From Necropolis to Metropolis:
Bringing Death Back into Urban Life

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Abstract

From Necropolis to Metropolis: Bringing Death Back into Urban Life

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This thesis seeks to explore the changing attitudes towards death through the design of funerary architecture that is resting place, processing facility, and public amenity. A new hybrid typology combining aspects of the cemetery and columbarium is proposed, housing the dead in a way that is dense, temporal, and creates moments of exchange between the presence and absence of life. The Ouroboros Project seeks to re-evaluate death in the urban environment, to continue the communal nature of the city in the memorial of the necropolis, and to be a generative force for the improvement of the civic landscape.

The project utilizes a new more ecological process known as resomation to propose an alternative system for the disposition and memorialization of the dead. Resomation is far more energy efficient than traditional cremation and the powdered remains can be collected in an urn for scattering or memorialization, while the remaining organic matter can be processed using biofiltration for horticultural use. This potential to grow plant life plays a key role in the mission of the new typology, reimagining death as part of a larger process of growth and renewal. Those left behind will be given the option of taking the ashes to scatter, interment of their loved one in the columbarium light wells, and/or selection of a seedling from the memorial garden for donation to the city parks or to take home as a personal reminder.

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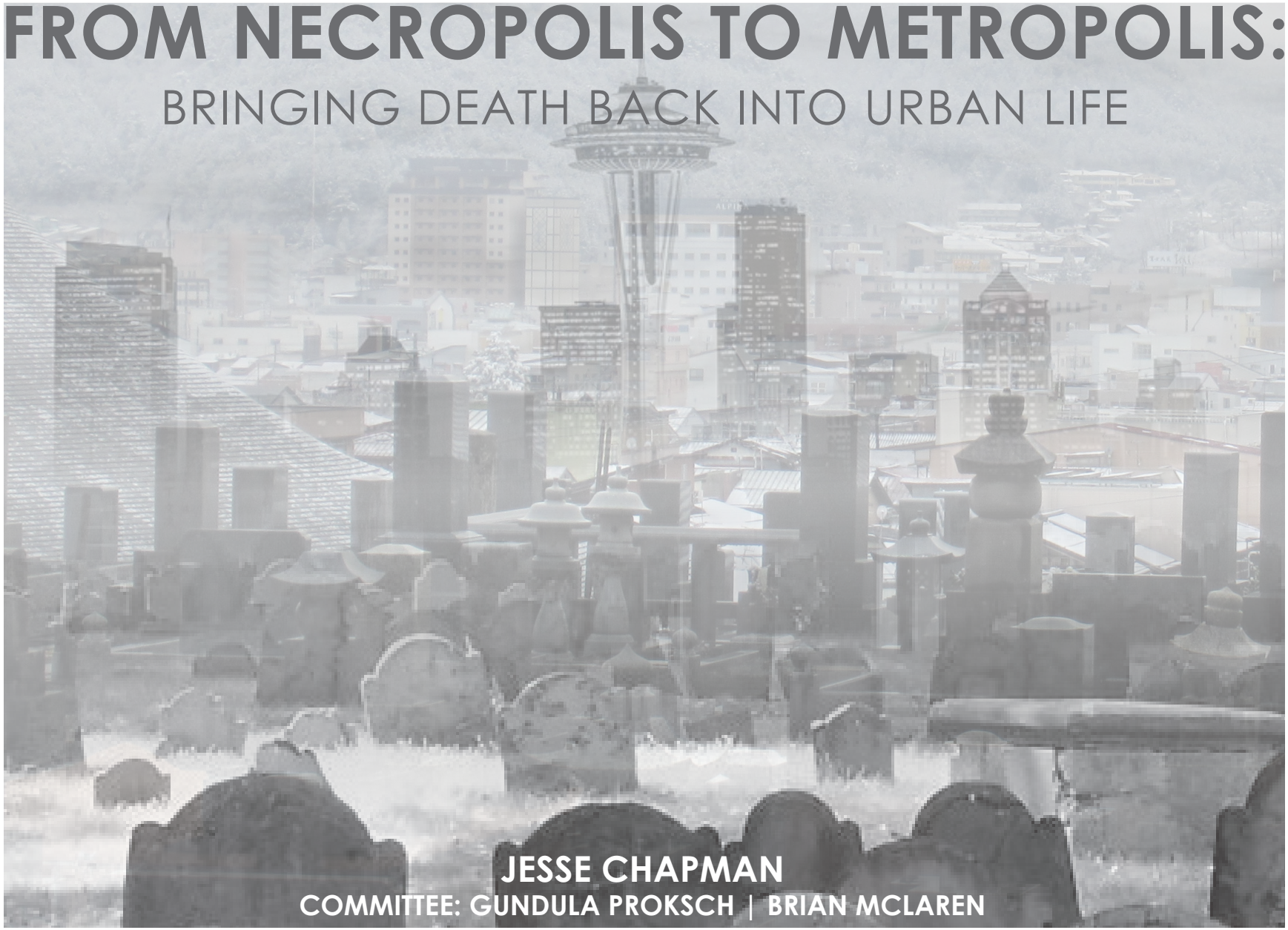

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CHAPTER 1: DEATH IN THE CITY

"…the necropolis is the city in negative; it is a realm in which absence is celebrated." [1]

- Edwin Heathcote

The development of the city has been fundamentally influenced by the challenge of how to lay the dead to rest. Spaces of the dead relate to the spiritual and cultural needs of their time, having a strong impact on the physical and social geography of cities. As architect Edwin Heathcote observes, they are a mirror for the spaces of the living and societal attitudes.[2]

The unavoidable reality of death has a powerful impact on an individual's understanding of the world and their place within it. As both cultural and personal responses, a multitude of beliefs have long been explored in religious and philosophical debate. There is often, however, a more direct relationship between how the living dwell and how we house the dead.

Figure 1 (Op. page): From Metropolis to Necropolis

1. Heathcote 1999, p8
2. Ibid.

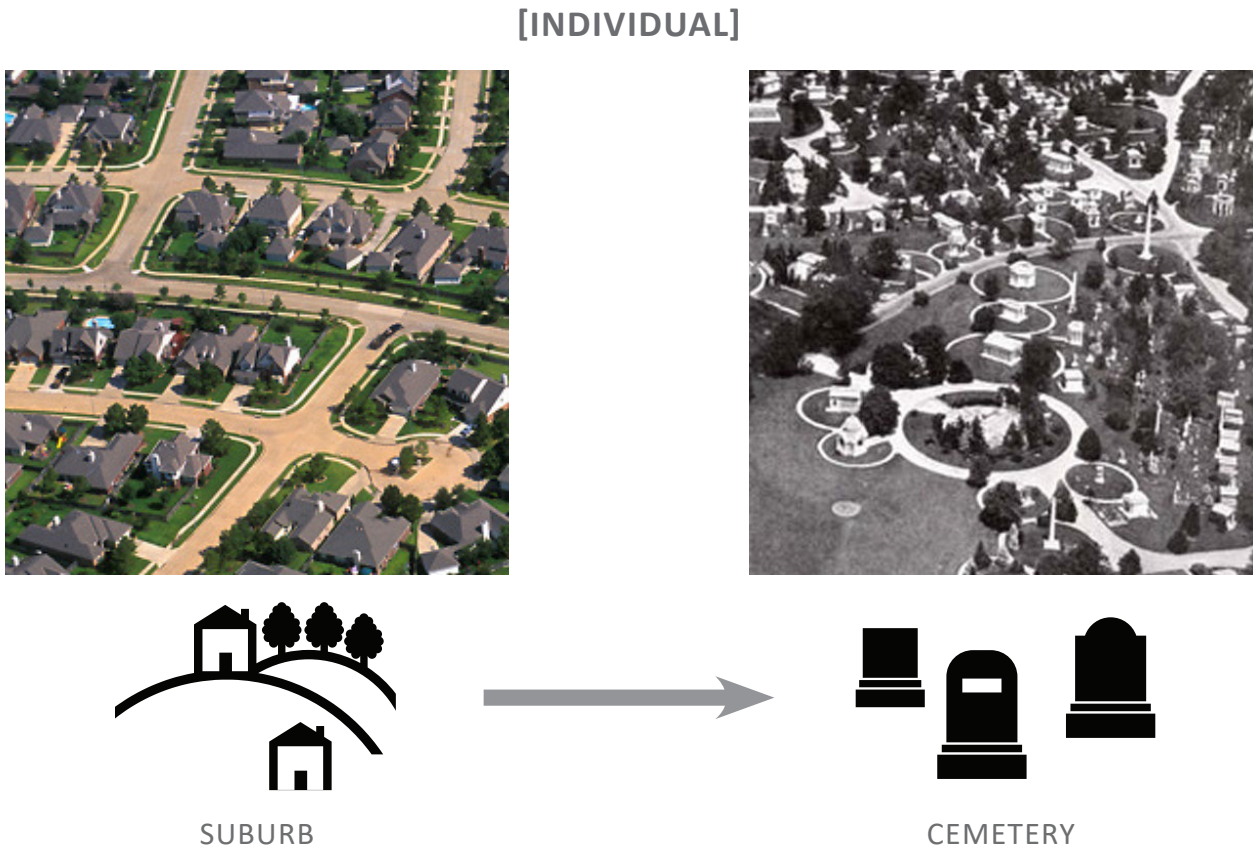

Figure 2: Relationships between modes of living and housing the dead

The evolution of 18th century village churchyards, sprawling garden cemeteries of the 19th century, and reinvention of the columbarium in the early 20th century parallels shifts in the density of human settlement. This thesis seeks to continue that development by exploring the changing attitudes towards death, presenting a new funerary space that is both resting place and processing facility.

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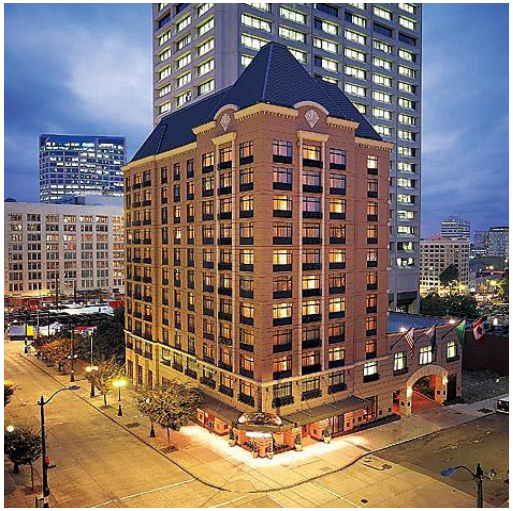
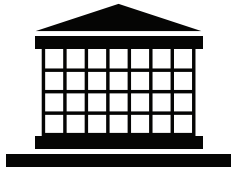
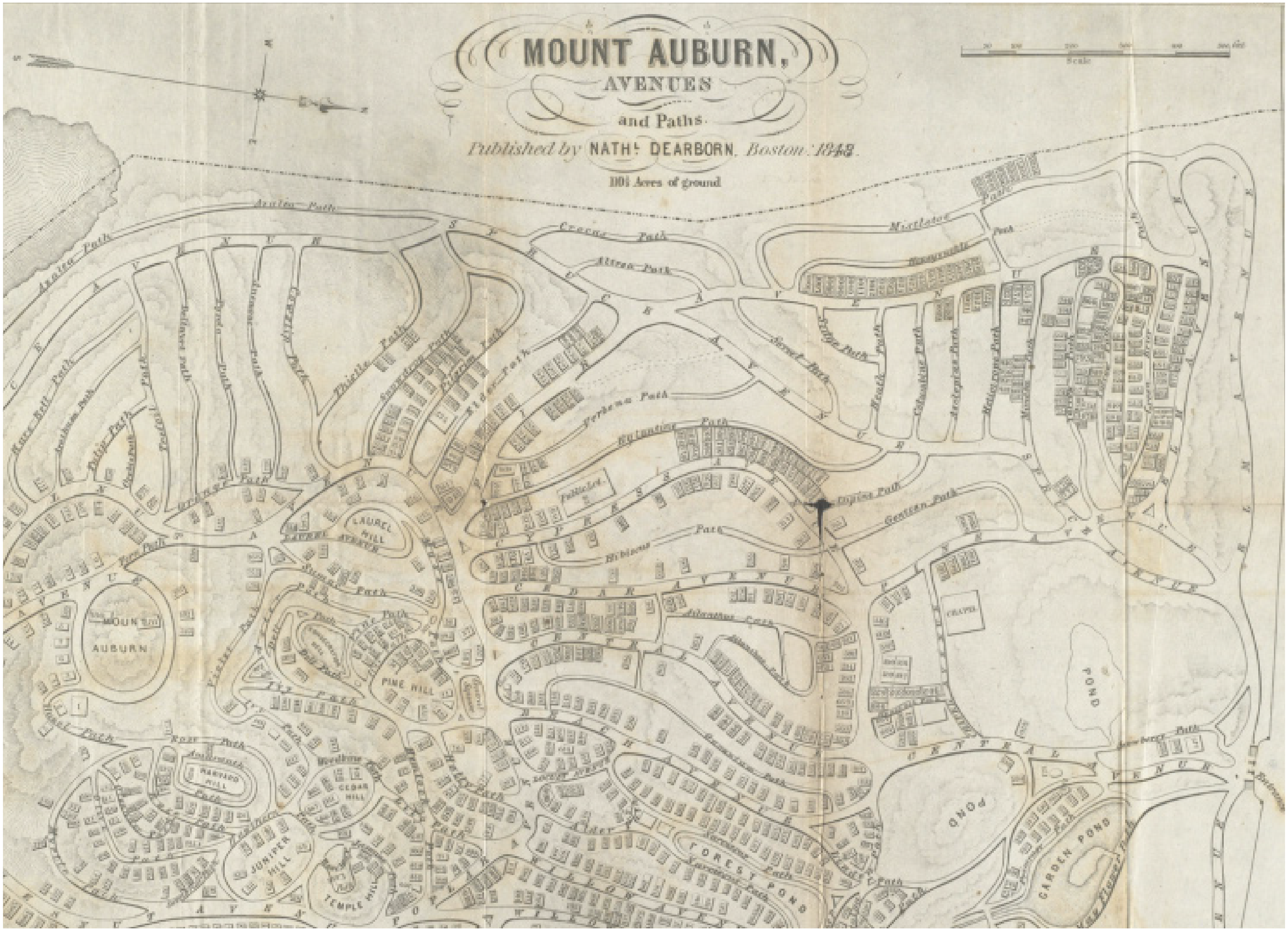




METROPOLIS

COLUMBARIUM

As an urban response to the distancing of death, the project analyzes the formal and symbolic structures of spaces of the dead in relation to the built environment. A hybrid typology of the cemetery and columbarium is proposed, housing the dead in a way that is dense, temporal, and creates moments of exchange between the presence and absence of life.


MOUNT AUBURN,
AVENUES
and Paths.
Published by NATHL. DEARBORN, Boston: 1843.
101 Acres of ground
Scale
Azalea Path
Crocus Path
Mistletoe Path
Verbena Path
Hibiscus Path
Gentian Path
LAUREL HILL
MOUNT AUBURN
PINE HILL
HARVARD HILL
CEDAR HILL
JUNIPER HILL
TEMPLE HILL
CHAPEL
POND
FOREST POND
GARDEN POND

II

CHAPTER 2: WHAT WE DO WITH WHAT REMAINS

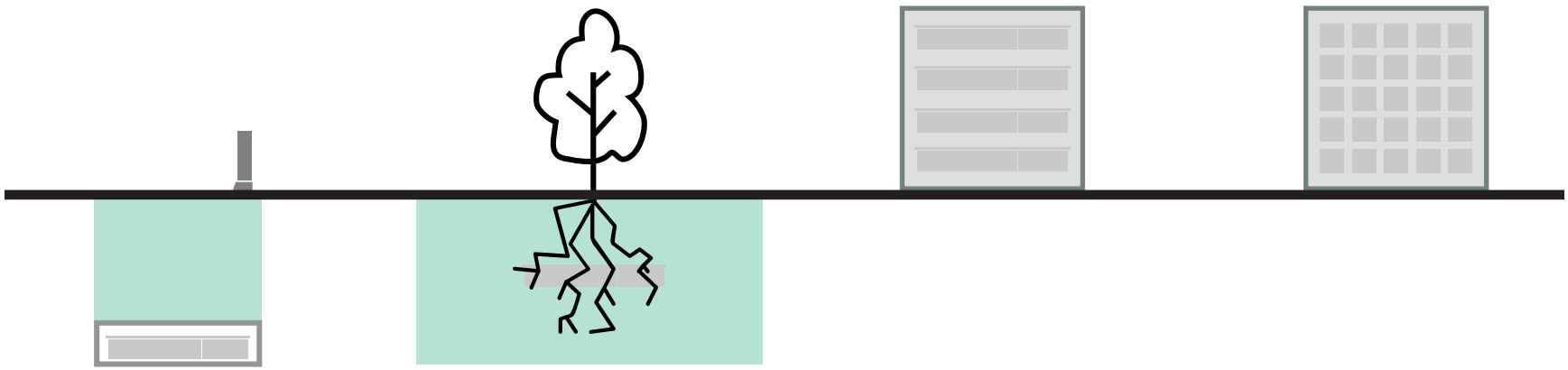
"Show me the manner in which a nation cares for its dead, and I will measure with mathematical exactness the tender meaning of its people, their respect for the laws of the land, and their loyalty to high ideal." [3]

- William Ewart Gladstone (1809–98)

Traditionally, there have been only a few basic modes for the ritual committal of the dead: burial in the earth, entombment of a body above ground, exposure to the elements, or disintegration through fire. While each practice has had historic eras of popularity, in the western world burial has long been the preferred method until very recently. Burial, or interment, the ritual act of placing the deceased in the ground, is perhaps the oldest and historically most common manner of dealing with the dead.[4] As a practical way to prevent odor and hide decomposition, it also serves the social function of providing a final opportunity for shared memorial rites and closure for those left behind. In many cultures, the ritual disposal of the physical body is seen as a necessary step for the deceased to enter the afterlife or to be given back to natural cycles.

Figure 3 (Op. page): Map of Mount Auburn Cemetery, Mass. the first garden cemetery in the US c.1848

3. Gladstone, n.p.
4. Heathcote 1999, p9



TRADITIONAL BURIAL

- Below ground
- 3' x 10' x 9' deep
- 30 sf per plot
- 1.6 million tons of concrete for vault liners in U.S. / yr

1 acre / yr

(SEATTLE)

GREEN BURIAL

- Below ground
- 8' x 8' x 4-6' deep
- 64 sf per plot
- Biodegradable materials

2 acres / yr

(SEATTLE)

MAUSOLEUM

- Above ground
- 3' x 9' x 3' high
- 27 sf per plot

COLUMBARIUM

- Above ground
- 18" x 18" x 3' deep
- 2.5 sf per plot

SEATTLE SPECIFIC INFORMATION:

CEMETERIES WITHIN CITY LIMITS: **6**

AVERAGE ESTIMATED YEARS TO REACH MAXIMUM CAPACITY: **31**

Figure 4: Spatial needs for various committal practices in the United States and Seattle

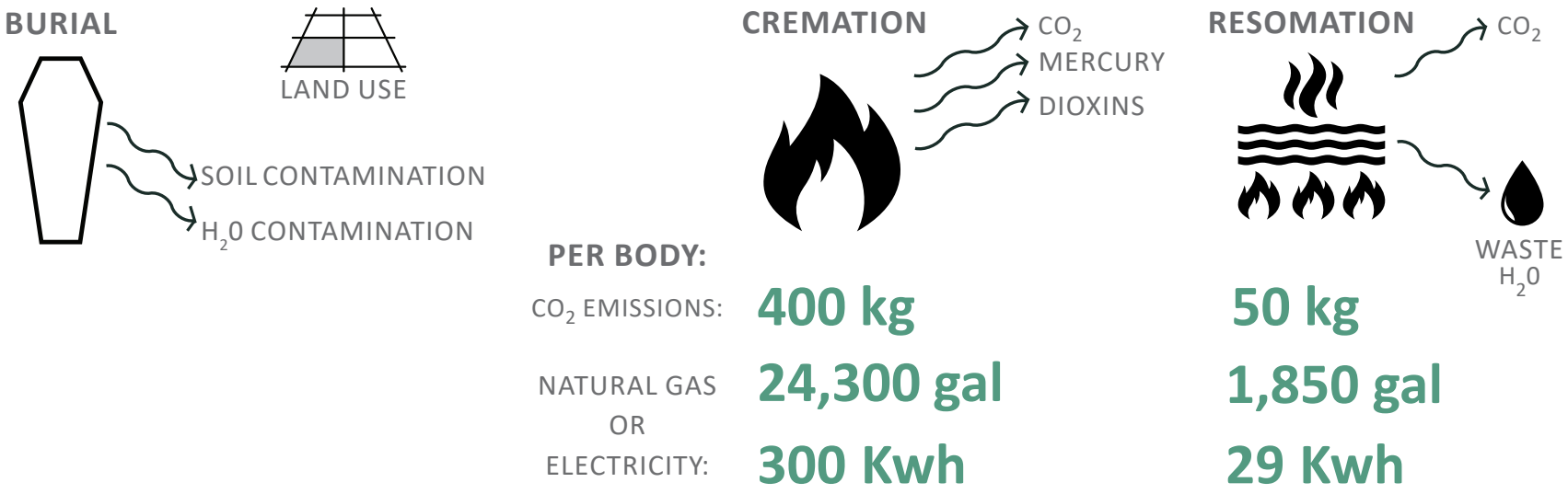


Figure 5: Comparison of resource use between burial, cremation, and resomation

As it is practiced in the industrialized world, burial has been separated from the cycle of decomposition. Modern burial is incredibly resource intensive, using thousands of acres of land, tons of hardwood and steel for coffins, and costing thousands of dollars.[5] In addition, the vast majority of bodies are preserved using toxic chemicals necessitating concrete liners in graves to prevent soil and water contamination.[6] [See Figures 4 & 5]

In response, there is a growing trend towards more ecologically conscious interment known as "green burials." These typically entail use of simple biodegradable coffins and shrouds, lack of body preservation by toxic means, and marking by way of living plantings rather than permanent objects.[7]

5. Grover 2014, n.p. | Richard 2006, n.p.
6. Hickman 2005, n.p.
7. Richard 2006, n.p.

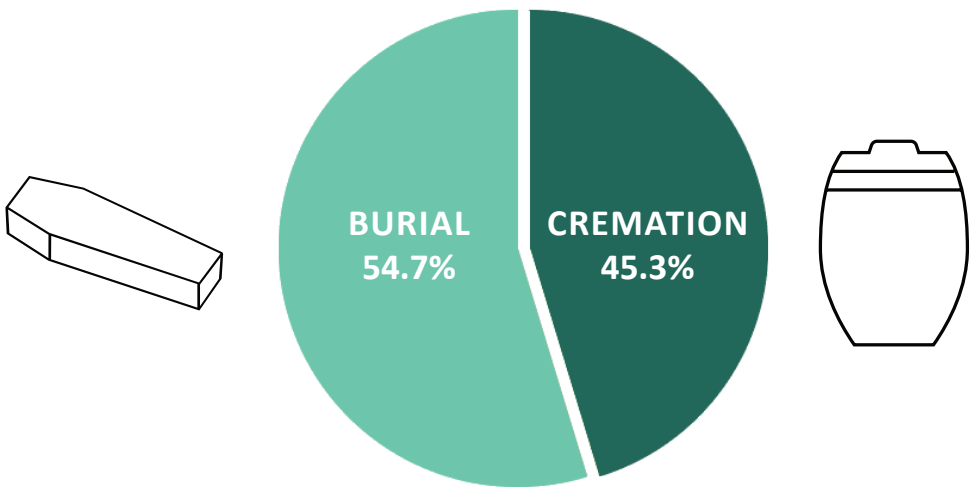
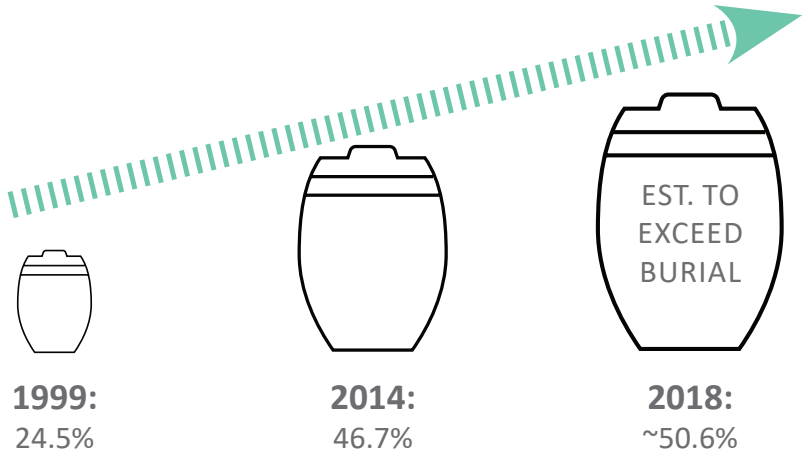


Figure 6: Statistics for burial and cremation in the United States

Since these burials need greater square footage to reduce sanitation risks, the Green Burial Council recommends a decrease in density compared to the traditional cemetery. At a distribution of 100 to 300 burials per acre, only a third of the conventional density, this would amount to 8,656 acres per year nationwide and 2 acres per year in Seattle at current burial rates.[8] As the need for space pushes cemeteries further from cities, issues of appropriate land use and equality of access will inevitably arise. Questions of maintenance, reliable grave marking, private ownership versus stewardship, as well as cost barriers result in an alternative for some that does not appear to be sustainable for dense urban environments.

8. Richard 2006, n.p. | "Deaths and Mortality." n.p.



SEATTLE'S CREMATION RATE [2012]: **[65%]** 20% HIGHER THAN NATIONAL AVG.

Figure 7: Increase in cremation rate nationally and in Seattle

If burial is thought of as returning matter to the earth, cremation has an opposing reading of incandescent dissolution into the invisible world. Today cremation is the most widespread funerary practice in the world, particularly in Asia, Northern Europe, and increasingly the United States.[9] Cremation rates in the United States have been on a steady rise since the mid-twentieth century, now the preferred option for nearly half the population of the country.[10]

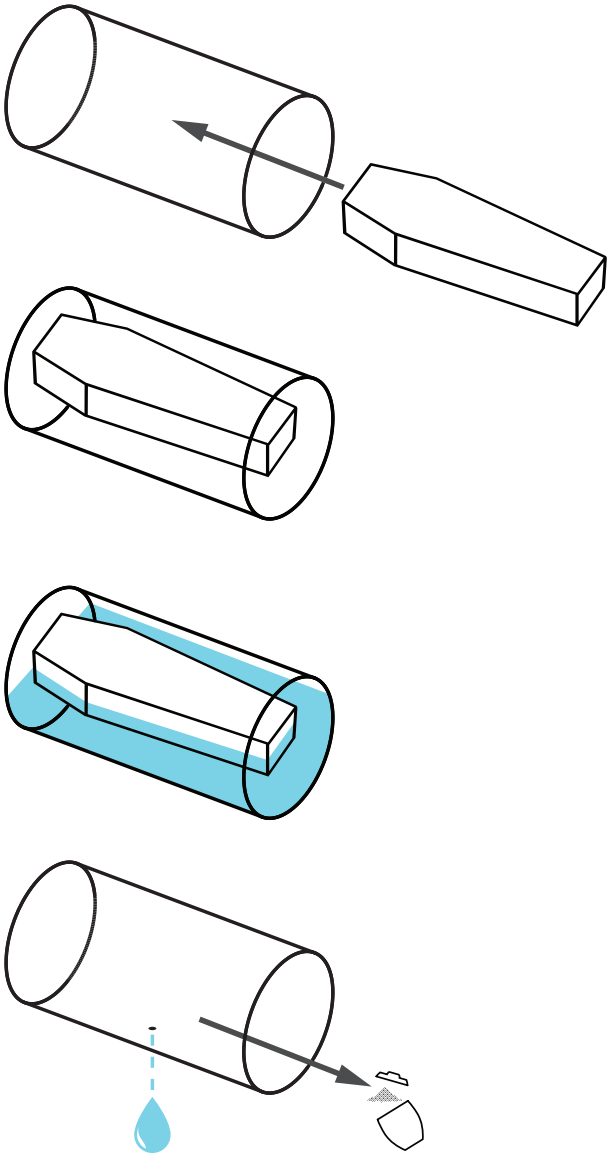
[See Figure 6]

9. Ragon 1983, p274
10. "Industry Statistical Information…" 2015, n.p.

Cremation is far more efficient in terms of spatial requirements but is still very resource intensive. The fuel and electricity used in combustion produce a considerable amount of greenhouse gas emissions, as well as mercury and other toxic contamination from dental implants and the embalming process.[11] [See Figure 7, previous page]

There is now a more ecological alternative to cremation as well. Resomation, or aquamation, uses high pressure and an alkaline hydrolysis process to accelerate the natural decomposition of the body to calcium powder and liquid peptides, sugars, and amino acids.[12] [See Figure 8] Hydrolysis is the same process by which bodies naturally decay in the earth. Rather than taking years, the process has been accelerated by mechanical means, taking only 2-3 hours.[13] Without combustion, the process uses only 10-15% percent of the energy of traditional cremation, producing far less pollution.[14] Powdered remains can still be collected in an urn for scattering or memorialization, while the remaining organic matter can be processed using bio-filtration for horticultural use.[15] The changing trends in committal practices support a reexamination of the relationship between the spaces of the dead with the city.

11. Grover 2014, n.p. | Hickman 2005, n.p.
12. Sincliar 2010, n.p. | "A Need for Change" n.p. | "What Is Bio Cremation?" n.p.
13. Briggs 2011, n.p.
14. Ibid.
15. Sincliar 2010, n.p.



1. The body is placed in a biodegradable coffin and slid into the chamber on a reusable stainless steel tray.

2. The machine weighs the body to determine the amount of water and alkali needed.

3. The vessel is filled with the solution, heated to 300 - 350 degrees, and pressurized to prevent boiling.

4. After about 3 hours only the bones remain. The liquid is drained and the bones are dried and processed into ash to be returned to the bereaved.

Figure 8: The resomation process. The name resomation is derived from the Greek words for 'rebirth of the body'

Figure 9: The garden cemetery was meant as much for public leisure and contemplation as interment.

Necro-geography: The Territories of the Dead

Unlike attitudes towards treatment of the body, spaces for the committal of remains have stayed largely the same for centuries. Families, villages, and religious orders all find strength and comfort in coming together to memorialize loved ones, often with physical objects similar to those known in life. Collective commemoration continues to be powerful: the inevitability of mortality can be recognized while the uniqueness of the individual need not be completely lost. As a result, places of the dead tend to be respected and preserved as physical embodiments of collective memory, often becoming the longest standing cultural institutions in a city.

From its founding, the United States followed the English model of burial in communal grave-sites in the village common or clustered within the local churchyard. As villages grew into cities and local churchyards struggled to maintain order and sanitation, a new form of the cemetery was developed based on Enlightenment models in Europe, known as the "garden cemetery".[16] Geographically removed from the city, these well landscaped and spacious burial grounds became the predominant model most people are familiar with today. By setting the cemetery within a curated landscape, proprietors intended to link the power of the natural world with moralizing decorations designed to enlighten the living.[17] [See Figure 11] These gardens of the dead became more than an interment site; they were conceived of as a public space for leisure and contemplation.[18] Once filled to capacity, they often became the first city parks.

16. Stannard ed. 1975, p78
17. Stannard ed. 1975, p78-79
18. Laqueur 2015, p277

Figure 10: Mt. Auburn in Boston Mass. was the first garden cemetery in the US. It was a popular attraction and became a model for others across the country.

Figure 11: The moralizing messages of the tombs at Mt. Auburn would not be lost on the well-to-do visitors.

The very organization of these new cemeteries was derived from the living. Each patron purchased a plot that was clustered into neighborhood like groups, arranged on streets, and surrounded by a monitored barrier to protect their property claim in perpetuity.[19] [See Figures 11 & 3 on p06] No longer integrated into the fabric of the public realm, the dead were separated literally and figuratively in a pastoral setting, to be visited on special occasions instead of being a part of everyday life.

19. Stannard ed. 1975, p83

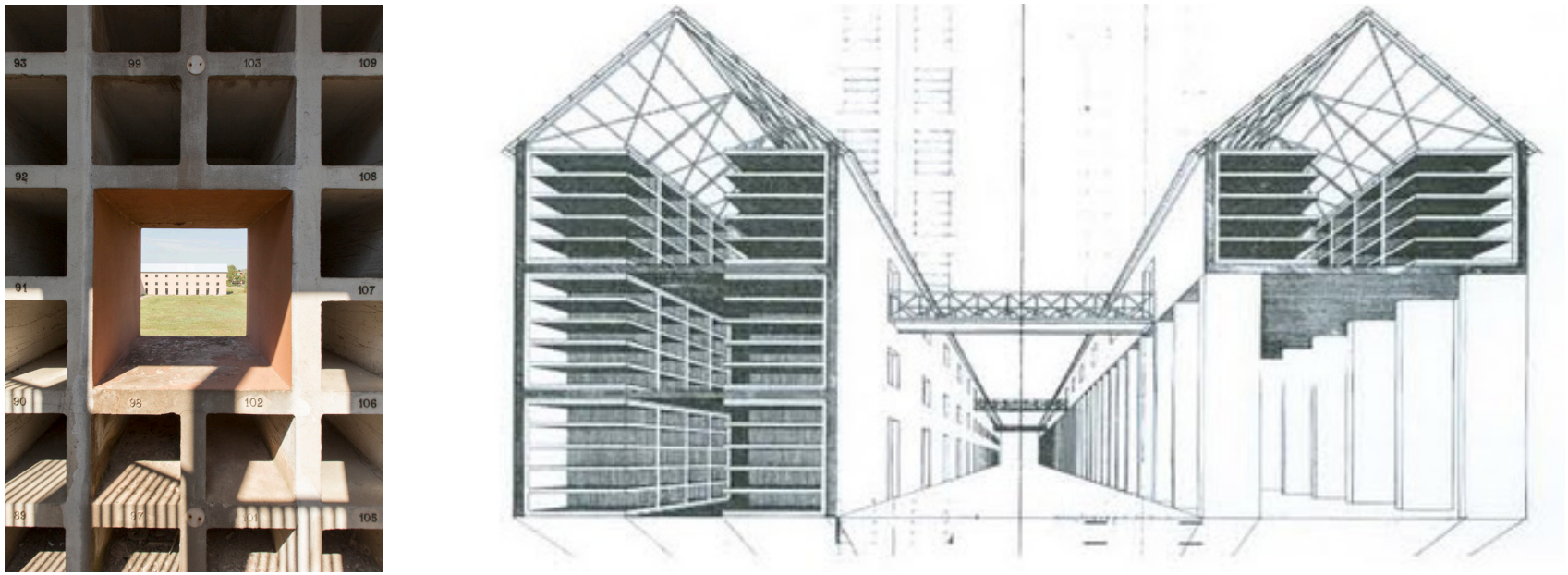


Figure 12: Aldo Rossi's San Cataldo Cemetery in Modena, Italy

A columbarium, by contrast, is more representative of the density and efficiency of the industrialized city. Early in the history of modern cremation, urns were stored in converted spaces within existing cemeteries. As the practice's popularity grew, specific buildings were constructed to house large numbers of urns. The typical columbarium is comprised of rational groups, in rows and columns, of spaces for urns. These are left open or covered by a plaque and include an area to leave flowers or mementos. This mode of committal is purpose built for mass storage and tends to lack the idea of gathering, ceremony, or potential for leisure that is seen in the cemetery model. [See Figures 12 & 13]

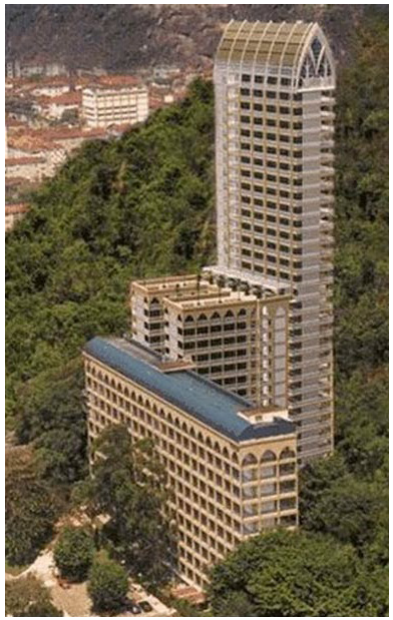


Figure 13: Built in 1983, the Necropole Ecumenica Memorial in Santos, Brazil is currently the world's tallest vertical cemetery with a capacity of 180,000 remains in crypts and columbarium niches.

The Last Act: Rites and Rituals

Anthropologists, sociologists, and historians have studied the ways in which the creation of a professional funeral service industry has effected the customs, rituals, and urban infrastructure of death in America. As Philippe Aries observes, the typical American attitude toward death has been one of denial, involving an increasing number of distancing filters.[20]

20. Stannard ed. 1975, p136-138

The American funerary service industry has created an entire vocabulary of euphemisms for softening the image of death. Funeral homes are places where the dearly departed are embalmed and transformed by undertakers or morticians for presentation to their families in slumber rooms.[21] It is the contention of this proposal that the separation of ceremony, treatment of the body, and interment creates discord and an abstraction of death that is detrimental, complicating and extending the grieving process.

Even in a growing secular society, people still desire rituals to mark the passing from life to death in a meaningful way. The National Funerary Association has observed an increased involvement in pre-planning one's own funerary rites, which has resulted in a wider variety of services from which to choose.[22] The Cremation Association of North America also notes that people report choosing cremation for its flexibility of interment location and ability to scatter cremated remains in a place significant to the person or family.[23]

Instead of accepting traditional practices that do not fit their world view or experience, more people are choosing to customize funereal services, take care of them on their own, or skip formal ceremonies altogether. The fact that many are creating their own rituals underscores a fundamental human need, but also exposes the growing inability of the American funeral industry to match the expectations of the current era. This presents an opportunity to bring the spaces of death and remembrance back into urban culture in a way that can benefit the bereaved and society.

21. Mitford 2000, p193
22. "New Study Shows Americans…", n.p.
23. "Industry Statistical Information…" 2015, n.p.
24. Stannard ed. 1975, p 'x'

Figure 14: Personalized memorials and services are becoming far more common.

One of the greatest fears of death concerns being forgotten, of leaving no mark on the passage of time during our brief transit of existence. Commemorative artifacts fight against the anonymity of death through an abstracted representation of the rich and complicated life of an individual and their relationships to others. These objects extend the longevity of our selves past the decomposition of the body, carrying on traces of our lives for centuries beyond the memories of those who knew us.

Spaces of the dead have always held significance for the living of the time, but they can also be valuable to those yet to come. Burial sites are often treasure troves of information about past societies, revealing indications of how people lived and what they believed was important. Modern resting places can be just as rich with embedded information, showing the ties between attitudes toward death and a sense of community purpose.[24] This thesis proposes a hybrid of the two existing systems that can supplement them both: a combination of the intimate reflection of the cemetery with the collective power and density of the columbarium.

III CHAPTER 3: PLANNING FOR THE FUTURE - PROPOSAL GOALS

"Society grows great when old men plant trees whose shade they know they shall never sit in."

— Greek Proverb (Unattributed)

This new place for housing the dead must be part of the city, accessible to its inhabitants, and providing for the safe and efficient disposal of physical remains. The design must balance the traditions of the past with the needs of the present and future. The garden cemetery has been the prevailing American typology of resting places for the dead since the early 19th century, largely due to the availability of open space and the persistence of the pastoral ideal of the United States. In today's cities, this mode is no longer sustainable. While cremation is becoming increasing popular, the typical columbarium lacks architectural presence.

This thesis proposes a new urban space that is both a resting place and a processing facility, closing the loop between the transfiguration of the physical and memorialization of the individual. Like the cemeteries of the past, it seeks to serve as a collective public space while remaining appropriately intimate and respectful. The project aims to serve the dead and the living, to provide spaces of exchange between them.

Figure 15 (Op. page): Early collage exploration

Death is a sensitive topic, laden with social implications. It is therefore particularly important to clearly define the scope and intent of this exploration. This thesis does not assume to change attitudes towards death but rather to respond to the urban implications of current trends. It presents a new architectural typology appropriate to the increasingly dense urban environment of Seattle, providing a physical space that can promote individual contemplation of death while maintaining the power of the collective history of the city. It also assumes that the codes and norms which govern where the dead can be committed will shift over time to allow new interment space within the city limits.

Of primary concern is the creation of a public space that holds the potential to connect the dead to the citizens of the city. As discussed previously, the funeral industry in the United States is a decentralized system of ceremony, industrial process and memorial that tends to separate people from the intimate reality of death. Cemeteries and columbarium today are largely privatized, and while typically open to the public during business hours, their formal language is one of enclosure and separation. But funerary architecture is much more than the efficient disposal of human remains. Personal connections, cultural norms, rites, and rituals are all essential parts of the grieving process that the current decentralized system treats with inconsistent care.

Figure 16: Installation "A Part" by Winner Jumalon. Each portrait is painted with an object of personal significance on the back. The intersection of art and memorial has a long tradition as .

In order to connect death to a broader civic realm, the new memorial needs to be a permeable, inclusive, and social space rather than a collection of individual monuments. If spaces of the dead are reflections of how we live combined with what we choose to remember, then in a world of growing social networks and awareness of our place in larger systems, the proposed method must focus more on the connections and relationships one makes than personal achievements.

In addition to increasing social connections, reinforcing the place of the human body within natural processes is also essential to the new typology. Traditional means of interment are ecologically unsound while the increased separation and obfuscation of what actually happens to the deceased only causes more discomfort and fear of the unknown. The development of resomation allows a new opportunity to use the accelerated natural decay of the physical form to maintain both the ability for memorialization, while adding the symbolic and tangible benefit of regeneration.

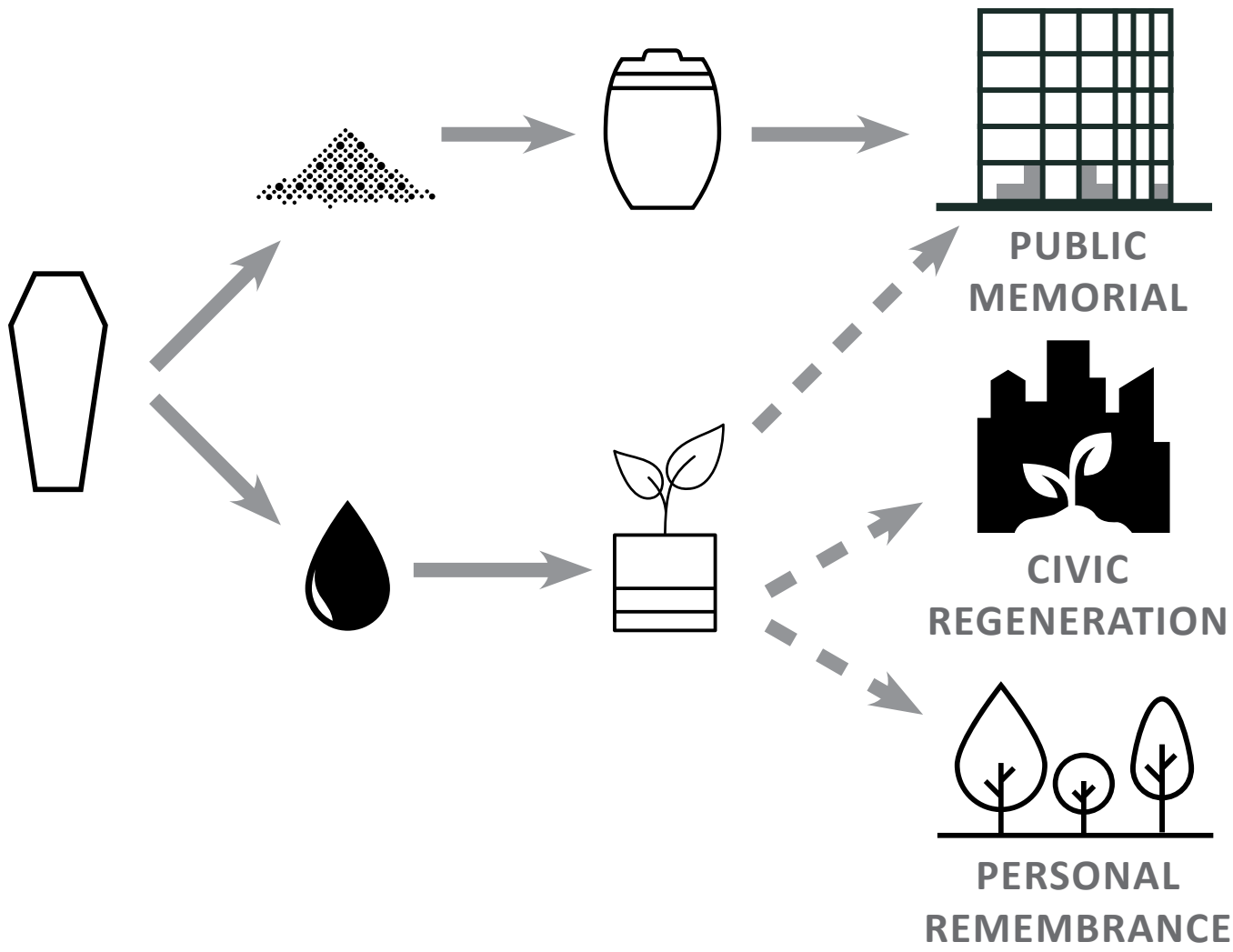


Figure 17: The three part strategy: personal remembrance, public memorial park, and civic regeneration

Figure 18: Planting trees with loved ones can become part of a new mourning custom.

Utilizing the resomation process and bio-filtration connects the memorial to an even larger system of regeneration. The addition of a the nursery program makes the growth and distribution of plant life part of the mourning process and linked to communal identity, The trend towards personalization and democratization of funerary customs seems linked to the desire to bring celebration and appreciation of life into our mourning rituals

Thus the strategy can be broken into three parts: personal *remembrance* of the individual with a physical object (the urn and remains), the larger social *memorial* of the nursery-park, and the civic *regeneration* of trees returning to the city through donation and personal plantings.

IV

CHAPTER 4: SPATIAL REMAINS - SITE ANALYSIS

"In the tissue of urban and rural space, death forms a network of places and objects, with its allegories and symbols, its signs and its reference points, forming a specific course."

- Michel Ragon, architectural and urban planning historian[25]

The city of Seattle currently allows only for the creation of new committal space within the confines of an existing cemetery or religious facility. In fact, even within those property lines, the code states that "no interment openings shall abut or be directly across the street from property other than cemetery property." [26] Neighbors to cemeteries often lobby against their expansion, which when combined with zoning laws, has historically forced new cemetery space well outside of the urban limits.[27] The expulsion of the cemetery from the city is another example of the distancing of death. Once centrally located, active public spaces, these cities of the dead can easily fall into obscurity and disrepair when pushed to the fringe.

Figure 19 (Op. page): Overcrowded cemetery in Isreal where existing grave space has become as dense as possible. Many cities are now building vertical cemeteries to handle the demand.

25. Ragon 1983, p21
26. Municode Library: Title 23 - Land Use Code Chapter 23.44.058, n.p.
27. Biegelsen 2012, n.p.

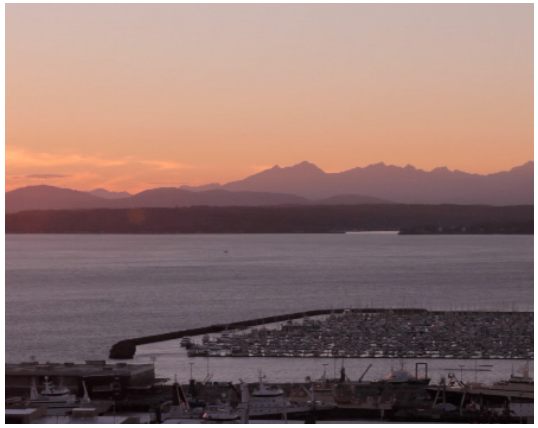
As a result of expense, public attitudes, and zoning ordinances, the national cemetery stock over the past 60 years has been at a near standstill.[28] Existing cemeteries are rapidly filling, with an estimated 50 year maximum capacity for all but one location in Seattle.[29] While this severely limits the ability of cemeteries to increase capacity, many are doing so by subdividing plots, removing decorative landscaping, and closing roads to create more space.[30] Such extreme measures can result in overcrowding and loss of the character that made these spaces desirable in the first place. [See Figure 16]

The rapidly aging population of the United States is also a growing concern for funerary services. If every American is buried in a standard sized plot between 2024 and 2042, roughly 130 square miles of grave space, an area about the size of Las Vegas, would be required.[31] This increased demand would place an undue strain on Seattle's existing cemetery infrastructure. Rather than creating new interment space further away from the majority of the population or diminishing the quality of existing facilities through overcrowding, a more desirable solution is to maximize the density of spaces of the dead and integrate them into the urban fabric.

28. Biegelsen 2012, n.p.
29. Van Nostrand 1993, p33-34
30. Van Nostrand 1993, p35
31. Biegelsen 2012, n.p.

BROWNFIELD

- Prime land for the living
- Potential to revitalize without as intensive remediation



VIEWS

- Connection to natural and civic landscapes

PROXIMITY TO URBAN CENTERS

- Within 2 miles of Downtown and major residential neighborhoods
- Good access to transit and pedestrian/bike infrastructure

Figure 20: Site selection criteria.

The site for such an emotionally and culturally charged project must be carefully considered. As an aspirational proposal, it should remain sensitive to its context while at the same time looking forward to the future needs and development of the city. An urban location will allow people to choose to be interred close to where they lived and enable loved ones to visit easily. A location near to the city center would make it accessible by a variety of means, and a visible landmark. At the same time, a close relationship to the landscape is also important. As with a cemetery, the experience of nature allows visitors opportunities for personal reflection and social interaction. The site should be large enough that a structure of significant capacity can be built. It must be a viable option well into the future to become a meaningful part of the civic fabric. A former industrial site or a brownfield, holds great potential as a space, abandoned by the living, that could be rehabilitated as a place for the dead.

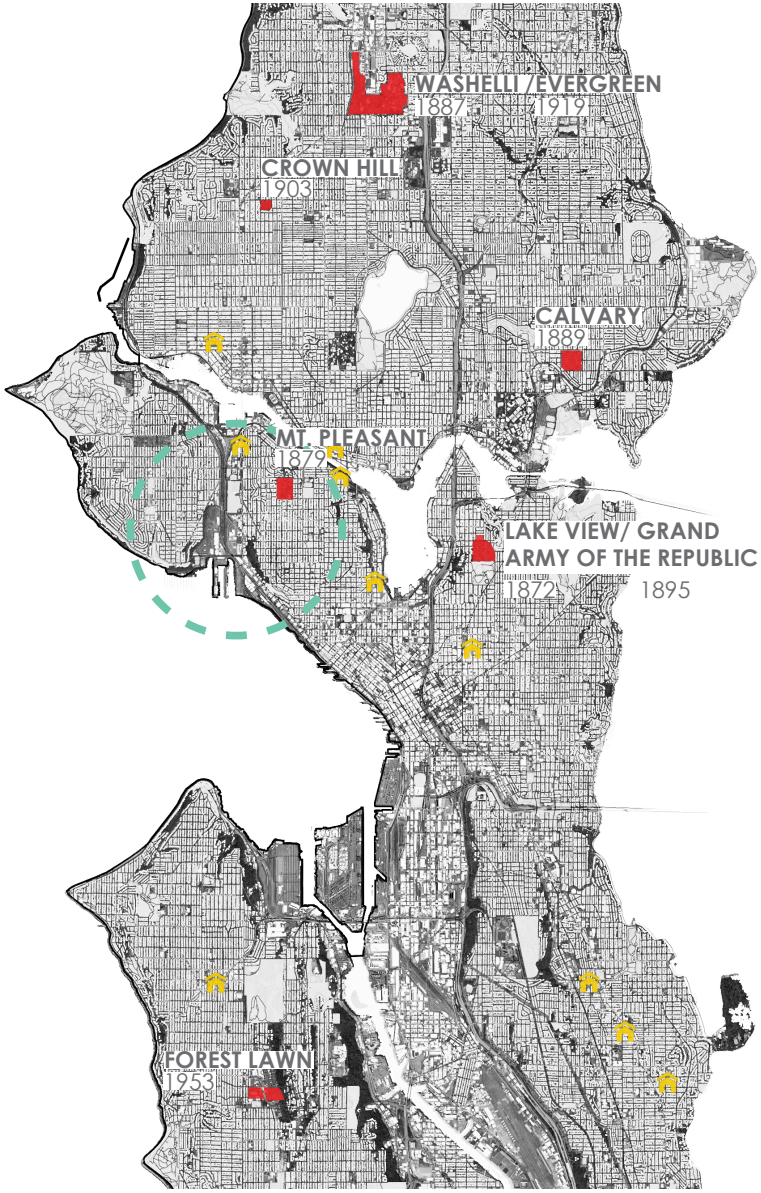


Figure 21: Map of Seattle showing current cemeteries and enlarged area of interest

Using these criteria, several large sites were identified, the most promising of which is the artificially created lowland between the hills of Queen Anne and Magnolia, known as Interbay [See Figure 18]. This light industrial and commercial zone forms a barrier between two major neighborhoods and has an abundance of leftover and underutilized space. The site highlighted in the inset for Figure 18 is one such space located at the edge of Elliott Bay, in an area called Smith Cove.

The cove's natural tide flat was filled in the early 1900's to be used for the Great Northern Railway's ocean docks, warehouses, and grain elevators. [See Figure 19] The site continued to be used to store cargo being transferred onto ships from the railway, until the existing dock was dismantled and filled in to form the current shoreline during the 1970's.[32] The area has been largely abandoned and fenced off since the early 2000's. The adjacent land was developed into a commercial park and Pier 90 became a cruise ship terminal, eliminating the need for an overflow staging area.

Located directly on Elliott Bay, the site provides expansive views of Mt. Rainier and downtown Seattle to the south, and partial views of the Olympic mountain range to the west. [See Figure 21, following page] The vistas from this location offer the potential to draw visitors other than mourners, but also ensures the project will be a visible civic landmark from many points around the city.

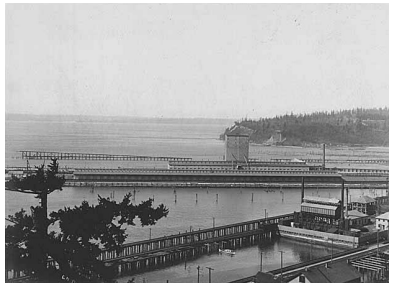


Figure 22: Smith Cove docks prior to 1934 (photo undated)

Figure 23: Pier 91 and Smith Cove c. 1947

32. Wilma 2001, n.p.

Figure 24: View south to Harbor Island and Mt. Rainier

The approximately 21-acre site can be broken into two sections: a roughly rectangular area along the docks (part 'A') and a smaller irregularly shaped portion between the commercial campus and grain silos (part 'B') connected on the south by the underdeveloped Centennial Park. [See Figures 22 & 23] Zoned for light industrial use, the scale and height limits should allow for a 75-100 year capacity when built to the full height of 85 feet.[33] The proposed facility would fit with the industrial and commercial scale of its surroundings, especially the silos to the southeast. [See Figure 24, following page] The industrial designation of the site also makes it reasonable to assume that resomation and water treatment on the site would be possible.

Figure 25: Centennial Park is the ambiguous end to the scenic trail.

The area is well connected to vehicular transportation, with multiple bus lines running on the main arterial of Elliott Avenue and across the Magnolia Bridge. Auto access for memorial services and remains is through the secondary street, Alaska Way, connected to Elliott Avenue via an overpass. The Helix Pedestrian Bridge is the major pedestrian connection linking to Kinnear Park and Queen Anne to the east across the rail-yards that separate part 'B' from Elliott Avenue. [See Figures 23 & 24]

33. Seattle's Industrial Zones, p2

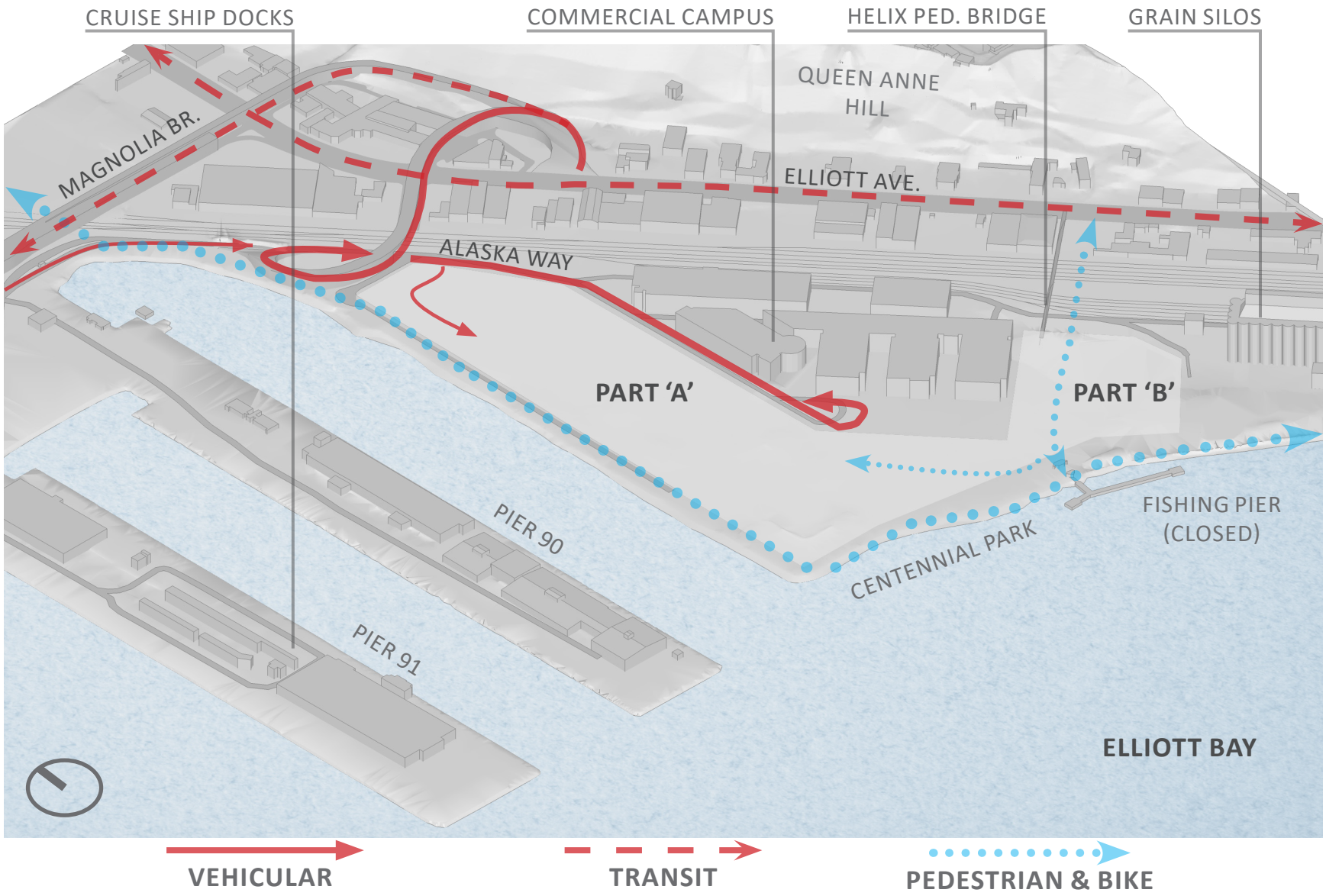


Figure 26: Site access and surroundings.

Figure 27: Industry and infrastructure surround and shape the site.

The most important bike and pedestrian link is the Elliott Bay Trail, wrapping around the edge of site along the waterfront. This is both a trail for leisure activities and a vital commuter route for cyclists traveling from northern residential areas to the commercial center of downtown Seattle. Extending north from the core of the Seattle waterfront, the scenic portion of the trail ends at Centennial Park, unceremoniously transitioning from parks and public activities to the industrial heart of Interbay at the threshold of the Magnolia Bridge. [See Figure 24] An intentionally planned terminus point for the waterfront trail would be appropriate considering the great investments currently underway to the southern portions with the demolition of the Alaskan Way Viaduct and development of the Seattle Waterfront Plan.

There are several challenges for this location to be addressed. To the north of the site is an industrial sector largely used for storage and light manufacturing, which while not aesthetically appealing, should not pose a significant noise issue. The larger source of sound is the railroad tracks to the east of the site. These are not as frequently used as those further south, however, long freight trains travel through creating a sustained period of noise.

Figure 28: The picturesque beauty of Elliot Bay hides the fact that the same industry that shaped Interbay has tainted the water to the point where it is no longer safe for direct interaction.

Directly adjacent to the west of the 'A' site are Piers 90 and 91 where large cruise ships dock, periodically blocking views to Olympic range, creating increased noise, and localized traffic. [See Figure 25] The noise and visual static of the background requires mitigation through design considerations such as controlled views and isolation of more sensitive spaces. In addition, with relatively regular schedules for both freight and ship traffic, it is possible to avoid scheduling ceremonial services during more distracting times.

Another consideration is pollution due to the industrial nature of the neighborhood and past uses of the area. Contamination is an issue for both land and water. The largest portion of the site next to the docks is potentially in need of soil remediation, and there is a combined sewer overflow (CSO) pipe on the western edge of the Smith Waterway. Water pollution in the area has caused indefinite closure for recreation and fishing, despite one of the few public fishing piers being on the southern edge. [See Figure 25]

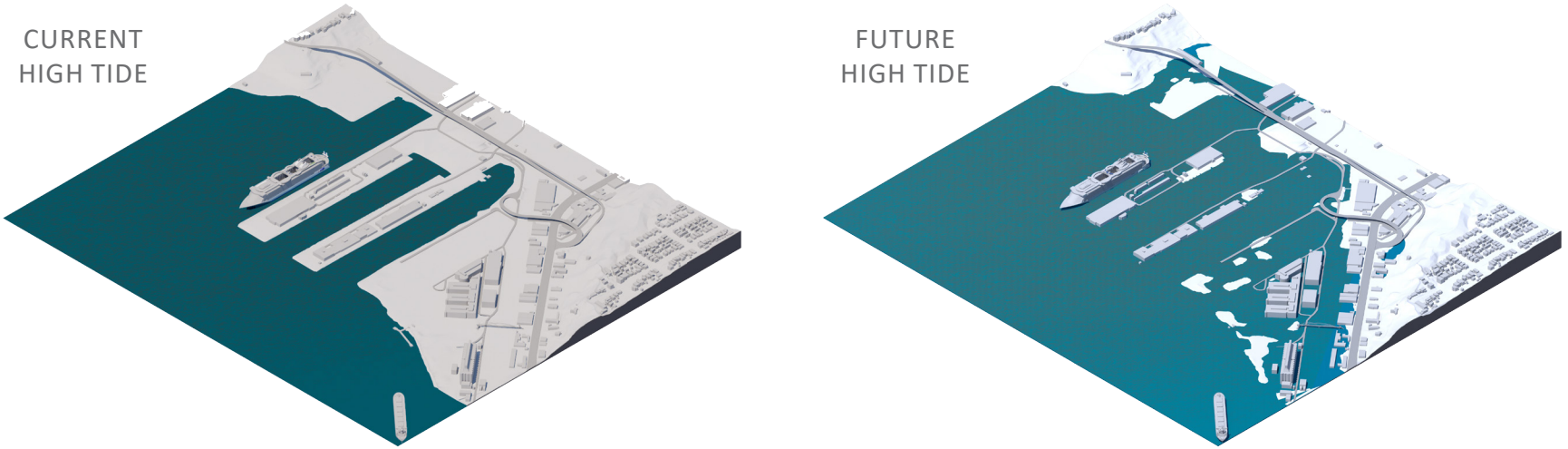


Figure 29: Area at risk of flooding in an 8 ft high tide with 3 ft of sea level Increase, possible within 50-100 years. (left)

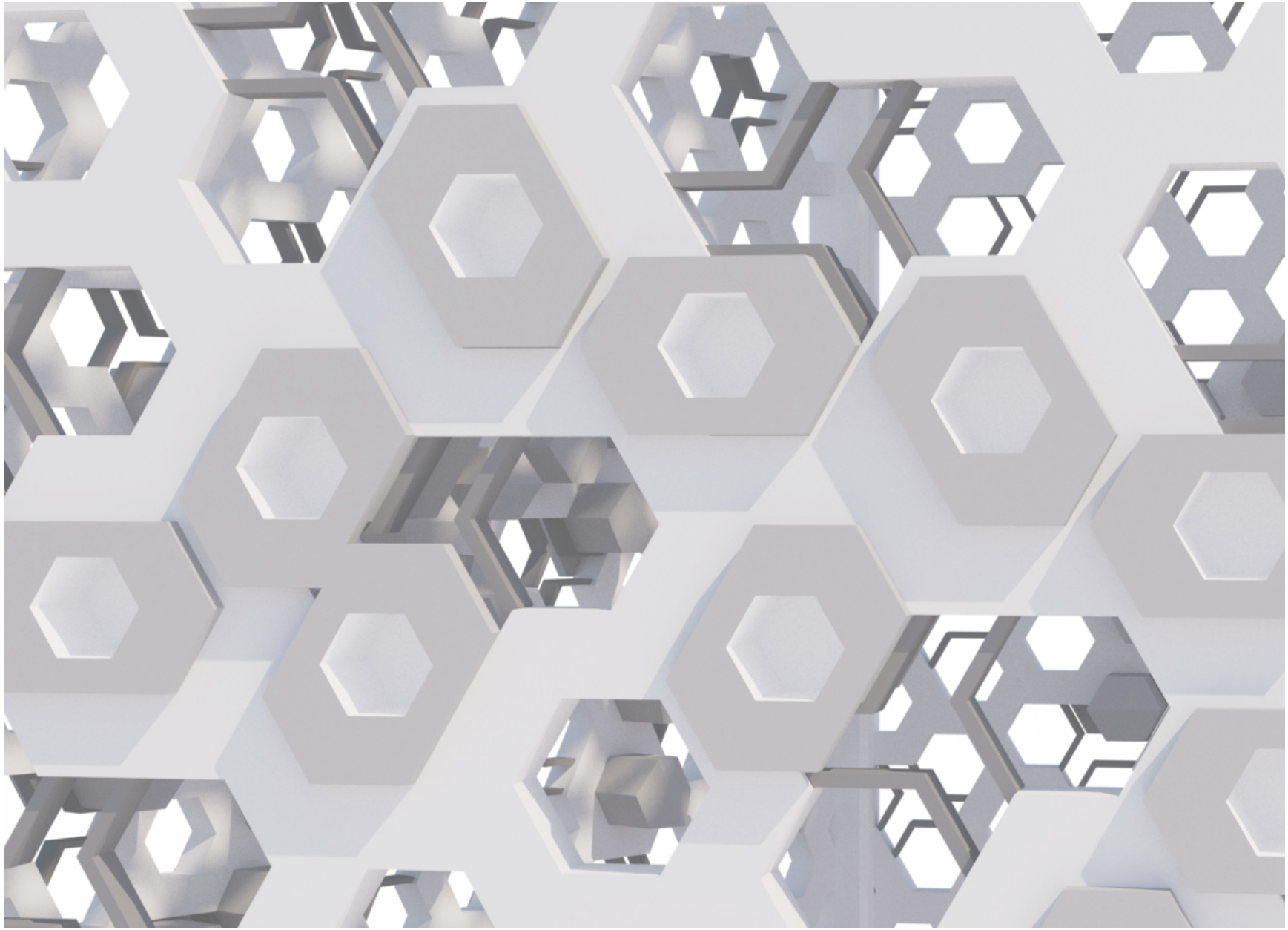
King County began addressing the issue with the construction of a CSO treatment facility in 2015 to handle water from Magnolia as part of the future expansion of Elliott Bay Park on the opposite side of Smith Cove.[34] Current plans do not address the Queen Anne watershed, however.[35]

Having been built over tide flats with several series of infill, the site is a seismic liquefaction zone that requires special attention to structural stability. Sitting approximately twelve feet above sea level, the area is also a serious flood risk, especially if sea levels rise due to global warming.[36] [See Figure 26] Rather than being viewed as risk factors, both can strengthen the argument that this location is not well suited for permanent habitation by the living, but with suitable planning can safely protect the dead. Indeed, this can be an opportunity to plan ahead for modifications that will ensure the longevity of the cultural wealth within.

Figure 30 (op. page): The site at night.

34. "Smith Cove Park Development.", n.p.
35. "Wastewater Treatment.", n.p.
36. "Climate Impacts in the Northwest.", n.p.


ARCTIC STORM
Tom Ringold '08



V

CHAPTER 5: PROJECT DEVELOPMENT AND DESCRIPTION

Spaces of interment have stayed largely the same for centuries. The cemetery celebrates the individual in a pastoral ideal, while the columbarium is the rational execution of density and efficiency. Both responses are inwardly focused, static monuments. This thesis seeks to reverse that relationship, acknowledging the complex and dynamic system of the modern urban environment, where people are increasingly more socially than physically connected. Yet it incorporates the attributes of the previous typologies in order to remain part of the same cultural progression. Adapting the connection with nature of the cemetery and the rational efficiency of the columbarium to the current paradigm, allows the project to continue accepted social norms regarding death while helping to shape future attitudes.

During the design process, these ideas were explored through the investigation of key moments and experiences using various media. Collage, watercolor, physical study and digital models were employed to explore the concept at different scales: from urn, to committal wall, threshold, key spaces, building organization, and integration with the site and surroundings. The looser forms of representation are well suited to mood and experience, while the more technical models are used to test ideas for systems and scalability.

Figure 31 (op. page): Study for committal wall pattern

Earliest experiential investigations revealed the use of permeability of mass and light to differentiate the emotional and programmatic needs of the spaces. A parti developed of a solid base enclosing the private ceremonial and service functions, the public growing layer carved out more open spaces above, and shafts of light connecting the two. [See Figure 32]

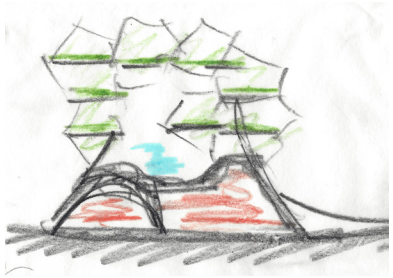


Figure 32: Parti diagram.

The solid form of the base holds a variety of interior volumes; like the human body it appears as one stereometric whole from the exterior. This weathered landform is carved away by its interaction with the activity of the living over and around it, representing the entropic return of all things to the earth, be they hardened stone or fragile flesh.

Materially, the base is constructed of an articulated, vaulted system of concrete shells and columns, infilled with inert natural materials such as stone and rammed earth. This constructed landscape is in part a permanent construction yet at the same time it is also possible for portions to be disassembled and reclaimed. The base is the realm of the earth, the space of parting the dead from their loved ones in both ceremony and material transformation.

Growing out of this solid base are a family of light well interment towers. Their scale, height, and function vary, but the consistent geometry of the hexagonal extrusion and latticed pattern of niches tie them together. These towers act as the threshold between the two states of the project; the static earthly base and the dynamic living forest of nursery frames.

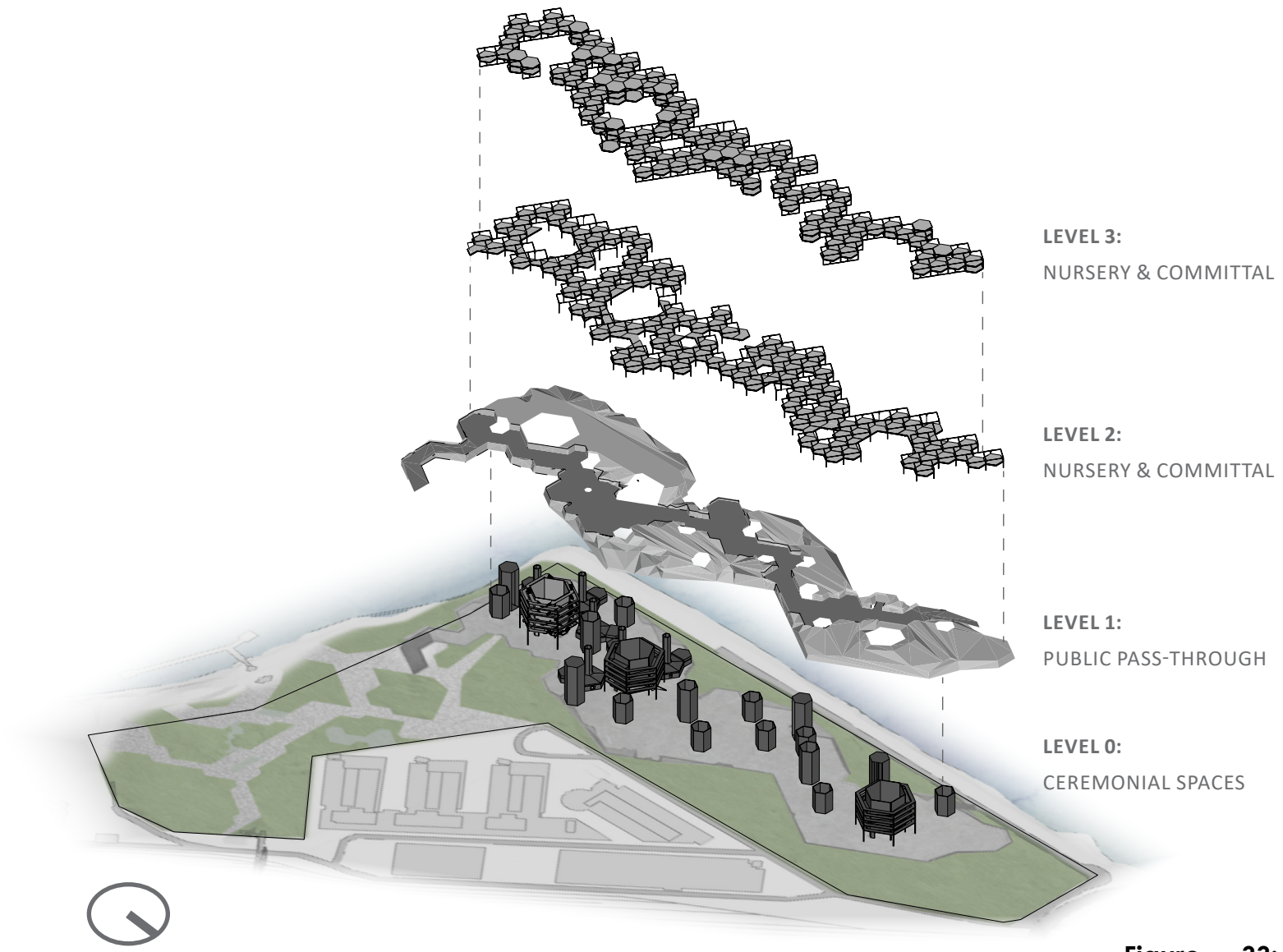


Figure 33: Exploded axonometric of key structural systems.

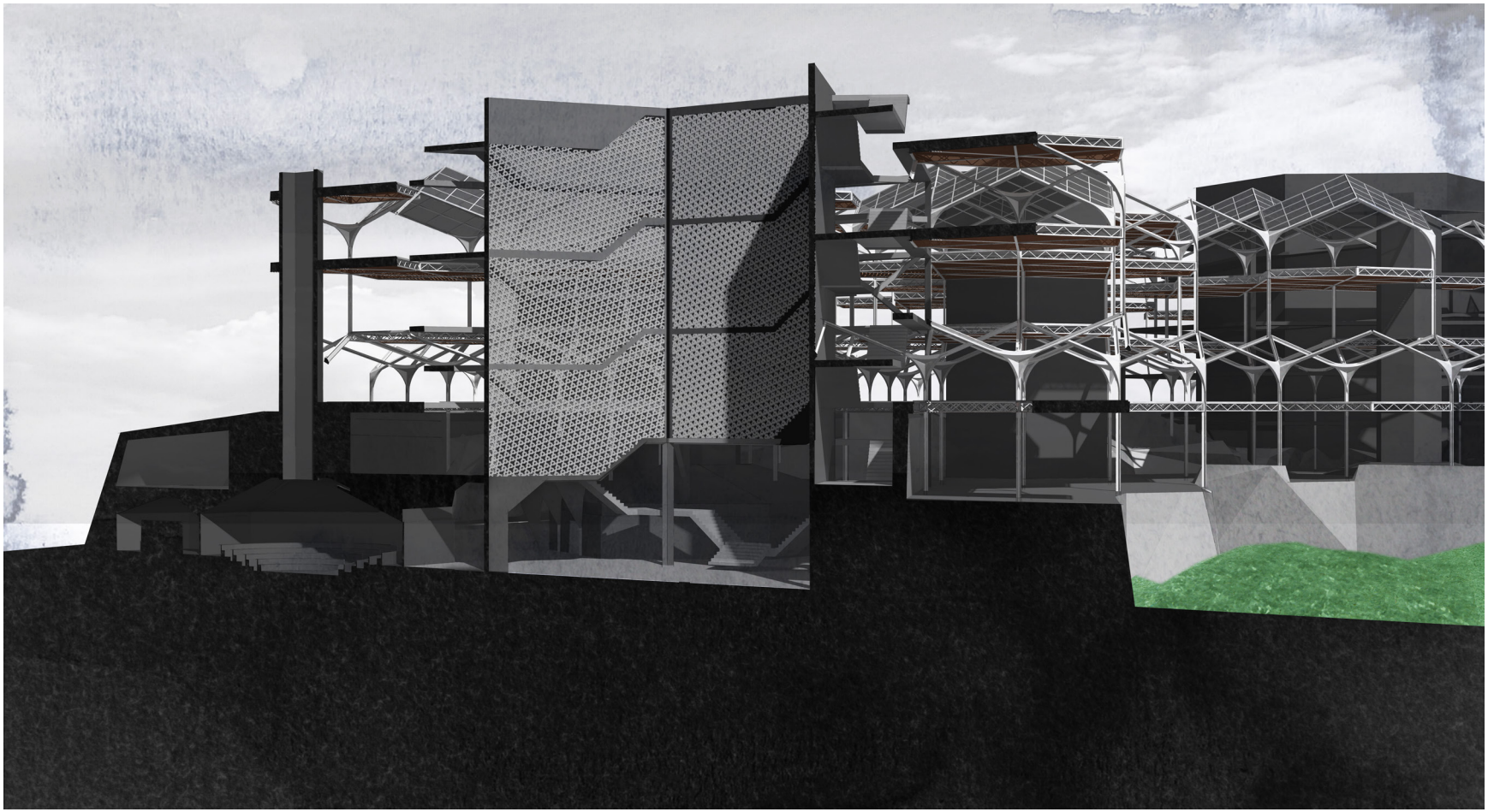
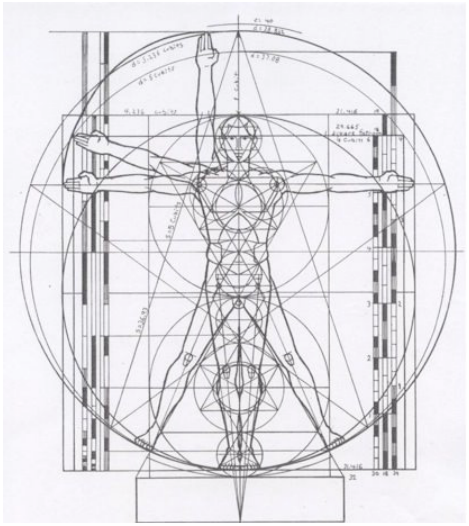


Figure 34: Perspective section A looking north through one of the main circulation lightwells and a radial cerimonial chamber.

The smallest light wells illuminate the ceremonial chambers with diffused light, while the largest remain open to the sky, allowing light, sound, air, and weather down into the depths. These are the vertical circulation axes of the project, bringing mourners up from the embrace of the inanimate earth, circling around the perimeter of the voids, and finally out into the dynamic realm of life. The solid form of the towers is perforated by a tessellated pattern that gets filled in with urns penetrating into its interior volume. The interior of the light wells are occupied only by the dead, but as the memorial spaces of the project, they play a key role as circulation points, structural supports, and iconic towers connecting the various layers with the natural elements.

Resting on top of the solid base is a tectonic system of geometric frame structures. These crystalline growths cling to the towers and root into the terrestrial base. The industrial lattice supports the functional apparatus that transform the material self into new plant life, creating a dynamic nursery suspended between earth and sky. Made of many smaller parts, the structure for nurturing new life is directly supported by the strength of the old. The memorial forest is primarily open-air, but portions are covered by other platforms, roof panels, or fabric shades, and in colder months the frame system allows for modular infill insulating panels to be installed to create flexible greenhouses. This is the ethereal realm, a place for the recognition of the incorporeal, immediate, and elemental wonders of the natural world.

The play of material and immaterial structure supports the symbolic mission of transformation from life to death to life. The weight of the material world encompasses space with planes and solids on the lower levels while the upper volumes are bound by delicate and conceptually infinite connections. On a practical level, the combination of steel frames and concrete structure should prove resistant to earthquakes and liquefaction. The deep piers needed to stabilize the structure could also serve a dual purpose as part of a heat exchange system for the limited conditioned spaces.



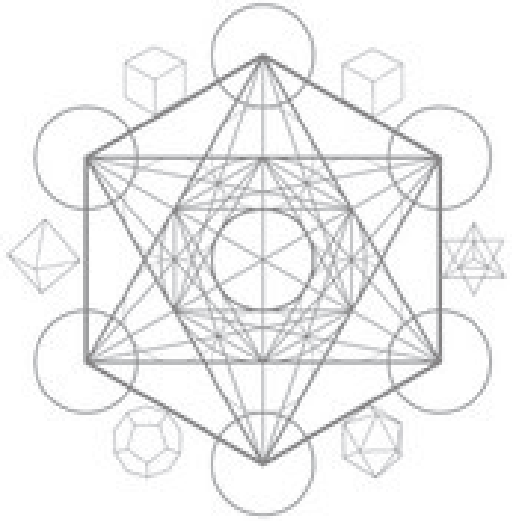


Figure 35: Geometric relationships between the human body and platonic solids.

We are all bound by the same existential constants. Exploration of universals, rather than religious or cultural symbols, provides an avenue for the creation of inclusive organizational schema. Geometric forms have long been associated with the human body. [See Figure 35] Referencing these proportions and relationships in structural and interment systems associate the universal with the personal.

Investigation began with the hope of using the geometric order of the committal system to bring cohesion to the entire project. Tessellated patterns allow for greater variation and introduce the element of randomness while keeping within a unified system. A hexagonal grid provides the opportunity for infinite expansion in two dimensions. Altering the shape of the memorial object to a more elongated form introduces directionality and spontaneous open spaces. [See Figure 37]

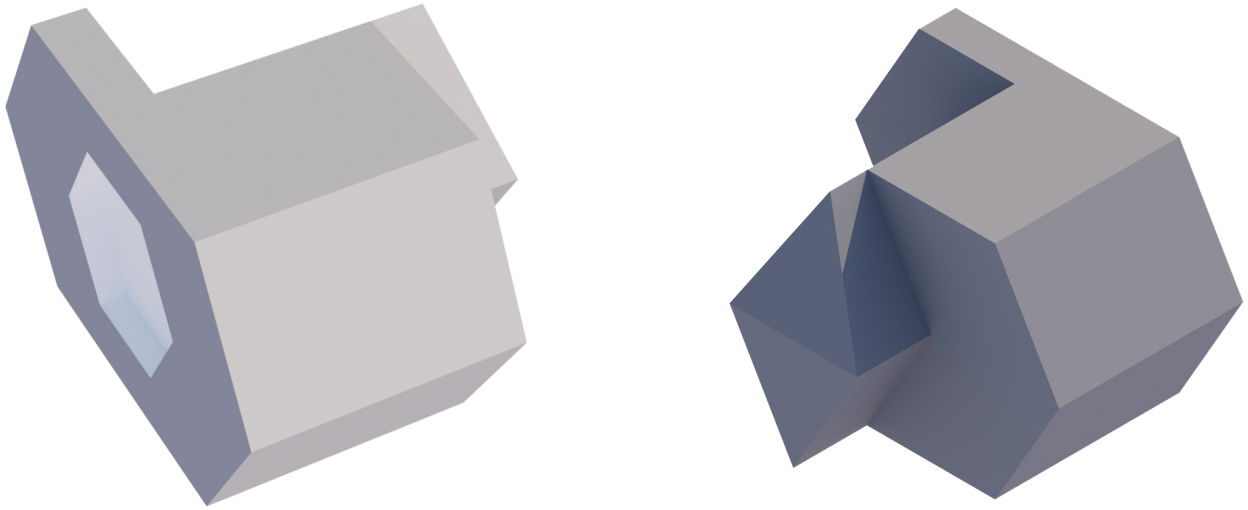


Figure 36: Committal vessel to hold both seedlings and the memorial urn.

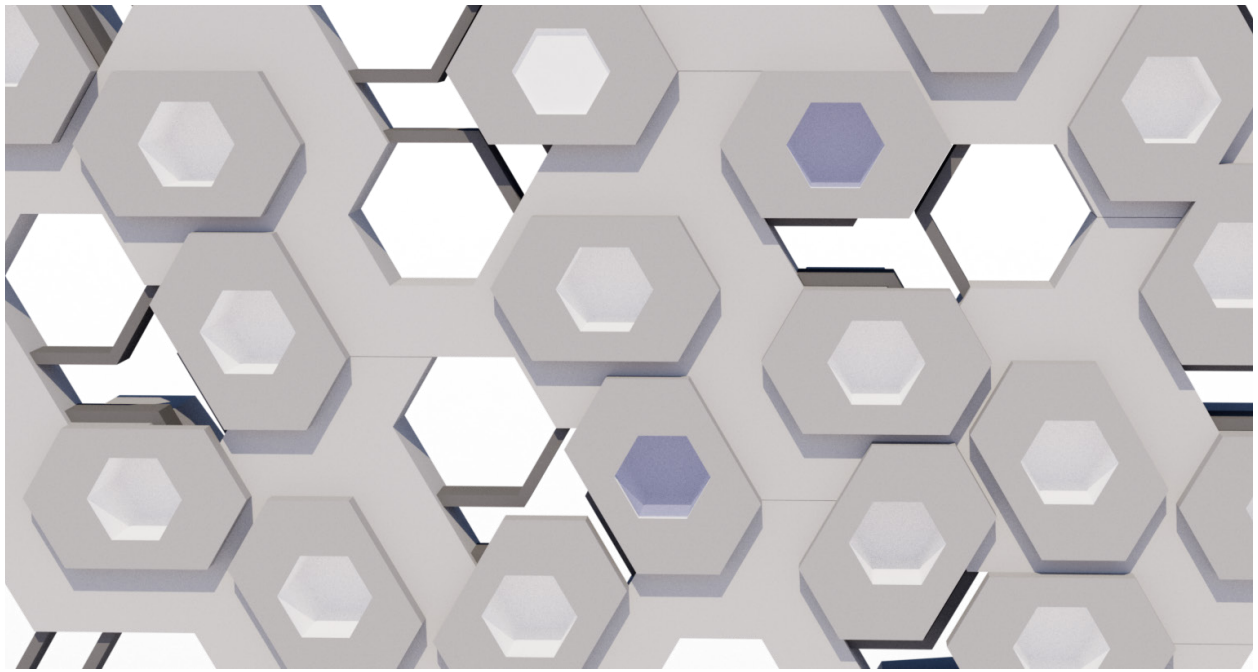


Figure 37: Example of tessellated wall pattern of committal urns.

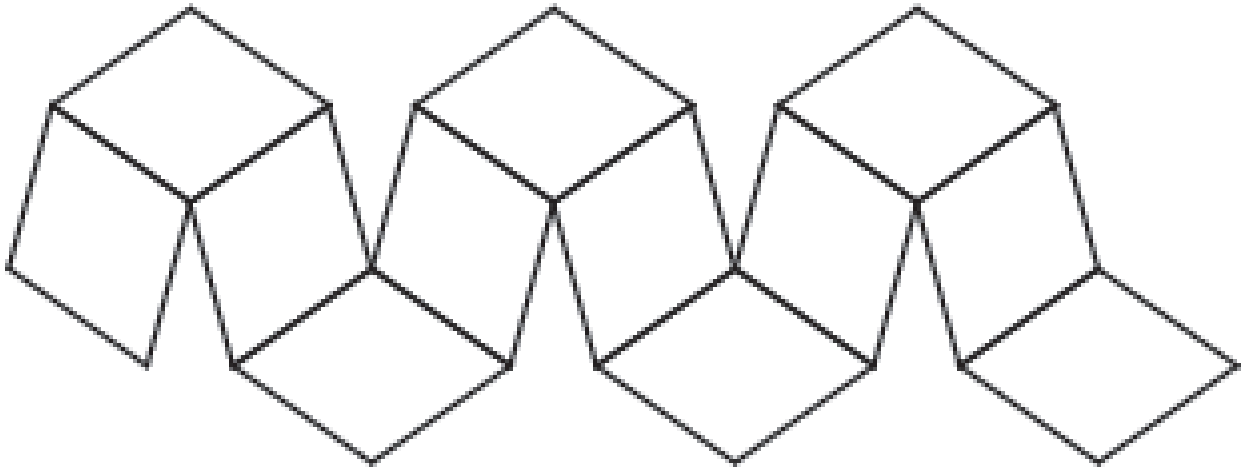


Figure 38: Unfolded rhombic dodecahedron showing 12 equal faces, each made of 2 equilateral triangles.

This led to the exploration of a three dimensional space filling equivalent, the rhombic dodecahedron. [See Figure 39] This solid is created from twelve identical rhombic (diamond) faces that can each be divided into two equilateral triangles. When the rhombic dodecahedron is arranged with one of its points along the vertical axis, a sectional slice forms either an equilateral triangle or hexagon. These primary shapes serve as the formal connection between the planar and spatial geometries: six of the same triangle around a central point form a hexagon, while overlapping two hexagons creates the elongated shape of the urn from 10 triangles. The planar and spatial geometries relate and reinforce each other, expand in multiple dimensions over the life of the building, and provide a framework within which the complex program can shape and alter space.

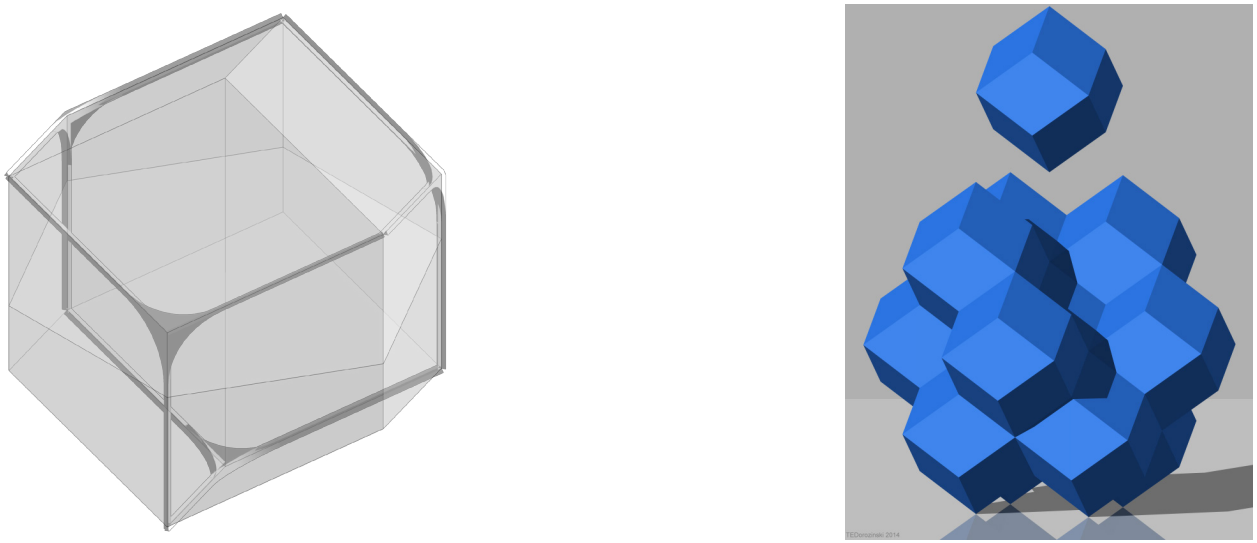


Figure 39: 3D unit frame and example of offset stacking to fill space.

This new system must be replicable in other locations to have a significant impact. A scalable solution, growing with the city, allows for long term investment and rehabilitation of underutilized locations similar to the site chosen. While the memorial grows, so does its impact on the surrounding landscape. This thesis proposes an architecture that can be both ephemeral and stable, a building that can grow and decay like a life form. Rather than a fixed formal expression filled with independent monuments, as with other forms of interment, the proposed memorial is additive, solidifying in form over time but with impacts that are more fluid and widespread.

Figure 40: Site map of fractured park landscape and ground floor.

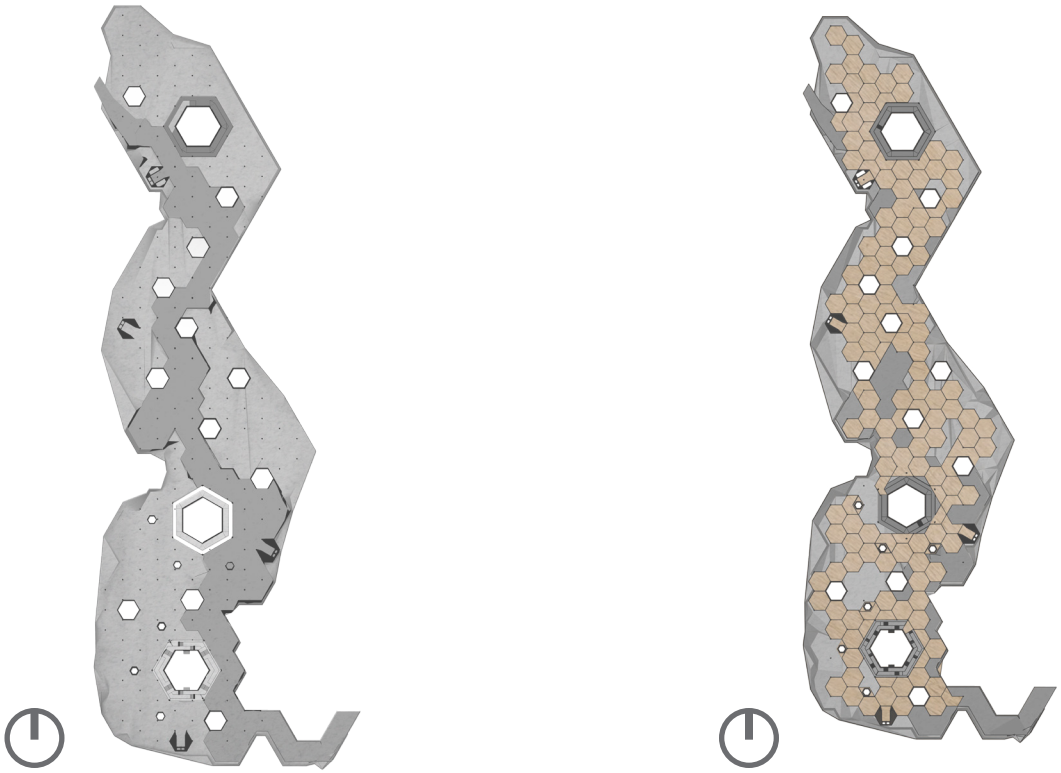


Figure 41: Level 1 plan showing public path (left) and Level 3 plan showing a typical growing floor (right).

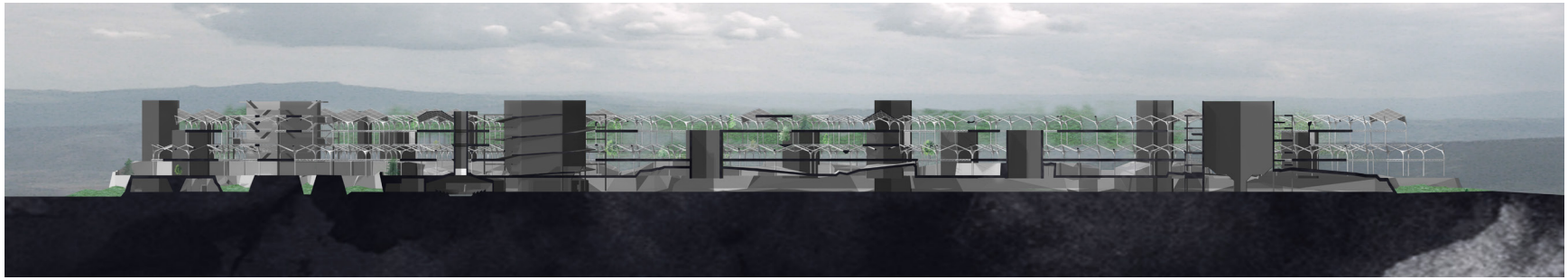


Figure 42: Longitudinal section B looking west.

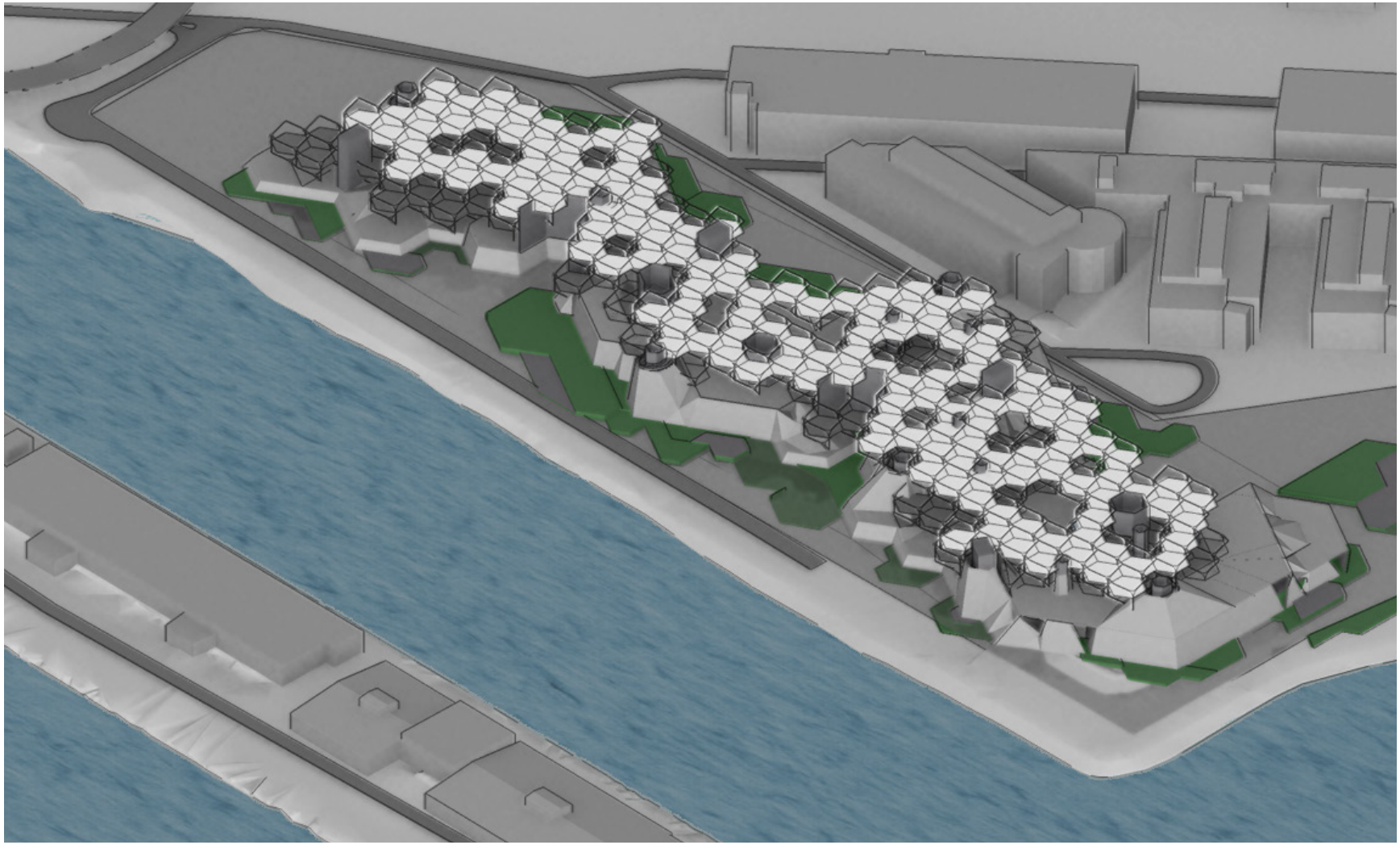


Figure 43: Proposal in site context

37. Barrie 1996, p148

Processional Experience:

Architectural historian Thomas Barrie identifies several key elements in movement through spaces of the dead that were helpful in thinking about the design: a clearly articulated entry, a sequence of increasingly sacred spaces along a path, a consistent ordering of constructive elements and materials, anticipation of attainment, and a symbolic story expressed by path and place.[37]

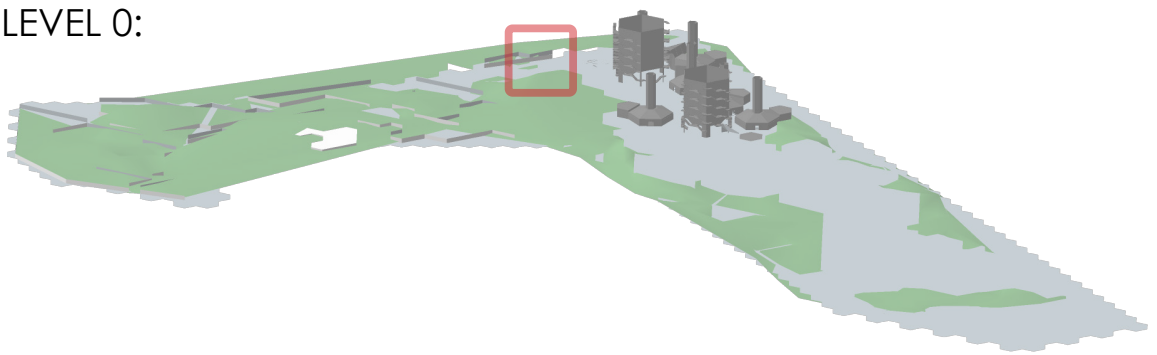
The procession of different user groups through the project was a major factor in the development of the building. The most obvious concern was with the path of the mourners. Being a civic amenity, it is also important to think about public interaction. The entry points to the site are at the northern and southern edges, mainly vehicular from the north and pedestrian from the south. Therefore, the procession is considered mainly from the southern entrances through the mediating terrain of the re-landscaped Centennial Park.

The committal towers of the memorial are obscured from the exterior, revealed in glimpses through the foliage and greenery that surround them. This garden of remembrance can only be entered by crossing multi-layered thresholds, a journey of unveiling and discovery. The process begins by separating the self from the chaos of the city and reducing sensory input before opening back up to the realm of death and rebirth – a space that is a microcosm of the urban environment, both orderly and ever changing.

EXTERIOR LANDSCAPE:

- threshold – site
- anticipation of attainment
- symbolic journey – beginning

LEVEL 0:



The constructed topography of the park swells and falls over the site from the highest point at the base of the pedestrian bridge, approximately eighteen feet above sea level, to four feet below sea level. Carved through with paths and plazas, berms surround the building's solid base, rising geologically from the earth. A public path sweeps over the base at the southeast corner, eroding its way through the form before cascading down to meet the existing pedestrian trail at the northwest corner.

Reading as a continuation of the sculpted landscape pulled over the exterior of the terrestrial plinth, the visitor is invited up onto the base as a vertical extension of the park. The flow of the path is irregular. Eddies carve out larger spaces with different framed views: out to Elliott bay and Mt. Rainier, back across the park to downtown Seattle, across the docks to the Olympic peninsula, or the Queen Anne hillside.

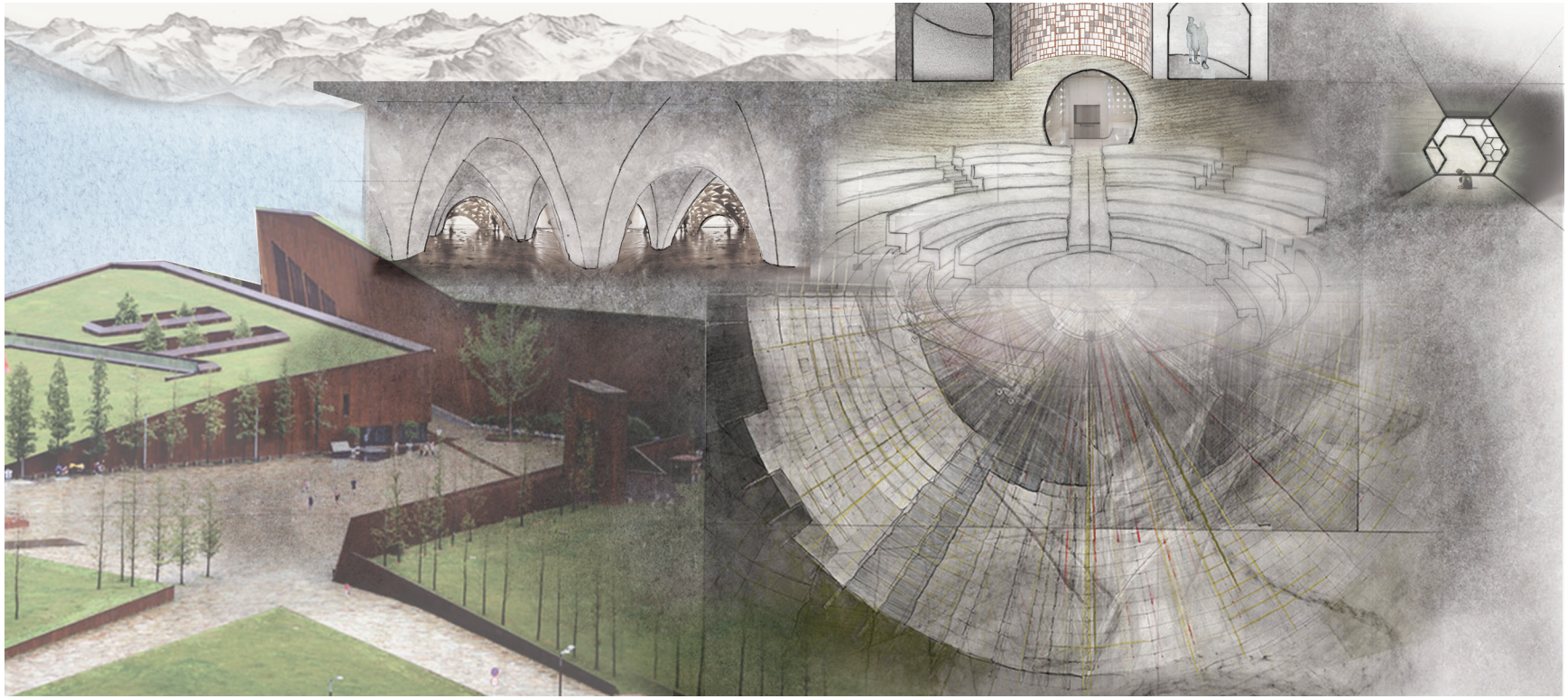
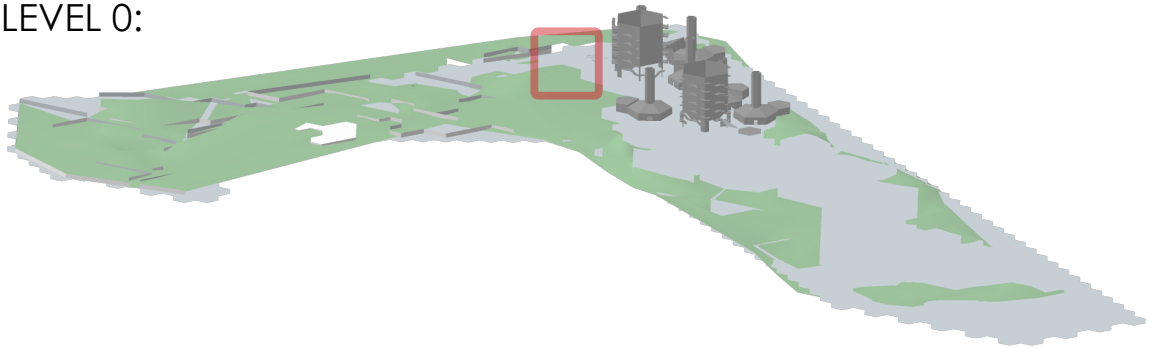


Figure 44: Experiential collage of entry sequence
(Illustrations by the author)

TERRESTRIAL BASE:

- threshold – building
- symbolic journey –return to the earth

LEVEL 0:



Underneath this broad ramp to the public path, a smaller tunnel digs down into the building from the main plaza to the central gathering gallery (See Figure 45). Mourners descend into the depths of this terrestrial realm, welcomed by shafts of light piercing the ceiling. Translucent stone windows set deep in the corridors lead to ceremonial chambers (See Figure 46, following page). This is the place for ceremony and parting; the contrast of light and dark, the weight, patina of material, and volumetric scale create a sense of time-worn strength and solemnity, emotionally preparing the bereaved for the parting process.

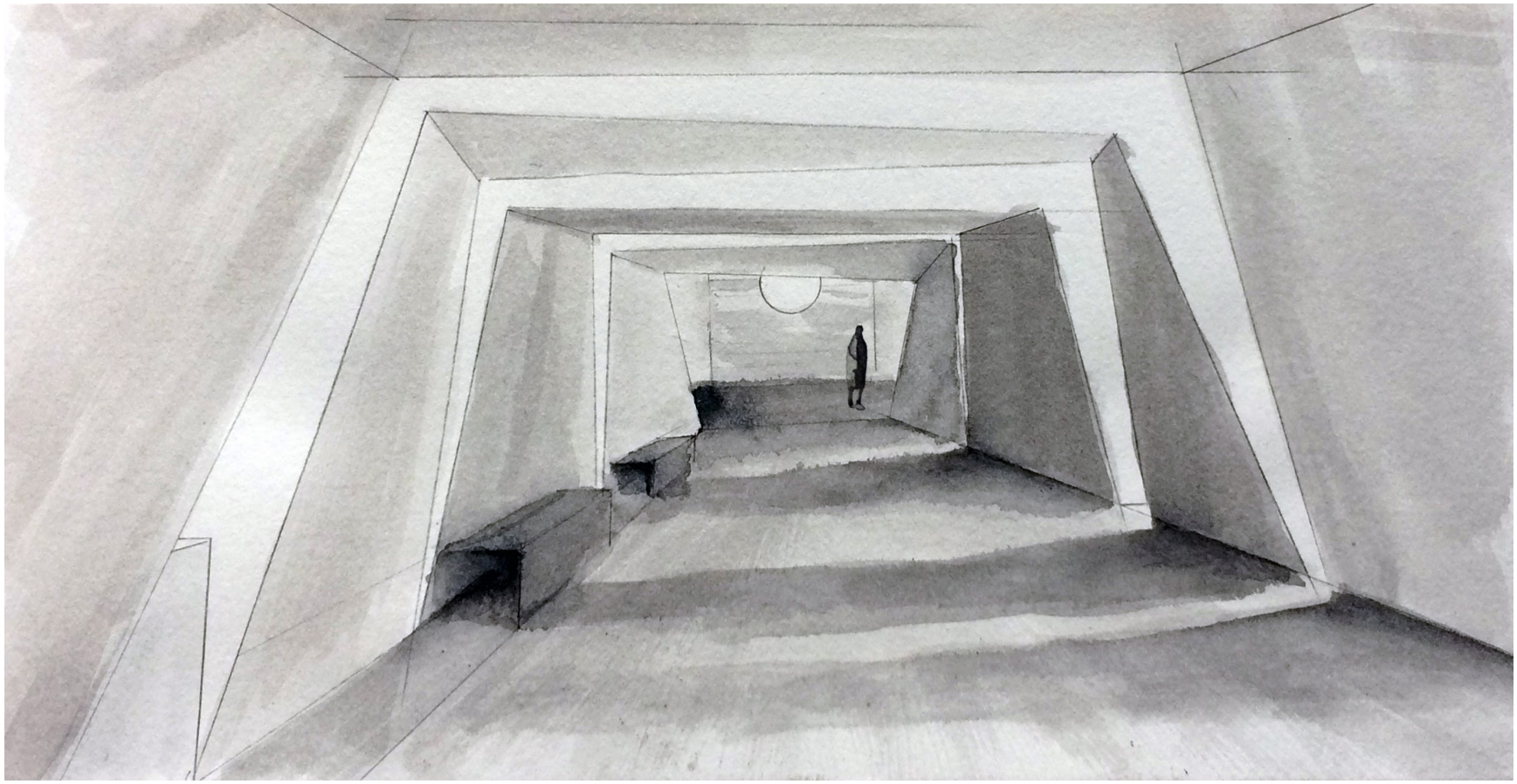
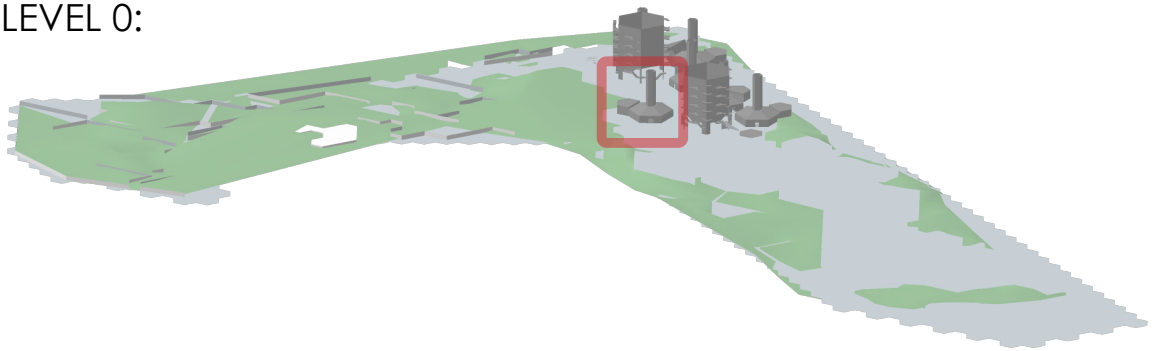


Figure 45: Tunnel entrance to the ceremonial base layer
(Illustrations by the author)

CEREMONIAL CHAMBER:

- threshold – material transformation
- symbolic journey – parting with the dead

LEVEL 0:



The ceremonial chamber is the most internalized in the project. The translucent skylight and recessed lights reflecting off the concrete roof structure, create an intimate, softly glowing, centrally focused enclosure embraced by shadow (See Figure 46), The casket lies in the center of the room surrounded by radial benches for mourners. All are equal in front of the dead. The resomation room remains clearly visible as a reminder that the process is an integral part of ceremonial rites and the transition from presence to absence.

The bereaved may help push the casket up the ramp to the resomator in a final act of parting, then continue with further communal grieving, or exit the ceremonial space back into the gathering gallery. While they wait for the process to complete, mourners can refresh themselves in the cafe and look out onto Elliott Bay and downtown Seattle, or continue on to wander the nursery's memorial platforms and select a spot for their loved one's remains.

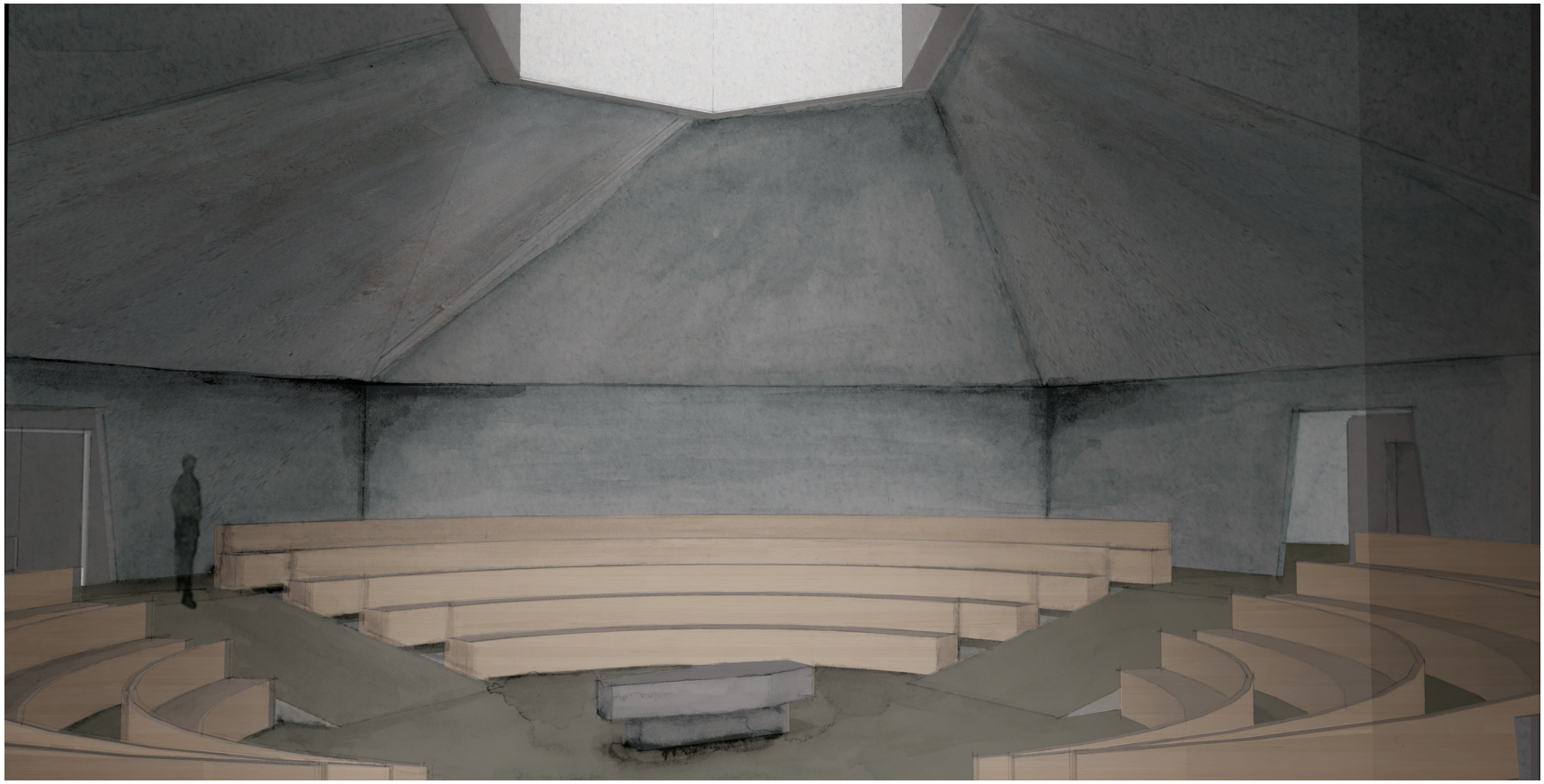
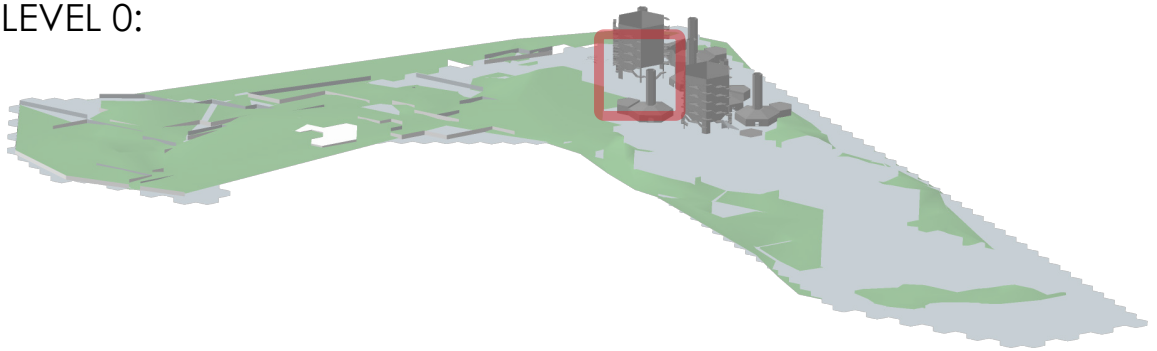


Figure 46: All have equal views of the deceased in the ceremonial chamber
(Illustrations by the author)

CENTRAL GALLERY:

- anticipation of attainment
- symbolic journey – moving on from loss

LEVEL 0:



The central gallery light well is the main vertical circulation from the lower ceremonial level to the upper growing floors. Connecting through interaction with natural elements, mourners are drawn upward along spiraling stairs to a bright world of greenery and life (See Figure 47).

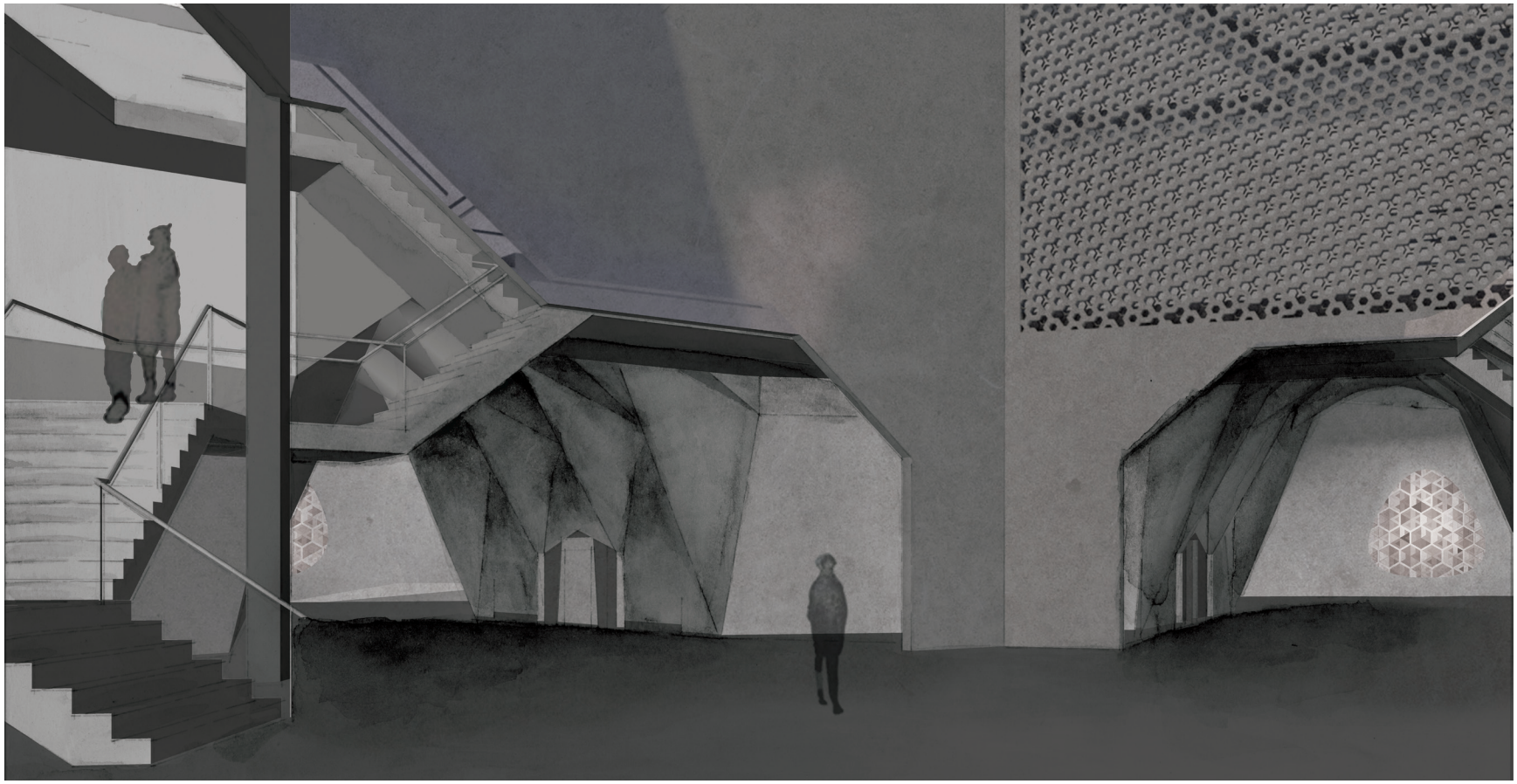
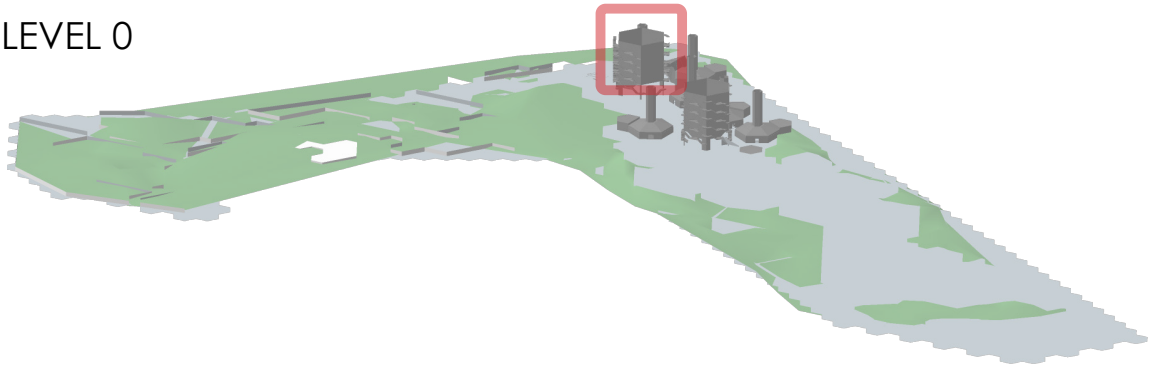


Figure 47: The central gallery light well is the main vertical circulation.
(Illustrations by the author)

COMMITTAL TOWERS:

- symbolic journey –attainment of goal
- personalizing memorial selection

LEVEL 0



Circulating up, the walls of the light well begin to disintegrate into the tessellated interment pattern as the threshold between solid and framed layers is reached, opening fully to the activity of growth (See Figure 48). Here mourners and public mix. The life of flora and the city's inhabitants intersect with memories of the dead in celebration of the past and hope for the future.

Figure 48: Map of Seattle showing current cemeteries and enlarged area of interest
(Illustrations by the author)

COMMITTAL TOWERS:

- symbolic journey –attainment of goal
- personalizing memorial selection

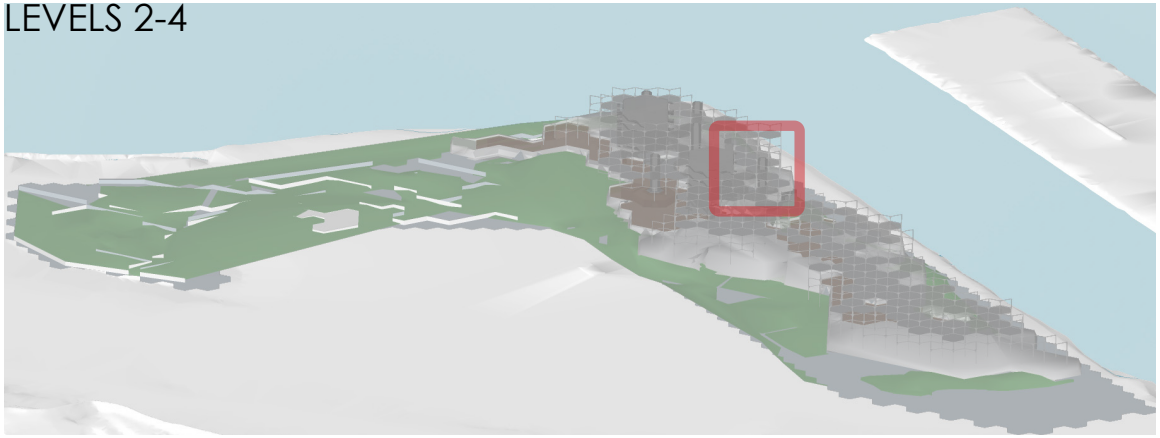
The light well committal towers are accessed from platforms suspended within growing frames. A location is selected based on view, proximity to others to whom the deceased was close, or preference for the particular landscaping of an area. The bereaved insert a temporary glass plug into the wall to identify the location, and let the staff know where it is and what species of tree they select to honor the deceased. After the resomation process is completed in 3-4 hours, a brass urn is filled with half of the remains and inserted into the glass plug in the memorial wall. The rest is mixed into a special vessel in which a seedling will be grown.

Figure 49: As the stairs emerge from the lower realm, the visitor is presented with a verdant diaphanous landscape in contrast with previous experience.

(Illustrations by the author)

NURSERY PLATFORMS:

- threshold – material transformation
- symbolic journey – new life from death



Once the tree matures enough to be replanted, the bereaved are notified. They can donate the memorial tree to city parks, or return to pick it up and plant wherever is significant. The deceased's loved ones may grow as many trees as they wish in this way. When they are finished or no longer able to be contacted, the vessel is capped using a brass urn which replaces the glass plug in the memorial wall. Family and friends may reconvene for each of these steps, or arrange everything in advance, but the cyclical nature of growth encourages a repeated relationship with the memorial that could be beneficial to the grieving process.

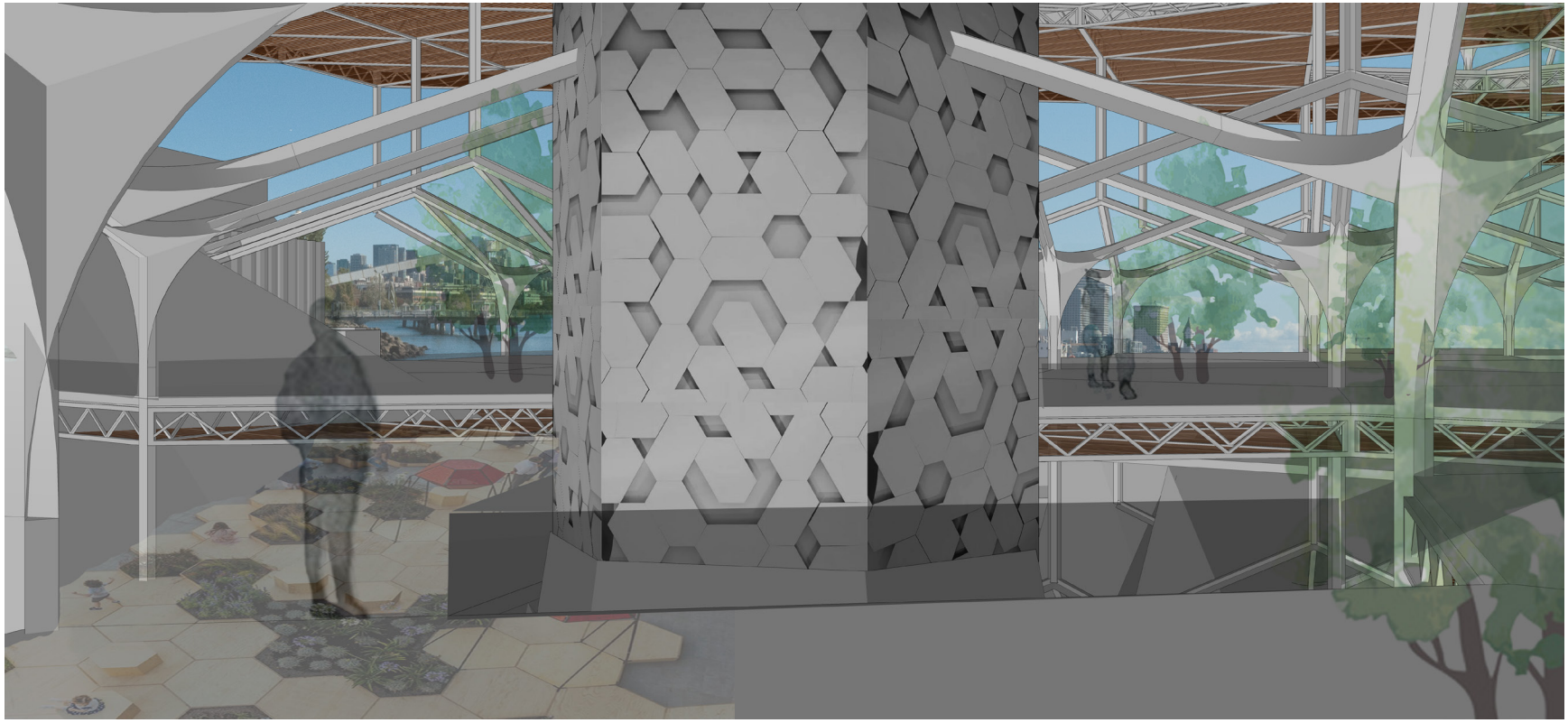


Figure 50: The nursery platforms are where the public and bereaved mix for the first time in the realm of promise for new life and memories of the past.

(Illustrations by the author)

PUBLIC PATH:

- threshold – end of journey and return to city

Finally, whether mourner or public explorer, all visitors exit the same way, circulating down one of the memorial light wells to the public path that lies at the transition between the two worlds (See Figure 51). Treated as more of a permanent vertical park than the ever changing growing floors, the path provides moments of pause and contemplation where one can look out on different framed views of the surroundings or up into the jungle of green and steel above. The last step of the procession is back out to the public realm of either the waterfront trail or fractured park landscape as the final transition back into an active urban environment.

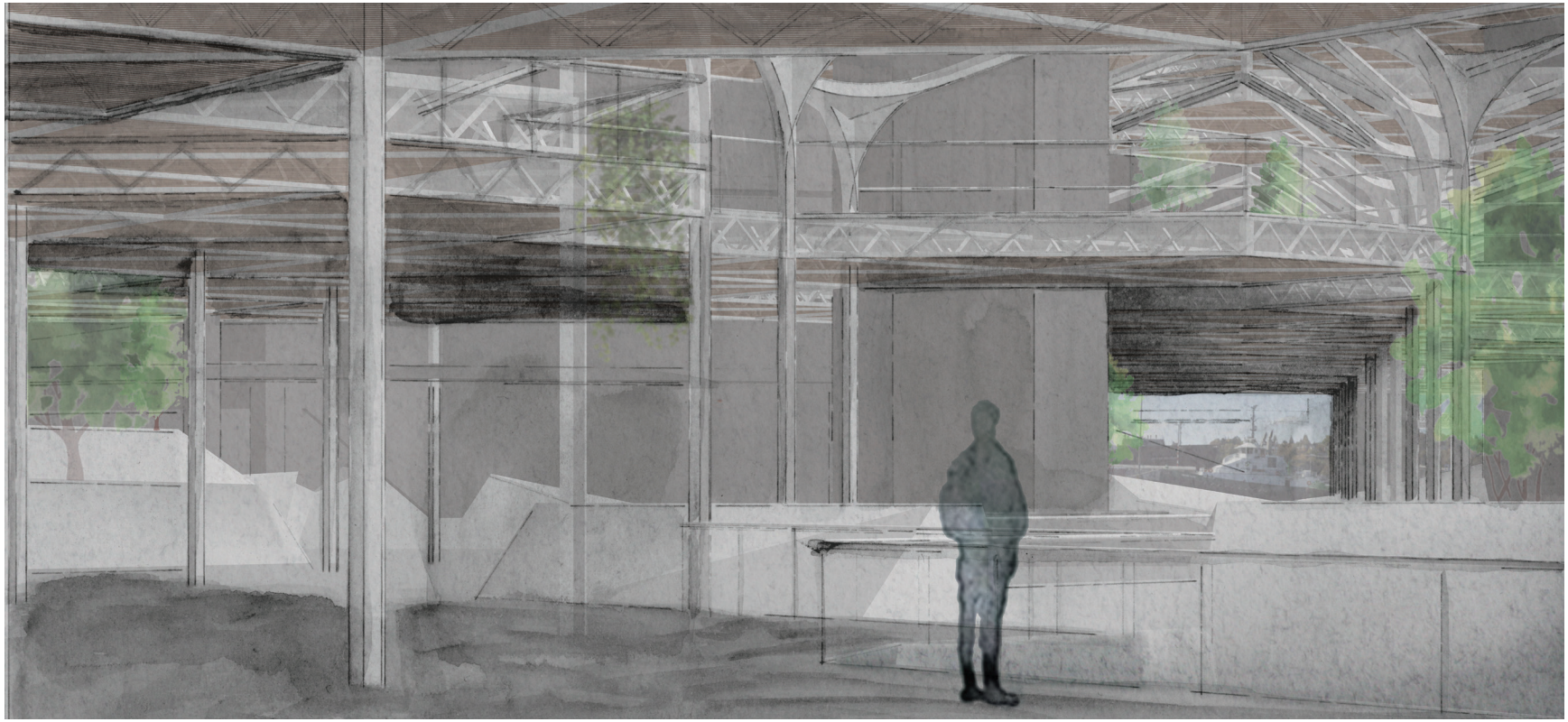


Figure 51: Exploration is encouraged on the public path through glimpses to the other levels.
(Illustrations by the author)

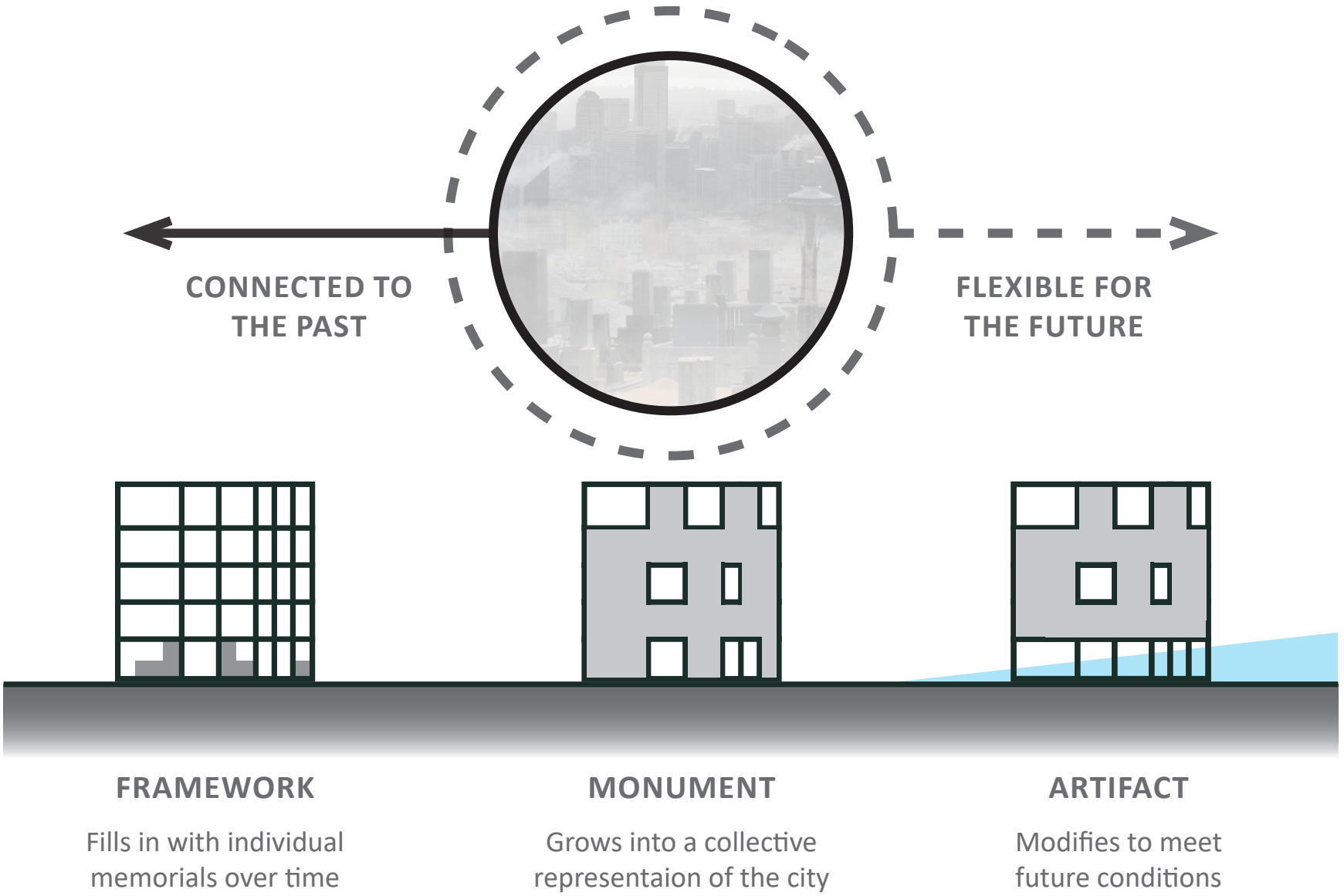


Figure 52: Theoretical framework diagram

(Illustrations by the author)

VI CHAPTER 6: POSTMORTEM - ANALYSIS AND CONCLUSIONS

Death shapes urban society in two important ways: physically though the organization of the built fabric and conceptually through the lens of human experience. Rather than merely disposing of mortal remains, this proposal utilizes the resomation method's potential of to return bodies to the natural cycle of rebirth by processing the residual matter and using it to grow into new plant life. In this way the project is both memorial to the past and contributor to the future.

The focus of this thesis is the idea of a platform for exchange between typically isolated scales and groups. Rather than the specific formal response, it is the relationships between the dead, their loved ones, and the public, or the personal territory, the city, and the region that are considered. These are complex and rich issues, and this proposal remains a loose schematic open to further interpretation, reinvention, and refinement. Because of the breadth of the issue, it is difficult to evaluate its ultimate success as there may be a multitude of other potential investigations that could change the course of thinking. Therefore, the analysis is more about the broader goals and the ideas that they generate.

One of the major goals of this project is to focus thinking about architecture of the fourth dimension, imagining the influence a single built work can have on urban fabric and society over years, decades, and centuries. Using a cultural institution that is about to undergo intense change, one that inherently deals with temporal and personal connections, allows for a rich exploration of future possibilities and impacts.

The issue of sustainability is by nature forward looking. This thesis seeks to create a new urban strategy that is not only more environmentally friendly than the alternatives, but that also contributes positively to its social environment, turning what is often a devastating life experience into an offering to the community. It is the contention of this thesis that systems level thinking must continue in parallel with practical improvements in order to advance the field of discourse and possibility.

Located on Elliot Bay, facing the Olympic Peninsula and downtown Seattle, the Ouroboros Project seeks to integrate spaces of the dead into the urban fabric. A new typological system is proposed to reunite the communal nature of the city with the memorial of the necropolis, to be a generative force for the improvement of the civic landscape. The project is a symbolic representation of the benefits of working together to create something greater than the sum of parts. Altruistic desires to make a difference in one's community combine with the individual desire to be remembered. Like the city, it is open to all who wish to participate, providing a structure for working within, while allowing for a multitude of uses and outlooks.

Figure 53: Around the world people are looking to bring celebration and appreciation of life back into our mourning rituals. Advertisement for Nishinihon Funeral Service in Japan.

Re-imagining the cemetery as an open public space allows both mourners and other citizens a connection with the past while enjoying iconic views and interaction with the natural world. The permeable landscape of the project allows leisure, exploration, and contemplation to overlap. This exposure benefits the public, venerates the dead, and creates an iconic terminus to one of Seattle's biggest future amenities, the waterfront redevelopment. It can evoke curiosity, empathy, and compassion between groups that would not normally cross paths. Consideration of how architecture fits within and influences larger systems is perhaps the most pressing and exciting issue in the field today.

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