

CommonRoots Health Centre

by

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ABSTRACT

A shift in medical paradigm, from a focus on curing disease to a focus on preventing it, demands a totally new type of medical infrastructure. Through an analysis of the preventative paradigm, two key architectural implications of disease prevention are revealed: the need to reach out to the healthy population; and the system nature of preventative care, which links seemingly unrelated lifestyle factors to health.

The site of the former Queen Elizabeth High School, on the Halifax peninsula in Halifax, Canada, is chosen as the site to explore the programmatic and spatial implications of preventative care. Through attention to the concepts of habitat and flow, a design is created which blurs the boundaries between building and landscape, between diverse programs, and between patient and passer-by.

ACKNOWLEDGEMENTS

Many thanks to my classmates and instructors for all the inspiring lessons, and to Sam for so much love and support.

INTRODUCTION

By contrast, in traditional Chinese medicine, people pay the doctor only when they are healthy; when they are sick, he is obliged to treat them, without payment.

- Christopher Alexander, *A Pattern Language*¹

The Preventative Paradigm

The 20th century has seen medicine conquer many once-epidemic infectious diseases. But the innovations that achieved this were not expensive miracle drugs or patentable techniques. Rather, simple preventative measures such as hand-washing and clean water have been the most profound medical contributions of the western world. Today, the potential for preventative medicine lies in changing public lifestyles. Poor nutrition and a lack of exercise are widely regarded as the primary cause of heart disease, as well as playing a major role in many cancers. These are the two most lethal and debilitating conditions affecting Nova Scotians.² The medical establishment has not overlooked this: as health-care costs rise at a rate far outstripping funding sources, low-cost preventative solutions are becoming more acceptable than surgery and drugs.

But while our hospital buildings are plastered with Eat-Healthy posters and pictures of happy octogenarians playing baseball, the design of the hospitals themselves negate this message. Instead, health care infrastructure can be seen to exhibit the same false economy as freeways, creating efficient, streamlined spaces for surgeries that could have been prevented with a timely cooking lesson.³

Michel Foucault, in *Psychiatric Power*, analyzes 19th century sanatoria and reveals several aspects of health care facilities that serve to entrench hierarchies of knowledge and power. The need for supervision is analogous to surveillance; isolation is as relevant to contagion in epidemiology as it is in psychology; and all medical professions think of themselves as sciences, which objectify illness and by extension, those who are ill. This puts the health care system in a position of power over the patient; the patient is no longer

a subject who can control his or her own well-being.

As a medical paradigm, preventative care has several profound differences from this conventional, curative one. Preventative care is focused outwards, serving the population at large, rather than people who are already sick. This implies that a preventative clinic cannot be removed from the flows of normal urban life; instead, the clinic must be part of the urban commons, a socially significant public space within the larger city.

In his book *A Pattern Language*, Christopher Alexander deals with the design of preventative health infrastructure. In Pattern #47, he states that a health center should be “organized essentially around a functional emphasis on those recreational and educational activities which keep people in good health,” and distributed evenly throughout the city. Because a health center contains public programs of interest to the healthy population, they feel comfortable being there, and “the question of their health becomes fused with the ordinary life of the community.”⁴



Diagrams comparing an isolated and sterile curative facility vs. a preventative space that is integrated with everyday life.

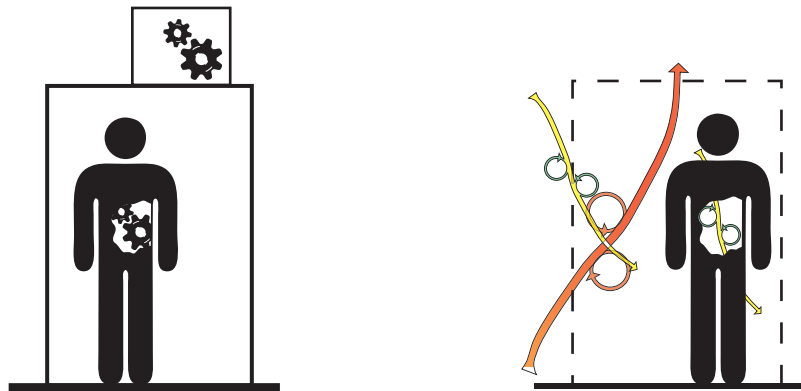
Preventative care also links cultural lifestyle elements, such as diet, with individual medical outcomes. A preventative health-care system bears a much closer resemblance to ecological models of systems theory than it does to conventional machine analogies. Over the last 100 years, as the medical profession has become more sophisticated, our understanding of health has moved towards the idea that mechanical and chemical interventions⁵ could fix bodily malfunctions.

Esther Sternberg makes this explicit in her book *Healing Spaces*, a history of western medical facilities. The Ancient Greeks had parallel health infrastructures; the Hippocratic tradition of diagnosis and prescription alongside the spiritual tradition of prayer to the God of Healing. She points out that Western medicine has developed in a lopsided way, so that now - despite what we know about placebo cures and the importance of social factors on health outcome - we dedicate large percentages of our hospitals to machines and diagnostic tools, the purpose of which is unintelligible to the layman.

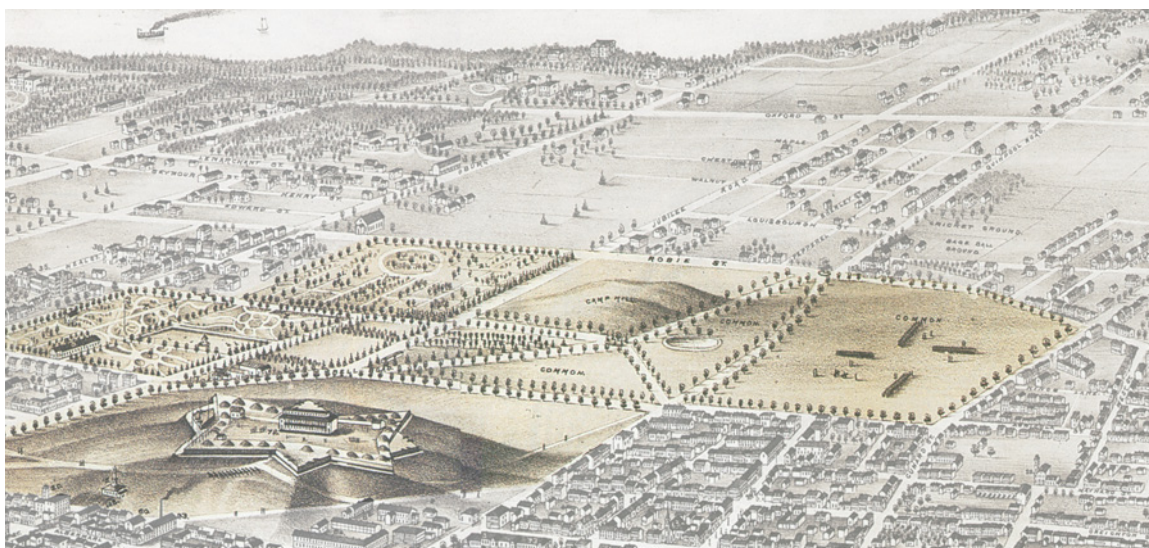
The preventative paradigm, on the other hand, implies a model of our bodies as ecosystems, as our individual health is linked to the healthiness of our communities and cities at a larger scale, as well as the proper balance of internal flows at a smaller scale.⁶ In fact, the most recent research on asthma and allergies shows that the *absence* of parasitic organisms in the intestines may be causing these conditions, since an under-worked immune system attacks healthy cells.⁷ The human body is the environment for many millions of smaller living things; our health is synonymous with the health of our personal ecosystem.

The concepts of ecology were developed initially to describe relationships between plant species in a forest, but the concepts have been expanded to describe cultural and social systems as well as biological ones. In *Dead Cities*, Mike Davis analyzes the landscape of the modern American west using ecological concepts. He shows the relationships between systems across scale; of particular interest is the idea that ecosystems have boundaries that are contextually determined, meaning that the edge of a system depends on which aspect of that system you are analyzing. His essays contain the ethical intent of this thesis; to create a structure which expresses the interconnected systems that influence health.

The body is a familiar metaphor for buildings. We speak of buildings as having structural “bones” and call the outer envelope a “skin”, while texts on urbanism demand windows as “eyes” on the street. As an architect, the building-body metaphor is the primary pedagogical tool for commenting on how we relate to our own bodies. By extension, architectural design can be a statement on how we understand and define health. A medical paradigm that sees the body as a system within a field of systems - at both larger and smaller scales - demands a building designed from the same ecological perspective, with material details supporting and supported by systems that exist at haptic, building and urban scales.



Diagrams showing the Building/Body as machine, vs. Building/Body as ecosystem.

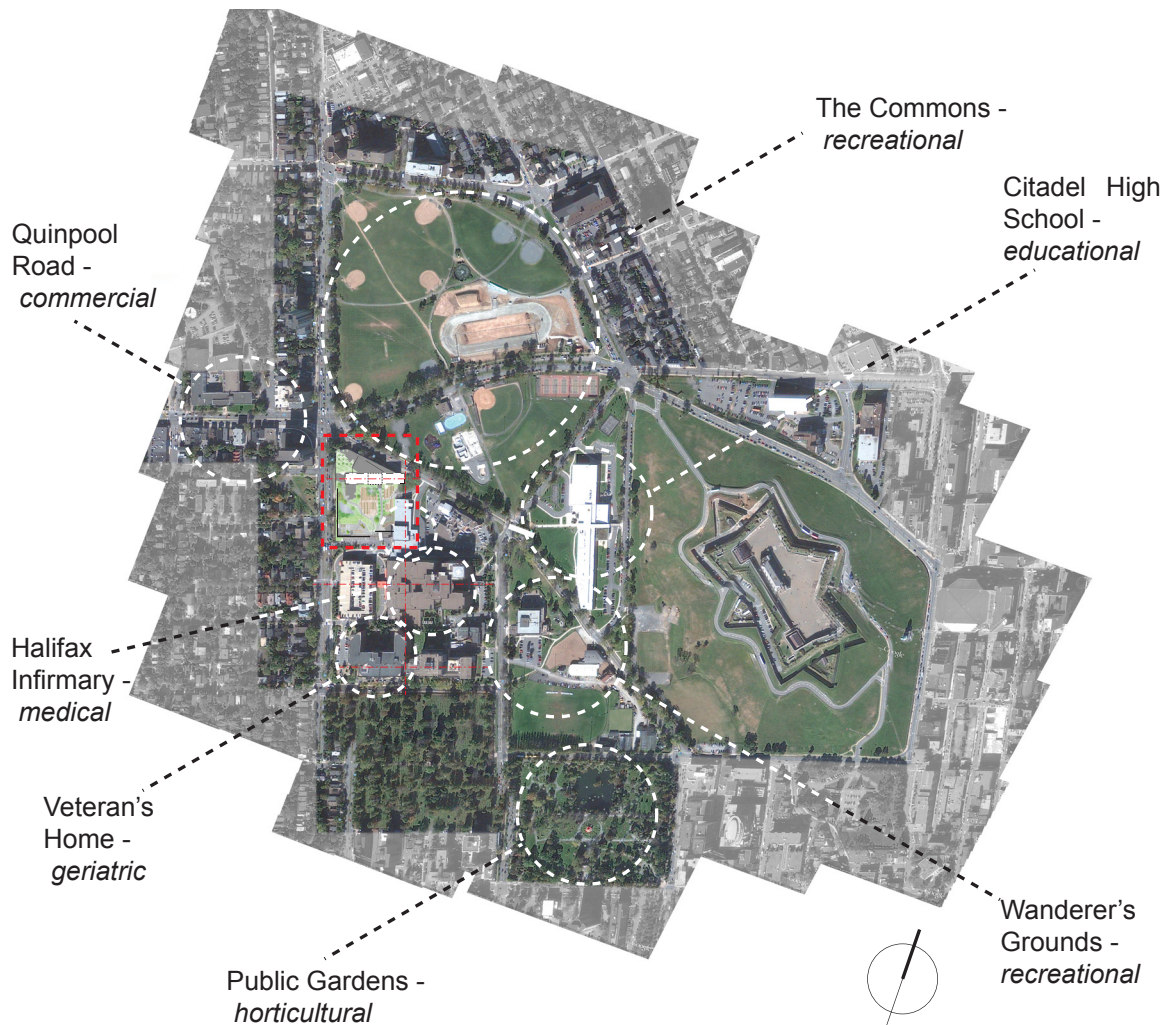


Camp Hill and surroundings in 1879. From A. Ruger, “Panoramic View of the City of Halifax, 1879.”

Site

The Halifax Infirmary hospital complex lies near the geographical centre of the Halifax peninsula. It is part of the former Halifax Commons, which was once over 200 acres of communally owned land used by inhabitants of the city for grazing animals, water supply and waste disposal. Camp Hill is a small rise in the Commons that was dry enough to be a preferred campsite for military units passing through, and a graveyard was placed there when the Old Burying Ground south of the city filled up. In 1917 the Camp Hill Hospital was built as temporary lodgings for casualties of WWI, and the block between the cemetery and the remaining Halifax Commons has been the site of intensifying health-care infrastructure ever since.

With the demolition of Queen Elizabeth High School in 2011 and the transfer of its grounds to Capital Health, the Halifax Infirmary complex will be expanding again. At the north end of the block, the QEH site rests between the Commons – the most public unbuilt land on the peninsula – and the Hospital. Located immediately adjacent to the intersection of Quinpool and Robie Streets and Bell Road, the site presides over one of the most important gateways to downtown. It rests between residential, institutional, commercial, and recreational zones, and so can programmatically interact with a wide variety of uses.



Site plan showing nearby infrastructure.

An extensive, distributed network of small clinics, attached to food and exercise facilities, is a desirable end goal for preventative infrastructure. But this site - located between a major hospital and the public Commons - provides an excellent opportunity to showcase the concept of preventative care, while also complementing and improving the adjacent health and recreational infrastructures.

Existing Health Infrastructure

The Halifax Infirmary consists of four generations of building: stepped boxes of brick and concrete aligned with Robie and Summer Streets. It has no accessible south-facing spaces, and so its landscape is unusable during all but the hottest summer months. Substantial parts of the hospital grounds are dedicated to parking and vehicle access, making the grounds less healthy, but providing vehicle infrastructure for the preventative health clinic.



View of existing Halifax Infirmary buildings from the parking garage.

The Infirmary's many staff and patients will be important beneficiaries of the new preventative care facility. It will provide relief from the hard, uniformly lit hospital wards while being close enough to accommodate a range of abilities and schedules. The hospital currently contains program which is suited to a more public space, while spaces offered by the clinic can improve the current hospital experience. The Infirmary complex contains a large institutional kitchen and a couple of cafeterias, as well as four Tim Horton's coffee-and-donut shops.⁸ The vegetables available in these facilities are inevitably shipped in from some distant location, despite the well known connections between eating fresh vegetables and health. As an example of complementary programming, an on-site productive garden could put fresh, seasonal vegetables on every plate, while creating a precedent for other nearby institutions. By adding a kitchen, the diet education classes which are commonly prescribed for heart conditions could be held on-site; currently, they

are held in re-purposed commercial spaces on the outskirts of town.

The hospital will be expanding as our population ages, and the proposed clinic will provide a direction for this future development, both medically, as we focus on low-cost and effective prevention, and architecturally. Currently, Capital Health is proposing adding five stories to the Emergency wing. In the chapter on Design, I will propose that the clinic can provide a better foundation for future development.

Existing Recreational Infrastructure

There are a number of open green spaces near the hospital, including the Camp Hill Cemetery and the Public Gardens, as well as the Commons. These spaces, like other peninsula parks, lack the sort of “natural” space that has been shown to have positive health outcomes. As I will discuss in more detail in the section on program, most therapeutic benefits do not come from simply looking at grass and shrubs, but rather by actively engaging with the landscape. As such, most Halifax parks do not live up to their potential as pieces of preventative health infrastructure; instead, they are static spaces intended to be walked over but not interacted with.

At an urban scale, the Commons, like other flat, unbuilt urban spaces, can be seen to have the character of a courtyard. This character is enhanced by tall buildings, berms, and large trees around the perimeter. The hospital has been a passive part of this wall, but the opportunity exists to create the clinic grounds as an alcove: a smaller, more intimate space that adds a new dimension to the urban courtyard as a whole.

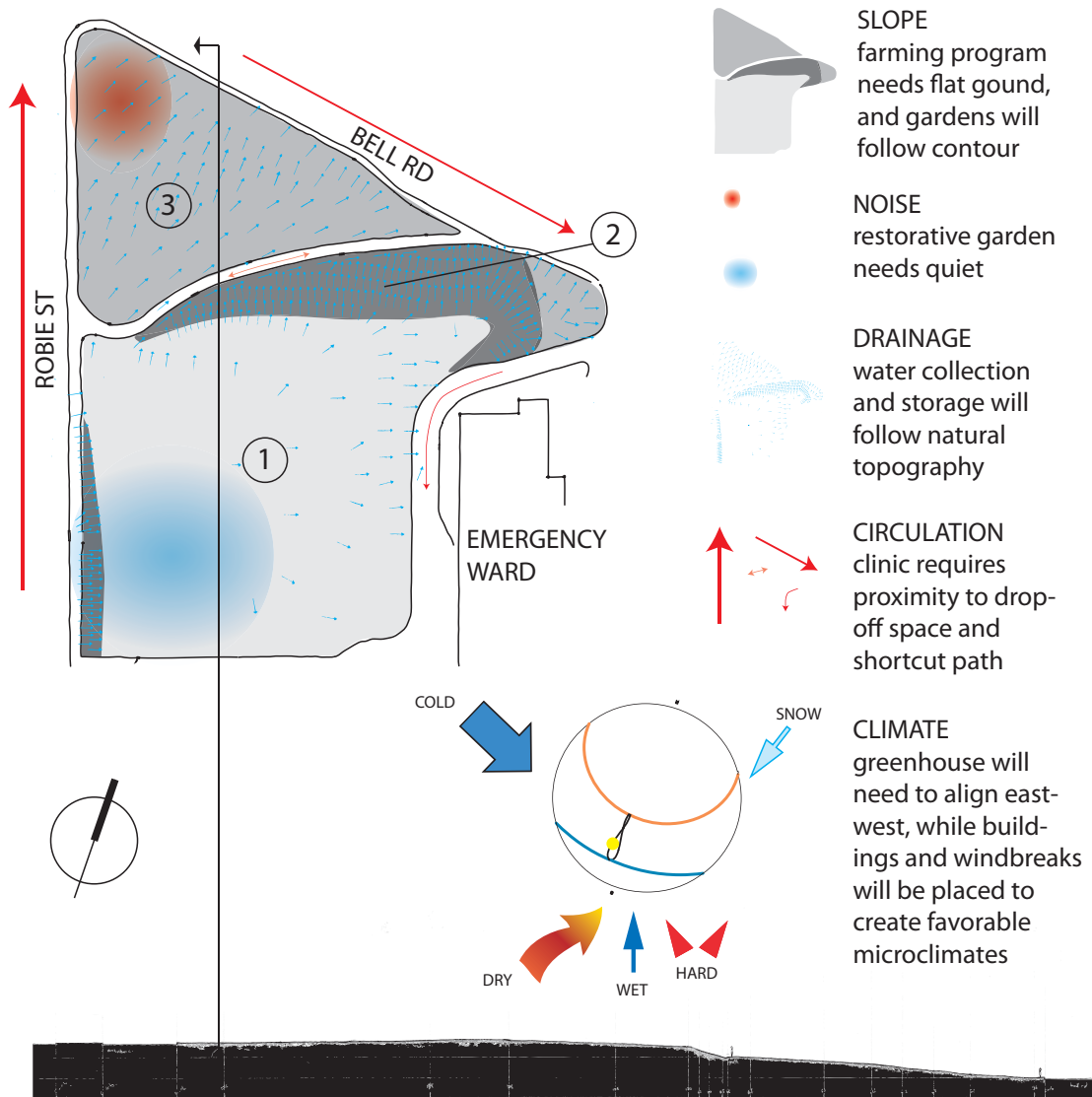
While the Commons currently provides little opportunity actively engaging the landscape - as opposed to the engagement invited by a community garden - it does provide ample outdoor sports facilities, and so forms a vital part of the peninsula’s recreational infrastructure. The Clinic will enrich the Commons by providing complementary programs to these sports facilities: massage after baseball, while-you’re-feeling-it physiotherapy for tennis elbow, and a sauna after skating around the Oval on a bright February afternoon.



Map and sketches of Halifax Peninsula parks with proposed site in red.

Site Microclimate

The project site consists of three zones: 1) a flat space between the existing emergency ward and Robie Street; 2) a steep North-facing slope just above an existing asphalt path; and 3) a moderate north-east-facing slope between the path, Robie Street and Bell Road.



Site plan showing initial conditions.

Program

Four aspects of preventative care are particularly relevant to Halifax's health-care landscape: diet, exercise, community space and knowledge sharing. The lectures of Dr. Dean Ornish and Dr. Mike Evans - which lay out the most cost-effective preventative care tactics - combined with an analysis of the Halifax Infirmary and the Commons facilities, has generated a list of activities to support a preventative care program. Since the population at large are the ultimate users of a preventative clinic, much of the site will be dedicated to activities that will attract the general, healthy population and provide opportunities for therapeutic interactions.

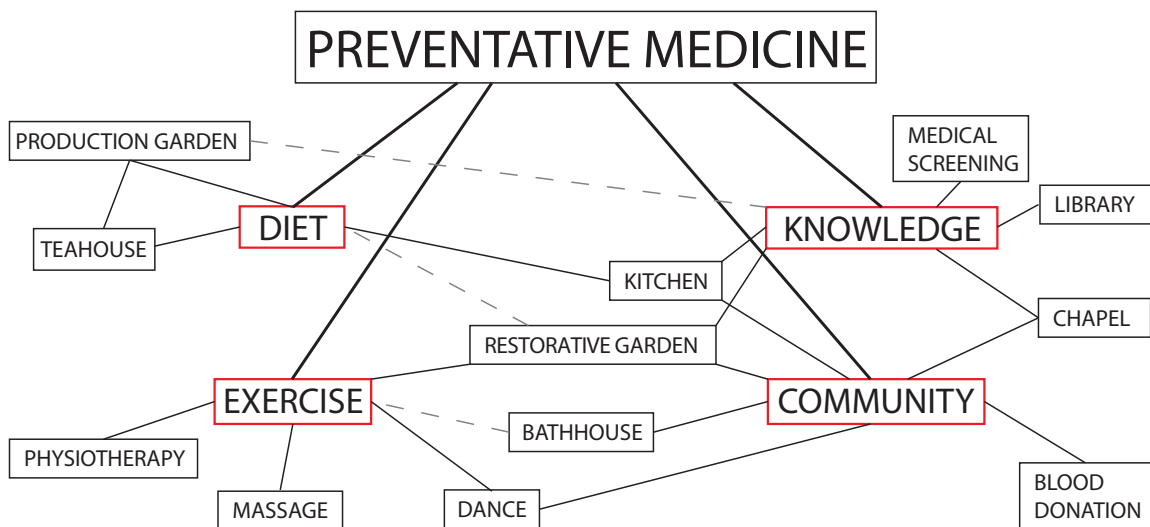


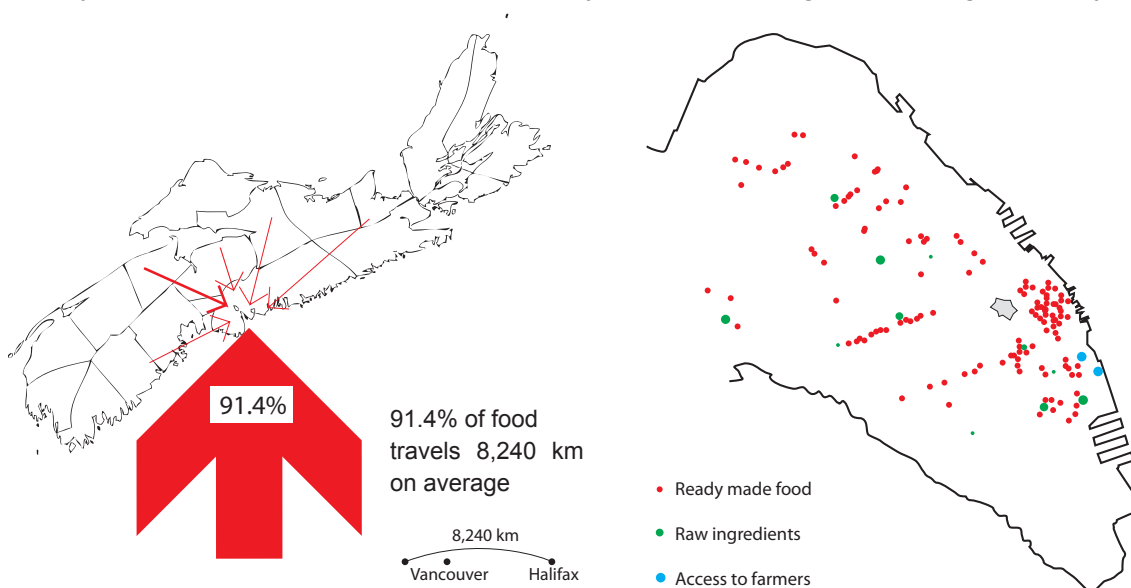
Diagram identifying programs which support preventative care.

Gardens

Carolyn Steel, in her book *Hungry Cities*, explores how food influences the design of cities. She shows how food is a social condenser; few things draw people together like sharing a meal. Spaces for preparing and consuming food will attract people to the preventative care center while promoting a critically important therapeutic lifestyle change: a healthy diet.

But no amount of education will convince people to eat vegetables if they are not available; improving access to healthy food is as important as telling people what healthy food is. Reports show that food in this city travels over 8,000 km on average.⁹ Capital Health has long recognized that this has negative individual health outcomes: shipping degrades taste and nutrition, and promotes the sale of easy-to-transport processed food.¹⁰ By showing what is possible to grow in an urban context, a small demonstration farm could simultaneously provide a steady supply of fruits and veggies to the clinic, provide gentle exercise to gardeners, and attract a specific group of nearby residents to the site.

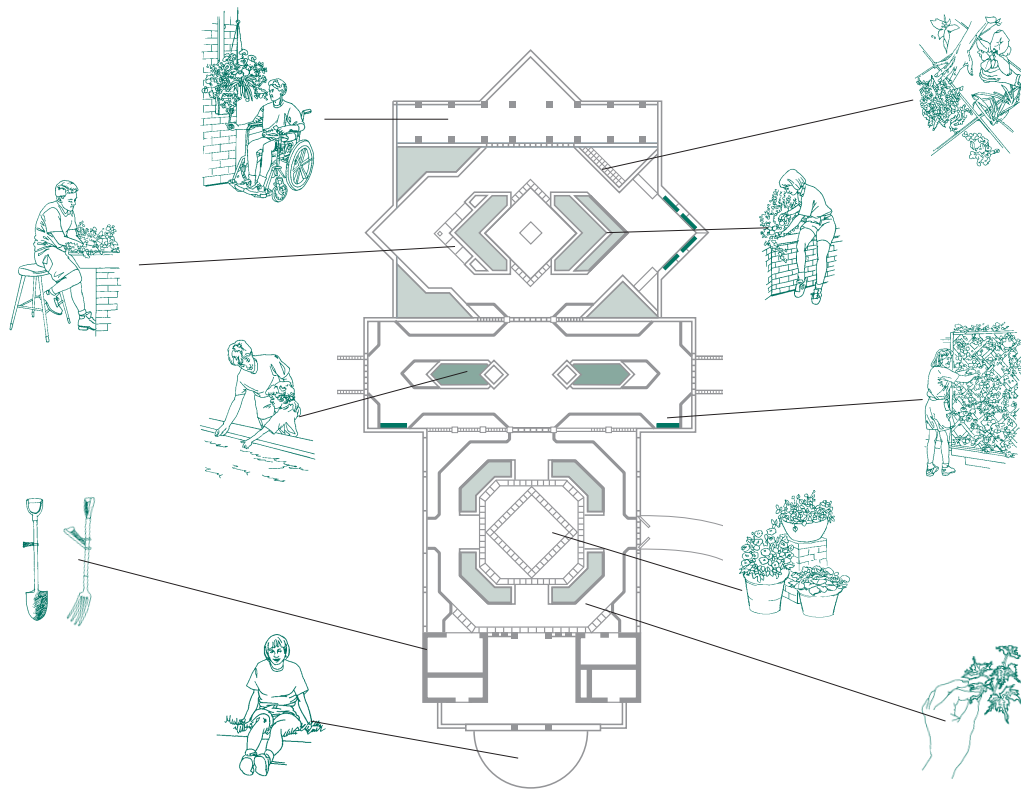
While the term ‘farm’ conjures images of extensive, monocultural fields, the most profitable farms operating in Nova Scotia today are small-scale and intensive. Hutton Family Farm, located in the Annapolis valley, is able to bring tons of vegetables, year-



Disconnection between Halifax and food production. Statistics from Jennifer Scott and Maria MacLeod, “Is Nova Scotia Eating Local?”

round, to the Halifax Market, from only 2 acres of intensive gardens. This is smaller than the proposed clinic site. A production garden cannot replace our rural hinterland, but it could provide truly fresh and healthy food to the hospital community.

Beyond producing food, a garden or greenhouse has other potential impacts on well-being: restorative “biophilic” space, and the opportunity for active stewardship. The essays of Judith Heerwaagen¹¹ present a growing body of research that show the beneficial effects of certain “natural” environments on human well-being. This research gives rise to the theory of “biophilia”, that human beings are evolutionarily predisposed to feel better in ecologically healthy, bio-diverse spaces. The clinic site has the ability to respond to this research through the inclusion of a biophilic restorative garden. One of the most widely recognized designs for a therapeutic garden is Buehler Gardens in Chicago. Through the careful design of individual garden elements, a truly accessible environment is created.



Buehler Enabling Gardens plan and sketches. From Chicago Botanic Garden, *Gardening for People of All Abilities*.

Active stewardship, as described in Erika Svendsen's article "Cultivating Resilience"¹², refers to the therapeutic benefits of getting actively involved in public space. Her research delves into the ways that well-being crosses scale from community cohesion to individual health. By including only loosely designed space for community groups, the clinic site will be able to actively engage the local population, in contrast with the passive experience available at most existing peninsula parks and open spaces.

To some users, the site will consist primarily of these productive and therapeutic outdoor elements: a unique micro-landscape on the way to the Oval, or on the walk home from work. The creation of space for active social interaction, improved access to healthy and delicious food, and gentle exercise will form the basis of the preventative care program.

As an urban landscape project, a statement on the relationship between the natural and built environments will be implicit in the design. Because our relationship to our bodies is the first scale at which we engage with our concept of "nature", architecture that expresses a changed medical paradigm will need to engage this construct on several other scales. In *Architecture and Nature*, Christine Macy and Sarah Bonnemaïson explore the evolving concept of 'nature' through selected architectural works. The interrelations between the way we conceive of 'nature' and the actual constructions we make is richly developed, as each project is shown to influence, and be influenced by, the environment in which it is created. The work of the architecture firm Weiss and Manfredi, in particular their concept of "inhabitable topography" as described in the book *Surface/Subsurface*, is relevant. Drawing heavily on land artists such as Mark Dion and Richard Serra, they examine the relationship between infrastructure and natural and cultural forces, and the ways in which this resulting landscape can be inhabited and programmed.

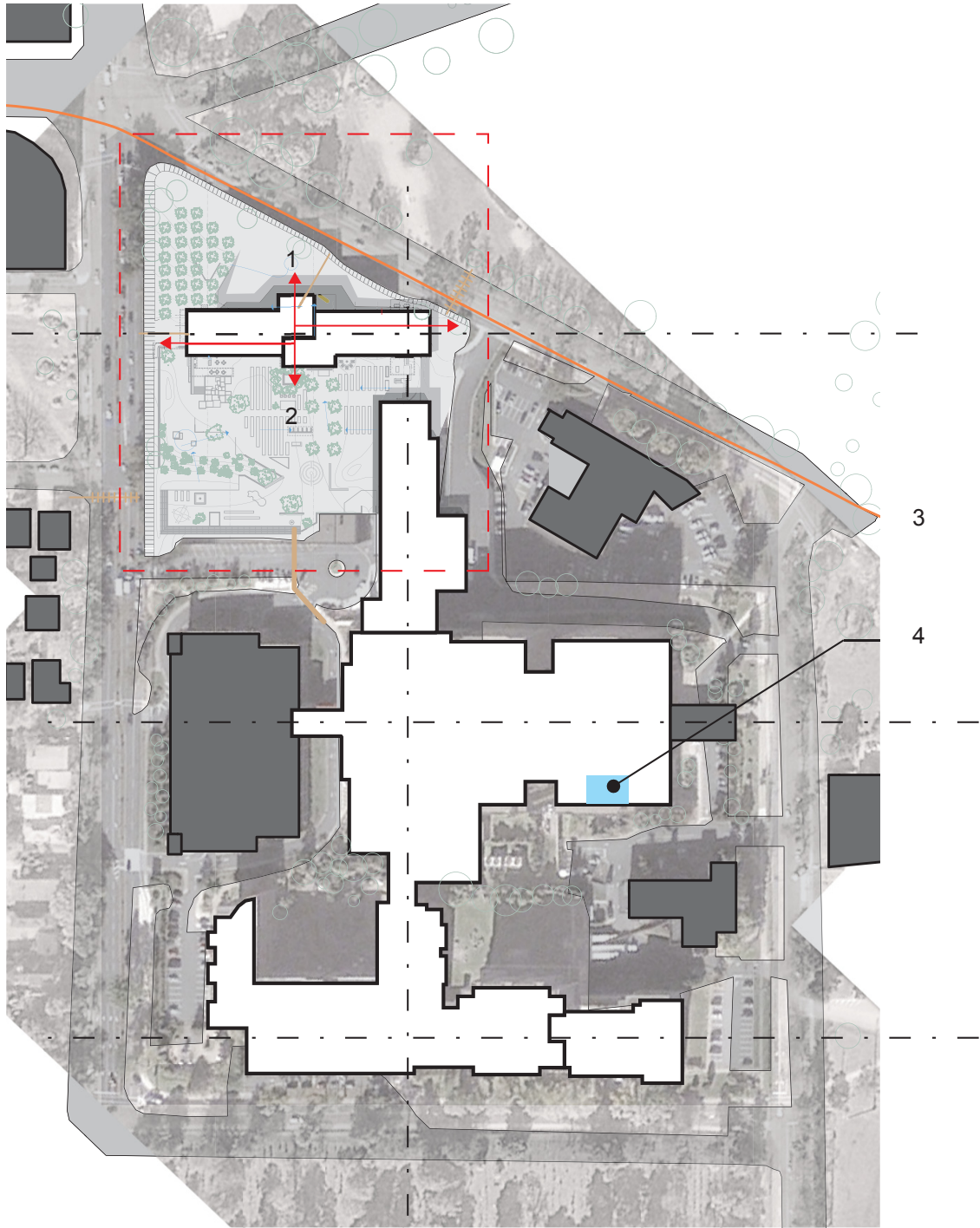
DESIGN

Urban Response

The Hospital and the Commons each have different requirements for complimentary outdoor space. The Halifax Infirmary requires south-facing, productive garden space that can be inhabited in the cool and windy shoulder seasons. The Commons, which already has flat open space to spare, needs more diversity while enhancing the feeling of enclosure. In particular, the Commons lacks shelter, accessible water, clumps of trees and intimate spaces. A separation in outdoor space is needed, distinguishing between the Commons' need for shade and the hospital's need for sun.

Several factors conspire to locate the building which will divide the sun and shade gardens. As the initial site conditions diagram on page 10 shows, the site is divided into three zones topographically. As a steep, north facing slope is unsuitable for food production, it is an appealing initial place for development. The previous hospital development has three clear axes running orthogonal to Robie Street, and this steep slope approximates another orthogonal axis. So building in this location extends the architectural language of the hospital towards the Commons. Placing a building on this new axis has a further advantage, as the building can become a shortcut path between Robie Street and Bell Road. People flow down through the building, bringing casual passers-by in contact with opportunities for improving and sustaining health. A linear building along this axis is the first design move.

A linear form implies a cross-axis - in this case the cross-axis is also a path connecting the Commons and the Clinic gardens. Making this cross-axis explicit is the second move. A secondary circulation path will draw people through the building and up into the more intimate and sunny garden above.

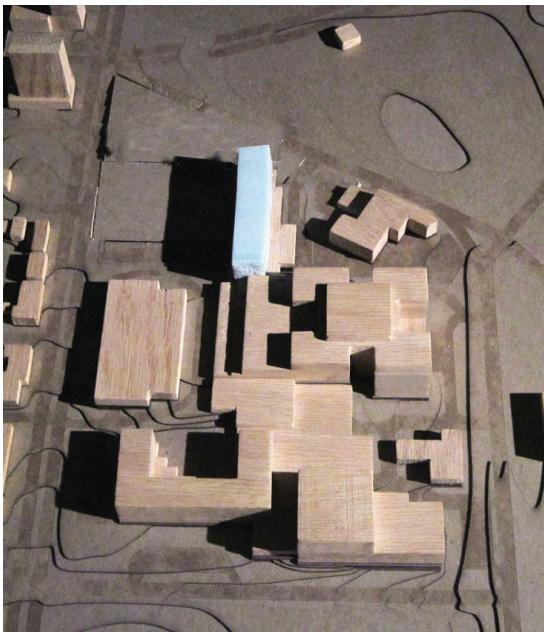


Site plan showing existing hospital and proposed clinic. Numbers refer to:

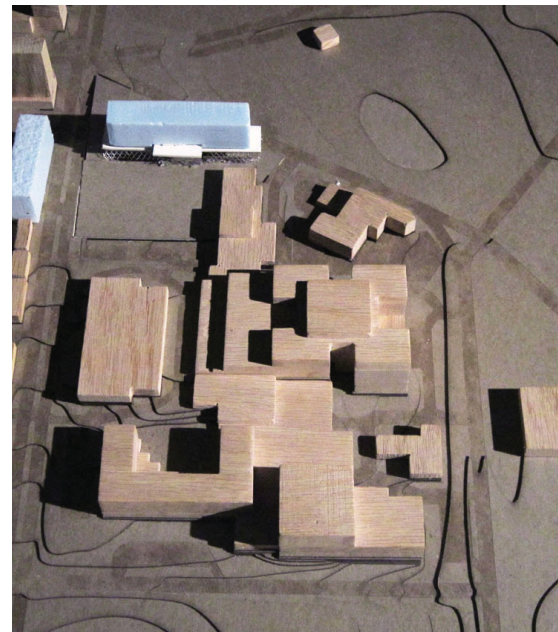
- 1) Shade Garden
- 2) Sun Garden
- 3) Existing bike route along Bell Road
- 4) Existing Library and Chapel location in Halifax Infirmary

Sun Studies And Future Development

The Halifax Infirmary intends to continue expanding as our population ages. The next phase of this expansion is planned on top of the existing Emergency wing, which was designed to accommodate an additional five stories. Sun studies show that building five stories up on the emergency wing of the Halifax Infirmary will cause significant shading in the south garden, and will not contribute to the wall enclosing the Commons. The current Infirmary complex lacks any public, south-facing space, which means the landscape around the hospital is unusable in all but the hottest seasons. Accessible, enjoyable outdoor space is a key requirement of a healthy lifestyle. Further, if preventative care is to become the foundation of our future medical paradigm, then the preventative clinic should architecturally form the foundation of future hospital development. Sun studies show that building the intended five-story expansion on top of the proposed Clinic, instead of the Emergency wing, will reflect large amounts of light into the south garden, while not substantially shading any open portions of the Commons. This will allow the garden to thrive as an expression of healthy lifestyle through the next phase of hospital expansion.



Current hospital expansion plans, with significant shading in the garden during the morning hours and no reflected light or wind protection.



Proposed preventative care clinic as foundation for future hospital development. Warm, south-facing space is created.

Creating the foundation of future hospital development makes demands on the Clinic structure and layout. Future construction can be facilitated by making a simple, linear form, with a flat roof, and by considering vertical circulation in this first phase of construction. A clear structural logic needs to be evident for future additions and renovations. A diagrammatic response to these considerations can be seen in the image below.

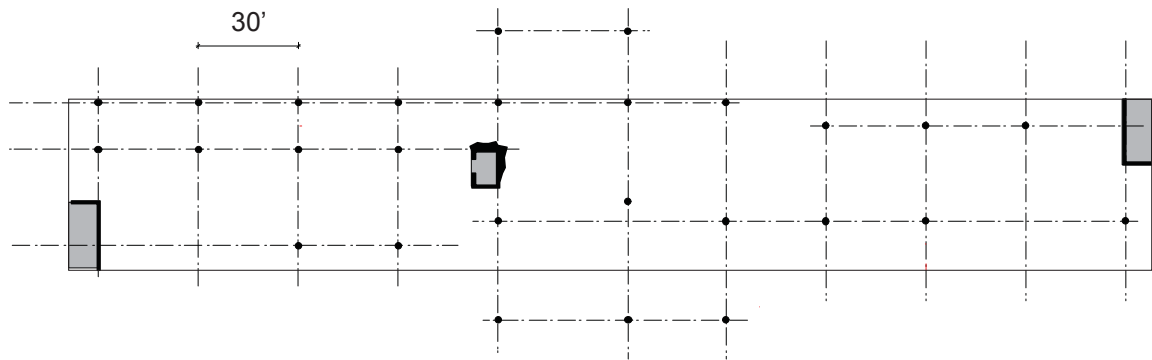
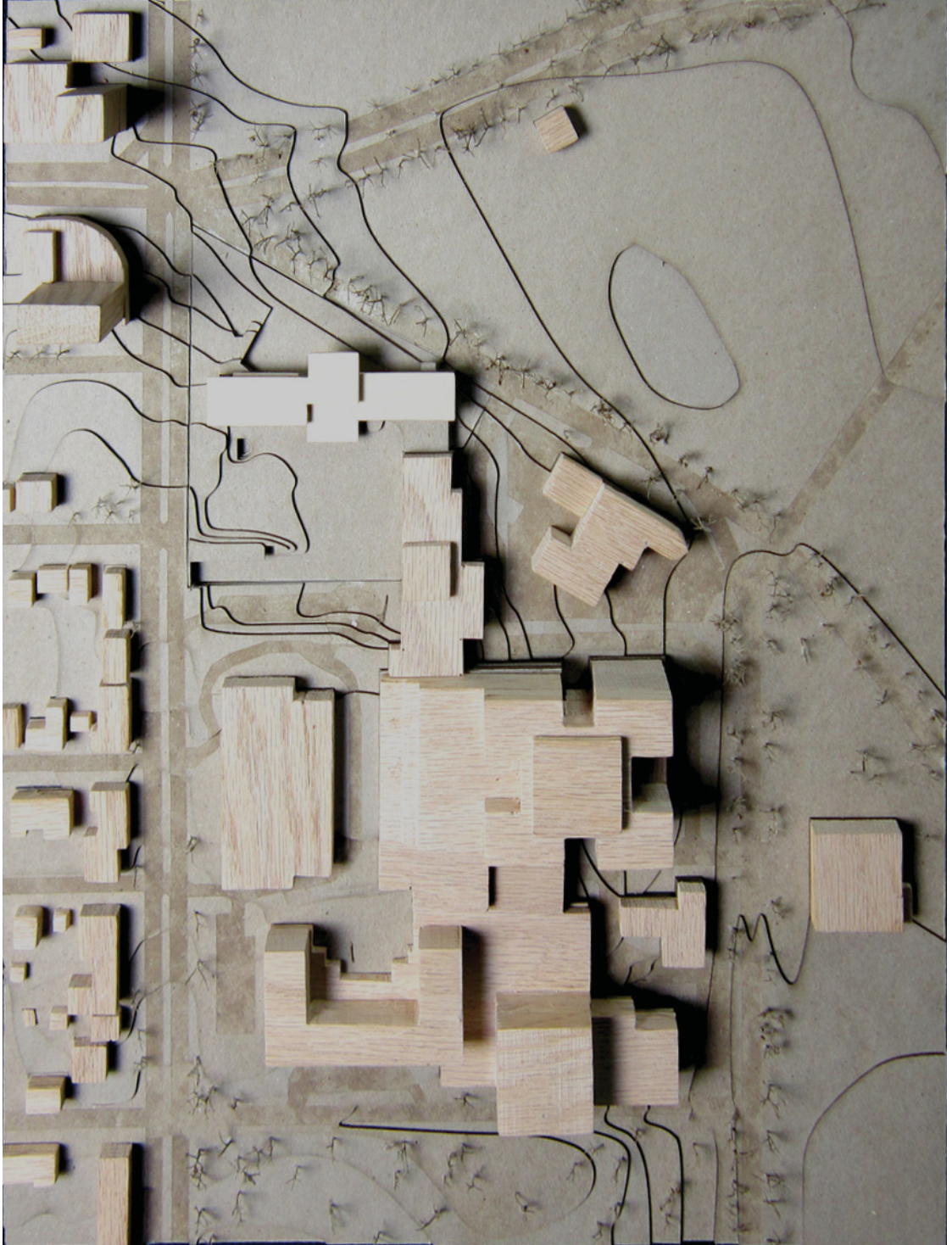


Diagram showing simple form with structural grid and fire escapes.

A regular 30' span along the building allows for simple beams and one-way slabs, facilitating future growth above the clinic. Across the building, the columns can move along the beams in response to program. In two places, transfer beams are used to eliminate columns and open the building to the south. Fire escapes are located at the ends of the building, with a central elevator core. This future development is not fully designed as part of this project, and is shown as a simple hatch in the sections.

The building location, orientation and the needs of future development generate the rough massing of the building. To complete the massing, the roof is split into two levels. This expresses the initial slope of the site along the building and allows two roof canopies to be created. The higher one opens to the Commons, operating at the larger scale of that space, while the lower one opens to the sun garden. Light pours through the space between the two levels, creating a ray of sunlight which moves through the shade garden throughout the day.



Site model showing the Halifax Infirmary, the Commons and the proposed Clinic.



Site model showing the North elevation massing, as seen from the Commons.

Habitat And Flow

Preventative care implies an ecological - as opposed to a mechanical - analogy for understanding our bodies, and the design of a preventative clinic reflects this. Whereas the machine is a clearly defined unit, made of discrete and comprehensible parts, an ecosystem has boundaries which depend on context. Oxygen may diffuse only a few centimeters into the soil, while the water that flows over it may come from rain many kilometres away. The clinic building should have similarly contextual boundaries, with spaces flowing into other spaces, programmatic boundaries blurring, and the landscape moving between inside and outside.

If each particular program can be considered a habitat, this habitat will have material and spatial qualities which relate to that particular program, and which need to be designed in themselves. Some of the key habitats will be presented in the coming pages as isolated moments within the building, with an explanation of the specific intentions behind each space.

As the various habitats in an ecosystem are connected by flows of energy and matter, the habitats in the clinic landscape will be connected by the flow of people, material and space. These flows will be shown following the individual habitats as larger scale drawings and photographs.

First Flows

The two first moves described in the Urban Response section above create the two most significant flows in the building, and deserve explanation before the habitats are explored. The first flow is the flow of people along the building thoroughfare from Robie Street to Bell Road. Along the main axis of the building, this first flow generates the main material strategy - hard, heavy, stereotonic materials along this flow and lighter, softer materials in the “eddies” around this flow. The initial organization of program also comes from this flow, as activities requiring more privacy or quiet are placed far from the building thoroughfare.

To celebrate the cross-axis connecting the Commons and the garden, the hillside flows through the building, explicitly blurring the line between building and landscape. This second flow is centrally located in order to fit the existing topography, as well as to allow sufficient room for accessible ramps connecting the upper and lower levels of the building.



Section through the cross-axis linking the garden to the Commons.

As integrating the clinic building with the landscape is an intention of the project, the topography of the site is inhabited by program wherever possible. This results in several programs which are banked into the hillside, and moments throughout the building where the ground plane changes elevation in order to mirror the topography in adjacent, outside spaces.

These first flows of landscape and circulation create the framework within which the various habitats of preventative care are developed.

Habitat

Play Infrastructure

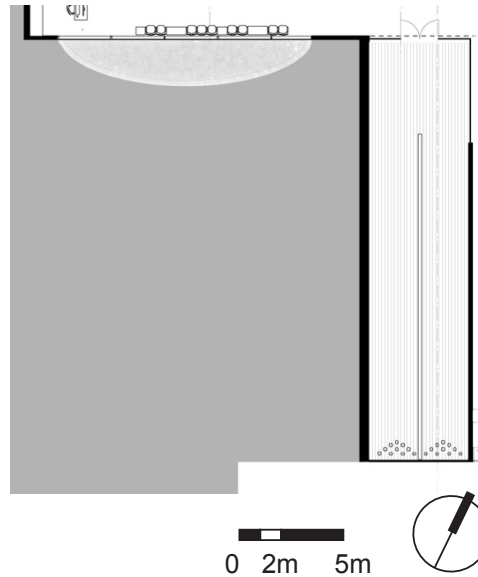
Exercise is one of the key pillars of the preventative care program. While this is exploited through several other programs, the opportunity exists within the building to transform certain architectural features into opportunities for play. The most visible of these is the climbing wall, which transforms the notion of vertical circulation. An elevator provides access for people unable to navigate stairs, in particular the nearby hospital population. Equally important, the outside of the core is clad with holds and an articulated surface for those members of the public who are healthy and want to improve their strength and balance.



Section showing climbing wall, creating vertical circulation options for people with a range of abilities.

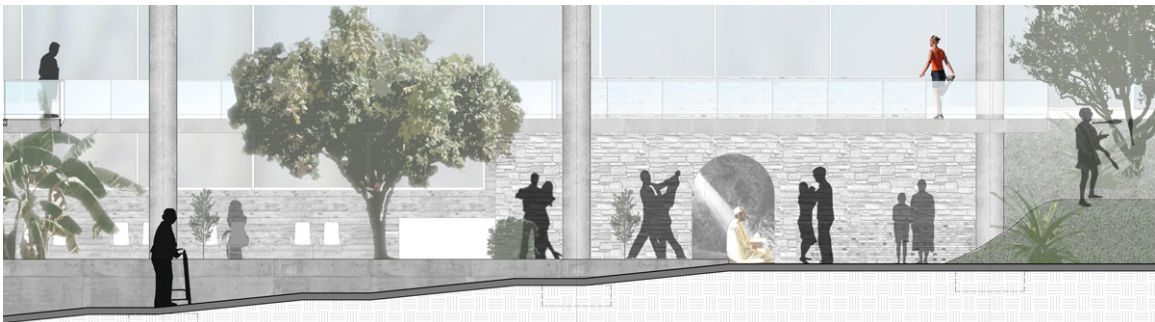
A bowling alley is included for two reasons: first, as a casual activity to activate the waiting room; and second, as a reference to the “Bowling Alone” hypothesis in public health. Robert Putnam revealed that while the number of Americans bowling has increased, the number bowling in leagues has dropped - part of a general decline in social connectivity that he notes in his book *Bowling Alone*. The image of lonely bowling has

been picked up by members of the public health community, who note the correlation between community and individual health. The location of the alley next to the waiting room allows an opportunity for those waiting to do something active, social and enjoyable while they wait.



Plan view of bowling lanes and waiting room, creating the opportunity for fun activity while waiting.

Dance is equally social activity and exercise. A dance floor is a flexible space, which draws upon the same intentions as - and serves as an indoor extension of - the Commons. The Commons are fundamentally an open space, available to any number of programs throughout the year; the dance floor can be used for yoga or a vaccination program as easily as for dancing. However, the dancing program is expressed through the placing of balconies, a raised dias at one end for a stage, and seating around the edges for resting one's feet.

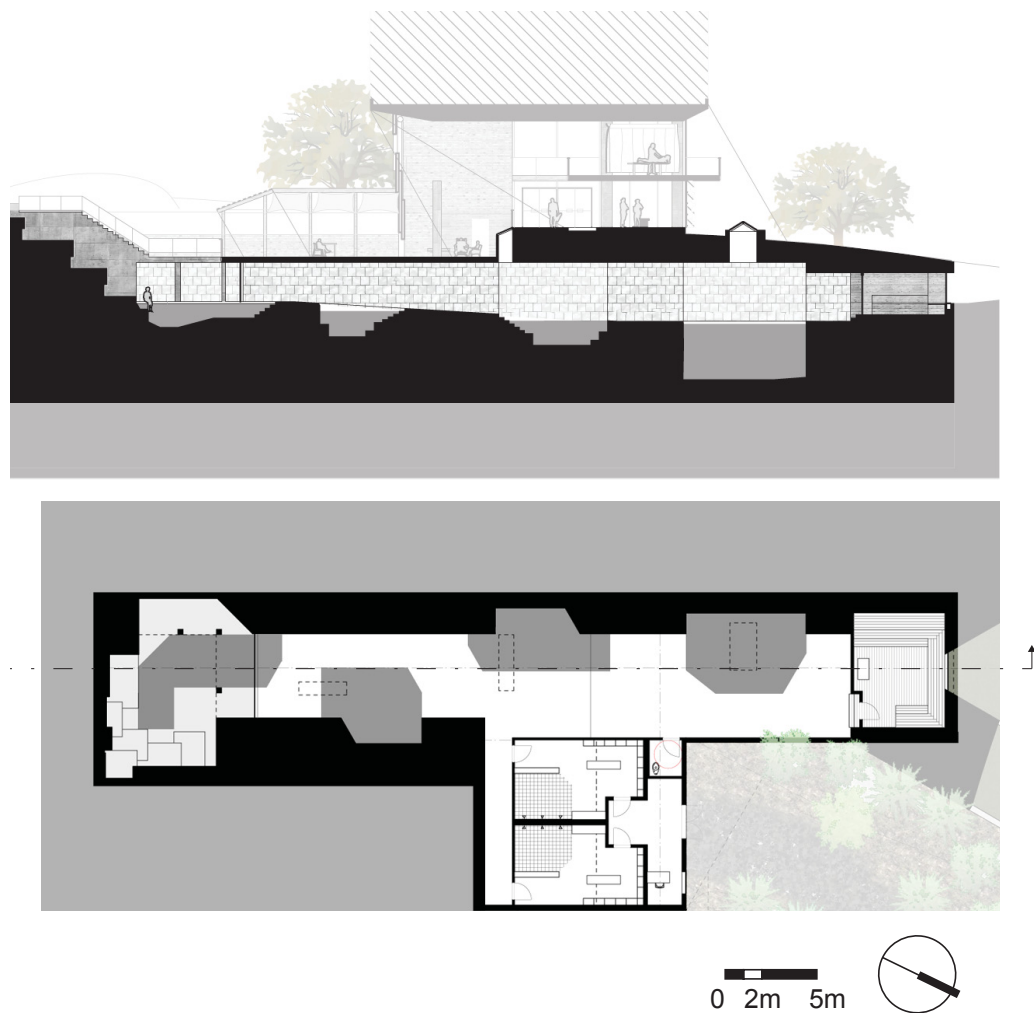


Section showing dance floor, with raised stage at the right side, and balcony at left side.

Bathhouse

Spas and saunas have a long association with health in other countries, and sweat lodges have long been used in Nova Scotia to promote health for both individuals and communities. The Halifax peninsula currently has no inclusive public sauna, and this program could support and enhance the existing sport infrastructure on the Commons.

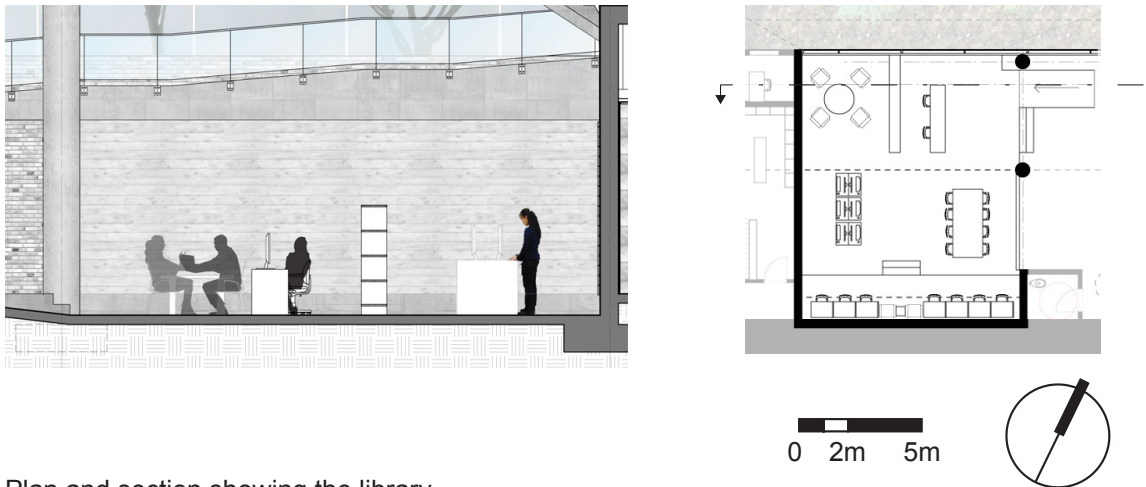
As a bathhouse is a non-light-intensive activity, as opposed to reading for example, the opportunity exists to make the bathhouse a space where the flow of light becomes a designed element.¹³ This allows the program to move underground, and creates the opportunity for the bathhouse to emerge as moments in the garden.



Bathhouse plan and section, with the program emerging in the garden at either end.

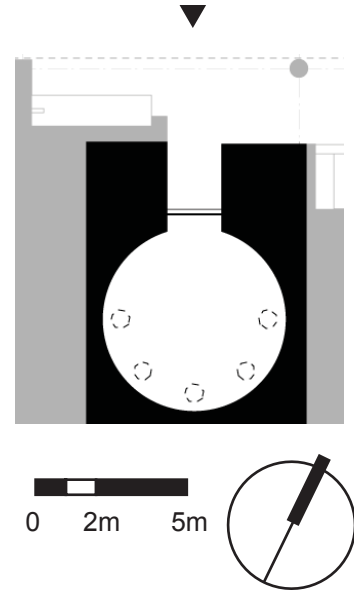
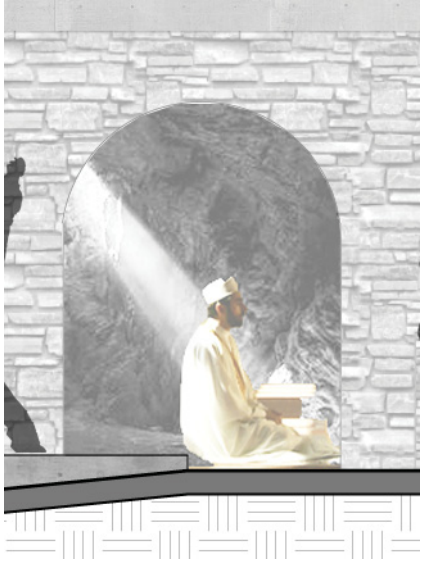
Borrowed Program - Library and Chapel

The library in the existing Halifax Infirmary occupies valuable space close to the edge of public access. Moving the library to a more public space will increase its profile and free up hospital space. As a library needs ample indirect light and controlled access - for security reasons as well as seclusion from busy activity - a north-facing space away from main circulation paths was chosen. Some acoustic dampening can be provided by cladding the walls and ceiling of the library alcove in wood.



Plan and section showing the library.

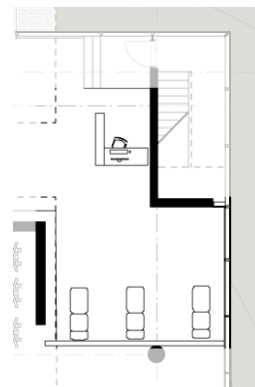
The existing chapel sits in a row of offices in the Infirmary, undistinguished from its neighbors except by a sign on the door. Again, room can be made available in the existing hospital while creating a more architecturally inspiring space by moving this program to the preventative clinic. An underground space was chosen, as light plays a metaphorical role in many spiritual traditions. Skylights, oriented different directions and scattered around the edges of the room bring in rays of light, which will play across the space as the sun moves across the sky.



Plan and section showing the chapel, with skylights generating moving pools of light.

Blood Services

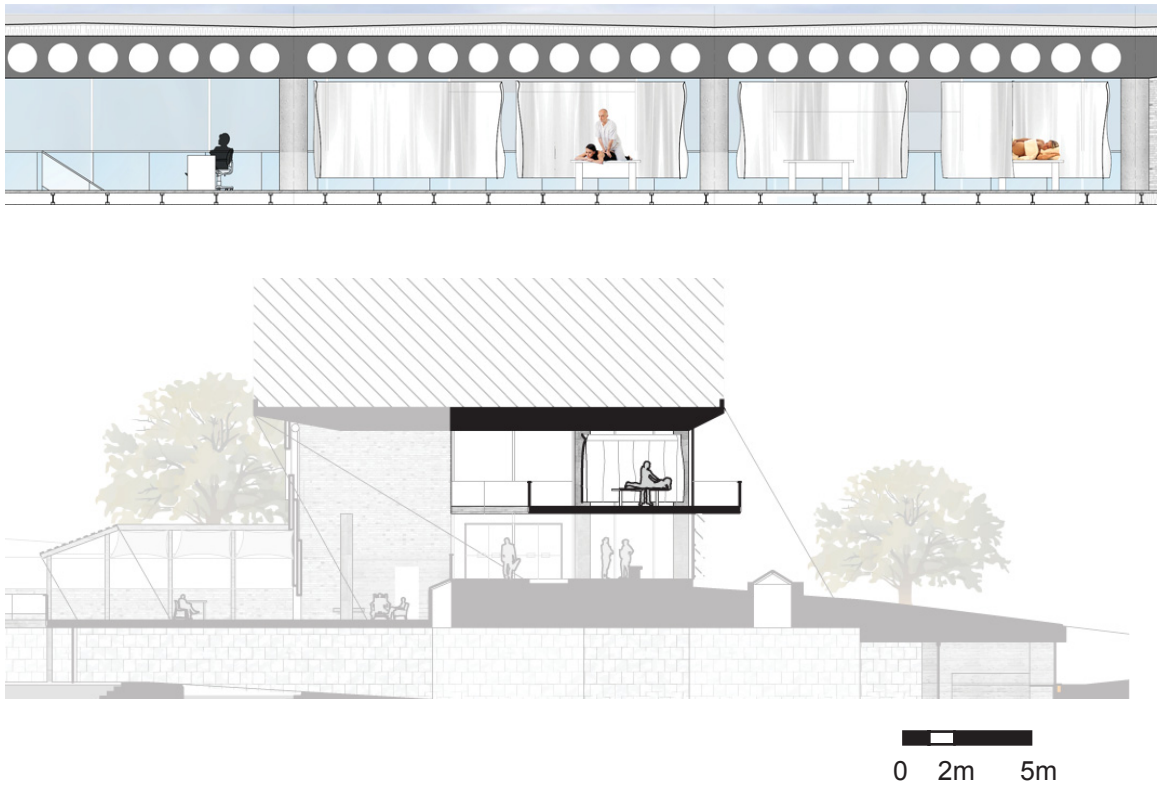
People who give blood need to be healthy in order for their blood to be used, so a blood donation area is a piece of conventional medical infrastructure that needs to connect with the healthy population. A small area, adjacent to the main circulation path and easily visible from Bell Road means that passers-by are continually reminded of the opportunity to donate. Donation is encouraged by placing the clinic in a space with a high ceiling and high south-facing windows, making it possible to place the donor couches among potted tropicals, in a subdued garden atmosphere.



Plan and collage showing blood donation area.

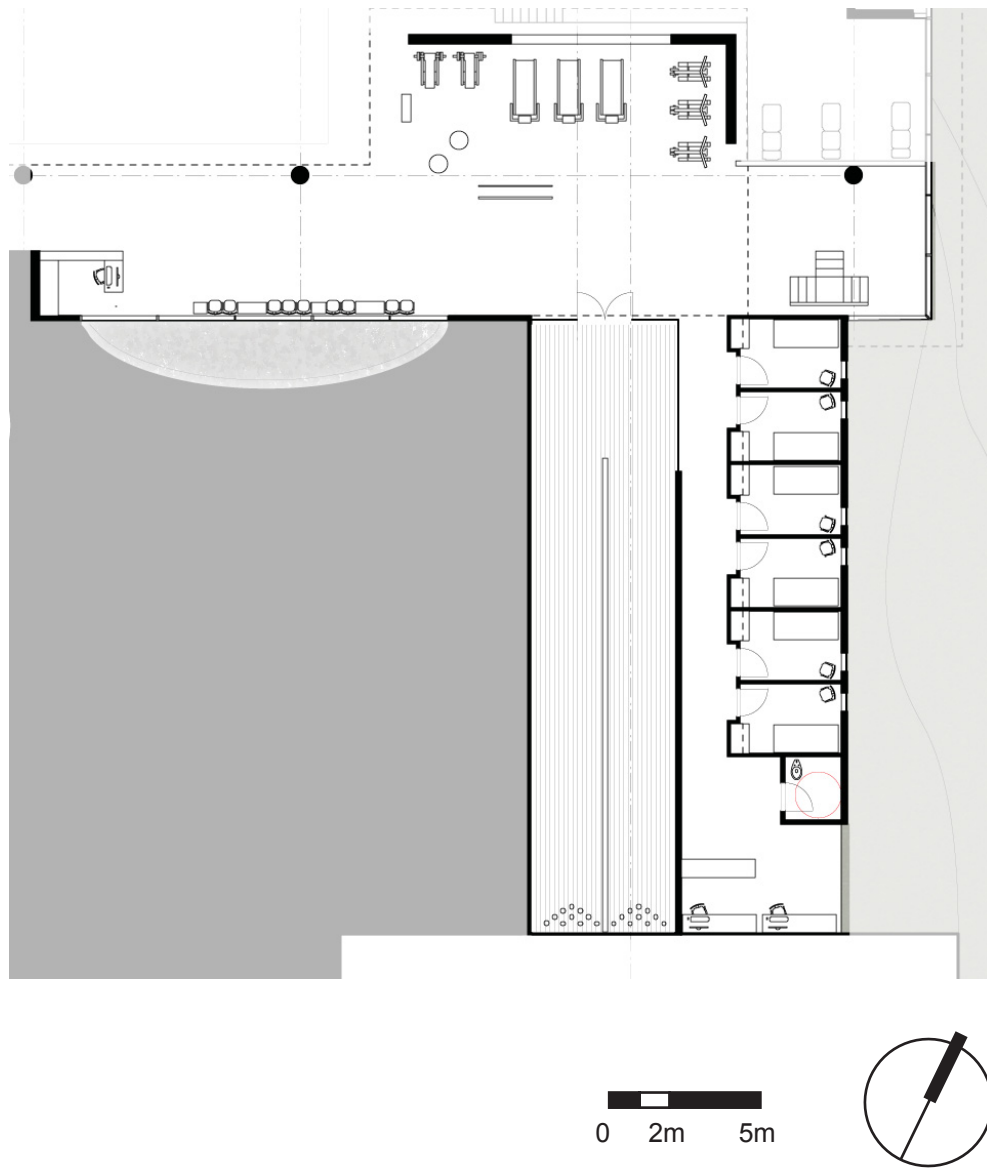
Professional Services - Massage and Physiotherapy

Massage has been shown to have numerous therapeutic benefits, particularly the ability to reduce stress and speed up muscle healing. The stress-reducing benefits of massage demand a space well removed from the flow of people, and with a softer texture of finishes around the massage areas. By placing the massage area on a platform high in the atrium, long-range views over the Commons are created.



Perpendicular sections showing the massage area, with flexible textile walls and balcony overlooking the Commons.

Physiotherapy in the traditional sense is a piece of curative infrastructure, but the possibility exists to provide advice before injuries occur by meeting with a physiotherapist as part of any exercise regime. Both private consultation rooms and an exercise space are required; by placing the exercise room in a public location, passers-by are invited to become active themselves.

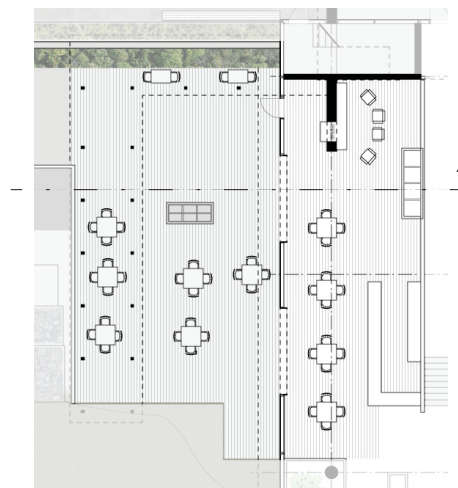
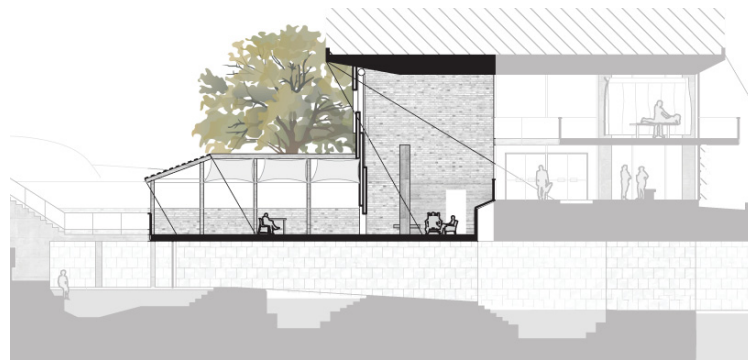


Plan of physiotherapy area, showing public exercise room, waiting area and attached bowling lanes, private examination rooms and offices.

Teahouse and Salad Bar

A large portion of the life that happens in a city is commercial, and food establishments are traditionally the one place to go in a hospital away from the wards. A teahouse and salad bar are the preventative care response to the Tim Hortons restaurants ubiquitous in the existing Halifax Infirmary - a healthier type of food available in a more integrated space.

Proximity to productive gardens and indoor growing space is a priority for the teahouse, as well as a range of seating options. Trellises and canopies, a south-facing aspect and significant windbreaks to the west and north all extend the program out into the garden and through the colder and windier shoulder seasons. By placing the teahouse at the west end of the building, adjacent to Robie Street, it acts as a draw to pedestrians in the nearby Quinpool Road area, and provides a getaway for hospital staff and patients.



0 2m 5m

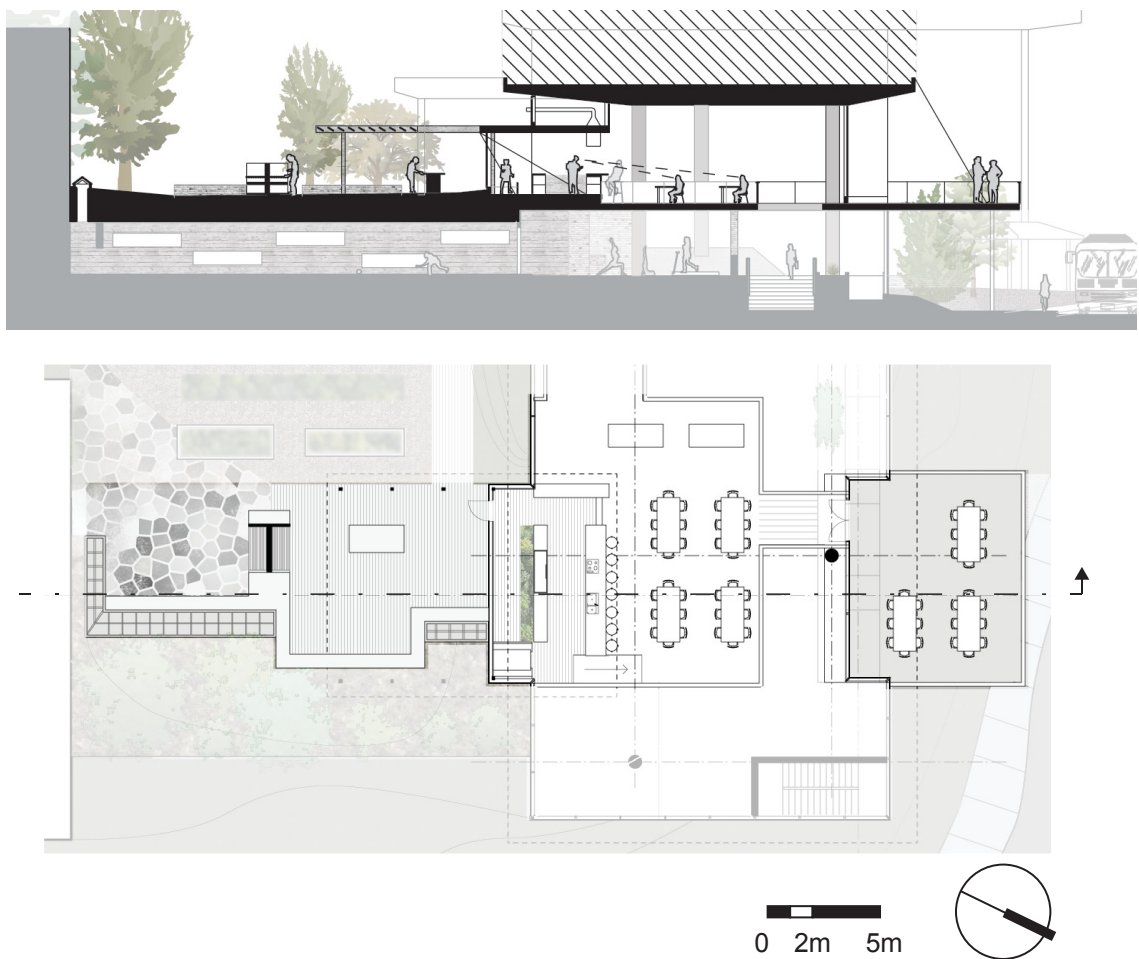


Plan and section showing the teahouse, with large operable doors that connect indoor and outdoor seating.

Kitchen

A kitchen, within the context of preventative care, has an educational role as well as a culinary one. This implies a certain theatrical nature, with the need for clear sight lines, as well as the proper equipment for cooking food and venting smoke.

As the connection between growing food and consuming it should be made explicit in this project, the kitchen needs to integrate with the garden without interrupting it. At the same time, eating is a critical activity for social connectivity, so the setting for the act of eating itself takes on another aspect of the theatrical. Diners and cooks are both seeing and being seen. Thus the kitchen flows through the line between inside and outside, becoming a dining terrace overlooking the Commons on one side, and an outdoor room for cooking and food preparation on the garden side.



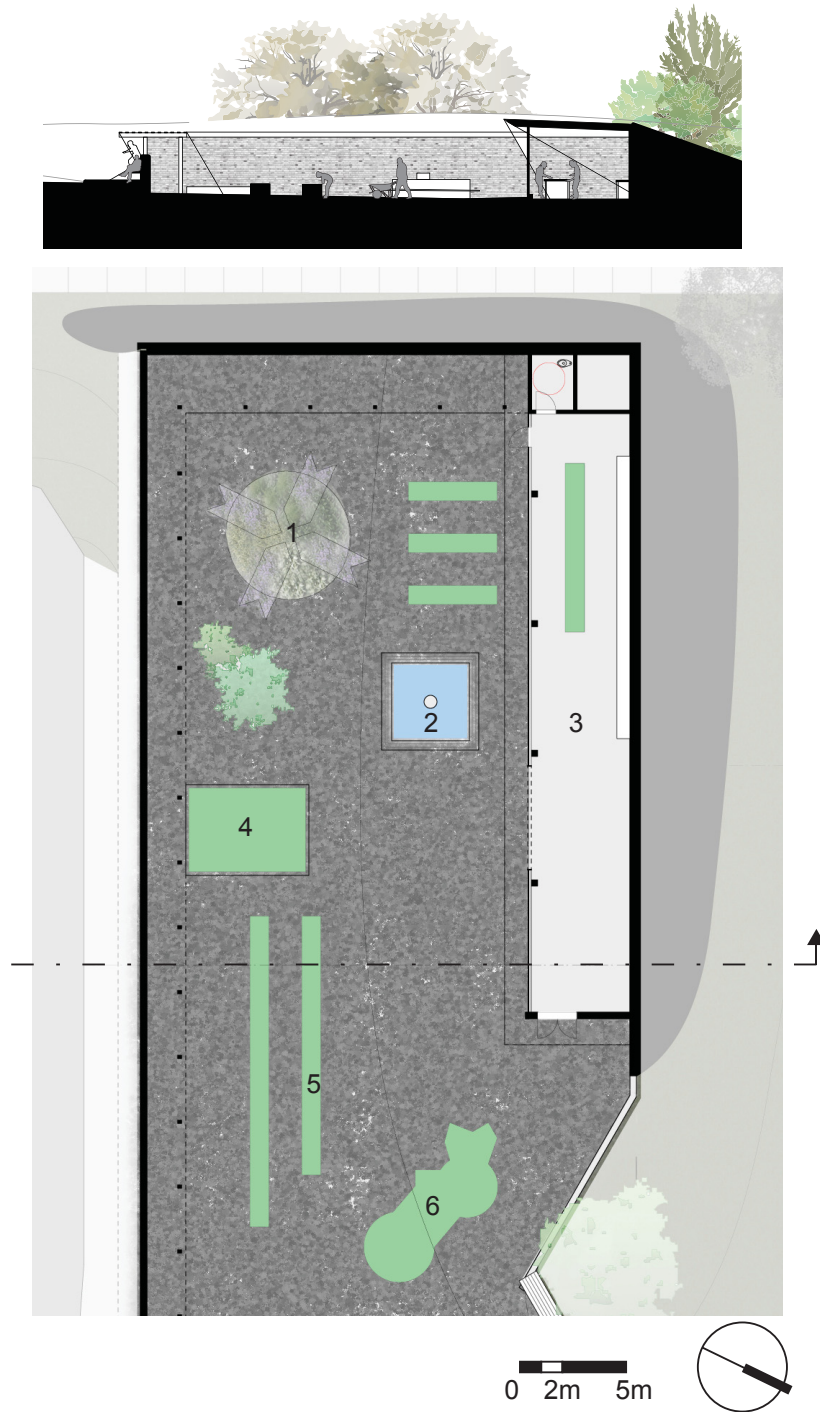
Plan and section showing the kitchen and dining facilities, flowing from the garden to a terrace overlooking the Commons.

Restorative Garden and Therapeutic Greenhouse

Horticultural therapy refers to gardening in order to achieve therapeutic benefits; it aligns more with the user group of curative care than the rest of the preventative clinic. A therapeutic greenhouse needs a direct connection with a secluded, quiet restorative garden, and so is designed as a separate entity within the landscape. As shown in the diagram on page 10, the existing topography of the site creates a small pocket of quiet at the south-west end of the garden. This is also close to the Infirmary entrance, and so the greenhouse and restorative garden are located in this pocket, with additional walls and berms to make the space more secluded.

The greenhouse only requires full sun in the winter, so it does not require a glazed roof. Instead, the greenhouse is bermed into the ground: it becomes a landscape element within the garden, and also benefits from the increased thermal mass. The garden elements in the restorative garden are inspired by the Buehler Enabling Garden discussed on page 13.

These programmatic habitats are connected by flows of people, material and energy, creating a system that connects the clinic with the gardens, the Commons, the Infirmary, and the city beyond. These flows will be explored following the drawings of the restorative garden, on the next page.



Plan and section showing restorative garden and therapeutic greenhouse. Numbers refer to:

- 1) Medicine wheel
- 2) Quiet fountain
- 3) Greenhouse
- 4) Raised grass
- 5) Accessible raised beds
- 6) Tactile garden bed

Flow

Gardens and Indoor-Outdoor Flows

The gardens are designed around the architectural moments that occur as a result of the habitats described above. Among these, the flows of water and circulation in particular generate the garden strategy.

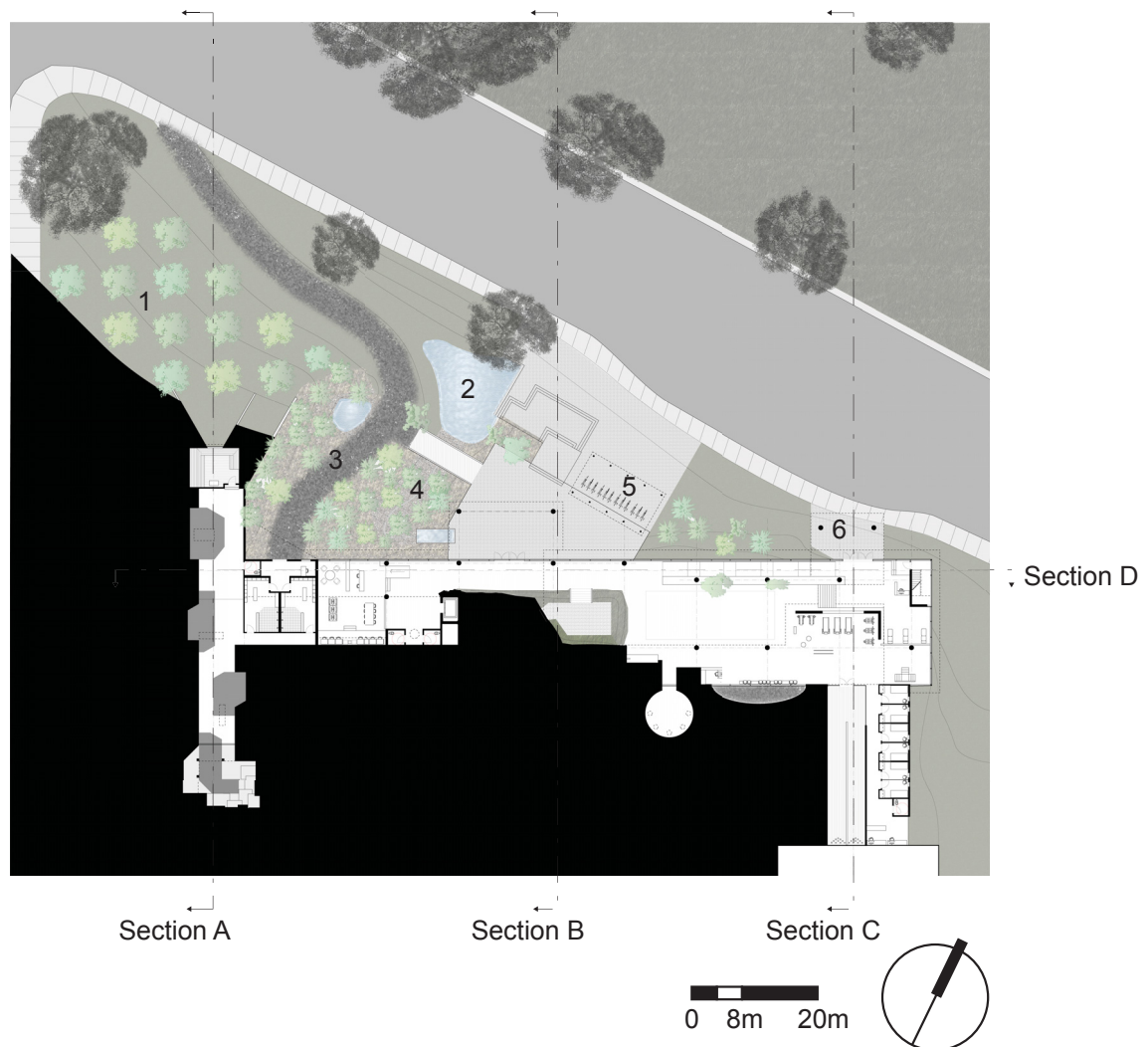
In the sun garden, the outdoor kitchen, the teahouse, the bathhouse, and the therapeutic greenhouse form a frame that the rest of the gardens move around. The flow of water off the greenhouse roof creates the opportunity to make an irrigation pond high on the property, so water can be driven to the gardens by gravity. People flow along paths around the pond and between architectural moments. Production gardens are placed in the remaining spaces. Beehives are placed in a wind-protected space far from regular circulation paths, with a large open take-off area to the south. A compost facility is centrally located among the gardens, and trees and benches are put in auspicious places as moments for reflection within the garden. An orchard occupies the west flank, gently sloping down along Robie Street to connect with the shade garden below.



Plan showing the sun gardens and the Clinic's second floor. Numbers refer to:

- 1) Orchard
- 2) Bathhouse step well
- 3) Beehives
- 4) Outdoor kitchen
- 5) Irrigation pond
- 6) Compost
- 7) Therapeutic greenhouse roof
- 8) Labyrinth
- 9) Restorative garden and hospital gate

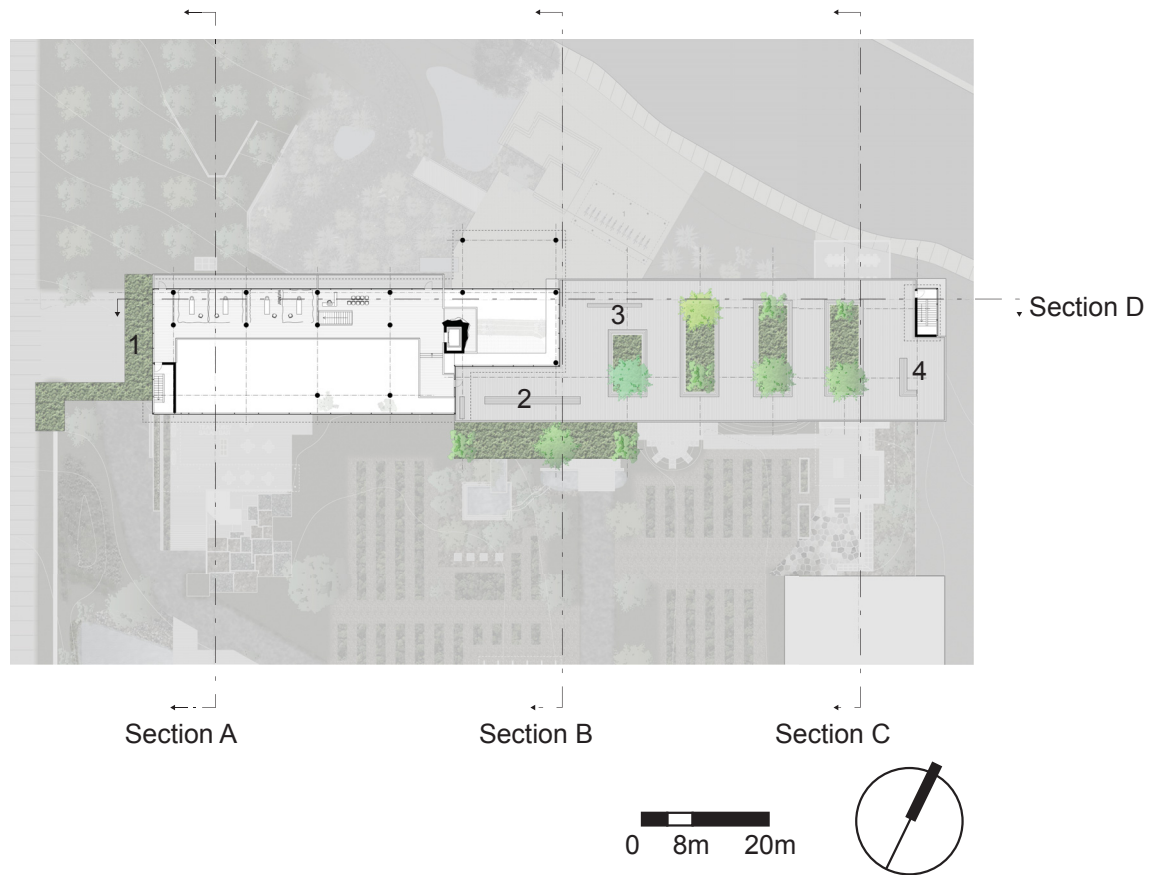
In the shade garden, water running down from the orchard is collected and funneled through a small ravine into a shallow pool at the front of the building. This ravine is inspired by the Acadian forest native to this area, with trees growing out of a mossy rock substrate. The shallow pool serves as an accessible, safe water feature adjacent to the Commons, and is protected from Bell Road traffic by a low berm.



Plan showing the shade garden and clinic first floor. Numbers refer to:

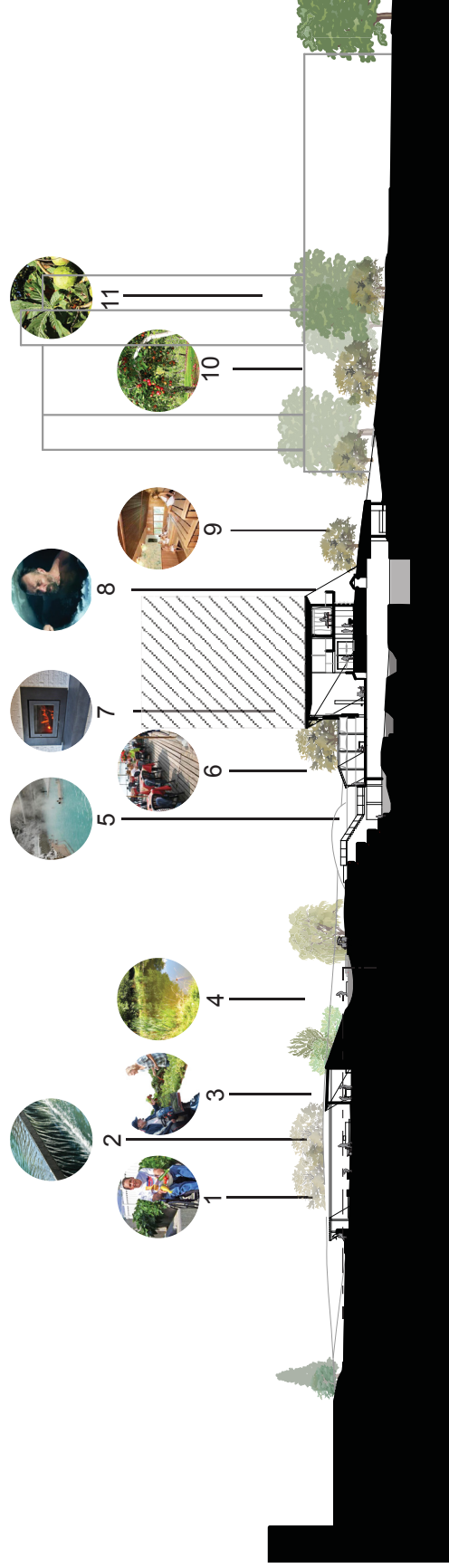
- 1) Orchard
- 2) Play fountain
- 3) Bathhouse access
- 4) Forested ravine
- 5) Bike parking
- 6) Bell Road bus stop

One half of the Clinic's roof is easily accessible from the massage platform, and so planters were designed to rest above the structural supports, connected by a wood deck. Benches were placed in specific locations in order to take advantage of particular views.



Plan showing the roof garden and clinic third floor. Numbers refer to:

- 1) Robie Street entrance canopy
- 2) Garden-view bench
- 3) Commons-view bench
- 4) Citadel-view bench



Section A.

Numbers refer to:

- 1) Raised beds
- 2) Fountain
- 3) Therapeutic greenhouse
- 4) Irrigation pond
- 5) Hot pool in bathhouse
- 6) Teahouse terrace
- 7) Fireplace in teahouse
- 8) Cold pool in bathhouse
- 9) Sauna
- 10) Orchard
- 11) Existing street trees



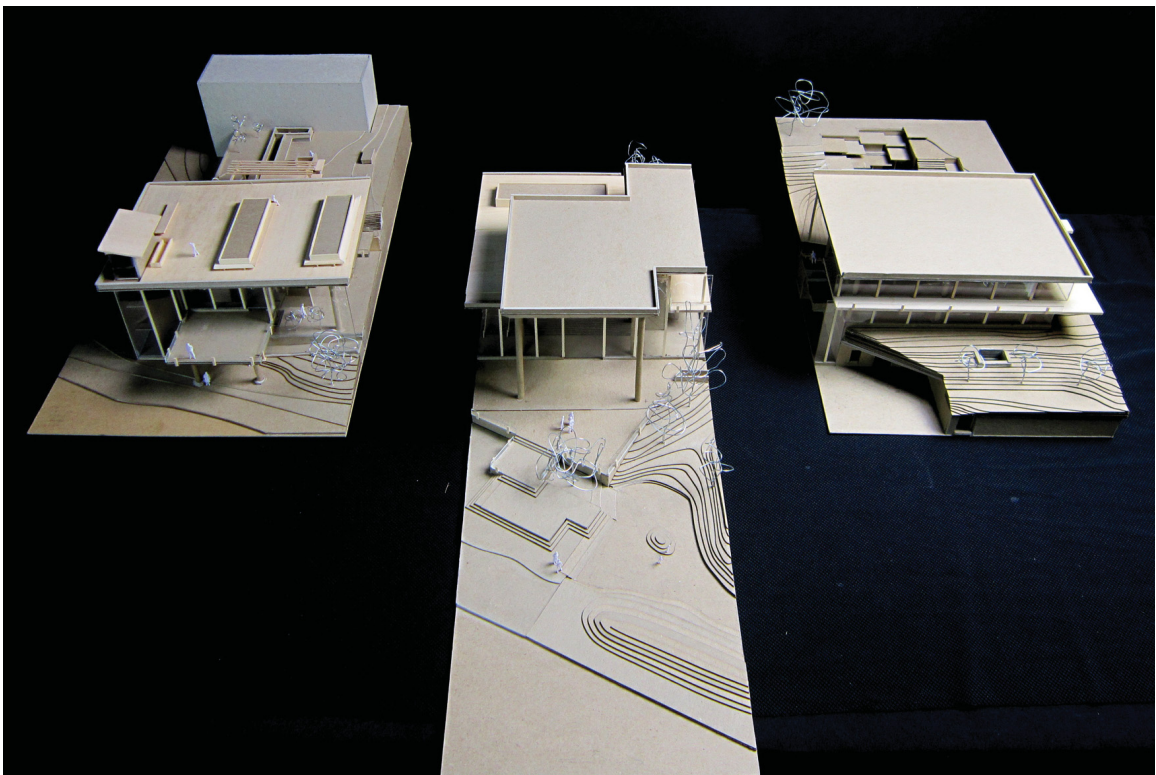
Section B.

Numbers refer to:

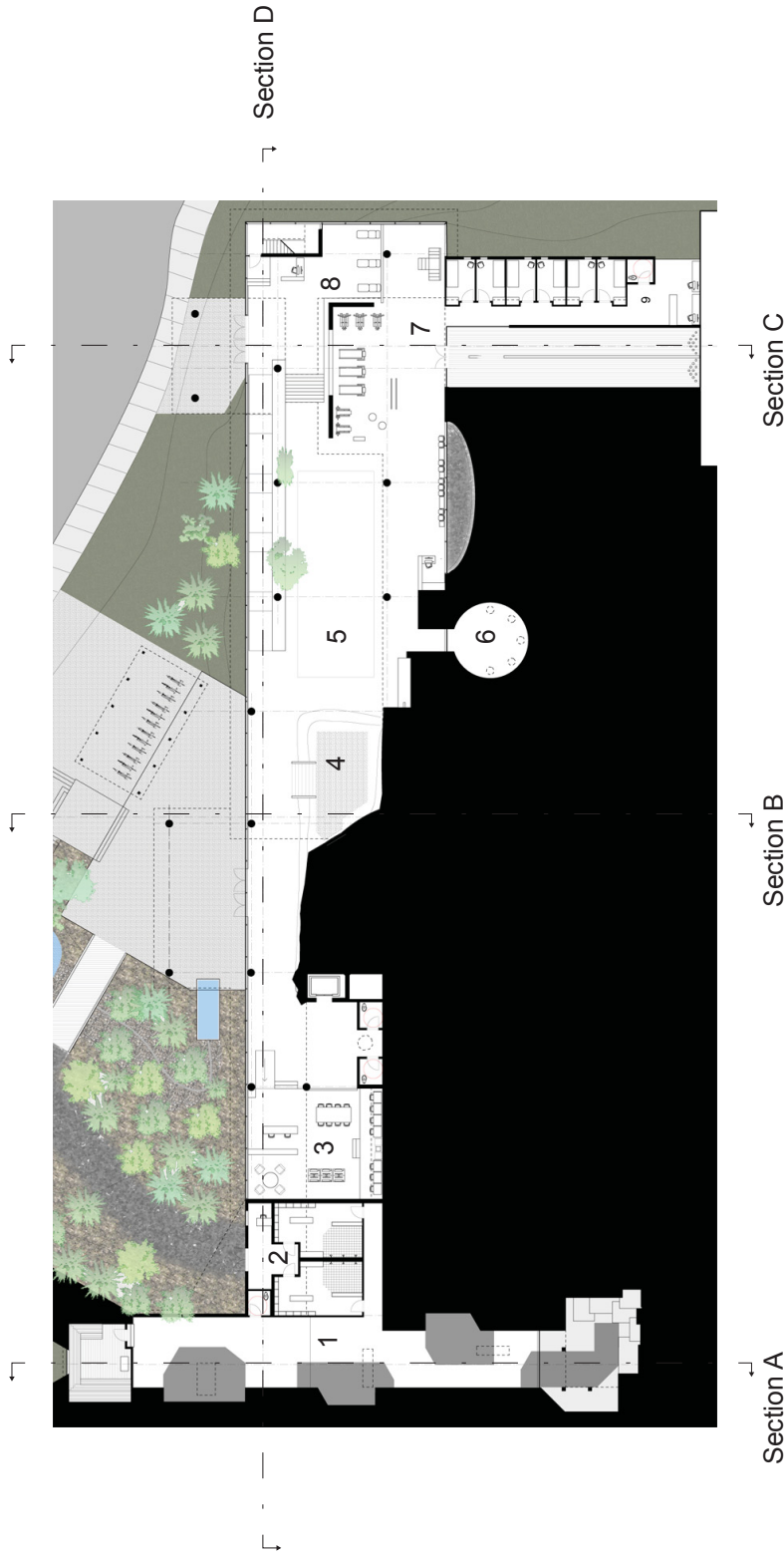
- 1) High visual impact tree
- 2) Wall garden
- 3) Shade tree
- 4) compost bins
- 5) Production garden
- 6) Beehives
- 7) Water collection
- 8) Climbing wall
- 9) Shade garden

Clinic Flows

As the landscape flows through the building, the programs within the clinic itself flow into each other. This spatially links unrelated programs, turning the building into a pedagogical tool for understanding the linked lifestyle factors which contribute to health. Over the next few pages, the interrelations within the clinic building itself will be explored through larger scale drawings and photographs.

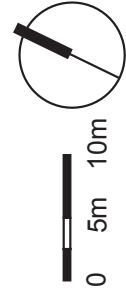


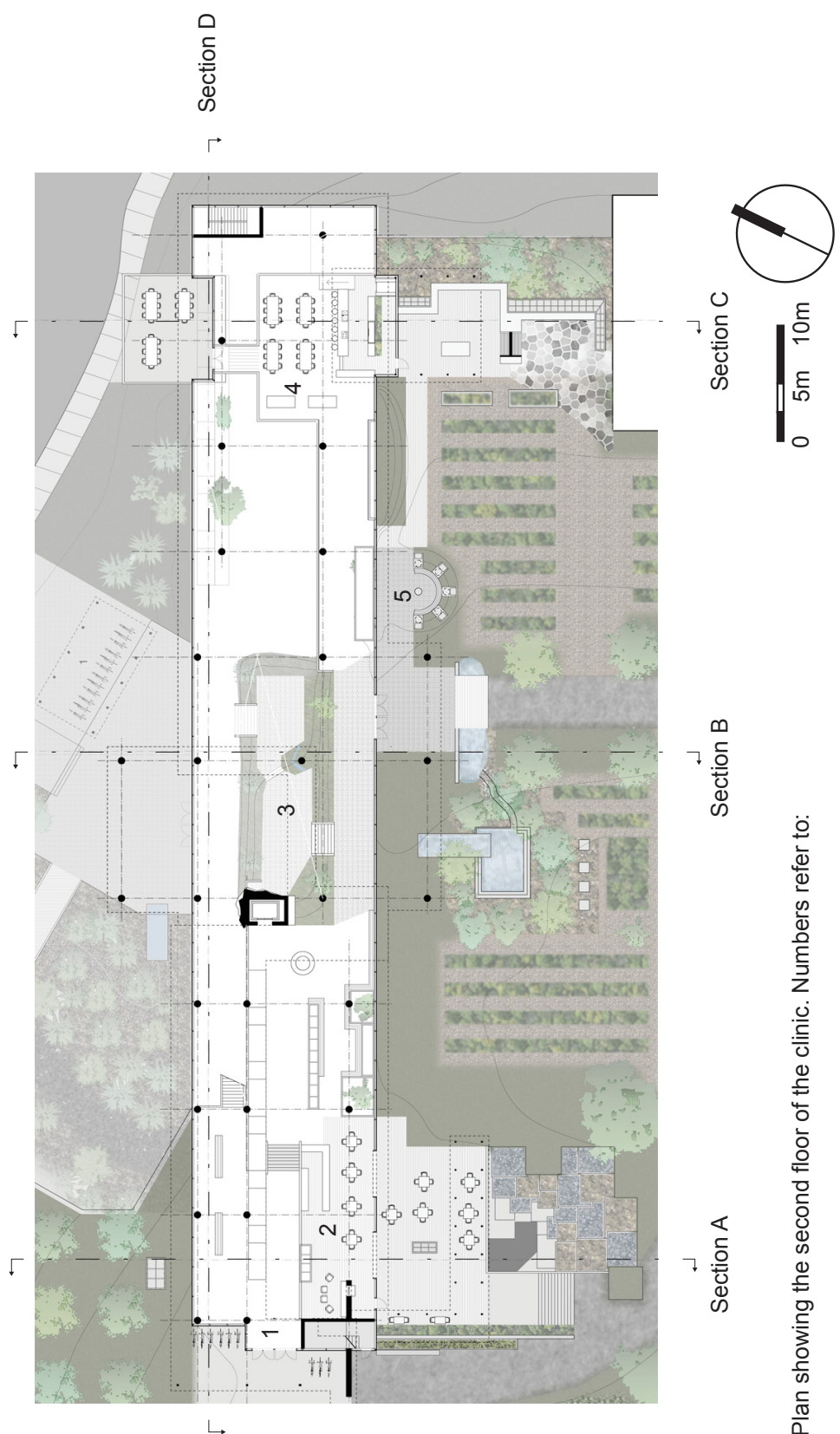
Physical models centered around Sections A, B and C.



Plan showing the first floor of the clinic. Numbers refer to:

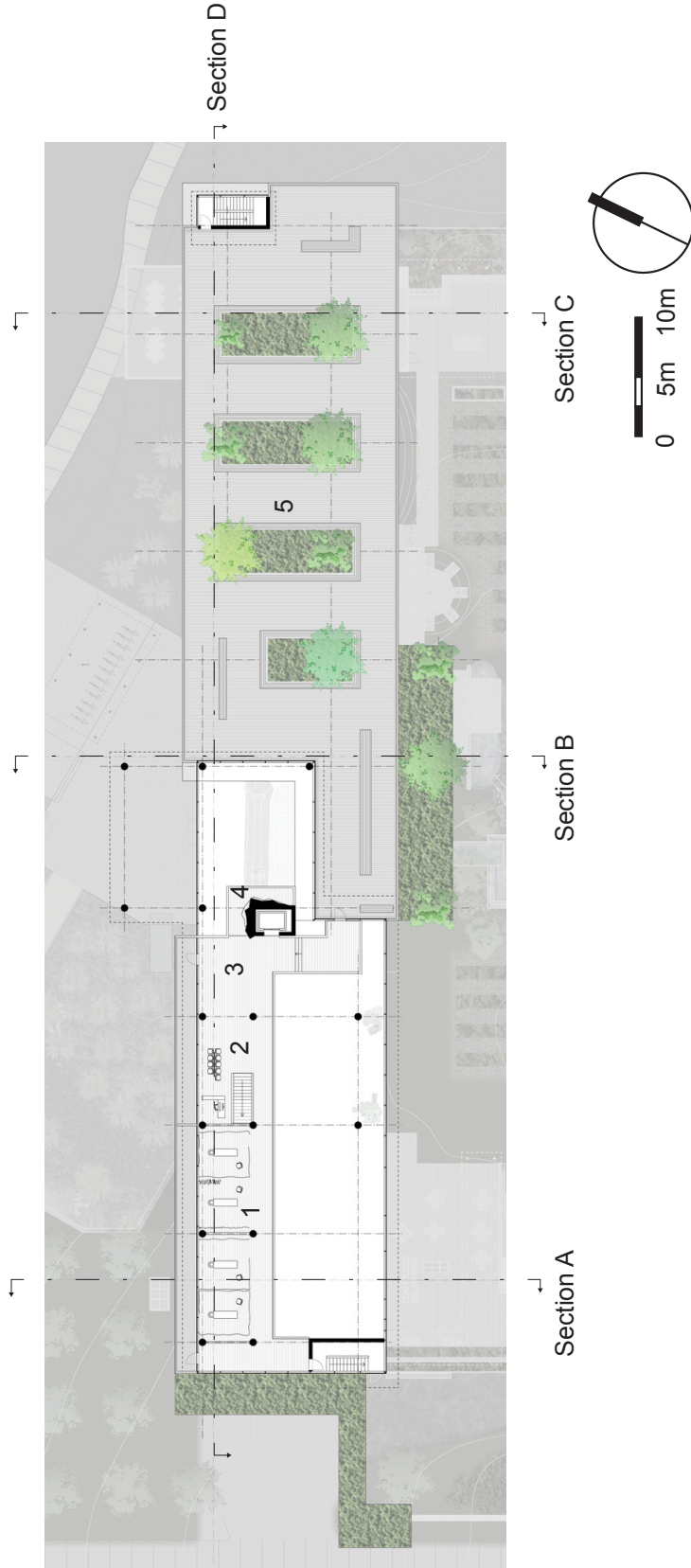
- 1) Bathhouse
- 2) Bathhouse reception
- 3) Library
- 4) Commons/Garden cross-axis
- 5) Dance floor
- 6) Chapel
- 7) Physiotherapy and bowling
- 8) Blood services





Plan showing the second floor of the clinic. Numbers refer to:

- 1) Robie Street entrance foyer
- 2) Teahouse
- 3) Commons/Garden cross-axis
- 4) Kitchen classroom
- 5) Busking space



Plan showing the second floor of the clinic.

Numbers refer to:

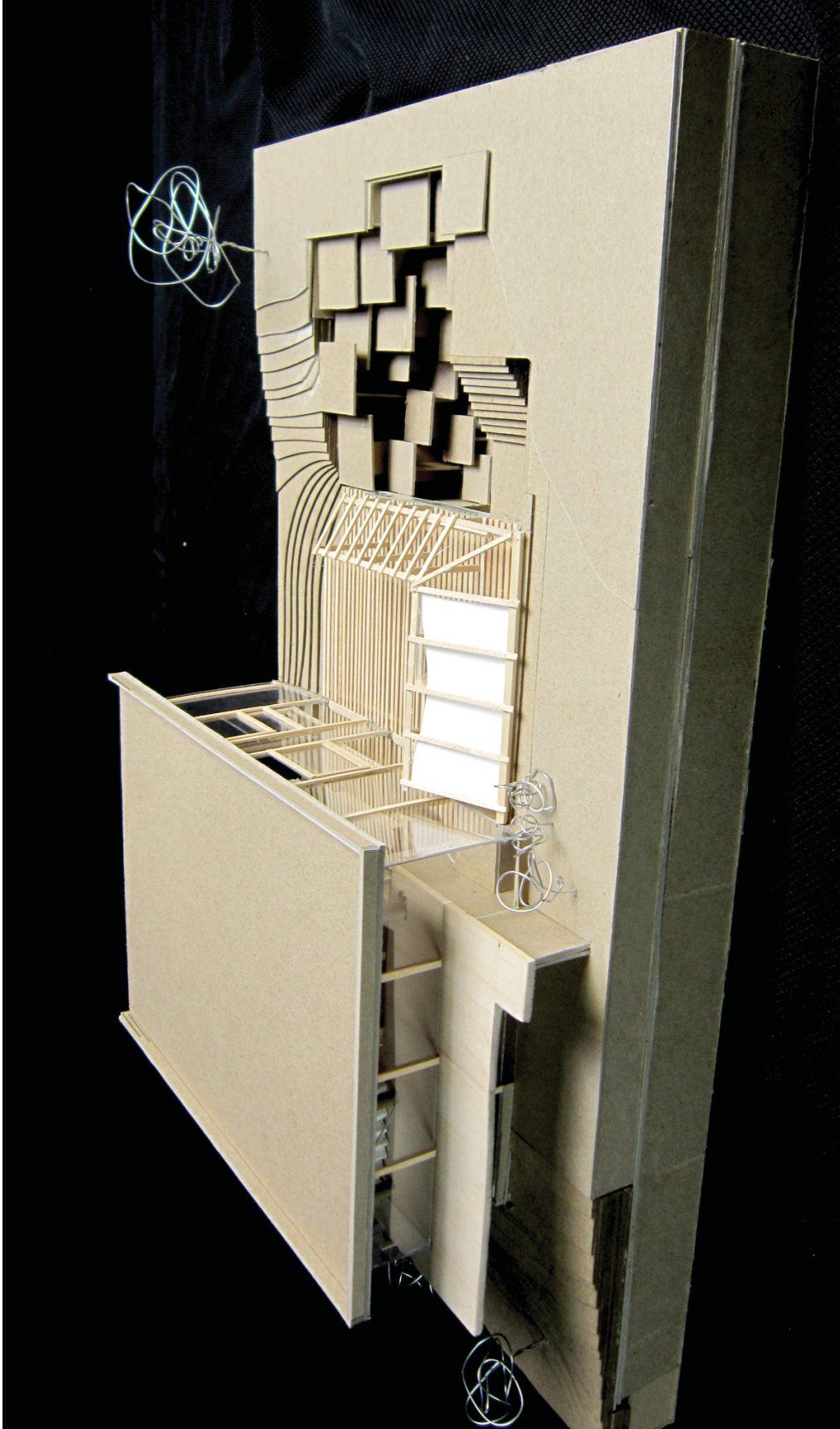
- 1) Massage area
- 2) Massage reception
- 3) Public lobby
- 4) Climbing wall rope platform
- 5) Roof garden



Winter Sun
Summer Sun

0 2m 5m

Section A enlarged, showing the interaction between the bathhouse, the tea house, the Robie Street foyer and the message area.



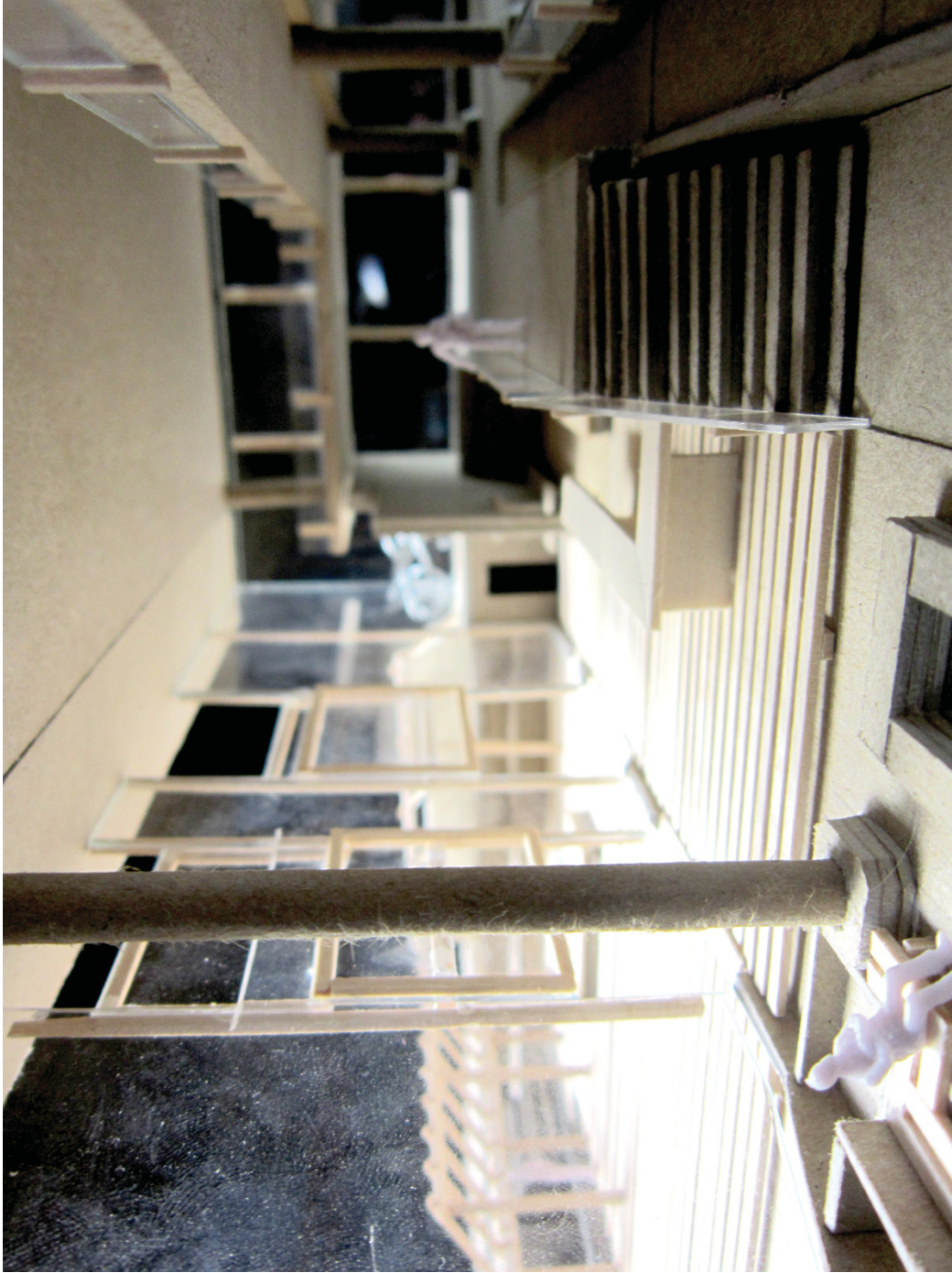
Physical model of the Clinic and Landscape around Section A. The Robie Street entrance canopy, teahouse terrace, and bathhouse step well can be seen in this image.



Physical model of the Clinic and landscape around Section A. Looking North from the garden, into the bathhouse step well and teahouse.



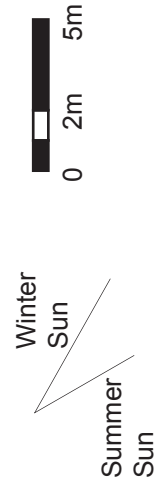
Physical model of the Clinic and landscape around Section A. Looking South at the massage balcony and Robie Street entrance.



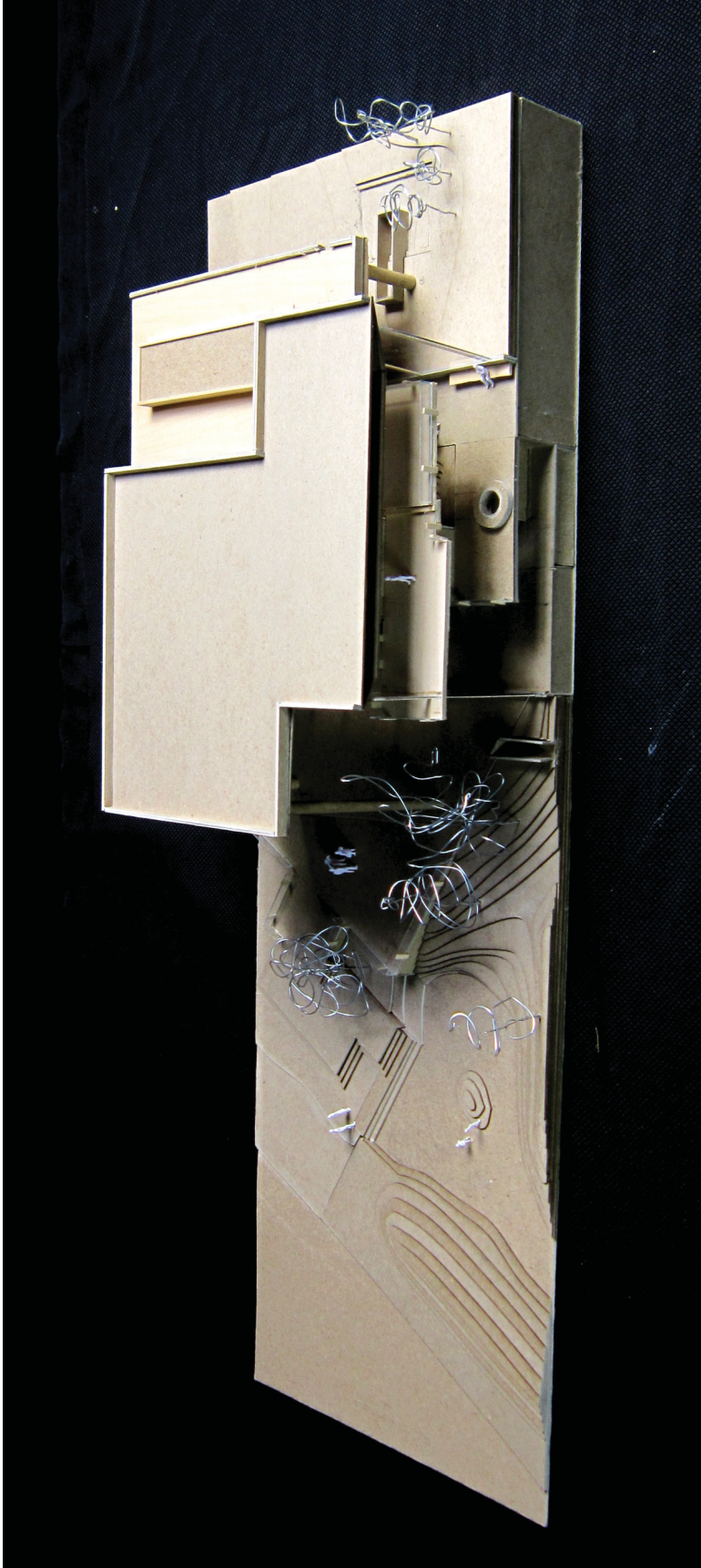
Physical model of the Clinic and landscape around Section A. Looking West at the interior volume flowing between the teahouse, the thoroughfare and the massage area,



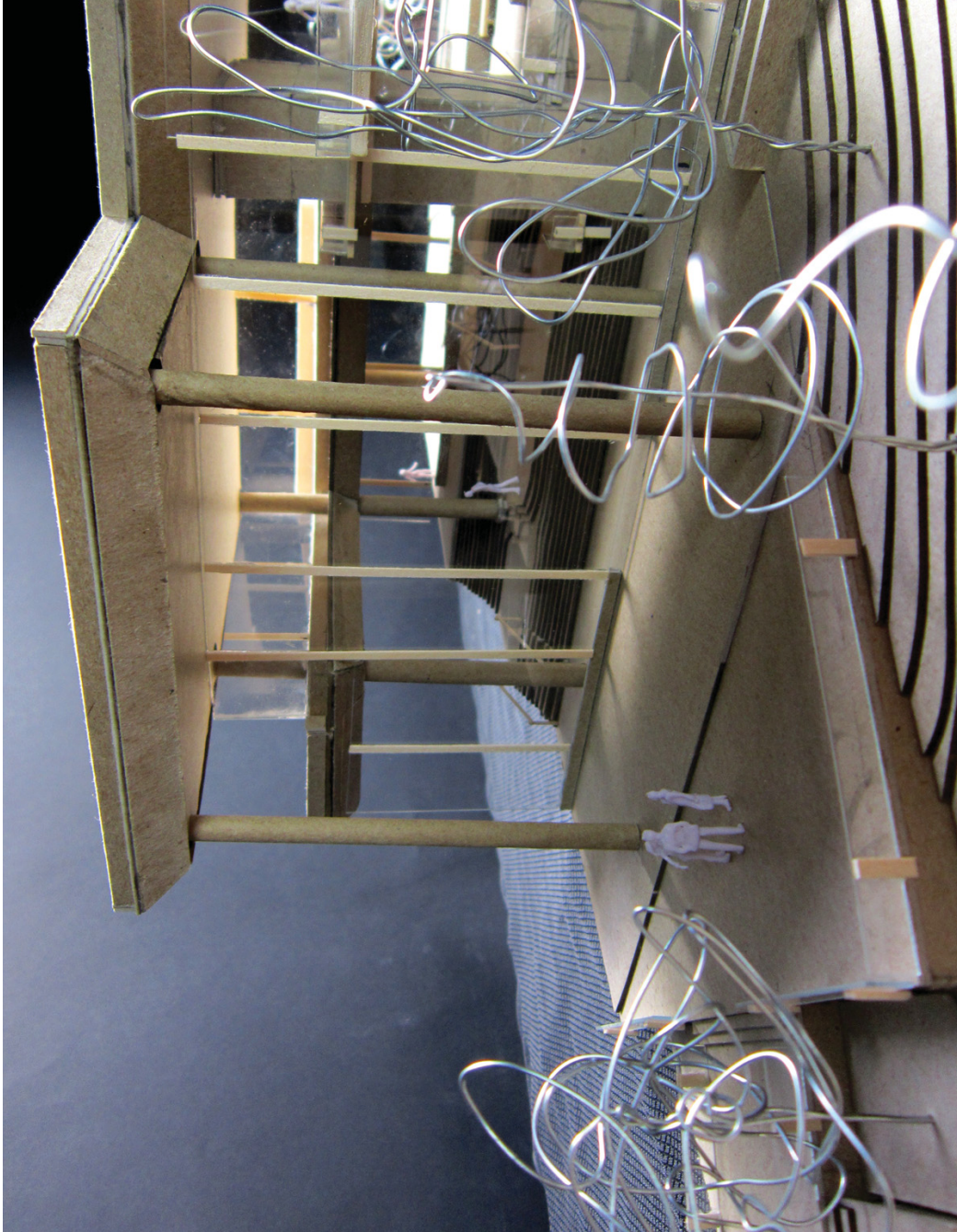
Physical model to study the flow of light inside the bathhouse. Pools are artificially lit while skylights bring in natural light.



Section B enlarged, showing the Commons/Garden cross-axis, with the entrance canopies to the South and North sides, and the climbing wall in elevation.



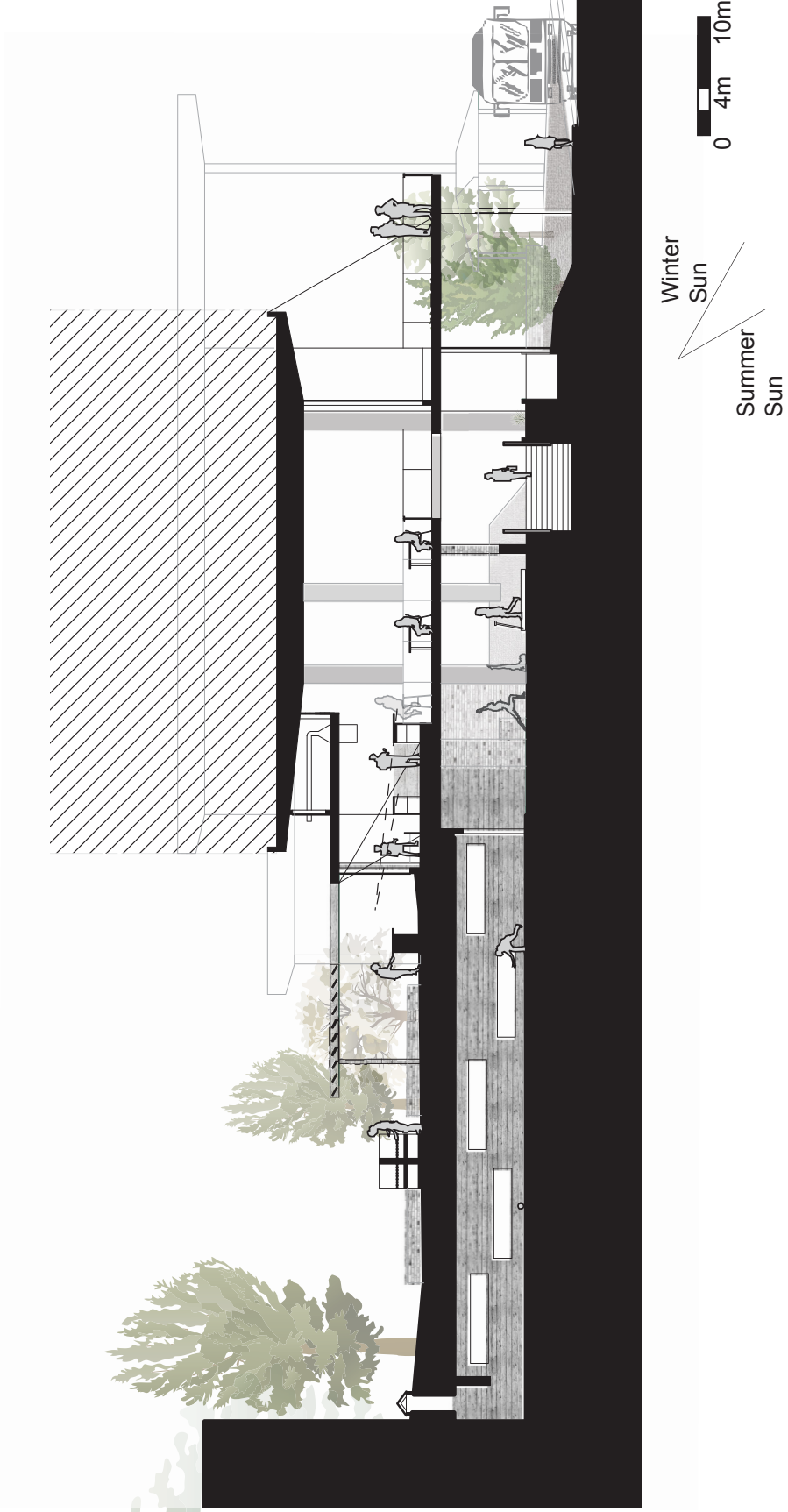
Physical model of the Clinic and landscape around Section B. The two roof canopies and the shade garden landscaping can be seen.



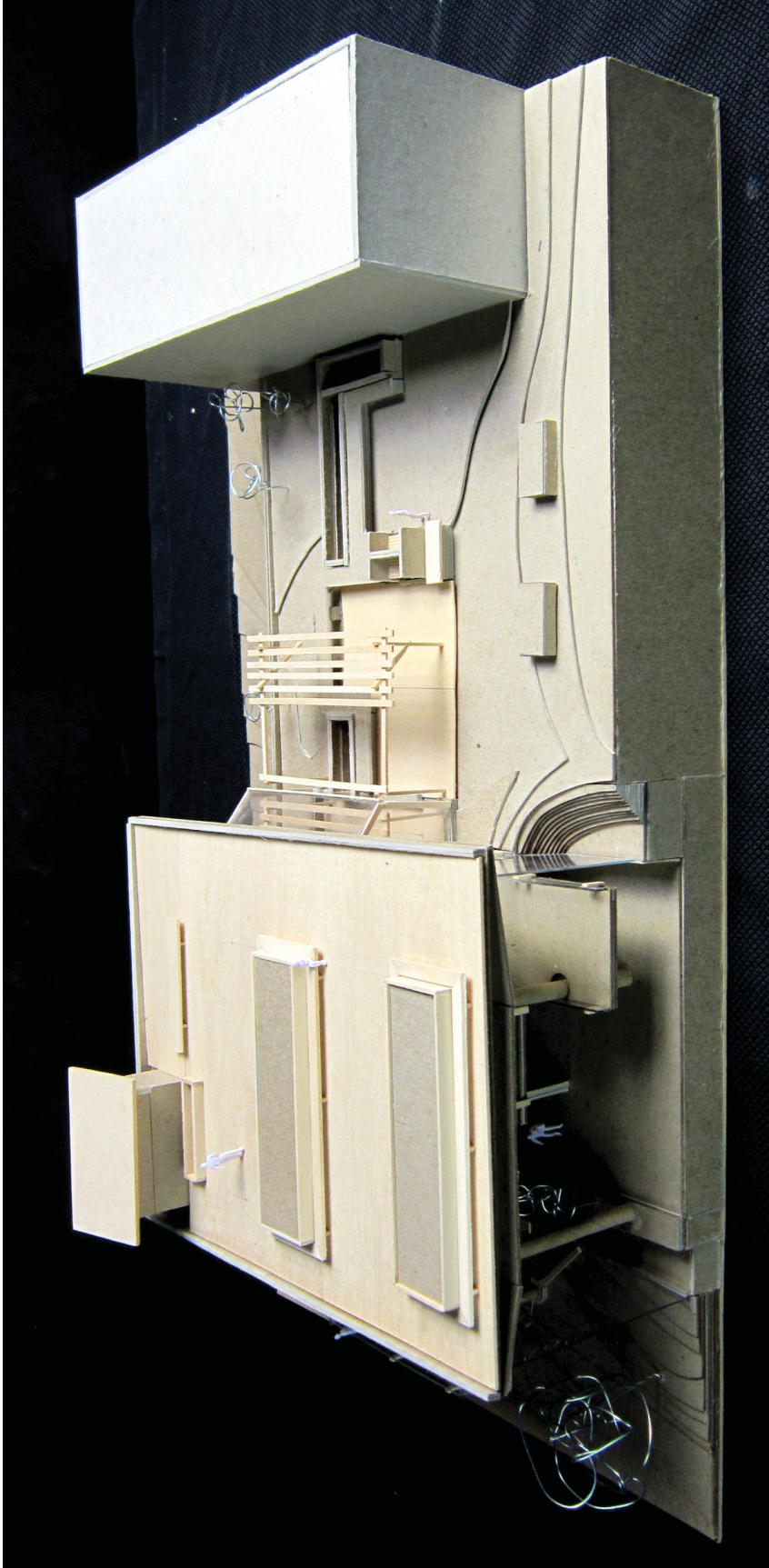
Physical model of the Clinic and landscape around Section B. The Commons entrance canopy can be seen with light coming through the split between the two roof levels.



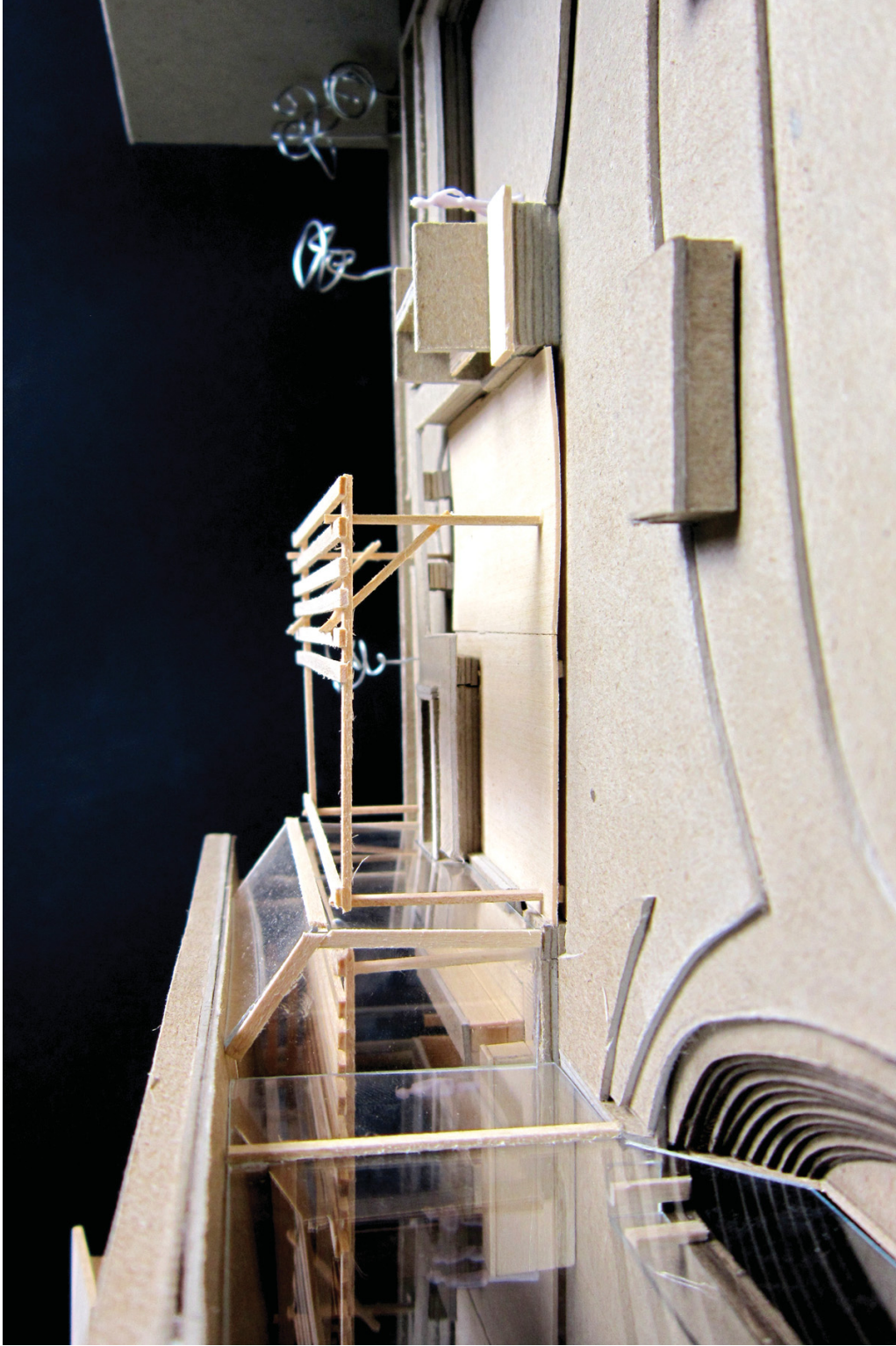
Physical model of the Clinic and landscape around Section B. The interior volume of the Commons/Garden cross-axis can be seen with the climbing wall elevator in the background.



Section C. The kitchen flows from the sun gardens through to the dining terrace, above the physiotherapy and bowling areas. The Bell Road entrance occurs under the dining canopy, which also shelters the Bell Road bus stop.



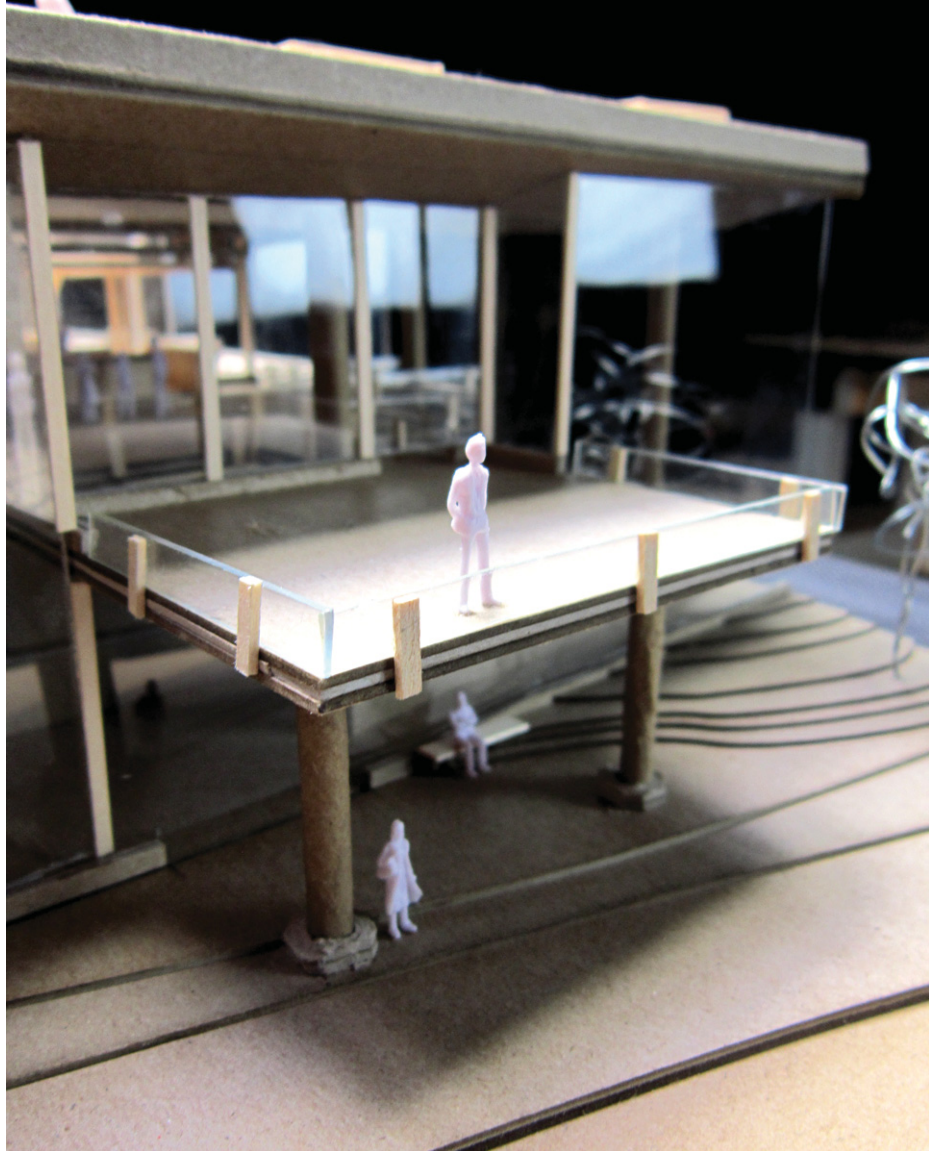
Physical model of the Clinic and landscape around Section C. The roof garden can be seen overlooking the outdoor kitchen.



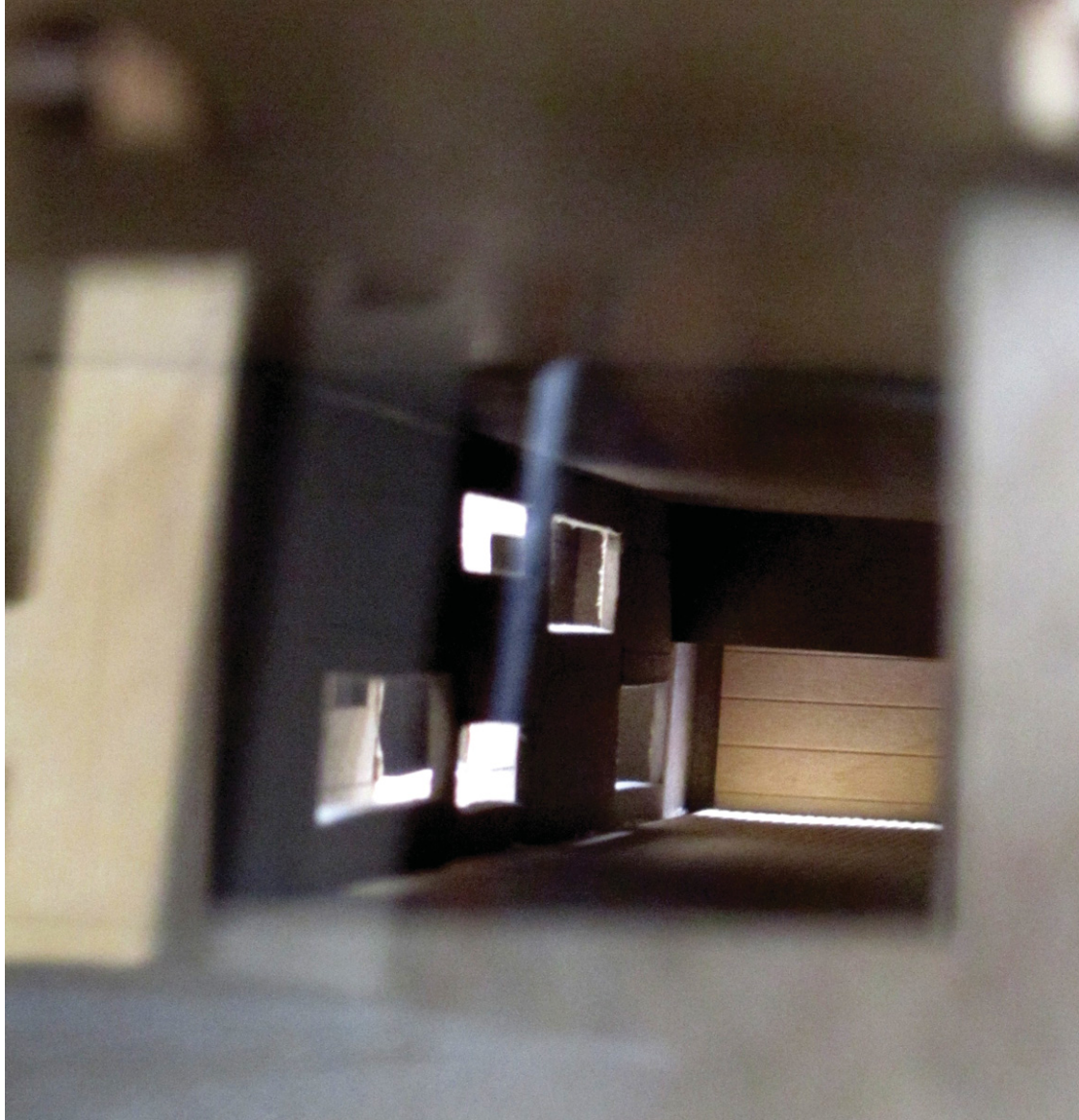
Physical model of the Clinic and landscape around Section C. The outdoor kitchen can be seen flowing from the production gardens through a series of thresholds before entering the building.



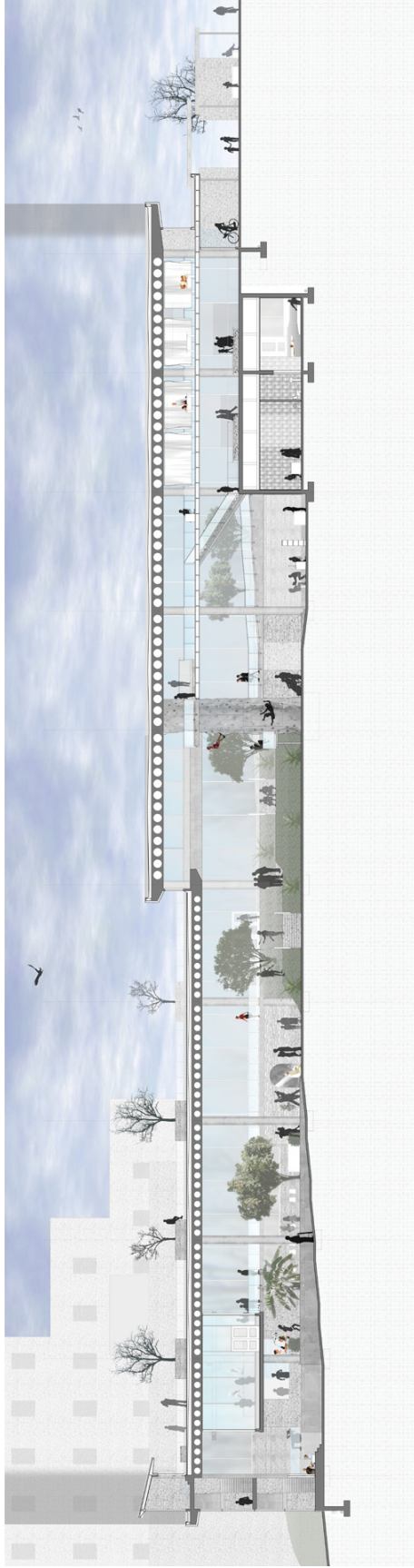
Physical model of the Clinic and landscape around Section C. The kitchen classroom can be seen above the physiotherapy area and the building thoroughfare.



Physical model of the Clinic and landscape around Section C. The dining terrace can be seen creating shelter for the Bell Road bus stop.



Physical model studying the flow of light into the examination rooms and bowling area. The light wall brings natural light down from skylights above while providing privacy for the examination rooms. The bowling pins at the end of the alley are lit by their own skylight.



Section D, showing flows through the whole building. The building thoroughfare runs from the Robie Street bus stop down through the Commons/ Garden cross-axis and out at the Bell Road bus stop. The edges of future hospital expansion can be seen above the Clinic. This section will be enlarged on the next several pages.



Section D enlarged, showing the roof access stair, blood services, the kitchen behind the glass of the dining terrace, and some of the physiotherapy area below. The Bell Road entrance is behind the section cut. The edge of future hospital expansion can be seen above the Clinic building.



Section D enlarged, showing the kitchen platform overlooking the dance floor, and the chapel in the background.



Section D enlarged, showing the Commons/Garden cross-axis, with the lower-left terrace forming a stage in front of the dance floor.



Section D enlarged, showing the climbing wall and elevator, the library below and message reception above, and the building thoroughfare descending in the background.



Section D enlarged, showing the bathhouse reception and bathing areas below and the massage area above, with the Robie Street entrance foyer in between. The edge of future hospital expansion can be seen above the Clinic building.

CONCLUSION

This project explored the programmatic and spatial implications of preventative care, as a distinct medical paradigm. The need to reach out to the healthy population was achieved by making the building itself a shortcut between Robie Street and Bell Road, and by designing a program which integrates with nearby infrastructure. The system nature of the preventative paradigm was achieved through the concepts of habitat and flow; by making programmatic spaces which function, then linking them with the flows of people, space and light. By providing a preventative foundation for future hospital expansion, the development of the hospital is both architecturally and philosophically changed.

While this project focussed on space and program, there are several other avenues of exploration that were not taken. I believe that study into the implications of a preventative paradigm on architectural detail could be particularly fruitful, especially as it relates to new materials.

A living organism has the ability to heal itself; this forms the core understanding that underlies preventative care. A building, built out of materials with this same ability, would embody preventative care in a more profound way than any building out of conventional architectural materials could. While some early explorations into this phenomena were undertaken in the course of this research, doing justice to the exciting possibilities of biological architecture was beyond the scope of this project. It is a fascinating area for future research.

NOTES

1. Christopher Alexander et al., *A Pattern Language* (New York: Oxford University Press, 1977), 252.
2. Ronald Coleman, *The Cost of Chronic Disease in Nova Scotia*. (Report prepared for GPI Atlantic, Dalhousie University and Health Canada, 2002), 3-6.
3. Or the inefficiency of high-speed, single occupant cars.
4. Alexander, *A Pattern Language*, 254.
5. In this case, I mean surgery and pharmaceuticals, respectively.
6. Erika Svendson, "Cultivating Resilience," in *Restorative Commons*, eds. Lindsay Campbell and Anne Weisen (Newtown Square: USDA Forest Service, 2009), 68-69.
7. Jo Leonardi-Bee et al., "Asthma and Current Intestinal Parasite Infection," *American Journal of Respiratory and Critical Care Medicine* 154 (2006): 514-523.
8. The irony of selling notoriously unhealthy food in a hospital is not lost on Capital Health, which has been trying to ban donuts from the on-site Tim Horton's.
9. Jennifer Scott and Maria MacLeod, *Is Nova Scotia Eating Local: and if not, Where is our Food Coming From?* (Report prepared for the Ecology Action Centre and Nova Scotia Federation of Agriculture, 2010), 8.
10. Government of Nova Scotia Healthy Eating Action Group, *Healthy Eating Nova Scotia*. (Report prepared in partnership with the Office of Health Promotion, 2005), 24-28.
11. Judith Heerwaagen, "Biophilia, Health and Well-Being," in *Restorative Commons*, eds. Lindsay Campbell and Anne Weisen (Newtown Square: USDA Forest Service, 2009), 39-55.
12. Erika Svendson, "Cultivating Resilience", 59-72.
13. The inspiration to play with light inside the bathhouse is inspired directly by Peter Zumthor's remarkable Thermal Baths at Vals.

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