



GIVING NEW LIFE



Nicholas Scott Weber

GIVING NEW LIFE

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

By

Nicholas Scott Weber

In Partial Fulfillment of the Requirements
for the Degree of
Master of Architecture

Mark M. Bamhouse 4/30/10

Primary Thesis Advisor

Mark M. Bamhouse 4/30/10

Thesis Committee Chair

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Abstract

This thesis project is the exploration of how technology may serve to reveal architectural opportunities within a damaged landscape. There are many places around the planet which have been used and then left to repair themselves without the aid of the hands who caused the damaged. These places need to be reconsidered for future projects. Taking the technological knowledge of professionals we now can reveal architectural opportunities which will not only repair the landscape but give it new life.

The building typology will be a four seasons resort destination. It will be a place for people to gather and be engaged in their surroundings. The resort will be designed for the mine site located in the southwesterly part of the greater Salk Lake Valley, which is in the northern part of the state of Utah. The mine in question is the largest open pit mine in the world.

Professional judgement, when applied to damaged landscapes, may reveal opportunities for architectural, and or landscape architectural, design responses that will resuscitate the damaged environment.

The Project Typology:

The building typology will be a four seasons resort destination. It will be a place for people to gather and be engaged in their surroundings not only from within the structure but from outside as well.

The Claim:

Technological knowledge of professionals is such that an architectural opportunity will be revealed when taking a damaged landscape into consideration.

Professionals

To reveal or conceal

A damaged landscape

State the Premises:

Professionals have a given set of skills (technology being one of them) that allows them to determine if a site is reclaimable. For example, a surveyor gathers data on a site which would allow an engineer or a landscape architect to determine if a given hillside is usable for construction.

When a site analysis is done by professionals there are opportunities revealed to the professionals.

For an architectural opportunity to be revealed within a damaged landscape there needs to be a site for that project to be realized.

The Theoretical Premise/Unifying Idea:

Professional judgement, when applied to damaged landscapes, may reveal opportunities for architectural, and or landscape architectural, design responses that will resuscitate the damaged environment.

Project Justification:

When a landscape (site) has come to an end of its original purpose there can be opportunities for the site that may not be apparent to the untrained eye, but through technology we can reveal the opportunities that are there.



The Proposal

Narrative

No matter what we do as people we will always leave behind some trace of our existence whether great or small. Therefore it is up to us to “leave your campsite cleaner than you found it”, as stated on the following website <http://www.thecampingsource.com>. After living near the world’s largest open-pit mine and taking part in it’s operations I would like to speculate on the reclamation of it.

The Kennecott Bingham Canyon Mine, located in the south west corner of the Salt Lake City valley, is nearing the end of its operations, which means the reclamation of it will soon follow. The funds for reclamation are already in place and ready to be used. As the mine sits in its current state there is not much that can be done with it to make it usable, so there will need to be drastic measures taken to prepare it for reclamation. The pit is at a depth that, “the lower portions of the mine are currently below natural groundwater; Kennecott is pumping to artificially suppress water levels to facilitate mining operations” stated Jared A Hawes, P.E. during an interview.

“What does Kennecott plan to do with the pit when the mine closes? After closure, the Bingham Canyon Mine, which is listed on the National Register of Historic Places, will look essentially as it does today. Kennecott is required by the Mining and Reclamation Plan approved by the Division of Oil, Gas and Mining to assure that the walls of the Bingham Pit are stabilized and that all unneeded facilities are removed. We will have only very limited opportunity to re-vegetate the pit slopes because they are generally bare rock, extremely steep, and inaccessible. After closure, we will continue to pump and manage water from the pit in order to maintain a dry pit or a small lake at the pit bottom.

This is necessary because some of the rock in the pit walls contains pyrite, and could generate acid rock drainage. By maintaining a dry pit, we expect that water pumped from the pit will have neutral pH, and with treatment to remove sulfate and iron could be beneficially used.”

“Will Kennecott reclaim the waste rock emplacements? The waste rock disposal areas are known as “emplacements”. These emplacements are the permanent repositories for this rock. Kennecott’s approved Mining and Reclamation Plan requires that the waste rock emplacements be left in a stable condition. Beyond this requirement, Kennecott’s closure objectives for the waste rock emplacements are to create conditions that minimize the amount of rain and snow melt that soaks into the emplacements and minimize visual impact. Closure work that has been completed or is planned for the waste rock emplacements includes:

- Reclamation has been completed on 330 acres of older waste rock emplacements, which included regrading, covering with topsoil, and re-vegetation. These include the lowest waste rock slopes just south of Copperton.
- Reclamation of the outer slope of recently placed waste rock in Bingham Canyon is nearing completion. Topsoil salvaged from the canyon before waste rock placement will cover the regraded outer slope and be seeded with grasses, shrubs, and trees.
- Regrading of approximately 4,100 acres of waste rock, including 900 acres that currently have favorable soil conditions that will allow re-vegetation.
- Segregation of newly mined waste rock that has characteristics that will allow vegetation to grow. This material has been stockpiled for later use in reclamation.

· Placement of future waste rock in a manner that makes it easier to flatten out slopes (shorter bench heights and greater bench setbacks)." <http://www.kennecott.com/library/media/papers/pdf/Closure%20Planning%20at%20Kennecott%20Utah%20Copper%2001.26.09.pdf>

The four seasons resort will offer all of the experiences that one could hope for year round, from downhill skiing to golf. It will be located in the most southwesterly edge of the mine nestled up against the natural mountainside. The site will have views to the east, over the Salt Lake valley to the Wasatch mountain range, to the north and south, and of the Oquirrh Mountains.

There will be an educational aspect to the site as well as it is already a destination for many to learn about mining operations, and it is also a landmark that can be seen from space. The visitors center that is located on the site today will be incorporated into the resort so that visitors can learn the rich history of the site and the mine.

This is a site that is nearing the end of its current life, it has become a large scar on the landscape and I fear that any attempt to make it better than it was to start will be very difficult to achieve due to the extensive change which has taken place. But any attempt will be better than no attempt at all.

User/Client Description

Looking at the larger local area in which this site is located, one sees that there has been a rich history of tourism in the region, from the famous ski resorts, to national museums, to nearly every outdoor adventure.

Ownership will be retained by Rio Tinto, which currently owns the mine and much of the surrounding land. They have ownership of similar projects already implemented.

The thesis will bring visitors from the local region, people from distant states and around the world. The site is currently a site of interest and since 1992 more than 2.6 million people have visited. A visitor center similar to the current one will be maintained for those interested in the mine and its former operations. This is a seasonal amenity, as the current visitor center is closed during the winter months. However, the hope is that visitors will come throughout the entire year.

Given the nature of a four seasons resort several employees will be required at the resort year-round. The large local population who visit will come and go as they please, but there will be many patrons who will need lodging and accommodations when visiting from distant places.

Major Project Elements

The four seasons resort will consist of several elements working as a whole to create a destination for nearly everyone.

Guest Suites

Guest sites will be of appropriate size and will be designed to accommodate those with accessibility needs. There will be various standards of rooms from deluxe to luxury, which will be determined.

Dining

There will be a restaurant within the resort which will provide food for room service along with intimate dining experiences and group dining that will take place in the restaurant and banquet halls.

Entertainment

Along with a pool there will be a gameroom, which will include pool, foosball, ping-pong, and a variety of board games. Several outdoor activities will also be available such as skiing, biking, and hiking.

Equipment Rental

There will be a small pro shop that will provide the equipment needed to participate in the activities.

Visitor/Educational Center

There will be a center for those who visit for the purpose of learning about the former mine and its operations.

Offices

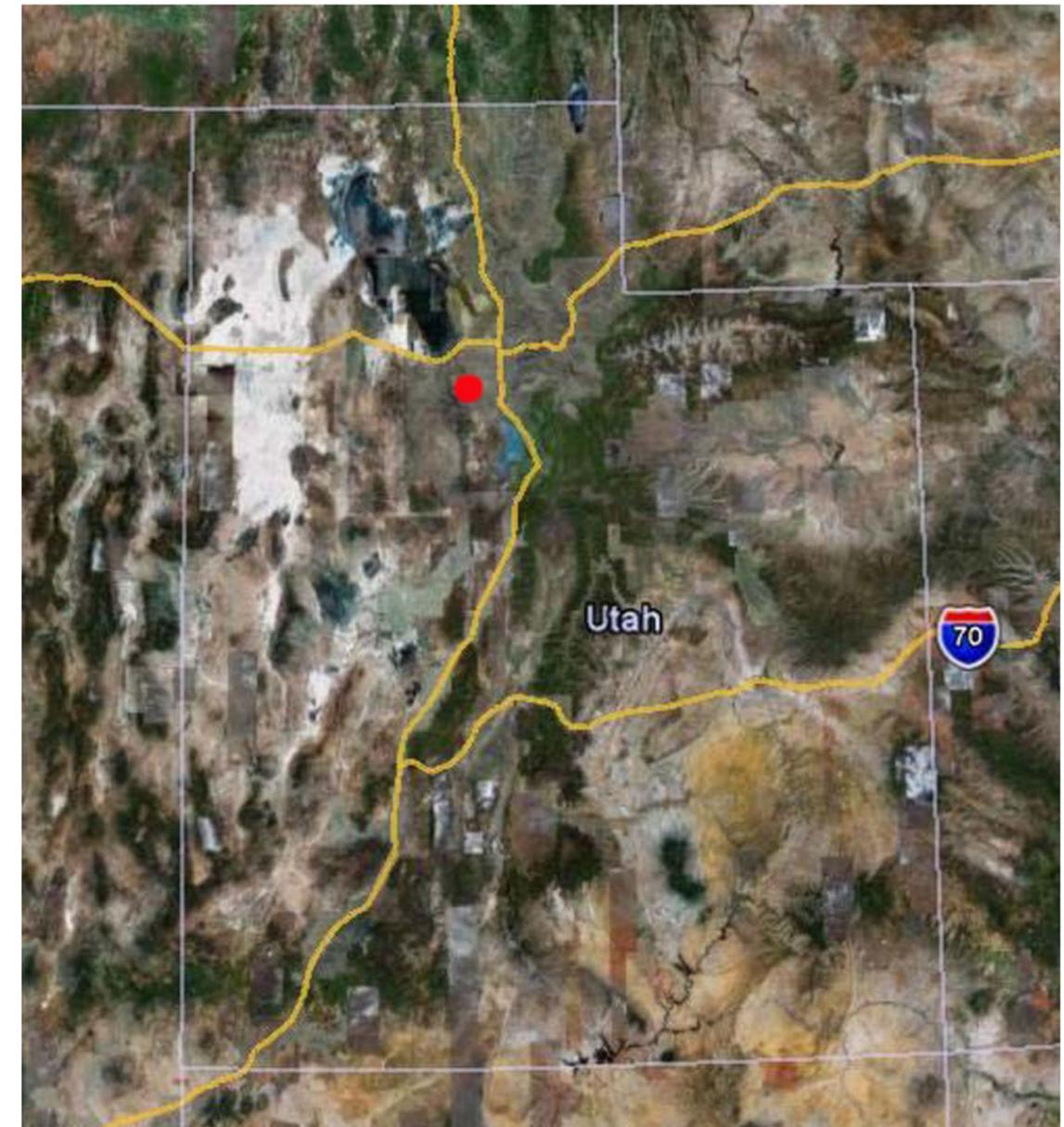
Offices will be provided for front office staff, management, and thefor sales and marketing staff.

Grounds Maintenance Facility

Site Information

Macro

The site is located within the state of Utah indicated by the red dot in the image below. It is a site that was established by the mining community over 100 years ago.



Google Earth

Site Information

Micro

The mine site is located in the southwesterly part of the greater Salt Lake Valley, which is in the northern part of the state of Utah. The site has a highway that passes by and is surrounded by cities on all sides. The site is of importance because of its location and because it is already a well-known landmark in the area. Also, the operations of the mine will be completed within the next few years, so the reclamation process can be started in a timely manner.

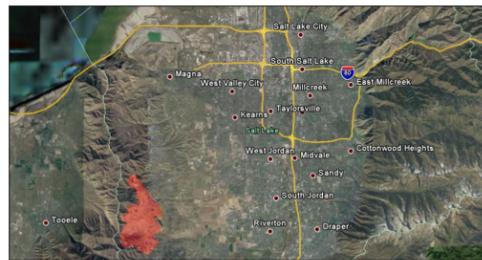
I will focus on the southwestern rim of the mine which currently is made up mined earth.



Nicholas Weber



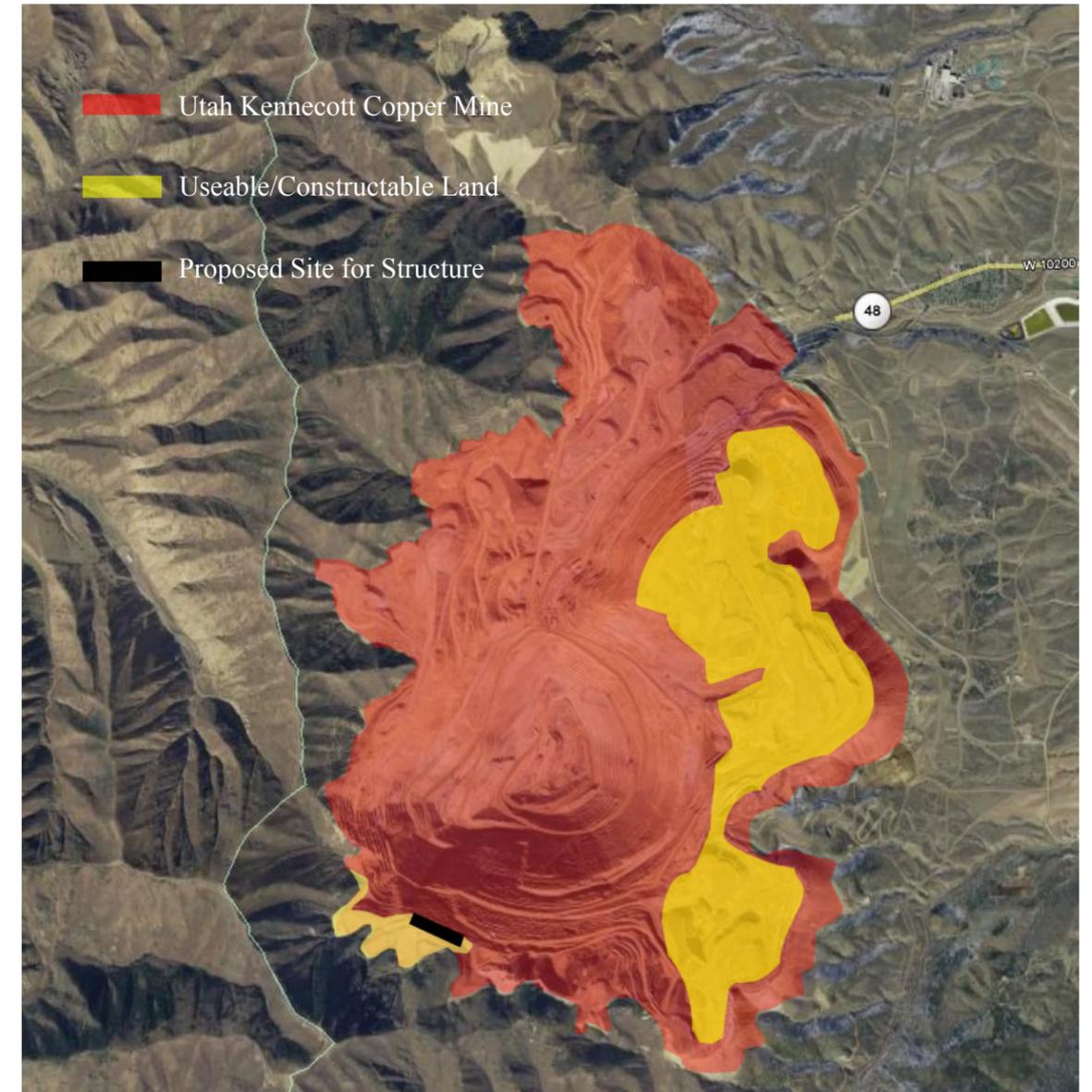
Google Earth



Google Earth



Google Earth



The land that is indicated by the yellow is part of the waste rock emplacements that have been determined to be useable, upon which I am proposing to locate the main structure indicated in black. This location will provide the best views in all directions.

Project Emphasis

The major emphasis for this project will be the reclamation of the land which will be used for the project. The four seasons resort will be carefully and thoughtfully designed and placed in such a way as to utilize all that the site has to offer in terms of views and security.

Plan for Proceeding

Research will be conducted in the following areas: Theoretical Premise, Project Typology, Historical Context, Site Analysis and Programmatic Requirements.

Design Methodology

A mixed-method and quantitative-qualitative approach will be followed and data will be gathered concurrently.

Quantitative data will be gathered from statistical methods. Statistical data will be gathered and obtained through an archival search.

Qualitative data will be gathered from observations, local surveys, archival searches, and direct interviews.

Documenting the Design

Process

The design process will be documented digitally from the beginning to make sure it is well preserved. Any data that is produced digitally, including text, images, and graphics, will remain digital; any data that is produced in a hard copy format will be scanned at 300 dpi resolution. All data will be saved to a permanent file dedicated to the preservation of any and all design information.

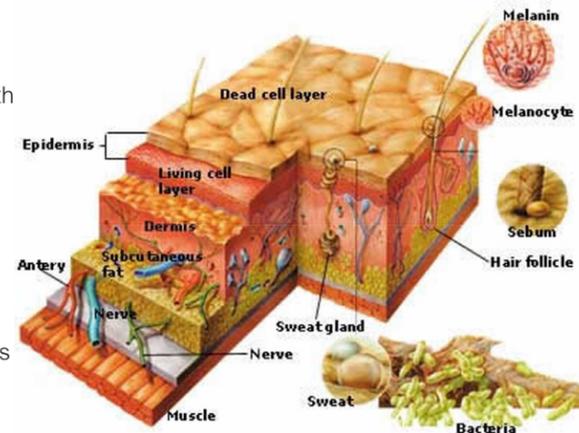
All data and information will be presented in the design thesis and project book to ensure its availability to future scholars. There will also be a verbal presentation to allow for questions and comments.

Documentation and collection of data will occur at the completion of the categories outlined in the thesis manual.

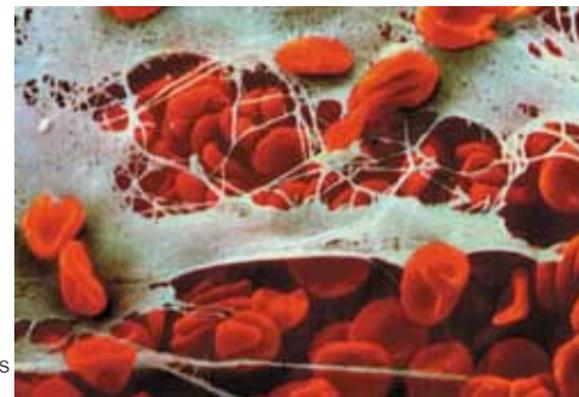
Theoretical Premise Research

The care of the human body is very important to our survival; if we do not care for it properly it will deteriorate and fall into disrepair. There are several measures which we must take to ensure that our health is maintained. One organ of the body which needs daily attention is the skin. "The skin, which covers the entire body of a human being just like a sheath, is full of amazing features. Its ability to repair and renew itself, its non-permeability to water, despite the existence of tiny pores on its surface as opposed to its function of discharging water through perspiration, its extremely flexible structure, allowing free movement, as opposed to its being thick enough to avoid easy rupture, its ability to protect the body from the heat, the cold, and harmful sun rays are only a few of the features of the skin that have been specially created for human beings" (Gamow, 1971, p. 245).

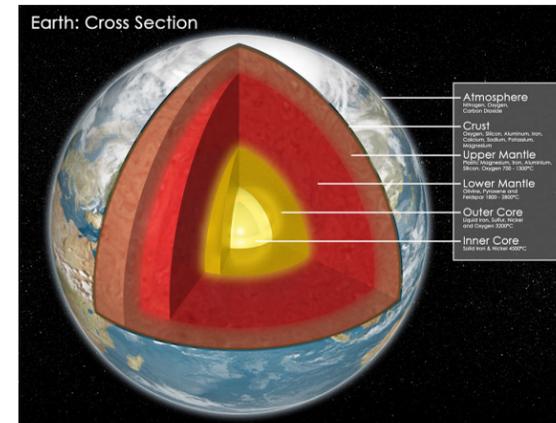
The one organ of the body which is tested more than any other is that of its covering, the skin. It has been referred to as "the strong walls" (George Gamow 1971 p. 245) of our bodies protecting us from all the enemies outside. One of the features of the skin is its ability to rapidly repair itself following damage that has been done. I remember as a youth running barefoot from my parents garden plot across the lawn to my home for supper when I stepped on a weed cutter that was lying in the tall grass I received a very deep cut in the arch of my foot which ran from one side to the other. The skin repaired the damage very quickly, without the aid of medical attention it would have left behind a very large and ugly scar which may have caused problems in the future. The skin alone would have solved the problem, but may have done so in a way that produced an undesirable result.



AN IN-DEPTH VIEW OF THE SKIN



The first defense response of the organism against its dangerous invaders is the rapid self-repairing of the skin tissue following the infliction of a wound. When such a wound ruptures the skin, defense cells immediately travel to the injured area to fight with the foreign cell and to remove the debris of the affected tissue. Later, some other defense cells enhance the production of fibrin, which is a protein that rapidly re-covers the wound with a fibrous network. This picture is of a fibrin that has spread over some red blood cells. (Gamow, 1971)



http://www.adamdorman.com/_images/earth_cross_section_big.jpg

"Both delicate and resilient, the skin constantly renews itself and has a remarkable ability to repair itself after injury." (www.auuuu.org/skin/)

Even so, the skin of the body is not indestructible and can be damaged to the point of non-repair. There are infections, poisonous bites, cancers, etc. that can cause the skin to enter such a state.

So too the Earth is a living organism often capable of repairing the damage that has been done to its skin, caused by landslides, tornadoes, earthquakes, hurricanes, etc. But there are times that not even the Earth is able to repair the damage that has been done.

In 1997 near Vernal, Utah there was a break in the side of a manmade canal that ran along a ridge line north of Dry Fork Canyon. Thirty cfs of water to ran down the mountain in a path it was not intended to run. "This runoff created a cut-back canyon 3/4 of a mile long, 400 feet wide and 200-350 feet deep within a 48 hour period." (Stated Brad Weber during a personal interview) This newly formed canyon has created a visual scar on the landscape, which will remain in its current state. All of the topsoil was removed by the water and all that is left is a soil which contains no nutrients and will not sustain any type of plant life.

Here we see on a small scale how the Earth may not be able to repair or restore some of the damage that has been done to the surface. There have been attempts to re-vegetate the walls of the canyon, but they are simply too steep to hold new soils, and the soil that is there does not allow plants to grow. After more than 10 years, no plant life has appeared in the canyon or on the deposits of material left in the canyon below.

Much of the non-reparable damage which has been done to the earth's surface has been caused by the human race. In the case of the aforementioned canyon, the canal which ran along the ridge line was manmade. The amount of water that caused the damage never would have occurred in this place without humans redirecting it there.



Google Earth



Google Earth Image was taken in 2008

We need to learn to be wise stewards. As long as we continue to live here we must learn to balance our needs with what the earth is able to offer. As our technologies evolve we find that we need more and more of the earth's minerals. How we obtain these minerals differs from place to place and one method may be more harsh on the environment than another. The one constant is that we need what the earth has to offer to maintain our current existence.

Over the thousands of years that we have been in existence on this earth, we have continued to make changes to it's surface, some small in nature, and some very large in scale. Take the Pyramids of Giza for example. Here we have a creation that dramatically changes the landscape. Can we say that these creations were unnecessary or extravagant? Yes, but that is not to say that we have not benefitted from them for many centuries.



The Pyramids of Giza

What did the creation of these great structures do at the time of their creation? First, they did what they were intended to do, which was entomb the bodies of those they were created for. Second, they brought a nation together during their construction. "Some believe that his (Giza) pyramid at Giza was built by slaves but this is not true. One hundred thousand people worked on it for three months of each year. This was the time of the Nile's annual flood, which made it impossible to farm the land and most of the population was unemployed. He provided good food and clothing for his workers and was kindly remembered in folk tales for many centuries. Is it conceivable that by bringing together so many people and giving them a common goal, that of making a mountain, a national identity is forged in their hearts?"

From Upper and Lower Egypt, communities would have got to know each other and a common bond would have been manifest in the object of the pyramid." (www.eyelid.co.uk/pyramid3) Here we see that through these enormous feats people were brought together and given an identity.

It could be argued that the pyramids are an eyesore and do not fit into the landscape, therefore they should be deconstructed and the land should be restored to its natural state. The main flaw with this way of thinking is that the energy it would take to remove such structures would outweigh the problems of leaving them where they stand.

It could be argued that preserving historic structures is a matter of taste. "In the Article 'Having Bad Taste' Gracyk argues for a set of necessary and sufficient conditions which he supposes unveil the operation of bad taste in revealing aesthetic preferences. According to this line of reasoning, you can only have bad taste if you make judgements within a specific aesthetic category- say, Mozart symphonies or Elvis Presley songs-- a category about which you are educated and to which you have been exposed through a broad range of experiences. Also, you must not only like but prefer one object to a second object within a category, when one's fellow experts recognize your preference as inferior to the object less preferred by you. Taste thus operates within precise categories or genres, and cross-category comparison introduces irrelevant considerations when it involves categories to which one has little or no exposure" (Cheryl Foster, 2001). Then according to this line of reasoning the one who is declaring that one thing is of lesser aesthetic quality than another must have some sort of history or background within the given category, if they do not then the opinion offered by them can be viewed as non-important and therefore thrown out. Is this always the case?

Is it wise to bring in an eye that has not been tainted in one way or another by the taste of another? It has been shown in courts that when a jury is needed the courts search out people who have no history or knowledge of the proceedings so as to not have a biased opinion. This too could be a useful method in determining if something contains aesthetic qualities or if it does not.

"Sibley makes a distinction between aesthetic concepts and aesthetic qualities. In 'Aesthetics and the Looks of Things' he claims 'If we are to discern and comment on certain qualities at all, some degree of aesthetic sensitivity is required'. Taste has a vocabulary and this develops in the wake of learning to discern, even though that same vocabulary can be employed, by others, to jump-start discernment itself. In these and many other cases, Sibley clearly presupposes a distinction between aesthetic qualities and aesthetic concepts." (Cheryl Foster, 2001).

We can see this in the universities as we study any subject that has the idea of taste involved. For example, we could have a piece of art displayed, which to the art community-those who have studied fine art- is of the utmost quality and beauty, but to anyone who has no knowledge of the arts it could seem unrefined.

Are we to suppose that if there is no formal training in aesthetic qualities then we are unable to discern if something is aesthetically compelling, repulsive, or dull? It is recognized "that we all have some degree of natural susceptibility to aesthetic qualities: children begin to discern aesthetic qualities in response to things like sunsets, flowers, woods. Although these occasions also serve... as informal induction ceremonies into the application of taste concepts, it could be argued that some children, not having the privilege of learning such concepts from their elders, nevertheless develop sensitivity to nature in the absence of such terms" (Cheryl Foster, 2001).

We might then conclude that even without the formal training there can still be some sort of aesthetic discernment in regards to things found in the environment.

Thayer (1994) coined the term "topophilia" when attempting to describe the relationship between humanity and the natural setting. He defined it as, "the affective bond between people and place or setting" or the "human love of place." (Thayer 1994) This may not be limited to natural places but might also include places such as public plazas, parks, or homes.

It would be safe to say that most people who stand with their toes on the edge of the Grand Canyon will sense the grandeur of the place whether it is their first visit or their hundredth. Other feelings may also be associated with the experience, such as fear, amazement, and excitement. As it pertains to taste it may be the most beautiful place on earth for one but for another it may be lacking in beauty. Who is right and who is wrong? Who has given the correct analysis of the Grand Canyon? This is a question which is open to debate and quite possibly may never reach a conclusion.



The Grand Canyon

The earth is a living organism that provides not only the necessities to sustain human life but also experiences that are nearly impossible to find within the built environment. If we want our future generations to enjoy the beauty and resources that earth provides we must learn to be wise stewards.

Theoretical Premise Research Summary

This summary will reflect the research done up to this point.

As the investigation continues, there may be more information added which may support or refute the thesis.

The earth is a living organism that battles back the forces of nature and man. It can be damaged beyond repair, which can sometimes be avoided. Through the forces of nature there are occurrences that are beyond our ability to stop or repair, but there are many negative effects caused by man which could be avoided.

We have placed ourselves in a position that is proving to be difficult to maneuver out of, because we have become very dependent on the minerals that are found within the surface of the earth. These minerals are what we fuel our lives with and use to create the things we feel we need. Some of the minerals we use are in great supply, but some are running out. To be wise stewards we need to learn to do better and be more efficient.

One of the most destructive methods of extracting these minerals from the earth is strip mining. This is a process of removing land in very large quantities to get to the minerals underground. The material that is removed and does not contain any minerals is relocated to places referred to as waste rock emplacements.

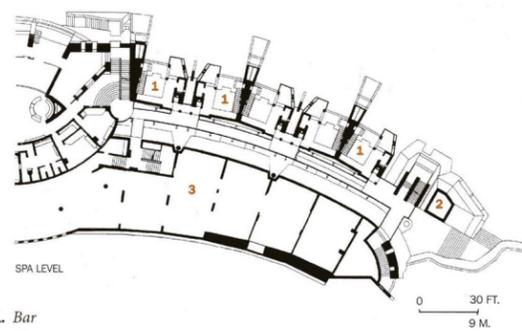
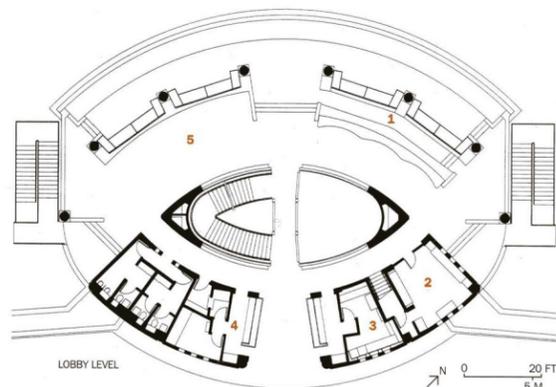
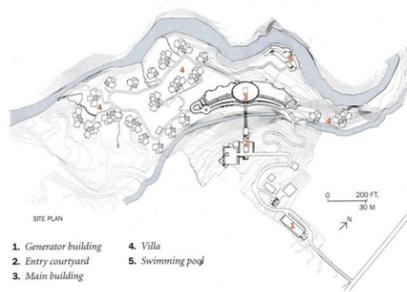
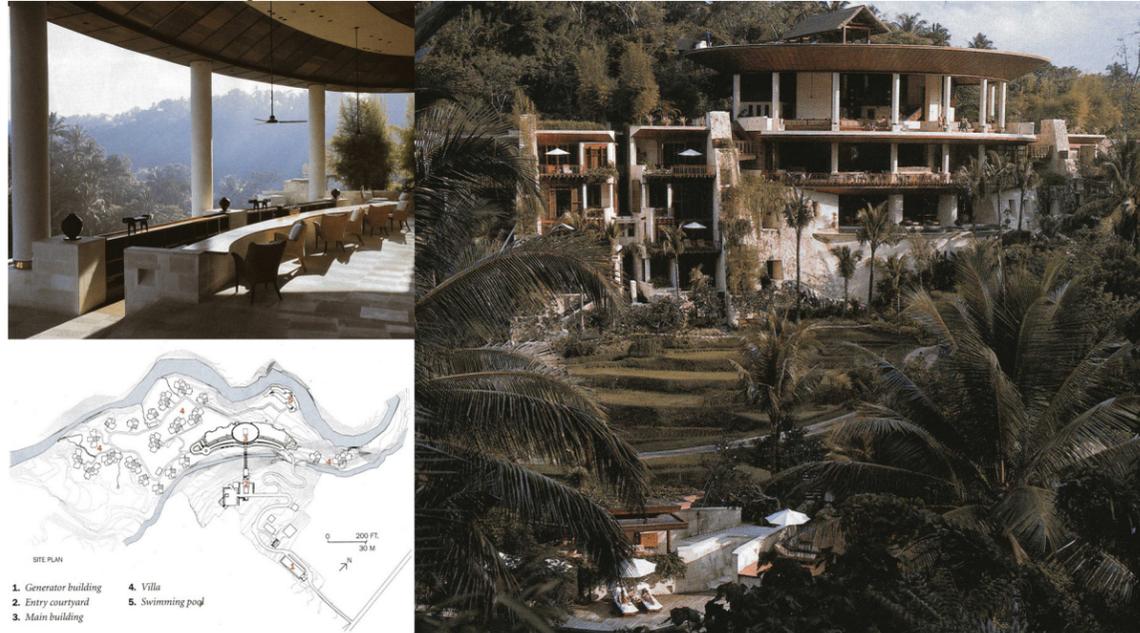
The displacement of this material creates another issue which will need to be addressed during reclamation: what do we do with these huge mountains of waste rock?

The mine which this thesis will be utilizing is the Utah Kennecott Copper Mine, the largest of its kind. The mine is near the end of its operations, which will start the complete reclamation of it.

What I have discovered through my research is that when this landmark is completed we need to view it with the understanding that it has become a landmark and there may be parts of it that should remain unchanged. This is in part due to the historical aspect of the site and also the aesthetics which it now provides.

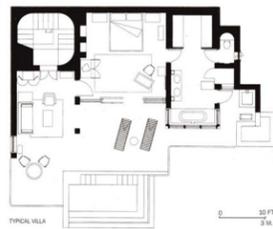
Referring to the discussion of 'taste' and what is tasteful and what is not, I feel the impact that this site has already had on the minds of those who have viewed it needs to be taken into consideration. I can see a beauty within this created space, almost like standing in the top row of seats of a stadium. The feat which has been accomplished here is astounding. So do we cover it up or do we allow it to continue to impact the lives of those who visit it?

Case Study #1



- 1. Bar
- 2. Shop
- 3. Concierge
- 4. Front desk
- 5. Seating

- 1. Duplex suite
- 2. Conference
- 3. Mechanical



Project Type: Four Seasons Resort
 Location: Sayan Bali, Indonesia
 Size: There are 28 Villas and 30 Duplex suites

INTRODUCTION:

This four seasons resort located in Sayan Bali, Indonesia has a spectacular location. It is one of several hotels in the area but it breaks free from the traditional design and is a very modern hotel, in which local materials and craft are combined with inventive design.

RESEARCH:

This case study shows how the design can be integrated heavily into the earth and play off of what the site has to offer. The available views were taken into careful consideration when the layout of it was undertaken, and nearly every opening contains a stunning scene. The low-lying nature of the design keeps the views open from every angle.

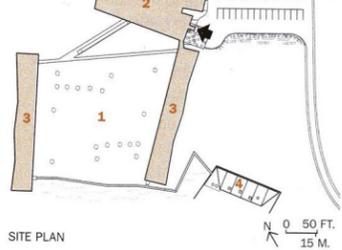
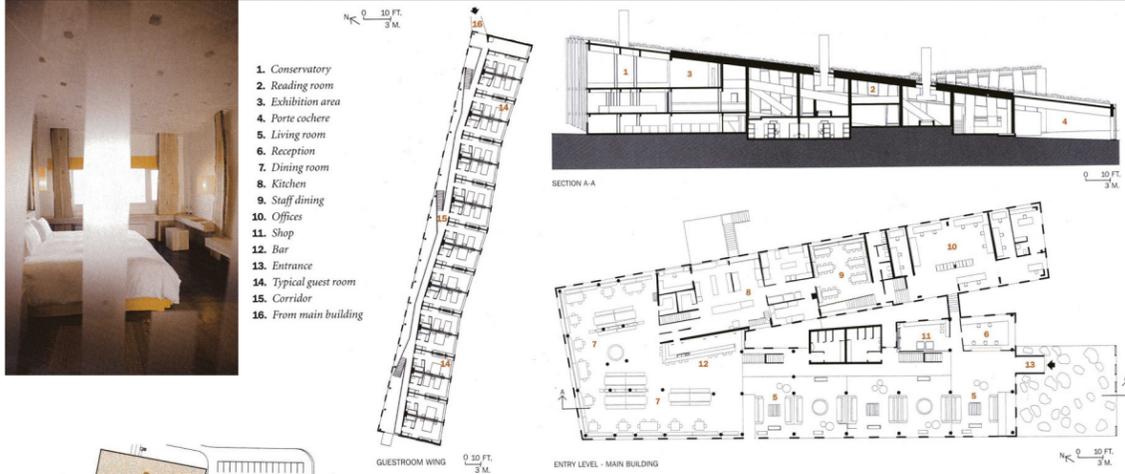
ANALYSIS:

The ways that you are exposed to the elements around you are exciting, from the entry sequence to the way you approach your personal villa. At every bend there is something new revealed to you, whether it is a view or a smell you will continue to be captivated. The use of local material was heavily tied into this project along with the use of local craft. The heavy use of concrete allowed for the main structure to stand where it is. The local tradesmen had to learn how to work with concrete on a much larger scale but they were able to do it well.

CONCLUSION:

The design was nicely integrated into the site and landscape. The scale was carefully planned and has worked wonderfully for the location on the site.

Case Study #2



- 1. Plaza
- 2. Main building
- 3. Guest-room building
- 4. Spa



Project Type: Hotel
 Location: Puerto Natales, Chile
 Size: Comprised of 72 rooms, a Spa, Conservatory, Reading Room, Exhibition area, Reception, Offices, Shop and bar, totaling 56,000 square feet.

INTRODUCTION:

The Hotel Remota is for people who love rugged and remote locations. The hotel serves adventurous travelers in both luxury and folk style.

RESEARCH FINDINGS:

The location of this hotel is very rugged and remote, and the majority of the material used to construct this building was hauled in on a boat. There is a very jagged design to this hotel which was at first difficult to persuade the owners to adopt. Being one of few structures around, the designer chose to let it hug the earth and not protrude into the sky. There is an interesting plaza built into the design which separates the two housing units, made up of local grasses and local stones. This hotel has been designed with those in mind who will be visiting and staying here.

ANALYSIS:

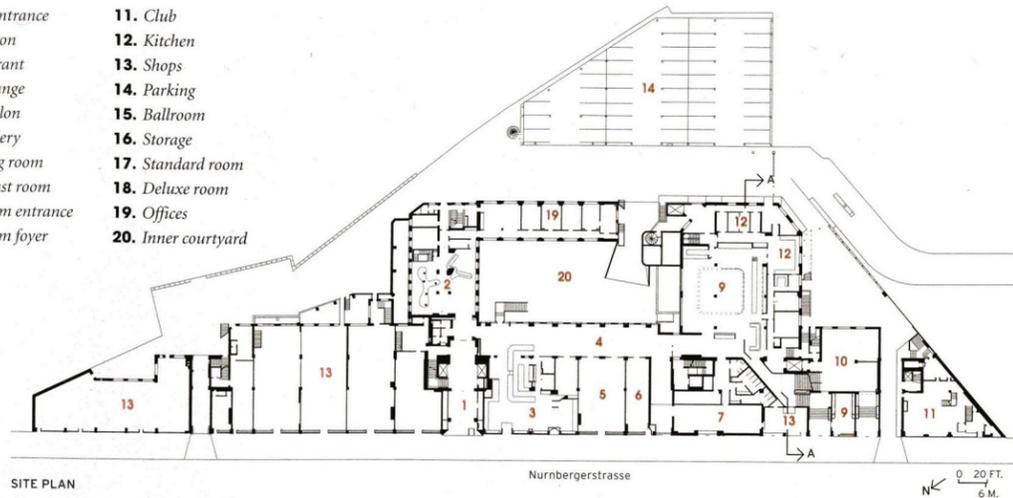
This case shows that it is possible to design for a landscape which is mostly bare of vegetation, with the exception of a few grass species. It was able to be part of the landscape and not overpower it. The layout of spaces has worked well to keep it low to the ground and functional.

CONCLUSION:

This case study will help to develop this thesis in terms of scale. It shows that one can create a structure on a mostly bare site and give it a sense of place.

Case Study #3

- 1. Hotel entrance
- 2. Reception
- 3. Restaurant
- 4. Bar/lounge
- 5. Hair salon
- 6. Art gallery
- 7. Meeting room
- 8. Breakfast room
- 9. Ballroom entrance
- 10. Ballroom foyer
- 11. Club
- 12. Kitchen
- 13. Shops
- 14. Parking
- 15. Ballroom
- 16. Storage
- 17. Standard room
- 18. Deluxe room
- 19. Offices
- 20. Inner courtyard



Project Type: Hotel
 Location: Berlin, Germany
 Size: Comprised of 285 rooms, Restaurant, Hair Salon, Art Gallery, Meeting Room, Breakfast Room, Ballroom, Club, Shops, and Offices. Totaling 217,969 square feet.

INTRODUCTION:

This case study is located in a different setting than the other two case studies. It is also a bit larger than the other two. This case study is being looked at for its use of other programmatic features.

RESEARCH FINDINGS:

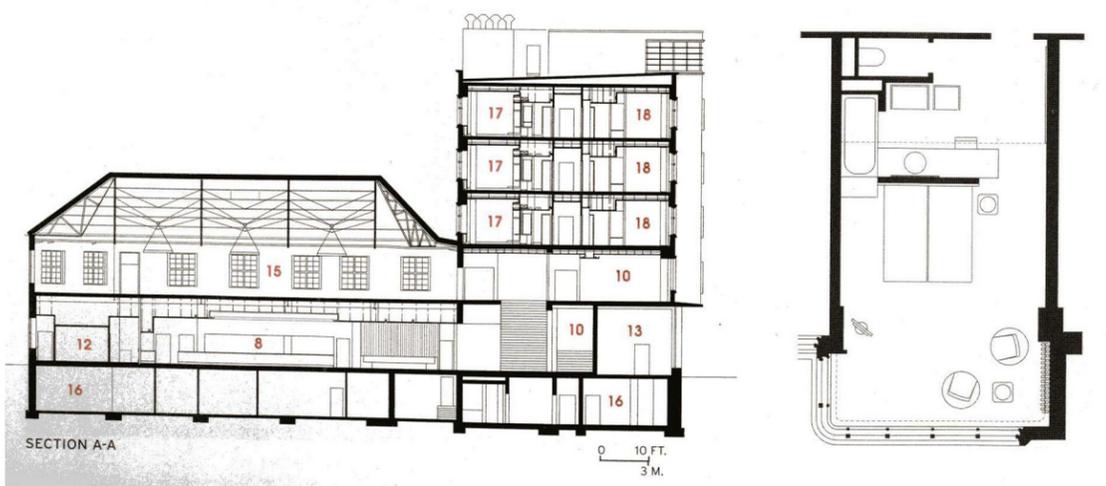
This hotel is not new in terms of original construction, but it has undergone renovations recently. The goal was to capture this building's notorious and varied past while delivering a fresh look and an additional 10,750 square feet of retail space. Because it was a structure that was constructed many years ago, there are block long hallways that are unbroken, which was a challenge for the architects to overcome.

ANALYSIS:

In the original design the guest rooms did not come with fixtures such as showers or sinks, now they are found in alcoves and at times the beds are pulled away from the walls, with sinks placed in counters on the perimeter. This case study shows the difficulties in restoring or renovating a site or an existing project.

CONCLUSION:

While the Hotel Ellington is a very interesting building, its location and style do not connect with the ideas in mind for this thesis. The layout of larger spaces not found in the other case studies will be taken into consideration.



The arrival in 1873 of the Bingham and Camp Floyd branch of the Utah Central Railroad dramatically changed Bingham's fortunes. This event revived lode mining and soon rich strikes were paying off. Milling and smelting facilities which made mining even more profitable soon sprang up in the canyon as well as in the Salt Lake and Tooele valleys." <http://www.media.utah.edu/UHE/b/BINGHAMCANYON.html>

"The variety of people in Bingham Canyon helped transform "the hill," as the mining operations of the Utah Copper Company (later Kennecott Copper Corporation) were originally called, into the world's largest open-pit copper mine. This expansion continually required the purchase of living areas for miners as the old towns of the canyon were gradually swallowed. Highland Boy and Copperfield were dismantled by 1960 and the last buildings in Bingham were torn down in 1972. Lark had disappeared from the map by the end of 1980. Copperton remains the sole survivor of the communities that helped to make Bingham Canyon one of the most culturally diverse and rich areas of Utah." <http://www.media.utah.edu/UHE/b/BINGHAMCANYON.html>

When the 19th century came to an end many of the smaller mine claims were consolidated into a few larger ones, this caused the demands for cheap labor which brought many immigrants to the area. The population soon grew to around 15,000 people of which 65 percent of the residents were foreign born.

Here is a short list of facts about mining and the Utah Kennecott Copper Mine.

- Today the mine is the world's largest open pit mine, which is now three quarters of a mile deep and two and three quarters miles across at the top.

- Kennecott's Bingham Canyon Mine has produced more copper than any mine in history - about 18.1 million tons.

- Only about one tenth of one percent of the land in Utah has been touched by mining.

- To make all the pennies, nickels, dimes, and quarters in 1999, the U.S. Mint used about 36,000 tons of copper. That's about as much refined copper as Kennecott produces every 41 days.

- Each American uses more than 40,000 pounds of new minerals every year.

- It takes about 15 different minerals to make a car ... 35 different minerals to make a television ... 30 minerals to make a computer ... and as many as 42 different minerals to make a telephone.

<http://www.kennecott.com/?id=MjAwMDEzMQ==>

Over the years the mine has become a historical landmark which has brought millions of visitors to the area. It has been in operation so long that there are only stories and written documents to tell us of its beginnings but now that we are nearing the end of its operations we need to preserve its history and make it available to experience.

There are people who have lived in the area who have a view of this historical place from their homes who have never seen the interior of this mine. This thesis will attempt to make the mine more accessible and exciting to visit, and will also attempt to take this mammoth manmade structure and preserve it as a historical place.

Goals For Thesis Project

1. A very clear and concise Theoretical Premise.

- It will be a continuous work in progress.
- It should be above the level of work which has been submitted in the past.
- It should be usable and understandable.

2. A very good understanding of the many different factors which contribute to the overall design and which aid in the final design.

3. A thesis program which is above that which was required in the past, in the hopes to push the bar higher and prepare me for the world of professionalism.

4. A project which will have meaning to more than just myself and which will drive the thoughts and artistic expression of all those who study it.

5. To come to a solution that will lie in the category of high design.

- That addresses how it reacts to the site in which it lies.
- That is functional and efficient.
- That considers the use of interior and exterior finishes of quality and availability.
- That studies the overall flow of the proposed layout.

6. A demonstration of understanding and ability in regards to:

- Physical modeling
- Digital modeling
- Graphical presentation

7. To create a project that is interesting enough for people to want to visit and revisit the project time and time again.

8. To develop a project that gets the attention of design professionals as well as non-professionals.

- New creativeness and solutions to complexities.
- Easily understandable and readable.

9. To follow the schedule which has been outlined.

- To demonstrate my ability to stay on task.
- To demonstrate my ability to complete my work on or before a required deadline.
- To distribute the workload so that it is manageable.

10. A well presented oral presentation which demonstrates my understanding of the project and puts me in charge of the presentation.

Site Analysis

To start this analysis there needs to be an understanding that the site has been under siege for many years, as the mining operations started more than 100 ago. The location that has been chosen for the building was not in existence when the mine was first started.

In short, all of the landscaping will need to be designed and implemented, because there is very little existing plant life on the site. This will allow for freedom with the landscaping that is not normally common to projects such as this.

The usable area is .5 miles wide from east to west and .25 miles long from north to south. This provides for a design which can be integrated very heavily with the ground.



Here is the site with a one mile grid overlaid. The yellow area indicates the area intended for use; the main structure location will be within the yellow area.

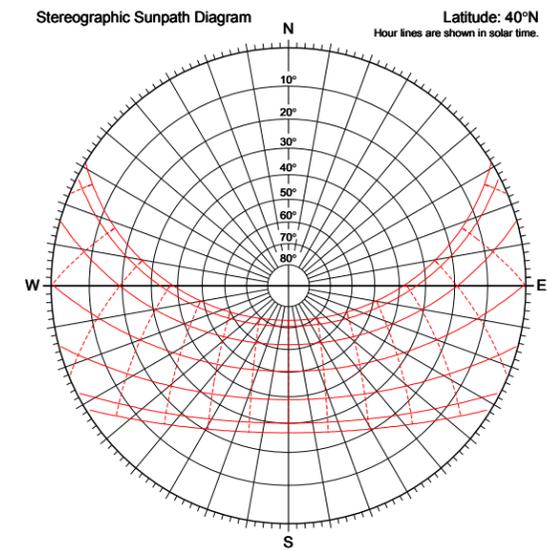
It will be nearly impossible to pick a location within the proposed area that would not have a great view. The intention of the project is to display the mine as a historical landmark as well as take advantage of the spectacular views which will be found in every direction.

To the east there is a panoramic view which starts at the Great Salt Lake to the north and ends at Utah Lake to the south. Within this panoramic are views of downtown Salt Lake City to the northeast and views of Provo to the south, and the Wasatch Mountains are displayed as a backdrop.

The landforms found in and around the site are primarily the mountain ranges, the Oquirrh Mountains raise to a height of 9124; the image below was taken at an elevation of 9003'. The Wasatch Mountain range to the east rises to a height of 11,055'. The valley below drops to an elevation of 4380' where the Jordan River flows from Utah Lake north to the Great Salt Lake.

The site sits on top of a waste rock emplacement which is at an elevation of 8565', to the west the bottom of the pit drops 3022'.

There will be no natural shading on the site until late in the evening when the sun drops behind the Oquirrh Mountains.

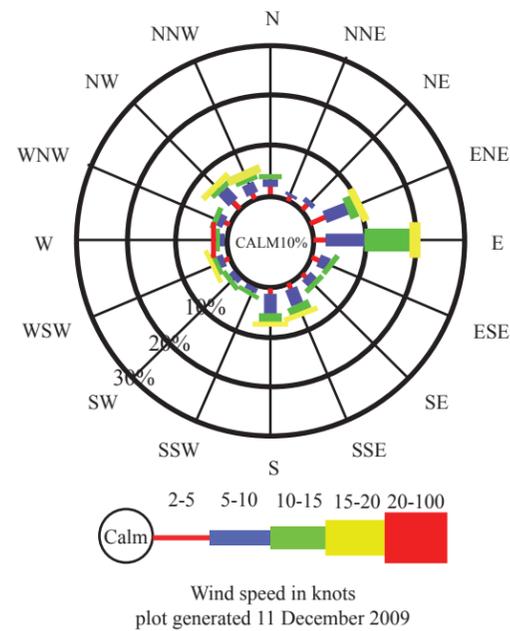


As for structures on the site, after the close of the mining operations all unnecessary structures will be removed. The pit will be allowed to make a small body of water at the bottom but the water will still be pumped out and treated for use. There will be a few structures remaining on the site but they will be small and not visible in any of the views from the construction site.

The light quality on the site is very good, because it is elevated off the valley floor enough to be out of the haze that can occur.

The wind will not be a terrible occurrence on the site it is close up to the mountains and protected from very strong winds. The weather is very mild for most of the year.

Bingham Canyon Mine Windrose Plot
During 2009-01-01 12:00 pm - 2009-12-01 12:00pm



The site is nearly all manmade; it is made up of waste rock material that has been relocated to this spot from within the mine. There are few people present today 24 hours a day, seven days a week taking care of the operations of the mine. When the mine is closed there will not be any people remaining on the site.

There has been much distress on the site but it has been highly controlled. The distress is caused by the excavation of the ground and its relocation elsewhere. This process encompasses the entire site and therefore no plant life is found on the site.

As far as soils go there will be a layer of topsoil brought in to recover the ground with nutrient-rich soil. This will allow for the regrowth of native grasses, trees, and other plant life.

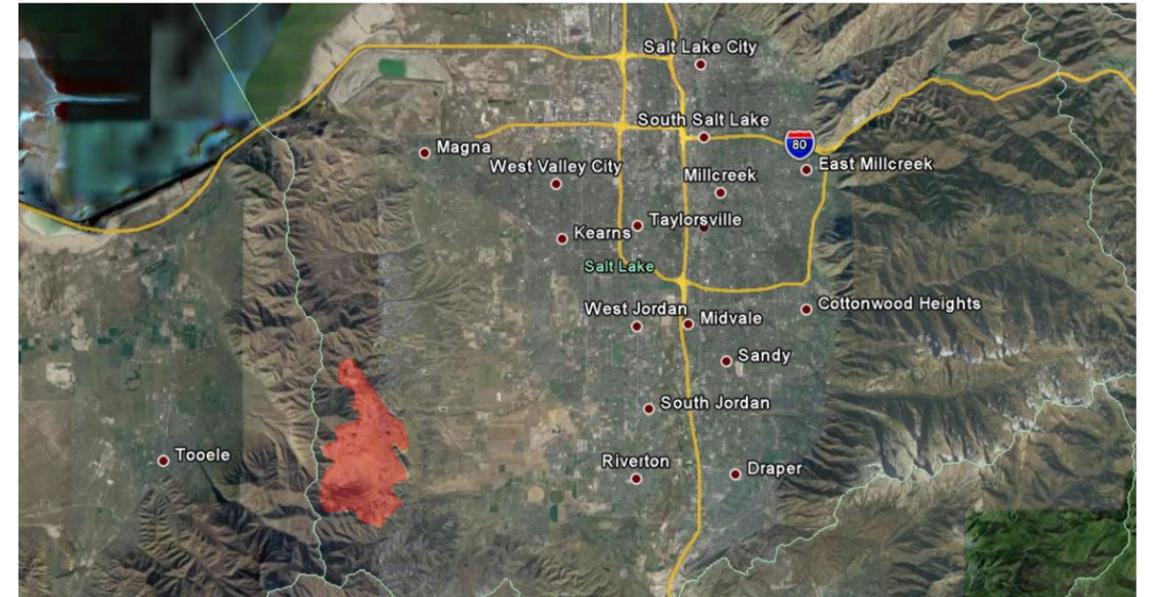
The land is more or less a filling of waste rock but has been regulated in such a way that construction upon the surface will be feasible.

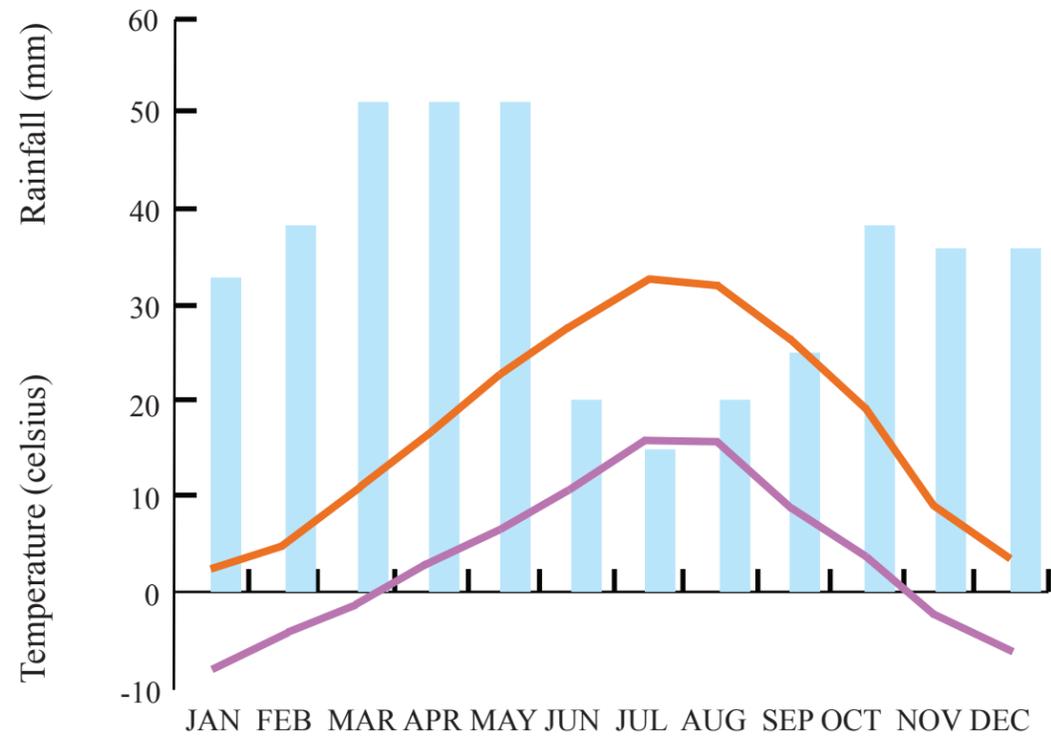
Utilities are not currently present on this portion of the site. The utilities needed for a project such as this are found within the mine but not currently on my desired location. This will require new utilities to be put in place at the time of construction.

Roads required for the project will be designed and built to conform to the design layout. All of the existing roads are not fit for domestic vehicles and will either be removed or resurfaced to accommodate the use of pedestrian vehicles.

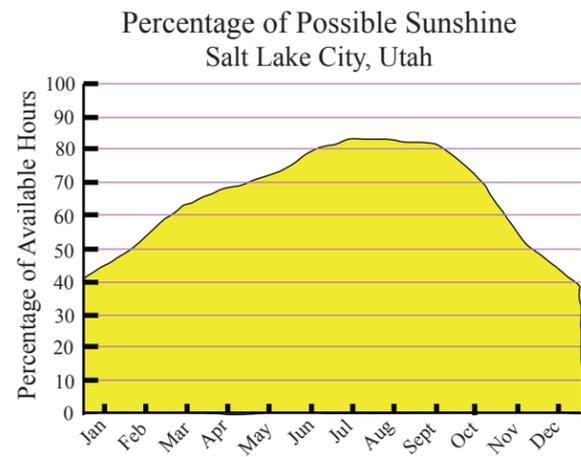
Currently there is no pedestrian traffic on the site but an option will be integrated into the project to allow for paved walking paths and dirt walk/run paths. There will also be bike paths integrated into the site.

The current condition of the site will allow for extensive landscaping. The topography can easily be manipulated and changed. There are grades around the site which exceed the limits of use so they have been excluded from use.

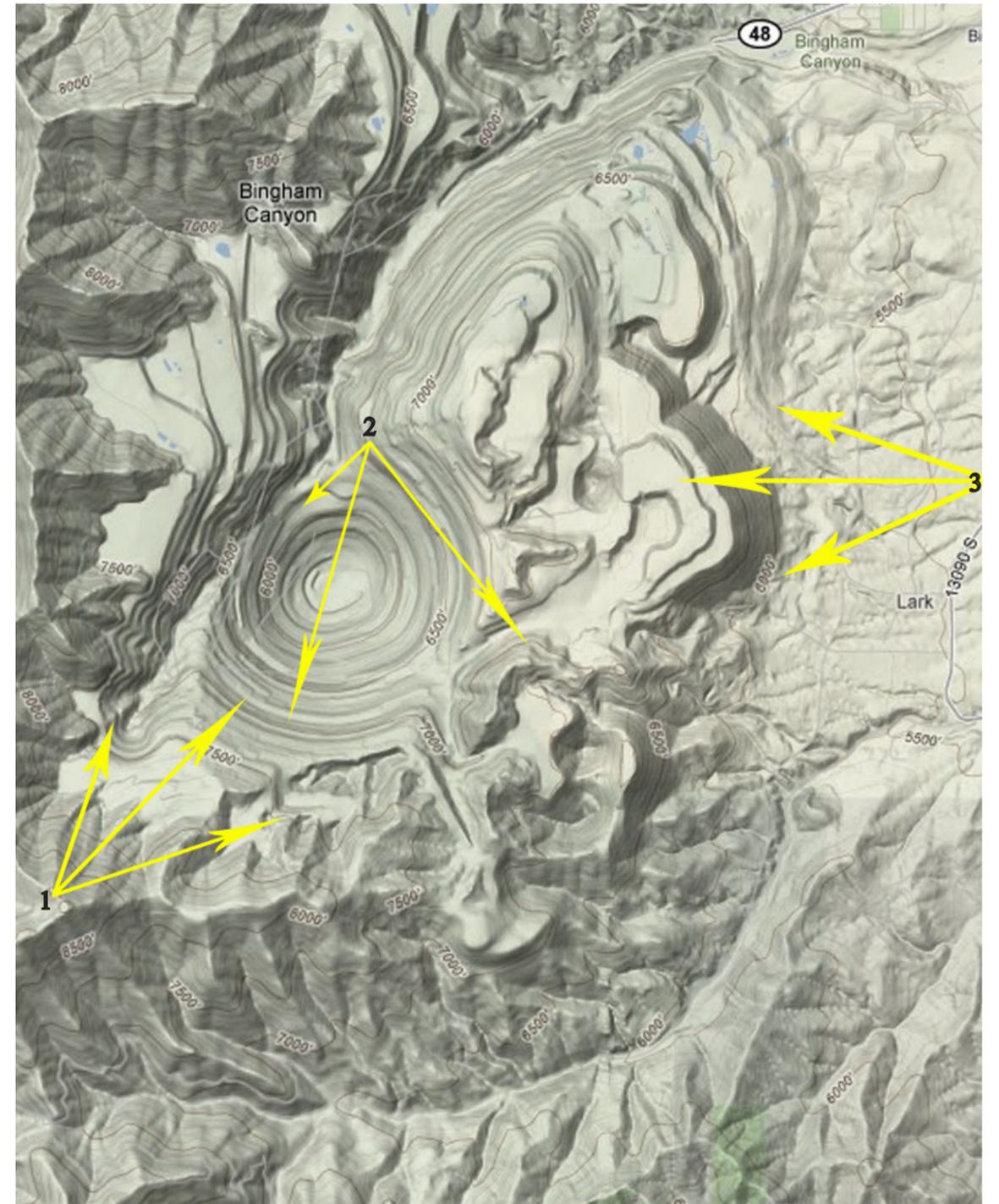




- RAINFALL
- AVERAGE DAILY TEMPERATURE (MAX)
- AVERAGE DAILY TEMPERATURE (MIN)



As you can see from the chart above the weather is very mild and allows for year-round outdoor activities. The sun also shines the majority of the year with its peak during the summer months.



The following images were taken from these three locations, looking in various directions.



Location 2



Location 2





Location 2



Location 2



Location 2



Location 2



Location 2



Location 1



Location 2



Location 1



Location 1



Location 1



Location 1



Location 1



Location 3



Location 3



Program Spaces

Guest Rooms

Net area of one typical guest room (40 guest rooms total)	1250 ft ² 50,000 ft ²
Net area of one typical guest room balcony/patio (40 balconies/patios total)	150 ft ² 6,000 ft ²
Net area of private cottage (10 cottages total)	1,500 ft ² 22,500 ft ²
Net area of private suite cottage (8 suite cottages total)	1,800 ft ² 18,000 ft ²
Total area of all guest rooms & cottages	96,500 ft²
Circulation, linen, vending, & storage	11,259 ft ²
Total guest rooms/unit block	107,759 ft²

Public Interior Spaces

Lobby	
Concierge	171 ft ²
Lounge	764 ft ²
Main Lobby	2,500 ft ²
Seating Area	3,500 ft ²
Front Desk	750 ft ²
Restrooms	1,000 ft ²
Subtotal:	8,685 ft ²
Retail Shops	
Gift Lodge	900 ft ²
Equipment buy/rental	1,500 ft ²
Subtotal:	2,400 ft ²

Dining / Lounge

Restaurant	5,000 ft ²
Bar and Grill	2,000 ft ²
Subtotal:	7,000 ft ²

Functional Spaces

Conference Room 1	2,000 ft ²
Conference Room 2	1,500 ft ²
Ballroom	3,500 ft ²
Reception Room 1	2,500 ft ²
Reception Room 2	2,500 ft ²
Reception Room 3	1,500 ft ²
Subtotal:	13,500 ft ²

Guest Amenities

Fitness Center	5,200 ft ²
Restrooms/Changing Rooms	2,000 ft ²
Game Rec-room	2,500 ft ²
Subtotal:	9,700 ft ²

Health Spa

Lounge	1,200 ft ²
Couples Suite Rooms	800 ft ²
Massage Rooms	650 ft ²
Body Scrub/Wax Rooms	600 ft ²
Saunas	550 ft ²
Salon	2,500 ft ²
Front Desk	150 ft ²
Waiting Area	1,025 ft ²
Spa Retail Store	530 ft ²
Locker Rooms	900 ft ²
Storage	500 ft ²
Circulation	3,560 ft ²
Subtotal:	12,815 ft ²

Child Services

Day Care	2,500 ft ²
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Pet Service

Pet Day Care	1,000 ft ²
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Pool Area	
Pool	2,000 ft ²
Pool Surface Area	12,000 ft ²
Sauna	120 ft ²
Restrooms/Changing Rooms	1,100 ft ²
Subtotal:	15,420 ft ²

Circulation 12,080 ft²

Visitor Center	
Displays	2,500 ft ²
Theater	1,500 ft ²
Restrooms	900 ft ²
Subtotals:	4,900 ft ²

Total Public Interior Spaces 90,000 ft²

Public Exterior Facilities

Pool and Deck	
Cantina	200 ft ²
Pool Surface Area	4,500 ft ²
Deck Surface	12,000 ft ²

Total Public Exterior Spaces 16,700 ft²

Total Public Facilities 106,700 ft²

Support / Service Facilities

Food Preparation	
Restaurant Kitchen	1,500 ft ²
Food Storage	400 ft ²
Subtotal:	1,900 ft ²

Back of House Delivery	
Loading Platform	800 ft ²
General Storage	1,800 ft ²
Receiving Office	150 ft ²
Circulation	720 ft ²
Subtotal:	3,470 ft ²

Employee Facilities	
Lounge	1,000 ft ²
Subtotal:	1,000 ft ²

Housekeeping	
Laundry	800 ft ²
Housekeeping Storage	1,205 ft ²
Subtotal:	2,005 ft ²

Repair & Maintenance	
Engineering Shop	1,200 ft ²
Computer Room	400 ft ²
Grounds Maintenance	2,400 ft ²
Subtotal:	4,000 ft ²

Equipment Rooms	
Telephone	335 ft ²
Mechanical/Electrical	3,000 ft ²
Subtotal:	3,335 ft ²

Administration 1,200 ft²

Security 400 ft²

Guest Services 600 ft²

Circulation 1800 ft²

Total Support/Service Facilities 19,710 ft²

Space Summary

Total area of guest rooms & unit blocks 107,759 ft²

Total Public Facilities 106,700 ft²

Total Support/Service Facilities 19,710 ft²

Grand Total of Spaces 253,879 ft²

At \$210/ft², the building cost of this resort would be \$53,314,590.

Reference List

http://www.thecampingsource.com/item/Camping_Etiquette/id/616/category.aspx

A good rule is to leave your campsite cleaner than you found it.

<http://www.kennecott.com/?id=MjAwMDA5Mg==>
Since 1992 more than 2.6 million people have visited

Geotechnical & GeoEnvironmental Engineering
Jared A Hawes, P.E.

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State of Utah, Division of Water Rights Engineer
Bradley F Weber



Nicholas Scott Weber
3101 34th Ave S #123
Fargo, ND 58104
701-364-0514
nicholas_weber@hotmail.com
Hometown: Vernal, Utah

"NDSU has proven to me that it is a university that can compete with any school throughout the country."