

Emphasis on Nature

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Emphasis on Nature

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PRIMARY THESIS ADVISOR

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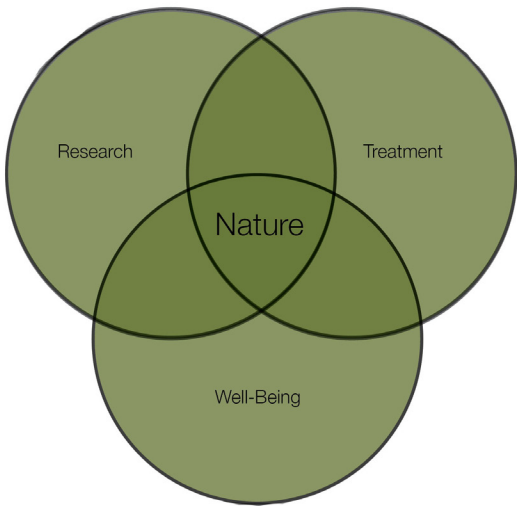
ABSTRACT

This thesis “Emphasis on Nature” will attempt to create an atmosphere that provides better healing and a more vital quality of life for people dealing with cancer. The healing process is different for every person, and there are many ways to help a person in this situation, whether it be through education about the processes, surrounding oneself with nature, or experiencing new adventures. Providing spaces that can aid in healing is a very essential part of the design for this facility. Humans and nature are interconnected, and both need to be treated in a holistic way, which is why the design will incorporate a treatment, research, and holistic rehabilitation areas, that has a 23,640 sq ft total. This facility is derived from the effects of the environment on the healing attributes for cancer patients and their families in the Midwest. This design will use the principles of regenerative architecture, which is an interconnected relationship between the systems of nature, the built environment, and the user of the space. These connections create great foundation for the holistic treatment of a person who has cancer to sustain a healthy lifestyle.

Key term: Regenerative Architecture, Environment, Holistic

PROBELM STATEMENT

Using the principles of regenerative architecture can we minimize the environmental impact and positively influence the ecology of the site to provide a better quality of life?



STATEMENT OF INTENT

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Typology

The typology of this thesis will be a research and treatment facility for cancer patients, emphasizing the influences that nature has on research and treatment in a holistic manner.

Claim

The environment can help create spaces that externally affect human societies' well-being. Being able to connect these relationships provides an experience of holism.

Premises

The environment can influence a multitude of components of people's lives, one being their health. There is a large percentage of people who are unwell, and the quality and atmosphere of institutional facilities does not promote a place of well-being that satisfies people as a whole.

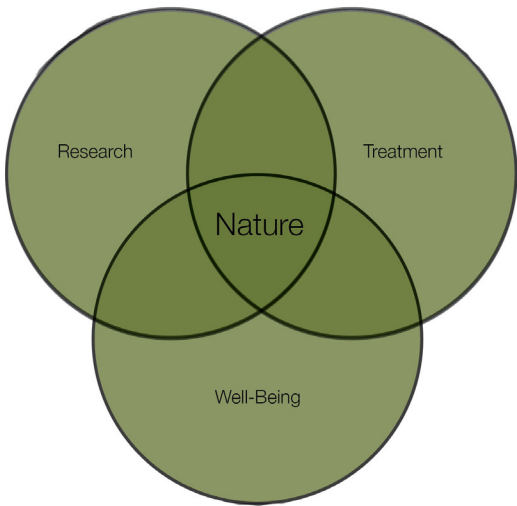
Designing with the principles of regenerative architecture, the structure and landscape become one entity, working together to provide a holistic experience for all who utilize the facility. Being able to provide comfort to a person who is unwell is the most important element at this research and treatment facility.

Theoretical Premise / Unifying Idea

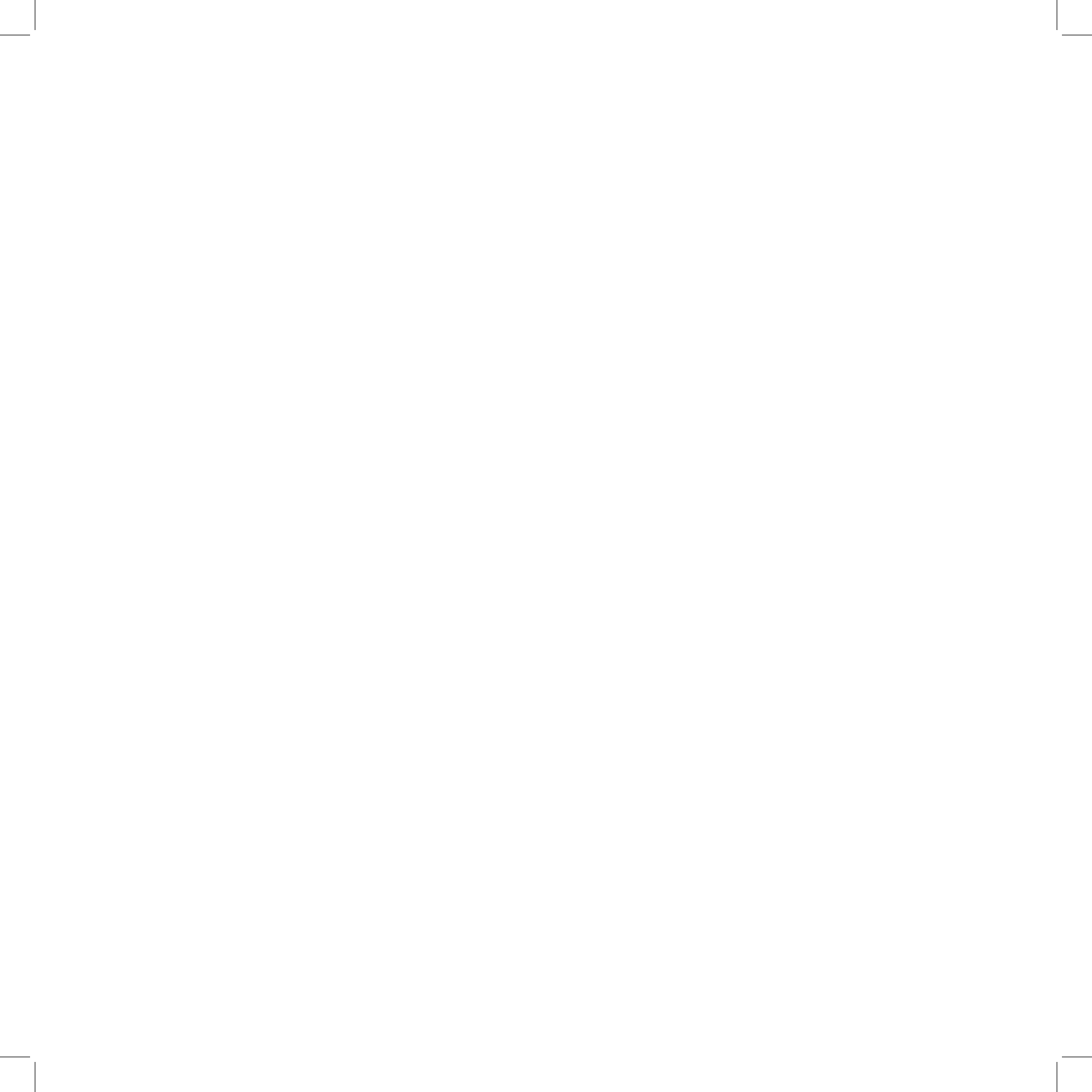
The environment of a place can impact and influence individuals' health. Creating a space using regenerative design combines both nature and built environments into one entity, to reduce the negative impacts while influencing a positive quality of holistic health.

Project Justification

People who are sick need to be treated on a level that incorporates their entire being, not just a certain part. The human body is an integrated system with many different layers and components that affect each other. The institutionalized facility does not consider people's emotional or mental reactions to what they may be going through. The body and mind is a delicate relationship that should be treated together, and omitting one part is only treating part of the problem. The environment that one is placed in while healing is a large factor in the way this person might heal. An institutionalized facility is not the appropriate place for people to heal properly.



THE PROPOSAL



NARRATIVE

Cancer has become a very large problem in the United States and especially the Midwest, where on average there are 490,000 cancer cases a year. However, the process of treating cancer has not changed that much over the years. People need to be accountable for how we treat others and their well-being, especially when it will affect the rest of their lives.

Providing a structure does not really make a difference if it does not co-exist with its surrounding landscape and nature. Regenerative architecture uses principles that revitalize the ecological site and nature to minimize the environmental impact but still make it a cohesive and sustainable place.

Using these methods not only in the site process but also in the design process will make it a holistic experience. The techniques will draw parallel connections between the landscape and the structure, essentially eliminating the boundary between the two entities, and providing a capacity for growth to sustain a healthy lifestyle for the patients who will be using this facility.

A research treatment facility is an effective way to use the surrounding environment as an element in the healing process. Treating only the cancer cells is just one part of the healing procedure; there are many more factors that are affected by this traumatic event in someone's life. Relationships with family and friends, along with lifestyles and even everyday tasks are changed and need to be redeveloped in a new way. This takes a toll on the patients as well as the people surrounding them. Essentially this facility utilizes nature and its components to not just treat but to provide care and comfort for those who are suffering because of cancer.

CLIENT/USER DESCRIPTION

This project is being developed for cancer patients and their families, in an effort to provide a viable quality of life. The structure is essentially being designed for the recipients of research and treatment, however, the client is the state of Iowa. There might be one owner but there are many people who occupy the facility and have different responsibilities and requirements. The users of the facility are grouped into three categories: physicians/researchers, patients, and administrative workers.

Physicians/Researchers

The Physicians category consists of:

- Doctors
- Specialists
- Therapists
- Nurses
- Biologists
- Lab Assistants
- Pharmacists

The main responsibilities for this group of people will be to treat, diagnosis, and create a pleasant and beneficial environment for all the patients. This group of people could have some physical limitations, since side effects differ from person to person, but a majority of these limitations from side effects would be emotional, which are even more scattered. These people can only do so much to help and the process is a daunting task that takes a toll and is not easy to deal with. Just like the patients, the physicians/researchers group comes from different backgrounds, and has experienced numerous things; this is not a bad thing but gives people unique characteristics that make them perfect to take care of such unfortunate people.

Recipients

The Recipients category consists of:

- Patients
- Family
- Friends

The recipients' main usage of the facility will be for treatment, diagnosis of symptoms, and fellowship. The recipients have many physical requirements since there are a lot of different types of people, types of cancer, and situations. There will be patient rooms even though a large percentage of people will be coming and going. No matter what the circumstances, the facility will definitely have adequate equipment and accessibility for anyone who might need it. There are different social, cultural, and economic circumstances. Because it is in a centralized location in the Midwest, there are a lot of different demographics and backgrounds. The facility will try to create an environment that is cohesive and beneficial for all who use the facility.

Administration

The administration category consists of:

- Chief
- HR personnel
- Information personnel

The main focus of the administrative group will be to make sure that the physicians comply with the needs of the recipients and do their best to provide the best care. This group is also in charge of making sure that the facility is working well and all policies are being followed. One of the main responsibilities for this group will be money. They need to make sure that patients can afford the treatment they are receiving, along with ensuring that the facility is managed correctly with the right people working in the correct departments. This group also ensures that any issue that the patients might have is addressed.

MAJOR PROJECT ELEMENTS

Common Areas

This research and treatment facility is split into many different facets for the type of space and healing they provide. There will be a small area that will be used by almost everyone in the facility and will provide more of a social connection than anywhere else. The common areas will provide people with place to bond with others in the same position. It will also provide for other situations where people might be able to enjoy the landscape of the bluffs or the river and get some fresh air. These are also the first spaces that people see when they enter the facility, and they are a welcoming first step for taking charge of their lives and futures.

Research Areas

One of the main components of this facility will be the research aspect, which will focus on natural outcomes for types of treatment for cancer patients. For the biologists, chemists, and lab technicians to work efficiently, there must be labs and clinical rooms for testing, along with offices and a library for research work on specific treatments. The patients rooms will be located in the treatment area but close to the research area so that the two areas can collaborate together. This area is restricted to the researchers and sometimes the administrative staff. At no time unless otherwise authorized will the general public be allowed to access these spaces.

Treatment Areas

There are many different ways to treat the many different types of cancer. In this facility alone there will be several methods utilized, which means that there will be several areas in the hospital that specialize in a specific type of treatment. Besides the clinical trial treatment work being developed in the facility, there will also be the usual methods like chemotherapy, radiation, and surgical spaces each designed for the specific type of treatment being administered. These spaces are not as restricted as the research areas, but the patients need to be escorted by a physician or administrative staff member to access these rooms for treatment. However, there are a few rooms in this general area that are not accessible to the general public even with an escort.

Well-Being Areas

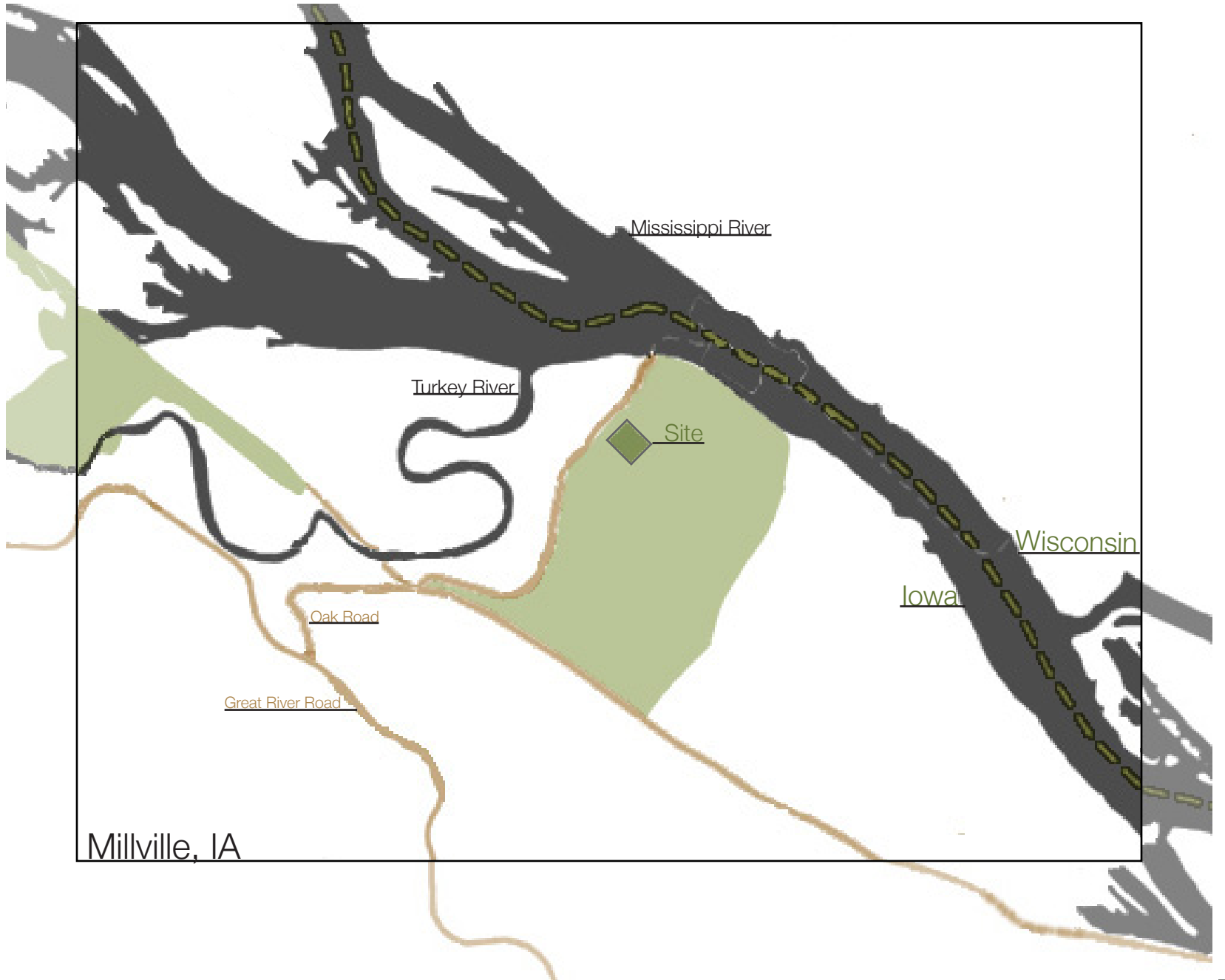
The one area that is the less restricted besides the common areas will be the spaces for well-being on the site. One of the most beneficial spaces will be the garden and outdoor landscape, which will provide a connection for people to get closer to the Earth. The majority of the spaces are indoors, and can be utilized by patients and their family and friends. Since cancer is a disease that takes a toll on not just the patient but everyone around, it is good to provide help for those who are dealing with the impact of this disease. There are special needs that should be considered when dealing with a lifestyle change like having cancer, such as dietary, therapeutic, and physical needs that can be treated in this facility as well.

SITE INFORMATION



According to statistical information from the American Cancer Society, the Midwest is located in the second highest bracket for cancer cases, with an average of 490,000 a year. Iowa has recently announced that cancer has become the leading cause of death the state. These are just a few reasons why this region was a viable place to look for a good ecological site for this building.

Millville, Iowa became the optimal site for a couple of reasons. One is the central location between the Midwestern states, so it can be accessed by multiple people from different areas. Also, Millville is a rural river community that is located on the Mississippi River. This specific area was chosen because the river and the bluffs provide scenery that is breathtaking and provides a great opportunity for the users of the facility to utilize the nature and landscape in a healing way.



Mississippi River

Turkey River

Site

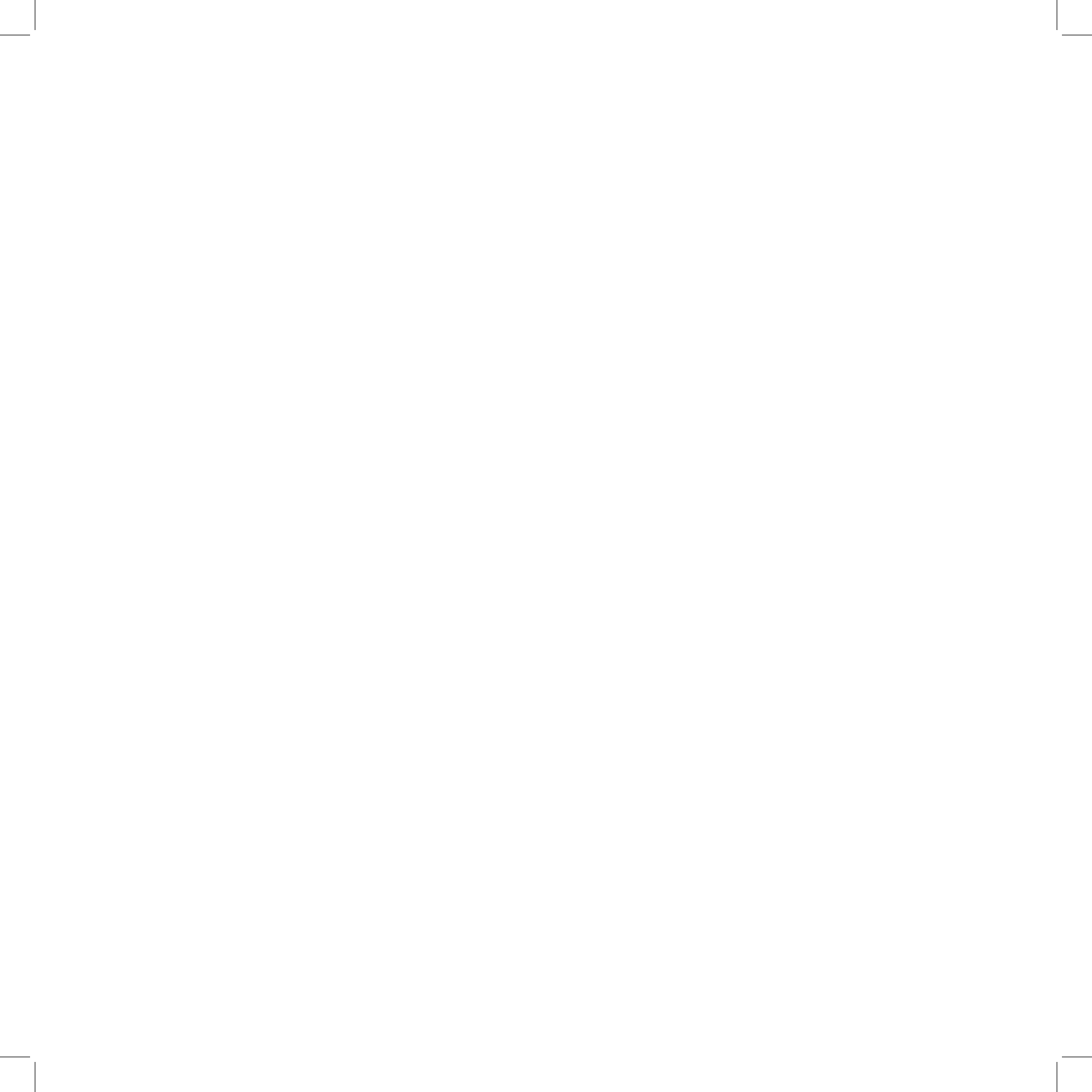
Wisconsin

Iowa

Oak Road

Great River Road

Millville, IA



PROJECT EMPHASIS

The emphasis of this project will be based on nature and the environmental impacts that are made to the built environment and society. This project will be separated into three different sections that will run throughout the entire development of design. The first will be how the environment affects humans' well-being and health, and the second emphasis will be utilizing the principles of regenerative architecture to produce an entire integrated system between the built environment and the natural environment. The last section will utilize both of these elements to create a holistic experience in the healing process for the whole person.

PLAN FOR PROCEEDING

RESEARCH DIRECTION

Theoretical Premise

The theoretical premise is split into three different areas, and each area has certain criteria that will be researched to fully understand the underlying idea of the concept. The starting place will be understanding the effects of the environment on a person's health and well-being. Next, the principles of regenerative architecture will be utilized to create a connection between nature and the built environment. The last aspect that will be addressed will be providing a holistic experience for the patients utilizing the facility.

Project Typology

The typology of this facility is multi-faceted in that it actually incorporates a couple different typologies in one area. This structure will encompass a research facility, treatment center, and a psychological/therapeutic area. These three spaces will provide well-rounded care for the patients that utilize this facility. Knowing what type of facilities should be incorporated, I can begin my research by thoroughly examining different types of buildings and choose a few case studies that provide the best aspects of design that I want to highlight. These case studies will be graphically analyzed and will provide a strong foundation for the design and development of this project.

Historical Context

The historical context will address two different issues for the type of research that will be discussed in this section. One issue will be cancer, and how, in general, the statistical information shows a rise in cases per year, and how the case and types of cancer in the Midwest have grown in the past years. Also, since a huge part of this project is based on nature and its effects on human well-being, the history of natural treatment research will also be discussed. The history of Millville, Iowa and the rivertown communities will also be addressed. Once again an important part of this project is nature, so the quality and history of the site in particular will be an important focus to make sure that there was no contamination that could effect the healing process, and if there is, that it can be taken care of in a reasonable and safe manner.

Site Analysis

One of the most important aspects of this design and the development of the building is its influence and emphasis on nature. The site is located on the Mississippi River in a very secluded and rural area. The site itself many positive aspects, but there is a lot that will need to be figured out. Going to the site, I will be able to personally analyze the quality of the land, air, and views of the surrounding landscape. Since the site is located near a national park, contact, should be made with facilitators regarding the rights to use the site. I need to ensure that the flood levels will not disrupt the flow of the building, but if it does flood, I need to create a plan so that the building does not disrupt the natural flow of the river. Weather conditions and sun paths are also factors in the well-being of people, especially someone who is healing, so optimizing the sun will be a beneficial aspect that should be considered along with being able to utilize the wind that occurs in this area as well.

Programmatic Requirements

The first step that will be addressed will be figuring out who will use this facility; since it is multi-faceted, it will incorporate more than one type of user. Once the user groups have been figured out the specifics of needed spaces and how they should be connected will be the next step. This is related to studying the history of cancer, the types of treatments that are used, and the rooms that are needed to make a well-prepared and sufficient facility to provide the necessary care. One of the other parts of this facility is the psychological care that is needed and goes along with having a traumatic event change someones life, as cancer would do not just for the patient but the family and friends as well. Education on my part will need to happen to make sure that all aspects of a patient's needs are taken care of in this establishment.

DESIGN METHODOLOGY

The information that will be presented will be done in a manner that emphasizes the most important aspects of the design process as they are relevant to this thesis. Since the most important part to understanding are my concept and ideas for this project, I do not want to overpower the written pages with a lot of images. Simplicity is what I am going for so the colors will be consistant throughout the document and the majority of the graphics will be in the typological research and site analysis portions.

I have interviewed the main archtiect of the Mayo Clinic in Rochester, Minnesota. He gave me a lot of insight into what a cancer patient might have to go through including the types of treatment and the toll treatment takes on the general routine of a person. We also discussed the different qualities of regenerative architecture and how the facility would respond to and reflect these qualities in the structure.

Strategically, the gathering of information has been based on the theoretical premise, which has a heavy emphasis on nature. Utilizing the principles of regenerative architecture to connect the natural environment and the built environment was the first step. The ability to combine both the effects of nature on well-being and the connection of the structure to the environment to create a holistic healing experience for the patients of this center was the last step.

All of this research will be gathered in many different ways, including interviews and statistical information. Analysis of all of these things is the largest component to this research, and it will show the interconnected relationships between nature, the built environment and the well-being of an individual.

DOCUMENTING THE PROCESS

Documentation throughout this process has been done according to the type of element I was working on. For the research element, there are a multitude of summaries and outlines of the journals and books that I have read and looked through. The site analysis is mostly captured in pictures and the personal evaluation of the site that I did when I was there. There is also a sketch book that has the majority of my findings, research, areas that need improvement, and conceptual ideas that are the heart of my thesis project. The reference list at the end of the book also shows the types of data that I found and used to complete this project in an educated way.

STUDIO EXPERIENCE

2nd year Fall 2008
Professor: Steven Wischer

- Mobile
- Tea House
- Boat House

Spring 2009
Professor: Mike Christenson

- Dance Academy
- Material Investigation Dwelling
- Pritzker Presentation

3rd year Fall 2009
Professor: Cindy Urness

- North Dakota Center for
Excellence for Future Studies
- Research and Analysis - "Context
Fargo"
- N.D.S.U. Downtown Center for
Health and Wellness
- Snow Sculpture
- Studio Portfolio Development

Spring 2010

Professor: Milton Yergens

- Fish House
- "Germ": The Machine in the Stubblefield Analogy
- Multi-Purpose Unit Located in the Downtown Area of Fargo, University Ave.

4th year

Fall 2010

Professor: Frank Kratky

- Transbay Terminal Highrise

Spring 2011

Professor: Paul Gleye

Term Abroad

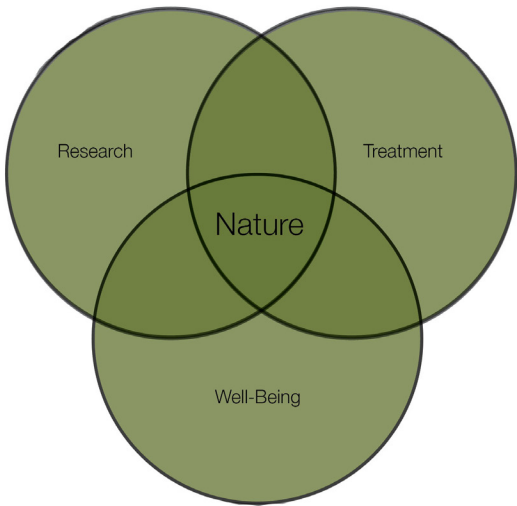
- Creating a new urban use for an unutilized space in Blois, France
- Renovating Rihour plaza to be a better utilized urban space in Lille, France

5th year

Fall 2011

Professor: Malini Srivastava

- Passive House - Constructin, Exhibit, Dismantle, and Publication of Documentation



PROGRAM DOCUMENT

THEORETICAL PREMISE RESEARCH

In architecture the structure becomes the main focus for design and the surrounding environment is put aside, when in all actuality the environment of the site is one of the most influential pieces in the design puzzle. The site does not just influence the way that the structure will be designed, but will also have an impact on the quality of life that the future users will have.

The quality of the ecological site and integration of structure and how it is constructed are just a couple of ways in which the environment influences human beings. The context surrounding a person influences the life that a person has and directs the changes that might occur in the duration of a persons life. Where people live, what they eat, drink, if they smoke, do drugs, go to school; all of these things make people who they are and are some of the determining health factors. A majority of the population believes that to have a healthy, illness-free life all they have to do is exercise and eat right; however that is incorrect. Even though having a healthy lifestyle lowers chances of getting diseases from chemicals that are in preservatives, and keeping a high metabolism lowers the chances of getting heart disease, there are other factors that people do not have control over. These factors include air movement, water pollution, light quality, ozone depletion, heating and cooling methods, and the surrounding landscape, which are embedded into our everyday lives. People generally don't think that these things might be harmful. This is not to say that all environmental factors are negative; there are a quite a few that are beneficial to people's health as well. The atmosphere is made up of a mixture of gases, liquid, and solid particles. When the atmosphere cannot remove the material that is added to it, a build-up of gases and aerosols, occurs which becomes pollution. Natural processes are the cause for some of this pollution, but as the majority of it is caused by human impact changing the natural state of the atmosphere. This change in the atmosphere causes an increase in the overall turbidity or dirtiness of an area. Since air is consistently moving, this causes a problem at the regional and local levels; places that might seem to have clean air do not because of this consistent movement, which definitely causes deterioration in the quality of life for some residents in the cities.

Pollutants and chemicals come in many different forms and can affect people in many different ways, whether these are from natural processes or not. This is not saying never go outside because there is no such thing as fresh air, because there is. Even though there are chemicals and pollutants in the atmosphere, not all places are heavily dense with turbidity, and the circulation of air, creates a freshness. The atmosphere is not the only thing that can affect the quality of a person's life; water has the same effect. Water is a necessity of life and is essential in having a healthy life. However, not all water quality is good, and it is hard to determine what is good and what is not. Most contaminated water can be detected by taste and color; these problems are caused by human activity. Even very small amounts of petroleum products can contaminate large volumes of water, and can be detected even after they have been diluted to acceptable levels. Water is used for almost everything: agriculture, industry, and public and private needs, and because of these large demands it is almost too difficult to replenish and recycle to have fresh water. Most of the time people notice when the water is not good quality, but there are so many small contaminants that it is hard to get fresh, good quality water, and even if the water is a little cloudy people will still use it, which means they are essentially putting some sort of contamination into their body that will affect it in some way. Water and air are both factors that affect people because they are ingested into the body. There are other types of factors as well, like light, which is an external environmental factor. Light can affect a person in many ways; not only is properly balanced light a prerequisite for all things, but the color of the light, the character of the environment, and the stimulation of the senses (or lack of) are all vital to normal life, as well as to survival itself (Birren, 9). Sunlight is essential to a healthy life, and ultraviolet radiation produces vitamin D, which keeps skin healthy, destroys germs, and affects certain chemical changes in the body. However, overexposure to ultraviolet rays may stimulate the production of malignant tumors of the skin (Birren, 13). Light affects not just the way things are seen but also the internal psyche of a person, how things are preserved, intelligence levels, and color especially evoke the emotions of a person. The quality of light, as long as it is not overexposed, does a lot of good for a person, more than people, may think. There are many things that affect a person; some are easily changed, like not being in the sun too long, but some come from years of ignorance like the depletion of the ozone layer. One might think that just because the effects

are not seen personally, that people are not being affected by these changes, but it actually affects the way people do things and live their lives every day. The impact of the international cooperation in controlling the release of ozone-depleting substances (ODS) has allowed considerable progress in making the ozone stronger and diminishing ozone depletion. The ozone protects the Earth from extremes of ultraviolet radiation, which would disrupt the Earth's biotic systems completely and life as we know it would be impossible. It seems as if this situation is being handled, but without being aware of what we are doing we could diminish the ozone layer once again and cause great danger to everyone. This depletion does not just affect people, the changes in ultraviolet levels have the potential to contribute to climate change, which affects the health of people as well. There are different ways that the environment outside can affect the environment inside of a building as well. The principles of heating and cooling an area are affected by outside environmental factors that can influence the health of an individual who utilizes the facility. Using passive methods circulate the air throughout the entire building is a great way to make sure that the air never settles, so less dust and molecules remain in the building. Creating and using passive methods like ensuring the building is orientated in the right direction to get the optimal amount of sun can help heat the building in the winter, and providing some sort of shading cover can help cool in the summer. These are just a few simple ways that heating and cooling can create a more comfortable living environment without providing more artificial and harmful chemicals that will eventually affect the individuals in the area. These principles also go along with the impact of bringing the outdoors inside. Nature is a great therapeutic tool to help healing. Fresh air, and getting out of dense city areas creates an oasis that rejuvenates the body and mind. There are preventorium's in the Western part of the hemisphere that are used to help children prevent and anticipate the risk of infectious diseases. These facilities are typically located in rural, wooded, mountain, or seaside locations, and it has been stated that these types of sites are beneficial to aid in healing health. Architectural features such as balconies, windows with views, verandahs, a playground, and gardens were designed to facilitate contact with fresh air for children inside the preventorium (Grose, 97). Landscape can also do a lot for the health of a person, whether it is just the difference of not being in the city or being able to enjoy the scenery of nature that has been long forgotten. The value that nature has for people can affect the health of a person like

the preventorium has been doing for some time. Because the landscape is something that is needed to survive, we need to try to protect the Earth so that in return the Earth can help and protect us as well.

We need to be conscious of our environmental surroundings and the impact that they have on us; this consciousness requires a level of intent. Through a more vitalistic connection with our environment and the ecosystem, we have the opportunity to really explore optimal performance—not just for ourselves, but for the fragile planet we call home (Bolles, 2010). The environment has changed a lot since its existence, especially since the presence of human beings and the impacts that we are making. Nature and society have a relationship with each other; one will always be affected by the other. Humans are leaving our mark deeper into the fragments of the land without conscious intent of the impact we are truly making, and the ignorance of the processes involved eventually will reduce and diminish the capacity of the land to maintain its contribution to the healthy environment on which society depends. The ecological site provides many opportunities for a more beneficial solution to a design problem where the land and building become one entity to work together to provide a more sustainable atmosphere. Combining the elements of structure and nature is not just being sustainable, it is actually going beyond the principles of sustainability and being regenerative.

Regenerative architecture is the practice of engaging the natural world as the medium for, and the generator of the architecture. It responds to and utilizes the living and natural systems that exist on the site that become the building blocks of the architecture (“A living systems Approach to Design” as cited in Litterman, 2009). Regenerative architecture describes processes that restore, renew, or revitalize their own sources of energy and materials, creating sustainable systems that integrate the needs of society with the integrity of nature. Essentially regenerative architecture goes beyond sustainability. It not only provides an environment that is balanced, but it adopts an understanding that everything is connected through a web of supportive relationships and reintegrates us with the environment. Humans need to start thinking about the damage that has been created by the counterproductive manner in which we live, and is degrading the quality of our world. The integration between the environment and the built world has without doubt been influenced by the interaction of human beings, and it is in our nature to help prevent any further depletion.

Regenerative design is based on the premise that everything that is built has the potential for the integration of the natural world as an equal part of the architecture. The process of regenerating our environment from the years of damage done to it is a process that will take some time but we can start by implementing regenerative principles to minimize the environmental impact and positively influence the ecology of a site. The principles are guidelines that integrate not just the built world and the landscape but incorporate humans into this interconnected web as well. The health of the ecosystem is improved and the architecture is now producing more than it consumes. Having a positive impact can be achieved with regenerative architecture. There are nine principles that will be applied to this thesis to create a regenerative design. These will encompass both the architecture and the landscape while creating an ecosystem that is improved. These principles are whole system design integration, integration into the landscape, intelligent limits, concentration, intelligent construction, bold ecology, community, experience of places, and culture. Whole system design integration means that all systems and entities are accounted for and incorporated into the system design. These systems need to be mutually involved in the communities of the systems, meaning that each entity provides support for more than one other entity, serves more than one function in the system, and provides more than one solution. It creates a supportive web in which each entity strengthens and can rely on each other to function and develop a balanced system. Analyzing the natural features of the site will give a better understanding to the type of landscape that will be dealt with. Being able to understand the site will then create a foundation in terms for designing the different types of systems that will be incorporated into the building. When analyzing one must also think about the limitations. Intelligent limits is the next step in the process of being regenerative. Each material and space should be maximized and integrated to its fullest potential as a part of the whole system. This process will create and reflect a natural equilibrium for the program it is intended to be a part of. In this process concentration is something to consider, realizing that less is more, that each space is necessary, and creating a duality between the spaces so that the spaces are flexible. Once the elements of the system are figured out construction is the next step, but people need to be intelligent when constructing. Intelligent construction incorporates the use of both natural and artificial processes, and maximizes the efficiency and potential of the materials used.

Figuring out the best process for construction is essential, but the structure needs a site, which is one of the most important components to construction and design. Ecological sites are regenerative by nature, the production provides a positive net output, which embodies all natural elements and harnessing the artificial ones. Energy is transcendent, it provides information along with production, and the site has a lot of different energy that can be utilized by the structure during construction and during the use of the building. All of these things combined create a community, and making sure that the community is in good condition and is interconnected is one of the principles that needs to be followed for a site to be regenerative. In this community all entities are an integral part of the process and system, and need to support each other and function. The influence of the construction and design are both based on the system as a whole and not a sum of the parts, so the ability for it to work well together is very important in this process. This process would not be completed until the involvement of the people who are going to utilize the facilities are put into the structure and truly experience the place. Experiencing the place means that the image of the structure needs to formulate a positive experience, which is driven by a clear systematic form. This place needs to tell a story that showcases a positive response to the humans who are interacting within its walls. People should be able to feel the welcoming aura of the facility as soon as they enter the building, and this feeling should not leave until they exit. The environment within the walls need to be one that evokes a positive feeling all around the area, creating a culture that is unique to the structure. The culture of the design and construction needs to be evident in the building, by highlighting the social history of the area and place. The culture, along with experiencing the structure, need to enhance the quality of life for the individuals who utilize the space. These principles will provide a site and structure with a sense of wholeness that goes beyond sustainability and provides a more beneficial space for years to come. Regenerative architecture, through the whole systems thinking model, reconnects humans to their surroundings. It becomes an embedded piece of the ecosystem, contributing to the natural balance, which inherently connects the occupants of the dwelling to the land on a deep and spiritual level. The deep connection returns humans to their role as equal shareholders in the health and wealth of the place and the biosphere in which we exist (Litterman, 8). Constructing a structure utilizing these principles along with figuring out

how the environment affects human's health are only parts of the problem and solutions to providing a better quality of life to sustain a healthy lifestyle. Knowing the risks and learning how to make conscious choices to reduce them by embracing a holistic lifestyle is the very first line of defense.

There is no need to emphasize the fact that the environment is a huge part of everyday life; it influences a multitude of components that make up the uniqueness of people. The ecological site, construction of the built environment, and the environmental factors that affect a person's health all create an atmosphere that is holistic when working as a single entity. The word "Holistic" has many meanings. According to Merriam Webster's dictionary, it is a theory that the universe, and especially living nature, is correctly seen in terms of interacting wholes (as living organisms) that are more than the mere sum of elementary particles. According to the Britannica Encyclopedia, holistic relates to or is concerned with wholes or with complete systems rather than with the analysis or treatment of dissection into parts. So essentially it is the wholeness of things, or in this case, of people. The person is not just the sum of his or her parts; the human being is an organism that is a whole integrated system that is very much interconnected. In many cases especially medical, the only thing that is treated, or at least looked at, is one thing or symptom, when in actuality this one thing is affected and affects many other elements in the system. There are six domains: physical, emotional, social, intellectual, spiritual, and environmental, that can affect someone's ability to be in complete equilibrium and balanced as a whole. In most cases a majority of these factors are not in sync, thus causing a not so good outcome for an individual. With our personal health, the key is in learning the basics and then acting responsibly (Snell, 2008). We as humans adapt to change but are inept at predicting the consequences of that change. This is one reason why this is a problem that needs to be addressed. Health care is not just institutional; people do not get better sitting in a tiny room. However, if a person gets the care they need while being in an atmosphere that is safe and nontoxic, and the care is not just conditional, but provides a balance for the ecosystem of the individual, this creates a healing, holistic experience. In a world of specialization, we have been trained to think of medicine as a separate world – when we are sick, we go to doctors and follow their advice. This is starting to change with the increasing popularity of alternative and holistic approaches to overall health and well-being (Cook, 2002). Holism in medicine obtains a healthy lifestyle.

This is a very controversial topic, because most holistic methods are considered alternative and contemporary because they can not be fully tested to see if they actually work or not. However, the one consistency that is proven is that these so-called alternative methods do provide for the wholeness of the mind and body of a person and do not just stop at the point of interest like most conventional medicine does. Patients need to be at the center of the care, physicians are not just treating illnesses but unique individuals who react and respond in different ways. Providing a holistic environment will give the patients time, care, and treatment. The disease is not a separate entity but is part of the individual and cannot be treated in an isolated way. The mind and body need to work together to get through this difficult time and being in a place that was developed as a holistic space can create a quality of change in a person for the better.

There are many factors that can affect a person's well-being; most of these factors are out of our control and we can only be aware of our affect on the Earth. If everyone is conscious of what they are doing, then as time goes on these factors will only affect people in a positive way. Until then, however, these principles of creating a holistic experience incorporate not just the human as a whole but also the sum of the structure's parts as well. The principles of regenerative architecture will at least be a starting point to ensure that the structure is designed and created in a way that benefits the individual in a positive way along with the surrounding environment as well. Being able to provide a place that evokes a positive emotion in people and that also treats their illness as not just a single component but treats the body as a whole will create an atmosphere that is comfortable. A holistic concept of health has to encompass our bodies, our buildings, and our planet. Creating this holistic experience is a very important component to making sure that the uniqueness of the individual is celebrated, along with making sure that he or she gets the treatment that is needed to get better. People who experience these spaces will hopefully become at peace with this difficult time in their lives and be able to forge through it with grace and elegance to a better quality of life that sustains a healthy lifestyle.

THEORETICAL PREMISE SUMMARY

The theoretical premise emphasizes three main aspects of the underlying idea that will influence the entire design process and development. These aspects revolve around the research, treatment, and well being of a person who is diagnosed with cancer, which is influenced by nature that is the heart of the project. There are many different components to the environment, which is a very influential element to the well being of a person. What people eat, drink, where they live, where they work, and if they smoke or abuse substances are all factors of the environment that people can surround themselves in and all affect people's health. Health is not a separate entity; the human body is an integrated whole system, so when functions change the effect is severe. In this research I looked at a few factors such as air, light, water, heating and cooling methods, and the depletion of the ozone layer to see how these specific factors affect the quality of health in a human being. In all instances there were both negative and positive affects on a person, however, most of these were very generalized statistics and were not specific to this particular climate or site. The surrounding environment, in the most basic ways, however, can affect the human body, and this potential has not been fully recognized to cause an effect that is worth a change.

Just like the human body, the environment is made up of a web of interconnected relationships. In this aspect, every cause has an effect that might not show a difference right away but might cause a change years from now. Being sustainable is not enough anymore, especially when designing and constructing a structure, and going beyond the methods of sustainability is an aspect that this project is trying to accomplish. The principles of regenerative architecture will be utilized in the design and construction process of this project. These principles actually go beyond sustainability in revitalizing the ecological site by utilizing the natural and living systems that exist, to

become the building blocks for the architecture. This process involves nine different components that need to be completed efficiently in order for this type of construction to work the way it is intended. The different components are whole system design integration, integration into the landscape, intelligent limits, concentration, intelligent construction, bold ecology, community, experience of places, and culture. These principles integrate the built environment and the surrounding environment into one entity, providing an interconnected relationship of components that involve human beings and the impacts that they might have on the site. To minimize the environmental impact and positively influence the site to provide a better quality of life for the patients that will utilize the establishment is the main focus of this project; regenerative design helps to achieve this outcome. The environment is a complex system, but using simple principles can provide a better connection to the Earth.

The effect that the environment has on a human's well being, along with the connections that can be made reduce human impact while influencing positive relationships are all consumed by the last aspect of the theoretical premise. Providing a holistic experience for a patient is not just treating the cancer cells alone, but making sure that the person as a whole is taken care of as well. People are more than the sum of their parts and providing care for just one part is not fully treating the whole problem. Since the human body is an interconnected web of relationships the whole person needs to be taken care of for a person to truly heal. It is in our best interest to create a facility that will encompass all elements of a person, including the physical, emotional, social, intellectual, spiritual, and environmental factors. This way people as a whole can get better in their own way and the facility still can provide a holistic experience that can fit any type of situation people might have while trying to sustain a healthy lifestyle.

BRADBURY CENTER



Project:
Health, social, and medical center

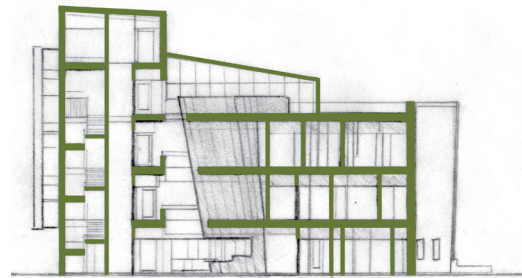
Architects:
Penoyre & Praasad LLP

Location:
Belfast, Ireland

Footage:
39,826 sq. ft.



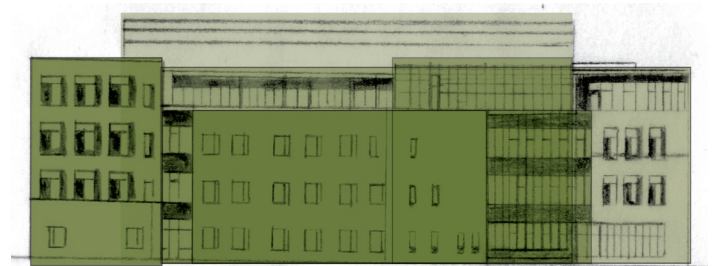
The Bradbury Center is a unique type of building for the United States but is actually quite common in the United Kingdom where a majority of my case studies are located. This center not only provides community healthcare in its clinic, but it also includes social services, so that everything can be taken care of in one place. The procedures that take place in the building are very common; there are no specializations that happen in this building even though it is a landmark in the community. This four-story building was developed to replace several of smaller dispersed service buildings in a state-of-the-art fashion. The creation of this structure took some innovation considering where the site is located. The site is in a very narrow and restrictive area, with the main line railroad on one side and the tower of the city hospital on the other. With its glass organic forms and dimensional design, this building certainly stands on its own. Besides the formal design, the interior atrium is another astonishing feature of this facility. This atrium vertically spans three stories that allow natural daylighting to enter all spaces and create a more friendly environment. The dimensional design comes from the different orientated levels that emphasize the public spaces as being more important. Having this direct indicator is great for people trying to navigate through the facility. The designers also made it easy to navigate by the circulation patterns in the building; it is easy to see what the areas are for and which are just for the administrators. The layout, using simple geometry, makes this possible. The Bradbury Center was also designed to facilitate future applications for technologies, growth, and practices.



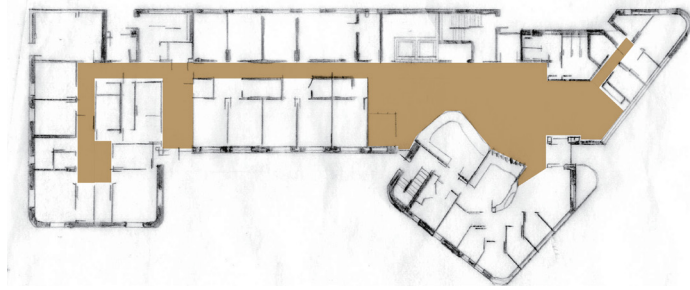
Structure



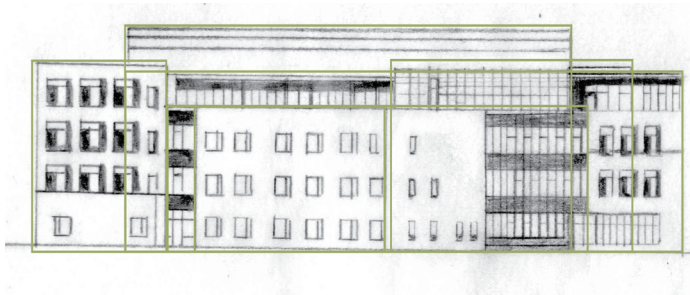
Natural Lighting



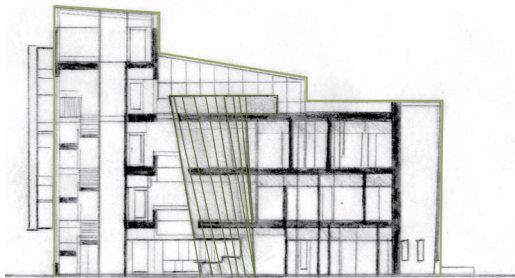
Massing



Circulation



Geometry



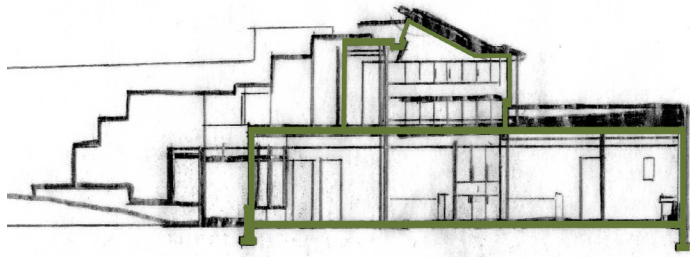
Heirarchy

The theoretical premise for this project is based on nature; how research, treatment, and care can positively change a person's life. The Bradbury Center does positively change the lives of those who utilize the building and those in the community. It has become a landmark for not just health, but providing social services in the same area creates a multi-faceted structure that is essentially a hub for well-being in Northern Ireland. The development of the atrium is one of the most unique features, and it, is also one of the most important aspects to the building. This atrium is located by the main entrance, which creates an open atmosphere that is inviting and welcoming. It also spans three stories, so this comforting feeling can be used in the treatment areas and waiting areas on the other levels as well. Even though it is an institutionalized facility, some of the aspects that were created and the reason why they were done in that particular way focus on the healing of people as a whole and not just the illness or issue that they might have. The idea behind having a multi disciplinary facility that addresses both the body and the mind is one of the concepts that my thesis is trying to develop. The idea is not just treating one aspect but, since the body is an interconnected system, treating all aspects to ensure the healing process is actually working. The materials, natural light, and organic forms make this facility more than a building, it makes it an experience that will help with the needs of the people who visit or end up staying in this building. This is why it is a case study for this project; it might not fully relate to the theoretical premise, but it shows some ways to create healthcare facilities that are not just about health but social issues as well.

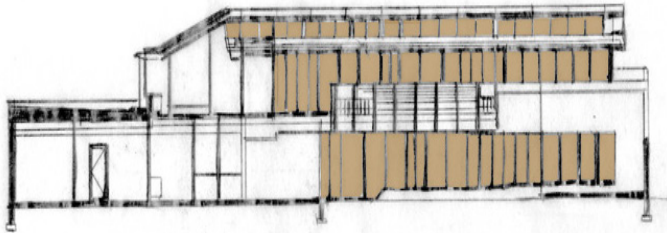
CONAN DOYLE
MEDICAL CENTER

Project:
Design/Build Medical Center
Architects:
Richard Murphy Architects
Location:
Edinburgh, Scotland
Footage:
32,991 sq. ft.

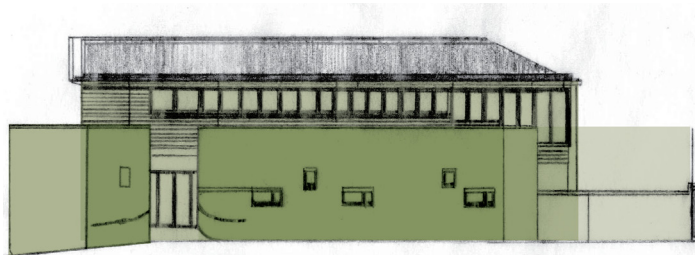




Structure



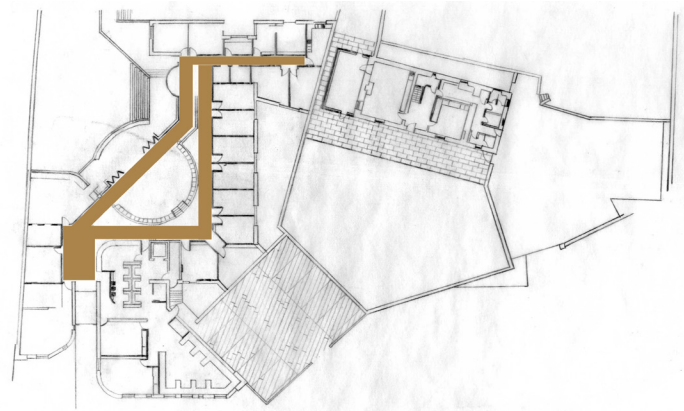
Natural Lighting



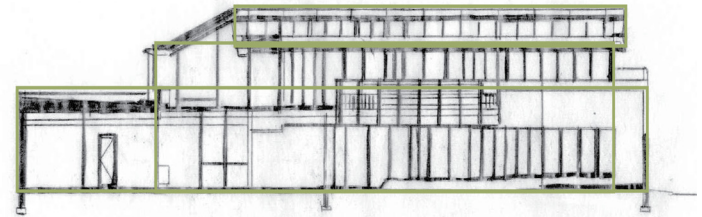
Massing

The Conan Doyle Medical Center was designed to provide health, it does not just use the trained physicians, but also uses the aesthetic quality of the building. Unlike the Bradbury Center there is not an atrium that it illuminated with natural day lighting, however the architects of the Conan Doyle have taken a more environmental approach to developing this structure, to try to minimize the impact on the site as much as possible. In doing so, the surroundings became an elemental part of the design process, especially the 200 year flood levels, which is why parts of the design are built up, especially since the building was built 4.5 meters below the road. The design of this facility is definitely not traditional. Besides minimizing the impact on the site, the other main aspect of the design was to make sure that the common areas for both the physicians and the visitors, along with the circulation, focus on a private, walled garden. This garden provides an element of nature and an atmosphere that is calming and soothing, and it can also be seen from the entrances of the building, so people can glimpse this garden as a welcoming place as soon as they enter the building. The architects truly tried to surround this medical center with aspects of the environment to create a non-institutional feel to a place that it usually does not feel inviting. For this site to be tucked into a town, the designers really focused on providing a better environment for health, not only for the patients but also for the physicians and administrators who work there. The western perimeter of the building has a retaining wall around the entrance, but the eastern side is a pedestrian route that connects this site to the surrounding roads. This provides an opportunity for those utilizing the space to get further into nature by utilizing the pathways provided.

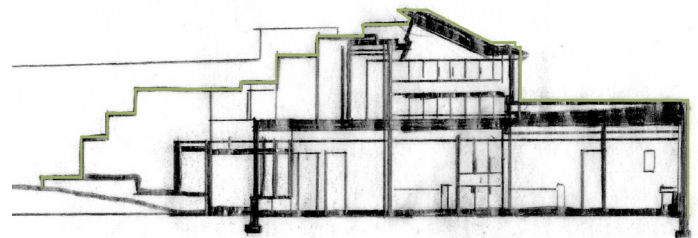
There are a lot of aspects to the design of the Conan Doyle Medical Center that resonate well with the aspects of the design and theoretical premise of this thesis project. There are interconnected relationships between the environment and medicine. Even though this case study only briefly discusses how the surroundings can influence and impact the medical field, it still shows that nature is an essential piece to the healing and health process. This facility tries to connect the built environment with the natural environment in a very literal way, and that would be the only thing that deters me from applauding this building in its design aspect. The green roof on this building is just there to provide a sense of ambiguity, not to be a functioning piece that would minimize the environmental impacts humans have on the land. Having the walled garden is an easy wayfinding tool, especially since it is located in a very centralized location. Also, the use of nature within the building is a great way for people to stay connected to the feeling that they might have had while in the garden. Using the garden walls as the division for the consulting rooms gives these spaces privacy and makes them not so intimidating to be in. In this building nature has become a secondary tool for the development of health, not only to the patients and visitors but also to the people who work there. This case will be a great way to understand some of the basic ideas of how a medical clinic will run and what types of spaces will be utilized. There are a lot of aspects of this building that make it a very important case study that is very relevant to the main components of the theoretical premise for this project.



Circulation



Geometry



Hierarchy

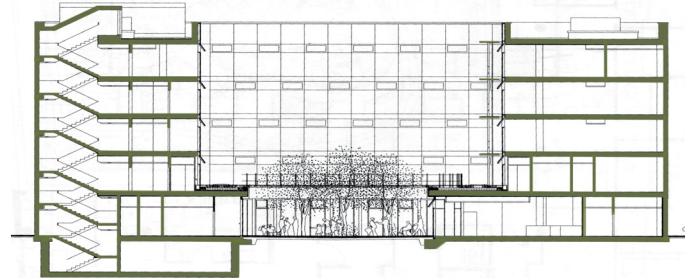
KALEIDOSCOPE
CHILDREN & YOUNG
PEOPLE'S CENTRE



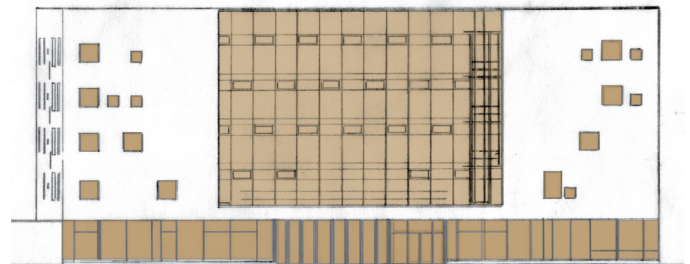
Project:
Children and young people health center
Architects:
Van Heyningen and Haward Architects
Location:
Lewisham, London
Footage:
46,284 sq. ft.



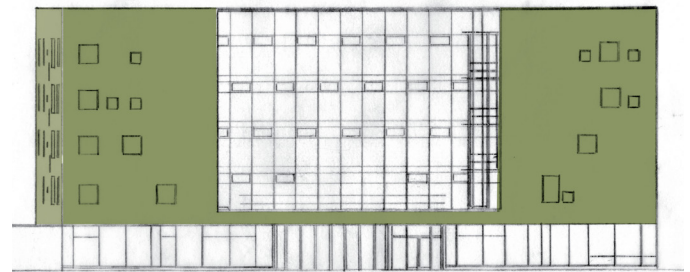
The Kaleidoscope Children and Young Peoples Medical Center was designed with the same intentions that are guiding this design project. This five-storey facility tries to provide a holistic solution to this building dealing with health and social welfare issues. Establishing a foundation that is based on holism is not common how healthcare facilities are designed. The architects wanted to provide a sense of welcome and evoke the psyche even before entering the center. A large range of colors are utilized in this facility; color helps mentally with healing and coping with change. Besides using color, the architect created the floor plan to be in a 'C' shape, for two very important reasons. First, it ensues that there are no enclosed corridors, and that all the circulation that happens is located near the center area. Second, the center of the facility is a grand outdoor space that is a very pivotal point in the design of the building. This outdoor area brings the surrounding environments into the facility, just like in the Conan Doyle Center, however, this outdoor area is more than the sum of its parts. The outdoor is great for naturally daylighting the entire interior of the facility, since the circulation is based around being able to experience this area, and becomes an easy wayfinding tool for navigating this large structure. It not only provides sunlight, but also provides a time out for relaxation, and collecting oneself, if needed. The other aspect of the outdoor area that has not been mentioned in any of the other case studies is that having this area in the center of the structure is a great tool for natural ventilation of the interior spaces. The architect that designed this facility did so in a way that was innovated, sustainable, and gave people the type



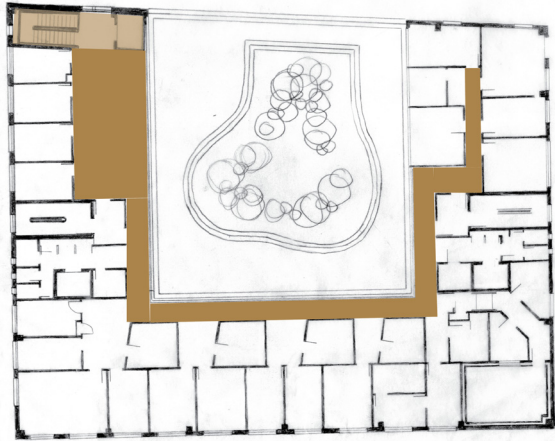
Structure



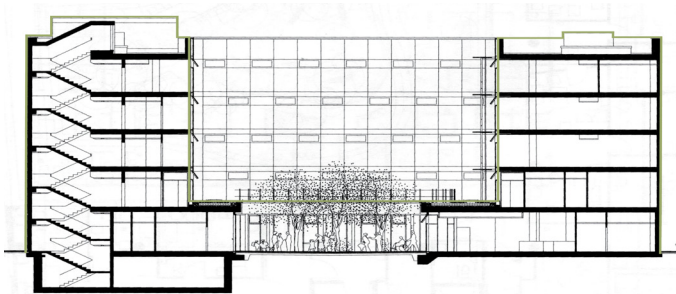
Natural Lighting



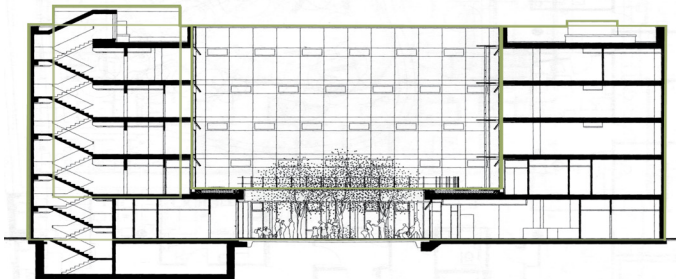
Massing



Circulation



Geometry



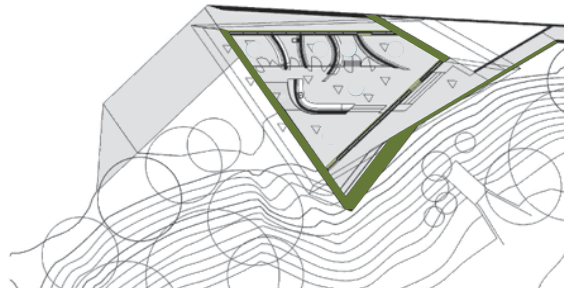
Hierarchy

of care they will need to face any future issues. The underlying principles that were utilized in this structure definitely compare with the aspects of my theoretical premise for the design of this project. Besides the fact that this entire building is designed around the outdoors, and the positive effects that will have on the users of the building, the focus on using environmental methods is an aspect that no other case studies have explored yet. The quality of the interior elements such as air, ventilation, water, and heating and cooling methods are all things that need to be considered when dealing with healthcare. Naturally ventilating the interior from the massive outdoor area that was already designed is an economic and smart way to regulate the specifics that a medical center might need to facilitate correctly. The sustainable practices did not just stop at ventilation; the architect decided to apply motion sensitive lighting and Battiso cooled ceiling panels throughout the building as well. Even though these aspects are not as aggressive as regenerative is, it is definitely a step in the right direction in trying to make a difference. In healthcare it is very hard to develop certain components like sustainable acts, and provide a holistic experience in the spaces and the care of the patients. It is a field that has very strict guidelines of what is required and utilized depending on the type of care provided. The government owns most healthcare facilities, and these principles are thought to be more expensive, which is not always the case. The Kaleidoscope Medical Center used these principles and are providing care that treats the whole person, and was created for around the same cost as a conventional healthcare facility. This facility has the best of both worlds, being sustainable while treating the total person, which is the direction that healthcare should be going towards.

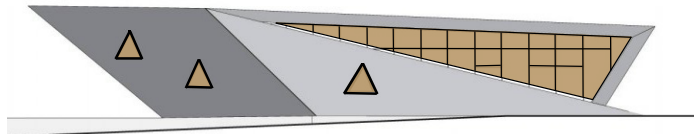
MAGGIE'S CENTRE

Project:
non-institutional cancer center
Architect:
Zaha Hadid
Location:
Kirkcaldy, Fife, Scotland
Footage:
2,690 sq. ft.

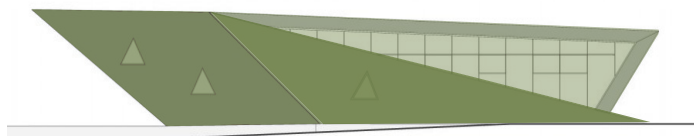




Structure



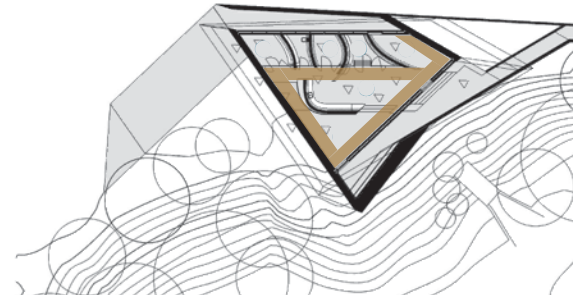
Natural Lighting



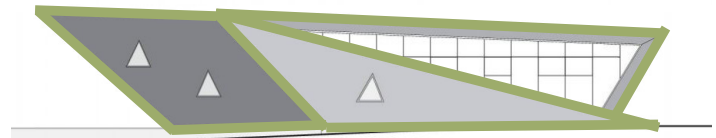
Massing

This case study is completely different from any of the other studies because this facility's concept is based around the kitchen table, and how the connect between people becomes more personnel. Maggie's Center is an establishment that focuses on the care of cancer in the patients, and provides the necessities that are needed to cope and heal with such a huge change in peoples lives. The main principles for these centers are emotional and psychological support, relaxation and stress management, and any other essential information or support that might be needed. This building is more of a psychological center that deals with cancer in an atmosphere of domesticity, which contrasts with to the institutional nature of many National Health Service buildings. These principles are the commonality for all of the Maggie Center, however, each center has its own entity, and reflects different thoughts on designing non-institutional facilities that provide a holistic experience for the users in the building. Usually, these centers are located in a secluded area where the building and users can interact with nature, but are still in a location that is close to an institutional cancer center. This center is located in Kircaldy, Fife, Scotland, and designed by Zaha Hadid. This cancer center has a very unique layout that reflects the desire to create a relaxed and aesthetically uplifting environment, where additional support is provided for those affected by cancer to build a life beyond cancer. The folding surface articulates a directional emphasis of moving the visitors into a different space from the rest of the hospital grounds. The distance from the institutional hospital is also evident in the large overhangs

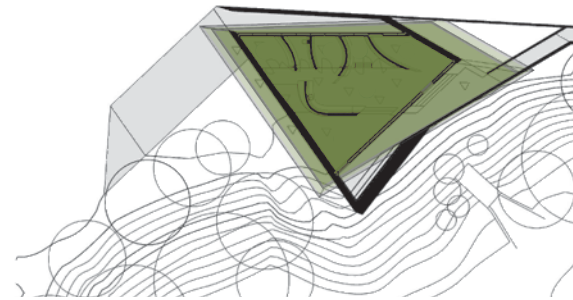
of the roof that are used to extend the building into the landscape on both sides. They protect the entrance doors on the north side while on the south side they provide solar shading for the glass elevation and partially cover the terrace. This facility is trying to be its own entity in the care of cancer patients, but the location in relation to the hospital is something that is quite relevant to the utilization of this center. The convenience of having both types of care so close together is just another way that this facility tries to benefit the patient as much as possible. The design is very simple, but does wonders in the context in which it was placed. This facility is located in a somewhat secluded area, and emphasizes that nature is part of the healing process in this building. The landscape of the site has a bluff located on it, and the glass elevation and terrace were strategically placed on this side to overlook the surrounding environment, and be able to capture the views from the interior of the building. Since the structure is so small and triangular, there are not a lot of places windows, so to obtain natural daylighting, wall skylights are scattered over the building to allow views, light, and continuity of form into space. This facility is a bit too small to be the type of facility that I want to design, however, the underlying ideas the Maggie's Center concept are ideas that make sense in providing a life beyond cancer. The structure itself is simple to navigate and provides the healing process of interacting with nature and provides views that can all add to a holistic experience in a space, which is one of the main concepts of this project. Zaha Hadid created a structure that provides the types of care unseen in other facilities and is the main reason for its inclusion in the case studies.



Circulation

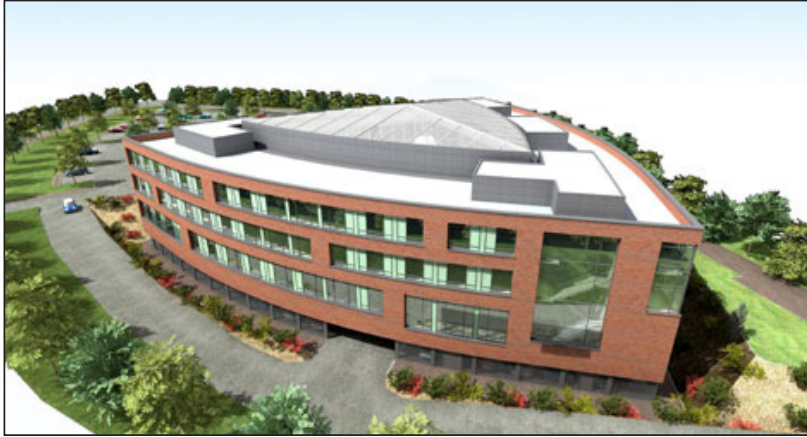


Geometry



Hierarchy

PORTADOWN CCTC



Project:
community care and treatment clinic

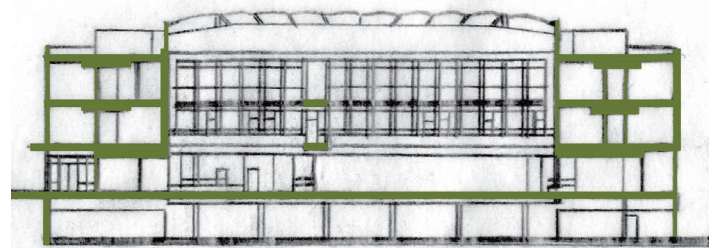
Architect:
Avanti Architects with Kennedy
FitzGerald and Associates

Location:
Portadown, Ireland

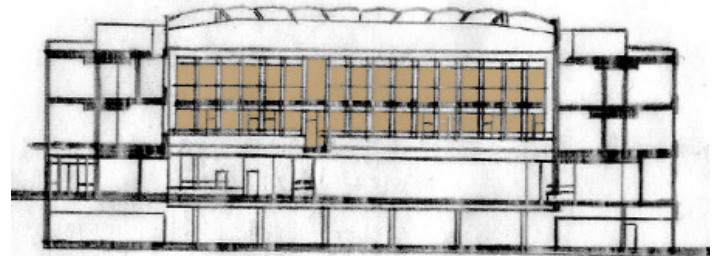
Footage:
64,583 sq. ft.



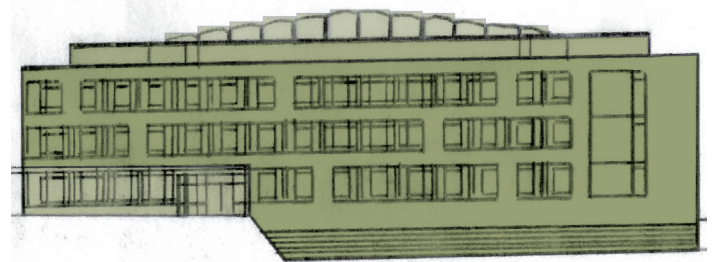
The original design for the Portadown Health Center was to replace the existing facility that had become incapable of meeting the demands of the growing local community. This facility now has become a hub for modern and dependable primary care, while hosting numerous other services to become a one-stop shop to improve patient access and reduce pressure on nearby Acute Hospitals. With all of these services it would be easy to get lost in such a large institution, but the designers considered that. In the center of the facility there is a three-storey atrium. The atrium has influenced the design of the building along with the fluidity of the spaces and circulation. The space that the atrium creates is utilized not only by the vertical circulation but also as a communal area in this building. This permits the visitors of the facility to take a break from the intense dynamic of this area. Not only does the atrium provide natural day lighting for the interior spaces of the facility, it also acts as a way finding tool for easy navigation throughout the building. The triangular function of the building as a whole provides for optimal space and movement, but also allows for the development of future uses and establishments. Because the atrium space is the centralized navigation area it provides optimal exits and entrances to certain areas of the facility. The structure has good supporting concepts and aspects to it that make it a viable case study, however, it does have some weak points that make me think that it might not influence the design of my project much. Having everything in one place is somewhat in the holistic realm since it satisfies more than one area of care for someone, however, having all of



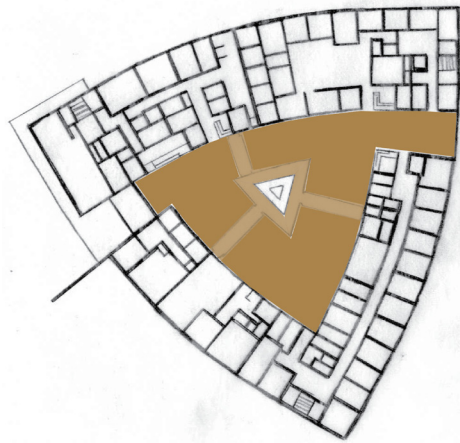
Structure



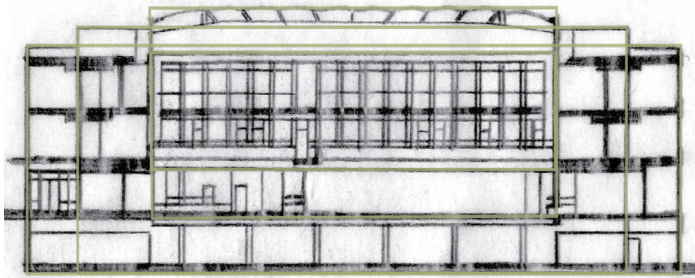
Natural Lighting



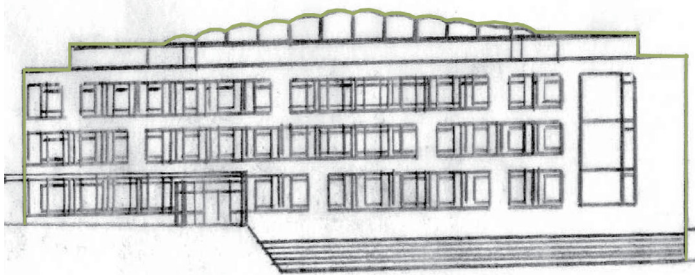
Massing



Circulation

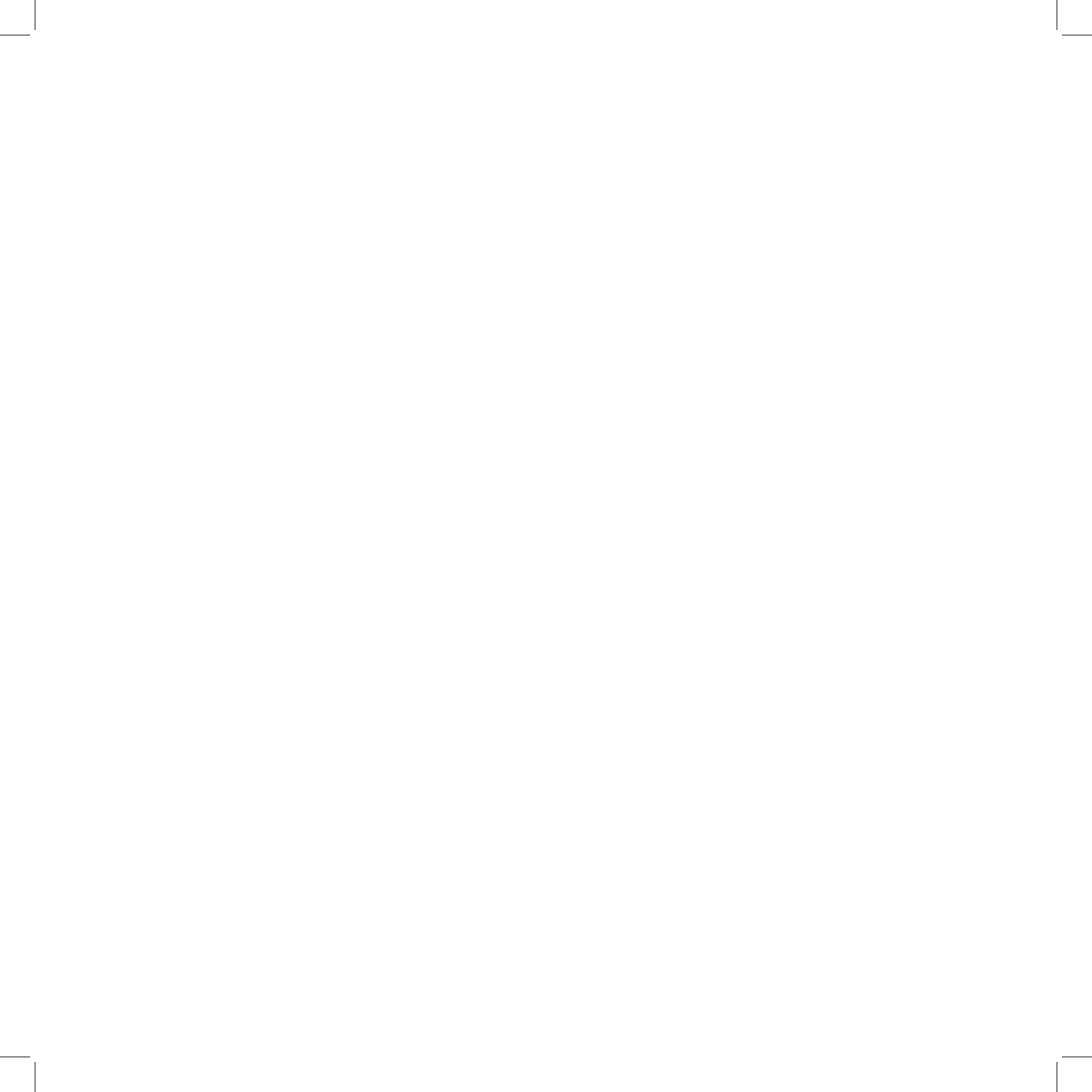


Geometry



Hierarchy

these services in one place might make the care more general, and people may get lost in the hustle of all the people utilizing the spaces and services. Generalizing care for the public is not the type of care that is preferred for the facility being created for this thesis. Besides the care, the utilization of the site and the environment are almost irrelevant to these designers and do not even consider the possibilities of the positive effect that it might have on the people who use this facility. Creating a multi-faceted building such as this one in a very functional and easily circulated way is not an easy task, however, these designers do this in a way that even provides for future use, since everything is constantly changing. This case study is being evaluated because it is a multi disciplinary building that is very integrated and connected. Since the whole theoretical premise is about connections and integrated relationships, this is a great way to see how a facility on a much, larger scale deals with making sure everything stays connected. On the other hand, I want to make sure that the services provided do not overpower the actual ability for things to be accomplished in an effective manner. The layout is simple, and the circulation is centralized and consistent on every level, which makes such a large building seem not so big. Even though the project being designed is not this large, easy fluidity and accessibility to the services needed is definitely something that needs to be figured out. Even in small areas, if the layout is confusing, it will make the process even more stressful, and stress is something that this building should eliminate, not influence. This case study was essentially evaluated because of the ease in the layout and placement of spaces in the building, to provide a more convenient facility for healing a life beyond cancer.



TYOLOGICAL RESEARCH SUMMARY

The case studies that were presented in the previous section showcased a range of different aspects that could potentially influence the future design of this thesis project. A majority of these case studies focused on the combination and connection of health and social issues, which is relevant to providing a holistic experience within a facility. Creating spaces that encompass care and well-being for not just the illness but also the person as a whole is something that will be focused on in this project. This method of care was the main characteristic of the Maggie Center, created by Zaha Hadid; utilizing the method that this facility provides along with the rest of the Maggie centers would give the basic blocks of a solid foundation for the type of care that is emphasized by nature but creates a life beyond cancer. Since this project will be a multi-disciplinary design, the layout, circulation, and fluidity of the two is something that will definitely be focused on to make sure that the navigation of the building does not cause more stress than needed. The Portadown Community Care and Treatment Center is a very good example of how a complex building that provides many services can have a simple layout and easy circulation throughout the entire facility. In most of these cases, the circulation and layout revolved around some centralized entity, usually green spaces or an atrium of some sort. Having buildings that captivate the energy and potential that nature can provide benefits not only the administrative staff but helps with the healing and coping processes that most of the visitors will have when dealing with lifestyle changes that come with having cancer. This interconnected relationships of nature to the human body is another principle that this thesis project focuses on. The surrounding environment can make a huge impact on a person, not just on the affects of views but quality of life as well. The Conan Doyle Medical Center utilized the site and environmental elements as part of the design process.

The most important part of this design was the walled garden that everyone in the building can experience. Not only did this create a more cohesive and fluid building, it also became a functional aspect to the design as well. The walled garden façade became the ventilation system for the building so the interiors have natural ventilation, and with this circulation creates a better quality of air throughout the entire building. Not only can the systems be impacted by nature, but the quality and quantity of natural light that is permitted into a space also affect not just the physical but also the mental states of a person. Having these green spaces located in a centralized area provides a large quantity of natural daylight into the interior spaces. This light creates an open and welcoming area for people, which is usually true of most institutionalized facilities. The Bradbury Center is a case study that does not have just one atrium area but a multitude of them to make sure that natural light can be accessed through every area of the center. Its main atrium, however, is a three-storey entrance that also provides direct light into the waiting areas and communal areas on the first and second levels. Like the Bradbury Center shows, consideration of family and friends is another aspect that needs to be examined. The surrounding support system, like any system or entity, is a web of interconnected relationships that creates a large chain of cause and effect when something is changed. A facility like the one that is going to be developed in this thesis project, should consider all of the aspects that are needed. There are a lot of different ways that people cope, mourn, and deal with huge changes, however, this is not a process that one individual can accomplish alone. These case studies have provided a good range of information about what type of structure is needed to be developed to satisfy the components of the premise. Not all of the case studies are relevant to each other and do not have to be; however, there should be a connection to the theoretical premise. Utilizing the information that was analyzed in these case studies will help develop a well-rounded building that has an emphasis on nature throughout the entire facility.

HISTORICAL CONTEXT

HISTORY OF CANCER

Cancer is a serious problem; statistically, about half of all men and one-third of all women will develop cancer in their lifetime in the United States alone. It is not a surprise that this disease has been at the forefront for medical advancement in the past few years. However, this was not always the case; cancer was actually very slow in its development. There have been many advancements in the medical and scientific fields that have made it possible for us to treat and diagnose cancer as well as we currently can.

The oldest discovery of cancer was in Egypt and dates back to about 3000 BC. Ancient manuscripts describe eight cases of tumors or ulcers of the breast that were treated by cauterization. In those times “there was no treatment.” Now this might not be true, but it is interesting that the disease has been around for so long and is fairly recently becoming a huge problem. In 1761, Giovanni Morgagni of Padua was the first person to perform an autopsy to relate the patient’s illness to pathologic findings after death. This discovery became the foundation for present-day scientific oncology. Soon after this discovery by Giovanni, a Scottish surgeon, John Hunter, suggested that if the tumor had not invaded nearby tissue and was removeable, that cancer might be cured by surgery. He believed that “there is no impropriety in removing it.” After these two realizations about cancer there was a long lull and it was not until about a century later that anesthesia was developed. This was one of the first discoveries that helped to develop an understanding of cancer in general. Anesthesia allowed classic cancer operations such as the radical mastectomy to become developed.

There were a few major discoveries that really helped and influenced the process of cancer to become such a vital part of almost everyone's lives. The 19th century was the birth of scientific oncology, which is the study of cancer and how it can manifest in various systems throughout the body and progress in different ways. Because of this understanding, along with the use of the modern microscope, Rudolf Virchow was able to study diseased tissues. These findings made Virchow the founder of cellular pathology, and provided the scientific basis for the modern pathological study of cancer. All of these findings and discoveries aided in the development of cancer surgery, and body tissues that were removed surgically could now be examined and a precise diagnosis could be made. This discovery also aided in being able to figure out if the cancer was completely removed from the body or not. By the middle of the 20th century, scientists had the instruments they needed to work on some of the complex problems of chemistry and biology that still remained unsolved, including some aspects of cancer. In 1962, James Watson and Francis Crick received the Nobel Prize for their work on discovering the exact chemical structure of DNA. This finding was one of the most monumental discoveries in the medical and scientific world, and it opened up a whole new realm of discoveries and advancements. DNA was found to be the basis of the genetic code that gives orders to all cells, and learning how to translate this code made it possible for scientists to understand how genes work and could be damaged by mutations. With this and more advanced knowledge of what cancer is and how to treat it, scientists could now diagnose different types of genes, mutations, and cells that either form cancer or change because of cancer. In 1970, a scientist discovered two particularly important families of genes related to cancer: oncogenes and tumor suppressor genes. The oncogenes are a mutated form of genes that cause normal cells to grow out of control and become cancer cells. These cells are mutations of the cell Proto-oncogenes, which normally controls how often cells divide and the degree to which they differentiate.

Another type of gene that became recognized would be the tumor suppressor genes, which are normally genes that slow down cell division, repair DNA errors, and tell cells when to die. When they do not work properly, cells can grow out of control, which leads to cancer. These new discoveries of gene types in the body provided the advantage of prevention, just like in the 1990s there was a discovery of two genes. BRCA1 and BRCA 2 genes have the potential to cause some breast cancers, and knowing these genes, scientists can use them to identify people who have a higher probability of developing breast cancer. Therefore, preventing these people from going through the process that many people have gone through after getting breast cancer or any cancer in general.

There are more ways to prevent cancer than just understanding the type of genes that cause cancer; for an actual person there are a few factors that can be determiners, such as the elements that a person surrounds and interacts with. In 2011, the World Health Organization's international agency for research on cancer has identified more than 100 chemical, physical, and biological carcinogens. Carcinogens are any substance that is a cancer causing agent. This may be due to their ability to damage the genome or to the disrupt the cellular metabolic processes. Many of these associations were recognized, explaining how they cause cancer and providing insight into ways of prevention. As the understanding of genes increased, scientists have a better knowledge base of how cancer occurs, whether it was damage to the DNA by chemicals and radiation or the introduction of new DNA sequences by viruses that led to the development of cancer in a person. With the advancement in the past and the new innovative technology and knowledge in the scientific and medical fields, prevention and treatment will always be advancing as rapidly as the cancer cells mutate and divide. Cancer is becoming an important part of many people's lives, and this increase in cases and the evolution of the cancer cells need to be controlled and hopefully some day eradicated. Statistically, it is the second

leading cause of death in the United States, but it will probably soon become the leading cause of death.

HISTORY OF CANCER TREATMENTS

For a long time most people believed that there was no cure for cancer, and some people still do. The development of cancer has been a slow one and thus the development of treatment has been even slower. Over the past centuries there has been some work that needs to be recognized as part of the steps forward in the treatment process. Surgery was the first step to cure the disease, but at this time in the 1800s it was considered primitive, with many complications, including the loss of blood. In 1846, with the development of anesthesia, progress rapidly advanced over the next 100 years. There were three surgeons that stand out as renowned surgeons in the field of cancer, Bilroth, Handley, and Halsted. Their work led to cancer operations designed to remove the entire tumor along with the lymph nodes in the region where the tumor was located.

In the last decade of the 19th century, based on the work of Handley, Stewart Halsted developed the radical mastectomy. He believe that the local removal of the cancer would cure it, however, if it should return elsewhere in the body it was a new process. He developed the radical mastectomy for breast cancer, which became the basic cancer surgery for almost a century. In the 1970, with the development of modern techniques and new technology, a less intensive surgery was demonstrated in clinical trials, which was equally effective for most women with breast cancer. This surgery is now rarely done; women now undergo local removal of the primary tumor, followed by radiation therapy. During the 20th century there was a lot of advancement in minimizing the amount of healthy tissue removed during cancer operations. It used to be

considered exploratory surgery to be able to cut someone open to take tissue to test for cancer. Now, with the advancement in technology and information, there are ways to detect cancer that do not require an operation. Since the 1970s progress in ultrasound (sonography), computed tomography (CT scans), magnetic resonance imaging (MRI scans), and positron emission tomography (PET scans) are just a few responses to the new advancements that are making it easier to prevent, diagnose, and treat cancer patients. All of these treatments had to start with the understanding of cancer, and then the development better surgical instruments, and finally combining surgery with chemotherapy and radiation.

This new understanding of cancer brought some developments that are supposed to help with the extermination of any cancer cells left in the body after surgery, these being radiation and chemotherapy. In 1896, a German physics professor, Wilhelm Conrad Roentgen, presented a lecture about a new ray called the "x-ray," and within a month the x-ray was being used to diagnose, and within three years radiation was used to treat cancer. Radiation therapy started with radium in low voltage diagnostic machines, until a breakthrough that found if a patient used radiation several times a week it greatly improved the chances for a cure. As good as this all seemed, in the 20th century radiation was discovered to cause cancer as well as cure it. However, this was only true in patients who became overexposed to the radiation over long periods of time, and there is an estimated proper fraction of radiation that can help cure. Today, radiation is delivered with great precision to destroy cancer tumors while limiting the damage to nearby healthy tissues. Radiation is not the only thing that helps with cancer after surgery; chemotherapy is a method that was developed to destroy small tumors, and is still used today. The era of chemotherapy actually started during World War II. Nitrogen mustard was produced as a protective measure, and it was studied and found to work against cancer of the lymph nodes. This agent was just the start of other

agents that killed rapidly growing cancer cells by damaging their DNA. Not long after the discovery that chemical reactions needed for DNA replication can be blocked, in essence of chemotherapy was created. This type of drug can cure cancer in some cases, however, in most cases cancer is just controlled or sustained, and can be for long periods of time. The only problem with chemotherapy is the side effects that people get from this chemical being in their body. These are just a few of the major types of cancer treatment that have been produced over the past centuries.

Since the development of cancer was a slow process, the treatment was produced even slower. However, there have been many advancements in the process of treating this disease, and scientists are always developing and discovering new methods for survival. Cancer is definitely not in jeopardy of having a lull in treatment any time soon. As history has shown, a lot of treatment methods are based on treating cancer with other potentially harmful chemicals. In this time and age of innovation there should be a way that we can treat cancer or any disease without causing horrible side effects. In the 21st century we should be looking in a different direction such as nature. The environment that we live in changes and affects the health of people, and it is about time that we take these advancements in the treatment of cancer and harness the natural entities that we have been given to use to heal in a positive way.

GOALS FOR THESIS

ACADEMIC

- To create a well developed and fully understandable thesis project.
- To broaden my horizons when it comes to design, this field is rapidly changing and advancing and I want to make sure that I am prepared for the future.
- To never stop learning from my past, to learn from my mistakes and to make sure that I never stop looking for opportunities to make myself better.
- To be able to some day be able to give back to those who have helped me get to where I am today, and hopefully someday to give back to the school that has given me so much.

PROFESSIONAL

- I am not sure what type of architecture or where exactly I want to go when I am done with school. I would like to work in a firm that is currently interested in sustainable design along with the processes that go beyond.
- Eventually I would like to become licensed but I am in no real rush to do this. I would like to test the waters a bit and figure out where I belong.

PERSONAL

- I want to learn how to cook better and finish the challenge that I set for myself to get through Mario Batali's italian cook book.
- I would like to design and construct the house that I will raise children and grow old in one day.
- I would like to experience the world more then I already have. Understanding other cultures and traditions of people is something that truly makes me appreciate the life that I have.
- I would like to help humanity, whether that is in Americorp or the Peacecorp. I have been given so much and it would be nice to give back to those who did not get all the opportunities that I had.
- I want to laugh everyday and never stop enjoying the small moments in life with those who mean the most to me.
- I never want to stop living life to the fullest, never hold back because of fear, and dive in head first without regret.

SITE ANALYSIS

The site of a place is one of the most important factors for the initial design and the final project. The environment of the site needs to be researched and analyzed to make sure that the conditions of this area mesh well with the components of the design. The Midwest region of the United States is a very thriving place, it is full of nature, and has a culture different from other states. Unfortunately, this region is in the second-highest cancer bracket, with on average having 490,000 cases of cancer a year. This, along with the fact that the state of Iowa has just determined cancer as its leading cause of death, have brought Iowa into focus for a potential site. Since this thesis has a heavy emphasis on the effects of nature incorporated with every entity of the project, it would only make sense that the site would encompass a lot of nature.

The site that was chosen is located in Millville, Iowa which is a small rural river town located on the Mississippi River. The site is more specifically located in the area where the Turley River forges into the Mississippi. This area is heavily wooded with great views from every angle. There are no other buildings or other roads besides the gravel road that you drive up on, and the only type of transportation that might affect the surroundings would be circulation on the river, even though barges should be the only things on the river. Essentially, there is nothing on this site that might disrupt the experience of being in a place that is completely in sync. As you drive into the general area you are on a gravel road that is curvy, and as you drive along all the other components of life such as stores, cars, and houses slowly start to disappear until it's just you and a gravel road that is getting narrower as you drive, and all of a sudden it opens up and all you see is land. Within this piece of land, there is a large prairie that will be the placement for this future facility. In this particular area the views are breath taking from every angle. From this space the river provides just enough of a glimpse that makes a person want to go to it and see what

more it might offer. Behind you would be the bluffs that give the area some dynamic dimension since a majority of the area is flat. To the left, from where you drove in, all you see is the narrow drive and the curvy road, and if you turn in a complete 180 degrees you will see an everlasting landscape that seems to never stop. Fortunately for this facility, both sides of the site are national state parks and will not be developed, so the lushness of the landscape will forever stand untouched. This being said this makes the aspect of minimizing the environmental impact so much greater, because one little mistake would make a world of difference to these areas that are untouched by human hands. This site provides so much environment and harmony that even when it is windy it almost feels as if the wind slows down to be able to touch the prairie grasses ever so lightly that it make a gentle rustling sound, that provides more tranquility and calmness that will be perfect for healing people coping with this change in their lives.

This site will be very beneficial to the people who will be using it, and hopefully this and the other aspects of nature will provide some comfort for patients and their families. This site also has a few environmental issues that need to be incorporated into the design as well. Since this site is so close the river, flooding may be an issue that needs to be prevented to make sure that even if the site floods the facility can stay open. The other factor is the solidity of the soils and the ground condition, both as it is and how it might change. Since it is close to the river it might not be deep enough to sufficiently support a building. If this is the case which I do not think it will be a problem, not all sites areas of the site would be at the same level and even though it might not be the same particular spot I would rather be in a different spot with in the same location then change locations all together. This site is the perfect area for this research and treatment facility, especially since this project has a huge emphasis on nature and this landscape provides more then enough nature to create beautiful sceneries and views to help people cope with having cancer and trying to obtain a life beyond cancer.

CHARACTERISTICS

Millville, Iowa is a small rural town that has in an abundance of nature. The site is located between two state parks on either side and located right on the Mississippi River. The unique area is surrounded by native prairie grasses and trees which provide texture, views, and natural elements uncharacteristic of a dense city or urban area.







Light Quality

Since there are no other buildings on the site there is nothing to block or interfere with the sun's rays. The sun is intense and clear even on a cloudy day, like it was when these photos were taken.



Vegetation

There are a lot of different types of vegetation on this landscape: trees, grass, flowers, and bushes. The prairie grass is the most common type that I saw, but there is definitely an emphasis on nature in this area.



Water

This site is located on the Mississippi River, which that is a very large permanent body of water. The quality however is definitely not good enough to drink but if it is being needed it should be cause any problems to ones health at all.

Wind

The forms around the land do not affect the wind; the wind, however, affects them. The wind rustling through the vegetation provides a calming sensation as it blows across the land.



Human Impact

There is human impact on this site as there have been some newly planted trees. Part of the landscape is owned by the national wildlife and fish refuge so I assume that they planted the trees. I think this is good practice and would not change this if people want to plant trees they are encouraged to do so.

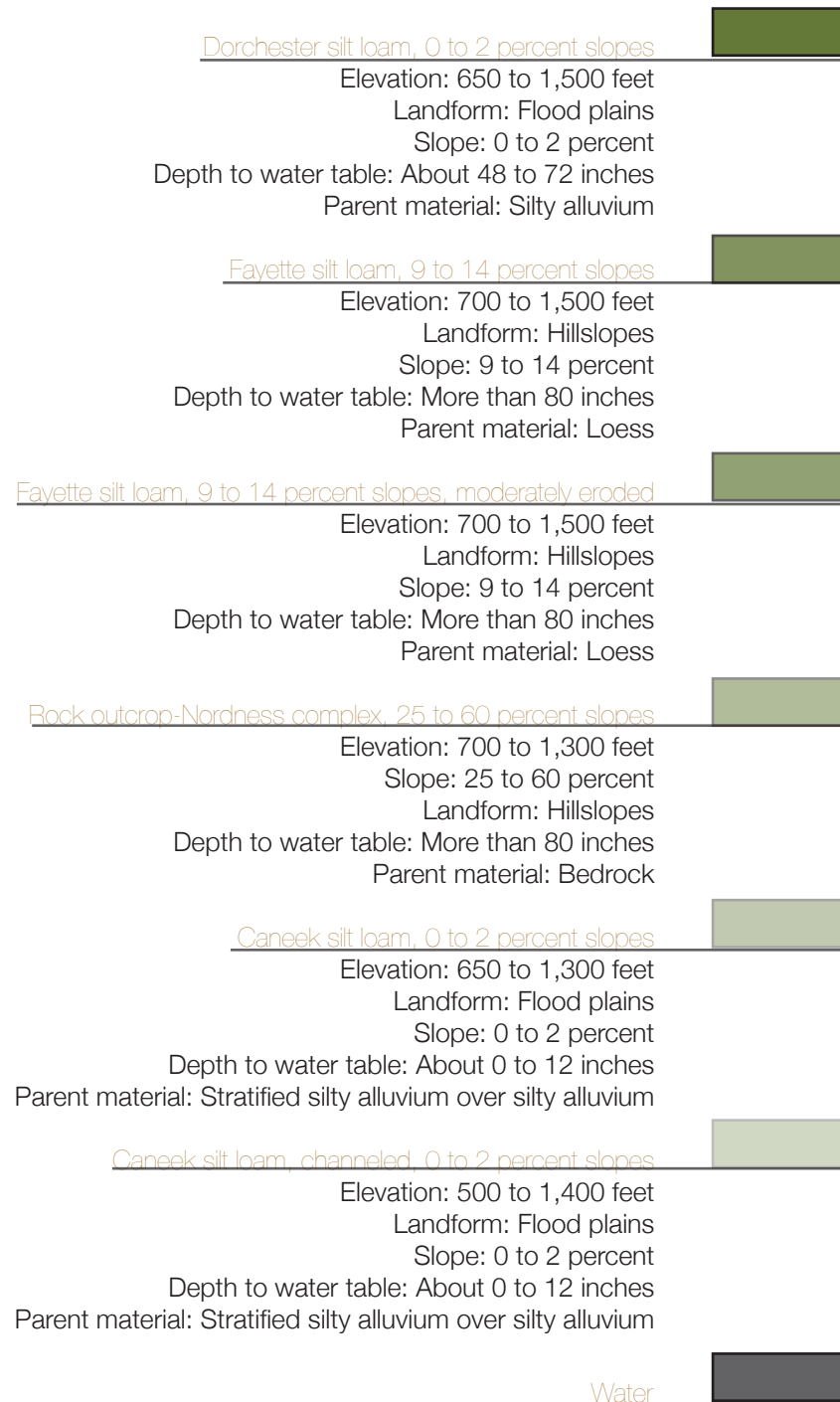


Distress

There were a few areas of distress on the site, which I think it was from the trees being planted, or the site flooded and this was a way to control the puddle of water. Because it is located so close to the river there could be some erosion, but I did not see any extreme examples when I was there.



SOILS ANALYSIS



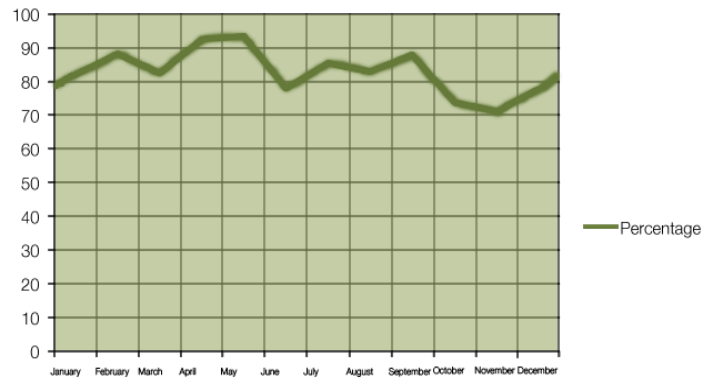


WATERSHED ANALYSIS

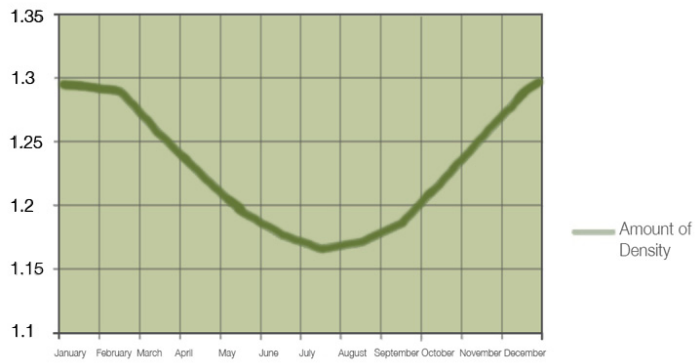


CLIMATE DATA

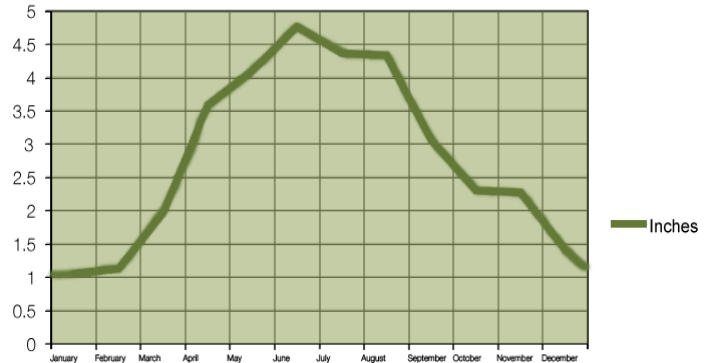
Humidity



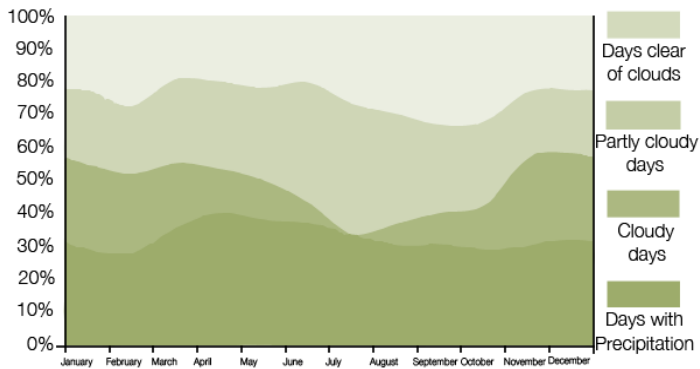
Air Density



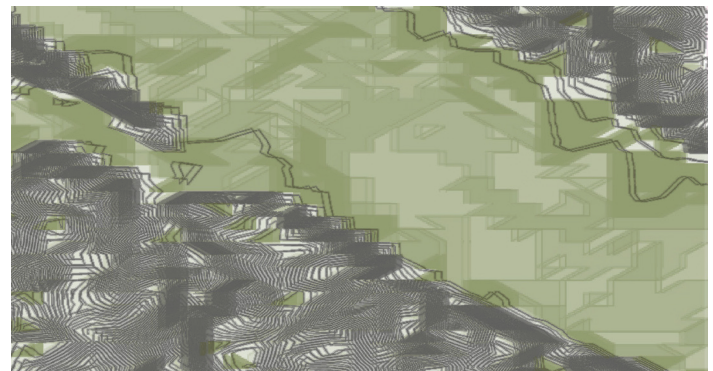
Percipitation



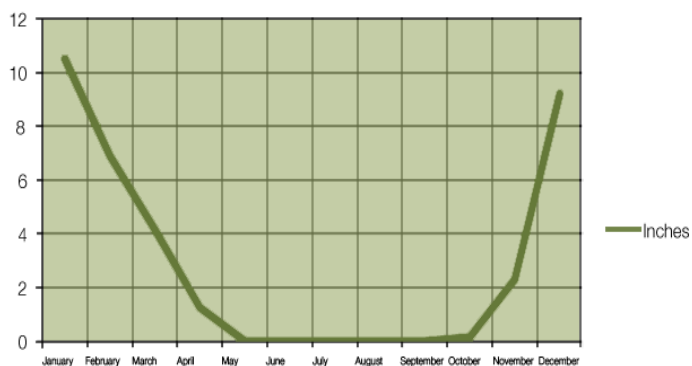
Cloudy Days



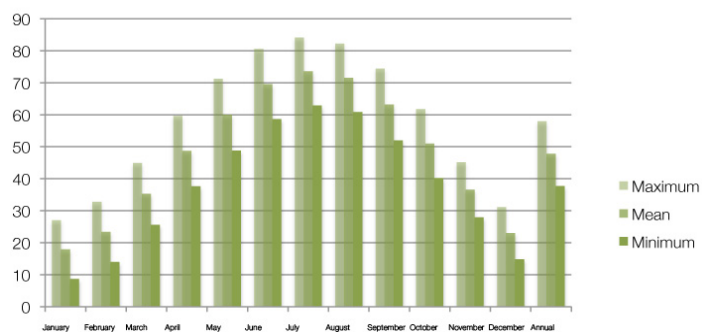
Slope/Topography



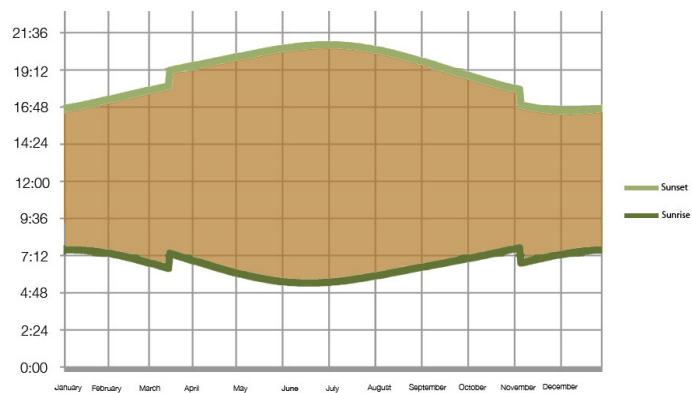
Snow Fall



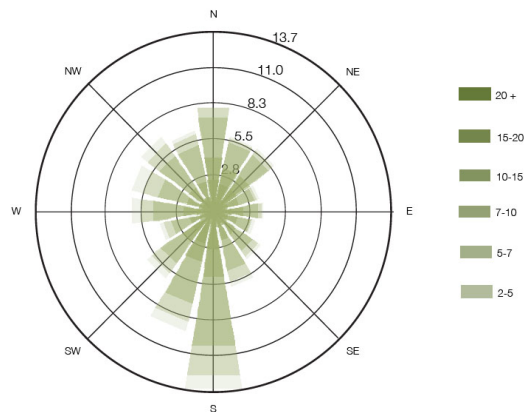
Temperature



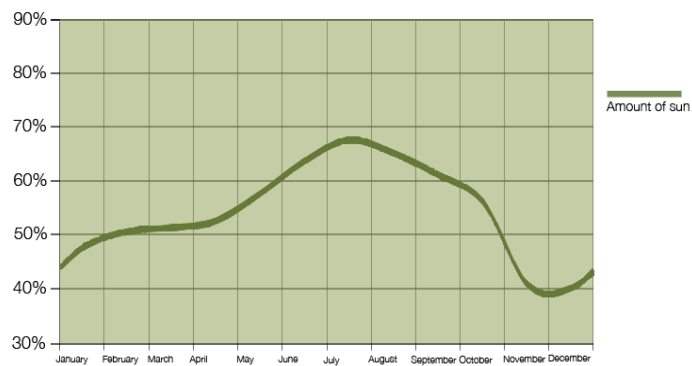
Sun Path



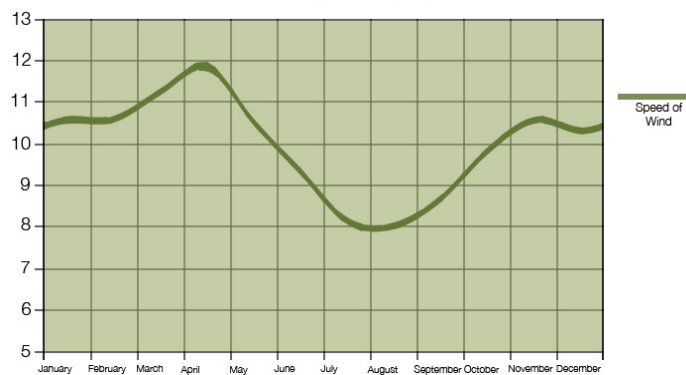
Wind Direction



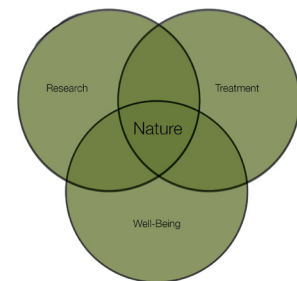
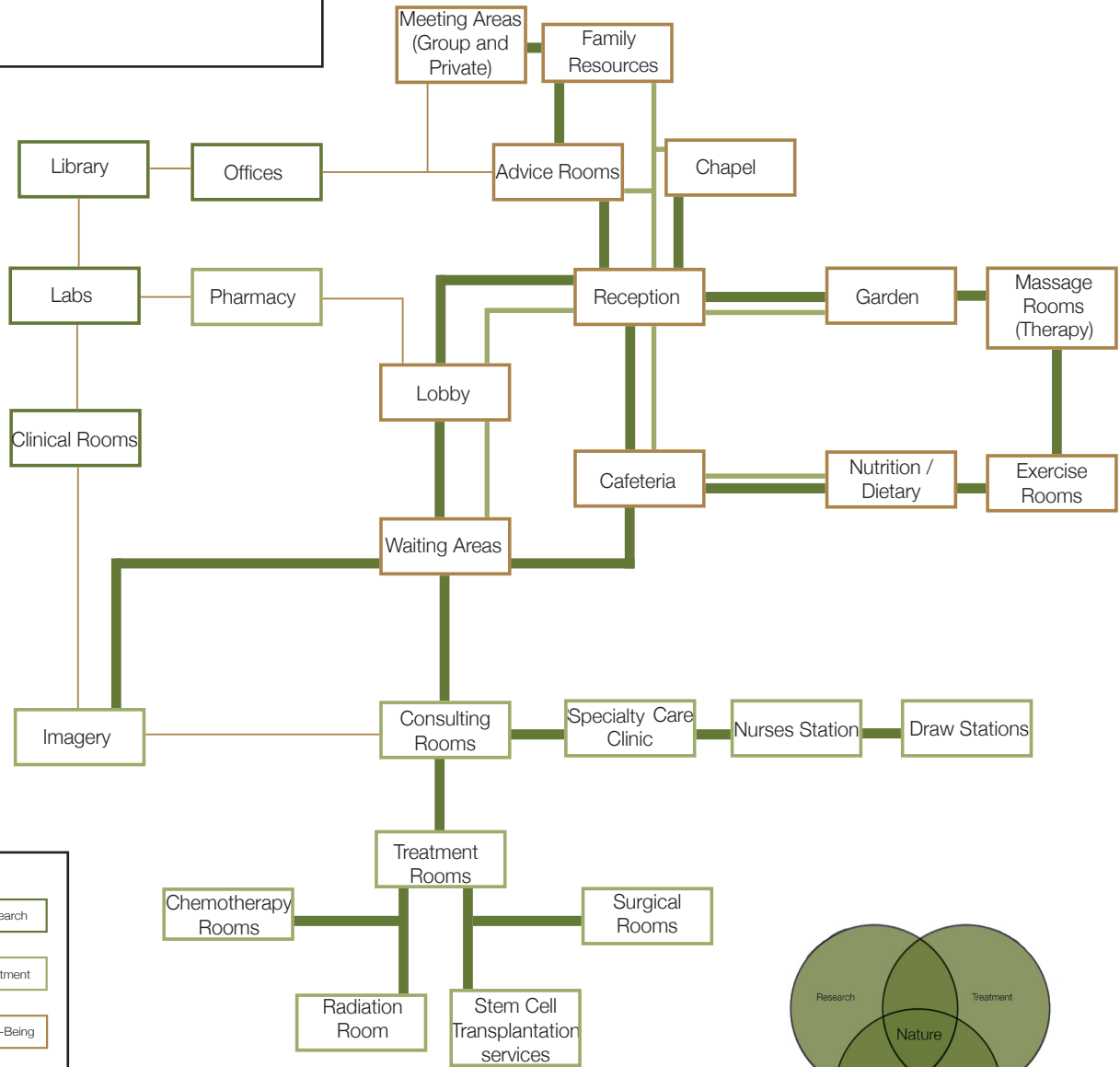
Sunshine



Wind Speed (mph)



PROGRAMMATIC REQUIREMENTS



RESEARCH

Research work space - 300 sq ft
Wet Lab - 1300 sq ft
Dry Lab - 1300 sq ft
Clinical rooms (100 x 3) - 300 sq ft
Offices (25 x 4) - 100 sq ft
Storage - 300 sq ft

TOTAL = 3,600 sq ft

TREATMENT

Pharmacy - 500 sq ft
Consulting rooms (120 x 3) - 360 sq ft
Nurse station w/ office - 200 sq ft
Draw Station - 200 sq ft
Treatment Rooms (50 x 3) - 150 sq ft
Chemotherapy 800sq ft
Radiation Room (1400 x 2) - 2800 sq ft
Surgical Rooms (300 x 3) - 900 sq ft
Gastroenterology (100 x 3) - 300 sq ft
Waiting areas 300 sq ft

TOTAL = 6,710 sq ft

WELL - BEING

Meeting areas

- Group - 300 sq ft
- Small (180 x 3) - 540 sq ft
- Private (30 x 3) - 90 sq ft

Family Resources - 600 sq ft

Advice Rooms - 100 sq ft

Chapel - 1500 sq ft

Reception - 100 sq ft

Garden - 2500 sq ft

Classrooms - (750 x 2) - 1500 sq ft

Nutrition / dietary - 200 sq ft

Cafeteria - 700 sq ft

Lobby - 200 sq ft

TOTAL = 8,330 sq ft

SUPPORT

Restrooms - 500 sq ft

Circulation - 2000 sq ft

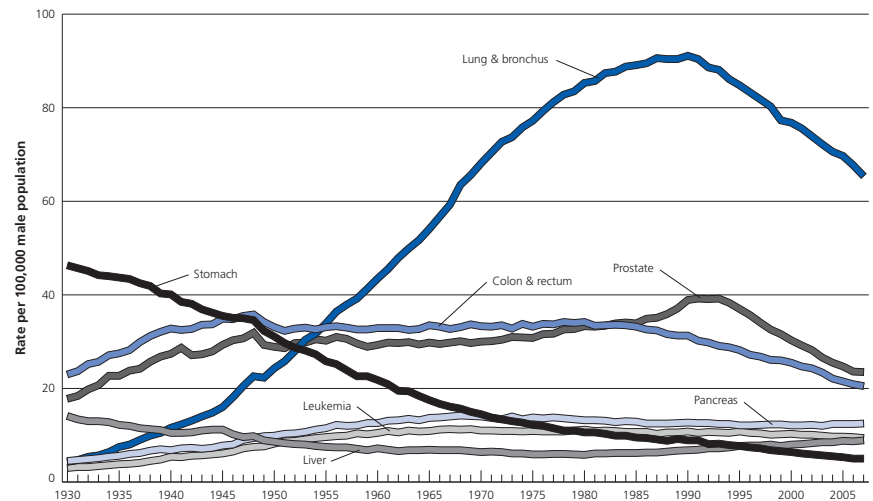
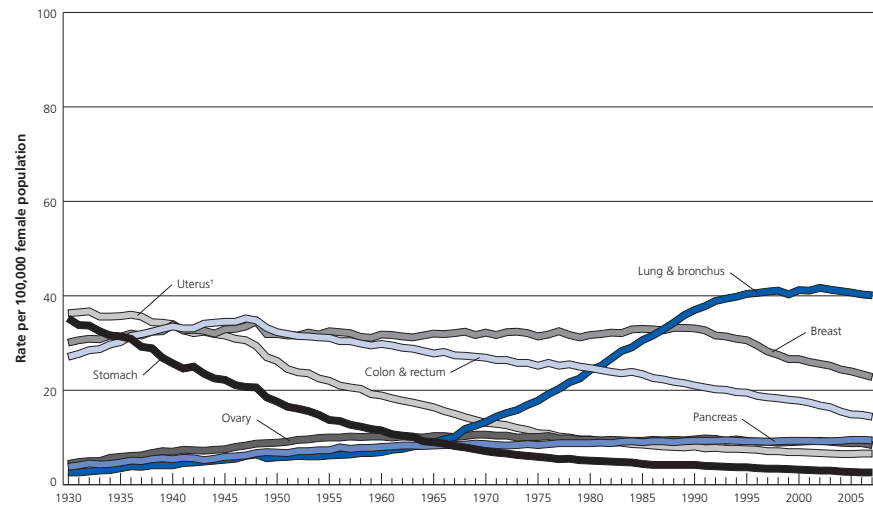
Storage - 1200 sq ft

Mechanical / Electrical - 1300 sq ft

TOTAL = 5,000 sq ft

TOTAL = 23,640 sq ft

APPENDIX



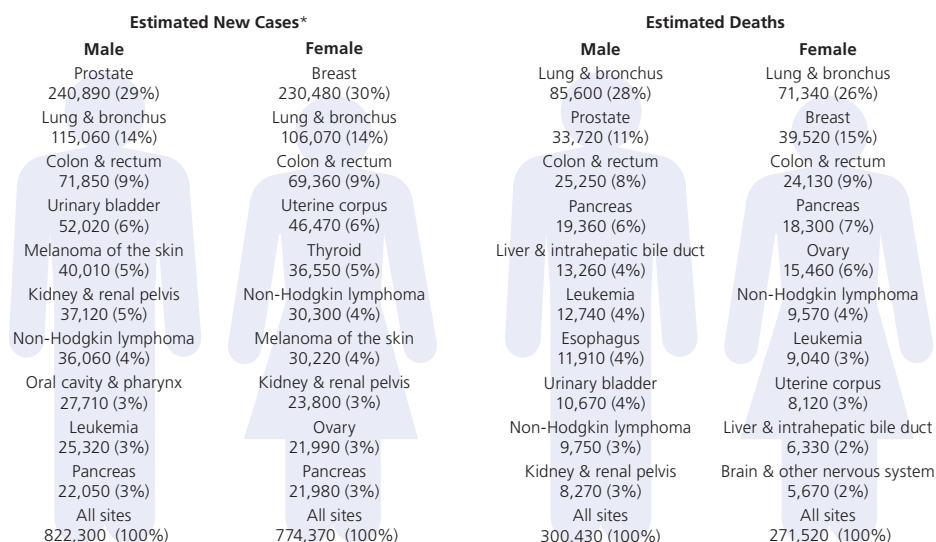
Estimated New Cancer Cases for Select Sites by State, US 2011

State	All Sites	Brain/ Nervous System	Female Breast	Colon & Rectum	Leukemia	Lung & Bronchus	Non- Hodgkin Lymphoma	Ovary	Pancreas	Prostate
Illinois	65,610	9,510	570	6,240	2,050	9,210	2,340	2,640	9,340	2,910
Iowa	17,500	2,120	100	1,670	560	2,480	890	770	2,590	810
Michigan	57,010	7,890	360	4,800	1,810	8,140	2,470	2,530	8,940	2,680
Minnesota	27,600	3,380	130	2,110	820	3,340	880	1,140	4,370	1,100
Wisconsin	30,530	4,430	190	2,690	960	4,020	1,160	1,390	4,900	1,450

Estimated Cancer Deaths for Selected Sites by State, US 2011

State	All Sites	Brain/ Nervous System	Female Breast	Colon & Rectum	Leukemia	Lung & Bronchus	Non- Hodgkin Lymphoma	Ovary	Pancreas	Prostate
Illinois	23,140	470	1,830	2,190	900	6,420	680	640	1,610	1,310
Iowa	6,390	160	380	600	300	1,770	290	190	390	410
Michigan	20,770	510	1,320	1,670	820	5,830	660	560	1,360	1,150
Minnesota	9,240	230	610	750	390	2,470	310	250	610	460
Wisconsin	11,440	260	690	860	480	2,940	390	330	730	600

Leading Sites of New Cancer Cases and Deaths – 2011 Estimates



REFERENCE LIST

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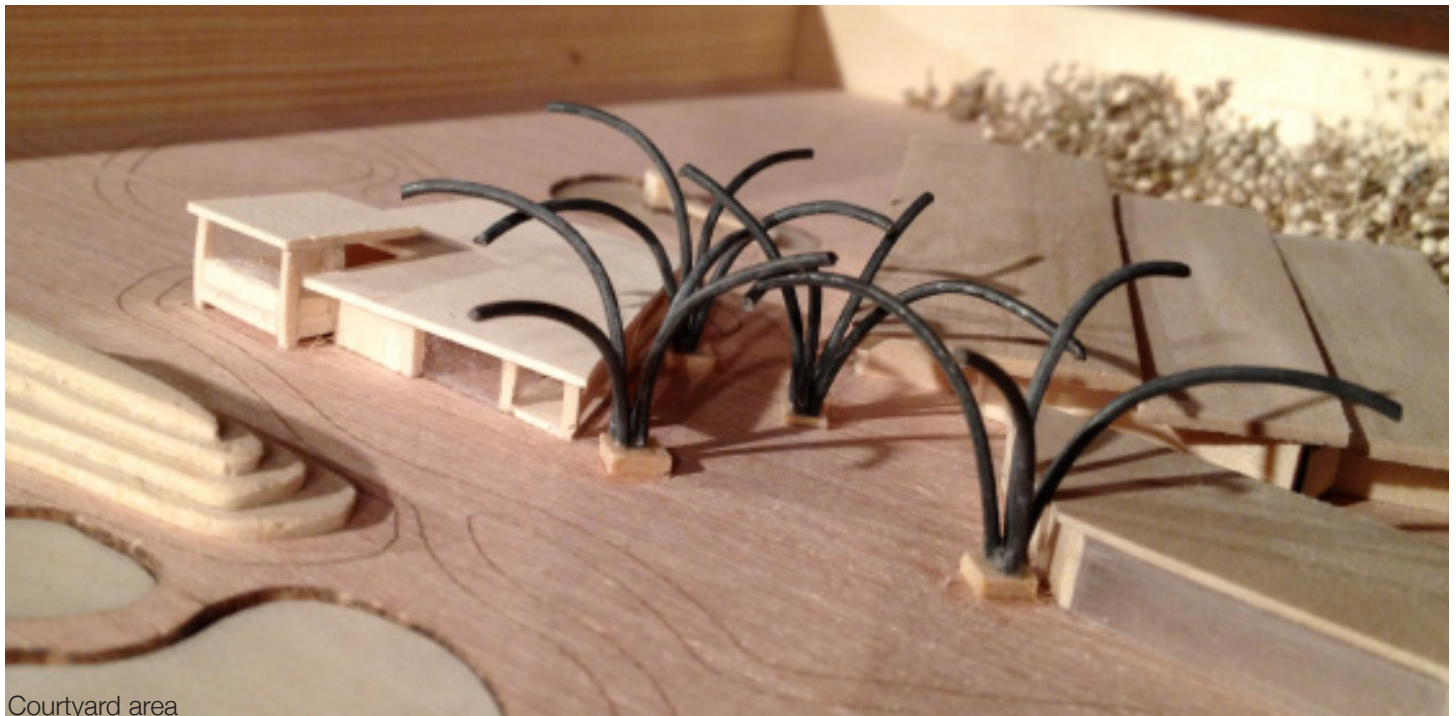
MODEL



Overview of the site

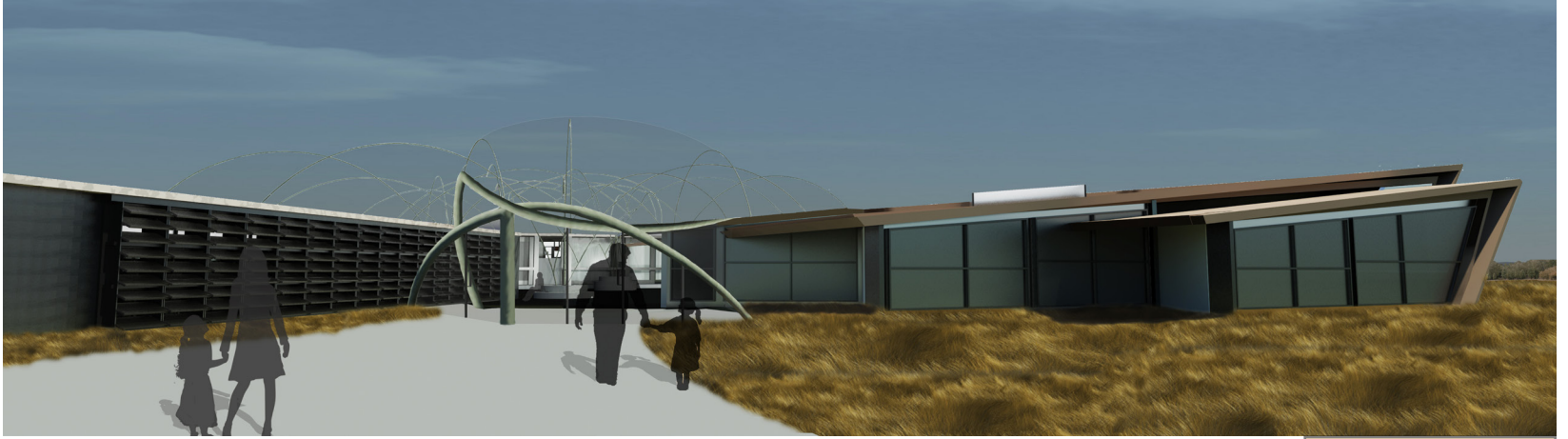


Entrance spaces



Courtyard area

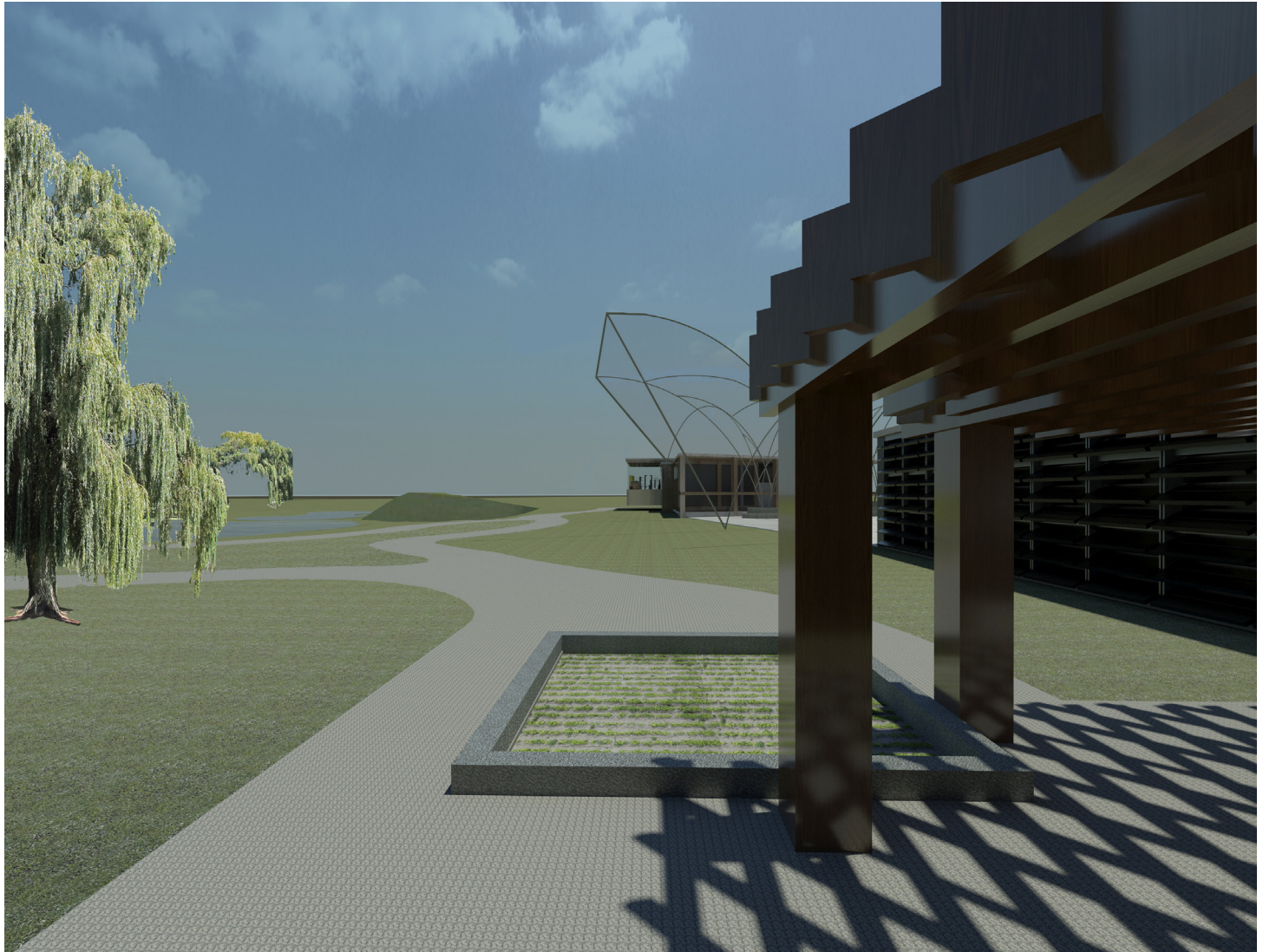
BOARDS



Entrance Space



Healing Walking Garden



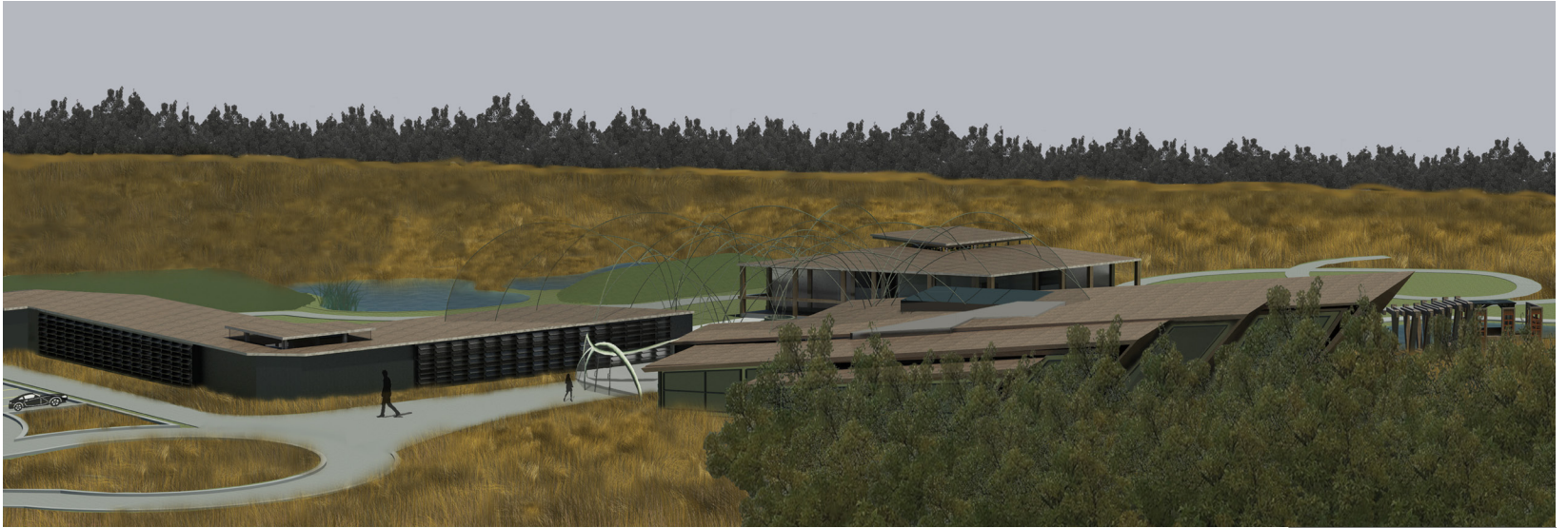
Herbal Garden



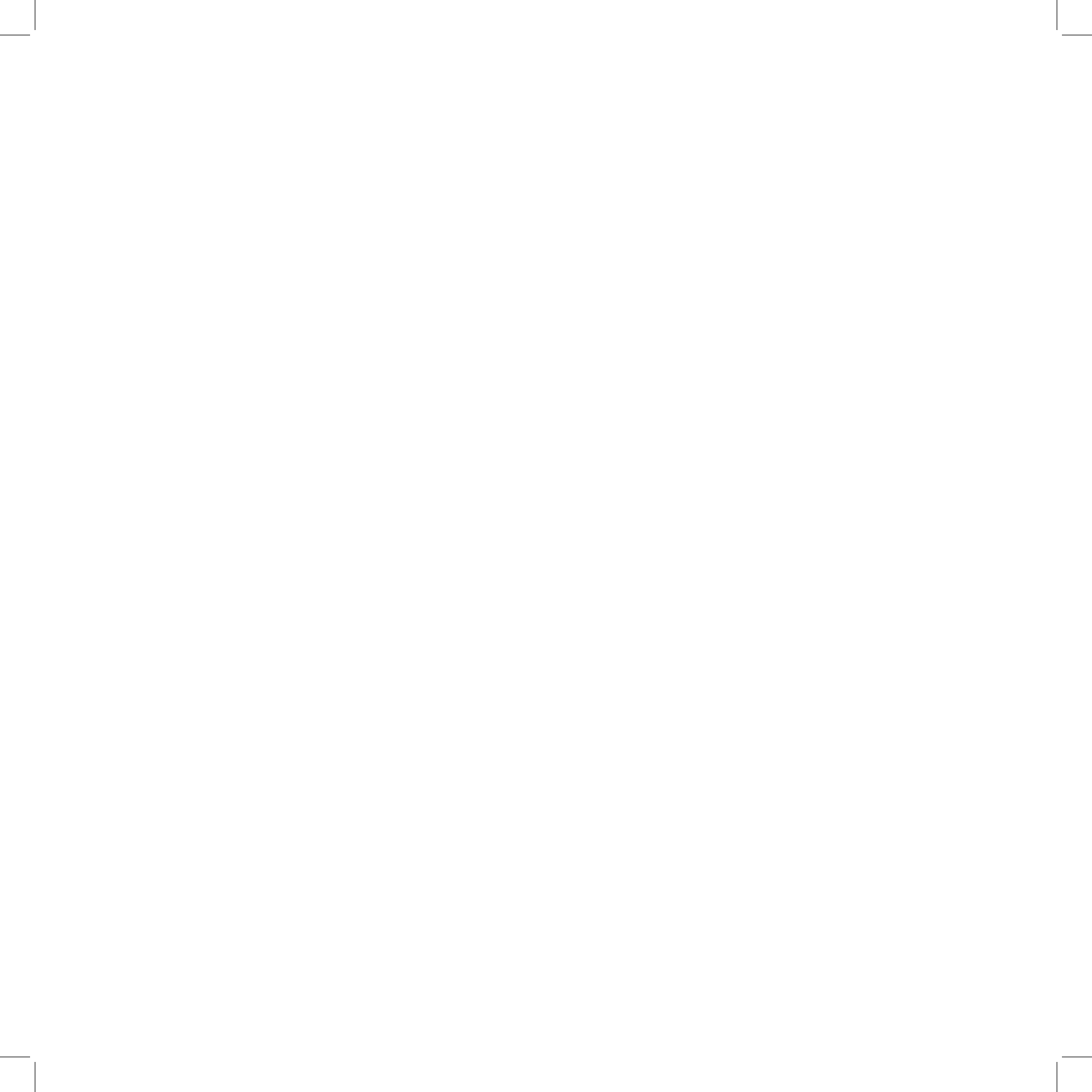
Memorial Sanctuary



Interior Space



Perspective Plan



PERSONAL
INFORMATION



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“NDSU, you have definitely given me many opportunities to experience new places and cultures that I would not have gotten to do otherwise.”