelines adjacent to open water lakes and rivers like that of Flathead Lake. The Montana Bald Eagle Working Group characterized quality habitat for the Bald Eagle as mature forest stand of low to moderate canopy closure consisting of cottonwood, Douglas Fir, Ponderosa pine or mixed conifer which is also the environment found on the island. Forest stands with nest sites should be 20 ac or larger and be located within one mile of open water. The stand should contain at least two suitable nest trees and more than three perch trees.

Bald Eagle nest site management decisions must take the prey base into account. Because young birds are especially susceptible to food deprivation, it is recommended that the feeding habitat be greater than 80 ac with shallows, grasslands and meadows intermixed. Outside of the breeding period, distribution and abundance of eagles reflects food supply and available roost trees. Bald Eagles are sensitive to human disturbance particularly if activity occurs after nest initiation and prior to fledging. For this reason, the Montana Bald Eagle Working Group prepared a management plan outlining recommendations for minimizing disturbance within and near nesting territories during the nesting season. These include strictly limiting human activity within 0.25 mi of the nest site from February through June, and they recommended that no more than 10 percent of the shoreline be developed on lakes within occupied nesting territories.



Cassiopeia  
(cass'-e-oh-pe'-a)  
The Queen



Ursa Major  
(ur'-sa may'-jer)  
The Big Bear



Ursa Minor  
(ur'-sa my'-ner)  
The Little Bear

Constellations used in Telling Time with the Stars .



Pictures Courtesy of AnimalKingdom.com

The nest site is located on the eastern half of the island at mid-slope. The nest platform is approximately 75 feet high. Guy-lines are wired to keep the tree erect. Despite the increased human traffic, the Flathead Lake eagles have been displaying an unusual tolerance for human activity. The eagles prey on the 25 fish species that are common to the lake and river system and on the waterfowl which are also common eagle prey. The Shelter Island eagles, like most eagles, consistently use favorite perches. There are six trees that are most frequently used by the eagles; however, other trees are also used for perches. Cutting down these trees in the future construction of the island should be avoided. It has been observed that the eagles do most of their hunting on the north end of the island.

The issue of most debate surrounding the Shelter Island bald eagles concerns their sensitivity to human-caused disruptions and disturbance. It has been observed that these birds were surprisingly tolerant of boats, human movement on the island, and the noise of the construction activity. The birds seemed aware of the activity but continued with their normal activities. The ultimate measure of sensitivity to disturbances is whether breeding would be successful. In this instance, the Shelter Island birds successfully hatched and reared two eaglets to fledging despite the construction activity that commenced once the eaglets had reached two weeks of age.

The Montana BEWG suggested that human activities should be minimize during the breeding season. The nesting habitat is within one mile of the site. To maintain the suitable nesting habitat, island management were encouraged to continue sustaining the existing forest cover, to preserve existing large trees and perches, and promote the growth of large ponderosa pine. A vegetative screening was also suggested between the nest tree and the sources of human activity. A conservation easement has also been considered on the property were construction activity should not take place.

## DESIGNING FOR SECURITY:

Prevention of crime can be done through environmental design. To avoid getting caught, intruders look for property they can get into and out of quickly. Their ideal target is a house surrounded by large hedges and shrubs, which may hamper visibility from the street and neighbors houses. Different alterations in a landscaping can be enough to put off intruders. Shrubs should be trimmed so that they don't block any portion of the windows. Trees, hedges or Shrubs should be avoided that conceal and entry door. Cover should never be provided for trespassers. Ground plants which are within four feet of any sidewalks, driveways, doors or gates, should be kept low to reduce cover. Plants should not create places of concealment, particularly adjacent to the entrance or at bedroom windows. Large gauge gravel on the ground can be used as a deterrent. The noise caused by intruders walking on it can become a psychological deterrent. River rocks or other items should never be placed near glass windows or doors since they can provide a burglar with tools. Protecting with spiny or thorny plants will discourage intruders and can be as affective as the use of barbed wire. These planting can be places under windows but must be trimmed so an escape can quickly be made during a house fire. Dense spiny hedges can be planted as a fence. Privacy fences should be looked into but they can also create enclosed spaces that can be dangerous. Material should be used that dose not block open view.

Outdoor lighting can provide security and beauty in Landscape Architecture. They come in a variety of landscape lighting styles for all outdoor needs providing security and pleasure. Flood light eliminate the areas around gates and doors providing a secure environment. Lights can be places along walks and be fixed to docks not only providing that feeling of safety but also preventing personal injury like falling or tripping. Lights should be mounted so that they shine on exterior walls and at night create silhouettes of intruders making them visible.



Not only is landscape lighting Aesthetic it also creates Security.

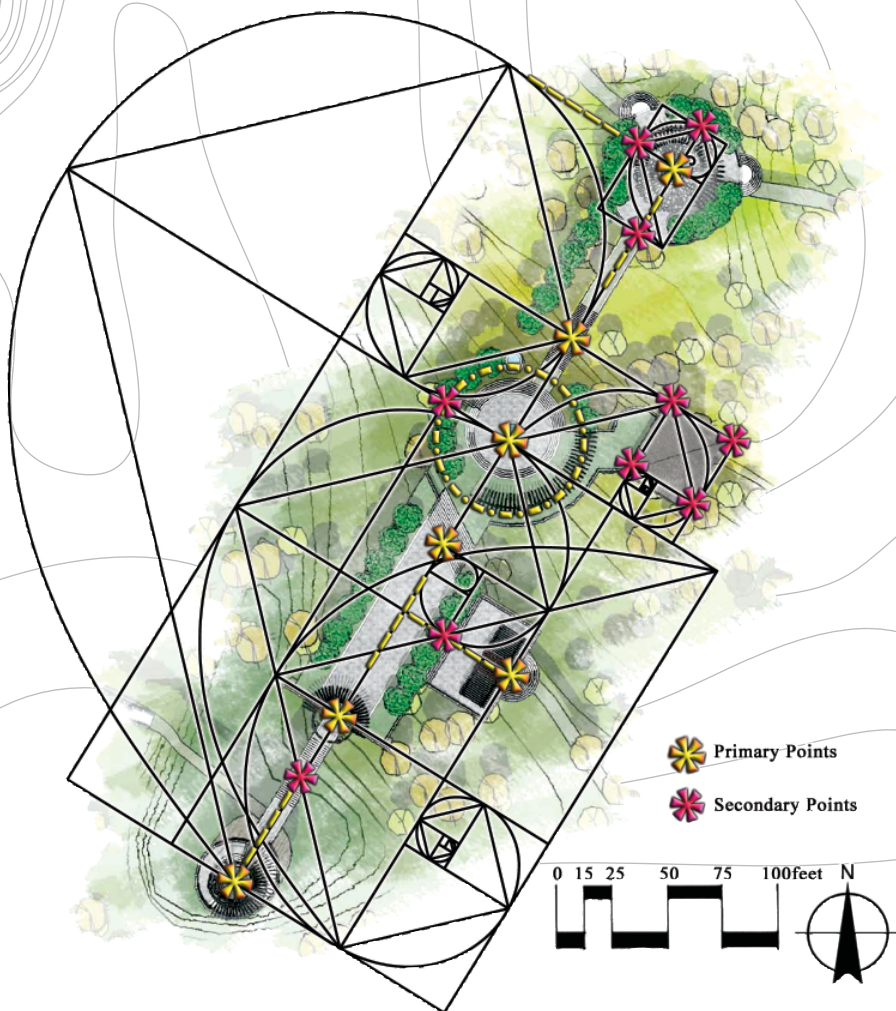


Transparent Fencing should be used as not to create a places to hide.

The site also provides the challenge of trespassers who are not aware that they are trespassing. Many people believe that since it is an island they have the right to be there thinking its not private property. Landscaping needs to be done in order to prevent these would be trespassers. The shoreline needs to be less welcoming to the public.

## DESIGN DEVELOPMENT

## GOLDEN SECTION RELATIONSHIPS:



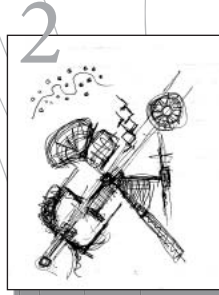
The Greek system of proportions has been used in the creation and master planning of the island plaza design. The illustration above shows how the proportioning was used in the layout and space relationships. By placing the golden section over the final design, one can see how the different parts and spaces on the design relate to each other using this proportioning system. The plaza is split into secondary and primary points all within the same

proportioning system. The primary points are some of the proportions that split the overall design up into specific spaces. From there the secondary points are used to break the proportions down even further. In this style of designing, perfection has been sought in all aspects of the design, just as it was 3000 years ago through the use of the Golden Section.

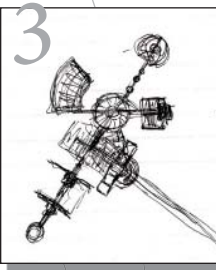
## PLAZA DESIGN:



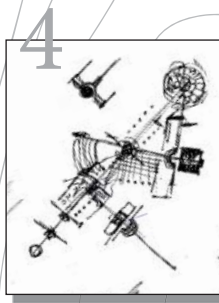
This first design layout focused on the different divisions of space in relationship to the golden section. It was a simple sketch for the beginning of an idea that would continue to build through the refining of the design.



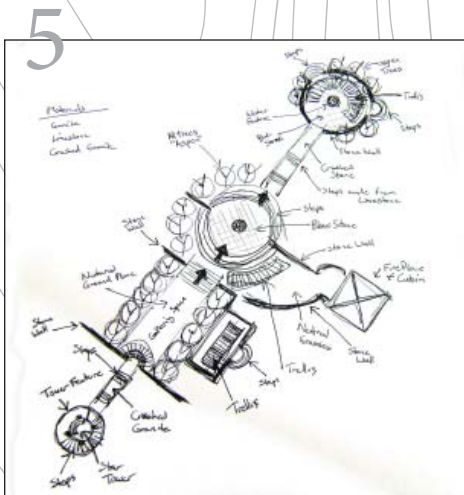
This second sketch looks deeper into different design features and the possibilities in the creation of a plaza. This sketch looks closer at the spaces themselves and what they might actually be used for.



This third sketch is the continuing refinement of the different spaces and begins to consider what actually might be located in each space. Different design features are implemented by placing different plazas and arbors in the image and adding a cabin feature.



This fourth sketch was the culmination of all the overall design processes. This was the design that was most pleasing aesthetically and functionally to the space it was intended. This final sketch was studied and refined for the final layout.

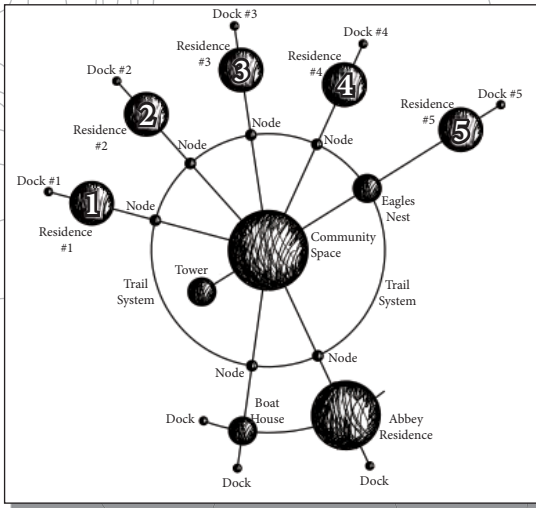


Plaza Sketch Not to Scale

This is a final refined design that showed different material along with more detailed look at different features of the plaza design. Walls were used along with many steps to take advantage of the overwhelming gradient change. A detailed representation of each important feature of the plaza is also illustrated.

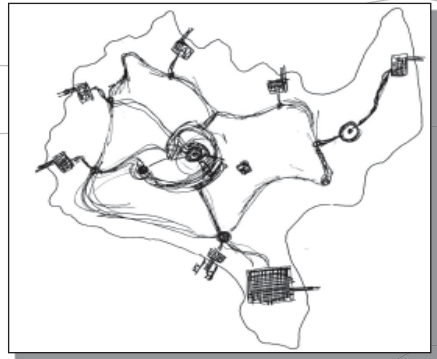
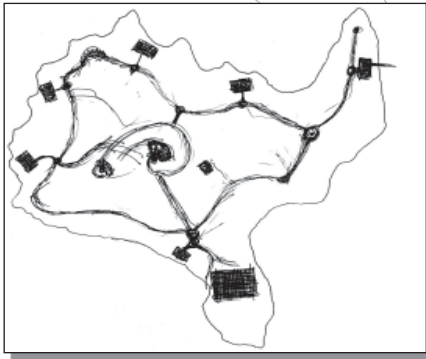


**CONNECTIONS:**



Defining the connections was an important part of the overall communal design of the master plan for the island. The diagram shows the important connections that needed to be maintained in order to preserve an efficient and working community space. Some of the natural points that connected different spaces become points of interest or nodes, which developed into important design features of the site. Each of the residences are plotted in the general proximity they might be located on the island. The residences each have unique space while still being connected to the overall community through a system of nodes that run along a trail. Points of interests are all connected by walking trails and a space that is meant to be shared has connection points to the overall community.

**DESIGNING A COMMUNITY:**

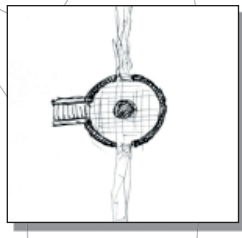
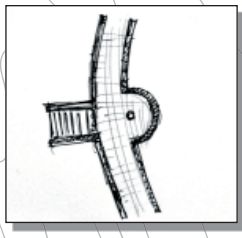
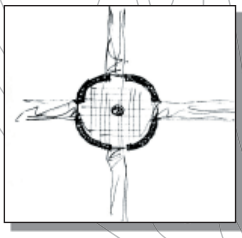


The residents who eventually live on the site will feel like they belong to a community and won't be isolated on their portion of the island. Although they will each have their unique space, the site layout will encourage interaction and social cohesion of the members of the community. These, along with the connections, were important points to consider when designing the over-

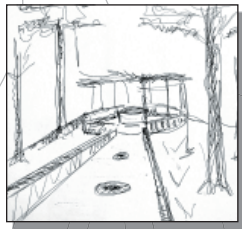
all master plan. Many sketches of different layouts were studied to create a successful overall site arrangement that would be aesthetic and make the most of the island's features while still being functional. By maintaining the important connections, the creation of the overall community became straightforward.



**CREATING NODES:**



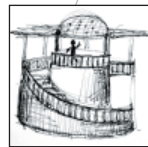
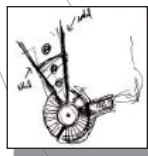
The nodes were an important feature that came about while trying to maintain and create connections through the site. These features also helped with site flow and to create points of interest that indicated a place to stop and reflect. These points are also practical since most of them are needed to maintain the connection among each residence because of the slope falling downhill from the trail system. Each of the nodes is equipped with stairs that lead down to each home on a slope that otherwise wouldn't be able to have a common path. These nodes make it possible to maintain connections throughout the site.



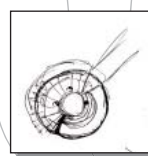
**SPECIAL FEATURES:**



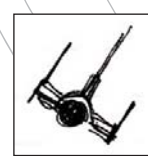
As a special design feature of the site, a few early sketches show a tower that was to be located on the southeast end of the island as a node on the trail system that overlooks the large portion of the lake. This tower uses the same materials and design style as the plaza design.



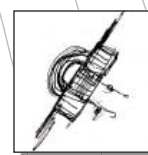
The tower was an important design feature of the site since it commanded a 360 degree view of the entire lake and surrounding area. Many different design sketches were made when trying to come up with the towers final construction.



Other important design features of the site were the central plaza space where there was a fountain and large trellises that created a warming personal space. The cabin also achieves this feel with the use of a fireplace and a resemblance to the existing log cabin.

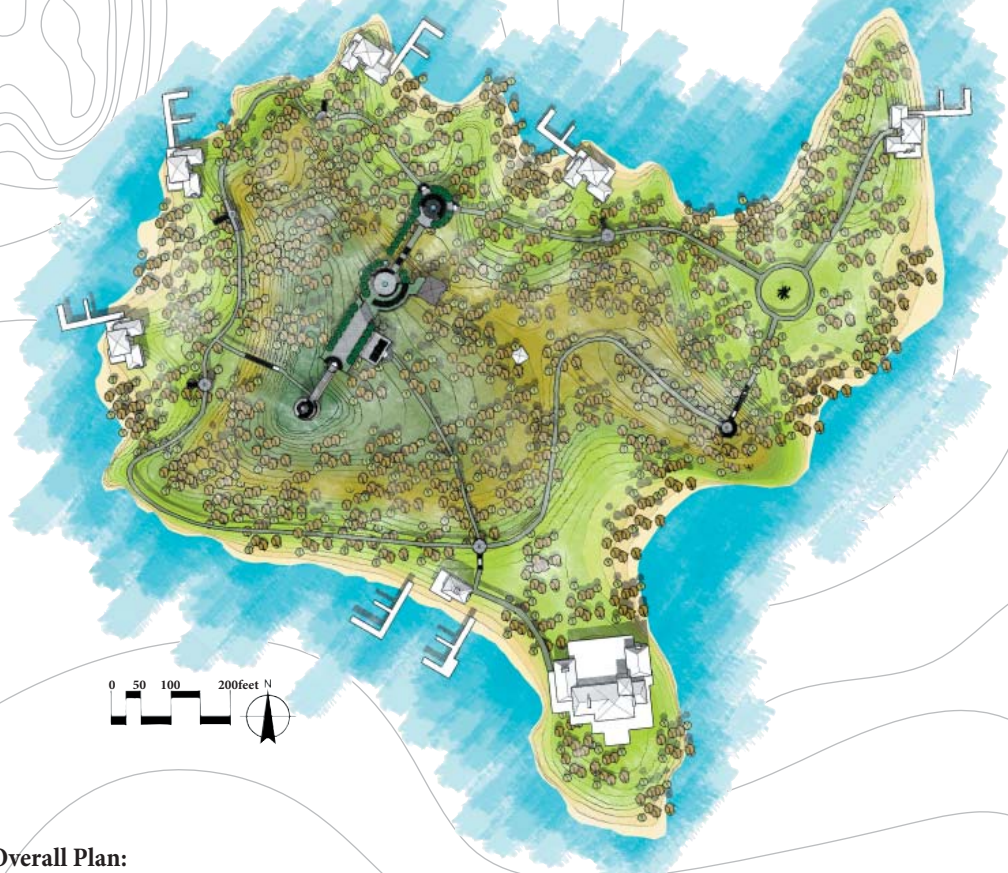


Many different individual design features were observed when putting together the final plaza design. These are a few of the different sketched features that were weighted when designing the overall plaza.



## MASTER PLAN:

## DESIGN SOLUTION

**Overall Plan:**

The residents who eventually inhabit the site will feel as though they belong to a community since they will not be isolated to only one portion of the island. Although each residence will have their own unique space and no view of the opposing residences, the site layout will encourage interaction and social cohesion of the members of its community. Creating social cohesion and maintaining important connections, were important points to consider when designing the overall master plan.

**Trail System:**

The trail follows a route that will maintain a gradual slope while following a smooth flow and connecting all of the features of the island. In order to maintain a natural feel the path is simply made of crushed stone that is excess material from the quarry. Nodes break up the trail, some are points that lead down to each of the residences and others are important points like connections to the community plaza, the eagles nest, and the overlook point. Connections to the plaza are maintained from all sides making it easily accessible. The trail also flows in directions that create wonderful vistas looking out over the lake and into the surrounding mountain ranges. There is overall the over half mile of walking trail system placed strategically throughout the climbing timbers and rolling topography of the site.

**Eagles Nest:**

The eagle's nest is isolated to maintain the bird's habitat. A space around the nest has been set aside as a "no building zone" to ensure no human disturbances. The nest is an important node along the trail and a connection point for the residence on the northeast peninsula of the island. The overall master plan makes the most of the natural surroundings and specific features of the site.

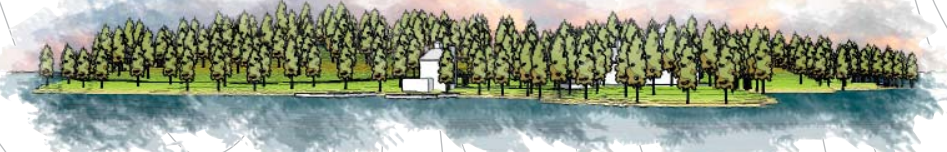
SW AERIAL:



NORTH PERSPECTIVE:



SOUTH PERSPECTIVE:



EAST PERSPECTIVE:



WEST PERSPECTIVE:





**VIEWING PLATFORM/  
EAGLES NEST:**

The viewing platform node takes advantage of the natural feature of the site. This area is perfect for posting a viewing platform since it is the second highest point which looks over the vast southeastern part of the lake. The platform can be located near the waters edge since there is a drop-off as you approach the lake. When approaching the platform on the trail the viewer is introduced slowly to the stunning views of the lake and mountain range. Another important feature of the viewing platform is the observation of the Eagle's nest found on site. Looking back towards the nest, the trail follows a vista, giving the observer a clear view from the viewing platform to the nest. Steps follow the slope down to the nest from the platform to make the slope more manageable. The viewing platform is a breathtaking addition to the master plan which takes advantage of the natural features of the site.

### STRAIGHT NODE:



The nodes are important features of the master plan intended to connect different parts of the site to the trail system. The straight node was designed for use on seep slopes. Many important purposes are served by this node to include not only connecting the residence down the hill via a rising staircase to the trail system, but also by keeping the path level on steep slopes. The retaining wall on the back side of the slope helps to hold back the soil and also is used as a sitting wall. Overall, the straight node configuration is a great way to keep the path level when using cut and fill methods, as well as retaining walls.

### FOUR SIDED NODE:



The four sided node has similar features of the other nodes since it too connects different parts of the site to the overall trail system. The main purpose of the four sided node is to provide four sides with which the trail system can be connected. On site, this node is used to connect the trail system, Abbey residence, and the communal space, therefore providing four entry points.

### THREE SIDED NODE:



The three sided node is another important design feature on the site and, out of all the nodes, is the node method most used on the site. The main use of this design layout is to connect the separate residences to the trail system and to make the falling slope towards each residence manageable through the use of a staircase. Each of these nodes has a sitting wall on the back side which doubles as a retaining wall. These nodes create attention-grabbing points along the trail as reflection and resting stops, and are constructed with the same materials found in the community plaza.

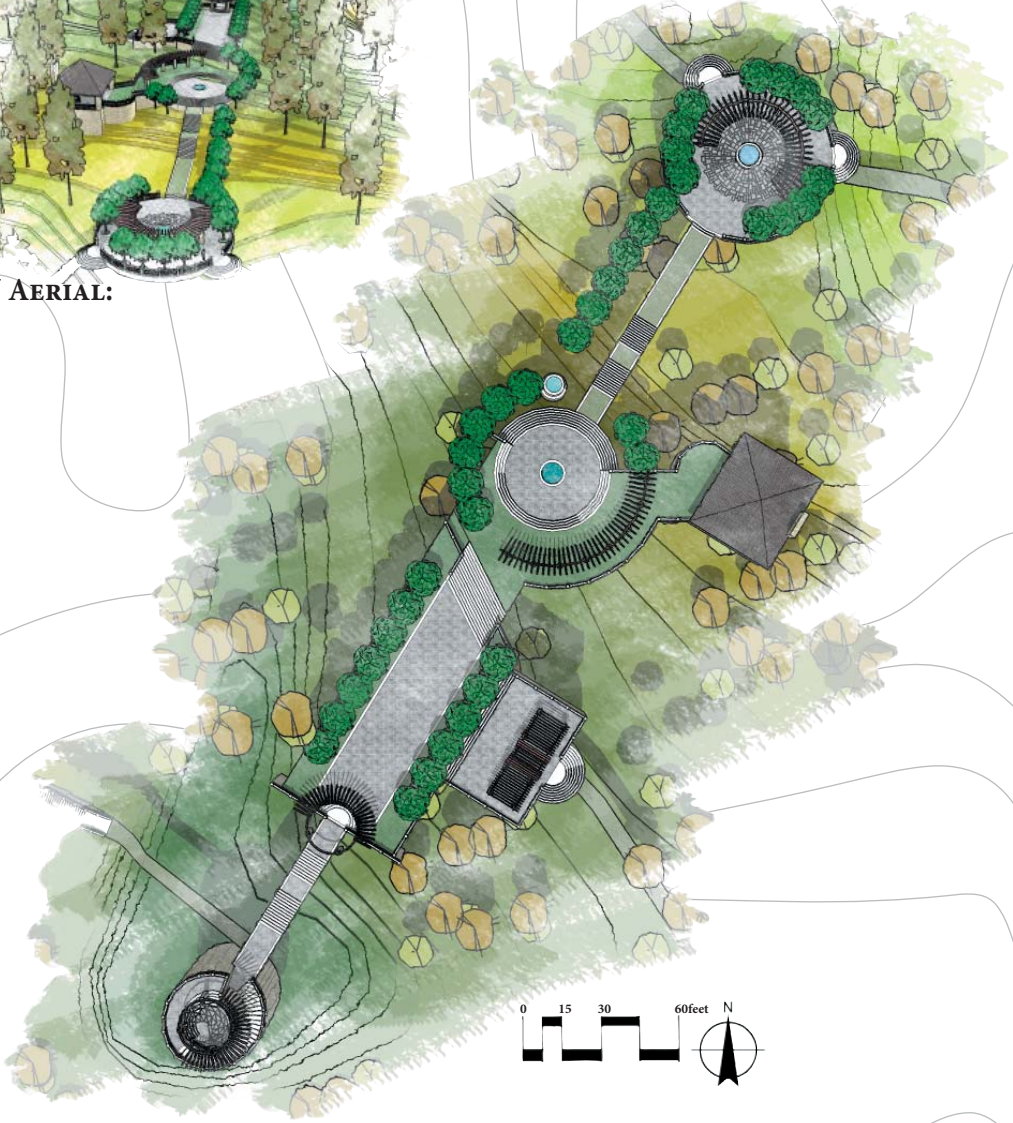
PLAZA DESIGN:

DESIGN SOLUTION



SW AERIAL:

OVERALL PLAZA PLAN:



PLAZA AXIS SECTION:



**Overall Plan:**

The community plaza has been divided into spaces utilizing the golden section proportion system that was used by the Greeks some 3000 years ago. These proportions and angles have helped to yield a more purposeful design. The plaza has been designed with a linear orientation and placed on a location where it can be accessible by all users. When dividing up the space, a golden section proportioning and angles was used to devise the master plan. The first space is the lower plaza which connects the area directly into the trail system as a node point on the footpath. The second space is the central plaza which is an axis point for the entire plaza. Rising up the steps, an open space is encountered that allows the viewer to observe the stargazing tower.

**Plaza Materials:**

Materials used in the construction of the plaza match those found on the Abbey residence which is currently under construction. A mossy-edged native rock obtained from a quarry owned by the owner is used in the construction of the plaza walls and the tower. Blue stone, shipped in from the East coast, will be used in the limited places where stone plazas appear. Carved limestone, from Indiana, will be the primary material composing the railings and capstones. Slate will be the material used for shingles and copper flashing will be used to accent different parts of the design. To keep a natural feel to the landscape, many of the large open spaces on the plaza will be filled with either grasses or crushed stone from the quarry. Areas of crushed rock will be made from excess material which cannot be used as construction blocks that is ground down. This will be an efficient way of using what normally would be discarded and will also help conserve a more natural look to the island, instead of using stone paths.

**Cabin Shelter:**

The cabin is a space that will reflect an existing structure located on the site. Demolition of the old cabin will need to be considered since it is no longer stable. The new cabin will create a space where people can be sheltered from the elements as an alternative to going back to their houses. The back eastern wall of the cabin is solid and contains a fireplace so the residents can have a somewhat rustic outdoor fire if preferred. This wall is solid since the wall was designed to block a view of a power station that is a few hundred feet to the east of the cabin's location. The other three walls of the cabin will have an open view.

**Vegetation:**

Primary vegetation to be planted on the island will be composed of Aspen as a way to contrast what is already present on the site. Aspens trees are common throughout the area; however, few, if any of these trees are growing on the island. These trees will make a great addition to the island and since they are native, the trees will fit in while also creating the contrast needed to dignify the space.



**STAR GAZING TOWER:**

The stargazing tower is an important feature that makes the most of the island's highest point. At the highest point, the island attains an altitude of 75 feet above the water level. The stargazing tower adds an additional 20 feet with a rising radial staircase. Once on the tower, observers have a fantastic 360 degree view of the entire lake and surrounding mountain ranges. Not only during the evening, but also from the morning sunrise to the evening sunset, there are spectacular views from this tower. Dim lights will illuminate the path to the top of the tower where the observer can relax and enjoy the starry skies of western Montana. The top of the tower is equipped with a radiating trellis to shield the sun during the day and an iron sculpted dome that illustrates how to tell time with the stars at night.



**LOWER PLAZA:**



The lower plaza is an important space as the main connection point of the plaza to the overall trail system. The whole plaza space lines up linearly and from any gazing point the lower plaza space will be the terminus. This lower plaza space focuses and radiates around a central point of a water feature and is composed of trellises and aspen trees. This area will be unique, as one of the few areas that there will be a stone ground plane which is to be constructed of Bluestone. Limestone steps will lead to the level of the plaza from the trail system. The view from the lower plaza up will be a rising stairways leading to the tower.

**CENTRAL PLAZA:**



The central plaza will be used as the axis point in the overall plaza design. This plaza is arrayed with Aspens trees and trellises that circulate around a central water feature. Many different levels to the space appear as the plaza rises slowly to meet the climbing natural contours of the island. The different steps and levels of the space are divided by simply following the contours found on the island. Directly east of this pivot pint on the axis, is the location of the cabin shelter containing the fire place. The location of the cabin helps to block a view of a PowerStation to the east. The trellis provides a transition from landscape to natural grasses while creating a shaded space from the sun. There is also a small overlook from the cabin where one can gaze down on the lower plaza and off to the north over the lake.

**GATHERING SPACE:**

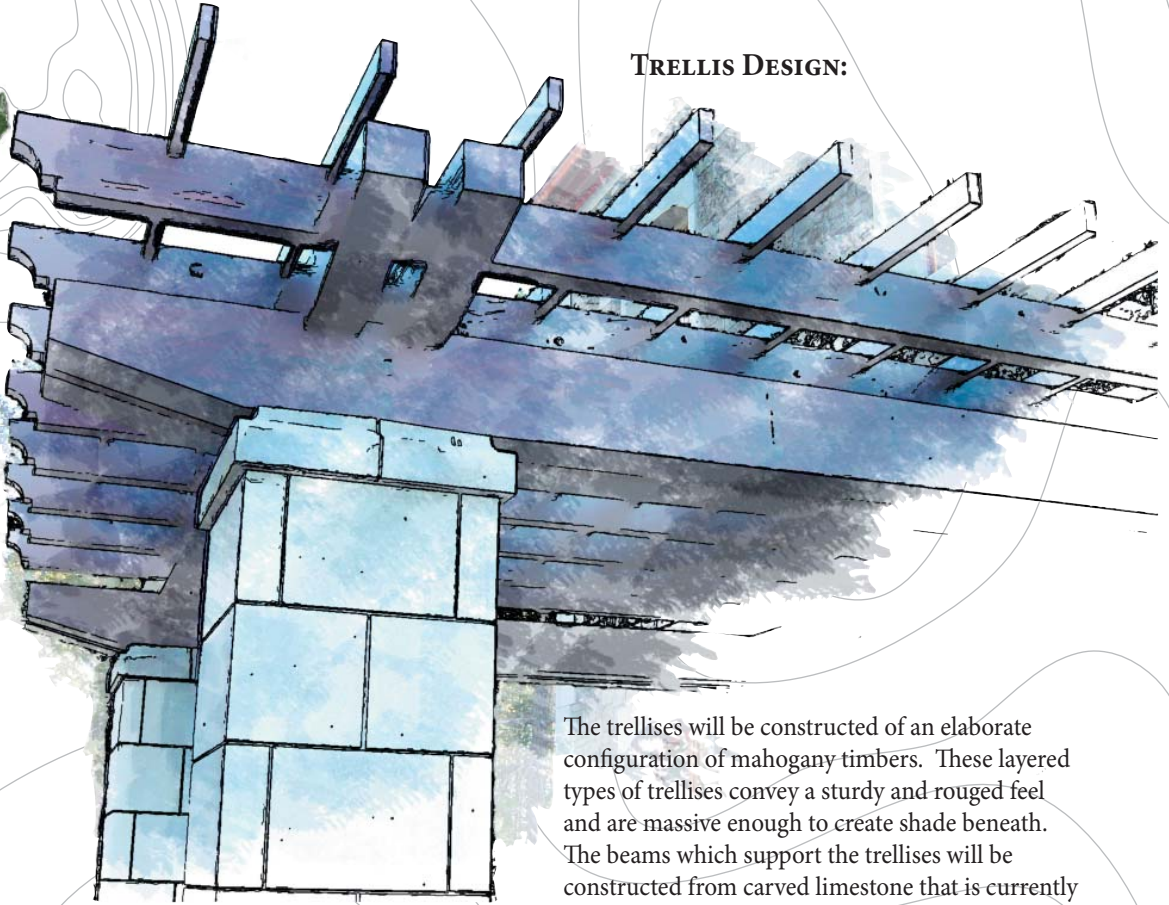


A gathering space is present as one ascends on the overall plaza design. This space is intended for large gathering events such as weddings, family gatherings, and church services. The gathering space is split into a small and a large area. The large area is intended for overflow space when the number of people exceeds that which would fit the smaller space. A trellis provides some shade over the small gathering space and Aspens are planted in rows along the large trellis to assist with the linear access and to create shade. The base of the larger gathering space is to be constructed of crushed stone while the base of the smaller space will be Bluestone paving. A path leads directly out from the small gathering space to the southern end of the trail adding another access point and with connection to the trail nodes.

## DESIGN DETAILS:

### TRELLIS DESIGN:

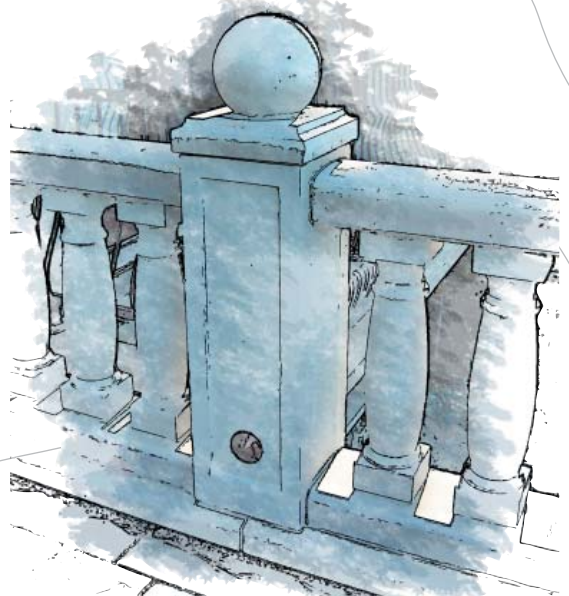
DESIGN SOLUTION



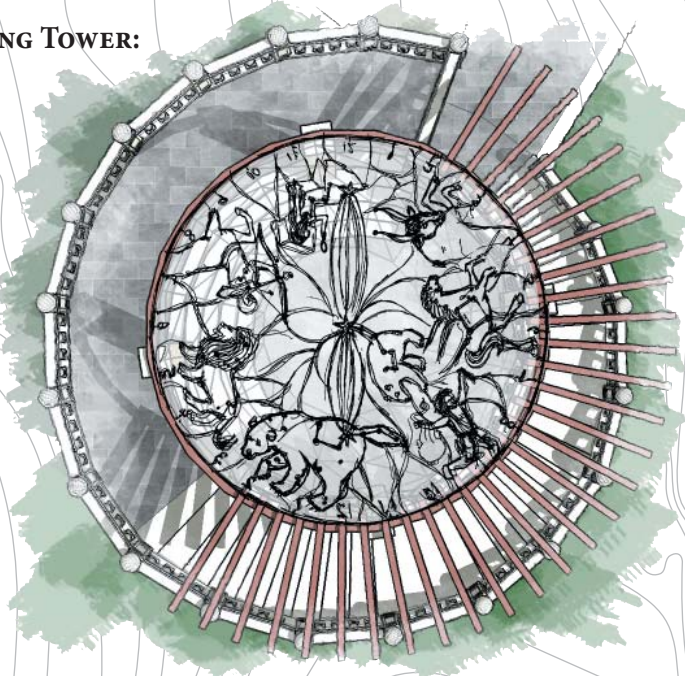
The trellises will be constructed of an elaborate configuration of mahogany timbers. These layered types of trellises convey a sturdy and rouged feel and are massive enough to create shade beneath. The beams which support the trellises will be constructed from carved limestone that is currently being used on the site in construction projects. This trellis design will be reflected in all trellises used in the master plan of the island.

### RAILING DESIGN:

This railing design is one that will be used in all railing scattered throughout the site. Like many other features on the site, the major material used in the construction of the railing will be a carved limestone shipped from a Kansas quarry. These railings have a commanding formal design and resemble those found in current construction projects on the island. To light the walks and plazas, the railings are equipped with a small light that shines down to illuminate the ground plane.



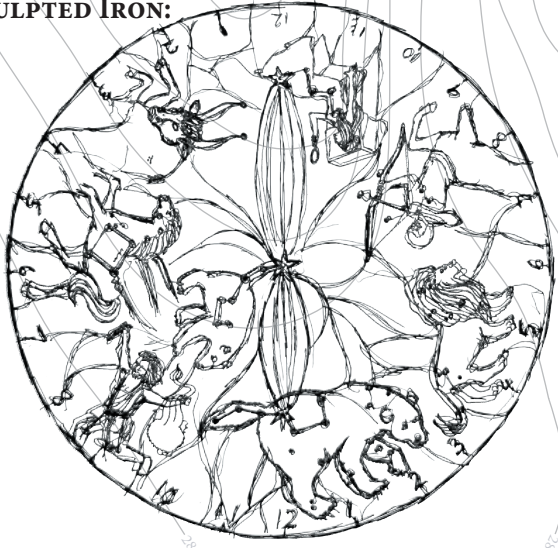
**STARGAZING TOWER:**



**PLACK:**



**SCULPTED IRON:**



The stargazing tower is one of the most important design features of the site. As a prominent feature, lots of thought had to be put into the overall construction and utilization. The tower is aesthetic, as well as practical in use. There is a dome of iron sculpture work above the viewing tower to illustrate how a person can tell time by use of the stars. The iron dome shows how to find the stars that assist in telling time using the constellations and stars. Images of the constellations and important stars will be sculpted of iron in the tower dome. This will assist those who wish to learn how to tell time with the stars. Along the radius of the dome there will also be numbers that serve to help with imagination of the sky as a clock. A plaque will also be located on the viewing tower that explains the steps on how one would tell time with the stars.

**GENERAL PLANTINGS:**



P L A N T L I S T

TREES:

- Apple Tree, Varieties selected by owner
- Pinus ponderosa, Ponderosa Pine
- Populus tremuloides, Quaking Aspen

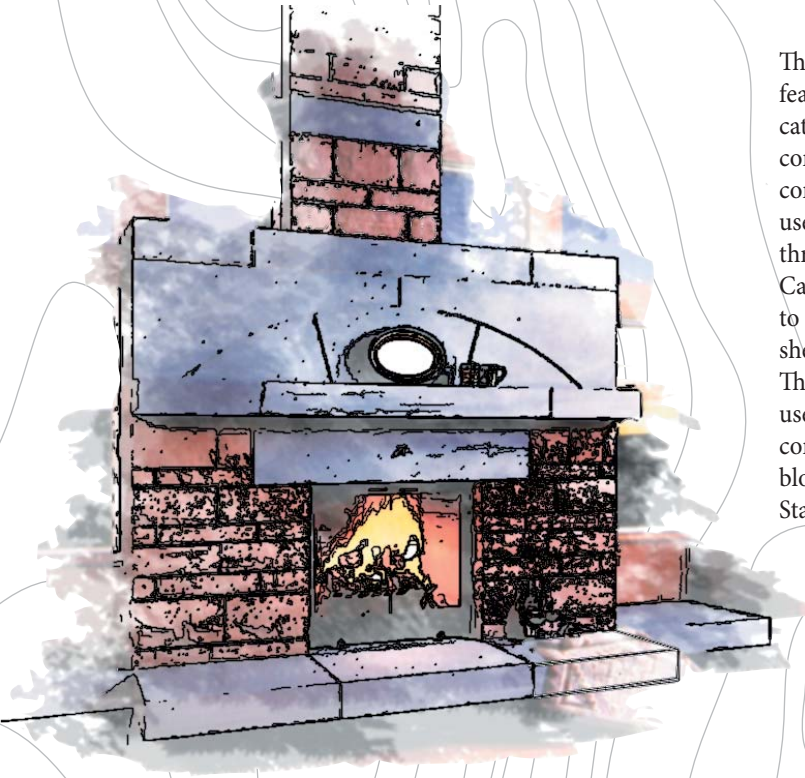
SHRUBS:

- Caryopteris clandonensis, Blue Mist Spiraea
- Cornus baileyi, Bailey's Redtwigged Dogwood
- Cotoneaster apiculata, Cranberry Cotoneaster
- Euonymus alatus compactus, Compact Winged Euonymus
- Mahonia repens, Creeping Mahonia
- Shrub Rose "Carefree Delight"
- Rose "Dwarf Pavement"
- Rose "Jens Munk"

PERENNIALS:

- Anemone hybrida "honorine jobert", Fall Anemone "Honorine Jobert"
- Arctostaphylos uva ursi, kinnkinn
- Calamagrostis acutiflora "K. Foerster", Reatherd Reed Grass "Karl Forester"
- Deschampsia caespitosa "Schottland", Tufted hairgrass "Schottland"
- Helictotrichon sempervirens, Blue Oat Grass
- Lavandula angustifolia "hidcote", Lavender
- Molinia litorialis "windspiel", Tall Purple Moor Grass "Windspel"
- Pervoskia atriplicifolia, Russian Sage
- Salvia minorosa "May Night", May Night Meadow Sage

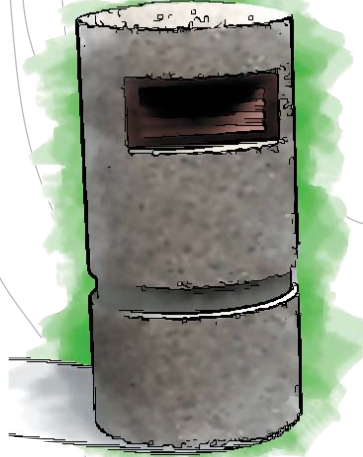
General plantings will be scattered throughout the site along retaining walls and walks. Below is a general pallet of the plants that will be used throughout the site. These plants are native to the area and require little maintenance and upkeep. The above illustration is a general image of the plant arrangement to be used throughout the site plan.

**CABIN FIREPLACE:**

The fireplace is an important feature of the cabin shelter located off the central axis of the community plaza space. The construction of the fireplace uses the same materials used throughout the entire site plan. Carved limestone will be used to construct the base and the shelving above the mantel. The native mossy stone will be used in the remainder of the construction of the wall which blocks the view of the Power-Station to the east of the cabin.

**TRAIL LIGHTING:**

Lighting along the trail is needed to ensure safety and security along the paths at night. These small lights will be placed along the trail at 15 foot intervals to provide the needed illumination when walking in the dark. The lights will be constructed of carved limestone with a copper vented plate covering the light and forcing the lamination downward toward the trail.



# FINAL PRESENTATION

FINAL PRESENTATION

SHELTER ISLAND MASTER PLAN  
PERFECTION INSPIRED DESIGNING

PERFECTION INSPIRED DESIGNING  
BENJAMIN P. BAKER

### SITE ORIENTATION:

Shelter Island is located in the Western End of Montana in the mountains to the west of Glacier House, 20 miles to the west of Glacier House, 20 miles to the west of Glacier House, 20 miles to the west of Glacier House.

### SITE HISTORY:

Shelter Island was first settled in 1882 by the first settler, Mr. J. H. ...

### EXISTING STRUCTURES:

There are several existing buildings on the island, including a small cabin and a larger structure.

### FUTURE STRUCTURES/PROJECTS:

The future structures include a new cabin and a larger building, designed to blend with the natural environment.

### MATERIALS:

The materials used in the construction are local, including stone and wood, to ensure a natural look.

### ENVIRONMENTAL ISSUES:

Environmental issues include the impact of construction on the local ecosystem and the need for sustainable practices.

### TRANSPORTATION & LINKAGES:

The island is accessible via boat from the mainland and has a small airstrip for private aircraft.

### SITE TOPOGRAPHY & LANDFORM:

The island's topography is rugged, with steep slopes and a central peak, providing a dramatic landscape.

### SITE VIEWS:

The island offers stunning views of the surrounding mountains and the lake, making it a prime location for a retreat.

### GEOLOGY:

The geology of the island is primarily composed of sedimentary rocks, with some igneous intrusions.

### CLIMATE:

The climate is generally mild, with a mix of mountain and valley weather patterns, suitable for year-round habitation.

## SITE INVENTORY

### SITE HYDROLOGY:

The island has several water sources, including a small stream and a well, providing a reliable water supply.

### VEGETATION:

The vegetation is diverse, featuring a mix of coniferous and deciduous trees, creating a lush and scenic environment.

### WILDLIFE:

The island is home to a variety of wildlife, including birds, mammals, and reptiles, offering a rich natural experience.

### CULTURE:

The island has a rich cultural heritage, with historical sites and a sense of community that adds to its appeal.

### LANDMARKS & ACTIVITIES:

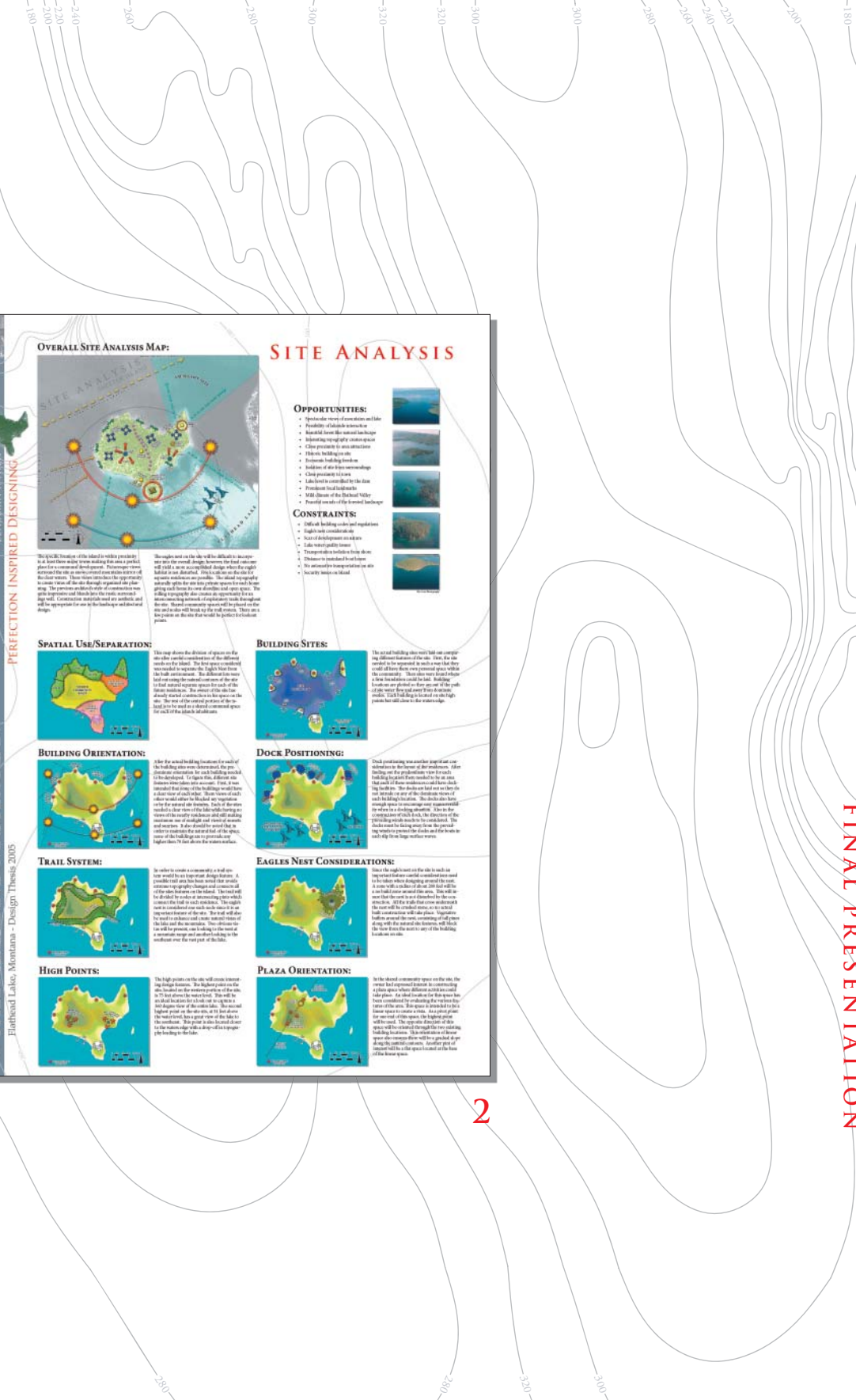
Landmarks include the island's unique architecture and natural features, while activities range from hiking to fishing.

SHELTER ISLAND MASTER PLAN  
Patterson Lake, Montana - Design, Thesis 2005

PERFECTION INSPIRED DESIGNING

1

70



**OVERALL SITE ANALYSIS MAP:**



The QCR location of the island is within proximity to a boat launch area, providing the site a perfect place for a resort and development. Proximity versus distance from the water is one of the primary drivers of the location. These three elements in the proximity to the water, the boat launch, and the boat launch area, will be an important factor in the development and design of the site.

The ruggedness of the site will be difficult to incorporate into the overall design. However, the fact that the site will still be an unspoiled island when the project is completed is a major asset. The ruggedness of the site will be a major asset in the development and design of the site.

**SITE ANALYSIS**

**OPPORTUNITIES:**

- Spectacular views of mountains and lake
- Potential for outdoor recreation
- Potential views of the mountain landscape
- Potential for water recreation
- Potential for water recreation
- Potential for water recreation
- Potential for water recreation
- Potential for water recreation
- Potential for water recreation
- Potential for water recreation

**CONSTRAINTS:**

- Limited building codes and regulations
- High water table
- Limited development options
- Limited water quality issues
- Limited water quality issues
- Limited water quality issues
- Limited water quality issues
- Limited water quality issues
- Limited water quality issues
- Limited water quality issues

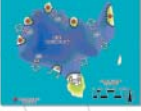


**SPATIAL USE/SEPARATION:**



This map shows the division of space on the site into different zones. The different zones are defined by their use and the way they are separated from each other. The different zones are defined by their use and the way they are separated from each other.

**BUILDING SITES:**



The most building sites are located in the central and eastern portions of the island. The most building sites are located in the central and eastern portions of the island.

**BUILDING ORIENTATION:**



The building orientation is based on the view of the building sites. The building orientation is based on the view of the building sites.

**DOCK POSITIONING:**



The dock positioning is based on the view of the building sites. The dock positioning is based on the view of the building sites.

**TRAIL SYSTEM:**



The trail system is based on the view of the building sites. The trail system is based on the view of the building sites.

**EAGLES NEST CONSIDERATIONS:**



The eagle nest considerations are based on the view of the building sites. The eagle nest considerations are based on the view of the building sites.

**HIGH POINTS:**



The high points on the site will be used to create a trail system. The high points on the site will be used to create a trail system.

**PLAZA ORIENTATION:**



The plaza orientation is based on the view of the building sites. The plaza orientation is based on the view of the building sites.

SHELTER ISLAND MASTER PLAN  
Flathead Lake, Montana - Design Thesis, 2005  
PERFECTION INSPIRED DESIGNING  
BENJAMIN P. WALKER

### THE DIVINE PROPORTION:



### TELLING TIME WITH STARS:



In 1202 AD, the Italian mathematician Fibonacci discovered the Golden Ratio. The discovery was a result of his study of the Fibonacci sequence, a series of numbers that starts with 0 and 1, and each subsequent number is the sum of the two preceding ones. The ratio of any number in the sequence to the number immediately preceding it is approximately 1.618, known as the Golden Ratio. This ratio is found in many natural phenomena, including the growth of plants, the structure of shells, and the proportions of the human body. The Golden Ratio is also used in art and architecture to create aesthetically pleasing proportions.

The sundial is a device that tells the time of day by the angle of the shadow cast by a gnomon on a flat surface. The gnomon is a rod or style that is aligned with the Earth's axis and perpendicular to the dial face. The shadow cast by the gnomon moves across the dial face as the sun moves across the sky. The dial face is marked with lines that indicate the time of day. The sundial is a simple and elegant way to tell the time of day, and it has been used for centuries.

### GREEK ARCHITECTURE:



### DESIGNING FOR SECURITY:



In Greek architecture there is a slight vertical convexity of proportion that makes each individual column or column capital unique. This is achieved by the fact that the columns are not perfectly straight, but have a slight curve. This curve is known as the entablature, and it is a key feature of Greek architecture. The entablature is a horizontal band that runs across the top of the columns, and it is supported by the columns. The entablature is made up of three parts: the architrave, the frieze, and the cornice. The architrave is the lowest part, the frieze is the middle part, and the cornice is the top part. The entablature is a key feature of Greek architecture, and it is used in many other styles of architecture.

The house is a place where we live, and it should be designed to provide a sense of security. This can be achieved by using a variety of design strategies, such as using a dark exterior, using a large window, and using a variety of materials. The house should be designed to provide a sense of security, and it should be designed to provide a sense of comfort and convenience. The house should be designed to provide a sense of security, and it should be designed to provide a sense of comfort and convenience.

The house is a place where we live, and it should be designed to provide a sense of security. This can be achieved by using a variety of design strategies, such as using a dark exterior, using a large window, and using a variety of materials. The house should be designed to provide a sense of security, and it should be designed to provide a sense of comfort and convenience. The house should be designed to provide a sense of security, and it should be designed to provide a sense of comfort and convenience.

### HABITATS OF EAGLES:



### SMALL CRAFT HARBORS:



The bald eagle is a symbol of strength and courage. It is a large bird of prey, and it is known for its ability to hunt and kill its prey. The bald eagle is a symbol of the United States, and it is a key feature of the American flag. The bald eagle is a symbol of strength and courage, and it is a key feature of the American flag. The bald eagle is a symbol of strength and courage, and it is a key feature of the American flag.

The small craft harbor is a place where small boats can dock and be stored. It is a key feature of a waterfront area, and it is a key feature of a waterfront area. The small craft harbor is a place where small boats can dock and be stored. It is a key feature of a waterfront area, and it is a key feature of a waterfront area.

The small craft harbor is a place where small boats can dock and be stored. It is a key feature of a waterfront area, and it is a key feature of a waterfront area. The small craft harbor is a place where small boats can dock and be stored. It is a key feature of a waterfront area, and it is a key feature of a waterfront area.

## RESEARCH



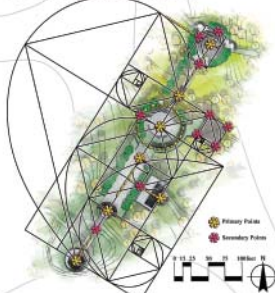
# CONCEPTS & PROCESS

## ABSTRACT:

This presentation is a design process design is difficult to illustrate, but it seems necessary to show how the design process has been used. What happens in the design process has been through that same design process. The design process is not an end in itself, but a means to an end. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

history and balance in their design using this methodology. The master plan of Shelter Island can be seen through the eyes of the design process. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

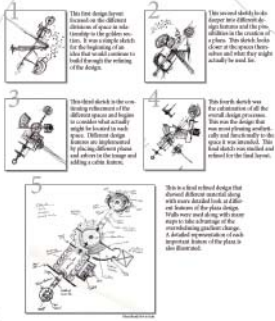
## GOLDEN SECTION RELATIONSHIPS:



The Golden Section of proportions has been used in the design process. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

proportion system. The primary proportion system is the Golden Section. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

## PLAZA DESIGN:



1. The first design is based on the site analysis. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

2. The second design is based on the site analysis. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

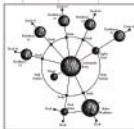
3. The third design is based on the site analysis. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

4. The fourth design is based on the site analysis. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

5. The fifth design is based on the site analysis. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

The final design is based on the site analysis. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

## CONNECTIONS:



Understanding the connections between the parts of the design is essential. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

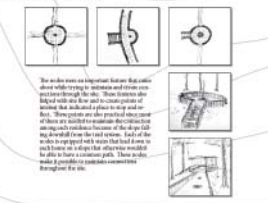
## DESIGNING A COMMUNITY:



The residents who eventually live on the site will find the site to be a community. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

when designing the overall master plan. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

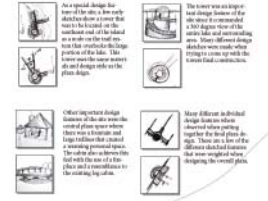
## CREATING NODES:



The nodes are an important feature of the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

The nodes are an important feature of the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

## SPECIAL FEATURES:



As a special design feature, the design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

Other important design features include the design process. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

Many different design features are included in the design process. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design. The design process is a means to an end, and the end is the design.

**OVERALL PLAN:**



**Overall Plan:**  
The entire site is envisioned within the site wall, but so much time has been spent in a community design that will have to be taken in only one portion of the island. Although each building will have distinctive design, a sense of unity will be achieved through the use of materials and landscaping. A sense of unity will be achieved through the use of materials and landscaping. A sense of unity will be achieved through the use of materials and landscaping.

**Trail System:**  
The trail system is a network that will provide a path for all to follow. The trail system is a network that will provide a path for all to follow. The trail system is a network that will provide a path for all to follow.

**Lighting:**  
The lighting is to be used to enhance the look of the island. A sense of unity will be achieved through the use of materials and landscaping. A sense of unity will be achieved through the use of materials and landscaping.

**SW AERIAL:**



**STRAIGHT NODE:**



The nodes are important features of the master plan that will provide a path for all to follow. The nodes are important features of the master plan that will provide a path for all to follow.

**FOUR SIDED NODE:**



The four-sided node is a unique feature of the master plan that will provide a path for all to follow. The four-sided node is a unique feature of the master plan that will provide a path for all to follow.

**THREE SIDED NODE:**



The three-sided node is a unique feature of the master plan that will provide a path for all to follow. The three-sided node is a unique feature of the master plan that will provide a path for all to follow.

**NORTH ELEVATION:**



**EAST ELEVATION:**



**SOUTH ELEVATION:**



**WEST ELEVATION:**



**MASTER PLAN**



**VIEWING PLATFORM/ EAGLES NEST:**

The viewing platform is a unique feature of the master plan that will provide a path for all to follow. The viewing platform is a unique feature of the master plan that will provide a path for all to follow.





SHELTER ISLAND MASTER PLAN  
PERFECTION INSPIRED DESIGNING  
BENJAMIN D. WALKER  
Flathead Lake, Montana - Design Thesis, 2005



**OVERALL PLAZA PLAN:**

**SW AERIAL:**

**Overall Plan**  
The community plan has been developed from open-air walking paths and a central plaza area. The plan has been designed with a central plaza area and a series of walking paths. The plan has been designed with a central plaza area and a series of walking paths. The plan has been designed with a central plaza area and a series of walking paths.

**Plant Materials**  
The plant materials are selected for the plaza area to provide a variety of textures and colors. The plant materials are selected for the plaza area to provide a variety of textures and colors. The plant materials are selected for the plaza area to provide a variety of textures and colors.

**Water Features**

The water features are designed to provide a sense of movement and life to the plaza area. The water features are designed to provide a sense of movement and life to the plaza area. The water features are designed to provide a sense of movement and life to the plaza area.

**Vegetation**

The vegetation is selected to provide a sense of enclosure and shade to the plaza area. The vegetation is selected to provide a sense of enclosure and shade to the plaza area. The vegetation is selected to provide a sense of enclosure and shade to the plaza area.



**PLAZA AXIS SECTION:**



**LOWER PLAZA:**

The lower plaza is an important space for the community. It provides a place for people to gather and socialize. The lower plaza is an important space for the community. It provides a place for people to gather and socialize.



**CENTRAL PLAZA:**

The central plaza will be used as an important space for the community. It provides a place for people to gather and socialize. The central plaza will be used as an important space for the community. It provides a place for people to gather and socialize.



**COMMUNITY PLAZA**



**STAR GAZING TOWER:**

The stargazing tower is an important feature for the plaza area. It provides a place for people to observe the stars and planets. The stargazing tower is an important feature for the plaza area. It provides a place for people to observe the stars and planets.



**GATHERING SPACE:**

A gathering space is an important feature for the plaza area. It provides a place for people to gather and socialize. A gathering space is an important feature for the plaza area. It provides a place for people to gather and socialize.



# SHELTER ISLAND MASTER PLAN

PERFECTION INSPIRED DESIGNING

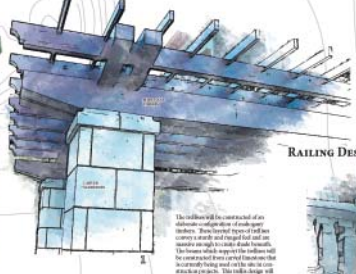


FINAL PRESENTATION



## DESIGN DETAILS

### TRELLIS DESIGN:



The trellis will be constructed of an aluminum-coated steel frame with wooden slats. The structure will be designed to support climbing plants and provide shade for the deck area. The trellis will be supported by wooden posts and will be anchored to the concrete deck.

### DETAILS LOCATOR MAP:

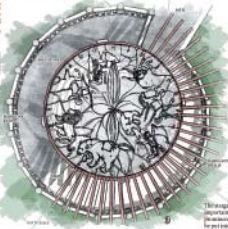


### RAILING DESIGN:



The railing design is one that will be made of a combination of materials. The railing will be made of a combination of materials and will be designed to provide safety and a decorative element to the deck. The railing will be supported by wooden posts and will be anchored to the concrete deck.

### STARGAZING TOWER:



### PLACK:



### SCULPTED IRON:



The stargazing tower is one of the most important features of the shelter. It will be made of a combination of materials and will be designed to provide a safe and comfortable place for stargazing. The tower will be supported by wooden posts and will be anchored to the concrete deck.

The sculpture is an important feature of the shelter. It will be made of a combination of materials and will be designed to provide a decorative element to the deck. The sculpture will be supported by wooden posts and will be anchored to the concrete deck.

### GENERAL PLANTINGS:



General plantings will be selected to provide a decorative and functional element to the shelter. The plants will be supported by wooden posts and will be anchored to the concrete deck.

### CABIN FIREPLACE:



### TRIAL LIGHTING:




Lighting along the deck will be provided to provide safety and a decorative element to the shelter. The lighting will be supported by wooden posts and will be anchored to the concrete deck.

PLANT	PLANT	PLANT
Aspen	Blackberry	Blueberry
Birch	Blackberry	Blueberry
Maple	Blackberry	Blueberry
Pine	Blackberry	Blueberry
Redwood	Blackberry	Blueberry
Spruce	Blackberry	Blueberry
Tweed	Blackberry	Blueberry
Yew	Blackberry	Blueberry

# REFERENCE LIST

## REFERENCE LIST

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# APPENDIX

**APPENDIX**

## **Building Codes for Western Montana**

Flathead County Zoning Regulations 1993

Flathead County Lake & Lakeshore Protection Regulations 1982

The building codes for Flathead Lake were looked at the following were a few codes that were of importance to the project on Shelter Island. The following could have some influence on the master plan and landscaping of the final plan.

### EROSION, SEDIMENTATION AND STORM RUNOFF

The interface of fill materials, such as rip rap, with the lake water shall be sloped at an average 2:1 ratio in order to dissipate wave energy. The face of the slope shall be covered with suitable materials to discourage soil erosion and slumping of banks. Natural vegetation shall be preserved wherever possible. Healthy trees three (3) inches in diameter or larger shall be preserved. Natural vegetation shall be provided, if required, as a means of stabilizing erosive areas.

### IMPERVIOUS COVER

The total of all constructed impervious surface areas over the body of water, at high water elevation, shall not exceed eight hundred (800) square feet per one hundred (100) feet of shoreline. The total of all constructed impervious surface areas within the lake and lakeshore protection area shall not exceed one thousand (1000) square feet per one hundred (100) feet of shoreline.

### SETBACK REQUIREMENTS

All structures shall meet the setback requirements

Lakeshore Frontage	Minimum Setbacks
Less than 60	10.0
60-75 feet	12.5
More than 75	15.0

### BOATHOUSES, BOAT SHELTERS AND SHORE STATIONS

Boathouses are essentially land based structures and, where built within the lakeshore protection zone, have a high potential to detract from the aesthetic values of the shoreline, block scenic views from neighboring properties, significantly alter the natural characteristics of the shoreline and diminish water quality.



## RETAINING WALLS

Retaining walls are permitted only where active erosion is present. The use of retaining walls solely for landscaping is not allowed. Retaining walls designed to extend the land area into the lake shall not be permitted. Retaining walls shall be built at or landward of the mean annual high water elevation and shall conform to the contours of the existing shoreline. Where active erosion is present and documented, an applicant may propose to regain erosional loss experienced in the past 12 months. No attempt shall be made to extend the land area into the lake any further. Rip rapping shall constitute the primary retaining wall method. Rip rap retaining wall standards should be followed.

## UTILITY LINES

No permanent overhead electrical lines are allowed in the lakeshore protection zone. All lighting shall be designed to reflect light away from abutting or adjacent properties and the lakeshore protection zone.

## FENCES AND HEDGES

No fence shall exceed six (6) feet in height and within ten (10) feet of average high water shall not exceed four (4) feet six (6) inches. All fences must maintain at least 50% open space in their design (solid fences are prohibited). Barb wire fencing is prohibited. Fences shall not extend waterward of the mean annual high water level except that special consideration shall be taken where private property abuts public or commercially zoned or used land.

## DECKS, WALKWAYS AND STAIRWAYS

All decks shall be ground mounted. Where topography is uneven, no portion of the floor of a deck shall extend higher than two (2) feet from the immediately adjacent or underlying lakeshore. Railings may be constructed; however, said railings shall not extend higher than four (4) feet in height and shall maintain at least fifty percent (50%) in open space design. Elevated decks including those extending from dwelling units, storage buildings, boathouses, etc., which extend higher than two (2) feet above the adjacent ground level, which cantilever over open space or which protrude from the second or upper story of a building are prohibited. Landscaping, rock rip rap or other natural methods may be required to obscure direct view of a deck from the lake or adjoining properties. Stairways shall follow the natural grade of the existing shoreline and should be designed and sized to provide access only. Typically, the stairway will be mounted flush or within a few inches of the adjacent or underlying lakeshore. In no case would a stairway walking surface be situated higher than two (2) feet above the adjacent or immediately underlying ground. Walkways shall be constructed on the existing terrain. The placement of individual stones, gravel or imbedded wood are recommended travel surfaces as opposed to concrete.



## Flathead Indian Reservation

Travel Montana, 2004

[http://www.montanakids.com/db\\_engine/presentations/presentation.asp?pid=170&sub=Tribal+Histories](http://www.montanakids.com/db_engine/presentations/presentation.asp?pid=170&sub=Tribal+Histories)

The Flathead Indian Reservation is located north of I-90 between Missoula and Kalispell. Fertile valleys and towering mountain peaks surround the 1.2 million acres of the reservation. The reservation is home to the Confederated Salish and Kootenai tribes. The tribes are a combination of the Salish, the Pend d'Oreilles, and the Kootenai. There are approximately 6,800 enrolled tribal members; and about 3,700 live on or near the reservation.

Timber industry sales and Kerr Dam are sources of income for the tribe. The tribes also own the Kwataqnuq (which means, "where the water leaves the lake") Resort Hotel and the S&K electronics manufacturing facility. The Salish-Kootenai Community College is located in Pablo. The college offers two- and four-year degrees

Points of Interest on the Reservation are:

- Flathead Indian Museum, St. Ignatius
- Flathead Lake State Park
- The National Bison Range/Pablo National Wildlife Refuge, Moiese
- Ninepipe National Wildlife Refuge and State Wildlife Management Area, Ronan
- St. Ignatius Mission, St. Ignatius
- The People's Center, Pablo

The Kootenai, Salish and Pend d' Oreille are native to the state. Archaeological evidence shows that native Americans inhabited Montana more than 14,000 years ago, and artifacts indicate that these tribes have roots in the area's prehistory. The Kootenai inhabited the mountainous terrain west of the Continental Divide, venturing only seasonally to the east for buffalo hunts.

The Kootenai were divided into two main groups. One band lived to the northeast and had a lifestyle based on bison hunting. The other band lived in the mountainous west and had a lifestyle focused on rivers and lakes. The Salish occupied territory in Washington, Idaho, and western Montana but ventured as far east as the Bighorn Mountains. As the tribe moved east, it had to change from a lifestyle based on salmon fishing to one more dependent on native plants and buffalo. During the 1700s, these two tribes — the Salish and the Kootenai — shared common hunting and gathering grounds.

Later, Christianity, in the form of Catholicism, heavily influenced the Salish. The effect of the Church played a major role in keeping western Montana relatively peaceful during the Indian wars. With the signing of the Hellgate treaty, the massive traditional lands of the tribes were reduced to the fertile grounds of the Flathead Reservation.

## The Flathead Lake Erosion Control and Water Stabilization Project

NW National Service Symposium /1999

Shawn Orloff

Montana Conservation Corps

Kalispell, Montana

“Studies have shown that wave energy and water level are the two most important factors in determining the extent of shoreline erosion. Wave strength is determined by wind strength and “fetch,” or the length of open water the wind can blow across. Because of Flathead Lake’s oval shape and prevailing winds, north-south waves may reach 1.5 meters, enough to do serious damage to waterfront property. Unfortunately this is the side of the island where the owner’s residence is located. Before Kerr Dam was built in the 1930s, Flathead Lake only reached full pool levels for 40 to 50 days at the beginning of summer. With the dam in place, full pool levels are maintained from mid-May through October-nearly three times as long as in the natural cycle. These high water levels allow waves to attack more sensitive areas of shoreline, and cause greater erosion. Recent studies have shown significantly increased erosion since the dam was built. One study reported a loss of 2,400 acres on the north shore alone.

Human alteration of the lakeshore frequently contributes to erosion in two ways: structures prevent the natural transport of gravel or sand and alter wave patterns. A citizen who builds a seawall may succeed in preventing erosion on his or her own property, but the wall will reflect the waves, resulting in greater loss to the neighboring property. Some types of structures will actually magnify wave energy. Our Yellow Bay project intended to build a strong, cost-effective, and attractive alternative to these types of structures.

Water quality deterioration is another issue concerning lakefront residents everywhere. Although Flathead Lake is still one of the cleanest lakes of its size in any temperate zone in the world, studies by the University of Montana Biological Station have shown continually declining water quality since the start of their monitoring in 1977. Levels of phosphorus and nitrogen indicate general water quality. High levels of these nutrients are dangerous to aquatic life and humans. Leakages from older and malfunctioning septic systems contribute even more nutrients to the lake. These problems are not unique to Flathead Lake; they occur all across the country on lakes of all sizes.

Grass lawns do little to slow the export of nutrients into the watershed. Lawns sloping toward the water will allow rain or irrigation water to drain directly away, taking organic material and any pesticides or fertilizers that may be present into the water. A natural lakeshore environment, with a “buffer zone” of deep-rooted woody plants, is much better at maintaining water quality. Natural contours in the ground allow rainwater to pool up and filter through the soil, while the plants soak up nutrients below ground. Our project incorporated native plants from a nursery and the surrounding area and gentle contours to take advantage of the natural filtering properties of a forested buffer zone.



## APPENDIX

A four-year monitoring study by the Lake Harriet Watershed Awareness Project in Minnesota showed that water quality can be significantly enhanced by educating homeowners. Results showed a large (50 to 80 percent) decline in pesticides and a significant decline in phosphorous reaching the lake. While we were not set up to do such sophisticated analysis, we hoped that our efforts would lead to a reduction in the amount of nutrients reaching Flathead Lake, and be used as a model for conservation work elsewhere.

Much like the above mentioned project, our MCC project on Flathead Lake grew out of what seemed to be a real and present need to educate the local citizens about alternative lakeshore stabilization techniques. In order to validate our suspicions that water quality was in decline, my MCC crew met with a University of Montana professor at the Flathead Lake Biological Station in early August 1998. She confirmed that Flathead Lake had indeed lost shoreline on all sides and that water quality had deteriorated. In addition, recent stopgap measures designed to slow erosion, such as seawall construction, often allow more nutrients to enter the watershed, and may actually have increased erosion.

Our project design was to build a buffer zone on a piece of property at the Biological Station using special techniques, then write and distribute a pamphlet aimed at lakefront homeowners. MCC solicited a donation from the Flathead Lake Protection Association (FLPA) to cover travel expenses, materials, pamphlet printing, and distribution. These funds were donated on the condition that my crew make a public presentation to the FLPA upon completion of the project. During August and September, we planned the project and began removing the grass lawn at the Biological Station.”

## Statement of Intent

August 27, 2004

“Perfection Inspired Designing”

Location: Flathead Lake, MT

There is an island in the middle of Flathead Lake, located deep in a Rocky Mountain ridge of Western Montana that's waiting to be developed. It is surrounded by picturesque views of mountains and crystal clear water. Donald Abbey of “The Abbey Company” has acquired the island and plans to build a small scale residential development. Including his own home, he intends to erect homes for those who seek the clean air, calm atmosphere, and the mountainous views of the Montana skyline at a place that they can call home.

At the request of the owner, the project is to design the residential master plan for the entire island with a concentrated Landscape Architectural plan of the Donald Abbey residence, all taking advantage of one of the countries most beautiful natural settings. The island is 30 acres of rocky forested land. Boats will be the only form of transportation because of the islands distance from the nearest shoreline. Therefore, the island circulation will consist mostly of exploratory walking paths. Each separate residence will have its own unique space in the residential master plan that makes the most of natural elements and land features of the island. A closer more detailed landscape plan of the Abbey residence will reflect the architecture of the building currently being constructed. The natural scenery being the essence of the design, the site will showcase its natural surroundings using all the modern amenities while still preserving its natural beauty.

A study of Greek architecture will help with the design process. In Greek architecture there was a highly structured system of proportions that related each individual component to the whole building. The Greeks took architecture to a higher level when they built impressive symbols of their society, culture, and temples to their gods. They were influenced by mathematics and used it to create beauty and balance in their design. Many lessons can be learned through the study of Greek architecture and their search for perfection that can be used in modern designing.

An understanding of the Greek method of architecture will bring this project to a higher level of design. Using their system of proportions in the design of the landscape, perfection will be sought in all aspects of the design, just as it was 3000 years ago. This understanding of Greek perfection in combination with the study of secluded small scale residential planning will help with the creation of a tranquil sanctuary away from common day living. The overall underlying premise of this design is that the principals of ancient Greek architecture can be applied today to yield Landscape Architecture of the highest order.

# SHELTER ISLAND MASTER PLAN

PERFECTION INSPIRED DESIGNING

## PERSONAL IDENTIFICATION



220

240

260

180

160

160

PERSONAL IDENTIFICATION



**BENJAMIN P. IWEN**  
GRADUATE OF  
OMAHA CENTRAL HIGH - 2000  
NORTH DAKOTA STATE UNIVERSITY - 2005

PERSONAL IDENTIFICATION

# SHELTER ISLAND MASTER PLAN

PERFECTION INSPIRED DESIGNING

## DIGITAL PRESENTATION





**DIGITAL PRESENTATION**

**DIGITAL PRESENTATION**

**DIGITAL MEDIA INCLUDES:**

**PDF. OF PRESENTATION BOARDS**

**AND**

**VIDEO OF 3D MODEL**

