

HEALING ARCHITECTURE

LUNG CANCER RESEARCH AND TREATMENT CENTER

Thesis Design by Jessica Grones



THESIS PREMISE

It can be hard to encompass a healthy mentality when cancer is a prevalent factor in your life. Cancer is one of the top leading causes of death. On average, 600,000 people die of cancer every year. One of the most common leading causes of cancer death is lung cancer, making up almost 25% of all cancer deaths. The number of people affected by cancer multiplies when family members, doctors and nurses are taken into consideration. Common feelings during this life-changing experience include anxiety, stress, and depression.





THESIS PREMISE

The Mental Effects on Lung Cancer Patients:

- 1 in 4 lung cancer patients experience depression
- Depression can lead to post-traumatic stress and suicidal thoughts

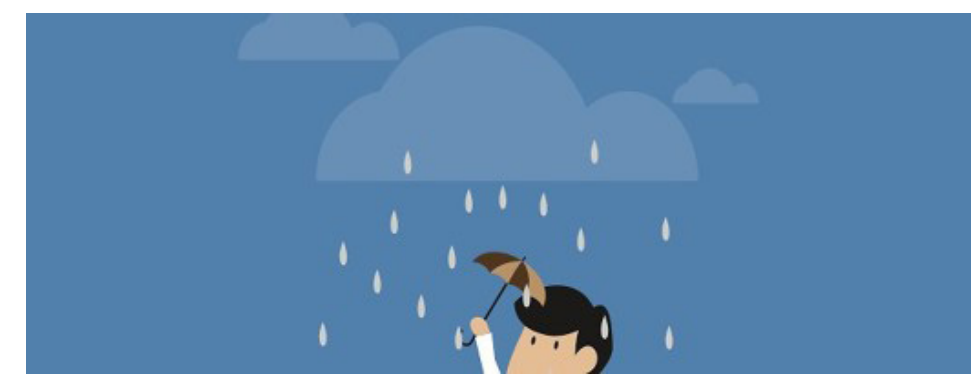
The Mental Effects on Family Members:

- Family members of cancer patients report feeling anxious, stressed, and overwhelmed
- Cancer typically has a negative impact on life at home from mental burden

The Mental Effects on Doctors and Staff:

- 300 physicians die from suicide in the United States each year
- 27% of surgical oncologists report high levels of mental health distress
- Oncologists report higher rates of depression than their internal medicine colleagues
- Physicians are less likely to seek treatment for depression for fear of showing weakness and taking time away from seeing patients

Studies have shown that a person's mental health and social well-being can affect the success of treatment. Leaving room to wonder how mental health is being supported.





THESIS PREMISE

Healing Architecture is a scientifically developed concept to nurture the physical and mental wellbeing of people.

- Spaces are designed to create environments to facilitate tranquillity and happiness
- Design typology combines architecture and psychology to induce the human ability to self-heal

Healing architecture will be used to promote the emotional well-being and enhance the lives of those who spend the majority of their time in a hospital. So, what aspects of design can be implemented to improve the emotional wellbeing of those affected by lung cancer?






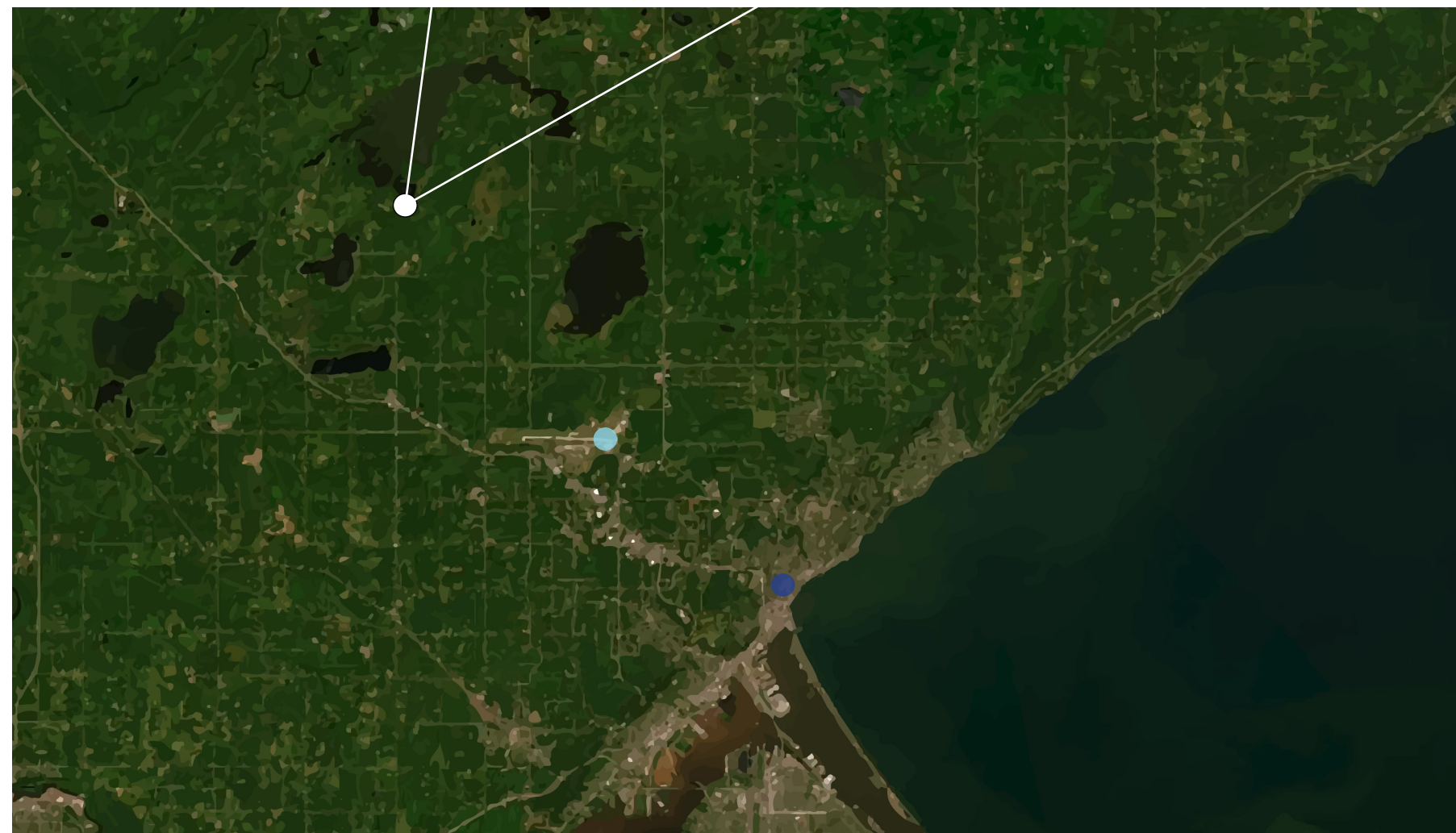
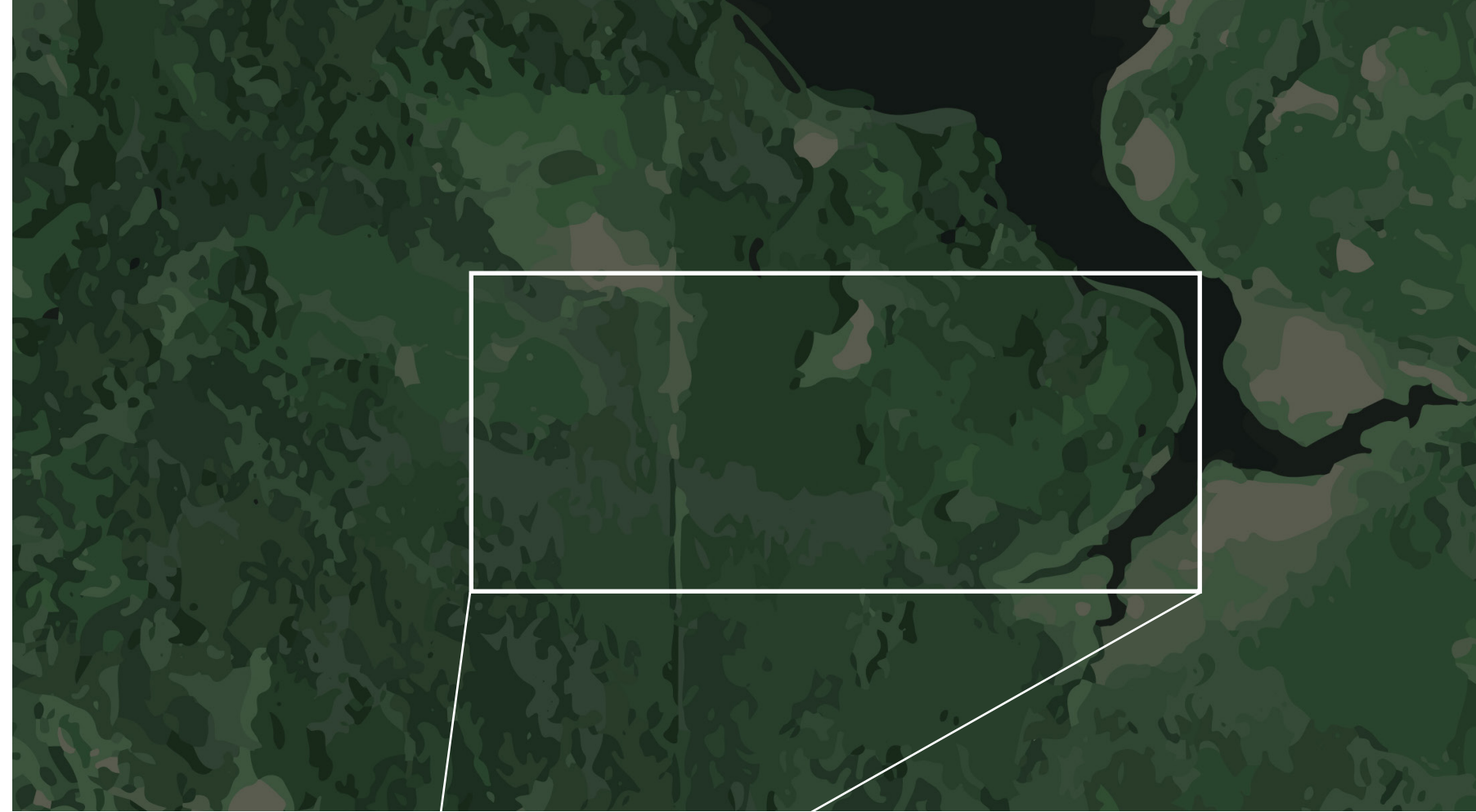
LOCATION

The site is located Southwest of Fish Lake Reservoir in northern Minnesota. It is in a heavily wooded area with a large variety of deciduous and coniferous trees. The site provides a secluded and serene context while still being in close proximity to a large population.

- Approximately 20 minutes from the Duluth International Airport
- Approximately 30 minutes from Essentia Health Medical Center in Duluth



-  Site Location
-  Duluth International Airport
-  Essentia Health Medical Center



FOREST BATHING *“Taking in the atmosphere of the forest”*

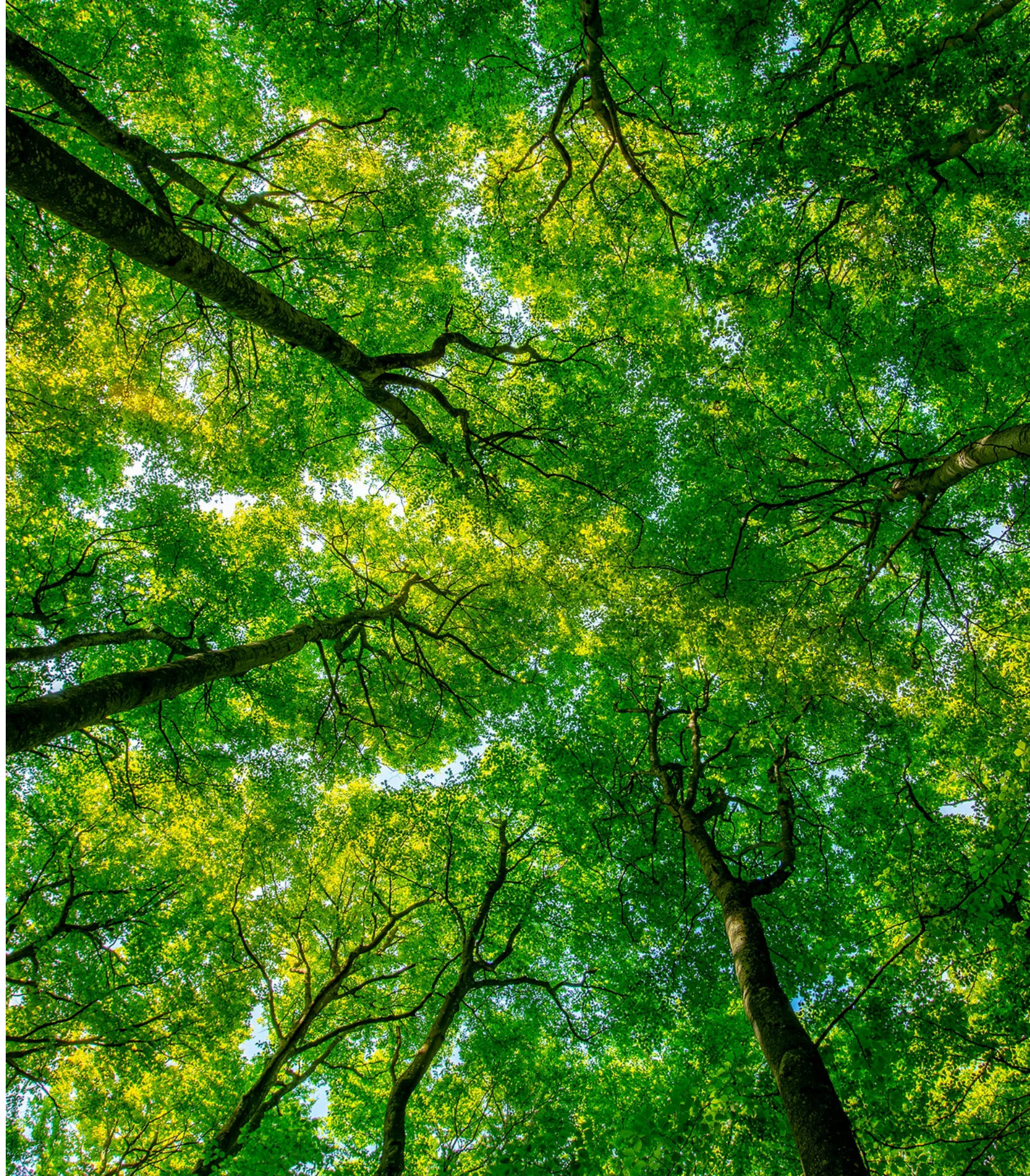
When we are surrounded by nature, we turn off our worries and obsessive thinking.

Plants and trees naturally emit a substance called phytoncide, offering stress reducing benefits.

Breathing in forest air increases the level of natural killer cells in our blood. A Japanese study showed NK cells increase in activity by those who forest bathe. Our body uses these NK cells to combat infections and cancers.

Benefits of Forest Bathing:

- Reduces stress and anxiety
- Strengthens immunity
- Lifts mood
- Improves sleep
- Boosts attention
- Sparks creativity



THESIS SOLUTION



Internal Wayfinding

Trying to find directions through a hospital can be confusing and frustrating. Maneuvering through the building should be intuitive and clear to eliminate stress.

Organizing Wayfinding:

- Use less signage
- Incorporate bold colors
- Create distinctive changes in appearance
- Use large windows to aid in direction



Nature

The use of indoor plants transforms the hospital stay. Plants help improve your overall sensory experience.

Using greenery provides privacy, comfort, and even aids in directing visitors through the hospital.

Benefits of Indoor Plants:

- Promotes healing
- Decreases stress
- Increases productivity



THESIS SOLUTION



Natural Design Elements

Research shows that incorporating organic materials, such as wood, into the built environment, can improve occupant comfort, reduce stress and contribute to improved health indicators. Along with using natural materials, increasing natural daylight throughout the building will improve the mood of patients, visitors, and staff.

Benefits of Exposure to Wood :

- Drop in cortisol, the hormone linked to negative impacts of stress
- Lower levels of blood pressure and heart rate
- Improved focus and concentration

Benefits of Natural Daylighting:

- Produces vitamin D and supports bone health
- Lowers blood pressure, preventing disease, and promoting good mental health
- Produces serotonin, providing more energy and helps to keep you calm, positive, and focused





PLANTERRA *"We believe a healthcare setting can also be a peaceful and calming place to recover."*

Planterra provides interior landscape services and plant rentals for hospitality properties and premier retail destinations.

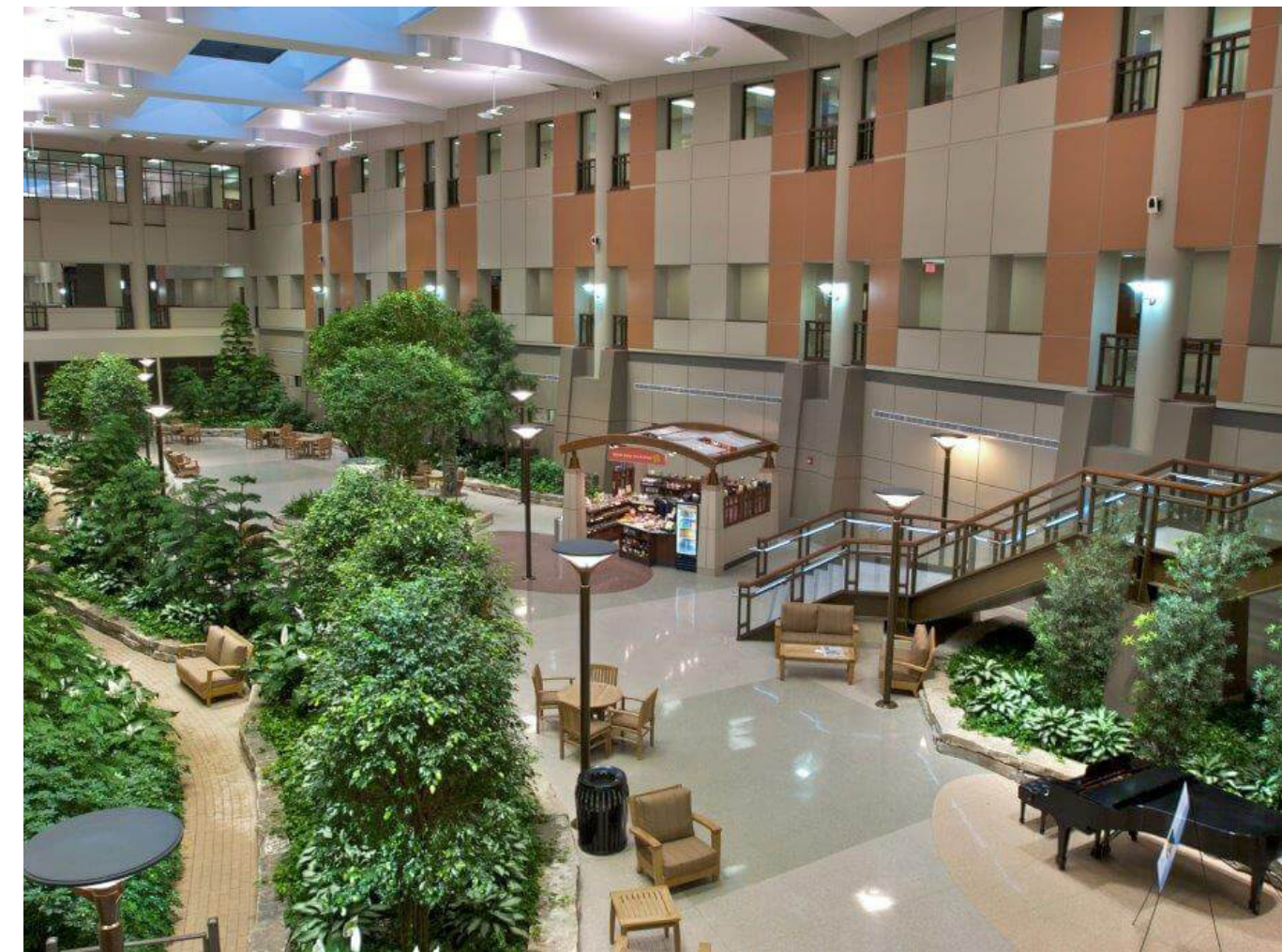
Planterra is used throughout the building to provide therapeutic healing gardens and living walls. Planterra staff works directly with the hospital to understand the needs of those working within the building.

Allergy-free indoor plants:

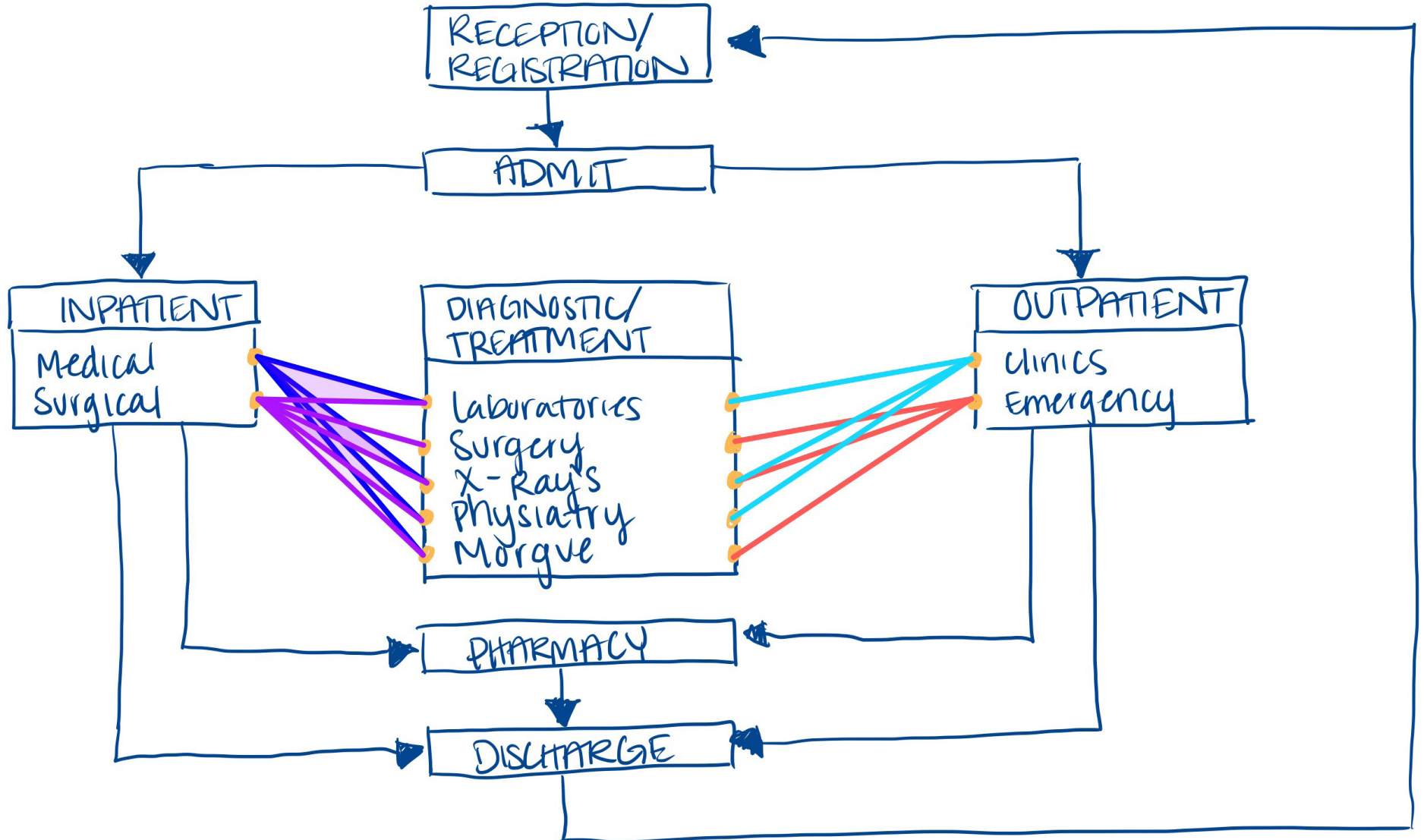
- Plants don't release airborne pollen
- Experts use informed practices to ensure chosen plants are safe

Safe, sterile plant maintenance:

- Soil-less growing media allows plants to thrive in a sterilized, soil-less mixture
- Free of organic materials which could attract pests or mold
- Sub-irrigation ensures a precise amount of water will be supplied as the plants need it
- Installs realistic replica plants when live plants are not an option
- Replica plants come with a cleaning and dusting option to help maintain the sterility and safety of a medical environment



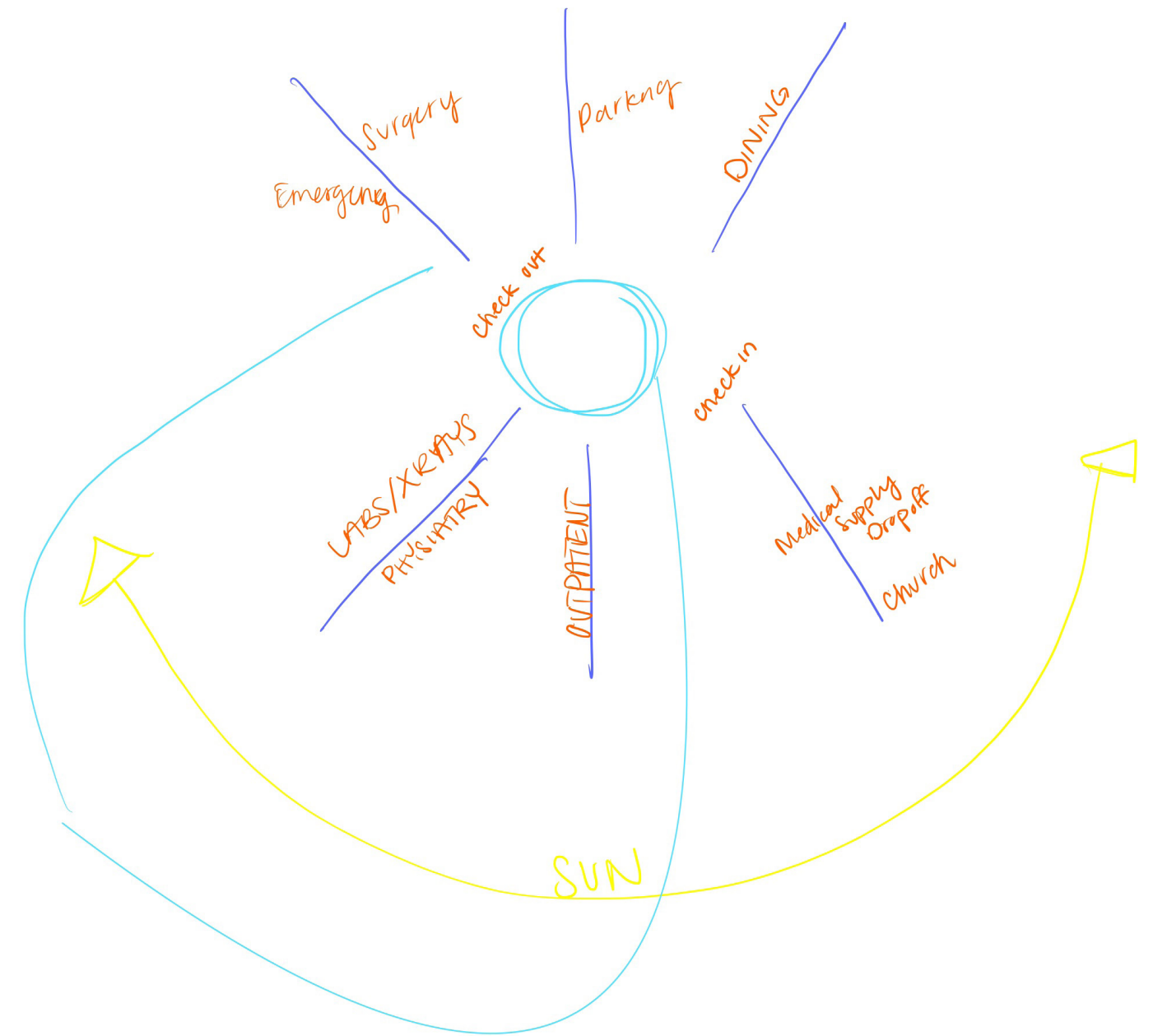
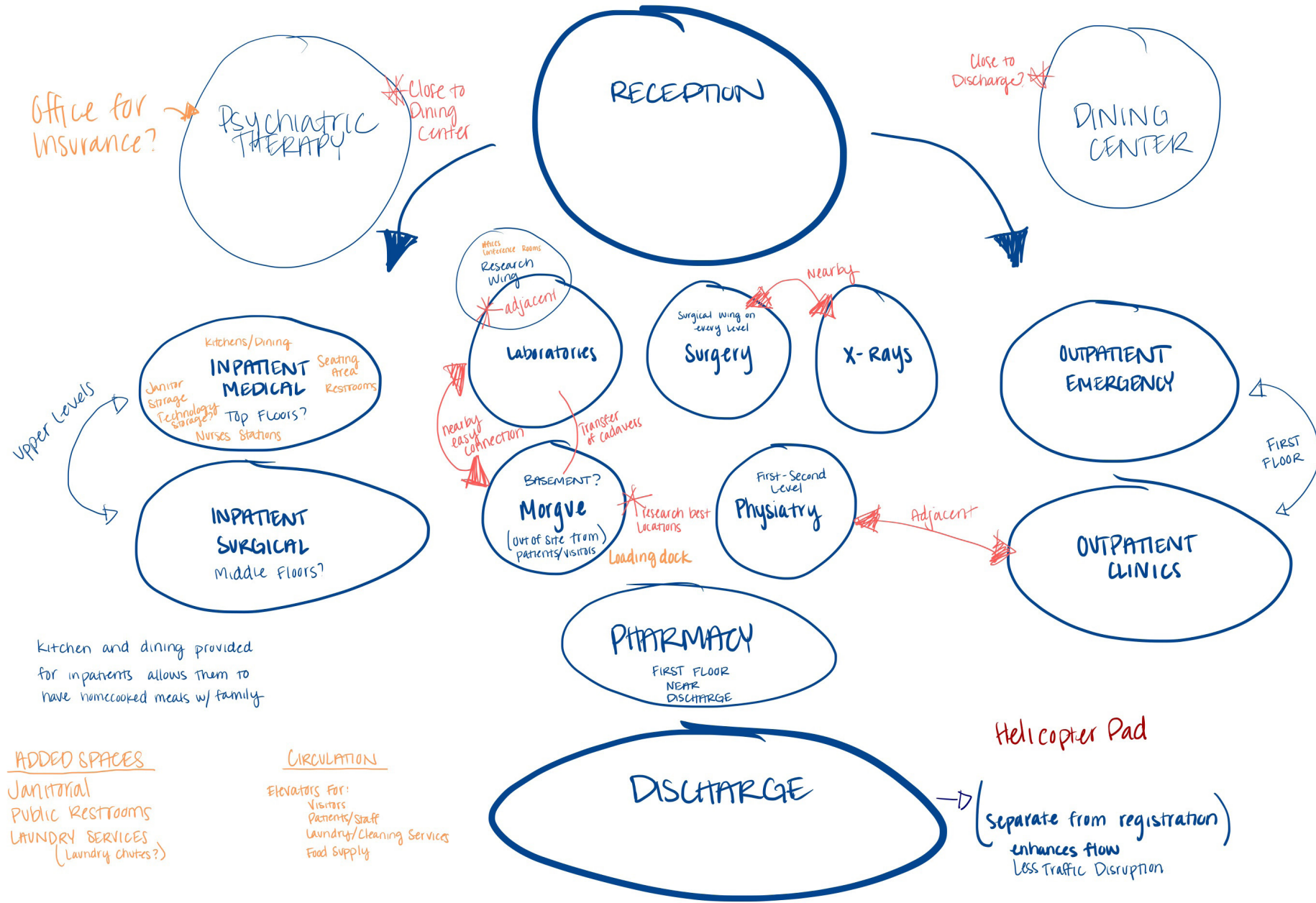
HOSPITAL CIRCULATION PATTERN

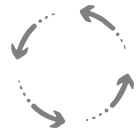


RESEARCH WING
ALL ACCESS AREAS { PUBLIC RESTROOMS
CAFETERIA
THERAPY CENTER

SPATIAL PROGRAMMING

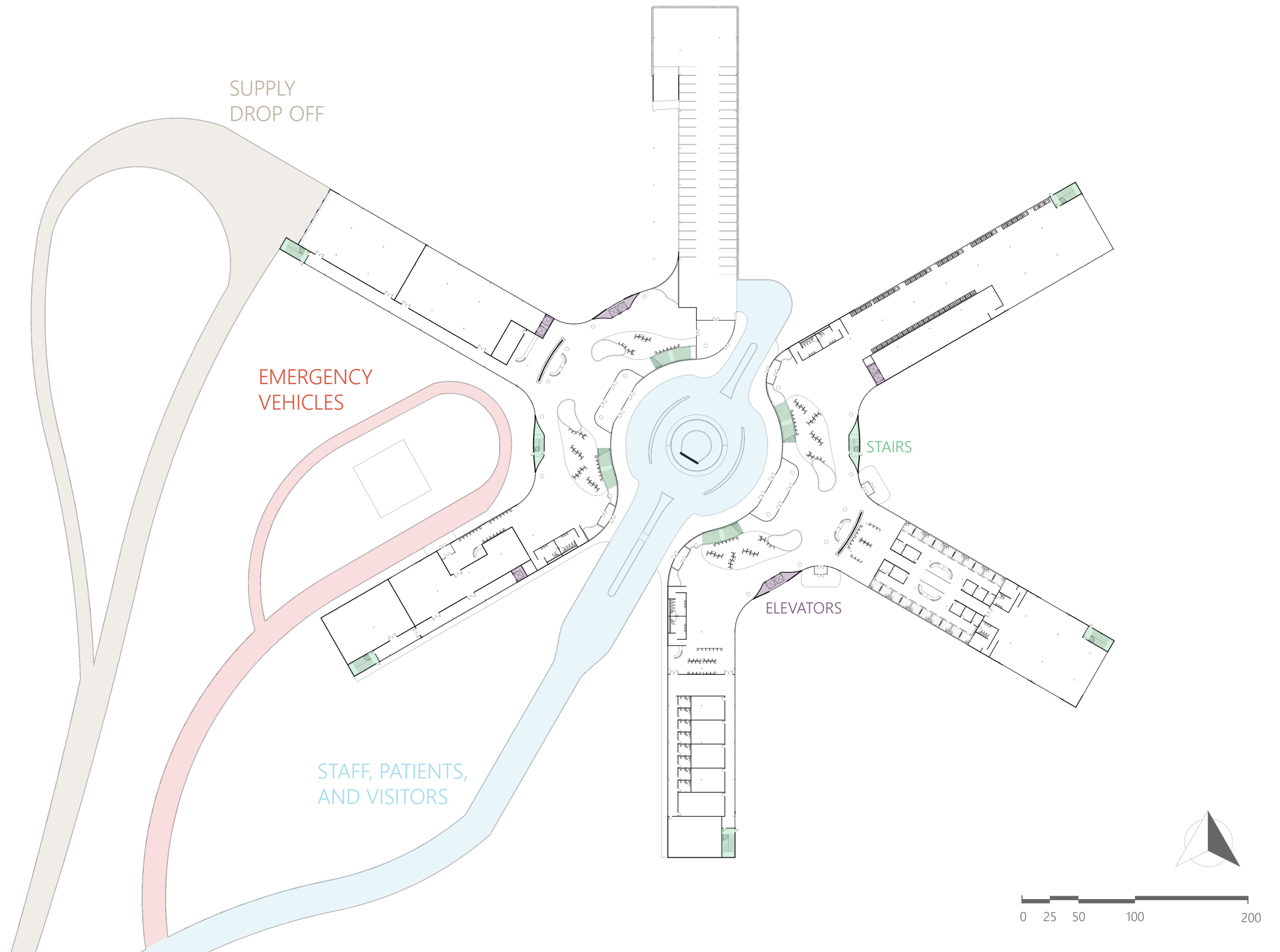
Outflow of trash/recyclables/soiled material separated from food/Clean supplies (both separated from patients/visitors)





CIRCULATION

To reduce confusion and simplify circulation patterns, all patients, visitors, and staff enter the building through the central roundabout. They are directly brought to check-in/drop off, parking, and check-out/pickup. The emergency room and loading dock each have a separate access road and entrance to prevent traffic disruption. The vehicular access and approach roads are designed to be intuitive and clear to eliminate stress while driving.

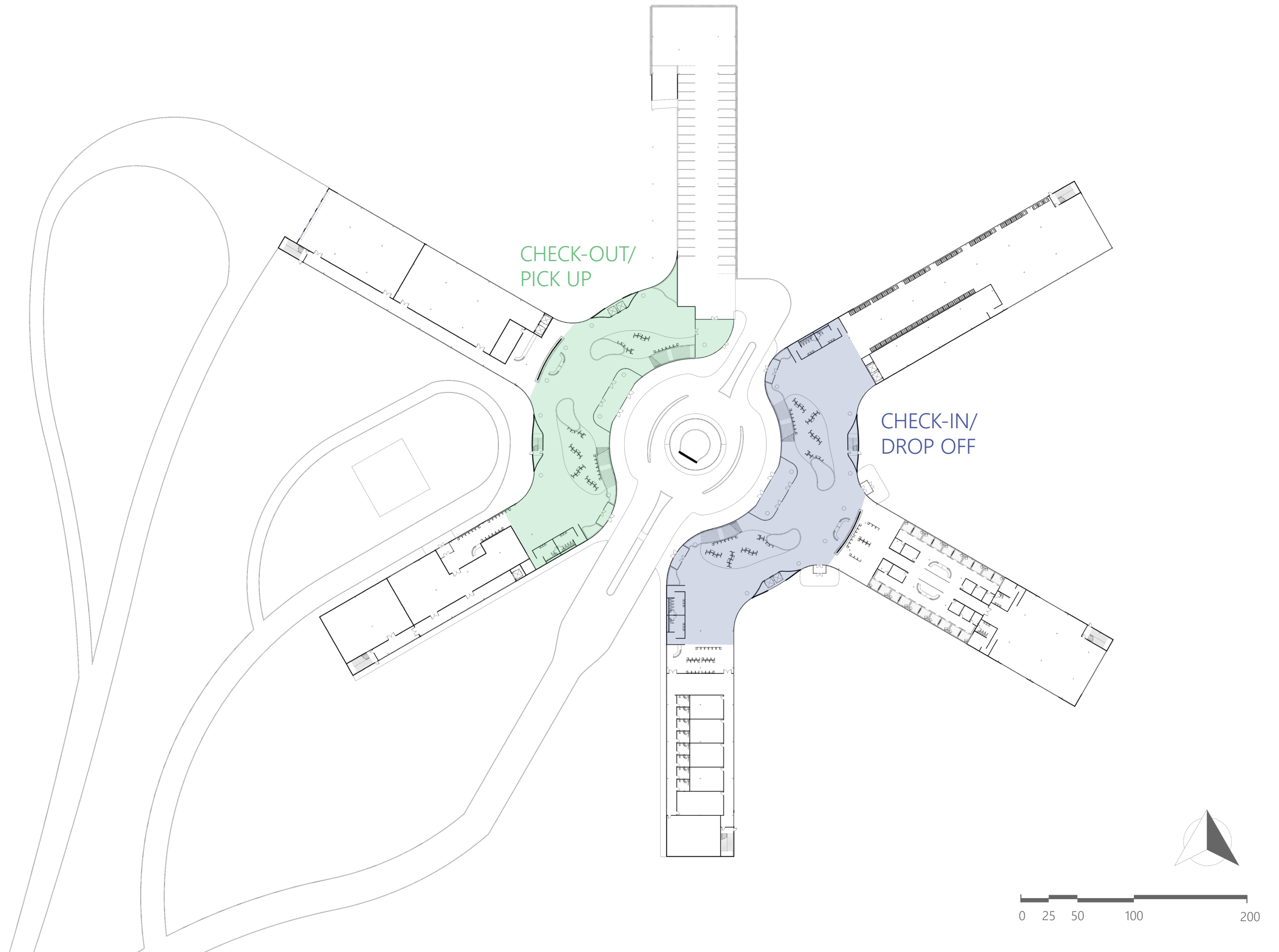


SPATIAL PROGRAM

Strategically programming the spaces in the building helps reduce the traffic footprint and increases productivity among the workers.

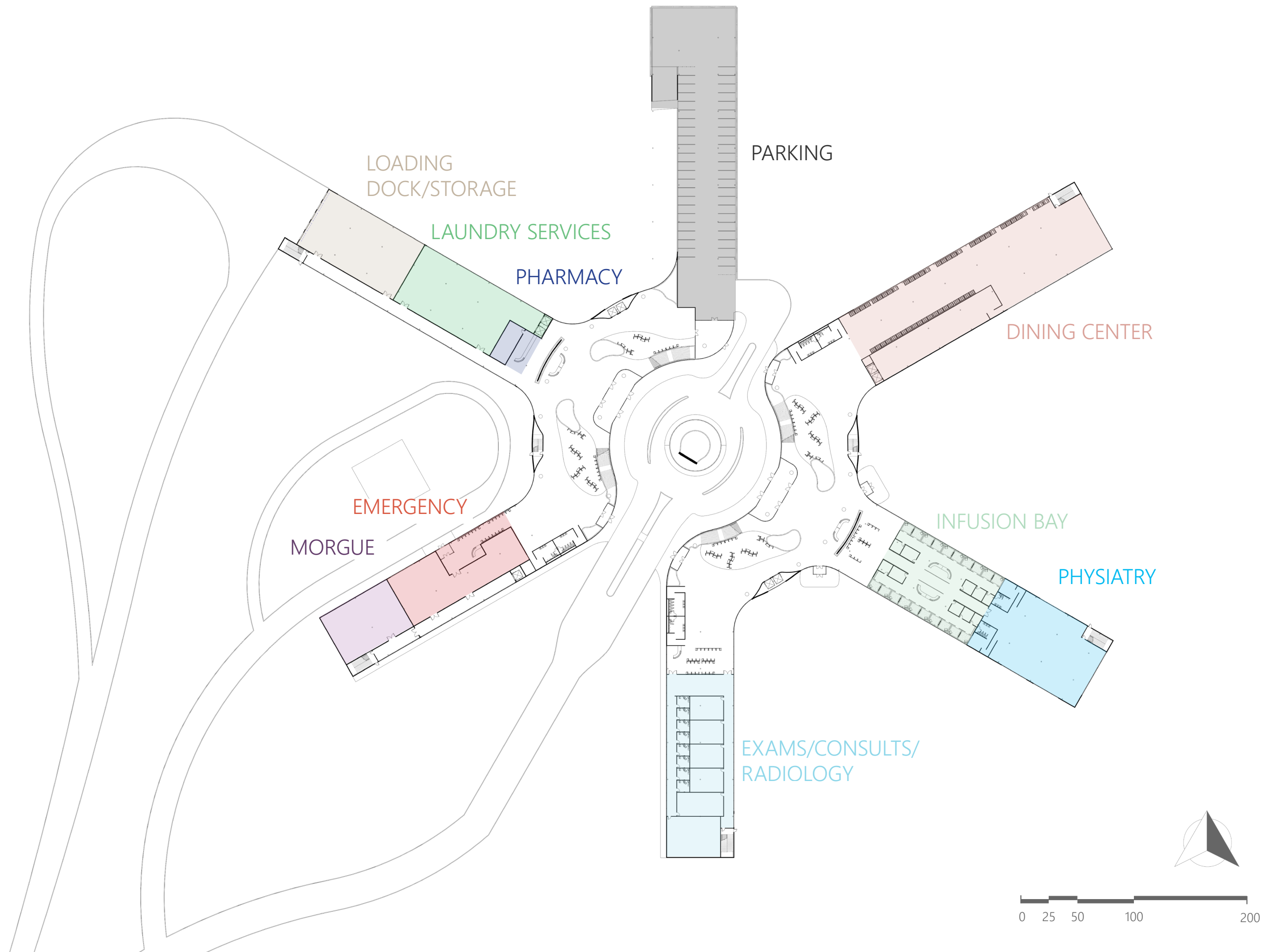
From the central location, the hospital branches out into “wings” that separate the different uses of the building. The first floor is separated into two portions, one houses the check-in lobby and one houses the check-out lobby.

- Reduces traffic disruption
- Keeps movement flowing through the building
- Provides a dignified exit for the patients leaving the hospital, that may require assistance



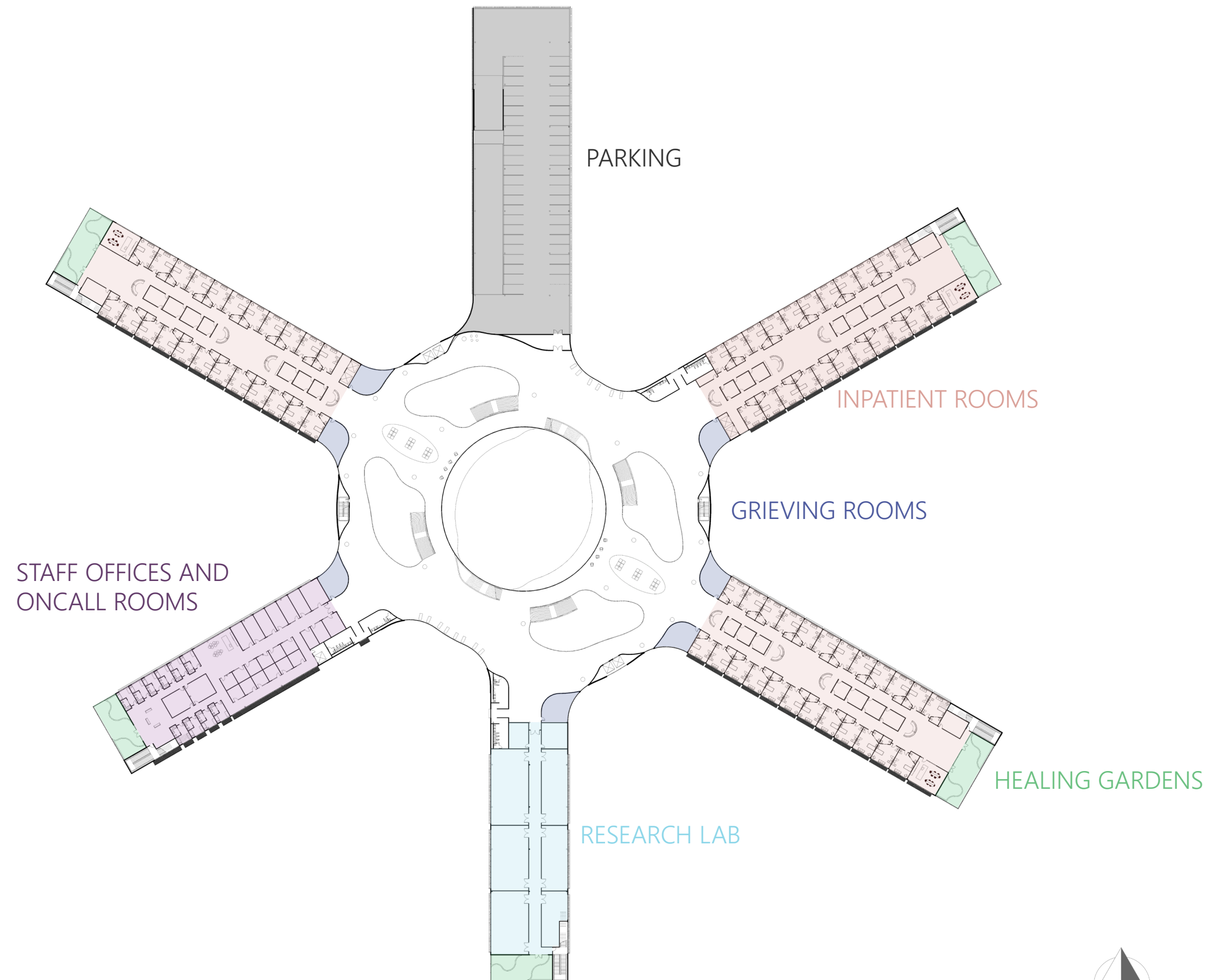
LEVEL 1

- Outpatient services are located on the first floor for easy access in and out of the building
- Emergency room and morgue are separated from higher traffic areas
- Loading dock is farthest from the central point to reduce vehicular traffic
- Pharmacy is located directly behind the check out desk
- Dedicated parking ramp provides easy access to each floor



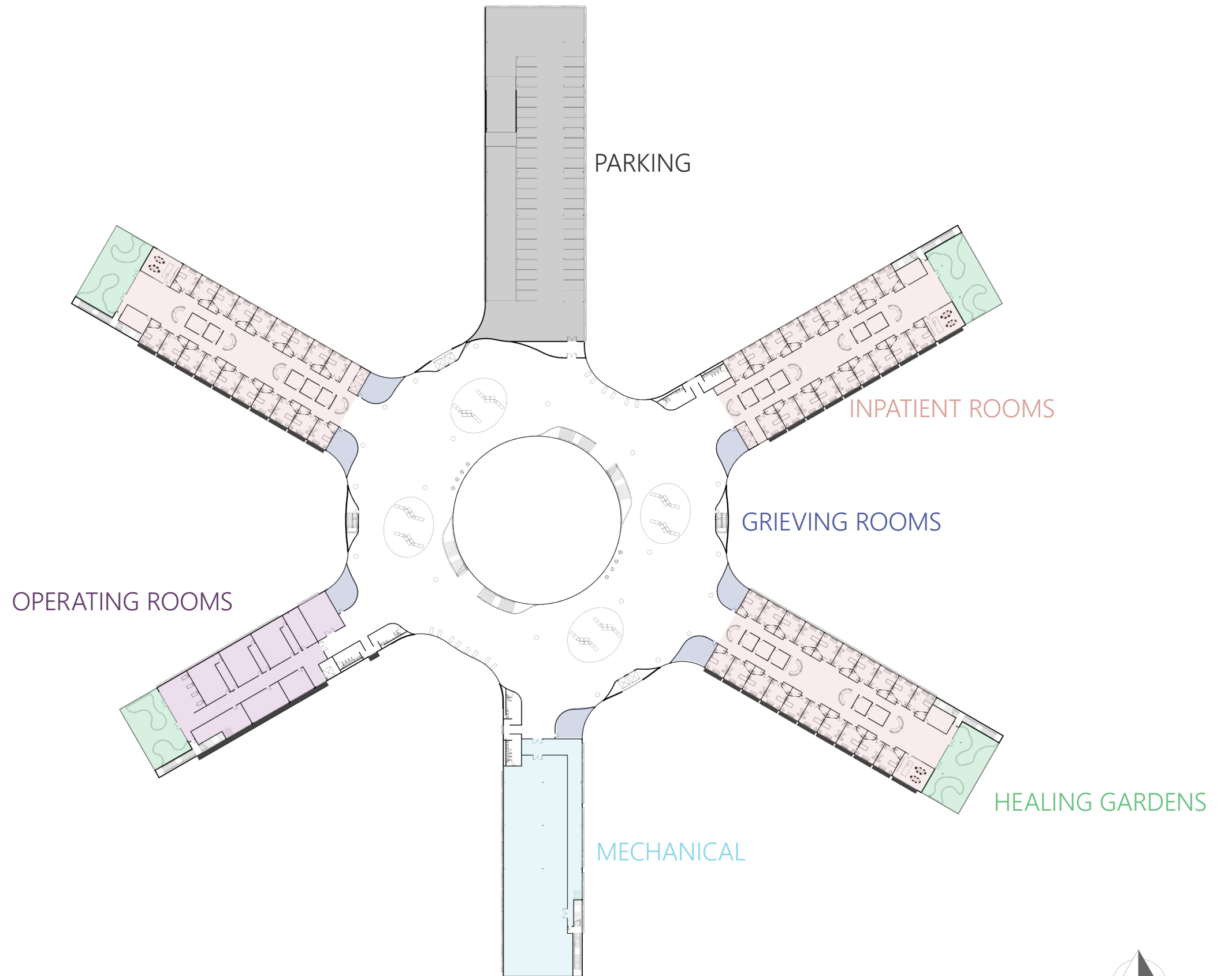
LEVEL 2

- Three wings are dedicated to inpatient rooms
- Staff offices and on call rooms are directly above the emergency room for more efficient time responses
- Grieving rooms are provided at the front entrance of each wing for private family meetings
- A healing garden is located at the end of each wing providing easy access from any location



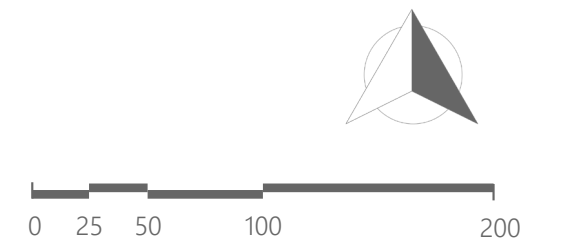
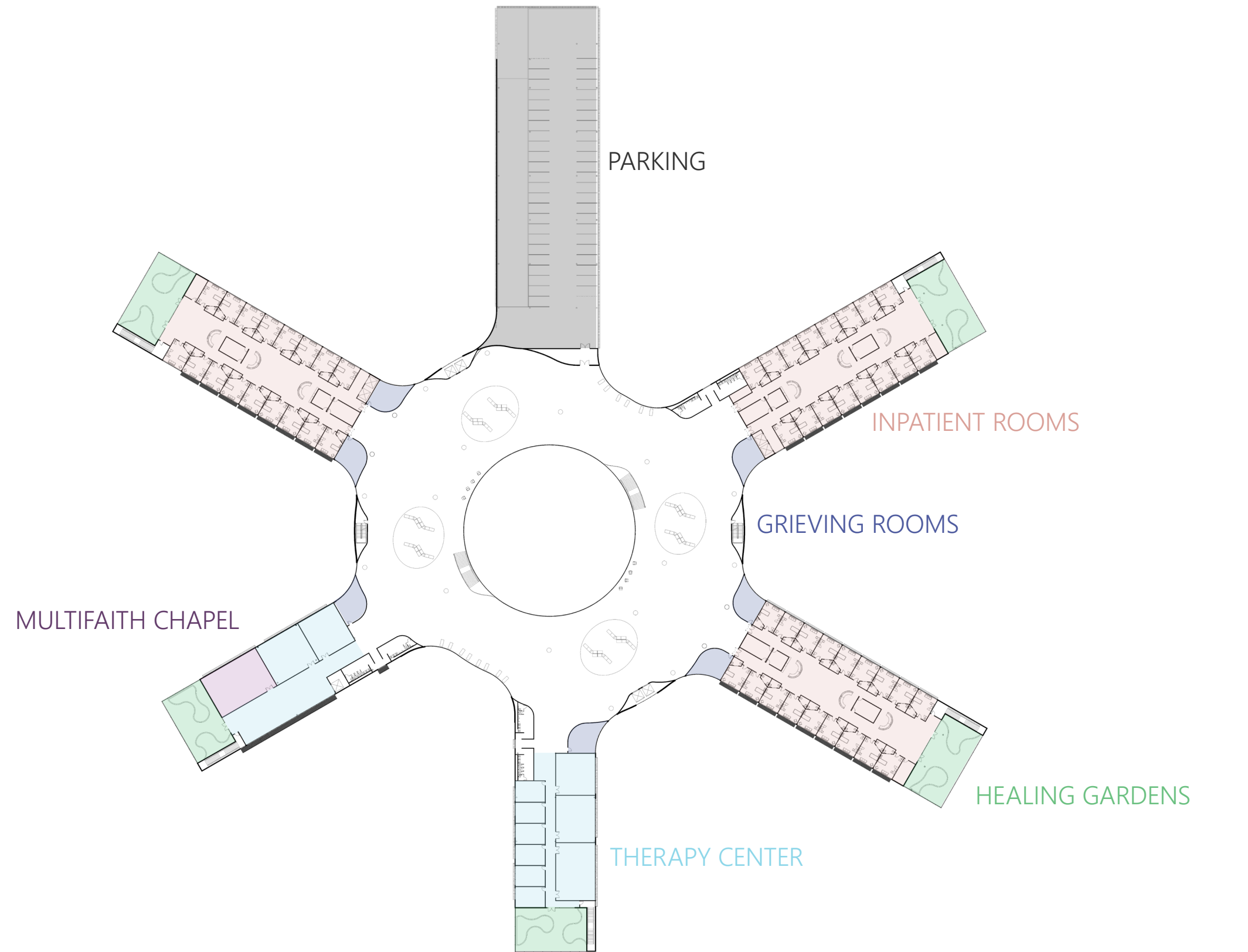
LEVEL 3

- More inpatient rooms are located in the same three wings for simplified internal wayfinding
- Grieving rooms are located in the same place for better visualization
- Operating rooms are located directly above the staff offices, on call rooms, emergency room and morgue
- One wing is dedicated to mechanical space for the whole building

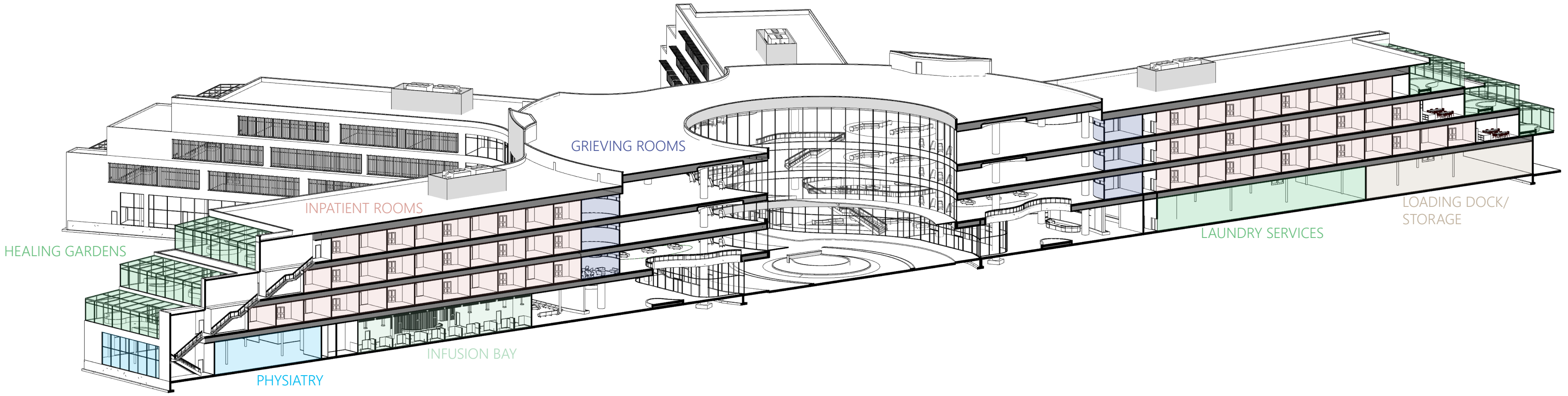


LEVEL 4

- The inpatient rooms on the fourth floor are Intensive Care Units for those in critical condition
- The ICU has restricted access and is on the top floor to reduce traffic and noise
- A therapy center is placed on the fourth floor providing different room sizes for one on one meetings and larger group meetings as needed
- A multifaith chapel is on the fourth floor for a more private location and is in close proximity to those who are losing loved ones in the ICU



BUILDING SECTION





SITE PLAN





ENTRANCE



SUSAN FOUNDATION
LUNG CANCER RESEARCH AND TREATMENT CENTER

CENTRAL POINT



SUSAN FOUNDATION
LUNG CANCER RESEARCH AND TREATMENT CENTER

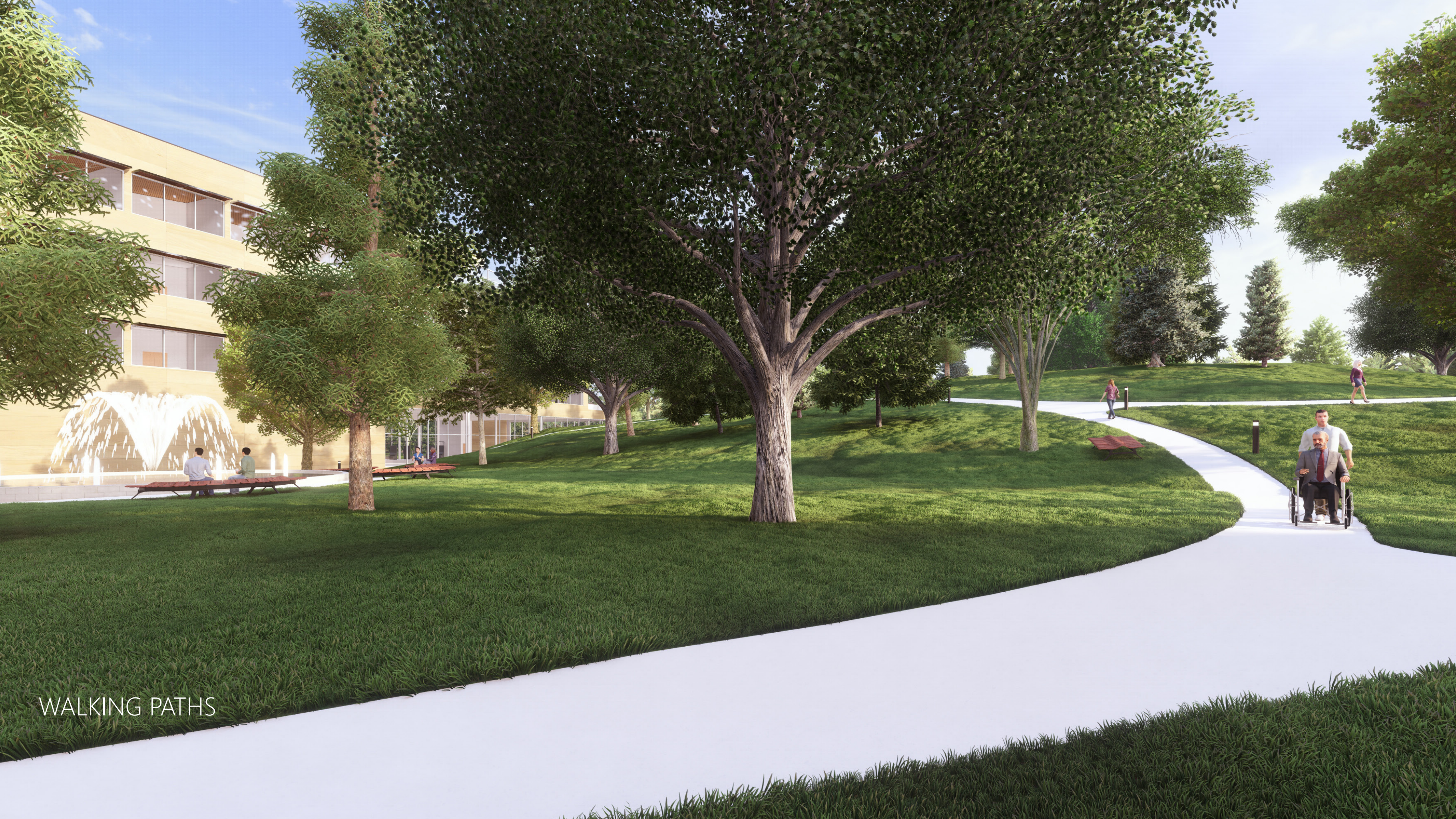
CHECK IN DESK



CHECK IN LOBBY



INFUSION BAY



WALKING PATHS



SECOND FLOOR

WING 2

INPATIENT ROOMS 223-246

NURSES STATION





GRIEVING ROOM



STAFF LOUNGE

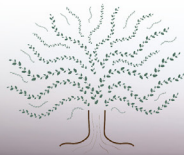


HEALING GARDEN

THIRD FLOOR VIEW

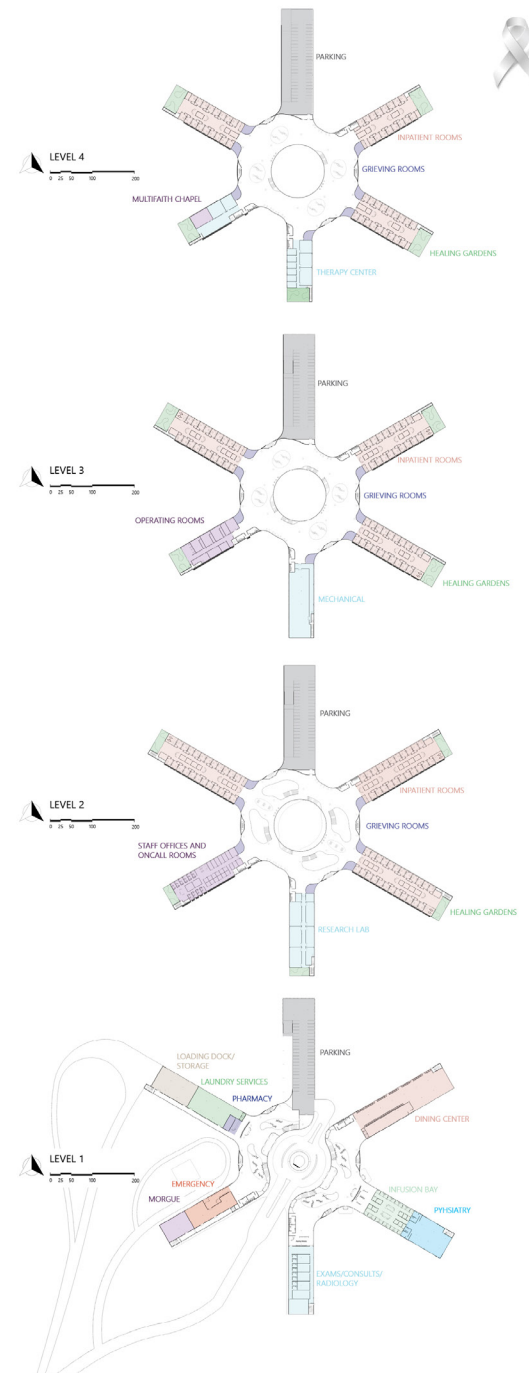






HEALING ARCHITECTURE

LUNG CANCER RESEARCH AND TREATMENT CENTER



CIRCULATION AND SPATIAL PROGRAMMING

To reduce confusion and simplify circulation patterns, all patients, visitors, and staff enter the building through the central roundabout. They are directly brought to check-in/drop off, parking, and check-out/pickup. From this central location, the hospital branches out into "wings" that separate the different uses of the building. The first floor is separated into two portions, the first portion houses the check-in desk, dining center, and outpatient services while the second portion houses the check-out desk, emergency room, and morgue. Separating check-in from check-out reduces traffic disruption and keeps movement flowing through the building. The overall layout simplifies circulation patterns, reduces the building footprint, and increases natural daylight in all spaces throughout the building.

THESIS PREMISE

It can be hard to encompass a healthy mentality when cancer is a prevalent factor in your life. Cancer is one of the top leading causes of death. On average, 600,000 people die of cancer every year. One of the most common leading causes of cancer death is lung cancer, making up almost 25% of all cancer deaths. The number of people affected by cancer can multiply by ten or more when family members and caregivers are taken into consideration.

Cancer patients, their family support, and caregivers all undergo challenging circumstances when cancer comes knocking at the door. Being diagnosed with cancer is scary and often traumatizing. Not only do they have to undergo chemotherapy, surgery, and constant hospital visits, they have to be able to mentally prepare and handle this newfound life of theirs. Studies have shown that a person's mental health and social well-being can affect the success of treatment. Leaving room to wonder how mental health is being supported.

Architecture has the ability to create meaningful spaces. In this case, architecture is used to create a healing environment. Hospitals can engulf a sense of serenity and peacefulness, when designed accordingly. Exposure to nature also contributes to a sense of health and wellbeing. By incorporating natural design aesthetics, stress and anxiety is reduced while instilling positive emotions in patients, staff, and visitors. Providing a greater overall experience. This Lung Cancer Research and Treatment Center is designed through the eyes of the patient, the family members, and the caregivers.



DULUTH, MINNESOTA
The site is located Southwest of Fish Lake Reservoir in northern Minnesota. It is in a heavily wooded area with a large variety of deciduous and coniferous trees. The site provides a secluded and serene context while still being in close proximity to a large population.

- Approximately 20 minutes from the Duluth International Airport
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FOREST BATHING - Taking in the medicine or atmosphere of the forest

When we are surrounded by nature, we turn off our worries and obsessive thinking. Breathing in forest air increases the level of natural killer cells in our blood. A Japanese study showed NK cells increase in activity by those who forest bathe. Our body uses these NK cells to combat infections and cancers. Plants and trees naturally emit a substance called phytoncides. Their antimicrobial properties influence immunity, improve sleep, lift mood and attention, and boost creativity. The affects of forest bathing alone can improve the emotional well-being of cancer patients, their families, and caregivers.



THESIS SOLUTION

Internal Wayfinding
Strategically programming the spaces in the building helps reduce the traffic footprint and increases productivity among the workers. The spatial program reduces confusion for patients and visitors, allowing for a more comfortable hospital experience. Architecture and interior elements provide direction with different colors and distinctive changes in appearance.

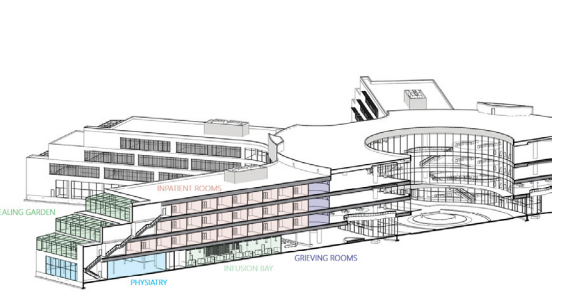
Nature
The use of indoor plants transforms the hospital stay. Plants promote healing, decrease stress, and are shown to increase productivity for the caregivers in the hospital as well. Plants also improve your overall sensory experience. Greenery provides privacy, comfort, and even aids in directing visitors through the hospital. The addition of water features help mask hospital sound as well.

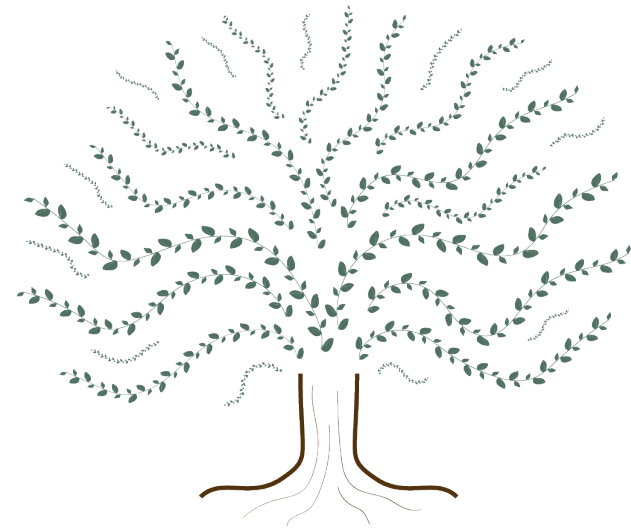
Natural Design Elements
Research shows that incorporating organic materials, such as wood, into the built environment, can improve occupant comfort, reduce stress and contribute to improved health indicators. Along with using natural materials, increasing natural daylight throughout the building will improve the mood of patients, visitors, and staff. The use of natural design elements offer patients a comforting, supportive and healing environment.

PLANTERRA - We believe a healthcare setting can also be a peaceful and calming place to recover.
Planterra is a leading provider of interior landscape services and plant rentals serving corporate campuses of the Fortune 500, medical facilities, hospitality properties and premier retail destinations. Planterra works directly with the hospital and healthcare staff to understand their goals and the needs of those working within the building. Planterra is used throughout the building to provide therapeutic healing gardens.

Therapeutic Healing Gardens
Allergy-free indoor plants:
When installing healing gardens within a hospital setting, experts at Planterra use informed practices to ensure the plants chosen for any design are a safe, healthy addition to the environment. We offer allergy-free plant options that do not release airborne pollen.

Safe, sterile plant maintenance:
We use soil-less growing media in the live plants. Soil-less growing media allows plants to thrive in a sterilized, soil-less mixture, free of organic materials which could attract pests or mold. When it comes to watering, Planterra uses a self-contained technology called sub-irrigation. This system of water-wicking technology ensures that a precise amount of water will be supplied as the plants need it. When live plants are not an option, Planterra can install realistic, replica plants to enhance the space. It also comes with a cleaning and dusting option to help maintain the sterility and safety of a medical environment.





THANK YOU