

FIVE WATERMARKS

*Five Design Interventions on the Ottawa Civic Hospital that
Explore the Potential for Water and Architecture to Assist in
Inhabitant Well-Being*

By

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A thesis submitted to the Faculty of Graduate and Postdoctoral Affairs in
partial fulfillment of the requirements for the degree of

Master of Architecture

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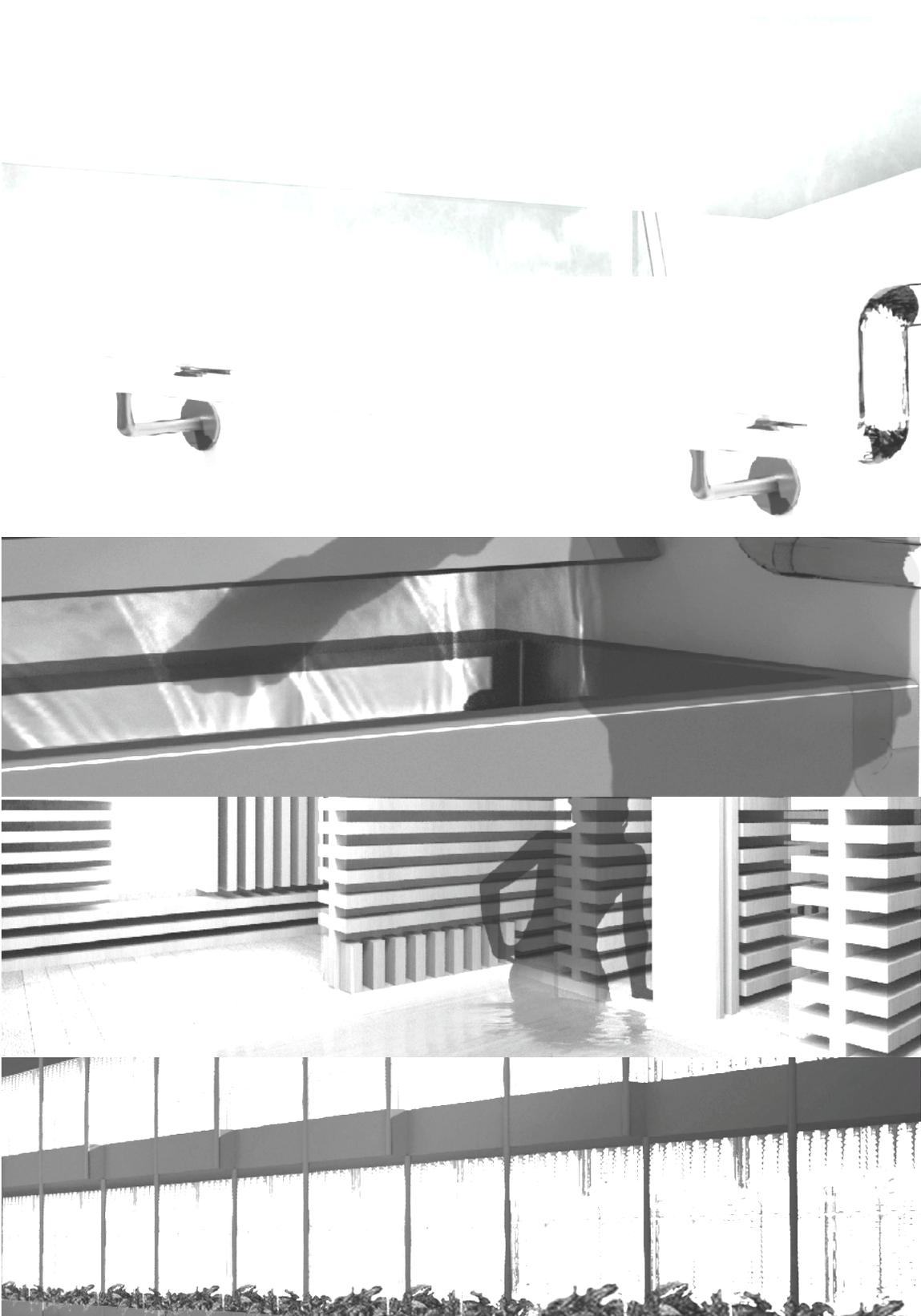


Figure 01. Cover Image: *Five Watermarks*

ABSTRACT

Five Watermarks explores the question of ‘healing’ in the built healthcare environment, and in particular asks what role the incorporation of water can play in increasing inhabitant well-being. The primary role of healthcare architecture is to house technological tools and medical professionals. This project searches for ways in which architecture can be further integrated into the healing process. Through the design of five “Watermarks” (water-centralized design interventions) on the Ottawa Civic Hospital, the influence of water on atmosphere and environment is explored. The interventions incorporate water as either a natural building material or a filtered substance for cleanliness, while investigating concepts of dream, wayfinding, hygiene, tranquility and contemplation, through space and matter. Five Watermarks studies water’s capacity to deconstruct the boundaries between the self and the environment and to unify the conditions of space, life and well-being.

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Jade Labonte-Gregory

A conceptual drawing of a room, rendered in a wireframe style. The room features a window on the left wall and a raised platform or stage area in the foreground. The drawing is overlaid on a dark background filled with numerous out-of-focus, colorful bokeh lights in shades of teal, blue, green, and yellow. The overall aesthetic is ethereal and artistic.

How can water foster well-being?

Figure 02. Preliminary Conceptual Drawing

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Appendix A: A Visual History of Water Consumption

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Figure 03. Preliminary conceptual laser-cut image.

00:

Introduction

Five Watermarks explores the question of well-being in the healthcare environment, and asks what role the incorporation of water can play in increasing the well-being of the inhabitants. Traditional healthcare architecture responds to the notion of *healing* within spaces that house technological and medical instruments to heal biological bodies. However, 'Health' according to the World Health Organization, is "[...] a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity."¹ Based on this definition, it can be stated that in order to heal in a holistic sense, the architecture of healing spaces must address considerations beyond biological well-being. This thesis will explore five *Watermarks* (five water-centralized design interventions) at the Ottawa Civic Hospital, while questioning ways in which water, implemented as a building material, can transform both the atmosphere of a place and its environment.

The first chapter, on water *collection*, is rooted in the work of philosopher Gaston Bachelard, and particularly his theories of material imagination. By understanding the imagery evoked through substance, the potential for water's *matter* to blur the boundaries between the self and the environment will be explored. In the context of well-being, the role of the built environment lies in its ability to provide an oneiric escape, by matter and space. A comparison will be made to Architect Marco Frascari's *Spaces for Thinking*, to argue the important role of architecture in the process of

1 WHO < <http://www.who.int/about/definition/en/print.html>>, visited Dec 23, 2015.

thinking, and its significance in achieving a good life. Drawing from Bachelard's *Water and Dreams*, the imagery of water's matter in light will provide insight into the potential for dream-like environmental immersion. This will be exemplified through the first Watermark – the design of 'Caustic Ceilings', which transform the patient's room ceilings through watery reflections.

The second chapter, on *circulation*, will explore the duality of water and patients' circulation. Drawing from Juhani Pallasmaa's *The Eyes of the Skin*, the important role of sensory engagement in architecture will be discussed. Questions of inner and outer experiences, tactile participation, memory and dream will be confronted, in the search for existential rather than visual architectural experiences. Moreover, the research of neural-immune specialist Esther Sternberg will give insight into the issue of illness and its effect on memory of place. As a result of the existing hospital corridor condition, in which visual cues are relied upon for wayfinding, inhabitants can often find difficulty in navigation. The second Watermark – the AquaRail – will question how a tactile design intervention that uses varying materiality and temperature can lead to a new type of sensorial experience, and how this might affect the formation of memory and assist in wayfinding.

In the third chapter, on *filtration*, an important differentiation between Bachelard's *dream water* and philosopher Ivan Illich's *H2O* will be made. Through an exploration of Illich's *H2O and the Waters of Forgetfulness*, and architect Gehrard Auer's "Living Wetter: On consumption of Water in the Townhouse", the evolution of water's integration into buildings will be summarized. The process through which this substance has morphed from one of *purification* – spiritual in nature – to one of *cleansing*, relating to the physical removal of dirt particles, will be studied. Illich's critique that the

omnipresence of piped “sewage water” might lead to an impermeability towards “dream water” will be addressed, though the third design intervention – the Water Cooler – will embrace a kind of *cleansing* water as a response to the problem of insufficient and inefficient hand hygiene in the healthcare environment.

The aim of the fourth chapter, on *storage*, will be to stimulate a discussion on a building typology that accepts, even encourages the absorption of water into a building as a means of providing environmental stimulation for well-being. This chapter, returning to sensorial design, will place an emphasis on sound and acoustic intimacy as key design elements for a tranquil environment. The important role of hearing to the experience of space and atmosphere will be explored in the fourth Watermark – the Phonic Baths, which redefine the staff end-of-day shower, and aim to provide a serene retreat for healthcare workers.

The fifth and final chapter will explore the notion of *release*, which addresses a metaphorical duality between the water’s physical release via irrigation, and the ultimate release of the patient due to the cessation of life. This section will compare traditional funerary practices, while presenting an emerging alternative ritual that turns bodies into soil-building material. *Five Watermarks* will end with the release of its water as irrigation for new life, both completing one cycle and beginning another.

SITE: Ottawa Civic Hospital

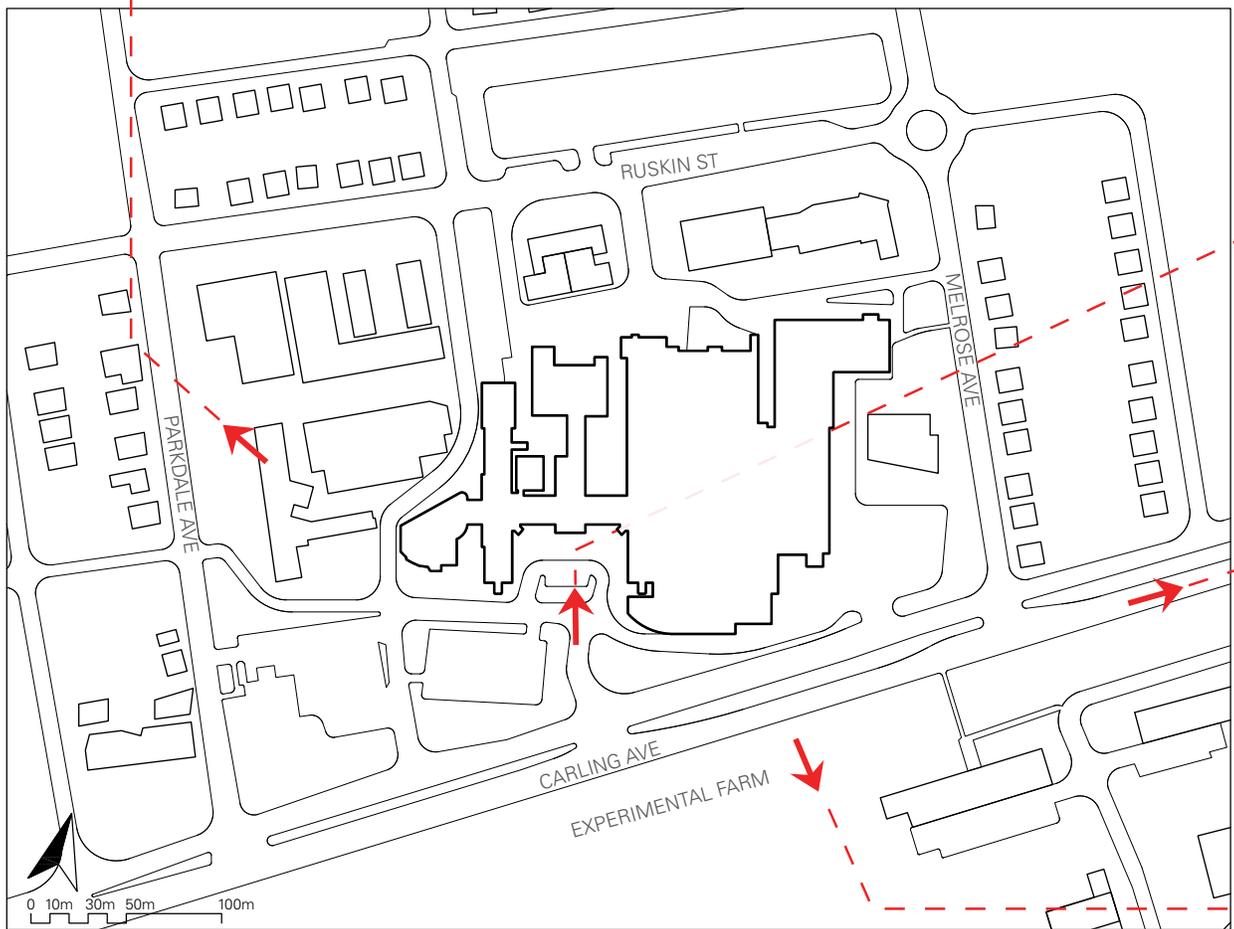


Figure 04. Site Plan & Surrounding Views / Significant Landmarks.



CIVIC FACADE



DOW'S LAKE



EXPERIMENTAL FARM

Site

The Civic Campus of the Ottawa General Hospital has been selected as the site upon which to explore the proposed design intervention. The hospital, originally opened in 1924², lived through many transformations at both the building and urban scales. The hospital was originally constructed on rural farm land, and was significantly distanced from Ottawa's core neighbourhoods.³ However, the surrounding site developed drastically in the following decades, as farmland was subdivided and residential neighbourhoods were constructed around the hospital in the 1930s and 1940s.⁴ (Figures 01-04)

The original Civic Hospital building was designed by architects Edward Fletcher Stevens, and Frederick Clare Lee, and comprised one of nearly 100 institutions designed by their practice, which ran from 1912-1933.⁵ The hospitals of Stevens and Lee were designed during a time of intersection between modernism and medicine in Canada, in the interwar period. It was argued that the interwar hospital *was* modern, predominantly in "its spatial attitudes (...) its structure, its endorsement of aseptic medicinal practices, its sanctioning of expert knowledge, its appeal to new patrons, its encouragement of new ways of working, its response to urbanization, its use of zoning, its acceptance of modern social structures, (...) its embrace of internationalism, and its endorsement of standardization."⁶ Of

2 <http://ottawacitizen.com/news/local-news/reevely-civic-hospital-to-be-rebuilt-on-experimental-farm-property>

3 Civic Hospital Neighbourhood History and Heritage Committee

4 Ibid

5 Adams, "Modernism and Medicine: The Hospitals of Stevens and Lee, 1916-32", 43.

6 Adams, "Modernism and Medicine", 45.

particular interest in this interwar hospital typology is the approach to the plan. According to Stevens, “Unlike most architectural problems, the *plan* of the hospital is the strongest factor in the design... While the design should never be overlooked, the plan should hold at least eighty per cent of importance of the entire structure; and if the plan is right, we should be able to clothe it properly.”⁷ The approach to the Civic Hospital included primarily double loaded corridors housing patient rooms to either side. It included aspects of the pre-war “pavilion plan” hospital, which allowed each room to have a window to the exterior.⁸ While the hospital’s floor plan was considerably modern, the elevation was its anti-thesis – clothing the plan in historic dress. The architects’ intents with this interwar hospital typology was to smooth the effects of social change, and to rely on the likeness to the large, safe house, in an attempt to convey an idea to incoming patients that their chances were equally good at the hospital as they would be at home.⁹

Water was a central design element to Stevens and Lee’s design philosophy, as Stevens was a firm believer in hydrotherapy, following a careful study of European Hospitals.¹⁰ In his research titled “The Need For Better Hospital Equipment for the Medical Man,” Stevens argued that while American Hospitals provided state-of-the-art surgical facilities, German hospitals provided a better balance with ample space for various types of heat and light therapies.¹¹ Water was, unfortunately, never included as a hydro-therapeutic design element in the Civic Hospital, though the concerns for

7 Edward F. Stevens, “The American Hospital Development, Part I,” *Architectural Record*, 38 (December 1915):645. In Adams, “Modernism and Medicine,” 57-58.

8 Adams, “Modernism and Medicine,” 51.

9 Adams, “Modernism and Medicine,” 58.

10 Adams, “Modernism and Medicine,” 54.

11 Ibid.

hygiene and diseases control were well addressed in an avant-garde design that provided covered flushing floor drains in every operating room, permitting the entire space to be hosed down.¹²

The Civic Hospital has undergone numerous expansions since opening, as a response to both population increase and technological advancements. The first series of utilitarian expansions in the 1950s enabled the hospital to flourish as a contemporary medical facility in Ottawa.¹³ While the building grew in size it could not keep up to the rapid city's growth and became increasingly overly-populated.¹⁴ It was not until 1997 that the hospital underwent a \$14-million transformation, with a modern expansion to the East of the existing complex, which began to accommodate this population growth¹⁵. This expansion, in contrast to Stevens and Lee's historic dress, clothed the building in modern facades, with the use of curtain walls and ribbon windows. The latest expansion of the hospital occurred in 2006, with a \$10-million addition of a new Emergency wing, expanding the grade level of the South façade.¹⁶

Future plans for expansion of the Civic Hospital include a proposal for a new building to the South of the existing campus, across from Carling Avenue, where the Ottawa Hospital Foundation will allegedly receive 60 acres of property on the Experimental Farm.¹⁷ These plans are in a preliminary phase, and there is moderate controversy over the use of this central green space for urban development, though the growing need for hospital space must be addressed with immediacy.

12 Adams, "Modernism and Medicine," 54.

13 <http://ottawacitizen.com/news/local-news/reevely-civic-hospital-to-be-rebuilt-on-experimental-farm-property>,

14 Ibid.

15 Ibid.

16 Ibid.

17 Ibid.

The *Five Watermarks* proposal will intervene the south facing wing of the building, which comprised part of the addition from the 1990s. It will aim to address the concept of “healing” through architecture, space and matter, rethinking the notion that a healthcare environment can only heal through medical and technological instruments. Through the incorporation of water as both a substance for cleanliness and one for sensorial and dream-like immersion, this design intervention will explore how to improve well-being in a holistic sense.

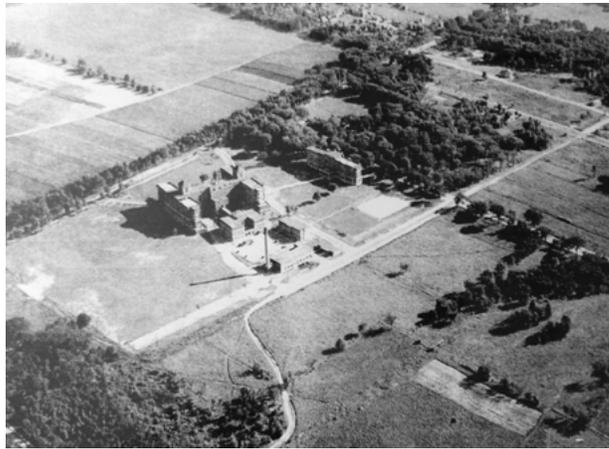


Figure 05 – Aerial View of Civic Hospital, 1924.
Source: Dunn, <<https://www.flickr.com/photos/rdb466/9547250101/>>



Figure 06 – Site Plan of Civic Hospital, 1965.
Source: GeoOttawa, <<http://maps.ottawa.ca/geottawa/>>



Figure 07 – Site Plan of Civic Hospital, 1991.
Source: GeoOttawa, <<http://maps.ottawa.ca/geoottawa/>>



Figure 08 – Site Plan of Civic Hospital, 2014, as currently existing.
Source: GeoOttawa, <<http://maps.ottawa.ca/geoottawa/>>



Figure 09 – Photograph of Private Room at the Royal Victoria Montreal Maternity Hospital, 1926.
Designed by Stevens and Lee, demonstrates same principles that were applied to the design Ottawa Civic Hospital.
Source: Adams, "Modernism and Medicine", 49.

Concept: *Five Watermarks*



Figure 10. Conceptual Diagram of *Five Watermarks*: Demonstrating order & function of each intervention.

Concept: *Five Watermarks*

1. **CAUSTIC CEILINGS**

PATIENT ROOMS

Deconstructing the boundaries between the constructed and dream worlds.

2. **AQUARAIL**

CORRIDOR HANDRAIL

Increasing ease of navigation through materiality and sensorial design.

3. **WATER COOLER**

HANDWASHING STATIONS

Bringing awareness and wonder to the handwashing process.

4. **PHONIC BATHS**

STAFF RETREAT

Creating serenity through sound and providing a staff retreat that redefines the end-of-day shower.

5. **VERTIAL GARDEN**

GREEN RECLAMMATION WALL

Assisting in the growth of new plants through commemorative soil building material from the deceased, while providing a space for mourning and conversation.

Site + Concept

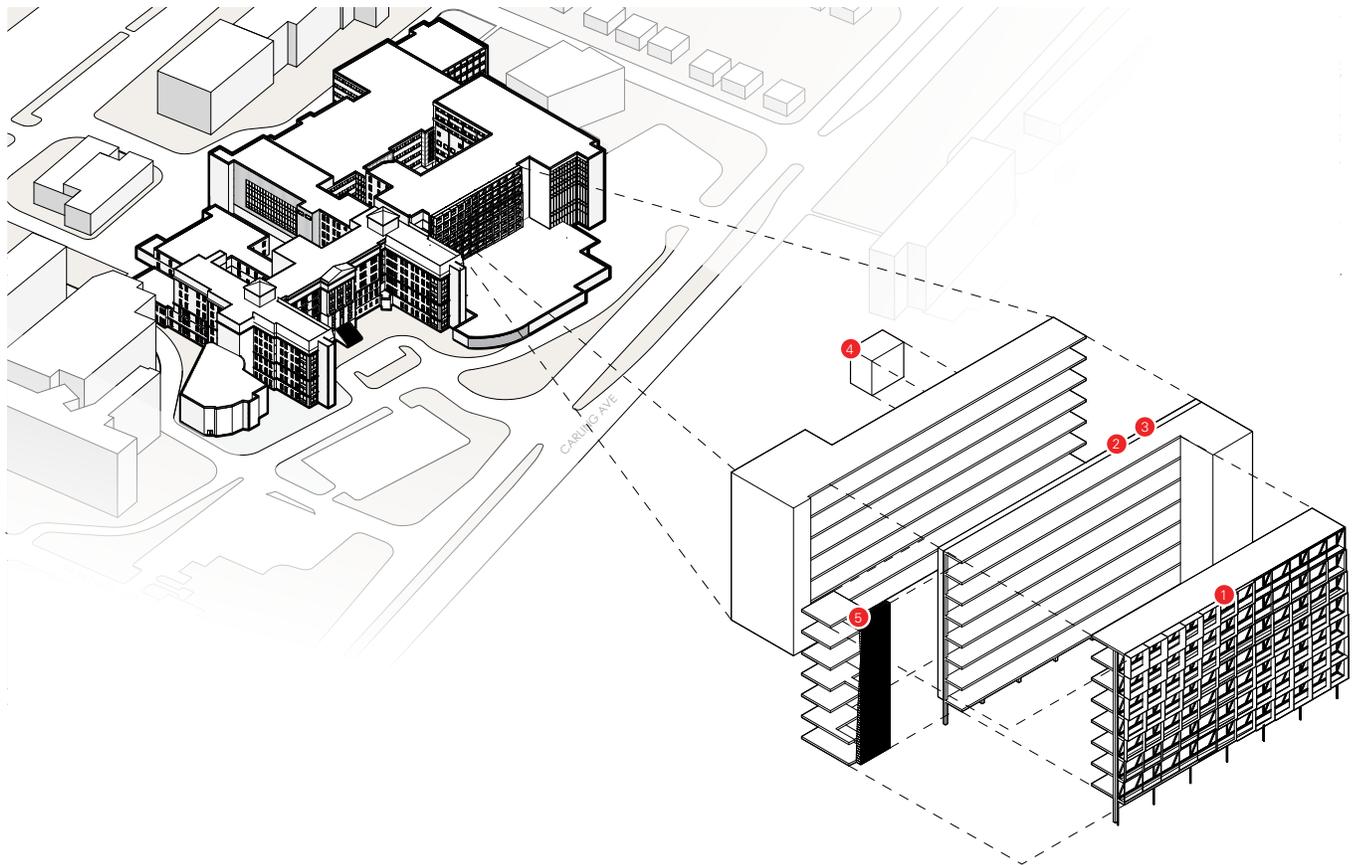
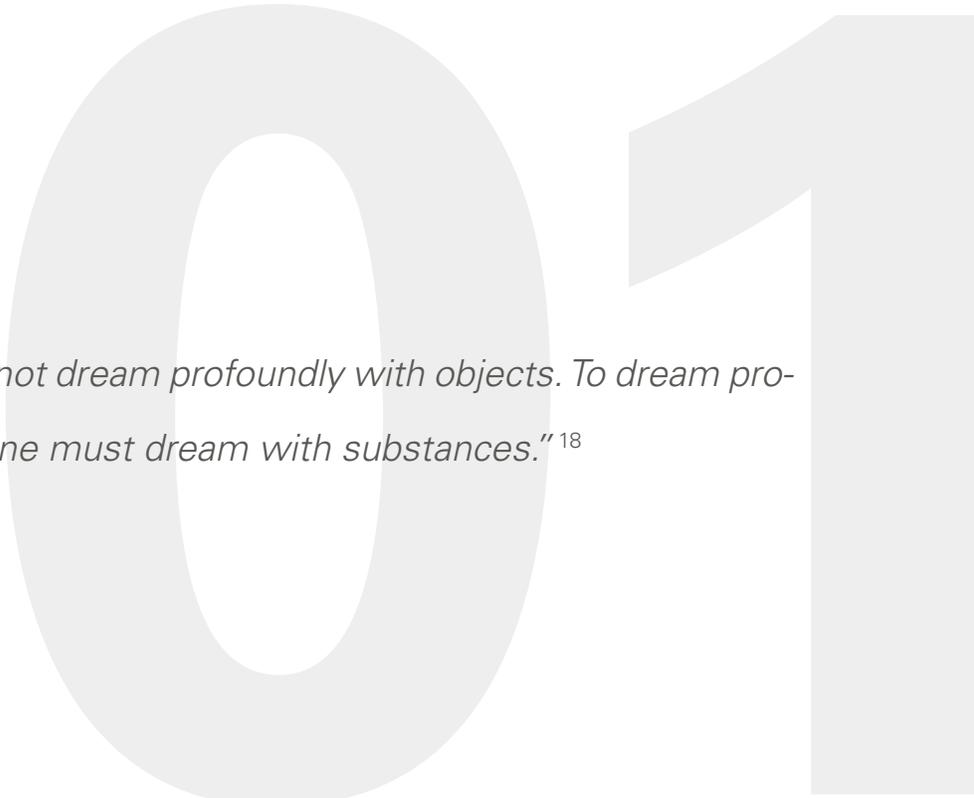


Figure 11. Site Axonometric View with Enlarged + Exploded Axonometric of modified 'D wing' on which *Five Watermarks* intervenes.



“One cannot dream profoundly with objects. To dream profoundly, one must dream with substances.”¹⁸

01 (Collection):

Water's Material Imagination

With the incorporation of water into the built environment for the purpose of well-being, the importance of the substance's imagery must first be understood. It would be ill-cautioned to design a water feature simply for its beauty. Beauty is a key element but when disassociated from other aspects that are necessary to define material imagination in a holistic sense the outcome would fall short from successful. The aim of this first chapter will be to understand the potential of water to immerse inhabitants in a dream. In particular, this analysis will pertain to images of *material imagination*. Philosopher Gaston Bachelard differentiates two types of imagination in his book *Water and Dreams*, describing *formal imagination*, as relating to the form, dimensions and proportions of space¹⁹. In contrast, *material imagination* gives life to the material cause, as substances evoke images that are given names only truly understood through the hand.²⁰ These images will be of great importance to the proposed design intervention, as it will be shown that they immerse the being into space, deconstructing the conventional value of inhabited space, the 'non-me' that protects the 'me'²¹.

It is important to dissolve the boundaries between the self and the environment, to achieve unity within the conditions of space and life, and to ultimately address the conditions of well-being. Drawing from Martin Heidegger, it can be stated that there is an indivisible connectedness between the acts of building, dwelling and thinking. He explains that "(w)hen

19 Bachelard, *Water and Dreams*, 1.

20 Ibid.

21 Bachelard, *La Poetique de L'Espace*.

we speak of man and space, it sounds as though man stood on one side, space on the other. Yet space is not something that faces man. It is neither an external object nor an inner experience. It is not that there are men, and over and above them space [...]."²² Space and the self are conjoined and mediated via the environment. In the context of the built healthcare environment, architecture may contribute to improve comfort, and it will be argued that a deconstruction of the boundaries cleaving the constructed world and the dream world can begin to achieve this.

Dreaming With Substance

Water carries a multiplicity of symbols and images, and has, in the words of Illich, "a nearly unlimited ability to carry metaphors."²³ It is a specific kind of image that pertains to the interest of this chapter: images that stem directly from *matter*. It is through reflection on water's substance that a dream-like environment can be created. In the presence of light, water is above all a surface for reflection. It is a natural mirror that provides mystery by distorting an image. To demonstrate the qualities of reverie and mystery which this substance can evoke, Bachelard refers to the waters written by author Edgar Allen Poe. The reflections in Poe's poems and stories often appear more real than reality, because they are purer. For example, the reflection of a star in a lake holds a peculiar dual nature of a "star-isle, a liquid star, a prisoner of the lake, a star which could be an island in the sky."²⁴ The play on this mirrored image, or absolute of reflection, questions where reality lies: in the image of the lake, or the sky? Through the use of this ultimate mirror image, which doubles both the world and the dreamer, a completely immersive experience emerges.

22 Heidegger, *Basic Writings*, 334.

23 Illich, *H2O and the Waters of Forgetfulness*, 24.

24 *Ibid*

To further demonstrate the immersive nature of water, Bachelard draws from the Greek myth of Narcissus who gazed upon his reflection in a pond only to fall love with the image. In this imagery, water's matter is essential in creating a pseudo-reality that does not confine Narcissus' imagination. This could not have been accomplished with a mirror as an object, as is demonstrated by Louis Lavelle's words in *Water and Dreams*:

"If we imagine Narcissus in front of a mirror, the resistance of glass and metal sets up a barrier to his ventures. His forehead and fists collide with it; and if he goes around it, he finds nothing. A mirror imprisons within itself a second-world which escapes him, in which he sees himself without being able to touch himself, and which is separated from him by a false distance which he can shorten, but cannot cross over. On the other hand, a fountain is an open road for him."²⁵

The natural substance of water allows for Narcissus' beauty to be seen and encourages an open imagination for a quality of reverie that cannot be achieved through modern materials.

The substance of water offers a natural mirror, and reflects not only the viewer, but the entirety of the cosmos that surrounds it. "(A)t the fountain, Narcissus has not given himself over exclusively to contemplation of himself. His own image is the centre of a world."²⁶ In this passage, Bachelard reflects on two concepts: *contemplation* and *environment*. First, an important differentiation between *contemplation* and *observation* must be made. To contemplate is to find a state of reverie, to perform thinking, to

25 Lavelle, in Bachelard, *Water and Dreams*, 21.

26 Bachelard, *Water and Dreams*, 24.

engage the mind and imagination. To observe, Bachelard explains, takes on a certain harshness – using the example of the “eye” of the peacock feather that does not have an eyelid, the *permanent eye* that observes, Bachelard writes “an *Argus relation* warps the tender fascination of admiring love: A little while ago you looked at me, now you are spying on me.”²⁷ The first watermark, which aims to transcend the reality of the constructed world and provide an environment for dream, should not use water as an aesthetic object to observe, but rather as a substance to encourage contemplation and reverie.

It must secondly be noted that water reflects not only the viewer’s figure, but the entirety of its surroundings. An environment designed for dreaming can use water as a transformative material. Architect Marco Frascari writes about the important correlation between environment, thinking, and well-being. In his publication “Places for Thinking”, Frascari shares a passage from Semir Zeki, stating that “our brain, combined with the body, the corporeal mind, seeks, obtains and generalizes cultural, artistic and scientific knowledge through the formation of concepts arranged in a built cosmopoeisis.”²⁸ This formation of concepts, intrinsic to the process of thinking, requires an external environment in which to muse. Moreover, “a place for thinking generates an intensive cosensing, in emotionally dynamic terms, and it inaugurates the creative process because something in the surrounding built environment is forcing us to think; a process that is a coming across rather than one that is based on recognition.”²⁹ Much like Bachelard’s *contemplation*, in which *environment* presents a pond that encourages Narcissus’ ventures, Frascari’s practice and crafting of *thinking*

27 Bachelard, *Water and Dreams*, 29.

28 Frascari, “Places for Thinking”, 1.

29 Frascari, “Places for Thinking”, 8.

is “by the built environment, through a range of corporeal, perceptual and emotional processes, including walking, seeing, touching, listening, drinking, eating, reading, and bathing.”³⁰ A particular example of a space that encourages *thinking*, demonstrated by Frascari, is the American Bar in Vienna, which uses mirrors to virtually and infinitely extend the space. It is “the mirrors and the reflections of the coffered ceiling [that] create an internal coffered infinite sky for developing considerations (i.e. performing thinking in its purest way).”³¹ The reflective *material* of the mirrors serve to visually deconstruct the café’s built environment and convince the eye of a new, more wondrous space, thus encouraging thinking and imagination. While the modern mirror encourages thought, this research will support Bachelard’s theory that *water* is the ultimate material for dream. An environment designed for these experiences should include water as it would in literature, where “a poet who begins with a *mirror* must end with the *water of a fountain* if he wants to present a *complete poetic experience*.”³²

The first Watermark – the Caustic Ceilings – use watery reflections and refractions (caustics), to transform patient room ceilings along the south façade of the Civic Hospital. Through a wall system of exterior concrete ledges, which collect and contain rainwater, and angled glazing units, the sun’s ray refract off the surface water and into the building, creating a caustic effect on the ceilings. Without compromising the hygienic integrity of the interior spaces, water’s substance visually deconstructs the boundaries of the constructed space, creating a new, immersive space for dreaming or escape. In the words of Bachelard, “one cannot dream profoundly with *objects*. To dream profoundly, one must dream with *substances*.”³³

30 Frascari, “Places for Thinking,” 8.

31 Frascari, “Places for Thinking,” 10.

32 Bachelard, *Water and Dreams*, 22.

33 Ibid.

WATERMARK CAUSTIC CEILINGS 01

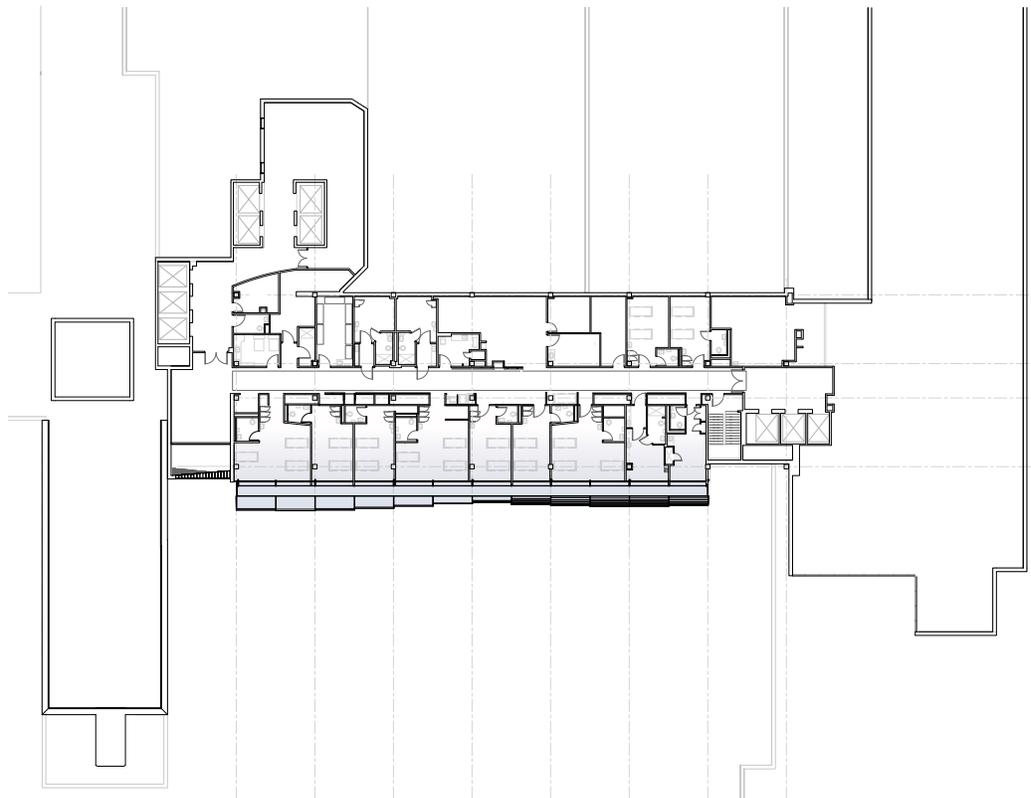


Figure 12. Area Plan: Caustic Ceilings

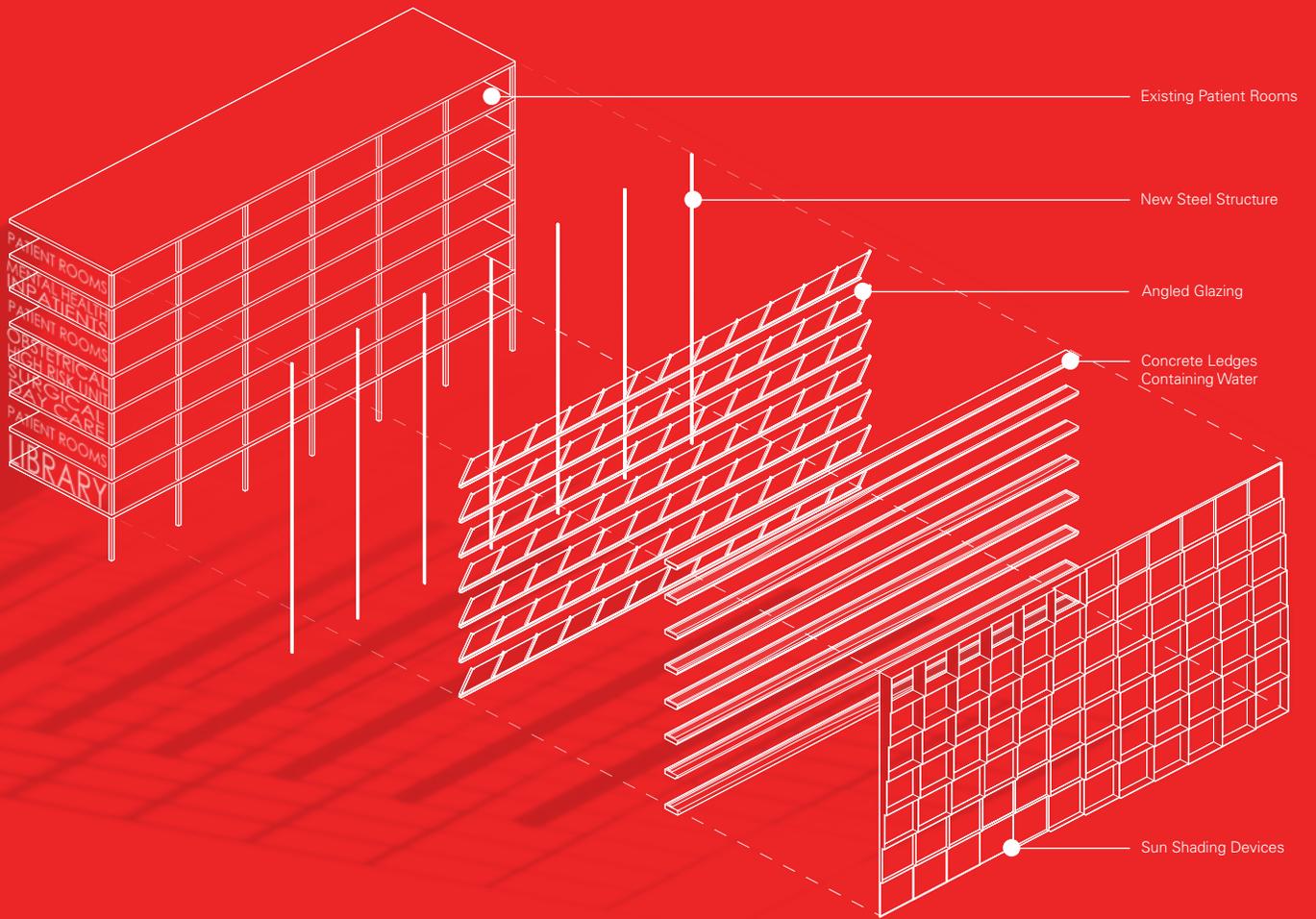


Figure 13. Exploded Axonometric view of *Caustic Ceilings* Composition.

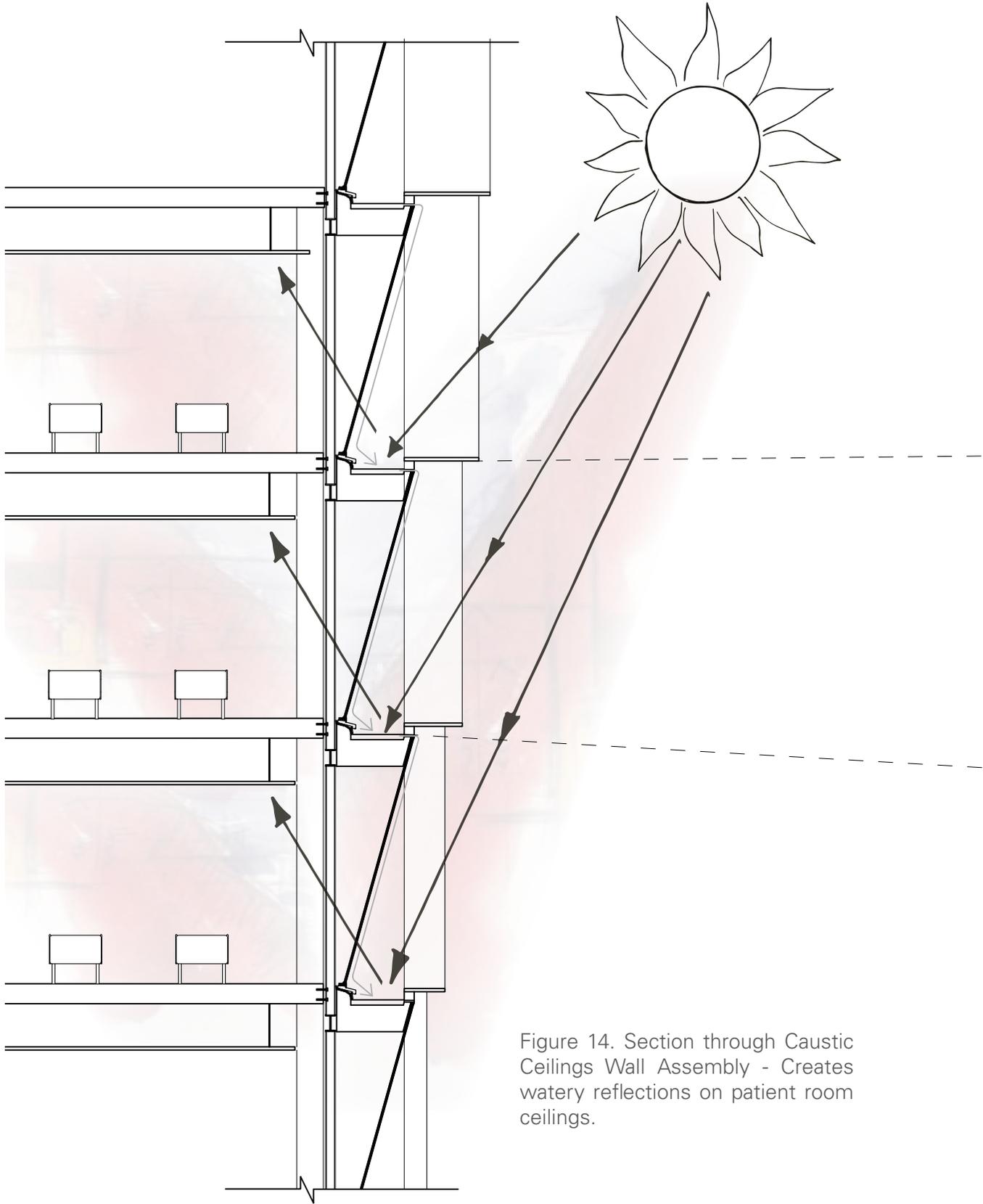


Figure 14. Section through Caustic Ceilings Wall Assembly - Creates watery reflections on patient room ceilings.

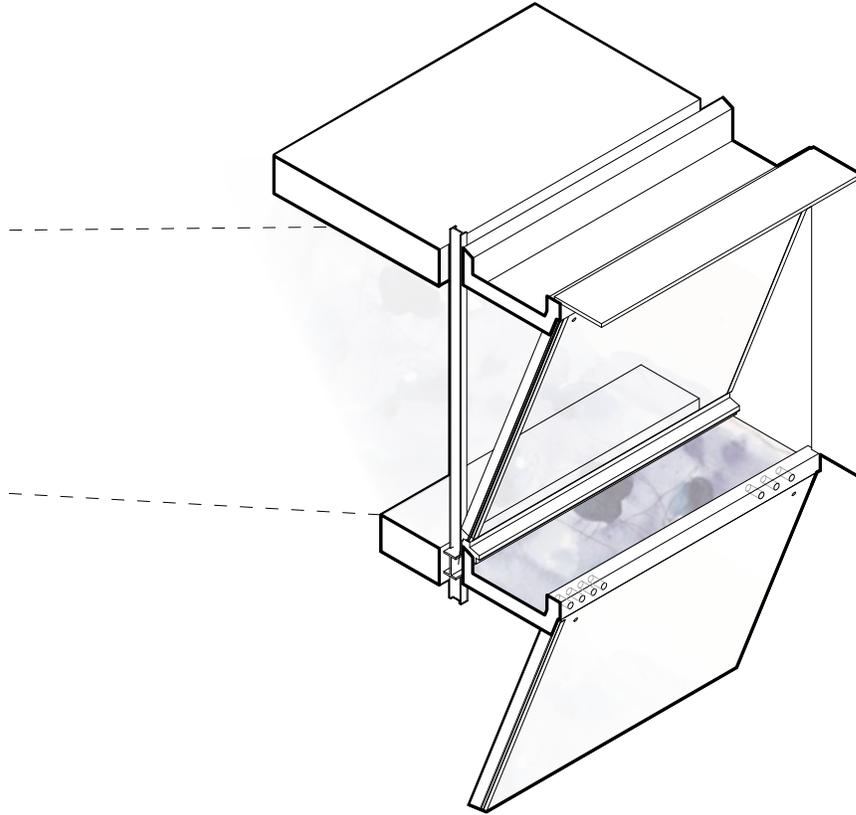
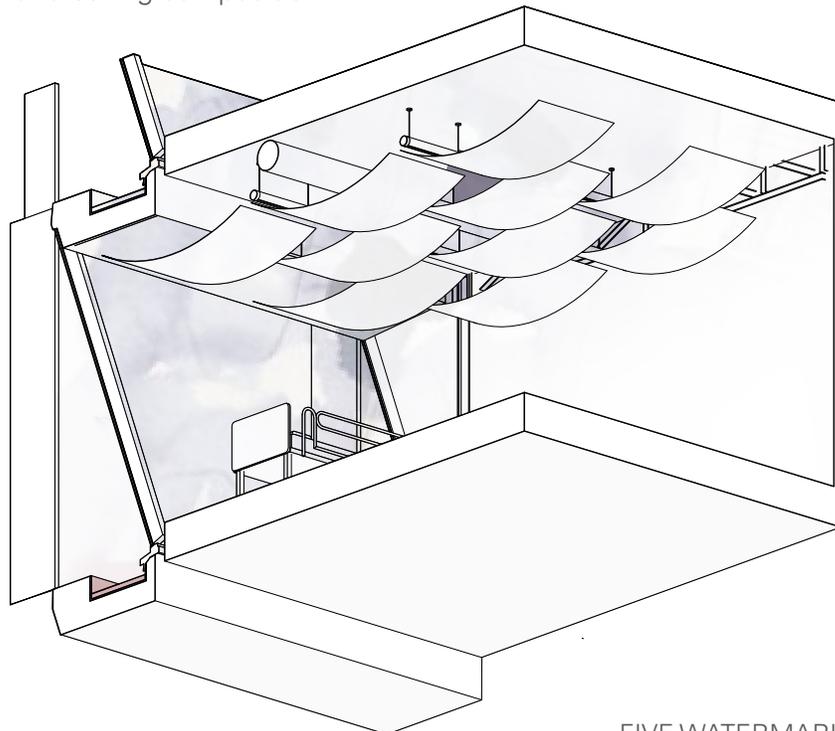


Figure 15a (Above). Enlarged axonometric detail of one window unit.

Figure 15b (Below). Interior worm's eye axonometric view of patient room wall and ceiling composition.



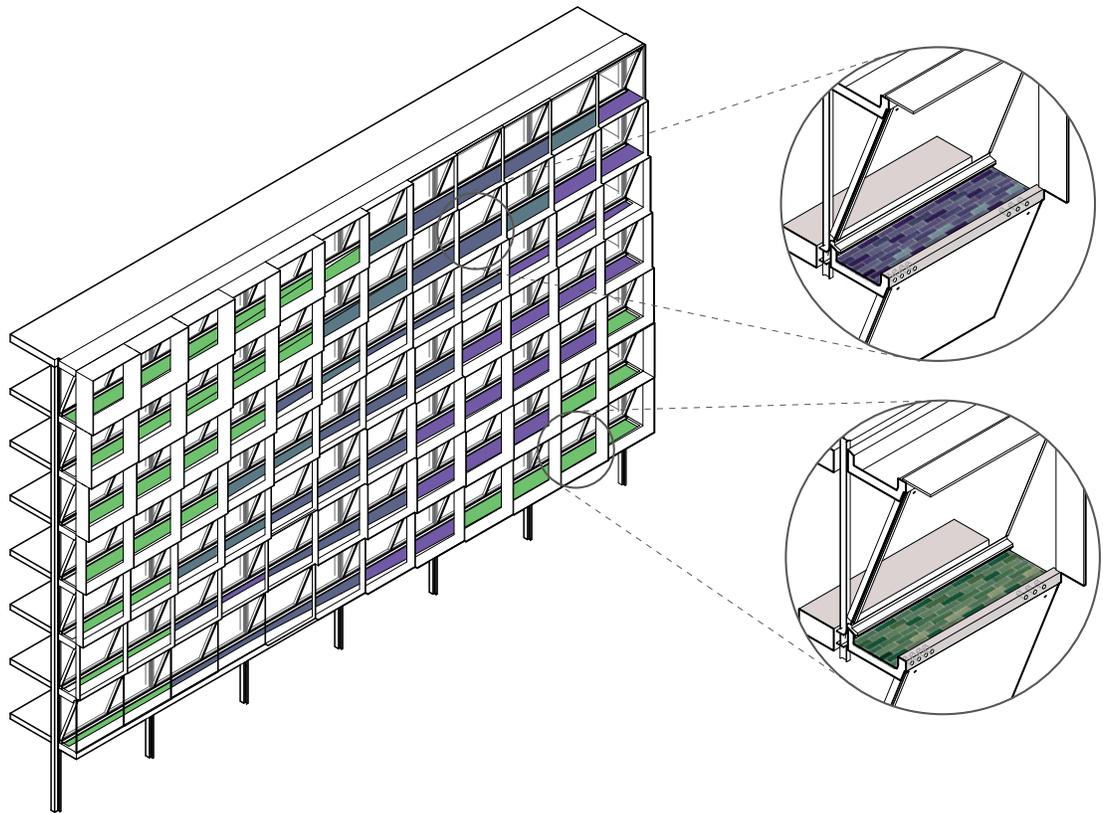


Figure 16. Axonometric view of coloured ceramics within water ledges: create colourful reflections & assist in wayfinding.

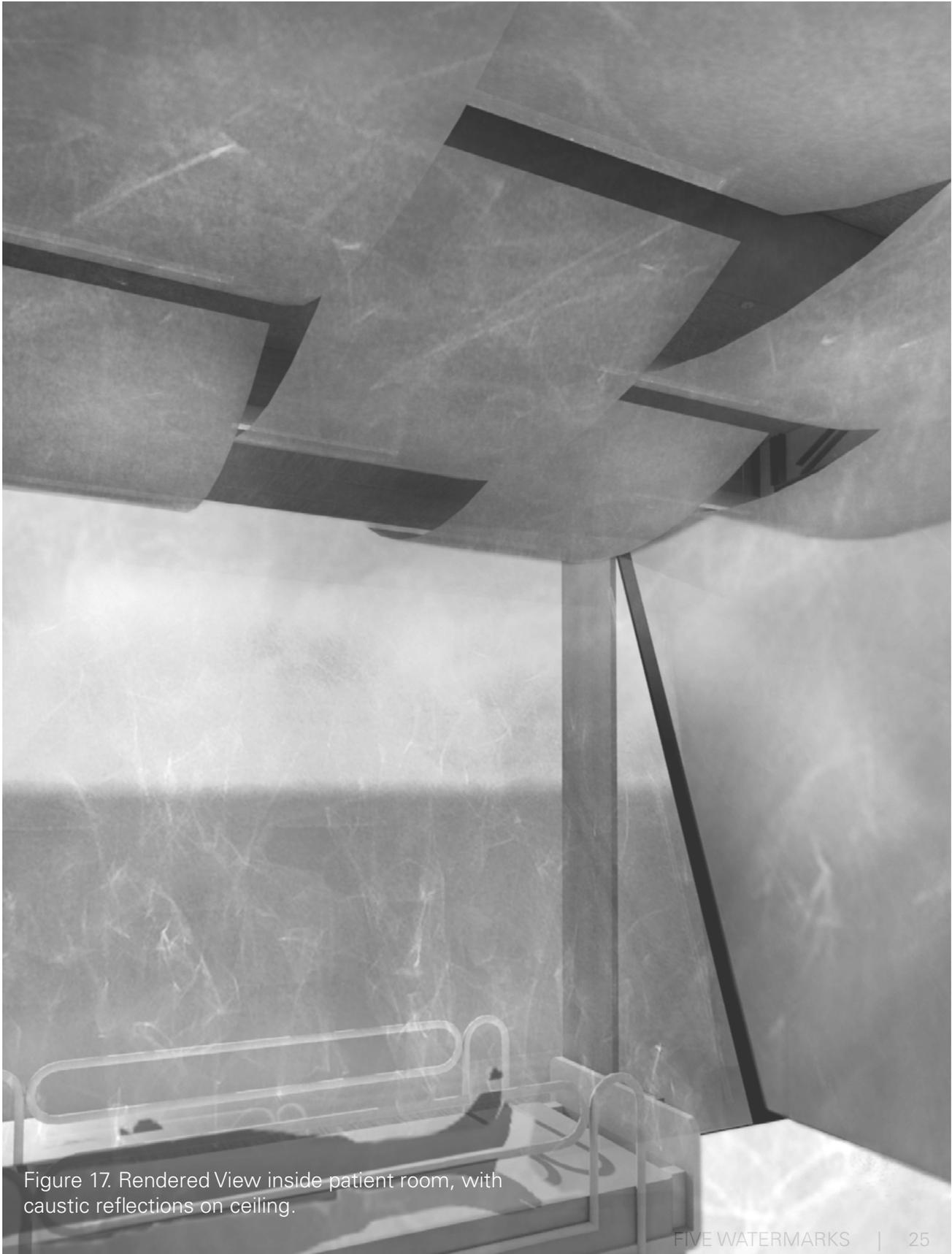
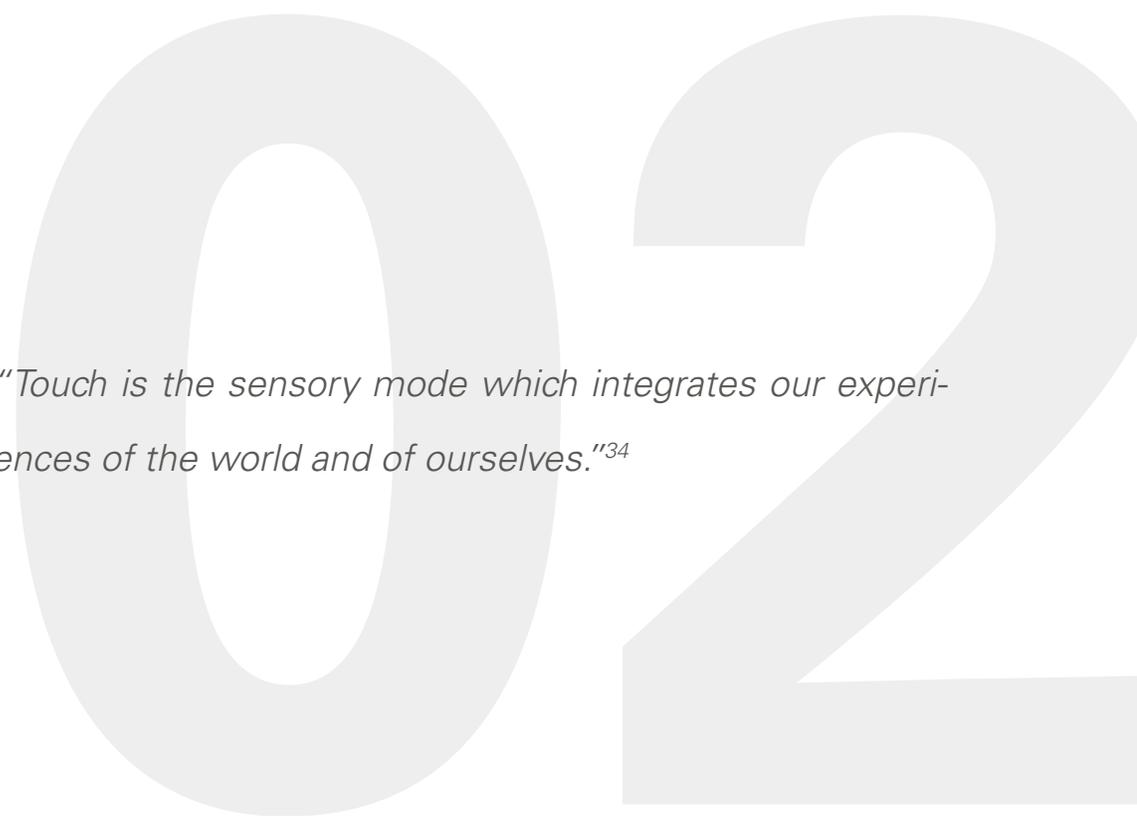


Figure 17. Rendered View inside patient room, with caustic reflections on ceiling.



“Touch is the sensory mode which integrates our experiences of the world and of ourselves.”³⁴

02 (Circulation):

Water, Wayfinding & the Senses

The second design intervention – the AquaRail – relates to the circulation of harvested rainwater within the hospital wing that houses *Five Watermarks*. The AquaRail explores a parallel concept of water and patient circulation, and questions how merging both functions can improve inhabitant well-being. The current hospital condition relies heavily upon visual senses for ease of navigation, with tools such as signage and coloured markers. The AquaRail proposes circulating a specific kind of clean water in the form of a piped handrail, rather than solely isolating the substance in concealed pressure water piping. Through the use of different handrail materials, with varying densities and textures, the handrail can assist in tactile guidance throughout the hospital corridors, while circulating water to the other Watermarks.

Tactile Architecture

Juhani Pallasmaa describes the importance of sensorial architecture in his thought-provoking book *The Eyes of the Skin*, in which he explains that “all the senses, including vision, are extensions of the tactile sense; the senses are specialisations of skin tissue, and all sensory experiences are modes of touching.”³⁵ The skin, the body’s oldest organ and outermost layer, is vital to our embodied experience of the world. The way in which we perceive and experience the environment “takes place at the boundary line of the self through specialised parts of our enveloping membrane.”³⁶

35 Pallasmaa, *The Eyes of the Skin*, 12.

36 Ibid.

However, our interpretation of the world is primarily visual. Sharing a passage from *Modernity and the Hegemony of Vision*, Pallasmaa identifies that “beginning with the ancient Greeks, Western culture has been dominated by an ocularcentric paradigm, a vision-generated, vision-centred interpretation of knowledge, truth, and reality.”³⁷ Moreover, “modernist design at large has housed the intellect and the eye, but it has left the body and the other senses, as well as our memories, imagination and dreams, homeless.”³⁸ But architecture, the medium through which we confront the world, is rooted in questions of existentiality, history and space. Architecture confronts metaphysical questions about the individual and the collective, of life and death, and of inner and exterior experiences.³⁹ While beauty and the intellectual sense through which we understand the world are key elements, the capacity for architecture to provide for well-being does not lie in a retinal relationship to the built environment, but in existential, sensorial experiences. Through the use of materiality and space, a building can invite its inhabitants to touch, to participate, and to experience the world through their body.

In healthcare architecture, the concern for materiality is guided primarily from hygienic and budgetary concerns. The resulting condition of synthetic materials – formalized predominantly through rectilinear gypsum interior walls, acoustic ceiling tiles, plastic flooring materials and fluorescent lighting – creates an environment that arguably dissuades inhabitant participation. The lack of desire to touch or physically engage with the machine-made building further increases the scenographic qualities of the

37 Levin 1993, in Pallasmaa, *The Eyes of the Skin*, 19.

38 Pallasmaa, *The Eyes of the Skin*, 22.

39 Pallasmaa, *The Eyes of the Skin*, 19.

architecture, leading to inhabitant alienation. As Pallasmaa writes, “the detachment of construction from the realities of matter and craft further turns architecture into stage sets for the eye,”⁴⁰ whereas “natural materials – stone, brick and wood – allow our vision to penetrate their surface and enable us to become convinced of the veracity of matter.”⁴¹ To this list of materials should be added the substance of water, a tectonic material that encourages tactile experience.

Illness & the Memory of Place

While the AquaRail invites participation through the senses, it also serves as a wayfinding tool, guiding patients via their elemental senses. Difficulty navigating healthcare buildings can be a significant concern, as illness affects the brain’s memory of place and consequently hinders the spatial sense of the ill. Neural Immune specialist Esther Sternberg explains that the “feeling of being sick,” commonly recognized through symptoms such as fever, fatigue, loss of appetite and depressed mood, is controlled by a part of the brain called the *hypothalamus*, which controls stress response and is activated by immune molecules known as interleukin-1.⁴² Scientist Steve Maier explains that these same immune molecules bind most tightly to the hippocampus, the part of the brain that is important in the memory of place.⁴³ He explains that “when you’re sick the brain has to take the hippocampus offline, so you don’t associate place with sickness”⁴⁴ This disassociation results in an increasingly difficult ability to recognize landmarks

40 Pallasmaa, *The Eyes of the Skin*, 34.

41 Ibid.

42 Sternberg, *Healing Spaces*

43 Maier, in Sternberg, *Healing Spaces*.

44 Ibid.

and orient oneself in space. It has been proven that “of the many sorts of memory a person forms, illness affects them all, but in particular it affects the memory of place,”⁴⁵ and if a patient has to wander through a hospital with a hindered spatial sense they may find greater difficulty navigating the corridors.

How can the connection between stress response and its effect on the memory of place be addressed architecturally? As Sternberg writes, “more than anything, a person who is ill needs an environment that fosters calm and comfort as a means to healing”⁴⁶. They need an environment that can be easily navigated, to decrease anxiety, and the AquaRail – designed primarily for touch, defines a new environment that does not rely solely on sight. The process of moving through the corridor while touching varying temperatures and textures would transform the patient’s experience and memory. The Aquarail questions how active patient participation through sensorial engagement with the building can deconstruct the boundaries between the self and the environment, and how, through this tactile experience, a different type of memory can be formed.

45 Sternberg, *Healing Spaces*, 151.

46 Sternberg, *Healing Spaces*, 166.

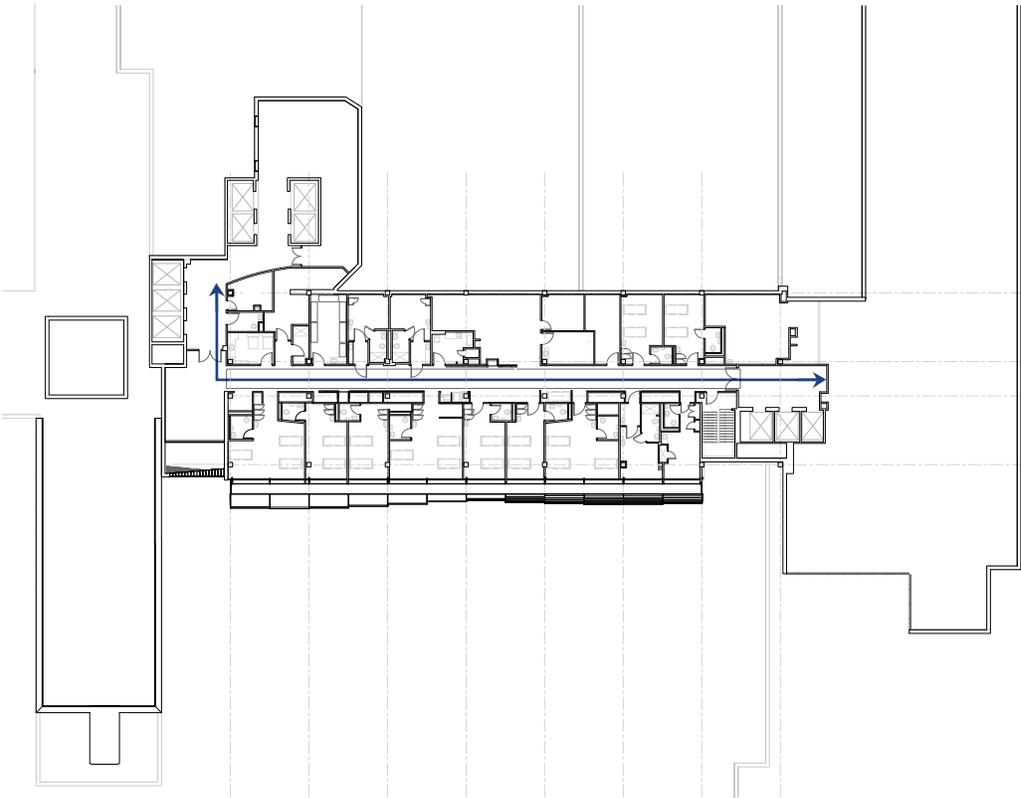


Figure 18. Area Plan: AquaRail

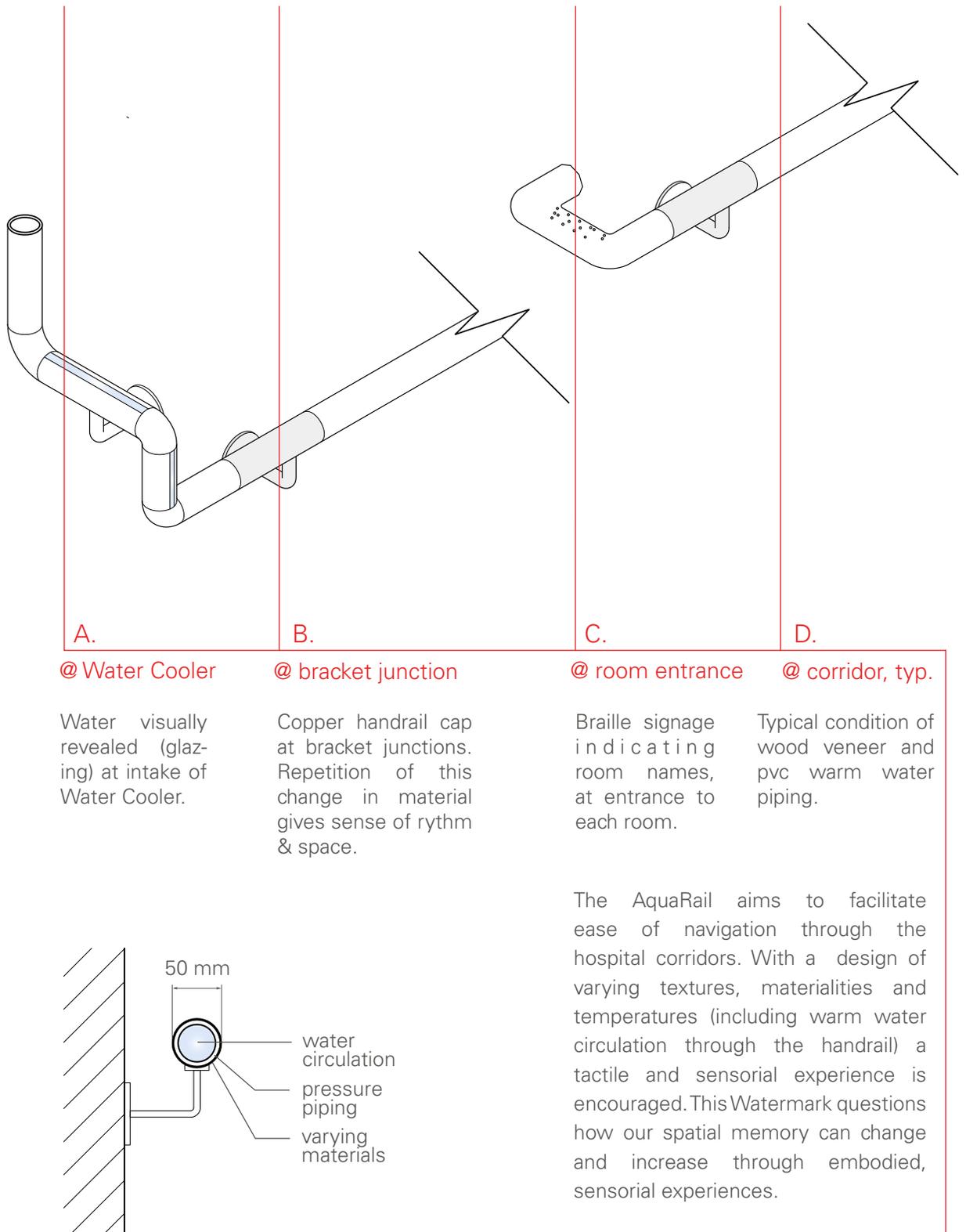


Figure 19. Details + Section: AquaRail

AquaRail Intervention

Location: New “Double Wall” System

This intervention proposes incorporating the AquaRail along a newly integrated “double wall” system, which could include various modules (figure 23) to solve various corridor problems. This Double Wall system could house modules such as equipment storage (see existing condition photographs in figures 20-21), and access to building systems, including a slow sand filter for the harvested rainwater.

Existing Hospital Corridor Condition:



Figure 20. Photograph of Civic Hospital Corridor.
Source: Jade Labonte-Gregory



Figure 21. Photograph of Civic Hospital Laundry Hampers.
Source: Jade Labonte-Gregory

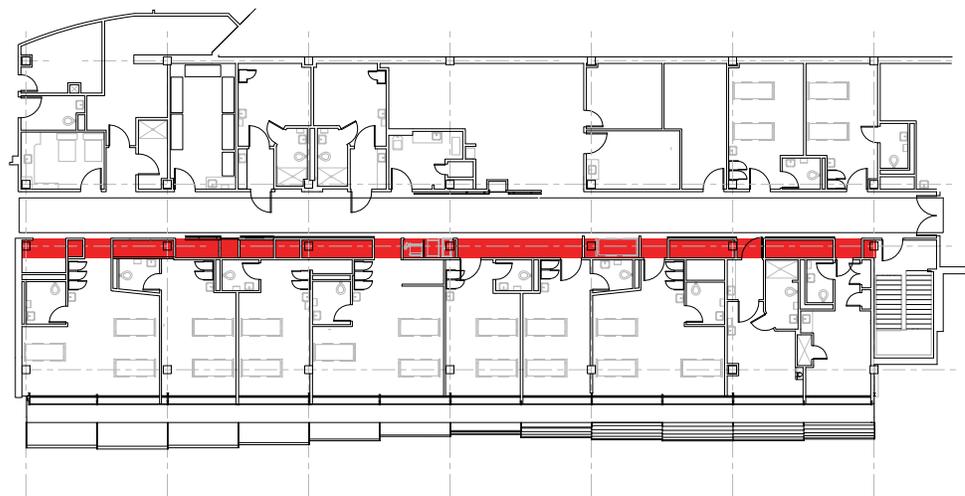
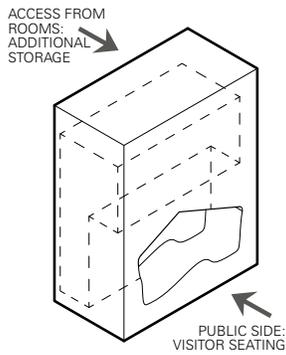
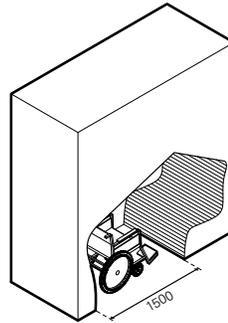


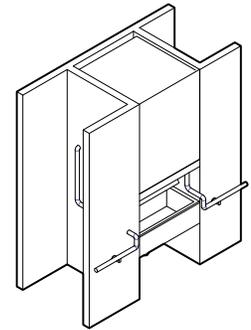
Figure 22. Proposed Corridor Intervention Area



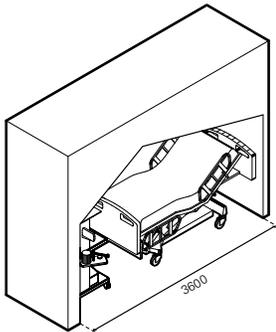
A. VISITOR SEATING



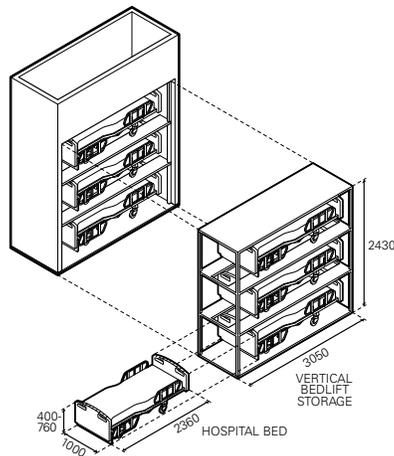
B. VISITOR + PATIENT SEATING



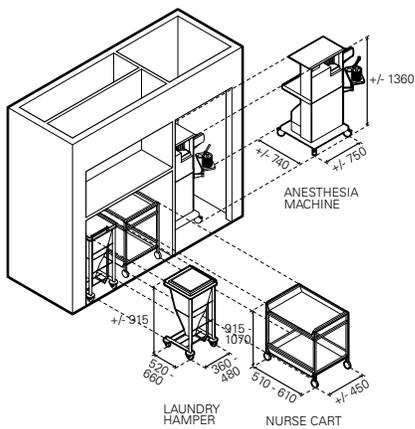
D. WATER COOLER



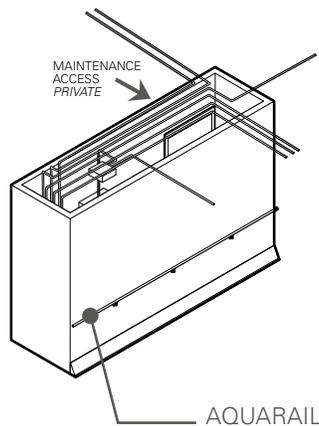
C. TEMPORARY PATIENT ALCOVE



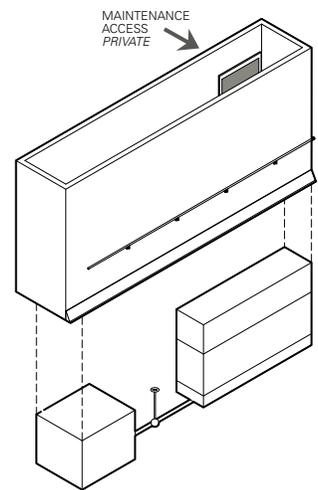
D. VERTICAL BED STORAGE



E. MISC. EQUIPMENT STORAGE



F. SYSTEMS ACCESS



H. SLOW SAND FILTER / SYSTEMS ACCESS

Figure 23. Examples of Modules for Corridor Intervention



Figure 24. Rendered View of Corridor intervention showing AquaRail

"H2O and Water have become opposites: H2O is a social creation of modern times, a resource that is scarce and that calls for technical management. It is an observed fluid that has lost the ability to mirror the water of dreams."⁴⁷

⁴⁷ Illich, *H2O and the Waters of Forgetfulness*, 76.

03 (Filtration):

Water's Dual Nature

While the previous chapters elaborated upon the potential for water to engage the inhabitant's senses and imagination, it must now be argued that the described *water of dreams* is scarcely, if at all, present in today's architecture. In the built environment, water is almost exclusively used in mechanical fixtures relating to the cleanliness and hygiene of a building and its inhabitants. Exempt are buildings that serve a primary purpose directly related to water for healthy or social activities: spas, pools and fitness centres, resorts and retreats. The substance does not seem to be incorporated into a public building for the purpose of well-being, unless the program of that building is exclusively a *health complex*. While the analysis of water's material imagination gave insight into its potential for holistic well-being in the built environment, an important question that arises is why water is only present today in the pipes of our buildings. To understand the existing condition of piped water, the following passage will present a brief history of water in the built environment.

A History of Water Consumption

Water was first brought into the built environment for the purpose of bathing, though the implications of this activity have greatly varied throughout history. Bathing culture originates in the Orient, and the first Mesopotamian domestic baths date as far back as 4,500 AD.⁴⁸ It was much later, during the time of Imperial Rome that bathing became a type of luxury,

48 Auer, "Living Wetter: On Consumption of Water in the Townhouse" 40.

and Constantine Rome was recorded to have had 11 large hot springs, and approximately 850 small baths that allowed even the poorest Romans to bathe on a quotidian basis.⁴⁹ Bathing was not a tradition rooted in personal hygiene as it is today. Bathers attended these complexes to socialize, achieve well-being and sometimes engage in erotic activities. The purpose for bathing transformed with the fall of Rome into Barbarism, as the Fathers of the Church, declaring luxury a sin, only approved of baths that served the purpose of health.⁵⁰ However, it was ultimately not Lutheran reprimands, but syphilis and the plague, which put an end to public baths, and the festive nature associated with bathing.⁵¹(Refer to Appendix A for a visual history of water consumption and baths.)

In London, circa 1815, a revolution was brought about by pressure water piping, leading to a weekly household bath – not yet located in a designated “bath room.”⁵² Physicians at the time warned against dangers of immersing the whole body in water, such as softening the skin and muscular atrophy, and this skepticism combined with a general lack of household space delayed the widespread usage of baths.⁵³ As architect and author Gerhard Auer points out, “neither the hydrotherapies of Hippocrates nor the bathing fervour of the Middle Ages were motivated by hygiene.”⁵⁴ In fact, the roman invention of soap was warily regarded right up to the Modern Age, for fear that it would result in the dissolution of the layer of dirt that was regarded as protective.⁵⁵ Thus, Europeans opted to “clean” with powders and scented perfumes.⁵⁶The scented oils, called “eau de toilette”

49 Ibid
50 Ibid
51 Ibid
52 Auer, “Living Wetter”, 41.
53 Ibid.
54 Auer, “Living Wetter”, 42.
55 Auer, “Living Wetter”, 42.
56 Ibid.

were part of “toilette” that carried no connotations to water, referring simply to powdering and grooming.⁵⁷ Washing did not require the use of water. It was not until later in the 18th century, that water became a genuine cleaning agent. Medical enlightenment, miasma theories and flooding cities with clean water “finally elevated body care to the status of a veritable water cult (...) in which washing and bathing became indivisible.”⁵⁸ As the European apartment came to include a “bath” room, the activities of bathing and body cleansing became fused.⁵⁹ “‘Toilette’ retired behind locked doors. It now involves the flow of tap water to carry soapy suds and excrement to the sewer.”⁶⁰ With this indivisible relationship between water and cleaning, and the invention of pressure piping, water has become inescapably present in buildings. Whether or not this is desired, the fact has arguably become that society accepts water as “a characterless, tasteless every-day liquid of unknown origin.”⁶¹ Has the association of water to this omnipresent liquid that flows through the pipes of our buildings erased the potential for *Dream Water*?

57 Illich, *H2O and the Waters of Forgetfulness*, 65.

58 Auer, “Living Wetter”, 43.

59 Illich, *H2O and the Waters of Forgetfulness*, 65.

60 Ibid.

61 Auer, “Living Wetter”, 46.

Purification vs. Cleanliness

Philosopher Ivan Illich states that “H2O and Water have become opposites: H2O is a social creation of modern times, a resource that is scarce and that calls for technical management. It is an observed fluid that has lost the ability to mirror the water of dreams.”⁶² Is it simply that water flows through a pipe that makes it “H2O”? Can a design intervention using water for the purpose of well-being be achieved despite the material’s association to “cleaning”?

The water pursued in this design is the antithesis to sewage liquid. It is “the fluid that drenches the inner and outer spaces of the imagination.”⁶³ This substance is more perceptible than space, but even more elusive, in particular because it always possesses two sides.⁶⁴ Of particular interest to design for well-being is water’s dual nature of purity and cleanliness. “Water communicates its purity by touching or waking the substance of a thing and it cleans by washing dirt from its surface.”⁶⁵ After water cleans, by detaching particles that stick to people and things, the substance become “dirty”. “All washing pollutes the water used; it has to be thrown away, or rather run off. Running water is therefore the technical term of the cult of cleanliness.”⁶⁶ The process of purification, however, does not necessarily require water. “Purity refers to a quality of being.”⁶⁷ Certain ceremonies historically utilized water for both functions, such as the cleansing of the dead in Celtic mythology. For the completion of the ritual, the dead were first washed with water before they could set out on a journey of

62 Illich, *H2O and the Waters of Forgetfulness*, 76.

63 Illich, *H2O and the Waters of Forgetfulness*, 24.

64 Illich, *H2O and the Waters of Forgetfulness*, 25.

65 Illich, *H2O and the Waters of Forgetfulness*, 27.

66 Auer, “Living Wetter”, 43.

67 Illich, *H2O and the Waters of Forgetfulness*, 28.

purification; “at the end of the journey, they reach a body of water. This water separates two worlds: it divides the present from the past into which the dead move.”⁶⁸ During the ritual, “the slow, flowing waters the traveler crosses are everywhere emblematic of the stream of forgetfulness; the water has the power to strip those who cross it of memories that attach them to life.”⁶⁹ This ceremonious transition from life to death used water for both washing the body and purifying the soul of the dead. It is arguably two distinct waters that perform these oppositional functions.

Illich argues that the omnipresence of “H₂O” – the substance that flows through the pipes of our buildings – has led to an impermeability towards dream water. He critiques the ease with which “a group of architects could very well create out of this sewage a liquid monument that would meet their own aesthetic standards.”⁷⁰ It is a concern that giving monumental form to this sewage substance, for the sake of “aesthetic symbol of a wedding between water and urban space”⁷¹ could be the loss of *dream water*. It must thus be stressed that the purpose of water’s substance in all five Watermarks is not to fetishize the aesthetic of water. The interventions use water in many ways – namely, creating *dreaming* spaces through reflections and assisting in wayfinding, as have been demonstrated in the first two Watermarks. The third Watermark – the Water Cooler – does however shamelessly embrace a piped, “clean,” water. Stepping away from the *dream water* of the Caustic Ceilings, the Water Cooler uses a modern *clean* substance for the sake of cleanliness, while addressing a severe concern within hospitals: insufficient handwashing.

68 Illich, *H₂O and the Waters of Forgetfulness*, 30.

69 Ibid.

70 Illich, 7.

71 Ibid.

Handwashing in Healthcare

According to the World Health Organization, it is estimated that there are at least 1.4 million cases of Healthcare-Associated Infections (HAI) at any given time in the world.⁷² Common infections to spread in healthcare settings include bloodstream infections, surgical site infections, urinary tract infections, chest and respiratory infections as well as gastrointestinal infections.⁷³ The spread of such diseases propagates both through touch and air, and substantial epidemiologic evidence supports that “most health care-associated infections are preventable through good hand hygiene – cleaning hands at the right times and in the right way.”⁷⁴ The proper procedure implemented by Public Health Ontario involves 4 moments for hand hygiene: before patient environment contact, before aseptic procedure, after body fluid exposure risk, and after patient environment contact.⁷⁵ While this procedure may sound simple, healthcare workers have listed a number of reasons that can lead to lack of adherence to procedure, including the high volume of washing leading to skin irritation and dryness, inconvenient sink locations, lack of soap and paper towel, lack of time, and understaffing or overcrowding.⁷⁶

72 WHO, http://www.who.int/gpsc/tools/faqs/evidence_hand_hygiene/en/

73 Ibid.

74 WHO, http://www.who.int/gpsc/country_work/en/

75 Public Health Ontario, <https://www.publichealthontario.ca/en/eRepository/poster-series-4-moments-for-hand-hygiene.pdf>

76 Centers for Disease and Control Prevention (CDC) “Hand Hygiene Core,” 6.

The Water Cooler design intervention, relating to “filtration,” addresses concerns for staff hand hygiene by placing washing stations along the primary path of travel for convenient access. Most importantly, these stations confront the issue of hand washing by bringing a sense of wonder to the process. Proposing a series of washing stations which interrupt, and receive water from the AquaRail, the Water Cooler allows an inhabitant to follow the water’s path as it flows through the handrail, and pause at designated moments. If one were to place their hand on the rail while moving through the corridor, their hand would be stopped by the rail’s return into the wall at each moment where it meets a Water Cooler station. The traveller, turning to view the object which has interrupted their path, might wave their hand in the void space above a Cooler’s basin, triggering a sensor that releases a marvelous waterfall. The Water Cooler relies on wonder and curiosity to invite all participants in the building to engage with the substance, and increase hand hygiene compliance.

WATERMARK
WATER COOLER 03

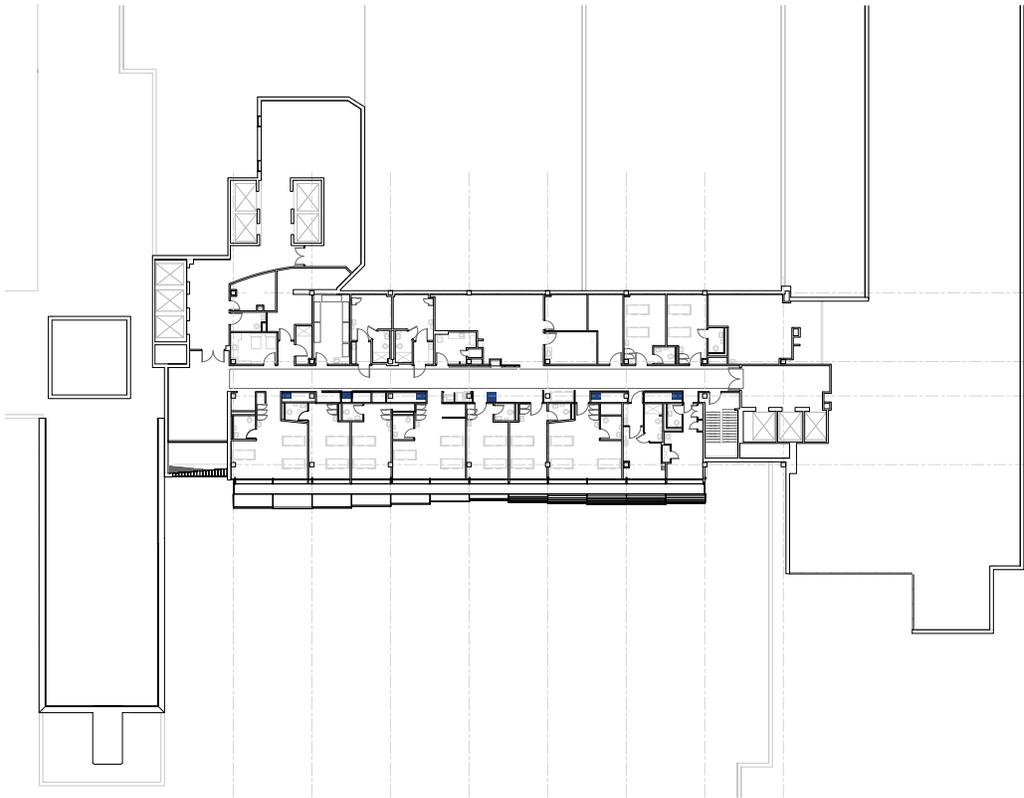


Figure 25. Area Plan: AquaRail

Filtered Water Storage Tank

Represents volume of water that should be consumed by the area of the hospital that it serves, in a 12 hour period, in order to comply with proper hand hygiene.

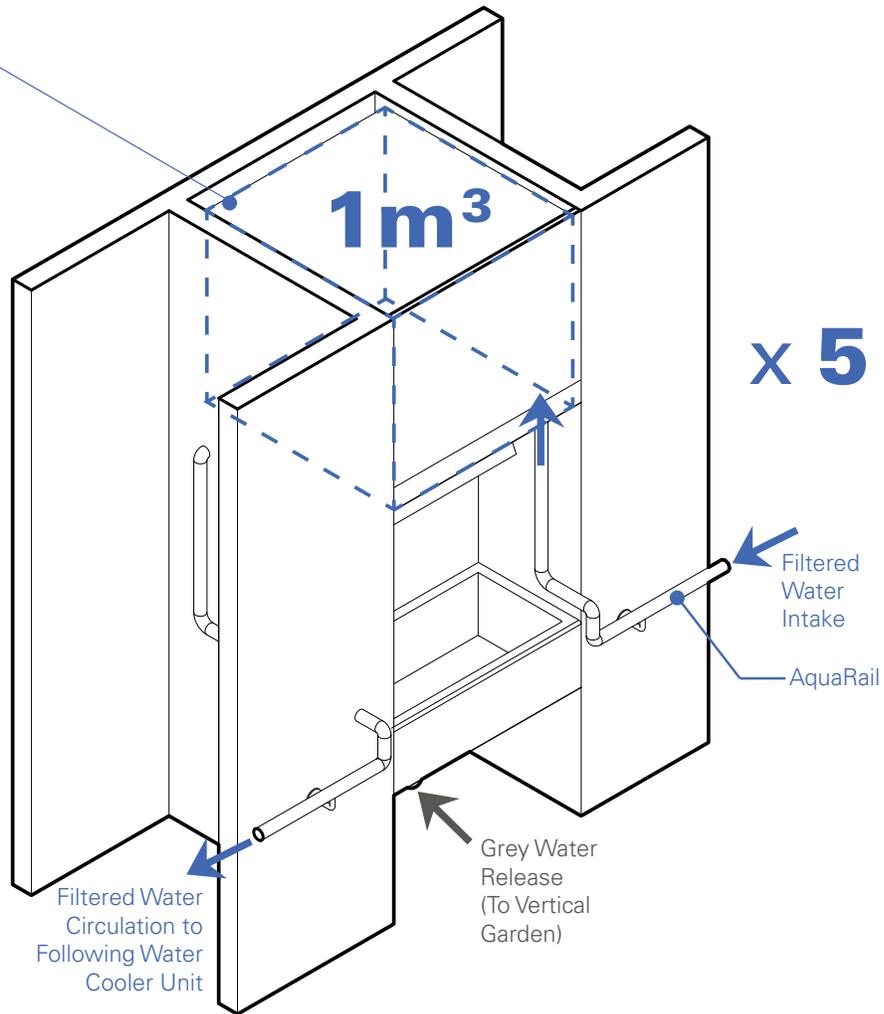


Figure 26. Diagram of water flow: Intake, storage and release of water from 1 Water Cooler unit.

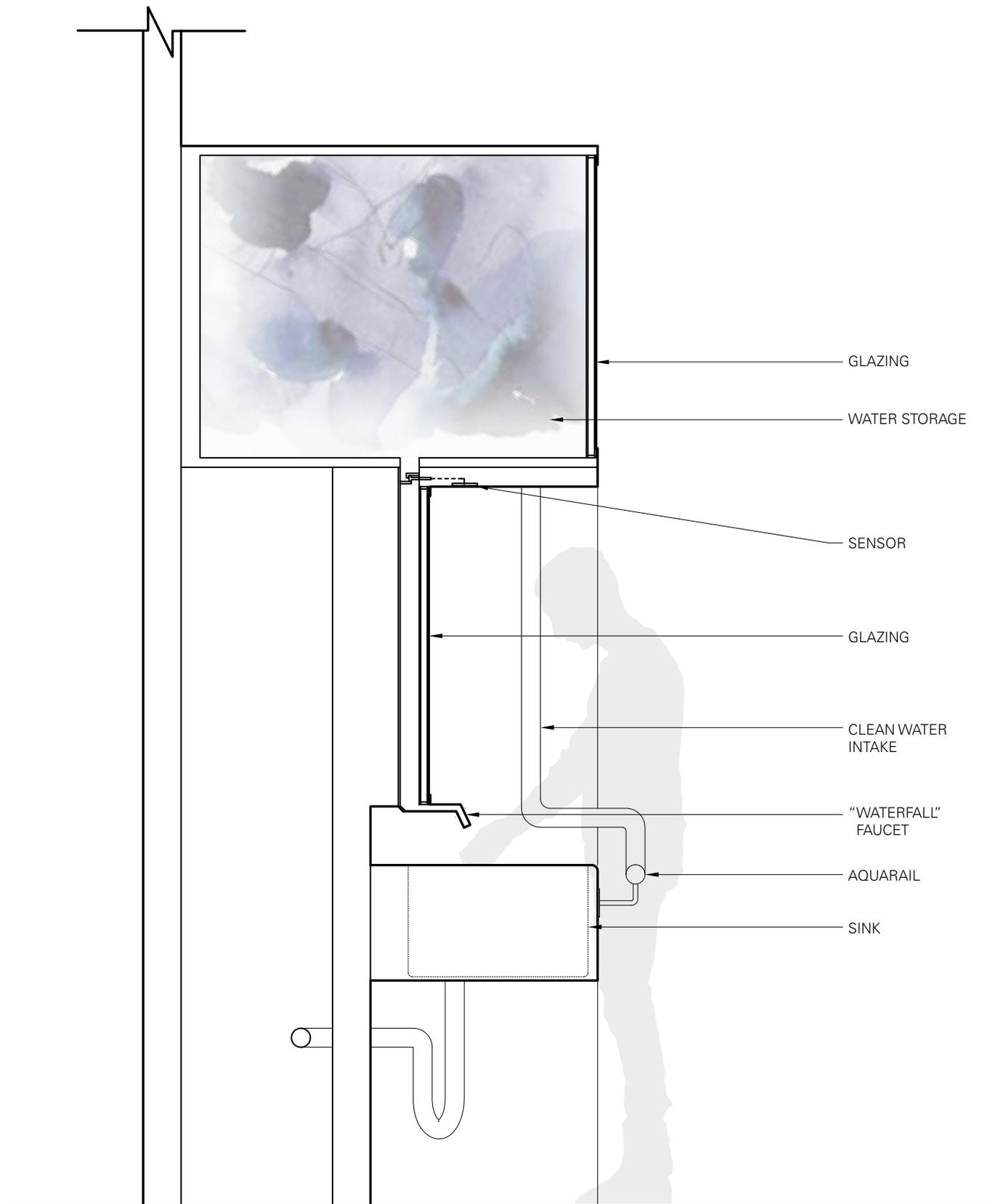
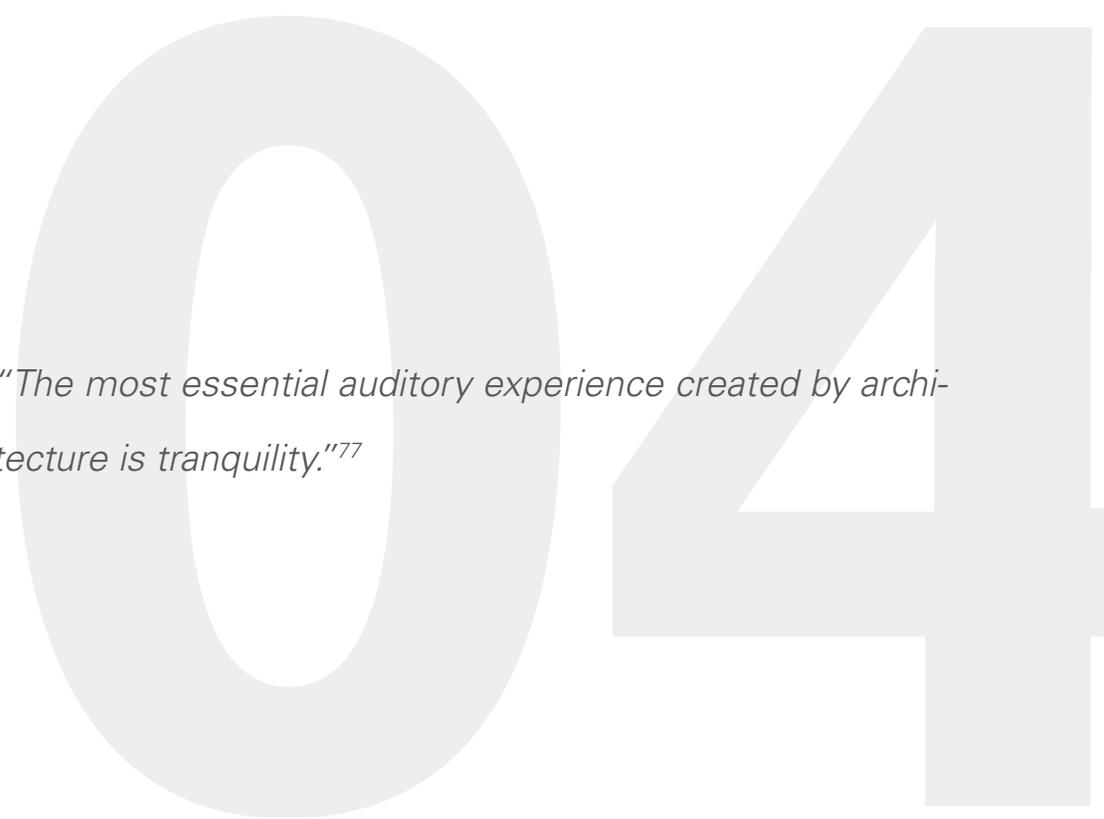


Figure 27. Section of one Water Cooler Handwashing Station



Figure 28. Rendered View of Water Cooler



“The most essential auditory experience created by architecture is tranquility.”⁷⁷

77 Pallasmaa, *The Eyes of the Skin*, 55.

04 (Storage):

Submerged Silence

A Typology of Absorption

The acts of building and sheltering primarily mean to protect from the elements. As Gerhard Auer writes, “to build means to protect oneself against the rain and snow, asserting one’s superiority over the ground-water and being safe from floods; living means knowing that one’s life and possessions are kept dry.”⁷⁸ Contemporary buildings aim to perfect the act of sheltering. The evolution of building science, mechanical equipment and technical air flow for heating and cooling theoretically enables the absolute of “comfort” to be reached. However, as Auer explains, “the more the *intelligent building* succeeds in stabilising its temperature and humidity, the more uncomfortable we feel. Atmospheric homogeneity causes discomfort. A feeling of well-being results from stimulating variety.”⁷⁹ In fact, the excessively controlled interior environment can lead to *Sick Building Syndrome* (SBS), which generally stems from lack of natural ventilation and stimulation in atmosphere and can cause inhabitant illness, commonly manifested as headaches and respiratory problems. To counteract SBS and to provide essential environmental stimulation, the elements must re-enter the built environment.

Fire was brought into the built environment, in the form of ovens, over 600,000 years ago.⁸⁰ It wasn’t until 4500 AD that water was brought into shelters with the integration of baths, and not until the 18th century that it

78 Auer, “Living Wetter”, 38.

79 Auer, “Living Wetter”, 52.

80 Ibid.

was found flowing through the pipes of buildings. Contemporary building techniques encourage design elements such as natural ventilation, passive heating, and interior greenery; opening the doors to fire, air and earth. The exposed substance of water remains the single element regarded with skepticism in interior environments. Water has, however, been accepted into the home as an exposed substance for aesthetic and ornamental purposes, with an example being the aquarium.⁸¹ Recent developments have also seen the integration of “water walls” and interior fountains, as aesthetic focal points in public spaces. While there is knowledge to be gained from these technologies, the incorporation of water into architecture should be thoughtful, and to return to Illich’s critique, should not merely use piped water to create aesthetic form, as this would only strengthen the demise of water as a substance of material imagination.

Averting the implementation of water as an observed object of beauty, its incorporation into the built environment can serve either as a filtered substance for cleanliness – as in the Water Cooler – or can act as a natural, tectonic building material that confronts the existence of the body within its world. While the Caustic Ceilings have been designed with an emphasis on *dreaming* through environment and matter, and the AquaRail strengthened the relationship of the individual to the built environment through tactile participation and memory, the fourth Watermark – the Phonic Baths – returns to sensorial experiences with an emphasis on hearing. While responding to the need for storage of harvested water for the overarching *Five Watermarks* intervention, the baths provide a silent and immersive staff retreat that redefines the end-of-day shower.

81 Auer, “Living Wetter”, 53.

Experiencing Interiority

The second chapter, on Water and the Senses, began to discuss the existing human condition in which sight is considered the noblest sense, and certainty is based on the visible. As Heraclitus wrote, “the eyes are more exact witnesses than the ears,”⁸² and Plato furthered that vision is “humanity’s greatest gift,”⁸³ asserting that “ethical universals must be accessible to ‘the mind’s eye.’”⁸⁴ However, with the introduction of water as a building material for the sake of well-being, the design implications should transcend the intellectual eye and penetrate the realm of the “body’s eye.” Architecture for well-being should not only house intellect, but the body, memories, imagination, dreams, and senses. The fourth Watermark, the Phonic Baths, intend to create a space for tranquility, through sound, where staff can end their work days. As Pallasmaa writes, “The most essential auditory experience created by architecture is tranquillity. Architecture presents the drama of construction silenced into matter, space and light. Ultimately, architecture is the art of petrified silence.”⁸⁵ The power of a building to provide for moments of serenity emerges from its acoustic performance. To understand the influence of sound on atmosphere one has only to think of the experience of hollow reverberations in a desolate building, as compared to the affability of the same space when inhabited, where sound is softened and absorbed by the many surfaces and objects in the building.⁸⁶ The capacity for a building to provide an environment of tranquility emerges from its ability to shelter audibly and to provide an experience of acoustic intimacy. As Pallasmaa writes, “The sense of sight

82 Heraclitus, in Pallasmaa, *The Eyes of the Skin*, 18.

83 Plato, in Pallasmaa, *The Eyes of the Skin*, 18.

84 Ibid.

85 Pallasmaa, *The Eyes of the Skin*, 55.

86 Pallasmaa, *The Eyes of the Skin*, 54.

implies exteriority, but sound creates an experience of interiority. I regard an object, but sound approaches me; the eye reaches, but the ear receives. Buildings do not react to our gaze, but they do return our sounds back to our ears.”⁸⁷ Hearing is integral to structuring and experiencing space in a similar way that a soundtrack plays a greatly influential role in film.⁸⁸ Thus, sound, or lack of sound, significantly defines atmospheric qualities of a space.

While the primary emphasis in previous Watermarks has been placed on the design for *patient* well-being, the Phonic Baths, in turn, address *staff* well-being by redefining the end-of-day shower. Through the use of water and wood as natural building materials to provide acoustic intimacy, the baths aim to create a tranquil atmosphere where healthcare workers can end their day.

87 Pallasmaa, *The Eyes of the Skin*, 53.

88 Ibid.

WATERMARK PHONIC BATHS 04

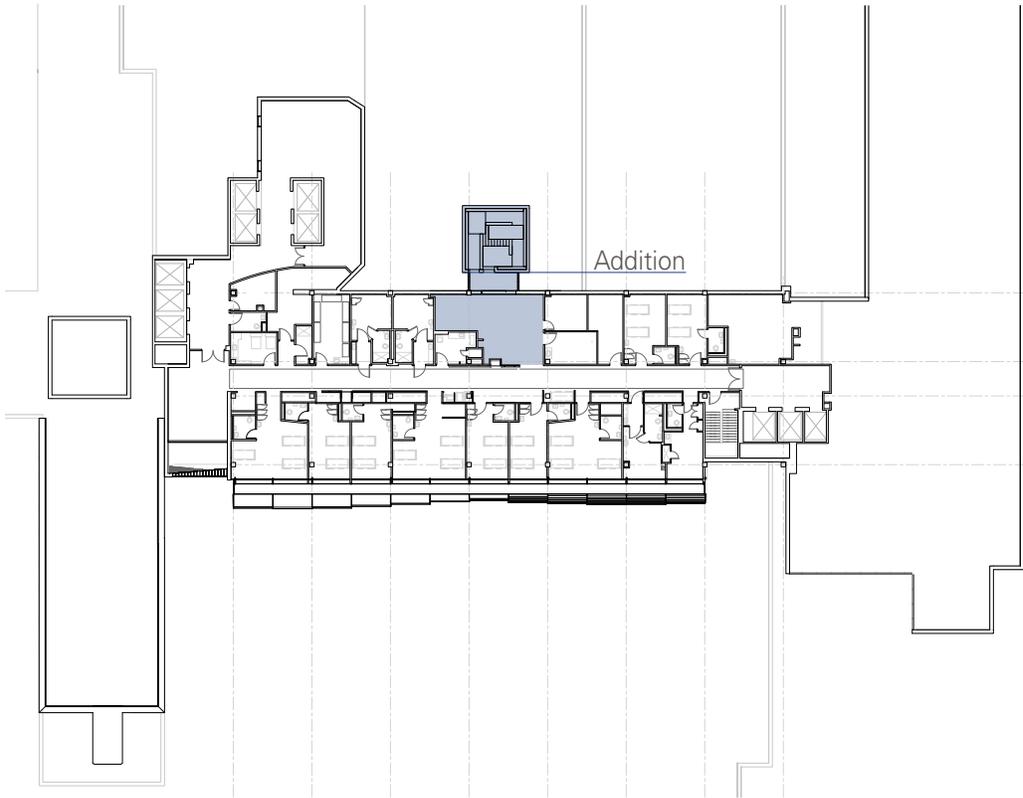


Figure 29. Area Plan: Phonic Baths

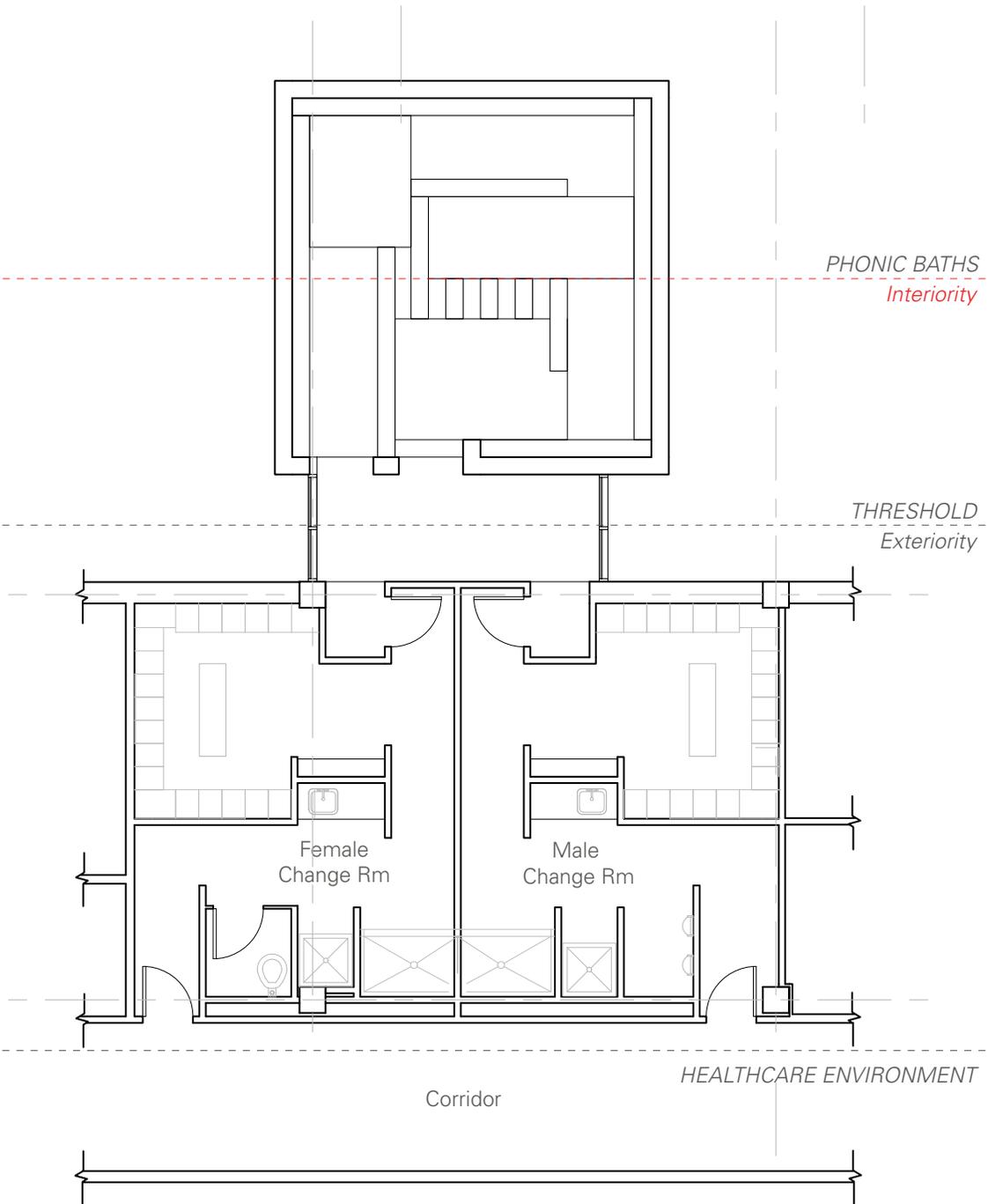


Figure 30. Plan: Phonic Baths

The plan of the Phonic Baths is designed with perpendicular wood partition walls for sound absorption. The perpendicular pattern is recalled in the details of the ceiling and interior elevations, creating a “silent box” to which workers can retreat for a tranquil moment.

Three pools of varying temperatures- cold, warm and hot, are integrated into the plan’s intersecting partition walls to form a path, with the entry point on the left. The phonic baths lead the inhabitant through these waters, starting with the coolest experience and ending in the heat, to provide a hydro-therapeutic experience. Each bath is acoustically sheltered to create a serene experience.

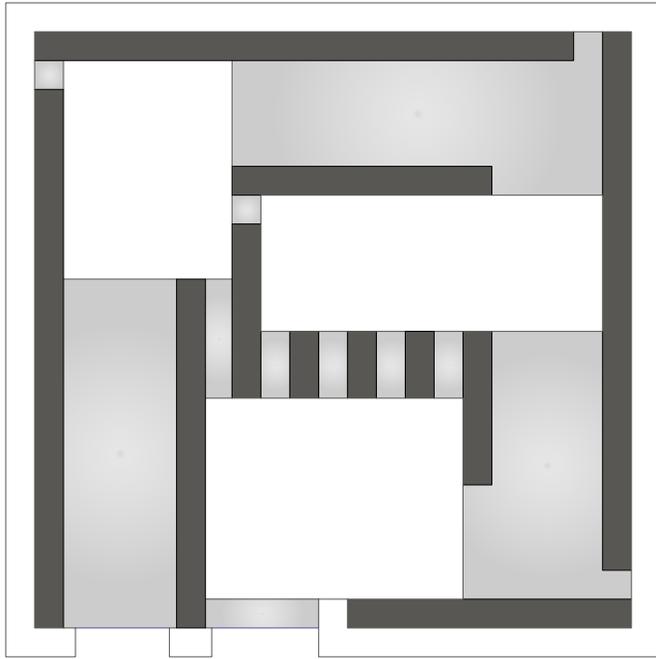


Figure 31. Plan view of Phonic Baths, demonstrating perpendicular walls that enclose baths & provide acoustic intimacy.

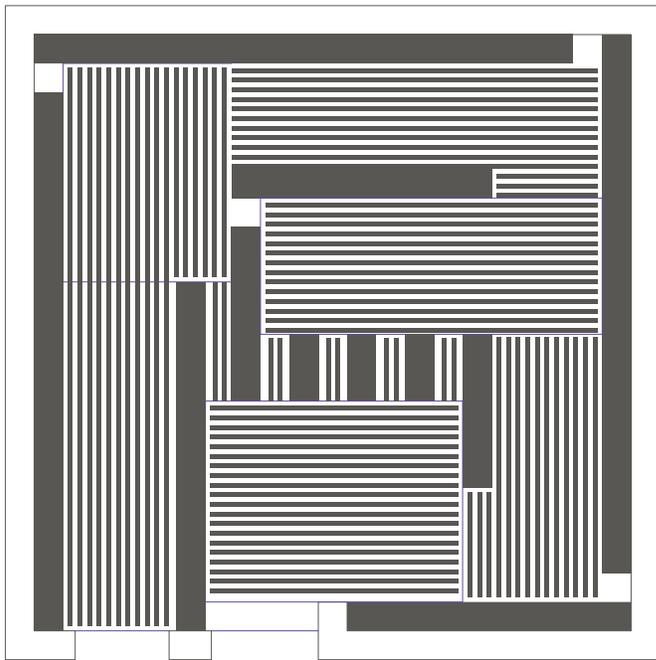


Figure 32. Reflected Ceiling Plan: Perpendicular, louvred wood panelling.

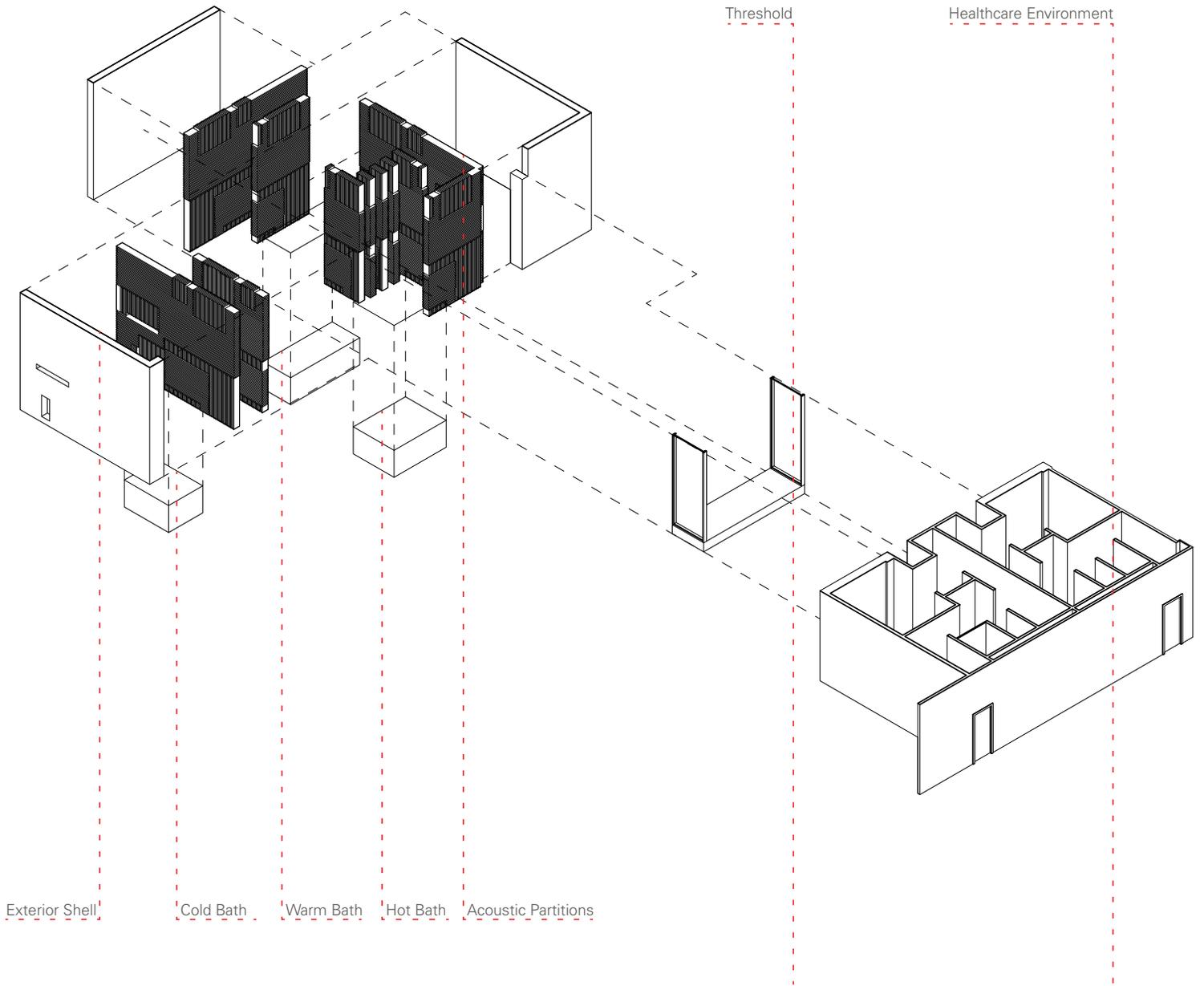


Figure 33. Exploded Axonometric View of Phonic Baths



Figure 34a. Rendered View Inside Phonic Baths



Figure 34b. Rendered View Inside Phonic Baths

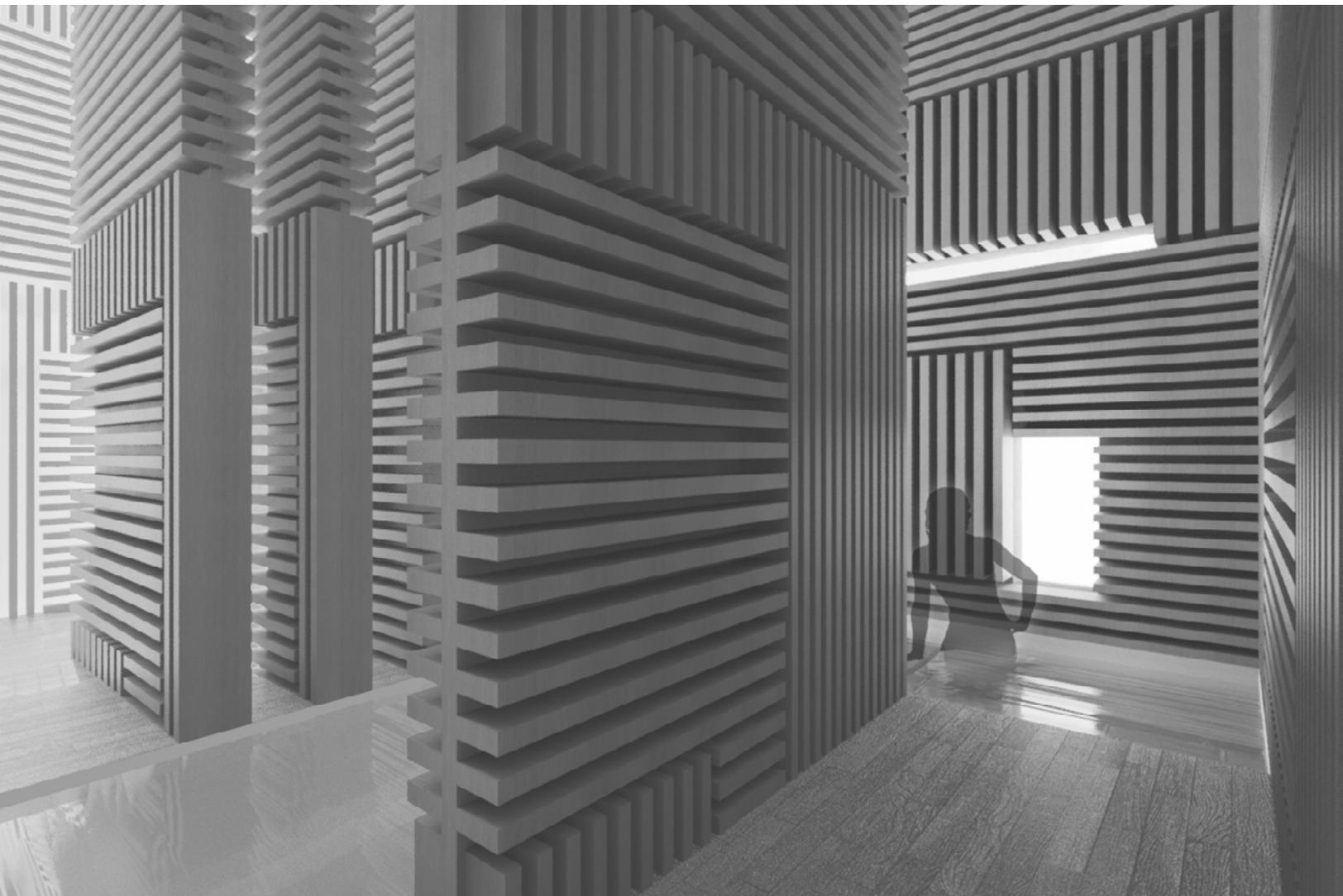
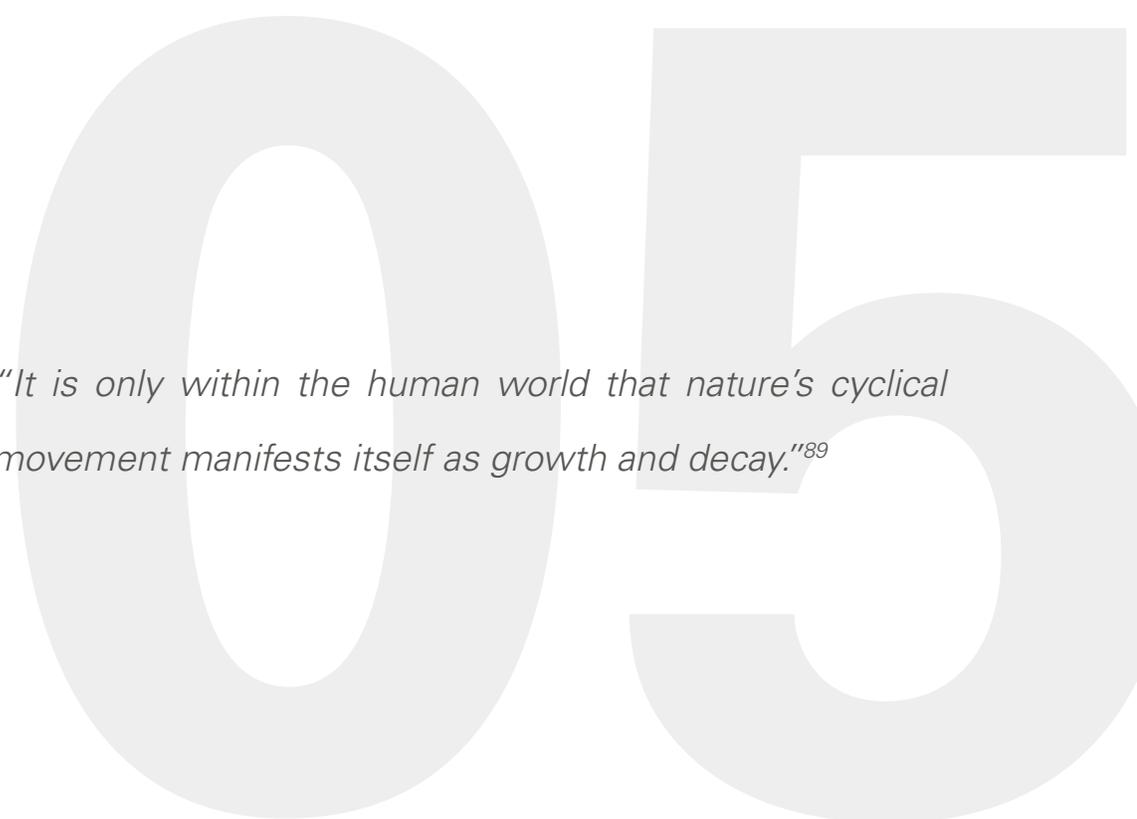


Figure 34c. Rendered View Inside Phonic Baths



“It is only within the human world that nature’s cyclical movement manifests itself as growth and decay.”⁸⁹

05 (Release):

The End & the Beginning

The fifth and final Watermark relates to the release of water within the overarching design intervention. This speaks of a metaphorical duality between the water's physical release via irrigation, and the ultimate release of the patient due to the cessation of life. According to the Canadian Institute for Health Information, approximately 65% of Canadians die in hospitals, which represents upward of 150,000 lives ending in hospitals every year.⁹⁰ Traditional funerary practices in Canada and in Ottawa are cremation and burial, with evidence demonstrating a recent rise in the practice of cremation. According to the President of the Ontario Funeral Service Association, Scott Miller, "cremation has become increasingly popular mainly because the cost of cemetery property has become too expensive for some."⁹¹ In recent years, an alternative funerary practice, called the "Urban Death Project" has emerged. It is a compost-based renewal system that involves a ceremony in which the deceased are laid to rest in a bed of earth and high carbon materials, to encourage and accelerate the inevitable process of decomposition.⁹² Human bodies are rich in nutrients such as Phosphorus, Nitrogen and Calcium, and when combined with high carbon materials such as wood chips and saw dust, they can produce a rich soil-building material in only 4 to 6 weeks.⁹³ The composting process provides great environmental benefits: it does not pollute the earth with the steel and concrete of cemeteries, nor the air with the greenhouse

90 Canadian Institute for Health Information, <http://yourhealthsystem.cihi.ca/hsp/inbrief?lang=en#!/indicators/005/hospital-deaths-hsmr;/mapC1;mapLevel2;/>

91 Cain & Young, <http://globalnews.ca/news/480871/burial-vs-cremation/>

92 Urban Death Project, <http://www.urbandeathproject.org/tablet/index.html>, last accessed March 27, 2016.

93 Urban Death Project, <http://fast.wistia.net/embed/iframe/bbkqvqn1m?popover=true>, last accessed March 27, 2016.

gases produced through burning in cremation. However, this project raises issues far beyond concerns for environment. According to the project's founder and executive director, Katrina Spade, "the Urban Death Project is not simply a system for turning our bodies into soil-building material. It is also a space for the contemplation of our place in the natural world, and a ritual to help us say goodbye to our loved ones by connecting us with the cycles of nature."⁹⁴ This poetic ritual, decentralized from questions of culture and religion, speaks of a cyclical relationship between humans and nature. Comparatively to the process of cremation, in which ashes are given to the deceased's family, the Urban Death Project returns to families their loved one's soil building material.

The concluding Watermark – the Vertical Garden – proposes the integration of a green wall that uses soil building compost from the hospital's deceased (voluntarily donated by interested families) to assist in the growth of new plants. The Vertical Garden houses an integrated water delivery system for the plants. This water is metaphorically the same substance that the deceased would have previously enjoyed on their *Caustic Ceilings*, used to wash their hands in the *Water Cooler*, and followed along the corridor's *AquaRail*. *Five Watermarks* thus ends with a release of its water as irrigation for new life, completing one cycle with the beginning of another.

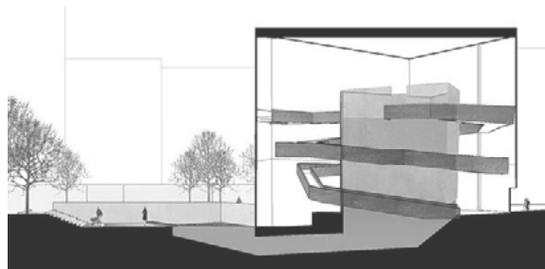


Figure 35 – Section through Urban Death Project Decomposition Structure.
Source: <http://www.urbandeathproject.org/>



Figure 36 – View of Moment within Burial Ceremony
Source: <http://www.urbandeathproject.org/>

94 Urban Death Project, <http://www.urbandeathproject.org/tablet/index.html>, last accessed March 27, 2016.

WATERMARK VERTICAL GARDEN 05

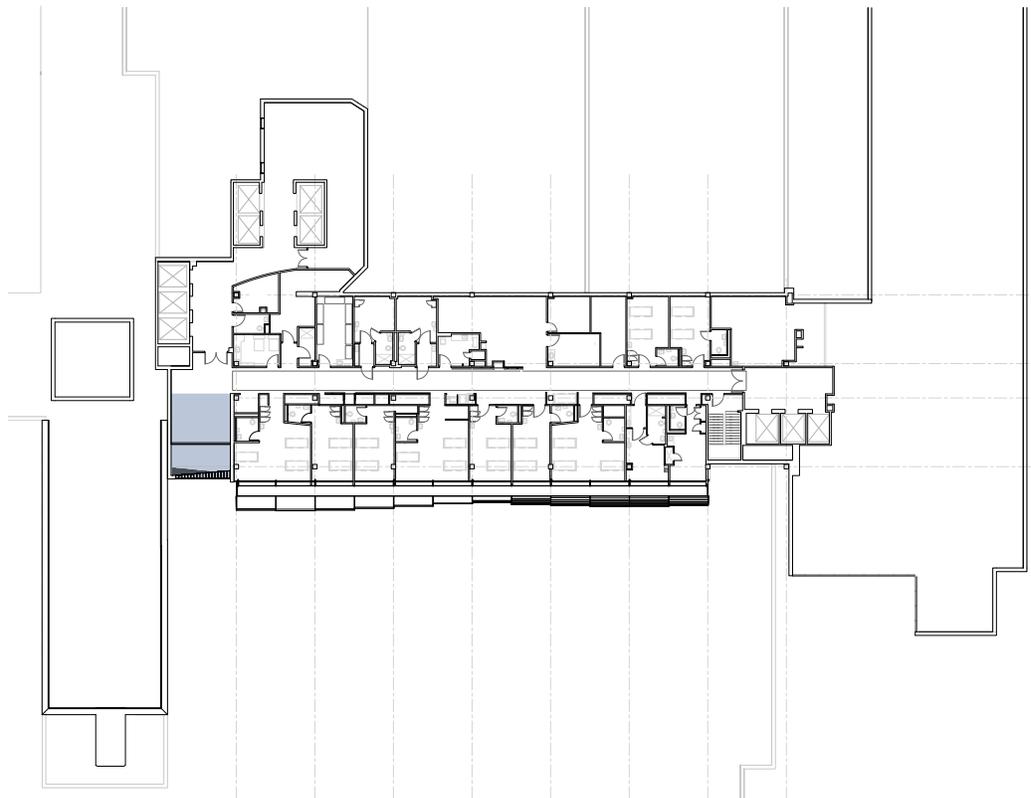
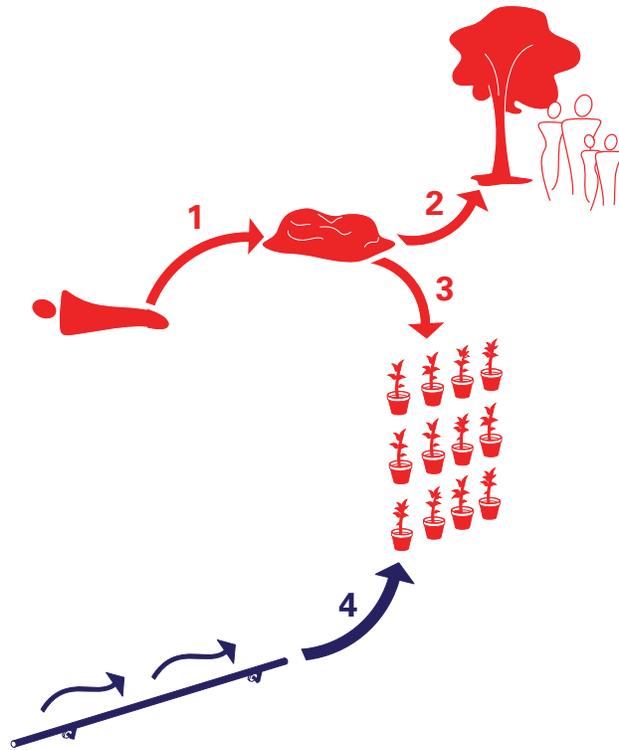


Figure 37. Area Plan: Vertical Garden

Figure 38. Conceptual Diagram: Processes of Decomposition, New Growth & Water's Release



- 1 Decomposition**
Body sent off-site to centre such as Urban Death Project. 4-6 week process for full decomposition & resulting compost.
- 2 Soil-Building Material Returned to Family**
Compost given back to family, which can be used to plant a commemorative tree, etc.
- 3 Soil-Building Material Donated to Hospital's Vertical Garden**
Families can volunteer their loved one's soil-building material to the hospital, where it will be implemented in the Vertical Garden, to assist in the growth of new plants, which commemorate the deceased and provide a space for processes such as conversation and mourning.
- 4 Integrated Water Delivery System from AquaRail**
Greywater from previous Watermarks (circulated via AquaRail) feeds into the Vertical Garden.

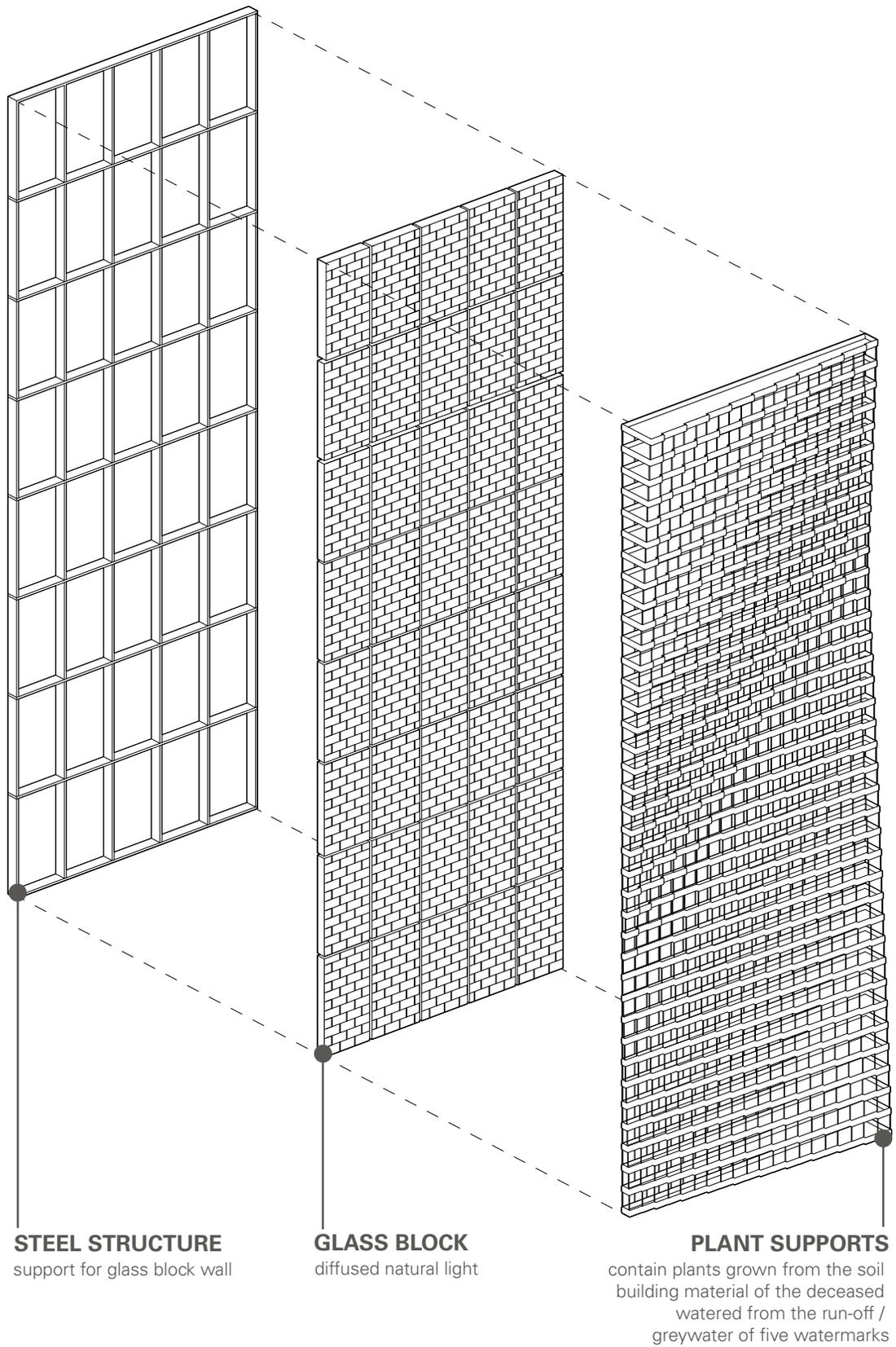


Figure 39. Exploded Axonometric of 8-Storey Vertical Garden Wall Assembly



Bird's Nest Fern



Heart Fern



Kangaroo Paw Fern



Peace Lilly



Philodendron



Rabbit's Foot Fern

Figure 40. Proposed Plant Species for Vertical Garden

Role of Plants

Use in irrigation for release of water used in five watermarks.

Increase environmental comfort, and inhabitant well-being.

Assist in cyclical growth process.

Commemorate deceased through new plant cycle made possible by their soil building material.

Contribute to spaces for conversation, contemplation, mourning & retreat.

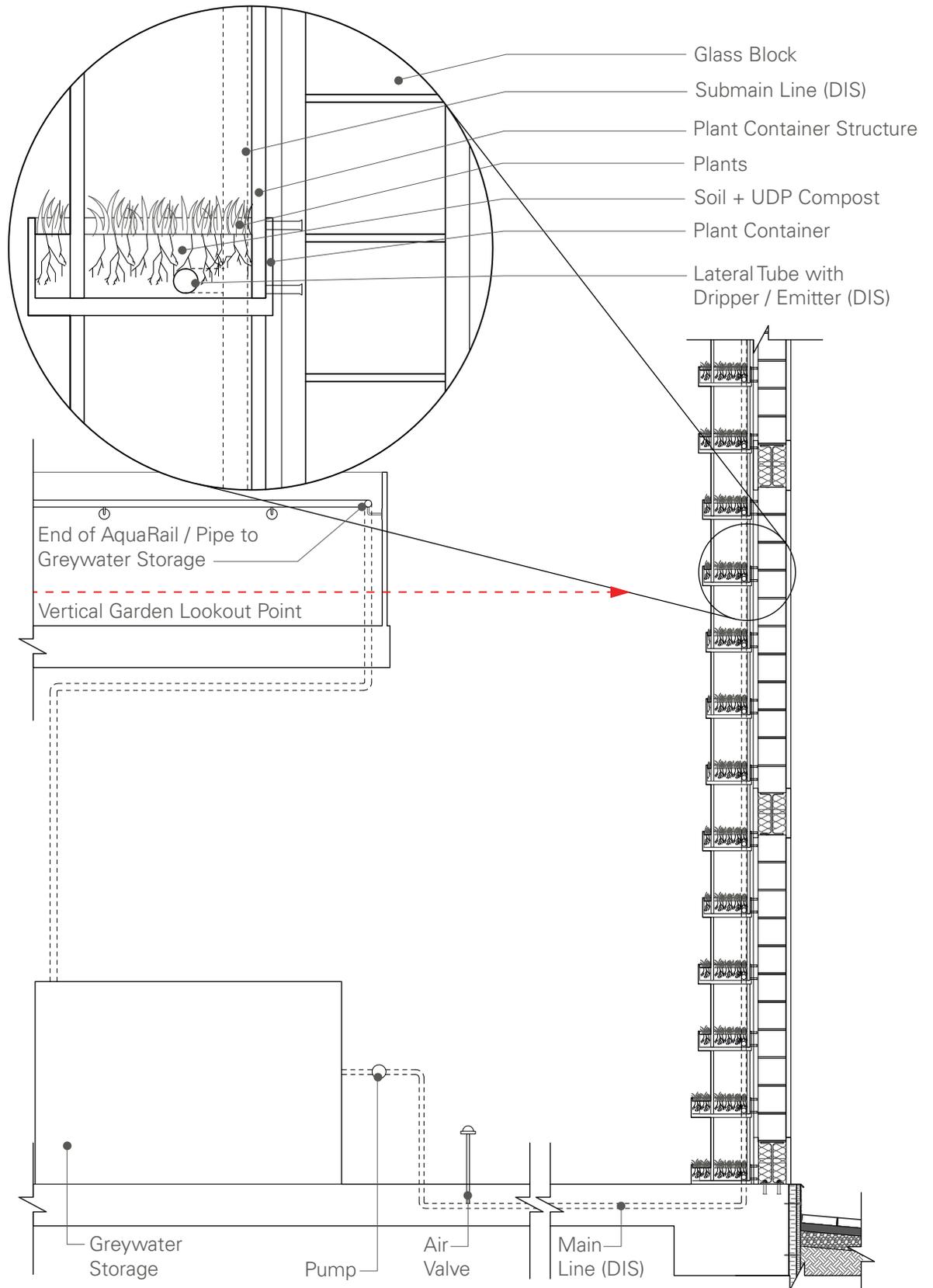


Figure 41. Section of Vertical Garden with Integrated *Drip Irrigation System (DIS)*



Figure 42a. Rendered View of lookout to Vertical Garden

FIVE WATERMARKS

SYSTEMS DIAGRAM

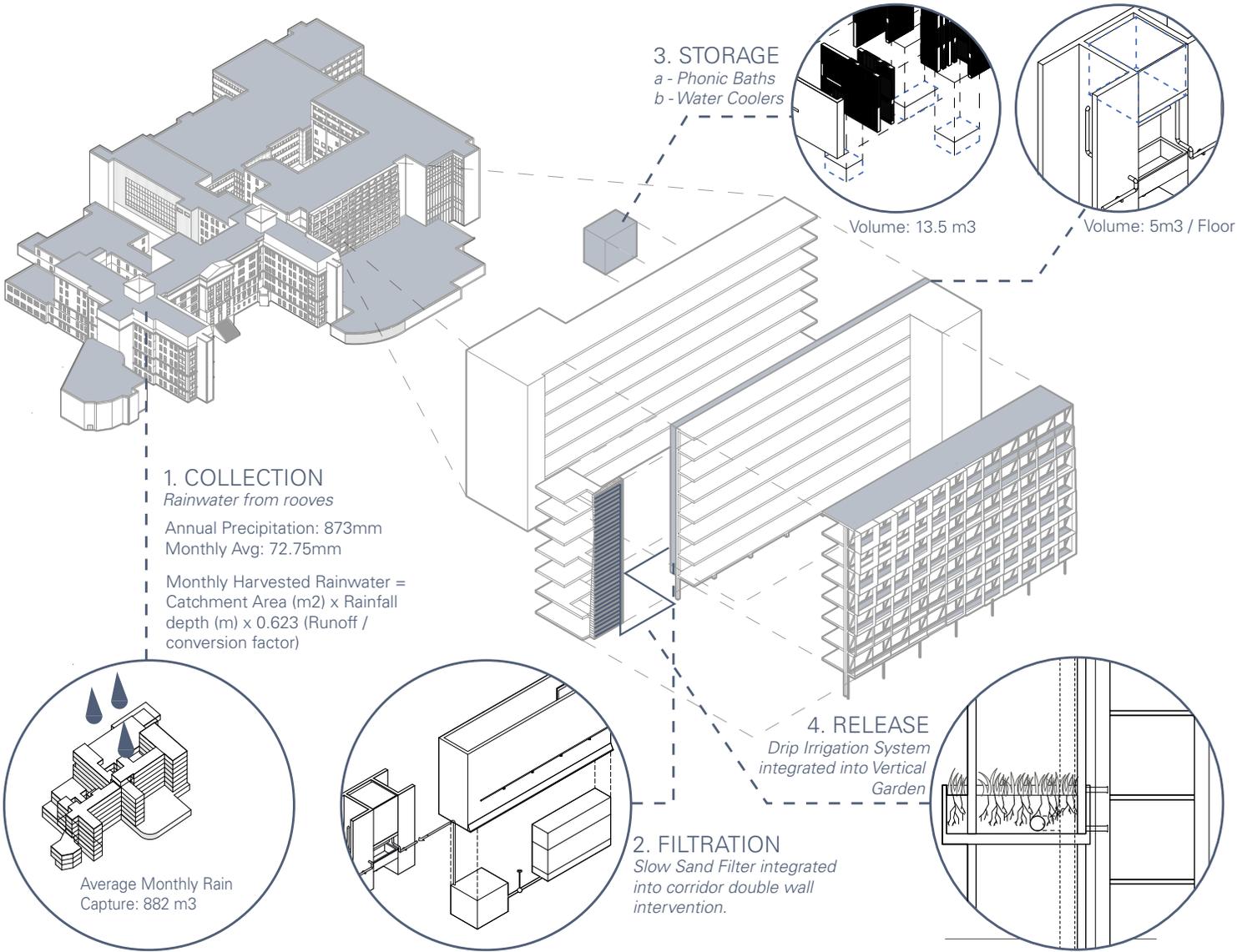


Figure 43. Five Watermarks Water Systems Diagram

APPENDIX A

A VISUAL HISTORY OF WATER CONSUMPTION



Figure 44 – Heinrich Aldegrever, *The Bath House*.

Tinted Copper Engraving, 16th century.

“The mixed clientele of a public bath house; one dedicates oneself to the care of the body, receives medicinal treatment, and gives oneself up to play and sexual pleasure.”

Source: Auer, “Living Wetter,” 40.



Figure 45 – John William Waterhouse, *Daneiden*, 1904.

IMI Advertisement from 1931.

“The modern housewife assumes the role of the water nymph in advertising”

Source: Auer, “Living Wetter,” 40.

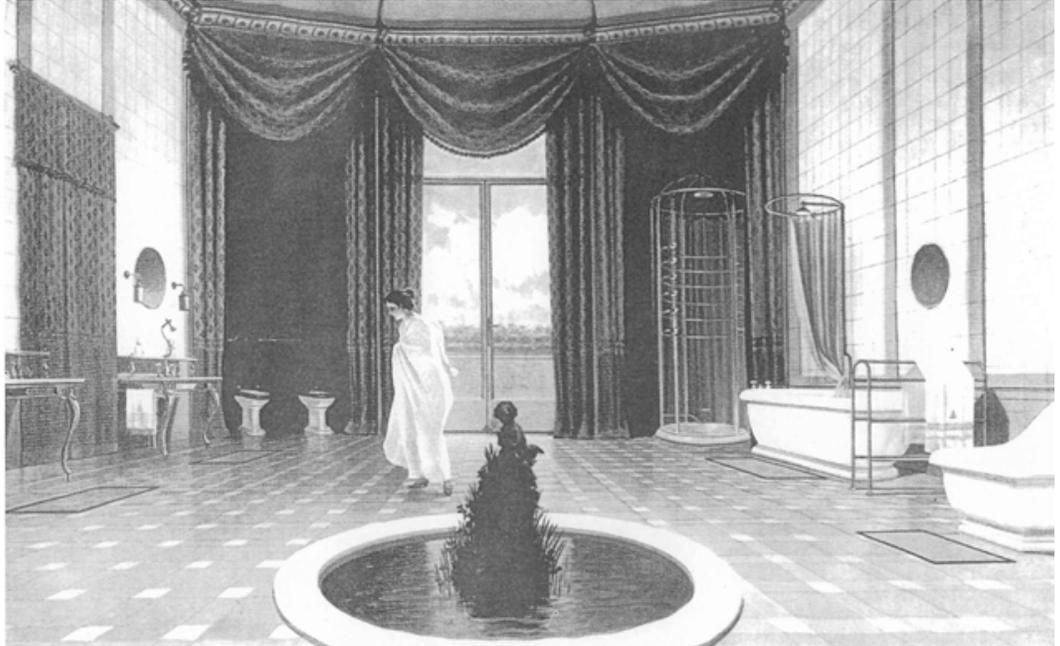


Figure 46 – The Luxurious Bath Circa 1900.

“The compilation of all that was possible in the bath at the time. Two washtables (one with head-shower), toilet, bidet, shower (with foot and side nozzles), reclining and sitting bathtub (with towel warmer) are complimented by a small decorative fountain. Especially sophisticated: all water and drain pipes are plastered over.”

Source: Auer, “Living Wetter,” 41.

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