

**Collage of the Senses: Healing Devices for Transitional Pediatric
Care in Calgary, Alberta**

by

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Dalhousie University is located in Mi'kmaq'i,
the ancestral and unceded territory of the Mi'kmaq.
We are all Treaty people.

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Abstract

The current approach to pediatric healthcare design throughout North America produces three care scales: hospitals, clinics, and home care services. These forms of healthcare architecture often fail to create spaces that are genuine healing environments for children due to a lack of accommodation for families and friends. This thesis develops a mid-rise clinic as Transitional Pediatric Care Centre in Calgary, Alberta, which aims to address the transitional healthcare needs between hospital and home. Drawing from phenomenology and using collage as a design tool, the project integrates sandstone ruins of Calgary's first major hospital. The program provides suites for patients and families, and explores the roles of play in the healing process of children experiencing body-image and body-mobility related medical conditions. The scope is specific to allow exploration of key design decisions, but is transferable and well suited for other transitional care units aimed at inclusive reintegration into the community.

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Chapter 1: Introduction

The Beginning: Personal Roots



Top: Sophia (age 6) and Mom, 2002

Bottom: Sophia (age 24) and Mom, 2021

This thesis draws from my childhood and adolescence and in retrospect, it has been forming in my mind for nearly 20 years. My mother has worked in the healthcare field for over 35 years, and her work as nurse with children in the pediatric care unit at the Carolinas Medical Centre in Charlotte, North Carolina is relevant to this thesis. While I was fortunate to not spend time in the hospital as a patient, I often frequented the place as a visitor between the ages of 4 and 8. This, coupled with the stories my mother would tell from her long days at bedsides and with families, was enough for me to piece together two critical observations. The first was that I knew how important it was to have one's family around when one was sick, yet there was nowhere in the hospital for the families to stay with their child to help them get better. The second was that I truly did not enjoy spending time in the hospital, even as a healthy child; it was cold, unfriendly and certainly did not feel like a place where people went to heal.



Carolinas Medical Centre (Google street view 2017)

As an adult developing this thesis, I began to dig deeper into my childhood observations: what exactly was it about that space that brought me to those conclusions? Perhaps it was the double-loaded corridor that prevented natural light in any of the hallways; the whitewashed colour palette that made the floors, walls and ceiling blend into one neutral volume; the repulsive scents coming from the cafeteria; the feel of the stiff pillows and thin blankets that graced the beds; the sound isolation in the rooms, creating an odd sense of vacuum by isolating it from life outside. Through this analysis, I began to recognise the role that each of our senses play in the perception of a space, even if these are subconscious or not articulated. Through the collage of sensory perceptions, we can fully experience and understand our environments, for better or for worse.

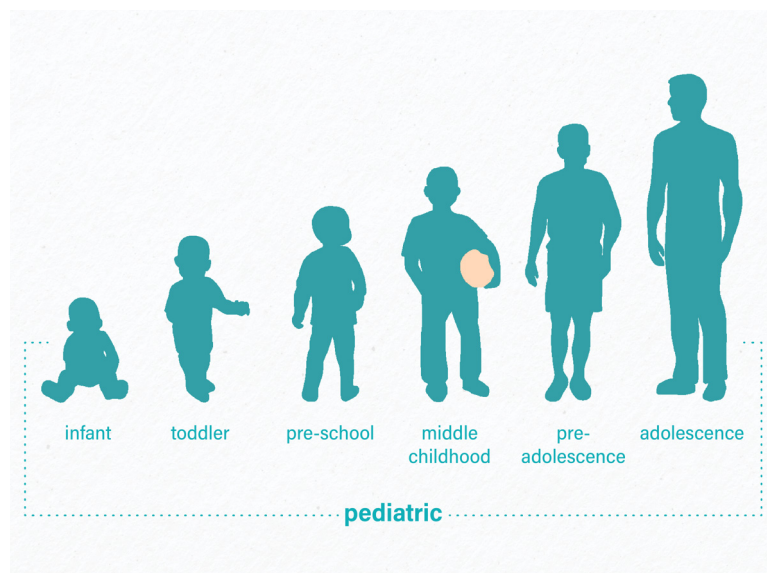
Given my experience and these observations, there is an opportunity and a necessity for change in the way pediatric healthcare spaces are designed at the scale of the body as well as the scale the building.

Key Terms

Pediatric

Pediatric describes the state of being, affecting, or relating to an infant, child, or adolescent (Merriam-Webster n.d.). In a medical sense, pediatrics refers to the physical and emotional care and development of children from birth to young adulthood, including preventative care, diagnosis, and treatment of conditions (Rimsza et al. 2015, 780). While pediatrics deals specifically with the healing of children, it can be argued that parents and families also receive parallel treatment in many circumstances. In addition to differences in physiology, anatomy, development and

psychology, an important distinction between pediatric groups and adult groups is that the former generally cannot make legal decisions for themselves without the consent of an adult guardian. This, combined with the natural element of dependence that comes with being a child, places a strong emphasis on child-family relationships throughout the process of pediatric healthcare.

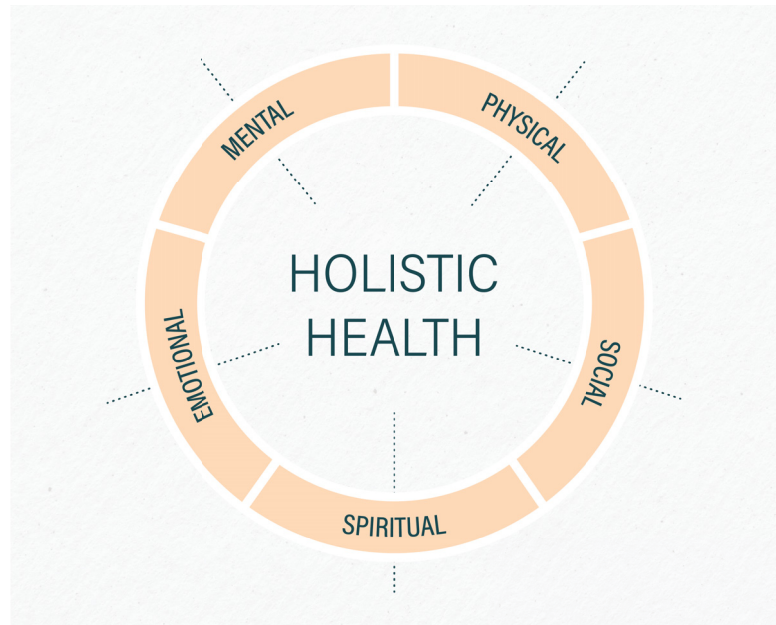


The term “pediatric” encompasses a range of ages.

Holistic

Holistic healing is an approach that “balances every aspect of a person’s wellbeing . . . the consideration of the complete person, physically, psychologically, socially, and spiritually, in the management and prevention of disease” (Rasweswe et al. 2021). This notion represents an increasingly important way to see patients as more than their health conditions; to see them as full people in relation to other people. This holistic approach provides well-rounded and specific treatment that addresses both root causes of the disease as well as the immediate symptoms. I will draw from this

holistic approach to design the health care unit at both the body and building scale, always referring one to the other.



Holistic diagram

Hypothesis and Goals

If pediatric healing environments are designed using the philosophy of phenomenology and techniques of collage, then the quality of care and healing experience will improve due to the inclusion of families, attention to sensory perception, and use of a holistic healing approach. This project aims to explore phenomenology through the design of a mid-scale transitional pediatric care centre in Calgary, Alberta that is built on the site and with the ruins of the city's first major hospital. Strategies of collage are implemented throughout the process to develop a layered design that overlaps concepts of history (landscape), child and adult (sensing bodies), healing and play (activities).

Chapter 2: Experiencing Architecture

An Architectural Day in the Life

Architecture is experiential by nature; envision a well-known building, room, or space, and then consider what is immediately noticeable. Perhaps the light is bright, or the walls are painted with a vibrant colour. Are there sounds coming from outside or does the quietness suggest a solitary place? Maybe there is running water, or an echo that reaches the ears. The wooden floor might let off a scent, one that triggers a specific memory of a grandparent's house for example. If one is eating inside, the taste might tickle the tongue, and as the salt air enters from a window it changes the taste ever so slightly. The exposed brick wall begs to be touched by running the fingers along the mortar, and the unevenness of the surface is contrasted by the smooth floor supporting one's bare feet.

These are all elements that combine to form architecture, and in turn create a sensory perception of the world. The beauty is that "different persons at the same time have a similar and different experience of the same environment" (Norberg-Schulz 1968, 30). The inconspicuous components of space have the potential to be designed and collaged in ways that evoke emotions, inspire actions, and provide affordances. In the case of the pediatric transitional care centre, this may take the form of brightly coloured walls that wake up the eyes, interactive gardens that connect the senses of smell and taste to foster a holistic relationship with food, or a large therapeutic pool that brings the sounds and sights of play into a space of healing. It may even be

expressed through the integration of old stone ruins into the new building, bringing a powerful sense of memory that is also supporting the dreams of the future through a collage of colors, textures and materials.

Phenomenology and Healing

Phenomenology, as a body of knowledge, has been incorporated by architects in different ways. Christian Norberg-Schulz, for example, speaks of phenomenology as “a return to things, as opposed to abstractions and mental constructions,” looking at the world through the lens of concrete phenomena such as people, animals, plants, water, sun, moon, and stars, night and day, and changing seasons, as well as intangible phenomena like feelings,



A design exercise in the primary stages of research: thesis students and first year undergraduate students work together to produce a collage exploring the phenomenology of Steve-O-Reno's Cappuccino, a Halifax coffee shop. (Created by Jonah Kurylowich 2021)

intuitions, and attitudes (Norberg-Schulz 1980, 6). Stephen Holl and Juhani Pallasmaa on the other hand, borrow from phenomenology as an architectural concept by focusing on the fundamental elements of water, colour, and light (Holl, Pallasmaa, and Gómez 1994).

Philosopher Maurice Merleau-Ponty created the concept of phenomenology through extended case studies on sensory perception, neurology, and psychology. He argues that the definition of phenomenology remains ever-changing as it simultaneously “pertains to the study of essences,” and is also a “philosophy which puts essences back into existence” (Merleau-Ponty 1962, xvii). In this way, phenomenology is both an input and an output of the cycle of perception, which integrates each of the human senses and gives meaning and complexity to human experience.



Collage depicting a whimsical, idealistic visualization of a pediatric healing environment

The heart of phenomenology lies in “the interplay between experiential phenomena and intention” (Holl, Pallasmaa, and Gómez 1994, 42). When framed in an architectural lens, phenomenology becomes critical to the foundation of experience. For human beings, there are typically five physical senses (and countless other instinctual and emotions senses) that inform how the world is perceived. Vision allows the perception of light, colours, and scale; hearing perceives music, the movement of people through a space, and elements of privacy; taste perceives moisture, food, and drink; scent perceives cleanliness, materiality, and nature; and touch perceives textures, gravity, and temperature. It is through the collaging and weaving together of these individual perceptions that the built environment, including architecture and all aspects of design, become fully realised in the human mind.

Pallasmaa states, “the way spaces feel, the sound and smell of those places, has equal weight to the way things look” (Pallasmaa 2012, 2), which aligns well with the following excerpt from an article on healing spaces:

When you’re in a healing environment, you know it; no analysis required. You somehow feel welcome, balanced, and at one with yourself and the world. You are relaxed and stimulated, reassured and invited to expand. You feel at home. (Bazuin and Cardon 2011, 259)

When applied to concepts of health and healing, phenomenology has immense potential to improve the architectural design of healing spaces. This becomes particularly relevant when studying forms of architecture that are inherently vulnerable in their program and population. I have defined “vulnerability” as a state in which some or all of that which makes us feel safe, comfortable, and at ease has been extracted from a situation. In this thesis, I investigate



Five human senses



Concepts of vulnerability can be broken into three categories: vulnerable population (children), vulnerable program (healing spaces for children), and vulnerable architecture (the built environments that afford such programs).

a fundamentally vulnerable population in a condition that leaves them even more so (children who are experiencing illness or disease), and explore the impact of architectural phenomenology on their healing experience. By giving specific attention to the sensory needs and experiences of chronically ill children, I am pursuing a branch of phenomenology that I have identified as Phenomenological Healing, the precise architectural implications of which I am exploring through the design of a Transitional Pediatric Care Centre. The project offers therapy and care to families and children with body movement and body image related diseases and conditions, which I illustrate through the application of youth patient characters with cerebral palsy, anorexia, and amputation.

Chapter 3: The Collage of Site

Collage: A Concept and Design Tool



Top and bottom: Lycee Hotelier de Lille (Caruso St John Architects 2016)

Collage has taken an extensive journey through various periods of visual art, including cubism, surrealism, contemporary art and pop art. It now plays a significant role in architectural design, as shown through the works of Caruso St John Architects and Tatiana Bilbao. Colin Rowe and Fred Koetter also study collage as it relates to urban design, exploring the roles of solid and void in different types of cities (Rowe and Koetter 1983, 62). I work with collage to layer and overlap disparate components to create a new meaning. It is important for me to recognise that collage is an inherently process-based, giving priority of the method over the product; it can be phrased as a noun or a verb; and it can also be a tool for analysis and design (Shields 2014, 2).

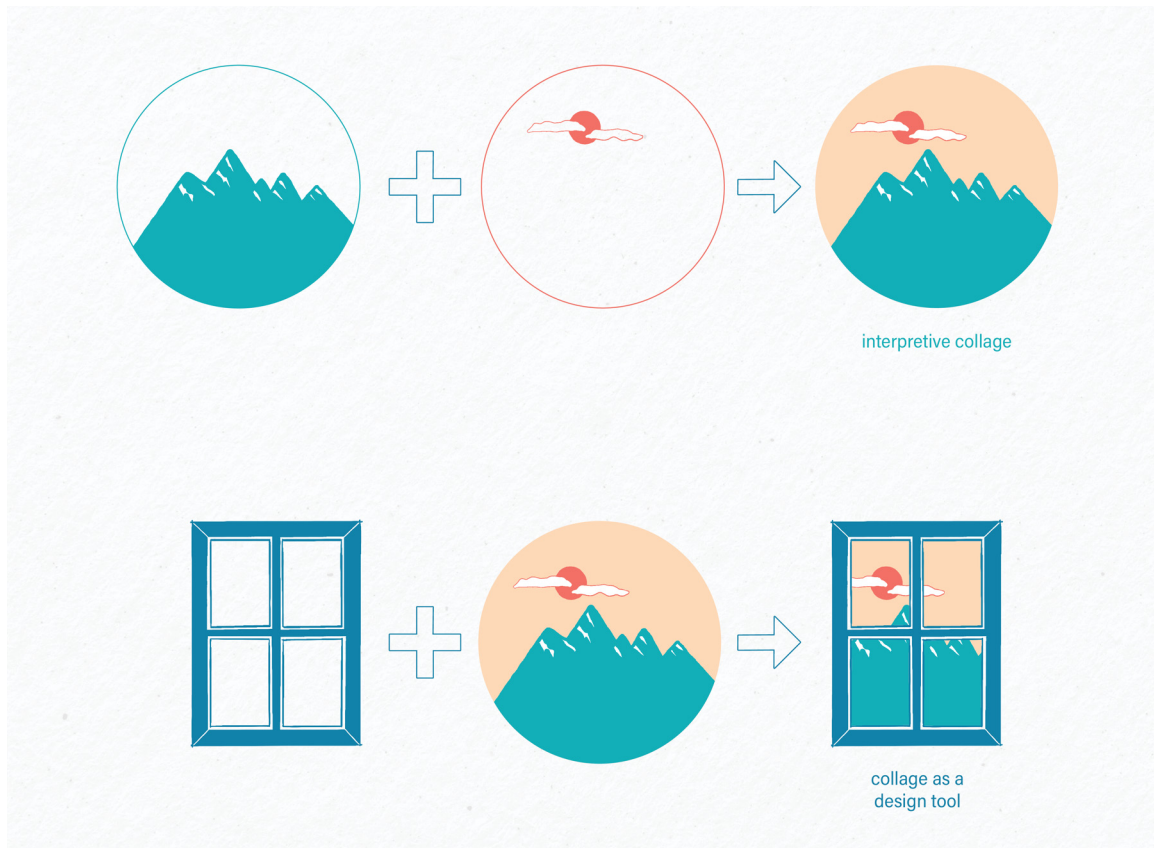


Apan housing (Bilbao 2018)

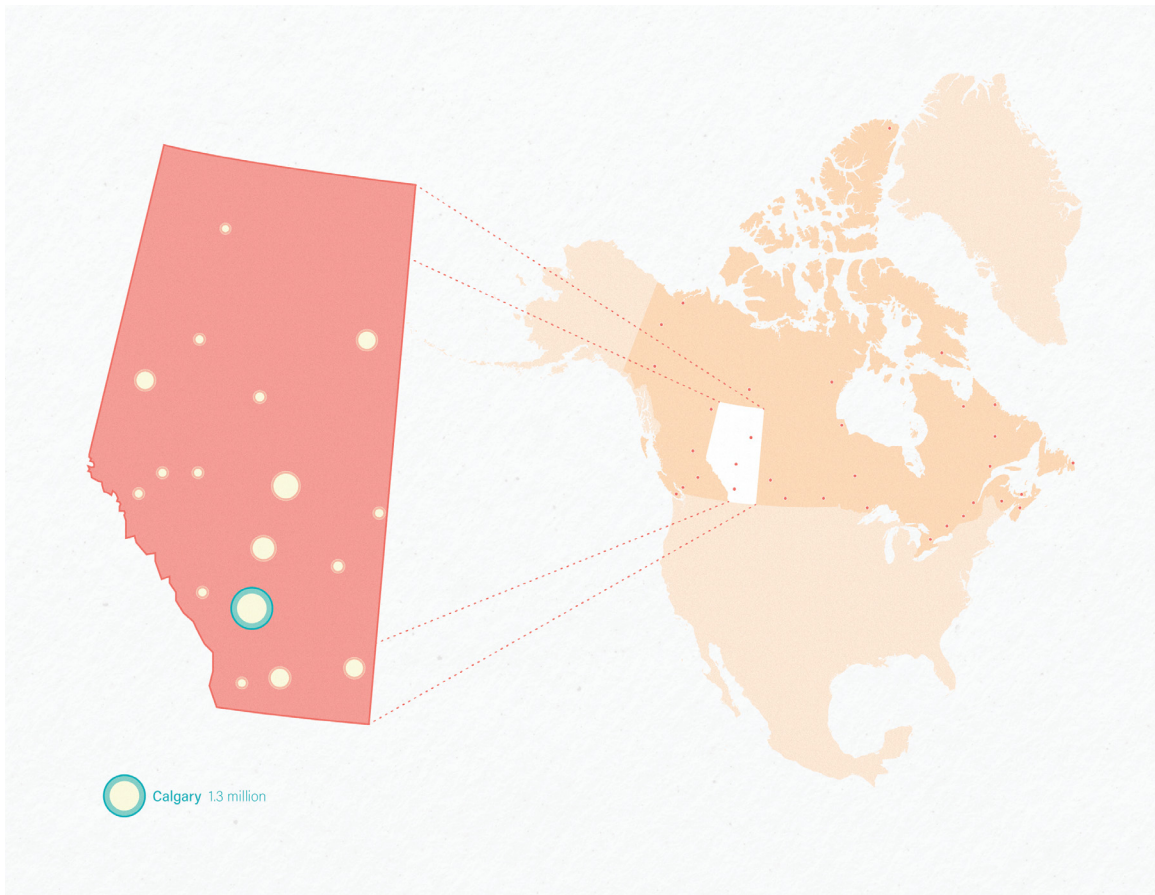
Reading the city through the lens of collage, Stephen Holl posits:

A city is never seen as a totality, but as an aggregate of experiences, animated by use, by overlapping perspectives, changing light, sounds, and smells. Similarly, a single work of architecture is rarely experienced in its totality (except in graphic or model form) but as a series of partial views and synthesized experiences. Questions of meaning and understanding lie between the generating ideas, forms, and the nature and quality of perception. (Holl, Pallasmaa, and Gómez 1994, 130)

Collage can be a form of interpretation of what is there, or a design tool. Interpretative collages describe the layers that have taken shape, such as a land collaged with a sky to create a landscape. By contrast, collage as a design tool is an intentional layering of components to achieve a desired effect, such as placing a window to frame a specific feature of the land beyond.



Interpretive collage and collage as a design tool



Major Canadian cities mapping exercise (base map from Free Vector Maps 2022)

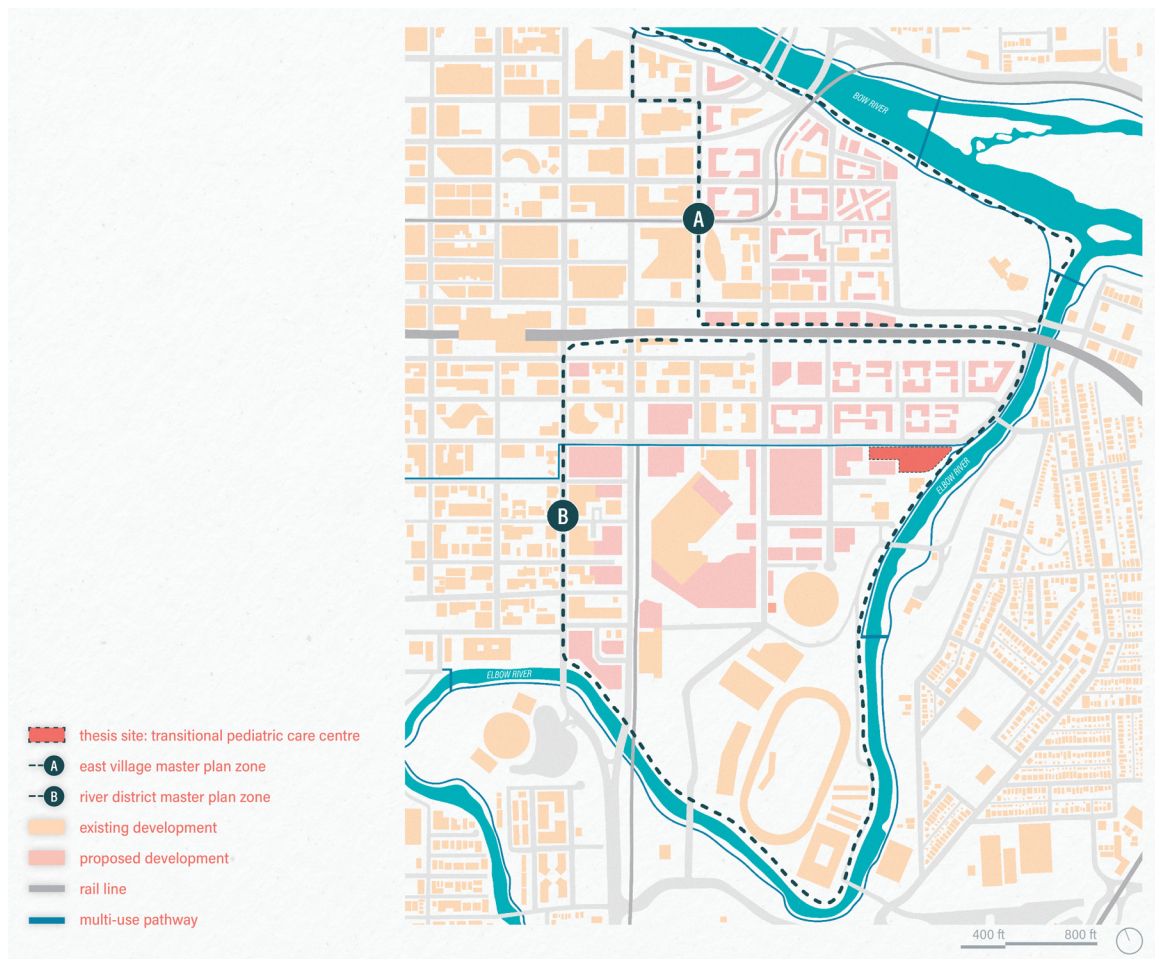
The Site

Much of my design approach was informed by the concept and tool of collage, including my approaches to site, program, and inhabitant interactions with the space.

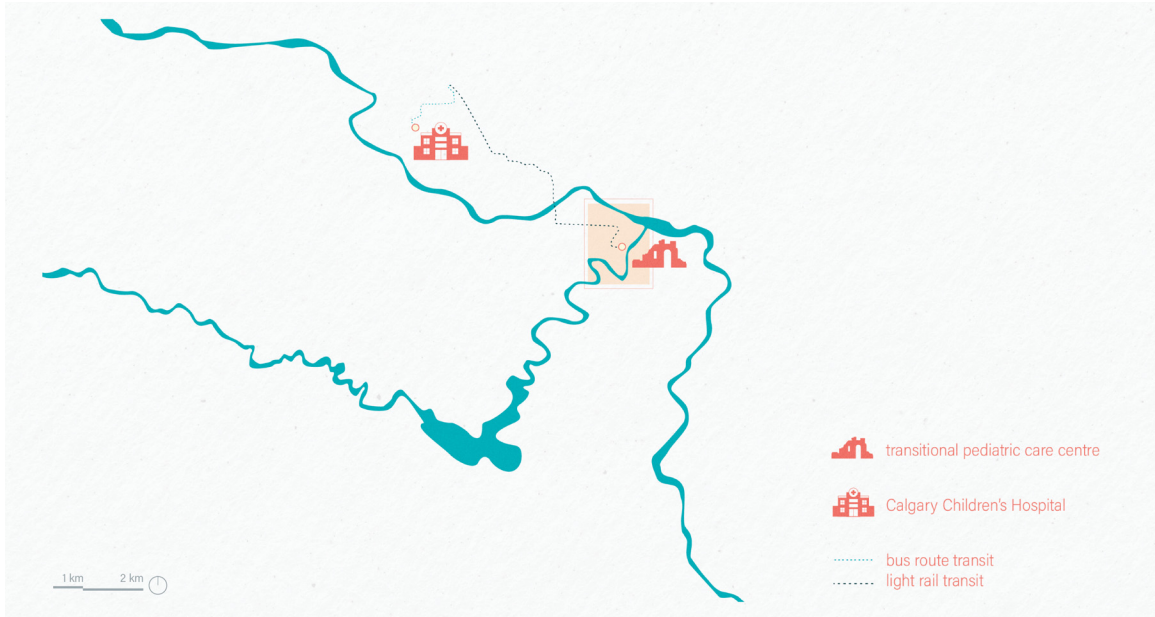
Site Selection

The goals of choosing the right site for this pediatric center were the following: to have immediate access to nature and yet be in the city with all the services and transportation networks, to be close to other public amenities so that the family and friends visiting the child could walk to places of interest.

The site I chose is in the east end of downtown Calgary, surrounded by three distinct zones of development: the downtown to the north and west, the entertainment and cultural buildings to the south, which include the Calgary Stampede grounds, and residential areas to the east across the Elbow River. This area is on the cusp of a large urban shift, as two master plans are set to bring intense new development in phases over the next two to twenty-five years (Calgary Municipal Land Corporation 2016, 2017). My thesis site is located inside the River District Master Plan zone, which “envisions a mixed use culture and entertainment [area] that . . . will deliver a vision for future growth, investment, attraction, connectivity, and livability”



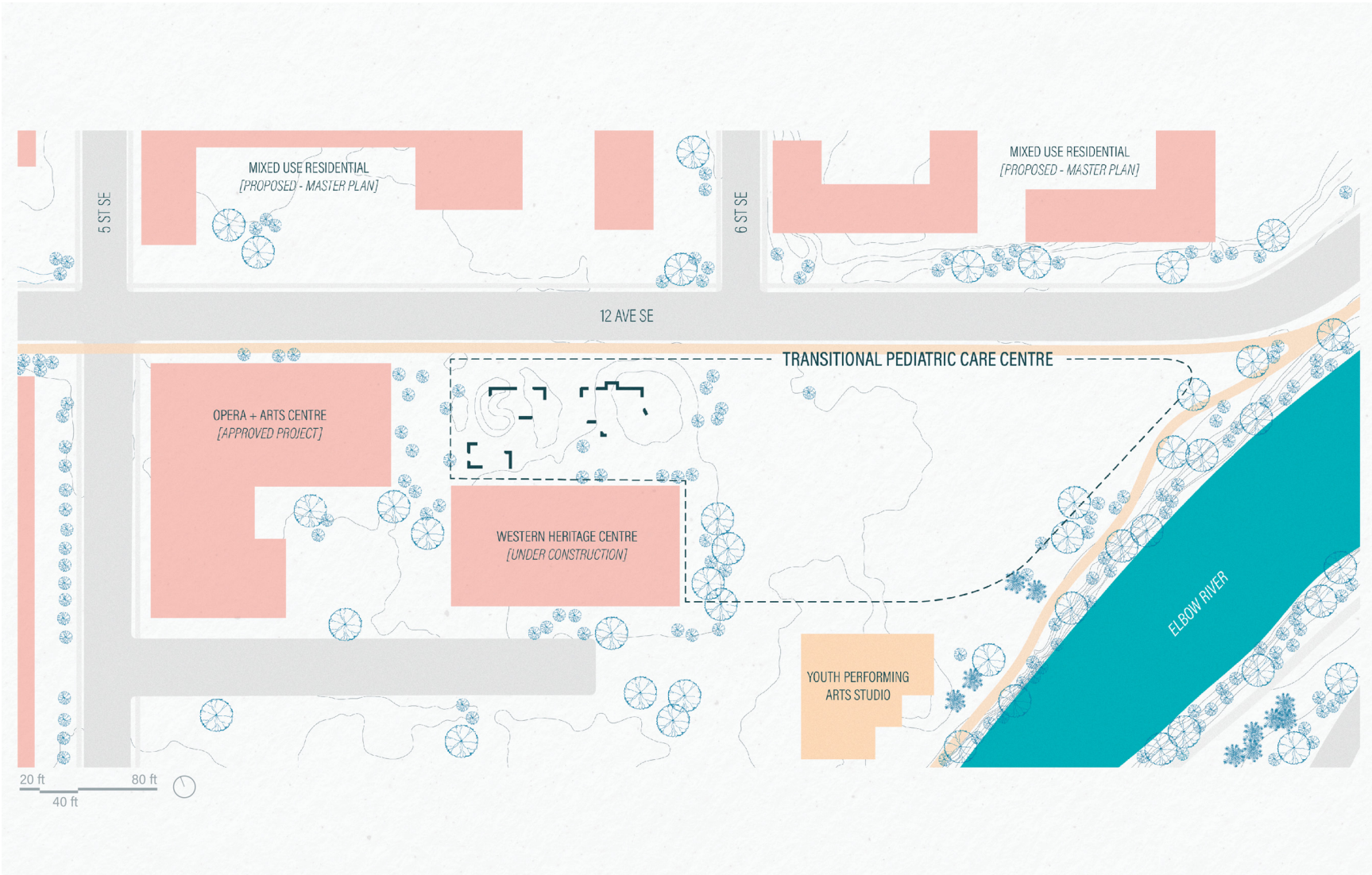
Urban design strategy, downtown Calgary



Site relationship to Calgary Children's Hospital

(Calgary Municipal Land Corporation 2017), and is bordered by the East Village Master Plan zone to the north, which aims to rebuild a portion of the city through new building styles, a strong connection with the river waterfront, and an emphasis on mixed use development (Calgary Municipal Land Corporation 2016). The developments proposed as part of these master plans provide an opportunity to build cohesively and share resources, such as solar panels and underground parking, therefore reducing the amount of necessary infrastructure.

Situated in the north portion of a block near the intersection of 12 Avenue SE and 6 Street SE, the immediate surroundings of the site are currently empty parking lots and vacant lots. The only existing building is the TransAlta Youth Performing Arts Studio, which offers shared creative space for community use in conjunction with the Calgary Stampede (Calgary Stampede Foundation n.d.a). The land directly south of the site is the future location of the SAM Western Heritage Centre, which will exhibit the history of



Immediate context: proposed master plan development adjacent to the site



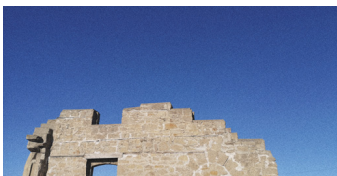
Elbow River along the site

the Calgary Stampede (Corporate Communications Team 2020), is currently under construction. The lot to the west of the site is designated to become a new Opera House and Community Arts Centre, intended to provide rehearsal spaces, classrooms, studios, and production shops for arts groups throughout the city (Saeed 2019). Across 12 Avenue, several mixed-use residential developments are proposed as part of the River District Master Plan. The Elbow River runs alongside the site to the southeast, and is bordered by an exiting multi-use pathway intended for cyclists and pedestrians to share. The eastern portion of the site is currently an open grassy park, and the western portion is home to the Rundle Ruins.

The Rundle Ruins



Main entrance of the Rundle Ruins

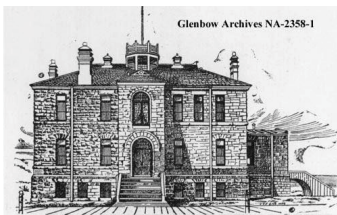


Sandstone ruins

The memory embodied in former buildings can be associated with a new construction, creating unexpected juxtapositions; a topic explored by Colin Rowe as he argued that even if the integral elements of certain components remained the same, they could be perceived differently due to their new contextual relationship to one another (Rowe and Koetter 1983, 79). This concept of the old and the new informed the site selection for the project: a park with the ruins of the first major hospital in Calgary, the Rundle Hospital, and a meaningful place regarding the history of healthcare and health care workers. Through association, the ruins become an allegory for the cyclical nature of health and sickness in our lives. The ruins of the Rundle hospital are an element in a collage but also a design tool, as they triggered phenomenological components of the building and the park associated with it.

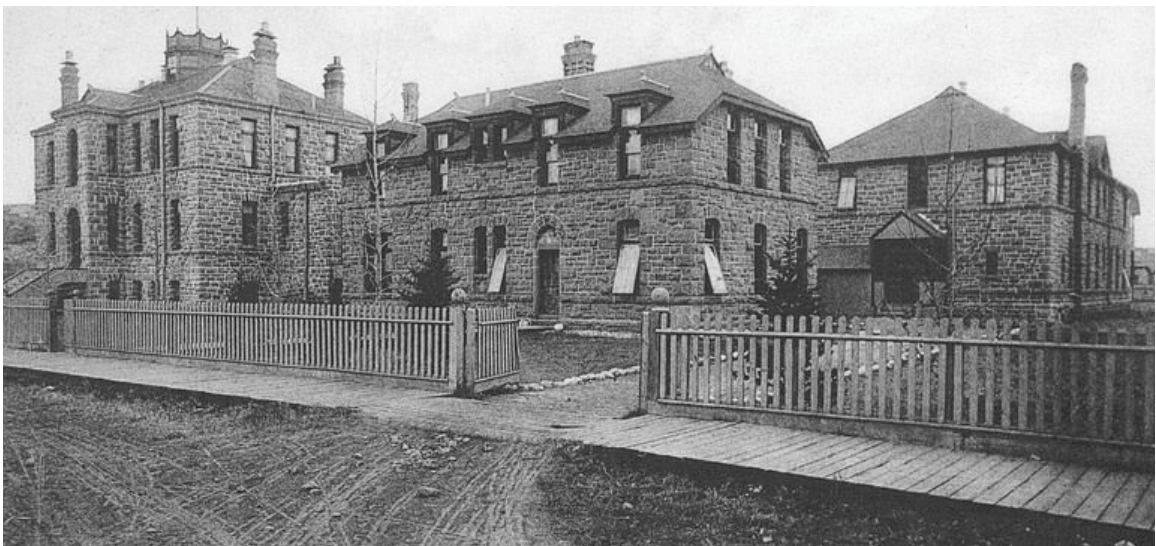


Ruin sandstone texture



Original Rundle Hospital
(Calgary Stampede
Foundation n.d.b)

The Rundle Ruins are all that remain of Calgary's first major hospital. While the Rundle Hospital was technically the city's second hospital, it is considered the first major one given that the first general hospital was a two-storey house in a state of disrepair (Calgary Stampede Foundation n.d.b). Designed in 1894 by the architects Child and Wilson, the Romanesque two-building facility had 35 beds and an operating room, as well as a nursing school and additional maternity wings (Calgary Stampede Foundation n.d.b). The Rundle Hospital was also one of the earliest examples of sandstone construction in the city, taking resources from the banks of the nearby river to create the large stone blocks that formed the walls of the buildings. The demand for healthcare eventually outgrew the scale of the Rundle Hospital, which became a senior's residence in 1954 following the construction of a new, larger hospital across the river. (Calgary Stampede Foundation n.d.b). Renamed the Rundle Lodge, the development maintained its status as a senior's residence for nearly twenty years until it was purchased by the Metropolitan Foundation of Calgary and ceased operation in 1971. After much debate about its value



Original Rundle Hospital between 1894 and 1954, during its operating years (Calgary Stampede Foundation n.d.b)

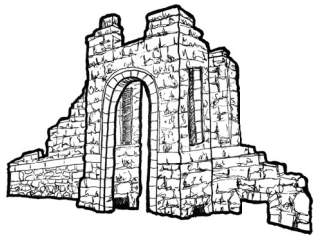


LOUGHEED PAYS TRIBUTE TO PIONEERS OF CALGARY
- new Rundle Lodge in background shows 65 years' progress

Premier opens Rundle Park

Premier Peter Lougheed, kneeling before the old and new of the Rundle Lodge and the new Rundle Park, opened the park as a memorial to the city's first hospital which was built in 1871. The building was built by the Alberta Mining Corporation. The old sandstone building was demolished and the park built in the memory of the city's first hospital. The building was built in 1871 and was one of the first buildings in Calgary. The building was built by the Alberta Mining Corporation. The old sandstone building was demolished and the park built in the memory of the city's first hospital.

Calgary Herald article (Burn 1974)

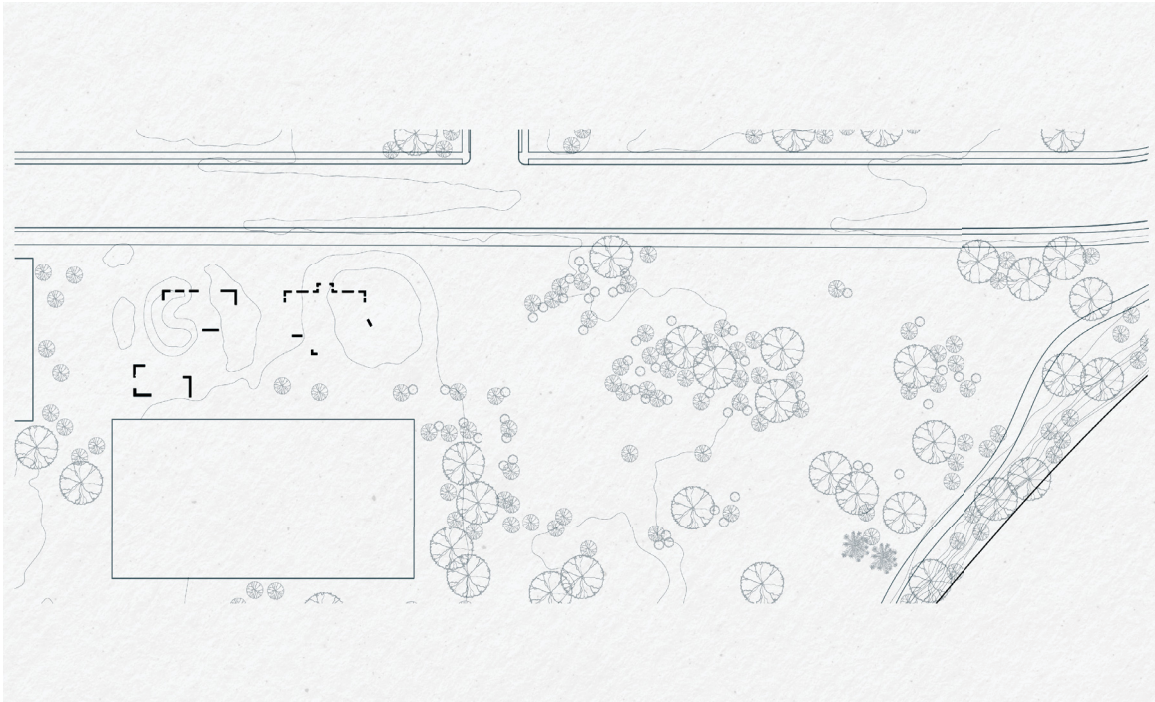


Rundle Ruins sketch

as a historical landmark building, the Rundle Lodge was demolished in 1973. The following year, the remaining ruins were commemorated and transformed into Victoria Park, intended to symbolize “a beautiful bringing together of the old and new, of the future and history,” according to former Premier Peter Lougheed (Burn 1974, 25).

The massive sandstone blocks that were the original Rundle Hospital vary in size and shape to form archways, windows, portions of walls and corners of buildings. To help gain a sense of scale, I have included myself (at 5’4”) in photos with each of the eleven ruins. While exploring the site, I was struck by the natural urge to interact with the ruins; the architecture student in me wanted to observe them, to appreciate the authenticity of the material, and run my fingers along the rough texture; while the child in me wanted to climb them, peek through the window openings, and pretend I was in some sort of castle. I chose to work with both instincts as I moved forward with my project, following the thread of the site narrative to investigate the collage of history and future; architecture and landscape; and child and adult.

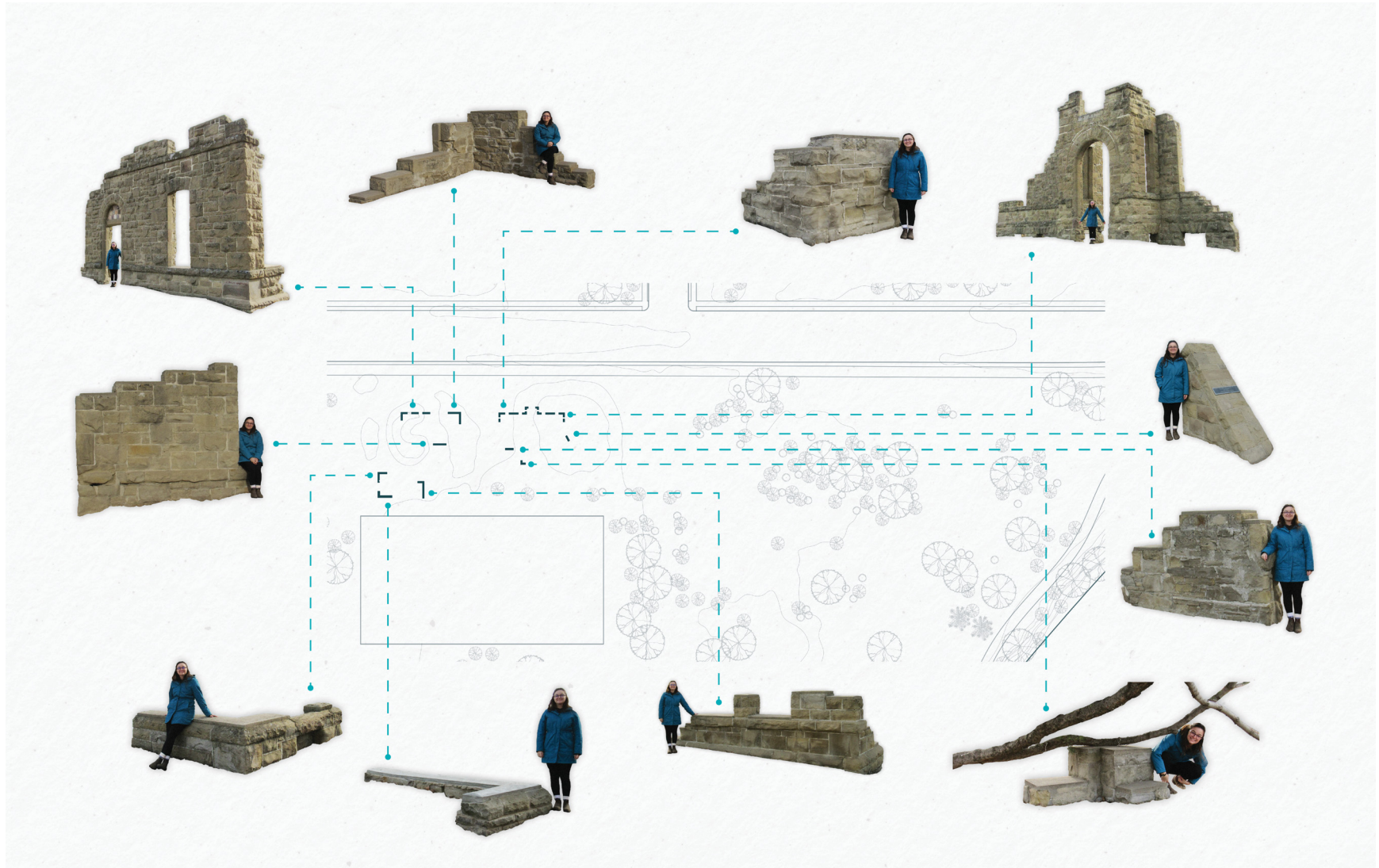
In addition to the Rundle Ruins, the presence of the Elbow River along the southeast edge of the site provided inspiration for programmatic direction. The Elbow River is a branch of the Bow River, which flows down from the Rocky Mountains and cuts through Calgary, defining the landscape and creating an interactive waterfront edge throughout much of the city. My design was guided by the concept of bringing the water and energy of the river up into the landscape and building. The building and landscape are designed cohesively to provide a sensory-rich experience that extends from interior to exterior and is not restricted by the walls of the building.



Rundle Ruins in current location on the site



The largest ruin was the main entrance of one of the original hospital buildings



Rundle Ruins in their existing location on the site, photographed with me (5'4") to show scale

Chapter 4: The Architecture of Pediatric Healthcare

History and Practice

History of Children's Hospitals

In Canada, prior to the 1880s, hospitals were places for the least fortunate of society, and the conditions within them were often no better than the environments which the patients came from (Wright and Haddad 2016, 2). They were not places of healing, but rather places to send people to die from whatever ailed them. However, in the twentieth century hospitals became places to develop knowledge: critical pillars of the scientific and professional community, where “technology and laboratory science reshaped the architecture, patient population, and clinical practice of health care” (Wright and Haddad 2016, 2). The Canadian Society for the Study of Diseases of Children was formed in 1922, signifying the emergence of pediatrics as a separate branch of healthcare in Canada (Canadian Paediatric Society 2018).



Top: parents and patients waiting inside hospital hallway in 1915 (Wright and Haddad 2016, 190)

Bottom: a mother and child separated in 1916 (Wright and Haddad 2016, 166)

In the mid-1900s, the effects of separating young patients from their families and friends became increasingly apparent to the scientific community. Simultaneously, children's hospitals were beginning to house a number of patients with diseases and conditions that required isolation, and the general attitude toward visitors of any kind was one of fear: what if they brought germs or other diseases into the hospital, infecting the vulnerable residing there? (Wright and Haddad 2016, 167). This attitude is not unlike what our society has experienced in the past 2 years as a result of the COVID-19 pandemic, and its effects are equally detrimental

in both instances. Each individual has a network of family and friends that support them emotionally and physically through their healing journey, and when that network is not able to function to its full potential for any number of reasons, it has a negative effect on both the families and the patient. A woman waiting to visit her child in the Thistleton Country Hospital in 1952 recalled “when the [front] doors were finally opened it was like a herd stampeding; all the parents hurrying down the halls to have every available minute with their children” (Wright and Haddad 2016, 167).

Realities and Challenges

Stressed, scared, and grieving. These are the feelings we associate with [Intensive Care Unit] environments. A sense of well-being? Not so much. And that is all the more reason to be mindful of how an ICU environment can be designed to focus on healing the body, the mind, and the senses. (Bazuin and Cardon 2011, 259)

It is an unfortunate reality that hospitals, as the largest scale of healthcare architecture, are often not designed as places of healing. Hospital environments have transformed into rooms “built merely to warehouse and care for the sick” efficiently (Miller, Swensson, and Robinson 2012, 240). The attention to individual patient care from a holistic standpoint is often missing, resulting in environments that do not foster a sense of healing and well-being, but rather feelings of vulnerability, fear, and uncertainty.

Healthcare design faces the challenge of implementing “humanistic architecture,” which is defined by placing human welfare at the heart of building design while drawing “on international research in the fields of psychology and sociology, biology and physiology into the effects of the environment on health” (Mazuch and Stephen 2005, 48). According to an article from the Journal of Child Health

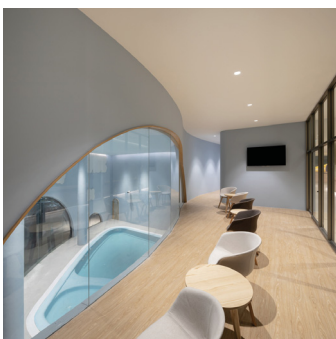
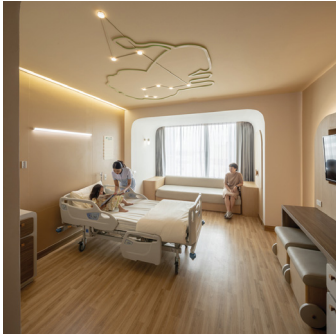
Care, “[healing] environments need to be constructed not just to be child friendly, but to also respect children’s right to dignity, privacy, family support and self-control” (Lambert et al. 2013, 57). Children’s sense of dignity and privacy are the values at the core of my design for the patient rooms and their family.

Case Studies in Pediatric Healthcare

Fortunately, there are many examples of beautiful and effective designs for pediatric healing spaces which address some of the challenges of alienation and fear in hospital settings and other types of healthcare architecture. Each of these precedents offer several design approaches that have inspired my thesis project.

Precedent 01: EKH Children’s Hospital, IF

Few healthcare designs integrate the aspect of play as obviously and effectively as Thailand’s EKH Children’s Hospital by Integrated Field (IF). The main atrium features a large slide for children to move from the upper to lower levels, immediately activating the sensory perceptions of sight and touch, and appealing to the target audience’s sense of adventure and exploration upon entry into the facility. Each patient room is themed around an animal, which appears on the ceiling of the room with a constellation of nightlights to provide visual stimulation and consistency while spending long periods of time lying in bed. All patient rooms have large windows that offer direct views to the outdoors from any position in the space. The project also incorporates a swimming pool, various interactive play areas, and a large dining hall. Clear attention was paid to the importance of scale in many aspects of the design; the washrooms have sinks and toilets that are an appropriate height for children



Top to bottom: EKH Children’s Hospital room (day), room (night), common space, above pool (Wongwan 2020)



EKH Children's Hospital, therapeutic pool (Wongwan 2020)

in addition to those scaled for adults, and there are many examples of child-scaled features in play areas and patient rooms. A soft colour palette and curved wall features are used throughout the entirety of the building, which are aesthetically pleasing and illicit a calming effect (Luco 2020). I took inspiration from many aspects of this project, as seen through the integration of a therapeutic pool, interesting social areas of play, and child-scale components into the design.

Precedent 02: Ronald McDonald House Charities

The Ronald McDonald House Charities are well-known for offering safe, comfortable, and affordable places for families and patients to stay while receiving medical treatment at hospitals. With over 375 locations across the world, these projects are typically found in close proximity to children's hospitals and are specifically designed for families that live outside the immediate area of the hospital where their child is receiving care. While the facilities do not offer direct medical care, they do offer the ability for parents and siblings to stay close to the patient, fulfilling the deep need for a strong patient support system (Ronald McDonald House Charities Canada 2022).



Top to bottom: shared kitchen and lobby area of Ronald McDonald House, Vancouver, British Columbia (MGA n.d.)

From a design perspective, Ronald McDonald Houses vary in scale and level of architectural intervention. The majority of the Houses serve a large number of families and offer common kitchens, dining spaces, libraries, play areas, fitness facilities and outdoor spaces, while others are designed to be a series of smaller individual apartments. One of the larger Ronald McDonald Houses was designed by MGA Architecture in Vancouver, British Columbia, and provides accommodation for 73 families receiving medical treatment at the BC Women and Children's Hospital (MGA n.d.). The main goal of the project was to provide a space that "would feel like a home and not a hotel," and this was achieved by integrating multiple scales of privacy and social interaction into the design (MGA n.d.). The specific attention to the needs and care of families resonates most with me and appears as a consistent thread throughout my design.



Ronald McDonald House, Vancouver, British Columbia (MGA n.d.)



Top to bottom: Calgary Cancer Centre interior courtyard, exterior view (DIALOG 2022)

Precedent 03: Calgary Cancer Centre, DIALOG + Stantec

The Calgary Cancer Centre is an emerging project that will complete construction in 2023. The design of the building is based on the comforting premise of giving and receiving a hug; the massing bends in two L-shaped forms to create an embrace with an outdoor courtyard space in the centre (DIALOG 2022). All other design strategies emerge from the core idea of comfort and control: the centre provides entirely integrated care, meaning that patients and families can receive every aspect of treatment required in one facility; each patient room has large windows that provide unobstructed views of downtown Calgary and the Rocky Mountains; and the building is carefully engineered to reduce noise and vibration, providing a sensory experience that is proven to promote healing in patients (DIALOG 2022). Every patient room features electrically charged glazing, giving patients and families the ability to control the amount of light entering the space as well as the opacity



Calgary Cancer Centre patient room with charged glazing (DIALOG 2022)

level of the glass. This intervention reduces healthcare stay by 15-20% and provides numerous other environmental and sustainable benefits (Parkes 2022). In addition to the design intentions of sharing comfort and warmth, I also integrated the technology of charged glazing into my project, giving patients ultimate control over the lighting environment in their rooms.

Scales of Healthcare Architecture



Scales of healthcare architecture

Hospitals

At the outer ring, the largest form of healthcare architecture takes the shape of a hospital. In hospitals, there are many programs and types of treatment being administered, including but not limited to: birthing and delivery, surgery, cancer treatments, organ transplants, cardiovascular care, neurology, and palliative (end of life) care. A portion of their space is often designated to emergency care. Hospitals also have a very specific set of design criteria which

must be followed to adhere to medical standards of care. Some hospitals are exclusively pediatric, while others are general and have a section that is designated to children's healthcare. Patients can receive care in a hospital for short or long durations; some procedures and treatments are completed within hours, and other patients will stay in the hospital for weeks, months, or even years depending on their condition and timeline of care.

Clinics and Centres

The mid-scale portion of healthcare architecture is comprised of clinics and care centres. These are typically more focused in their programmatic scope and catered either to a particular age group or non-emergency health condition. Their specificity means they are generally smaller in size and scale than hospitals, though they often provide types of treatment that may not be as clinically advanced due to availability of equipment, resources, and space. Clinics and care centres tend to operate on a day-time schedule; overnight stays are typically directed to the hospital scale (CDPH 2019).

Home Care

The most precise scale of healthcare architecture is home care. This involves a medical professional or clinician coming into the home of the patient to provide the required treatment and care. These services can include family-centred care at home or in school, assessment of a child's needs, educating and supporting families as they learn to care for their child's medical condition, and consultations to clinics and/or hospitals (Alberta Health Services n.d.). Home care can be used independently of other care, or in conjunction with clinic or hospital care, and is a wonderful

tool for enabling families to perform necessary medical tasks to care for a sick child.

Missing the Middle of Pediatric Healthcare

From my research on typical healthcare architecture, I can see a gap between the scales of care. Ironically, the hospital is the only form of healthcare architecture that supports overnight stays and provides a full range of treatment. For a child, the hospital is also the most intimidating and least approachable of all the forms of health care. In the current pediatric healthcare system, if a child needs long-term care or has an extensive recovery time, they are faced with a lengthy hospital stay; this also means being uprooted from their day-to-day life, experiencing disruption in their social relationships, and being unable to share daily activities with their family. I have identified this as the “missing middle” of pediatric healthcare, and I believe it highlights an opportunity for an architectural exploration.

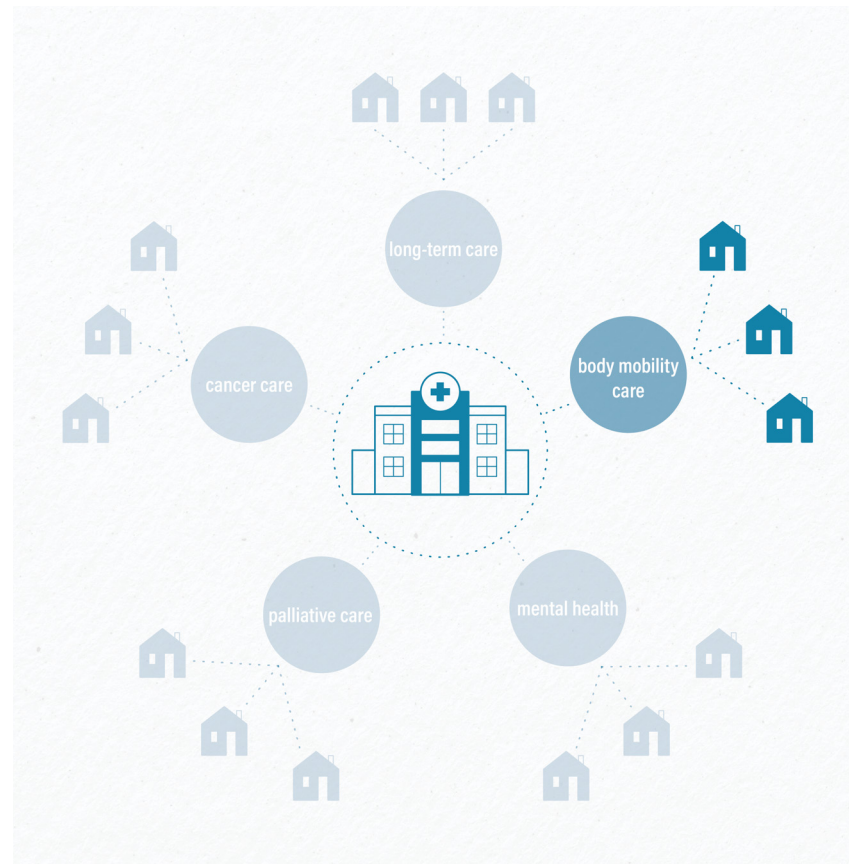
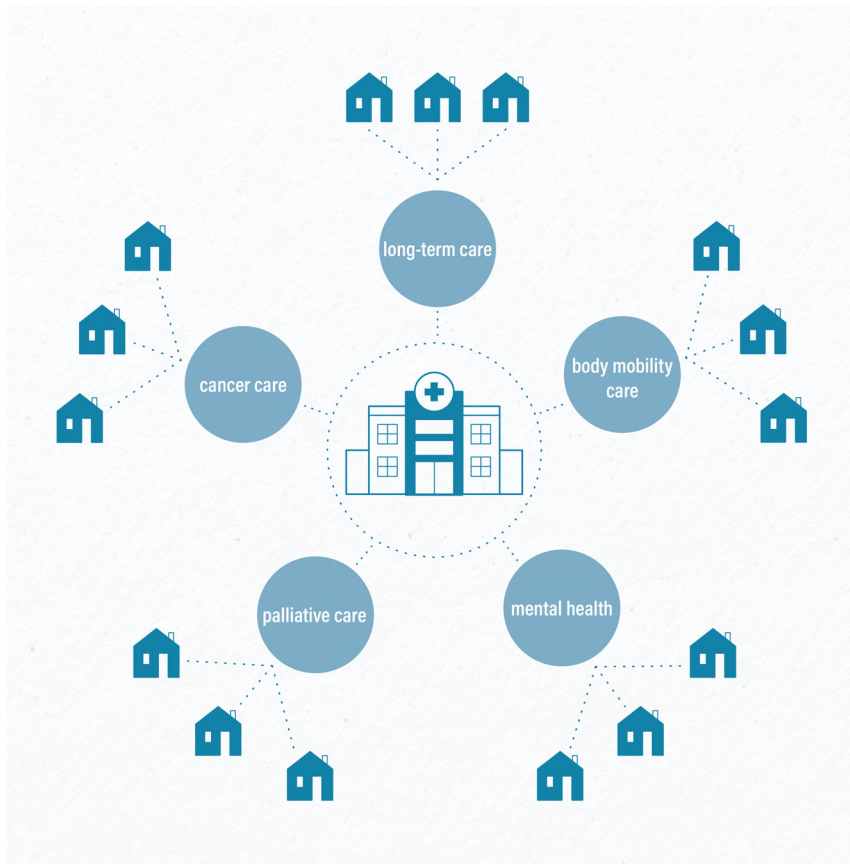
I envision the solution to the “missing middle” as a web: a set of mid-scale overnight care centres for patients and their families which branch off from a central hospital and are



The “Missing Middle” of healthcare architecture

specifically designed to address a certain aspect of health while filling the gap between hospital care and home care. For example, individual transitional centres could each specialise in caring for patients with cancer, palliative care, mental health, long-term care, and body mobility care with a corresponding architectural scale that feels inviting and approachable on a recurring, ongoing basis.

My thesis project focuses on conditions and diseases related to body mobility and body image. Through architectural expression, I explore how the design of a facility of 18 bedroom suites can support the need for treatments while being a healing device in its own right. In the case of body image and body mobility conditions, water therapy and horticultural therapy are presented as excellent tools for treatment, and are supported by the collage approach to design. By being specific in the scope and type of care offered in this facility, it enables me to address the particular needs of these patients. In other words, by focusing on certain health issues related to the body, I could be more expansive in my architectural design.



The “Missing Middle” web explores other potential programs for transitional care; in this case, the targeted program is body mobility care

Chapter 5: Children Will Be Children

Designing for Children

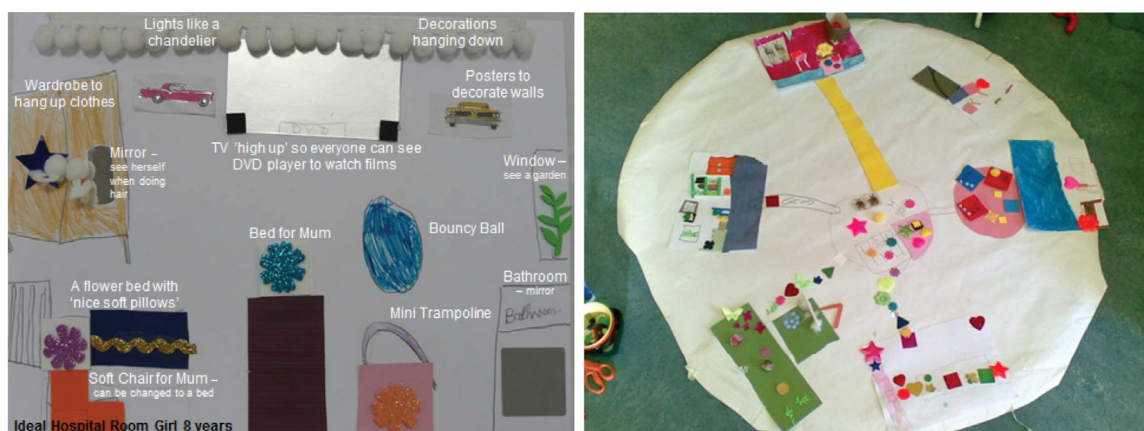
It is an architectural paradox that spaces intended for children must be designed by adults, meaning that the voices and opinions of those using the space are often overlooked or misinterpreted by adult proxies (Lambert et al. 2013, 57). An article published in the *Journal of Child Health Care* studied young children's perspectives on the design of hospitals through conversations pertaining to physical environments, access, and personal space, and followed with an analysis of their opinions on what mattered most in the space (Lambert et al. 2013, 57). Some narrations from the children during the conversations include:

The doctor said only little kids are allowed to sleep on the big bed, but my daddy and mommy have to sleep on the floor on a mattress . . . I won't stay on my own . . . just stay with my mommy and daddy, not on my own (5-year-old boy).

A picture [on the wall] of my family . . . maybe I should draw it . . . maybe I'll just make a picture of me and my sister (5-year-old girl).

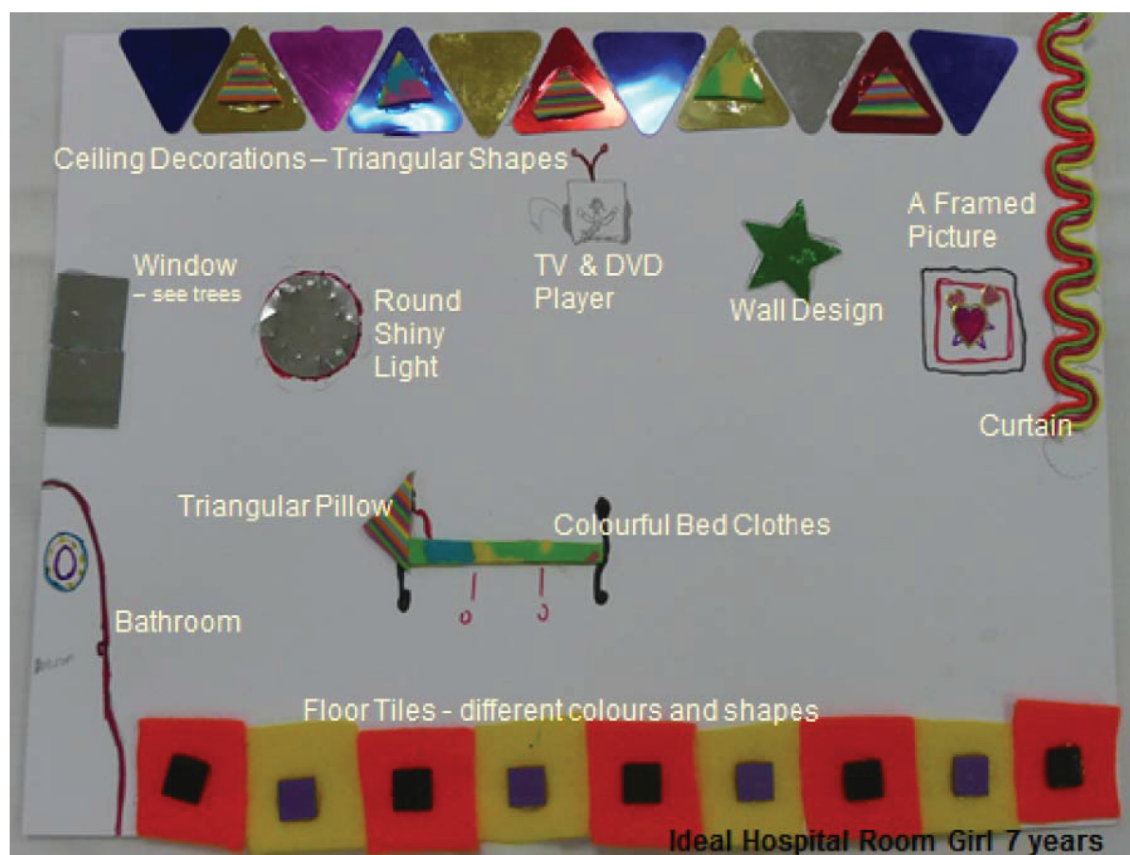
If you put it [box for paint / crayons] up there [top shelf], then how can you reach it? (5-year-old girl). (Lambert et al. 2013, 61)

The study also afforded children the opportunity to draw or create a collage depicting their ideal hospital configuration and room design. These drawings and collages tell us what is important to them: all three illustrations feature areas of play and technology, and the two room layouts indicate individualised elements of the space, such as colourful bedding and wall decorations, specific types of lighting, and windows that provide a connection with nature. Other aspects of the drawings include mirrors, a place for



Left: collage depicting ideal hospital room, designed by 8-year-old girl and labelled by the study coordinator working with the child (Burns-Nader, Scofield, and Jones 2019, 66)

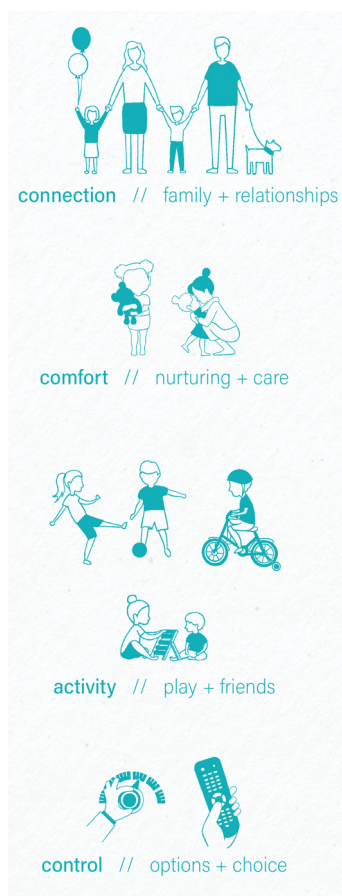
Right: hospital plan designed by children age 5-7 (Burns-Nader, Scofield, and Jones 2019, 65)



Collage depicting ideal hospital room, designed by 7-year-old girl and labelled by the study coordinator working with the child (Burns-Nader, Scofield, and Jones 2019, 64)

parents to sleep, soft pillows, and storage for clothing and art supplies. The study shows the significance of creative use of space, inclusion of nature, privacy, control over noise and lighting, and designated family areas. All of these would help contribute to the mitigation of stress generated by the “separation from friends and family; exposure to multiple and often painful interventions; encounters of the unknown; and contact with unfamiliar environmental contexts and senses” (Lambert et al. 2013, 58).

Based on research in both pediatrics and child psychology, I identified four prevalent childhood needs: connection, pertaining to family and relationships; comfort, pertaining to nurturing and care; activity, pertaining to play and friends; and control, pertaining to options and accessibility. Typical hospital environments often put stress on each of these areas, and sometimes do so simultaneously, which can be detrimental to mental and social development at various ages.



Four prevalent childhood needs: connection, comfort, activity, and control

To properly provide care for children, the spaces must also be designed to accommodate adults, calling into question the ways that design can adapt to suit the needs of various age groups. From a social perspective, the needs of children and adults are quite similar; they both require spaces that provide a range of privacy and levels of interaction, allowing them to have moments of solitude in one place and moments of socialization in another. A possible design solution for this could be a spectrum of spaces collaged into one project, providing a series of private rooms, small social nooks, and larger gathering spaces such as pools and dining halls. Physically, the most obvious difference between children and adults is height, though it is often overlooked. Interventions as simple as a multi-height countertop at nursing desks and



EKH Children's Hospital: washroom design for different heights (Wongwan 2020)



Child plays in cardboard box transformed into a fort (Lou 2018)



Young girls play first aid with their dolls in London (Speller 1940)



Boys play by fire hydrant in New York (Bettmann 1937)

varied sink heights in washrooms can address the needs of both groups while also helping children to feel a sense of belonging in the space. The types of activities that children enjoy are generally different from those of adults, and children tend to have more active imaginations that take them on journeys of play and make-believe. The difference in perception is particularly clear through a study on the role of shape and specificity in children's play and object substitution. While participating in play, children often swap out objects for imaginary items, such as a stick for a sword, or a box for a car or house. The study found that children tend to prefer objects or toys that are more ambiguous in their identity, because that leaves room for interpretation and choice in their imaginative play (Burns-Nader, Scofield, and Jones 2019). The lack of limitation and element of choice are enticing and inspire creativity in many contexts.

The Importance of Play

Play, in the most general sense of the word, describes an activity that is enjoyable, spontaneous, and undertaken for its own sake (Roe and McCay 2021, 136). There is now a wealth of research and data to support the claim that play is essential to children's mental and social health. Play can take a variety of forms, including physical (running, tag, hide and seek, etc.), expressive (creating music, drawings, etc.) and games (those involving rules and strategies) (Whitebread 2018, 239). Each of these forms equally supports the development of key areas in the brain. Less structured time and scenarios provide the opportunity for children to "focus on 'means' rather than 'ends', to try out new behaviours, exaggerate, modify, abbreviate, or change the sequence of behaviours, endlessly repeat slight variations of behaviours, and so on, thus developing improved strategies for tackling

particular tasks and enhance their cognitive and behaviour control” (Whitebread 2018, 240). This directly supports the process of healing in children of all ages because it increases the ability and capacity of the individual to cope with challenges, come up with solutions to problems, and develop skills to navigate painful or uncomfortable situations. In my project, the transitional care centre is specifically designed for the treatment and rehabilitation of patients with body mobility or body image related conditions, which can be debilitating from both a mental and physical perspective. Taking advantage of the natural healing processes offered through play, the pediatric care centre affords children the opportunity to connect with peers in the therapeutic pool and lazy river, explore and interact with the natural landscape in the form of gardens and wooded paths, and the partake in creative activities that involve the greater community of patients and their families, such as communal gardening and cooking.



Children play in water sprinkler: Harlem, New York (Webb 1946)

Designing for the Support System

Given that children are dependents, it is critical to consider those whom they depend on when designing pediatric care spaces. The levels of dependency and strength of relationships differ with each individual based on a variety of factors, including age, maturity, and personal situations, but the fact remains that the health and healing of pediatric patients is greatly improved by the presence of a support system in one form or another. Throughout the design process, I constantly placed myself in different roles and scenarios to engage my imagination and address a wide

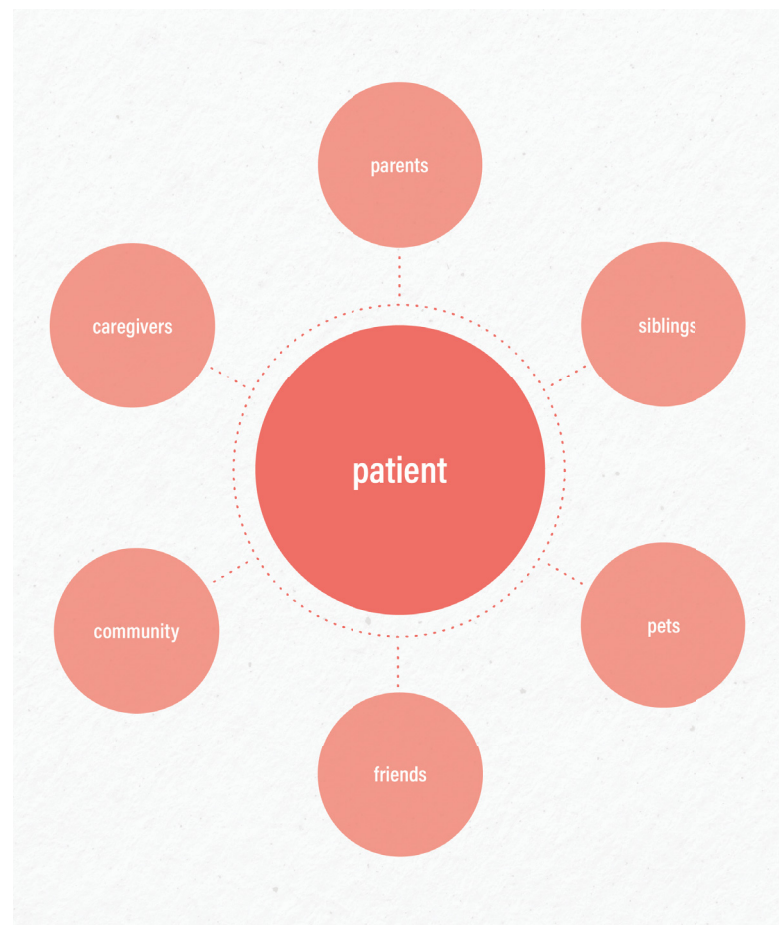


Diagram of pediatric patient support system network

range of perspectives, such as those of parents, siblings, friends, caregivers, the community, and animals.

Parents

The stress of having a sick child can be a heavy burden to carry. Parents fill many roles during this, including caring for their child, organising their lives around medical schedules, and potentially taking care of other children. Since this often means sacrificing their own needs on a daily basis, my project offers designated areas in each patient room for parents to comfortably stay within sight and earshot of their child, and provides the option for other children to stay as well. The project aims to provide an element of choice at every opportunity; for patients and families experiencing difficult health conditions, it can often feel like everything is decided for them and they have lost the ability to act independently. Introducing aspects of design that are flexible and accessible puts some of that control back in the hands of those experiencing the space. This also gives a space for parents to be supported and guided by health care professionals as they learn continued care practices and routines.

Siblings

There can be an element of fear and confusion for siblings of patients in healthcare environments; the desire to be near them can be at odds with the discomfort felt while in typical hospital spaces, and there can also be a layer of emotional guilt that they are able to carry on their lives normally while their sibling cannot. The project offers activities that are comfortable and engaging for all people, regardless of ability level or health condition. It is important to offer spaces for siblings of patients, regardless of age, to stay overnight and

spend time together as a family. This also removes stress felt by parents relating to arranging childcare for young siblings, and helps siblings feel included and valued as an integral part of the healing process.

Friends

Similar to siblings, friends often want to spend time with patient, but are not sure how to do so while also protecting their own emotional needs. Having the option to participate in a common activity, such as swimming in a therapeutic pool, can serve as a middle ground for patients to interact with their friends in a way that feels natural and enjoyable.

Caregivers

The medical caregivers that work with pediatric patients often become an integral part of their support system. These may include nurses, doctors, physical therapists, acupuncturists, etc. A specific portion of my project is designated to facilitate the care and comfort of these critical staff members, providing sleeping areas, lounge spaces, and washrooms to those providing medical and therapeutic care. This in turn increases the quality of care that practitioners are able to provide, which contributes to the healing process and wellbeing of the patient.

The Community

The community can be addressed as a singular entity, or as individual members. In either case, the aspect of community can add a layer of normalcy to life within a pediatric care centre, highlighting the transitional nature of the space and reducing feelings of isolation and solitude. By bringing community members into the building through the public porosity of the landscape and programs such as cafes and

dining areas, the project becomes integrated in its context in both a physical and social sense.

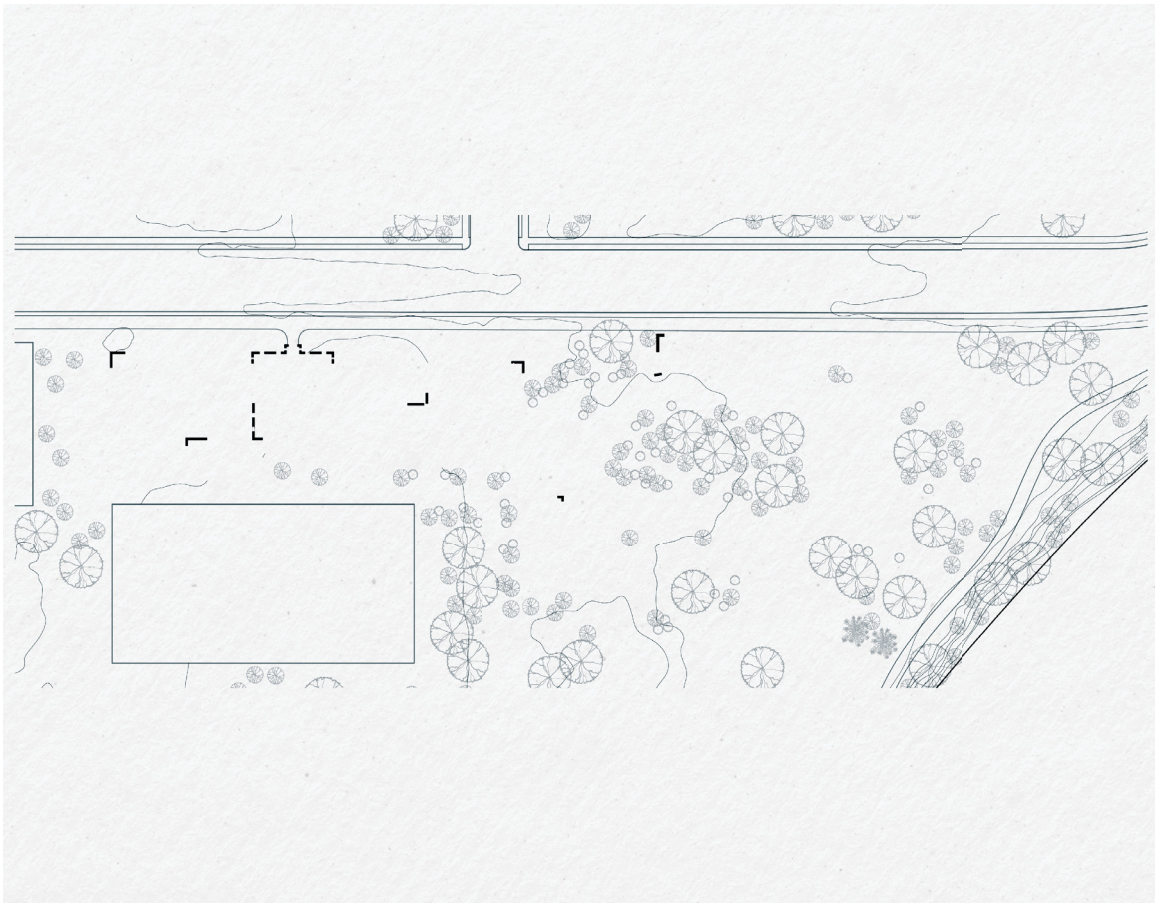
Animals

While human support plays the predominant role, the inclusion of pets and animal therapy can also be immensely helpful. This manifests in my project through the permittance of family pets in certain patient rooms, designated animal therapy spaces within the building, and the integration of therapy dog training in the adjacent landscape.

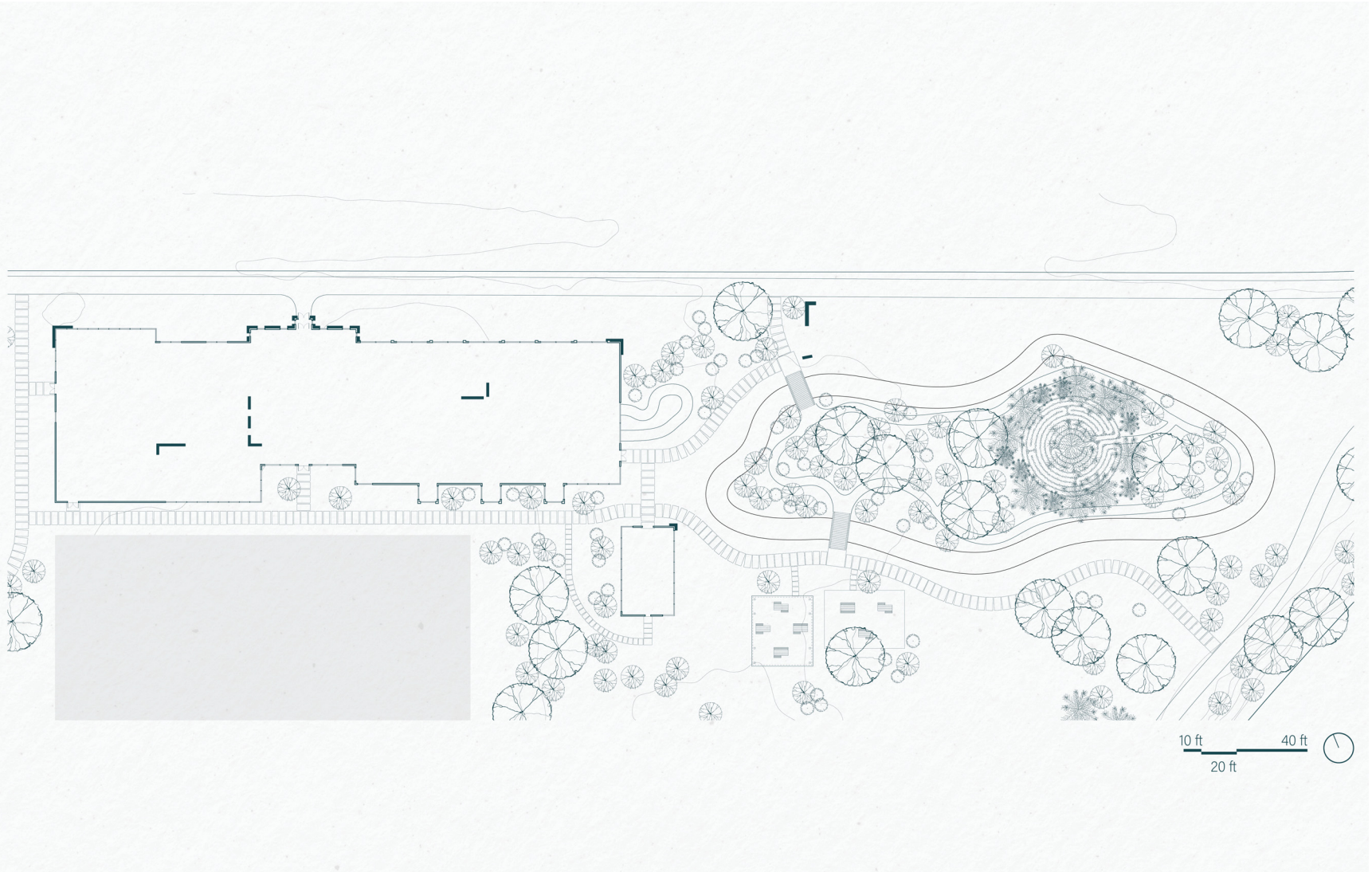
Chapter 6: Broad Scale Design

Rearranging the Ruins

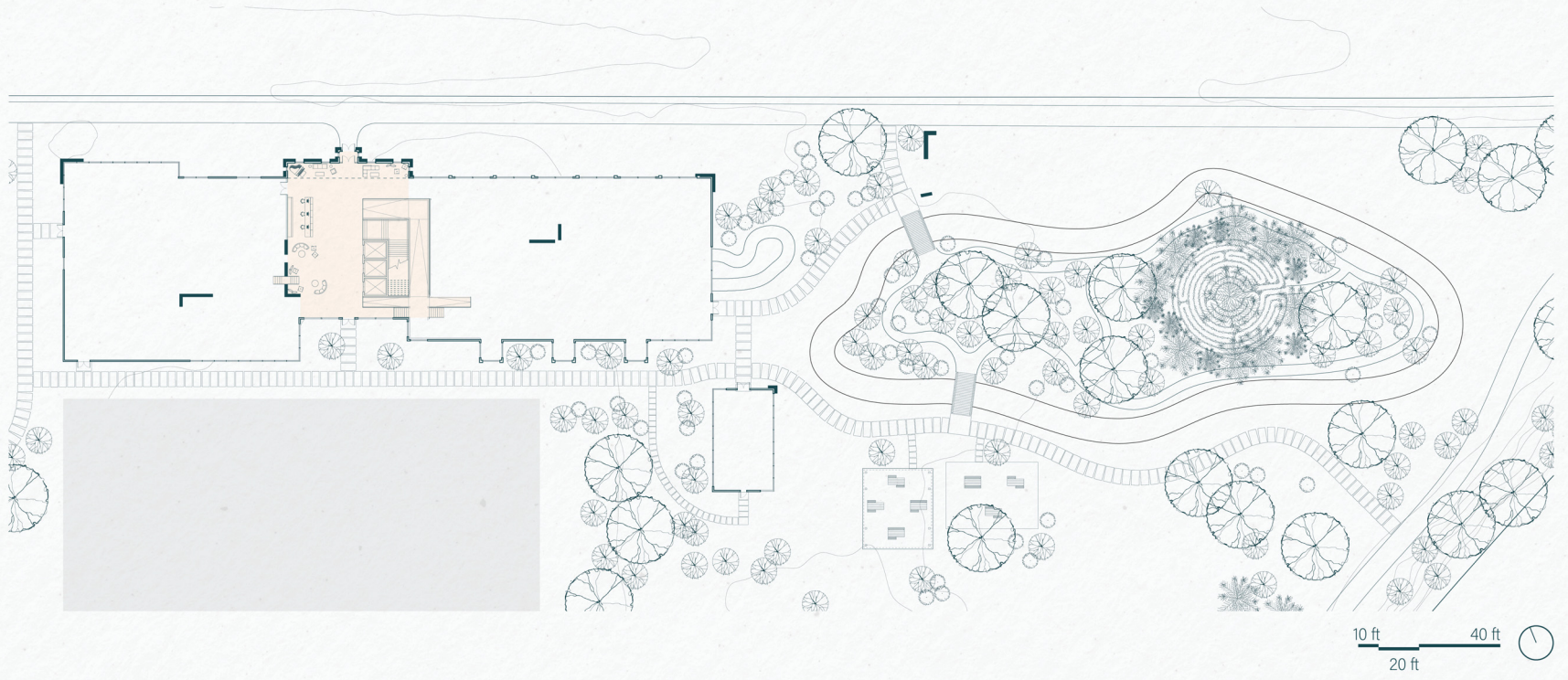
The design of the Transitional Pediatric Care Centre is largely informed by the rearrangement of the Rundle Ruins. The ruins are specifically arranged throughout the ground floor and landscape of the project, which features an entrance hall, therapeutic water features that draw on the energetic connection to the Elbow River, and various horticultural therapies. Portions of the original Rundle Hospital form the main entrance and corners of the building, define interior spaces, and serve as accent pieces in the pool, while others are distributed throughout the adjacent landscape.



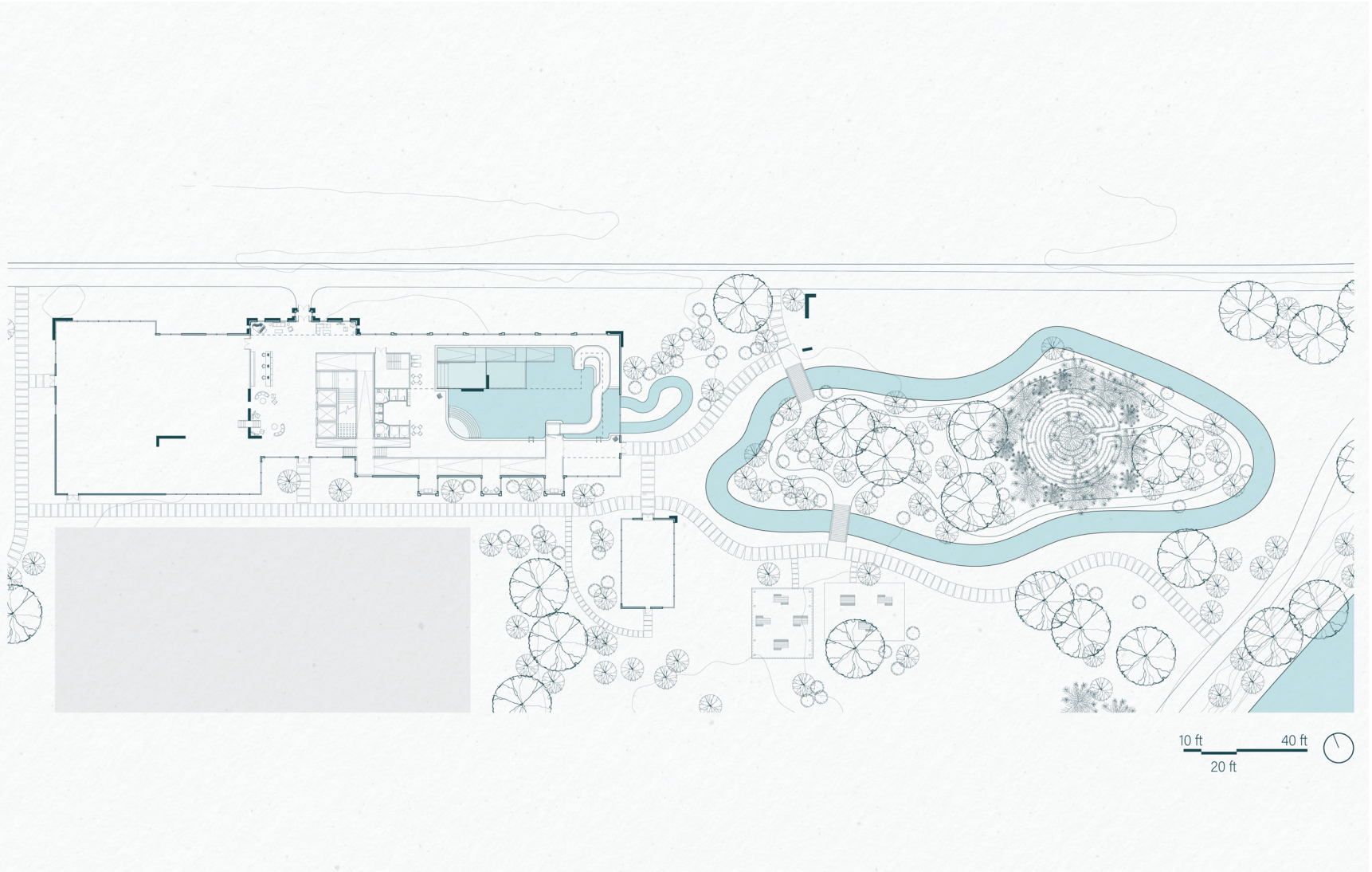
Ruins rearranged on the site to form components of the Transitional Pediatric Care Centre



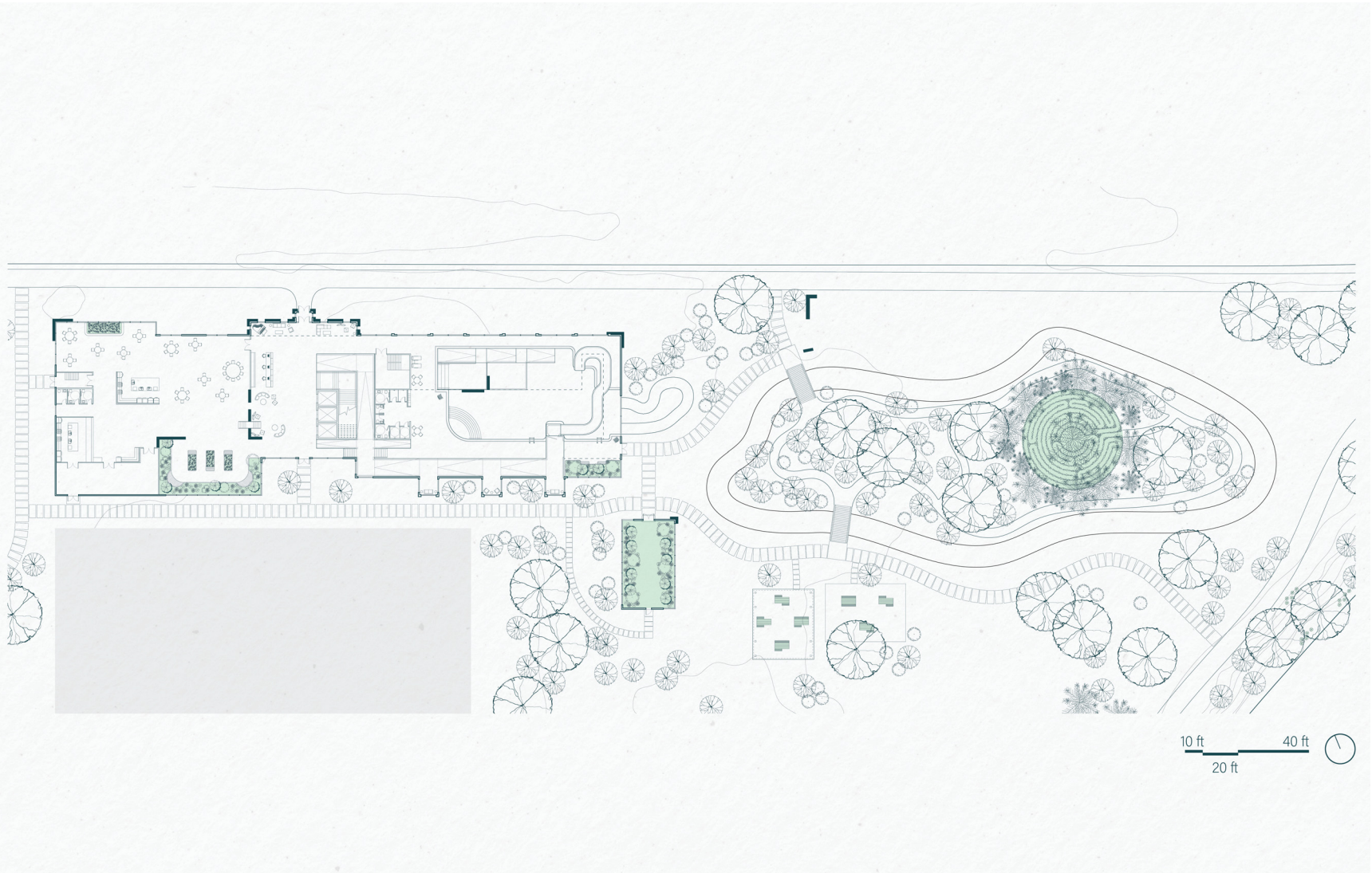
Rundle Ruins in the design: forming exterior walls



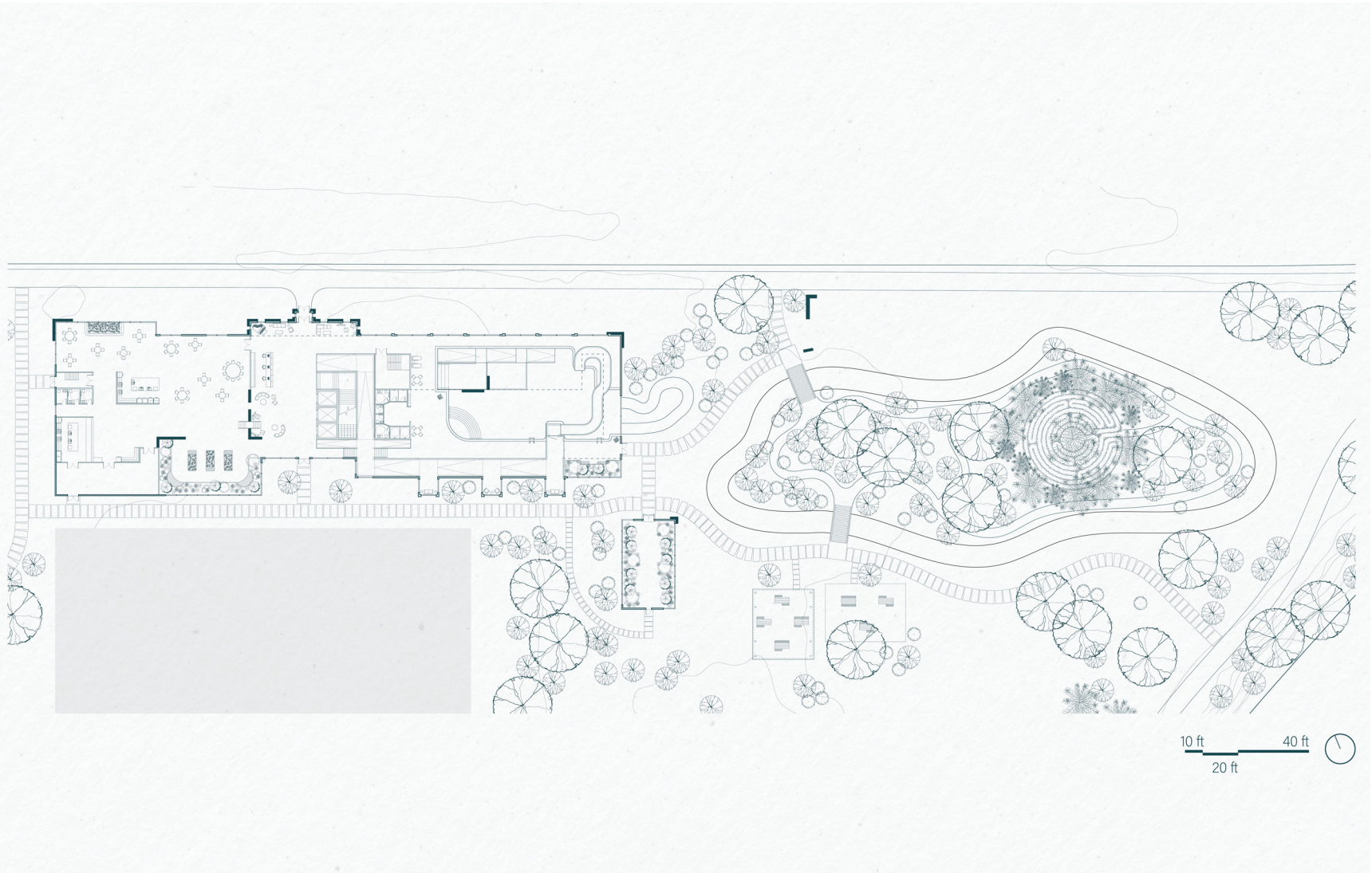
Rundle Ruins in the design: entrance hall highlighted



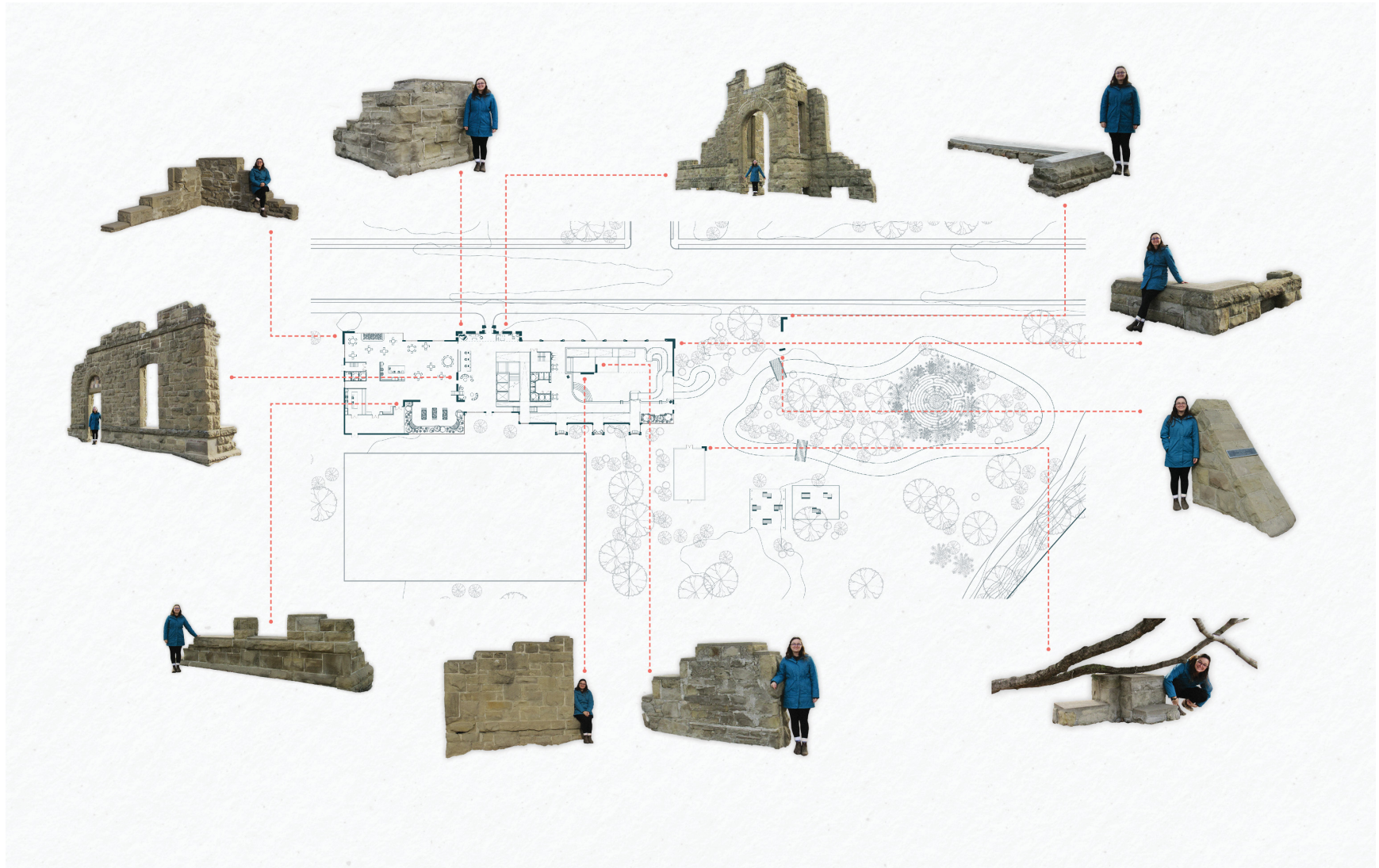
Rundle Ruins in the design: entrance water therapies highlighted



Rundle Ruins in the design: entrance horticultural therapies highlighted



The ruins of the old hospital become the accents of the plan, linking the building to the landscape and the past to the future.

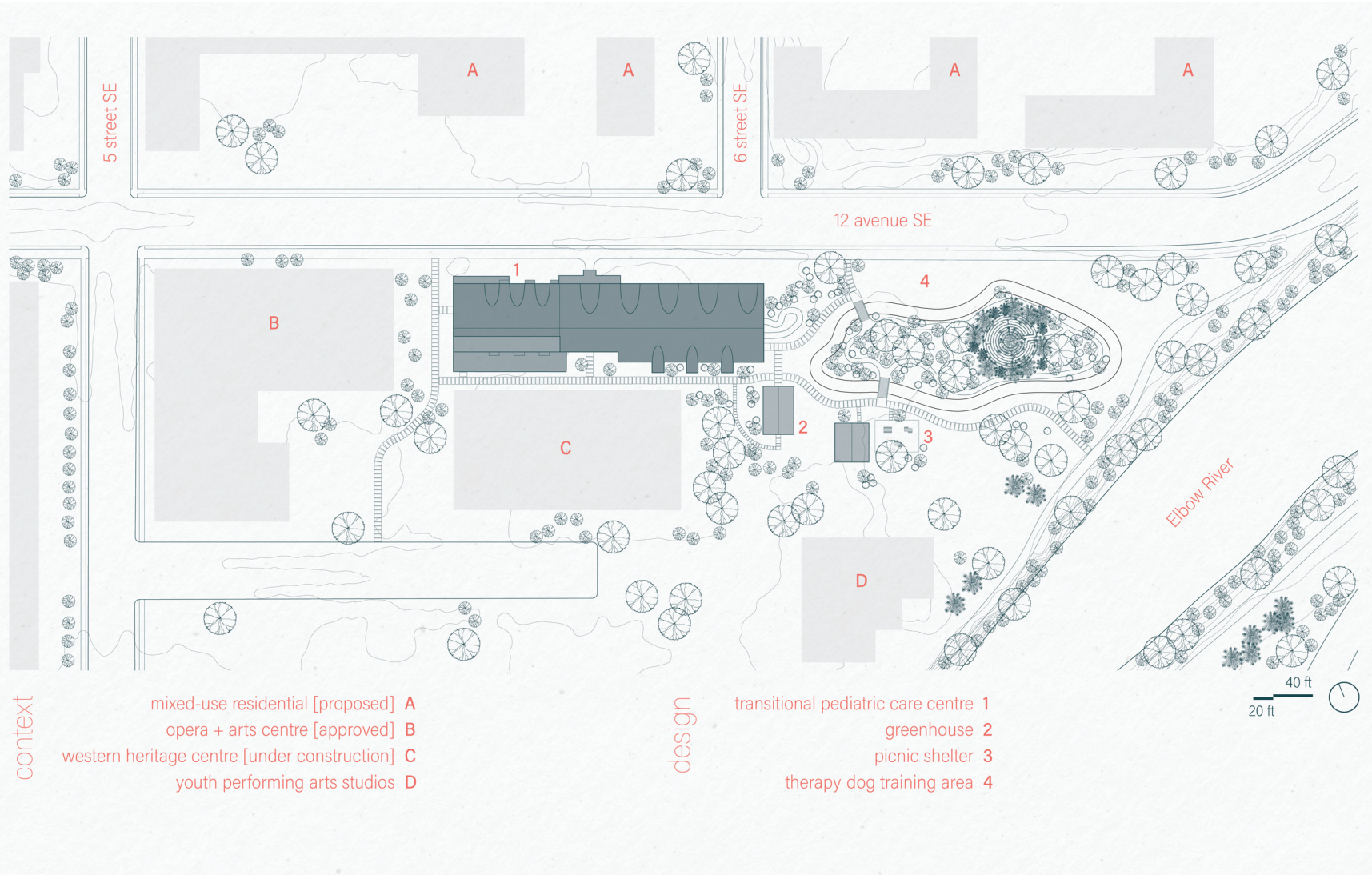


Rundle Ruins in their new locations in the project

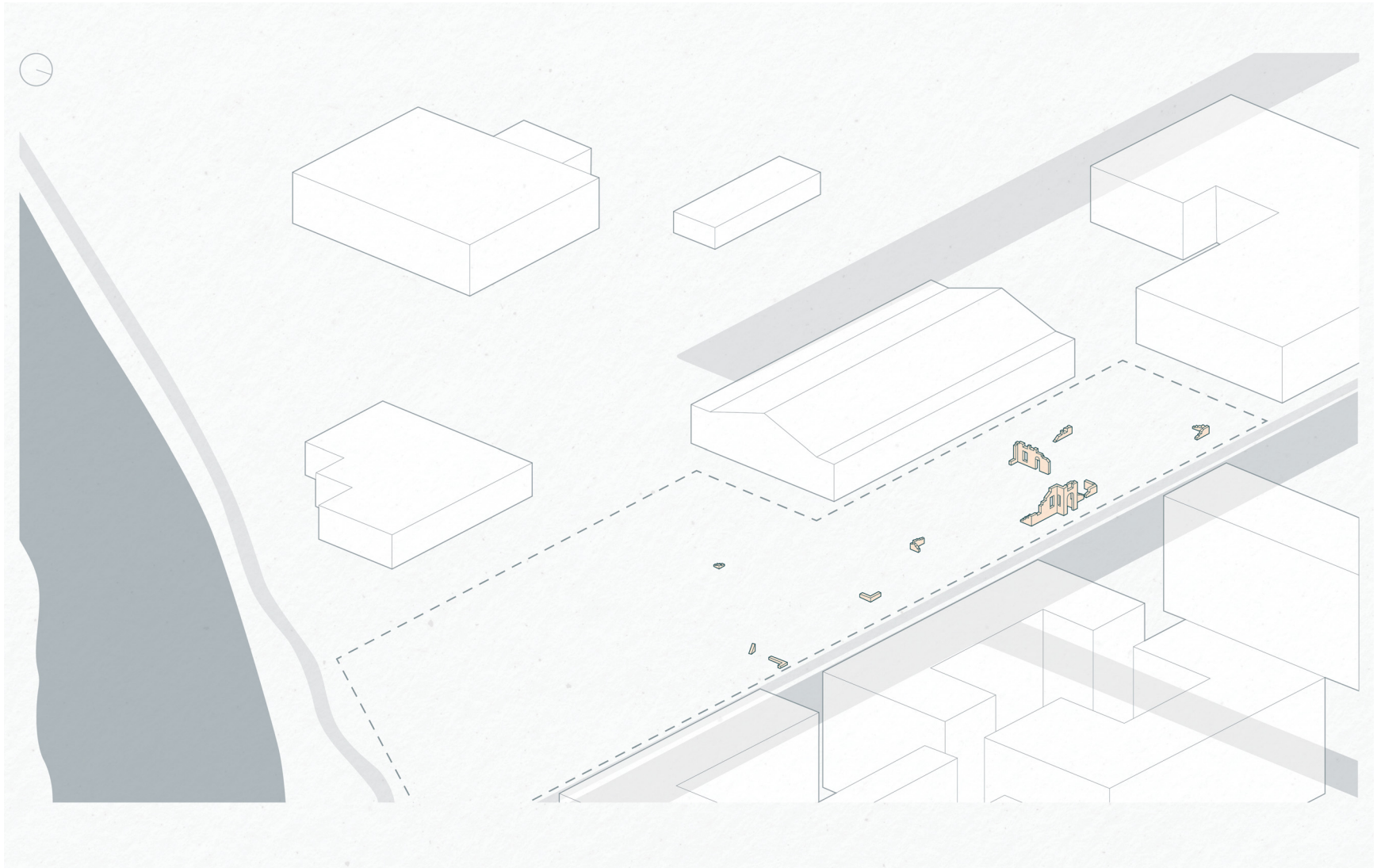
Design Process

There were several key design intentions that guided my process. Respecting and responding to the immediate urban context was the first consideration. It was important to consider the scale and size of the project in relation to the surrounding buildings, both existing and proposed. The landscape design flows into the established multi-use pathway and the Elbow River, acting as a bridge between the public spaces of the community and the more private spaces of the proposed design.

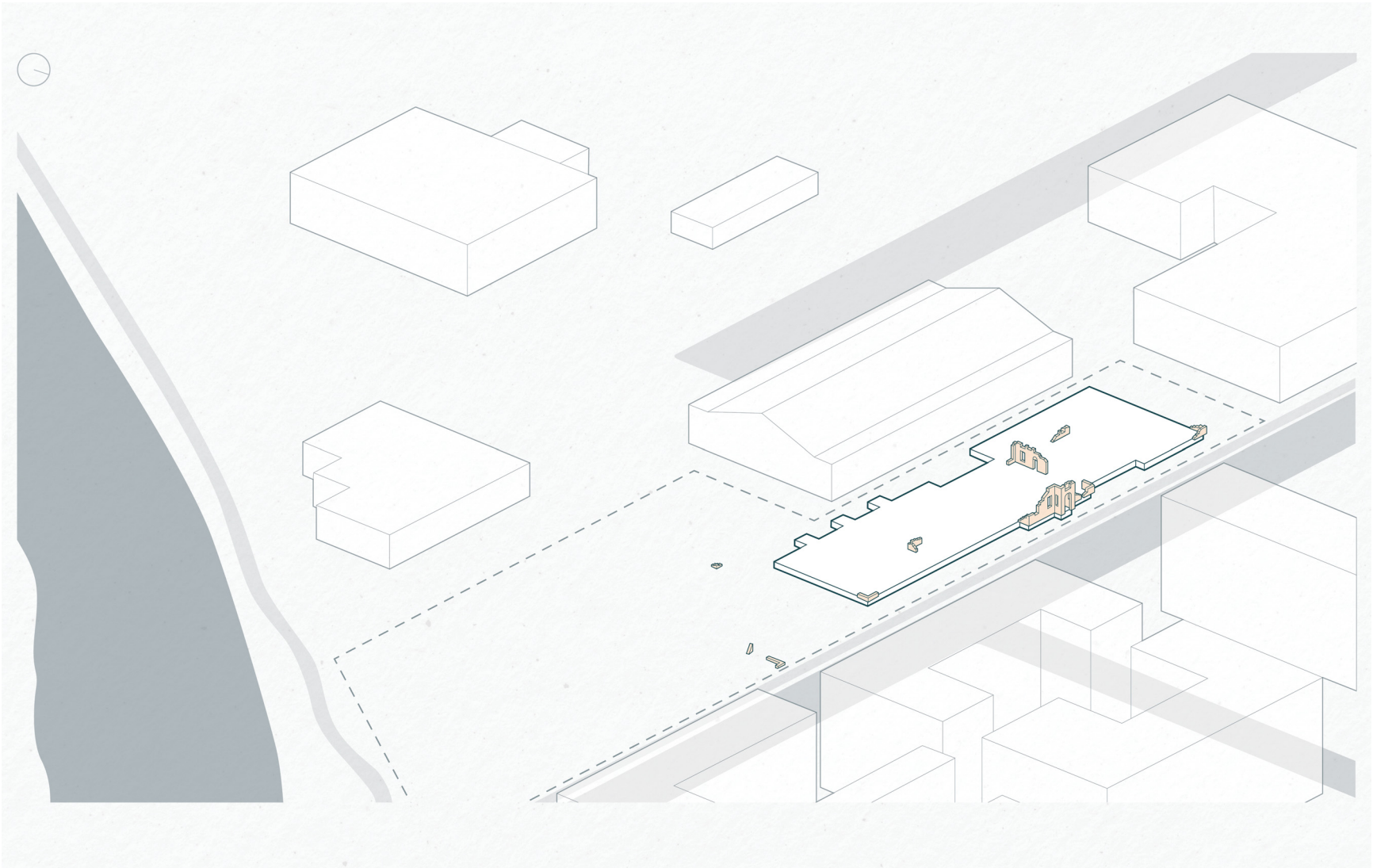
The project design was explored through a collage strategy in a series of stages to integrate the project with existing site history and connect it to the natural landscape. First, the site boundaries were established, and the Rundle Ruins were positioned in their new locations, which were determined in conjunction with the design of the first level floor plate. The upper level floor plates could then be laid out. Scale and size informed the capacity of the building and the viability of its programs, which support the sensory-based treatment and rehabilitation of children with body movement and body image related conditions. These programs include patient family overnight rooms, communal and community spaces, physical therapy, water-based therapy, and horticultural therapy, some of which extend into the adjacent landscape. When considering ways to navigate between programs and spaces, I adopted a strategy of thinking through the eyes of a child to help me imagine creative solutions for vertical circulation that offer playfulness, accessibility, and the element of choice. The roof and articulation of exterior walls were then considered and combined to form the final project.



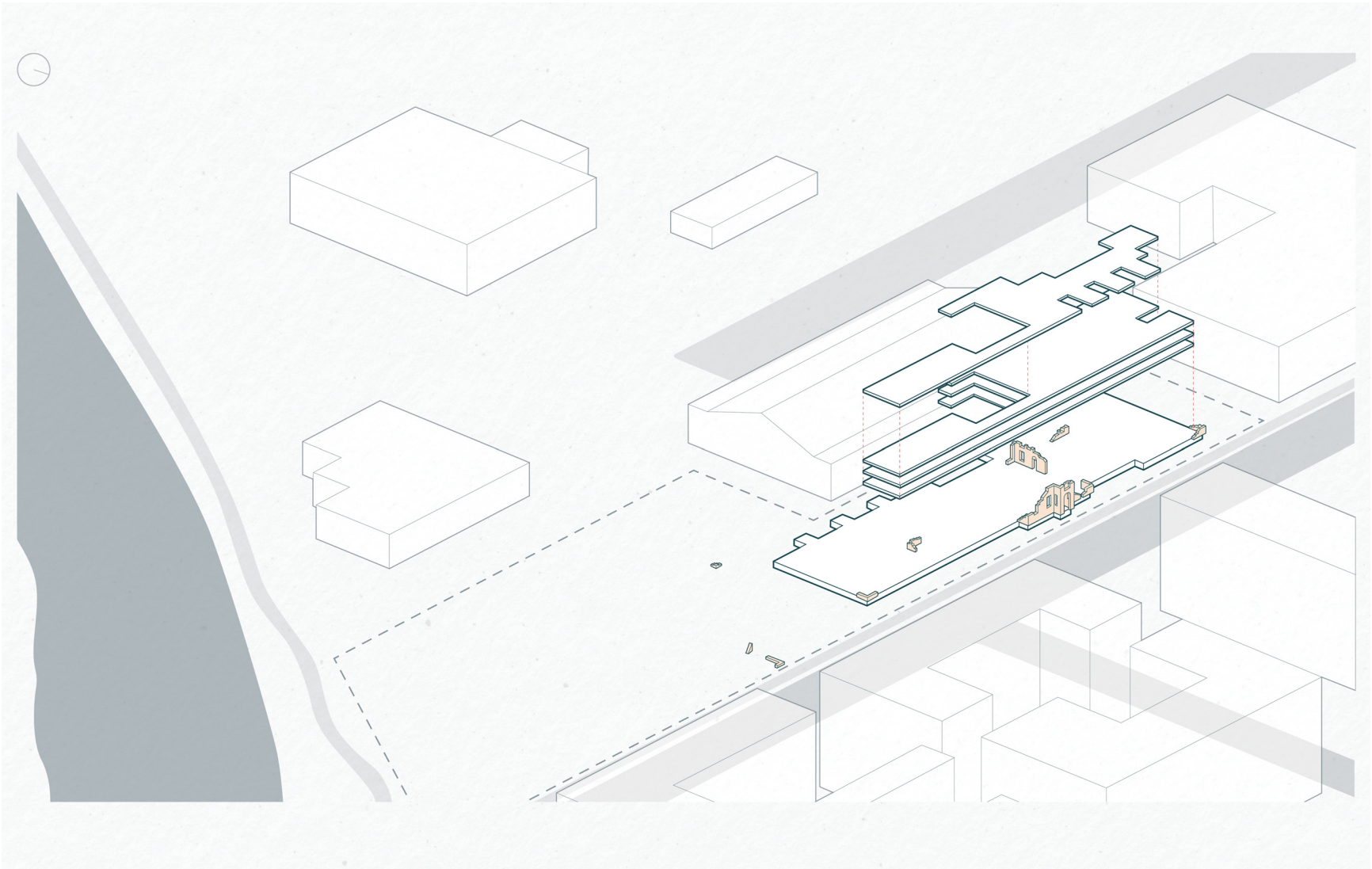
Rooftop plan view of the Transitional Care Centre and immediate urban context



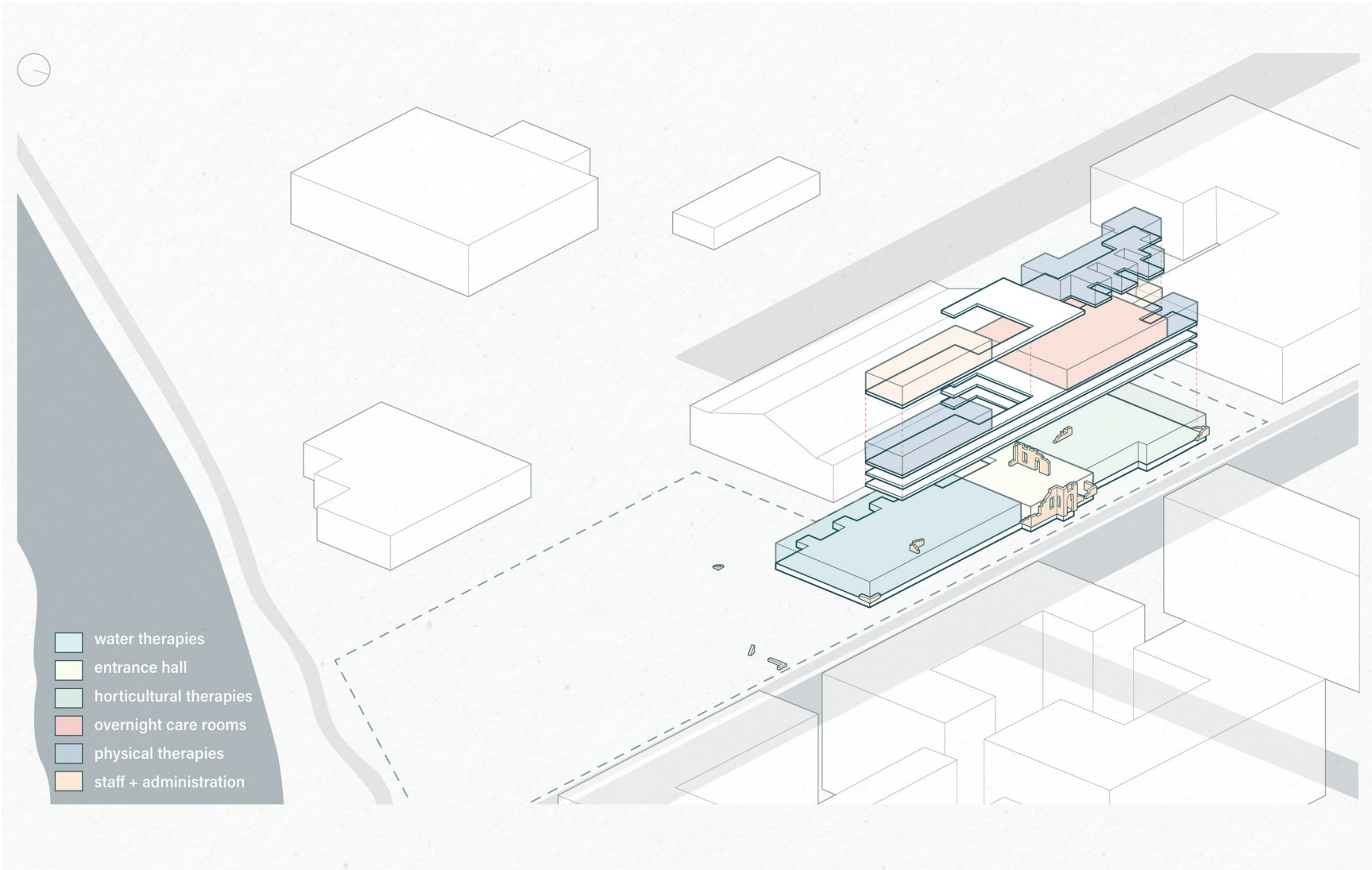
Design stage 01: defining the site and positioning the ruins



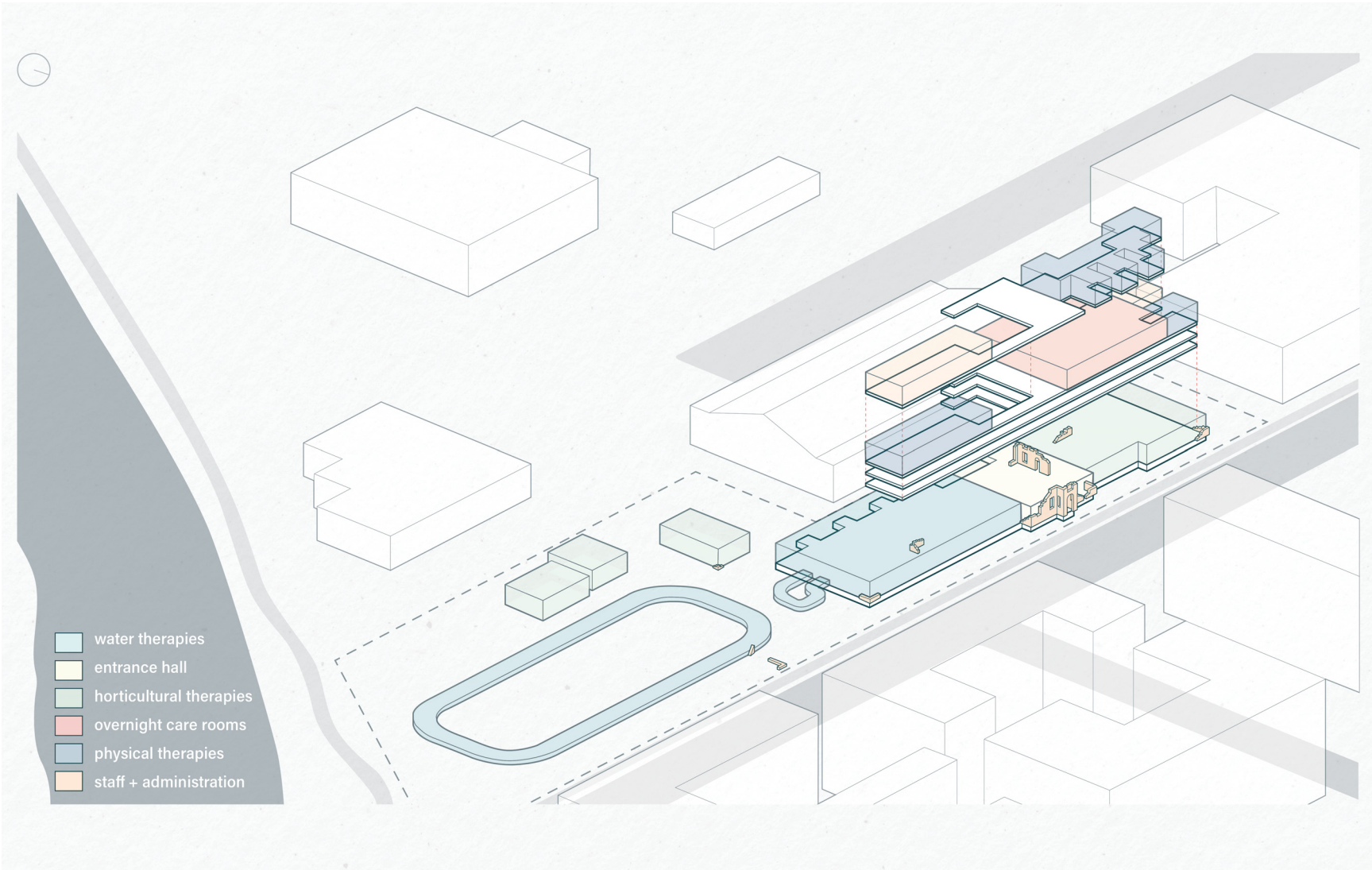
Design stage 02: main level floor plate



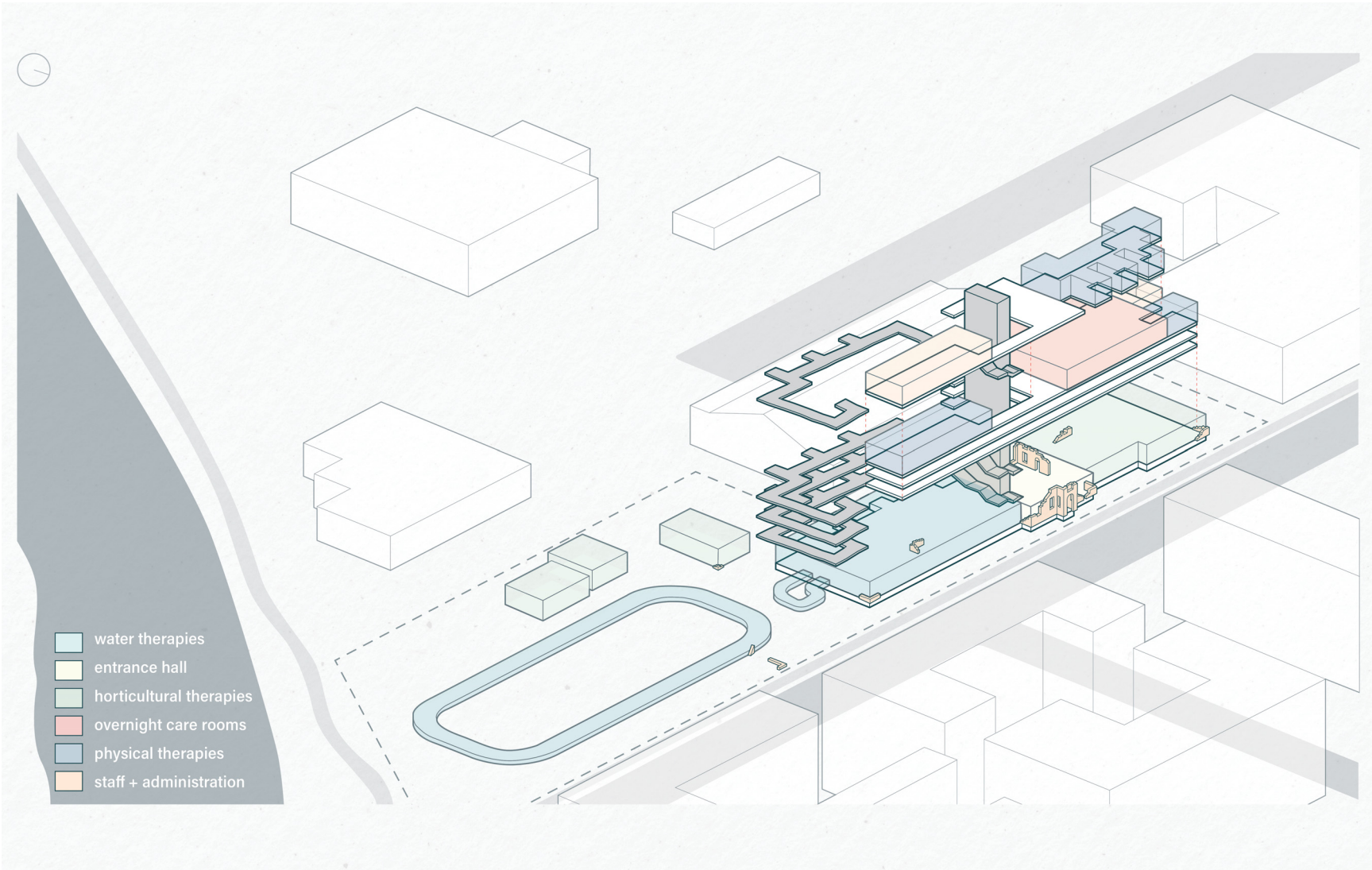
Design stage 03: upper level floors



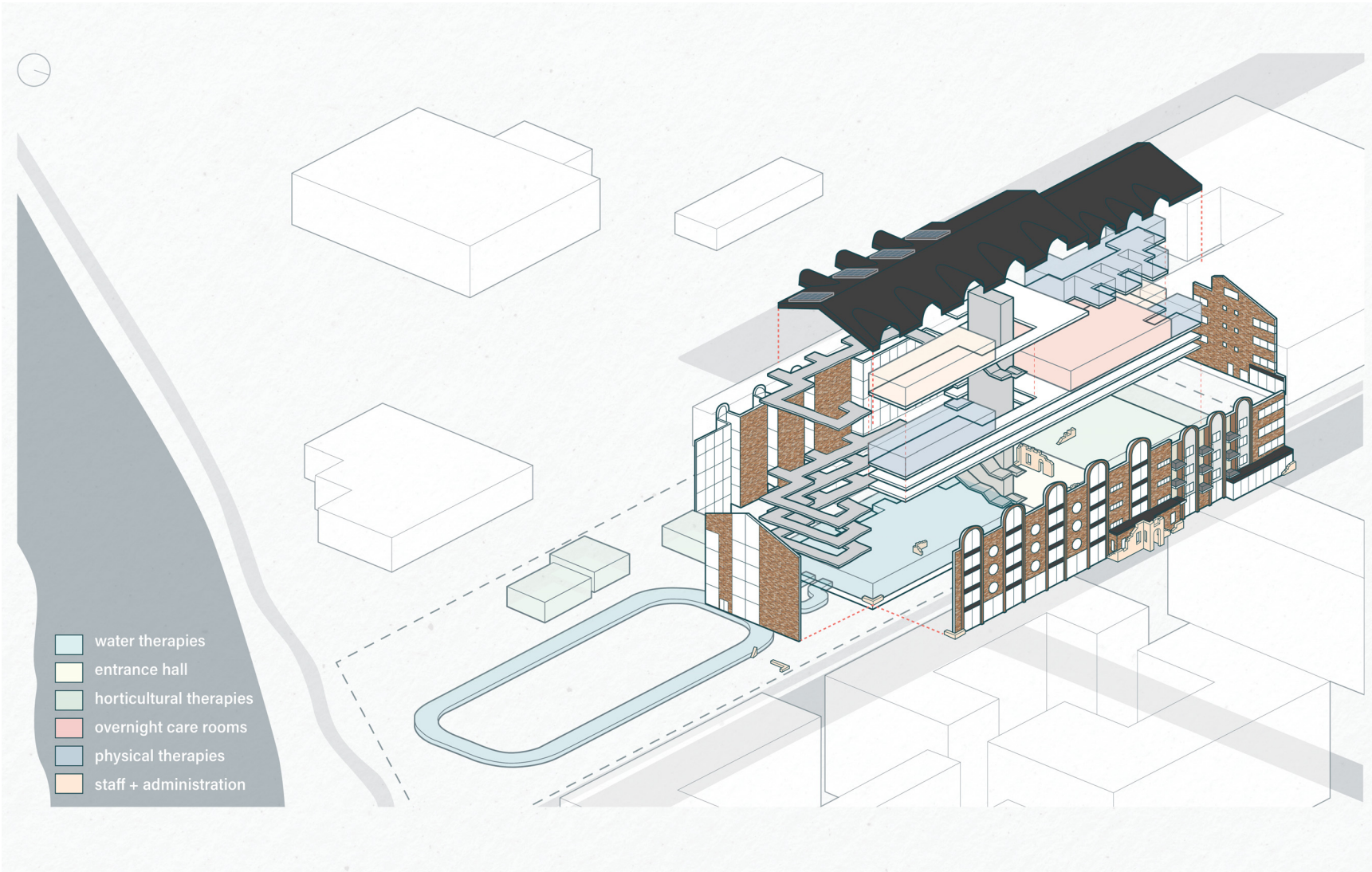
Design stage 04: programming of interior spaces



Design stage 05: programming of exterior spaces



Design stage 06: integration of vertical circulation between programs



Design stage 07: articulation and expression of roof and exterior walls



Design stage 08: compilation of all stages and exploration of landscape design

Form and Articulation

I referenced the original Rundle Hospital as a source of inspiration for façade and articulation. Glass, brick, and wood compliment the existing sandstone material of the ruins and give a historical edge to the modern design. The roof form showcases a similar roof pitch and represents a different interpretation of the classic dormer seen in the original design. The rounded dormers tie together the iconic archway of the entrance ruin with the upper levels of the building, providing thematic and material similarities to the Rundle Hospital.

Glazing is an important component of the façade. In many areas of the main level, floor to ceiling windows allow maximum visual permeability and natural light to enter the space. There are curved windows to match the arched dormer forms on the top level, and there are also round windows which appear in the private therapy rooms and introduce an extra element of visual interest on the exterior.



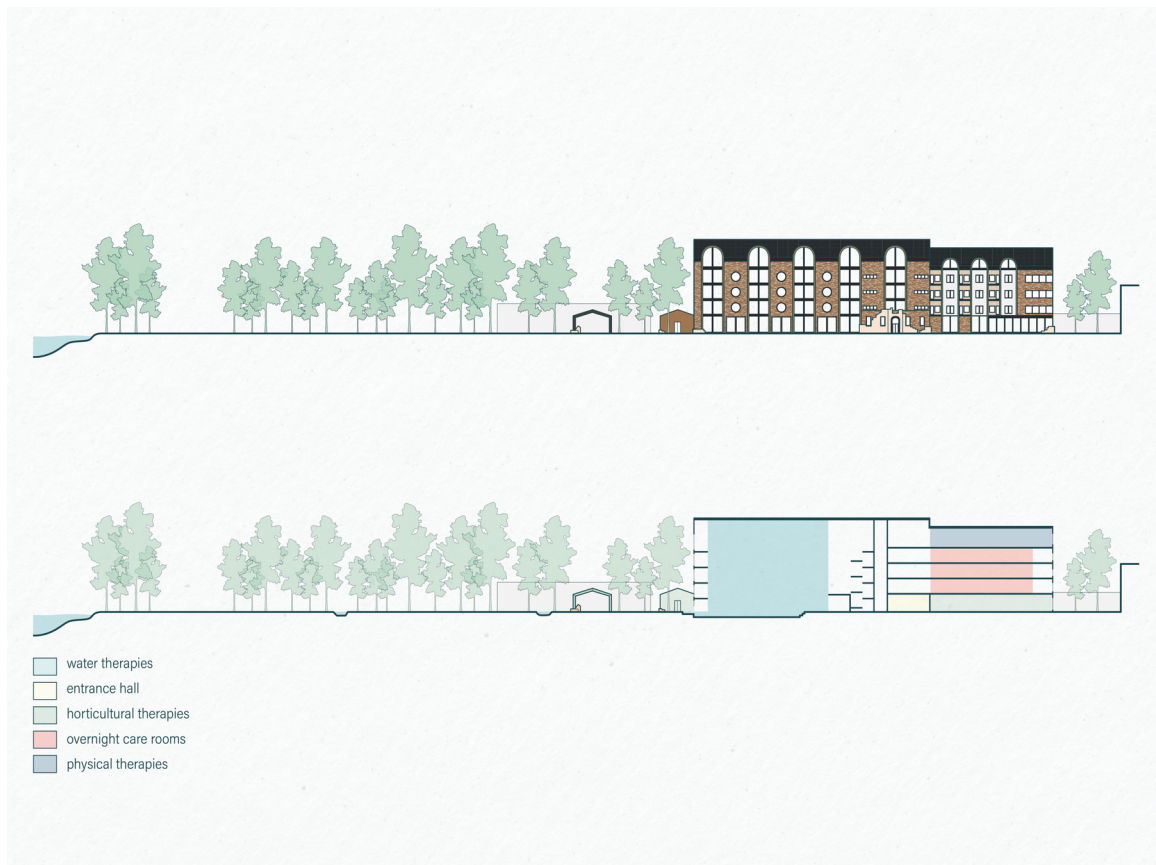
Roof form and dormers in the original Rundle Hospital (Calgary Stampede Foundation, n.d.b)



Roof form and dormers in the proposed thesis design

Journey Through the Building

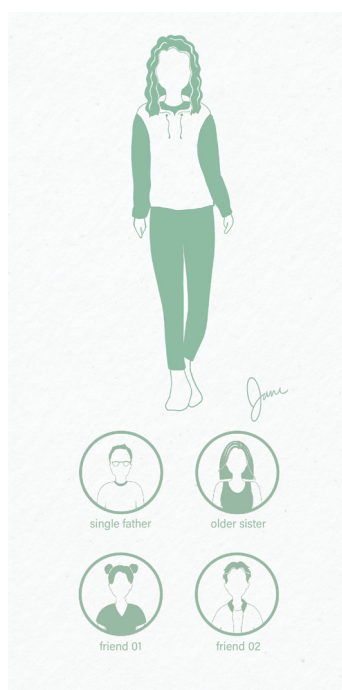
The combination of all these elements creates a project that embodies the essence of holistic healing by providing space for patients to exist as whole people, experiencing a range of programs designed to activate and appeal to each of the senses. The experience of the project can best be explained through the exploration of five key areas: the entrance hall, the overnight patient and family care rooms, areas of physical therapy, areas of horticultural therapy, and areas of water therapy. These programs and areas culminate in a building and landscape that are designed cohesively to provide a sensory-rich experience that is not restricted by the walls of the building.



Front building elevation (looking south from 12 Avenue SE) and full building section highlighting key programmatic areas

Chapter 7: Meet the Characters

To help illustrate the specific uses and potential of the project, I have identified three patient characters. While they are completely fictional, they are meant to depict three examples of children and youth with varying health conditions and analyse how each would benefit from this care centre in similar and different ways. In keeping with the design values and research, I have also given each patient character a support network: a set of sub-characters that appear during their time in the care centre and aid in the healing process. It is also important to note that each character is given qualities that relate to their personal interests, aligning with the holistic approach that patients are treated as whole people, rather than being identified by their health condition alone. Jane, Freddie and Julio appear throughout the following chapters in drawings and descriptions of programming and inhabitation of the project.



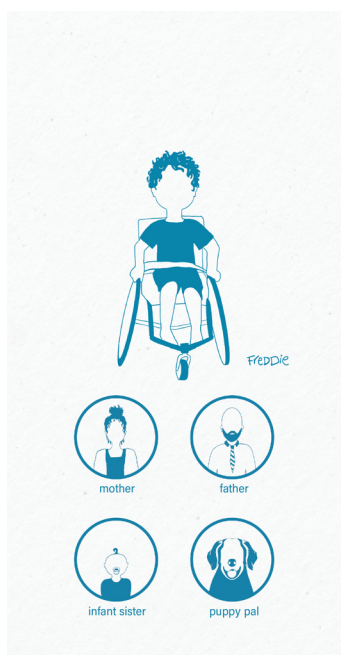
Jane and her support system

Jane

Jane is a 15-year-old in the process of recovering from anorexia. She loves reading, music, and yoga, and her support network is made up of her older sister, father, and a couple close friends. Anorexia is defined by the Mayo Clinic as “an eating disorder characterized by an abnormally low body weight, an intense fear of gaining weight and a distorted perception of weight” (Mayo Clinic 2018). Given her eating disorder and body image condition, Jane has the ability to choose the size and location of mirrors in her room and participates in horticultural therapy to help re-build and re-define her relationship with food and consumption. She also partakes in a daily yoga practice on the top floor of the centre, which is held outside on pleasant days.

Freddie

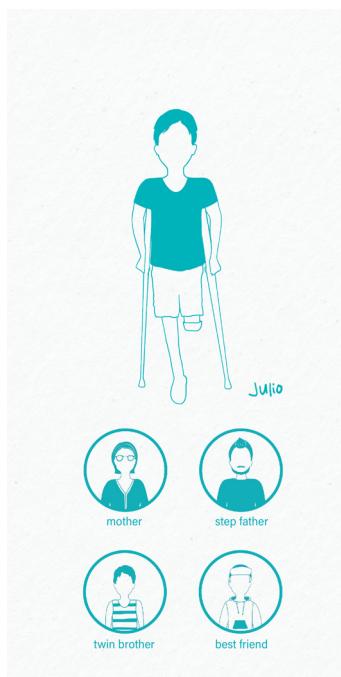
Freddie is a Cerebral Palsy (CP) patient. As a 4-year-old, he has a strong relationship with his parents and baby sister. He loves his golden retriever, who usually stays with him at the centre, airplanes, and swimming. Freddie spends short periods of time in the care facility, in between brief hospital visits and time spent at home. CP is a “group of neurological conditions . . . [that] causes impaired muscle tone and movement” (Schulze 2020). Freddie has level four gross motor functions, meaning that he cannot walk, but can operate his own wheelchair (Schulze 2020). He enjoys taking the long ramp from his room to the therapeutic pool, where he participates in aquatic physical therapy to soothe his muscles and improve his mobility.



Freddie and his support system

Julio

Julio is an 8-year-old in the process of recovering from an amputation. A couple months ago, he had the lower half of his left leg amputated due to damaged arteries and insufficient circulation. His support system includes his mom and stepdad, twin brother, and best friend, who is also an amputee. Freddie’s passions are cars, biking, and longboarding. Freddie arrived at the centre a couple weeks ago, following his surgical operation at the children’s hospital, and his rehabilitation schedule will include water therapy, expeditions around the adjacent landscaped paths, and one-on-one physical therapy with a medical professional. He is currently relying on a mixture of crutches and a wheelchair to navigate around the facility, but he is optimistic and can’t wait to adjust to his new prosthetic leg and learn how to ride his bicycle and longboard again.



Julio and his support system

Chapter 8: Experiencing Transitional Care

The Entrance Hall

Patients begin their journey when they arrive at the transitional centre from the hospital. First impressions matter, particularly to children, so the entryway of the project features the largest and most intriguing portion of the ruins. Their scale and texture provide visual interest at the threshold and invite exploration of the space.

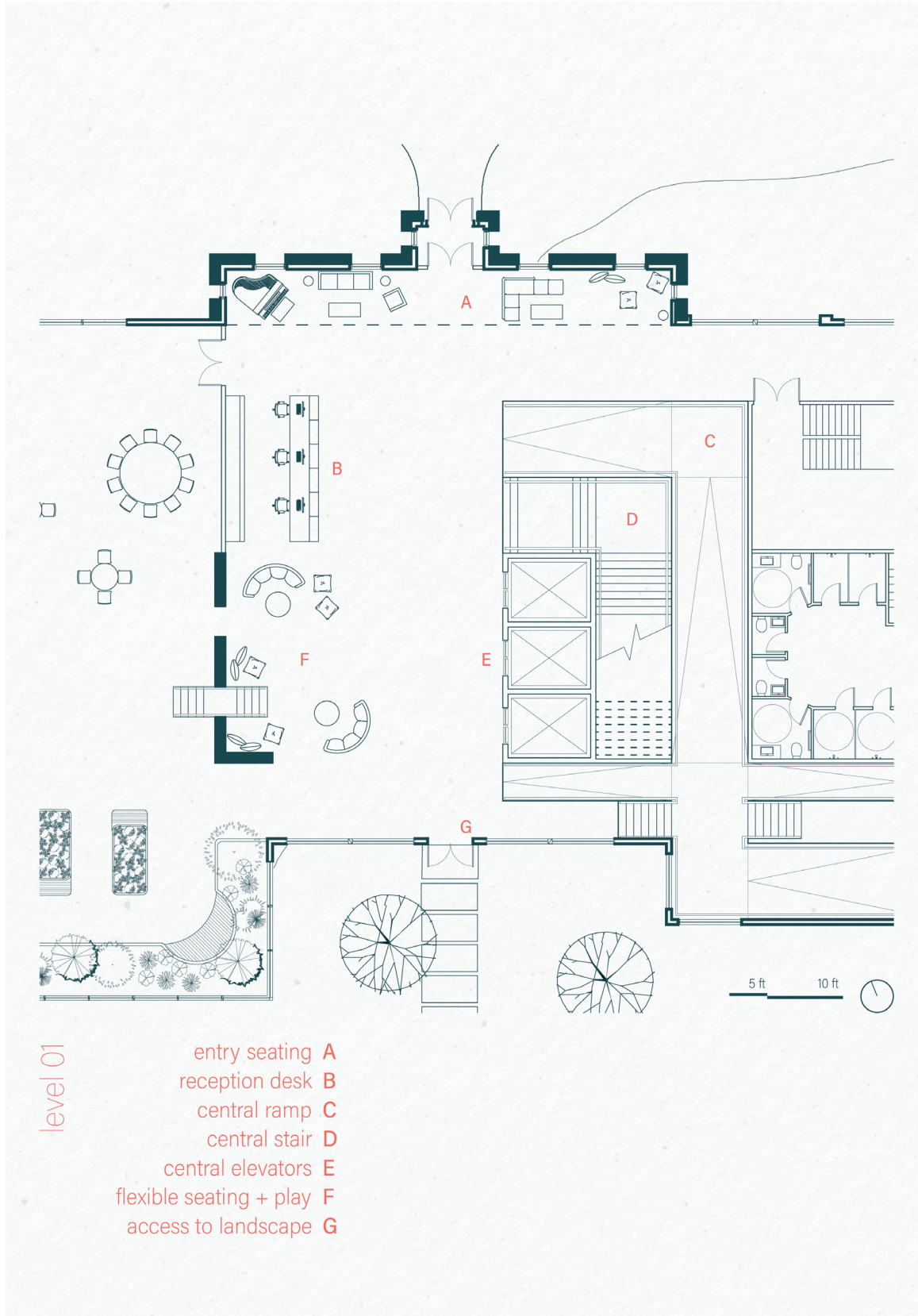
The interior of the entrance hall is the core area of the main floor, acting as a divider between the kitchen and dining space and the pool. It also serves as a communal gathering space, as its scale is naturally welcoming and cozy.

There are several key features along the length of the space. Upon entry, Jane finds the piano in the corner and starts to play, filling the hall with a pleasant melody. The reception desk offers counters at varying heights, meaning that Freddie can still easily see the nurses while his mother signs papers at a taller counter. Soft seating is offered next to the ruin wall, allowing Julio to rest and explore the texture of the sandstone while peering through the window into the dining room. Children and parents wander through the hall into the garden area, as the scent of fresh cooking from the nearby kitchen wafts into the space.

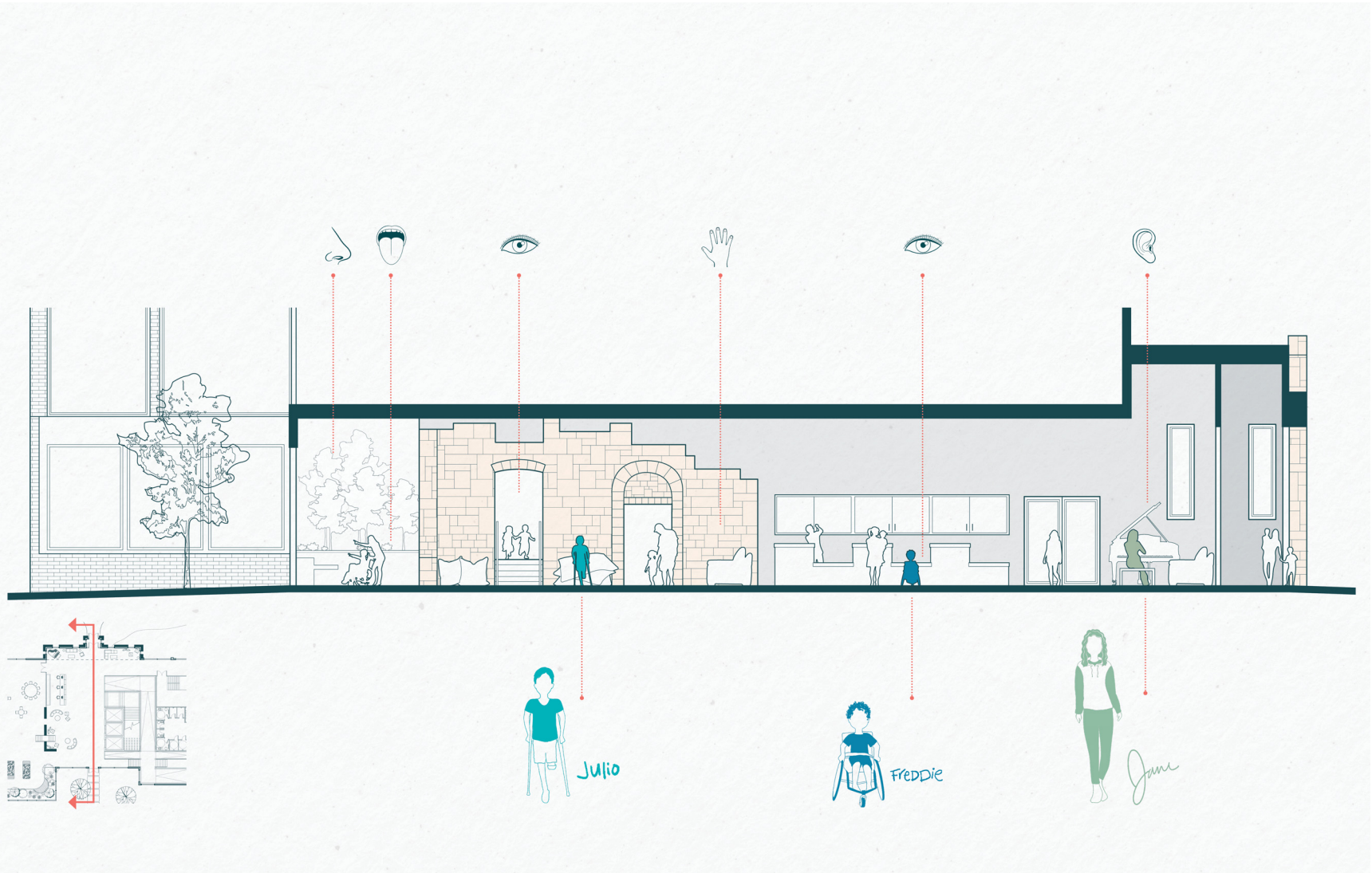
From the main entrance hall, patients move to the upper levels and get settled in their rooms. There are three options for ascending through the building: the elevators, a large staircase, and a winding ramp that weaves alongside the therapeutic pool.



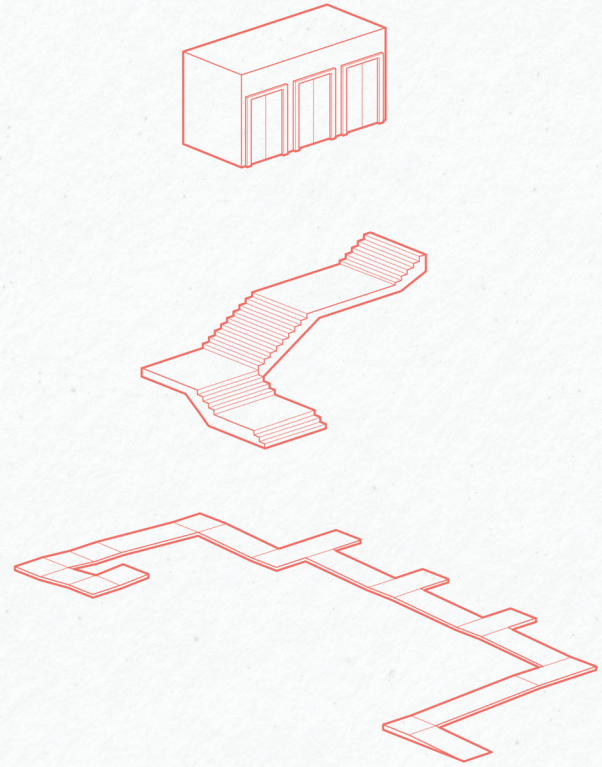
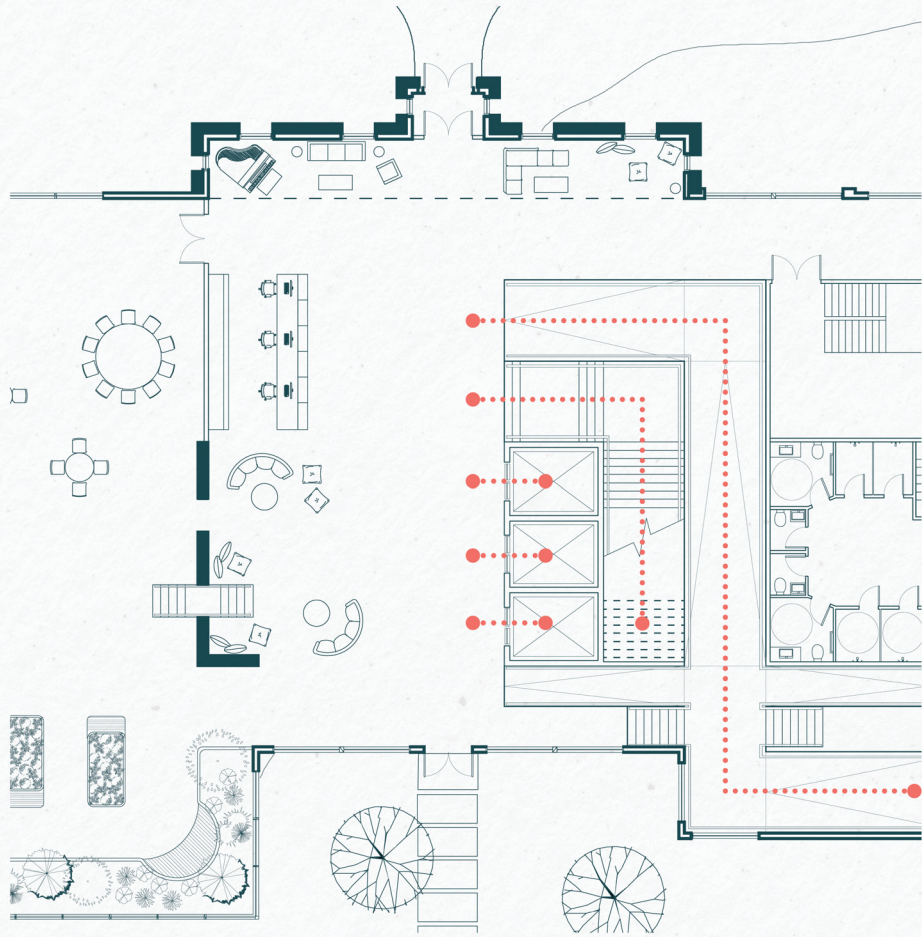
Entrance of the Transitional Pediatric Care Centre



Entrance hall: plan



Section cut through the entrance hall

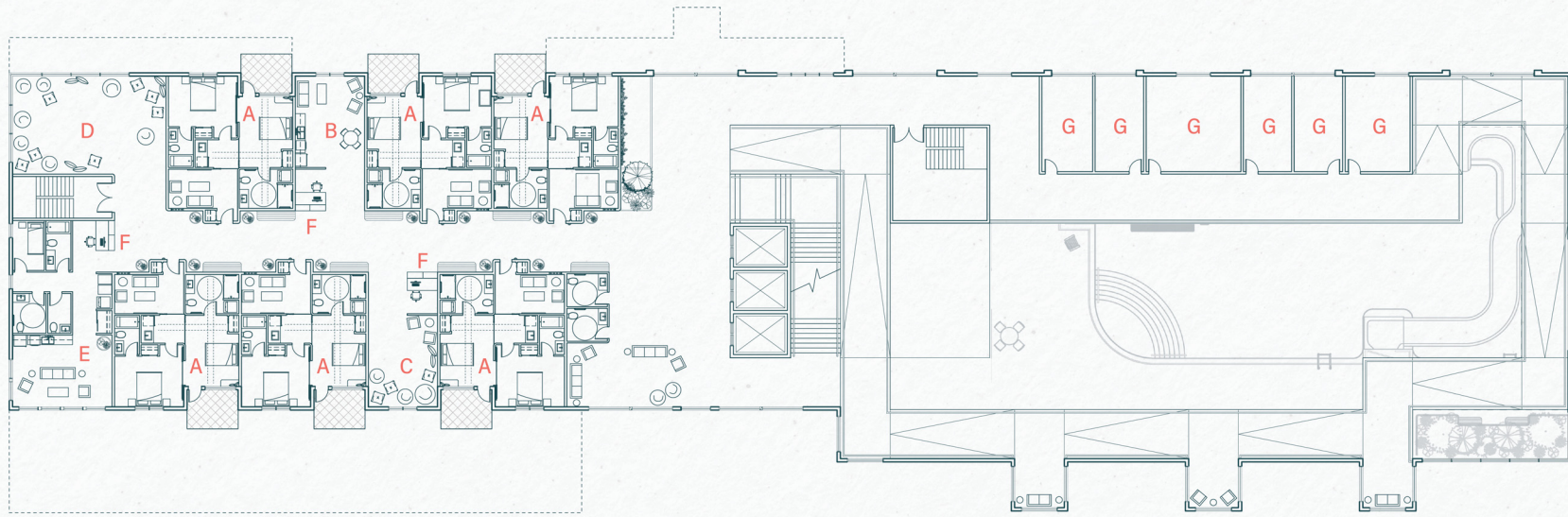


Vertical circulation options from entrance hall to upper levels

The Patient and Family Care Rooms

The second, third, and fourth floors each have six patient family rooms, which are arranged around a generous hallway and open common areas that allow natural light to fill the space. Nursing desks are distributed throughout the corridor, and the ends are anchored by a flexible group therapy room and the central circulation area. The opposite end of the floor includes individual therapy treatment rooms, and is open to the pool area below.

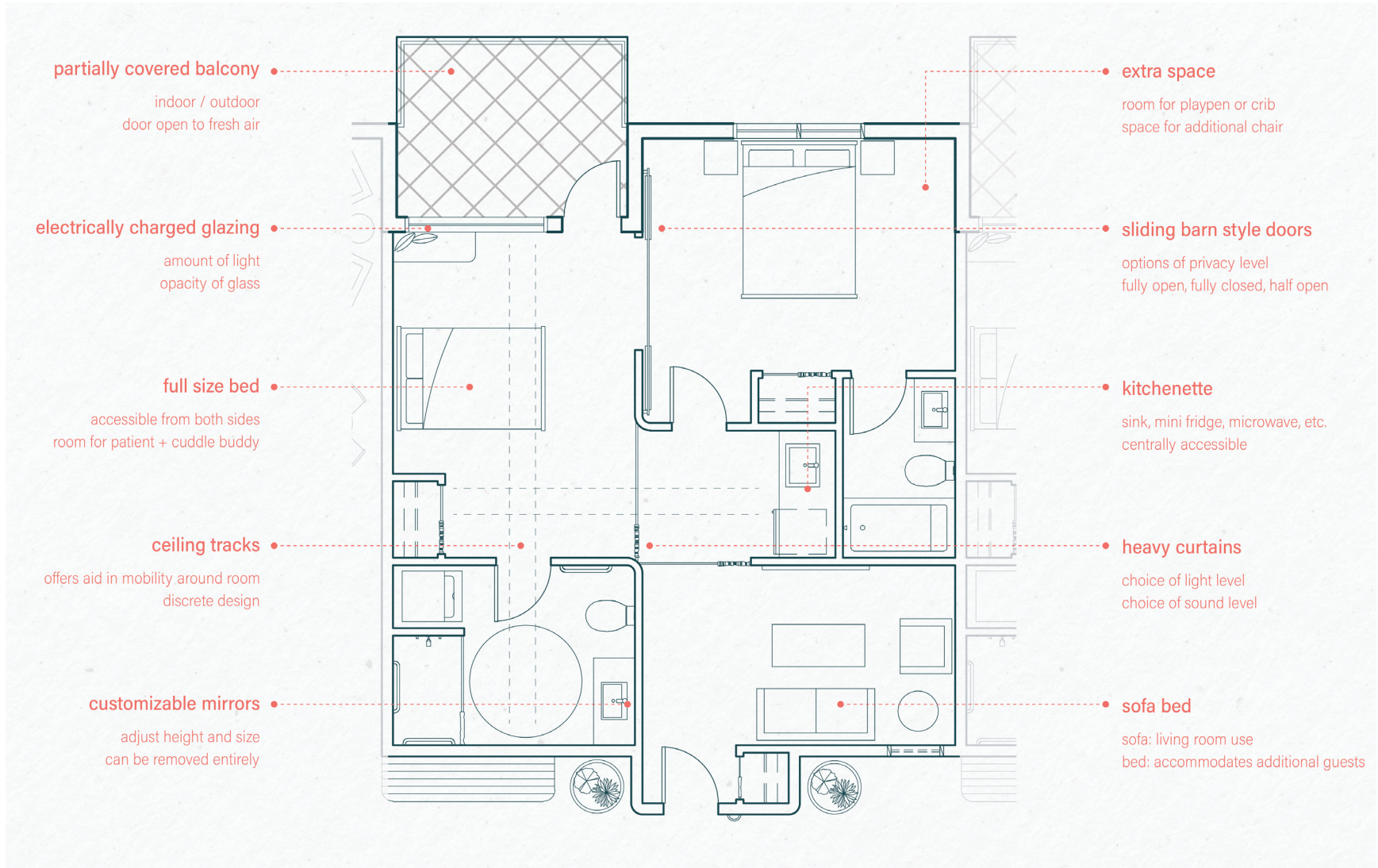
The overnight rooms are designed to be flexible and accommodating. A living room space forms a threshold between the hallway and patient area, which can be sectioned off using heavy curtains that block light and sound. There is also a sofa-bed in the living room area, providing additional space for overnight guests. A kitchenette, which includes a small fridge, sink, kettle, and microwave, is nestled centrally in the room. Sliding doors offer a choice in privacy level between the patient and family sleeping areas, and a secondary door allows family to come and go without disturbing the patient space. The family sleeping area is designed to have additional space to accommodate a crib or playpen. The bed on the patient side is full-sized, allowing room for children to have a parent, sibling, or friend cuddle in with them comfortably. Overhead tracks are discretely included to enable mobility assistance for those who need it, and the window bench intentionally occupies only half the window, leaving space for a person in a wheelchair to roll directly up to the large window and look out. Each room has a balcony and a large window with electrically charged glazing, providing patients the ability to control the amount of light in the room, as well as the window's opacity.



levels 02-04

- patient + family overnight rooms A
- family lounge B
- flexible play C
- group therapy D
- staff lounge + rest space E
- nursing desk F
- private therapy rooms G

Floor plan for levels 2, 3, and 4



partially covered balcony

indoor / outdoor
door open to fresh air

electrically charged glazing

amount of light
opacity of glass

full size bed

accessible from both sides
room for patient + cuddle buddy

ceiling tracks

offers aid in mobility around room
discrete design

customizable mirrors

adjust height and size
can be removed entirely

extra space

room for playpen or crib
space for additional chair

sliding barn style doors

options of privacy level
fully open, fully closed, half open

kitchenette

sink, mini fridge, microwave, etc.
centrally accessible

heavy curtains

choice of light level
choice of sound level

sofa bed

sofa: living room use
bed: accommodates additional guests

The flexible design of patient and family care rooms

The nature of the rooms allows them to be built identically, which simplifies the design and makes all rooms equally accessible to patients, regardless of their health condition or structure of their support system. The flexible elements of design bring an aspect of individuality and choice to each room, and each patient and their families have options to make the space their own.

Jane often has the company of her older sister or father in her room. Given that she is recovering from anorexia, she has customised the space to have only one small mirror in the washroom. The barn doors are often left closed to give her some privacy for sleeping. When her friends come to stay, they use the living room space and convert the couch into a comfortable sofa bed.

Since Freddie is a 4-year-old, the sliding doors are always open in his room, giving his parents a clear sightline from their bed to his. While they learn the routine of his therapy from the nurse, Freddie can wheel over to the window and look outside while his dog sits on the bench beside him. When Freddie is having trouble moving on his own, there is a ceiling lift that guides him around the space.

Julio has a lot of physical therapy in his room, and when it's nice out, they practice exercises and movements on the balcony. He loves having the kitchenette nearby, so he can easily get snacks even when he has difficulty moving around with his recent amputation. He spends a lot of time in the living room area with his best friend, leaving the main door open and hearing the sounds from the rest of the building trickle into the space.



age: 15 years old

health condition: recovering from anorexia

likes: reading, music, yoga



single father



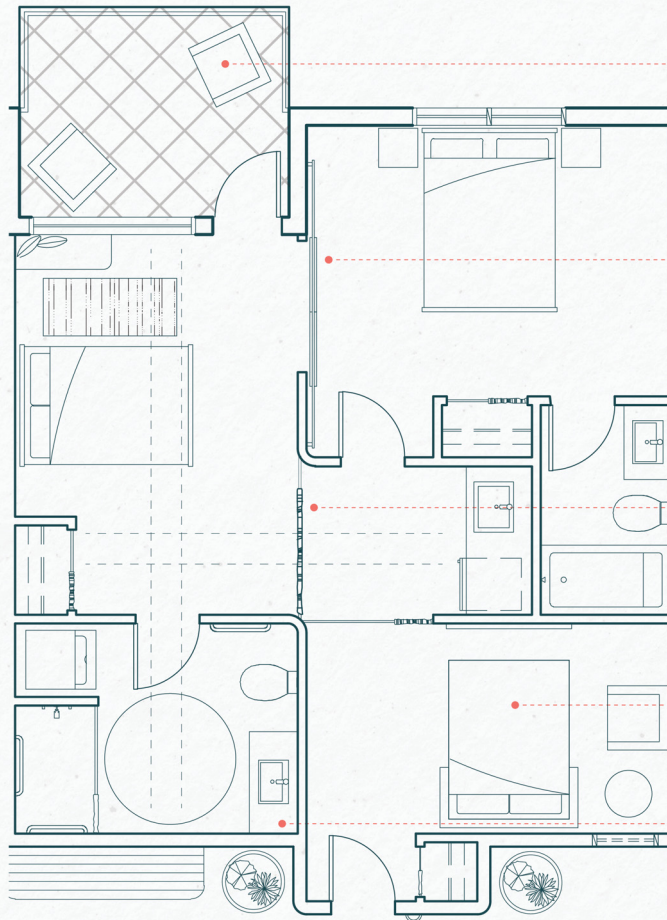
older sister



friend 01



friend 02



• partially covered balcony

outdoor furniture

• sliding barn style doors

closed for full privacy

• heavy curtains

one set closed

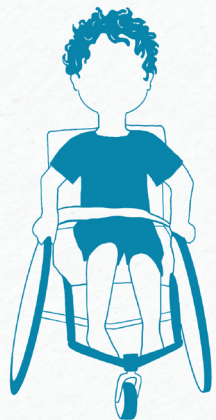
• sofa bed

for visiting friend

• mirrors

one small mirror above sink

Jane's room



Freddie

age: 4 years old

health condition: Cerebral Palsy

likes: dogs, airplanes, swimming



mother



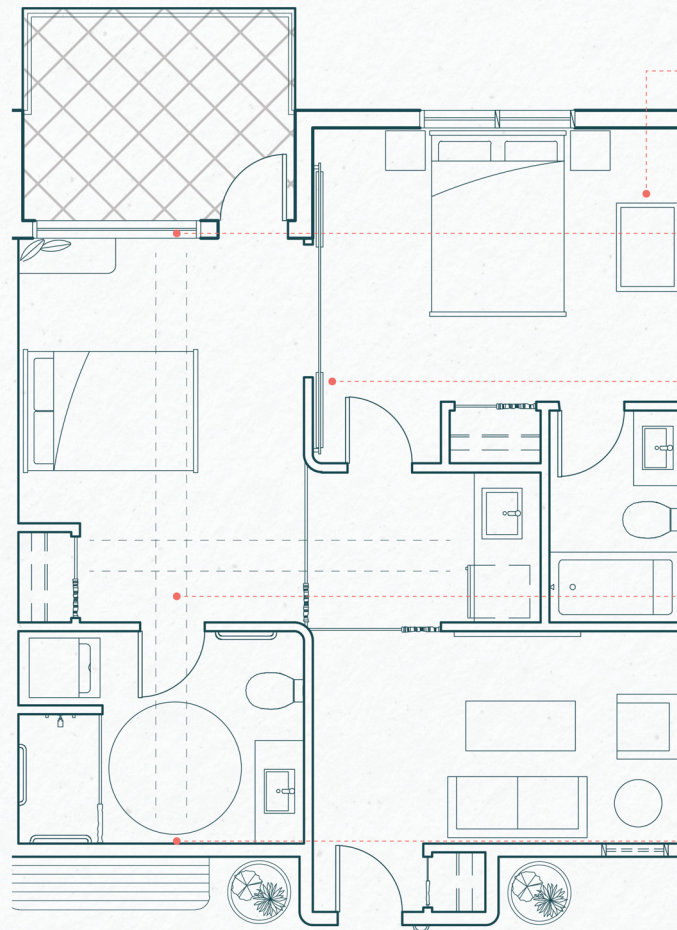
father



infant sister



puppy pal



• extra space

playpen for baby sister

• charged glazing

full clarity for outdoor views

• sliding barn style doors

open for full sightlines

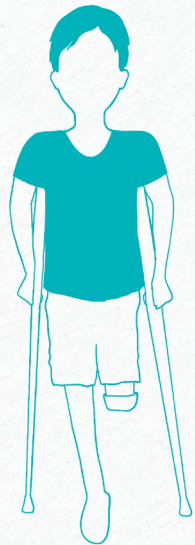
• ceiling tracks

aiding mobility to washroom

• mirrors

lowered mirrors at appropriate height

Freddie's room



Julio

age: 8 years old

health condition: recovering from an amputation

likes: cars, biking, long-boarding



mother



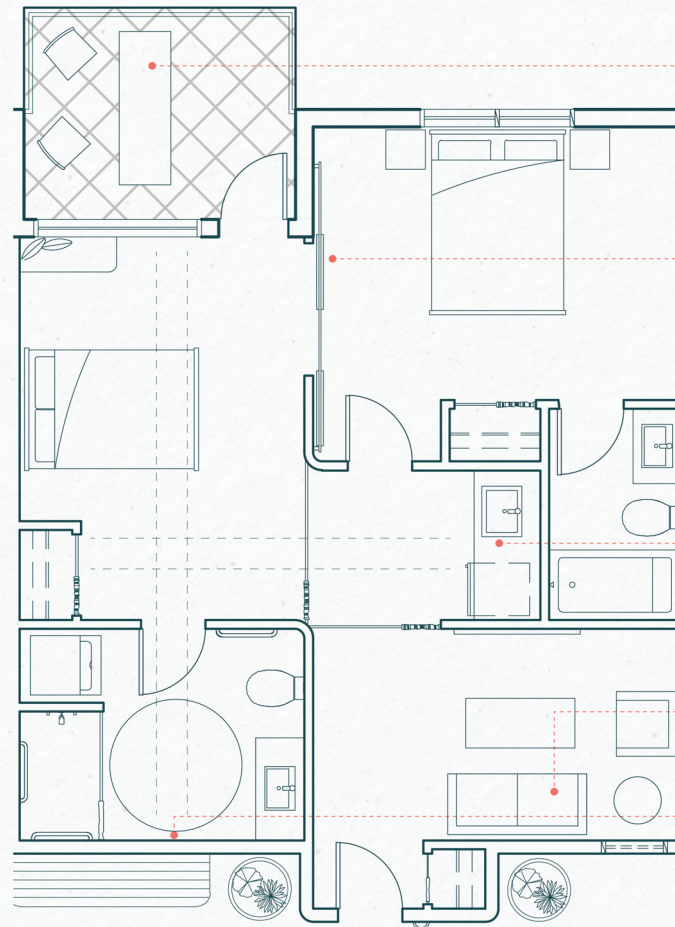
step father



twin brother



best friend



• partially covered balcony
used for physical therapy

• sliding barn style doors
half open for partial privacy

• kitchenette
fully stocked with snacks

• sofa bed
standard sofa for family + friends

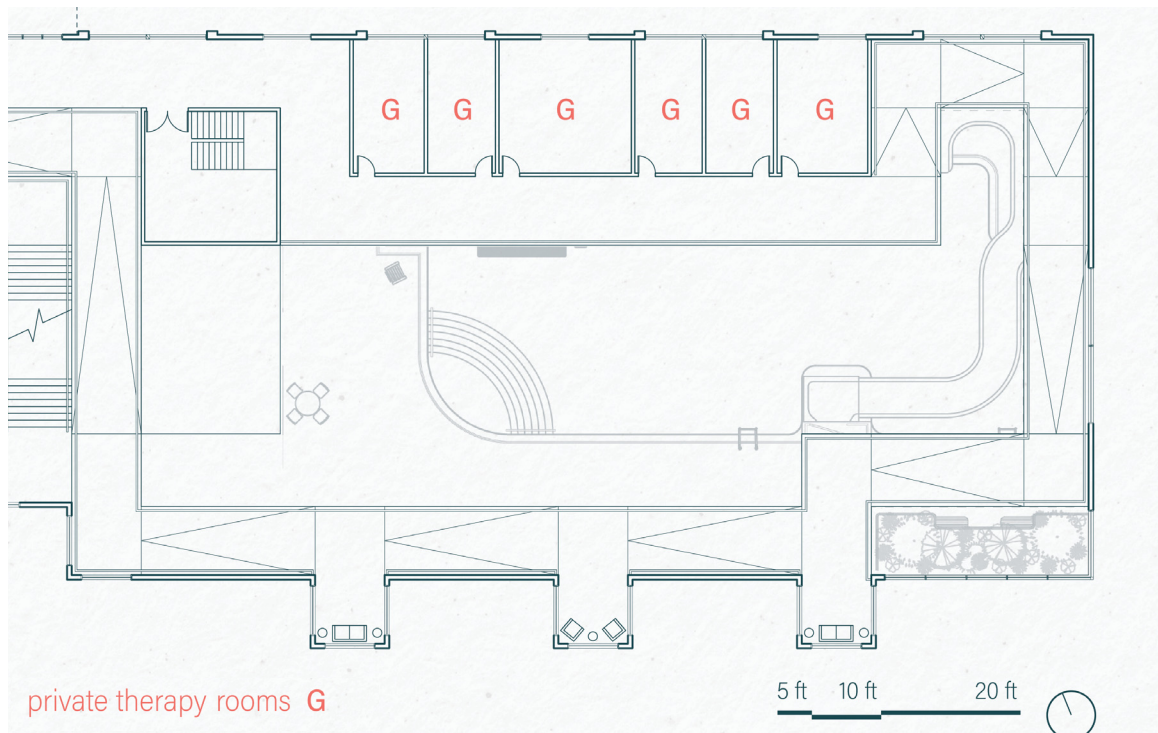
• mirrors
full body mirrors

Julio's room

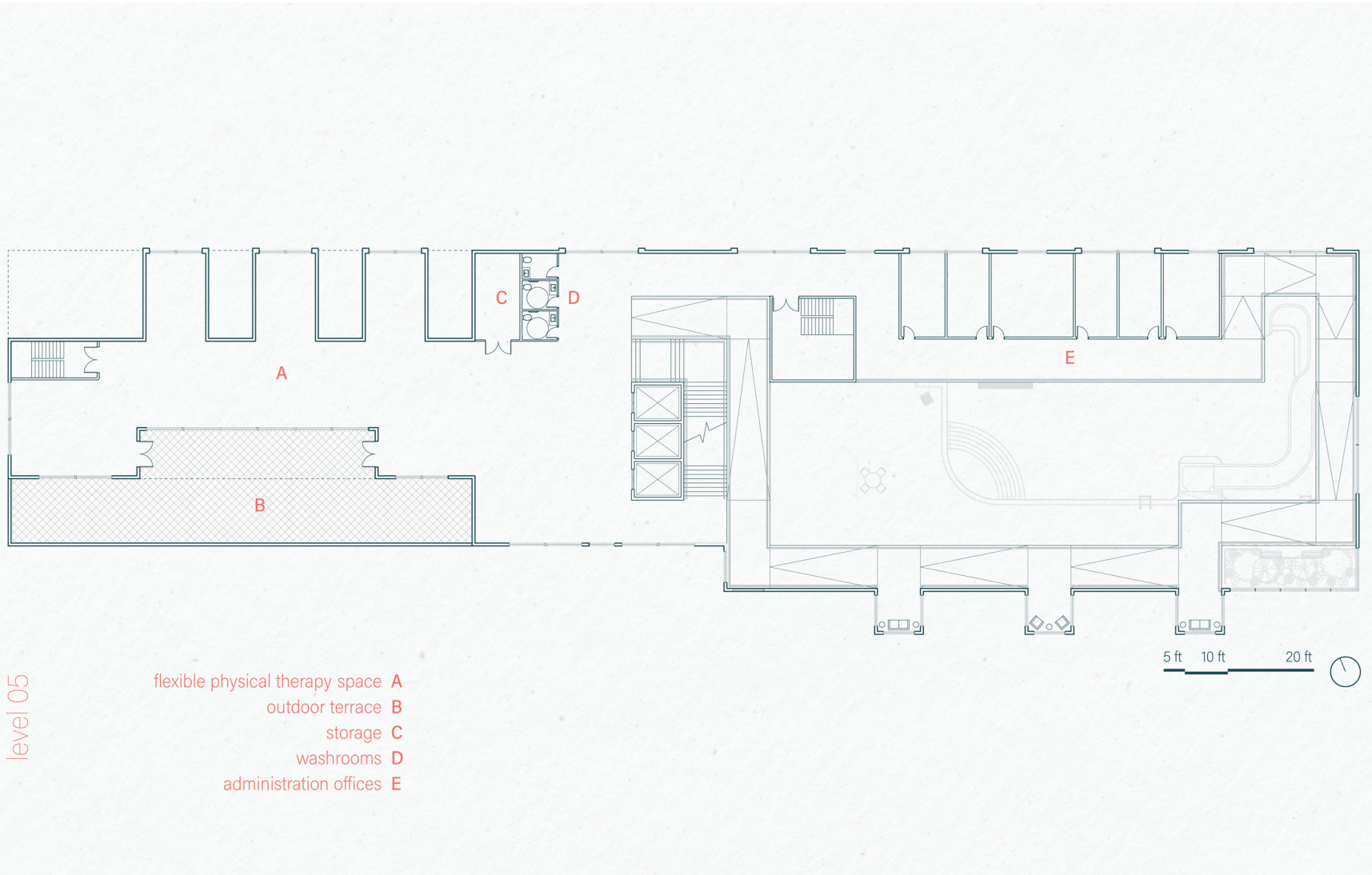
Physical Therapy

There are six individual therapy rooms of various sizes on each of the second, third, and fourth floors. These are flexibly programmed to include massage therapy, acupuncture and acupressure treatments, sensory therapy, and physical therapy. There are Snoezelen Rooms on each floor, which are “multi-sensory environments [and] relaxing spaces that help reduce agitation and anxiety, but they also engage and delight the user, stimulate reactions and encourage communication” (Snoezelen Multi-Sensory Environments 2022).

There is a large open area on the fifth level that provides space for group physical therapy both inside and outside on the rooftop terrace. The nature of the roof form and dormers make interesting nooks in the space that are filled with natural light.



Floors 2, 3, and 4 feature individual therapy rooms on the east end, overlooking an area open to the pool below



level 05

- flexible physical therapy space A
- outdoor terrace B
- storage C
- washrooms D
- administration offices E

Level 5 (top floor) plan

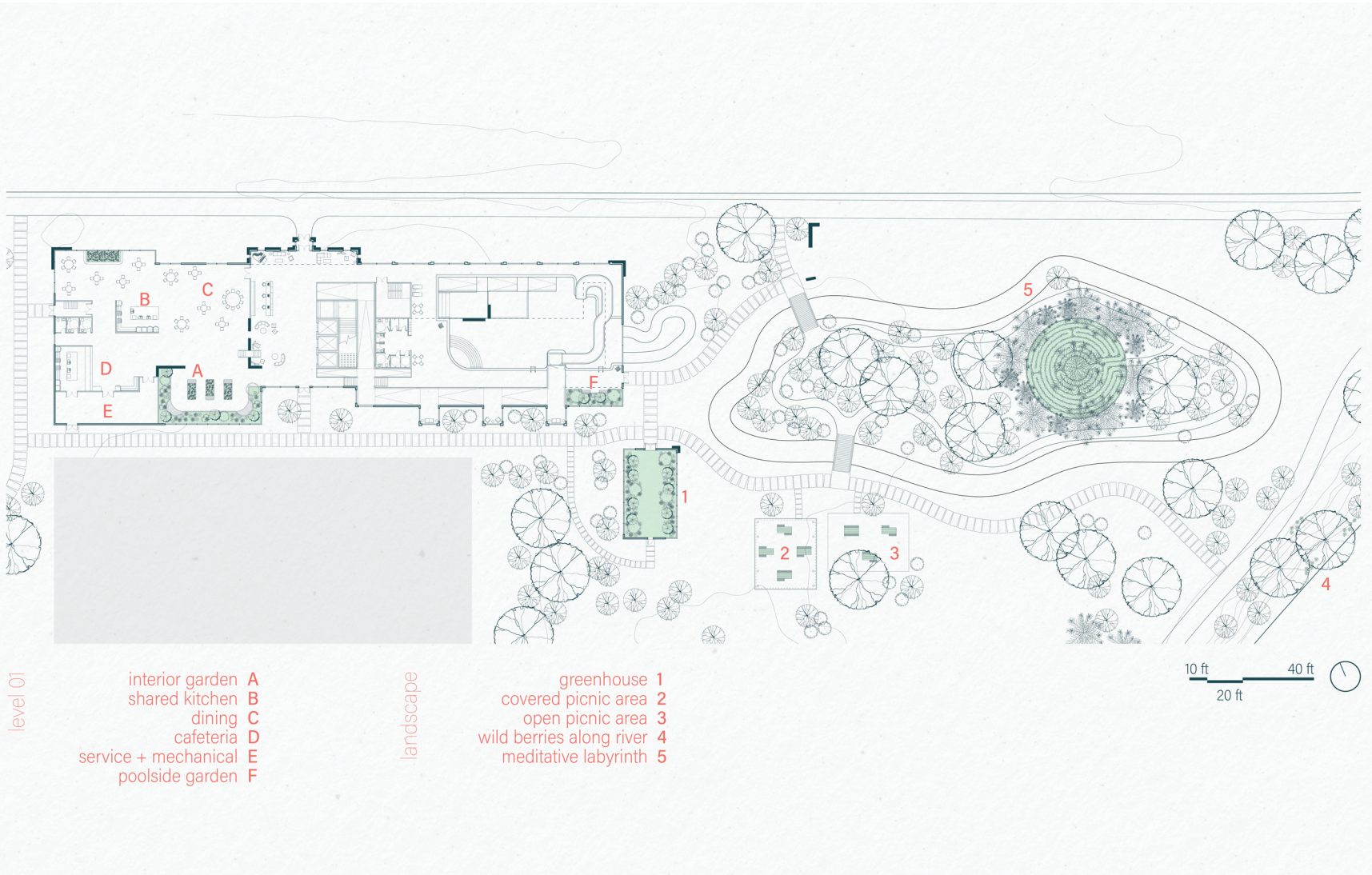
Horticultural Therapy

There is a wealth of research supporting the positive impacts of greenery and vegetation on people of all ages, particularly those undergoing a process of healing:

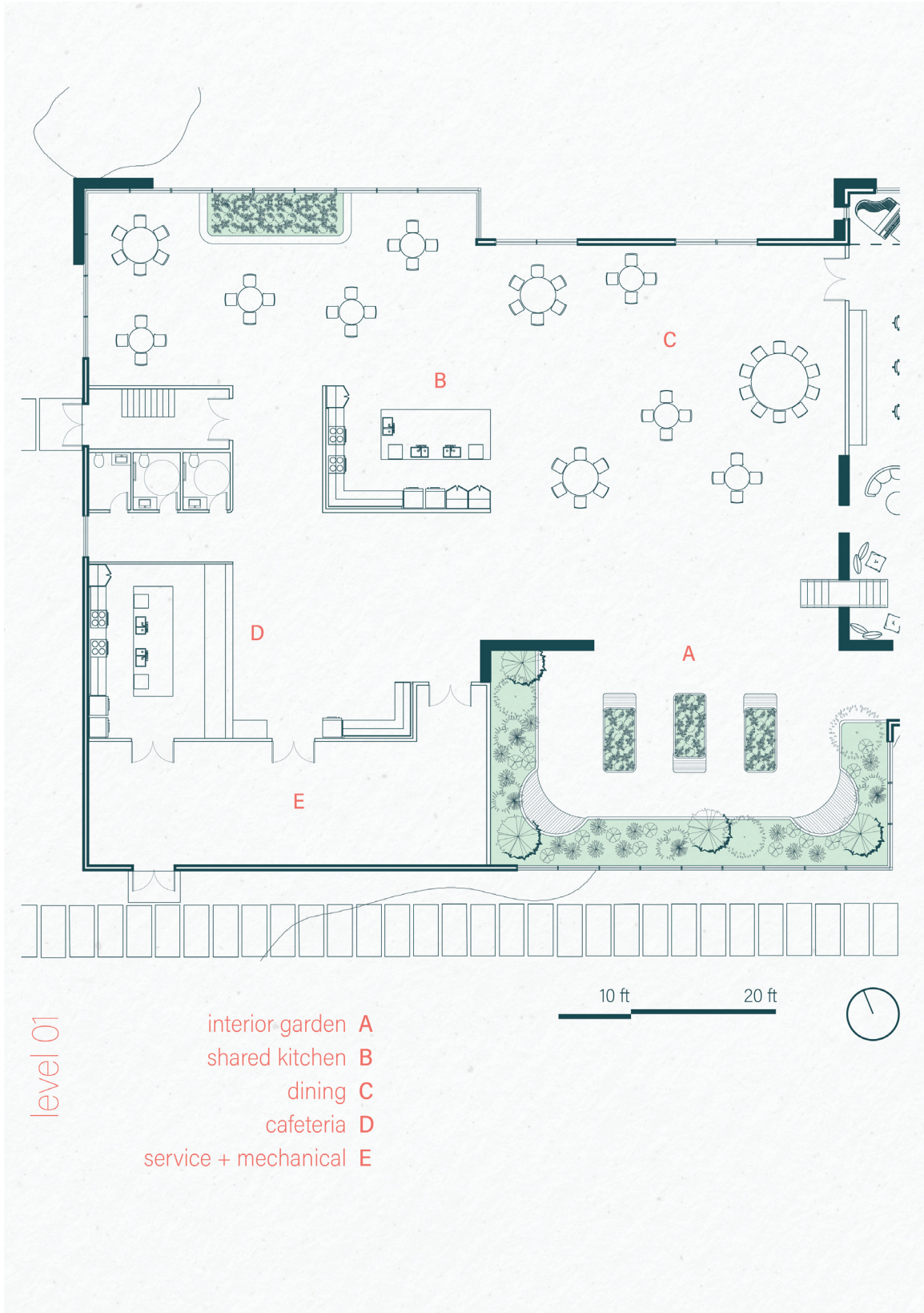
The concept of healing gardens draws on the broader idea of salutogenic – or health promoting – environments, in which it is proposed that the physical environment impacts on health in myriad ways through behavioural, psychological, social and biological pathways. Salutogenic environments entail not only the absence of disease promoting factors (such as pollution and stress-inducing stimuli), but also have factors that bring about wellbeing. (Reeve, Nieberler-Walker and Desha 2017, 49-50)

Once settled in their rooms, patients and families can now return to the main level to explore a variety of healing options, including horticultural therapies. The acts of experiencing, growing, preparing, and consuming plants are explored on the interior of the building through a shared kitchen, dining area, and garden. The interior garden space offers room to grow herbs, vegetables, and plant-based remedies such as arnica. The southern exposure offers natural light and clear views to the outdoor greenhouse, forming a visual connection between the programs of both interior and exterior spaces.

In addition to growing food, preparation and consumption are also important elements in the project. A large communal kitchen provides the opportunity to cook in groups, take cooking lessons, or prepare a meal as a family. There is a fully-serviced cafeteria as well, allowing patients and families to select their meals and snacks from a pre-prepared menu. The open concept dining area is meant to invite conversation and mingling between groups, and the floor to ceiling windows create a bright and permeable space that feels connected to the community life outside.



Main level plan, highlighting elements of horticultural therapy



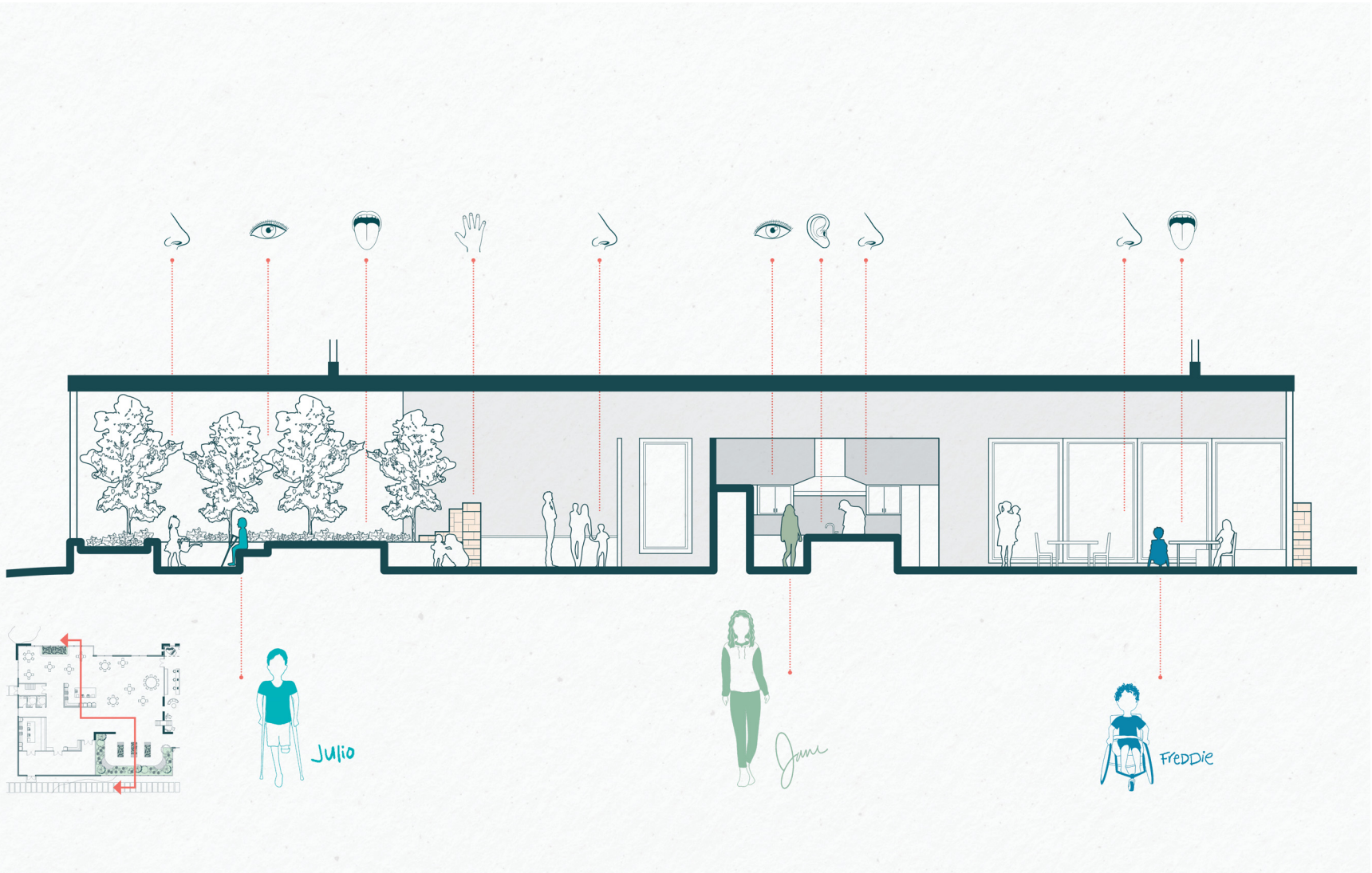
Main level plan, zoomed to highlight interior horticultural therapy spaces



Interior rendering of the garden space, with framed views to the greenhouse outside

There is a clear progression of growing, preparing, and consuming food throughout the space. In the garden, Julio rests on a planter bench while picking fragrant rosemary for tonight's dinner, enjoying the visually immersive experience of the greenery. Beside him, a mother and young child sample some of the edible flowers growing next to the ruin wall. Jane is enjoying a cooking lesson with her dad in the shared kitchen space, which helps rebuild and redefine her relationship with food. Freddie and his mom sit by the windows, eating a meal they chose from the cafeteria service area.

The interior spaces of horticultural therapy connect with various components in the landscape. The greenhouse provides flexible growing year-round, and the picnic areas offer a variety of family sized tables that accommodate wheelchairs and walkers. The level paths and bridges offer access to the wooded island formed by the channel, the east end of which hides a meditative labyrinth sheltered by large coniferous trees. Saskatoon berries grow along the edge of the river, continuing the sensory thread between landscape and building.



Section cut through the interior spaces of horticultural therapy

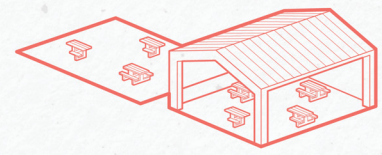
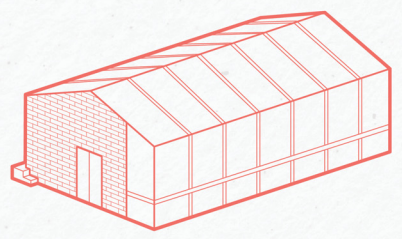
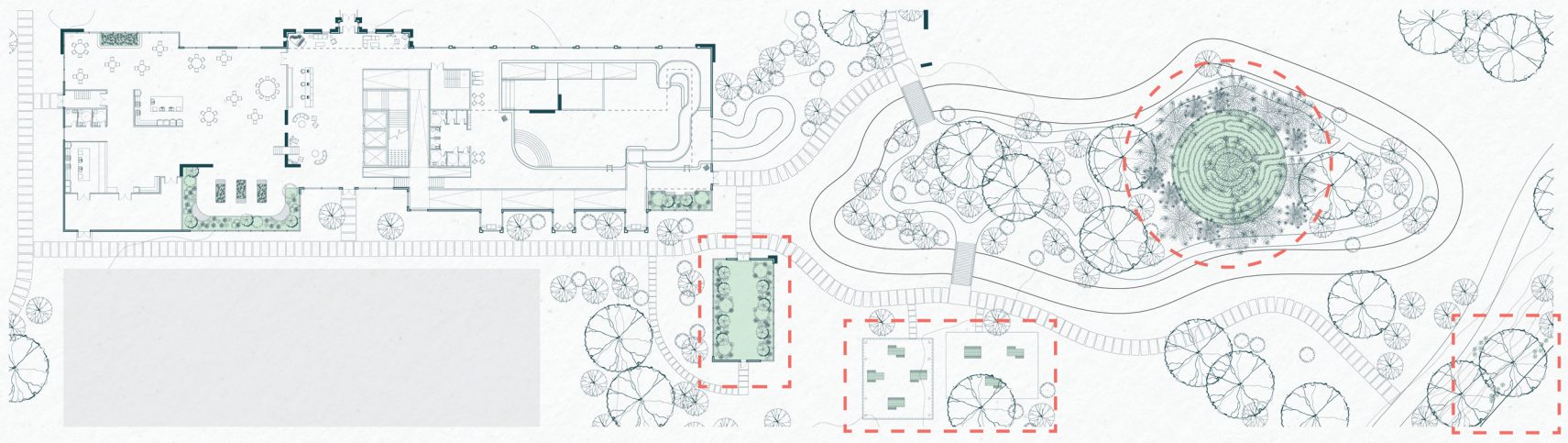
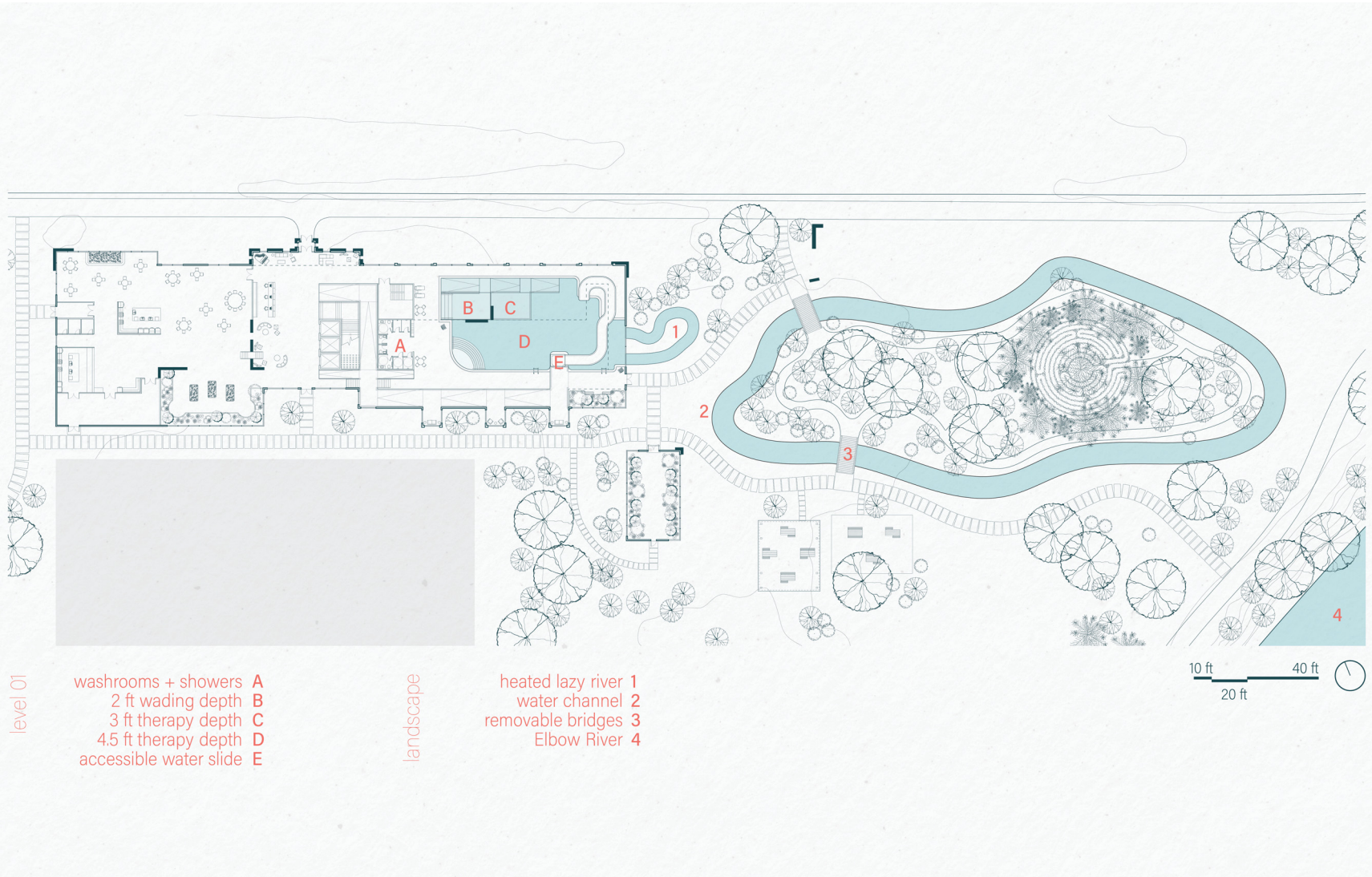


Illustration of key horticultural elements in the landscape

Water Therapy

Patients also interact with water throughout the building and the landscape as part of their re-integration journey. The primary vehicle for experiencing water therapy is the large interior pool. The pool connects to the landscape through a heated lazy river, which mirrors the shape of the adjacent water channel. Water therapies are offered at various depths to accommodate a range of ages and levels of mobility. This includes a shallow 2 foot wading area, a 3 foot therapy section, and a generous area of 4.5 feet, which is often the ideal depth for floating and weightlessness. The varying depths are aligned with a change in ceiling height, creating spaces of immense openness and others that are more intimate and sheltered.

Julio is ready for aquatic exercises, which he completes at the 3 foot depth to help build strength and mobility in his left leg. He enters the pool from the north side ramp, using the textured surface material and railings to guide him while he uses crutches. A water curtain falls from the floor above onto a piece of the ruins, creating a gentle splashing sound and adding a visual edge to the more intimate end of the pool. Freddie is helped into the accessible water slide by his father, while his mother and baby sister splash in the shallow wading pool area by the ruin wall. He laughs with glee as he slides down the gentle slope toward the caregiver waiting to catch him below; this is something he has never experienced before. Jane is quietly reading by the garden. In time, she builds the confidence to swim with her friends in the deeper sections. Patients and families meander up the ramp that runs alongside the pool. The openness of the space provides full views and a strong visual connection between water and movement.



level 01

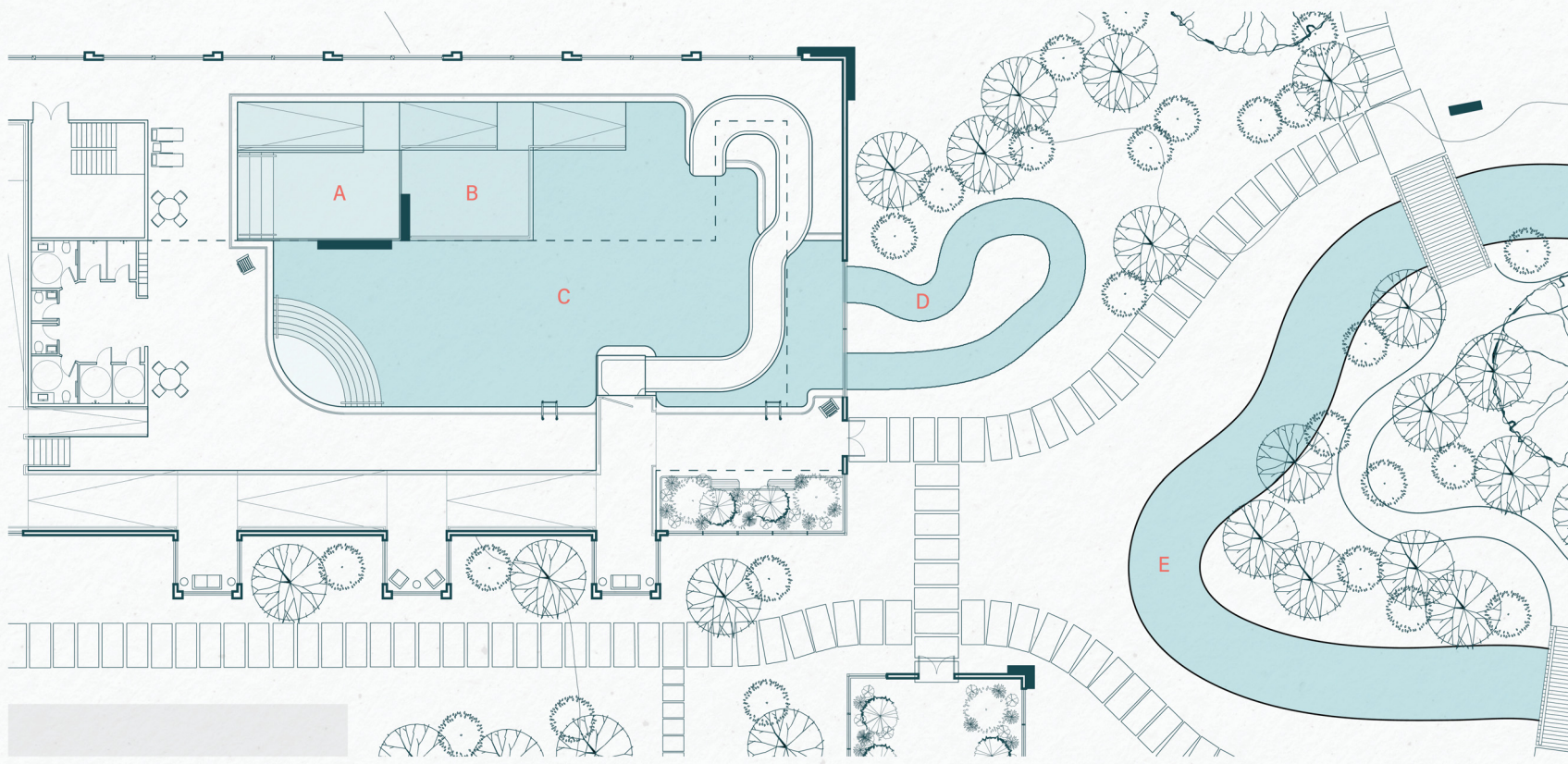
- washrooms + showers A
- 2 ft wading depth B
- 3 ft therapy depth C
- 4.5 ft therapy depth D
- accessible water slide E

landscape

- heated lazy river 1
- water channel 2
- removable bridges 3
- Elbow River 4



Main level plan, highlighting elements of water therapy



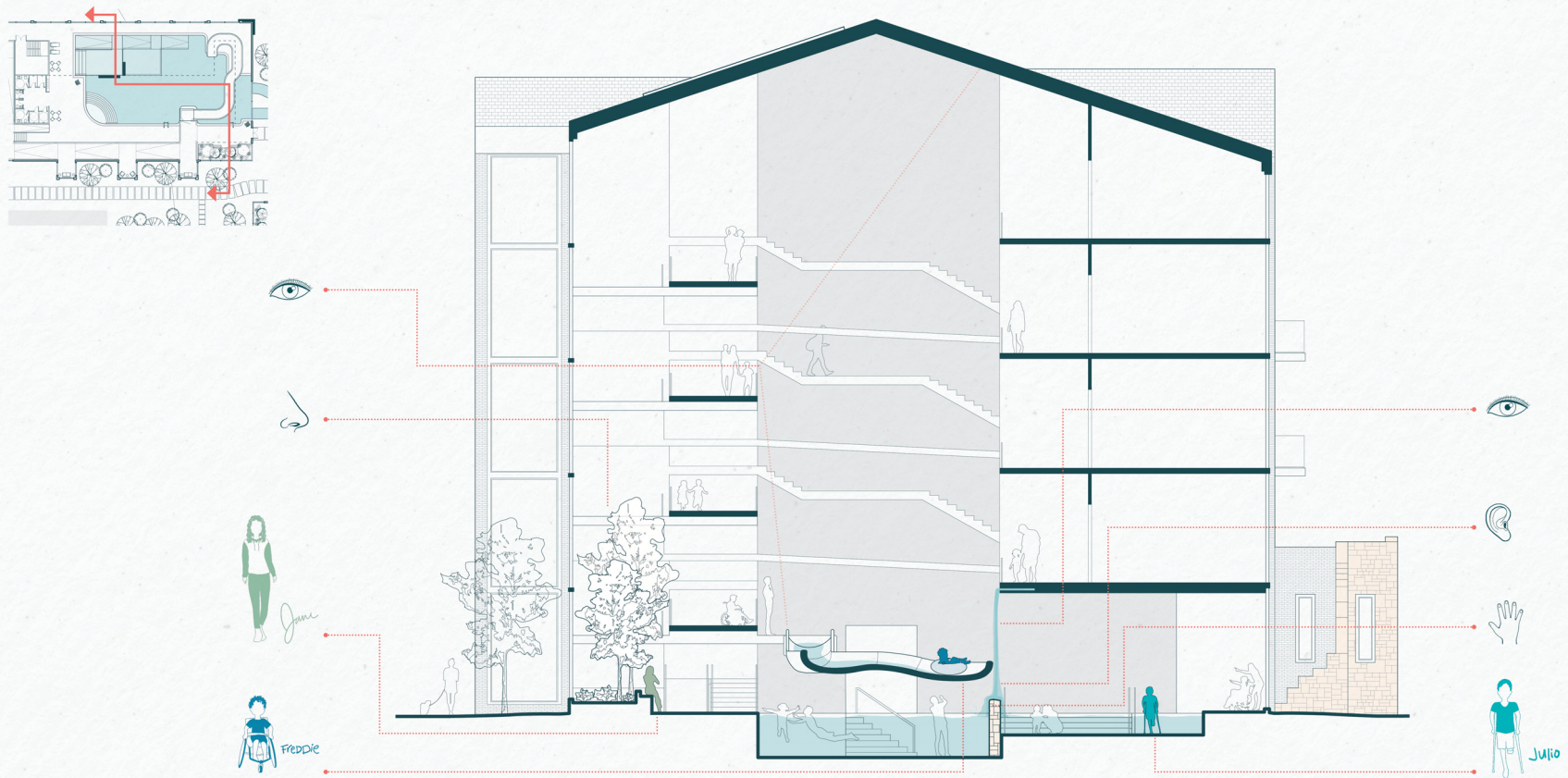
depths

- 2 ft wading A
- 3 ft therapy B
- 4.5 ft therapy C
- 3 ft lazy river D
- 3 ft water channel E

10 ft 20 ft



Main level plan, showing depths of therapeutic pool and landscape water features



Section cut through the pool area, showing the difference in ceiling height and key water features

When standing at the ramped entry to the pool, the ceiling is lower and there is a natural feeling of safety and comfort, encouraging participation and play. The dynamic edge created by the water curtains ignites the senses through touch, sight, and sound, as the water lands on parts of the ruins and meets the surface of the pool.

The pool extends into the landscape through a series of water based experiences that connect the care centre to the river. The lazy river is a heated, slow moving body of water that forms a loop with the pool inside. The water channel is another loop, which can be crossed using flat bridges and is open to exploratory play in the summer months. In the winter, the bridges are removed, and the channel becomes a skating area. Skating supports and wheelchair attachable skis are also offered.



Render from the northwest corner of the pool, at the ramp entrance; highlighting the change in ceiling height and intimacy of shallow areas

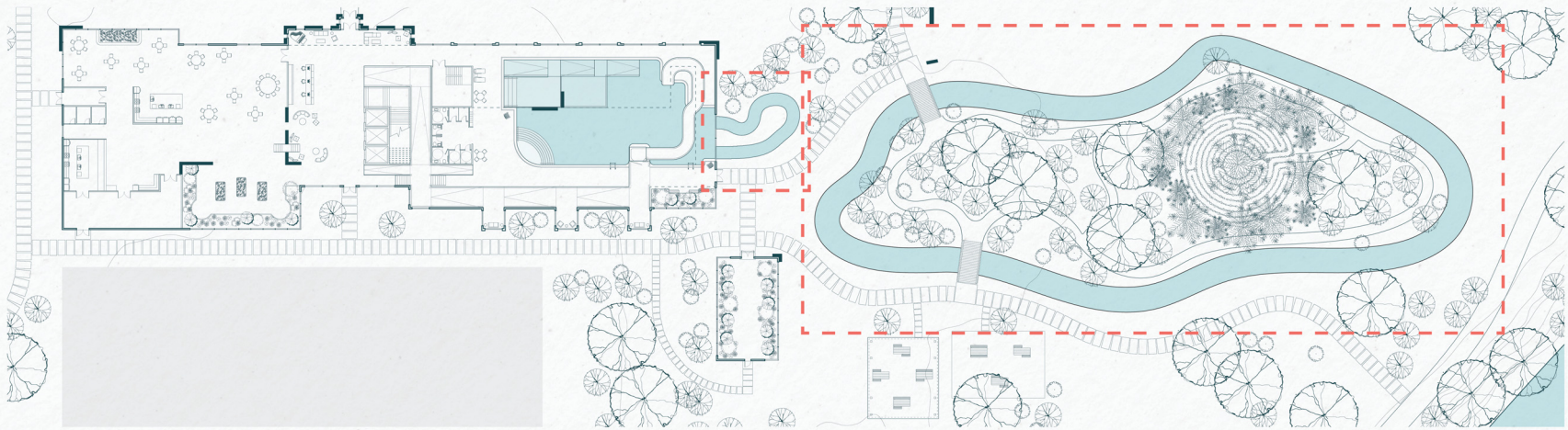


Illustration of key water elements in the landscape

Complete Re-Integration

This completes the re-integration journey, or the transition from full care back into the community through increased exposure and interaction with various elements that are of similar complexity to those found outside the care centre. The outdoor water therapy components of design represent the highest level of the re-integration journey, and even after the patients have transitioned from the care centre back to their own homes, this is a place that they can return to, experiencing enjoyment of the community landscape design and contributing to the full circle approach of holistic health and healing.



Exterior rendering, showing the seasonal uses of the water channel in the landscape and the highest level of the re-integration journey

Chapter 9: Conclusion

The transitional pediatric care centre acts as a catalyst for re-integration between the hospital and the home, offers various forms of therapy, and addresses a key niche in the architecture of pediatric healthcare. By nature, the sensory-based design accommodates both patients and their families, providing a safe and welcoming healing space that is engrained in the community and the history of its context.

In a broader context, this project is one piece of larger equation that calls for a re-evaluation of healthcare design. The project's specificity reflects its unique program, and this approach could be applied to other transitional care centres, such as those that provide cancer care, hospice care, long-term care, and mental health care. A strong connection to the landscape and focus on sensory-based design make the project replicable in a variety of scales and programs. The driving concepts and ideas of compassion, well-rounded care, and designing with elements of fun and playfulness could also be applied to other age groups, including geriatric and elderly patients and their families. While the main challenges this thesis aims to address are large-scale and systemic in nature, the project explores the simple yet critically important ways that architecture can make a profound impact on the lived experience of patients and their families as they navigate the transition from the hospital to the home.

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