SPIRITUS

2023

JACK SEIBERT

SPIRITUS

Dedication

Mom, I never got the chance to express my gratitude for everything you did for me, for forging me into the person I am today. Your compassion knew no bounds. You touched the hearts of everyone you met with your warmth and kindness. Our time as a family ended too soon, but I take solace in the fact that your memory lives on through everyone you love.

I designed Spiritus, a lung cancer treatment facility, to honor you. It brings forth new ideas for planning and preparing for lung cancer patient needs. It represents the hope for a brighter future for those affected by lung cancer, a disease that took you away from us far too soon. I hope this book brings healing, caring, and compassionate ideas to help move cancer research forward.

Mom, I will always love you with all my heart, and I know you would say, "Jackie, I'll always love you more."

Committee

Gregory Luhan
Ph.D., FAIA | Department Head of Architecture | Committee Chair

Rey Pentecost
Ph.D., FAIA, FACHA, Leed AP | Professor of Practice | Committee Member

Bruce Dvorak
ASLA, PLA | Associate Professor | Committee Member

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Associate Professor of Practice | Studio Professor

Acknowledgement

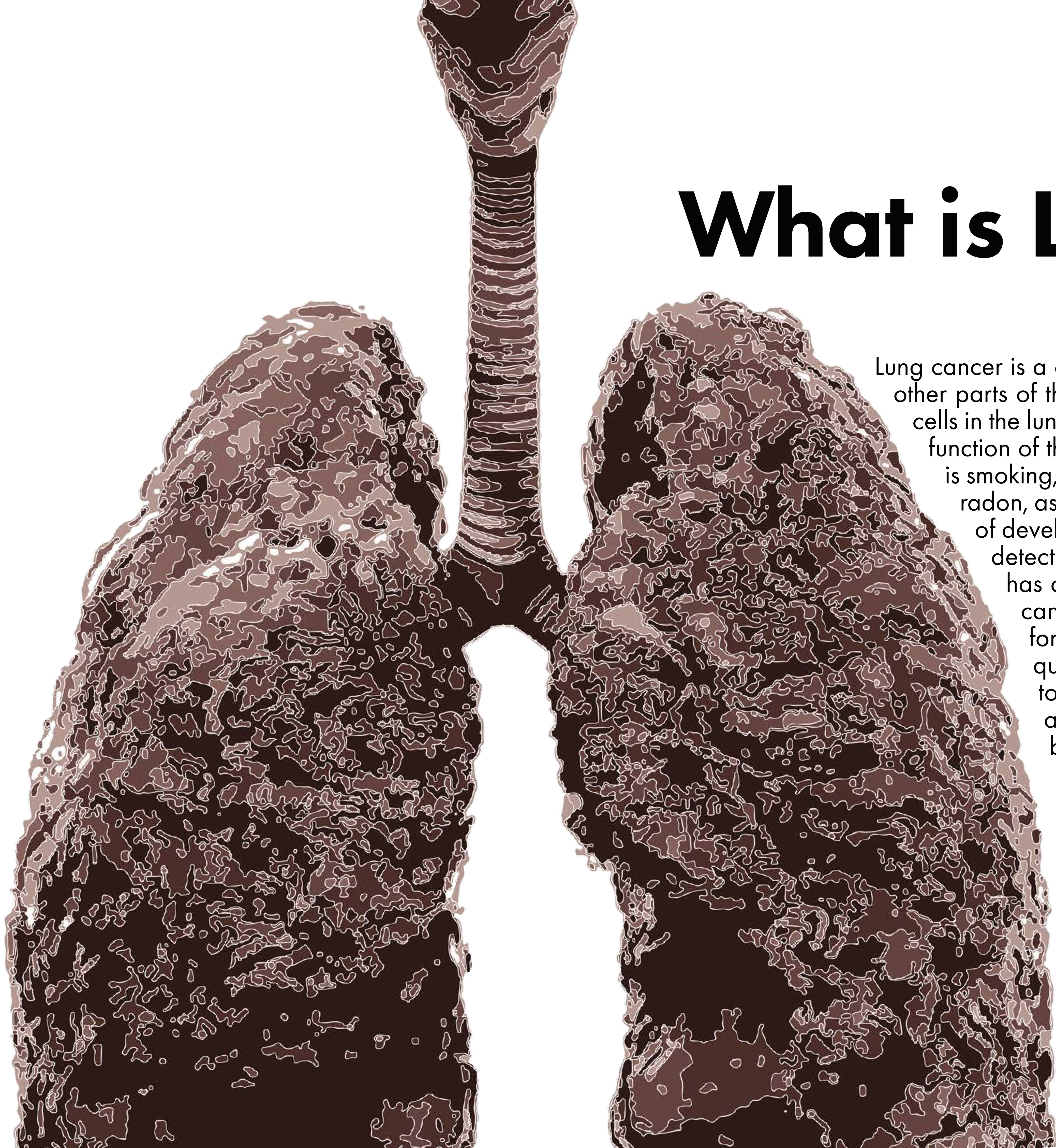
I express my heartfelt gratitude for the invaluable contributions to this year-long investigation to Dr. Ray Pentecost, Professor Bruce Dvorak, Professor Marcel Erminy, and Dr. Gregory Luhan. This project was only possible with your continued guidance, support, and expertise.

Dr. Pentecost, thank you for your assistance in getting this project off the ground. You were instrumental in its success. As my first project in the healthcare field, I could not have asked for a better mentor. Your insights into programming and patient flow of healthcare buildings were critical in bringing this project to life.

Professor Dvorak, I am grateful for your expertise in helping me understand greenery's valuable role in patient healing. Your guidance on green walls, therapeutic landscapes, and their integration with buildings was invaluable. You helped me integrate these elements into the building to create a healing environment for the building's users.

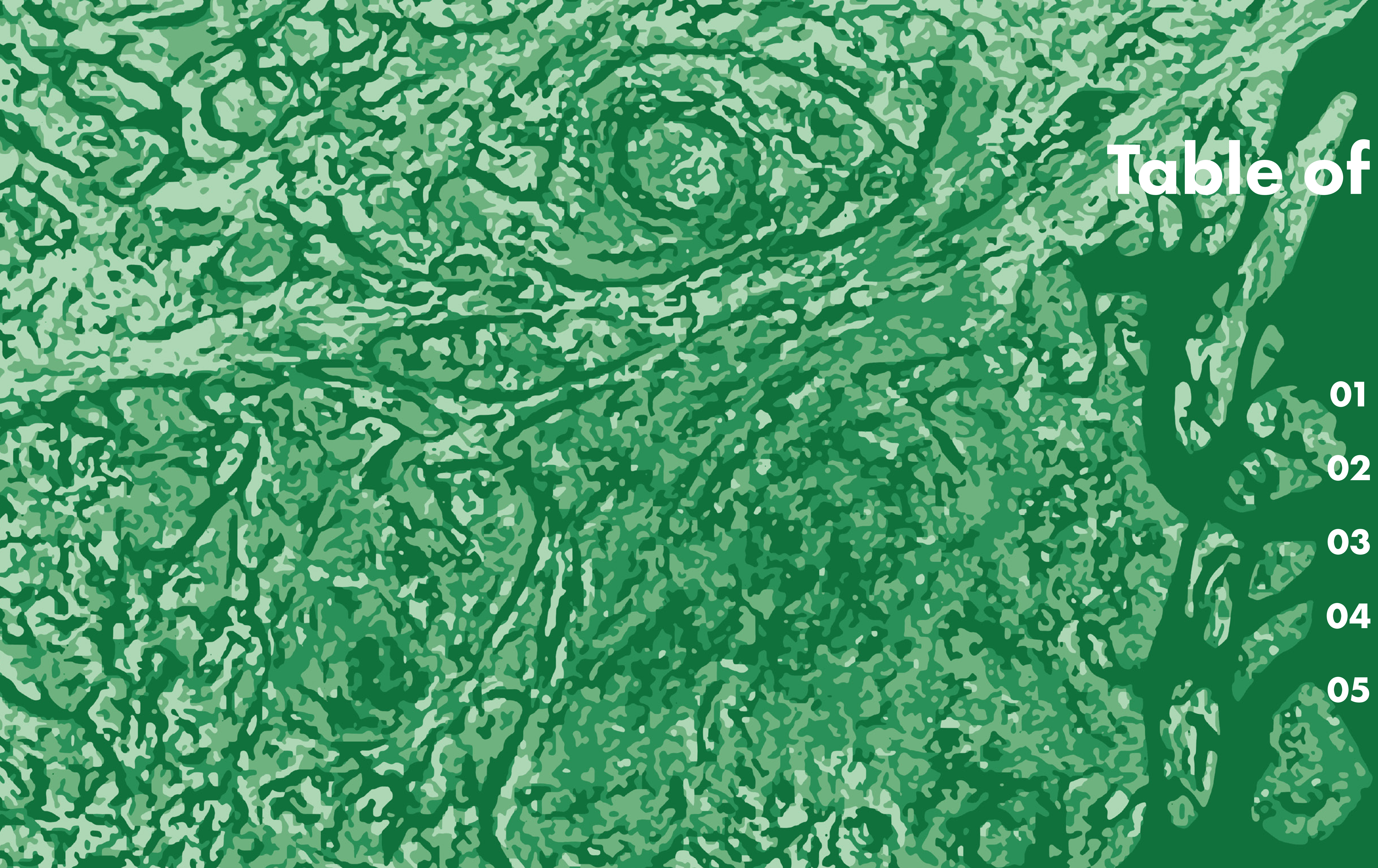
Professor Erminy, your high standards, and unwavering support challenged me to create my best work. Your guidance on graphic standards elevated my work to a new level. Thank you for always being there for us students and pushing us to achieve our best.

Dr. Luhan, I cannot thank you enough for recruiting me to Texas A&M University. I often wonder how different my life would be if I hadn't taken that leap of faith. Your guidance and encouragement throughout this project challenged me to think differently and to push beyond my limits. I hope that realizing all the goals we set at the beginning of this project is a testament to all the hard work we put into this project. When you read this book, you can see your contributions reflected in its pages. Again, thank you for everything you have done to make this project a reality.



What is Lung Cancer

Lung cancer is a disease that starts in the lungs and can spread to other parts of the body. It is caused by the abnormal growth of cells in the lungs, which can form tumors and disrupt the normal function of the lungs. The most common cause of lung cancer is smoking, but exposure to environmental pollutants such as radon, asbestos, and air pollution can also increase the risk of developing the disease. Lung cancer can be difficult to detect in its early stages and is often diagnosed after it has already spread to other parts of the body, which can make treatment more challenging. It is important for individuals to take preventative measures such as quitting smoking and avoiding exposure to pollutants to reduce their risk of developing lung cancer. As architects, we have a role to play in designing buildings and environments that promote healthy lifestyles and minimize exposure to harmful pollutants.



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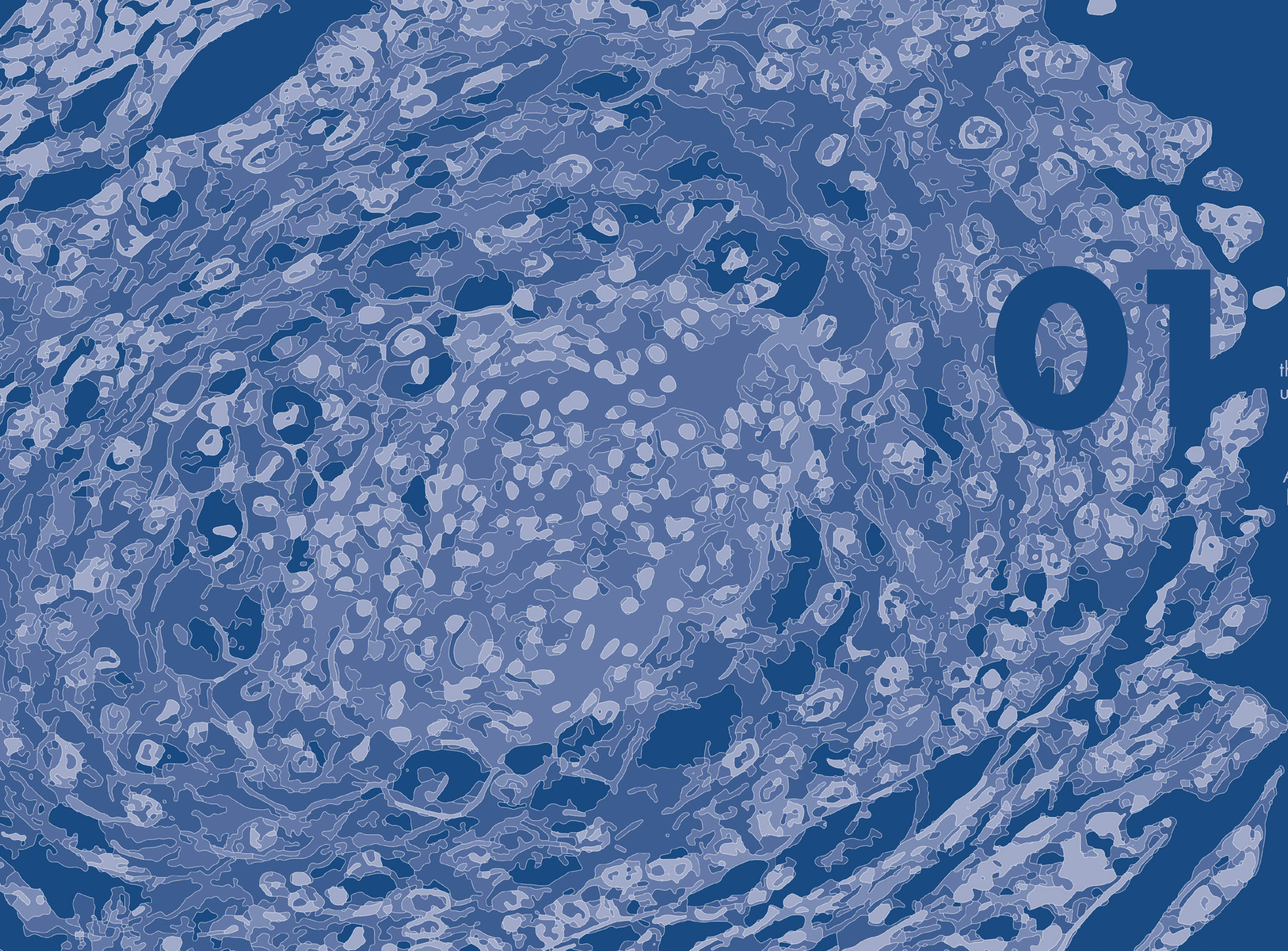


01

Research

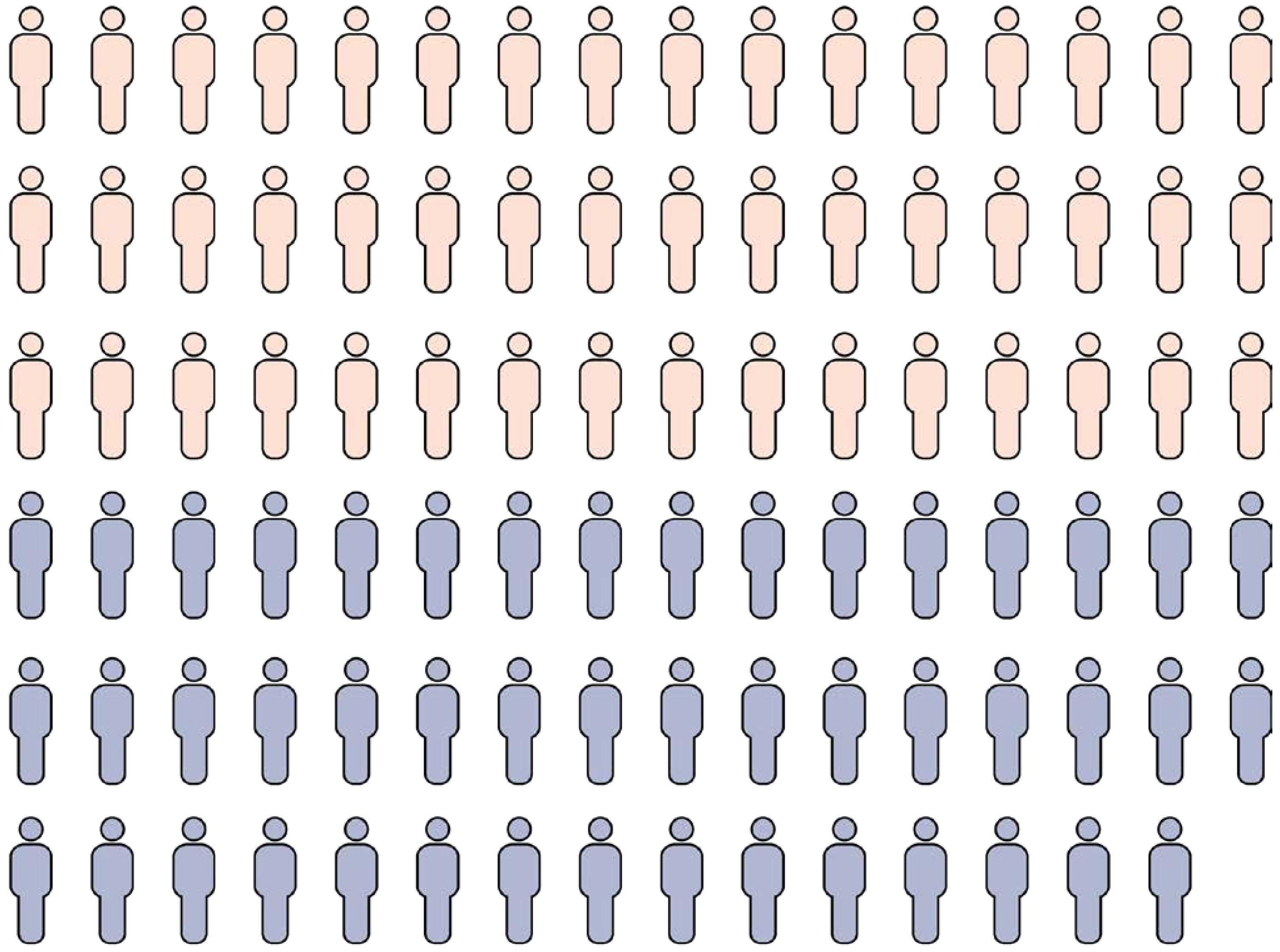
From its inception, the Spiritus project included extensive research that influenced its design and comprehensively informed its program of requirements. The ensuing in-depth investigations into lung cancer, treatment options, healing methods, and precedent analysis enabled design conceptualizations I never thought possible. The research also helped me to recognize how understanding cancer, especially lung cancer, from multiple vantage points would lead to this project's success.

According to the World Health Organization, lung cancer is the leading cause of cancer deaths globally, accounting for 1.8 million deaths in 2020. Lung cancer is the second most common worldwide, accounting for 11.4% of all cancer diagnoses. It is, therefore, critical to understand the overarching similarities between cancer types and recognizes cancer treatment differences when designing facilities to combat specific types of cancer. By conducting thorough research, we created a facility that meets the needs of lung cancer patients.

The research identified necessary measures to help reduce the risk of developing lung cancer, such as avoiding smoking and secondhand smoke exposure, minimizing exposure to environmental pollutants and radon, and maintaining an overall healthy lifestyle.

01.

Research

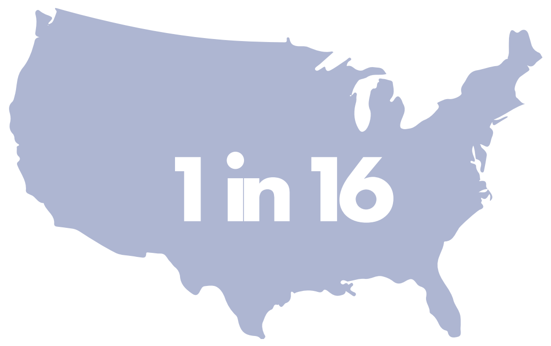


1.0 - 2022 New Lung Cancer Patients Nationally

238,340 New Cases
1 = 2,500 Cases

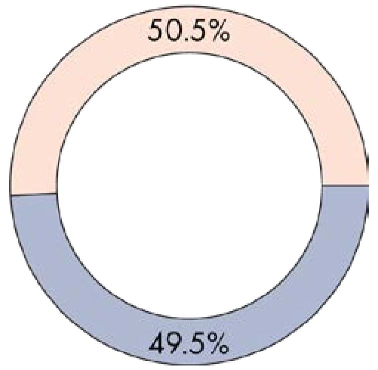
Female Patients

Male Patients



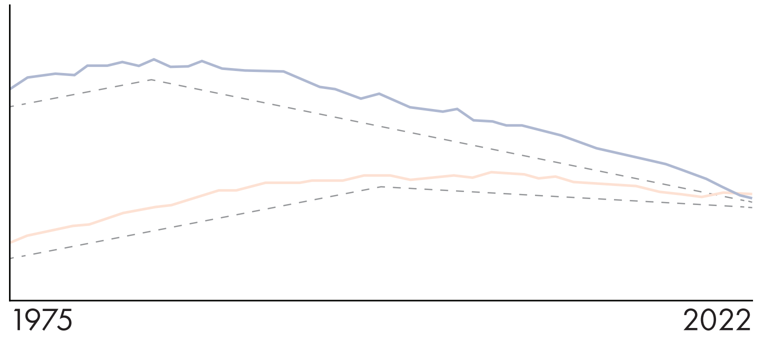
1.01 - 1 in 16 Americans will get Lung Cancer

1.02 - Every 2.2 minutes, an American gets Lung Cancer



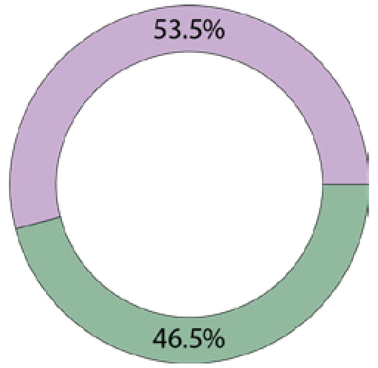
1.03 - 2022 Male/Female Lung Cancer ratio

In 2022, there were approximately 238,340 cases of lung cancer reported nationwide, making it the second most common form of cancer. Despite remaining consistent over the past decade, this number is still alarmingly high. Interestingly, the cases are almost evenly split between males (49.5%) and females (50.5%), indicating that the illness is not biased toward one gender. However, a closer examination of lung cancer trends reveals that this is not entirely accurate for male and female patients.



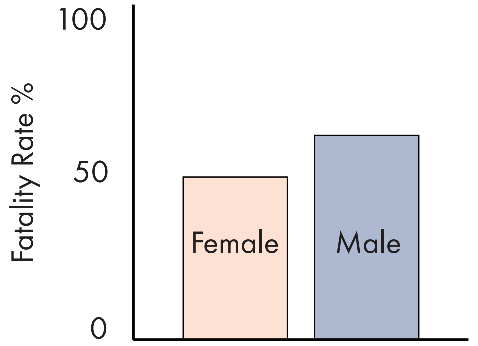
1.04 - Lung Cancer Trends Male/Female

Since 1983, there has been a significant decrease in lung cancer cases among males, while the number of cases among females steadily increased from 1975 to 2000 before stabilizing over the past two decades. In 1975, the number of male lung cancer patients was approximately double that of females, but recent data shows that the number of female cases has surpassed that of males.



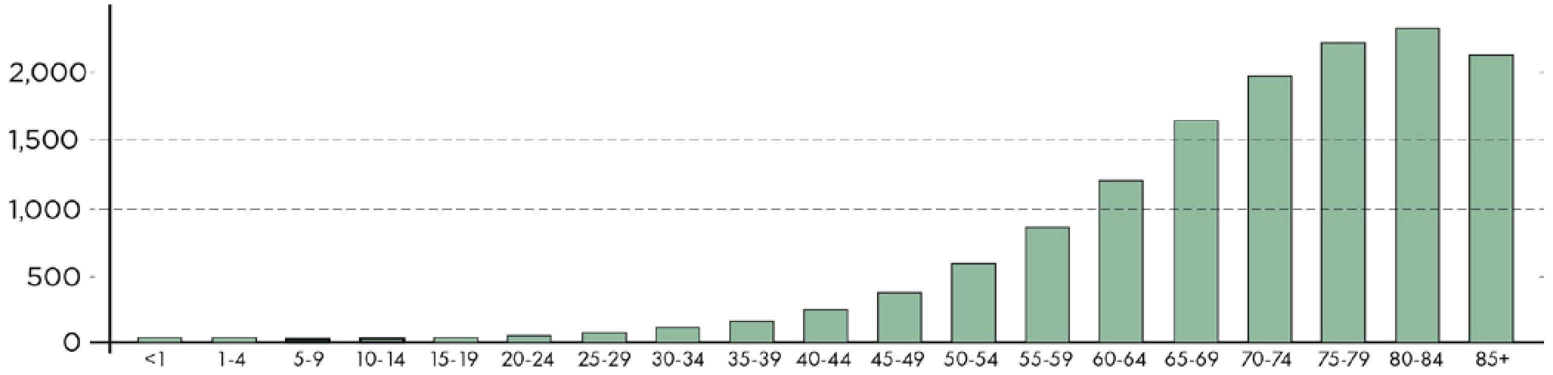
1.05 - Lung Cancer fatality rate

Despite being the second most common form of cancer, lung cancer is the most dangerous, with an alarmingly high mortality rate. In 2022, approximately 238,340 people will receive a lung cancer diagnosis. Out of these cases, around 127,070 individuals will die from this disease. This staggering fatality rate of 53.5% makes it the deadliest form of cancer, considering that colon/rectal cancer, the second most fatal form, has a fatality rate of only about 25%.



1.06 - Male / Female fatality rate

While lung cancer is now more common in females than males, it is still more fatal for men than for women. In 2022, 57% of men diagnosed with lung cancer can expect to succumb to the disease, compared to 49.5% of women. This difference in mortality rates relates to men being more frequent smokers than women.



1.07 - 2022 Lung Cancer age groups per 100,000 people

As people age, their likelihood of developing lung cancer increases significantly, with most cases occurring in the senior citizen age group (65+). Lung cancer research points to possible reasons due to damaged cells, which tend to deteriorate over time. Once cells start deteriorating, repairing them to their former state becomes difficult. However, people can take preventive measures to help avoid this issue altogether.

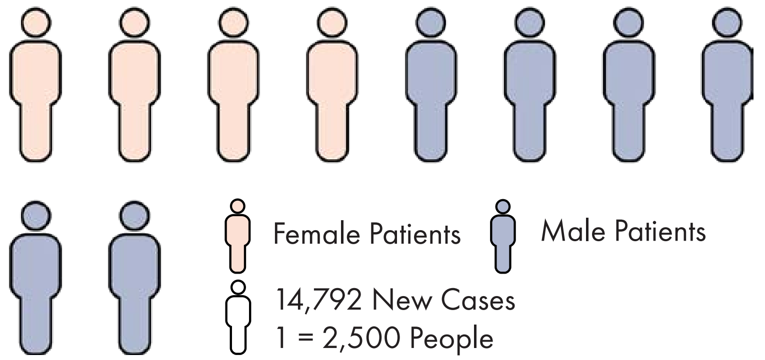
1.08 - Measures to reduce cell deterioration

Simple steps that minimize the likelihood of developing lung cancer include limiting sun exposure, moderating alcohol consumption, avoiding smoking, maintaining a healthy weight, and engaging in physical activity. Adopting a healthy lifestyle is the most effective way to reduce the risk of developing lung cancer. These measures help prevent lung cancer and enhance the overall quality of life.

1.09 - National Cancer Institute (NCI) Cancer Facilities Nationwide

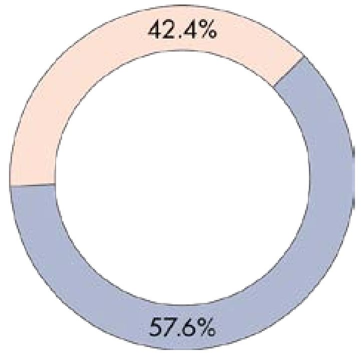
Comprehensive Cancer Care
Cancer Center
Basic Labatory Cancer Center

The National Cancer Institute (NCI) at the National Institutes of Health has 71 state-of-the-art cancer research facilities distributed nationwide. NCI stems from the National Cancer Act of 1971, which serves as the nation's cancer research plan and a standard of excellence. The NCI's primary objectives include preventing, diagnosing, and treating cancer. NCI facilities categorize into three types: Comprehensive Cancer Centers (51), Cancer Centers (11), and Basic Laboratory Cancer Centers (7). Comprehensive Cancer Centers dedicate to in-depth research, clinical trials, prevention, cancer control, and population science. Cancer Centers focus on cutting-edge clinical trials and prevention. Basic Laboratory Cancer Centers prioritize study and collaborate with institutions or are affiliated with University Medical Centers, allowing for resource sharing between the two.



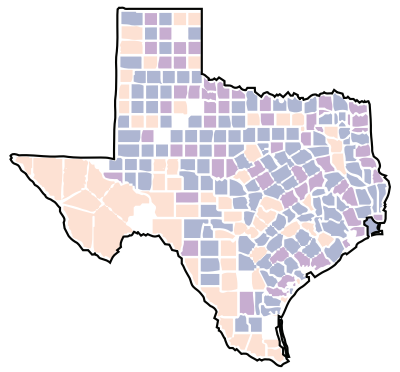
1.10 - 2022 New Lung Cancer Patients Texas
1 person = 2,500

In 2022, Texas recorded 14,792 new lung cancer cases, comprising 6.3% of the nation's total lung cancer cases and placing it second only to California. The high incidence of lung cancer in Texas is staggering and attributed to various factors. The top three are the state's high smoking rate, the prevalence of odorless radon gas in the air, and air pollution. Texas has an average smoking rate of 13%, the 14th highest in the country, and smoking remains the leading cause of lung cancer. Additionally, Texas ranks fourth highest in the country for radon levels and has the 10th highest level of air pollution. Considering these factors and the state's large population, it is unsurprising that Texas has a significantly high number of lung cancer cases.



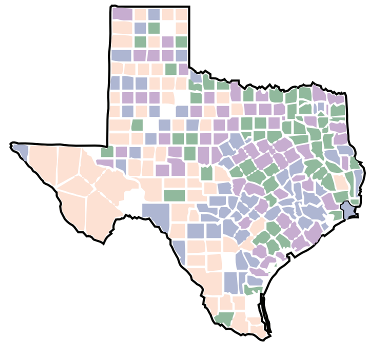
1.11 - 2022 Texas Male/Female Lung Cancer ratio

In Texas, there is a deviation from the national trends regarding the number of male and female lung cancer cases. Typically, male lung cancer cases have decreased over the past few decades while increasing in females. However, the opposite is true in Texas, with 57.6% of lung cancer cases being male and 43.4% female. This gender discrepancy attributes to the higher percentage of male smokers (17.5%) compared to female smokers (11.4%) in the state.



1.12 - 2022 Texas Cancer rate per 100,000 people

- Risk Population less than 1,000 people
- 200 - 325 per 100,000 people
- 325 - 450 per 100,000 people
- 450 - 575 per 100,000 people



1.13 - 2022 Texas Cancer Mortality Rate

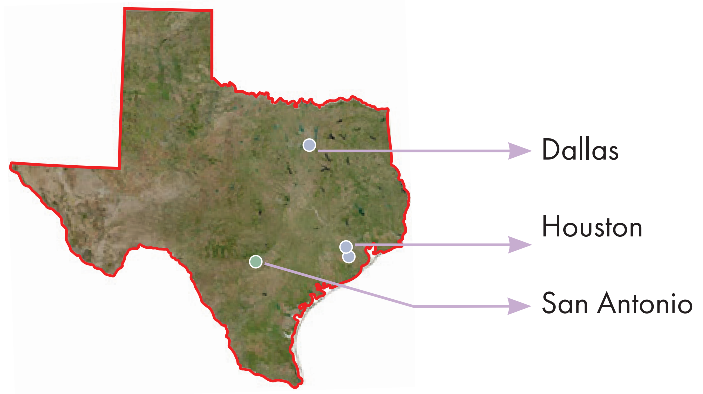
- Risk Population less than 1,000 people
- 66 - 150 per 100,000 people
- 150 - 165 per 100,000 people
- 165 - 180 per 100,000 people
- 180 - 250 per 100,000 people

An analysis of lung cancer cases in Texas reveals that the highest incidence rates concentrate around major cities such as Dallas and Houston. Additionally, several counties in Western Texas have high lung cancer rates, possibly attributed to higher smoking rates in the region. The fatality rate also follows a similar pattern, with higher rates in counties with many cases and limited access to cancer treatment facilities.

Rate of New Cases	Survival Rate	Early Diagnosis	Surgical Treatment	Lack of Treatment	Screening
Above Average	Below Average	Below Average	Bottom	Bottom	Bottom

1.14 - Texas Treatment vs National Average

"When comparing Texas to the rest of the country, it is evident that the state is falling far behind in cancer treatment facilities. Although Texas has several top-quality facilities, such as the renowned MD Anderson in Houston, the state's limited number of National Cancer Institute (NCI) facilities is a major factor. Texas currently has only four NCI cancer facilities, including two (2) in Houston, one (1) in Dallas, and one (1) in San Antonio, with zero (0) located in the state's capital - Austin (TX). In contrast, California has the country's highest number of lung cancer cases and has ten (10) NCI cancer facilities, six (6) more than Texas. The lack of facilities is a significant problem that must be addressed, especially considering California sees approximately 3,000 more lung cancer cases yearly than Texas."

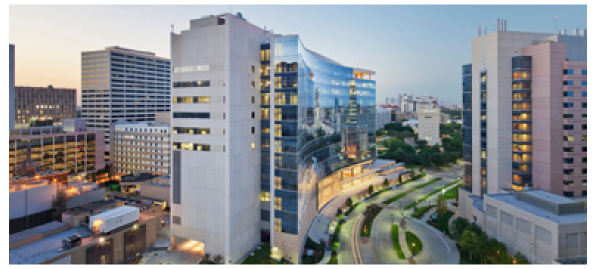


1.15 - NCI Cancer Facilities in Texas

Although MD Anderson Cancer Center (Houston, TX) is the leading cancer and research treatment center in the US as ranked by the US. Health News, the state has three other rated facilities - UT Southwest Medical Center (Dallas, TX) is ranked 25th with a rating of 60.2/100, followed by Houston Methodist Hospital (Houston, TX) at 29th with a rating of 58.2/100, and the University Health - San Antonio (San Antonio, TX) at 65th with a rating of 48.1/100, which falls far below the national standard.

1.16 - MD Anderson Cancer Center - Houston, Texas

1.17 - UT Southwest Medical Center - Dallas, Texas

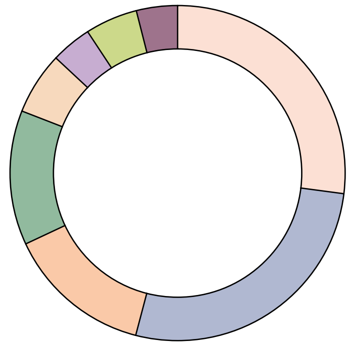


1.18 - Methodist Hospital - Houston, Texas

1.19 - University Health - San Antonio, Texas

1.20 - Precedent - AGORA Pôle de Recherche Sur le Cancer (Lausanne, Switzerland), Behnisch Architects

"The AGORA Pôle de recherche sur le cancer, located in Lausanne within sight of Lake Geneva, specifically provides working and research space for 400 scientists and practitioners under one roof. The major focus was on a comprehensive, holistic concept to design communication and working spaces for the cancer research center. Existing visual connections on the site and to the landscape beyond were crucial for a cautious formulation and adaption of the building mass. Thus, the building's sculptural character makes it easily recognizable within its surroundings and contributes to its autonomous presence."



1.21 - Precedent - AGORA Pôle de Recherche Sur le Cancer Program

- Lab - 27% - 30,000 SF
- Mechanical + Circulation - 27% - 30,000 SF
- Parking - 14% - 15,000 SF
- Offices - 13% - 14,000 SF
- Lobby - 6% - 6,600 SF
- Lounge - 5% - 4,500 SF
- Teaching - 4% - 4,000 SF
- Auditorium - 4% - 4,000 SF

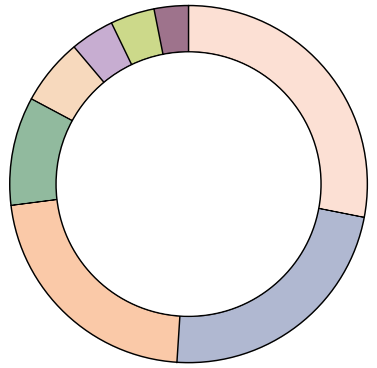
Total Square Footage - 107,000 SF

1.22 - Precedent - AGORA Pôle de Recherche Sur le Cancer Laboratory Section

The AGORA Pôle building has a unique layout that stacks programs on top of one another rather than dedicating entire floors to specific departments. This type of blocking and stacking design provides several advantages that enable different building programs to interact with each other on the same floor. This feature is particularly useful for research, teaching, and collaboration. The second to fourth floors contain laboratories, classrooms, and conference rooms, allowing users to interact voluntarily without forcing groups to interact. Additionally, this layout provides a significant advantage in terms of mechanical systems, as stacking the laboratories on top of each other simplifies the exhaust of the laboratories. Laboratories typically have negative air pressure to prevent the spread of germs throughout the entire building, and by stacking the labs, the air of these rooms has a direct route out of the building.

1.23 - Precedent - UCLA Outpatient Surgery and Oncology Center (Santa Monica, CA), Michael W. Folonis Architects

"The Outpatient Surgery and Oncology Center in Santa Monica expresses the continuation of early California Modernist sensibilities and incorporates extensive sustainable, green-building strategies. The design concept asserts that a more natural and less clinical environment promotes healing in patients and alert, productive behavior in doctors, staff, and students."



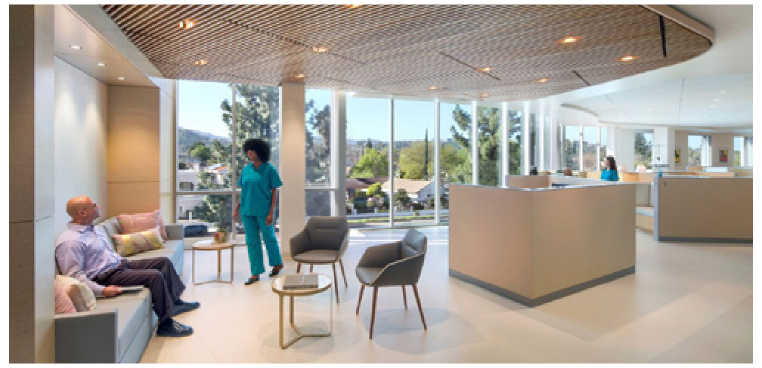
1.24 - Precedent - UCLA Outpatient Surgery and Oncology Center Program

- Parking - 29% - 17,000 SF
- Clinic's - 23% - 13,500 SF
- Surgery - 22% - 13,000 SF
- Circulation - 10% - 6,000 SF
- OR Care - 6% - 3,000 SF
- Lobby - 4% - 2,500 SF
- Pre/Post Op - 4% - 2,500 SF
- Mechanical - 4% - 2,500 SF

Total Square Footage - 132,000 SF
Clinical Building - 60,000 SF
Parking Garage - 72,000 SF

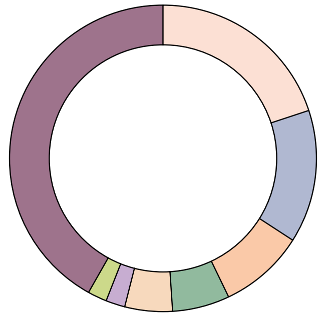
1.25 - Precedent - UCLA Outpatient Surgery and Oncology Center Parking Section

The UCLA Outpatient Surgery and Oncology Center stands out for two reasons: their approach to introducing natural light throughout the building and the patient entrances through the parking garage. Patient convenience is crucial when designing cancer centers, as patients are often frail, and any inconvenience can significantly impact their experience. Michael W. Folonis Architects recognized this and introduced the parking garage below the building to cater to patients' worst days, eliminating weather as a factor. The garage has elevators that lead directly into the patient lobby, where they check-in and proceed to their appointments. The lobby itself is designed to create a welcoming and warm environment, with a triple-height space and a large skylight above, allowing ample natural light to enter the building.



1.26 - Precedent - Cedars-Sinar Ventana Cancer Care Clinic (Tarzana, CA), ZGF Architects

"The new 29,477 SF Cedars-Sinai Ventana Cancer Clinic brings specialized oncological care to the heart of Tarzana, a community located just north of Los Angeles. The design concept centers on creating gentle, yet dynamic spaces that support the journey of healing, with color, materiality, and lighting intended to evoke a sense of safety and tranquility. The new clinic comprises a reception area that flows to a living room-style main waiting area, which is set at the heart of the clinic. All other spaces radiate from this welcoming point, including a large, sun-drenched infusion room with adjoining pharmacy, phlebotomy area, private consult rooms, and clinical spaces that feature an on-stage / off-stage relationship between exam rooms and care team workspaces."



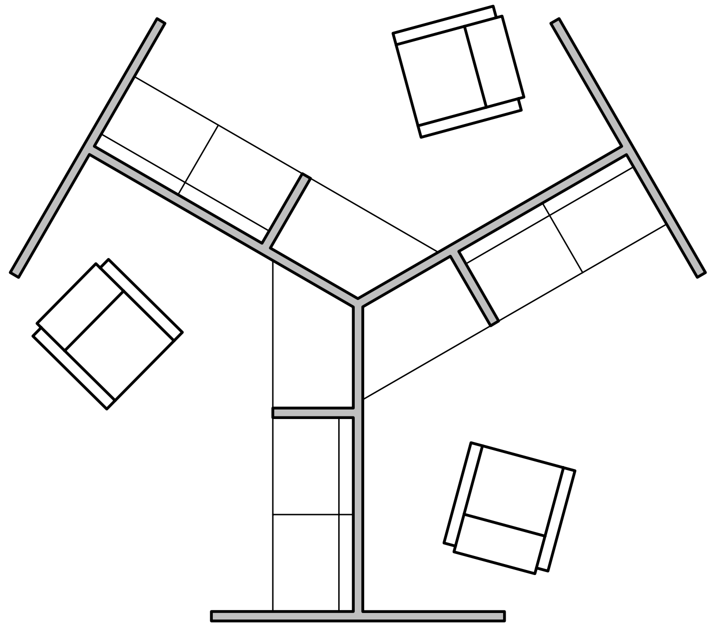
1.27 - Precedent - Cedars-Sinar Ventana Cancer Care Clinic Program

- Exam - 20% - 11,000 SF
- Offices - 14% - 7,000 SF
- Reception - 9% - 5,000 SF
- Restrooms - 6% - 3,500 SF
- Infusion - 5% - 3,000 SF
- Pharmacy - 2% - 1,250 SF
- Lab / Support - 2% - 1,250 SF
- Circulation - 2% - 23,000 SF

Total Square Footage - 55,000 SF

1.28 - Precedent - Cedars-Sinar Ventana Infusion Bay

The infusion bays at Cedars-Sinar Ventana Cancer Care Clinic are a remarkable innovation in the project, providing for the needs of patients, their families, and healthcare providers. According to ZGF architects, "The custom infusion bays, modeled after first-class airplane seating, are grouped in radiating configurations to create a sense of togetherness, with soft glow lamps throughout to create a hospitality-inspired look and feel." The hexagon layout of the bays ensures patient privacy, with four-foot partition walls between neighboring bays while still allowing visibility to other patients in the adjacent bay grouping. The infusion bays also allow one to two caretakers with visitor bench seating in each bay. For a single bay, the layout is almost perfect due to its connectivity to caretakers and nearby patients. However, there are two downsides to ZGF's layout: they only offer single infusion bays, and every bay has an exterior view. It's crucial to consider the preferences and experiences of each patient since everyone's chemotherapy journey is unique. For some, chemotherapy is a social process, and they want to be surrounded by other patients, uplifting each other. Connecting with nature is also essential, as greenery and sunlight aid healing.



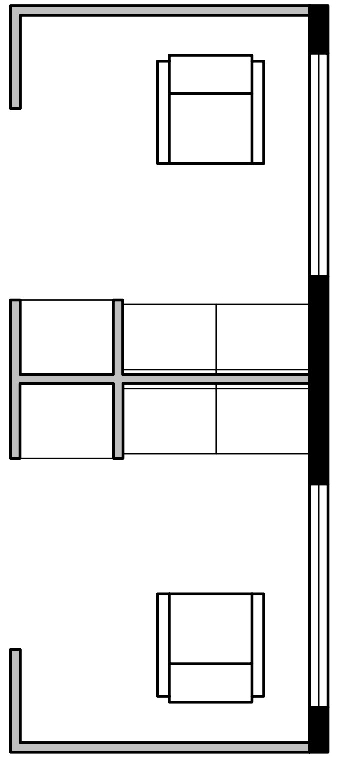
1.29 - Cedars-Sinar Ventana inspired Infusion Bay's Layout option one

Pros:

- Offers privacy from neighboring patients
- In-bay seating for visitors
- In-bay storage for belongings
- Nurses can easily see over the privacy barrier
- Viewing connection to other patients
- Warm materials create a relaxing environment

Cons:

- Lines of sight can be bad for privacy
- Not all patients have a window view
- Layout shape makes awkward floor plans
- Limits the number of patient seats



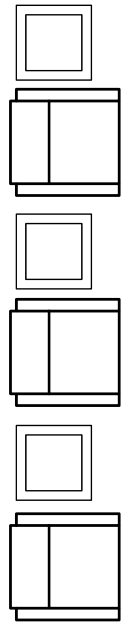
1.30 - Infusion bay layout option two

Pros:

- Offers privacy from neighboring patients
- In-bay seating for visitors
- In-bay storage for belongings
- Nurses can easily see over the privacy barrier
- Every patient has an exterior view
- More private with an entrance partition

Cons:

- Bays have to be set up against an exterior wall
- No visual connection to other patients
- Bay may feel secluded to some
- Limits the number of patient seats



1.31 - Infusion bay layout option three

Pros:

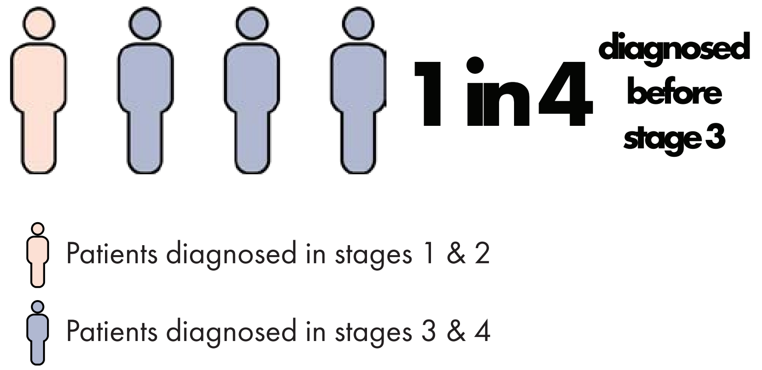
- Highest possible number of patient seating
- Easy for nurses to watch all patients at one time
- Allows for a social aspect of treatment
- Table for personal patient items

Cons:

- No option for patient privacy
- Seating for caretakers is not nearby
- Noise levels are the highest
- Chance of increased stress levels

Best option:

Combining infusion bays two and three would be the optimal solution for an infusion department. Patients can have a choice by utilizing these bays to design the department layout, empowering them to make their own decisions and allowing patients to choose whether they want their chemotherapy cycles to be in a social environment or a private one with only their family members. Moreover, all bay designs have an exterior view, which aids in the natural healing process.

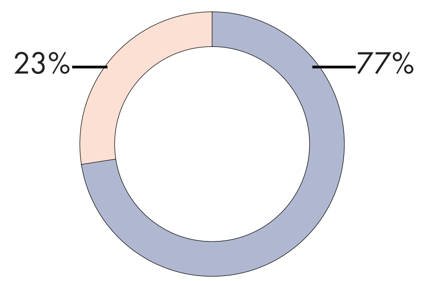


1.32 - When is lung cancer diagnosed?

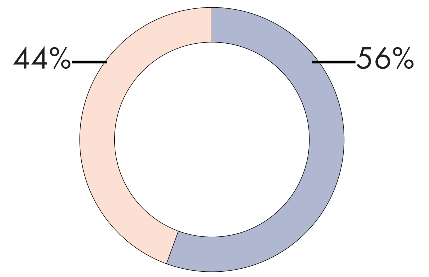
1.32 - When is lung cancer diagnosed?
Lung cancer is often diagnosed in its later stages because the early stages of the disease usually do not produce any noticeable symptoms. In many cases, the signs that appear in the early stages of lung cancer are often attributed to other less severe health conditions, such as a cough, chest pain, or fatigue, leading to delays.

Additionally, lung cancer can be challenging to detect early on because the cancerous cells may not show up on imaging tests or may be mistaken for other noncancerous conditions, such as pneumonia or bronchitis. As a result, lung cancer diagnosis usually does not occur until it has progressed to more advanced stages, thus limiting the available treatment options and making the disease more difficult to treat. It is important to note that early detection of lung cancer through regular screenings for high-risk individuals, such as those who smoke or have a family history of lung cancer, can help improve the chances of successful treatment and reduce mortality rates. Frequent screenings are not a standard measure for patients. For these reasons, this research project focuses on stage three and four patients.

1.33 - CT Scanner detection examination



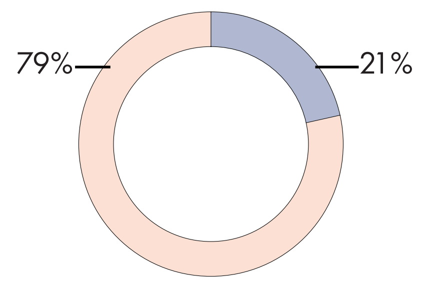
1.34 - Stage 3 Patients who received chemotherapy



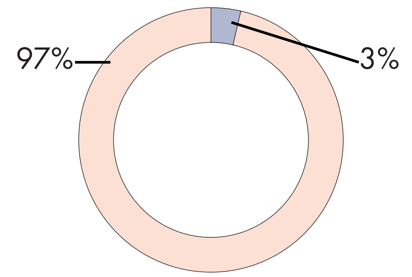
1.35 - Stage 4 Patients who received chemotherapy

Patients who did receive Chemotherapy
Patients who did not receive Chemotherapy

Chemotherapy is a type of cancer treatment that involves using drugs to kill cancer cells and is often used to treat lung cancer that has spread beyond the lungs or combined with other early-stage lung cancer treatments. In lung cancer chemotherapy, the drugs are usually given through a vein, either intravenously (IV) or through a port, which is a small device inserted under the skin. The drugs then circulate throughout the body, killing found cancer cells. The chemotherapy drugs used for lung cancer can vary, but some common medications include cisplatin, carboplatin, paclitaxel, docetaxel, gemcitabine, and etoposide. The specific drugs and dosages used will depend on the type and stage of cancer and the patient's overall health. Chemotherapy for lung cancer can have side effects, such as hair loss, nausea, vomiting, fatigue, and an increased risk of infection. However, medication or other treatments can manage many of these side effects.



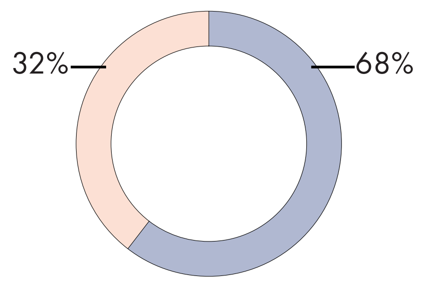
1.36 - Stage 3 Patients treated by Surgery



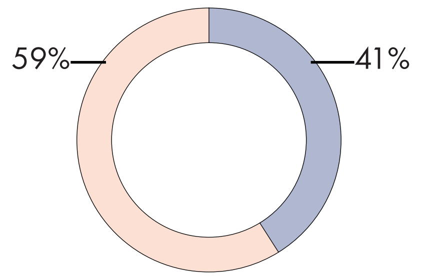
1.37 - Stage 4 Patients treated by Surgery

Patients who we treated by Surgery
Patients who were not treated by Surgery

Surgery is a standard treatment option for lung cancer, particularly for early-stage non-small cell lung cancer. Surgery aims to remove the cancerous tissue from the lung and potentially cure cancer. There are different types of surgeries for lung cancer, and the specific procedure performed will depend on the location and size of the cancerous tissue and the patient's overall health. The most common type of surgery is Lobectomy, which involves removing the lung's entire lobe containing the cancerous tissue. Performing lung cancer surgery usually occurs under general anesthesia, and the patient may need to stay in the hospital for a few days after the procedure. Recovery time can vary depending on the type of surgery performed and the patient's overall health, but most patients can return to normal activities within a few weeks to a few months. Surgery for lung cancer can have risks and potential complications, such as bleeding, infection, and damage to surrounding tissues. However, surgery can offer a good chance for a cure and long-term survival for patients with early-stage lung cancer.



1.38 - Stage 3 Patients who received Radiation Therapy



1.39 Stage 4 Patients who received Radiation Therapy

Patients who we treated by Radiation Therapy
Patients who were not treated by Radiation Therapy

Radiation therapy is a cancer treatment that uses high-energy radiation to kill cancer cells. It is often used to treat lung cancer, typically in combination with other treatments such as surgery or chemotherapy. A linear accelerator delivers high-energy radiation beams to the cancerous tissue in lung cancer radiation therapy. The radiation can be directed to the tumor from outside the body (external beam radiation) or by placing radioactive material inside the body near the tumor (brachytherapy). Radiation therapy for lung cancer can have side effects, such as fatigue, skin irritation, difficulty swallowing, and shortness of breath. However, medication or other treatments can manage many of these side effects.

02

Site + Context

The project site locates in Austin, Texas, for three primary reasons:

1. Austin (TX) is the only major city in Texas without a cancer facility.

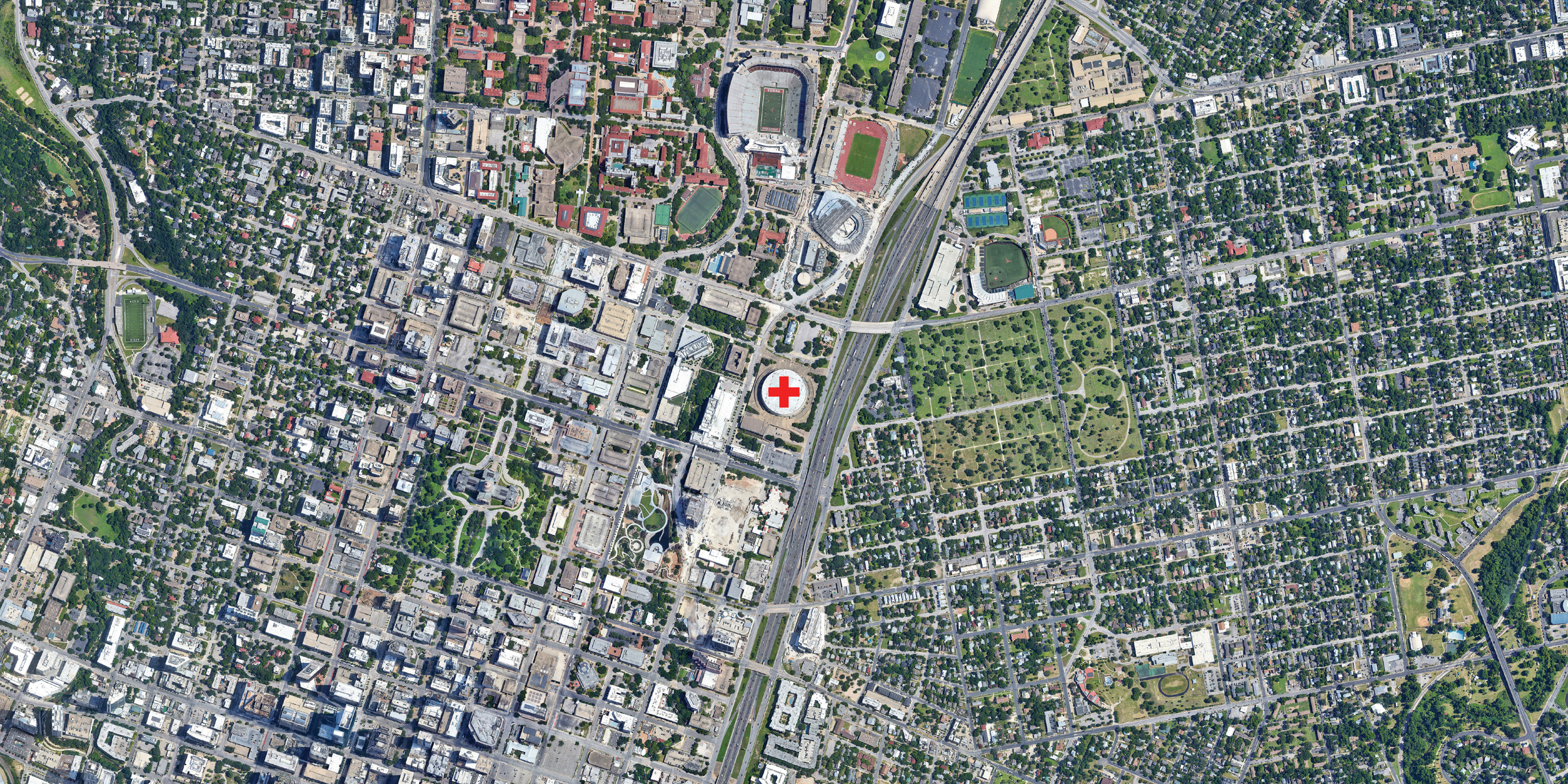
2.Austin continues to grow rapidly, thus necessitating the planning and development of an NCI facility shortly.

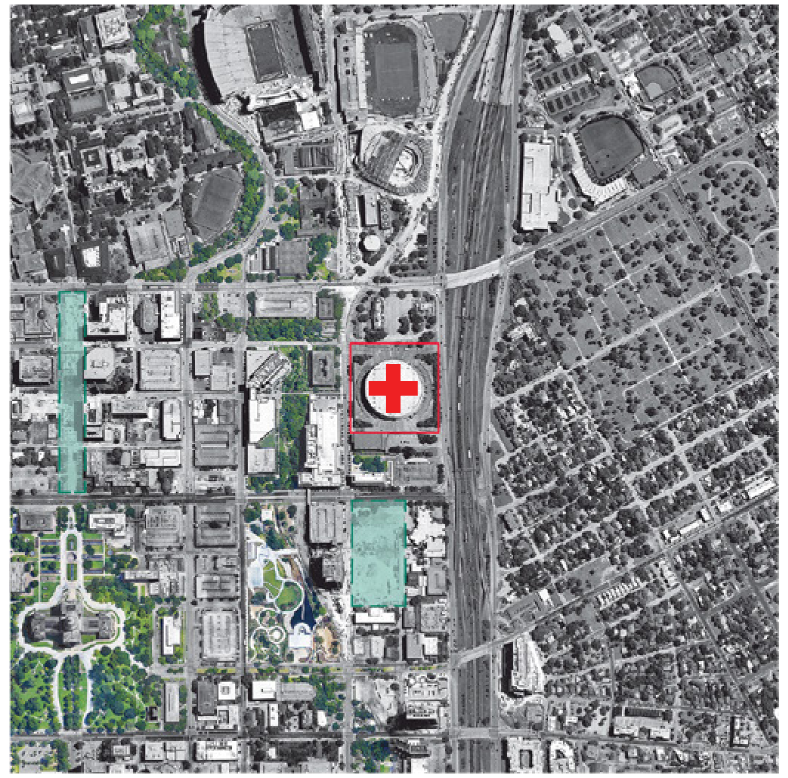
3.The proximity of the well-regarded Dell Medical System, which partnered with the University of Texas at Austin and has moved to the forefront of academic and industry-based research, and currently, no cancer facilities are part of the Dell Medical System.

The project site is located on the east side of the Dell Medical district. The site's proximity to the rest of the campus allows researchers and healthcare providers of the Spiritus facility to work with other parts of the district efficiently. The site itself is where the Frank Erwin Center currently occupies. The Frank Erwin Center previously served as the University of Texas at Austin's basketball arena, but with the recent completion of the Moody Center serving as UT's new basketball arena, one half a mile down the road from the original one, the Frank Erwin Center is now obsolete. UT plans to raze the Frank Erwin Center and add to the Dell medical campus very soon.

02.

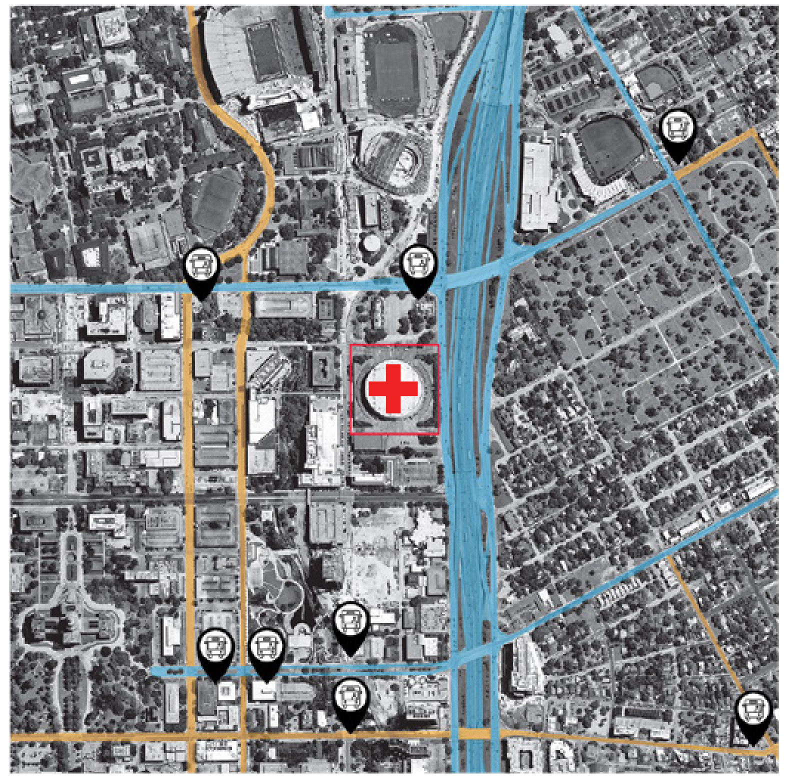
Site + Context





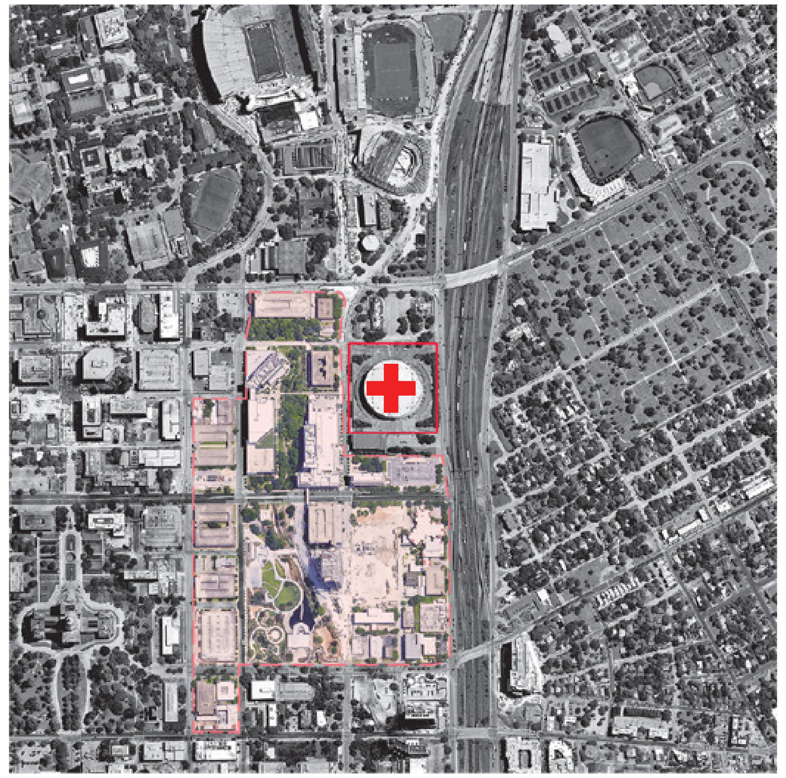
Site
Proposed Green Spaces
Existing & Proposed Parks

Existing Parks

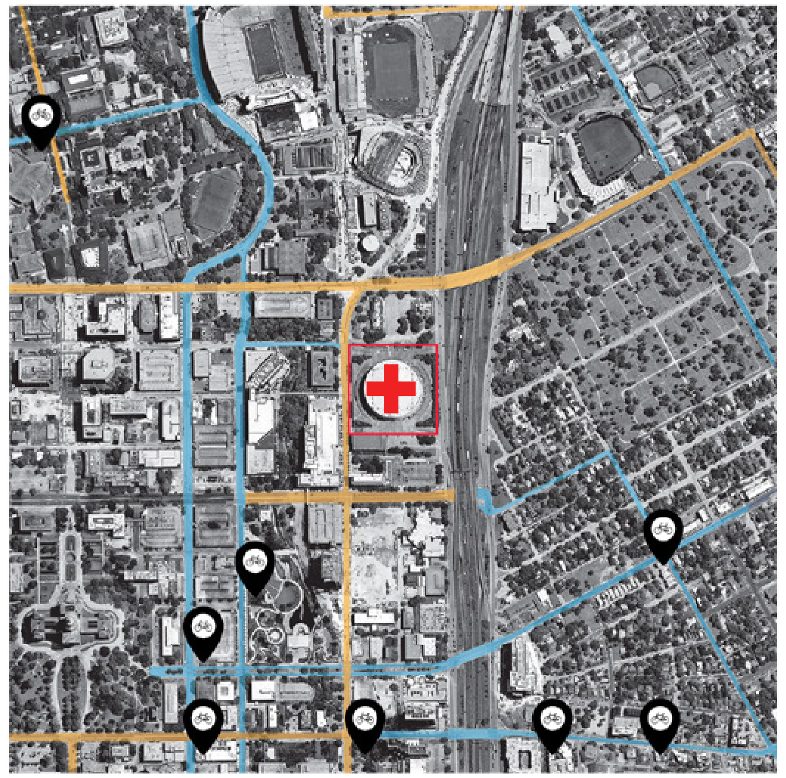


Site
High Frequency Bus Routes
Bus Routes

Bus Stops
Medium Frequency Bus Routes



Site
Dell Medical Campus
Dell Medical Campus



Site
Well Paved Bike Lanes
Bike Routes

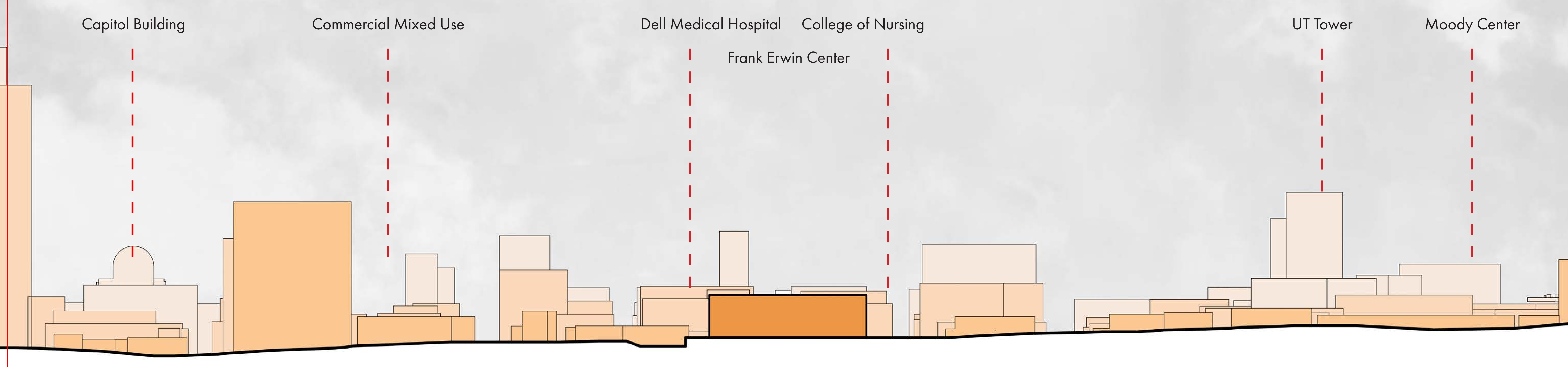
Bike Rental
Paved Bike Routes

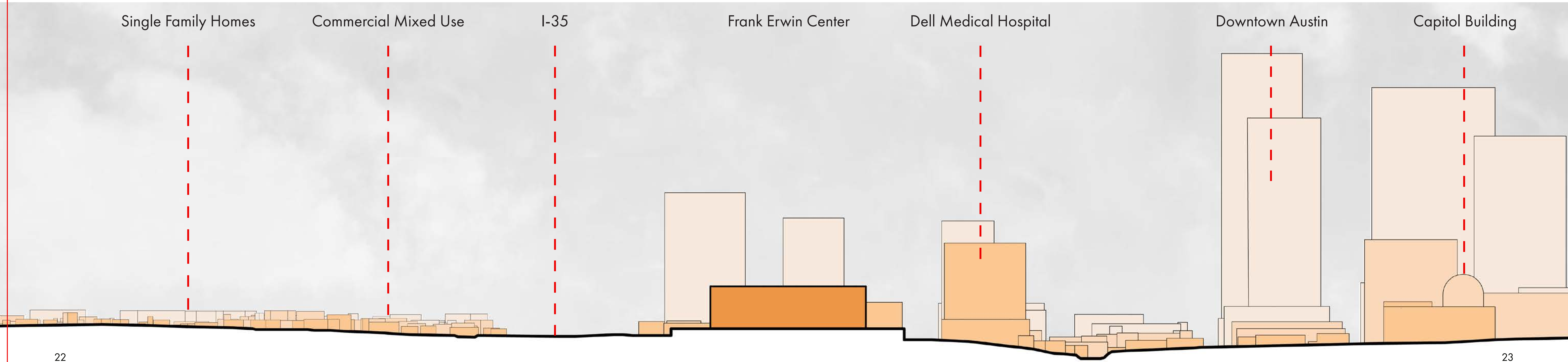
2.01 - Southwest Aerial View of Site

The Frank Erwin Center sits just outside of Austin's downtown core, and since it elevates on a plinth above the surrounding context, it offers a prominent striking view as drivers enter the city on southbound Interstate 35. Adjacent to the center situates renowned institutions such as Dell Medical Center - which includes hospitals and colleges operated by the University of Texas. Beyond this bustling hub, the site offers uninterrupted views of the city's majestic skyline stretching beyond the horizon.

2.02 - Northwest Aerial View of Site

As drivers leave downtown Austin, the Frank Erwin Center comes into view, offering a unique perspective from the opposite direction. Surrounding the center are various buildings that are part of Dell's medical campus, while the rest of the University of Texas campus lies beyond, seamlessly connected to the site.


Capitol Building
Commercial Mixed Use
Dell Medical Hospital
College of Nursing
Frank Erwin Center
UT Tower
Moody Center

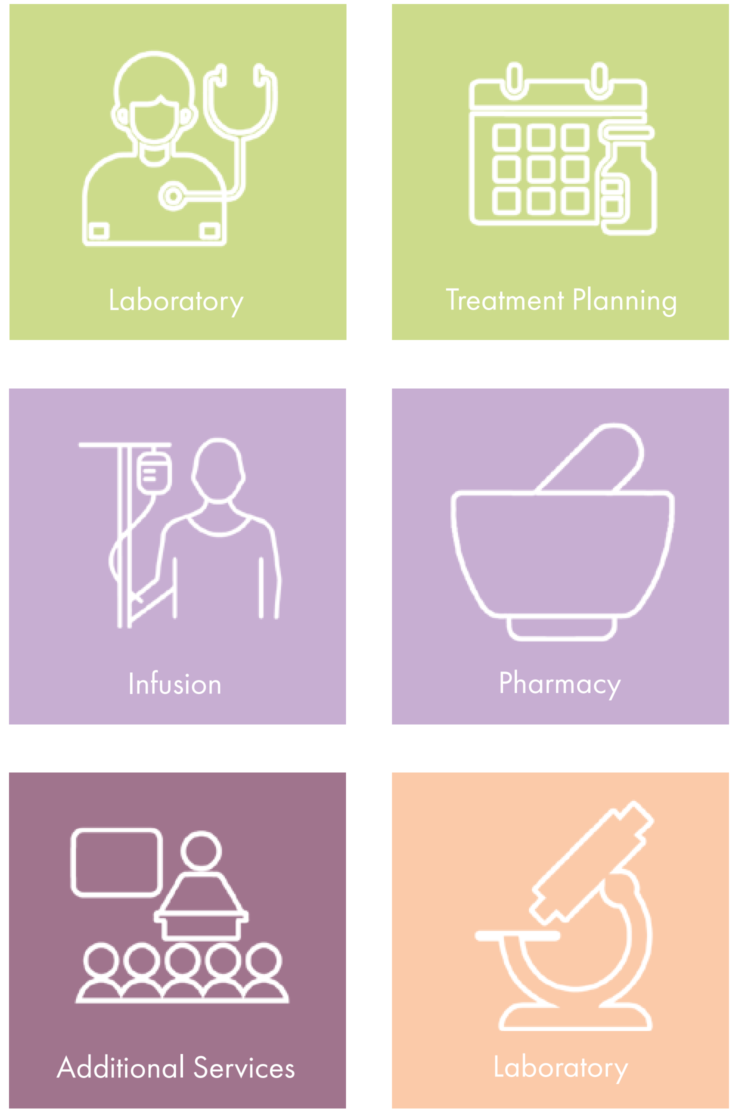

Single Family Homes
Commercial Mixed Use
I-35
Frank Erwin Center
Dell Medical Hospital
Downtown Austin
Capitol Building

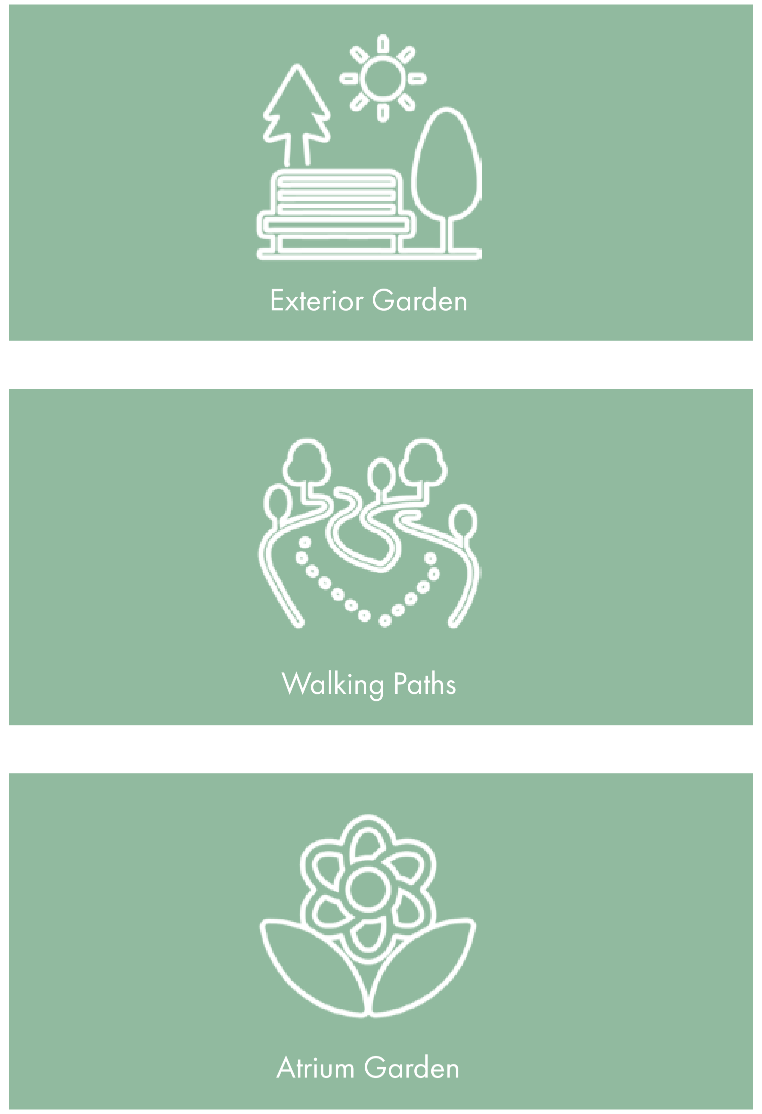
03 Program

The program of the Spiritus building fits within the Dell Medical System campus in Austin, Texas. The building program includes Lung Cancer diagnostics, chemotherapy treatment, additional patient services, and research laboratories to study lung cancer. Different treatment options, such as surgery, are not provided on-site but rather provided at nearby Dell Medical System facilities. All program elements are within the garden areas surrounding the building or built within the heavily-planted green atrium at the heart of the building. Research demonstrates that greenery promotes a healing environment, which is why the Spiritus design contains interior and exterior garden space and provides inward-looking views toward the atrium and outwards toward the site's gardens. The additional services aspect of the building is critical for the patients. The program considers spaces for living with cancer classrooms, group therapy areas, and a store specializing in goods for all patient needs.

03.

Program



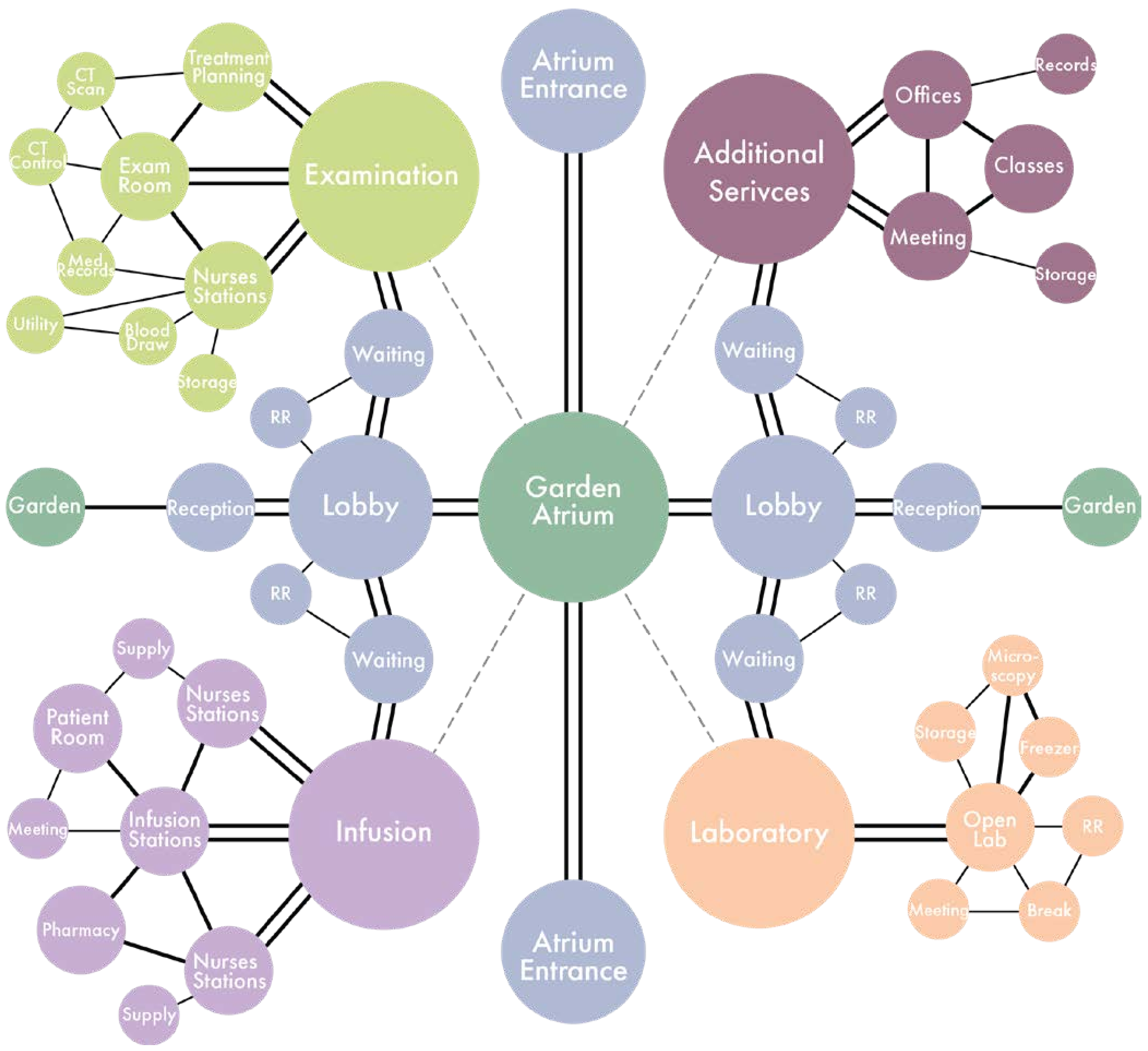


3.01 - User Needs

The building program comprises five main sections: exam, infusion, green atrium, laboratories, and additional patient services. Separating these areas is crucial, allowing for voluntary interactions between departments instead of forced relationships. The centrally-located atrium divides the building's program with treatment areas on the west-facing side (exam and infusion) and all other patient services and laboratories on the east-facing side. Both sides represent one lung, with the green atrium in the middle symbolizing the windpipe as it serves as the facility's entrance.

3.02 - Creating a Healing Enviorment

The facility's design features an immersive garden that serves as the main entrance from the street level. The garden provides a peaceful and calming environment for patients and visitors, strategically placing hearty, non-invasive, drought-tolerant plants and trees that add to the aesthetic appeal and promote a healthy and natural atmosphere. Patients that enter the serene garden alleviate anxiety associated with medical visits. The garden connects to the green atrium, enhancing the facility's overall healing atmosphere.



3.03 - Adjacency Matrix

Primary
Secondary
Tertiary

- - - - Visual Connection

The adjacency matrix is a visual representation that illustrates the flows, relationships, and connections between spaces, providing valuable insights for the project. The links classify into primary, secondary, and tertiary categories, based on the frequency of travel, with tertiary being restricted to employees only. All spaces in the building orient around the garden atrium, which serves as a central hub and provides patients and users with a connection to the natural environment.

3.04 Spiritus Space Program
Austin, Texas

Lobby	#	NSF	Room NSF	Depart. NSF	Depart. GSF
Lobby	2	1,500	3,000		
Reception	2	150	300		
Communal Restrooms	4	300	1,200		
Waiting	2	1,500	3,000		
Storage	2	100	200		
Office Supply	2	100	200		
Department SF				7,900	
Gross Factor					1.35
Department Gross SF					10,655

Examination	#	NSF	Total NSF	Depart. NSF	Depart. GSF
Exam Room	24	120	2,880		
Nursing Stations	6	80	480		
Treatment Planning	3	200	600		
Decenteralized Supply	6	300	900		
Medical Records	3	150	450		
Blood Draw	3	150	450		
CT Scan	3	400	1,200		
CT Control	3	100	300		
Soiled Utility	3	150	450		
Individual Restrooms	12	60	720		
Department SF				9,330	
Gross Factor					1.35
Department Gross SF					12,596

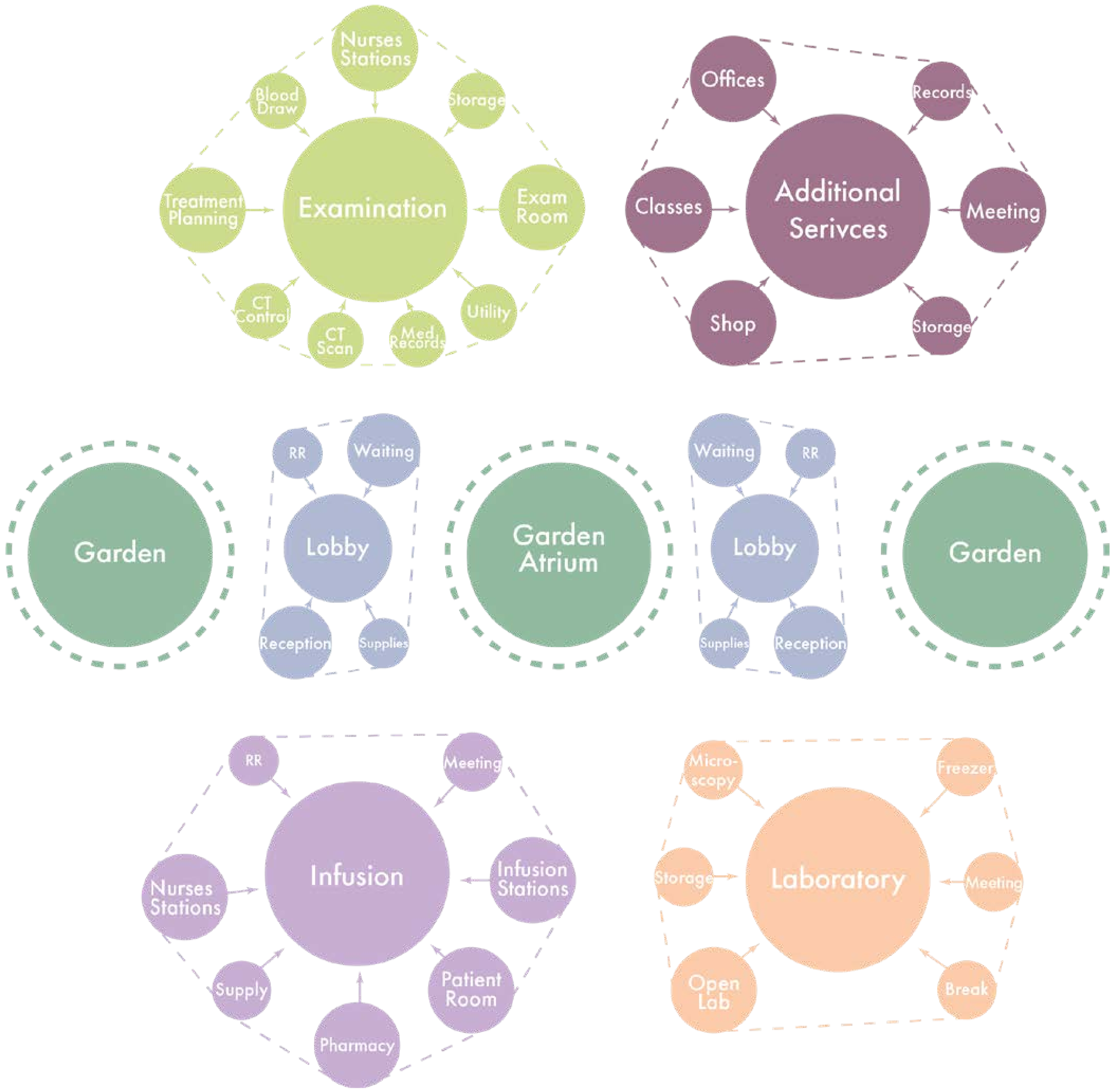
Infusion Department	#	NSF	Total NSF	Depart. NSF	Depart. GSF
Patient Rooms	3	120	360		
Nursing Stations	12	80	960		
Infusion Bays	48	115	5,520		
Sub Waiting	2	300	600		
Pharmacy	1	2,000	2,000		
Meeting	5	300	1,500		
Workroom	1	500	500		
Decenteralized Supply	6	150	900		
Soiled Utility	6	150	900		
Individual Restrooms	10	60	600		
Outdoor Terrace	1	550	550		
Department SF				14,390	
Gross Factor					1.35
Department Gross SF					19,427

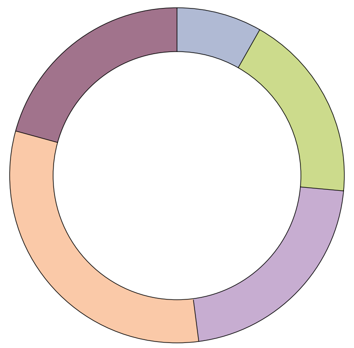
Laboratory	#	NSF	Room NSF	Depart. NSF	Depart. GSF
Open Lab	3	4,000	12,000		
Lab Freezer	3	500	1,500		
Microscopy	3	500	1,500		
Storage	3	300	300		
Meeting	3	300	900		
Breakroom	3	500	1,500		
Communal Restrooms	6	300	1,800		
Blood Draw	9	150	1,350		
Department SF				21,750	
Gross Factor					1.35
Department Gross SF					29,363

Administration	#	NSF	Total NSF	Depart. NSF	Depart. GSF
Communal Offices	10	120	1,200		
Conference Rooms	3	300	900		
Breakroom	1	500	500		
Storage	1	100	100		
Records	1	150	150		
Communal Restrooms	2	300	600		
Subwaiting	1	300	300		
Department SF				3,750	
Gross Factor					1.35
Department Gross SF					5,062

Patient Store	#	NSF	Total NSF	Depart. NSF	Depart. GSF
Open Shopping Area	1	2,500	2,500		
Checkout Area	1	1,200	1,200		
Store Storage	1	1,000	1,000		
Changing Rooms	4	120	480		
Department SF				5,180	
Gross Factor					1.35
Department Gross SF					6,993

Patient Learning					
Classrooms	4	700	2,800		
Sub Waiting	1	300	300		
Outdoor Terrace	1	550	550		
Department SF				3,650	
Gross Factor					1.35
Department Gross SF					4,928

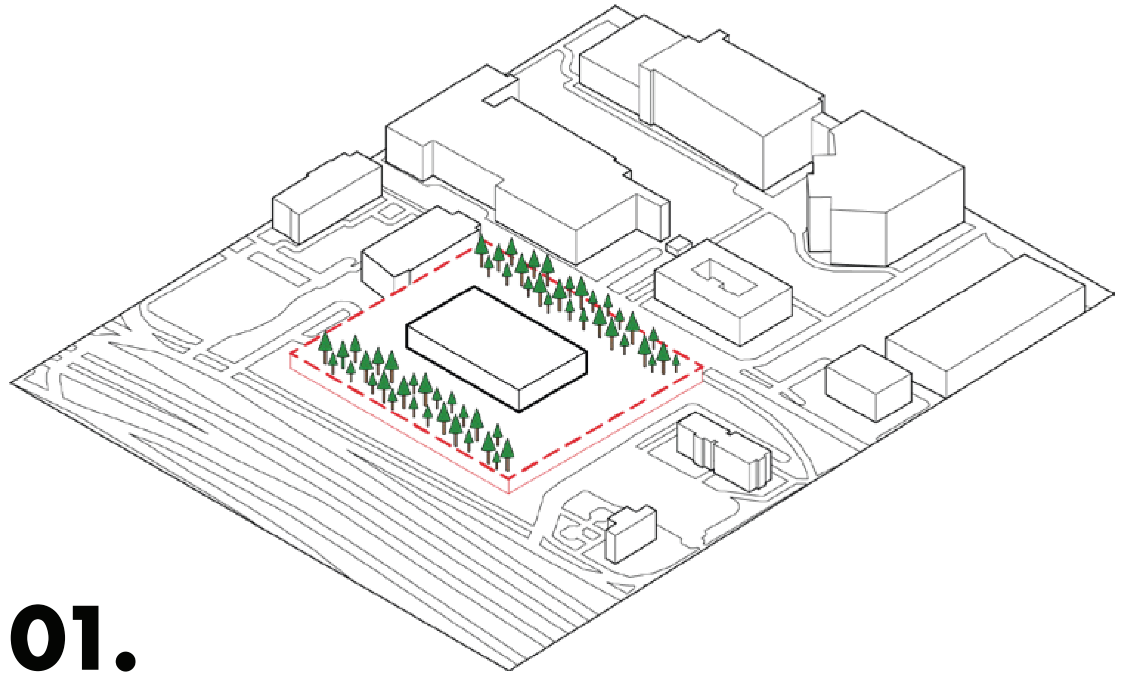




3.05 - Spiritus Program breakdown

- Lobby - 12% - 10,655 SF
- Examination - 14% - 12,596 SF
- Infusion - 22% - 19,427 SF
- Laboratory - 33% - 29,363 SF
- Additional Services - 19% - 16,983 SF

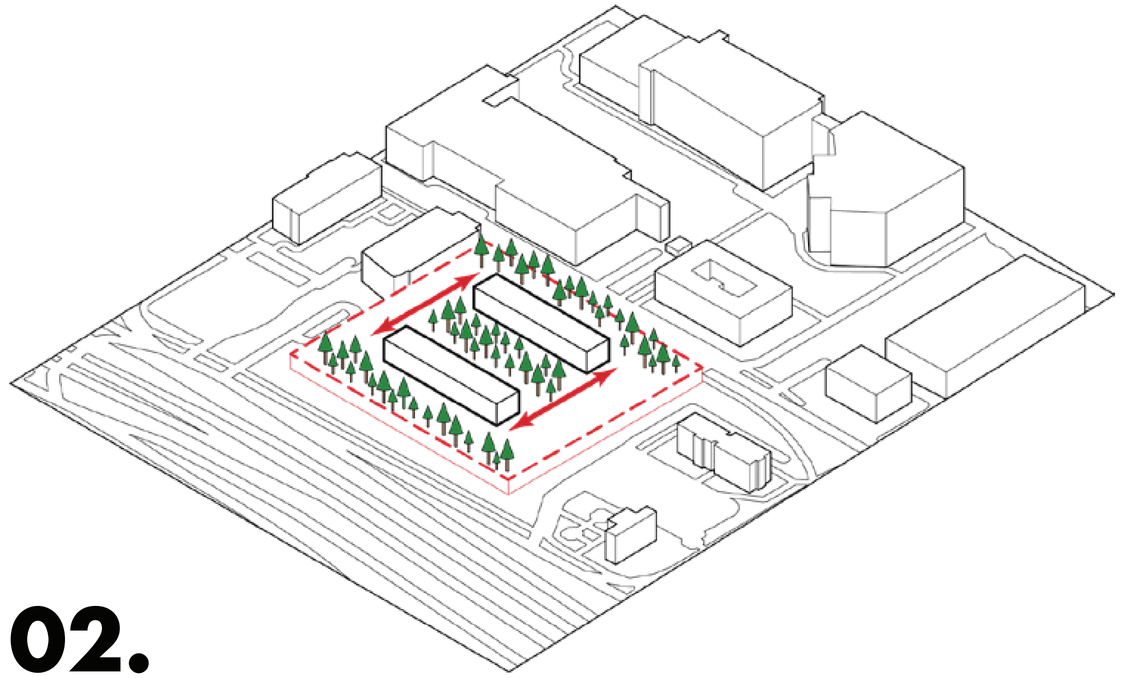
Total Square Footage - 89,023 SF



01.

3.06 - Parti diagram

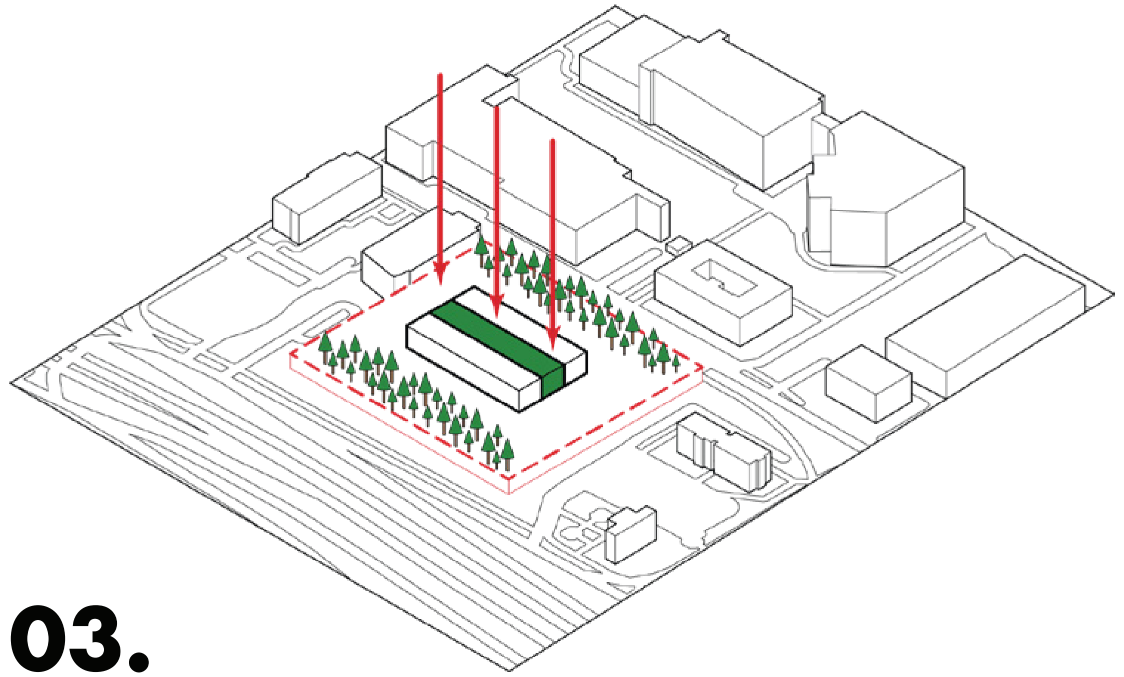
- Place mass in the middle of the site
- Place gardens around both street barriers for a natural sound buffer



02.

3.07 - Parti diagram

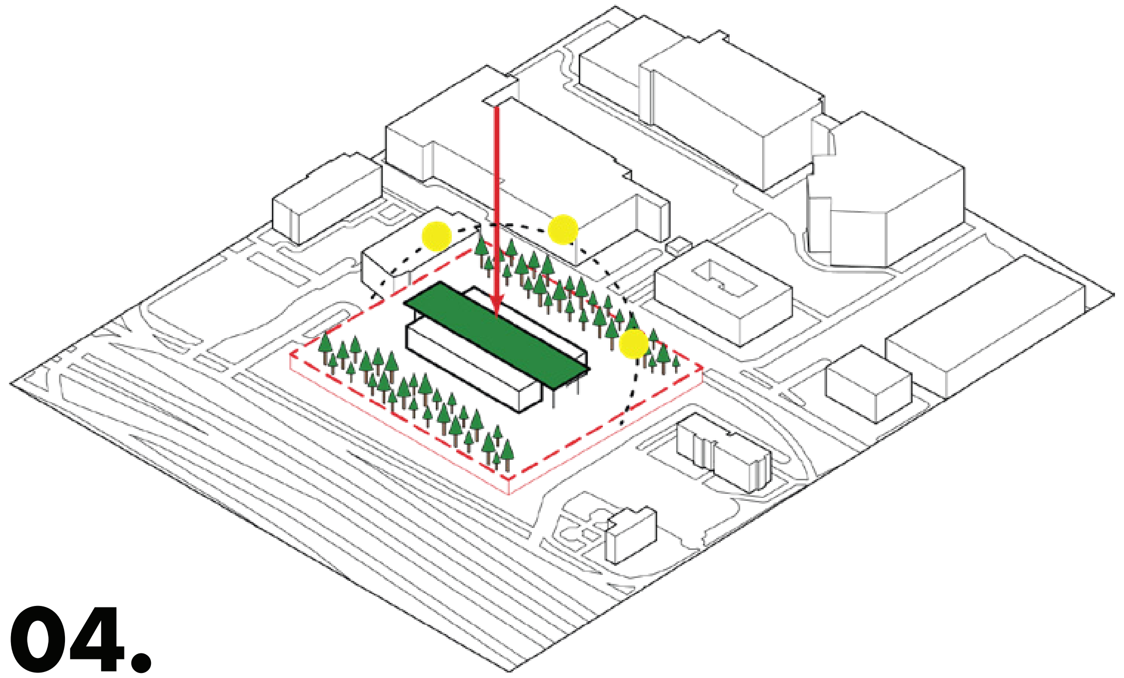
- Split mass in half forming two equal buildings
- By splitting the mass it opens an opportunity for a green space in between buildings



03.

3.08 - Parti diagram

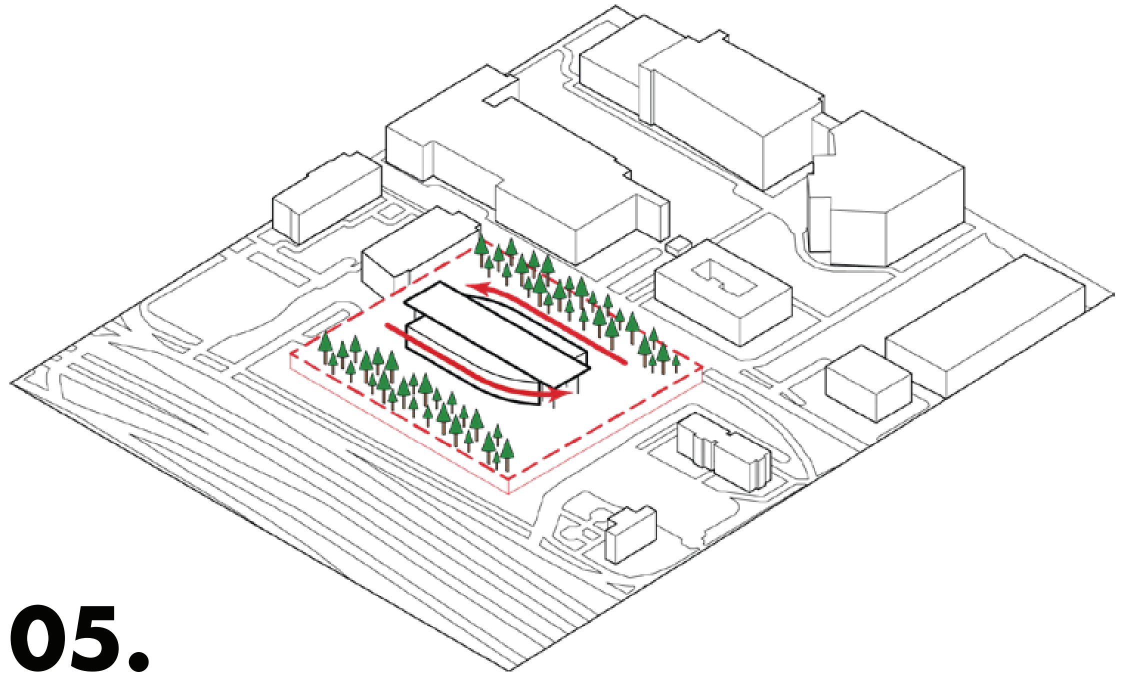
- Enclose garden space between the two buildings to form a green atrium
- A green atrium creates a healing environment both inside and outside of the building



04.

3.09 - Parti diagram

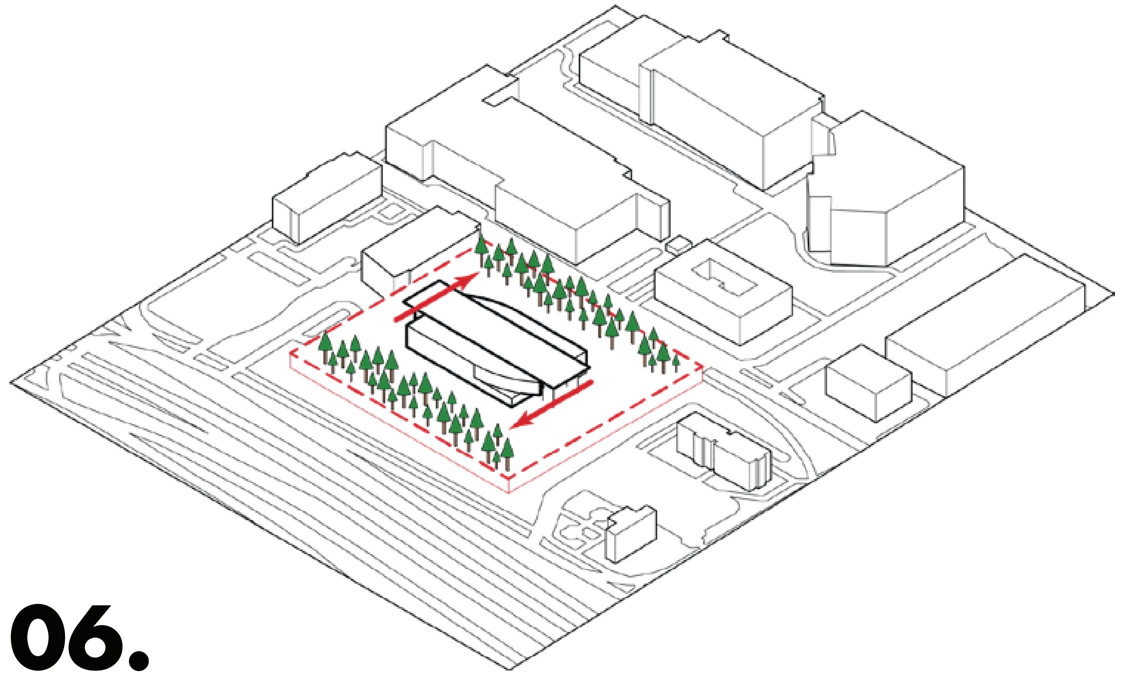
- Place second atrium roof above the building
- The second atrium roof will serve for shading purposes, creating an environmentally comfortable space



05.

3.10 - Parti Diagram

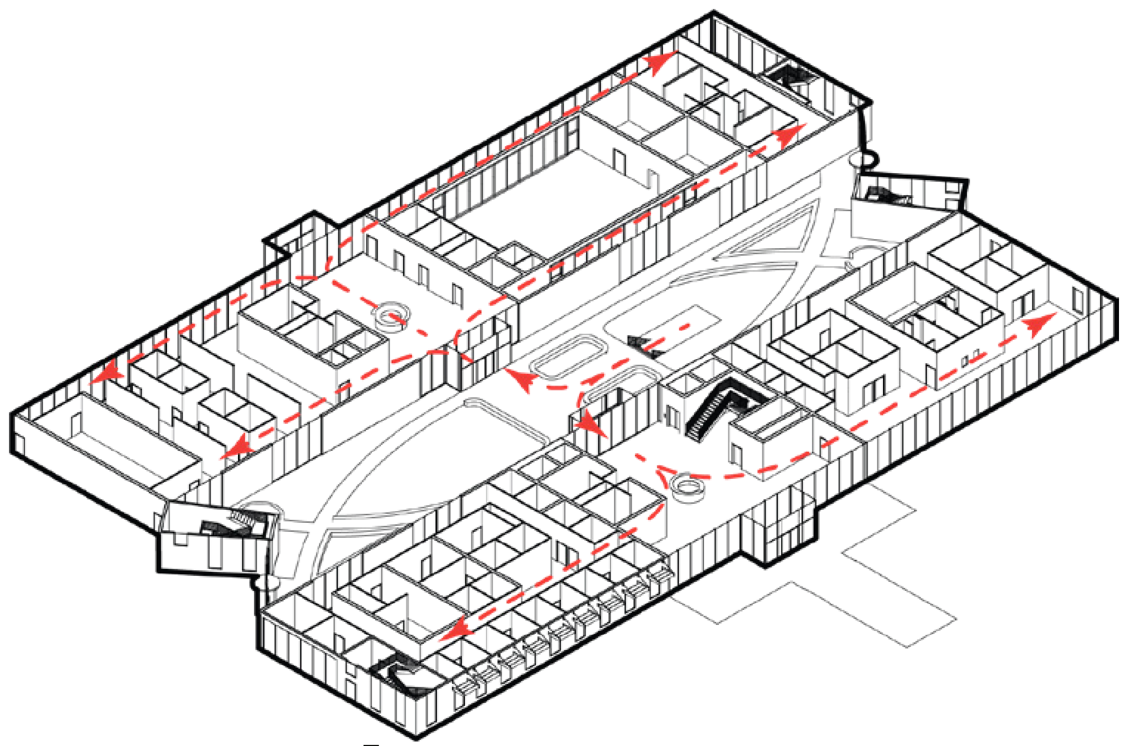
- Curve the sides of the building at halfway point
- Curving the building represents the breathing motion of a lung



06.

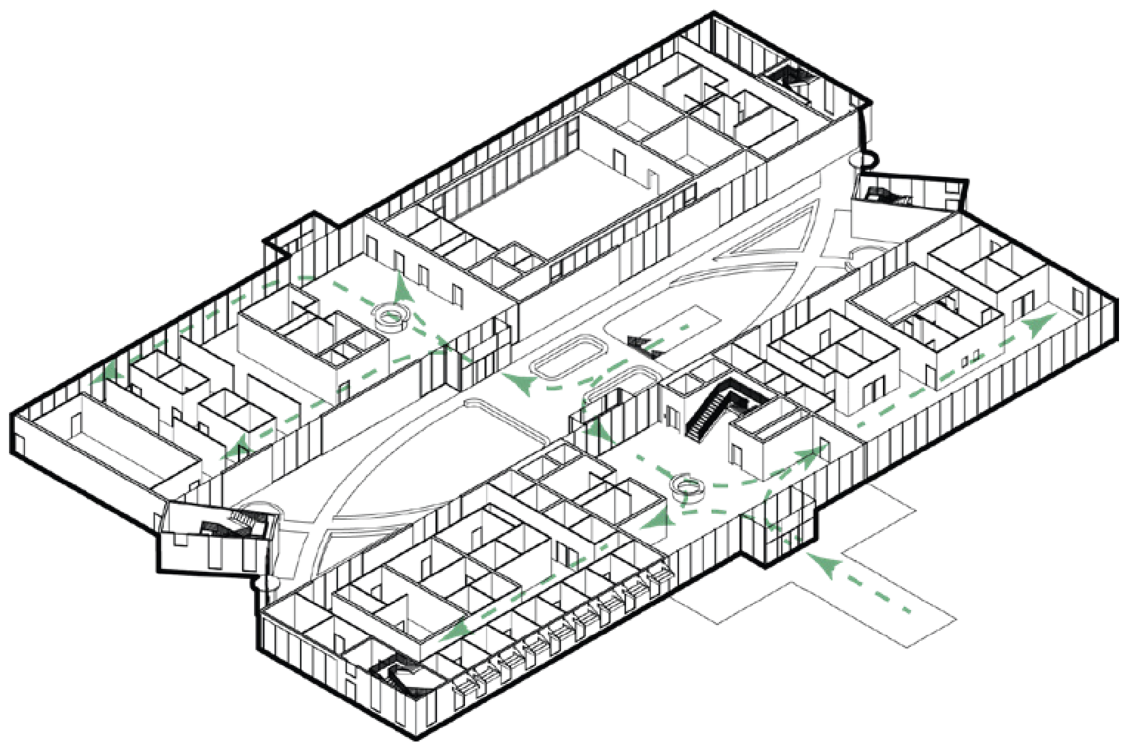
3.11 - Parti Diagram

- Straightening bottom floor of building to being straight again
- By straightening out the bottom floor it creates outdoor balconies for the patients



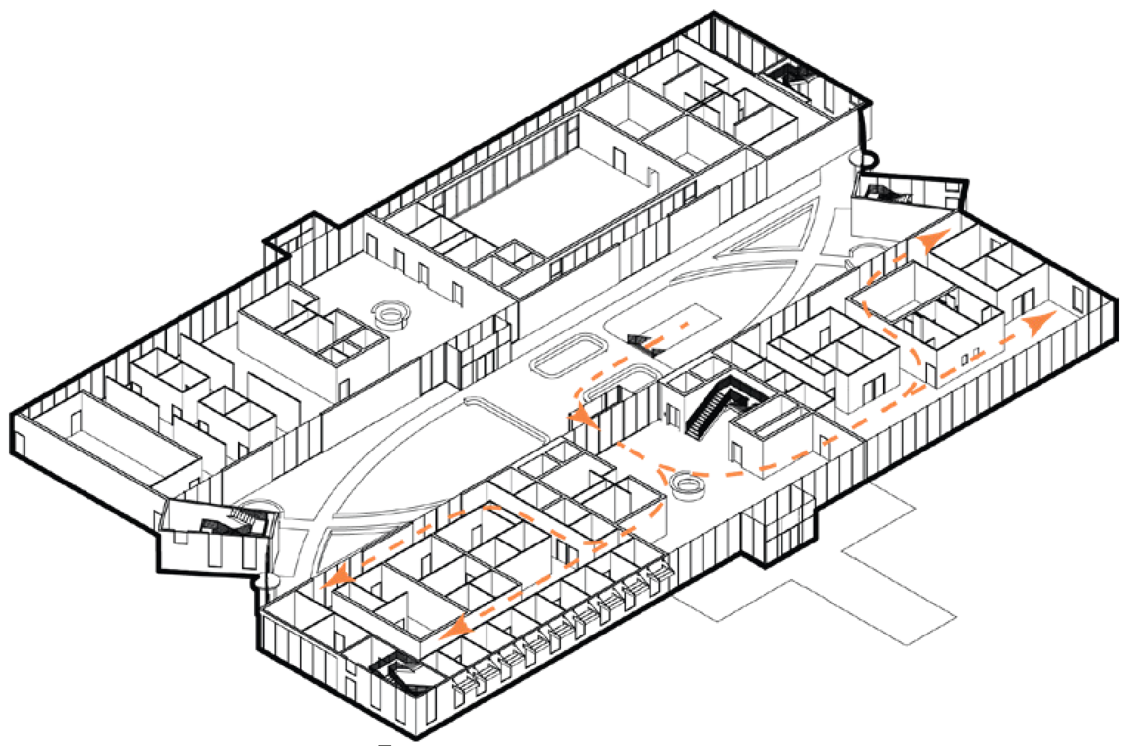
Researcher

Full access to all areas of the building will be granted to researchers and lab workers, as it is crucial for them to have comprehensive oversight, allowing them to closely monitor their work based on their specific requirements.



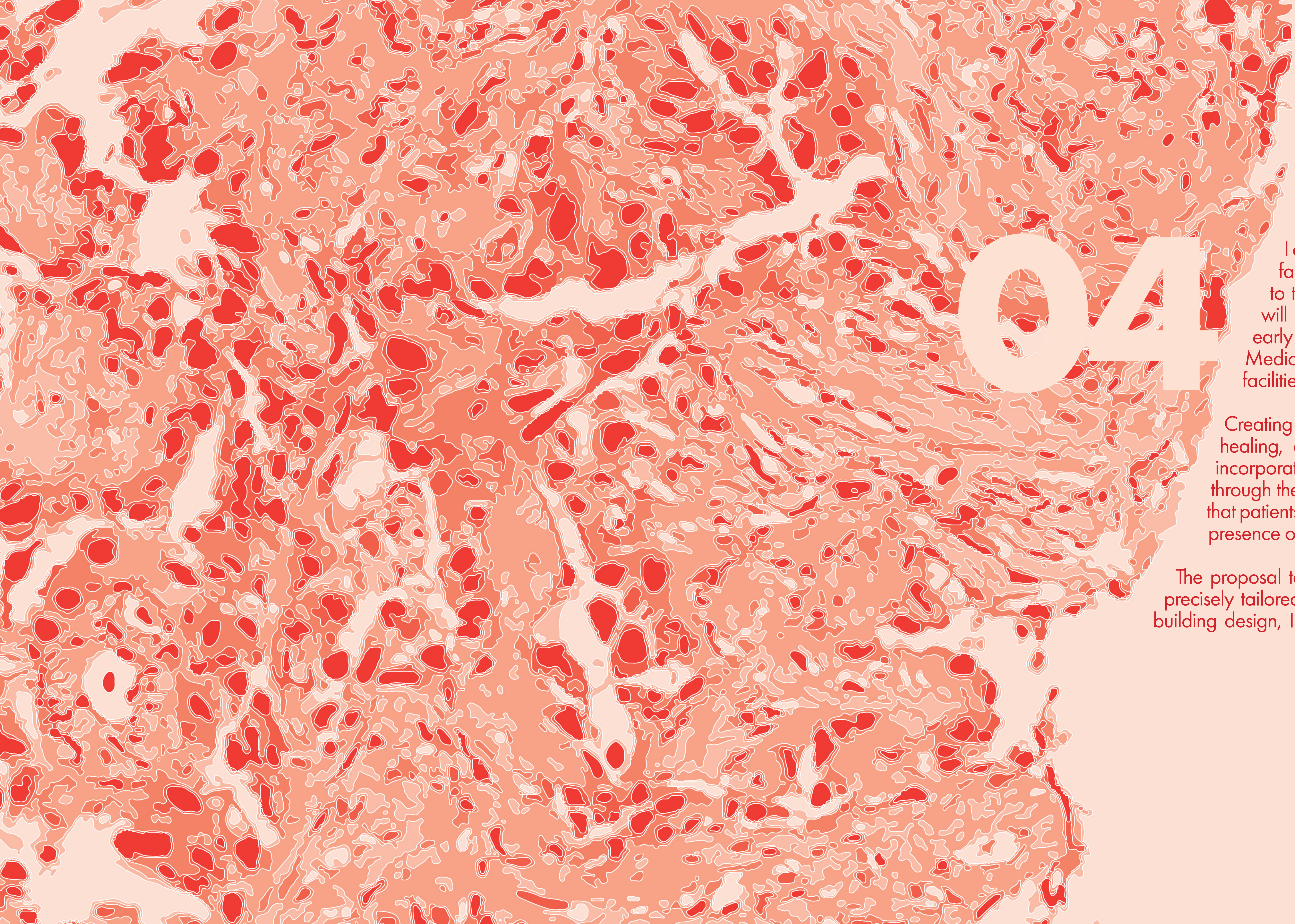
Patient

Patients will be able to access the Examination department, Infusion department, and other patient services department. It's worth mentioning that access to the Examination and Infusion departments will be regulated based on appointments to ensure efficient and secure operations.



Doctor / Nurse

Doctors and nurses will generally have access to the Examination and Infusion departments, as these areas are dedicated to their work, including their offices. Consequently, their access to these departments will not be restricted, allowing them to carry out their responsibilities seamlessly within this designated area.



04

Proposal

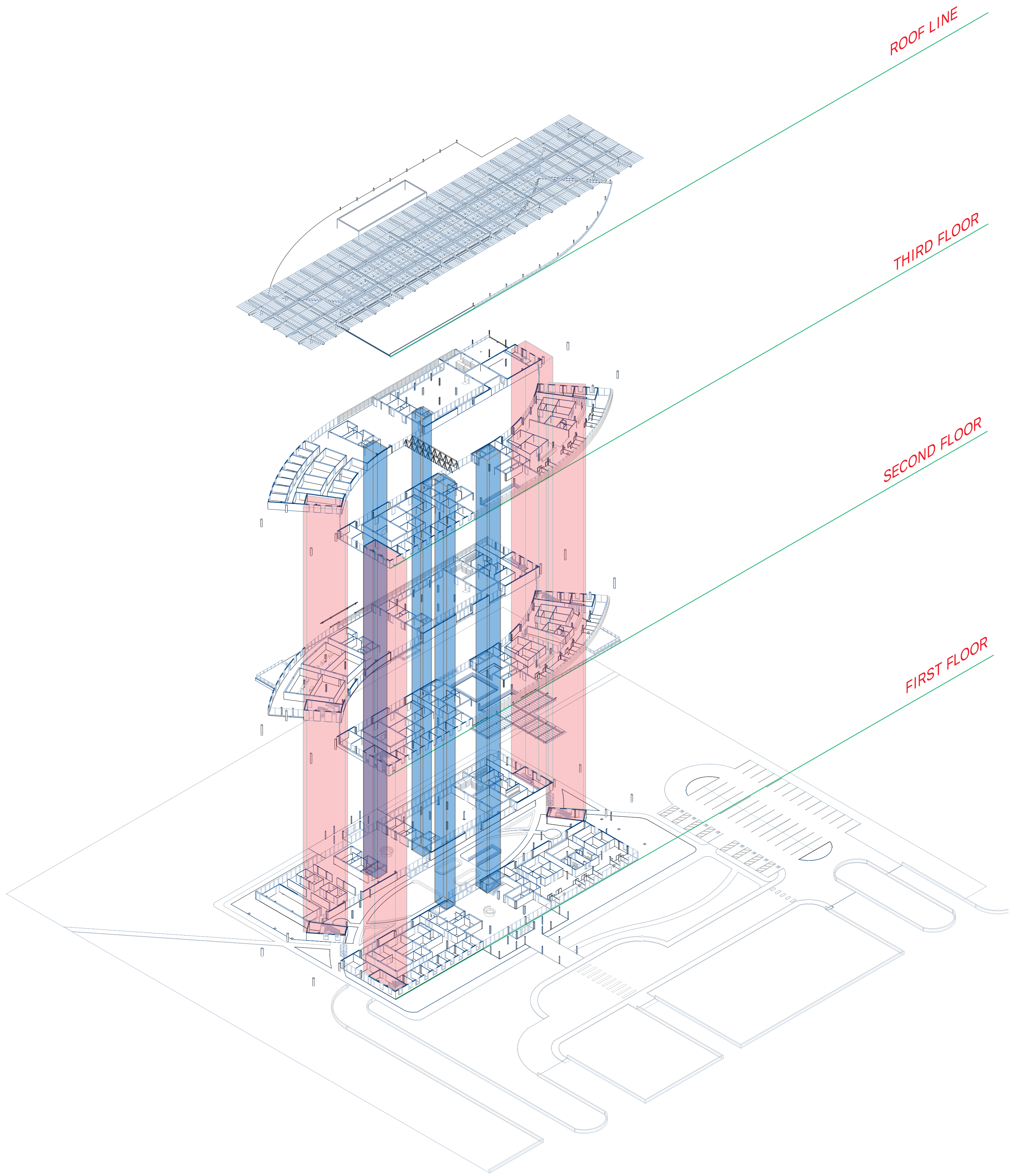
I am proposing that Spiritus will be the first Lung Cancer specialty facility in the world. The need for such a facility is evident due to the high prevalence and fatality rate of Lung Cancer. Spiritus will be at the forefront of treatment, specializing in examination, early detection, infusion treatment, and research. As part of the Dell Medical System, Spiritus will have access to the resources of other facilities within the system for additional treatments, including surgery.

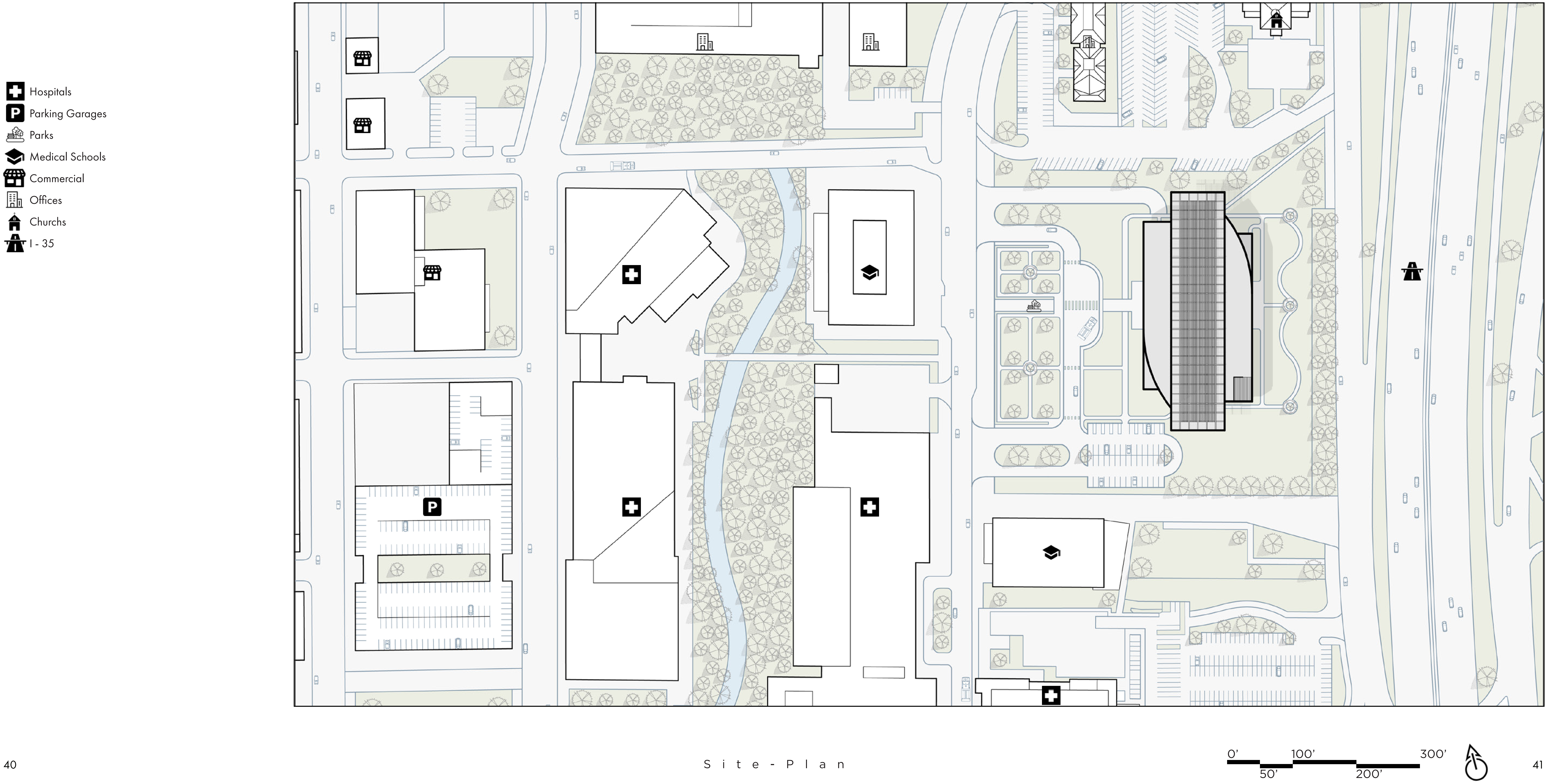
Creating a healing environment is crucial for reducing stress, promoting healing, and alleviating patient anxiety. To address this, I propose incorporating gardens into the design of Spiritus. This will be evident through the gardens surrounding the building and a central green atrium that patients and workers can access directly from the parking garage. The presence of greenery will reinforce the concept of a healing environment.

The proposal takes into account all the research gathered, making Spiritus precisely tailored to the needs of Lung Cancer treatment. Through innovative building design, I aim to introduce new ideas for creating a patient-centered environment for Lung Cancer patients.

04.

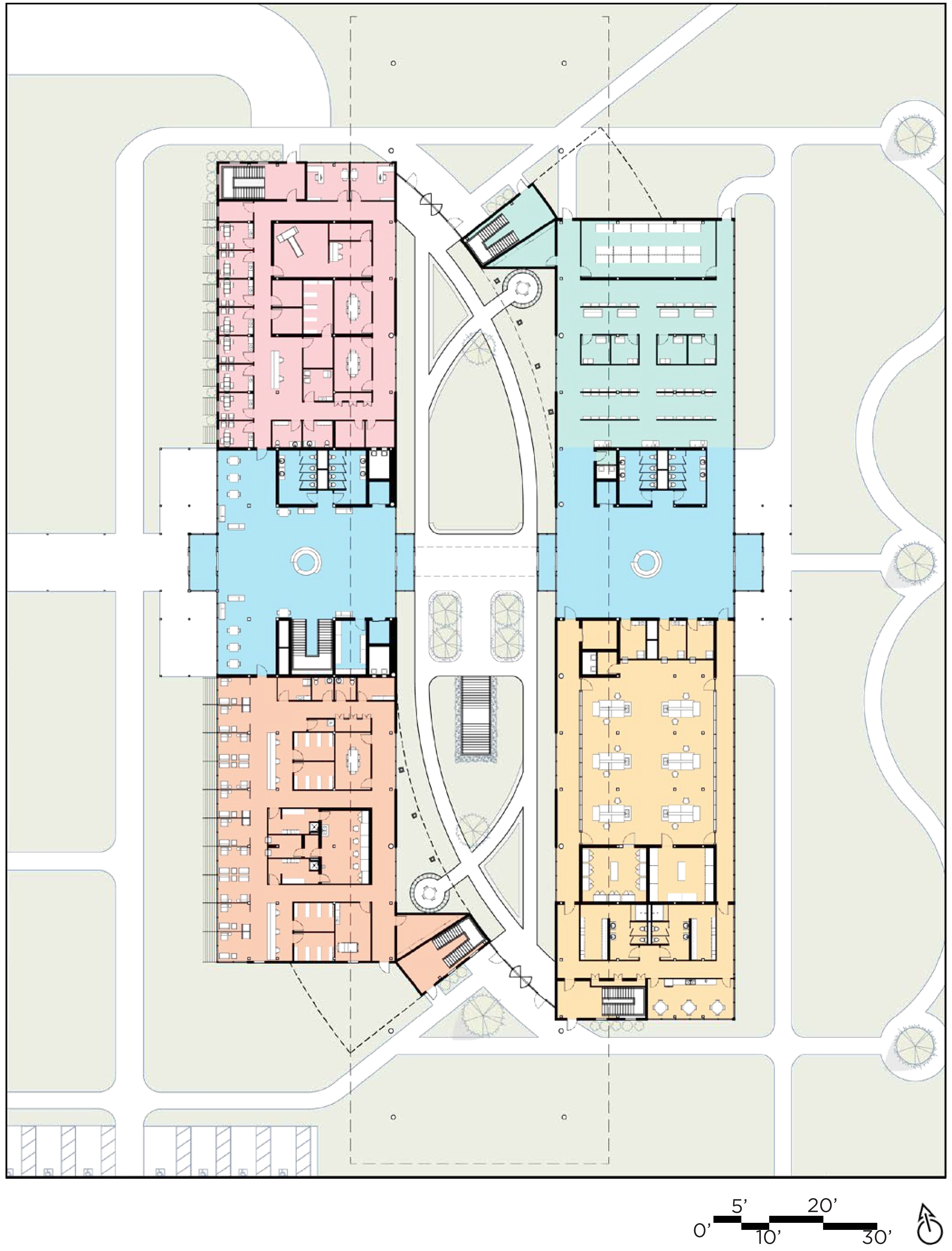
Proposal




Hospitals
Parking Garages
Parks
Medical Schools
Commercial
Offices
Churchs
I - 35
0'
50'
100'
200'
300'

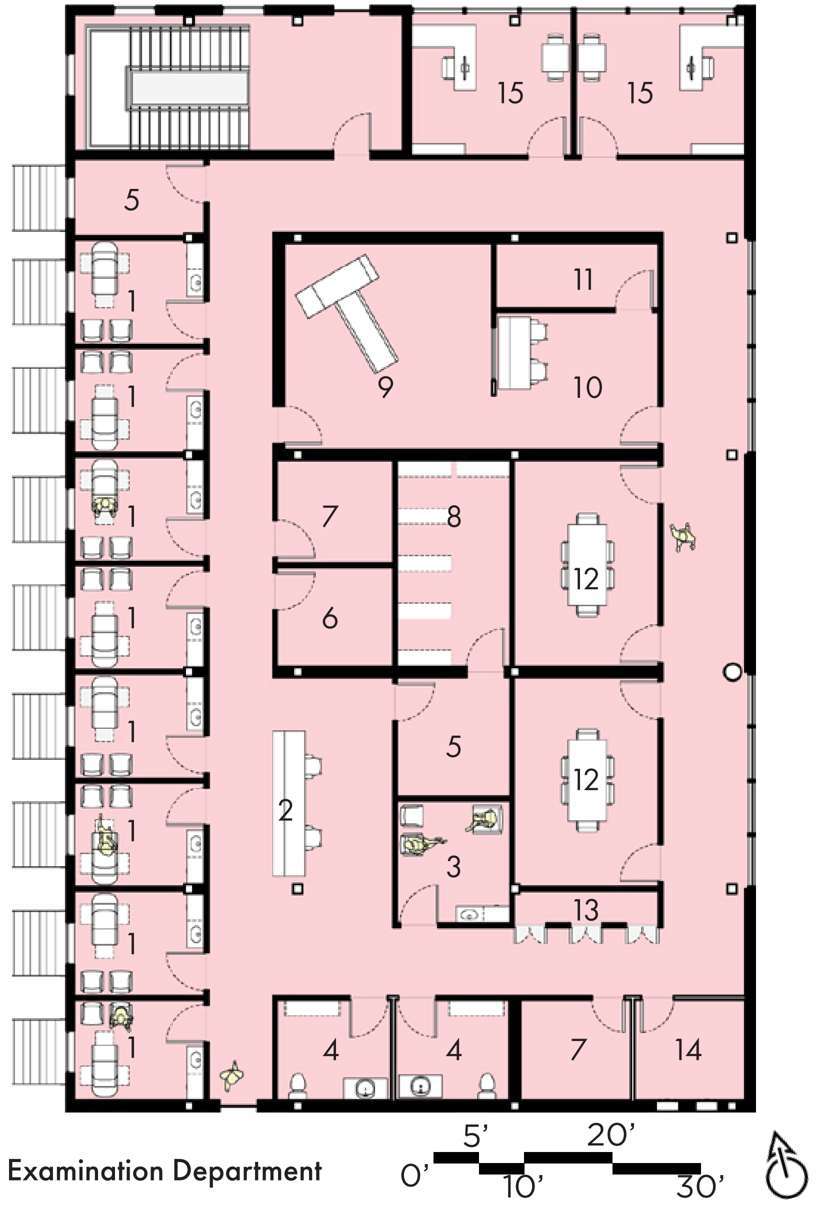
Site-Plan

Infusion
Laboratory
Lobby
Examination
Patient Shop



Infusion Department

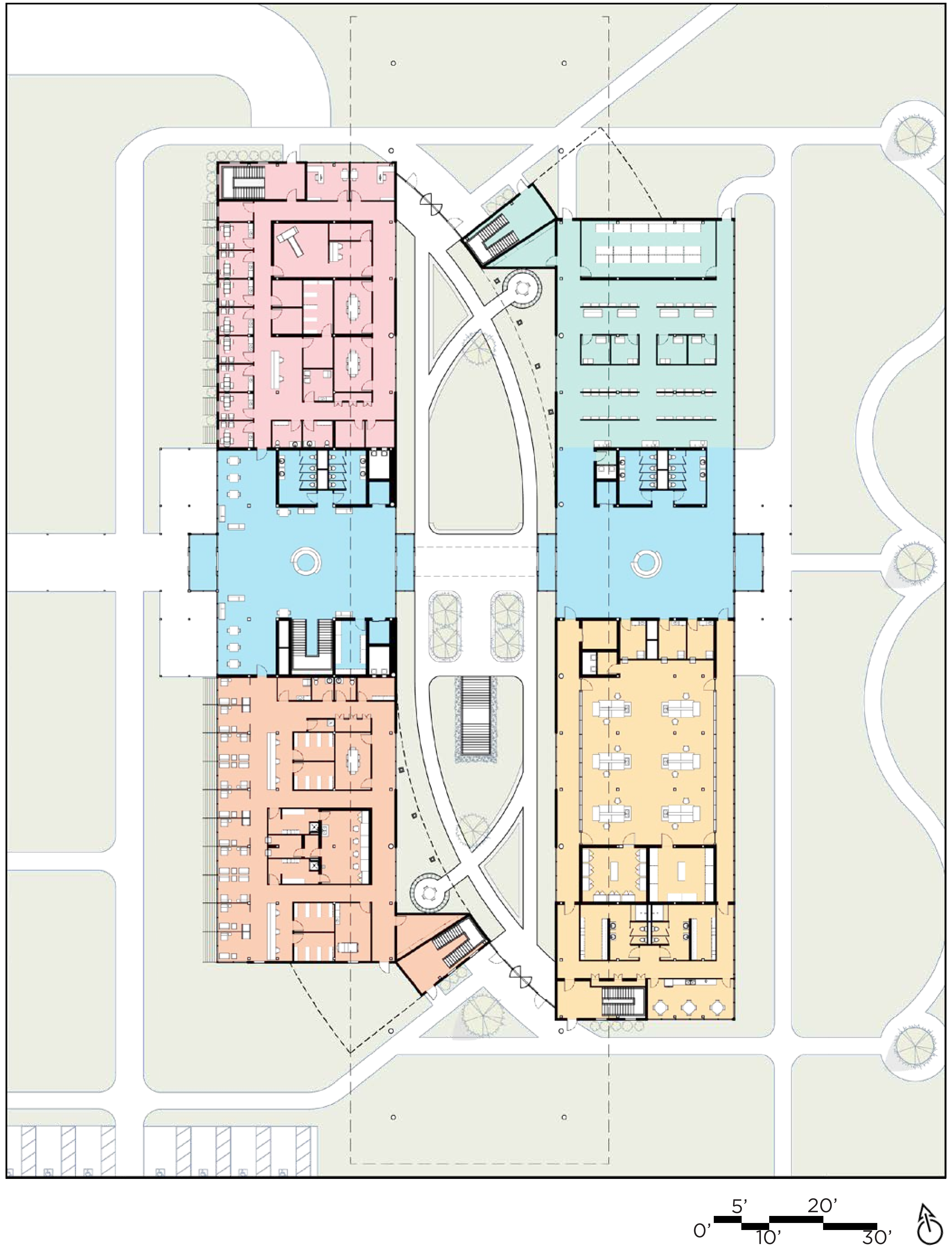
1 - One Patient Infusion Bay
2 - Four Patient Infusion Bay
3 - Blood Draw Station
4 - ADA Single Restroom
5 - Soiled Utility
6 - Nursing Station
7 - Clean Utility
8 - Nursing Supplies
9 - Janitor Closet
10 - Electrical Closet
11 - Treatment Planning / Conference
12 - Locker Room Airlock
13 - Pharmacy Passthrough
14 - Pharmacy Airlock
15 - Pharmacy
16 - Emergency Patient Room

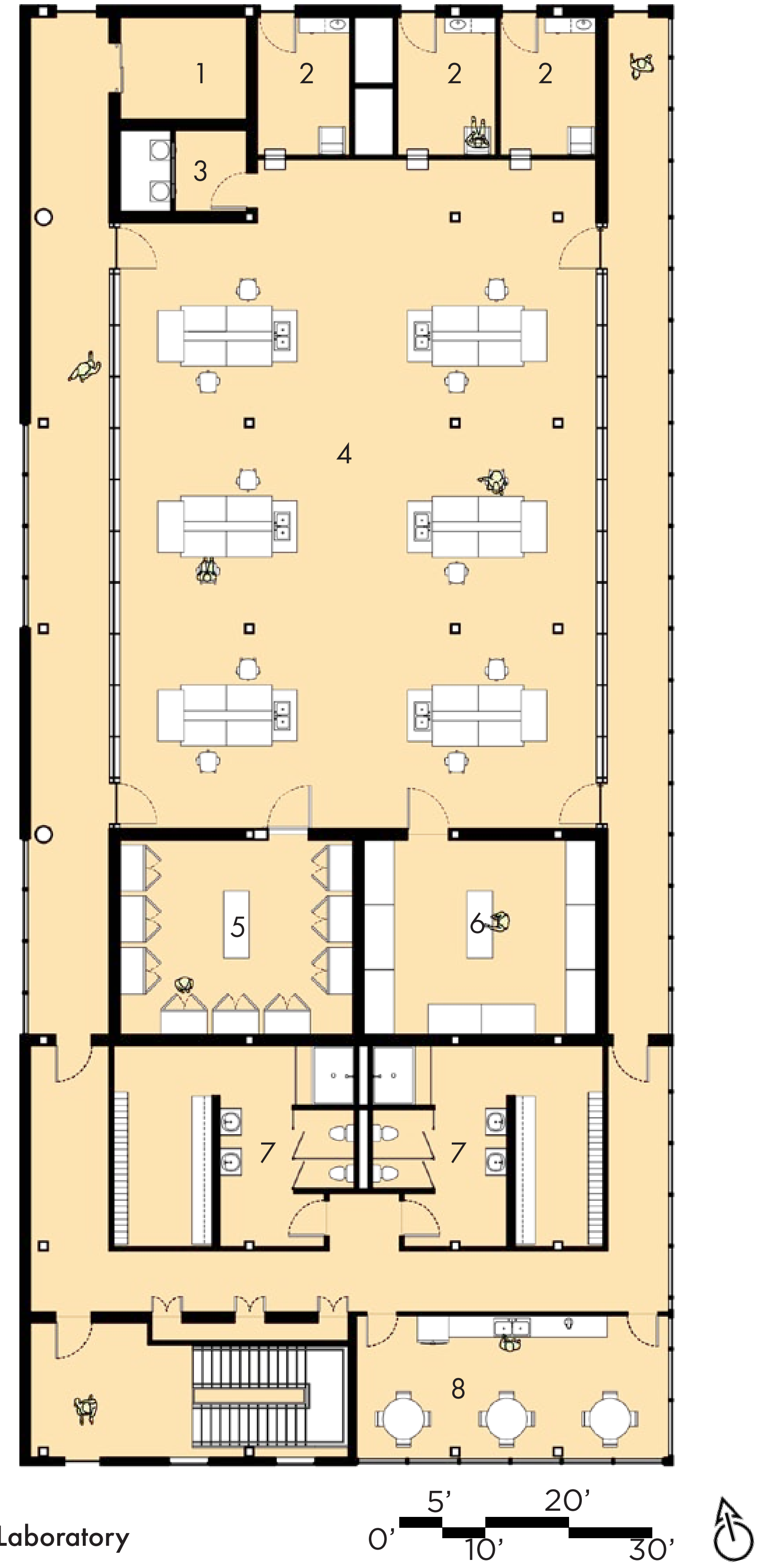


Examination Department

1 - Exam Room
2 - Nursing Station
3 - Blood Draw Station
4 - ADA Single Restroom
5 - Nursing Supplies
6 - Soiled Utility
7 - Clean Utility
8 - Patient Records
9 - CT Scanner
10 - CT Controler
11 - CT Storage
12 - Treatment Planning
13 - Electrical Closet
14 - Trash Chute
15 - Doctor Offices

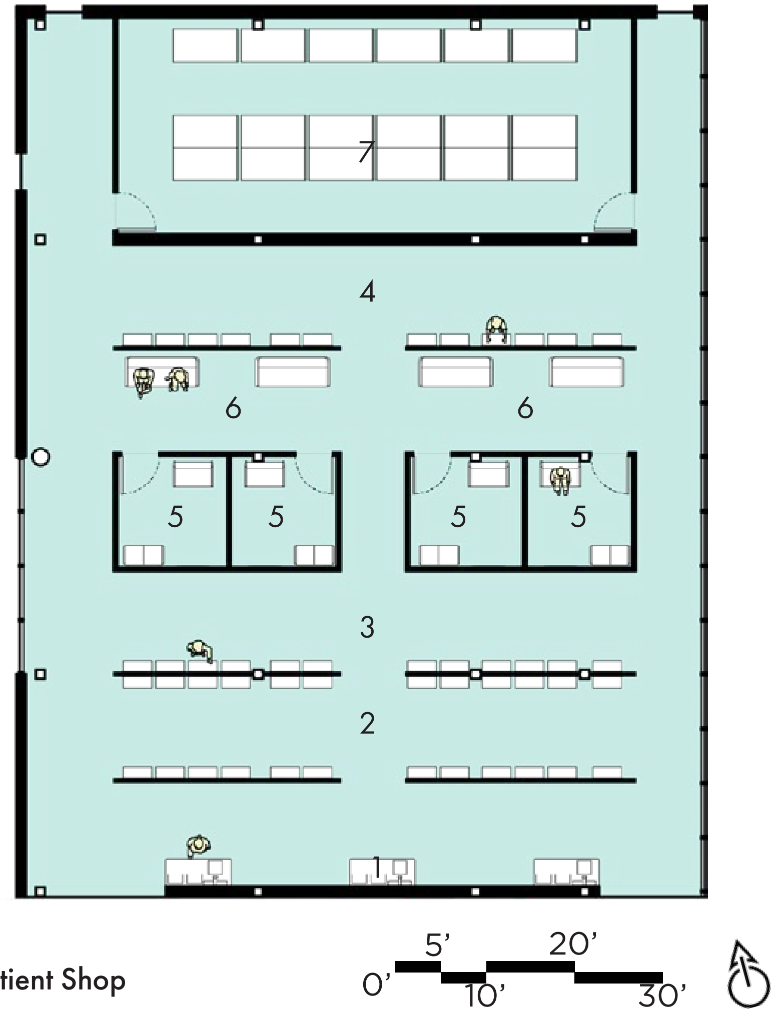
- Infusion
- Laboratory
- Lobby
- Examination
- Patient Shop





Laboratory

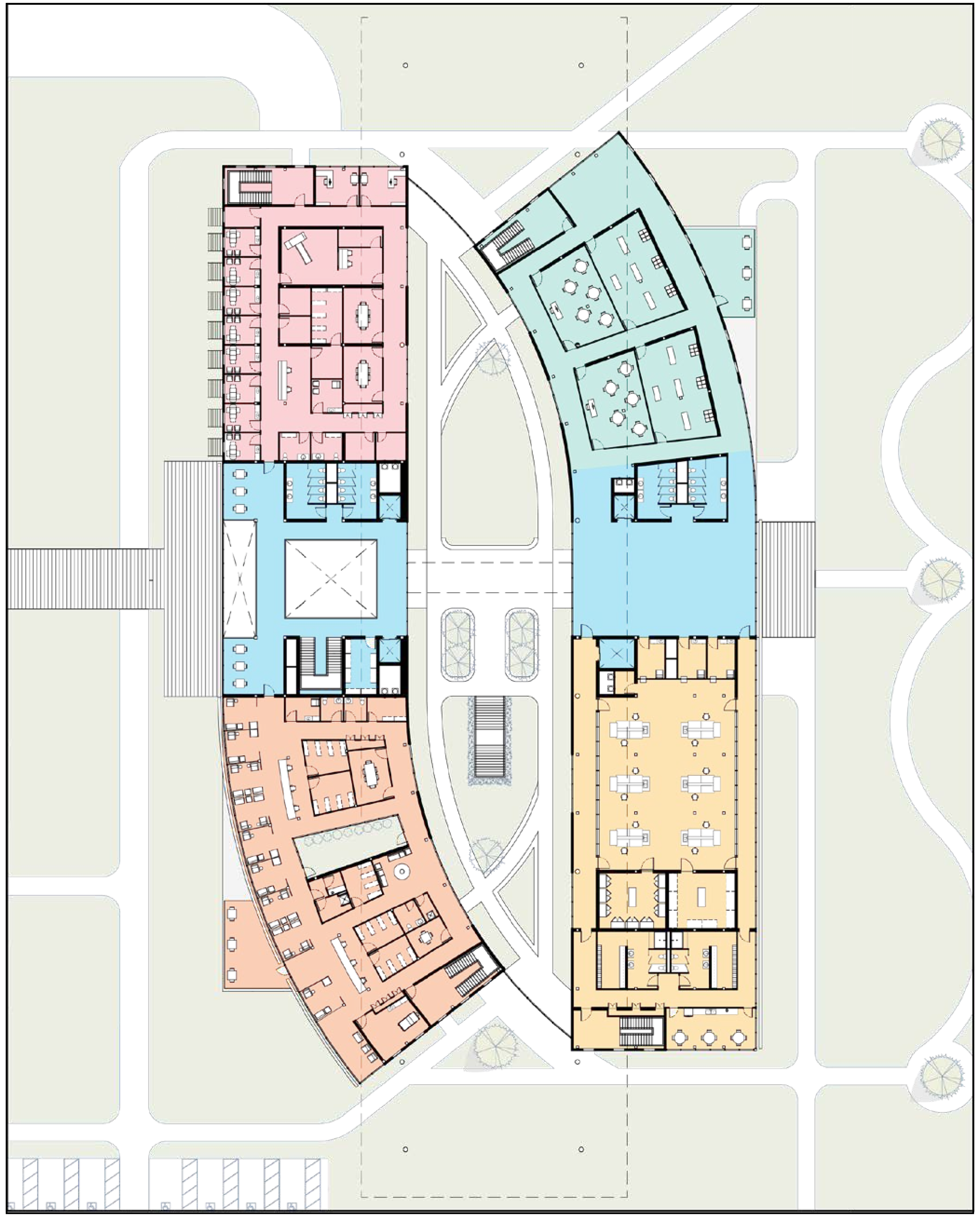
1 - Freight Elevator
2 - Blood Draw
3 - Trash Chute
4 - Open Laboratory
5 - Cold Storage
6 - Storage
7 - Locker Rooms
8 - Breakroom



Patient Shop

1 - Self Checkout
2 - Clothes
3 - Food
4 - Wigs
5 - Changing Rooms
5 - Waiting Area
7 - Storage

- Infusion
- Laboratory
- Lobby
- Examination
- Patient Education

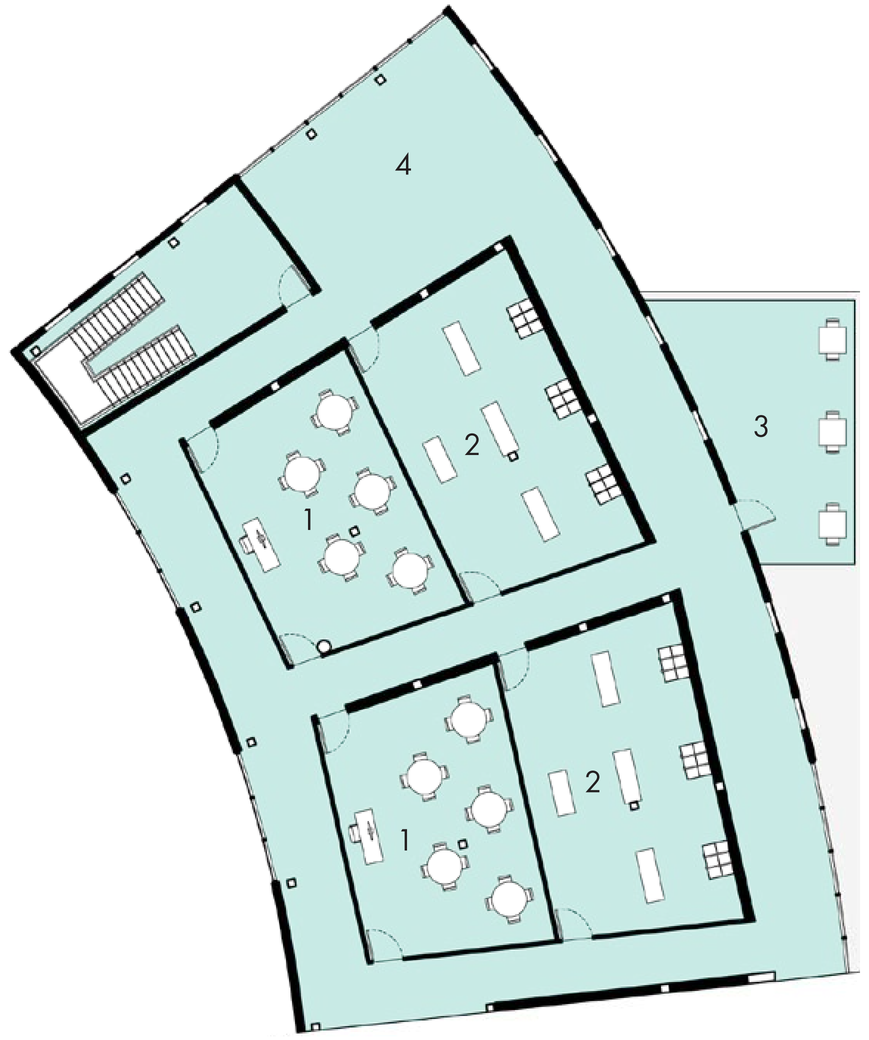


0' 5' 10' 20' 30'

Infusion Department

1 - One Patient Infusion Bay
2 - Four Patient Infusion Bay
3 - Blood Draw Station
4 - ADA Single Restroom
5 - Soiled Utility
6 - Nursing Station
7 - Clean Utility
8 - Nursing Supplies
9 - Janitor Closet
10 - Electrical Closet
11 - Treatment Planning / Conference
12 - Interior Green Space
13 - Waiting
14 - Outdoor Terrace
15 - Pharmacy
16 - Emergency Patient Room

0' 5' 10' 20' 30'



Patient Services

1 - Classrooms
2 - Cooking Classrooms
3 - Outdoor Terrace
4 - Waiting

0' 5' 10' 20' 30'

Second-Floor-Plan

Infusion
Laboratory
Lobby
Examination
Administration

Laboratory

1 - Freight Elevator
2 - Blood Draw
3 - Trash Chute
4 - Open Laboratory
5 - Cold Storage
6 - Storage
7 - Breakroom
8 - Outdoor Terrace
9 - Janitor Closet
10 - Electrical Closet
11- Treatment Planning / Conference
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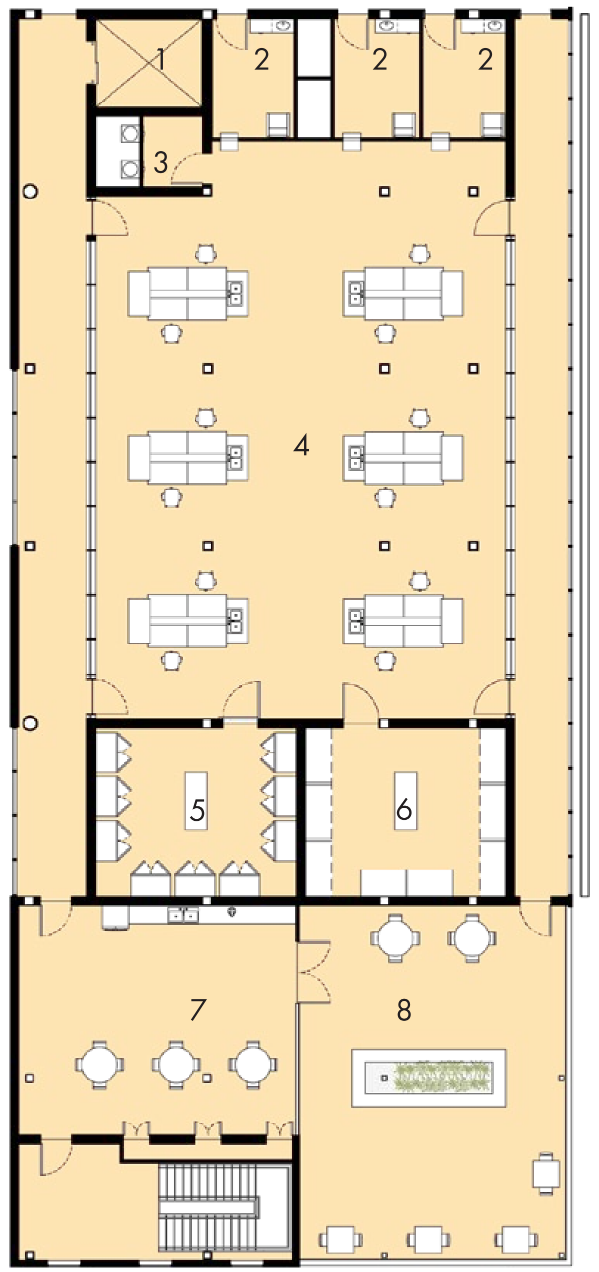
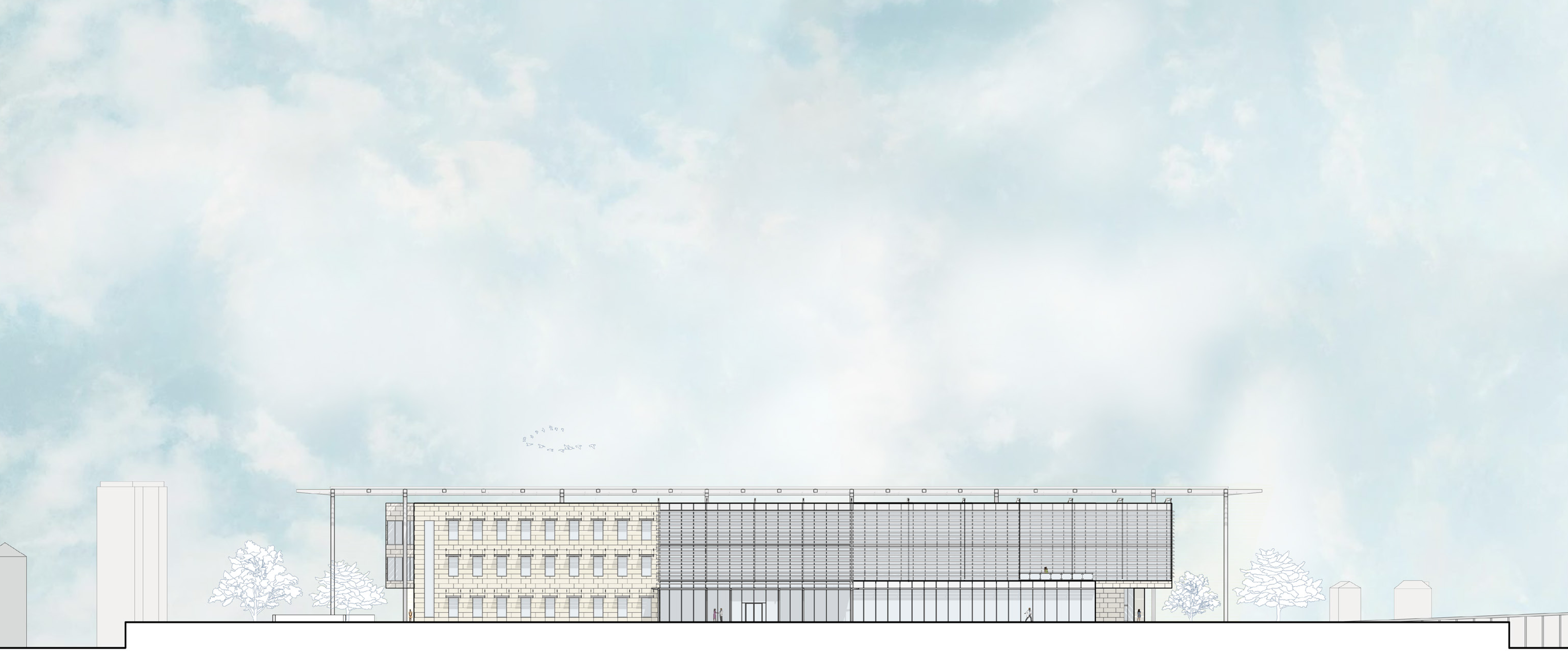
15 - Pharmacy
16 - Emergency Patient Room



Administration

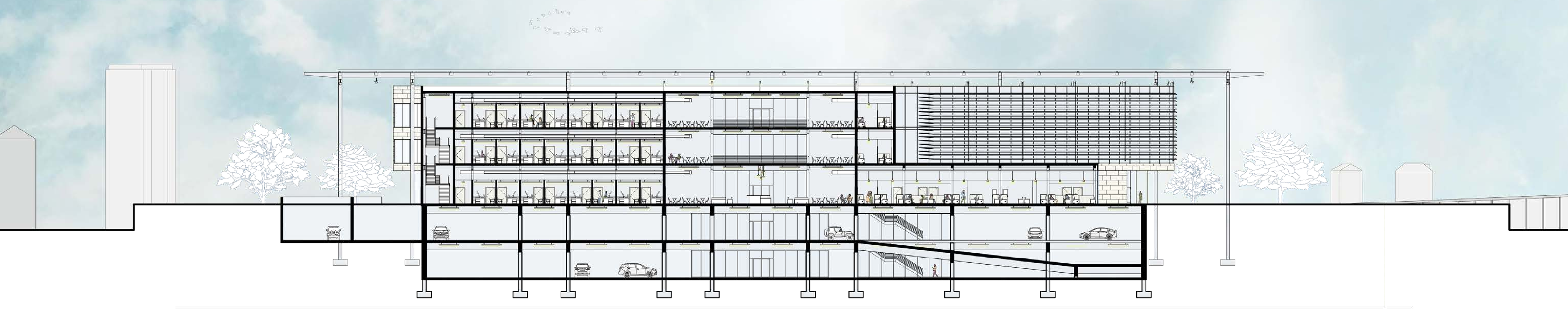
1 - Waiting
2 - Offices
3 - Conference
4 - Breakroom

Third-Floor-Plan



West-Elevation

0' 5' 10' 20' 30'



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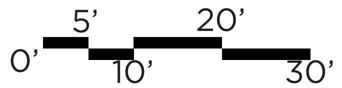
West-Section



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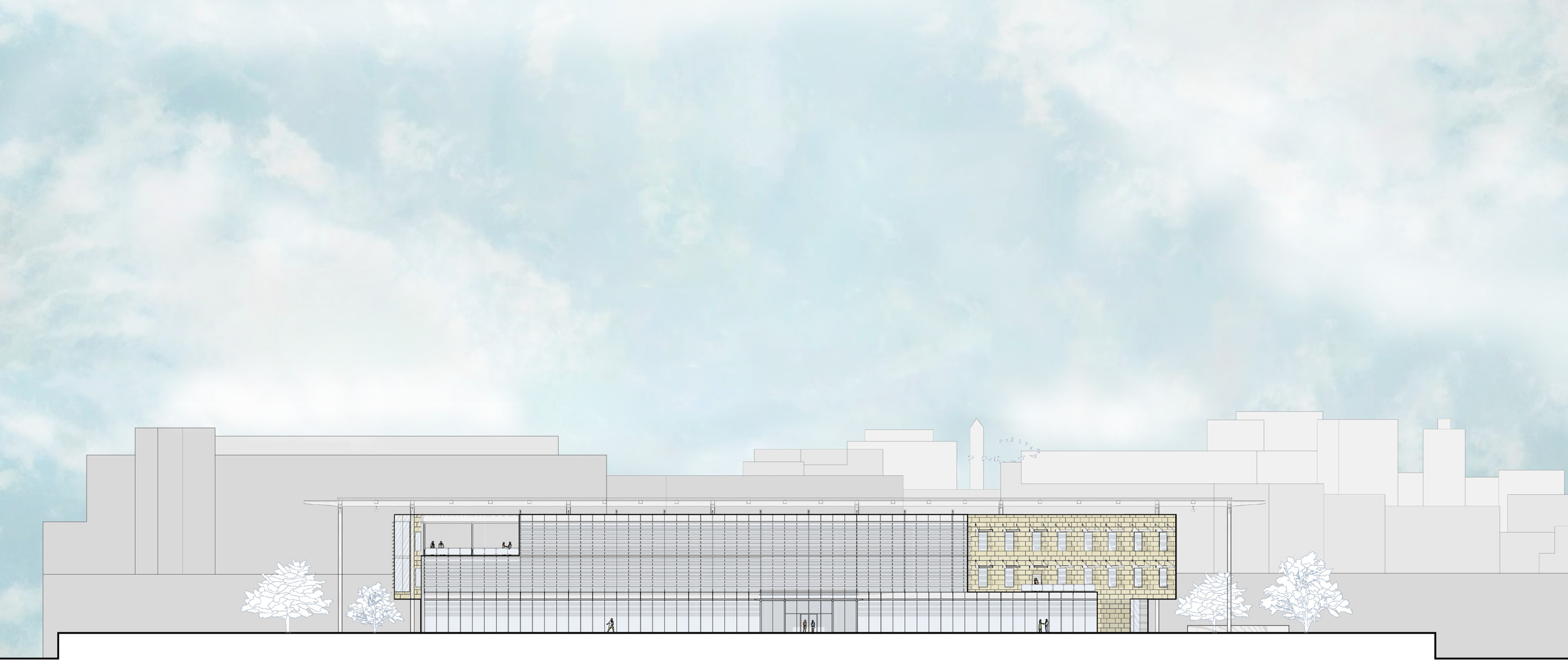
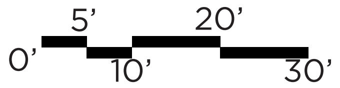


East-Elevation

0' 5' 10' 20' 30'

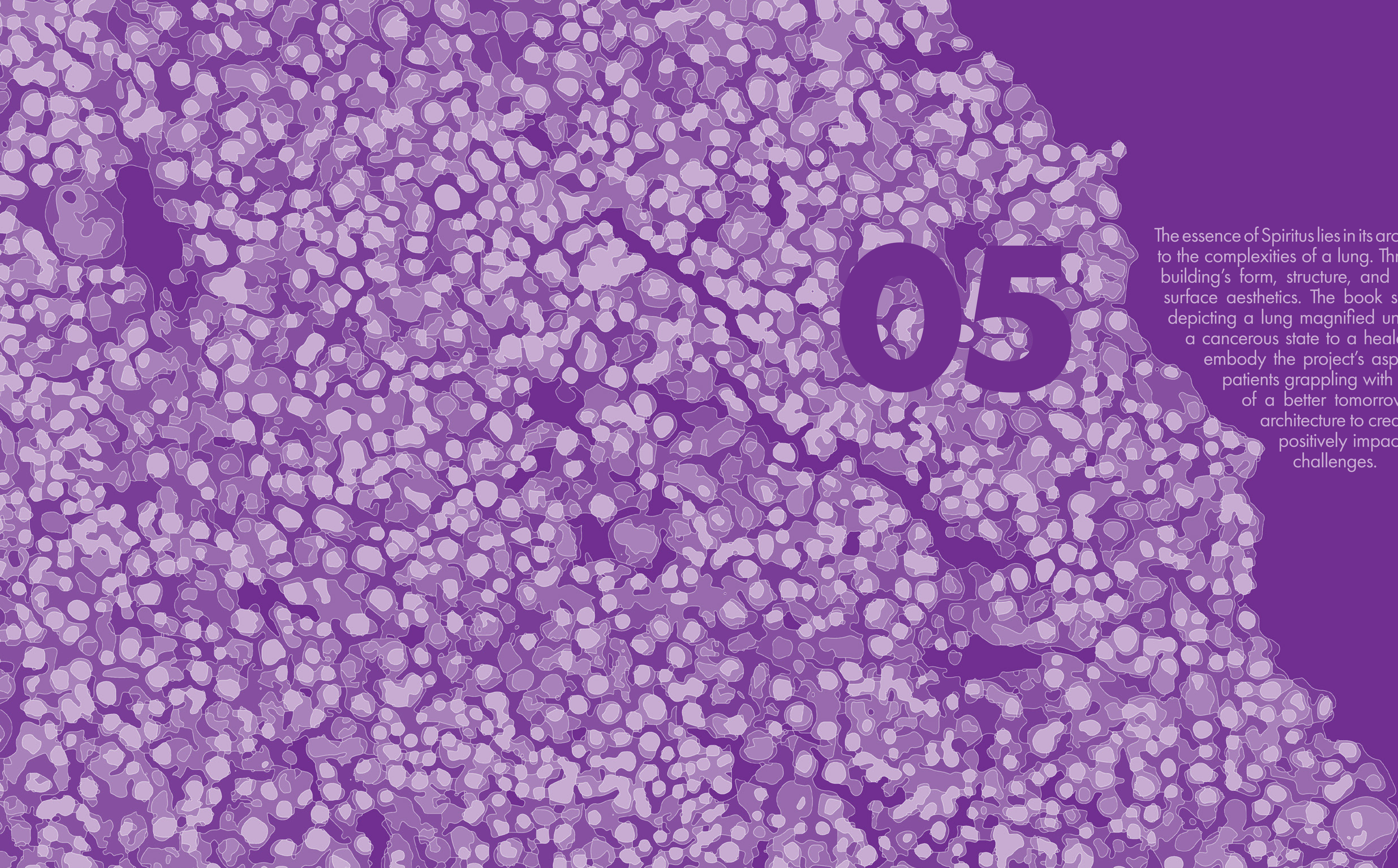
East-Section



South-Elevation

South-Elevation

South-Elevation



05

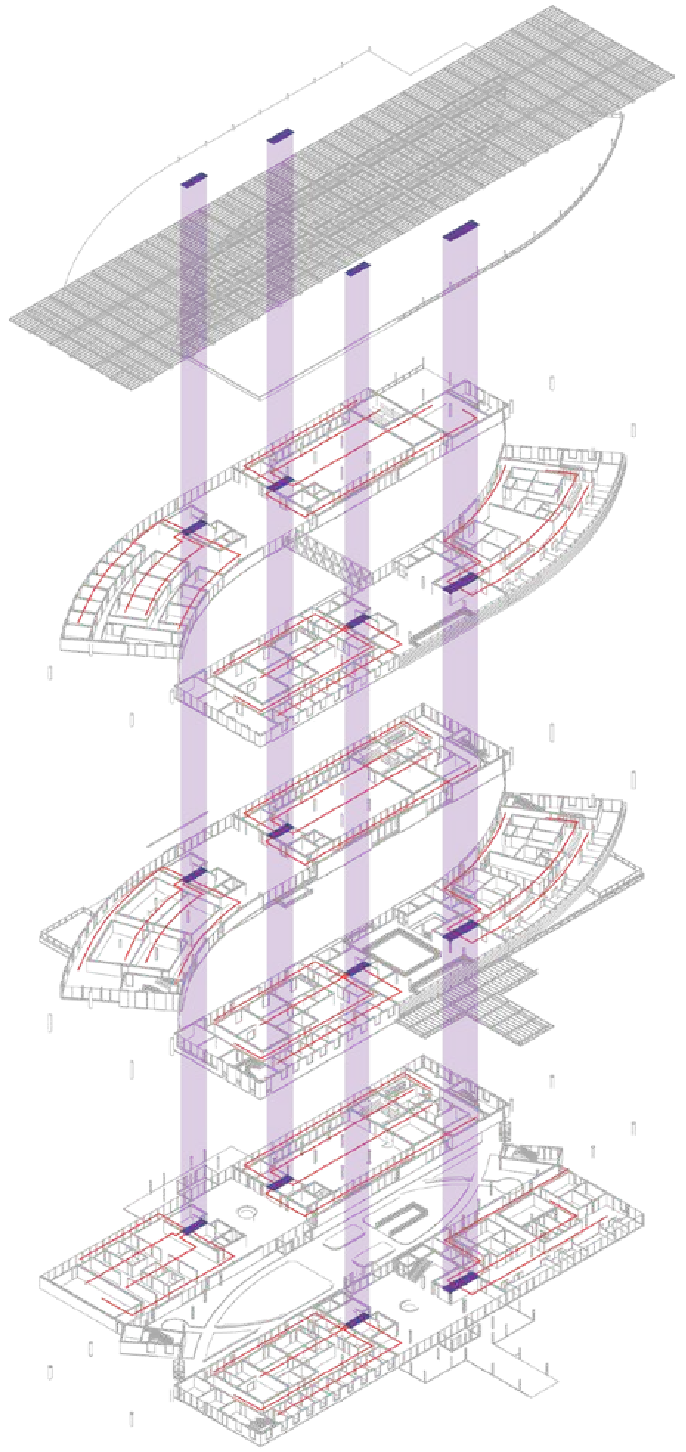
Details

The essence of Spiritus lies in its architectural details, which draw parallels to the complexities of a lung. Through a meticulous exploration of the building's form, structure, and function, the project delves beyond surface aesthetics. The book showcases a progression of images, depicting a lung magnified under a microscope, transitioning from a cancerous state to a healed state. These visual representations embody the project's aspiration to offer hope and healing to patients grappling with lung cancer, encapsulating the vision of a better tomorrow. Spiritus exemplifies the power of architecture to create meaningful spaces and details that positively impact the lives of individuals facing health challenges.

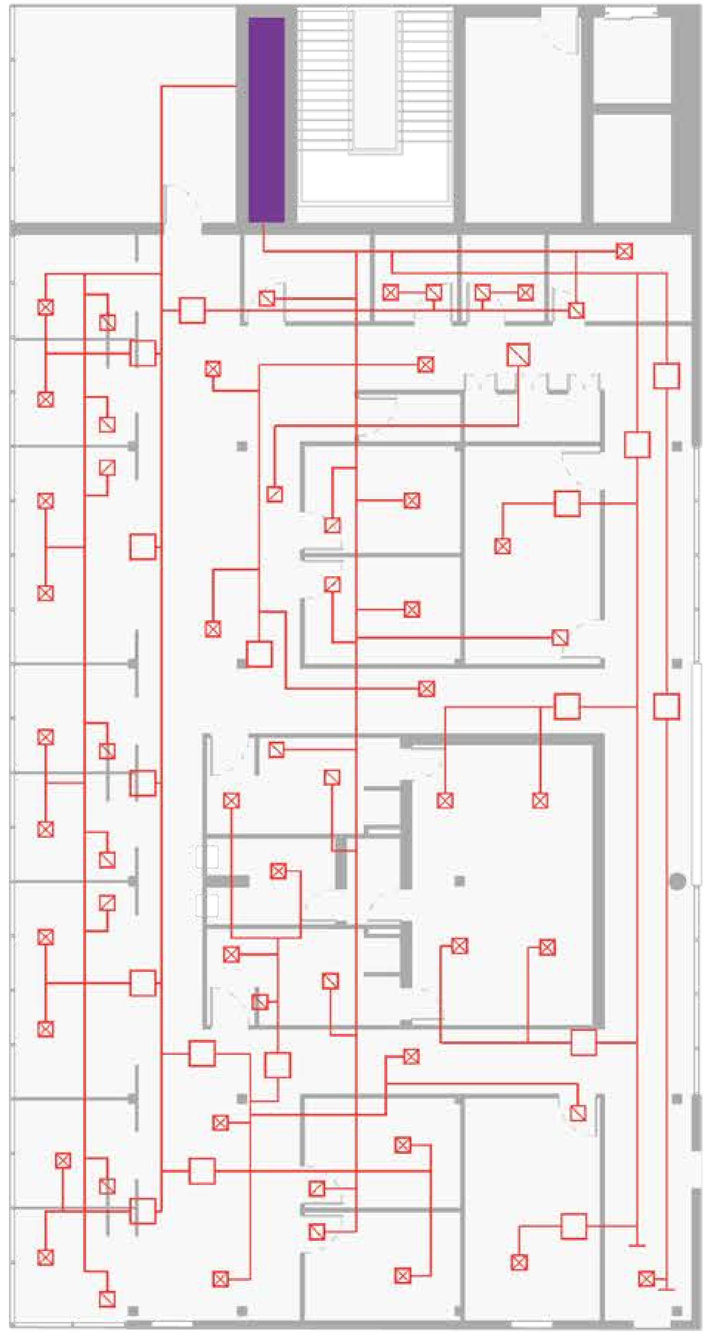
05.

Details

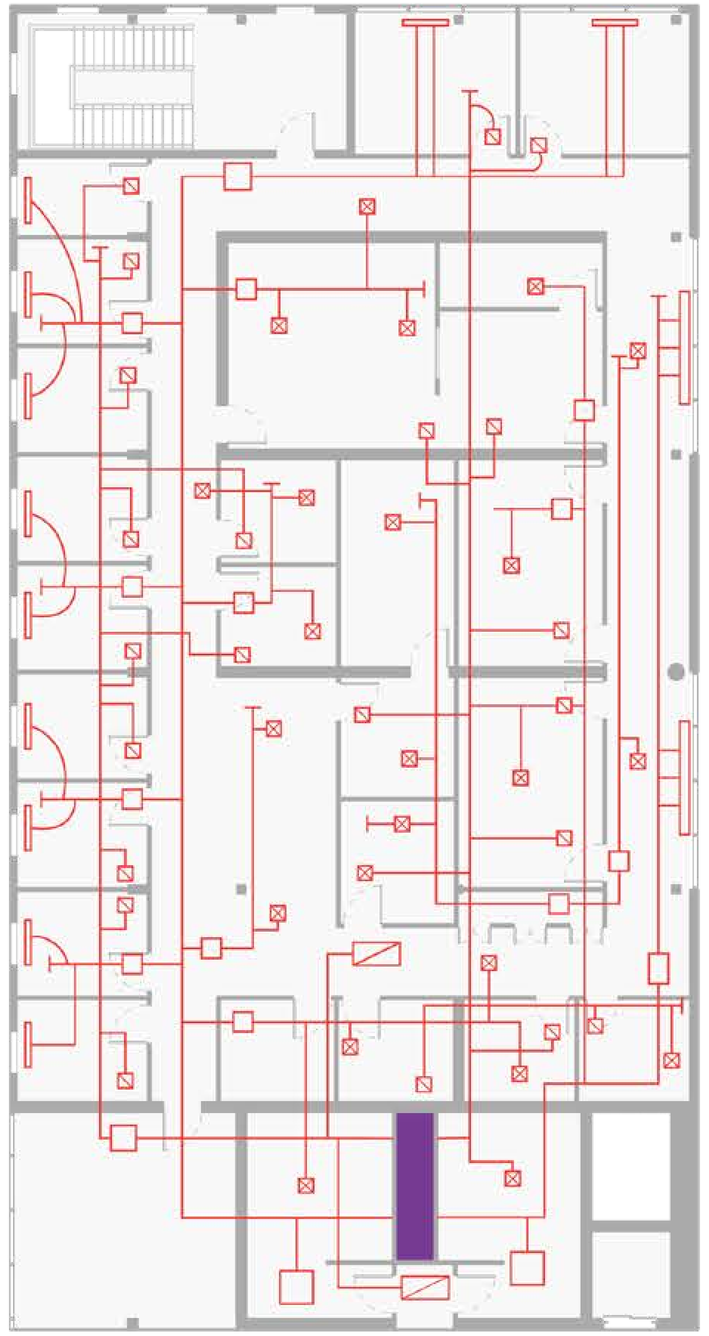
5.01 - First Floor HVAC Plan



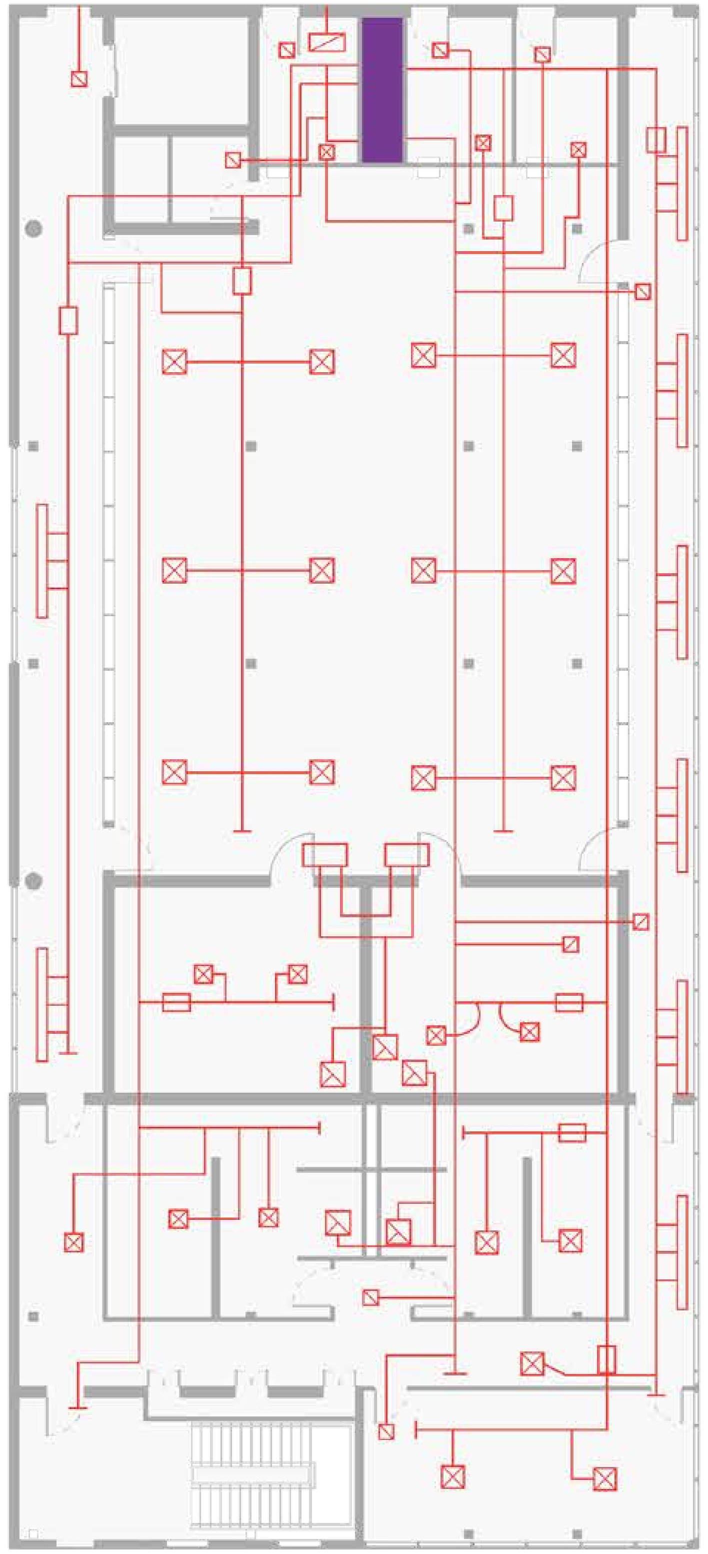
5.02 - Axon Showing Building Chases and Supply/Return Ducts



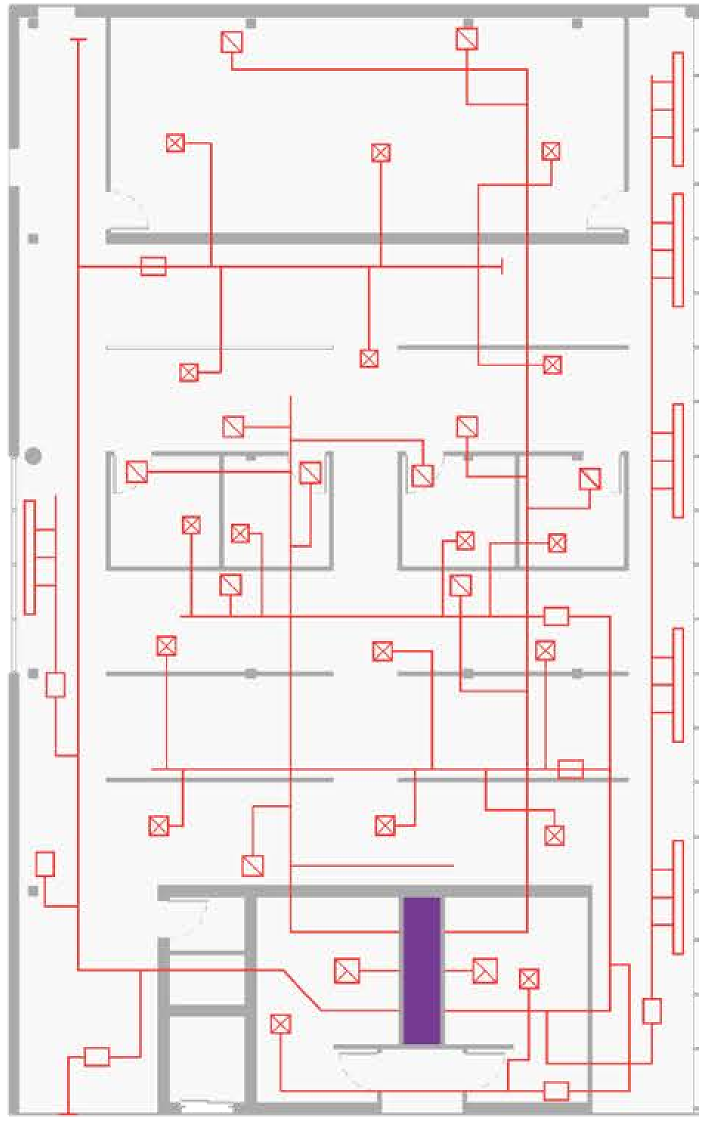
5.03 - Infusion HVAC



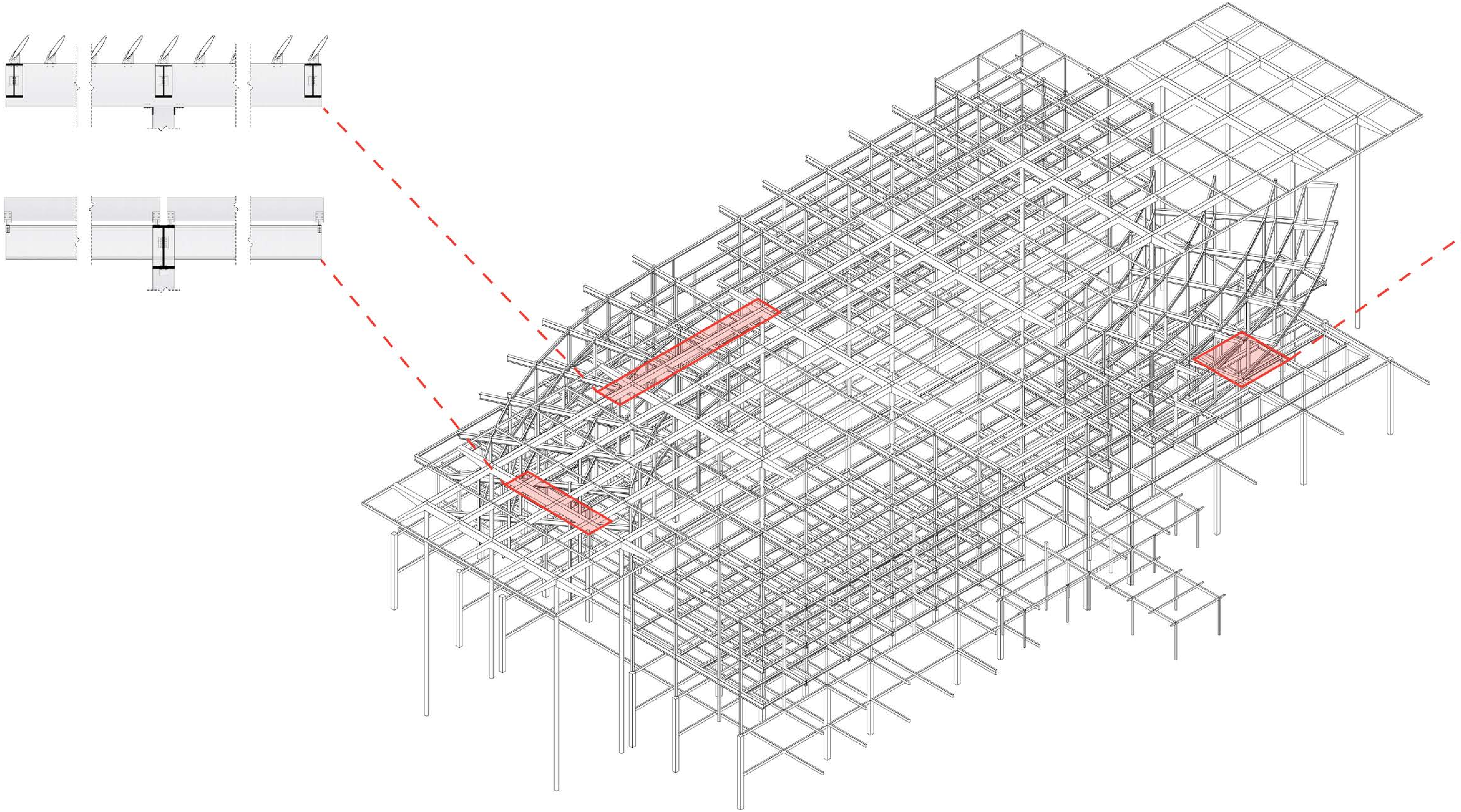
5.04 - Examination HVAC

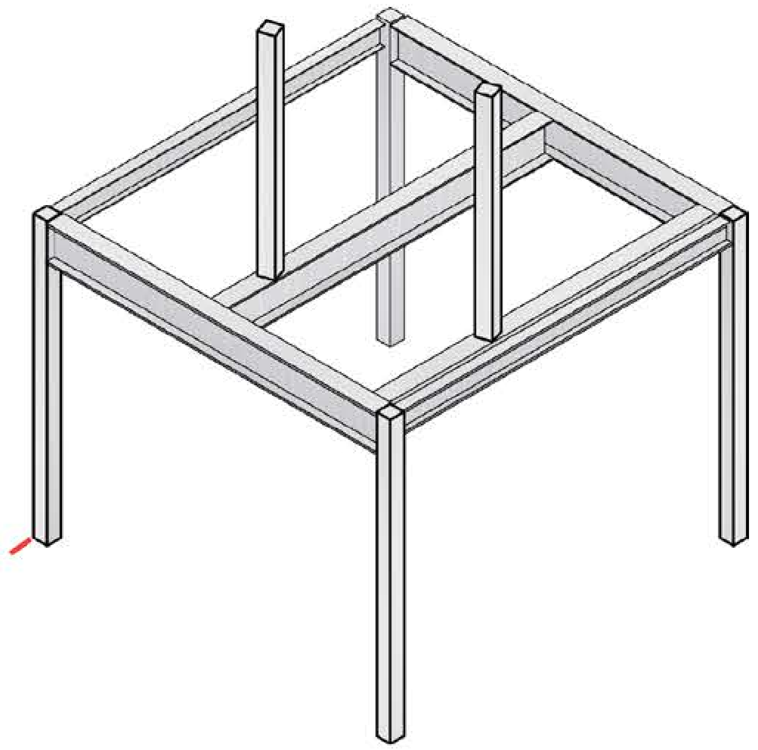


5.05 - Laboratory HVAC

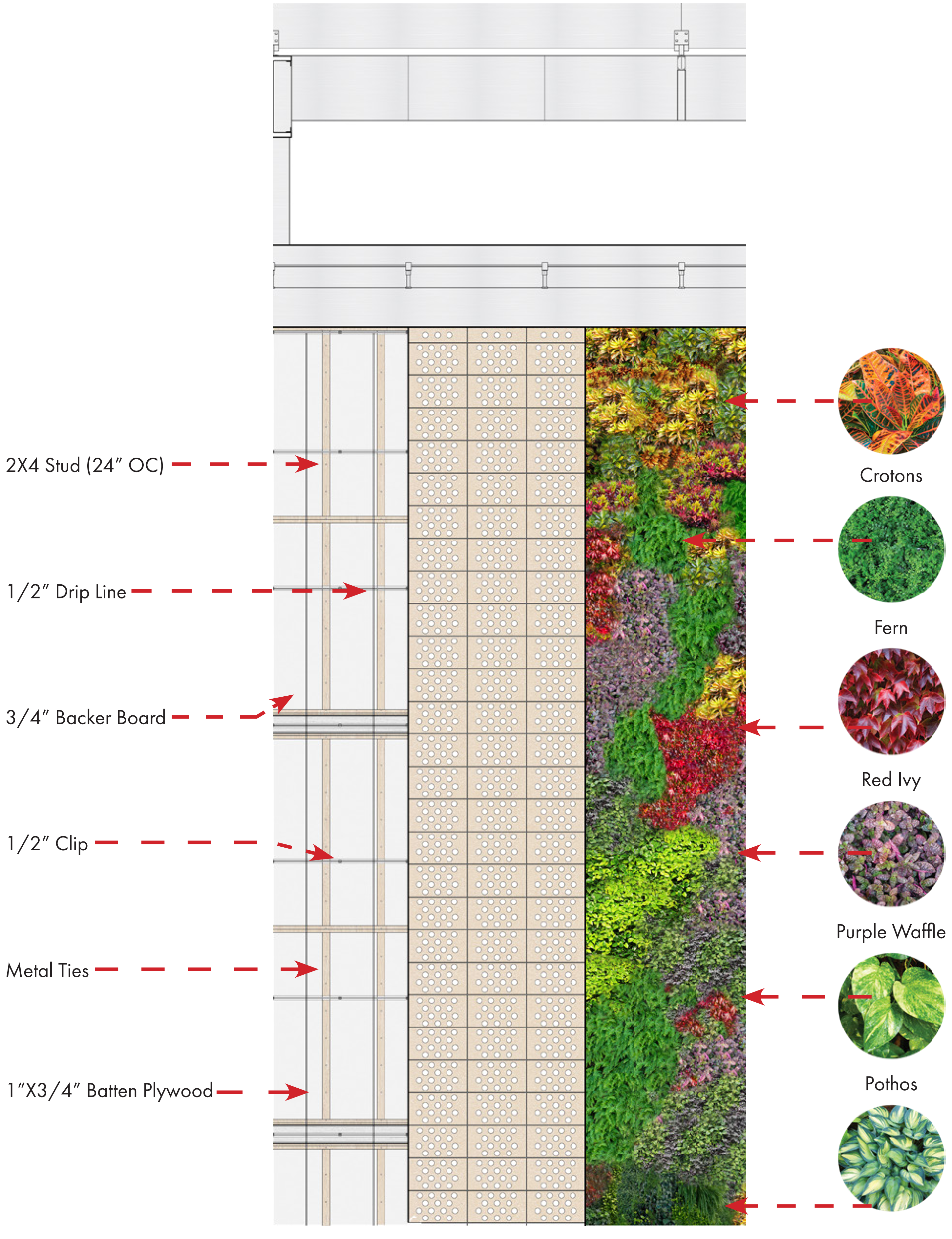


5.06 - Patient Shop HVAC



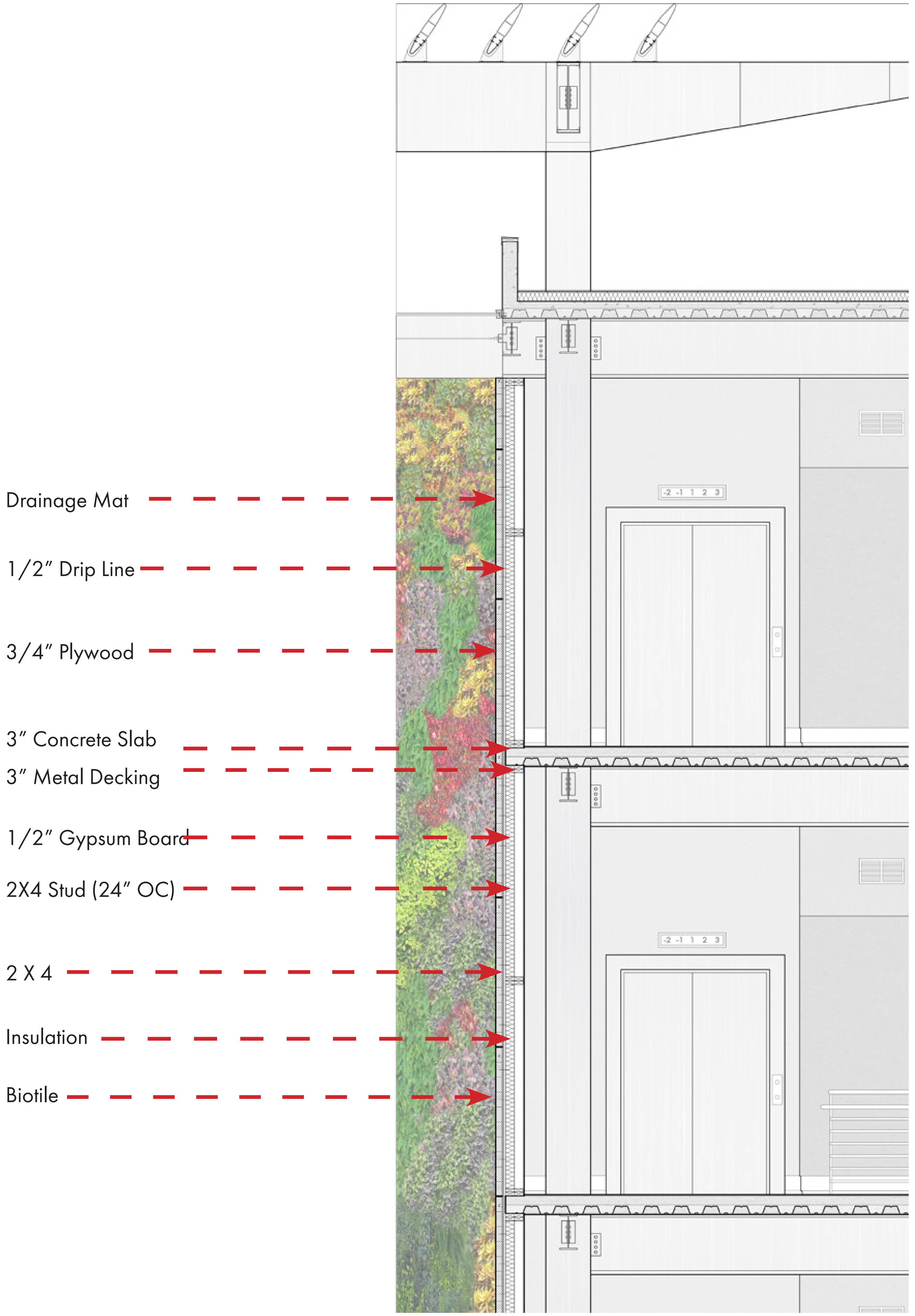


5.09 - Transfer Beam Diagram



5.10 - BIOTILE Green Wall System

5.11 - Atrium Render

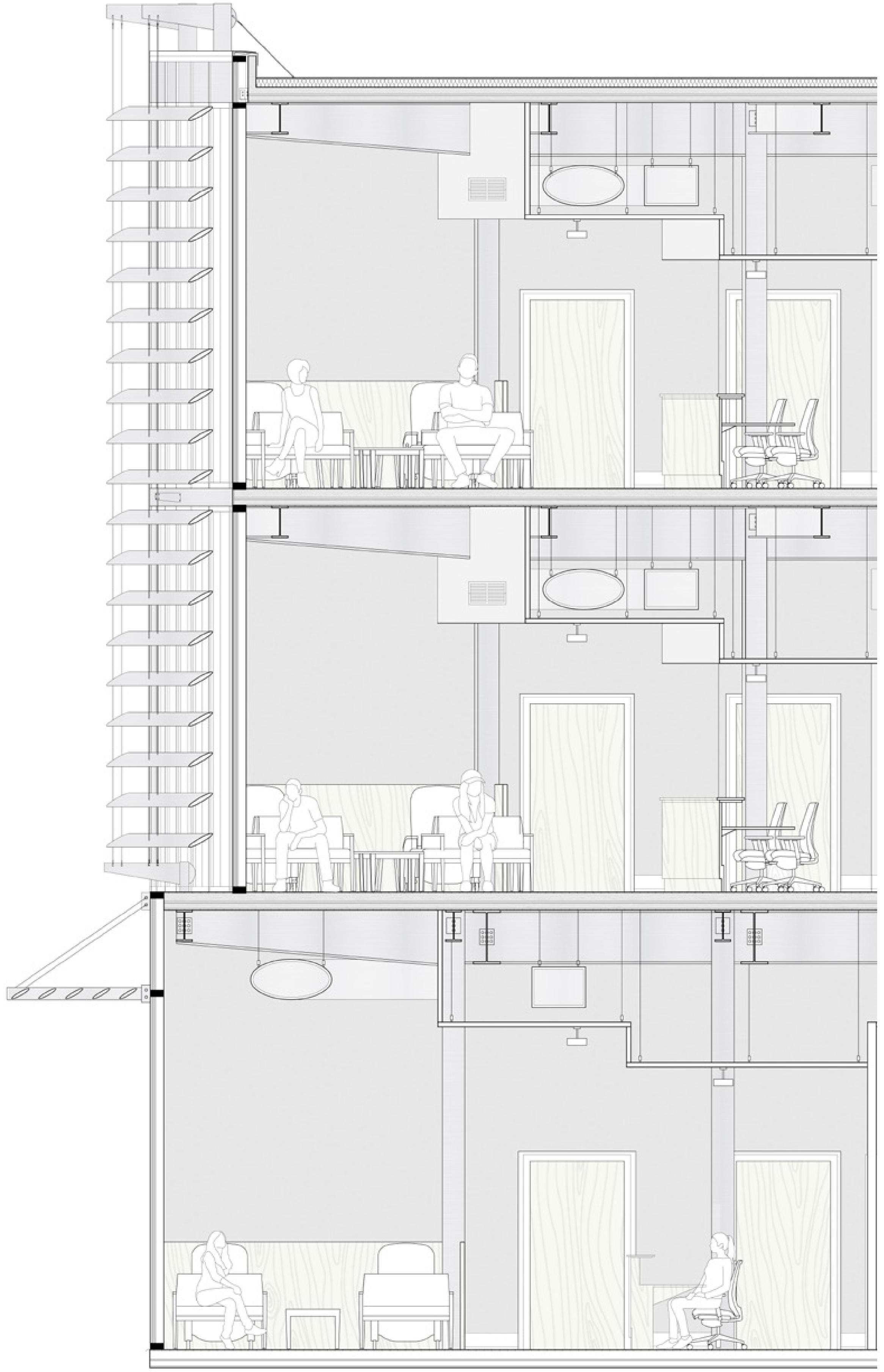


5. 12 - BIOTILE Wall Section

5.13 - Atrium Render

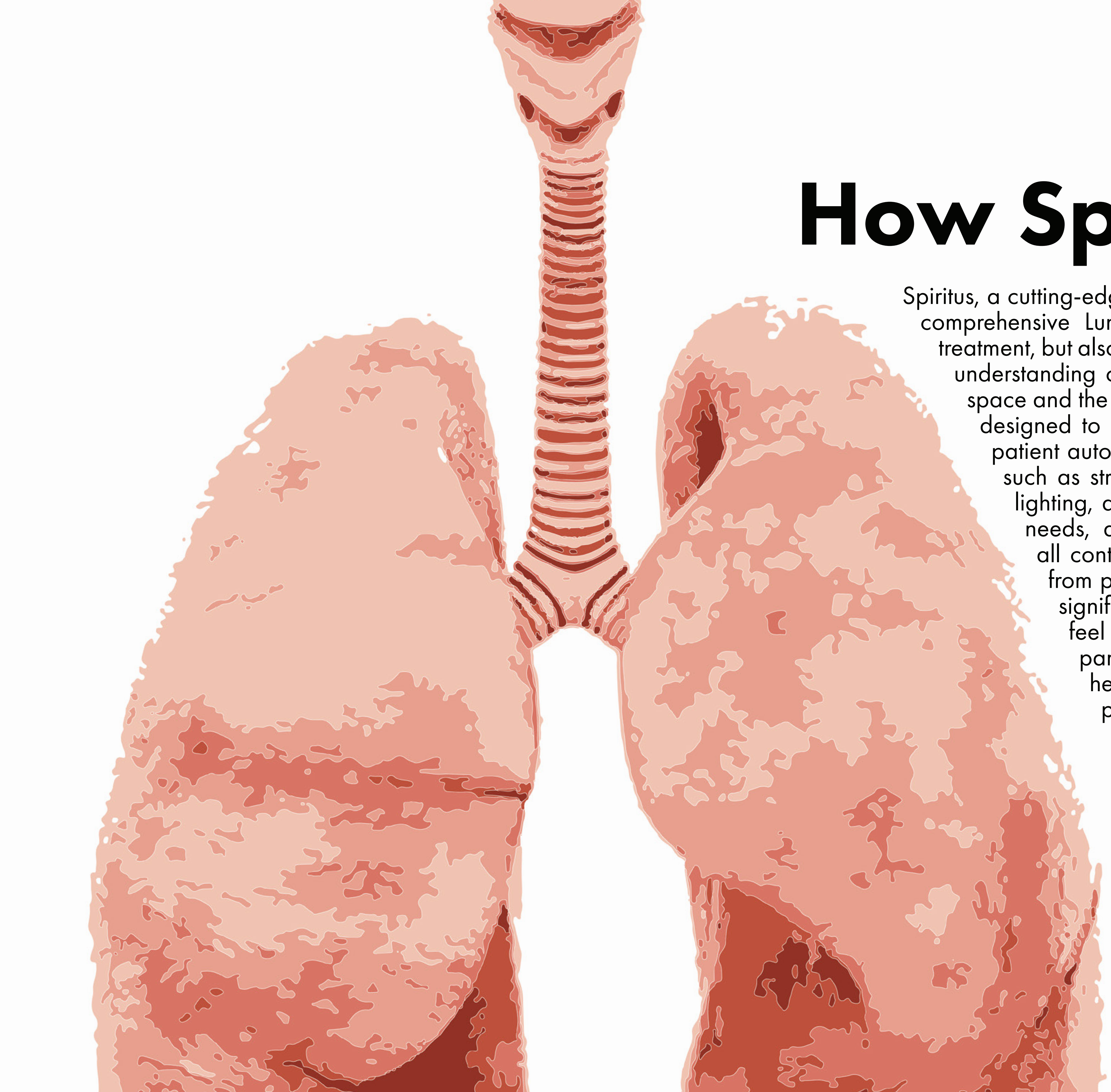
5.14 - Infusion Department Layout

5.15 - Single Patient Infusion Bay



5.16 - Exterior Shading Device Section

5.17 - Four Patient Infusion Bay



How Spiritus Heals

Spiritus, a cutting-edge healthcare facility, is dedicated to providing comprehensive Lung Cancer care that encompasses not only treatment, but also the holistic well-being of patients. With a deep understanding of the symbiotic relationship between physical space and the healing process, Spiritus has been meticulously designed to create a nurturing environment that prioritizes patient autonomy and control. Thoughtful design elements, such as strategically placed greenery, abundant natural lighting, a specialized store catering to cancer patients' needs, and customizable features like infusion bays, all contribute to a patient-centric approach. Drawing from personal experience, I am acutely aware of the significance of empowering patients and making them feel in charge of their treatment. Spiritus represents a paradigm shift in healthcare architecture, redefining healthcare facilities as sanctuaries that elevate patients' overall quality of life, promoting not only physical recovery but also emotional and psychological well-being for patients and their families.

Sources

U.S. News & World Report. "Best Hospitals for Cancer."
https://health.usnews.com/best-hospitals/rankings/cancer
U.S. News & World Report. "Houston Methodist Hospital - Best Hospitals for Cancer."
https://health usnews.com/best-hospitals/area/tx/houston-methodist-hospital-6741960/cancer
U.S. News & World Report. "University Hospital - Best Hospitals for Cancer."
https://health.usnews.com/best-hospitals/area/tx/university-hospital-6743105/cancer
U.S. News & World Report. "UT Southwestern Medical Center - Best Hospitals for Cancer."
" https://health.usnews.com/best-hospitals/area/tx/ut-southwestern-medical-center-6740343/cancer
American Cancer Society. "Cancer Statistics Center."
https://cancerstatisticscenter.cancer.org/?_ga=2.164138879.150100765.1681017511-643661483.1680232597#!/
American Lung Association. "State of Lung Cancer - Texas."
https://www.lung.org/research/state-of-lung-cancer/states/texas
Texas Department of State Health Services. " Texas Comprehensive Cancer Control Program - Cancer Data & Surveillance."
https://www.dshs.texas.gov/texas-comprehensive-cancer-control-program/about-tcccp/cancer-data-surveillance
KLTV. "Cancer mortality rates decreasing nationwide, still increasing slightly in East Texas."
https://www.kltv.com/2020/01/17/cancer-mortality-rates-decreasing-nationwide-still-increasing-slightly-east-texas/
American Lung Association. "State of the Air - Texas."
https://www.lung.org/research/sotc/state-grades/texas
Texas Office of Health Coordination. "Smoking Data Dashboard."
https://txohc.org/communication/data-dashboard/smoking/
ArchDaily. "UCLA Outpatient Surgery and Oncology Center / Michael W. Folonis Architects."
https://www.archdaily.com/388708/ucla-outpatient-surgery-and-oncology-center-michael-w-folonis-architects/51baa58fb3fc4b117900005c-ucla-outpatient-surgery-and-oncology-center-michael-w-folonis-architects-section?next_project=no
ArchDaily. "Agora - Pôle de Recherche sur le Cancer / Behnisch Architekten."
https://www.archdaily.com/907557/agora-pole-de-recherche-sur-le-cancer-behnisch-architekten
Behnisch Architekten.
"Agora - Pôle de Recherche sur le Cancer." https://behnisch.com/work/projects/1030
Michael W. Folonis Architects. "UCLA Outpatient Surgery and Oncology Center."
https://folonisarchitects.com/projects/ucla-outpatient-surgery-and-oncology-center
American Lung Association. "Targeted Therapies for Lung Cancer."
https://www.lung.org/lung-health-diseases/lung-disease-lookup/lung-cancer/treatment/types-of-treatment/targeted-therapies
Everyday Health. "Cancer Diagnosis: 12 Questions to Ask Your Doctor."
https://www.everydayhealth.com/cancer/guide/cancer-diagnosis-tests/

Image Sources

Skyline Scenes. "Frank Erwin Center Austin Texas." Skylinescenes.com,
https://www.skylinescenes.com/products/frank-erwin-center-austin-texas-v52684.
Statesman. "Frank Erwin Center Special Events, Home of UT Texas Longhorns Basketball, to Close in May."
Statesman.com, 8 Mar. 2022, https://www.statesman.com/story/sports/2022/03/08/frank-erwin-center-special-events-home-ut-texas-longhorns-basketball-close-may/9416947002/.
Lankenau Institute for Medical Research. "Lung Cancer in Never Smokers: An Epidemiologic Perspective." Ilcn.org,
https://www.ilcn.org/lung-cancer-in-never-smokers-an-epidemiologic-perspective/.
Google Earth. "Austin, Texas." Earth.google.com,
https://earth.google.com/web/@30.27581009,-97.73227887,172.86406494a,414.8380969d,35y,-146.2659333h,86.67608438t,0r.
Michael W. Folonis Architects. "UCLA Outpatient Surgery and Oncology Center."
https://folonisarchitects.com/projects/ucla-outpatient-surgery-and-oncology-center
ArchDaily. "UCLA Outpatient Surgery and Oncology Center / Michael W. Folonis Architects."
https://www.archdaily.com/388708/ucla-outpatient-surgery-and-oncology-center-michael-w-folonis-architects/51baa58fb3fc4b117900005c-ucla-outpatient-surgery-and-oncology-center-michael-w-folonis-architects-section?next_project=no
ArchDaily. "Agora - Pôle de Recherche sur le Cancer / Behnisch Architekten."
https://www.archdaily.com/907557/agora-pole-de-recherche-sur-le-cancer-behnisch-architekten
Behnisch Architekten. "Agora - Pôle de Recherche sur le Cancer." https://behnisch.com/work/projects/1030
UT Southwestern Medical Center. "CUH Third Tower Groundbreaking."
Utsouthwestern.edu, 2017, https://www.utsouthwestern.edu/newsroom/articles/year-2017/cuh-third-tower-groundbreaking.html.
Kohn Pedersen Fox Associates (KPF). "Houston Methodist Research Institute."
Kpf.com, https://www.kpf.com/project/houston-methodist-research-institute.
San Antonio Report. "University Health System Sky Tower."
Sanantonioreport.org, https://sanantonioreport.org/san-antonio-life-good/universityhealthsystemskytower_courtesy/.
MD Anderson Cancer Center. "Following Hurricane Harvey, MD Anderson Maintains Exceptional Patient Care."
Mdanderson.org, https://www.mdanderson.org/newsroom/following-hurricane-harvey--md-anderson-maintains-exceptional-patient-care.h00-159148401.html.
"How to Care for Your Croton Plant." Living House,
www.livinghouse.ca/news/title/how-to-care-for-your-croton-plant/, Accessed 24 Apr. 2023.
"June Hosta - 4.5 Inch Container." NH Hostas,
www.nhhostas.com/june-hosta-4-5-inch-container/.
"Stunted Pothos: Why Your Pothos Plant Is Not Growing." Gardener's Path, gardenerspath.com/plants/houseplants/stunted-pothos/.
"Hemigraphis alternata 'Exotica' (Purple Waffle Plant)."
iStock, www.istockphoto.com/photo/hemigraphis-alternata-exotica-purple-waffle-plant-gm1159108689-316838728.
"Ivy Colored with Autumn Colors." Crushpixel,
www.crushpixel.com/stock-photo/ivy-colored-with-autumn-colors-112537.html.