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Not All Parasites Are Predators:

A parasitic social infrastructure for the Maen Sri Waterworks, Bangkok

School of Art and Design

An exegesis submitted to Auckland University of Technology in partial fulfilment of the requirements for the degree of Master of Design.

03/05/2024

Attestation of Authorship:

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor any material which, to a substantial extent, has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

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Contents

Abstract

This creative practice-led research thesis explores how parasitic architecture can reinvigorate abandoned urban sites, with a specific focus on the Maen Sri Waterworks in Bangkok's historic district. Embracing the concept of symbiotic relationships, the study advocates for a transformative shift in perspective, where the parasite serves to enhance rather than exploit the host structure. This approach emphasizes the preservation and augmentation of the host's historical and architectural significance while integrating new functionalities, creating new environmental niches, and fostering new life. The proposed paradigm envisions a parasitic material realm, informed by both existing materials and original investigations, to infuse new vitality into abandoned space.

Through this initiative, the Maen Sri Waterworks is re-envisioned for public life centred on water use. Integrating elements such as water harvesting systems, purification facilities, and communal spaces, the proposal offers a water infrastructure that not only addresses practical challenges but also celebrates the historical significance of water towers in urban landscapes. The project seeks to advance a holistic spatial approach to urban revitalization, fostering sustainability, community engagement, and architectural innovation.

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I INTRODUCTION

Living in a city centre often entails being surrounded by towering skyscrapers dominating the skyline. However, amid these impressive structures, one can also encounter unfinished and abandoned buildings that have gradually deteriorated over time. While some of these buildings have undergone repairs and repurposing efforts, many remain abandoned. Some property owners choose to neglect maintenance, leading to decay, while others opt for demolition to pave the way for new developments. Alternatively, retrofitting often preserves nothing more than facades to retain historical significance. Adding to old buildings to increase floor area can ultimately help preserve them from demolition.[1] However, despite these efforts, numerous abandoned structures still blight urban areas. This creative practice research inquiry aims to explore the potential of parasitic architecture to breathe new life into these neglected urban spaces once again.

The term "parasitic architecture" began when O. M. Ungers published Grossformen im Wohnungsb (Large Forms in Residential Construction) in 1966, where he discussed the context of infrastructure networks in housing planning and urban life (see Section II.I below).[2] The term was later developed to describe a new structure attached to, and integrated with, an existing building. Parasitic architecture imagines a new architecture that inhabits the old without killing or replacing it. It keeps the old alive while making room for new things to happen.

Throughout my journey as a designer, I have aimed to reuse architecture and interiors instead of tearing them down and starting over. I am fascinated with the aesthetic qualities and life of spaces being used in new ways. I like to walk the streets, draw, paint, and take pictures of such spaces. After joining the Urban Sketcher Auckland group on Facebook, I sketched various places in Auckland. Silo Park is among the most striking places (figures 1–4). Now home to a unique exhibition space called Silo 6, Silo Park is a large cluster of cylinders used to hold cement for transport by the old railway system. The inside of these cylinders is now reimagined as inclusive exhibition space which hosts curated works by different artists and communities of people. It comes to life at night when films are projected onto the walls during events such as Silo Cinema. [3]

1 Donghwan Kim, "Adaptive Reuse of Industrial Buildings for Sustainability; Analysis of Sustainability and Social Values of Industrial Facades" (2018), 1-7.

2 Pandhu Putra Pratama, Arina Hayati, and Asri Dinapradipta, "Parasitic Architecture and the Conversion of Abandoned Buildings into Green Open Space," RUANG: Jurnal Lingkungan Binaan (SPACE: Journal of the Built Environment) 10, no. 1, 117–128.

3 "History," Silo Park, accessed March 5, 2024, https://www.silopark.co.nz/history.

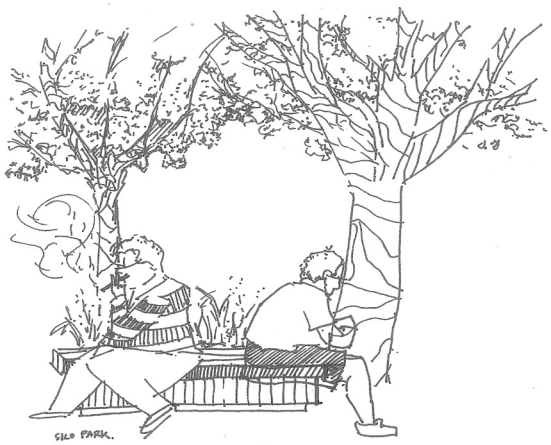


Figure 1. Piraya, R. Silo Park, urban sketcher, drawing, 2023.

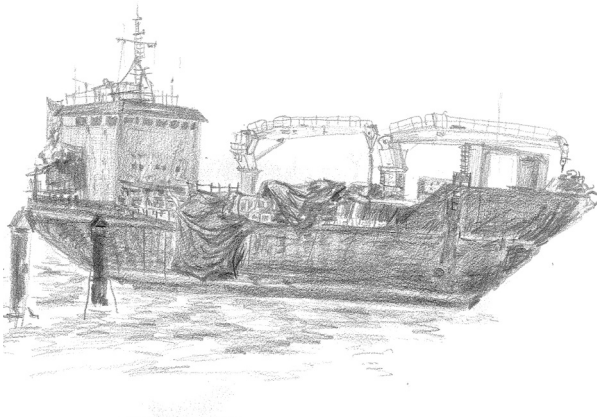


Figure 3. Piraya, R. Silo 6, planning sketching, drawing, 2023.

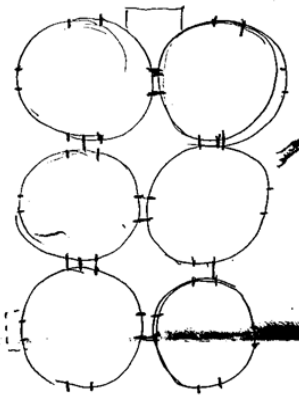
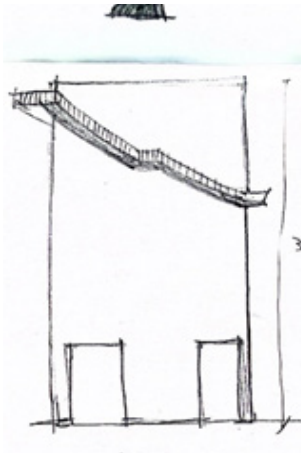


Figure 2. Piraya, R. North Wharf at Silo Park, urban sketcher, drawing, 2023.



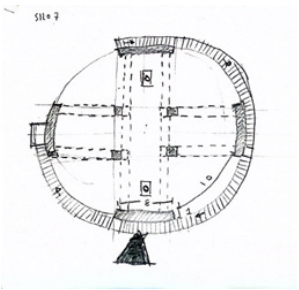


Figure 4. Piraya, R. Silo 7, elevation sketching, drawing, 2023.

Silo Park reminded me of a place in Bangkok, my hometown, featuring a distinctive water tower known as the Maen Sri Waterworks. These towers share a similar narrative, situated in different locations but facing comparable circumstances, as depicted in my imagination through a collage (figure. 5). Both once served their respective urban areas but have languished in abandonment. I began to wonder how, like Silo Park, Maen Sri could take on a second life without losing its original character.

The Maen Sri Waterworks is situated in Bangkok's Pom Prap Sattru Phai District's old town. It is surrounded by communities, such as Baan Bat, Sra Ket Temple, and the Soi Siang Hai neighbourhood (figure 6). The waterworks site includes the former Bangkok Waterworks offices as well as two water tanks that date back a century, built in 1914, once used to deliver water to the city and which consist of a main department building, two water towers, and six-storey structures beyond (figure 7).

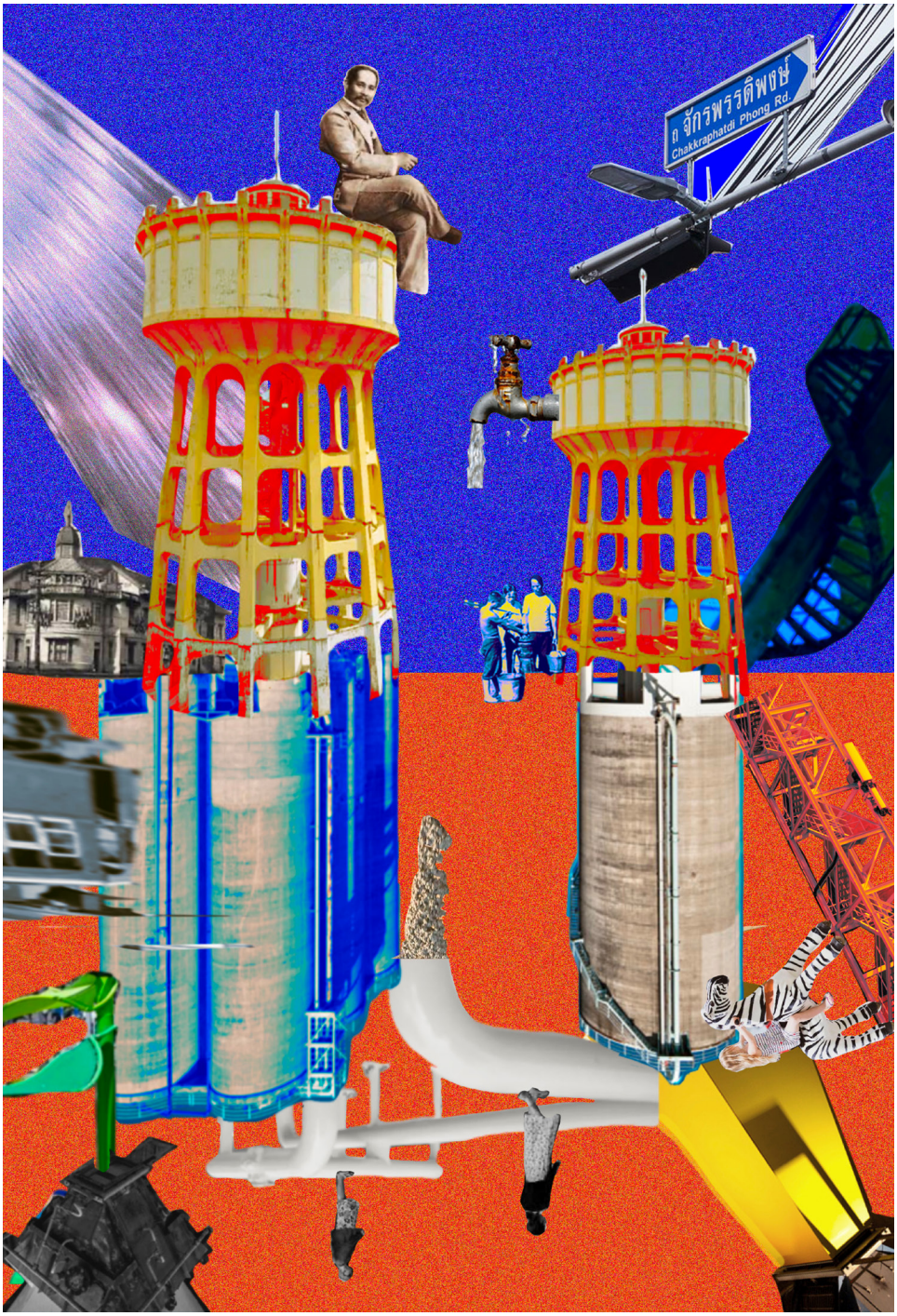


Figure 5. Piraya, R. Maen Sri Waterworks and Silo Park, collage/digital, 2023.

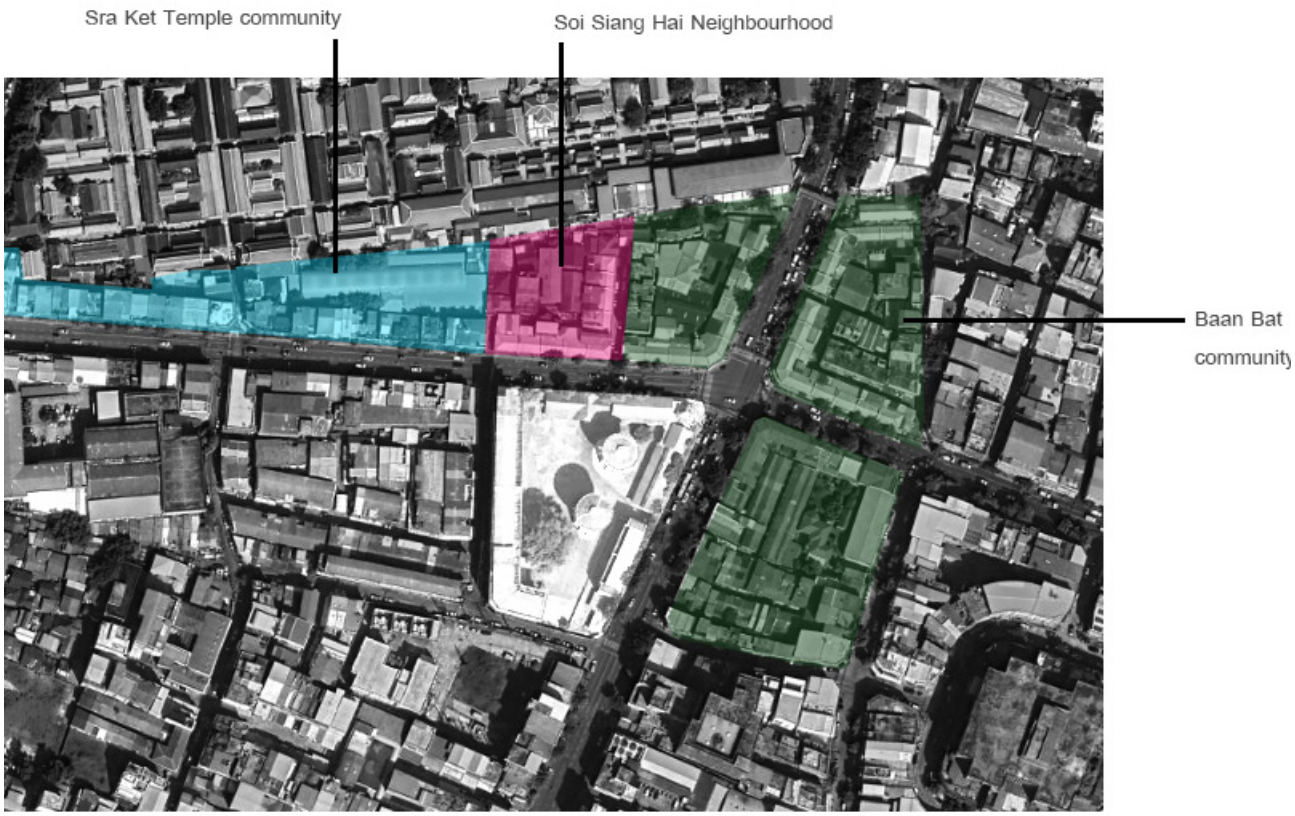


Figure 6. Piraya, R. Maen Sri Waterworks: Urban planning, digital, 2023.

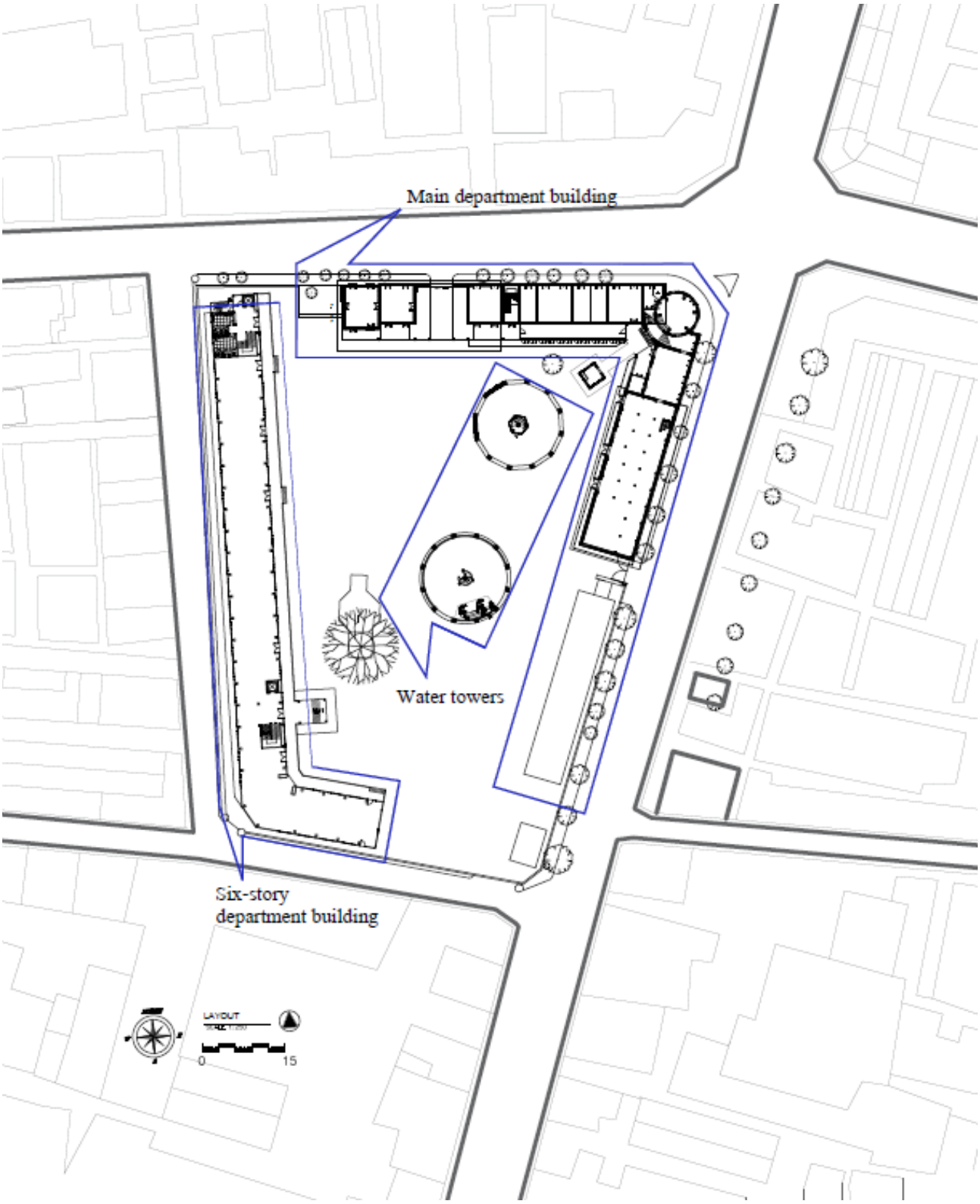


Figure 5. Piraya, R. Maen Sri Waterworks and Silo Park, collage/digital, 2023.

The Western-style main department building was built in 1914. It has two stories, made of brick with lime mortar, and its exterior walls are plaster-finished. It has three parts: the entrance hall (A), the north wing (B), and (C) the south wing (figure 8).

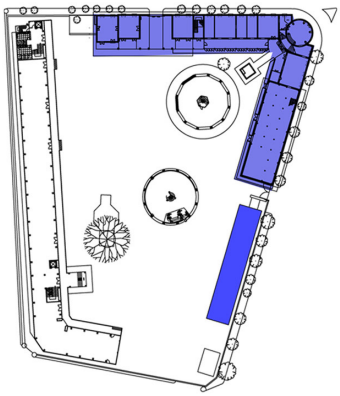
The lofty circular water towers are constructed from reinforced concrete. They reach a height of approximately 24 meters above the ground and have a diameter of about 16 meters. These water tanks have a 1,000-cubic meter capacity. The top is hexagonal to support the weight of the water, adhering to Western style building practices. The tank has pressure meters, float valves to measure water levels, and large suction pipes. This technology uses high-pressure water systems. Water is pumped up and stored in the tanks before being distributed through pipes to various locations. The water tower serves as the heart of the site (figure. 9).

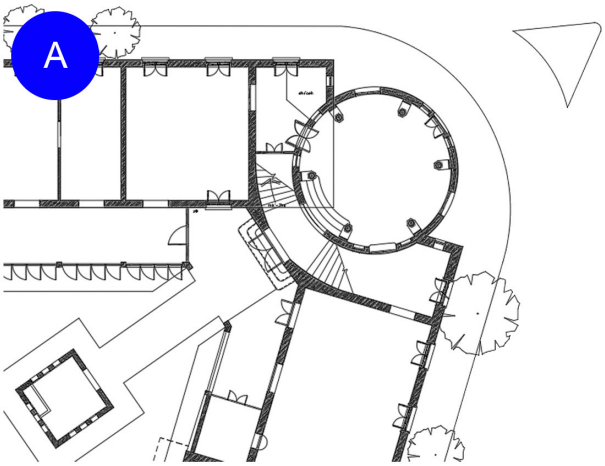
The 6-storey department building was constructed in 1967 to accommodate evolving management practices. It represented a new era of architecture, featuring six floors with a single-load corridor design. The structure utilizes reinforced concrete columns and beams, with brick walls plastered. It includes staircases, elevators, and concrete fire-escape stairs. The exterior facade is comprised of cast concrete combined with steel columns at intervals (figure. 10).[4]

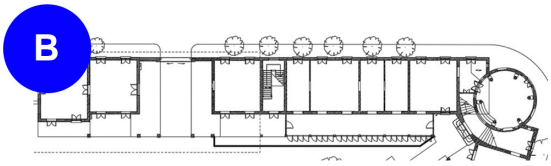
Maen Sri Waterworks, now abandoned after being relocated to new premises, has become a makeshift shelter for homeless individuals and serves as a refuge during the flood season. The Cloud, a local Thai magazine, describes this area as densely populated with shophouses and lacking open space. Piriya Boonchaipruk, professor in the faculty of Architecture and Urban Planning at Silpakorn University, expressed the hope for a new social infrastructure: “We want this place to be a Third Place for people, where they can come to sit, chat, or engage in various activities”.[5] This existing land should provide public space and improve the environmental well-being of the area.

Many people in Thailand still struggle to have access to safe drinking water, even though there is a primary water supply available throughout the country. Buying bottled water comes with additional expenditure. For many low-income earners, accessing adequate water infrastructure poses significant challenges. The redesign of the Maen Sri Waterworks presented in this study proposes a life water infrastructure that encompasses various elements designed to address these challenges. These include water harvesting systems to collect rainwater, nature filtration reservoirs, water purification systems to ensure safe drinking water, recreational water gardens for leisure activities, communal farming areas, and bathhouses. Additionally, beyond these essential functions, the infrastructure celebrates the resurgence of the water tower, serving once again as a vital water storage component and an infrastructure for social life.

4 Parinyakanit, Thos.“Thesis_2560_ThosP_MaansriWaterworkRenovation.Pdf,” n.d.
5 Panyanut(cherry), “Maen Sri Waterworks: The First Water Supply in Bangkok for Homeless Shelters Towards New Possibilities in BKKDW2023.”,” The Cloud (blog), January 26, 2023, https://readthecloud.co/prapa-maensri/.







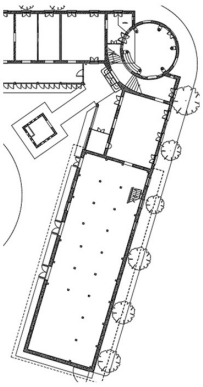


Figure 8. Thos, P. Maen Sri Waterworks: Department building perspective, photograph, 2023.

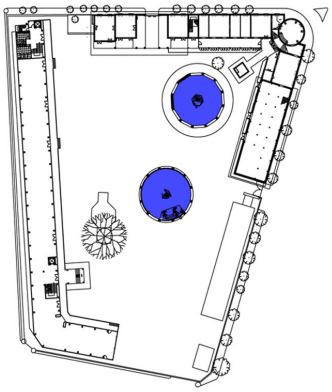
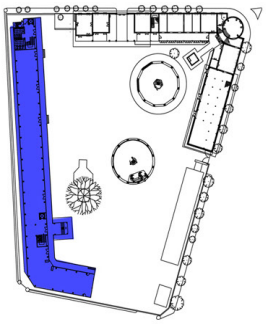


Figure 9. Thos, P. Maen Sri Waterworks: Water towers perspective, photograph, 2023.



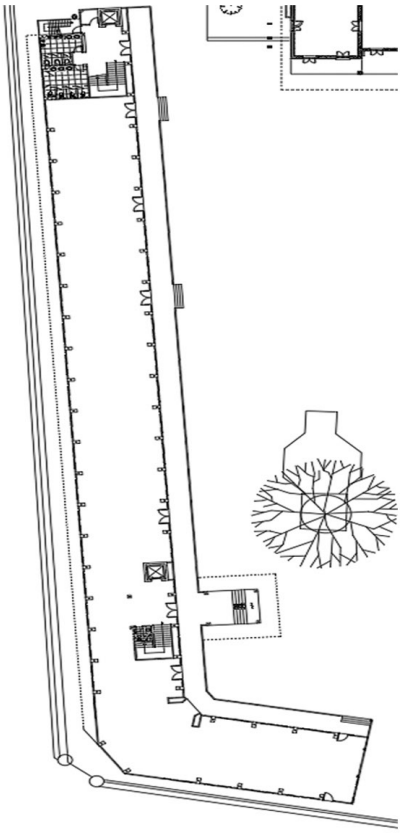


Figure 10. Thos, P. Maen Sri Waterworks: 6-Storey building perspective, photograph, 2023.

Parasites are seen negatively as villains. While parasitic architecture inherently exploits its host structure, it also however ensures the continuation of that host. Consequently, its methodology inherently opposes destruction. Rather than opting for demolition, preservation of solely historical features, or gentrification through a complete change of use, this approach seeks to maintain the essence of the original while accommodating new functionalities. It strives to breathe new life into the old while allowing space for innovation and evolution.

II Architectural Symbiosis: Research Contexts

II.I Understanding the Essence of Parasitic Architecture

The term “parasite” originates from the root “para”, indicating alongside but separate, and “sito”, referring to food consumption. It is defined by the Oxford English Dictionary as describing an organism that resides in, on, or with another organism to acquire nutrients, develop, or reproduce, often causing harm to the host, either directly or indirectly. [6]

Parasitic architecture, originating from this biological context, mirrors a symbiotic connection similar to that of a parasite and its host. Within this relationship, the parasitic structure prospers by obtaining resources from its host. This interdependence implies that novel architectural designs lack full functionality alone and require integration with preexisting pre-existing structures. Despite its inherent exploitation of the host, the survival of parasitic architecture depends on maintaining the host’s presence. Consequently, its creation inherently discourages destruction.

In 1966, architect O. M. Ungers published Grossformen im Wognungsbau (Large Forms in Residential Construction), examining the impacts of infill architecture and quantifying the utilization of informal and unplanned architecture. Ungers wrote,

> Grossform (Large Forms in Residential Construction) creates the framework, the order and the planned space for an unpredictable, unplanned, spontaneous process - for a parasitic architecture. Without this component, any planning remains rigid and lifeless.[7]
>
> Oswald M. Ungers, Grossformen im Wohnungsbau, not numbered. (Translation by MARTIN HÄTTASCH.)

6 “Parasite Noun - Definition, Pictures, Pronunciation and Usage Notes | Oxford Advanced Learner’s Dictionary at OxfordLearners Dictionaries.Com,” accessed October 30, 2023.

7 HÄttasch, Martin. “Form after Urbanism: The Potential of Grossform.” The Plan Journal, (2015). accessed January 30, 2023, 67.

Visionary architect Lebbeus Woods (1940–2012) was renowned for his parasitic architecture, particularly for his "Injection Parasite" works.[8] To cause disruption or change, the Injection Parasite entails injecting new architectural components into pre-existing structures. It seeks to start a conversation between the modern and the traditional. Woods stated,

Woods' approach of injecting temporary emergency interventions into the building, akin to providing first aid, fosters scab-like growths over wounds to facilitate internal healing, and leaving scars as reminders of past injuries. New tissue is created through meticulously crafted joints with existing structures, all with the aim of generating novel and unfamiliar spaces within architectural designs.[9]

The sketches of Lebbeus Woods's concepts of "Injection", "Scab", and "Scars" regarding the destruction of buildings in Sarajevo, Bosnia, depicted in figures 11–13, illuminate the intricate relationship between destruction and creation in post-war architecture. Woods's exploration offers a nuanced perspective on how new structures emerge within the voids left by devastation (which he termed 'freespaces'), defy traditional paradigms and invite inventive approaches to habitation. Through the metaphorical lenses of scabs and scars Woods navigates the phases of healing and transformation inherent in rebuilding efforts, emphasizing the beauty and resilience that arise from the fusion of old and new. The acceptance of scars as emblematic of existence is championed, advocating for a society founded on individual agency and diverse narratives. This perspective positions architecture as a catalyst for both personal and collective reinvention, presenting a compelling discourse on the intersection of architecture, memory, and societal evolution in the aftermath of conflict.[10] Furthermore, the areas depicted in figure 14 are envisioned as dynamic, parasitic shelters integrated into the literal ruins of existing architecture, serving as experimental platforms for pioneering new modes of living.[11]

8 Kanekar. Aarati. "Between Drawing and Building," The Journal of Architecture 15, no. 6 (December 1, 2010): 771–94. 777–779.
9 Aarati. "Between Drawing and Building," 786–792.
10 Woods, Lebbeus. War and Architecture = Rat i Arhitektura /, Pamphlet Architecture (Princeton Architectural Press, 1993).
11 "Towards Parasitic Architecture by Zhuocheng YU (Joey) - Issuu."

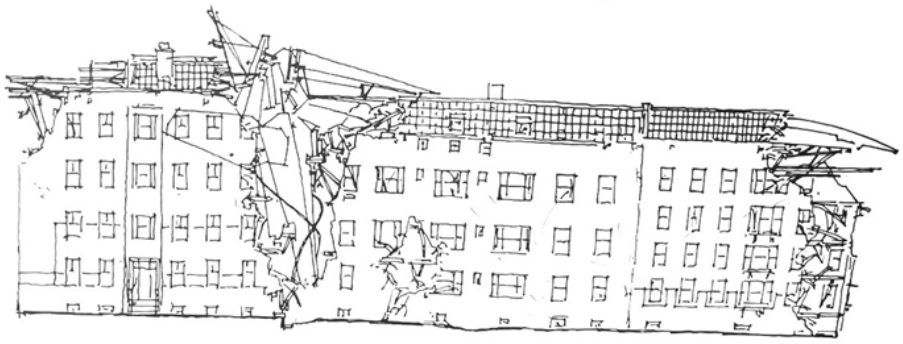


Figure 11. Lebbeus Woods. Injection Construction, notebook drawing, 11 June 1992.

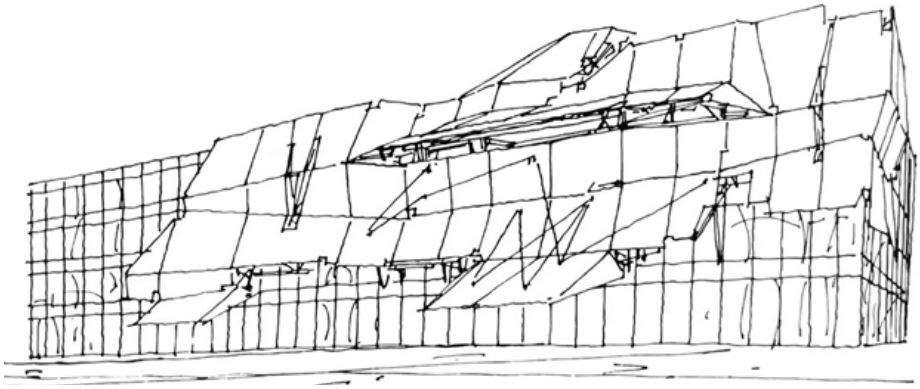


Figure 12. Lebbeus Woods. Scab Construction, notebook drawing, 11 June 1992.

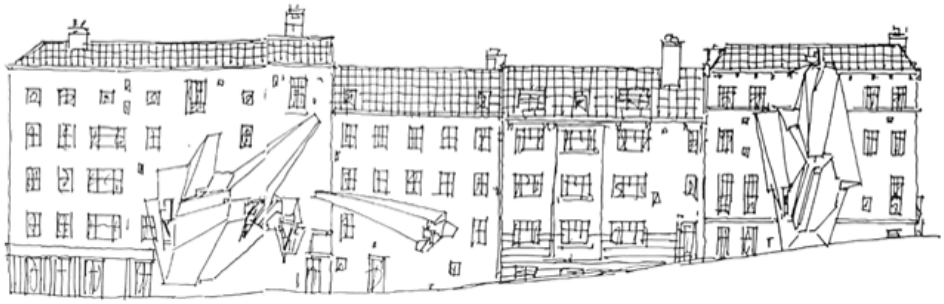


Figure 13. Lebbeus Woods. Scar Construction, notebook drawing, 11 June 1992.

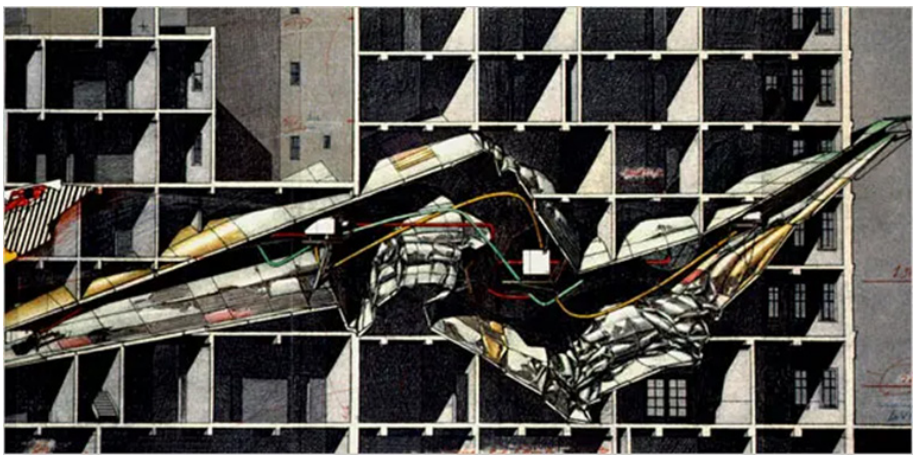


Figure 14: Lebbeus Woods. Berlin Free-Zone, abandoned government building in reunified Berlin, drawing, 1990.

II.II Not all parasites are predators

Other notable case studies relevant to this study are SESC Pompéia Factory by Lina Bo Bardi, (São Paulo, 1976 –- 1986) The Brewery Yard by TZANNES Architect (Sydney, 2010-2014), and Warka Water Towers by Arturo Vittori (Ethiopia, 2015). Examining these, I investigate and evaluate how parasites might coexist in existing buildings, taking into account accessibility and purpose in addition to parasite relationships, form, and material.

II.II.I Pompéia Factory by Lina Bo Bardi

Figure .15. Unknown photographer. © Instituto Bardi / Casa de Vidro. The old drums' factory, the 1940s.

In 1976, when Lina Bo Bardi first set foot inside the abandoned Pompeia barrel factory, she was immediately struck by the potential for its revitalization into a dynamic leisure centre.[9] What initially caught her attention were the warehouses, meticulously arranged in a manner reminiscent of early English industrial projects from the mid-19th century. However, it was the elegant concrete structure that truly enchanted her. Drawing inspiration from the pioneering concrete work of François Hennebique, Bardi felt compelled to conserve and celebrate this architectural heritage. Fast forward to 1982, and São Paulo was graced with the remarkable transformation of the factory into the SESC Pompéia, a testament to Bardi's visionary design prowess. Through her ingenious approach, she breathed new life into the deactivated industrial space, sculpting it into a vibrant, multi-dimensional hub for sports and culture. Embracing Modernism while championing populism, Bardi successfully repurposed the old factory, preserving its original essence while catering to the evolving needs of the community. This project stands as a shining example of adaptive reuse, where an obsolete structure is transformed into a thriving center of activity, ensuring the continued vitality of its surroundings.

12 Anelli, Renato. "Bauhaus and Lina Bo Bardi: From the Modern Factory to the Pompeia Leisure Center," Docomomo Journal, no. 61 (November 1, 2019): 42–49.

Key
1 Sports complex with swimming pool, gymnasium and apartments (5 duplex apartments)
2 Laundry, changing rooms, and rooms for gymnastics, wrestling and dancing (11 floors)
3 Water tower
4 Solarium deck
5 Water feature
6 Workshops for ceramics, painting, engraving, typography and textiles
7 Photography lab
8 Theatre, seating 1,200
9 Vestibule and covered theatre/place for spectacles
10 Self-service restaurant
11 Industrial kitchen
12 Changing room and kitchenette for workers
13 Multi-use space, with a water 'mirror' shallow pool
14 Library and media lab
15 Large temporary exhibitions pavilion
16 General administration (2 floors)
17 Maintenance office

Figure 16. © Instituto Bardi., SESC Pompeia Floor Plan, drawing/digital, 1987.

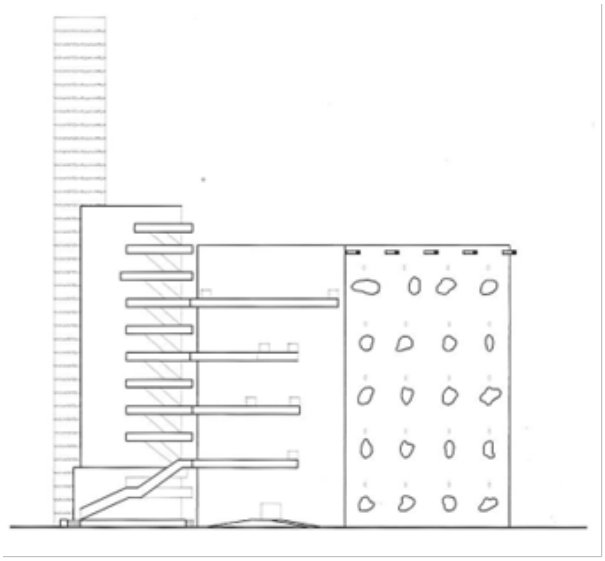


Figure 17. © Lina Bo Bardi. SESC Pompeia Elevation, drawing/digital, 1987.

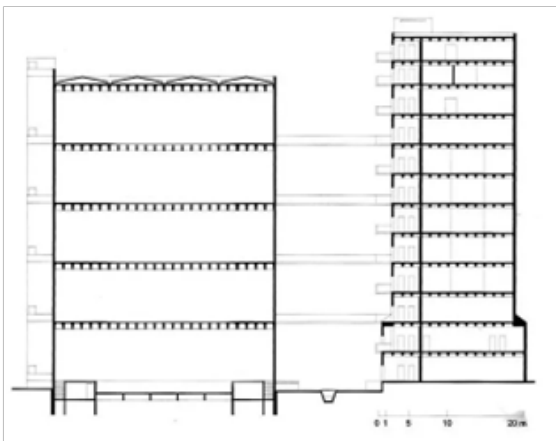


Figure 18. © Lina Bo Bardi. SESC Pompeia Section, drawing/digital, 1987.

The SESC Pompéia occupies a former factory building that was offered for demolition to the architect by the Serviço Social do Comércio (SESC), a non-profit institution working across Brazil to foster health and culture among workers and their families. Instead of starting afresh or maintaining a reverent stance towards the original structure, Bo Bardi chose to preserve the building's framework to subvert its intended purpose. The factory premises, once emblematic of the rigid world of labour, were repurposed into a more loosely programmed space for leisure and cultural activities.[13]

The facility now hosts art and craft workshops, a theatre, a bar/restaurant, a library, exhibition spaces, and public multi-use areas. Additionally, two new vertical blocks were constructed to accommodate sports activities, including a swimming pool, gymnasium, dance and wrestling rooms, and sports courts. The diverse program for the project emerged from the informal activities that were already taking place in the disused factory after SESC assumed ownership. Dubbed "the citadel of freedom", the centre serves as a nexus for athletic, artistic, spiritual, and political pursuits, reminiscent of the ancient Greek agora.[14] Public life is integrated into the centre, with public seating areas by the fire or water, spaces for playing chess and debating, and a sun terrace that spans the site's length, serving as an urban beach, market space, carnival venue, and informal exhibition area. This hybrid program enables the centre to function as a protected space for political and cultural production and preservation, aligning with SESC's mission to document its activities to create a "memory" of Brazilian culture.

The case study of the SESC Pompéia presents a compelling example of building a vibrant infrastructure for community life. Rather than demolishing the existing structure, Bo Bardi retained its framework to subvert its original meaning, repurposing the factory as a leisure destination. The design parasitically emerged from existing informal activities within the disused factory.

13 Renato. "Bauhaus and Lina Bo Bardi: From the Modern Factory to the Pompeia Leisure Center," 42–49.
14 Rachel Sara, "Citadels of Freedom: Lina Bo Bardi's SESC Pompéia Factory Leisure Centre and Teatro Oficina, São Paulo, Architectural Design 83, no. 6 (November 2013): 52–57.
15 Sara, "Citadels of Freedom", 52–57.

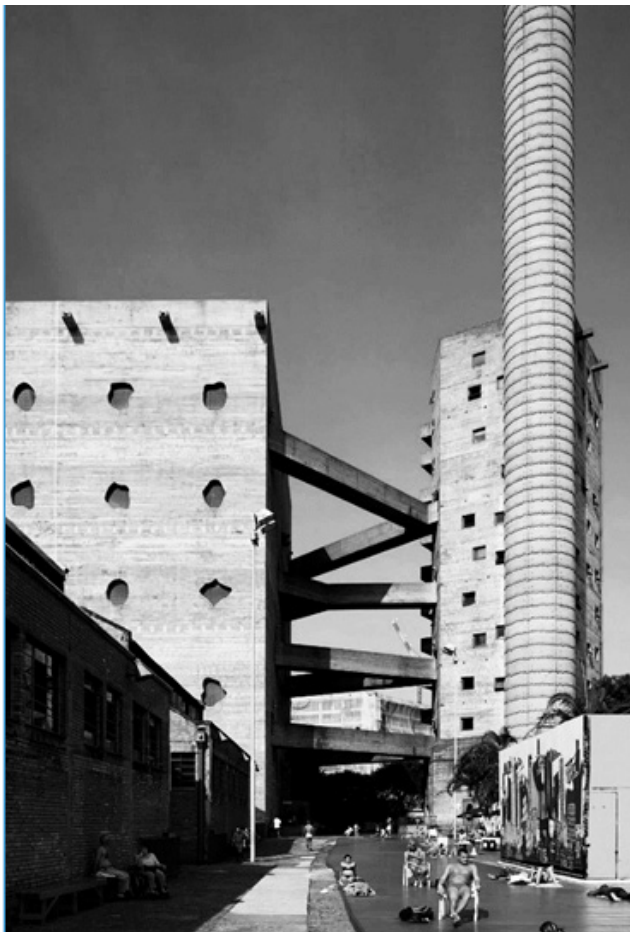


Figure 19. Marcelo Ferraz. Sunny Sunday at SESC Pompeia, photograph, 1982.

Figure 20. Marcelo Ferraz. Pompeia Cultural Centre, photograph, 1982.

Figure 21. Marcelo Ferraz. Theatre, SESC Pompeia, São Paulo, photograph, 1982.

Figure 22. Sérgio Gicovate. © Photographer Wolfgang Sievers, Fábrica da Pompeia's hangar of general activities, photograph, 1987.

II.II Not all parasites are predators

II.II.II The Brewery Yard by TZANNES Architect

Figure 23. City of Sydney Archives. Aerial view over Chippendale, photograph, 1940.

From 2010 to 2014, Tzannes Architect redesigned the Carton and United Brewery Yard in Central Park, Sydney (figure. 23), undertaking a radical project. Renowned for its inventive ideas and dedication to sustainability, the firm took on a special challenge: adapting a historically significant facility that had been a brewery until 2005 and was now preserved as a true depiction of the region's.[16]

This project showed a more integrated approach than Lebbeus Woods' critical and speculative notion of Parasitic Architecture, which aspired for drastic disruption. To maintain harmony with the architectural environment and satisfy functional needs, Tzannes attempted to effortlessly integrate new functional parts into the profile of the existing structure. Using moulded zinc mesh sheets to highlight their curving structure, Tzannes Architect created metallic trigeneration towers that complemented the red brickwork of the former brewery (figure 24). This extension satisfies technical requirements while also expressing the importance of cutting-edge technology to its urban setting.

16 "Brewery Yard," Tzannes Architect (blog), accessed February 11, 2024, https://tzannes.com.au/projects/brewery-yard/.

Figure 24. John Gollings, Brett Boardman. The Brewery Yard by TZANNES exterior, photograph, 2015.

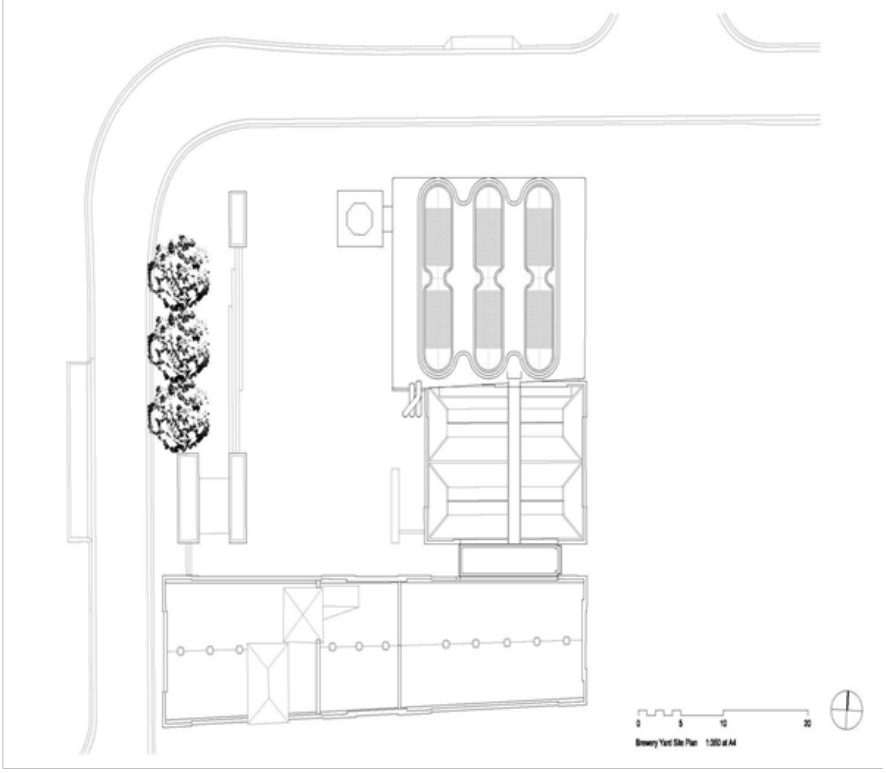


Figure 25. TZANNES Architect.
The Brewery Yard Planning,
drawing/digital, 2010–2014.

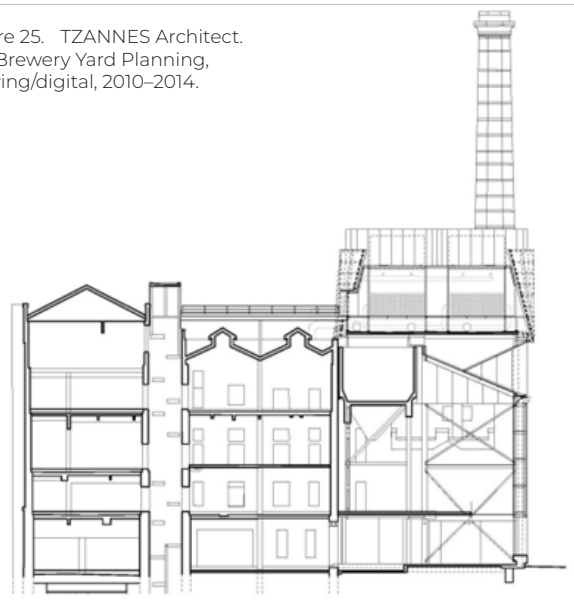


Figure 26. TZANNES Architect.
The Brewery Yard Section,
drawing/digital, 2010–2014.

The design concept reimagined the interplay between the existing buildings and new spatial expansions, offering a novel solution to the difficulties of working with limited urban space while Tzannes Architect's redevelopment of the Carton and United Brewery Yard demon strates an innovative approach to integrating new functional elements, it also raises questions about the preservation of historical authenticity and the potential loss of intrinsic character within the built environment. By hollowing out the brewery building to serve primarily as a facade, there is a risk of reducing its significance to a mere aesthetic backdrop, potentially overshadowing the rich historical narrative it once embodied.

II.II.III Warka Water Towers by Arturo Vittori

The Italian architect and artist Arturo Vittori, responsible for architectural projects that address pressing social challenges, designed the Warka Water Towers in Dorze, Southern Ethiopia in 2015, threading together indigenous knowledge and new materials.[17] These towers, built over eight years, are more than just buildings (figure 27). They are acts of optimism. The devastation caused by contaminated waters spoiled by human and animal waste is a major cause of illness that kills many young

people each year in underdeveloped countries where there is an acute need for clean water. The Warka Towers collect drinking rainwater from the sky, harvesting fog and dew. They do not require power because of their modest dependence on the natural processes of gravity, condensation, and evaporation. More than just a beautiful structure, it is a lifeline to its community, becoming a life-giving infrastructure. It is also a heart teeming with social activity, providing refuge under its vast canopy and nourishing areas for education, meeting, and bonding.[18]

Figure 27. © Warka Water. Bamboo structures positioned to collect and harvest rainwater, photograph, 2015.

17 Nathalie Verbrugghe and Ahmed Z Khan, "Water Harvesting through Fog Collectors: A Review of Conceptual, Experimental and Operational Aspects," International Journal of Low-Carbon Technologies 18 (February 4, 2023): 392–403, https://doi.org/10.1093/ijlct/ctac129.

18 "WARKA TOWER – Warka Water," accessed February 11, 2024, https://warkawater.org/warkatower/.

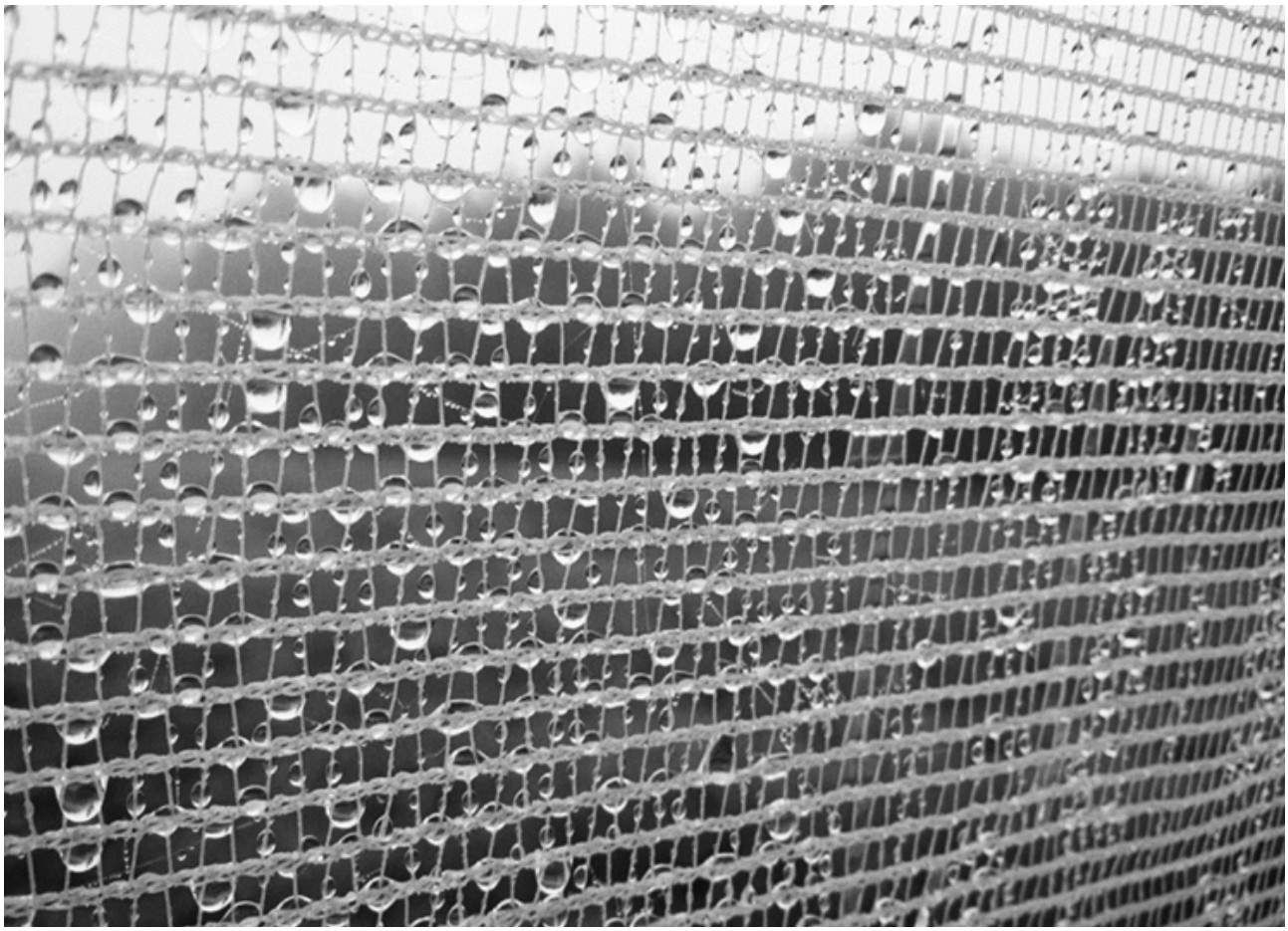


Figure 28. © Warka Water. Meshed fabric to collect rainwater, photograph, 2015.

Vittori's creative method is a tapestry woven from a profound understanding of regional traditions and subtle environmental aspects (figure 28). The novelty of the 9-meter-tall standalone wooden cylinders lies in their prefabrication, 80 kg lightweight rapid assembly, and simple maintenance requiring only basic tool knowledge. Additionally, they utilize eco-friendly, locally sourced materials like bamboo and are intended for ownership and operation by community members.

Figure 29. © Warka Water. Meshed fabric to collect rainwater diagram, drawing/ digital, 2015.

The essence of life's most valuable resource is made visible in these imposing structures, and it is provided in a way that is both creative and sustainable while also being extremely considerate of local customs and traditions.

Unlike the other case studies that have been discussed, the Warka Water Tower is not directly parasitic. However, as a water tower, it offers ideas for addressing the Maen Sri Water Towers. The Warka Towers are a prime example of a contemporary water tower made of readily formed, biodegradable materials that can be assembled simply and moved by hand. Along with showcasing an unusual method of gathering water, Warka addresses the problem of water scarcity in dry areas and provides insightful analysis of material utilization and design ideas that may serve as inspiration for my Maen Sri Water Tower's parasitic design, which offers remedies to Thailand's drinking water crisis.

II.III Parasite Imaginary Unveiled

It's crucial to distinguish between adaptive reuse generally and parasitic architecture in particular. Adaptive reuse involves repurposing existing buildings or sites for functions different from those originally intended. This might involve converting warehouses into offices, repurposing old schools as community centres, or transforming industrial buildings into recreational spaces, as seen in the example of SESC Pompéia Factory. The primary objective is to retain the cultural and historical significance of the original structure while adapting it to contemporary needs.

On the other hand, parasitic architecture functions distinctively from adaptive reuse. Essentially, it thrives by leveraging the host structure on which it resides. Unlike adaptive reuse, which aims to preserve the original building's integrity, parasitic architecture depends on the host for support and resources. For instance, the Brewery Yard by TZANNES Architect features a power plant that acts as a parasite on the roof structure. While the parasitic structure may not completely dominate the host, it often carves out a niche within the existing structure, coexisting alongside it. Over time, it may evolve into a physical manifestation as an alternative architectural form, existing parallel to traditional structures.

III. Parasitic methods: METHODOLOGY OF STUDY

III.I. Wound and Scar

As identified in Section II, Woods' concept of "Scar Construction" provides a lens through which to view existing buildings as repositories of history and resilience. In this framework, wounds on buildings represent challenges and the need for intervention, while scars embody the enduring imprint of past events and the building's ability to adapt and persist. Scars carry memories and emotions of those who have interacted with the building, forging a connection between people and place. Buildings are not only physical structures but also vessels of collective memory, telling stories of resilience, adaptation, and human experience. A parasitic methodology for spatial design works by adding and growing into these living sites, respecting scars, and healing wounds.

Urban sketching is a meaningful way for me to reveal wounds and scars and situate places in memory. I recall the circumstances surrounding each sketch: who I was with, where I was, and even the weather. Memories are etched into the lines of the drawing, making them an integral part of the artwork (figures 31–33). It also prompts me to reflect on the places missing from our sketchbooks due to demolition and redevelopment. Urban sketcher Louis-Supachai Wongnoppadoldecha has raised thought-provoking questions about the societal implications of these processes.

> Demolition proceeds with the passage of time, but we have questions for society: Is development or the trend nowadays a valid reason for the complete eradication of what once existed? Or should it be something preserved? [19]
>
> Louis-Supachai Wongnoppadoldecha

He emphasizes the importance of recognizing the social significance of built environments as they serve as markers of historical epochs. Once they are gone, future generations lose access to this history, leading to a sense of regret and loss.

This led me to appreciate the aesthetic value of old, worn, and damaged structures, and the deeper understanding of their significance. One can react by actively engaging in documentation and preservation efforts. Although I was unable to visit the Maen Sri Waterworks site during this research period, I tried to walk and draw it from this perspective, noticing particularly the marks of time and change.

19 Maensiri, Usa. "Urban Sketcher" An artist who will make you fall in love with the city all over again through their enchanting drawings of the capital., The Cloud (blog), July 12, 2018, https://readthecloud.co/urban-sketcher/.

Figure 30. Pei Luk. Joining the Urban Sketcher group in Auckland, Devonport, photograph, 2023.

Figure 31. Piraya, R. Sketchbooks, Devonport, photograph, 2023.

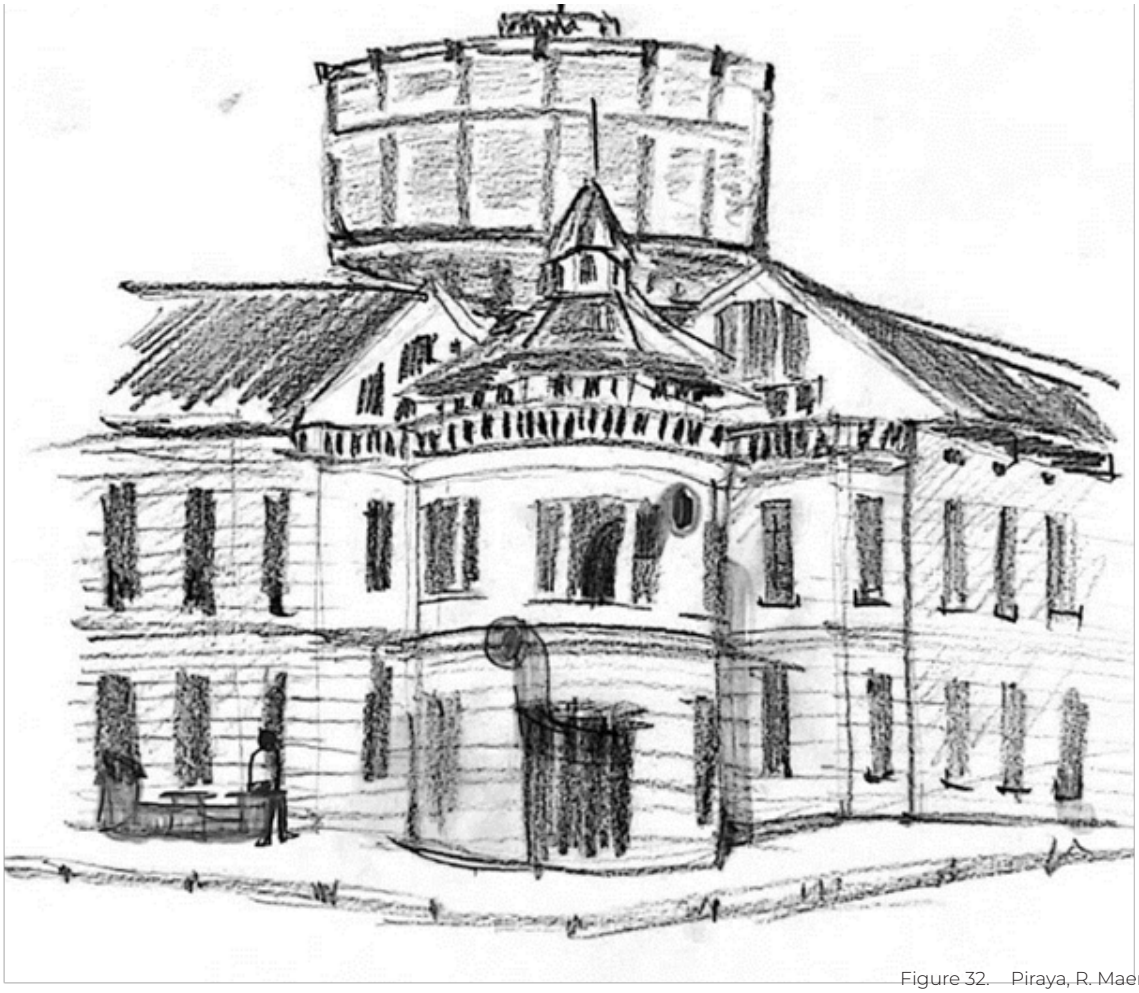


Figure 32. Piraya, R. Maen Sri Waterworks: Street corner view, sketchbook, photograph, 2023.

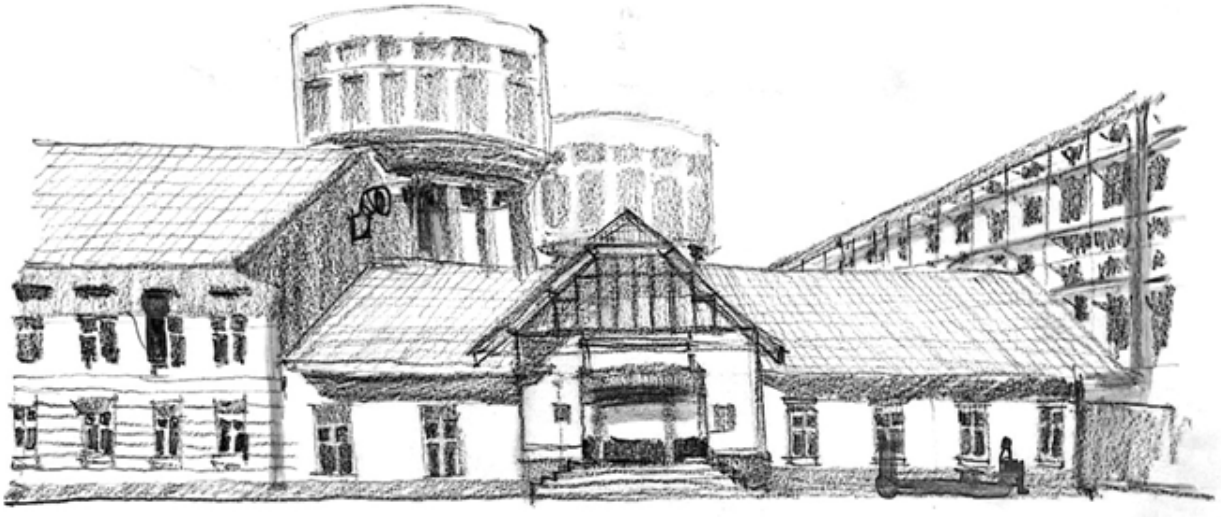


Figure 33. Piraya, R. Maen Sri Waterworks: Street view, sketchbook, photograph, 2023.

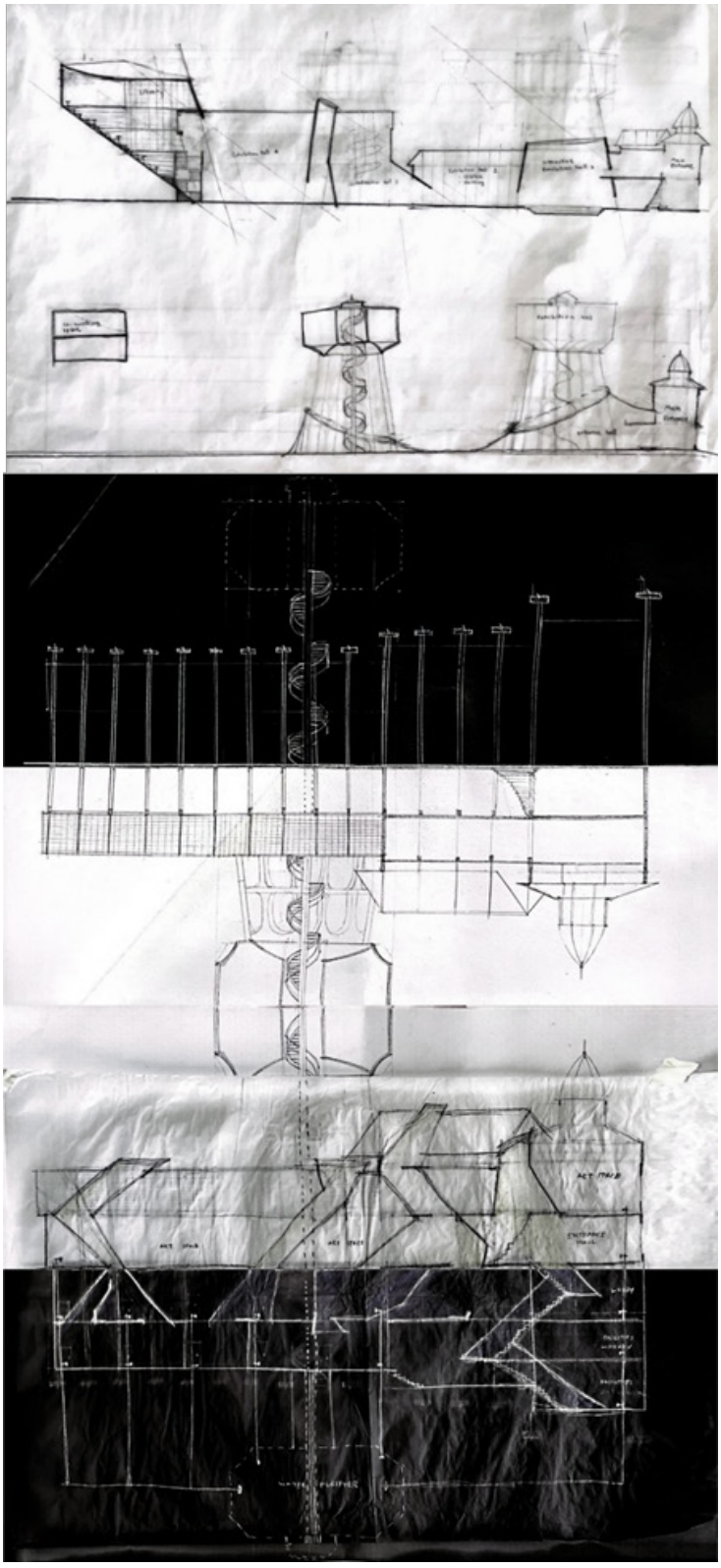
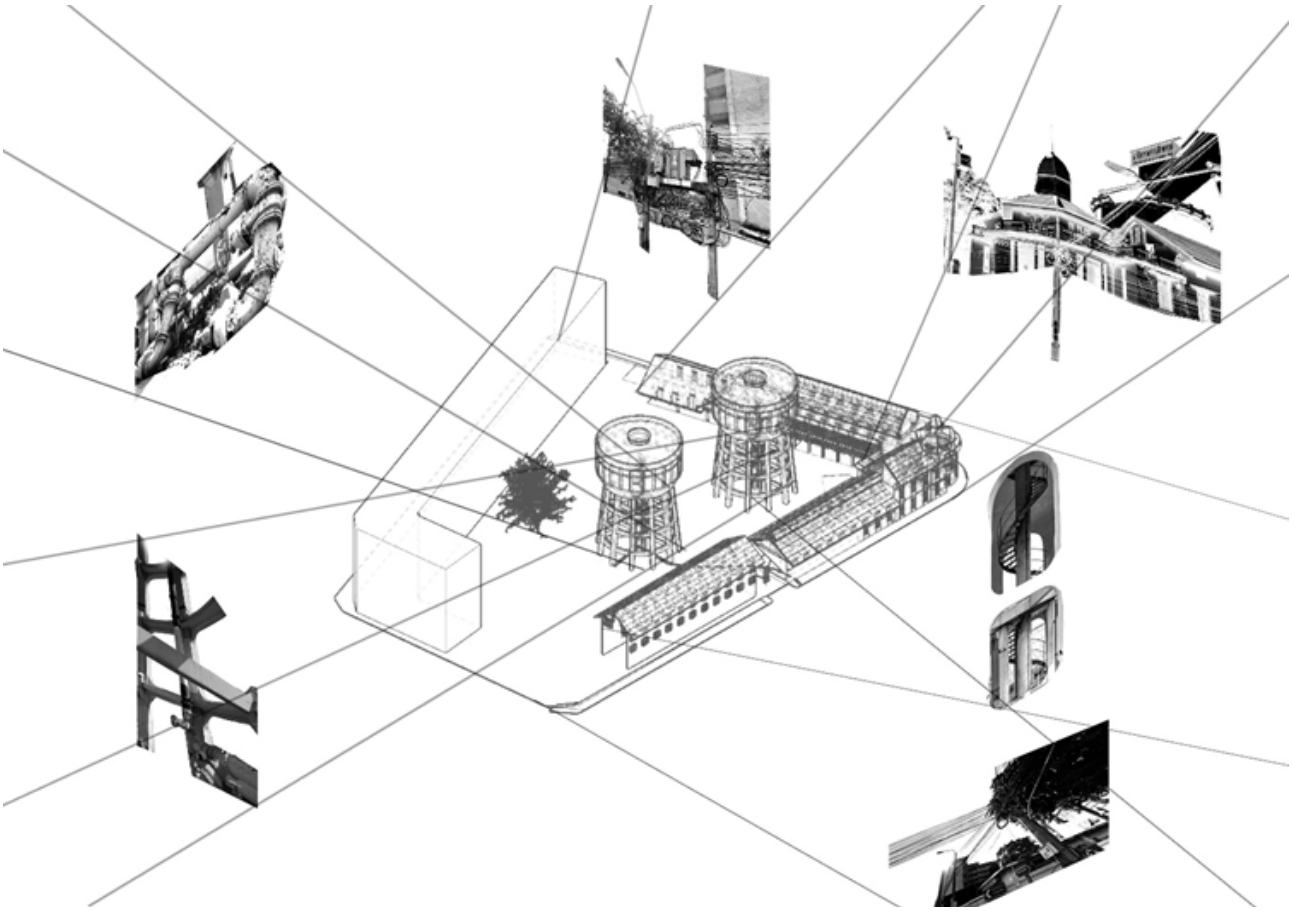


Figure 34. Piraya, R. Experimenting with scar construction on Maen Sri Waterworks, drawing, 2023.

(Figure 34 shows experiments injecting temporary emergency interventions into buildings, like providing first aid, fostering scab-like growths over wounds to aid internal healing and leaving scars as reminders of past injuries—as in the notion of "Scar Construction".)

I also collected historical documents, photographs, and records related to the site, including architectural plans, maps, and written accounts detailing their significance and history.

Figure 35. Piraya, R. Mapping wounds in the site, drawing/ digital, 2023.



Just as urban sketching provides a personalized interpretation of these spaces, capturing not only their physical appearance but also the atmosphere and context in which they exist, I built my own understanding of the place to complement detailed architectural drawings encompassing floor plans, elevations, and sections (figures 36–42). The mind-map shown in figure 43 unveiled for me an intricate relationship between memory, space, and perception, highlighting how these structures have evolved and are perceived by variouscommunities.

In my exploration, I have identified several wounds within the site. One significant wound is the structural damage resulting from prolonged neglect and decay. This encompasses unused water pipes, dangling electrical cables, and rusted metal staircases, as seen in figure 35, all of which pose not only safety hazards but also serve as stark reminders of the challenges faced by neglected urban spaces. The challenges posed by identified wounds associated with abandoned buildings, underscore the critical importance of proactive intervention to safeguard these spaces and unlock their potential for regeneration and renewal within the urban fabric.

(Figure 36, illustrating site elevation across the road, is captured by Google Earth.)

Figure 36. Piraya, R. Maen Sri Waterworks, Google Street view, photograph, 2023.

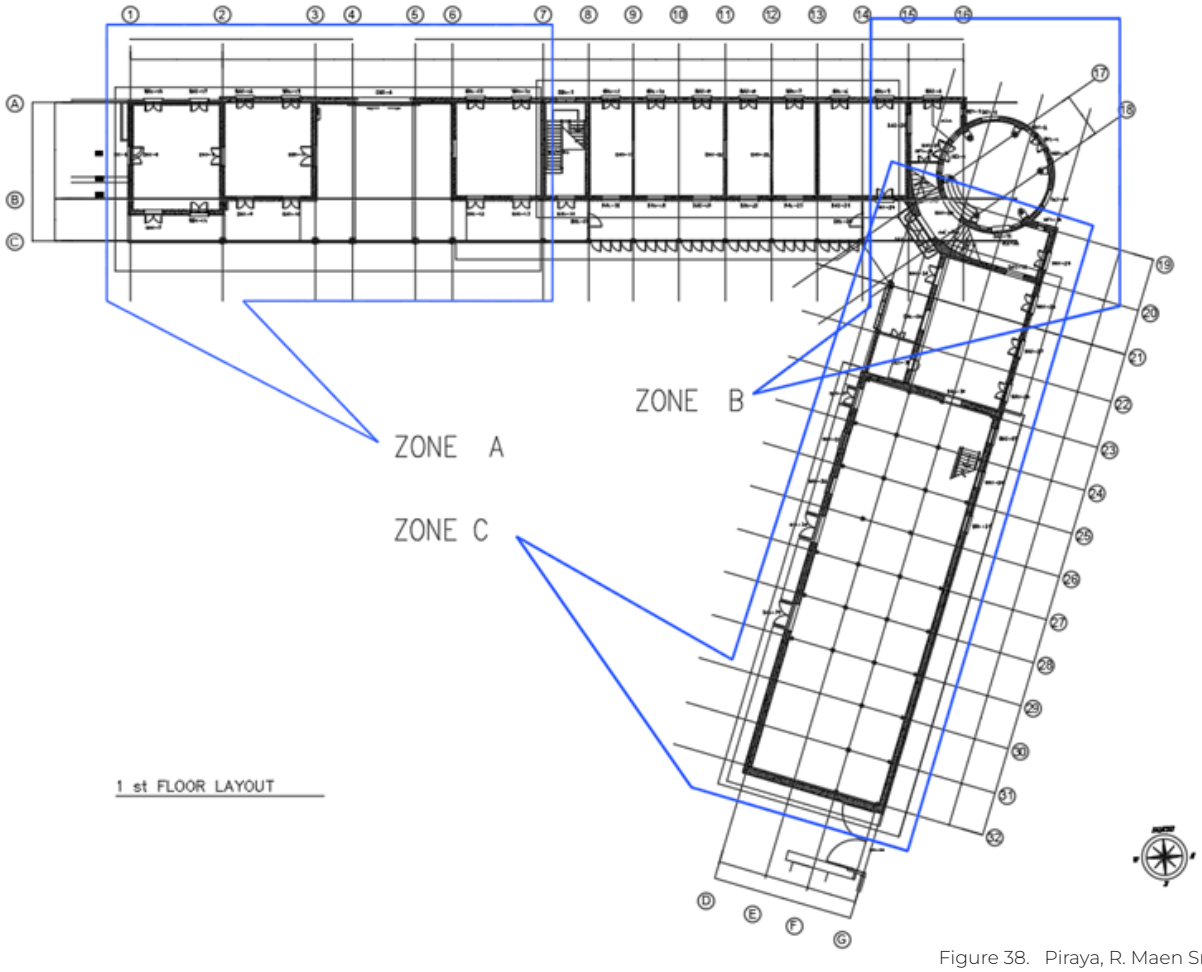
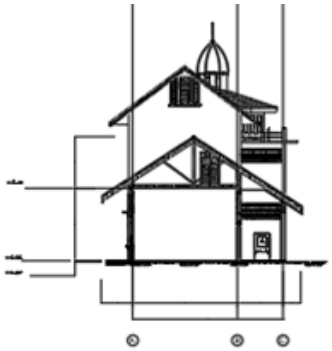
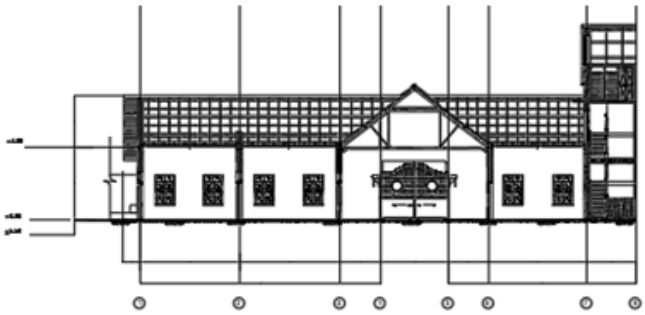


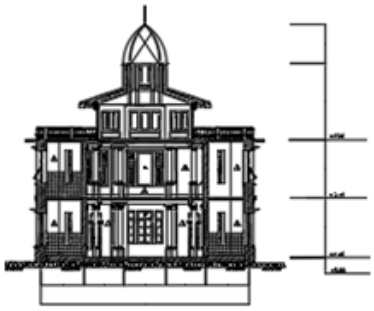
Figure 38. Piraya, R. Maen Sri Waterworks: Architectural drawings, main department building; layout, drawing/ digital, 2023.



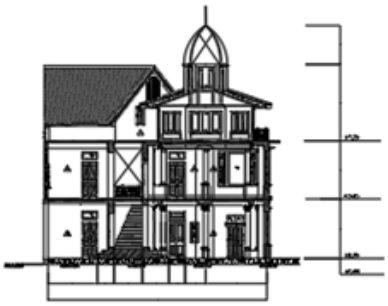
ZONE Ⓐ SECTION



ZONE Ⓐ SECTION



ZONE Ⓑ SECTION



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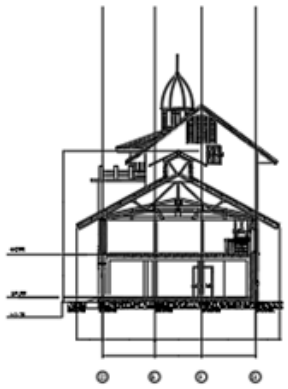

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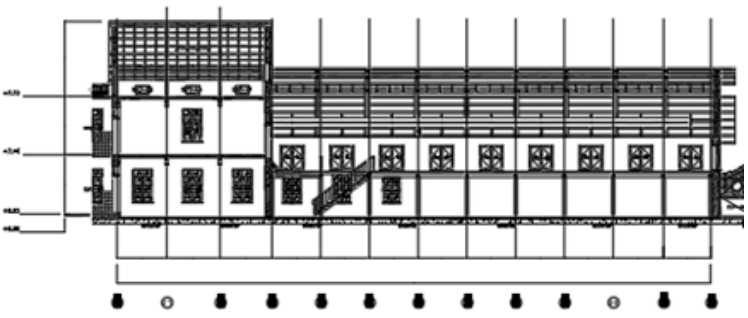
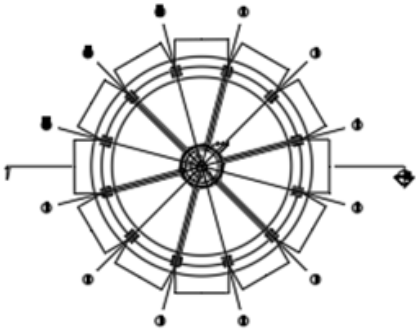
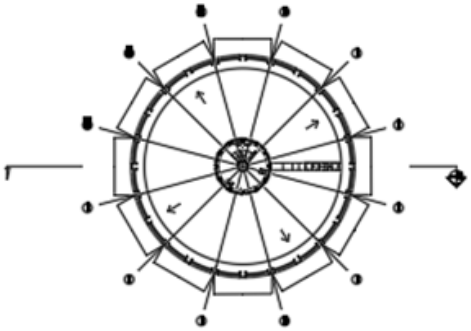
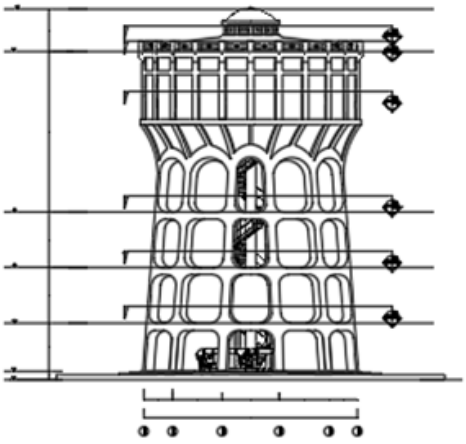


ZONE Ⓒ SECTION

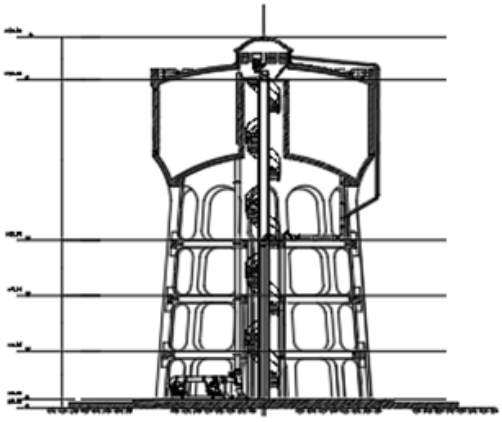
Figure 39. Piraya, R. Maen Sri Waterworks: Architectural drawings, main department building; section, drawing/ digital, 2023.





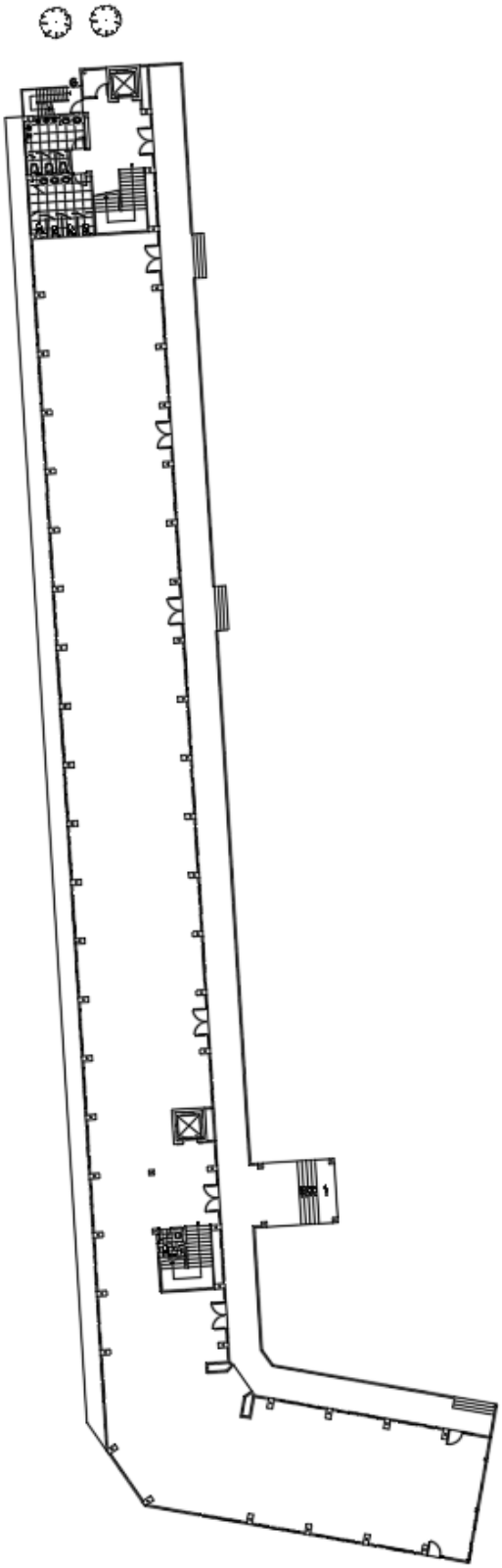


ZONE ⓒ ELEVATION
SCALE 1:125



ZONE ⓒ SECTION
SCALE 1:125

Figure 40. Piraya, R. Maen Sri Waterworks: Architectural drawings, water towers, drawing/digital, 2023.



6-Storey Department Building

Figure 41. Piraya, R. Maen Sri Waterworks: Architectural drawings, 6-Storey department building, drawing, digital, 2023.

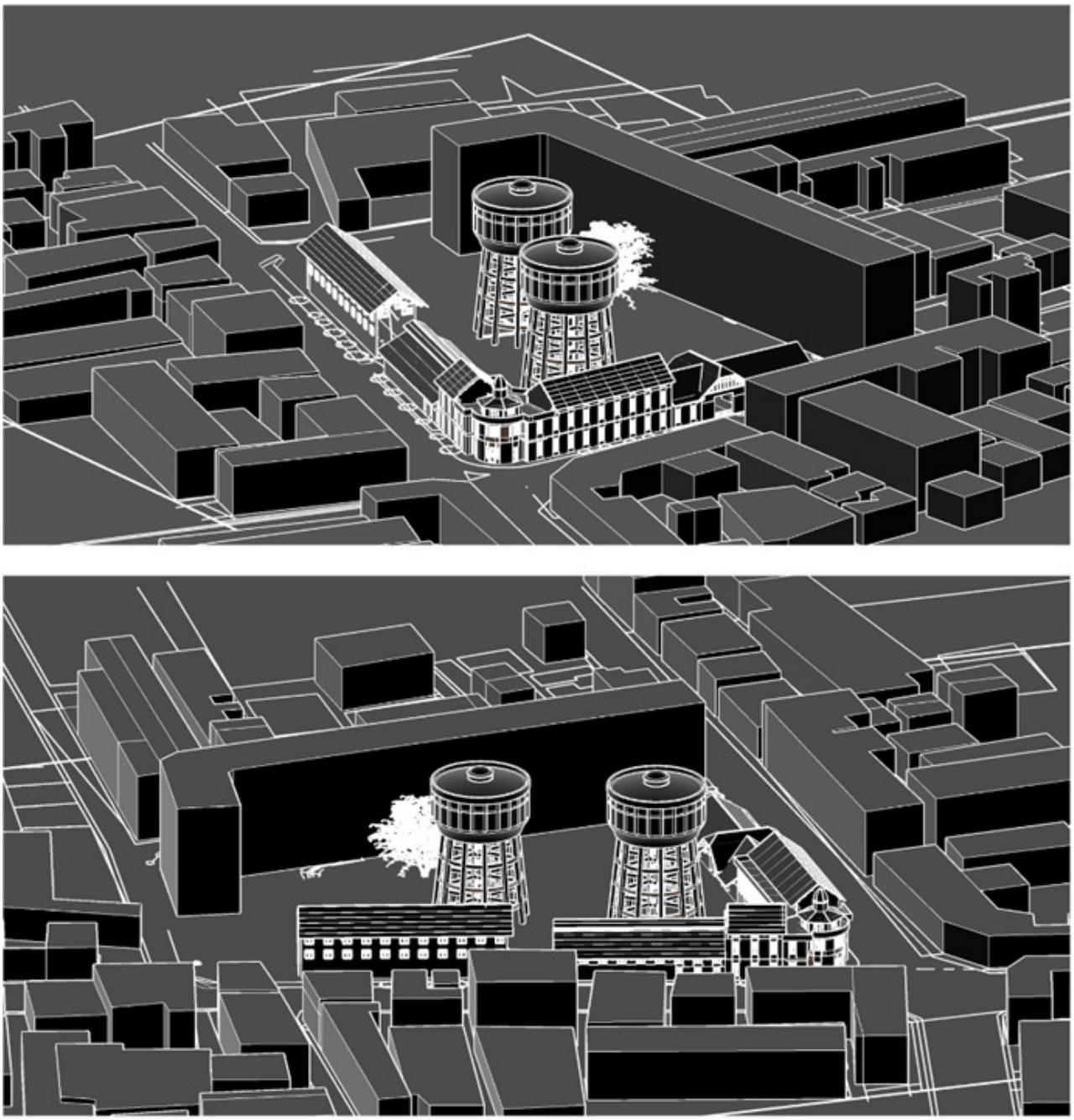


Figure 42. Piraya, R. Maen Sri Waterworks: Architectural Model, isometric, digital, 2023.

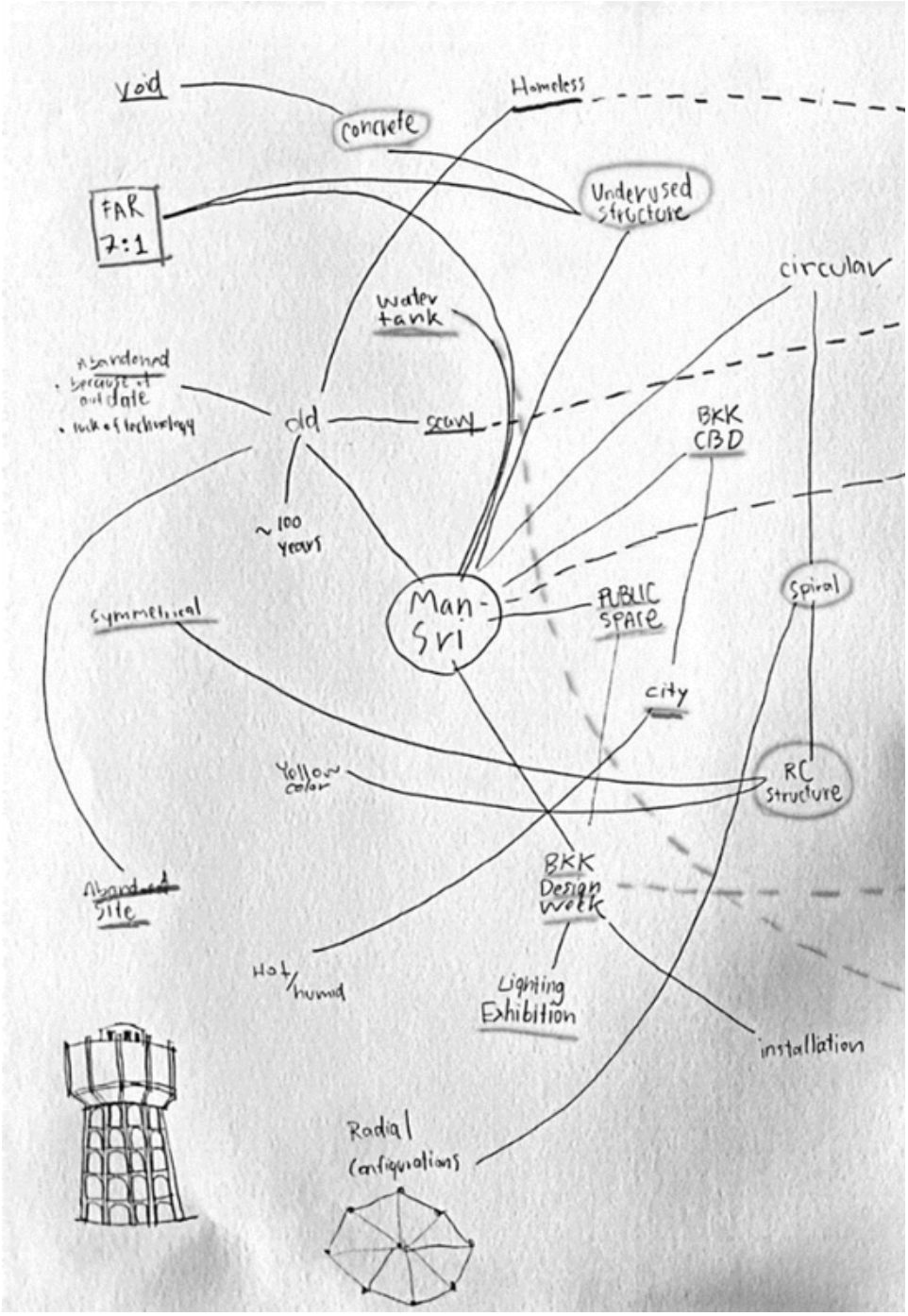


Figure 43. Piraya, R. Mapping, photograph/digital, 2023.

III.II Invading

In Françoise Astorg Bollack's book, Old Buildings, New Forms: New Directions in Architectural Transformations, she outlines five general typologies of adaptive reuse (Figure 44): “insertions”, “parasites”, “wraps”, “juxtapositions”, and “weavings”.[20] The parasites-type invades the existing space, while “parasites-stacks” and “parasites-juxtapositions” types do not disrupt the old structures.

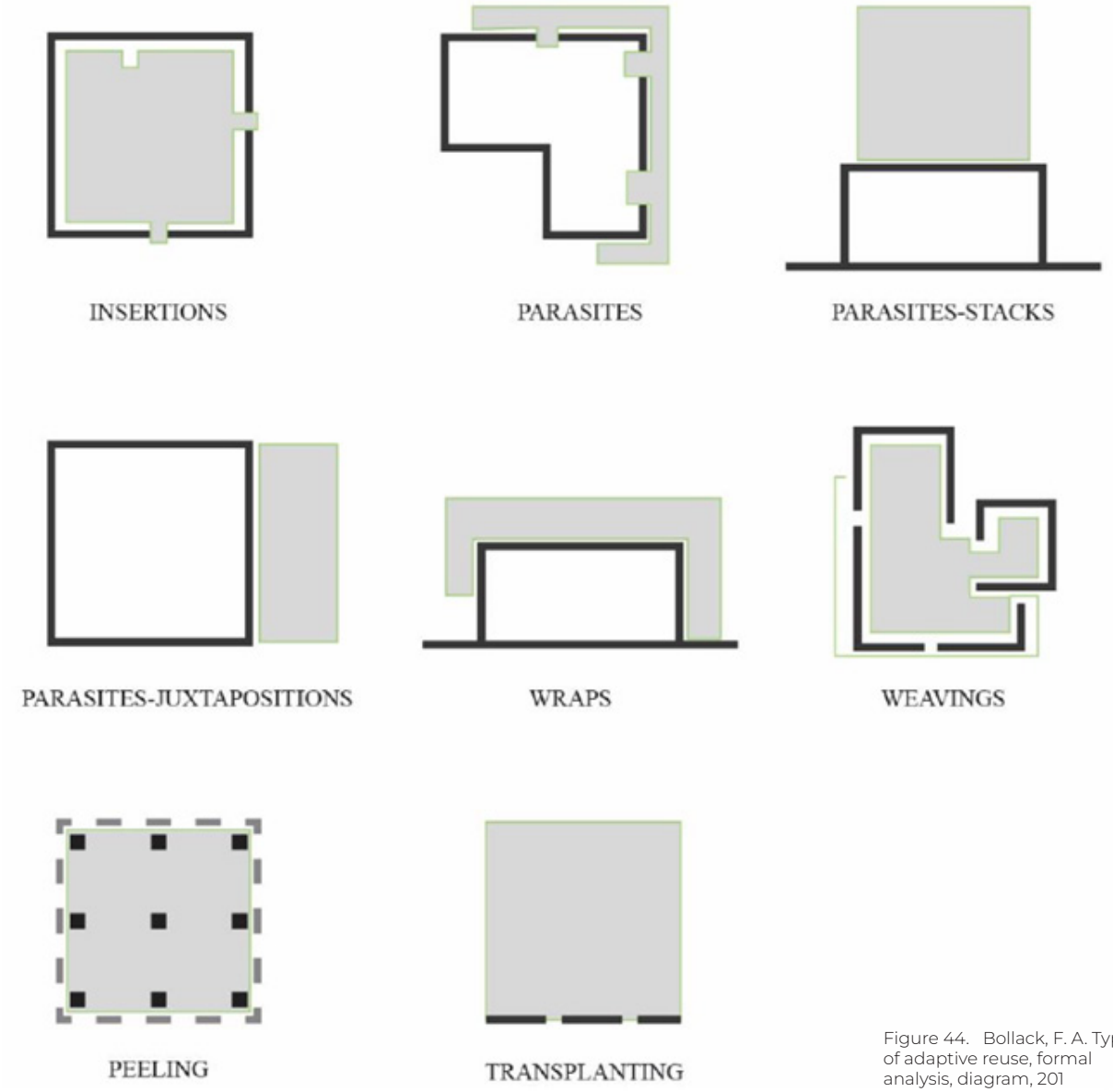
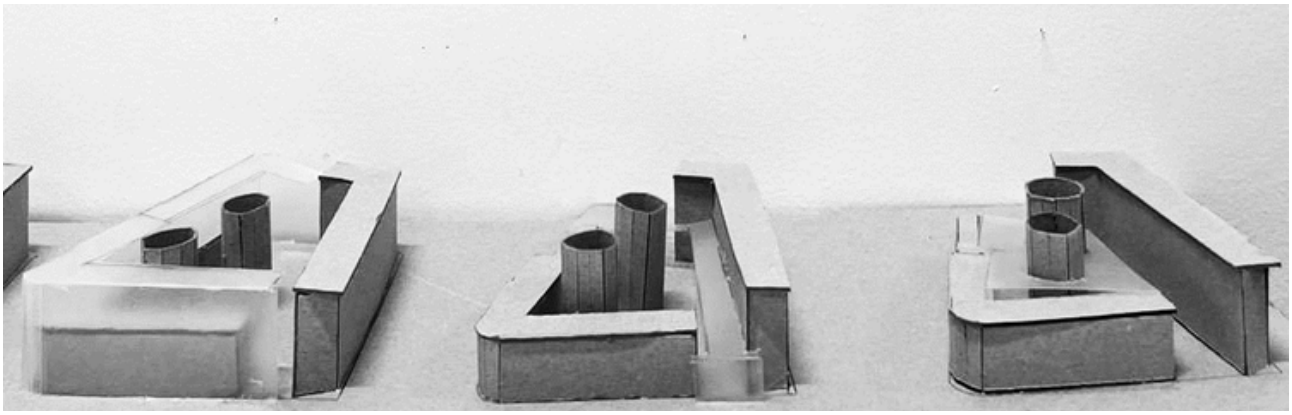


Figure 44. Bollack, F. A. Types of adaptive reuse, formal analysis, diagram, 201

20 Françoise Astorg Bollack, Old Buildings New Forms; New Directions in Architectural Transformations (New York: The Monacelli Press, 2013). 30-31.

Figure 45. Piraya, R. Experiment on a model to visually depict the relationship between old building and host: Prototype, photograph, 2023.



This illustration shows the relationship between an old building and a newly proposed addition. The black line represents its structure, such as wall, floor, or envelope. The grey colour space with green borderline shows an added function. Figure 45 shows a series of models where I experimented with these diagrams with respect to the Maen Sri Waterworks.

The first prototype wraps the older structure to safeguard its original materials and forms. While this strategy preserves the original volumes, the old facade remains concealed from external view.

The middle prototype illustrates the concept of parasites, where the new architecture clings onto the existing structure. This type of adaptive reuse involves establishing a positive relationship between the old and new elements.

The third prototype embodies the concept of insertions where new spaces are inserted into the existing volume of the old building. This method aims to protect the original structure to preserve memories and emotions while accommodating new functions within it.

From the above experimentation, I find the concepts of parasite and insertion particularly intriguing for further development. To actualize the idea inspired by Lebbeus Woods' Injection Parasite, I crafted a 1:1000 prototype using red and blue clay to study how a parasitic form could move and interact with the site (figures 46–47). The colours help delineate the different aspects of the intervention, providing a visual guide to understanding how parasitic elements relate to a single organism.

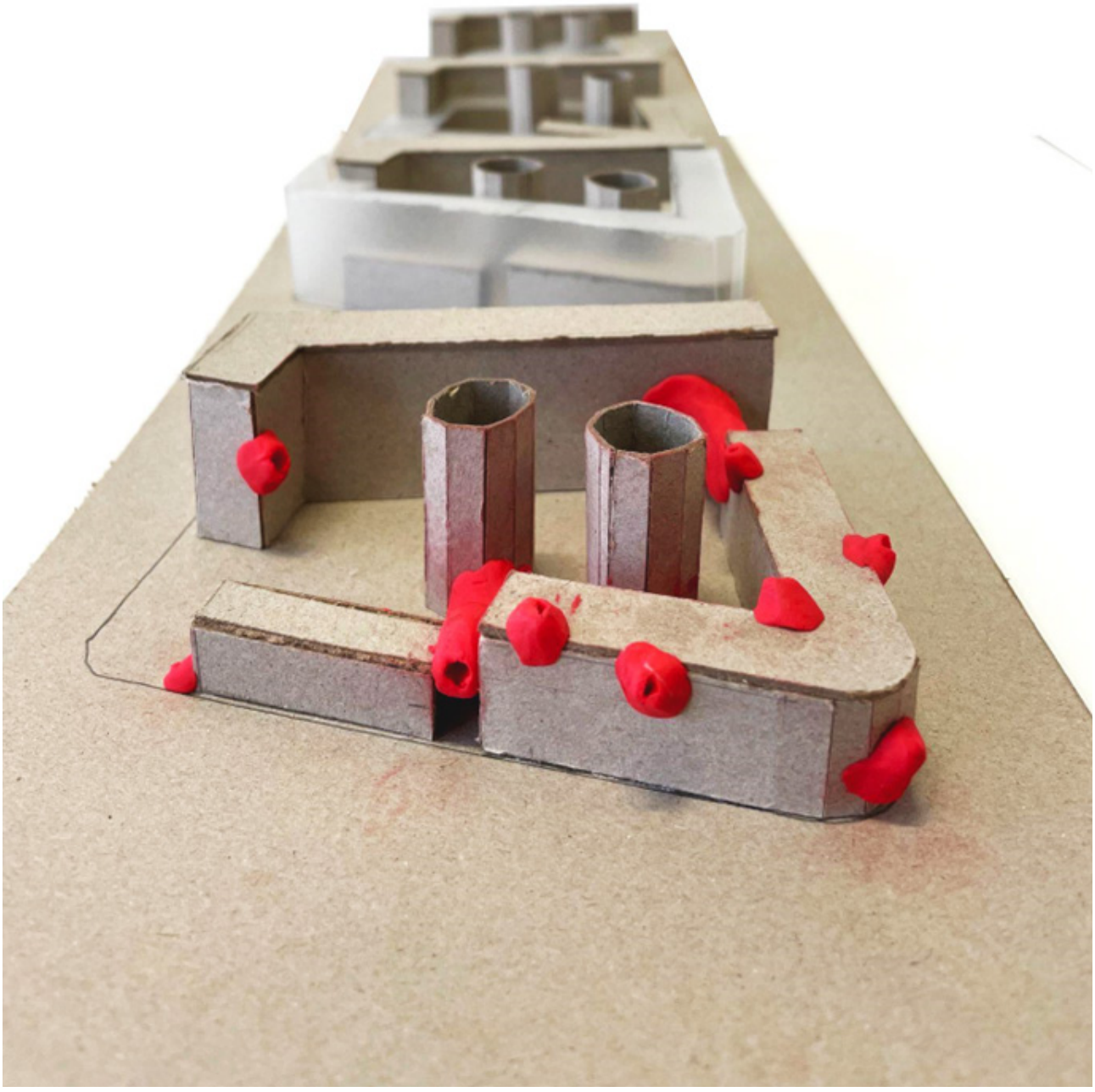


Figure 46. Piraya, R. Experiment 2, model to visually depict the relationship between an old building and host: Prototype, photograph, 2023.

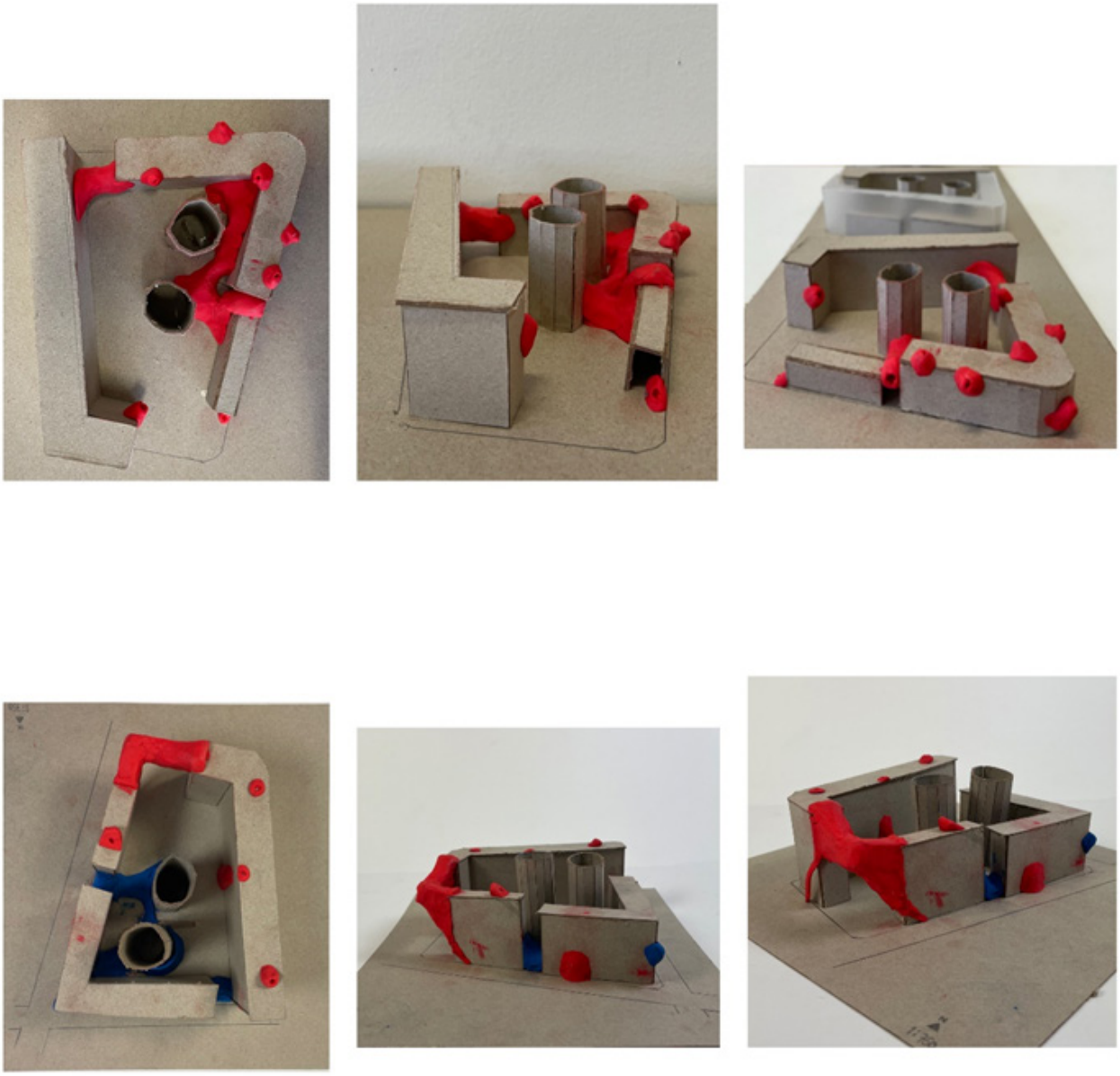


Figure 47. Piraya, R. Experiment 3, model to visually depict the relationship between an old building and host: Prototype, photograph, 2023.

III.III Drawing Life

The idea of parasitic architecture lends itself to imagining buildings that breathe, evolve, and resonate with the human experience while considering the broader impact on the environment and society. Architecture, at its best, doesn't just provide shelter; it enriches lives and shapes experiences. [21]

Figure 48. © Lina Bo Bardi.
SESC Pompéia Factory sketch, drawing, 1987.

Drawings by Lina Bo Bardi, show how she imagined the future life of the SESC Pompeia building in its expressive and intuitive nature. Bardi often used freehand sketching as a primary tool for developing her design ideas. Her sketches were fluid and dynamic, capturing the essence of her concepts rather than focusing on precise details. (figure 48). She believed that drawing allowed her to engage directly with the spatial qualities of a project.

For me, drawing frames a spatial relationship between existing buildings and activities, a bond between people and activities. When approaching the design and exploration of a site, particularly in urban design contexts, starting with sketches of activities can be a highly effective way to understand the potential of the space (figure 49).

Instead of beginning with a rigid overall plan, these sketches allow designers to envision the space as an infrastructure for people engaging in various activities.

Figure 50 is a sketch that depicts visitors enjoying various activities within the site, including strolling through the art gallery space, relaxing in the water garden, and admiring the water tower and surrounding landscape. In these sketches, the red and blue lines represent the water system clinging to the building's structure visibly tracing the flow of life through the site. Furthermore, I experimented with collage design on figure 51 to expand upon the visualization of relationships between human activity, infrastructure, and the built environment within the site. Collage allows for a dynamic exploration of these connections by combining various elements, such as photographs, sketches, and diagrams, to create a layered composition that conveys the complexity and interdependence of different aspects of the site.

21 Lina Malfona, "Review: Zeuler RM de A Lima, Lina Bo Bardi, Drawings.," n.d.

Figure 49. Piraya, R. Maen Sri Waterworks: Sketching, activities, drawing, 2023.

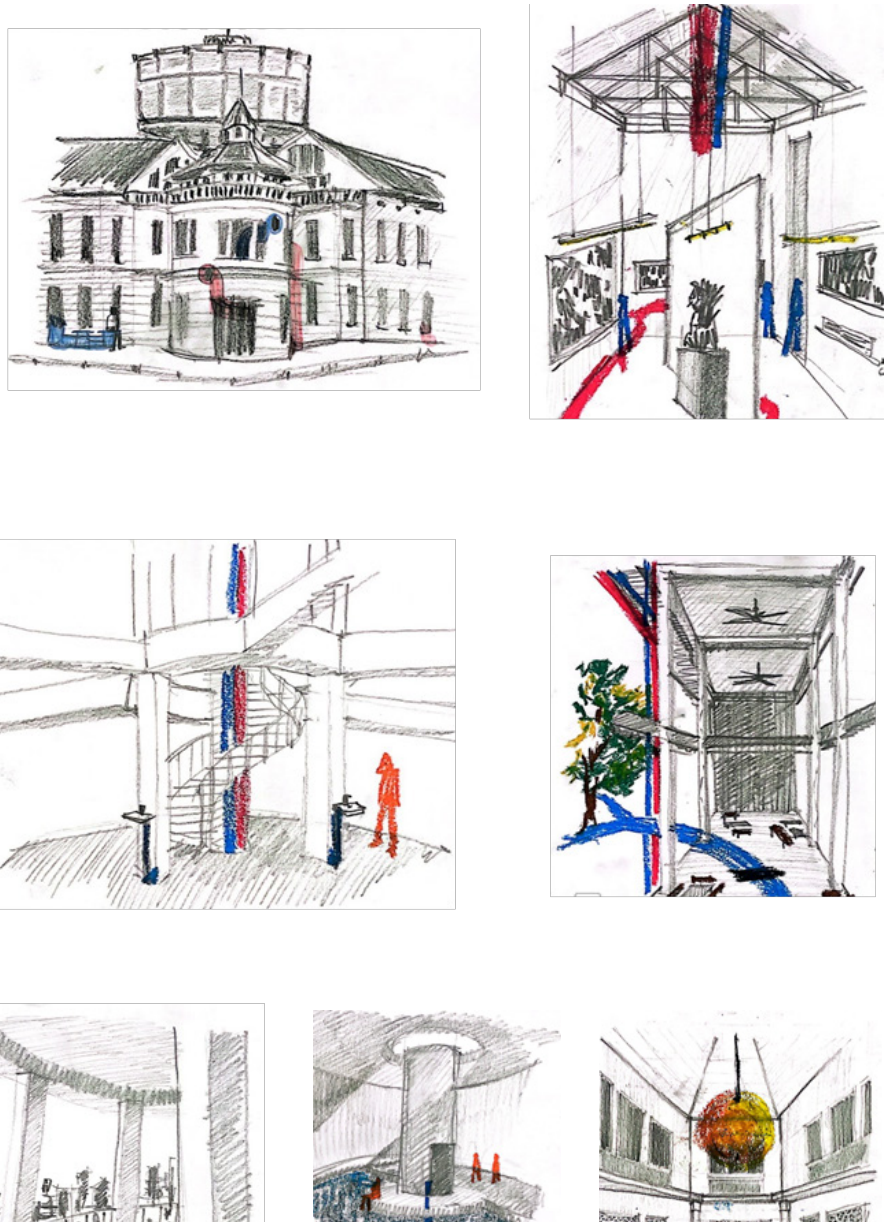


Figure 50. Piraya, R.
Pencil sketching activities in the site, drawing, 2023.

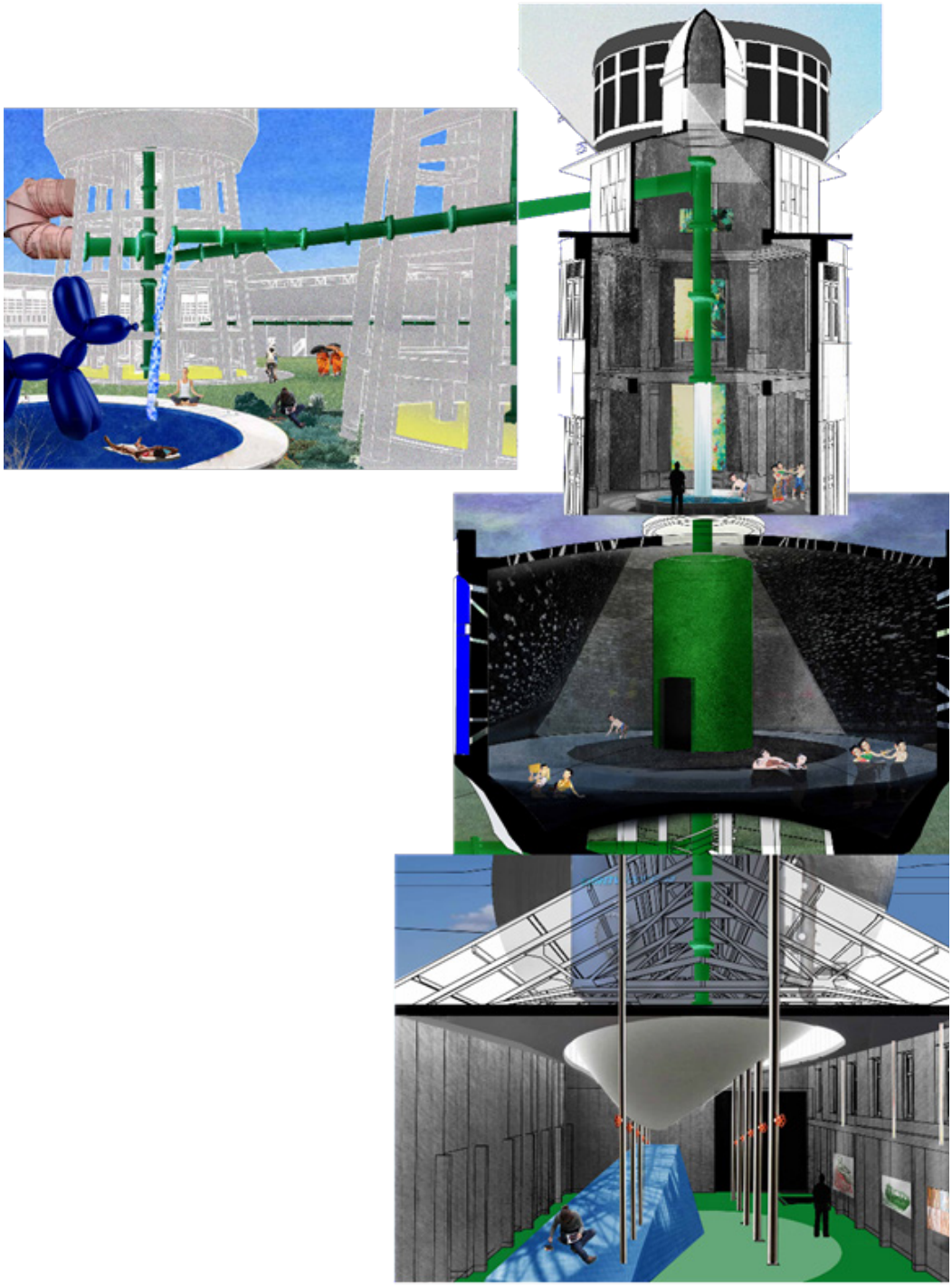


Figure 51. Piraya, R. Experiment in collage design, collage/digital, 2023.

These sketches and collages also prompted a series of programming diagrams (figure 52) that determined the possibility for incorporating an art gallery, studio, workshop, housing, and public place water infrastructure.

At this stage, the focus lies not on the intricate design specifics of each individual space but rather on visualising a life-giving parasitic infrastructure to animate and empower these spaces, fostering community engagement and vitality. By leveraging the existing building as a catalyst for positive change, the aim is to cultivate a supportive parasite ecosystem where a diverse range of people can collaborate, innovate, and thrive.

Figure 52. Piraya, R. Maen Sri, proposed programming, diagram, drawing, 2023.

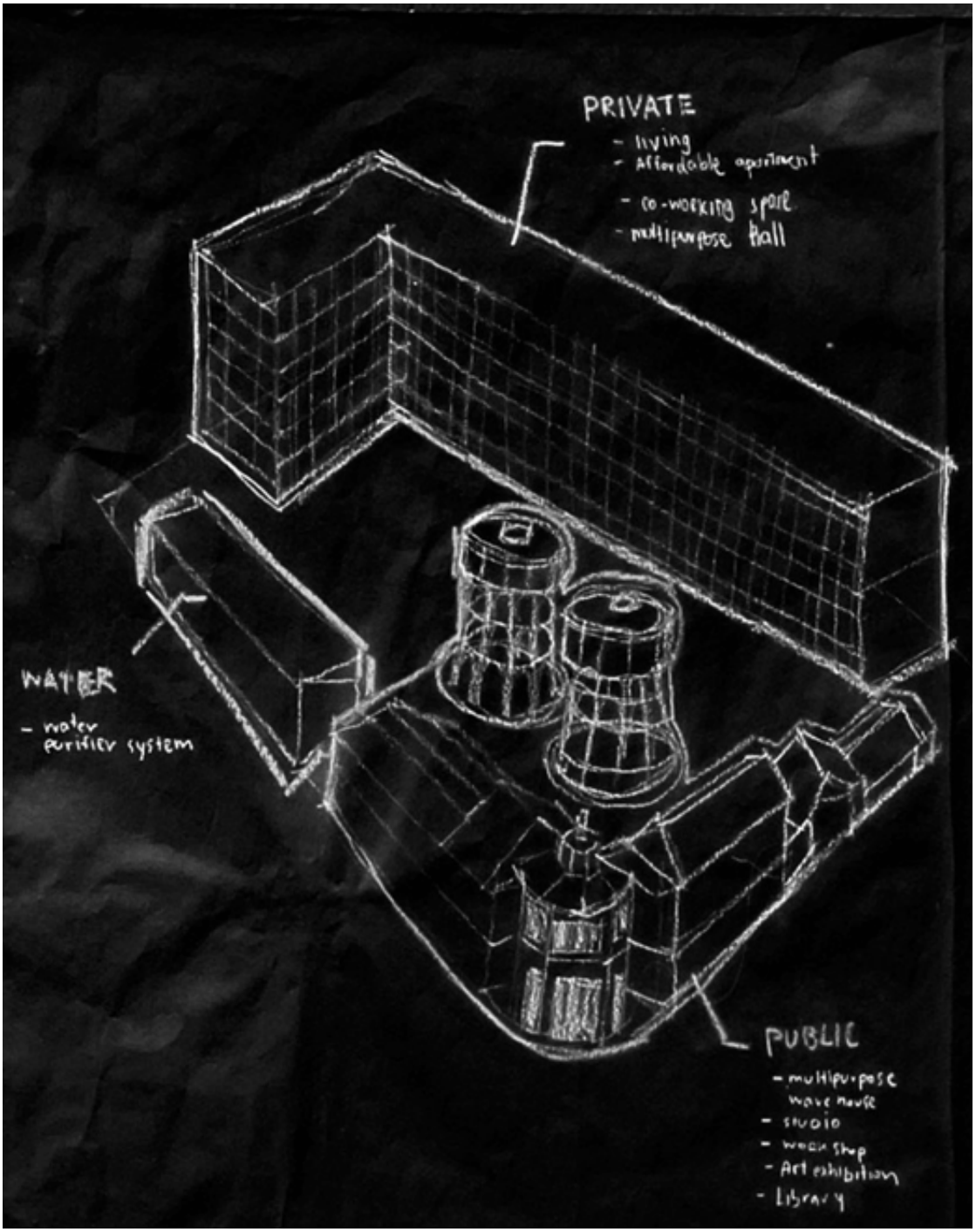


Figure 53. Piraya, R. Maen Sri, proposed programming, isometric, drawing, 2023.

III. IV Infrastructure

The genesis of the novel life-centric water infrastructure stemmed directly from these life studies. It became evident to me that water would play a significant role not only as a functional necessity but also as a catalyst for social cohesion and community vitality.

The historical significance of the water towers within the site's infrastructure provided additional inspiration. As Thailand's inaugural water tanks, these structures served as tangible reminders of scars in the city. The project sought to elevate their role to that of a central organizing principle, driving the design and programming of the site, much like the working life of SESC Pompeia's factory buildings did for Bo Bardi.

The brief that arose was for a comprehensive water infrastructure that would breathe life into the site and its surroundings. Life would start with harvesting, purifying, and circulating water, and then reintroducing clean water for various uses—drinking, bathing, swimming, and nurturing plant life, fostering an engaging and vibrant environment teeming with playful possibilities.

The water cycle diagram presents the planned water circulation and cross-sectional view of the site, as seen in figures 54–56. In the diagram, the blue line represents cold-water flow, while the red line signifies wastewater running from one building to another. The overlaid tracing paper drawings illustrate experimental pipe installations as part of a contemporary design initiative seeking to introduce new creative possibilities and opportunities for further research. These pipe installations undergo a continuous transformation, serving dual roles as both water pipes and bench seating within the public space.

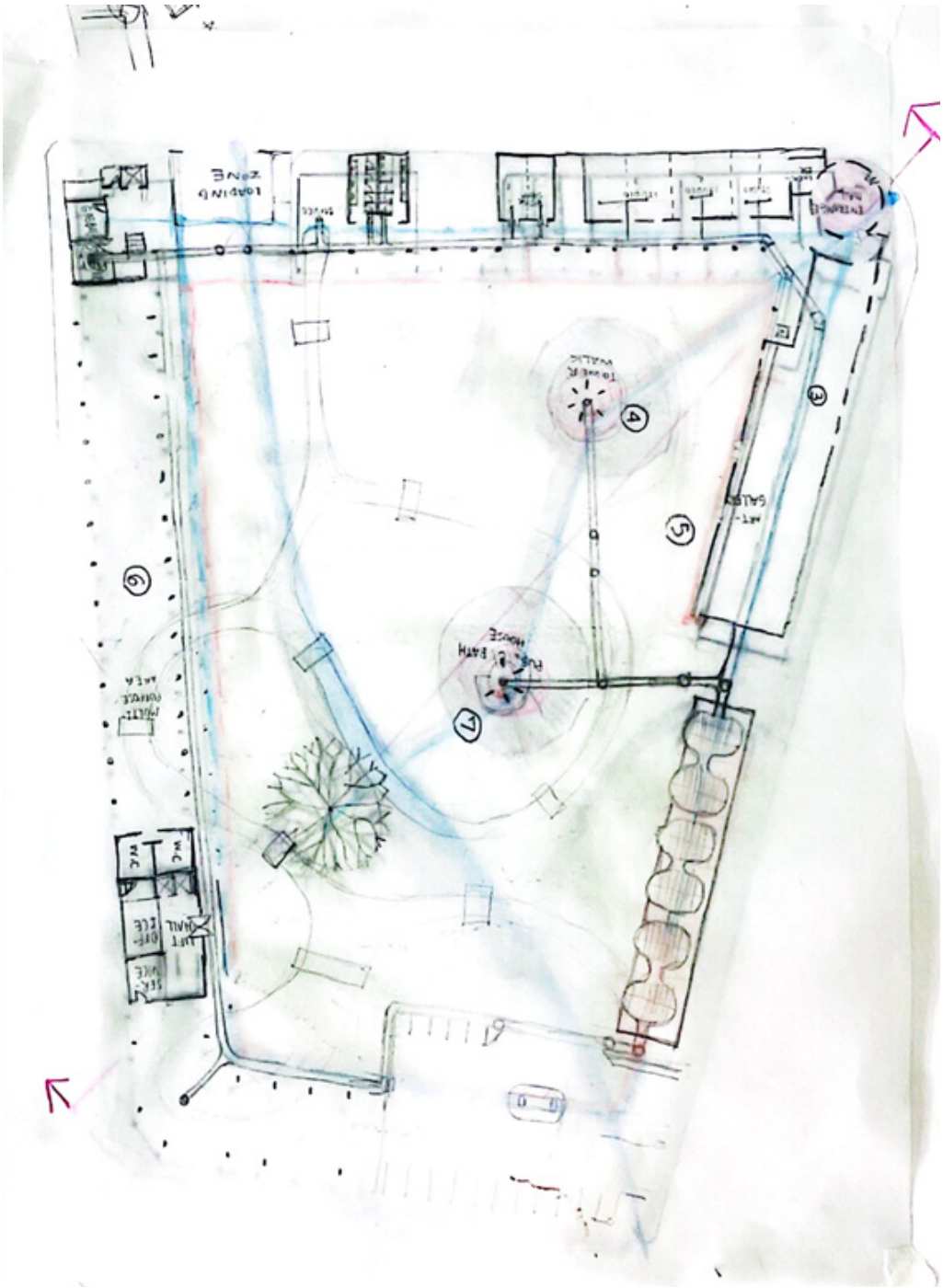


Figure 54. Piraya, R. Maen Sri, water circulation, planning, drawing, 2023.

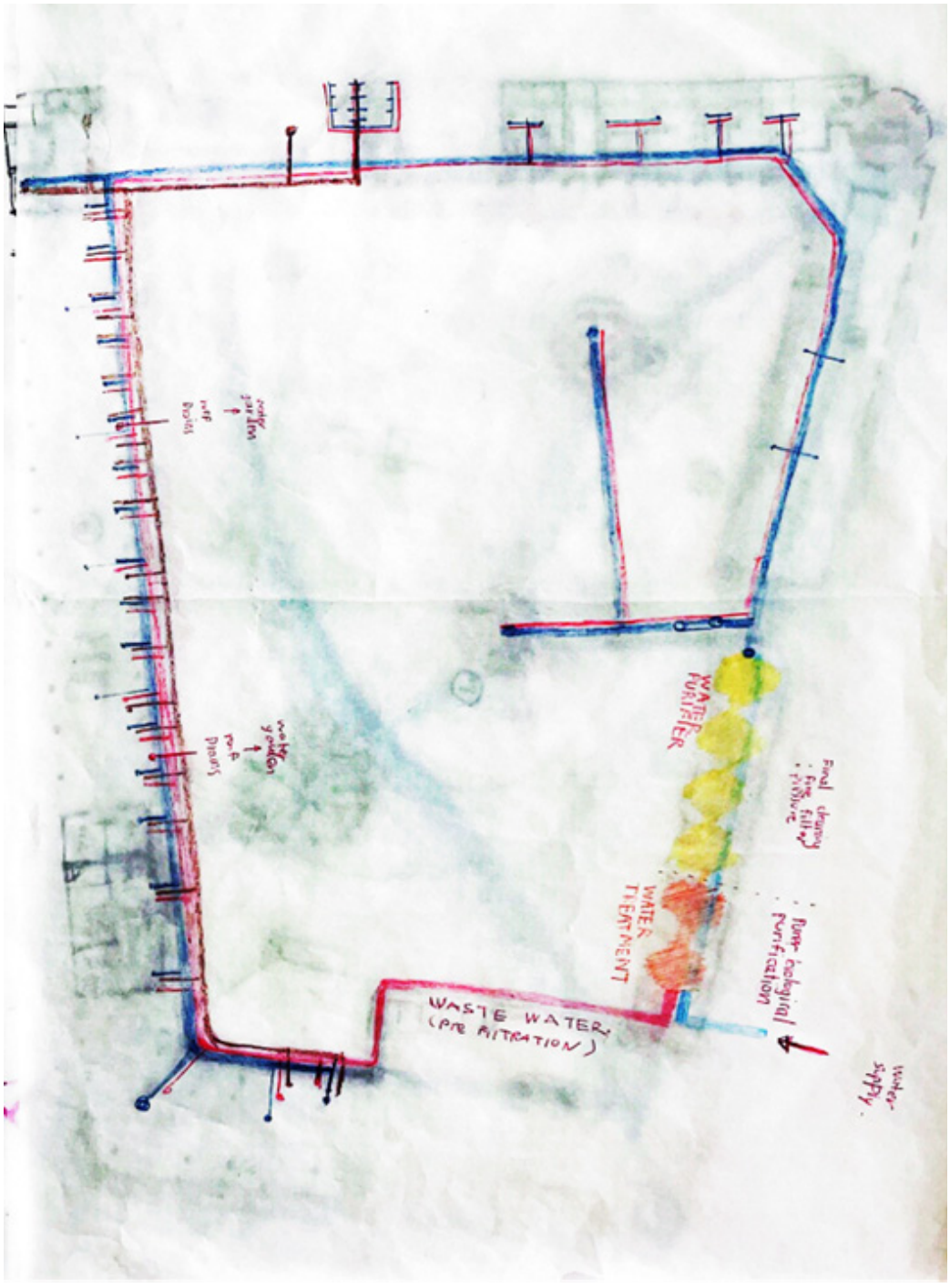


Figure 55. Piraya, R. Maen Sri, water circulation 2, planning, drawing, 2023.

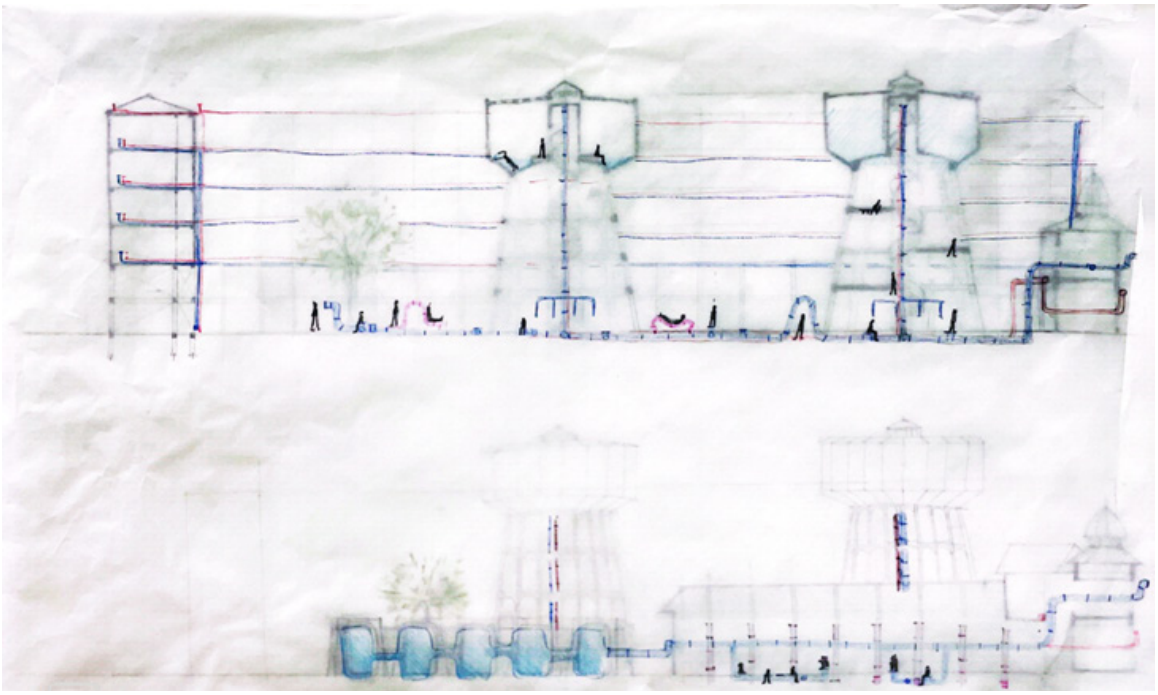


Figure 55. Piraya, R. Maen Sri, water circulation 2, planning, drawing, 2023.

These system diagrams linked activities or scenarios within the site, showcasing the relationships between different spaces and their interactions. The red and blue lines in each drawing represented the infrastructure network responsible for circulating water. Still, they also serve not only as conduits for water flow but might also transform into seating or public furniture. This emphasized the importance of connectivity and integration within the site, moving away from viewing each location in isolation.

Instead, the drawings illustrated how these spaces were interdependent and mutually reinforcing, contributing to the overall coherence and vitality of the environment. By weaving this infrastructure network through the existing fabric of the site, the drawings conveyed a sense of continuity and evolution, where old and new elements seamlessly merged to create a unified whole.

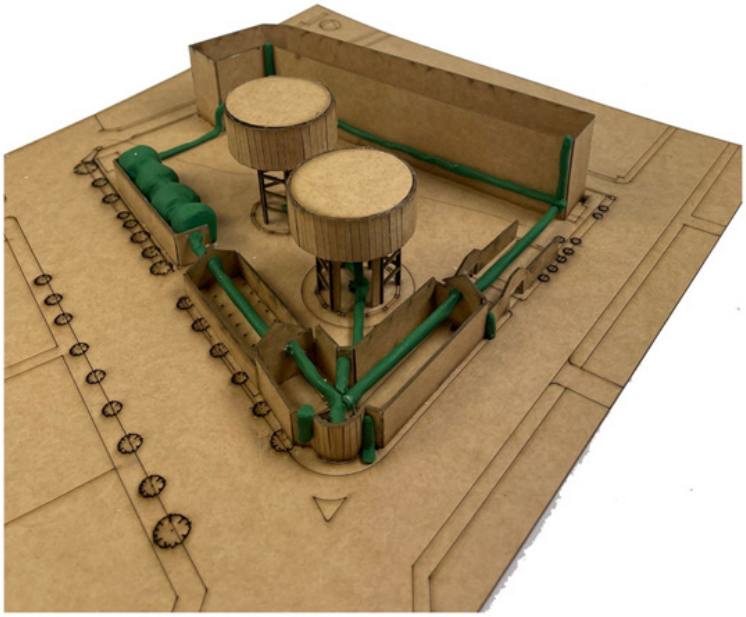


Figure 57. Piraya, R. Maen Sri, wWater cycle system:, Prototype, pPhotograph, 2023.

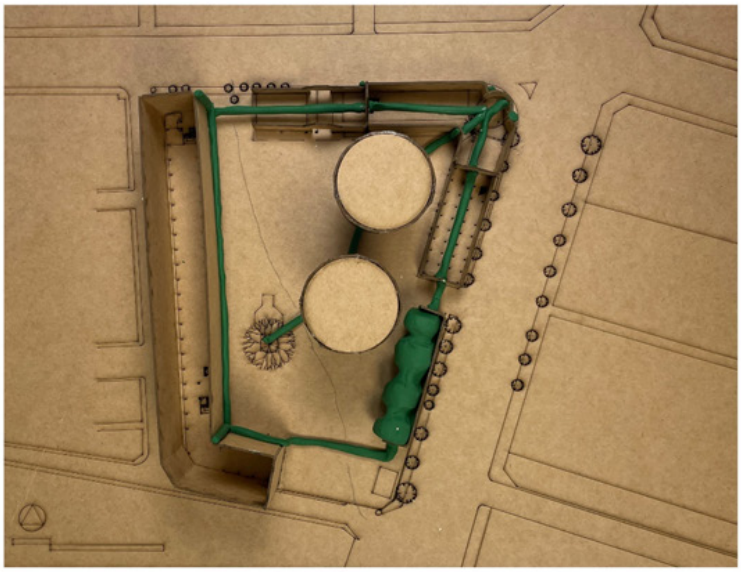


Figure 58. Piraya, R. Maen Sri, wWater cycle system 2:, Prototype,, pPhotograph, 2023.

Figure 59. Piraya, R. Maen Sri, water cycle system 3: Prototype, photograph, 2023.

Figure 60. Piraya, R. Maen Sri, water cycle system 4, interior: Prototype, photograph, 2023.

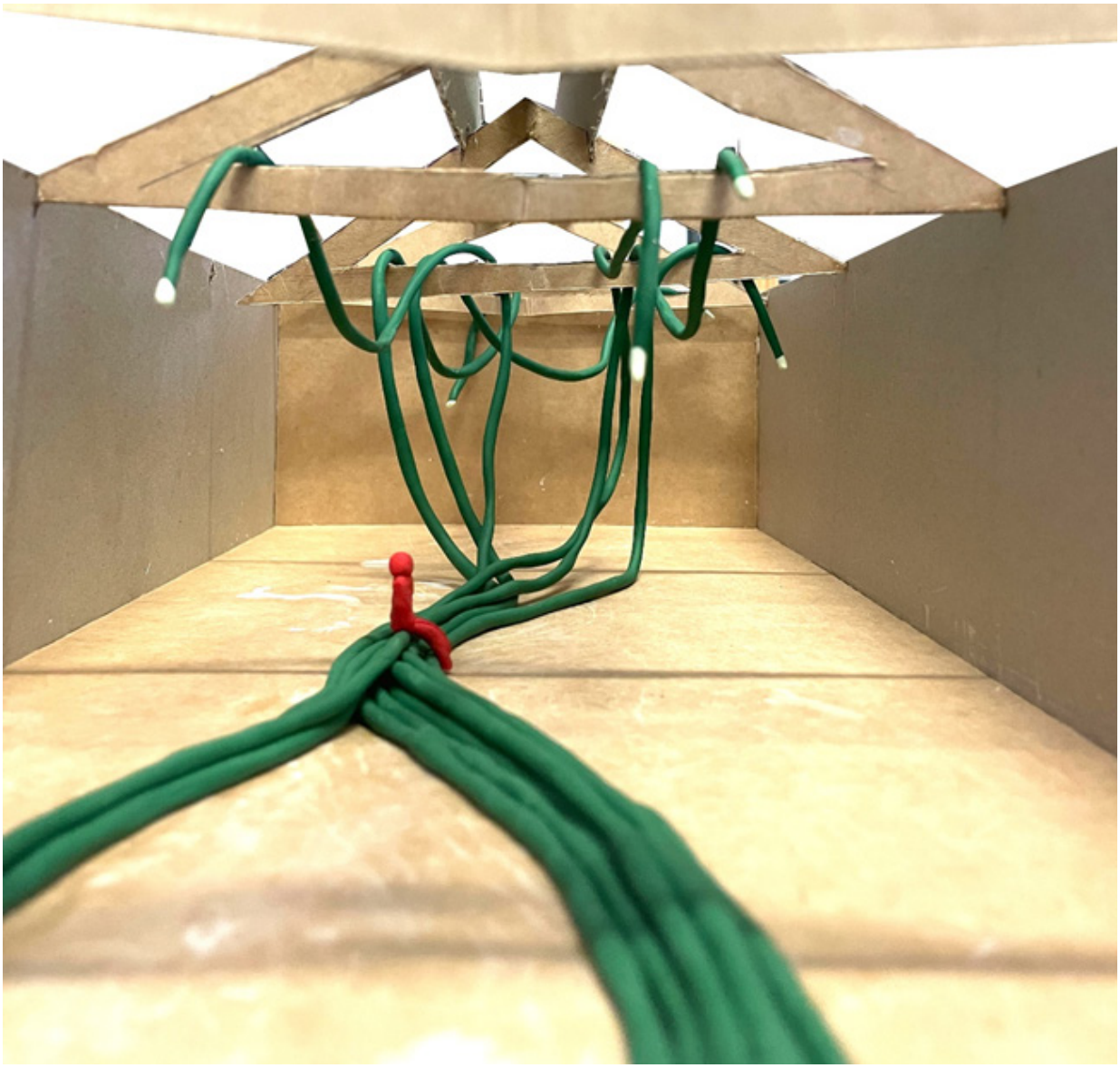


Figure 61. Piraya, R. Maen Sri, water cycle system 5, interior: Prototype, photograph, 2023.

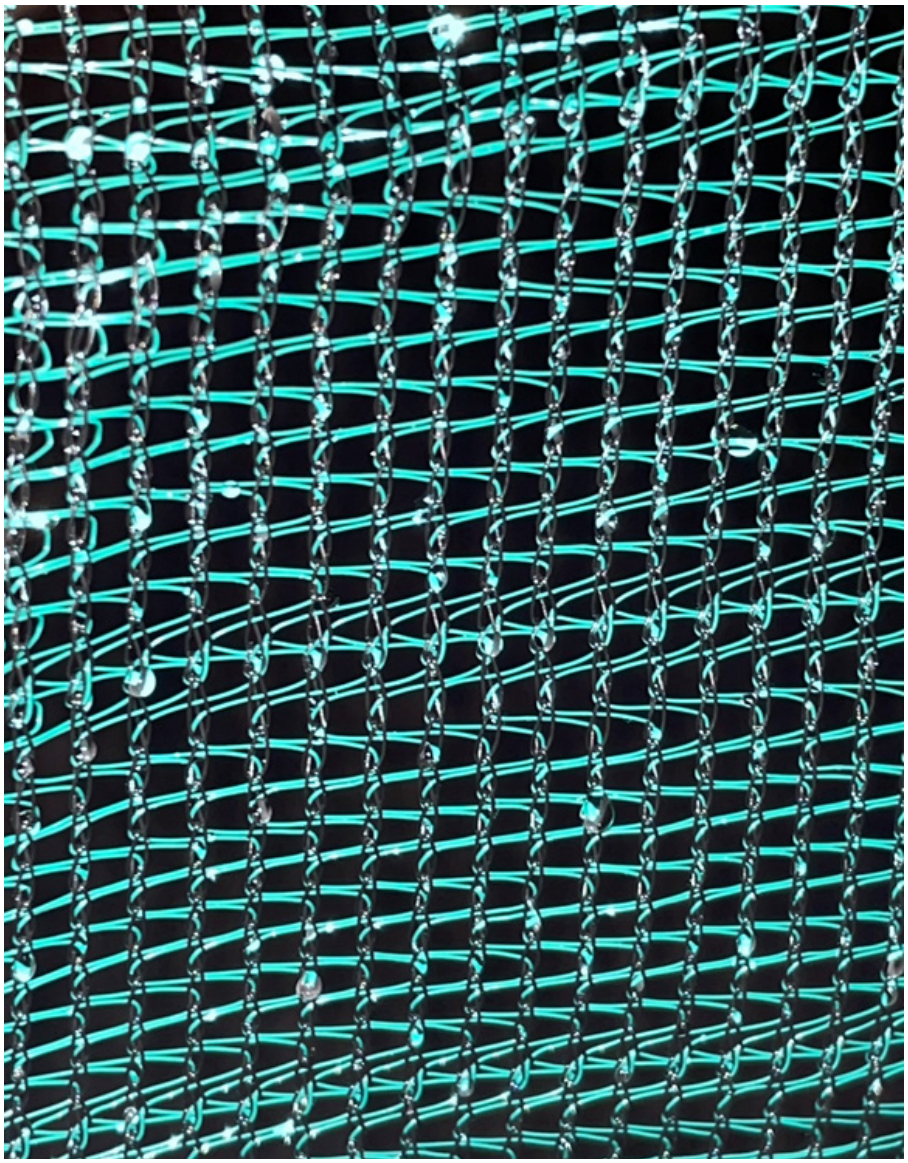


Figure 62. Piraya, R. Experiment in suspending a polyester mesh, photograph, 2023.

Applying the parasitic approach to the site involves utilizing the water tower as a central element for sustaining life. This is achieved by incorporating meshed fabric that adheres to the water tower's structure, adapting the system used by Arturo Vittori for the Warka Water Towers (see Section II.II.III).

This system collects rain, harvests fog, and captures dew, operating solely through natural phenomena such as gravity, condensation, and evaporation without the need for electrical power, as seen in figure 62. I tested this for myself by suspending a polyester mesh in an outdoor space overnight. In the morning water droplets had adhered to the mesh and begun accumulating into larger droplets, exhibiting self-organizing behaviour.

I imagined such a net, stretched out from the water towers would form a canopy. Under the shade, people can gather for public meetings, fostering a sense of community and social interaction (figure 63).

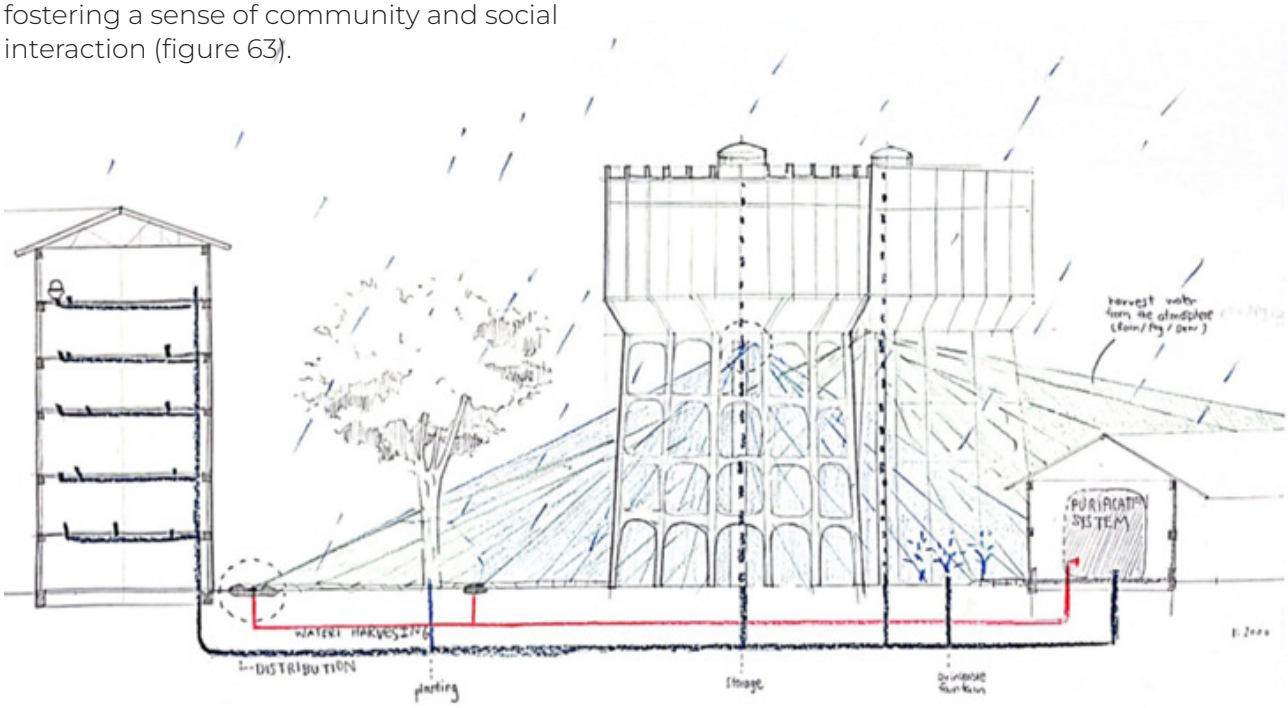


Figure 63. Piraya, R. Maen Sri Waterworks: Section diagram, drawing, 2023.

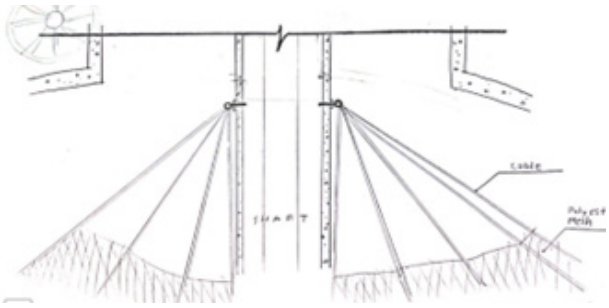


Figure 64. Piraya, R. Detail of water catcher (parasite) hanging on water shaft structure, drawing, 2023.

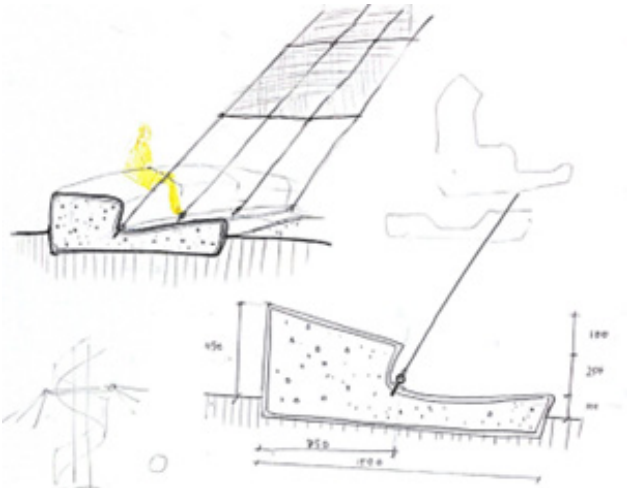


Figure 65. Piraya, R. Detail of water catcher (parasite) attached on seating structure to create gathering space, drawing, 2023.

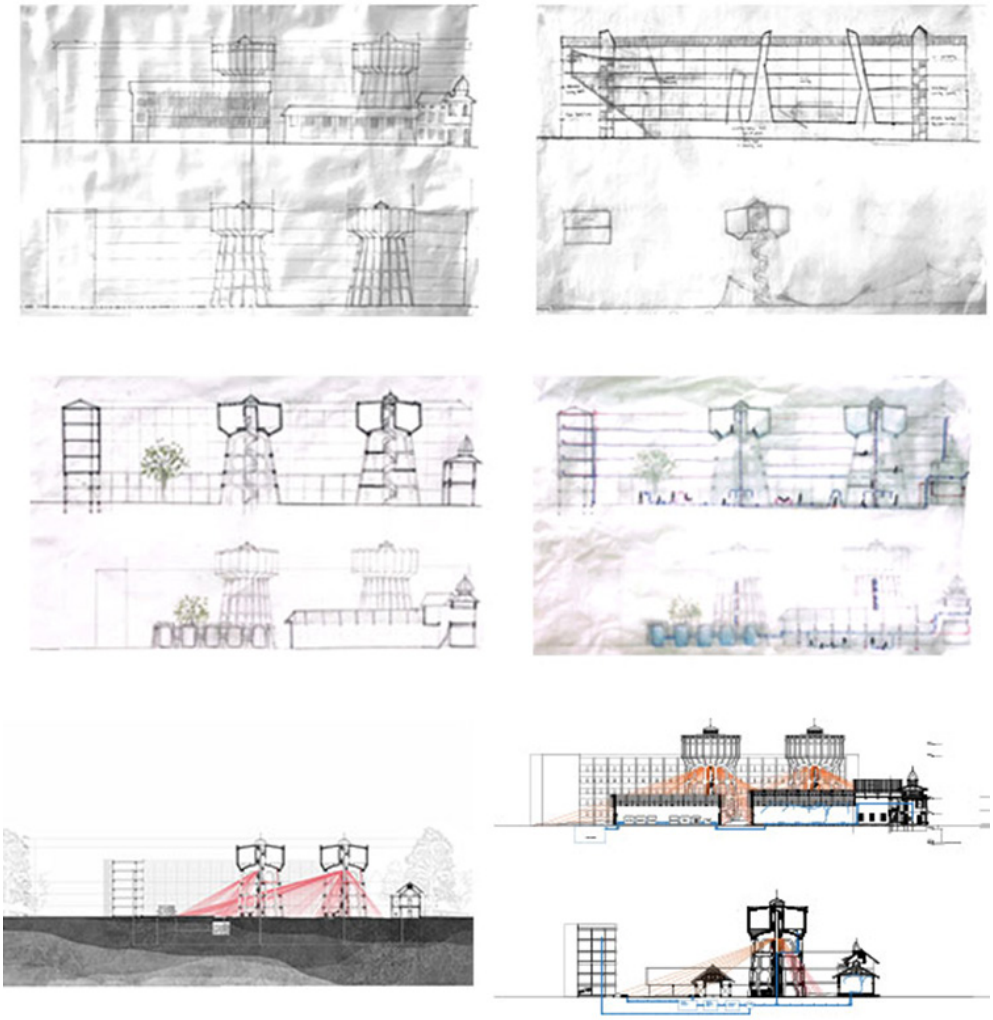
IV Research Outcomes

This research is ongoing and will be presented at St Paul St Gallery in June 2024. My research effort revolves around reimagining the Maen Sri Waterworks. I propose a revitalization initiative rooted in the concept of a parasitic water infrastructure. I see the parasite as a metaphor for symbiotic alliance.

In this perspective, the parasite contributes to the vitality of the host, recognizing that architecture thrives on connections and remains incomplete without them. Contrary to the negative connotations associated with parasitic architecture, this approach highlights its essential reliance on the host's structure and the new ecosystem of life it makes possible.

Planning Developed

Figure 66. Piraya, R. 6 Maen Sri Waterworks: Planning developed, drawing/digital, 2024.



Section Developed

Figure 67. Piraya, R. 6 Maen Sri Waterworks: Section developed, drawing/digital, 2024.

Figure 68. Piraya, R. 6 Maen Sri Waterworks: imagery, parasit, digital, 2024.

Parasitic creatures cling to the host building, feeding off their strength and resources without killing it, nurturing their own community while Letting the host alive.

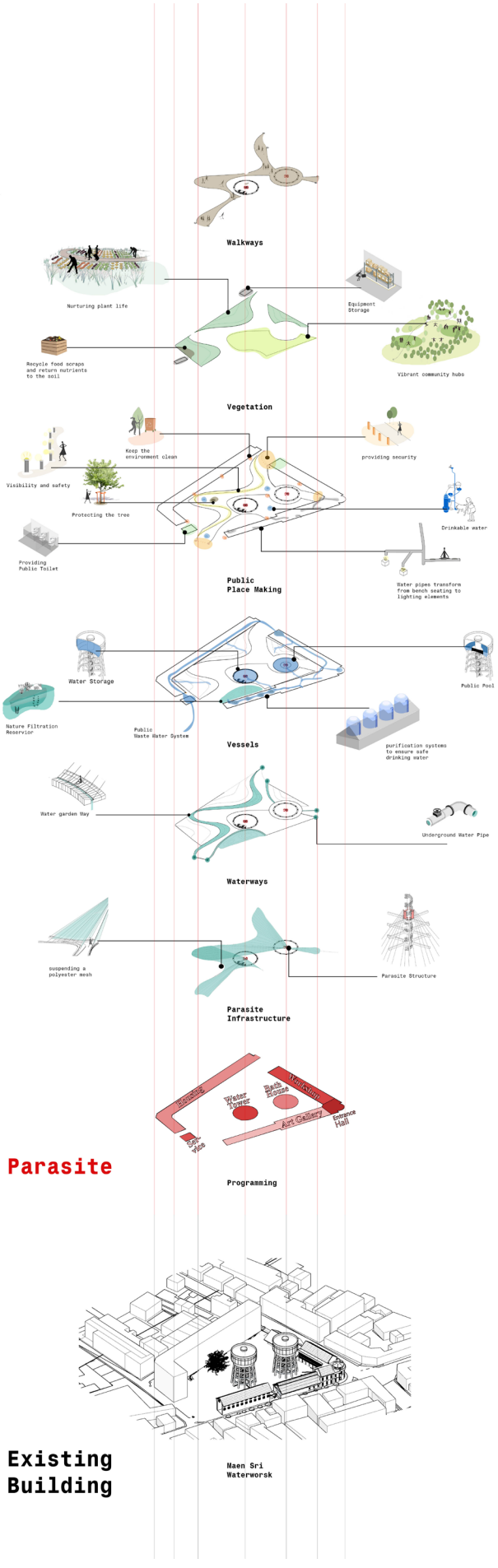


Figure 69. Piraya, R. 6 Maen Sri Waterworks: Diagram, digital, 2024.

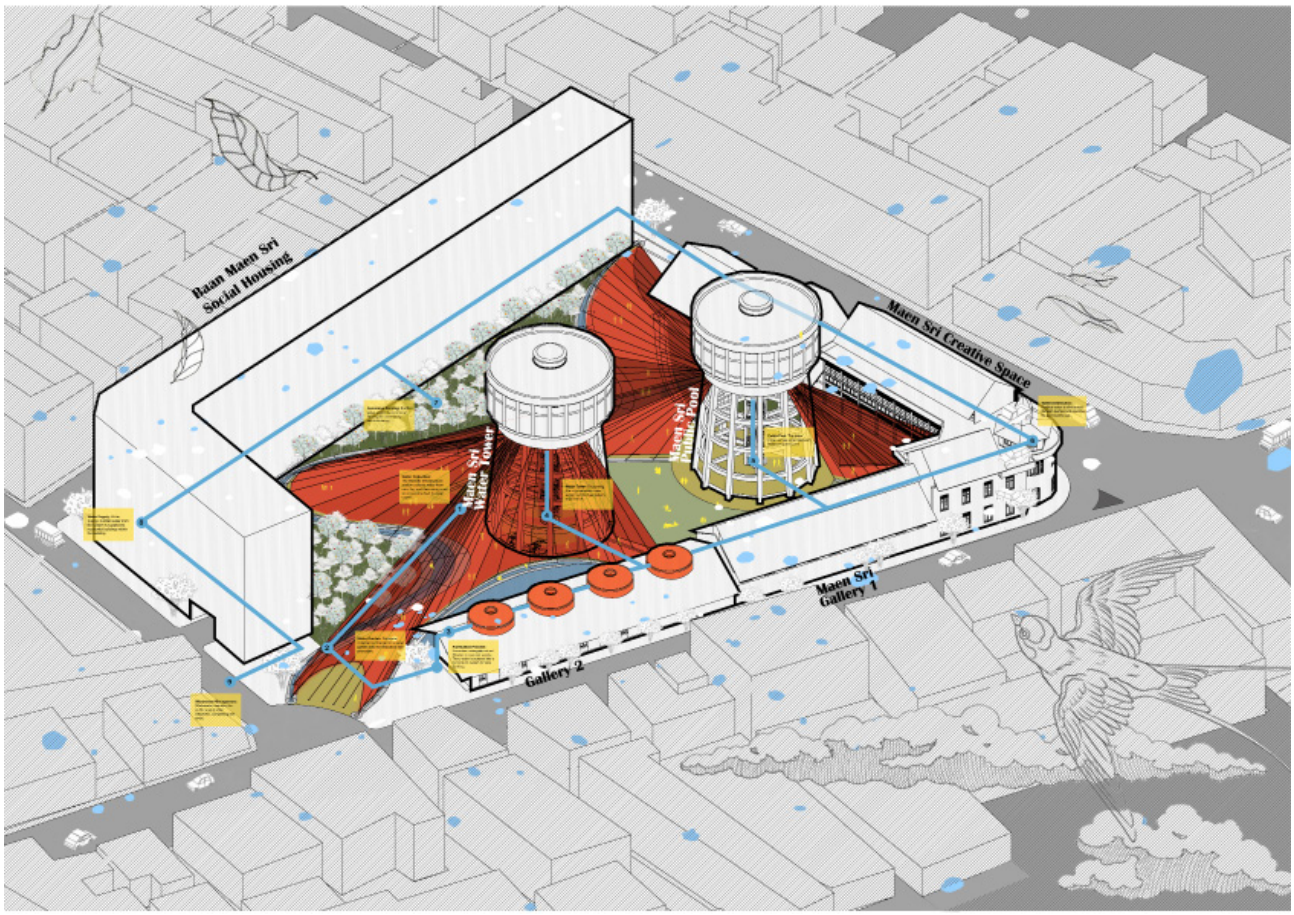


Figure 70. Piraya, R. 6 Maen Sri Waterworks: Isometric, layout, drawing/digital, 2024.

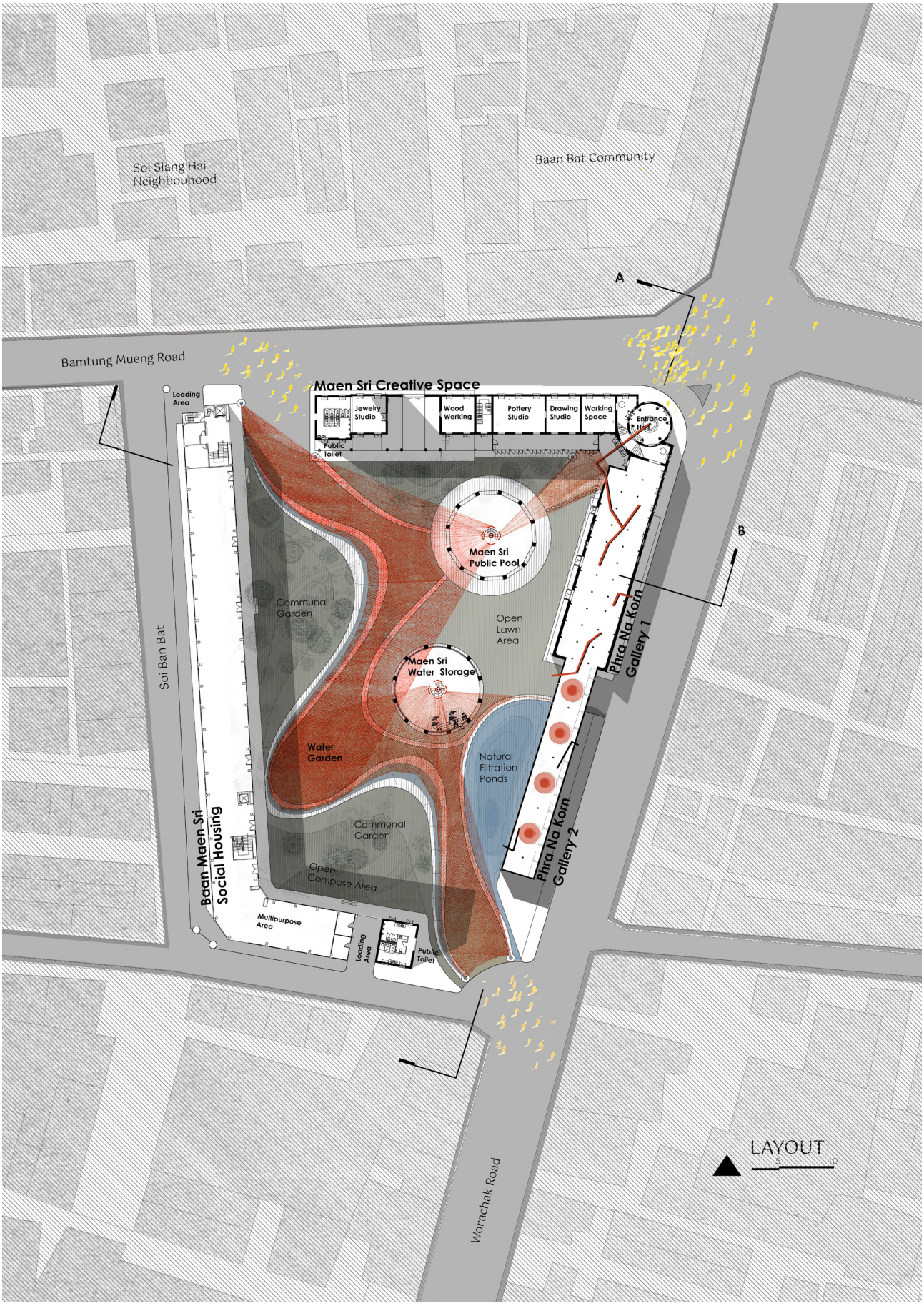


Figure 71. Piraya, R. 6 Maen Sri Waterworks: Layout, drawing/ digital, 2024.

Figure 72. Piraya, R. 6 Maen Sri Waterworks: Elevation, drawing/ digital, 2024.

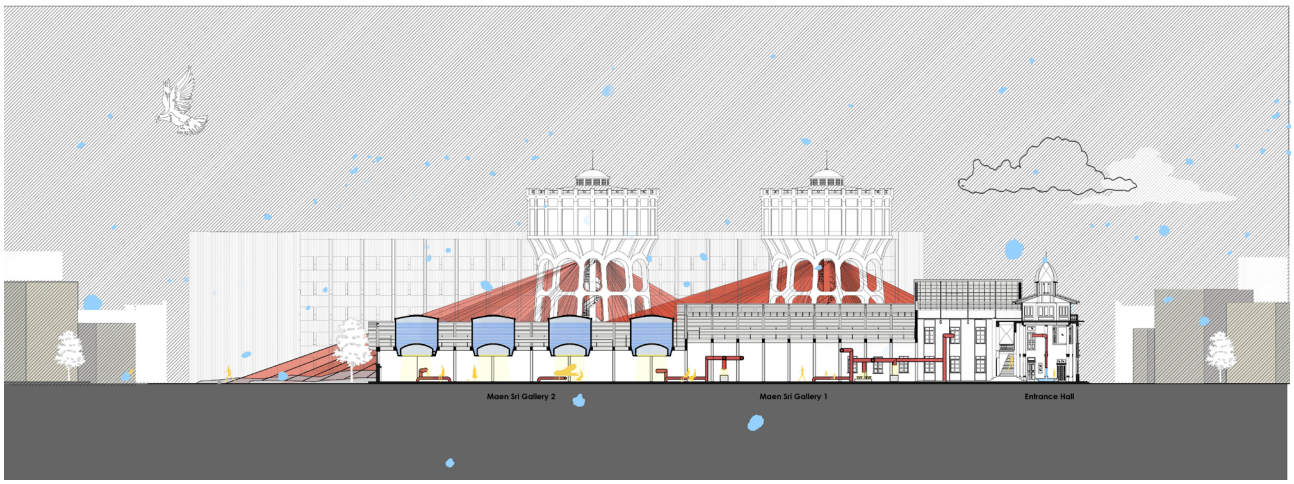


Figure 73. Piraya, R. 6 Maen Sri Waterworks: Section A, drawing/ digital, 2024.

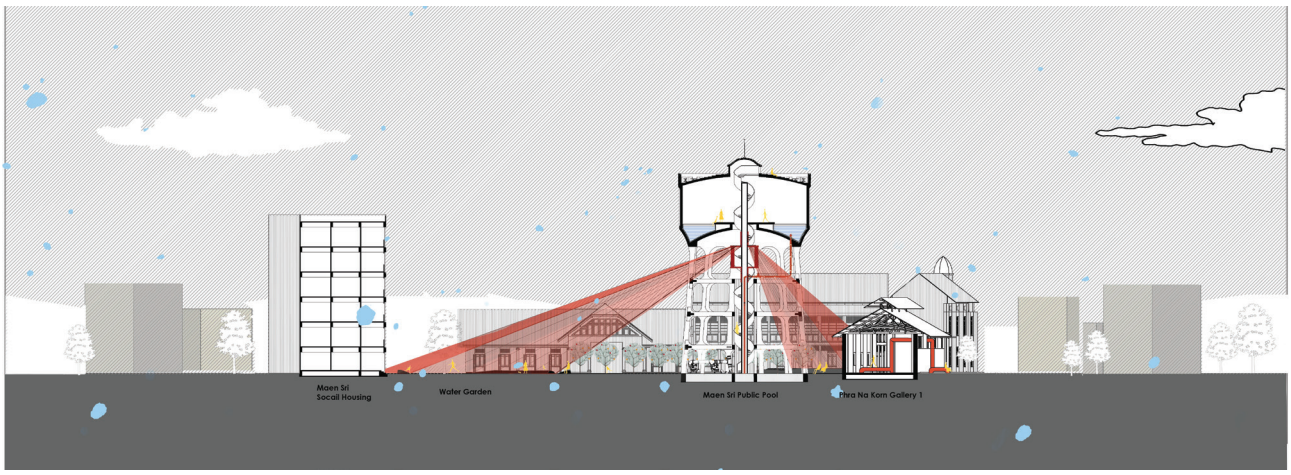


Figure 74. Piraya, R. 6 Maen Sri Waterworks: Section B, drawing/ digital, 2024.

The central feature of the proposal is the water towers in figure 73, which preserve their original aspect. One will serve as an elevated Maen Sri public pool, and the other celebrates the resurgence of the water tower, serving once again as a vital water-storage component utilizing water collected from the catchment of the parasite net structure attached to the shafts of the water towers. The interior of the bath-house tank, as seen in figure 74, will include space for storing belongings, resting, and sitting. The incorporation of these new elements will manage and conceal the pool's filtration system, skimmer, and maintenance convenience, and even implement natural lighting through circular skylights shaped according to the building's circular structure. This innovation will allow natural light to penetrate the pool, creating a distinct and unique ambience for the swimming area.

The central staircase axis within the pool will provide an experiential journey for visitors ascending the tower, rising above the moisture-collecting nets. It will mimic the traditional functionality of the original water tower's central staircase. Upon reaching the highest-level platform, visitors will encounter a panoramic view that overlooks the city's intersections, and the area once served by the original water pumping station.

Framing the north and northeast edges of the block, as seen in figure 74, the buildings of the former water department are re-envisioned as an art hub. Leveraging the water cycle of the parasite, the building employs it to provide a water supply, water purification systems and pumps to distribute water to consumers efficiently. Additionally, the pipe structure transforms into seating, offering a unique and functional element to the space. Spatially, the building is aligned along the street in two wings and connected by a formal entrance atrium (figure 75).

In the North Wing, upon entering through the main atrium, there will be studios catering to various artistic disciplines, including ceramics, woodworking, life drawing, and a public workshop space where artists can create their work. The upper floors of this section will house a library and coworking spaces. While key spaces have been designed, the working parts of these spaces would be developed in consultation with the end-users. The East Wing has been transformed into two large double-height exhibition galleries (figures 76–77).
The six-storey building along the western edge was originally an office building with a long single corridor spanning all six floors. It will be repurposed into residential housing by reconfiguring the original floor plan. The ground floor of the building will serve as a common area for the project, while floors 2 to 6 will be transformed into residential units. Additionally, the water-cycle system of the water infrastructure will provide clean water for the residents within the building. Washing and storage facilities for the homeless will also be included at street level. Detailed interior design for these residential spaces would be a future stage of the project.

At ground level, our open spaces serve as vibrant community hubs where people relax, socialize, and honour water's historical significance. The lush community garden offers a serene retreat, while water features promote sustainability and habitat. A bustling weekend market on an open lawn area showcases local artisans, and a central gathering space hosts events, fostering an outdoor art space. Water reservoir areas provide natural filtration ponds, as seen in figure 78, before entering the chemical system, ensuring water quality and making water purification visible.

By repurposing the historic water towers, Thailand’s first, transforming as sources of clean water, the design aligns with Thai beliefs where water represents purity, renewal, and life. Water, symbolizing life itself, is rejuvenated, much like the renewed life of the building. Therefore, leveraging its history as the first water tank in Thailand, it sparked the concept of a life-oriented infrastructure centred around water. Ultimately, the new structure living within the host serves to breathe new life into the architecture and community.

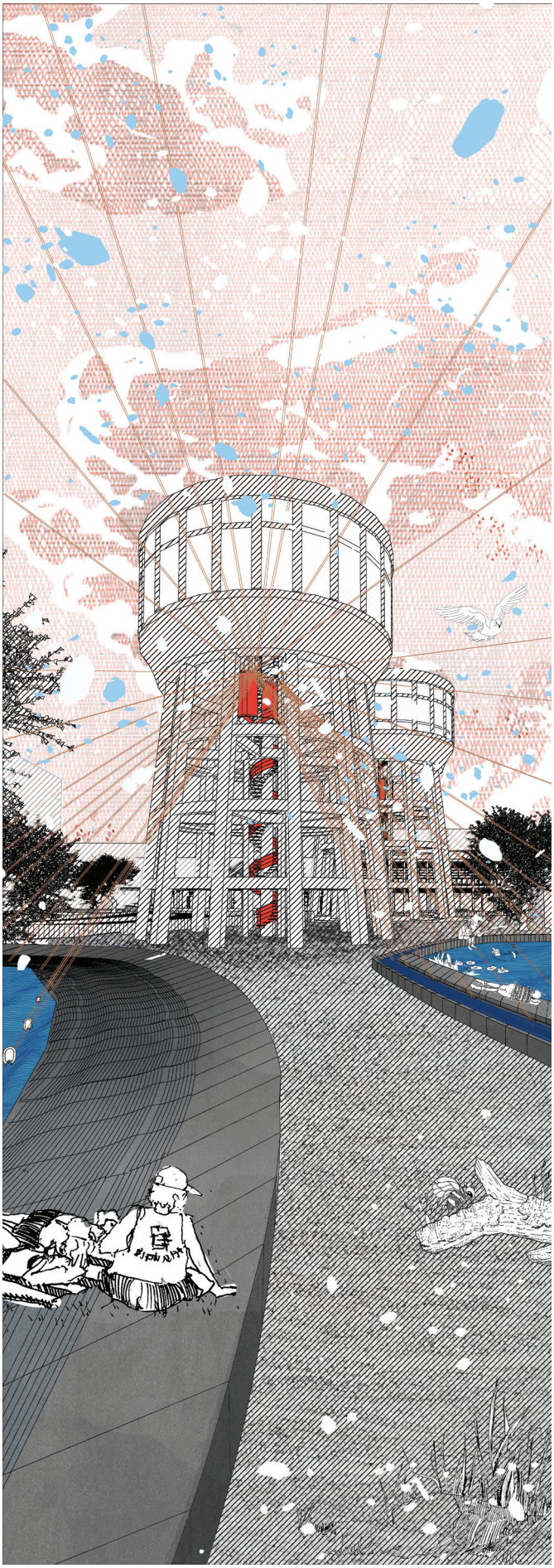
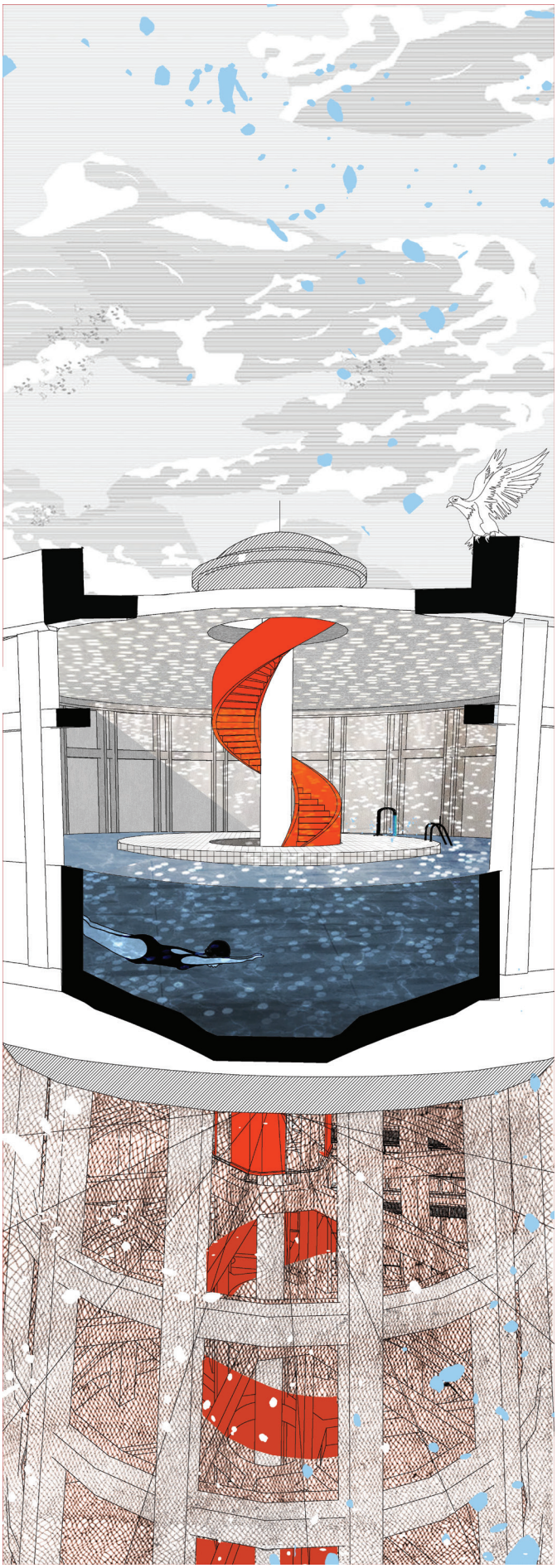


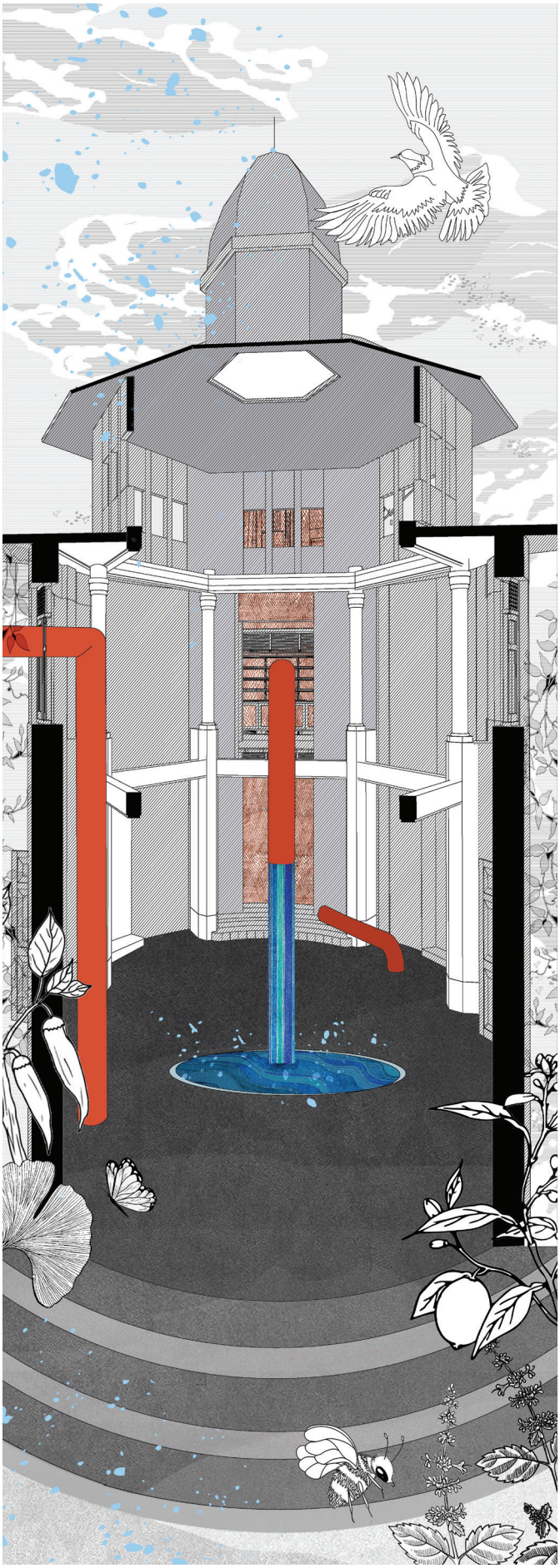
Figure 75. Piraya, R. 6 Maen Sri Waterworks: Water Garden; perspective, digital, 2024.

Standing under the parasite, rainwater is harvested through a net attached to the towers, directed to a water garden for use.



Reviving the Maen Sri water tower as a public pool, featuring natural lighting and a central staircase, rising above the parasite net structure.

Figure 76. Piraya, R. 6 Maen Sri Waterworks: Water Tower Pool; perspective, digital, 2024



Entering the atrium from the corner of the street, where linking two building wings, pipelines circulate water in and out of the structure.

Figure 77. Piraya, R. 6 Maen Sri Waterworks: Entrance Hall; perspective, digital, 2024.

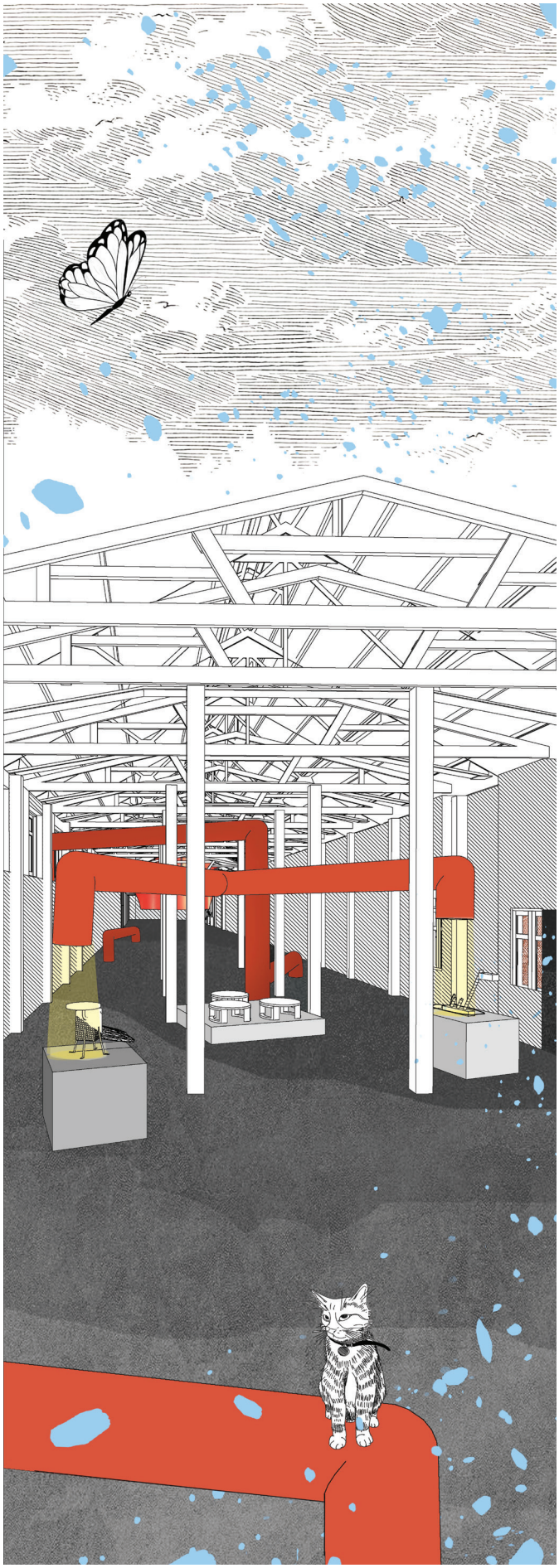
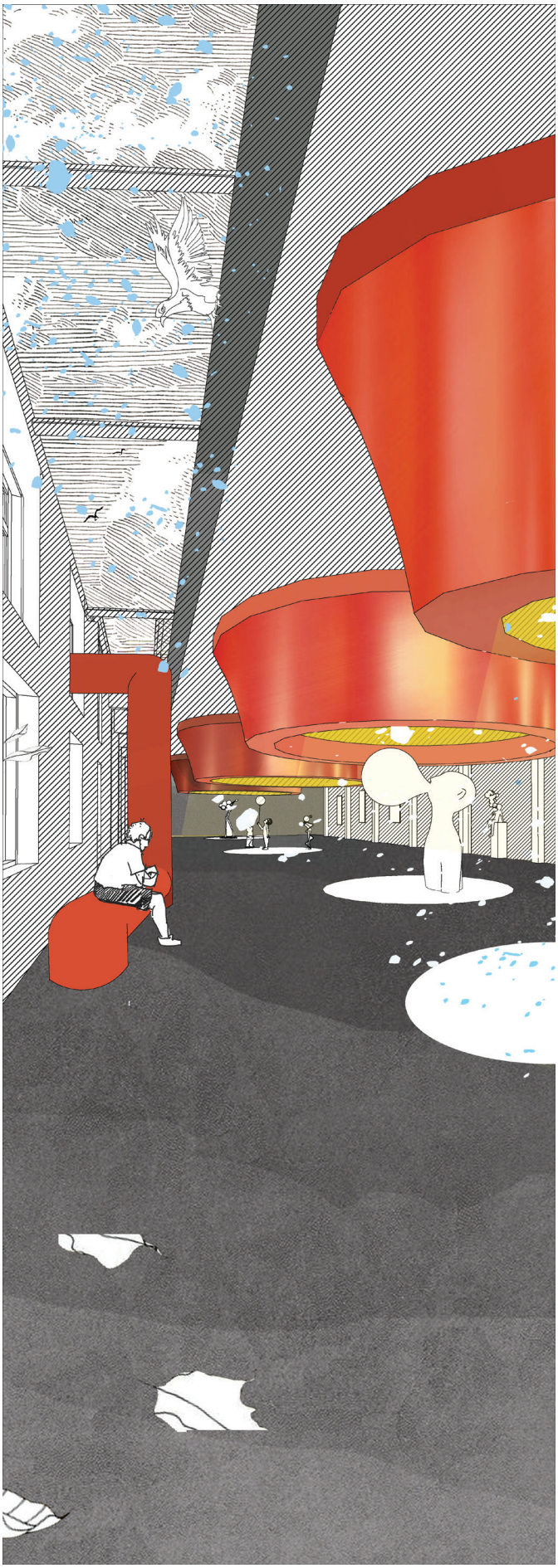


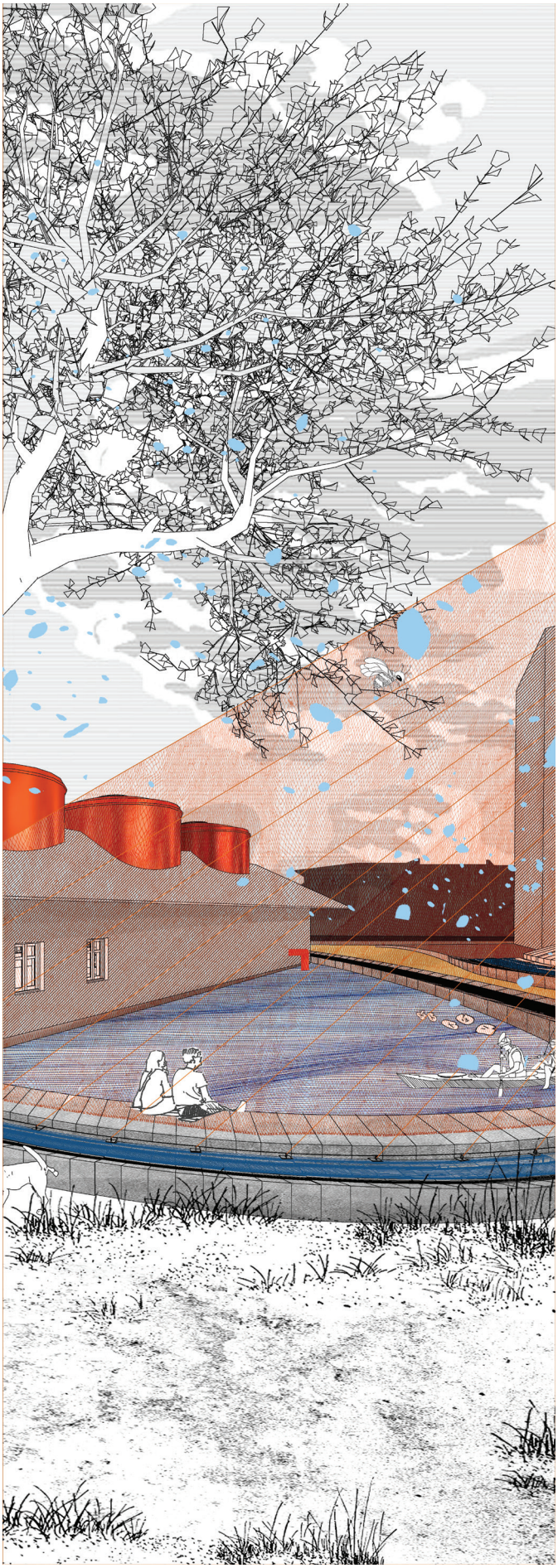
Figure 78. Piraya, R. 6 Maen Sri Waterworks: Art Gallery; perspective, digital, 2024.

Stepping into the East Wing exhibition galleries. The pipes continually transform from bench seating to lighting elements, ultimately conveying the parasite's conceptual goal.



Floating water tank above the ceiling transforms into a striking artpieces within the gallery space.

Figure 79. Piraya, R. 6 Maen Sri Waterworks: Art Gallery 2; perspective, digital, 2024.



Gathering in the shade, sitting beside the ponds under the canopy of the parasite structure.

Figure 80. Piraya, R. 6 Maen Sri Waterworks: Water Infrastructure; perspective, digital, 2024.

Figure 81. Piraya, R. Exhibition Front Face. photography, 2024.

Front facing view of drawings and model.

Figure 82. Piraya, R. Exhibition overview. photography, 2024.

View showing entirety of exhibition, show 3 models on the table in front of drawings.

Figure 83. Piraya, R. Exhibition side view. photography, 2024.

Figure 84. Piraya, R. Wall mounted drawings, photography, 2024.

Figure 85. Piraya, R. Not all parasite are predators exhibition, photography, 2024.

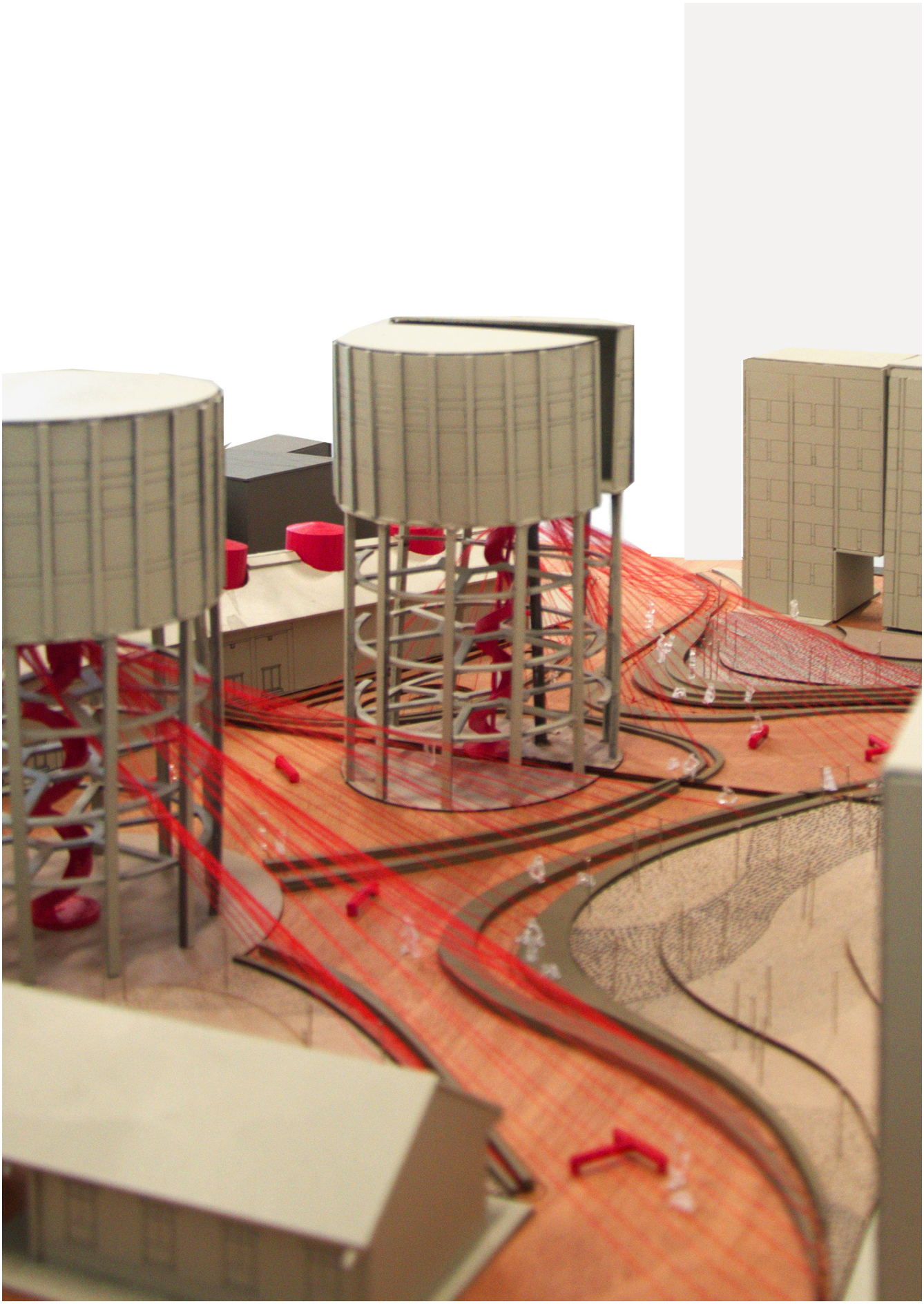


Figure 86. Piraya, R. Water towers and parasite structure_1, photography, 2024.

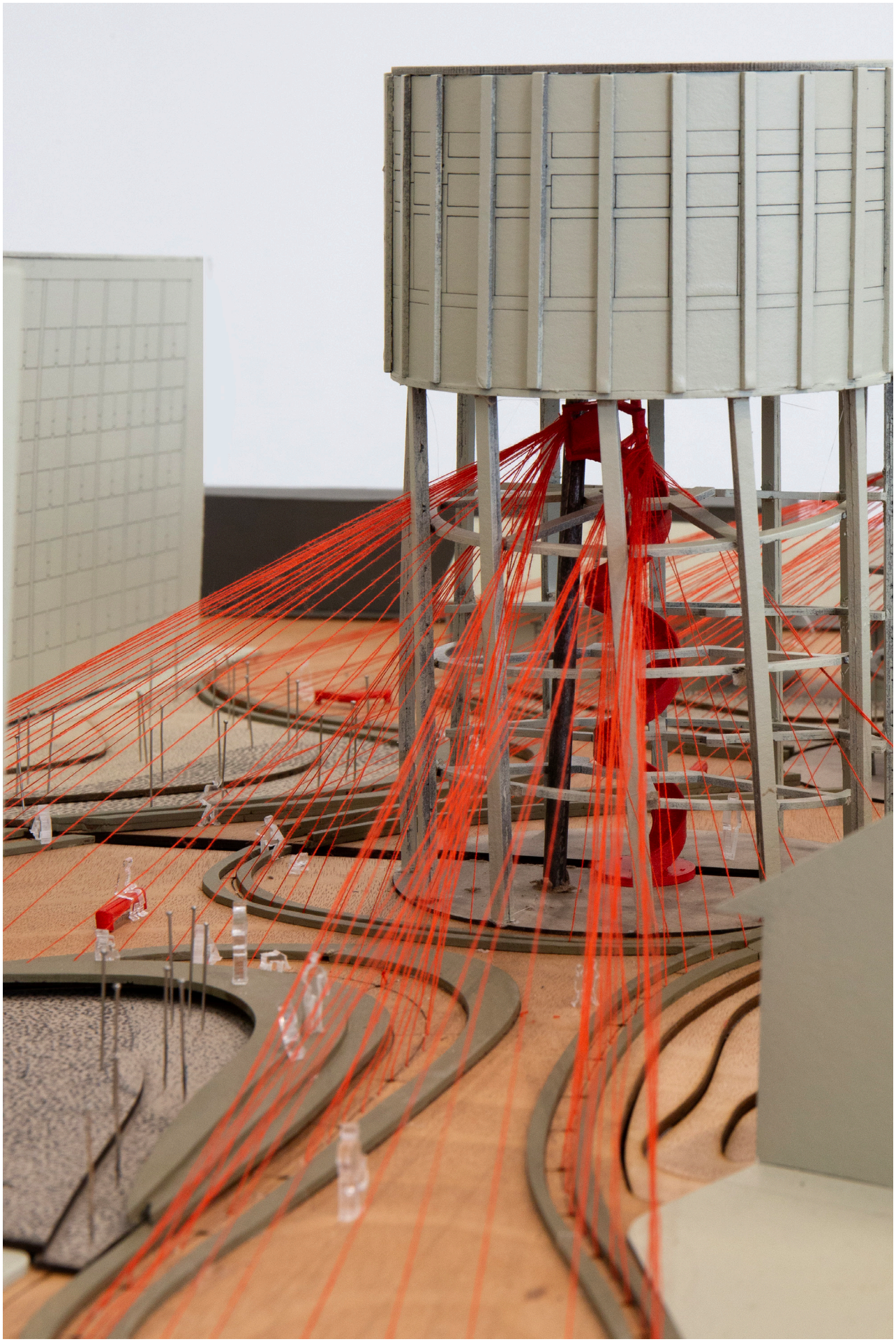


Figure 87. Piraya, R. Water towers and parasite structure_2, photography, 2024.

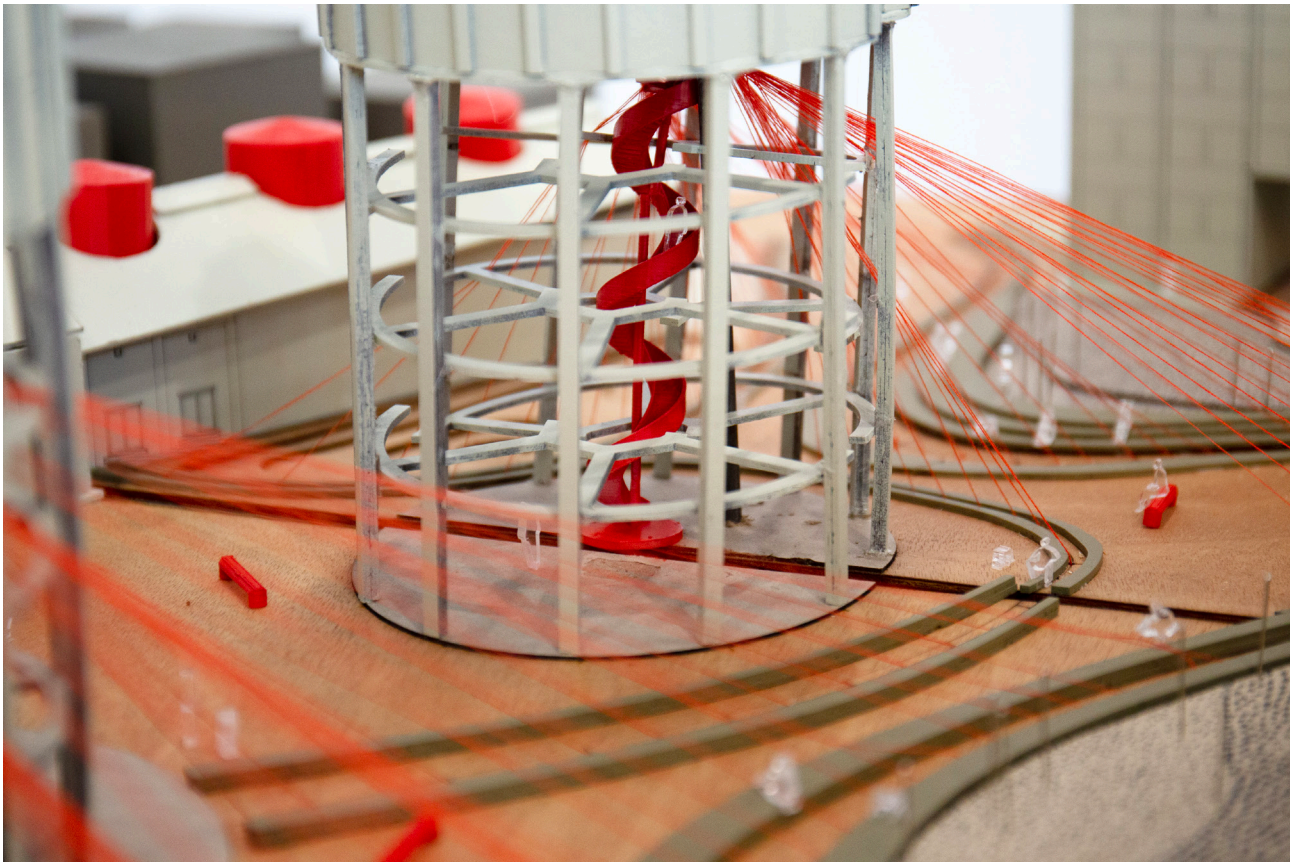


Figure 88. Piraya, R. Water towers and parasite structure_3, photography, 2024.

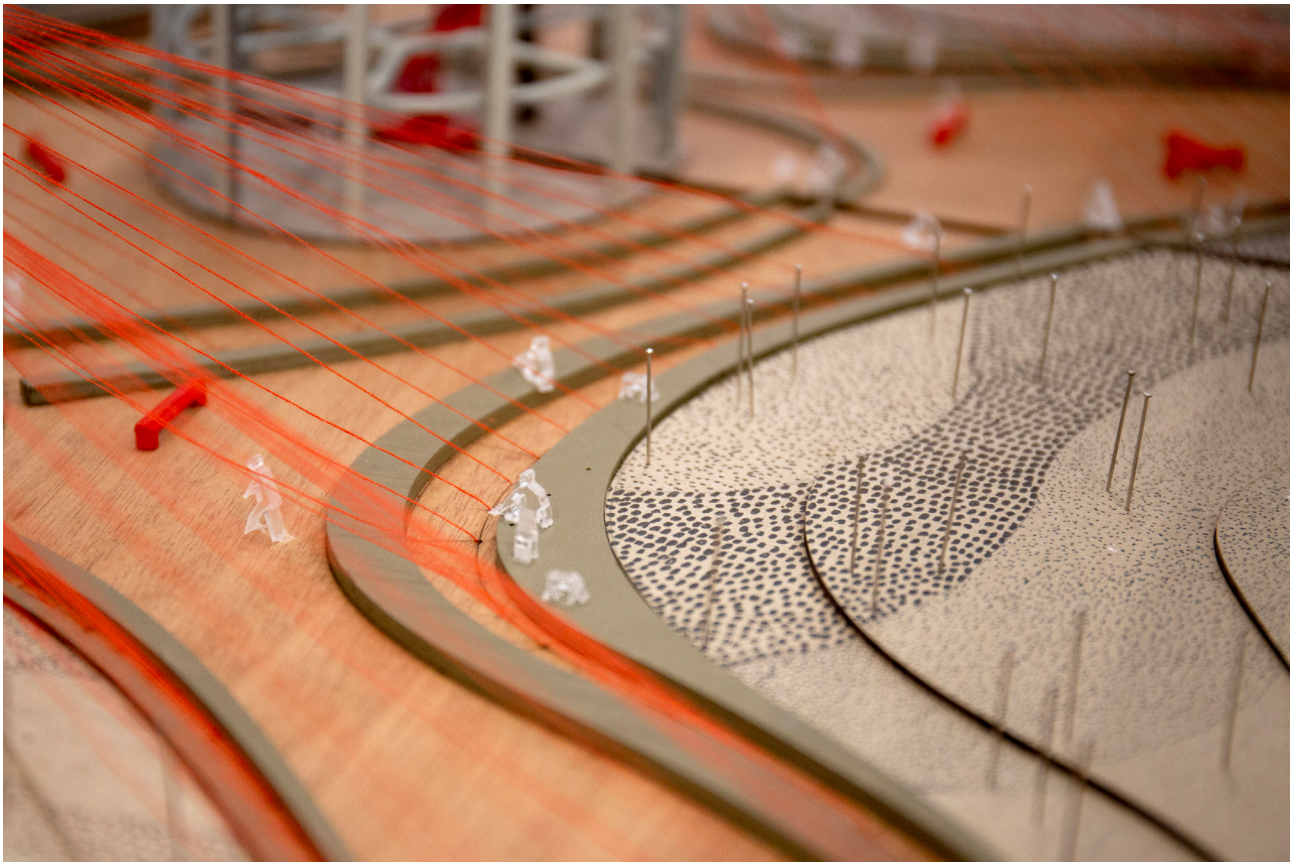


Figure 89. Piraya, R. Parasite elements as public seating_1, photography, 2024.

Figure 90. Piraya, R. Parasite elements as public seating_2, photography, 2024.

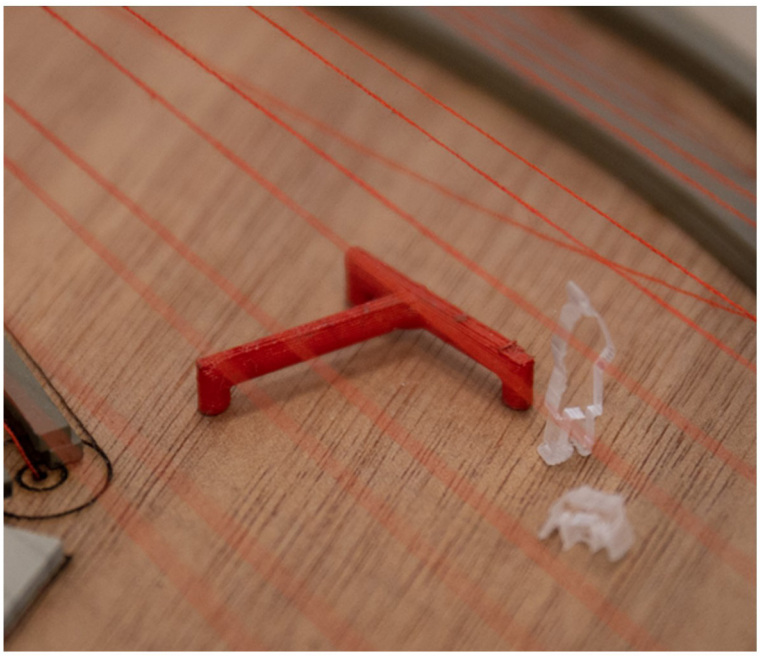


Figure 91. Piraya, R. Parasite elements as public seating_3, photography, 2024.

Figure 92. Piraya, R. Parasite elements as public seating_4, photography, 2024.

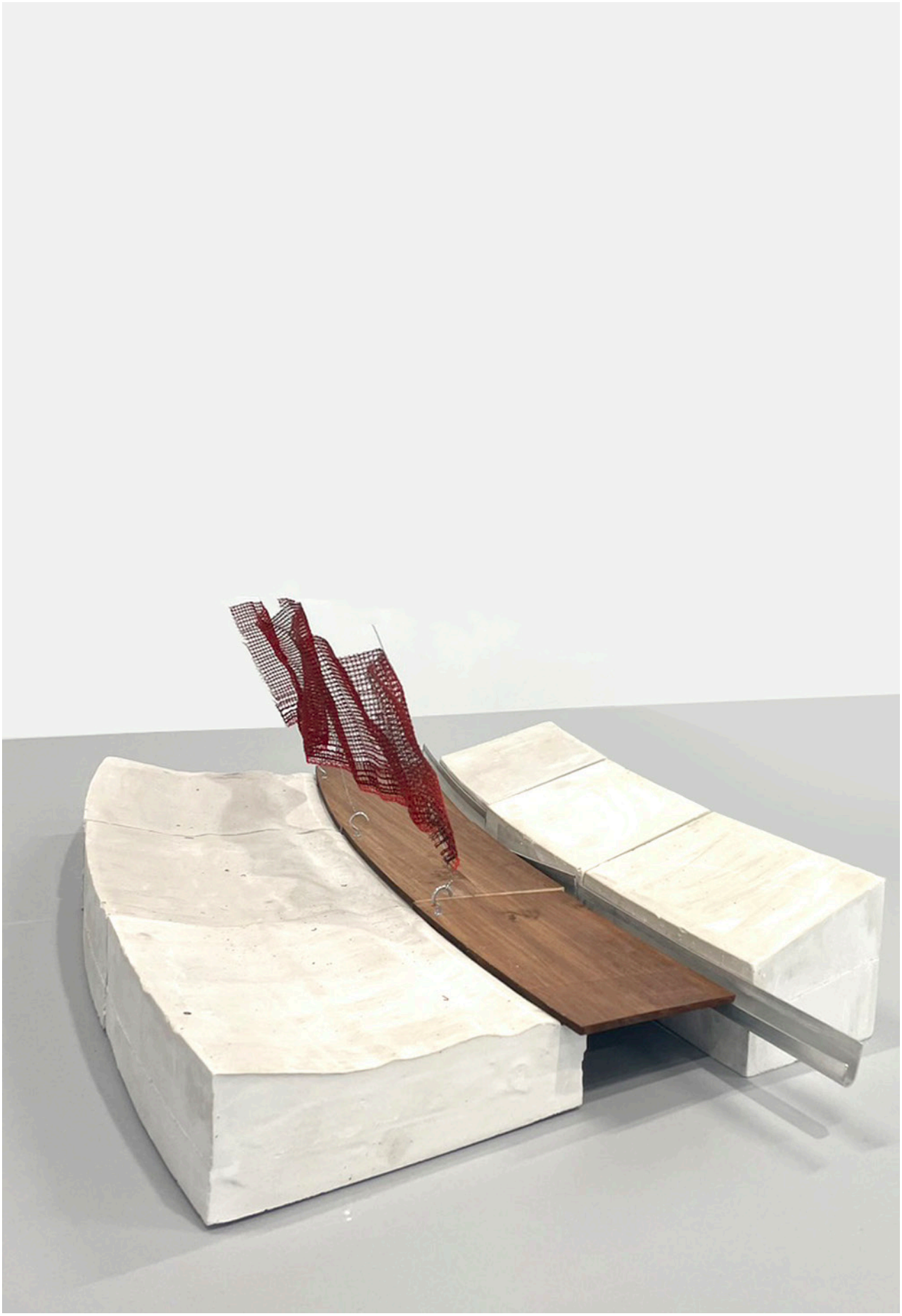


Figure 93. Piraya, R. Detail of water catcher (parasite) attached on seating structure to create gathering space, photography, 2024.

Figure 94. Piraya, R. Detail of water catcher (parasite)_1, photography, 2024.

Figure 95. Piraya, R. Detail of water catcher (parasite)_2, photography, 2024.

Figure 96. Pakakoon.P. Piraya and her works; photography, 2024.

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