

The
PLANETARY RIFT
AWAKENING THE SENSES TO
THE NECESSITY OF NATURE

An Architecture Thesis By Trevor Guck

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PLANETARY RIFT
AWAKENING THE SENSES TO
THE NECESSITY OF NATURE

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By
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of
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PROPOSAL

THESIS ABSTRACT

Around the world, confirmation of the deterioration of our planet's ecosystem is evident. It's become so common that we are no longer disturbed by the incineration of ancient rainforests and depletion of drinkable water and breathable air. History shows that ancient humankind always saw themselves as fundamentally intertwined with Nature and understood that a balanced co-existence was vital for survival. However, as humankind advanced, we have severed ourselves from this life-giving force perceived in the rituals and symbols in the traditional world, pursuing instead an intellectualized agenda of productivity which has had a tremendous impact on our treatment of "Nature." How can we begin to weave ourselves back into this delicate fabric from which we originated to awaken an emotional and cognitive empathy for the unique planet we call home?

Placed in the sensitive climate of Australia to frame the devastation of our neglected planet, this Natural History Museum and Inexhaustible Energies Laboratory also reforms the way humankind views its entanglement with Nature by creating an interface with the cycles and processes intrinsic to Nature itself. Various historical perspectives showing shifts in our cultural understanding of the world are embodied in the programmatic unfolding of spaces in the attempt to weave us back into the fabric of a living, feeling Nature through architecture and language.



Figure 001

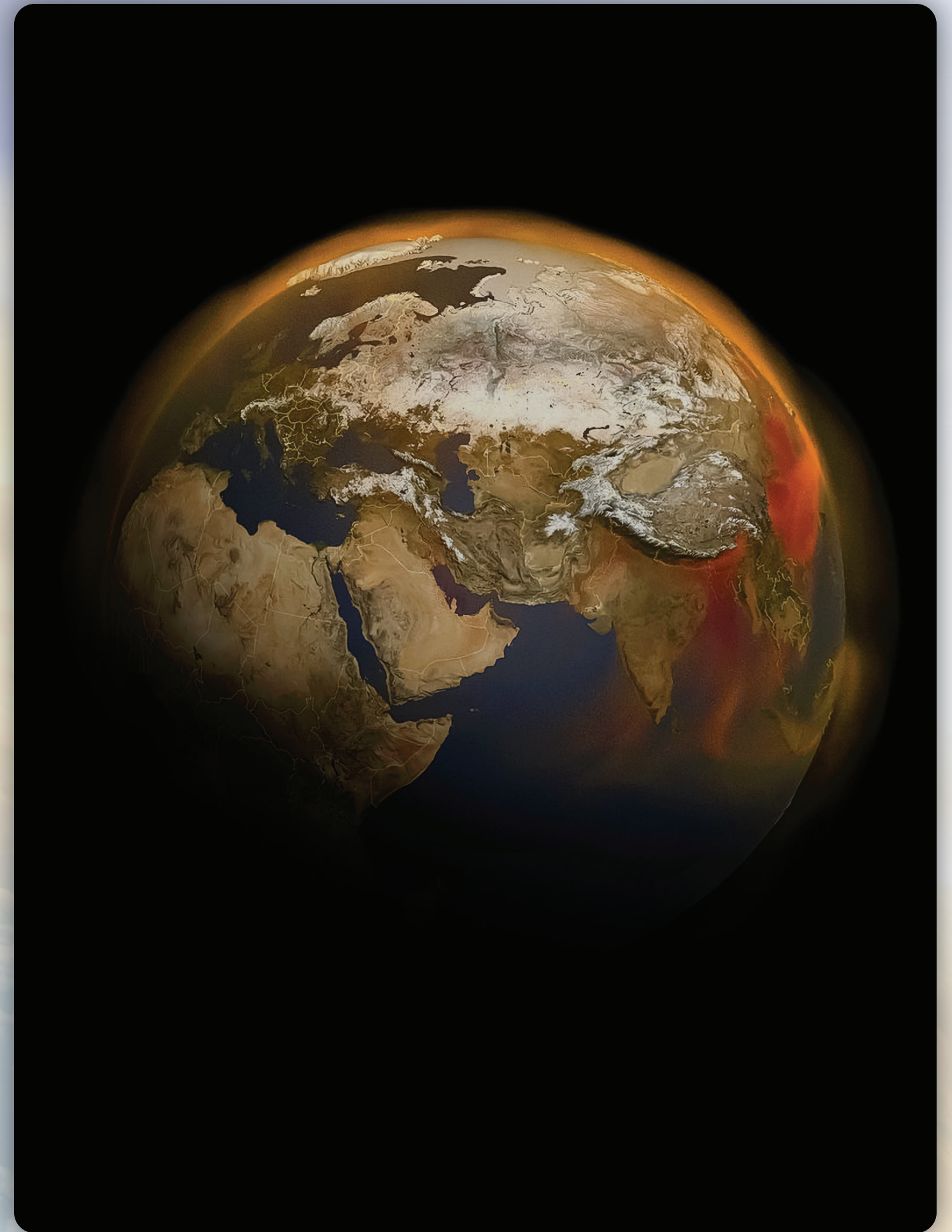


Figure 002

THESIS NARRATIVE



Figure 003

In the beginning, everything humans encountered was filled with life. Not only did it seem that the other animals in the forest had their own personal motives, it seemed that the forest itself along with the wind and weather had their own motives as well. Natural phenomenon like these were seen as living beings willingly acting upon man in the environment. If he found himself caught in a bad rainstorm, he may feel that he is being punished by nature itself, or if he stumbles across an abundance of food, he feels he is being rewarded for a good-doing. It was this viewpoint upon which early man formulated many of their creation stories and myths of the unexplainable, where natural phenomena take the form of living immortal beings acting upon mortal man with a rather specific personal agenda. Ancient humankind had a lot of respect for nature for this reason.

The use of language was pivotal in the course of humankind and was originally drawn directly from nature’s dialect to share thoughts. Early on, written language was pictorial and there were only a few certain symbols used to represent things or concepts that resisted pictorial representation. The symbols related directly back to the animals and other things we encountered in the world. The heavy symbolism of animals and nature in the thoughts of ancient man explain their profound connection with the world in which they lived. It was no surprise that early man saw many of the answers to their existential questions in the nature they encountered on a daily basis.

ANCIENT ALPHABETS.						
Egyptian Hieroglyphic.	Egyptian Hieratic.	Phoenician on Moabite Stone.	Siloam Inscription.	Hebrew on Coins.	Samaritan.	Square Hebrew.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Aleph.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Beth.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Gimel.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Daleth.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ He.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Vau.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Zain.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Cheth.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Teth.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Yod.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Caph.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Lamed.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Mem.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Nun.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Samech.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Ain.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Pe.
Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ	Ⲁ Tsadik.

Figure 004

Abrams summarizes the progression and current form of linguistic representation stating in his book , The Spell of the Sensuous, “Today, the prevalent view of language, considers any language to be a set of arbitrary but conventionally agreed upon words, or “signs,” linked by a formal system of syntactic and grammatical rules. Language, in this view, is rather like a code; it is a way of representing actual things and events in the perceived world, but it has no internal, nonarbitrary connections to that world, and hence is readily separable from it.” (Abram, 1996, p. 54)



Figure 005



Figure 006

While much of the advancing civilizations began to unknowingly sever themselves from nature on a cultural level, there were still many civilizations, heavily influenced by the traditions of their predecessors, who managed to preserve the connection. Much of this preservation was found not necessarily in the language of the people, it was found in their rituals and methods of creation. For the Kogi, the spindle and the loom are sacred objects that gather preconceived attributes or ideas. The sense of rhythm and the notion of continuity are present in all significant activities such as weaving, thinking, building, planting, sewing, lovemaking, walking, and singing. Spinning generates thought and weaving intertwines them into the Fabric of Life, which is a web of knowledge. The spindle from which the thread originates is also seen as an analogue of the axis on which the earth spins on and parts of the loom align to celestial bodies and the seasons.

THESIS NARRATIVE cont.

For many ancient civilizations, just like the Kogi, the home was a very significant place in their lives. Home was the place for deep contemplation and meditation, where one could look into their own inner realms and relate themselves to the vast cosmos of outer space where the divine being of nature lived. This didn't stop at the walls of the private dwelling either, it expanded to vast areas that facilitated self-contemplation and tranquility. It seems that home is a place which causes us to look inward at inner psychic realms as well as outward to the universe to contemplate our place within the vast cosmos. Looking at the domestic architecture of American Indians offers many examples of dwellings serving multiple ontological and symbolic roles. Their buildings often represented not only their social order, but their tribal view of the cosmos.



Figure 007

As we have examined, humankind was woven into the vast web of nature alongside every other being on Earth. What they needed was provided for them and there were also many opportunities for awe and contemplation when confronted by the wonders of nature whether that be a shooting star streaking across the night sky or a towering waterfall dazzling in the sunlight. This was a truly imbedded relationship with the environment, and it seemed to allow humankind to thrive like never before. Civilizations began to spring up in inspiring cultural areas with plenty of resources, and discoveries about our world were being uncovered rapidly, most of which we didn't fully understand. As we learned more about how we could predict the environment around us and control our health, humankind's life expectancy rose exponentially along with the population. With the huge increase of people of the earth, much more food was needed and advancements in science were needed increasingly faster. It is perhaps at this moment where meaningful actions begin to be replaced with efficient actions in order to stay ahead of the ever-increasing demand. Sacred rituals that traditionally guided a harvest or manufacturing process were dissolved by the pressures of production.



Figure 008

The biggest cultural shift however, started in the beginning of the 17th century and would ultimately alienate man from the one thing that nourished him. Mankind, using the telescope, put within grasp of an earth-bound creature and its body-bound senses what had seemed forever beyond his reach. He provided a new perspective of the world and universe from outside the confines of the earth in space, something that would never be naturally experienced. There were many new patterns and processes that started gaining the attention of scientists and it was from these occurrences that were millions of miles away that scientists drew from to explain occurrences here on earth. Because of this, the development of the modern scientific method during the seventeenth century reduced autonomous natural phenomena to sets of explainable, predictable occurrence. With the assumption that everything is subject to universal laws, the free-acting will of nature was dissolved.

THESIS NARRATIVE cont.



Figure 009

However, this will hopefully change with the popularization of a few new relevant hypotheses on our role in the ecosystem and the evidence of a feeling, reactive earth. These are emerging from the scientific study of ways climate change is affecting organism behaviors which is changing the chemical composition of our atmosphere. One of these discussions, The Gaia Hypothesis, was originally proposed by James Lovelock in 1972 and suggests that living organisms on the planet interact with their surrounding inorganic environment to form a synergetic and self-regulating system.

The air that surrounds us is so close to us that we tend to leave it out of our thinking entirely. It is invisible to our eyes except for its influences on other things such as the swaying of the leaves of a tree, which may explain why we say we live on the Earth instead of in the Earth. The Gaia Hypothesis indicates that the atmosphere in which we live is itself an extension of the planetary surface, a functioning organ of the Earth. The air can no longer be considered an absence of solids for it too has density. We are immersed in its depths just as a fish is immersed in the sea. As Abram states, "It is the Medium, the silent interlocutor of all our musings and moods. We simply cannot exist without its support and nourishment, without its vital participation in whatever we are up to at any moment... If Gaia exists, then we are inside her." (Abram, 1990, p. 2)



Figure 010

Knowing now that we do not live in a void, but rather a gaseous sea we call our atmosphere, the issues of polluting these gaseous seas becomes personal. Through the media, we learn of the massive build-up of manufactured chemical compounds in our atmosphere that burn holes in the protective layers of ozone and the drastic increase in atmospheric carbon dioxide and other chemicals that warm our atmosphere. However, the information remains alienated from those it reaches because it takes on the form of an abstract cluster of statistics. Perhaps it is only when we feel the chemical breeze stinging the moist membranes that line our nose or when we watch in horror as gale force winds tear signs and awning off buildings that we will personally realize the extent of the damage. The main issue here is a cultural and scientific human dissociation from a more-than-human world. Abram states in this book *The Spell of the Sensuous*, "As long as we experience the invisible depths that surround us as empty, we will be able to deny, or repress, our thorough interdependence with the other animals, the plants, and the living land that sustains us. We may acknowledge, intellectually, our body's reliance upon those plants and animals that we consume for nourishment, yet the civilized mind still feels itself somehow separate, autonomous, independent of the body and of bodily nature in general. Only as we begin to notice and to experience, once again, our immersion in the invisible air do we start to recall what it is to be fully a part of this world." (Abram, 1996, p. 154) By investigating The Gaia Hypothesis on a scientific and cultural level, we may be able to awaken societies once again to a living Earth. We will then know that the consequences of our actions do not disappear into a vast void called the sky, but rather accumulate in an already delicate mixture of atmospheric chemicals needed to sustain all life of Earth. Through The Gaia Hypothesis and other supporting theories, we may once again consider our actions in regards to the sacred Earth and begin a long-awaited global healing process that will halt the accelerated extinction of animals, and reverse the poisoning of the essential air we breathe.



Figure 011

THESIS NARRATIVE cont.

Although these theories are promising in provoking empathy for nature, the toll of hundreds of years of neglect are already beginning to show and action must happen fast. Carbon emissions are filling our atmosphere, acting like a blanket on a bed, trapping heat in our atmosphere. This heat is causing the globe to warm at an alarming rate, melting our ice caps and drastically affecting vital weather patterns around the world. Some places are much more sensitive to this than others and have already experienced apocalyptic-like destruction. For example, Australia is particularly sensitive to climate change and is experiencing their hottest and driest seasons in all of recorded history. Extinction scale fires which were believed to only happen 2 times a century just a hundred years ago is now occurring over 10 times a summer. The very same forests that harbored the dinosaurs and have gone unchanged for millions of years are now being turned to ash in a matter of days. Even entire species of animals who have adapted and lived these historic forests are being wiped off the face of the earth with no chance of ever existing again. Related to this product of overconsumption and neglect, the expansive collection of unique species that live in our oceans are in peril as well. Due to the overconsumption of fish for food and fashion and the enormous pollution of human waste that poisons the very water these fish are taken from; the ecosystems of the ocean are dying. Some may say that there is a lack of discussion on climate change causing a slowing of social reformation, but perhaps it is also the fact that these disasters are so common, and the public is terrifyingly misinformed that people don't see it as much of an issue anymore. Environmental devastation is becoming so common in the news headlines of today that people are becoming numb to the idea. One does not see the magnitude of destruction and deceit whilst living amongst the affected population. This is a startling path which will inevitably lead to the total collapse of our ecosystem if we chose to keep following it. As someone who knows how important our decisions are to the ecosystem of all living beings on earth and who is ultimately affected by the decisions made by the people in control, I keep asking myself an important question. A question whose answer has the potential to awaken mankind once again to the importance of their actions on Earth: How can we begin to facilitate new connections between nature and mankind, and awaken a sense of responsibility when it comes to protecting our future on Earth? Perhaps through what we have discovered about the ways ancient civilizations have interacted with nature and how closely we today are connected with it whether we want to be or now, we can synthesize an architectural solution that invigorates the user with empathy and compassion to save our dying planet.

PROJECT TYPOLOGY

In order to cultivate new connections with society and progress development in the environmental sciences, the project will take on the form of a museum and laboratory. The museum will be open to the public where historical perspectives are embodied to reveal the cultural shifts that blinded us from our truly embedded reality, and attempt to weave us back into the fabric of Nature through the awakening of our senses to the eternal presence of a living, feeling Nature. The historical exhibition spaces in the museum will allow for many examples of the relevance and important of nature to ancient man. There will be a wide range of exhibits covering the presence of nature in some of humankind's first religions and social structures as well examples of our dependence of this ever so delicate system. The goal with these spaces is for people to empathize with nature and see it as a fragile, inescapable system that we are very much a part of.

What one could consider to be the workhorse behind our revival of the planet, laboratories are also integrated into the architecture to bring forth the inexhaustible energy and pollution extracting technologies necessary to reverse the dangerous direction we are headed. In these spaces scientists will work together to produce the necessary measures needed to halt the use of single use and wasteful energies. Development will also occur in areas working to scrub the air, water, and ground of dangerous pollutants and revitalize the ecosystems vital to a healthy life for all organisms.



Figure 012

MAJOR PROJECT ELEMENTS

The Entrance

The entrance of the site will portray the immensity of the issue at hand. Featured will be the results of the overconsumption and misuse of the Earth's creations. Also present will be the history of the Earth laid out for all to see. Here you will also see the overall design of the project which will interact with the effects of our planetary abuse as well as its history. I would also like to weave the Earth's eternal processes into the building and allow for the architecture to record these processes as time passes. Also necessary at the entrance is the interaction with these processes and nature itself.



Figure 013

Exhibition Spaces

The museum will be open to the public where historical perspectives are embodied to reveal the cultural shifts that blinded us from our truly embedded reality, and attempt to weave us back into the fabric of Nature through the awakening of our senses to the eternal presence of a living, feeling Nature. The historical exhibition spaces in the museum will allow for many examples of the relevance and importance of nature to ancient man. There will be a wide range of exhibits covering the presence of nature in some of humankind's first religions and social structures as well as examples of our dependence of this ever so delicate system. The goal with these spaces is for people to empathize with nature and see it as a fragile, inescapable system that we are very much a part of.



Figure 014

Laboratories

What one could consider to be the workhorse behind our revival of the planet, laboratories are also integrated into the architecture to bring forth the inexhaustible energy and pollution extracting technologies necessary to reverse the dangerous direction we are headed. In these spaces scientists will work together to produce the necessary measures needed to halt the use of single use and wasteful energies. Development will also occur in areas working to scrub the air, water, and ground of dangerous pollutants and revitalize the ecosystems vital to a healthy life for all organisms.



Figure 015

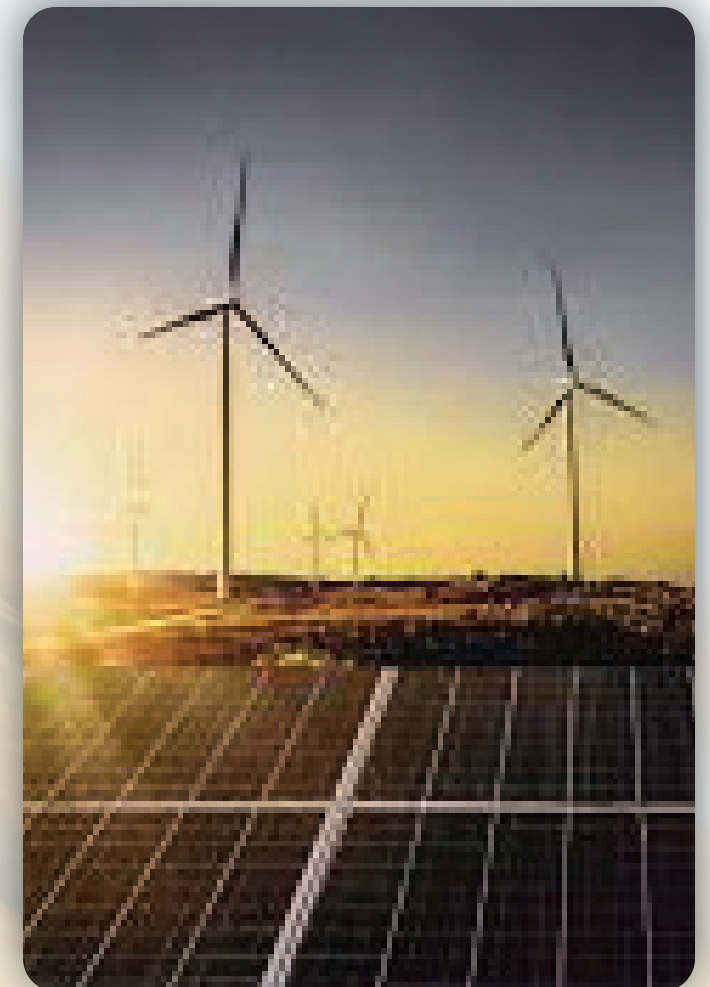


Figure 016

Inspirational Walkways

In order to weave the scientific development of a cleaner future with the rich historical perspectives of the museum, walkways bridge from the laboratories through the exhibitions to open a space for discussion and integration of these incredibly relevant ideologies into the technologies powering the future.

CLIENT DESCRIPTION

Students

Local and international schools and universities will be invited to the project in order to learn about the history of man and nature as well as the current state of our environment. The hope will be to build lasting influence that will affect the decisions made by these students as their educational and professional careers unfold. These students will be utilizing the building during normal hours of operation, 8:00 am to 8:00 pm and will arrive with a volume of roughly 500 visitors a day.

Educators

Educators will use the space when accompanying these visiting school as well as when building their own research on the topics at hand. They will help guide students through the history and information in order to produce a cohesive understanding. They too will use the space during normal hours of operation and will arrive in volumes correlated with the volume of students.

General Public

Consisting of the rest of the population, the general public will make up the rest of the visitors who aren't students or educators. They will use the space just like the students, except they will be accompanied by a guide or left to explore on their own. Their presence will help to spread the knowledge gathered in this project to others in society in hopes of a global awakening on the issues at hand. These users will inhabit the space during normal hours of operation and are expected to arrive with a volume of 1,500 visitors a day.

Scientists and Engineers

With the inclusion of research and development in the project, scientists and engineers will be needed to make it happen. They will be the driving force behind the research of the environment and development of new technologies. These two groups will work together to solve any problems encountered and create a flawless flow of innovation. The engineers will also be available for maintenance of the advance technologies on-site. Ideally, we hope to have a team of roughly 50 scientists and 50 engineers. Mainly, we can expect them to use the project from 6:00 am to 6:00 pm but will accommodate use around the clock for more intensive projects if needed.

Maintenance

To keep the whole operation running smoothly, maintenance staff will need to be employed. They will clean and fix exhibition and laboratory spaces mainly while visitors aren't present, but will be available should something urgent arise. They will be inhabiting the space around the clock to accommodate the arrival of visitors and the operations of scientists and engineers. We can expect to employ a teams of 10 to 20 maintenance experts for the project.

SITE PROPOSAL

To anchor the project into a relevant context, I feel that it will be important to look for a site with rich geology, vegetation, wildlife and history. Beginning with geology, I believe that an appropriate location may be a place where open-pit mining took place. This will be a great way to show and relate to the timeline of earth shown in the rock layers. It also could serve as a source of inspiration highlighting the byproducts of overconsumption. To focus the site on the issues of climate change and our efforts towards saving the planet, it may be beneficial to find mines where essential components of batteries used for renewable energy are extracted. These components are lithium, cobalt and nickel. Thankfully, these extracted materials are recyclable so they will only need to be mined once, however it will still leave a scar on the earth, and it may be important to show that these types of scars are ultimately caused for a brighter future and can be reused even after all precious minerals are extracted. The proximity of wildlife and vegetation will help enact a presence of nature on the site and add a historical context that informs visitors on the delicate balance of our ecosystem.

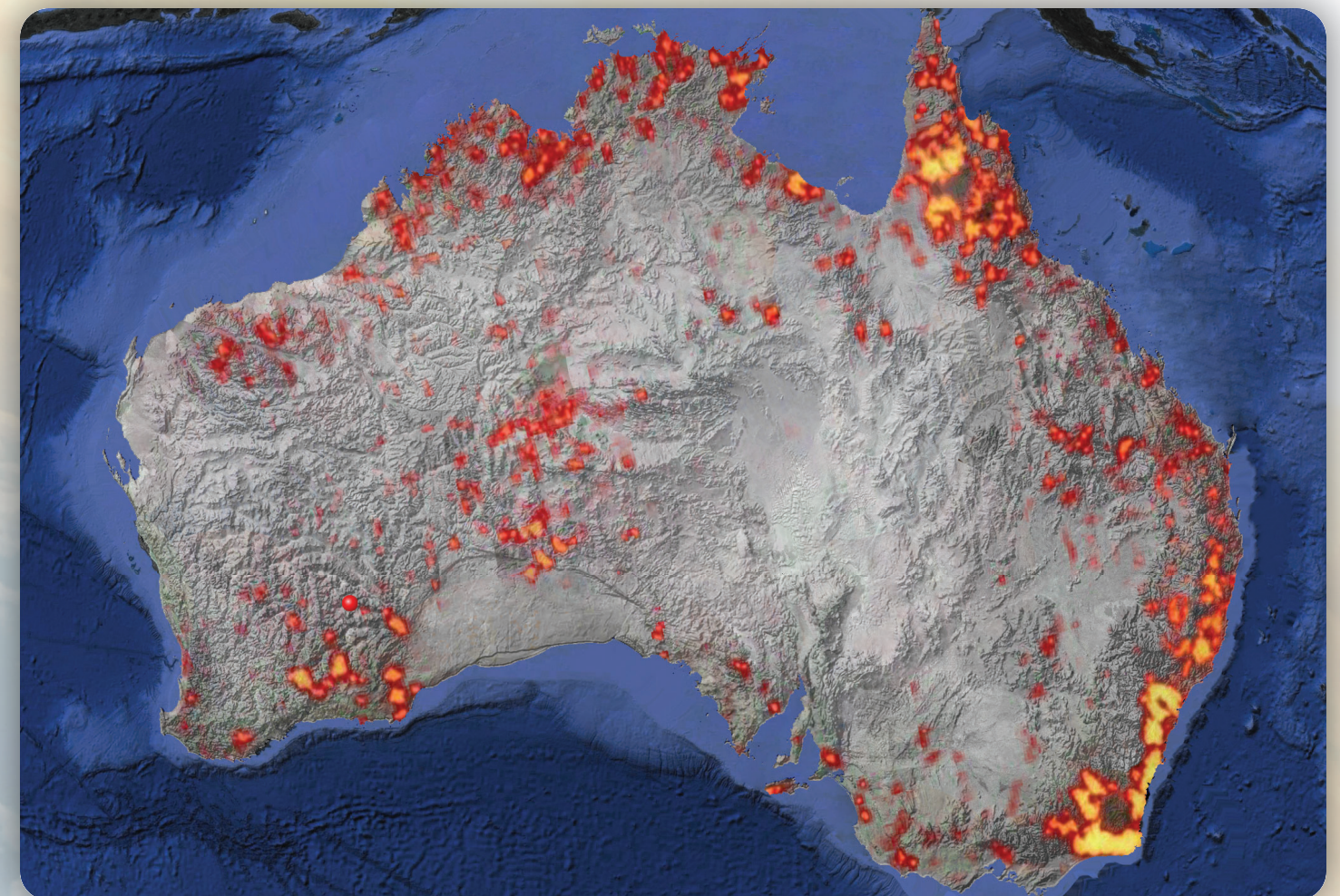


Figure 017

SITE PROPOSAL cont.

One specific event which inspires the location of the project is that of mass death and destruction and has been dubbed the “Black Summer”. This event, starting in the summer months of 2019 in Australia, is responsible for the decimation of 21% of Australia’s rainforests and the death and displacement of over 3 billion animals. The event was the result drastic changes in climate due to global warming that altered weather patterns and increased average temperatures. It all began in June of 2019 when the Queensland Fire and Emergency Service warned of the potential for an early start to the fire season. The warning was given due to worrisome signs portrayed in nature. That year had been especially hot on average and at this time, Australia had been in a drought for the past few years. Signs of distress were eminent in the animals and vegetation and were increasing by the day. Healthy trees that were around for centuries were seen shedding leaves to conserve nutrients and plants were seen wilting during times when they should be flourishing. People who lived in the affected areas said they could see trees dying by the day, seemingly losing all their leaves and drying out overnight. Their surroundings shifted from a lively green to a lifeless brown as much of the vegetation struggled to survive the heat and drought. The fire season began early as expected in June and intensified through October, causing hundreds of forest fires to burn out of control. It wasn’t until late October when officials knew they were on the edge of catastrophe and declared a state of disaster for much of eastern Queensland and New South Wales. Numerous smaller fires began joining together to form a few massive forest fires which would challenge countless inhabiting species, including ourselves, for months to come. Originating in the forests far away from civilization, these fires grew so powerful that the heat and massive smoke clouds in the atmosphere began to generate their own storm systems. These storms would produce rapid lighting and gusts of wind over 100 miles per hour which would spark and spread new fires at an exponential rate. Also, these storms did not produce vital precipitation needed for natural control of the fires. Regardless, these storms traveled with and intensified the menacing fires and would quickly begin to surround many inhabited cities. To show just how terrifying these firestorms were, I would like for you to imagine the point of view of an Australian resident experiencing one of these right in your backyards.



Figure 018



Figure 019

For days in advance, thick smoke lingers in the air. It is a dense fog which reeks of charred vegetation and burns the throat of those who breath it. At this point, visibility is still rather acceptable allowing you to seem the fires that burn miles in the distance. Around you tourists are still enjoying their vacations at the beach, seemingly in denial of the progressing destruction. Every morning when you wake up, the fires are noticeable closer than when you laid down the night before. It isn’t long until you are asked to evacuate, not knowing if you’ll ever step foot into your house again. However, whether out of hope or denial, many do not evacuate and continue on with their daily lives as the smoke thickens by the hour. It isn’t long until the sky is black with smoke. It is the middle of the day, yet there is no trace of the sun and the whole atmosphere is dark and ominous. This was the massive plume of smoke which was driven ahead of the oncoming storm by powerful winds. At this point, those who refused to evacuate began to change their minds and search for a way out, but it was too late. The fires had already cut off many of the evacuation routes and trapped people where they were at. If you hadn’t escaped by now, you were doomed to face the fury of the fire. It would only be a matter of hours before the full force of the approaching firestorm is unleashed. As time progresses, the sky begins to shift from black to bright orange and the ground and air around you begin to rumble fiercely. You cannot see the fires, but you know they are close. The wind begins to pick up drastically, carrying with it sheets of embers, and before you know it your yard is set ablaze.

SITE PROPOSAL cont.

Those who remained frantically watered down their belongings in order to save whatever they had left. The fire departments were so overwhelmed that it was up to the citizen to protect their homes with as little as a garden hose which proved useless against the raging fires. Eventually, supplies of water would be cut off due to the destruction of local infrastructure, and people were left to the mercy of the flames. They watered themselves down if they were able in order to lessen the burn of flying embers and cool the smoldering heat. As they fought for their lives, citizens recall countless smoldering winged creatures and tree branches the size of light poles raining from the sky. They saw numerous animals frantically running for their lives, some of which were burnt or burning, and most of which would not make it through the next hour. The fire itself was said to act like an animal, seemingly plotting against you and predicting you every move. Right when you felt that you had found an escape, the fire would cut you off. It was a truly apocalyptic scene one could only imagine seeing in movies. These fires burnt out of control until February of 2020 when they either ran out of fuel or were choked out by much needed torrential rain. In total, the fires burnt an estimated 46 million acres of land and 21% of Australia's rainforests, destroyed over 5,900 buildings and displaced, injured or killed over 3 billion terrestrial beings. It is also said that many beautiful endangered species were brought to extinction during the fires. A long line of ancestry withstanding millions of years of adaptation and survival is brought to an end in a matter of months.

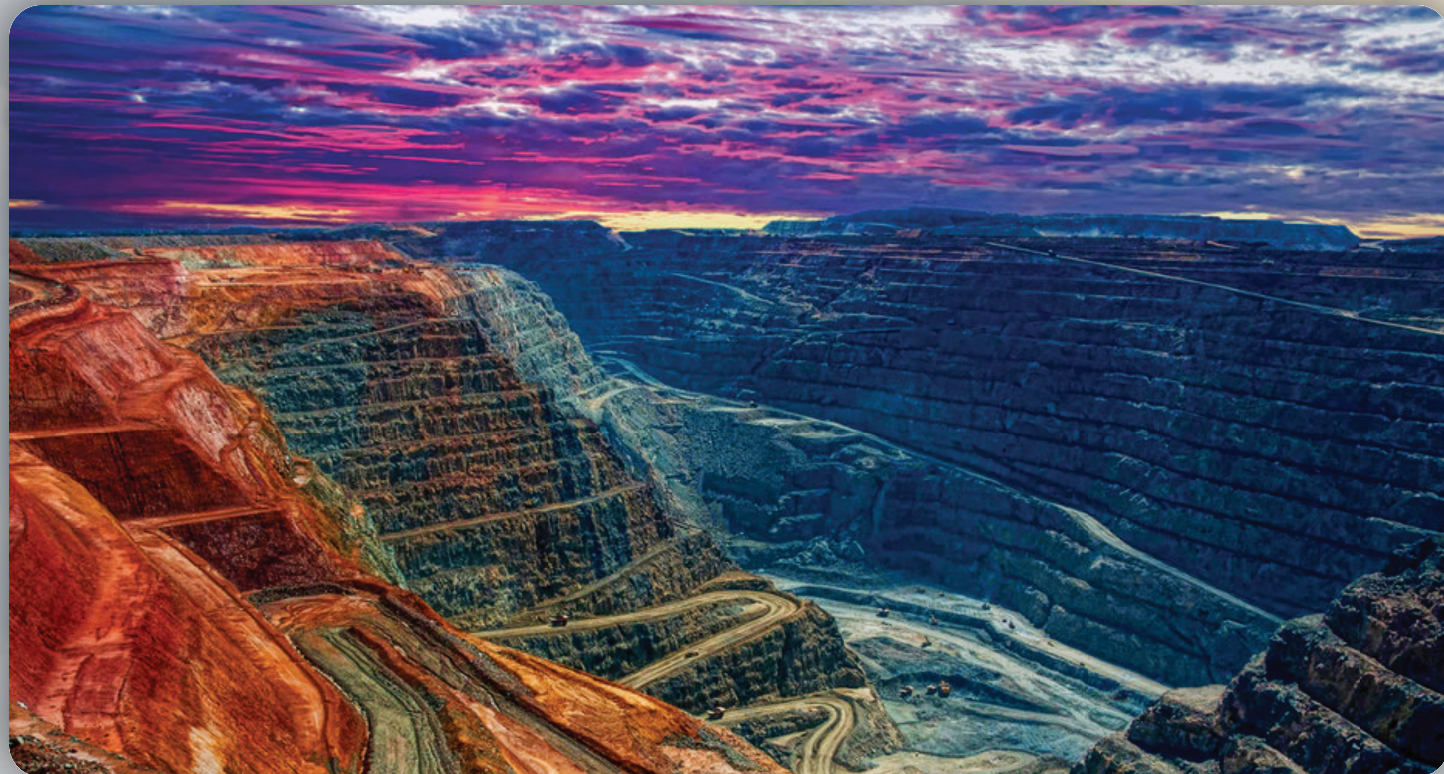


Figure 020



Figure 021

This magnitude of destruction is in no way sustainable to the ecosystem of Australia or of the world, and the high sensitivity of the region to climate change raises concern. How many more disasters can Australia handle before the damage is irreversible? In hope of not finding an answer to this question, we need to become more conscious of the influence we have on our environment. Initially, eliminating the toxic byproducts from current energy sources used in buildings and automobiles will cut off a major source of pollution in our atmosphere. Cleaner, renewable sources of energy will be essential to our survival as a planet. Inspired by this fact, the site of the project is located in a place which will make this vision possible. Major components for renewable energy production and storage are pulled from the ground and refined via the process of mining. The pulling of these elements from the ground leaves behind a massive void in the earth like a scar does on the skin. This is best seen in the voids created by open-pit mining and these scars then can act as motivation and inspiration for a cleaner future.

SITE PROPOSAL cont.

The void of the mine is immense and brings into perspective the cost of the material items we take so much for granted. As stated, through mining we take precious metals from the earth and use them for various things. On one side, these metals are used to feed the ever-growing demand for unnecessary jewelry and novelty items. The overconsumption of these items then continually increases the need to create wider and deeper scars into the earth just to keep up with demand. The mine in this case then represents the ghost of the mined earth that preceded it. Human overconsumption has taken from the earth without giving back, destroying the rich history told in its geological stratification and leaving in its place a desolate void of nothingness. This absence is bolstered by the miles of expansive mine walls surrounding it, its emptiness calls to the depleting resources our earth decreasingly has to offer. Yet, with this dismal image of the mine comes a hopeful one. While the mine is a scar in the earth's skin and an imbalance to the ecosystem's equilibrium, it represents a brighter future. Along with these abused precious metals that are ripped from the skin of the earth come materials which will ultimately allow for a cleaner, conscientious future through renewable energy production. The emerging renewable energy technologies today rely heavily on elements only found deep within the ground. These elements include nickel, copper and lithium to name just a few. With the development of these technologies, we can reduce the need to pollute our delicate atmosphere and the need to create more mines like these in search of alternative energy. These materials are proving to be recyclable as well, leading to the idea that massive open-pit mines like these will become less prominent. In this way, the mine acts as a new hope for humanity in saving our planet. The earth sacrifices its precious metals and humankind finally gives back in the form of no longer polluting the earths and all its inhabitants' lungs. The mine is a spring from which a new beginning is flowing. While the void of the mine is a scar on the earth's skin, it allows for some very unique opportunities for the earth to teach us about itself as well. With the extraction of material comes the peeling pack of the history that has been layering for billions of years. Like the rings of the tree trunk, the rock layers speak back to a time when animals and humankind lived as one in perfect equilibrium with the earth. They expose the history of the earth in an easy-to-follow timeline along the walls of the mine. The towering exposed rock walls also speak to the immensity of the issue at hand. The weight of the issue is as immense and the weight of the ground the project is situated in and without a change of ways, our ecosystem is bound to collapse.



Figure 022

PROJECT EMPHASIS

Providing An Interface In Which People Can Find Relation With The World

The first emphasis of the project will be the hopes of turning human-kind around, stopping them from building a barrier between themselves and nature. Those participating in the space will need ways to see themselves as one with the environment for many of the climate saving ideals to have a lasting impression. If there is no connection with nature at a more personal level, people may not see the truth about where our planet is headed and will continue down the path of severance from that which brought us up to be who we are today. Creating meaningful connections will allow these eco-friendly lifestyles to be much more involving and impactful. Ideally, opening the door for a mindful coexistence with the world around us.

A Call To Action For The Masses

In order to create a widespread and lasting effect of people, this project will also focus on appealing to the mass population and calling them to action. Spaces will be designed to invite people into them and allow them to wander within and explore the space as well as themselves and each other. The design will take on a bit of ambiguity in order to find ways to connect with people of various cultures and backgrounds. Allowing these free interactions and easy personal connections can draw people closer to each other and contemplate rigorously their place in nature. Once this is established, it is time for action. This action will be provoked through tension within the space. It is vital that the space provokes these emotions that will drive action in order for there to be a real change for the better.



Figure 023

PROJECT GOALS

My goals which I hope to accomplish throughout the thesis process range from personal to professional. I've set the bar quite high for myself to stretch the boundaries of comfort. Without goals that seem difficult to complete, I don't feel like I will put in the effort required to create something life changing. My goals are as follows:

First, I would like to dive into philosophical texts to unravel ways in which people may be able to connect with the world. I want to know how humans saw themselves as a part of nature as well as where and how the shift in perspective occurred. I don't believe I'll be able to adequately facilitate these connections unless I research into the mindset of man before overpowering technology. The challenge, then, will be crafting the built environment in ways where mankind is able to forget about the need to conquer nature as if it were something other than themselves. If this is successful, the project will have the life changing abilities we are striving for as mentioned in the project narrative. I do feel that this knowledge would be able to carry over into my professional career as well. If successful in my quest, I will have the knowledge to produce more human-centric designs that perhaps allow individuals to discover more about themselves through facilitating introspective thought.

Next, I want to know that I can create efficient and effective buildings that do their part in the search for self-sufficient design. I eventually want to create buildings that can collect their own water and energy from the environment without being harmful to the inhabitants or the environment. Without this, perhaps we would still be able to facilitate our interrelation with nature but will not be taking much action to reverse the damage imposed on the environment by us. By achieving this goal, I will know the difficulty associated with making this type of lifestyle possible. There may even be a possibility, if it does prove to be difficult, that I would research further into making it easier to acquire, as it should be.

A professional goal I would like to accomplish during the thesis process is to deepen my understanding of "green" design and how it can be applied in everyday buildings. Obviously, this is the way of the future, as it is the only way I can partake in reversing climate change. I feel that by deepening my knowledge in this respect, I will be much more useful in the firm setting. I also feel that I will be much prouder in my creations as this is something that aligns with my personal design philosophy. Every building that is constructed on the earth should do nothing but benefit the context in which it is located. That being said, every building that replaces an old one should improve upon the situation at hand. It should be an improvement upon that which it replaces. The extensive research into this topic will be very interesting to me and will equip me with many useful and necessary tools as I begin my professional career as an architect.

PROJECT GOALS cont.

Finally, I wish to produce a project that I will be proud of, knowing that I gave it every bit of effort I had in the hopes that one day it may contribute to the greater good of society. I believe that, since this is the last educational project that I will be completing, this may be my last chance to find and research into topics that truly interest me in hopes to truly define my design philosophy. I feel that I will have the ability to do this in my professional career as well, but not with the vast amount of time and freedom that I have now. In saying this, I know that if I use every minute I can to work through this project, I will create something that has the potential to change the world, even though it may never be built. It is my hope that this project will mold my perception of architecture into a means by which I can solve the major problems of the world. After all, architecture influences every person, every second of the day, and it is this influence which drives my passion to create beautiful, healthy and resilient structures for the betterment of mankind.



Figure 024

PLAN FOR PROCEEDING

Definition of Research Direction

The research to be completed during this project will range from theories of our importance in the ecosystem to precedent studies of successful designs in the fields of science and history. Initially I will dive into theoretical texts to uncover the fundamental aspects of our existence and interaction in the world. I wish to build an argument around the idea that the world makes up our existence and without it we have nothing. I want to show that we are a fundamental piece of the equation of the ecosystem, and we must rebuild our connection with nature before our chance is gone. I will also research environmental technologies and green design as these will be key aspects to the performance of the project. Much of these technologies will also be researched on the site so knowing what is needed for research and development will help shape the laboratories. Knowing about these technologies will also help to make decisions on the integration of sustainable technologies such as renewable resource harvesting and atmospheric purification. Overall, I will be researching, through numerous methods, how we fit into the big picture of earth and how to stir up a social awakening to our role and position in nature.



Figure 025

PLAN FOR PROCEEDING cont.

Design Methodology

Theoretical Argumentation

Much of the initial research will be on the theoretical premises of the project. We will want to pin down the underlying issues that we want to solve as well as the justification for our design solutions. These theoretical texts will explore the fundamental changes that have occurred on a social and cultural level from ancient times until now. They will also uncover much of the justification behind the author's personal theories and the famous theories of others. This will all be carefully summarized and cited as I piece together the justification for my own solution.

Case Studies

Researching case studies will allow me to develop context within my typologies as well as see examples of projects which succeeded or failed. Ideally, I would like to look at projects which align with my intentions with the hope of singling out factors which caused them to succeed or fail. Initially I will research into natural history museums and research and development laboratories and then extend my research into the environmental technologies. These case studies will be summarized and organized in a fashion that allows for quick and clear access to important information.

Environmental Model Testing

During the preliminary stages of design, many models will be built and ran in simulators to find efficient solutions. We will be doing this to make sure the building aligns with its environmental aspirations. First, digital models of certain design ideas will be drawn up in 3D modeling software. Then, sophisticated simulators will be applied to the model and will test for the most efficient combinations of daylighting design, efficient interior climate control equipment, renewable energy harvesting systems, and much more. Ideally, with all of this testing, we will be able to generate the most efficient building and pleasurable experience for the users of the project.

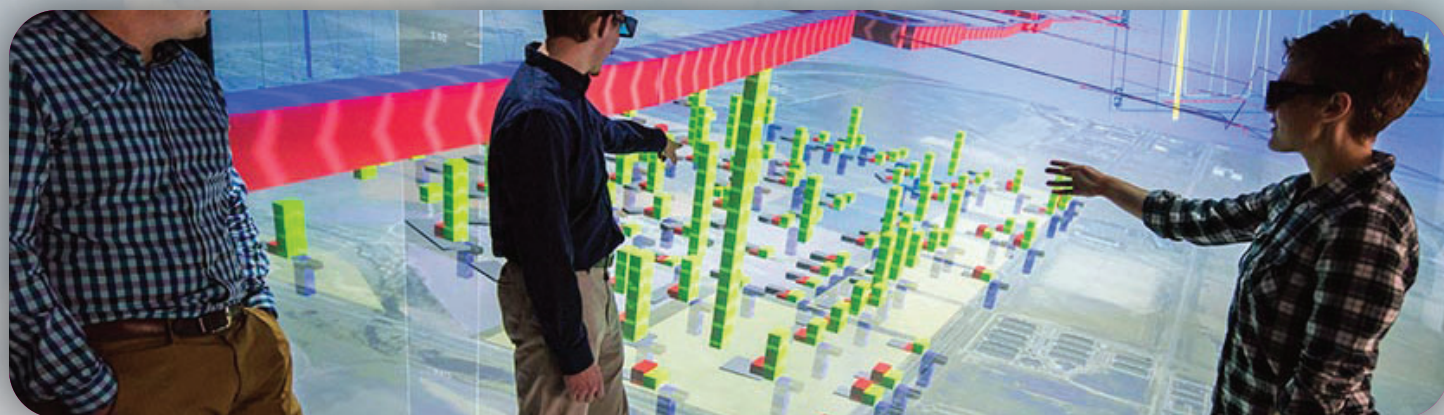


Figure 026

Documenting the Design Process

The documentation of the design process will happen in a couple different forms depending on what is being completed. All research collected from literature will be summarized in a short essay as well as cited throughout my argumentation and justification for the project. Precedent studies will be summarized in a few paragraphs with floor plans and defining aspects detailed out along the way. Once the research is thoroughly collected, design concepts will be documented in the form of sketches, physical models, and digital masses and will be arranged in ways that show the character of the design. During the process, all this information will be compiled into a book which will outline all of the research, the design process, and eventually the final result. The finished project will then be presented through digital, physical and oral means.



Figure 027

PLAN FOR PROCEEDING cont.

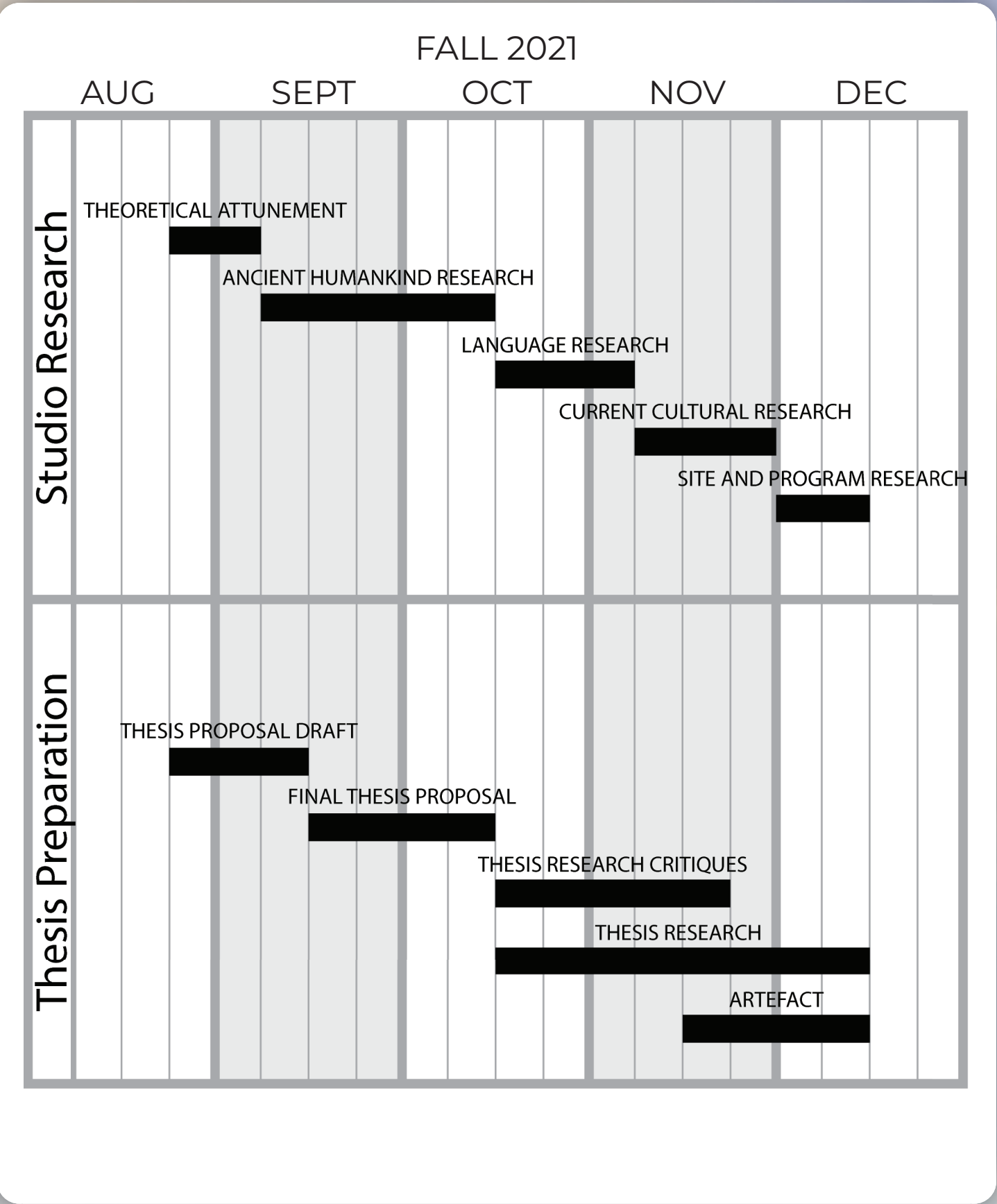


Figure 028

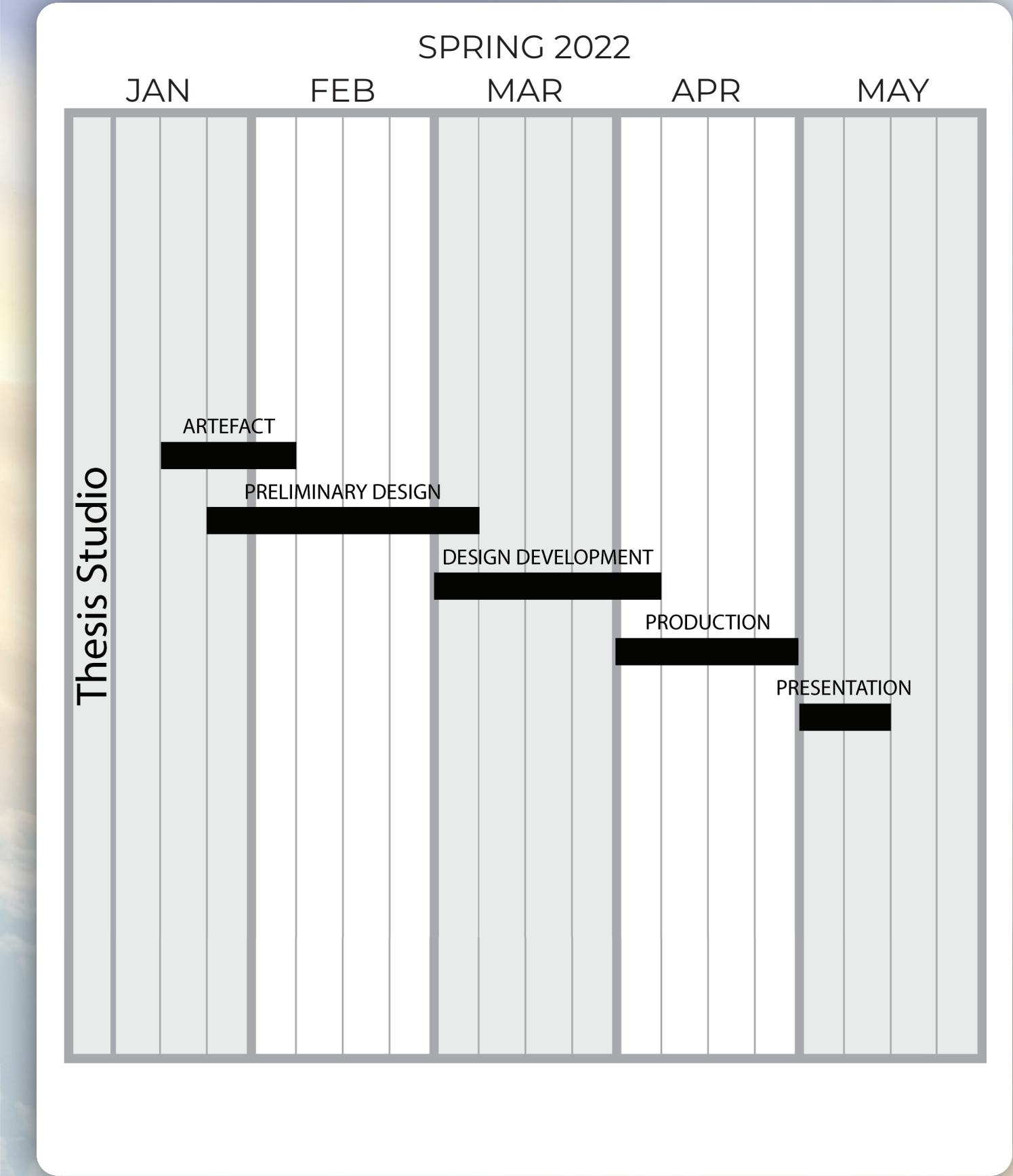


Figure 029



RESEARCH

THEORETICAL INVESTIGATION

The following is a culmination of months of research on various topics ranging from ancient humankind's relationship with nature to the changes in language that aided in our severance from a living, feeling world. The discussion will begin in the early times of humankind's existence on Earth and examine their dependence and interconnection with nature. As it progresses, it will discuss how humankind slowly and unknowingly severed themselves from this life-giving force to the point where we now see it as a dead, usable asset and the devastating consequences of this occurrence. Finally, it will discuss some new emerging theories that reinstate the fact that we live within a vast, living entity that we must care for and empathize with before it is too late. These in-depth investigations are what informed and inspired much of the architectural design and programming to follow towards the end of the thesis document. The text references are listed in the bibliography at the end of the thesis document if you wish to read further into any of these topics.

We live our lives, from birth till death, learning and exploring within a vast domain which provides us with all the things we need. This domain is called Earth, which gives us clean water, bounties of food, and most importantly, everything we need to establish a place of our own in the world, a place we can call home. This being said, not many people realize that home is much bigger than private space enclosed in walls and a roof. The notion of home spreads beyond that, to places where we find comfort and happiness out in the elements. From a very young age, we begin to develop strong memories of these places that we hold dear. Places where we laughed and loved alongside family and friends. Where we spent the hot summer days swimming in the river and the cool fall evenings watching the leaves turn. Places we found ourselves frequenting in a time where we were carefree, when we had nowhere to be any time soon and rarely had a due to pay. All of these precious memories that were foundational in our lives come together to create home for us. Yet, our own notion of home is but a fragment of the incredibly vast, diverse collection of homes around the world contained within the Earth. Earth is our collective home, humans and animals alike, and nature has ensured that we thrive, comforting and providing for us since the first humans entered the world.

It seems however, that in modern times we think we have outgrown the loving tether of nature. We have turned away from the one who has given us so much, and began to follow our own agendas in disregard to the effects it could have. Our gaze has shifted from a living, shared world to a lifeless, usable asset exploited by instruments with consequences rarely considered. Over the years our actions have taken an invisible toll on the world, and these tolls are finally beginning to reveal themselves. Global emissions are warming our atmosphere, melting the ice sheets

and drowning our cities on the coasts. Changing weather patterns are allowing wildfires to tear through the dry country sides, turning the homes of both humans and animals into piles of dust. Recent studies show that we may only have a few years left to change our ways before we are set on an irreversible path to extinction. Man has turned away and neglected his other half, nature, and in this severance, is on the verge of losing the place we called home since our beginning.

What brought about this change in perspective and terrifying misuse of our planet? How can we change the narrative in order to rescue our dying planet? To answer these questions, we will examine ancient human tendencies along with their relationship with nature. Next, we will look at pivotal discoveries and changes in culture throughout history, how it directly affected man's relation with nature, and where we are today. Finally, we will propose a solution that will rekindle our empathy for nature and work towards a better world for our decedents.

In the beginning, everything humans encountered was filled with life. Not only did it seem that the other animals in the forest had their own personal motives, it seemed that the forest itself along with the wind and weather had their own motives as well. Natural phenomenon like these were seen as living beings willingly acting upon man in the environment. If he found himself caught in a bad rainstorm, he may feel that he is being punished by nature itself, or if he stumbles across an abundance of food, he feels he is being rewarded for a good-doing. Henri Frankfort examines this in the beginning of his text *Before Philosophy* by explaining that in ancient times, humans saw themselves as a part of nature. They did not feel that there was any distinguishing between themselves and the plentitude of life that existed with them. When man was faced with phenomena in his experience, he would not see the phenomena as an "it", as something that can happen out of luck or coincidence, rather, man confronted the experience as a "thou" which brings a phenomenon to life. "Thou" states that a phenomenon is individual and unique, ultimately having a will to act upon man. Giving the actions of nature a subject allowed individuals to communicate their stories to others and make sense of the unexplainable driving forces of these happenings. Nature was not a passive wasteland for animals to consume, it was rather a living, reacting organism that even the animals themselves were a part of. In the words of Henri Frankfort, "The world appears to primitive man neither inanimate nor empty but redundant with life; and life has individuality, in man and beast and plant, and in every phenomenon which confronts man... In this confrontation, "Thou" reveals its individuality, its qualities, its will. "Thou" is not contemplated with intellectual detachment; it is experienced as life confronting life, involving every faculty of man in a reciprocal relationship... An account of such events and also their explanation can be conceived only as action and necessarily take the form of a story. In other words, the ancients told myths instead of presenting an analysis or conclusion" (Frankfort, 1946, p. 6-7).

It was this viewpoint upon which early man formulated many of their creation stories and myths of the unexplainable, where natural phenomena take the form of living immortal beings acting upon mortal man with a rather specific personal agenda. Ancient humankind had a lot of respect for nature for this reason. David Winterton, historian and architectural theorist speaks on this in his essay

THEORETICAL INVESTIGATION cont.

Architecture and the Vegetal Soul. Here he examines primitive agrarian civilizations and how they showed this respect through their architecture. He states that in the temples of these cultures were walls filled with symbols and sacred text. By examining these engravings, one would find divine characteristics attributed to nature and the cosmos. Lessons on the cultivation of soils along with the paths of the sun were portrayed over depictions of the bounty of the land. The sun itself, the driving force behind the bountiful land, was always considered an attribute of the divinities. Winterton states, "Agrarian life was symbolically mediated to appease 'divinity' or, more appropriately, the sacredness of nature. The land was labored upon in accordance with the lessons given by nature herself" (Winterton, 1999, p. 271) As you can see, the evidence of this acknowledgment of a real presence of nature was embodied in the myths and lifestyles of ancient man.

As shown, ancient civilizations found ways to live in harmony with nature over time, taking modestly, and never forgetting to give back. Ancient civilizations found themselves woven into the fabric of nature, receiving nourishment while maintaining nature's delicate balance. Seemingly for that reason, most humans in that time looked to nature in search of existential meaning and in doing so began to yield sacred objects, places and techniques. These things were used to symbolize and embody aspects of their own creation and understanding of the world. However, these wide acceptances of the meaning of life could not have been spread without one important interaction that changed the course of mankind forever. "For millions of years, mankind lived just like the animals. Then something happened which unleashed the power of our imagination. We learned to talk... Speech had allowed the communication of ideas, enabling human beings to work together to build the impossible. Mankind's greatest achievements have come about by talking, and its greatest failures by not talking." (Hawking, 1993) This quote by Steven Hawking captures the moment in time when mankind began to formulate their first stories and theories of meaningful existence. It would be this moment which would dictate the path of man forever.

The use of language was pivotal in the course of humankind and was originally drawn directly from nature's dialect to share thoughts. Early on, written language was pictorial and there were only a few certain symbols used to represent things or concepts that resisted pictorial representation. The symbols related directly back to the animals and other things we encountered in the world. The heavy symbolism of animals and nature in the thoughts of ancient man explain their profound connection with the world in which they lived. It was no surprise that early man saw many of the answers to their existential questions in the nature they encountered on a daily basis. David Abrams examines the origins of language among early man in his text *Becoming Animal: An Earthly Cosmology*. "Our first writing, clearly, was our own tracks, our footprints, our handprints in mud or ash pressed upon the rock. Later, perhaps, we found that by copying the distinctive prints and scratches made

by other animals we could gain a new power; here was a method of identifying with the other animal, taking on its expressive magic in order to learn of its whereabouts, to draw it near, to make it appear. Tracing the impression left by a deer's body in the snow, or transferring that outline onto the wall of the cave: these are ways of placing oneself in distant contact with the Other, whether to invoke its influence or to exert one's own... All of the early writing systems of our species remain tied to the mysteries of a more-than-human world. The Petroglyphs of pre-Columbian North America abound with images of prey animals, of rain clouds and lightning, of eagle and snake, of the paw prints of bear. On rocks, canyon walls, and caves these figures mingle with human shapes, or shape's part human and part Other." (Abram, 2010, p. 64)

Perhaps the most known evidence of this is found in the remnants of ancient Egyptian temples and pyramids whose society was heavily connected with nature. Countless murals in royal palaces and tombs depicted landscapes, gardens, an array of animals and plants, and sacred symbols indicating the natural world was revered by ancient Egyptians. Their survival depended greatly on the annual flood of the Nile and the resulting fertile ground. Without this cyclical event, famine may cause their civilization to destabilize, and pandemonium would ensue, so they paid respects to the divinities of nature where it was due. Much of these divinities took on the form of human/animal amalgamations which represented aspects of the natural living environment of Egypt at the time. In fact, illustrations or descriptions of appearances of gods were not seen by the Egyptians as real images of the gods, but instead portrayed their essence. Henri Frankfort proposed that the depiction of ancient Egyptian gods should be taken as ideograms, or as pictorial signs that convey meaning in a metalanguage. Whatever combination the Egyptians chose, the mixed form of their gods is nothing other than a hieroglyph, or a way of writing not the name but the nature and function of a deity. One of the many significant amalgamations was the deity Ra, the god of the sun and creation.

The depiction of Ra contained a mixture of human, falcon and the cosmos. The reason for the falcon head was to symbolize his king like nature which was associated with many types of birds in the Egyptian culture. This representation was said to be drawn from the bird's ruling presence and ability to fly high. As a solar deity, Ra embodied the power of the sun and was also thought to be the sun itself which explained the common presence of a golden disk behind his head. He was envisioned as the great god riding in his barge across the heavens throughout the day and descending into the underworld at sunset. As he made his way through the darkness beneath the earth, he was attacked nightly by the giant serpent Apophis (also known as Apep) who tried to prevent the sun from rising and so destroy all life on earth. Ra was also seen as the creator of the cosmos whose origin story goes as follows: "Before creation, according to Egyptian mythology, only Darkness embraced the Primeval Ocean out of which life would come. When the breath of life was strong and ready, the entity called Atum decided it was time for Creation to begin. An island emerged from the water to support this divinity, who manifested itself in the form of Ra, the sun god of Egypt. On a Primeval hill, Ra created out of himself the first gods, Shu (Dryness and Air), and his partner Tefnut (Humidity), who would engender other gods to complete the Cosmos: Geb the Earth god and Nut the Sky goddess. In turn, these two birthed the principles of life, namely Osiris who eventually would rule over

THEORETICAL INVESTIGATION cont.

the rest of the world and come to be known as the god of fertility shown in his green colored skin.” (Haikal, 2011) Much of the survival of the Egyptian people was attributed to Osiris for he was believed to be the one responsible for the fertility caused by the flooding of the Nile.

As shown, Egyptians used many hieroglyphs inspired by the things they found in their environment to convey important ideas of their existence and survival. This was similar for countless ancient civilizations for all they knew was what they encountered in nature. There was no abstraction from reality for ancient man saw everything in his world as living. Although much of early humankind used these pictorial systems to communicate ideas, it would not be long before these pictorial representations would begin to take on the form of symbolic scripts and no longer visually represent their meaning. As David Abrams discusses in *The Spell of the Sensuous*, “The innovation which gave rise to the alphabet was itself developed by Semitic scribes around 1500 B.C.E. It consisted in recognizing that almost every syllable of their language was composed of one or more silent consonantal elements plus an element of sounded breath—that which we would today call a vowel. The silent consonants provided, as it were, the bodily framework or shape through which the sounded breath must flow... By this innovation, the aleph-beth was able to greatly reduce the necessary number of characters for a written script to just twenty-two; a simple set of signs that could be readily practiced and learned in a brief period by anyone who had the chance, even by a young child. The utter simplicity of this technical innovation was such that the early Semitic aleph-beth, in which were written down the various stories and histories that were later gathered into the Hebrew Bible, was adopted not only by the Hebrews but by the Phoenicians (who presumably carried the new technology across the Mediterranean to Greece), the Aramaeans, the Greeks, the Romans, and indeed eventually gave to virtually every alphabet known, including that which I am currently using to scribe these words.” (Abram, 1996, p. 66)

With the invention of the aleph-beth, a new distance is opened between human culture and the rest of nature. Sure, the pictographic and ideographic writings already involved a separation of our sensory participation due to the ideas using the medium of a cave wall rather than the depth of the animate environment, but the images themselves did often relate directly back to the animal and environmental subjects. With the phonetic aleph-beth, however, the individual written characters rarely referred to any phenomena out in the world. The aleph-beth then made its final transformation into the alphabet when influenced by Greek scribes. As Abrams describes, “The Greek scribes took on, with slight modifications, both the shapes of the Semitic letters and their Semitic names. Thus aleph, the name of the first letter, and the Hebrew word for “ox” became alpha; beth, the name of the second letter, as well as the word for “house” became beta, etc. But while the Semitic names had older, non-grammatological meanings for those who spoke a Semitic tongue, the Greek versions of those names had no non-grammatological meaning whatsoever

for the Greeks. That is, while the Semitic name for the letter was also the name of the sensorial entity commonly imaged by or associated with the letter, the Greek name had no sensorial reference at all. While the Semitic name had served as a reminder of the worldly origin of the letter, the Greek name served only to designate the humanmade letter itself. The pictorial (or iconic) significance of many of the Semitic letters, which was memorialized in their spoken names, was now readily lost. The indebtedness of human language to the more-than-human perceptual field, an indebtedness preserved in the names and shapes of the Semitic letters, could now be entirely forgotten.” (Abram, 1996, p. 67)

Abrams summarizes the progression and current form of linguistic representation stating, “Today, the prevalent view of language, considers any language to be a set of arbitrary but conventionally agreed upon words, or “signs,” linked by a formal system of syntactic and grammatical rules. Language, in this view, is rather like a code; it is a way of representing actual things and events in the perceived world, but it has no internal, nonarbitrary connections to that world, and hence is readily separable from it.” (Abram, 1996, p. 54) While much of the advancing civilizations began to unknowingly sever themselves from nature on a cultural level, there were still many civilizations, heavily influenced by the traditions of their predecessors, who managed to preserve the connection. Much of this preservation was found not necessarily in the language of the people, it was found in their rituals and methods of creation. An example of this can be found in Richardo Castro’s essay *Sounding the Path*. The topic takes places in the Sierra Nevada de Santa Marta Mountain Range in northern Colombia. Residing here today are descendants of the now extinct Tairona who’s culture flourished in the region for over 1,300 years until the sixteenth century. They are the Kogi Indians who have remained mostly undisturbed by Western civilization and continue to use the physical infrastructure created by their predecessors. Like many ancient civilizations, they too have tools and techniques that infuse meaning into their daily lives. In the text is states that, “...unlike their neighbors the Ika and the Sanka, they reject commercial trade cloth and insist on using only the textiles they craft following traditional methods. This results from a profound mystic understanding of their place in the universe. For the Kogi, the spindle and loom are more than mere tools, and spinning and weaving more than simple productive activities.” (Castro, 1999, p. 31) What Richardo Castro is getting at here is that the spindle and the loom are sacred objects that gather preconceived attributes or ideas. The sense of rhythm and the notion of continuity are present in all significant activities such as weaving, thinking, building, planting, sewing, lovemaking, walking, and singing. Spinning generates thought and weaving intertwines them into the Fabric of Life, which is a web of knowledge. The spindle from which the thread originates is also seen as an analogue of the axis on which the earth spins on and parts of the loom align to celestial bodies and the seasons.

A good example of the presence of a divine nature is embodied in the Kogi women’s manufacturing of mochilas, or bags. These mochilas are an integral part of the Kogi’s attire and serve several physical and symbolic functions. They serve a range of uses due to the absence of basketry, making them the principal carrying utensil in the Kogi culture. “Both men and women usually carry several hemp bags slung over the shoulder. The babies are carried on their mothers’ backs in bags shaped like

THEORETICAL INVESTIGATION cont.

a chair. Still larger bags are used to pack animals.” (Castro, 1999, p. 36) The mochila’s knotless netting technique is symbolic, representing the womb of the mother and are associated with fertility. Richardo states, “In a society for which analogy is a fundamental concept, it is not surprising that the act of sewing the mochilas represents the twenty-eight-day lunar cycle, which in turn is associated with female fecundity. The incessant netting by the women also reinforces the belief in the continuity of cycles...” (Castro, 1999, p. 35) All day long, when not occupied by other menial tasks, the women can be sewing these objects. Even when nursing her baby or walking over steep mountain trails, a Kogi woman will continue her work. If fact, in this culture, a woman’s reputation as a wife and mother depends in part on her dedication to this activity. All of this symbolism is what brings meaning into the world of the Kogi and is maintained through memory and teaching.

For many ancient civilizations, just like the Kogi, the home was a very significant place in their lives. Home was the place for deep contemplation and meditation, where one could look into their own inner realms and relate themselves to the vast cosmos of outer space where the divine being of nature lived. This didn’t stop at the walls of the private dwelling either, it expanded to vast areas that facilitated self-contemplation and tranquility. A text called *The Domestic and the Numinous* in *Sacred Architecture* by Thomas Barrie unpacks a few definitions of home that expand the usual conception of it. He states that the home should satisfy our need for comfort and security while also providing the medium for our spiritual connection with the broader world, nature, and the cosmos. It seems that home is a place which causes us to look inward at inner psychic realms as well as outward to the universe to contemplate our place within the vast cosmos. Looking at the domestic architecture of American Indians offers many examples of dwellings serving multiple ontological and symbolic roles. Their buildings often represented not only their social order, but their tribal view of the cosmos. As Thomas Barrie states, “Many Indian narratives tell of a “Distant Time” or a “Myth Age” when a “First House” was bestowed upon a tribe as a container for their emerging culture.” (Barrie, 2015, p. 36) He goes on to say that some tribes have even likened the creation of the world itself to the creation of this “First House” strengthening the connection between dwelling and the cosmos. One tribe in particular, the Hidatsa of North Dakota, conceptualized their world as a colossal earth lodge. The sky was seen to be held up by four corner posts which was later replicated in the construction of their own private dwellings. The houses of American Indians usually symbolized the center of the earth and their architecture was seen as a living entity. An example of this can be found in their sweat lodges, which embodied the animal gods that their rituals sought connection with. As shown, all truly inhabited space can bear the essence of home regardless of scale. As long as there is a facility for tranquility and self-contemplation, there is home.

As we have examined, humankind was woven into the vast web of nature alongside every other being on Earth. What they needed was provided for them and

there were also many opportunities for awe and contemplation when confronted by the wonders of nature whether that be a shooting star streaking across the night sky or a towering waterfall dazzling in the sunlight. This was a perfect relationship with the environment, and it seemed to allow humankind to thrive like never before. Civilizations began to spring up in inspiring cultural areas with plenty of resources, and discoveries about our world were being uncovered rapidly, most of which we didn’t fully understand. As we learned more about how we could predict the environment around us and control our health, humankind’s life expectancy rose exponentially along with the population. With the huge increase of people of the earth, much more food was needed and advancements in science were needed increasingly faster. It is perhaps at this moment where meaningful actions begin to be replaced with efficient actions in order to stay ahead of the ever-increasing demand. Sacred rituals that traditionally guided a harvest or manufacturing process were dissolved by the pressures of production.

The biggest cultural shift however, started in the beginning of the 17th century and would ultimately alienate man from the one thing that nourished him. As Hannah Arendt explains in her book *The Human Condition*, the discovery of the Archimedean point alienated man by providing new perspectives of the world and universe from outside the confines of the earth. Galileo, using the telescope, “put within grasp of an earth-bound creature and its body-bound senses what had seemed forever beyond his reach... Now, even at the risk of endangering the natural life process we expose the earth to universal, cosmic forces alien to nature’s household.” (Hannah Arendt, 1958, p. 262) There were many new patterns and processes that started gaining the attention of scientists and it was from these occurrences that were millions of miles away that scientists drew from to explain occurrences here on earth. Because of this, the development of the modern scientific method during the seventeenth century reduced autonomous natural phenomena to sets of explainable, predictable occurrence. With the assumption that everything is subject to universal laws, the free-acting will of nature was dissolved. Winterton states, in place of a world literally resonating with human analogy and symbolic meaning, seventeenth-century scientists considered nature to be viewed and studied by a detached observer. It was perhaps at this point when the last thread tethering man with nature was severed. From now on, even at the risk of endangering the natural life process, we expose the earth to universal, cosmic forces alien to nature’s household.

Today, we live in a world dominated by these ways of science. This way of life is quite beneficial to humans, giving us safe sources of nutrients and advanced medicine, ultimately extending our life span. We’ve also been blessed with an abundance of luxury and leisure, but these things come at a price. To produce these things on a global level, vast amounts of material and fuel are required to be extracted from the earth. Also, the byproducts of this production are polluting our earth at an alarming rate. I believe us not seeing earth as a living organism has allowed us to go down a dangerous path of overconsumption that is draining the earth of its life-giving substances, and this issue is present everywhere from politics to science and culture. Political discussion today is riddled with talk of the environment, but not for the reasons you may think are obvious. Although the science shows that we are on the brink of catastrophic disaster, politicians around the world are still discussing

THEORETICAL INVESTIGATION cont.

plans to extract unnecessary minerals from the earth and abuse the fragile ecosystem that made it possible. The Earth is exploited for the monetary gain of these politicians. They are blinded by money and refuse to acknowledge the devastating consequences of their actions and the healthy alternatives that are readily available. These are the people who are in charge of making very important decisions for the masses and have the money and power to embody the wishes of many, but choose to focus on selfish, destructive motives of personal gain. On a cultural level, much of the population is misinformed and refuse to believe the tell-tale signs of neglect that nature gives us. With this wide spread of manipulated information, usually by those benefitting from the exploitation of the earth, the general population is led to believe that there is no issue, and many choose not to read much further into the discussion. In addition to this, many who believe there is a problem are typically discredited by powerful people and disregarded by an unbelieving public.

However, this will hopefully change with the popularization of a few new relevant hypotheses on our role in the ecosystem and the evidence of a feeling, reactive earth. These are emerging from the scientific study of ways climate change is affecting organism behaviors which is changing the chemical composition of our atmosphere. One of these discussions, The Gaia Hypothesis, was originally proposed by James Lovelock in 1972 and suggests that living organisms on the planet interact with their surrounding inorganic environment to form a synergetic and self-regulating system. Explained by David Abram, "The Gaia Hypothesis represents a unique moment in scientific thought: the first glimpse, from within the domain of pure and precise science, that this planet might best be described as a coherent, living entity... It suggests that the actual stability of the atmosphere, given a chemical composition very far from equilibrium, can best be understood by assuming that the atmosphere is actively and sensitively maintained by the animals, plants, oceans, and soils all acting collectively, as a vast, planetary metabolism. In James Lovelock's own words: The entire range of living matter on Earth, from whales to viruses, and oaks to algae, could be regarded as constituting a single living entity, capable of manipulating the Earth's atmosphere to suit its overall needs and endowed with faculties and powers far beyond those of its constituent parts." (Abram, 1990, p. 1) David Abram, in his essay The Perceptual Implications of Gaia, compliments the hypothesis by examining the one aspect of Earth we forget so easily. He explains that the air that surrounds us is so close to us that we tend to leave it out of our thinking entirely. It is invisible to our eyes except for its influences on other things such as the swaying of the leaves of a tree, which may explain why we say we live on the Earth instead of in the Earth. The Gaia Hypothesis indicates that the atmosphere in which we live is itself an extension of the planetary surface, a functioning organ of the Earth. The air can no longer be considered an absence of solids for it too has density. We are immersed in its depths just as a fish is immersed in the sea. As Abram states, "It is the Medium, the silent interlocutor of all our musings and moods. We simply cannot exist without its support and nourishment, without its vital participation in whatever we are up to at any

moment... If Gaia exists, then we are inside her." (Abram, 1990, p. 2)

From a young age, many of us remember the fascination the atmosphere offered. We watched as white fluffy clouds seemingly formed from nothing and wondered what kind of magic was behind it. Its vast expanse was something we learned to take for granted perhaps due to its limitless appearance and invisible influence on our own body. We believed we cannot possibly have any kind of influence being as small as we are compared to the Earth, yet our actions were unknowingly detrimental on an unfathomable scale. A personal account of this was given by Abrams: "As a child, growing up on the outskirts of New York City, I often gazed at great smokestacks billowing dark clouds into the sky. Yet I soon stopped wondering where all that sooty stuff went: since the adults who decided such things saw fit to dispose of wastes in this manner, it must, I concluded, be all right. Late, while learning to drive, I would watch with some alarm as the trucks roaring past me on the highway spewed black smoke from their gleaming exhaust pipes, but I quickly forgave them, remembering that my car, too, offered its hot fumes to the air. Everybody did it. As the vapor trails from the jets soaring overhead seemed to disperse, perfectly, into the limitless blue, so we assumed that the wastes, these multicolored smoke and chemical fumes, would all cancel themselves, somehow, in the invisible emptiness." (Abram, 1996, p. 153-154)

Knowing now that we do not live in a void, but rather a gaseous sea we call our atmosphere, the issues of polluting these gaseous seas becomes personal. Through the media, we learn of the massive build-up of manufactured chemical compounds in our atmosphere that burn holes in the protective layers of ozone and the drastic increase in atmospheric carbon dioxide and other chemicals that warm our atmosphere. However, the information remains alienated from those it reaches because it takes on the form of an abstract cluster of statistics. Perhaps it is only when we feel the chemical breeze stinging the moist membranes that line our nose or when we watch in horror as gale force winds tear signs and awning off buildings that we will personally realize the extent of the damage. The main issue here is a cultural and scientific human dissociation from a more-than-human world. Abram states in this book The Spell of the Sensuous, "As long as we experience the invisible depths that surround us as empty, we will be able to deny, or repress, our thorough interdependence with the other animals, the plants, and the living land that sustains us. We may acknowledge, intellectually, our body's reliance upon those plants and animals that we consume for nourishment, yet the civilized mind still feels itself somehow separate, autonomous, independent of the body and of bodily nature in general. Only as we begin to notice and to experience, once again, our immersion in the invisible air do we start to recall what it is to be fully a part of this world." (Abram, 1996, p. 154) By investigating The Gaia Hypothesis on a scientific and cultural level, we may be able to awaken societies once again to a living Earth. We will then know that the consequences of our actions do not disappear into a vast void called the sky, but rather accumulate in an already delicate mixture of atmospheric chemicals needed to sustain all life of Earth. Through The Gaia Hypothesis and other supporting theories, we may once again consider our actions in regards to the sacred Earth and begin a long-awaited global healing process that will halt the accelerated extinction of animals, and reverse the poisoning of the essential air we breathe. We will also

THEORETICAL INVESTIGATION cont.

realize that even if we were to become an interplanetary species to escape the horrors created on Earth, we can no do it without the Earth. If we venture beyond the edges of its atmosphere, we do so with vehicles made of Earth and filled with Earth's sky, the sky we need in order to survive. Finally, we must realize that Gaia is no mere formula of the animals and chemicals contained on Earth. It is our own body, our flesh and blood, the wind blowing past our ears and the hawks wheeling overhead. Gaia is far bigger than a scientific understanding. When recognized from within one's own self, Gaia is far vaster, far more mysterious and eternal than anything we may ever hope to fathom.

Although these theories are promising in provoking empathy for nature, the toll of hundreds of years of neglect are already beginning to show and action must happen fast. Carbon emissions are filling our atmosphere, acting like a blanket on a bed, trapping heat in our atmosphere. This heat is causing the globe to warm at an alarming rate, melting our ice caps and drastically affecting vital weather patterns around the world. Some places are much more sensitive to this than others and have already experienced apocalyptic-like destruction. For example, Australia is particularly sensitive to climate change and is experiencing their hottest and driest seasons in all of recorded history. Extinction scale fires which were believed to only happen 2 times a century just a hundred years ago is now occurring over 10 times a summer. The very same forests that harbored the dinosaurs and have gone unchanged for millions of years are now being turned to ash in a matter of days. Even entire species of animals who have adapted and lived these historic forests are being wiped off the face of the earth with no chance of ever existing again. Related to this product of overconsumption and neglect, the expansive collection of unique species that live in our oceans are in peril as well. Due to the overconsumption of fish for food and fashion and the enormous pollution of human waste that poisons the very water these fish are taken from; the ecosystems of the ocean are dying. Some may say that there is a lack of discussion on climate change causing a slowing of social reformation, but perhaps it is also the fact that these disasters are so common, and the public is terrifyingly misinformed that people don't see it as much of an issue anymore. Environmental devastation is becoming so common in the news headlines of today that people are becoming numb to the idea. One does not see the magnitude of destruction and deceit whilst living amongst the affected population. This is a startling path which will inevitably lead to the total collapse of our ecosystem if we chose to keep following it. As someone who knows how important our decisions are to the ecosystem of all living beings on earth and who is ultimately affected by the decisions made by the people in control, I keep asking myself an important question. A question whose answer has the potential to awaken mankind once again to the importance of their actions on Earth: How can we begin to facilitate new connections between nature and mankind, and awaken a sense of responsibility when it comes to protecting our future on Earth? Perhaps through what we have discovered about the ways ancient civilizations have interacted with nature and how closely we today are connected with it whether we want to be or now, we can synthesize an architectural solution that invigorates the user with empathy and compassion to save our dying planet.

"For millions of years, mankind lived just like the animals. Then something happened which unleashed the power of our imagination. We learned to talk and we learned to listen. Speech has allowed the communication of ideas, enabling human beings to work together to build the impossible. Mankind's greatest achievements have come about by talking, and its greatest failures by not talking. It doesn't have to be like this. Our greatest hopes could become reality in the future. With the technology at our disposal, the possibilities are unbounded. All we need to do is make sure we keep talking." (Stephen Hawking)



Figure 030

PRECEDENT STUDIES

Project Name: Natural History Museum
Location: London, England
Architect: Francis Fowke
Completed: 1880

The Natural History Museum in London is a museum that exhibits a vast range of specimens from various segments of natural history. The museum is home to life and earth science specimens comprising some 80 million items within five main collections: botany, entomology, mineralogy, palaeontology and zoology. The museum is a center of research specialising in taxonomy, identification and conservation. Given the age of the institution, many of the collections have great historical as well as scientific value, such as specimens collected by Charles Darwin. The Natural History Museum Library contains extensive books, journals, manuscripts, and artwork collections linked to the work and research of the scientific departments and access to the library is by appointment only. The museum is recognised as the pre-eminent centre of natural history and research of related fields in the world.



Figure 031



Figure 032

Program Elements

The museum is divided into four sets of galleries, or zones, each color coded to follow a broad theme.

The Red Zone is a gallery themed around the changing history of the Earth. It shows specimens of rocks, minerals and gemstones behind glass in a dimly lit gallery. Also in this zone is a small gallery containing specimens of rocks, plants and minerals, of which most can be touched.

The Green Zone follows the theme of the evolution of the planet. Displayed here are ancient ancestors of the birds, reptiles, and creepy crawlers we know today.

The Blue Zone explores the diversity of life on the planet. Shown here are various types of dinosaurs, fish, amphibian, and reptiles all from distant branches on the tree of evolution. The zone hopes to show the visitors the massive variety of forms that life can take on this planet.

The Orange Zone enables the public to see science at work and also provides spaces for relaxation and contemplation. In this zone you can find gardens that are actively studied and manipulated as well as opportunities to connect with nature.

PRECEDENT STUDIES cont.

Orange Zone

The Orange Zone will introduce you to the Museum's spirit collection, the futuristic Cocoon and our Wildlife Garden. It is designed for all ages and is for those who are short on time or just want a faster experience. In this hi-tech space you will find scientist-led talks, specimen handling and other interesting events. Also in these spaces are wildlife gardens that feature a bee tree and drop-in workshops investigating pond life.

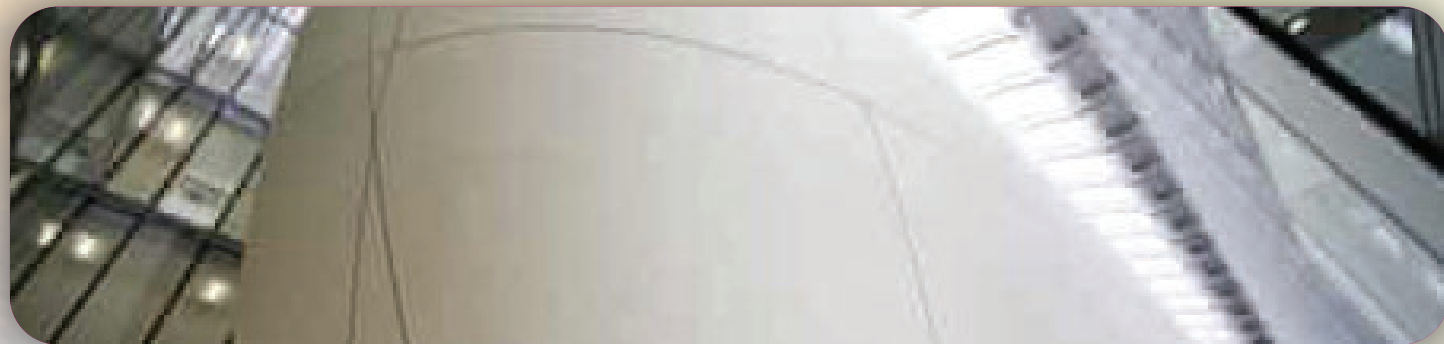


Figure 033

Red Zone

In the Red Zone you will be introduced to their Stegosaurus specimen, the Museum's earthquake simulator and a 3,500-kilogramme meteorite. Displayed along with the stegasaurus skeleton is a celestial map and an array of minerals, gems, and moon rocks. Past this is the Volcanoes and Earthquakes gallery which includes the earthquake simulator, a volcano and earthquake map, and a heat resistant suit. From here you will encounter many fossils and rock formations dating back to the creation of Earth as well as a massive meteorite that helped form the Earth today.



Figure 034

Blue Zone

When you start the Blue Zone tour, you begin with the dinosaur gallery. You are able to get up close with the prehistoric specimen. Next, you will go through the mammals gallery to meet some of the most dangerous warm-blooded animals including African hunting dogs and sabre-toothed cats. Finally, you will see the aquatic gallery which features a massive blue whale model along with other water dwelling creatures such as anglerfish and sharks.



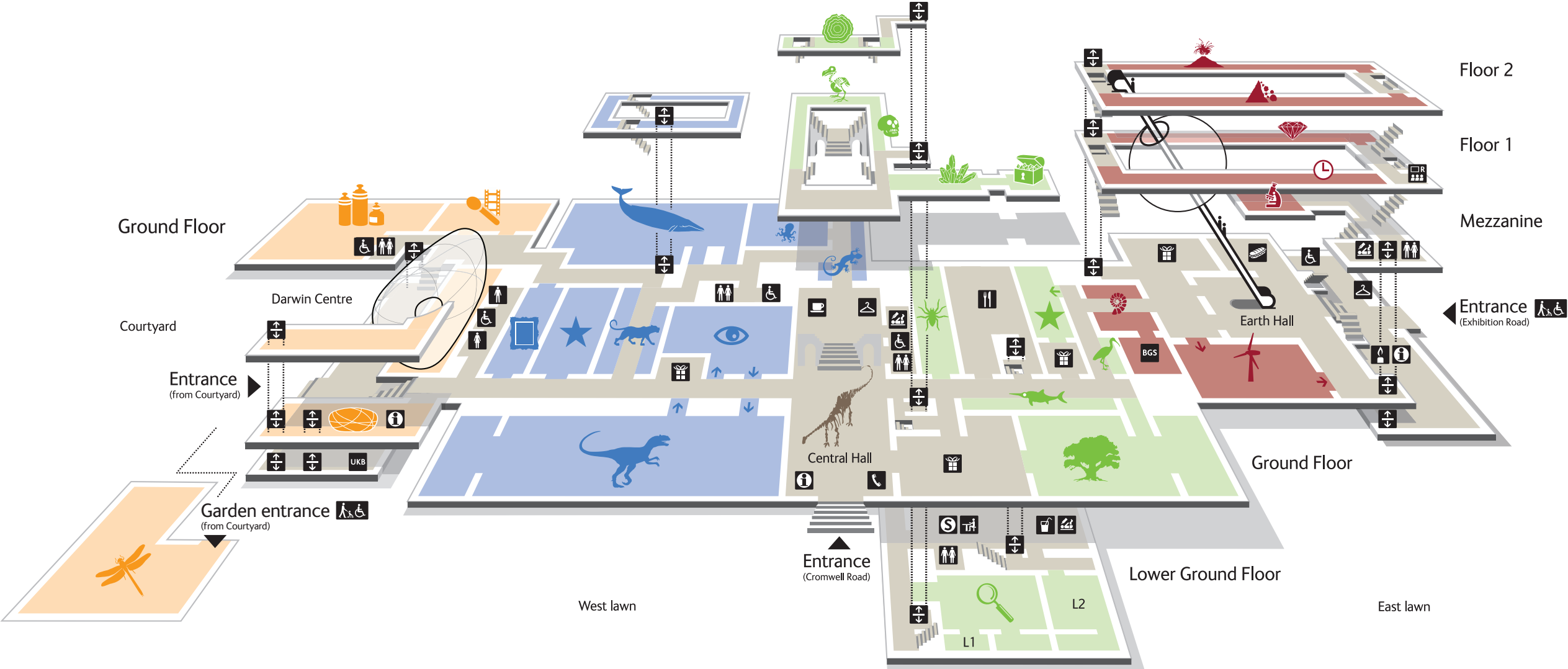
Figure 035

Green Zone

The Green Zone tour will introduce you to Charles Darwin's specimens, the Museum's hidden treasures and Guy the gorilla. First you will find the discoverers of evolution, Charles Darwin and Russel Wallace. Next you will see the western lowland gorilla, Guy, standing watch over the Museum's Treasures gallery. You will also find an array of spectacular specimens such as glass models of marine invertebrates and a first edition of Darwin's On the Origin of Species. The tour finishes with a display of creepy crawlers such as termites and insects, fossil marine reptiles, and numerous types of birds ranging from prehistoric to modern times.



Figure 036



- Facilities**
- Information and tickets
 - Toilets
 - Accessible toilets
 - Baby care room
 - Cloakroom
 - Shop
 - The Restaurant
 - Deli Café
 - Central Hall Café
 - Snack Bar
 - Lifts
 - Picnic Area
 - School Reception
 - Flett Events Theatre
 - Faith Room
 - Centre for UK Biodiversity
 - British Geological Survey
 - Telephones
 - L1 Learning Room 1
 - L2 Learning Room 2

- Galleries**
- Orange Zone**
 - Cocoon (entrance)
 - Attenborough Studio
 - Wildlife Garden (entrance outside)
 - Zoology spirit building
 - Blue Zone**
 - Dinosaurs
 - Fishes, Amphibians and Reptiles
 - Human Biology
 - Images of Nature
 - Jerwood Gallery
 - Marine Invertebrates
 - Mammals
 - Mammals (blue whale)
 - Green Zone**
 - Birds
 - Creepy Crawlies
 - Ecology
 - Fossil Marine Reptiles
 - Investigate Centre
 - Minerals
 - Our Place in Evolution
 - Treasures Cadogan Gallery
 - The Vault
 - Waterhouse Gallery
 - Red Zone**
 - Earth Lab
 - Earth Today and Tomorrow
 - Earth's Treasury
 - From the Beginning
 - Lasting Impressions
 - The Power Within
 - Restless Surface

Figure 037

PRECEDENT STUDIES cont.

Project Name: Energy Systems Integration Facility
 Location: Golden, Colorado, USA
 Architect: SmithGroupJJR
 Completed: 2013



Figure 038

The Energy Systems Integration Facility (ESIF) is a three-story, 182,500 square foot research complex designed by SmithGroupJJR and contracted by JE Dunn Construction. The ESIF at the Department of Energy's National Renewable Energy Laboratory (NREL) campus in Golden, Colorado is a model in sustainable design and energy efficient performance. The ESIF allows for scientists and engineers to work together to develop leading edge renewable energy technologies and houses the most powerful and energy efficient data center in the world. This data center is dedicated solely to renewable energy and energy efficient research with the hopes of transforming the nation's energy infrastructure.



Figure 039

The ESIF is the nation's only facility that can conduct integrated megawatt-scale testing of the components and strategies needed to safely generate and move clean energy onto the electric grid at the speed and scale required to meet federal policy. This facility incorporates the best in energy efficiency, environmental performance, and advanced controls with a building wide integrated design approach complying with Energy Star standards. The architects and contractors worked closely together to ensure the goals of the facility were met and ultimately designed the facility to earn a LEED Platinum rating from the U.S. Green Building Council.

The team used a range of advanced technologies and practices to balance the building's energy and performance goals:

- Natural cooling and ventilation provided by operable windows
- Solar powered fans extract excess heat generated in office environments
- Daylighting control is provided via vertical and horizontal exterior shading devices
- Large expanses of skylights and holes in floorplates allow for daylighting deep within the building
- Daily schedules shut off lighting in the office and laboratory buildings from 10:00 am to 2:00 pm
- Energy from experiments are captures and rerouted to laboratories around the campus for more experimental use of practical use.
- Waste heat from the data center is recycled to heat the facility during the winter months and is exported to other parts of the campus when in excess



Figure 040

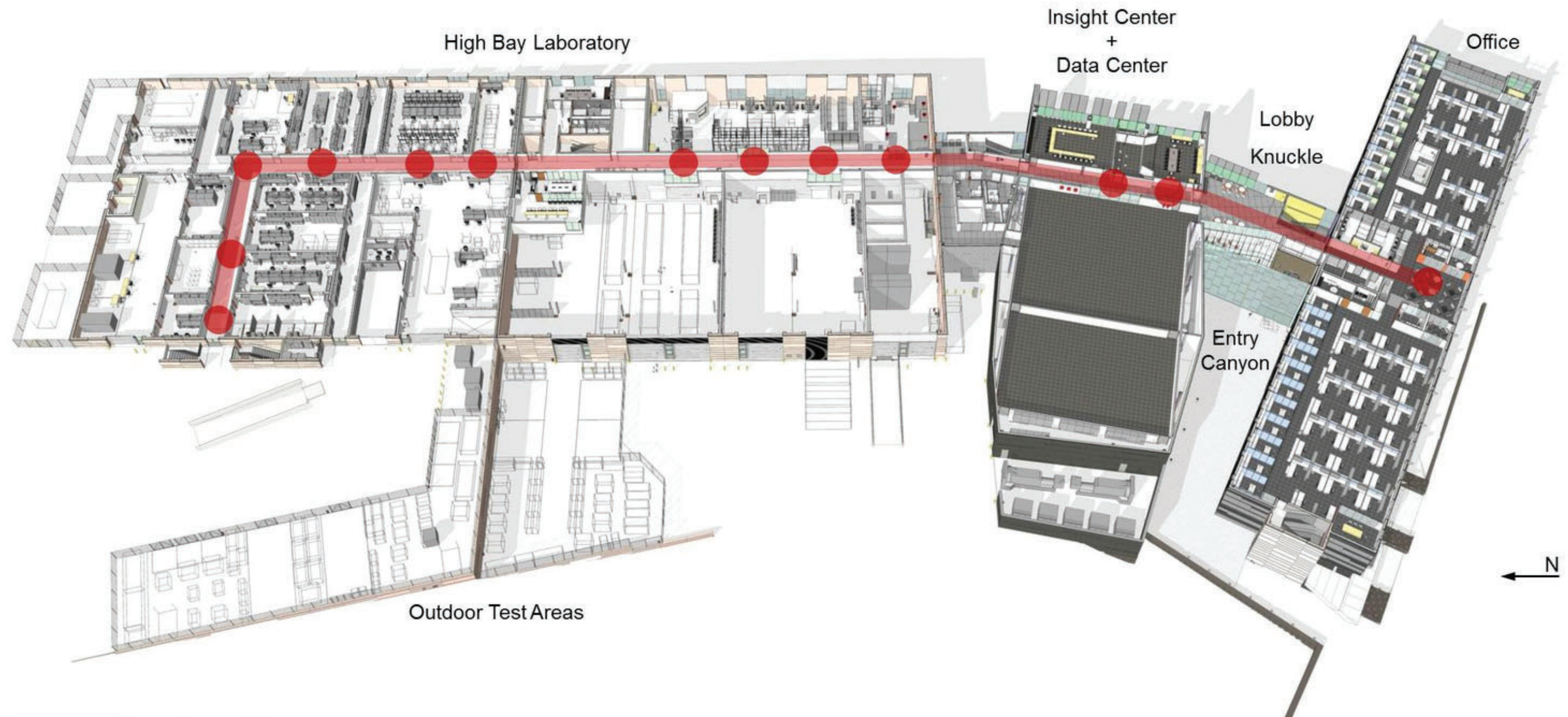


Figure 041

The ESIF houses nearly 200 researchers and consists of 14 laboratories, a high bay control room, outdoor testing pads, and ultra-green office building, and a high-performance computing data center. These researchers are dedicated to delivering emerging solar, hydrogen, biofuel and wind technologies to the mainstream marketplace. A key part that makes this laboratory revolutionary is its integrated megawatt-scale hardware-in-the-loop real-time simulation system which is the first in the country. This allows researchers to conduct integration tests at full scale and simulate actual loads experienced on the energy grid before they send a product to market. Also, a high-performance computing data and visualization center allows for large scale modelling and simulation of material properties, processes, and fully integrated systems that would not be economically feasible to study by direct experimentation. The visualization center offers the ability to experience these complex systems simulations in a three-dimensional, immersive virtual environment.

PRECEDENT STUDIES cont.

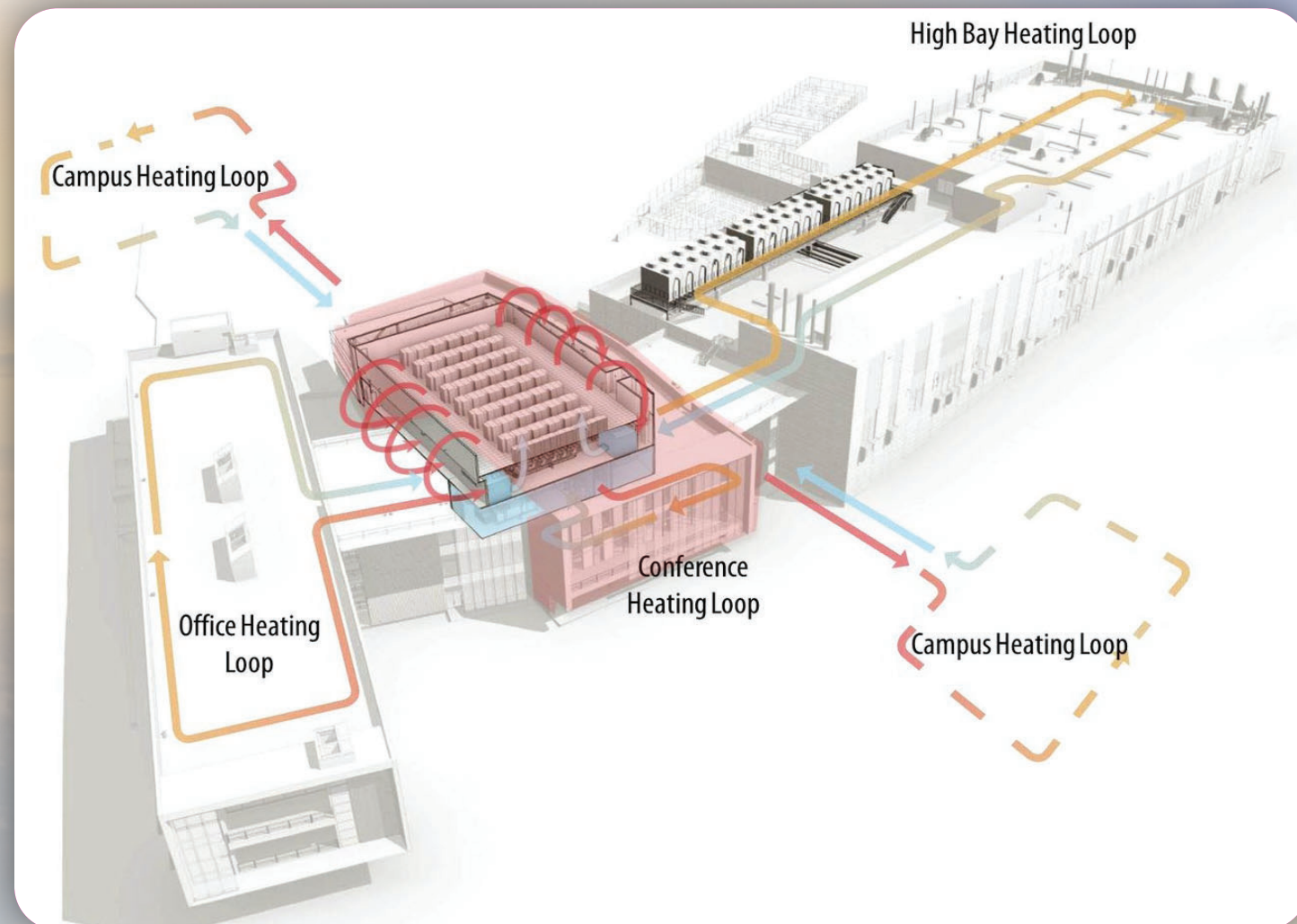


Figure 042



Figure 043



Figure 044

PRECEDENT STUDIES cont.

Project Name: Shanghai Natural History Museum
 Location: Shanghai, China
 Architect: Perkins+Will
 Completed: 2015



Figure 045

Designed by Perkins+Will's Global Design Director Ralph Johnson, the Shanghai Natural history Museum offers exploration of the natural worlds through the display of over 10,000 artifacts from all seven continents. Included in the building are exhibits, a 4D theater, an outdoor garden exhibit, and a 100-foot-tall atrium that provides plenty of natural light filtered through a striking glass wall inspired by the cellular structure of plants and animals. The building takes much of its inspiration from nature with even the overall shape and organization inspired by the nautilus shell, one of the purest geometric forms found in nature. Even the east living wall signifies earth's vegetation and the northern stone wall suggests shifting tectonic plates and canyon walls eroded by rivers.

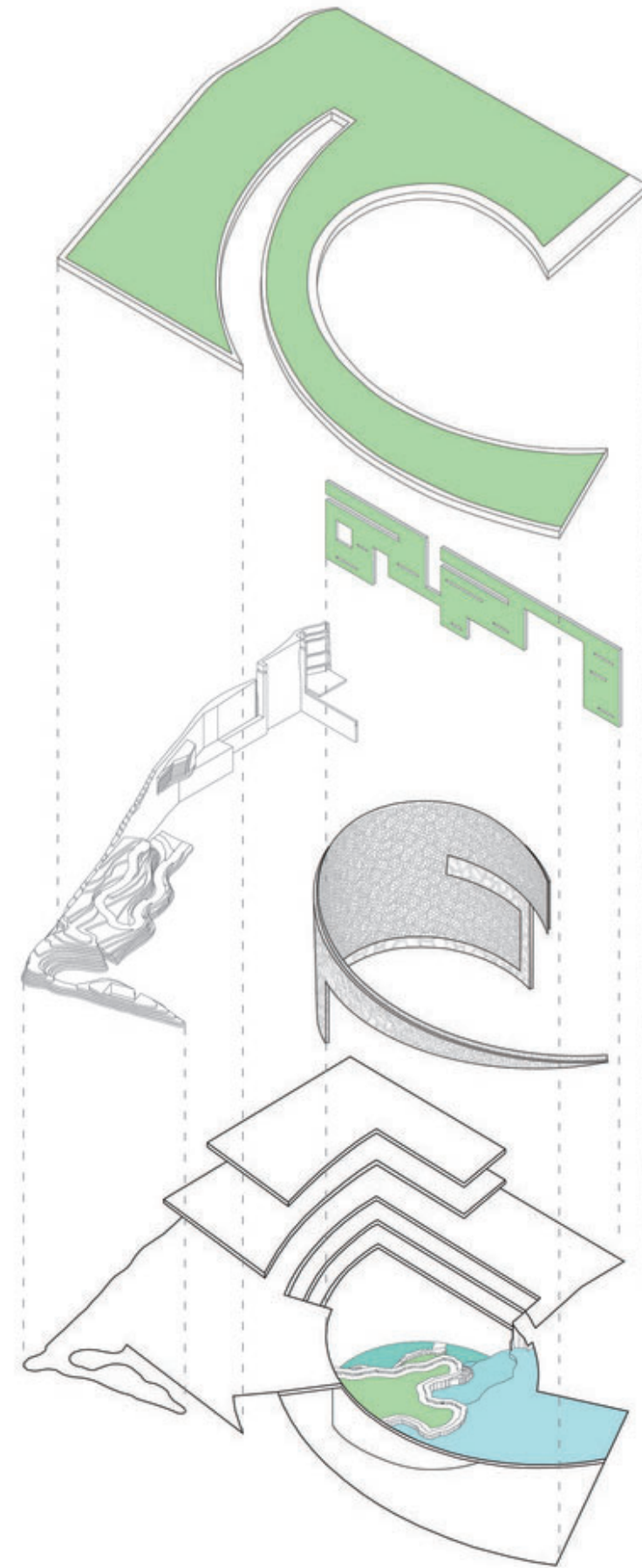


Figure 046

PRECEDENT STUDIES cont.

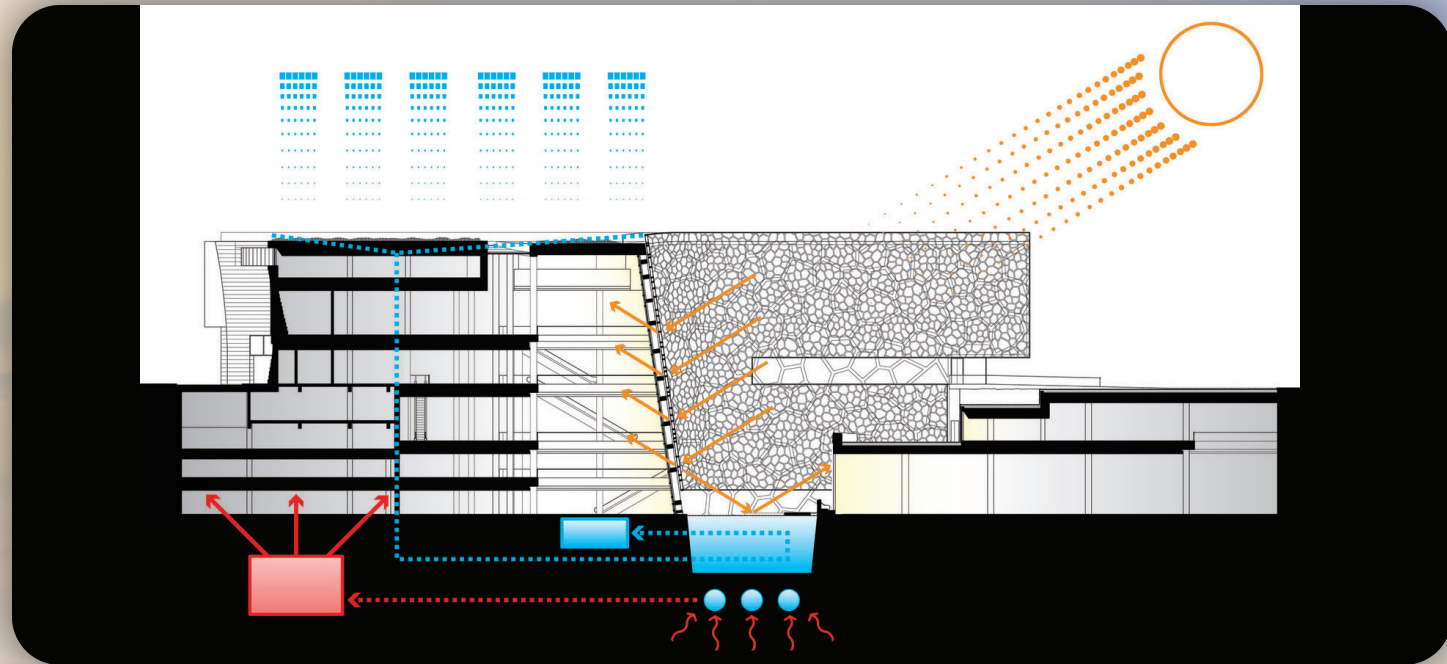


Figure 047

The building is bioclimatic in that it features an intelligent building skin that maximize daylight and minimizes solar gain. The courtyard pond provides evaporative cooling outside while temperature on the inside is regulated with a geothermal system that uses energy from the earth for heating and cooling. Water is collected from the roof system when it rains and is stored in the pond along with recycled gray water. These energy features aren't hidden away either, they are a part of exhibits and help explain the story of the museum. Even the 100-foot-tall cell wall has a practical purpose besides being aesthetically pleasing, it acts as the main light source for the building's interior. "It's a three-layer wall. The shape is very complex because it is circular and conical. And then when you apply that pattern onto a circle, it was a big challenge to design ... but it is the thing that unites the exterior with the interior," says Johnson.



Figure 048



Figure 049



Figure 050

PERFORMANCE CRITERIA

We would like to produce the highest quality, highest performing building we can to ensure a successful project. To do this, we need to set goals that can be worked toward to quantify the success. Below are plans for several categories that will be explored and judged. For each category we will choose aspects to explore as well as plans to explore and quantify their performance. First, we will identify the aspects, then the methods for obtaining measurements will be explained, and finally the criteria we will judge the measurements on will be identified.

Space Allocation

Beginning with the performance of space allocation, we believe some important aspects to measure are usable floor area and land coverage. We will want the most efficient utilization of the space we take to have a minimal impact on the site. These aspects will be measured in square feet, allowing us to make calculations telling us the efficiency of certain design options. The initial measurements to be taken are that of the site and surrounding area so that we have a good idea of what the site entails. From here, we can develop a program for the building that will use the site most efficiently. Inside the building itself, space will be carefully designed from the preliminary phase to achieve a highly efficient layout. We will judge that we have met the criteria based on a goal of 95% usable floor space within the building whether that is in the research and development portion or the museum portion.

Energy Consumption

The energy use performance of the building will be considering both the amount of energy the building uses, and the amount of energy it produces. The unit of measure we will be using for these criteria is kilowatt hours (kWh) and we will be comparing the two aspects, consumption and production, against each other. Originally these measurements will be pulled from a range of designs and equipment selections in preliminary models and processed by simulations to show the most efficient combinations. Once an efficient combination is selected for the consuming portion of the building, available space will be considered for options for energy production through renewable sources. This will give us a good idea of the building performance before construction begins. Once the project is built, we will be able to directly determine the energy input and output of the building and adjust accordingly. We will judge that the project is successful in this category based on if it is able to produce more renewable energy than it can consume.

Environmental Performance (luminous, thermal, acoustical environments, ecosystem balance)

The appearance of a new building in an existing ecosystem is bound to disrupt some aspects of the area. To do little to no harm on the site, we will measure the environmental performance of the building based on light pollution of the night sky, sound leakage into the wilderness, and wildlife influence in the area. In the preliminary phase of the project, much of this will be obtained through models and computer simulations. Also used will be case studies of similar existing projects. More sophisticated measuring equipment will be used on-site once the project is completed and things will be adjusted accordingly or the best result. The light pollution will be measured in Night Sky Brightness (NSB) which has a unit of candela per meter square (cd/m²), the sound leakage can be measured in decibels at various points around the building, and the wildlife influence can be measured through surveys of the local species. For the light pollution, there are certain guidelines that are set out by associations based on next to zero light pollution that we wish to judge the project off. Regarding sound, if the sound produced is almost imperceptible where nearby animals live then the project will meet the criteria. If the introduction of the building negatively affects the populations of species living nearby then the project is a failure. Ideal we'd like to maintain or increase the presence of wildlife on the site.

Behavioral Performance (usage patterns)

The behavior of the users of the space can be measured in a few ways depending on who is using a space and how. For the visitors of the museum, we can measure the time they spend in each space as how much they interact with the space, typically using minutes as the unit. For those doing research and development in the building, behavior can be measured with productivity and mood. The method of taking measurements will take on the form of post occupancy evaluations and visitor surveys as well as running computer simulations to achieve results from existing case studies. The simulations will be done in the preliminary phase of the project and the post occupancy evaluations can be done daily so that the design can be adjusted accordingly. We will judge the performance of the exhibit spaces based on the interest shown by visitors. If some exhibits are being passed by or not generating interest, then things can be adjusted accordingly. We will judge the productivity of the research spaces based on case studies of other existing projects of this kind. If certain conditions generated more productivity in the workplace, then we will implement some of the ideals into the design. Additionally, these spaces can be designed to be flexible for future revisions if a more efficient program is discovered.

PERFORMANCE CRITERIA cont.

Psychological Impact (aesthetics, sensory experiences)

Another important area to set performance criteria is the psychological impact the design has on the user. Some of the things we can measure that affect the experience of users is sound levels, temperature, air composition, and overall immersion. The units of these aspects will be decibels, degrees Fahrenheit, humidity, and user experience ratings respectively. For most of the sensory experiences, we will run computer simulations for the rough calculations to employ in the preliminary phase. Then when open, we can use surveys and reviews to see how the combination of experiences has worked in immersing the user in whatever the space entails. We will judge the performance on what the user feels. If they feel that they are making a great connection with the space or feel immersed in the function of the space, then we will see the project as successful. If there are certain complaints or comments of discomfort or ineffectiveness, then things can be adjusted on the spot. The criteria will be set high to ensure that every user is satisfied with their experience in the building.

Environmental Impact

A very key aspect of the project will be its environmental impact on the area which will also closely associated with the environmental performance criteria. The things that will be measured are CO2 emissions (or collections), energy flow (kWh), and wildlife presence. Originally, measurements will be taken from simulations of a variety of design options. From these we can select specific equipment for the project. We would like the building to be a zero-emissions building and generate its own power, so if the software estimates that we capable of this, then the criteria were met. We would also like to not only offset the carbon footprint of the project but offset other emissions as well. If we can begin extracting more carbon from the regional air than is being put into it, the project will be successful in this area.

Code Compliance

We believe the best aspect to measure is the number of infractions on the code. By measuring the infractions, the project makes on the code, we will know exactly where the project needs to improve. Through careful analysis of the regional building code, we will be able to determine the number of infractions during the preliminary phase. Once the project is built, we can utilize various building inspectors to ensure the project was executed correctly. If there are any infractions post-construction, then the appropriate trades can be contracted to complete the job. We can judge the code compliance based on the building needing zero infractions. If zero infractions are achieved and we exceed what is required, which shouldn't be hard, then the project will be successful

Cost

Perhaps the biggest factor behind the feasibility of the project is the cost. We will measure the cost of production, the cost of operation, and even the revenue generated by the structure. We will obtain the cost of production through labor and material estimations. This may be very generic in the beginning but will surely become quite detailed upon completion of the project. The cost of operation will be estimated alongside the environmental impact measurements as these are best when considered together. We will select equipment that is appropriately sized for the project while also not eating up a lot of the construction budget. This equipment will also need to be rather efficient which in turn will save money on energy use. Most software that assists in the appropriate selection of these efficient systems have the cost built in. The revenue will be obtained through general calculations on expected visitor traffic. We will judge the cost of construction based on available funding and an estimated construction cost of \$100,000,000. If we can construct the building based on reasonable grants and funding, then we will feel that it is adequate. We will judge the cost of operation based of if the project is making money or losing money while its doors are open. If the building is pulling in more revenue from visitors than is needed to run the building and complete adequate research, then the project is meeting the criteria.

Summary

To summarize, we will be setting a range of performance criteria in 8 different categories: Space Allocation, Energy Consumption, Environmental Performance, Behavioral Performance, Psychological Impact, Environmental Impact, Code Compliance, and Cost. This collection of categories allows us to plan and monitor every aspect of the building to achieve a high-quality, high-performance design.

In the realm of space allocation, we will want to make sure there is minimal impact on the site and efficient use of the available space. We will hold the performance of the space to a 95% efficiency goal to maximize use while minimizing site impact. Energy consumption criteria will ensure that the building is performing efficiently and living up to the social goals of the project. The energy consumption and production will both be monitored using kWh and aspects will be adjusted accordingly to ideally harvest more energy than the building uses, allowing it to export cheap renewable electricity. The environmental performance and impact criteria will be set to maximize the use of the site while minimizing the damage caused by the building. Several aspects will be considered such as the amount of disruptive noise it produces and the amount of carbon in the air it collects or releases. By setting high standards for these aspects, we can ensure that our building will benefit the context it is put in, leaving the site better off than before the project arrived. From a user point of view, behavioral performance and psychological impact standards can be set to provide an immersive, user-friendly experience. By examining case studies, we can

PERFORMANCE CRITERIA cont.

see what has worked in past projects and apply them to simulations of our preliminary designs. Once the project is built, visitor surveys and post occupancy evaluations can be done to further fine-tune the spaces for optimal experience. Code compliance should have some easy criteria to meet even when set at high standards if implemented from the earliest stages of design. To ensure this is done, we will do extensive research into the local building and safety codes in the preliminary phase and use the assistance of building inspectors as the project is built. Finally, the cost is usually what determine the feasibility of the project. We hope to construct the project through grants and public funding, so the criteria will be set based on what is available. If we can construct the building for less than what is available, we have succeeded. As for operation, we hope to generate more revenue through visitors and grants to cover the operation of the building as well as fund research on renewable energy. If we can sustainably fund the project in this manner, then we have succeeded.

By enforcing these criteria during every stage of the project, we can ensure a high-quality building that not only outperforms the average, but also gives the user a high-quality experience they won't find elsewhere. If the aforementioned results are achieved in every category of performance, then our building can be considered successful.

PROJECT JUSTIFICATION

When I was a child, I grew up in the outdoors. My parents raised me on a farm in rural Minnesota where I was constantly surrounded by nature. I've grown to love the outdoors because it allows me to escape from the frantic life in the city. So, when I became aware of the demise of our planet, I was shocked that we would ever be so reckless with our environment. I know that if we stand idly by things won't change so I have made it a passion of mine to do what I can to help keep our planet clean and healthy. Now that I am at a point in my academic career where I have the tools to create culturally significant project, I feel that I am ready to execute a project of this caliber. Through this project, I have learned so much about what's behind the issue of climate change, very important things that I would have never known otherwise. Acquiring this knowledge will greatly benefit me as I make important decisions in my professional career.

Since climate change is something that everyone on the Earth is subject to, some more than others, I feel that it has been and will continue to be a big topic of discussion in our profession. I feel that constant research and experimentation on this topic is very important if we wish to make any real change soon. I believe that this project could be a great source of argumentation on many aspects of climate change and how we design buildings for people to be more connected with nature. There will be much research that goes into the appropriate use for a site as well as how to design for the sight to compliment the nature around it. This project will be reusing a mine in Australia originally used for the extraction of materials for renewable energy. Since these elements are recyclable, they only need to be mined once and so the mining will eventually end. By having my project in a location like this, I can educate people on sustainable energy sources and provide easy access for research on the topic. The mine can also show the scars that are left on the Earth and act as an example of mining for the greater good rather than mining due to overconsumption.

The people of Australia feel the effects of climate change much more than people in other parts of the world. Their climate is especially sensitive to it causing widespread droughts and high heat. They experience massive fires that threaten their homes every year. I believe that this project can serve as a place of inspiration for people who aren't too involved in the discussion. A place where people can see the beauties of nature and the possibilities for a brighter future and how easy it can be. It will definitely get people talking about the major issues at hand and hopefully arouse change.

SITE RESEARCH

Qualitative Analysis

Name: The Super Pit

Location: Kalgoorlie, Western Australia | 30°46'38.16"S 121°30'20.30"E

Established: 1893

The Indigenous people of Western Australia, the Wangkatha, were the first to show European explorers their country by assisting these people with nutrients and knowledge as they travelled. These travelers began to notice deposits of precious minerals and saw opportunities to get rich and it wouldn't be long before their relationship with Wangkatha people would turn sour. As people flocked to the area for precious minerals, the Wangkatha saw their sacred land shredded for precious metals. In the winter of 1893, a large group of prospectors accompanied by some members of the Wangkatha people were travelling through the semi-arid climate of Western Australia when one of their horses cast a shoe causing the men to halt their journey. During this, three men from the group began to notice signs of gold in the soil and wanted to conceal their findings. The three men were Patrick Hannan, Thomas Flanagan, and Daniel Shea. Their plan to hide the finding was to pretend they had lost a horse and stay back to find it as the rest of the larger group moved on.



Figure 051

After the main group had left, the three began to pick up the gold and stake out their land. On June 17th 1893, Patrick Hannan, filed a public Reward Claim signaling that he had struck gold. This caused hundreds of people to swarm to the area in search of gold, and in just under a week, the area population exceeded 1,000. Since then, a number of towns were established and joined together to create what is today called Kalgoorlie. The current population is just under 30,000 and is still fueled by area mining but at a whole new scale compared to the few small mines in the early 1900's.

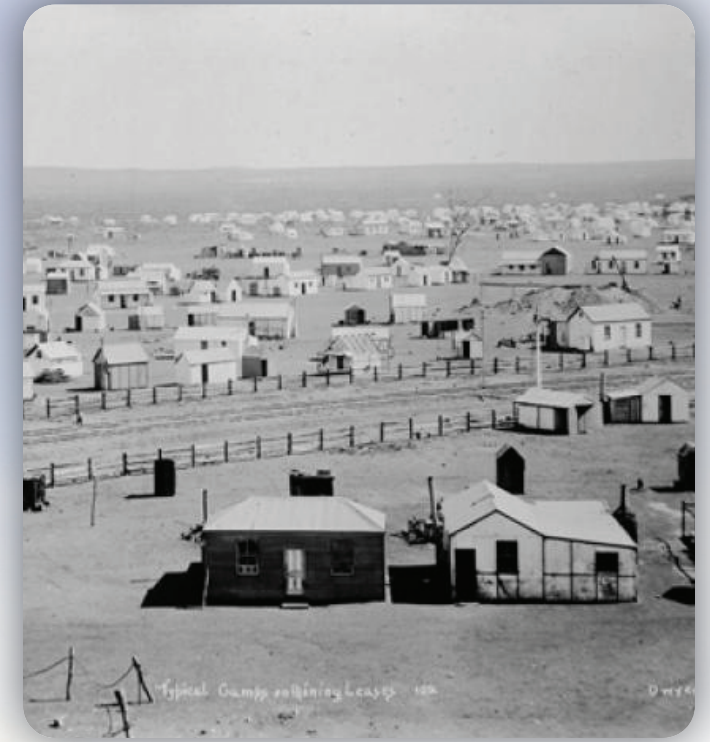


Figure 052

The Fimiston Open Pit, more popularly known as the Super Pit, is one of Australia's largest open cut gold mines and is located in Kalgoorlie, Western Australia. It began as a collection of separate underground mines which were started after the discovery of gold in the area by the aforementioned prospectors in 1893. This discovery went on to be called the Golden Mile as it ended up being one of the richest gold deposits in the world. By 1903, there were already 49 operating mines with more than 1,800 miles of underground tunnels collectively.



Figure 053

SITE RESEARCH cont.

In the 1980's, a man named Alan Bond began buying up these individual leases along the Golden Mile with the hopes of consolidating them into a single company. Although his company failed to complete this, in 1989 Kalgoorlie Consolidated Gold Mines Pty Ltd, or KCGM, was formed to finally consolidate these mines and manage all mining operations in the area. After this occurred, smaller pits were combined into what is today called the Super Pit and most underground mining was phased out.



Figure 054

Character

The character of the site is quite void of thick vegetation as is most of the region naturally, but the mine itself contains none at all. The mine obviously feels very artificial with the massive stepped walls of the mine and almost seems unreal due to its scale. At over two miles long, one mile wide and two thousand feet deep it is unimaginable to think that this massive void is man-made, but after knowing this is the product of over 100 years of extracting earth, it begins to make sense.



Figure 055

Activity

Most of the activity on the site is quite industrial. There is constant noise produced by massive machinery moving giant amounts of earth. Every now and then there are explosions that shake the ground from the mining crews blasting rock. Nearby there are a collection of processing buildings that process the extracted earth and prepare it for further refinement. Other activity on the site includes tourists who are interested to see the unimaginable expanse created over the years. The only lookout available to the public is located on the south side of Kalgoorlie and features a few pieces of equipment used during the mining process as well as historical information about the site.



Figure 056

SITE RESEARCH cont.

Quantitative Analysis

Located on the edge of the Great Victorian Desert, Kalgoorlie and the Super Pit find themselves in a semi-arid climate. Along with this comes high average temperatures and little to no rainfall. There are some slight seasonal fluctuations in precipitation and daylight with their declines occurring in Australia's winter months and a juristic change in the average temperature with a 30°F decrease during these winter months. Australia proves to have a somewhat unforgiving climate due to it's dry weather and heat which tend to be problematic in the summer month, fueling the ever increasing fire season that devastated the continent annually.



Figure 057

Climatic Averages in Kalgoorlie, Western Australia												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High (°F)	91	89	83	76	68	62	61	65	71	78	83	88
Average (°F)	79	77	73	66	58	53	51	54	60	66	71	76
Low (°F)	66	65	62	56	49	44	43	44	49	54	59	63
Rainfall	1.1	1.2	1.2	0.7	0.8	0.8	0.7	0.6	0.4	0.5	0.7	0.8
Muggy Days	0.7	1.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Wind Speed (mph)	12.2	11.9	10.9	9.5	9.2	9.6	9.9	10.2	10.9	11.4	12.1	12.2
Solar Potential (kWh)	8.3	7.5	6.4	4.7	3.6	3.2	3.5	4.3	6.1	7.5	8.2	8.6

Table 001

Soil Studies

Located under Kalgoorlie and in the Super Pit. The Golden Mile is one of the riches gold deposits in the world and is centered within the Kalgoorlie Goldfield. The Kalgoorlie Goldfield consists of volcanic and sedimentary rocks and is surrounded by extensive granite. These rocks belong to the Archaean period of Earth's history estimated to be between 2.6 and 2.9 billion years old. The deposit is composed of a series of mineralized faults which are known as lodes and were formed by ancient shears in the host rock layers. Here, there are two main types of mineralization consisting of the Fimiston Style and the Charlotte Style. The Fimiston Style consists of classic Golden Mile lodes and an abundance of sulphides and telurides. The Charlotte Style consists of younger white quartz veins. Over 1,000 ore lodes occur within the Golden Mile, some extending up to 6,000 feet long, 4,000 feet deep and 30 feet wide. All of this is contained within a region 3 miles long, 3,000 feet wide, and 3,000 feet deep.

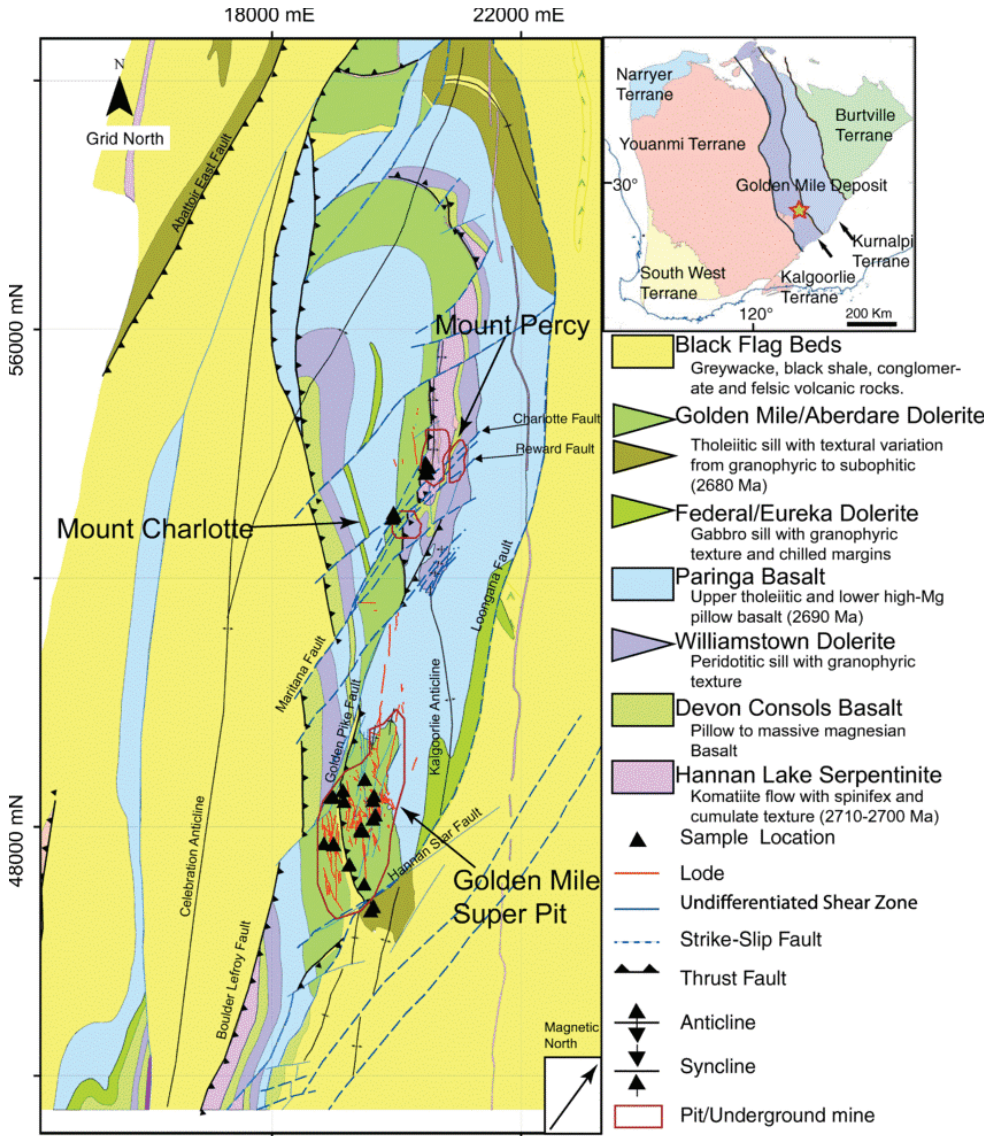


Figure 058

SITE RESEARCH cont.

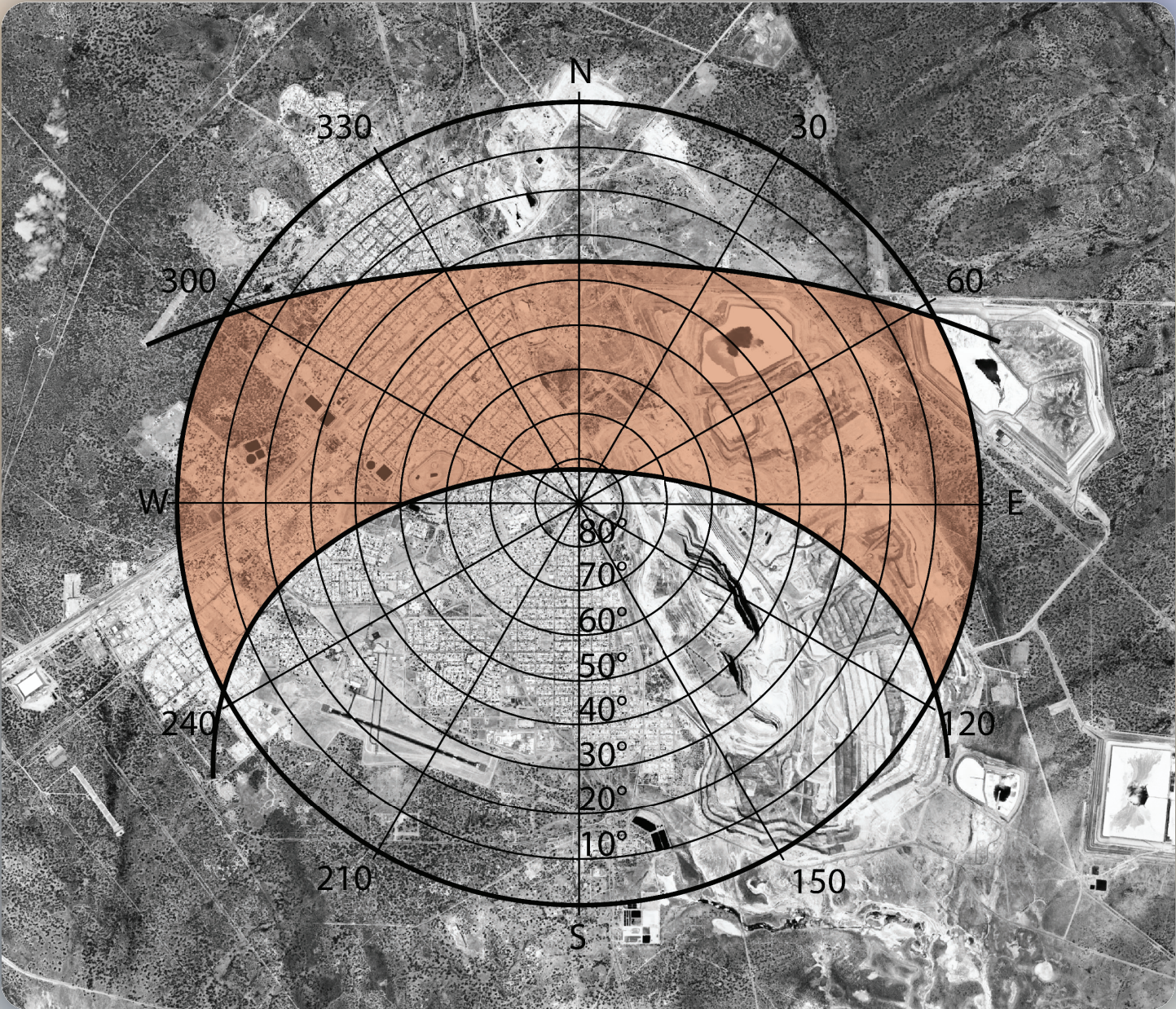


Figure 059

The length of the day in Kalgoorlie varies by about 4 hours throughout the year. On the shortest day, June 21st, one can expect 10 hours and 9 minutes of daylight. On the longest day, December 21st, one can expect 14 hours and 9 minutes of daylight. Although not completely equal, this consistency throughout the year is very helpful when considering opportunities for daylighting and photovoltaics. For the pit in particular, it will be most beneficial to locate the project on the southwestern wall of the mine to allow for maximum sun potential while taking advantage of the character of the site.

Amount of Solar Energy Reaching the Ground per Square Meter in Kalgoorlie												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
kWh	8.3	7.5	6.4	4.7	3.6	3.2	3.5	4.3	6.1	7.5	8.2	8.6

Table 002

After taking into account the several climatic variables including the absorption of light by clouds and other atmospheric constituents, we have found that there is actually a big flux in amount of solar energy provided throughout the year. The brighter period of the year lasts about 3.5 months from October 23 to February 12 with an average daily energy presence of 7.5 kWh, the brightest month being December with an average of 8.5 kWh. The darker period last just about as 3.5 months as well from April 29 to August 11 with an average daily energy presence of 4.3 kWh, the darkest month being Jun with an average of just 3.2 kWh.

Average Monthly Rainfall in Kalgoorlie												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (inches)	1.1	1.2	1.2	0.7	0.8	0.8	0.7	0.6	0.4	0.5	0.7	0.8

Table 003

Rainfall & Humidity

Being located in a semi-arid climate is may not be a surprise that the average monthly rainfall in Kalgoorlie is quite low. There are slight seasonal variations through the year, but the average rarely varies by more than 0.5". Yet, when looking solely at the data of the site, we can see that there is what we can consider a rainy season for nearly 11 months out of the year from October 15 to September 2 with an overall average rainfall of 1.2". This means that the dry season only lasts about a month and a half with an average rainfall of just 0.4" Although they call it a rainy season, there is very little precipitation that actually reaches the ground so it's not surprising that they are constantly battling extreme drought conditions in the advent of changing weather patterns.

Average Number of Muggy Days per Month in Kalgoorlie												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Days	0.7	1.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2

Table 004

SITE RESEARCH cont.

Along with little precipitation throughout the year comes very dry air. When analyzing the average humidity levels, we see that the summer months (November through April) tend to be comfortable only 20% of the time with 75% being dry and only 5% being muggy. The winter months (May through October) are no better with rarely any days on average of comfortable or muggy conditions. The data shows that during these winter months, there is almost a 100% chance that the air will be dry. Shown in the table are the average number of muggy days per month in Kalgoorlie. As we can see, the average never exceeds 1 muggy day per month with the majority of these days being in the December to April range. These climate patterns are quite conducive of drought and add to the sensitivity of the climate and are ultimately the cause and driving forces of many of Australia’s biggest wildfires.

Monthly Temperatures

Adding to the climatic mix is the season increase in overall temperature. Although it is not sweltering, it is still very high with an average high daily summer temperature of 85°F lasting just over 3 months. This heat is a big factor in Australia’s fire season as it too causes any present moisture to evaporate quickly. The fire season then usually dies down in the beginning of the winter months as daily highs begin to drop below 65°F.

Average Temperature per Month in Kalgoorlie												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High (°F)	91	89	83	76	68	62	61	65	71	78	83	88
Average (°F)	79	77	73	66	58	53	51	54	60	66	71	76
Low (°F)	66	65	62	56	49	44	43	44	49	54	59	63

Table 005

Wind

Although the wind experienced at any given point on the ground can vary greatly depending on surrounding topography, the average wind speed in Kalgoorlie tends to hover around 10 miles per hour. The windy season lasts roughly 6 months from September to March with an average wind speed of 12.2 miles per hour. The calmer season lasts the other 6 months with an average speed of 9.2 miles per hour. It’s no surprise that this coordinates with Australia’s fire season as wind is a massive spreading factor, they tend to face every year.

Average Wind Speed per Month in Kalgoorlie												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind Speed (mph)	12.2	11.9	10.9	9.5	9.2	9.6	9.9	10.2	10.9	11.4	12.1	12.2

Table 006

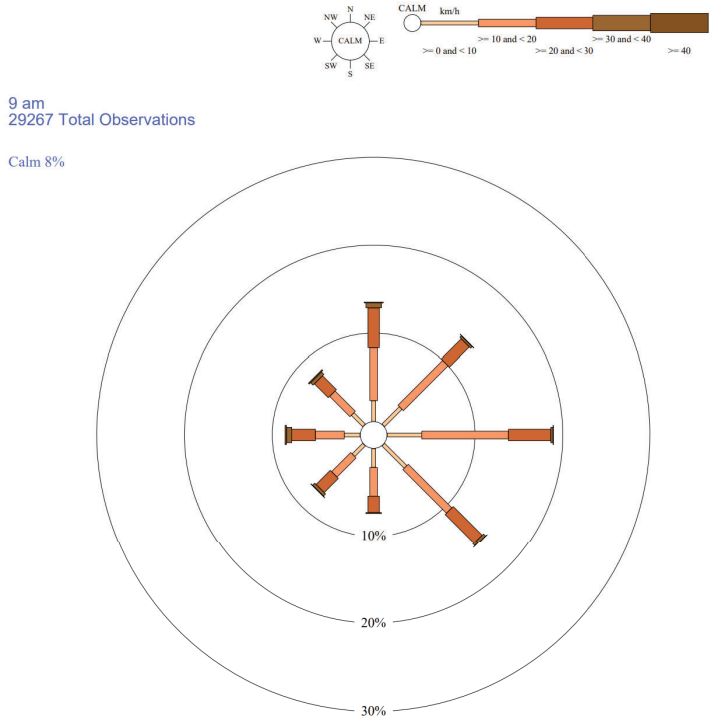


Figure 060

As shown by the wind rose, the predominant average wind direction varies slightly throughout the year, but the wind most often comes from the east with a dominance of nearly 8 months out of the year from October through May. From Jun to October the predominant wind is from the west and for only 3 weeks in May and June, the wind is dominantly from the north.

DESIGN PROCESS

ARTEFACTS

Through these artefacts I wish to portray several fundamental aspects of the ways in which we are intertwined with nature and why it is important that we maintain this environment for future generations, all while drawing inspiration from the Kogi people of Columbia. The artefacts I have chosen to do this with are reminiscent of a hand-crafted loom and the act of weaving which carries great importance in the Kogi lifestyle. For the Kogi, the loom is more than just a tool and weaving is more than just an activity; these hold and imply many tacit attributes that allow them to grasp a profound understanding of their universe. These meaningful attributes permeate even down to how the loom is constructed. Just as the Kogi use the loom to connect themselves with their universe, I too would like to use it to connect us with our universe.



Figure 061



Figure 062



Figure 063



Figure 064



Figure 065

With the first artefact, I want to show several aspects of nature that are not necessarily obvious to us in the modern era. The first thing I'd like to represent is how every being on this planet is woven into the ecosystem and how we all depend on each other to keep the balance. Every singular strand of the weave depends on the interlocking strands around it in a collective effort to hold their system together. If one strand were to break or fall out, the strong bonds of the strands around it would also begin to unravel in an ever-accelerating causal sequence. Next, I wish to show how the earth is shaped by nature and vis versa. The earth provides a medium for nature to grow in, and in turn the growing nature shapes the earth by pushing, pulling and moving it with roots or paws. Nature also helps to strengthen the earth with vast networks of roots which reinforce the ground, making it resistant to erosion and movement. Finally, through the whole process, I wish to show the cyclical processes of creation and destruction prominent in all corners of the world. For example, creation brings new life to a desolate wasteland, covering and creating a new welcoming environment. The environment flourishes but this inevitably must come to an end just like any other life cycle. As the life diminishes, it leaves behind traces of itself, proof of its existence, which both shapes the land and provides the ingredients for new life to spring from the once again desolate land.

ARTEFACTS cont.

To begin this process, tall stalks of grass which grew from the earth are cut down and woven together to form a mold that will support the creation of something new. The seeds and excess parts of the grass stalks are joined together to seal the gaps between each weave allowing for little to no loss of the substance to be formed.



Figure 066



Figure 067

Water and earth are mixed together and poured into the mold, seeping around the valleys and ridges of the woven grass and forming to the mold that supports its creation. It is the weaving of the grass that makes this creation possible, and it will be the idea of weaving of the grass that will be present from this point forward in the new creation.

Once this is complete, the woven grass form was burnt away, revealing the essential area where the character of the woven grass determined the character of the molded earth. This destruction devoured the woven form, creating a void that nature once filled. Petrified remnants of the life-giving form are left behind as well as a sharp, inverted profile of woven, shape-giving existence. These remaining fragments of the grass's existence deposit nutrients and fuel the creation of new life, starting the cycle all over again.



Figure 068

As shown, the mixed earth depends on the woven mold to give it shape and character, and the woven mold depends on the mixed earth to give it significance. The mold is created and dependent on the woven collaboration of elements of nature itself which in turn allows for the creation and definition of the mixed earth. Natural phenomena then destroy the mold to reveal something new within the mixed earth; an inverted remembrance of the significant weave and a scorched remnant of scared earth, desolate, waiting patiently to harbor new life once again.



Figure 069



Figure 070

ARTEFACTS cont.

The intent of the second artefact was to portray important aspects of our own creation and the dependency the rest of our relatives of nature have on us as humans. Unfortunately, most of the digital documentation of the process of this artefact was lost due to catastrophic technical difficulties, but luckily the artefact continued to evolve through my presentation which allowed for the capture of some very influential photos. Through the creation process of the artefact, it wished to show the creation of our world as well as the ways in which nature has impossibly sprung from it and ultimately shaped it into what it is today. The process also wished to show how our understanding of the world and each other is cultivated and held together by the vast web of nature and how the earth is the medium through which we communicate this understanding. Once finished, the function of the artefact was to show that we must maintain our role in the sensitive ecosystem instead of pursuing selfish matters.



Figure 071

In the beginning, the earth was an apocalyptic wasteland of constant chaotic movement and change. Fire, earth and water rained from the cosmos creating a primordial soup from which the building blocks of the earth and life would form. As the ingredients fell from the heavens, the resulting mixtures of elements layered on top of one another to create perhaps the first communicated record of existence. These occurrences continued to be recorded in the rock layers for a nonexistent audience and an inconceivable amount of time until something happened which would change the newly formed realm forever.

Through these infinite interactions between the earth and to cosmos, the ingredients for life were miraculously synthesized into the first feeling, thinking creatures. These creatures, being built from the very environment in which they found themselves, were not too lost in this new world. They found ways to survive and multiply as well as manipulate the environment whether for survival or by pure accident. With the addition of this variable, the chaos began to subside and life began to take on numerous forms, integrating themselves into the structure of the environment. For millions of years these simple creatures weaved themselves into the environment and created the rich ecosystems that processed harmful aspects of the hostile world into the atmosphere that supports the creatures of today. Over time, they too contributed to the stories of creation found between the pages of rock. They told the stories of their creation and purpose in the world through their fossils and influences on the world that they left behind.

As the environment changed over millions of years, so did the organisms that inhabited it, resulting in the first intelligent creatures we see in our oceans, rainforests and back yards today. These creatures were able to explore and interact with the environment like no other organism had been able to before. They were able to cover vast stretches of the earth and take in a seemingly infinite amount of influence from their surroundings. As one of these creatures, humankind began to notice a profound presence of life within everything they encountered and wished to connect with these forms of life in order to learn and grow. We began to talk to nature through our tracks, scratches on trees and rocks, and the scents we left behind. It was at this moment that we too began to record our history among the pages of the earth.

As nature herself shared many aspects of survival with the living beings, we too wish to share our own thoughts with each other. What began as communication through tracks, scratches and scents develops into a system of symbols and sounds derived from the things we encountered in our environment. We knew of nothing other than what we experienced, for what we experienced all the time was a living nature. With this communication, we were able build a collective understanding of our world, an understanding built upon and held together by nature herself. We were able to understand the importance of our fellow living beings and the balances that needed to be maintained to ensure survival. As humankind advanced, we brought with us the natural symbols and sounds through which we communicated because of the rich meanings associated with them. Eventually, we began to embody the sacred aspects of nature in our rituals and stories and integrated them into our cultures, allowing for a profound understanding of our world in which we lived.

ARTEFACTS cont.

In the modern era however, our dialect is far from relative to the natural world. We've chosen to remove any direct reference back to our living experience from our languages and replace them with abstract symbols with meaning seemingly created from thin air. Nature no longer plays a part in our everyday conversation and it seems that the consequences of this are beginning to show. Not only have we removed the presence of nature from our language, we've removed it from our justifications on decisions made about the earth. Today, decisions are made around the world with no consideration of the consequences they could have. Mass neglect of our planet is causing our ecosystems to degrade and in turn, creating the conditions for catastrophic disaster. These disasters begin to attack our delicate ecosystem, causing portions of the system to collapse, the very system upon which we formulated our understanding of the world. We effectively burn the ties that hold our world together. When this vast web of knowledge falls apart, our purpose and meaning is incomprehensible and sifting through the ashy rubble provides no answers. The earth will once again become a desolate wasteland.



Figure 072

From here, the artefact evolved into a group activity where four classmates held up two poles, one classmate on each side. On top of these two poles were two more poles perpendicular to the ones below them. On top of all this was a layer of grass stalks which would hold the artefact created in the first half of this artefact version. As the classmates shifted about and raised and lowered the poles they were holding on to, the second layer of poles would roll around and move the grass stalks. They had to be careful to keep the balance or else the poles would fall and the grass stalk and artefact would fall. The bending grass stalks was reminiscent of our fragile planet. If they were to put too much pressure on it, it would collapse. The rolling poles were representative of the balance act that is always at play in our ecosystem. If we are to continue to disrupt the precise composition of our atmosphere, chains of events will occur which could eventually cause the fall of our life source, the Earth. All of this was a team effort to keep this artefact together which is extremely true about us with our environment. It takes every last person to work together to reverse the dangerous path we are on.



Figure 073

ARTEFACTS cont.

Finally, I wanted to attempt to connect on a deeper level by hand making a loom and weaving by hand. This allowed me to understand some very strong metaphors that the Kogi Indians use to connect themselves with the universe around them.

In the eyes of the Kogi people, numerous analogies can be made with the construction of the loom frame since it functions interchangeably as a map, a chart, and a plan ranging from the cosmic through the geographical, to the microcosm of the human anatomy. There should be no surprise then that the four corners of the loom represent the four major Colombian cities outlining the boundaries of the Kogi domain. Within these boundaries they explore and learn about their world just like one would with a map. For us then, the frame of the loom can act as the boundaries in which our universe is contained. When we have these boundaries, we are then able to fill it with places to explore and creatures to explore them. Within this loom frame, a substrate is placed that will allow for future growth. This substrate is called a warp and to the Kogi people, the warp was all that one would encounter in their life from wild creatures to strange phenomena. These encounters allowed for an interchange between the Kogi and the world allowing for an intertwining of man and nature. We too can say that the warp of the loom is everything that is contained within the universe. Bounded by the frame of the universe, our environment is the substrate upon which we build our own stories and meanings. Without it, our conception of reality would fall apart and it would be impossible to make sense of anything. Our understanding of life would have nothing to hold it together.



Figure 074



Figure 075



Figure 076



Figure 077

ARTEFACTS cont.

At this point, the loom is built and prepped. We have our universe and all of nature that is contained within it, the only thing that we are missing is the weave. Weaving for the Kogi people embodies a sense of rhythm by setting the pace for thought and supports the notion of continuity by intertwining them into a vast web of knowledge. For us as well, the weave of the loom represents the very way in which we weave ourselves into the fabric of life. As we travel through our environment, represented by the warp, we too depend on the environment to answer our questions and act as the foundation upon which we develop our reality. And just like the map framed by the boundaries of the universe, with each pass of the weave, we are creating our own picture of the world and weaving together the story of our own lives. We are not alone in this loom either. As the thread of our lives pass through the warp, we create vibrations of influence that radiate outward affecting others. These vibrations can also be likened to the voice of nature, carried through the wind, vibrating and influencing the loom weaving together our own lives. Finally, as light passes through the loom, its scale is exaggerated to intense proportions ranging from the molecules in your own body to the cosmos. On a molecular level, the code dictating our very own existence is woven into delicate DNA strands and on the level of the cosmos, galaxies are precisely woven together to produce the greatest source of inspiration and wonder which has been shared with every living entity that has ever existed, the starry night sky.



Figure 078



Figure 079



Figure 080

Just as the loom acts as a tool for the Kogi for a profound understanding of the universe, so should it act as a tool for us to see the woven reality of our existence among billions of living entities. From the beginning we have been woven into the fabric of nature, and now more than ever, it is important to maintain this loom we call our universe before our weave falls apart, and with it all understanding.

DESIGN PROCESS

The design began with drawings and physical models in an attempt to synthesize research and inspirations into an architecture to reunite man with nature.

There was a big focus on taking advantage of the layers of history present in the rock layers on the mine wall as well as setting perspectives within these layers to frame different aspects of humankind's relationship with nature through history.

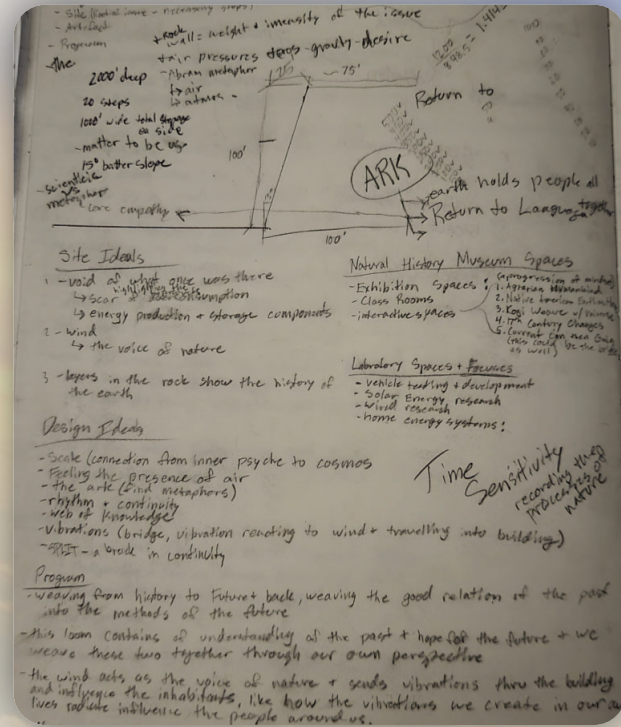


Figure 081

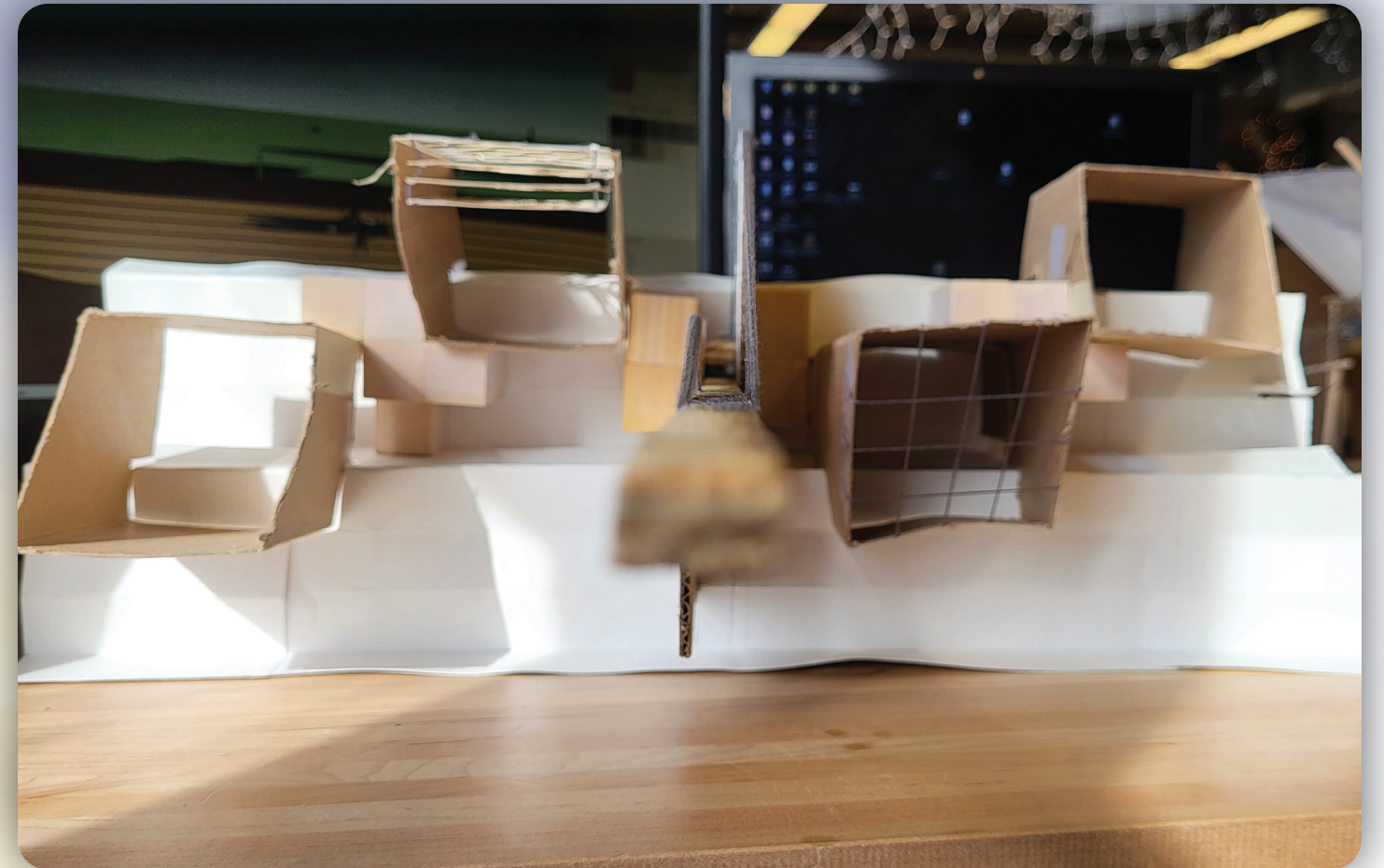


Figure 084

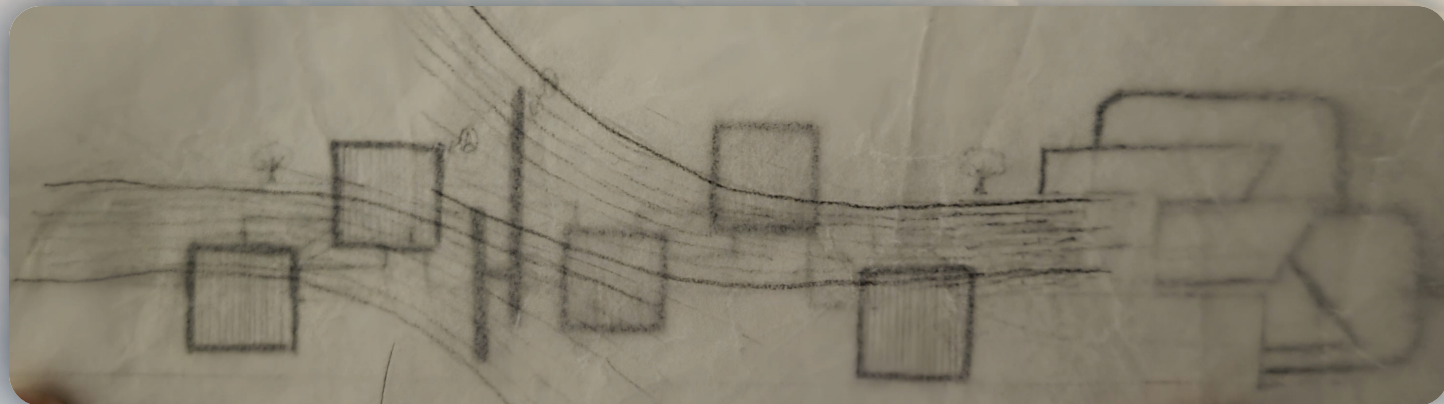


Figure 082

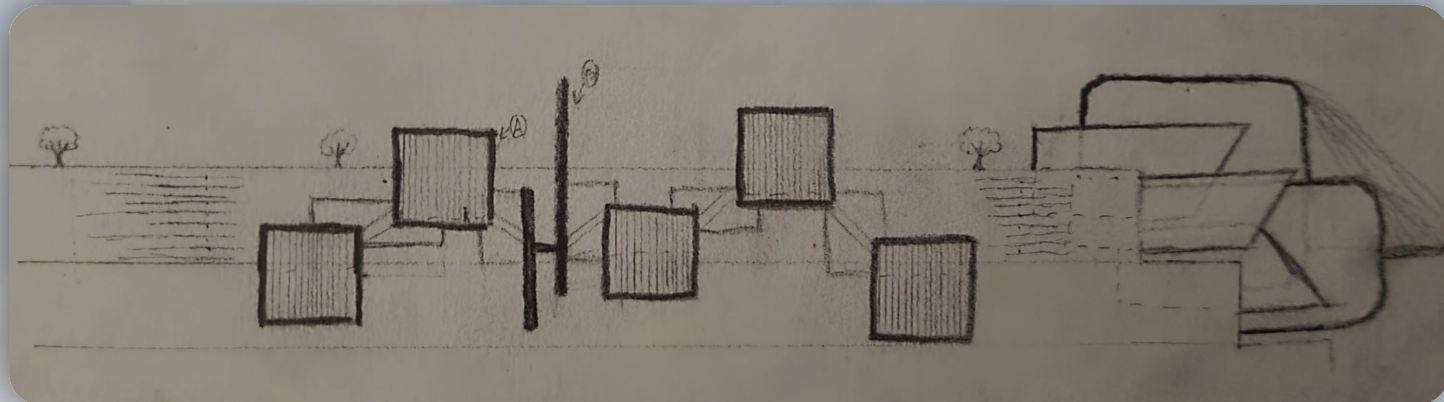


Figure 083



Figure 085

DESIGN PROCESS cont.

Aside from the focus of the interactions cultivated in the exhibition spaces themselves, from an early stage I wanted to successfully integrate the laboratories with the exhibition spaces and allow for these two perspectives to weave together.

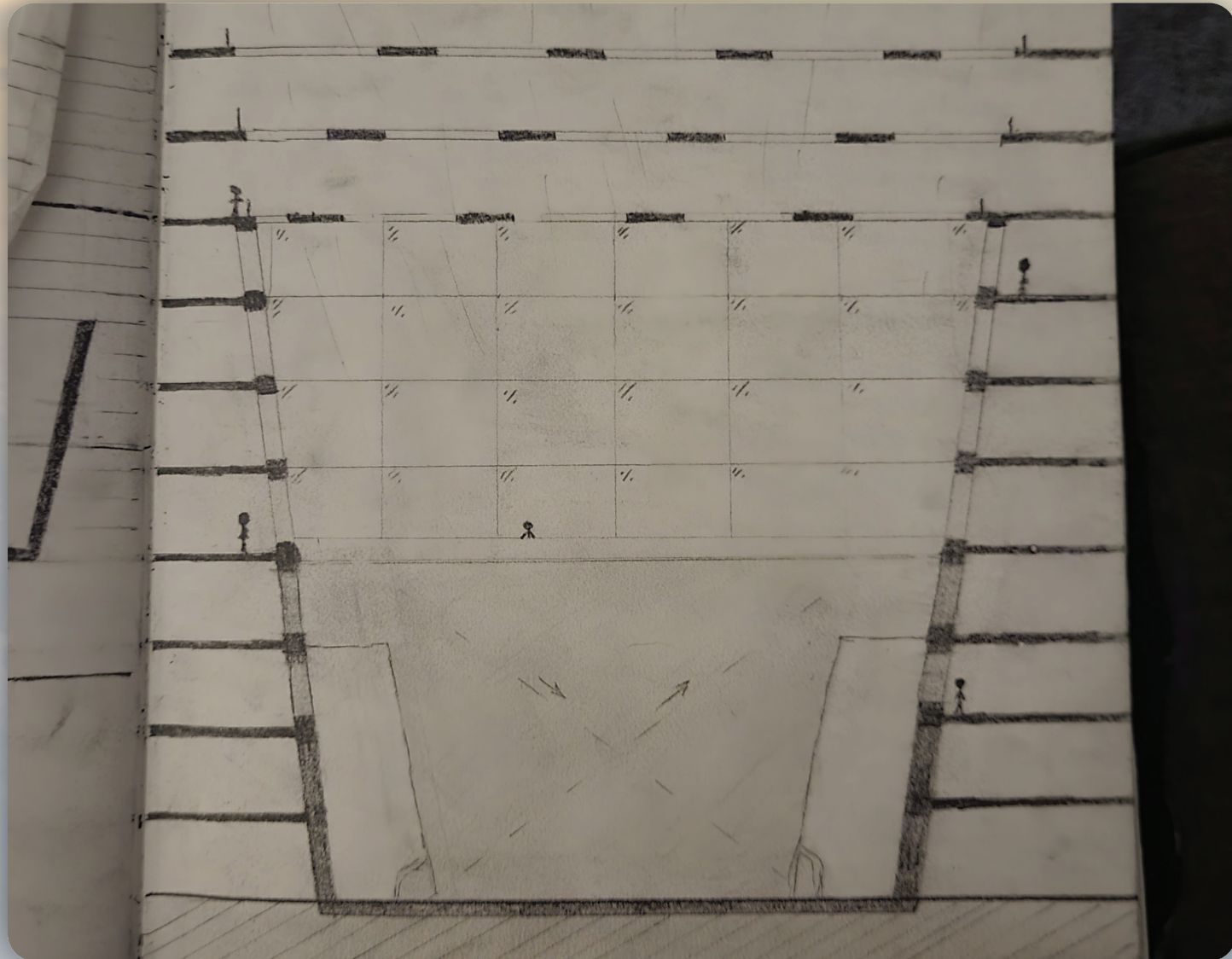


Figure 086

When looking at the site, I wanted to take advantage of the void of the mine by using it to isolate the visitors with one of nature's most surrounding and influential forces. By spanning a bridge across the mine, the individual is completely in the atmosphere's control as it brushes past their body and sways the bridge.



Figure 087

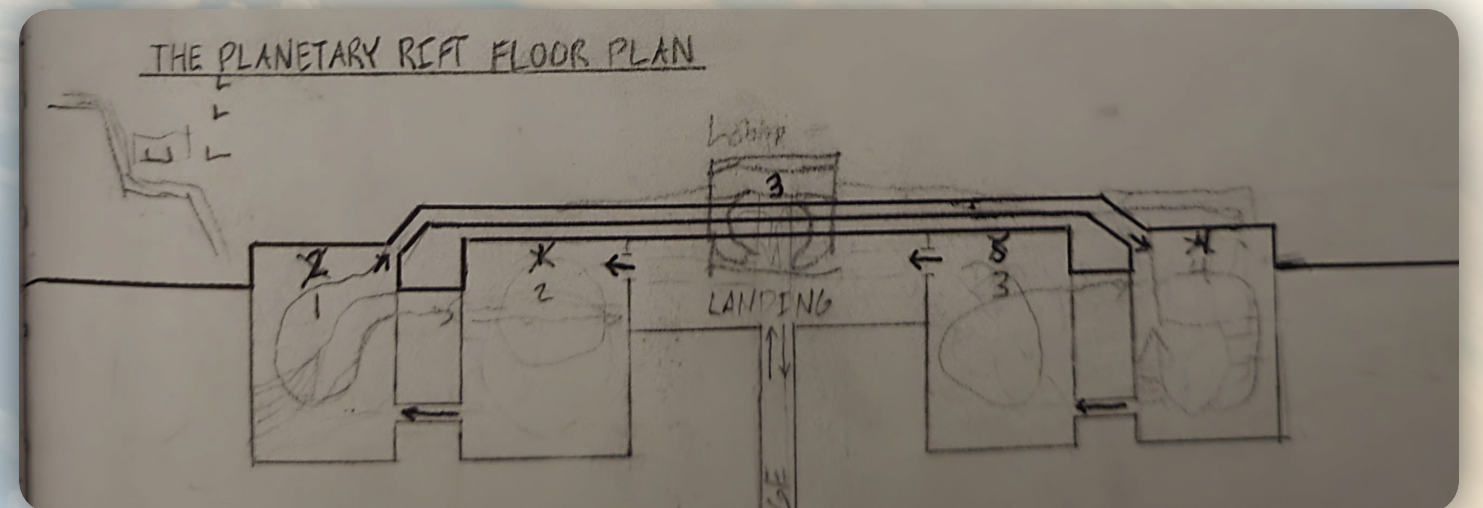


Figure 088

DESIGN SOLUTION

DESIGN SOLUTION

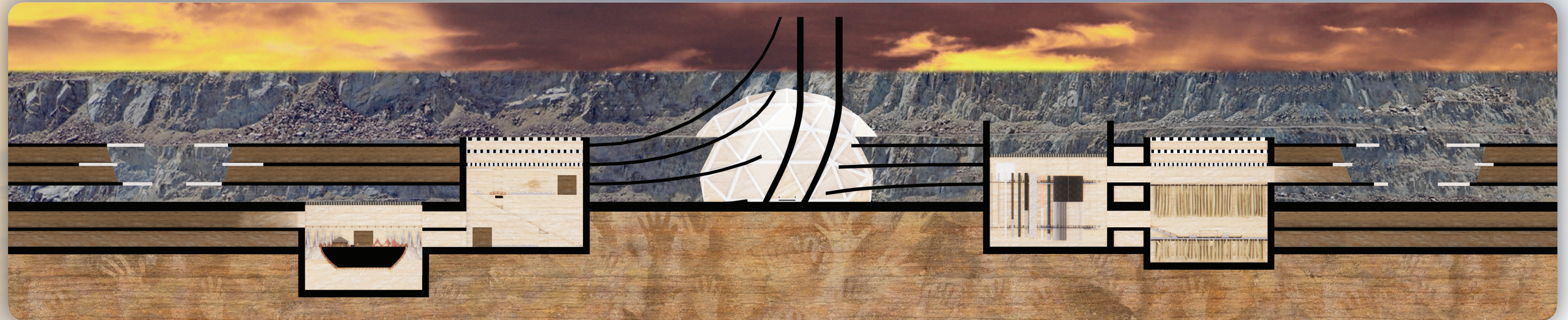


Figure 089

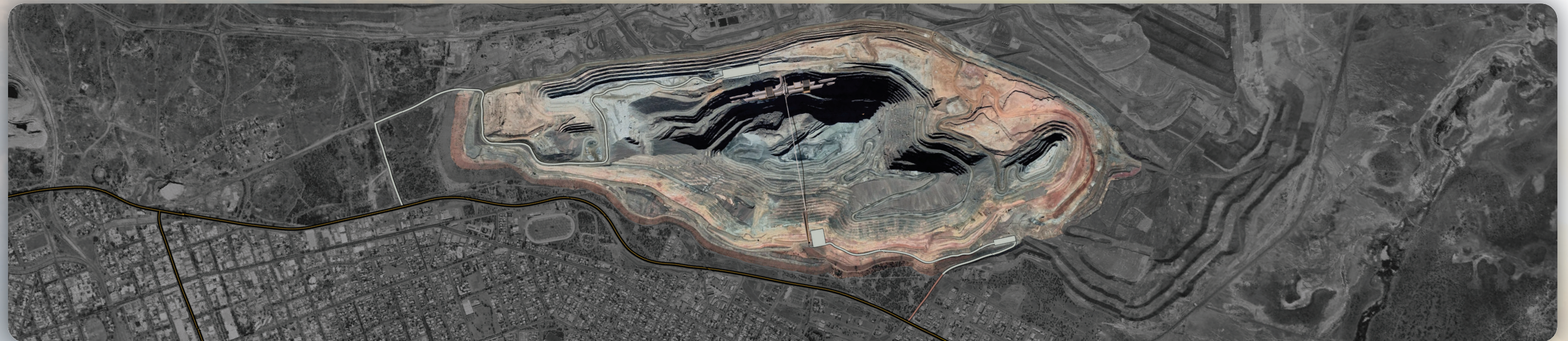


Figure 090

To provide an architecture for change, this Natural History Museum and Inexhaustible Energies Laboratory reforms the way in which humankind views its entanglement with Nature, and creates an interface with Nature itself. Historical perspectives are embodied to attempt to weave us back into the fabric of Nature through the awakening of our senses to the eternal presence of a living, feeling Earth. There also needs to be opportunities for changes to occur through advancement in technology which will ultimately act as the working force behind the change.



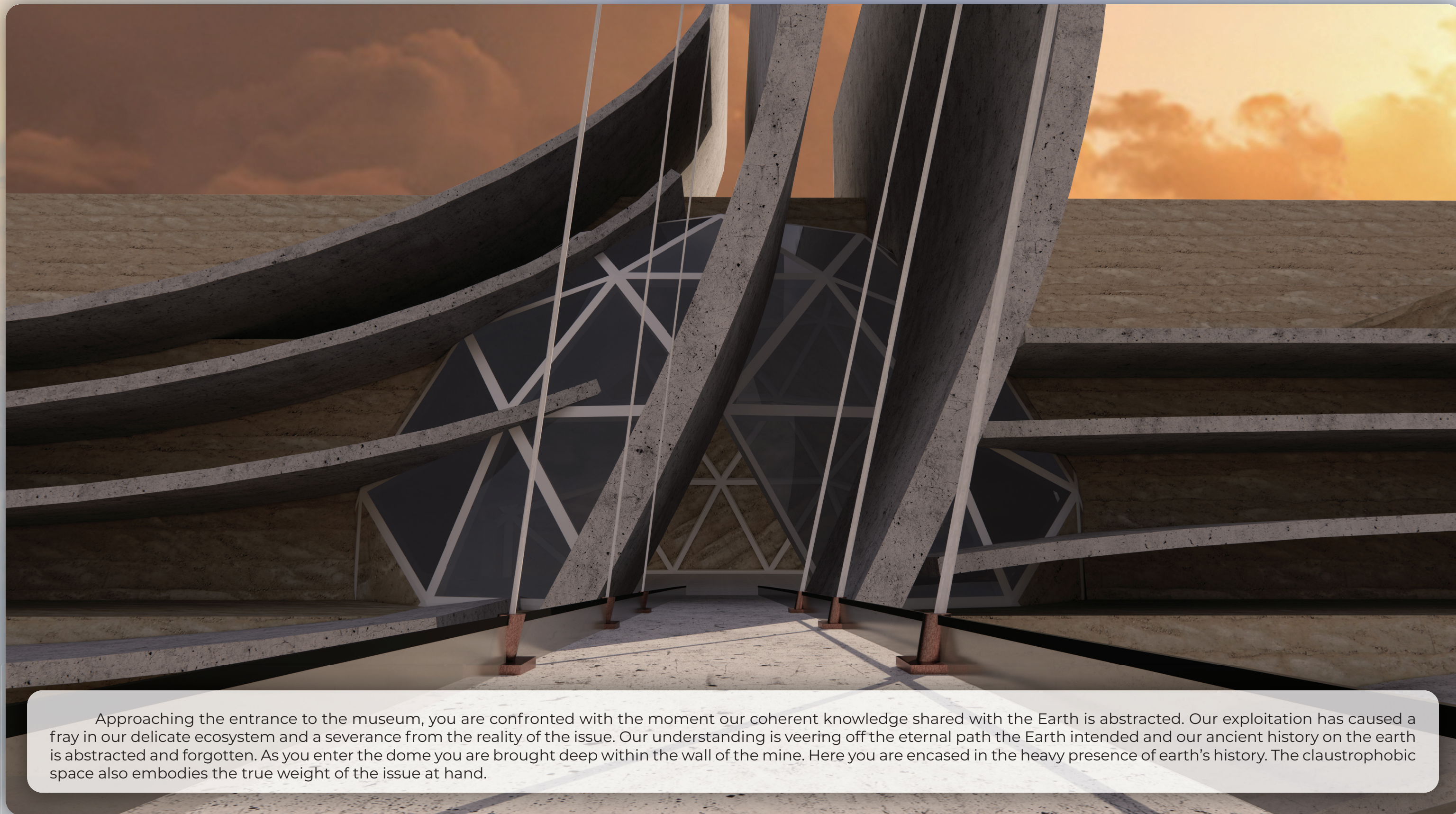




Figure 093



Oriented to the cosmos, the next exhibition is a space to realize that Earth is our nest, our only shelter from the unfeeling, unforgiving void of space. The exhibition sets up a contrast between the haven we live in and the desolate universe outside of this haven through the cold, uninhabitable space surrounding the displays of traditional dwellings. Showcased within the space are many examples of human dwellings through the ages which were used to anchor their place in the world and allow for a departure to the broader world as well as into inner psychic realms. Filling the space with an array of scattered light is what brings the vast universe into the exhibition and assists in relating the dwellings of our ancestors to the cosmos.



DESIGN SOLUTION cont.

The final exhibition highlights the extent of the average consumption of just one person over the course of a year. 100' tall cylindrical masses show the amount of raw material extracted from the earth for various applications as well as the actual portion of usable material that comes from the extracted substances once processed. The space puts in perspective the cost of the modern conveniences we take for granted as well as the efficiency, or rather the inefficiency of many of our refinement processes. As we abstract our thinking processes for the use of these precious resources, we lose sight of how little of each we actually have. As of right now, with all the excessive consumption occurring today, we need nearly 2 Earths to sustain our lifestyles. Hopefully, this space puts into perspective the vast misuse of the Earth precious and extremely limited resources and causes an empathetic shift in attitude towards the conveniences we take for granted every day.

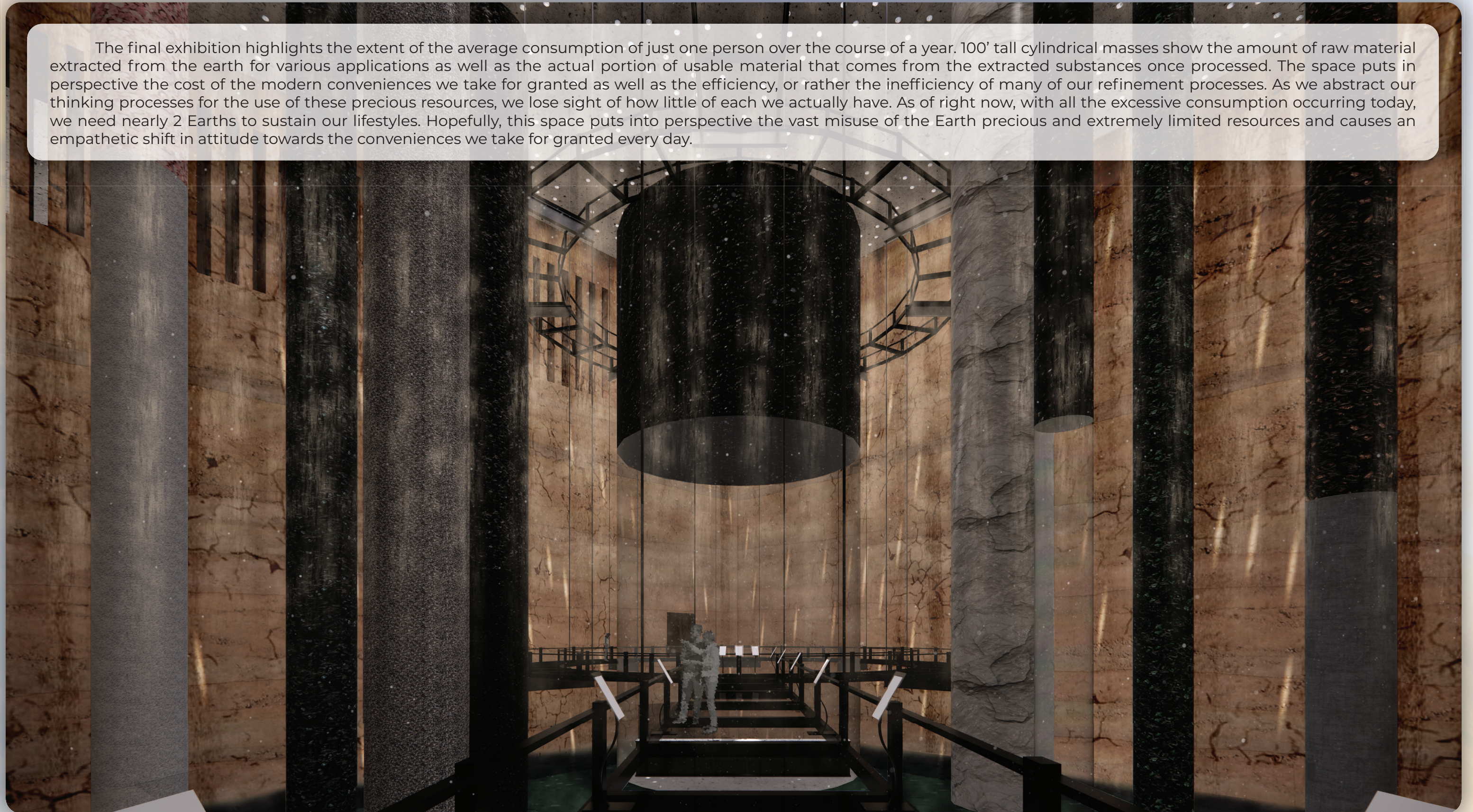


Figure 096

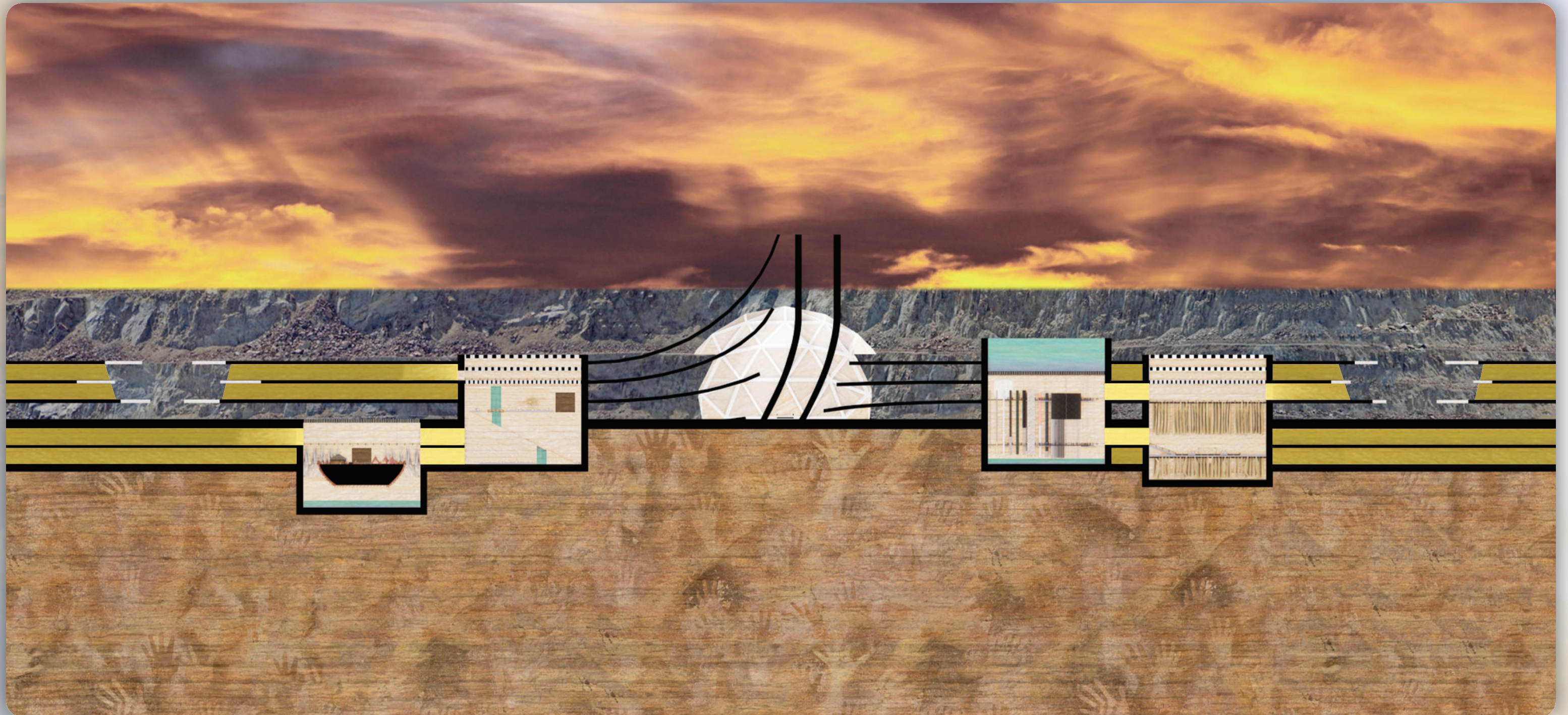


Figure 097

What one could consider to be the workhorse behind our revival of the planet, laboratories are also integrated into the architecture to bring forth the inexhaustible energy and pollution extracting technologies necessary to reverse the dangerous direction we are headed. In these spaces scientists will work together to produce the necessary measures needed to halt the use of single use and wasteful energies. Development will also occur in areas working to scrub the air, water, and ground of dangerous pollutants and revitalize the ecosystems vital to a healthy life for all organisms.

DESIGN SOLUTION cont.

In order to weave the scientific development of a cleaner future with the rich historical perspectives of the museum, walkways bridge from the laboratories through the exhibitions to open a space for discussion and integration of these incredibly relevant ideologies into the technologies powering the future.

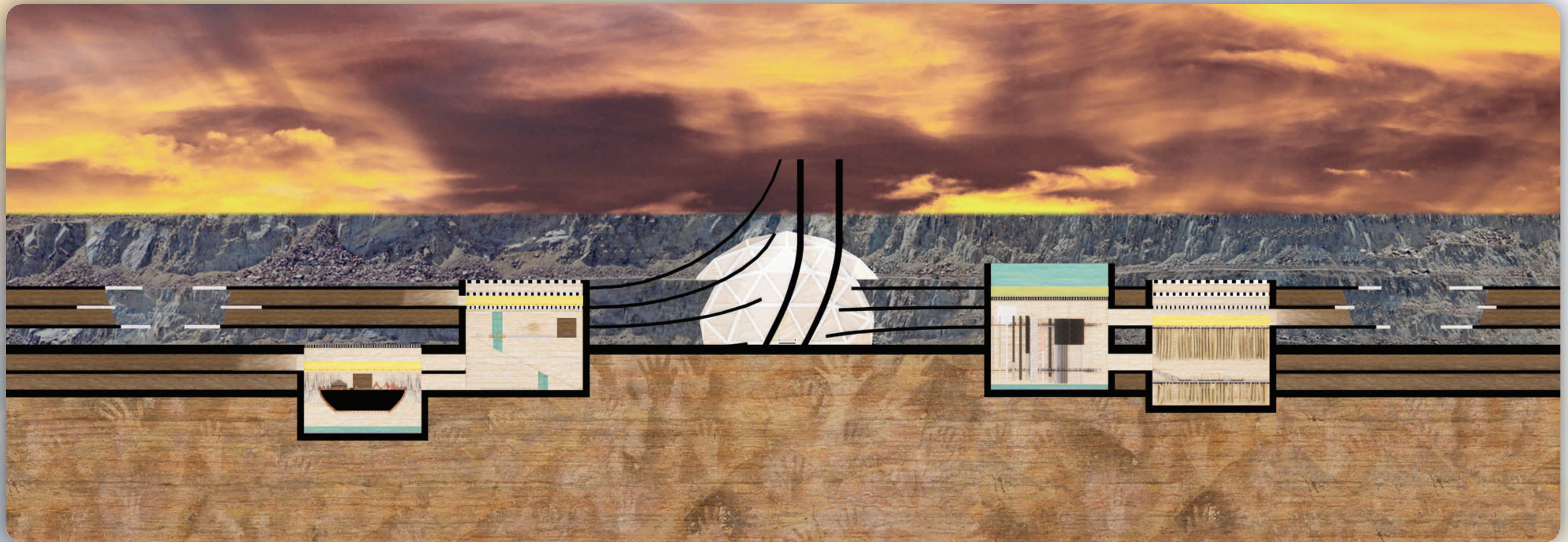


Figure 098

To conclude, through the deep research and careful design conducted throughout this thesis, I hope to open a space for conversation. Although most have become numb to the issue, our planet is in distress, and since we live within the planet, our actions may eventually lead to our own extinction. When you leave here today, think about the generations to follow, especially the people in these generations you hold most close to your heart. Think about the detriment to their quality of life caused by selfish motives. When you are in the wilderness, dwell on the mysterious occurrences you encounter and, like the ancient human, try to imagine why these happen without relating them to abstract scientific explanations. Find objects or activities that, like the Kogi, tune you into the harmony of nature in order to weave yourself back into this inescapable system we call Earth. When you are outdoors, think of how David Abram helped us become aware of the living entities around you, the forces of nature, and the ever-encasing atmosphere we all need and share. Not only our time, but the time of all living beings is now extremely limited here on Earth, and if we wish to continue building this fabric of life, it truly matters that we don't give up.

FINAL PRESENTATION



Figure 099



Figure 100



Figure 101

THESIS APPENDIX

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STUDIO DESIGN EXPERIENCE

Second Year 2018-2019

Fall: Milton Yergens
River Oak Meditation Center | Moorhead, MN
A space to destress from a busy lifestyle.
Jamestown Rowers Club Boathouse | Jamestown, MN
A facility for the training and maintenance for the Jamestown Rowing Club team.

Spring: Charlott Greub
River Bend Residence | Cripple Creek, CO
A residence in a private, environmentally conscious community.
Lumiere House | Transportable
A sunlight conscious dwelling for the house wren.
Moor on Main | Moorhead, MN
A multi-use building to revitalize downtown Moorhead.

Third Year 2019-2020

Fall: Bakr M. Aly Ahmed
Unity Aquatic Center | Los Angeles, CA
An all-inclusive competition space for the 2028 Olympics .
Harbor District Resort | Catalina Island, CA
A luxurious resort off the coast of California.
Partners: Taylor Hemmesch, Hunter Chaput, Greta Bleeker

Spring: Niloufar Alenjery
Oracle | Cairo, Egypt
A competition entry to awaken empathy for a dying Earth.
Of Land Sky and Wind | Bismark, ND
An office and performance space to honor the natives of North Dakota.
Partners: Daniel Ness, Ashton Barta, Bennett Rindy

Fourth Year 2020-2021

Fall: Cindy Urness
1400 Fusion | Miami, FL
An artistic community inspired high-rise.

Spring: Kristi Hanson
Victory Lane Villa | Middle Cormorant Lake, MN
A dwelling that blurs the line between nature and dwelling.
Vision for Medora | Medora, ND
A collective master plan by Kristi Hanson's 4th year architecture studio.

Fifth Year 2021-2022

Thesis Advisor: Stephen Wischer
The Planetary Rift: Awakening the Senses to the Necessity of Nature

PERSONAL IDENTIFICATION



Figure 102

Trevor J. Guck

Perham, Minnesota

