SHELTER ISLAND MASTER PLAN

Flathead Lake, Montana - Design Thesis 2005

BENJAMIN P. IWEN

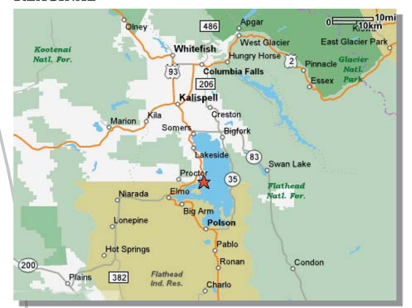
PERFECTION INSPIRED DESIGNING

SITE INVENTORY

SITE ORIENTATION:

State Wide

Reagional

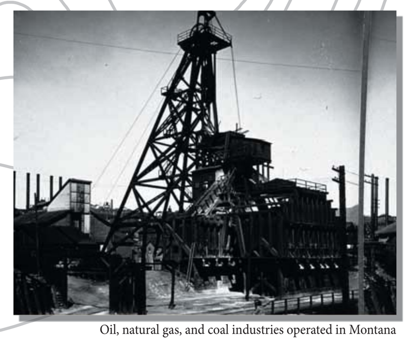


Local

Pictures Courtesy of Mapquest.com

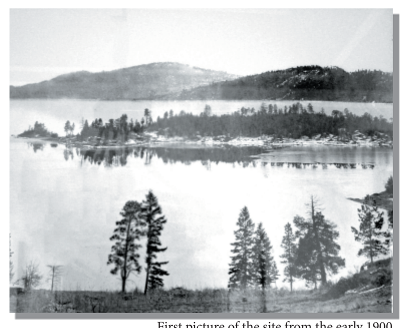
Shelter Island is located on the Western end of Montana in the mountains to the south of Glacier National Park. This site is a 20 acre island close to the Eastern shore of Flathead Lake and 3 miles Northeast of Wild Horse Island. The nearest mainland is 0.33 miles to the north of the island. The boat house on the mainland is 1.7 miles to the west. The largest area of open water is southeast of the island where water reaches depths of 260 feet. The Abbey residence (named after the owner) is located on the southern tip of the island and faces the open part of the lake to the southeast.

SITE HISTORY:



Oil, natural gas, and coal industries operated in Montana

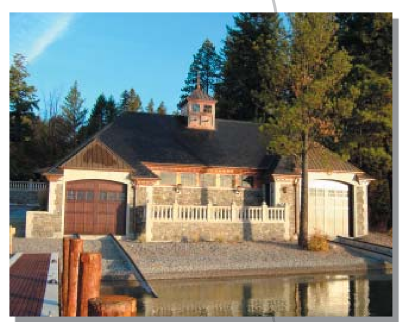
Agriculture is still the largest part of the economy



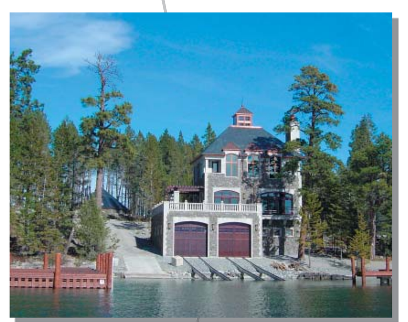
First picture of the site from the early 1900

In the 1840's, Polson was the first settlement on Flathead Lake. In 1938, Kerr Dam was built at this settlement. The site encompasses the entire area of Shelter Island. No historical records are available concerning this island. In the early 1900's, the island was logged and appeared desolate for many years; however, the trees eventually re-appeared and filled the island back to its previous condition which is what presently observed. What history is known of the island has been passed on by word of mouth. For the past hundred years, this oral history has been passed down through a family that first settled and still owes part of the island.

EXISTING STRUCTURES:



Completed Main Land Boat House

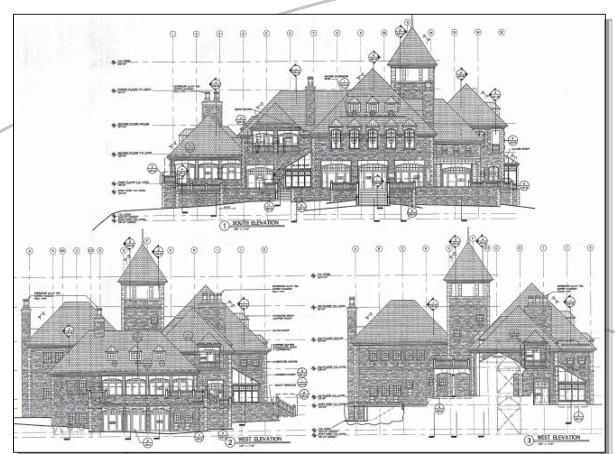


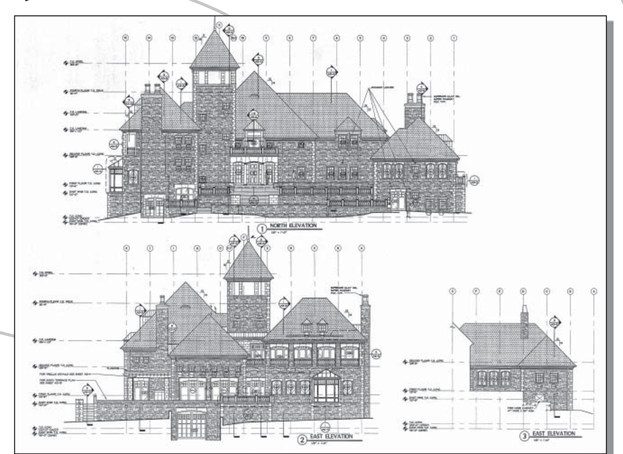
Completed Island Guest/Boathouse

Existing Primitive Cabin

Prior to the recent building activities on the island, there was one existing structure on the island which still stands today. This building is an old primitive cabin located on the northeastern tip of the island. This structure has no power except for that which comes from a gas powered generator. The structure was build from old cedar logs and is currently in decrepit condition showing signs of aging with the use of primal building methods. The owner of the island has begun construction on the site following the completion of a boat house and an office for the builders from a converted house on the mainland. The boat house and a guest house have already been completed and are in use by the owner along with a power generator station.

FUTURE STRUCTURES/PROJECTS:





Pictures Courtesy of Abbey Contractor

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 been 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:

Mossy Edged Native Rock from Kelly Quarry

Limestone carvings from Indiana

Mahogany Woodwork Copper Flashing

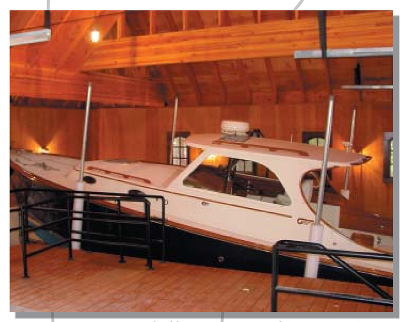
Blue Stone has been shipped from the East coast and is the material used for the base of most walks, plazas, and patios. Edging on the buildings along with steps and banisters have been carved out of limestone that comes from Indiana. The roofs on all the current structures have been made of slate which was shipped from Virginia. There is also a native rock that has been used as the façade for the project. This native rock has a mossy edge that comes from a nearby quarry called Kelly Quarry which the owner has bought the rights to ensure that plenty of material is available to complete the project. Another feature that is prominent on each structure is the copper work of the gutters and flashing along with the use of Mahogany woodwork within the current structures, which will continue to be a common theme throughout the proposed structures.

ENVIRONMENTAL ISSUES:

On site Eagles nest atop dead tree.

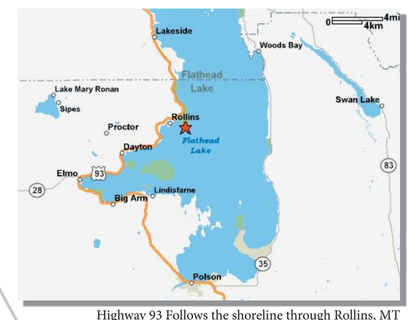
One of the major environmental issues for the project is the presence of a bald eagle's nest located on the site. The presence of this nest has been a major issue influencing future growth on the site. At the commencement of the building project on Shelter Island, an Eagle Observation Biologist was called in to observe the eagle during the construction. The nest and its inhabitants were watched closely to see if the construction on the site had any affect on the bird. The eagle's nest is located high atop a dead tree on the island and is visible from the north and the east looking on the island. The nest appears safe but careful consideration must be taken in the overall construction of the island to make sure the eagle's environment is not disturbed.

TRANSPORTATION & LINKAGES:



Docked boat in Main Land Boat House Garage

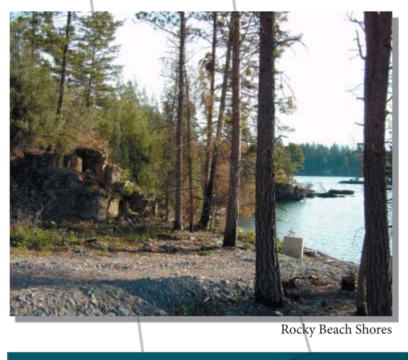
Service/Transportation Barges



Highway 93 Follows the shoreline through Rollins, MT

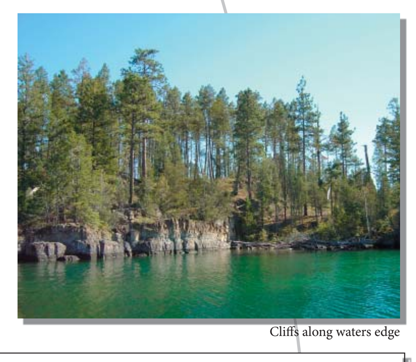
The closest town to the site is Rollins, MT, about one mile to the north of the island on the western edge of the lake. The closest city, about an hour away from the site, is Kalispell, MT which is on the way to Glacier National Park. No vehicular transportation will occur on the island since there is no way to drive a vehicle to the site. Future residents of the island will store their cars on the mainland and ride a boat to the island. Access to the shoreline is simple since a drive is available that goes along the lakeshore. Highway 93 follows the lakeshore from Polson up through Whitefish, MT

SITE TOPOGRAPHY & LANDFORM:

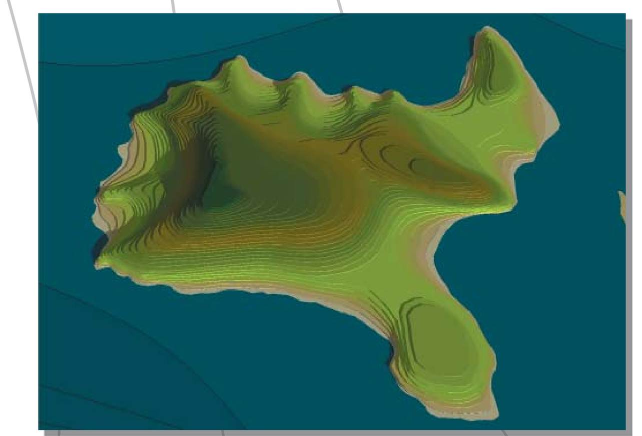


Rocky Beach Shores

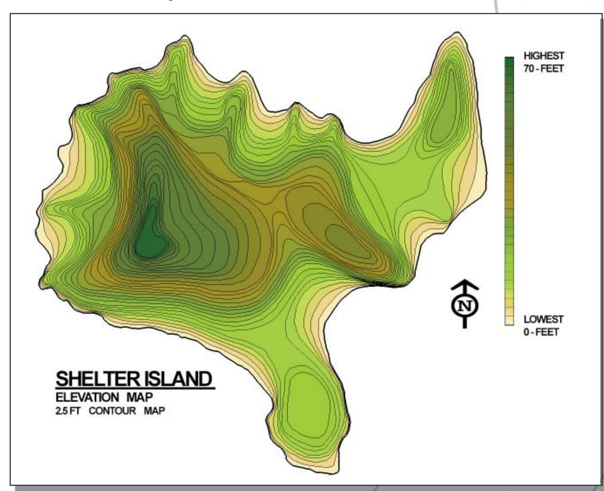
Forested Coniferous Landscape



Cliffs along waters edge



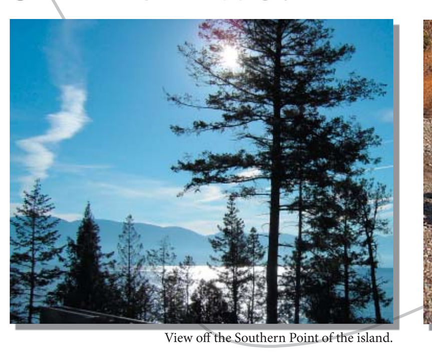
Forested Coniferous Landscape



Forested Coniferous Landscape

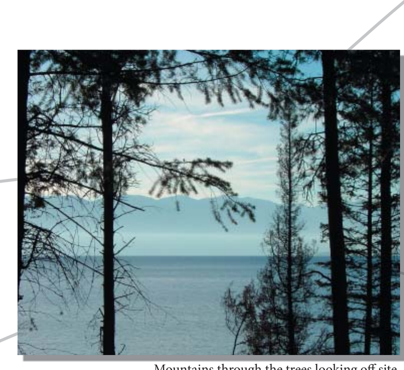
The rocky landscape and geology of the site create many cliffs and hills that generate unique features by splitting the island into separate spaces. These natural spaces are perfect areas for housing and will create a natural separation between each residence. Even though the island is small, only one location on the island is present where an individual can stand and observe the entire landscape without looking into a cliff or a hill. The location is a high point near the center of the island. Most of the shoreline is rocky requiring blasting for the foundation work. The large trees on site also create interesting landforms and shape areas throughout the site.

SITE VIEWS:



View of the Southern Point of the island.

Views of snow covered mountains in the distance.



Mountains through the trees looking off site.

There are fabulous views on and off site that captivate the viewers. Since the topography of the site is 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 for miles. Twelve miles to the east, of the lake are snow capped mountains. To the northeast there are vast rolling mountainous hills and to the southwest are views of other islands in the large open waters. Views onto the island are also magnificent with prominent features showing the island protruding high above the water level of the lake with the thick forested ground cover.

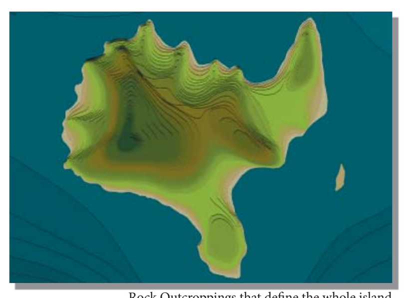
GEOLOGY:

View from the Space Shuttle showing the scar the glacier left when forming Flathead

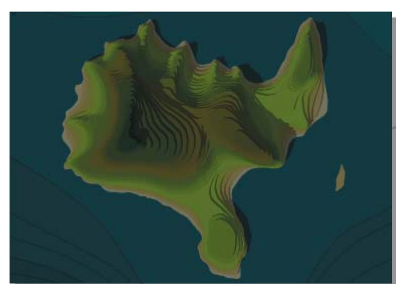
Flathead Lake was created by glacial movement over time with ice sheets that created dams which ended about 10,000 years ago. The region is mostly underlain by rocks and various glacial deposits. Flathead lake was created from the melt water of a vast stagnate glacier. Over the years, Flathead River broke through the marine at Polson and began rapidly eroding the elevation of the buried hill. Hard bedrock slowed the erosion down and ultimately saved Flathead Lake. The river subsequently cut a narrow gorge through buried bedrock hill and is now the site of Kerr Dam. This dam now maintains the lakes water level. (Flathead Region Geology 2004) (Flathead Lake History 2002)

CLIMATE:

Forested Coniferous Landscape



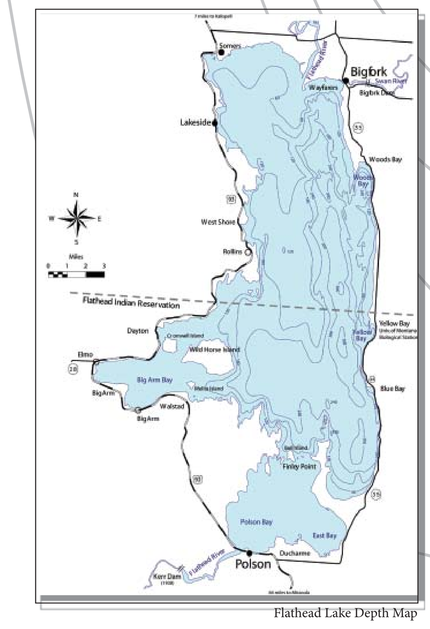
Rock Outcroppings that define the whole island



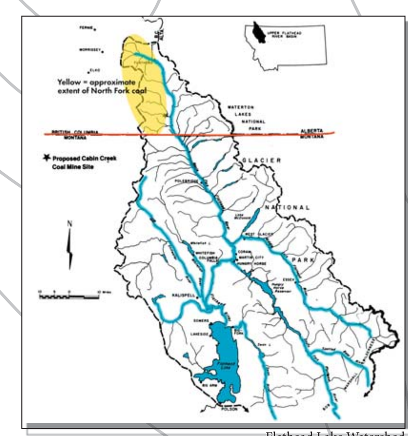
Cliffs along waters edge

The weather in the Flathead Area is generally mild with 4 distinct and spectacular seasons. The average annual temperature is about 42.8° F with a winter average of well above freezing at 36° F and a pleasant average summer temperature of 78° F. Annual precipitation in the area is only 18.51 inches of rainfall a year and an average of 55.2 inches of snowfall. Prevailing winds are usually out of the southeast from the site. Flathead Lake does not generally freeze over during the winter, although the bays often have winter ice cover. Growing around the lake are peppermint, Christmas trees, cherries, champagne, as well as barley, wheat, oats and potatoes. (Western Regional Climate Center 2004) (Western Regional Climate Center 2004)

SITE HYDROLOGY:



Flathead Lake Depth Map

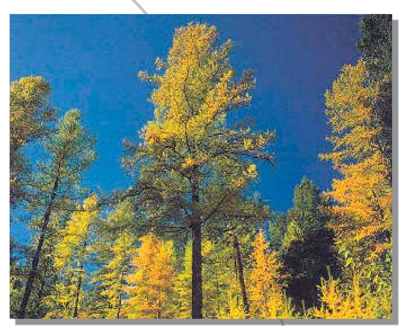


Flathead Lake Watershed

Kerr Dam controls the top 10 Feet of the lake.

Flathead Lake is one of the 300 largest natural lakes in the world and the largest natural freshwater lake in the western United States. It is 29 miles long and up to 15 miles wide reaching depths of 386 feet. The lake's major tributaries are the Flathead and Swan Rivers. 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. 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. (About Flathead Lake 2004)

VEGETATION:



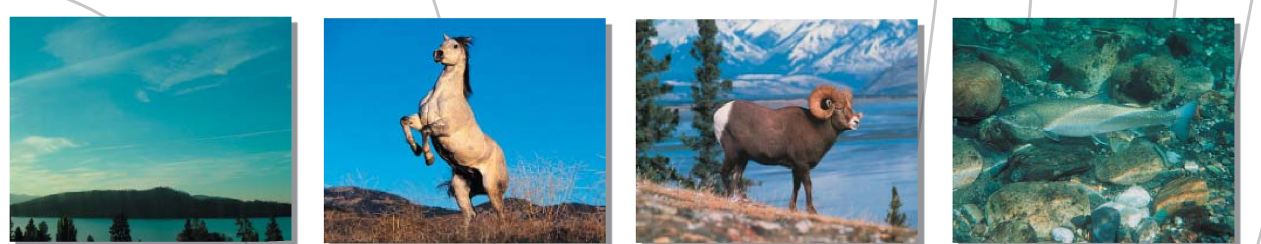
The Wester Larch is common to the area.

A mix of Douglas Fur and Spruce trees.

Gigantic Ponderosa Pine are scattered throughout the island.

Restoring the natural vegetation is planned by the owner 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 was logged recently to harness control over the recent "Missile Toe" problem with the Spruce Trees and to open the island for future growth. Missile Toe is a disease that spreads through Spruce which makes them grow in deformities and clumping. A few other common trees found in the area are Aspen and Western Larch, a conifer that loses needles in the winter.

WILDLIFE:



Wildhorse Island

Wild horses

Big horn sheep

Native Bull Trout

Open space on the shoreline of Flathead Lake includes a National Wildlife Refuge on the North Shore and a wildlife refuge on the South Shore at Polson's Bay which is managed by the Flathead Lake Biological Station. Wildhorse Island which is near Big Arm Bay, is the largest island in the lake at 2,100 acres. This island, which is managed by the Montana Department of Fish, Wildlife and Parks as a wildlife refuge, is noted for its herd of Rocky Mountain Bighorn sheep and several wild horses. Native grasses and flowers are abundant on the islands. Twenty-five fish species are commonly found in the Flathead River-Lake ecosystem with 10 species native and 15 species introduced. (Montana Fish, Wildlife and Parks)

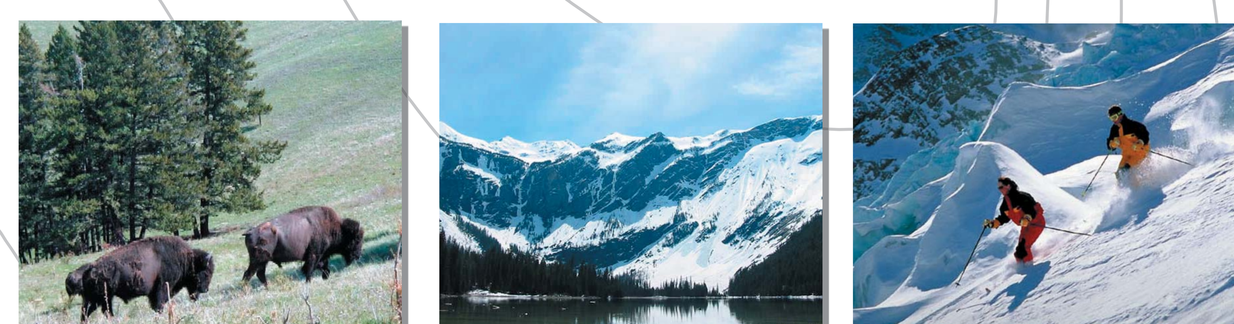
CULTURE:

Pictures provided by gowest.coalliance.org

Pictures provided by gowest.coalliance.org

Half of the 161.4 miles of shoreline is considered 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. Native Americans have inhabited Montana for more than 14,000 years and artifacts have proven that these tribes have roots in the prehistory of the area. Catholicism had major affects on the Salish tribe which can still be seen today through the old churches in the area. (Flathead Indian Reservation 2004)

LANDMARKS & ACTIVITIES:



National Bison Range

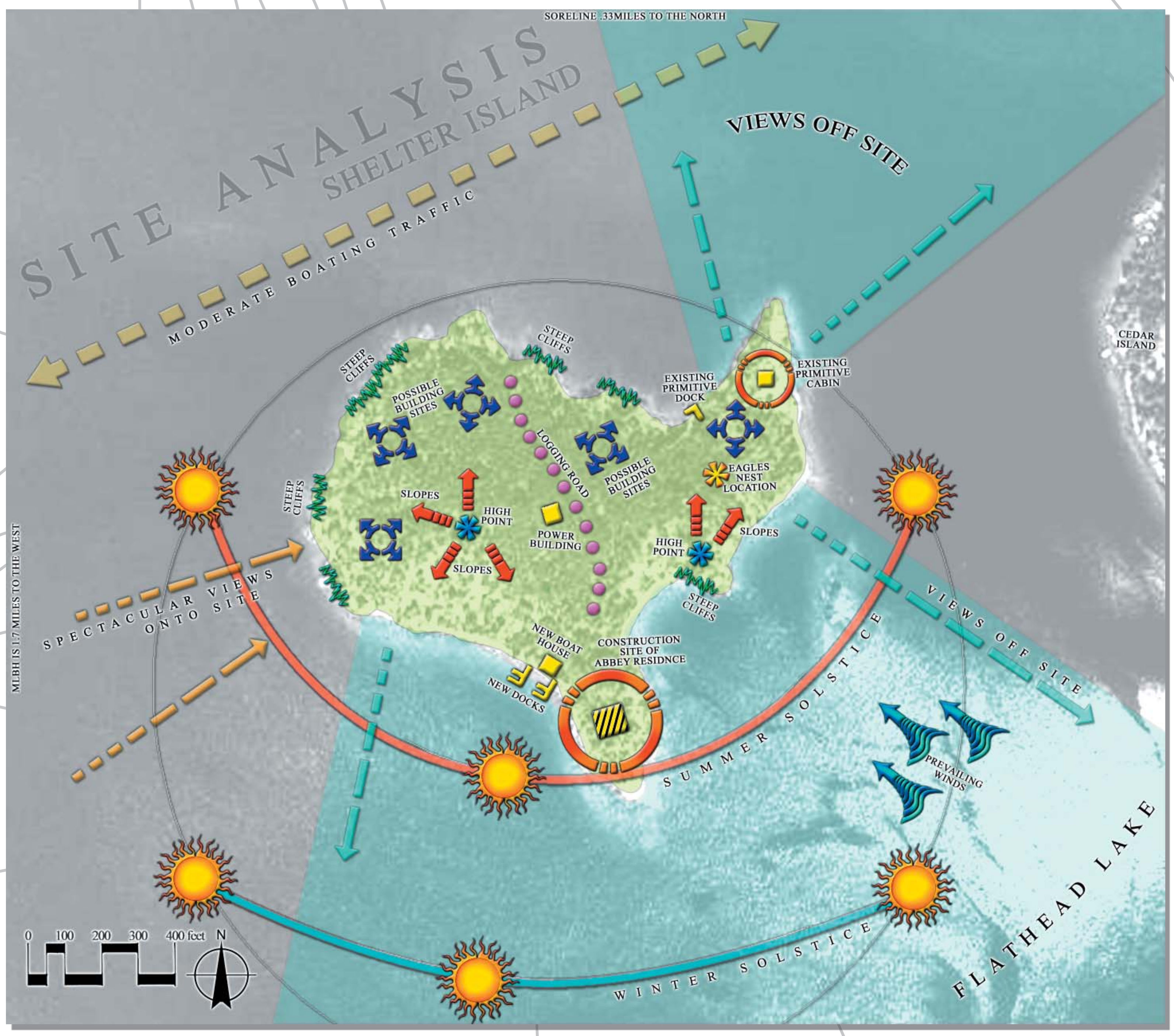
Glacier National Park

Ski slopes at Big Mountain

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. 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. (About Flathead Lake 2004)

Site Analysis

Overall Site Analysis Map:



The specific location of the island is within proximity to at least three major towns making this area a perfect place for a communal development. Picturesque views surround the site as snow covered mountains mirror off the clear waters. These views introduce the opportunity to create vistas off the site through organized site planning. The previous architect's style of construction was quite impressive and blends into the rustic surroundings well. Construction materials used are aesthetic and will be appropriate for use in the landscape architectural design.

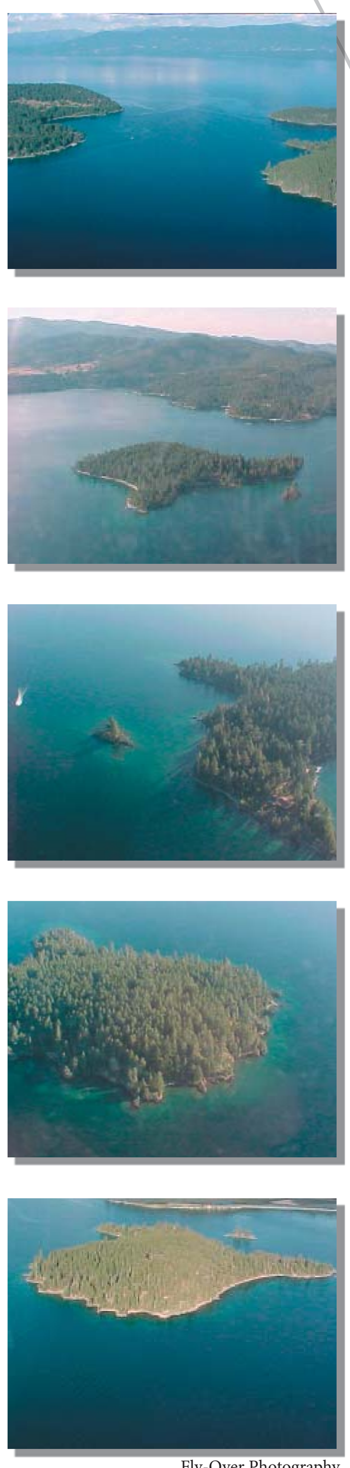
The eagles nest on the site will be difficult to incorporate into the overall design; however, the final outcome will yield a more accomplished design when the eagle's habitat is not disturbed. Five locations on the site for separate residences are possible. The island topography naturally splits the site 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. There are a few points on the site that would be perfect for lookout points.

Opportunities:

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

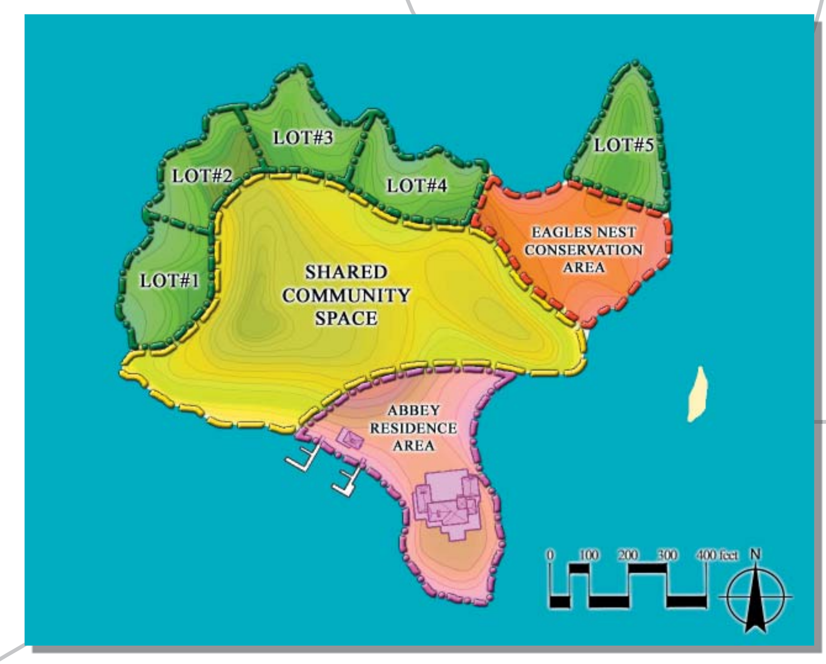
Constraints:

- 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



Fly-Over Photography

Spatial Use/Separation:

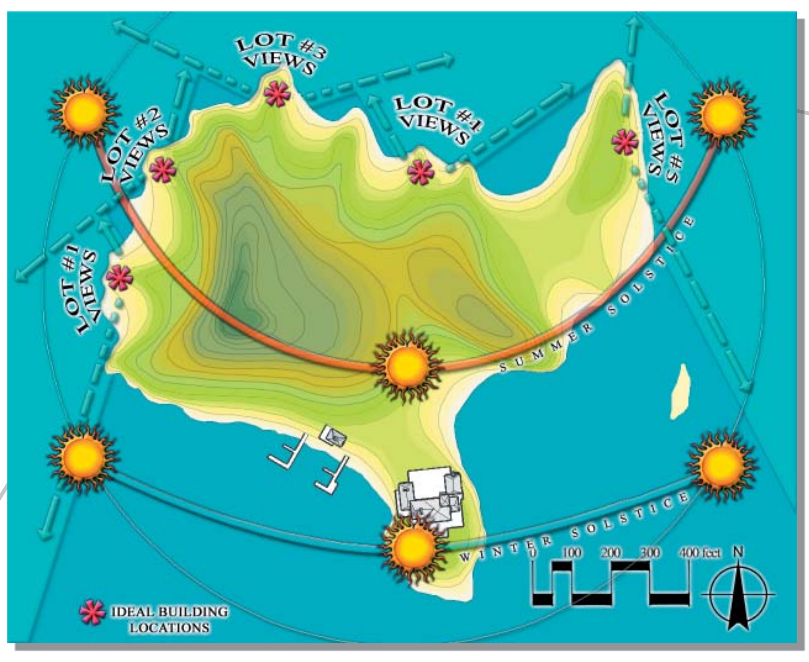


This map shows the division of spaces on the site after careful consideration of the different needs on the island. The first space considered was needed to separate the Eagle's Nest from the built environment. The different lots were laid out using the natural contours of the site to find natural separate 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:

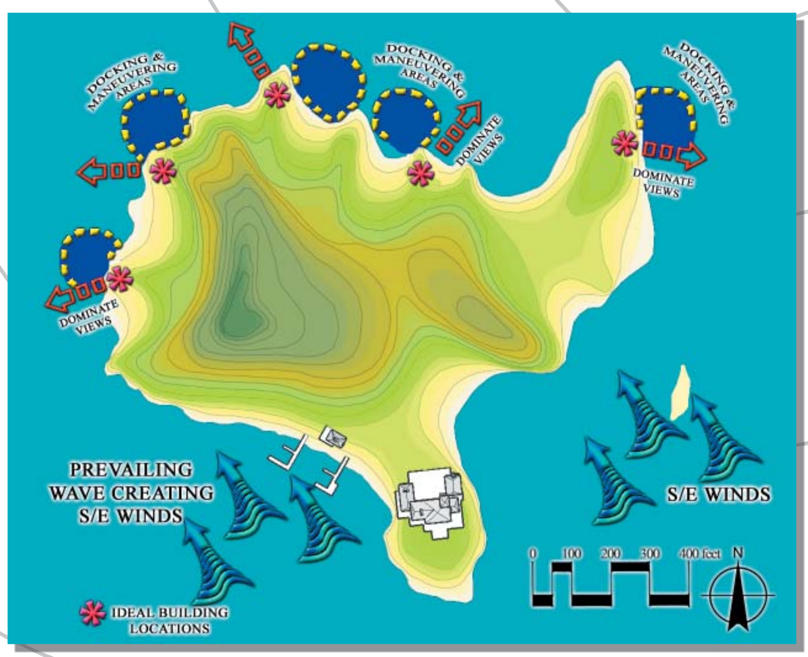
The actual building sites were laid out comparing different features of the site. First, the site needed to be separated in such a way that they could all have there own personal space within the community. Then sites were found where a firm foundation could be laid. Building locations are plotted so they are out of the path of site water flow and away from dominate 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. There views of each other would either be blocked my 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 then 70 feet above the waters surface.

Dock Positioning:

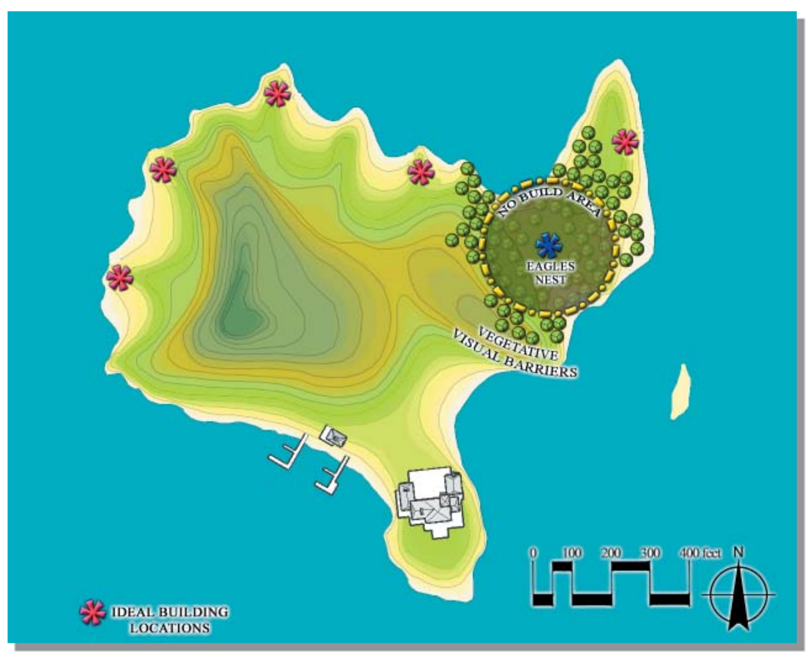


Dock positioning was another important consideration in the layout of the residences. After finding out the predominate view for each building location there needed to be an area that each of these residences could have docking facilities. The docks are laid out so they do not intrude on any of the dominate 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 System:

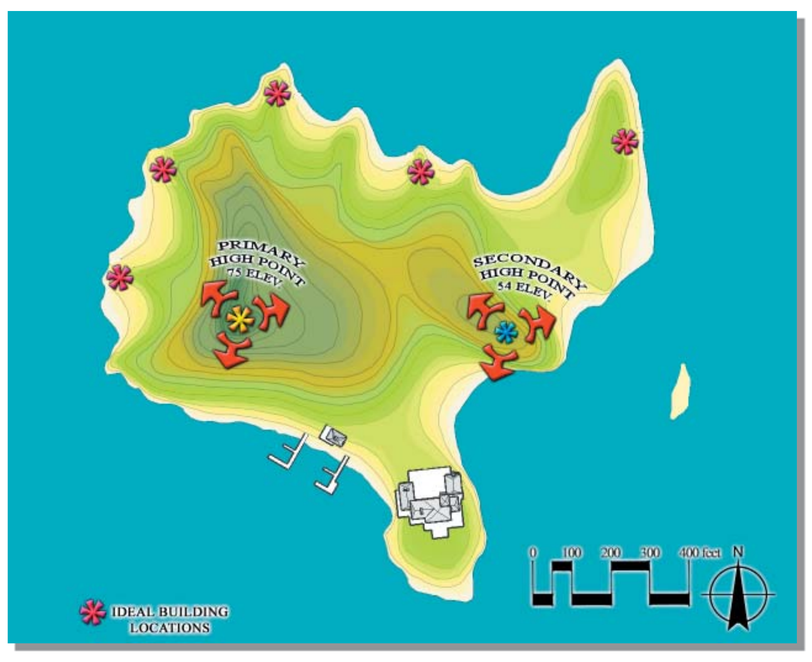
In order to create a community, a trail system would be an important design feature. A possible trail area has been noted that avoids extreme topography changes and connects all of the sites features on the island. The trail will be divided by nodes at intersecting pints which connect the trail to each 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:



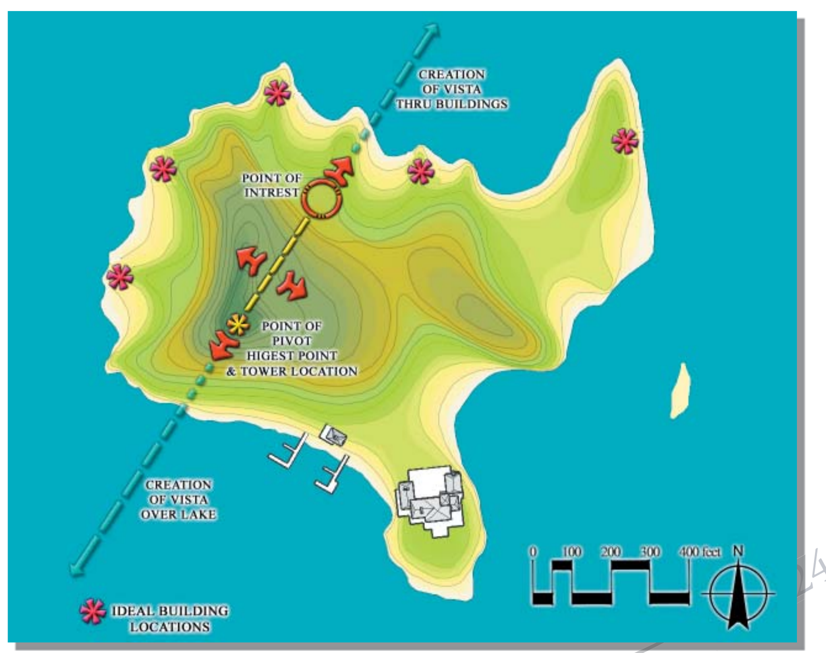
Since the eagle's nest on the site is such an important feature careful considerations need to be taken when designing around the nest. A zone with a radius of about 200 feel will be a no build zone around this area. This will insure that the nest is not disturbed by the construction. All the trails 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 next 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 apace 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 pint of interest will be a flat space located at the base of the linear space.

Benjamin P. Iwen

Perfection Inspired Designing

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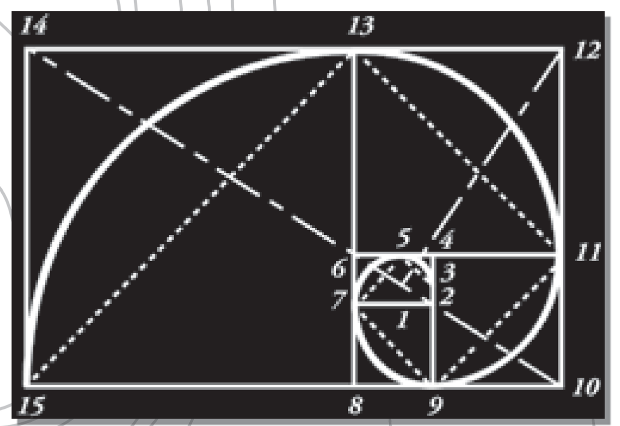
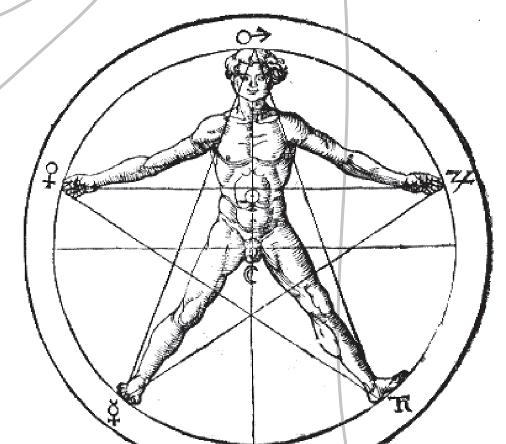
The Divine Proportion:



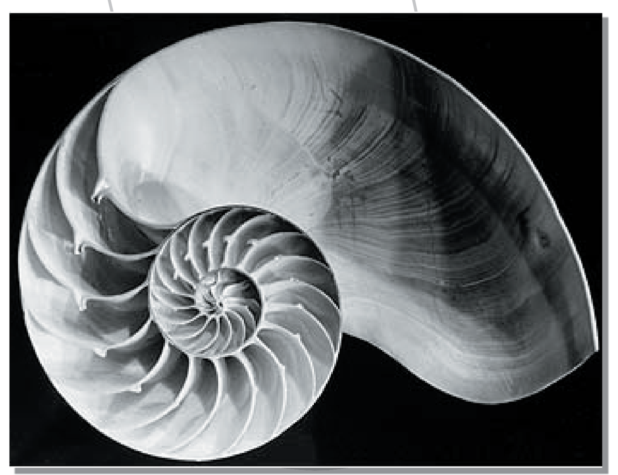
Fibonacci Spiral

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): fn = Phin / 5½



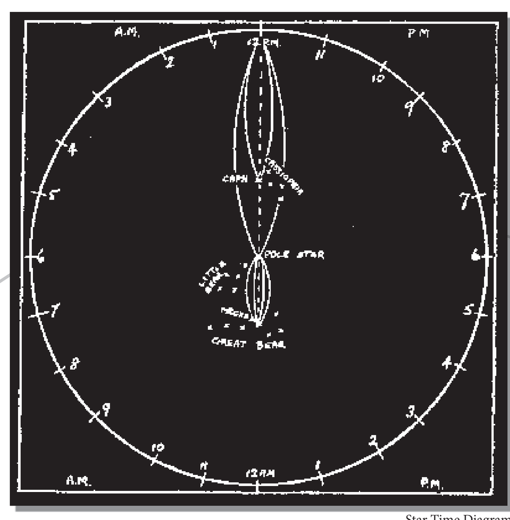
Divine Proportion in relation to the Human Body.

It has long been know that the Golden Section or Divine Proportion appears in certain proportions of living organisms. The human face shows examples of these 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.



Docked boat in Main Land Boat House Garage

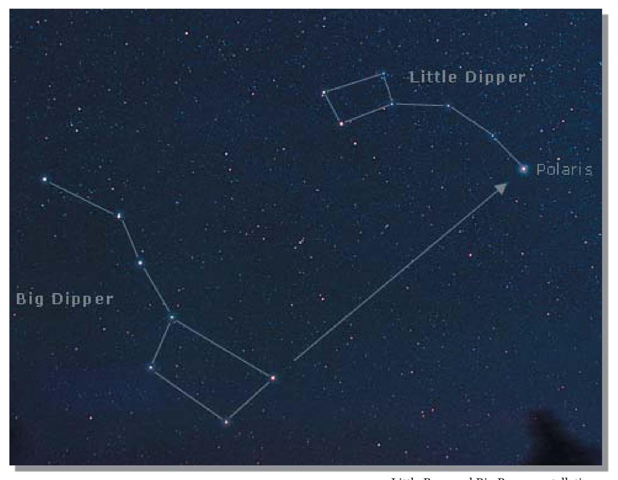
Telling Time with Stars:



Star Time Diagram

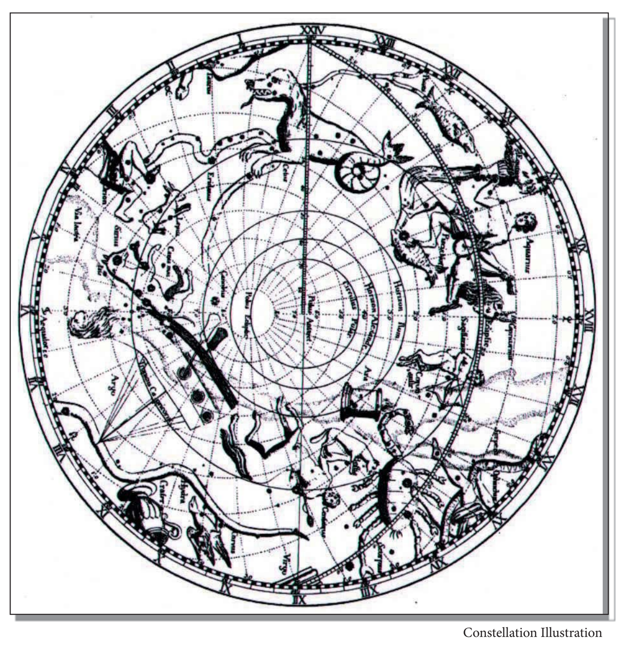
On the circle of sky overhead, imagine the hours written around the edge in a 24-hour clock, with 12 midnight at the north point, 12 noon due south, 6 A.M. to the west, and 6 P.M. to the east. All the A.M. hours are on the west or left side and all the P.M. hours are on the east or right. These hours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



Little Bear and Big Bear constellations

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.



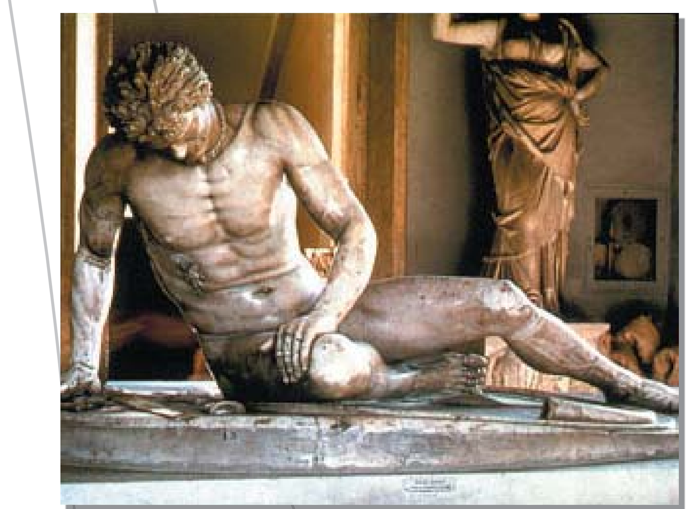
Constellation Illustration

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)

Greek Architecture:

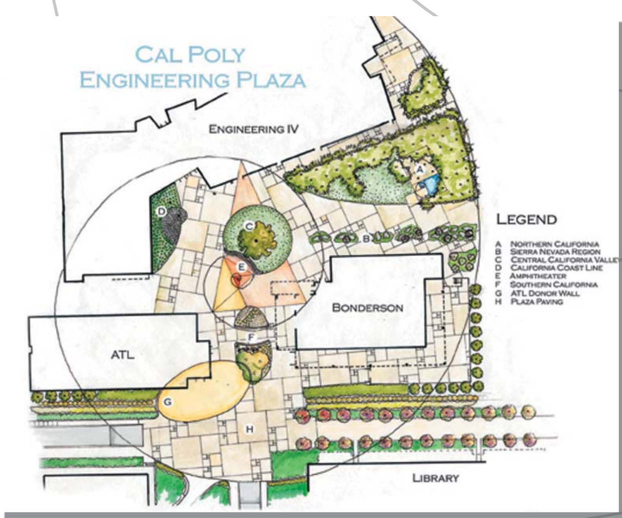
Greeks used Devine Proportion in the construction of the Parthenon.

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 is 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.



Greeks also use Devine Proportion in Sculpture and art.

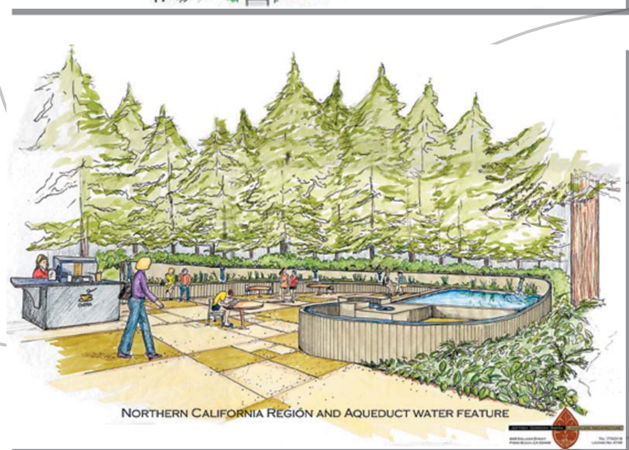
California Polytechnic Engineering Plaza:



San Luis Obispo, Ca.

Jeffery Gordon Smith

This case study was interesting since it used the same underlining premise in its design that is to be used on the Master Plan for Shelter Island. The design was 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 that can be found in nature which is based on the mathematical proportions used by the Greeks. This same spiraling design can also be affectively used in the layout for the overall island. It helps to bring the site together and creates connections and relationships among different parts of the site that are seamless and flowing.



Designing for Security:

Not only is landscape lighting Aesthetic it also creates Security.

Crime prevention can be done through environmental design to enhance security. Intruders look for property that is easily assessable. The ideal target is a house surrounded by large hedges and shrubs, which may hamper visibility from the street and neighboring houses. Alterations in a landscaping can discourage intruders. Plants should not create places of concealment, particularly adjacent to the entrance or at bedroom windows. Large gauge gravel on the ground can also be used as a deterrent. Crushed stone can have the same effect.

Outdoor lighting can provide security and beauty in landscape architecture. A variety of landscape lighting styles are available for all outdoor needs providing security and pleasure. Flood lights illuminate the areas around gates and doors to provide a secure environment. Other lights can be places along walks and be fixed to docks not only provide a feel of safety but also to prevent personal injury. Lights are mounted so they shine on exterior walls and create silhouettes of intruders at night making them visible. The site also provides a challenge for trespassers who are not aware they are trespassing. Many people believe that the island is not private property. Landscaping should be done to prevent would be trespassers. The shoreline should be less inviting to the public when the building is completed.

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

Habitats of Eagles:

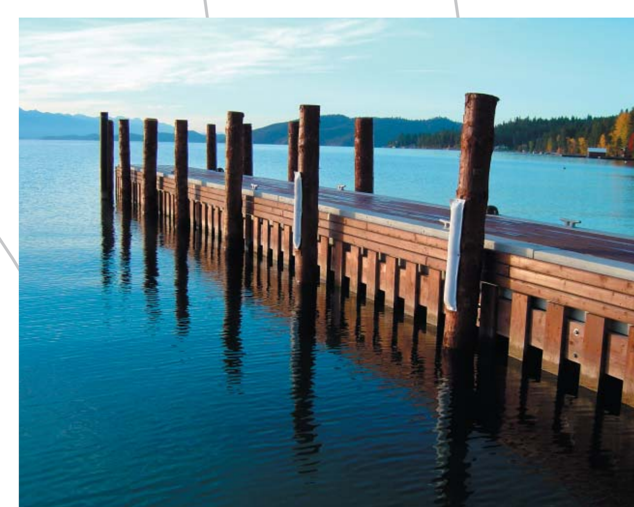
The nest site is located on the eastern half of the island at mid-slope. The nest platform is approximately 75 feet high. Guy-lines are wired to keep the tree erect. Despite the increased human traffic, the Flathead Lake eagles have been displaying an unusual tolerance for human activity. The eagles 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.

Pictures Courtesy of AnimalKingdom.com

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.

Small Craft Harbors:



Current docking foundation on concrete pylons.

Design, Construction, & Operation

Spacial Report No. 2 SR-2

Fort Belvoir, VA James W. Dunham and Arnold A. Finn

This survey evaluated problems encountered when designing master plans, between functional and aesthetic design trade-offs, by circulation, by utilities, and by winter conditions. All of these factors are important in the design of the Shelter Island project. Most docks are not intended to be aesthetic, but are designed to be functional. It is difficult to design a docking system that is both aesthetic and functional at the same time. The largest problem identified in this case study was the ice formation during the cold climate. Since most of the docks are permanent they cannot be removed as would occur with the smaller docks. If practical, in a pile dock system the piles should be driven butt-down where ice formation is anticipated so that as the water level rises the ice sheet will slide off the pile taper rather than wedge to the pile and pull it out. Another way to combat the ice is by using forced-convection or bubble systems to prevent the ice from forming. To help control the effects of ice on Shelter Island the elevation of the lake is lowers ten feet for the winter months through Kerr dam . When installing permanent docking structures it is important to make sure that non of the dock structures are deeper then that ten foot level. That will prevent any problems with ice destruction. If the ice does come in contact with the docks, the bubble systems will be used to help prevent any ice damage.

Tracks for parking the boats in the garage.

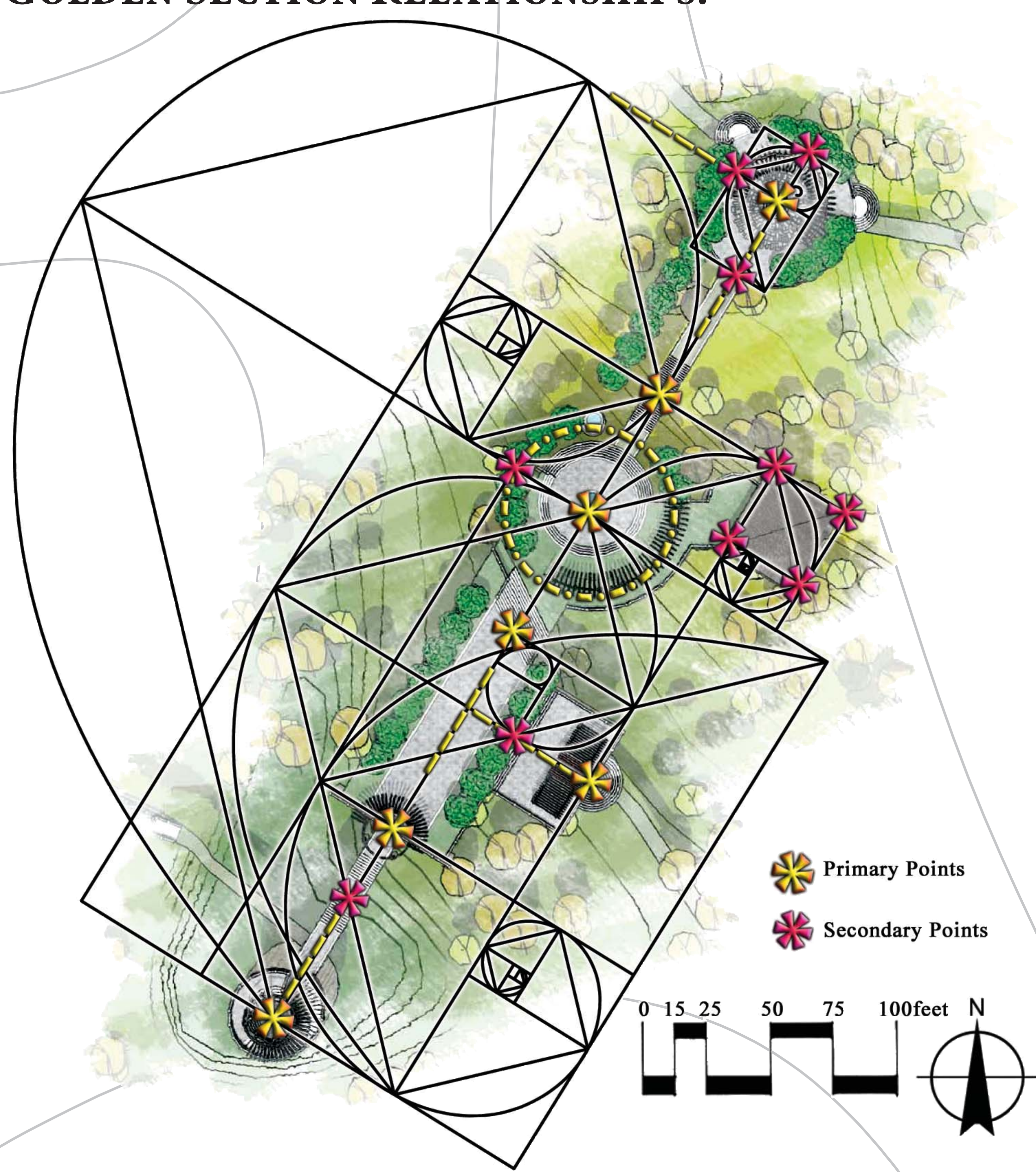
Bubble system combats ice formation around.

Concepts & Process

Abstract:

How a great designer achieves the perfect design is difficult to determine, but it seems one can recognize these perfect designs when they occur. What separates 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 one to these conclusions? The study of Greek architecture has been evaluated to determine what makes and how to make the perfect design. In Greek architecture a highly structured system of proportions that related each individual component to the whole building is present. 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 created beauty and balance in their design using this methodology. The master plan of Shelter Island can use many lessons learned through the study of Greek architecture and their search for perfection. These systems of mathematical proportions can be applied to master 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 a landscape design of the highest order. 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.

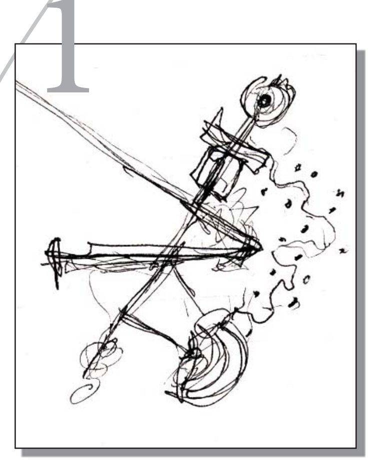
Golden Section Relationships:



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.

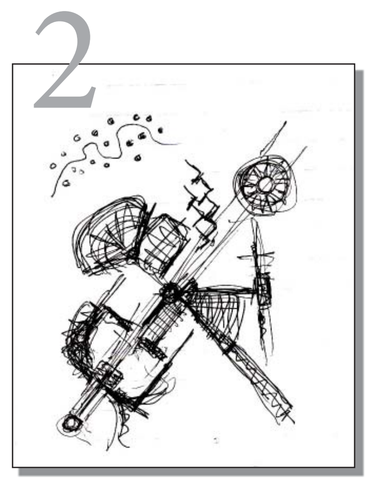
Plaza Design:

1



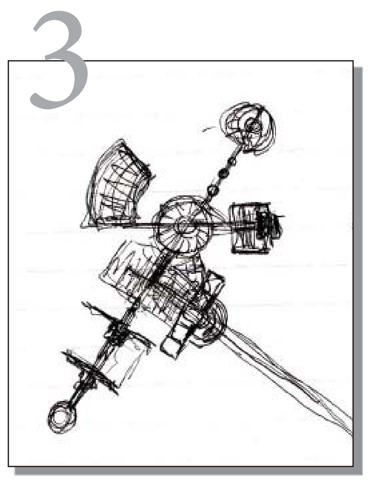
This first design layout focused on the different divisions of space in relationship to the golden section. It was a simple sketch for the beginning of an idea that would continue to build through the refining of the design.

2



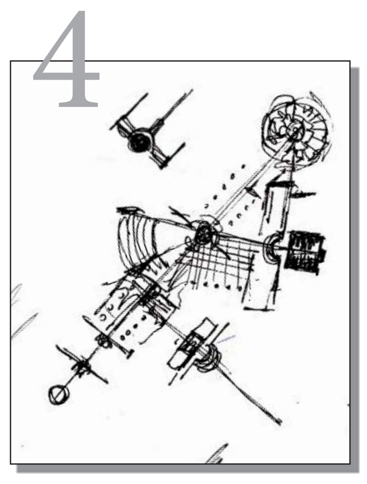
This second sketch looks deeper into different design features and the possibilities in the creation of a plaza. This sketch looks closer at the spaces themselves and what they might actually be used for.

3



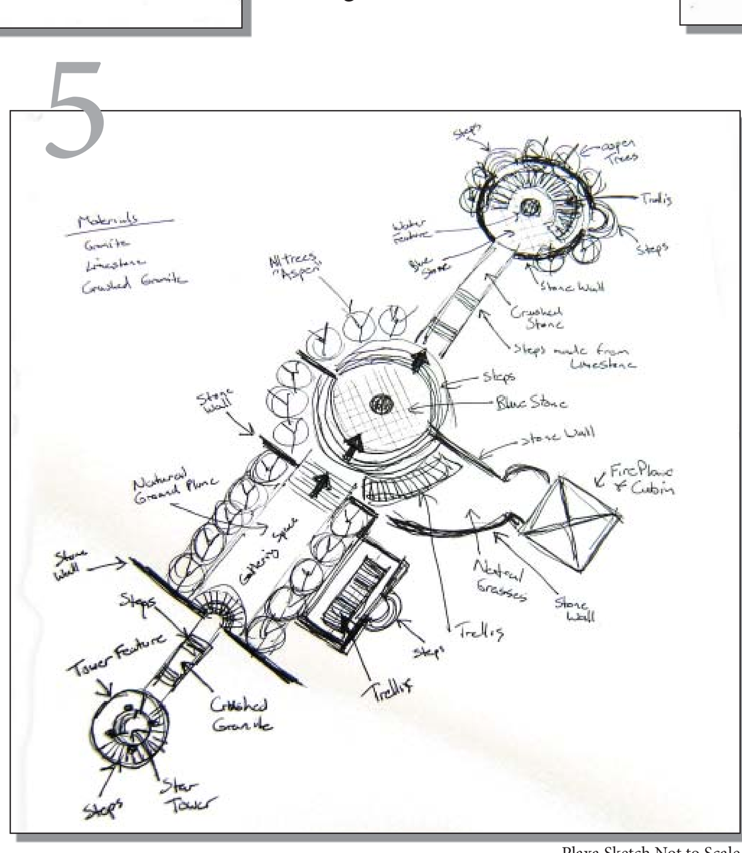
This third sketch is the continuing refinement of the different spaces and begins to consider what actually might be located in each space. Different design features are implemented by placing different plazas and arbors in the image and adding a cabin feature.

4



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.

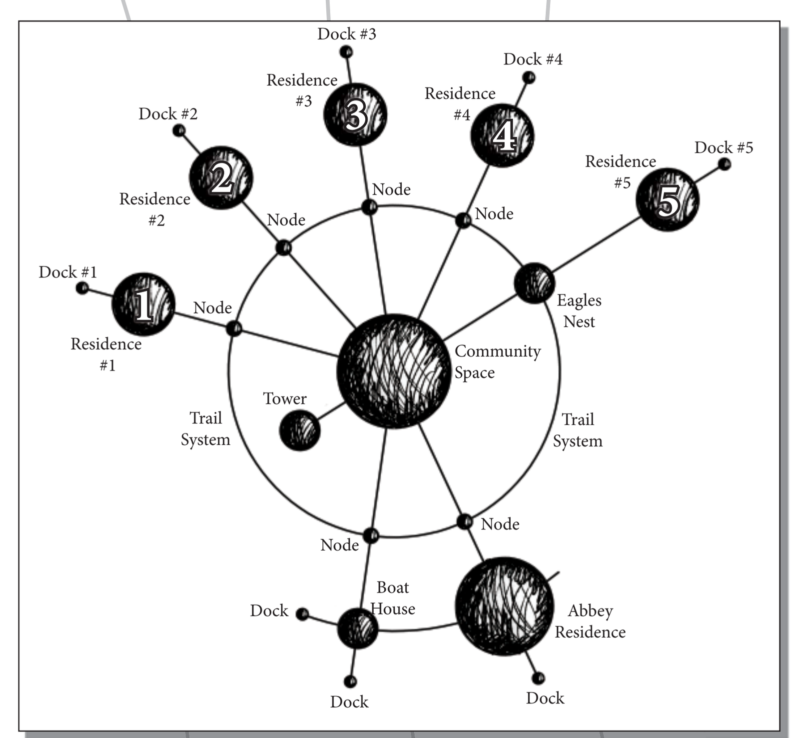
5



Plaza Sketch Not to Scale

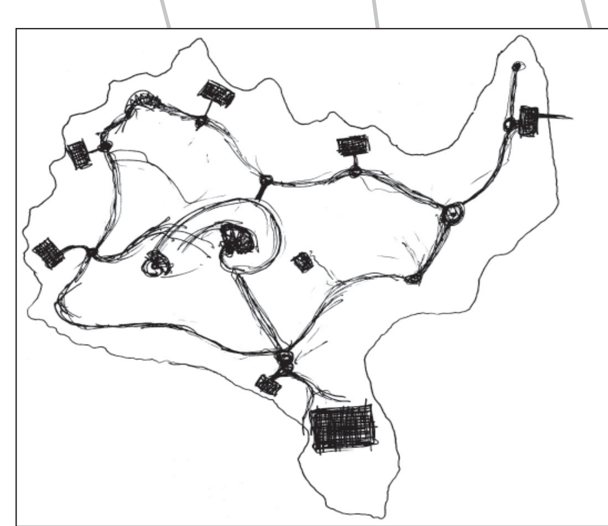
This is a final refined design that showed different material along with more detailed look at different features of the plaza design. Walls were used along with many steps to take advantage of the overwhelming gradient change. A detailed representation of each important feature of the plaza is also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

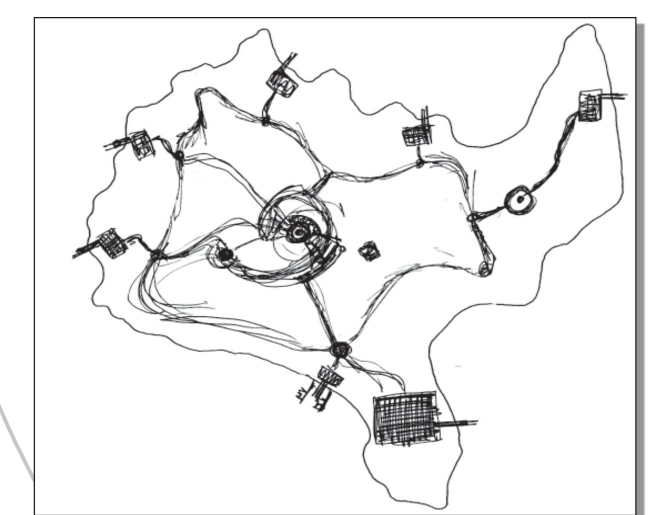
Connections:



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.

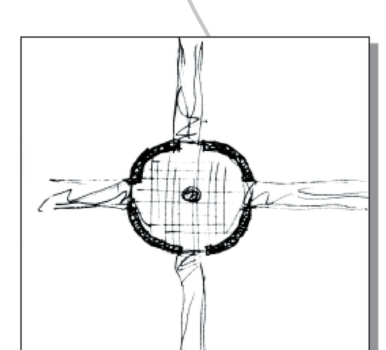
Designing A Community:

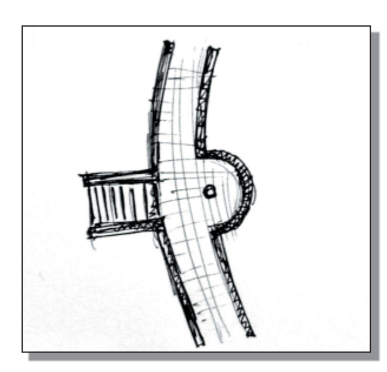


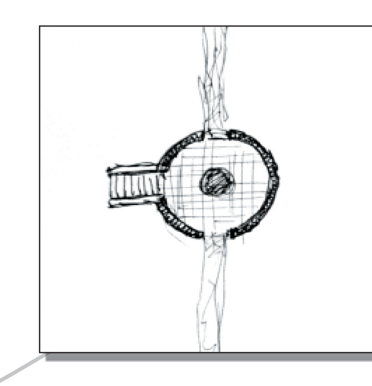


The residents who eventually live on the site will feel like they belong to a community and won't be isolated on there portion of the island. Although they will each have their unique space, the site layout will encourage interaction and social cohesion of the members of the community. These, along with the connections, were important points to consider when designing the overall master plan. Many sketches of different layouts were studies to create a successful overall site arrangement that would be aesthetic and make the most of the islands features while still being functional. By maintaining the important connections, the creation of the overall community became straight forward.

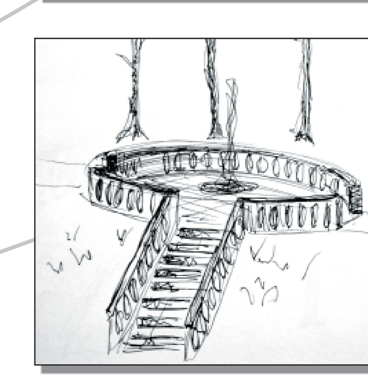
Creating Nodes:

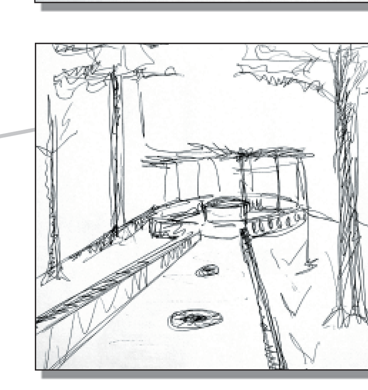




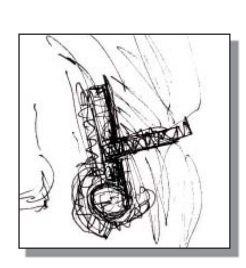


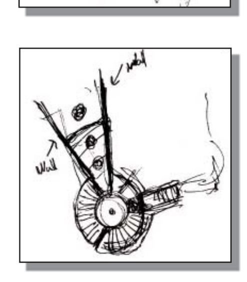
The nodes were an important feature that came about while trying to maintain and create connections through the site. These features also helped with site flow and to create points of interest that indicated a place to stop and reflect. These points are also practical since most of them are needed to 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.



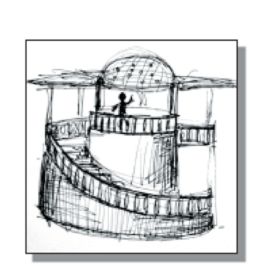


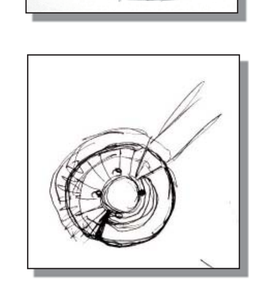
Special Features:



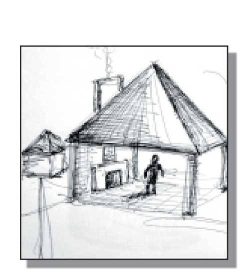


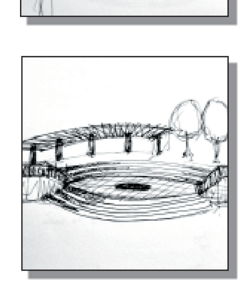
As a special design feature of the site, a few early sketches show a tower that was to be located on the southeast end of the island as a node on the trail system that overlooks the large portion of the lake. This tower uses the same materials and design style as the plaza deign.



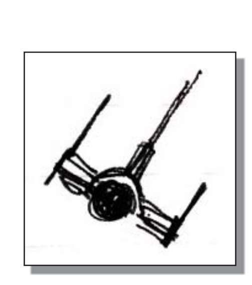


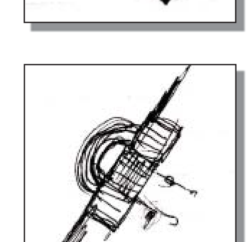
The tower was an important design feature of the site since it commanded a 360 degree view of the entire lake and surrounding area. Many different design sketches were made when trying to come up with the towers final construction.





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 where 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.

Benjamin P. Iwen

Perfection Inspired Designing

Shelter Island Master Plan

Flathead Lake, Montana - Design Thesis 2005

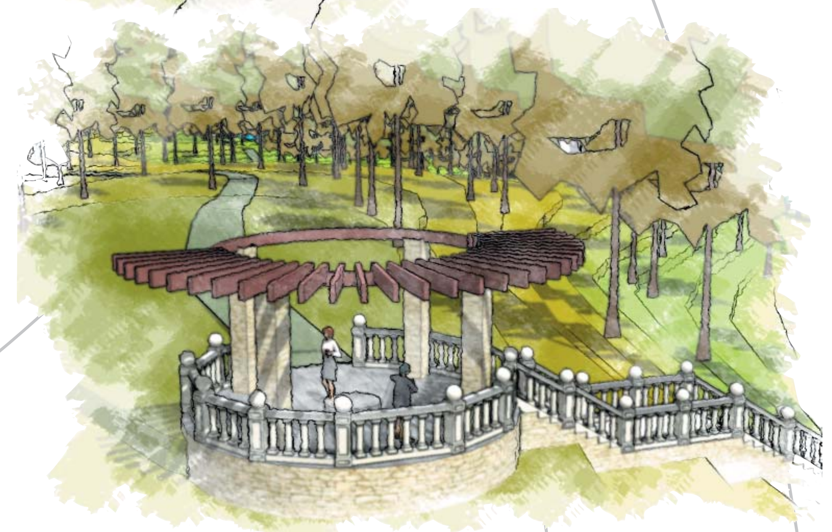
Master Plan

Overall Plan:

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 apposing 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.

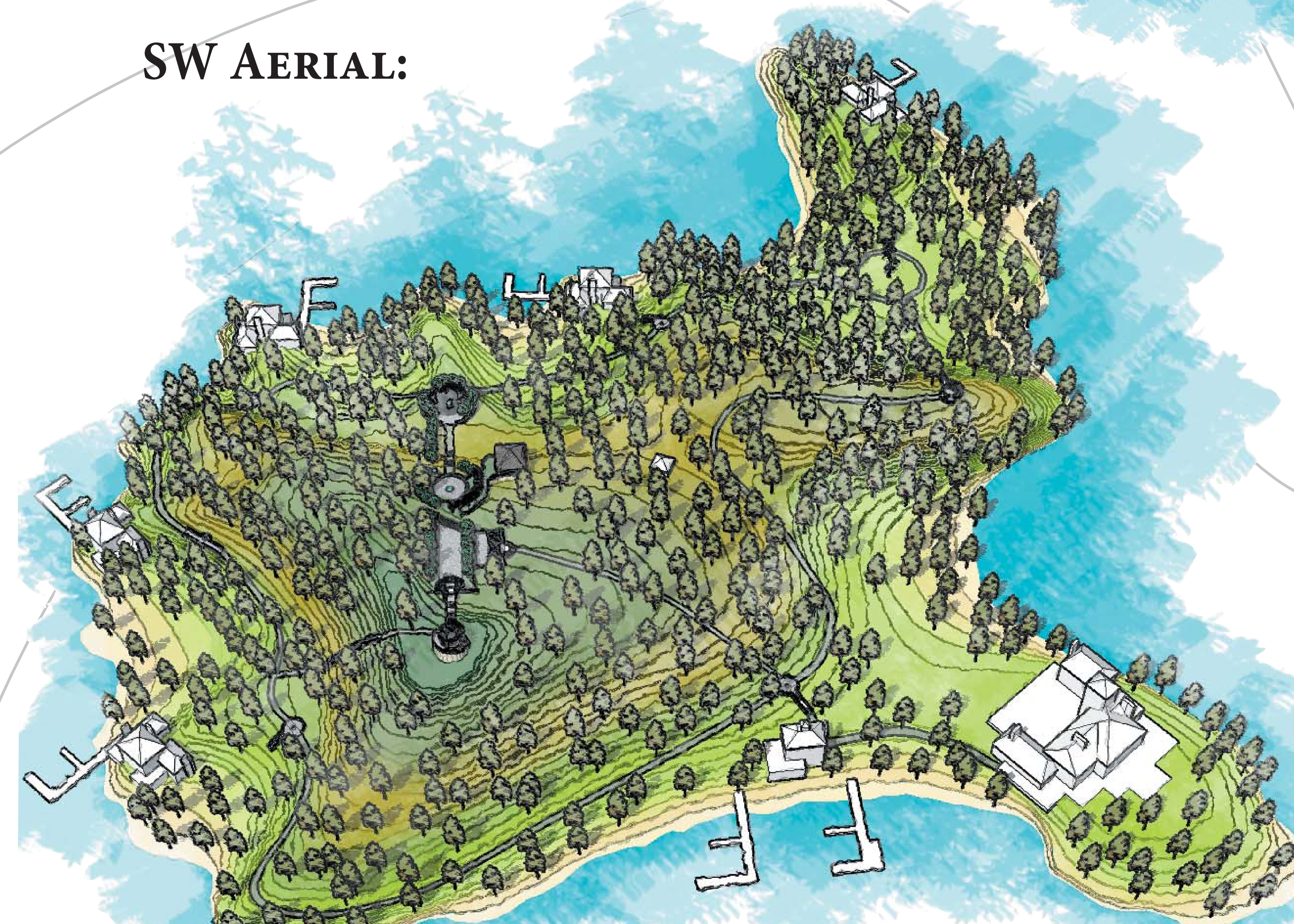
Eagles Nest:
The eagle's nest is isolated to maintain the bird's habitat. A space around the nest has been set aside as a "no building zone" to ensure no human disturbances. The nest is an important node along the trail and a connection point for the residence on the northeast peninsula of the island.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



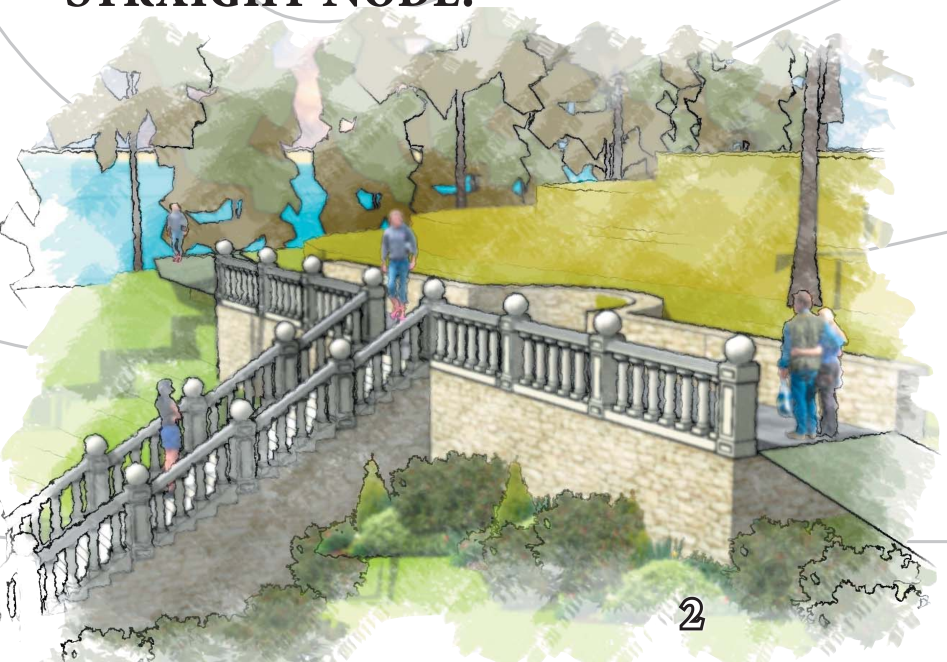
Viewing Platform/ Eagles Nest:

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 slop 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.

SW Aerial:



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 slop 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.

North Elevation:

East Elevation:

South Elevation:

West Elevation:

Benjamin P. Iwen

Perfection Inspired Designing

Shelter Island Master Plan

Flathead Lake, Montana - Design Thesis 2005

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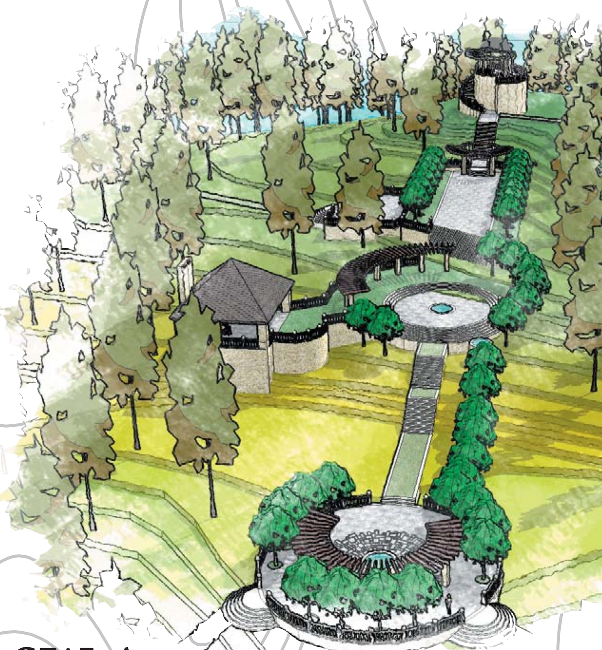
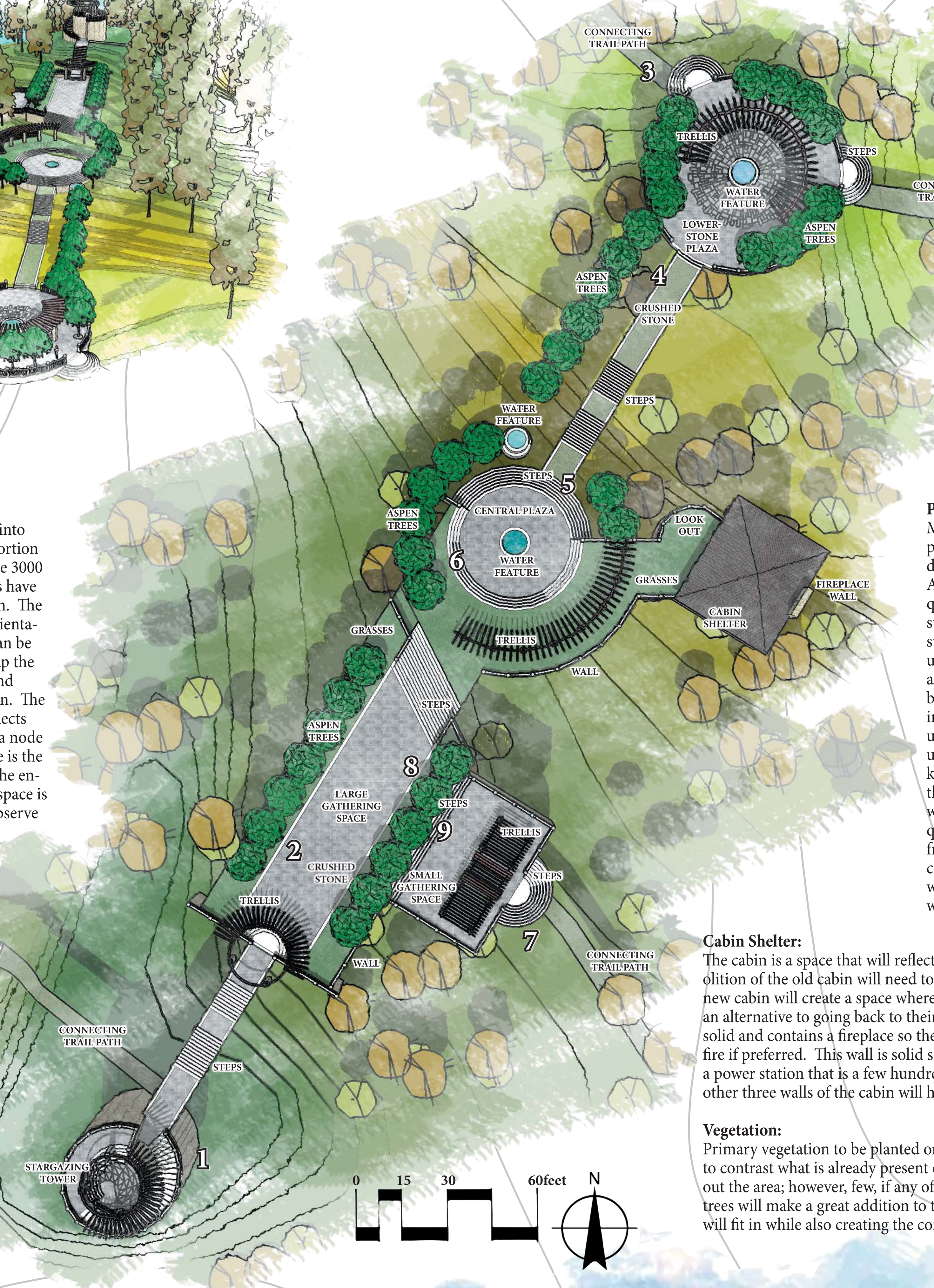
Community Plaza



SW Aerial:

Overall Plaza Plan:

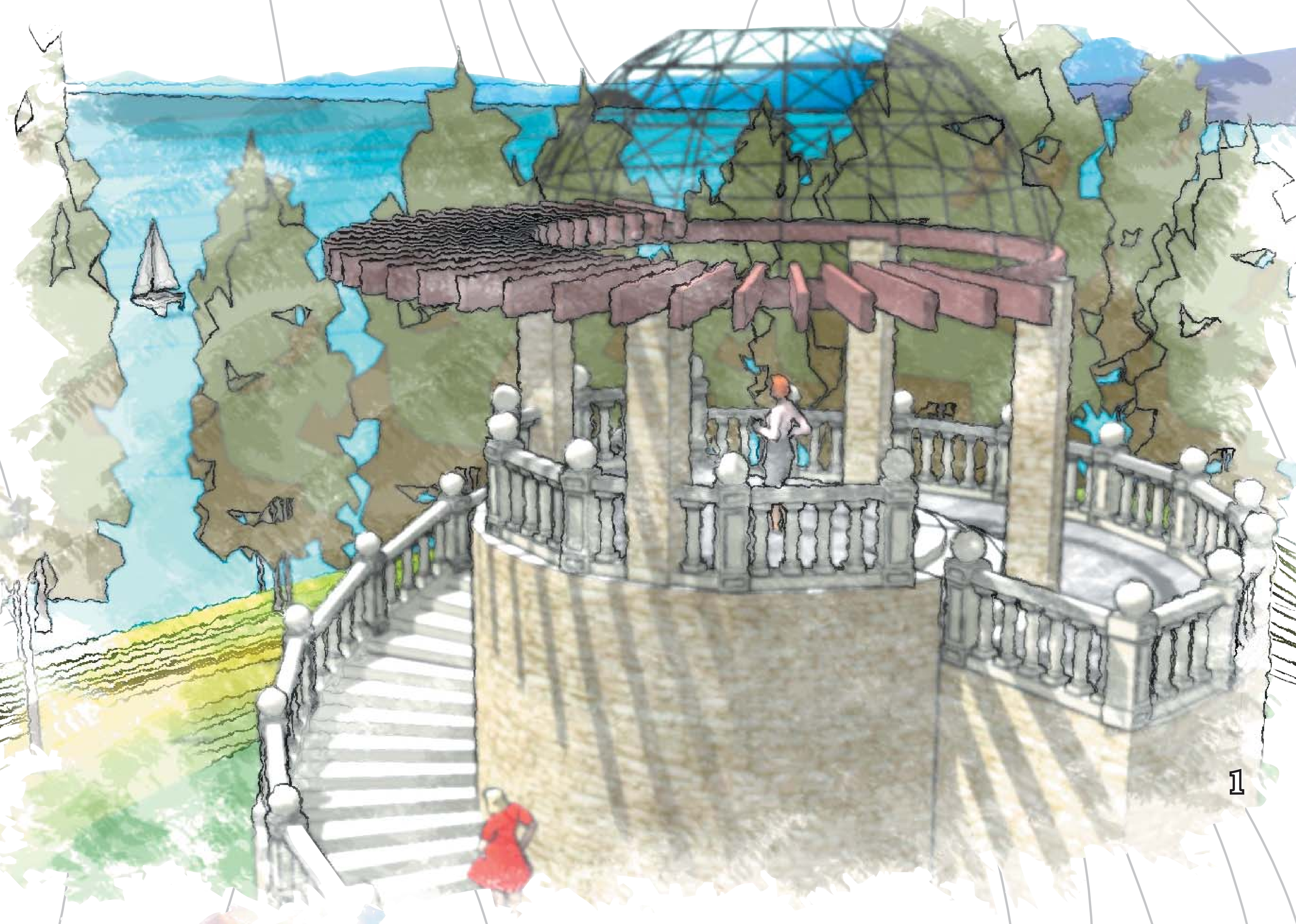


Overall Plan:
The community plaza has been divided into spaces utilizing the golden section proportion system that was used by the Greeks some 3000 years ago. These proportions and angles have helped to yield a more purposeful design. The plaza has been designed with a linear orientation and placed on 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

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.

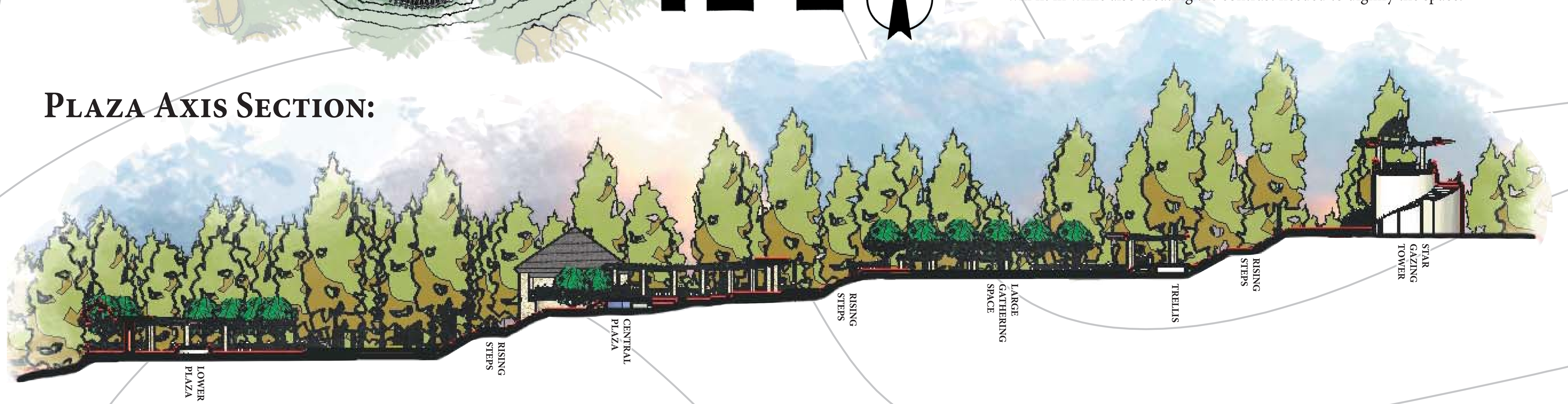
Vegetation:
Primary vegetation to be planted on the island will be composed of Aspen as a way to contrast what is already present on the site. Aspens trees are common throughout the area; however, few, if any of these trees are growing on the island. These trees will make a great addition to the island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

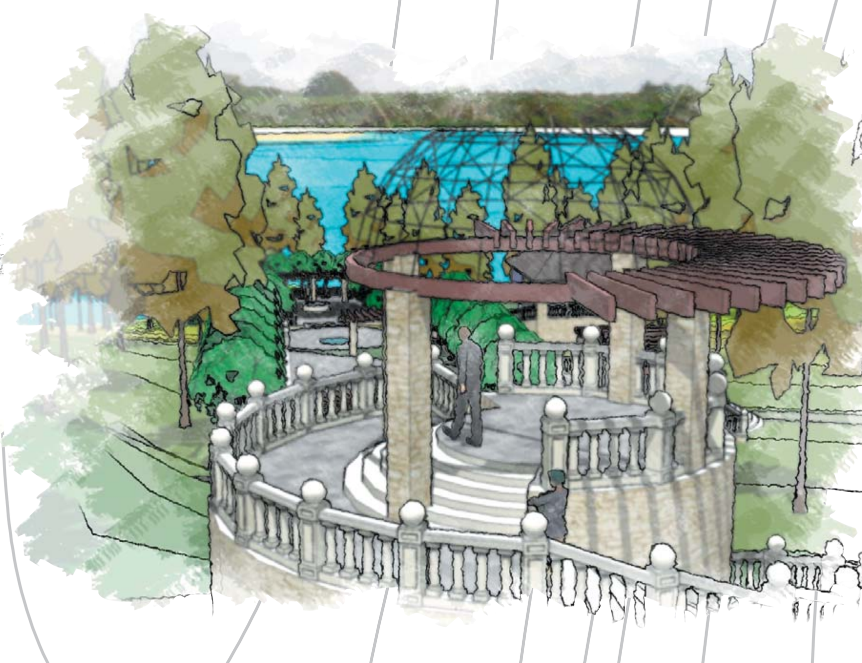


Star Gazing Tower:

The stargazing tower is an important feature that makes the most of the islands 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 a iron sculpted dome that illustrates how to tell time with the stars at night.

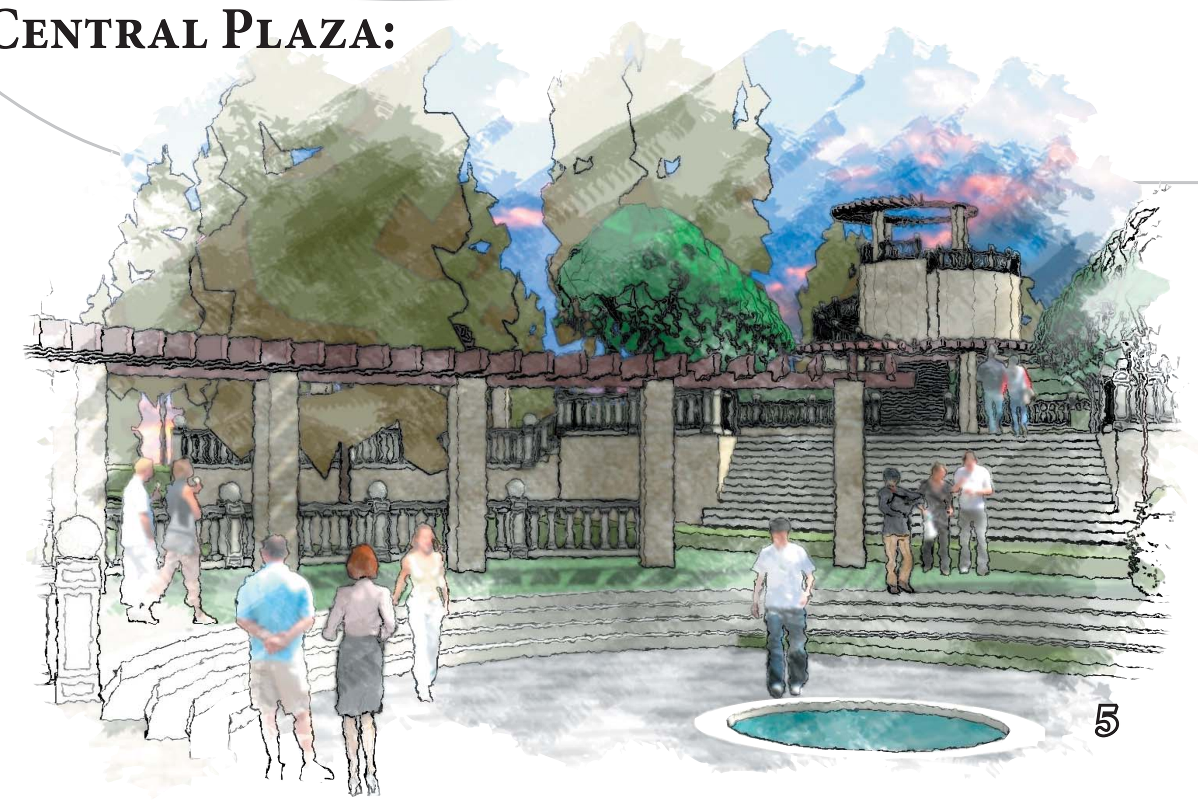
Plaza Axis Section:





Lower Plaza:

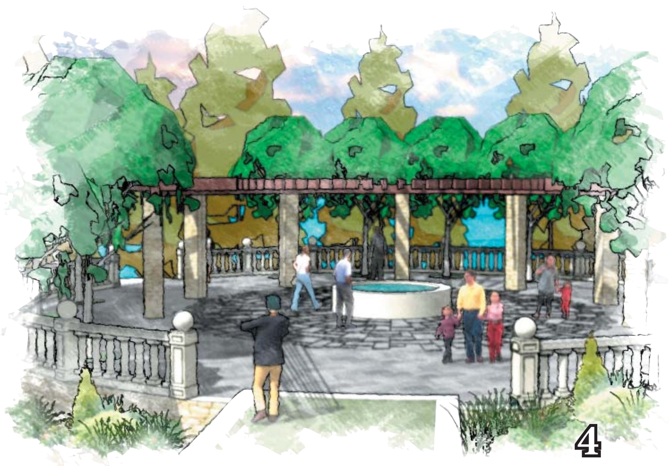
Central Plaza:



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.

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.



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.

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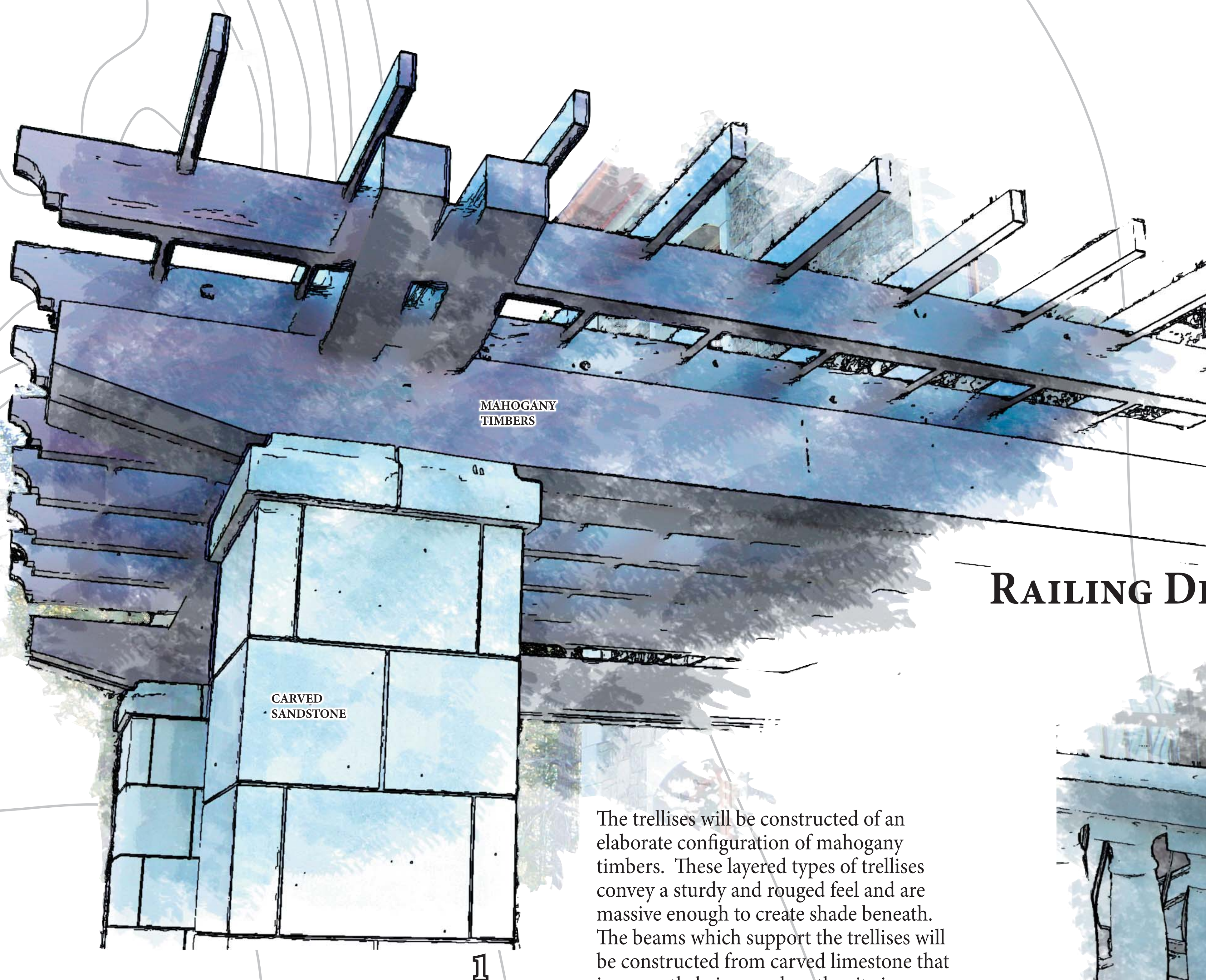
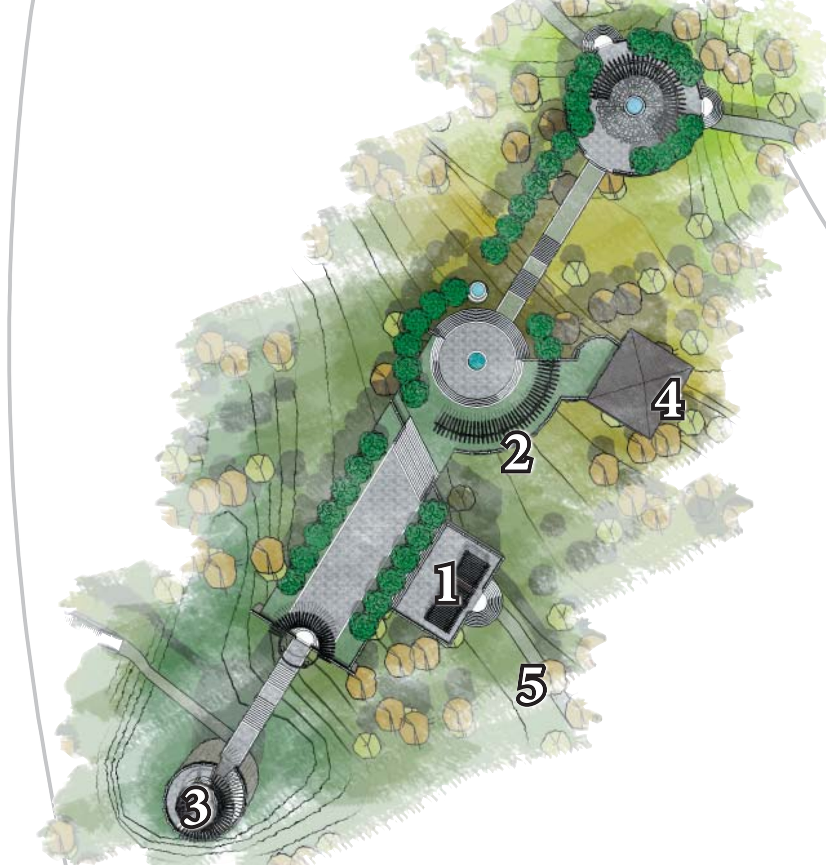
Design Details

Trellis Design:

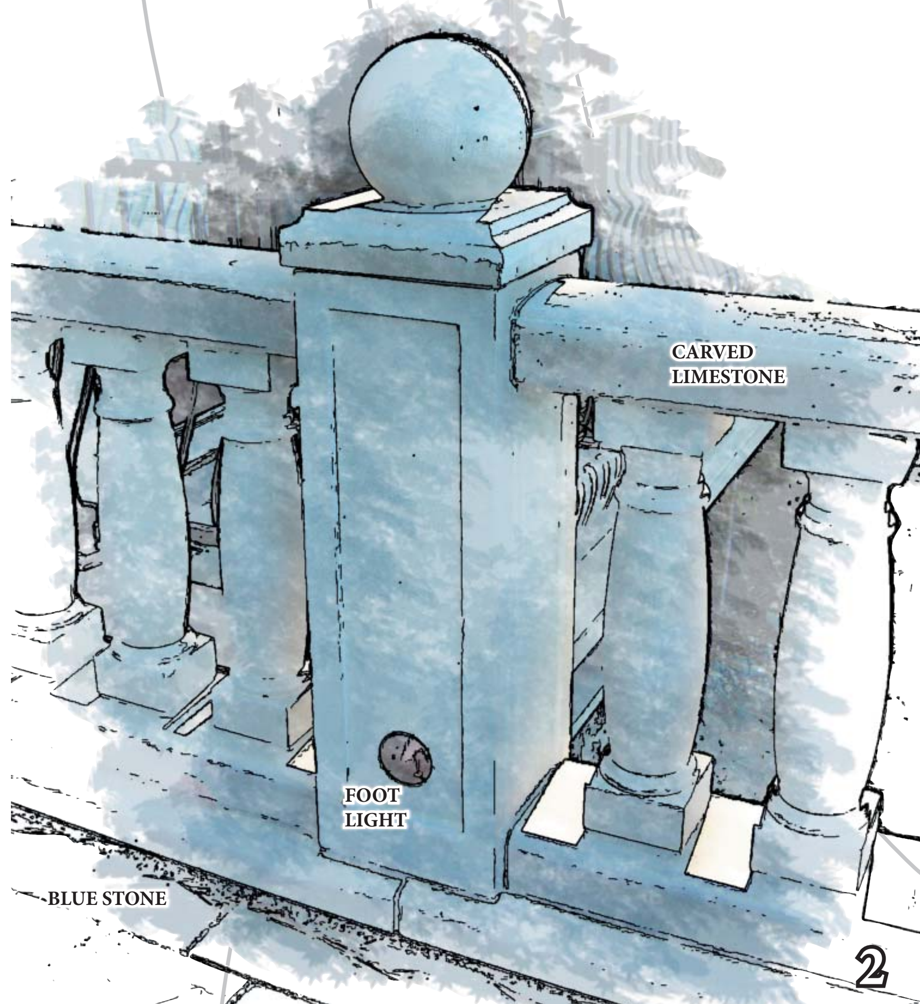


The trellises will be constructed of an elaborate configuration of mahogany timbers. These layered types of trellises convey a sturdy and rouged feel and are massive enough to create shade beneath. The beams which support the trellises will be constructed from carved limestone that is currently being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

Details Locatior Map:

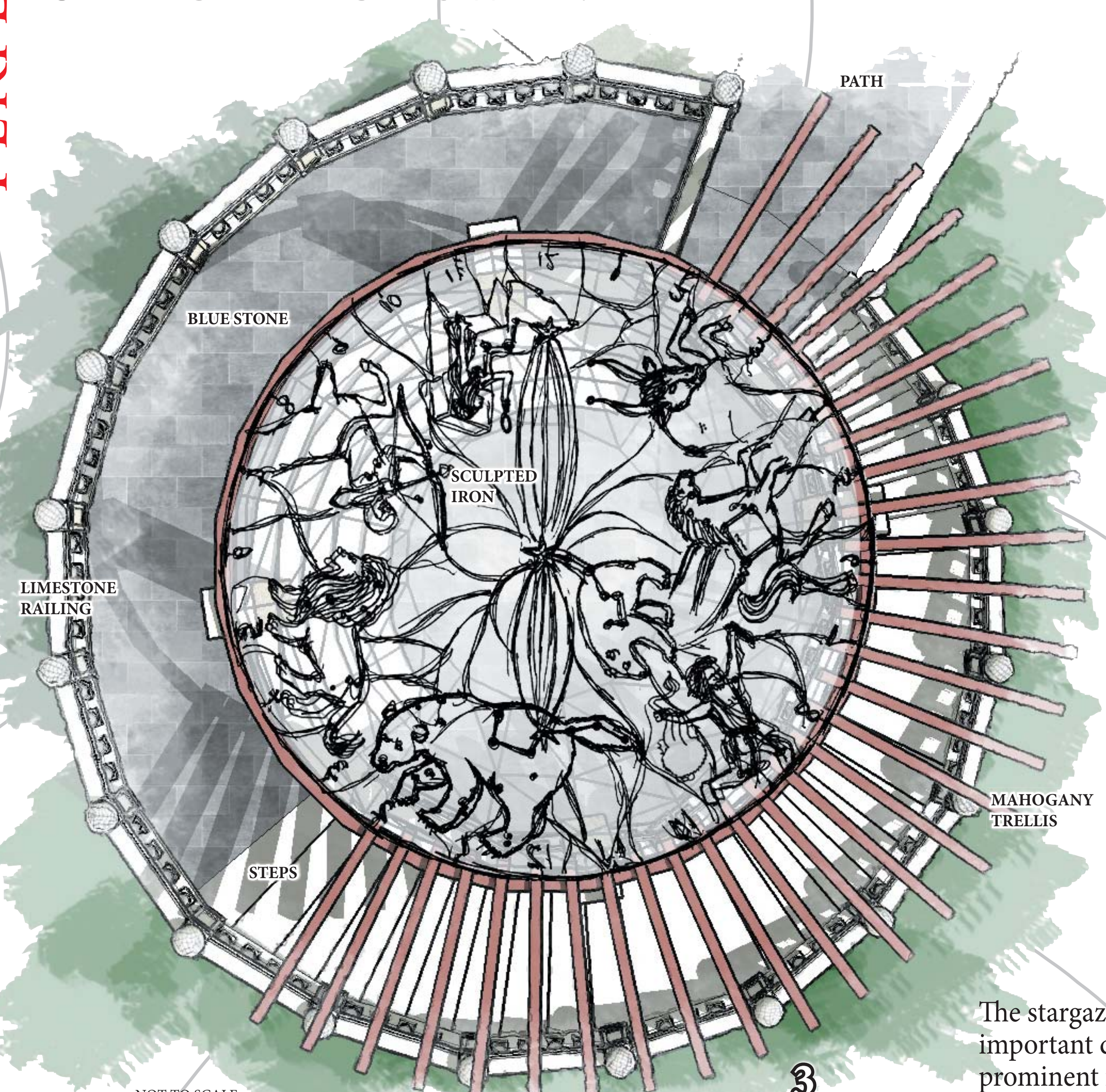


Railing Design:

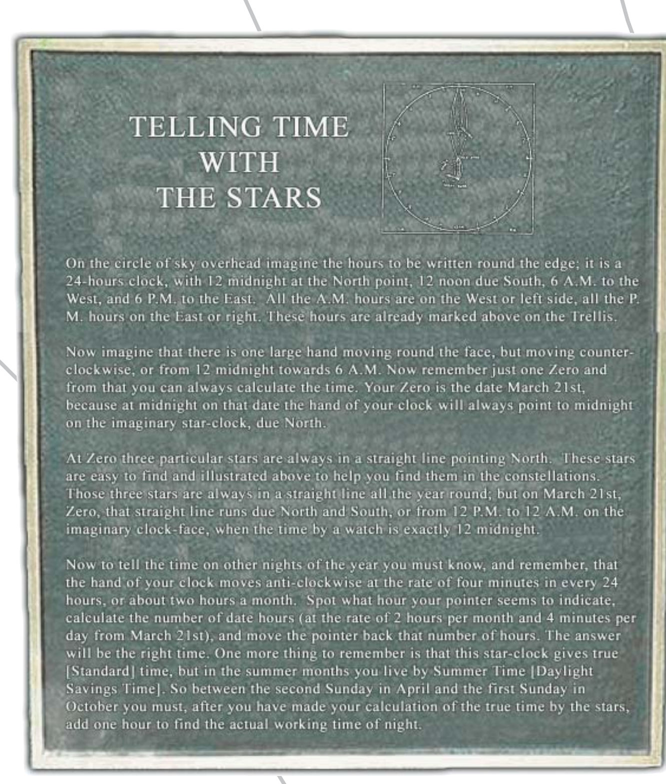


This railing design is one that will be used in all railing scattered throughout the site. Like many other features on the site, the major material used in the construction of the railing will be a carved limestone shipped from a Kansas quarry. These railings have a commanding formal design and resemble 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:



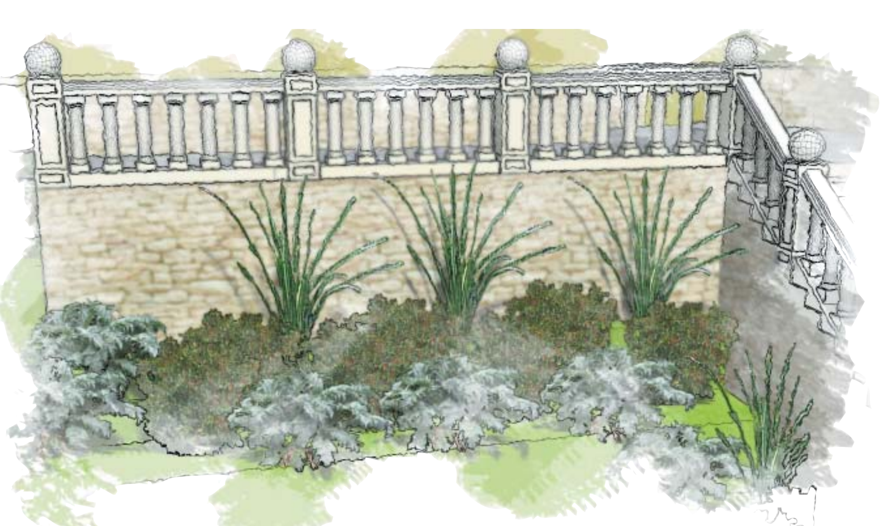
Plack:



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:



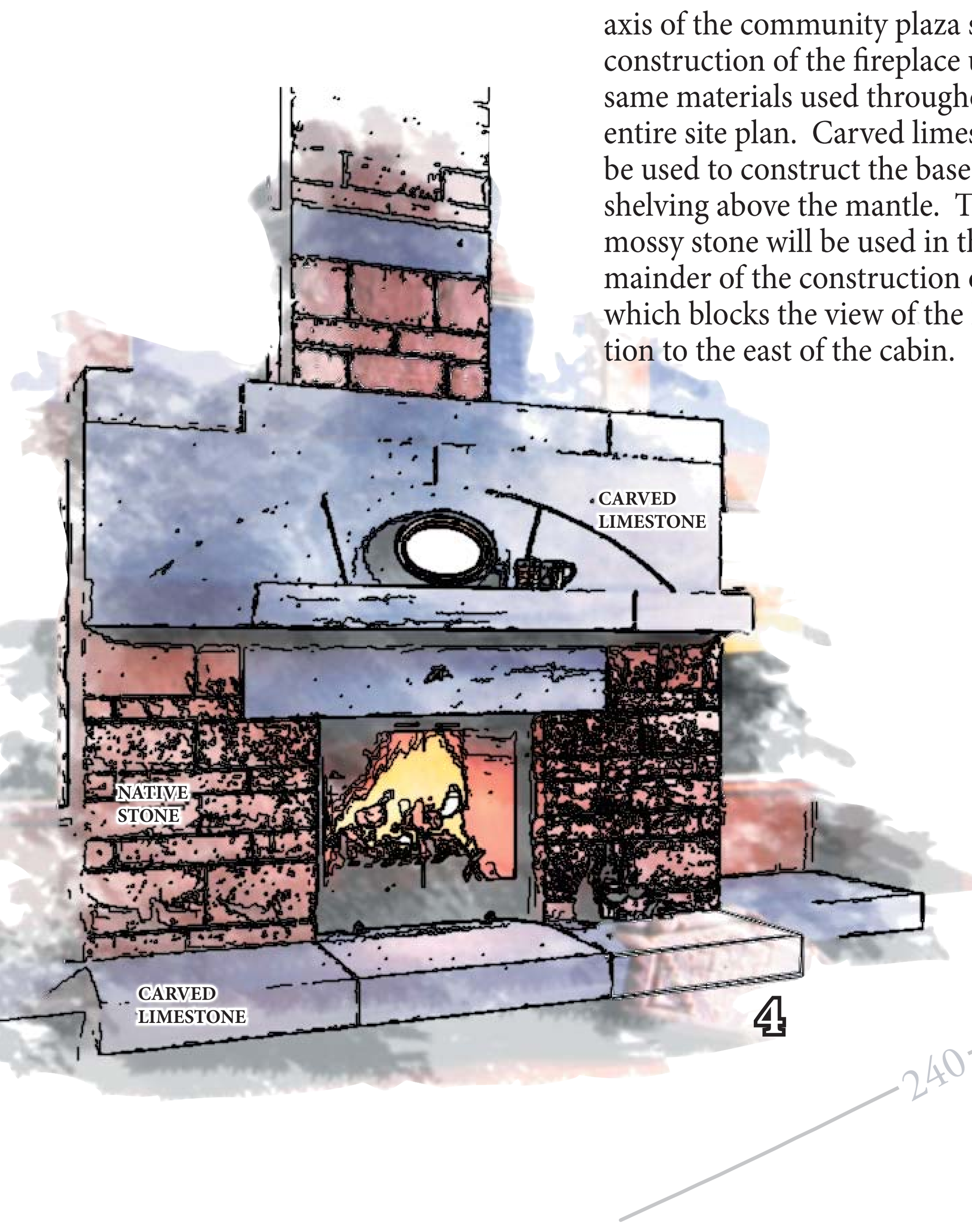
General plantings will be scattered throughout the site along retaining walls and walks. Below is a general pallet of the plants that will be used throughout the site. These plants are native to the area and require little maintenance and upkeep. The above illustration is a general image of the plant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

P L A N T   L I S T

TREES:		PERENNIALS:	
Apple Tree,	Varieties selected by owner	Anemone hybrida "honorine jobert",	Fall Anemone "Honorine Jobert"
Pinus ponderosa,	Ponderosa Pine	Arctostaphylos uva ursi	kinnkinnk
Populus tremuloidies,	Quaking Aspen	Calamagrostis acutiflora "K. Foerster"	Reatherd Reed Grass "Karl Forester"
		Deschampsia caespitosa "Schottland"	Tufted hairgrass "Schottland"
SHRUBS:		Helictotrichon sempervirens	Blue Oat Grass
Caryopteris clandonensis,	Blue Mist Spiraea	Lavandula angustifolia "hidcote"	Lavender
Cornus baileyi,	Bailey's Redtwigged Dogwood	Molinia litorialis "windspiel"	Tall Purble Moor Grass "Windspel"
Cotoneaaster apiculata,	Cranberry Cotoneaster	Pervoskia atriplicifolia	Russian Sage
Euonymus alatus compactus,	Compact Winged Euonymus	Salvia menorosa "May Night"	May Night Meadow Sage
Mahonia repens,	Creeping Mahonia		
Shrub Rose "Carefree Delight"			
Rose "Dwarf Pavement"			
Rose "Jens Munk"			

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 mantle. The native mossy stone will be used in the remainder of the construction of the wall which blocks the view of the PowerStation to the east of the cabin.



Trial 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 trial.