

Reimagining Satsop:
Future Life for an Industrial Ruin

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Abstract

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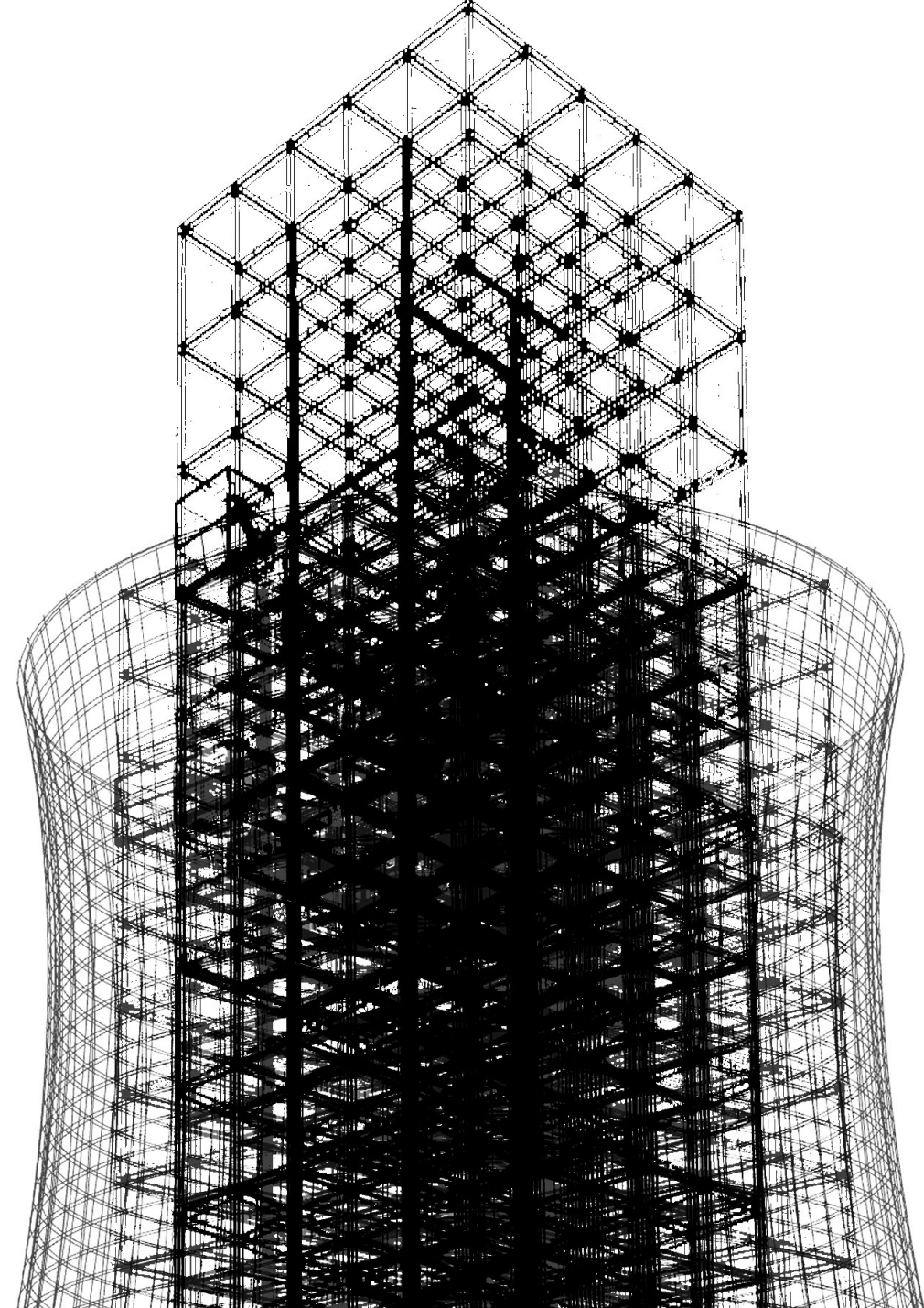
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As a strange and alluring artifact of abandoned industry, the Satsop Nuclear Plant has been represented and re-represented by many. This never finished industrial ruin is irreversibly tied to the optimism of 20th century nuclear technology and the project's subsequent failure, trapped in a state of tension between permanence and decay, the future and the past. Reimagining Satsop examines the site's entangled histories and questions how this disregarded industrial artifact can transform for future utility. This thesis explores imagination and transience within stigmatized abandoned structures, highlighting the power of perception and the role of architecture in constructing layers of physical strata and collective meaning.



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This thesis would not have been possible without the generosity of those who have inspired, advised, encouraged and supported me. I extend my deepest gratitude to Jeffrey Ochsner and Susan Jones for guiding me through this journey.

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PROLOGUE



Embracing Uncertainty

This thesis searches for an expression for the human experience of a specific place in the context of larger questions about rural community, landscape, and industry. The never finished Satsop Nuclear Plant near the Chehalis River in southwest Washington is irreversibly tied to the optimism of twentieth century nuclear technology and the project's eventual failure, now trapped in a state of tension between permanence and decay, the future and the past.

In summer 2019, I came across the Satsop site on a drive to the Washington coast, and the strangeness and vacancy of this place stuck with me. When it came time to choose a thesis project, I decided to return to the Satsop site as an exercise in imagination. However, like so many other things since March 2020, this thesis has been substantially shaped by circumstances of the COVID-19 pandemic.

Fig. 1 Satsop Nuclear Power Plant

After my tour of Satsop was cancelled early in the pandemic, the inability to visit followed by general isolation became an important condition of the project as it forced me to look inward to find a design response that expressed what I was only able to imagine. Largely working from information and images available online and from personal imagining, I built a relationship with this tower that I had never actually experienced. So my thesis project became a work of imagination by necessity, but it also speaks to a universal desire to understand the presence of our bodies in space, the relationship of materiality and imagination, and the sense of loss and grief that resulted from Satsop's initial optimism followed by failure. Thus, my thesis project explores overcoming failure and making something when initially all may seem impossible. Addressing a site of emptiness and loss became for me a way of coming to terms with my sense of loss and feeling of isolation under the peculiar circumstances of spring and summer 2019.



|
INTRODUCTION
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This project began as an investigation of the abandoned Satsop nuclear complex, a visible but largely unknown site near the Chehalis River in southwest Washington. Study of this site revealed deeper questions about comprehension of time and the role that built artifacts play in perception of time and memory.

This thesis considers the meaning, memory and future of industrial lands, the intertwinement of space and time, decay and longevity.

The scale and heft of Satsop's structures engenders a sense of permanence which defies common perceptions of time. Yet, simultaneously, the decay of these abandoned structures brings an acute awareness of time's relentlessness and ultimate fragility.

These uncelebrated monuments symbolize elements of our collective history, yet they are mostly forgotten.

Perhaps the fate of Satsop suggests a larger conversation about rural communities and industry as the forgotten fragments of our society today. But this thesis primarily questions architecture's potential to shift the way we perceive our industrial past and imagine potential futures of these remains.

Fig. 2 Detritus at Satsop Nuclear Reactor



II

THEORETICAL FRAMEWORK



“The places in which we have experienced daydreaming reconstitute themselves in a new daydream, and it is because our memories of former dwelling-places are relived as day-dreams these dwelling-places of the past remain in us for all the time.”¹

Gaston Bachelard, *Poetics of Space*

The two conceptual themes of memory and meaning guide this thesis. In regards to physical space, philosopher Gaston Bachelard links memory to imagination in how people make sense of the world in which they find themselves, through the poetic language of images and likeness which expand the internal structures of the world.² The reverberance of past comes from our associations of things, as we prescribe meaning to the spaces and artifacts we encounter, which then shapes our experience of future spaces and artifacts.

Our experience of buildings and places is undeniably linked to memory, but in a way that is framed by our anthropocentric perception of time. We think of past and future, layered histories of place, decay and permanence. Meaning emerges from our limited temporal perspectives and our individual associations with artifacts or places.

Fig. 3 Satsop Cooling Tower



Memory

Italian architect and theorist Also Rossi argues that built space is the locus of collective memory, as it gathers traces of lived experience, embodied in artifacts that Rossi calls monuments.³ Monuments may have associations to events, histories, places or spirits, but always they contain memory.

Memory is not an exact science; it is rarely completely accurate and often cumbersome. For Rossi, architecture is a constant reinterpretation of memory, an assembly of fragments from disparate things continually altered in a constant state of becoming. The built form is an embodiment of our collective memory.⁴ We think of memory in terms of time, but memory encompasses time beyond its linear progression, suggesting elements of duality, tension, permanence, and place. This thesis considers our memories of post industrial remains and how our memories are shaped by our anthropocentric associations.



Fig. 4 Homesteaders and their home, 1900

Meaning

Humans have a fundamental desire to make artifacts that endure, compelled to resist the endless cycle of nature's eroding forces. This pursuit is part of what defines humanity, but it is through collective understanding that the artifacts acquire revelatory quality or meaning. German-American philosopher and political theorist Hannah Arendt describes this as "the human condition."⁵ According to Arendt, the production of worldly objects is significant in that it is human fabrications that endure beyond the lives of their producers and provide a source of instruction for the future.

Industrial structures are often built with a similar permanence, yet they hold a different place in the human mind due to the paradoxical character of our relationship with industry. The distance of industry from everyday human activity can mean we have few personal associations with industrial structures. The remains of industry may remind us of the past, but they also allow other associations if we now encounter them as ruins.



Fig. 5 Old Building in Centralia, WA

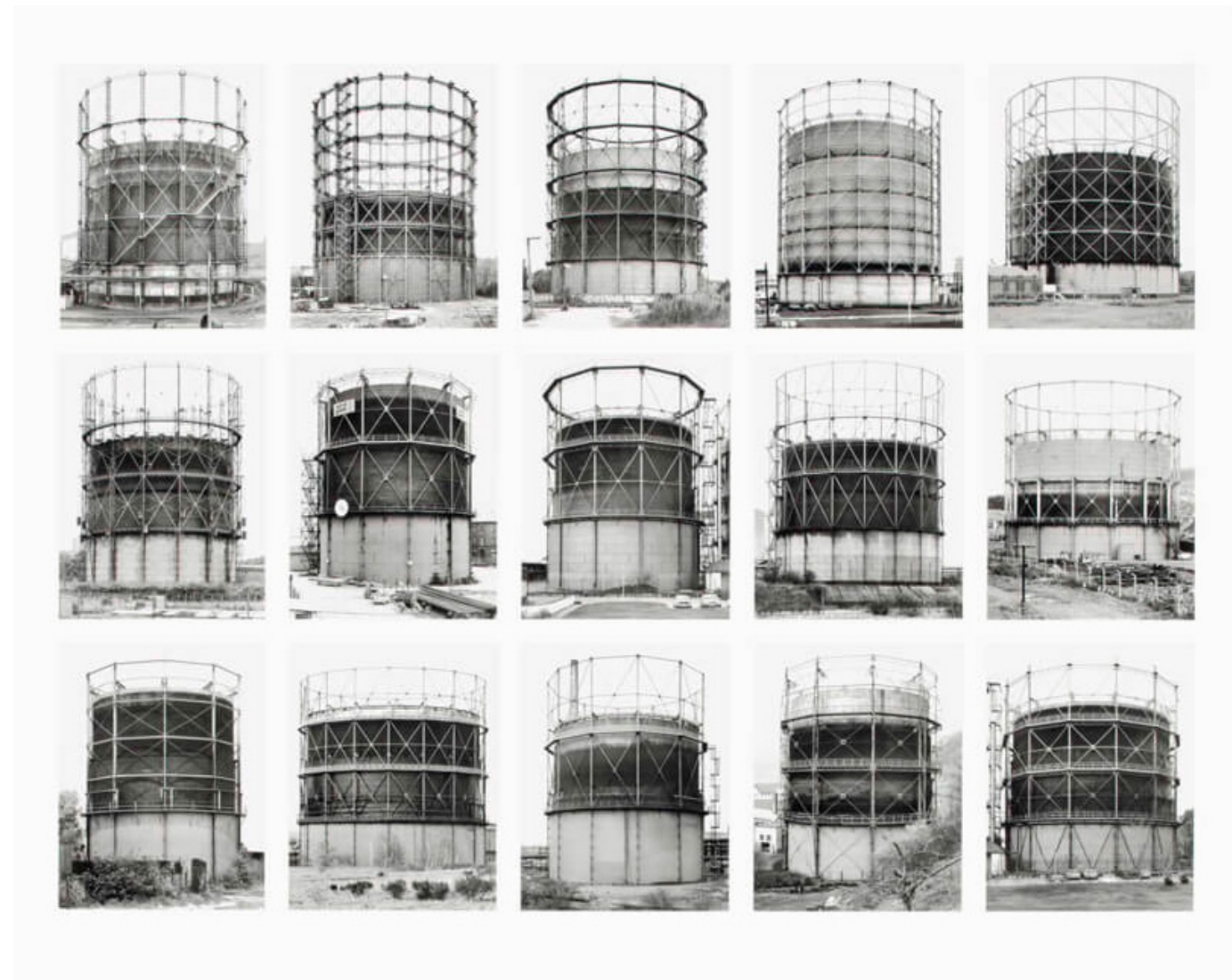


Fig. 6 Gas Tanks 1965-2009, Bernd Becher and Hilla Becher

Industrial Remains

As a typology, industrial infrastructure is often associated with sentimentality or stigma. The images included here (to the left) show photographs by German photographers Bernd and Hilla Becher documenting the architecture of industrial structures as a typological study. Beginning in the early 1960s, German artists Bernd and Hilla Becher spent decades photographing hundreds of industrial plants and buildings in Europe and North America, such as water towers, blast furnaces, and gas tanks. The structures were photographed in an obsessively formalist way that explored the notions of archive and emphasized the structures' monumental effect.⁶

In his work *Homage to Bernd Becher* (to the right), British artist Idris Khan superimposes the Becher photographs into a densely layered composite image, representing the way these structures exist in our collective memory, as one blurred, singular symbol of industry. The resulting ghostly palimpsest suggests the serial nature of the original documentation and also a melancholy reminder of passing time.⁷

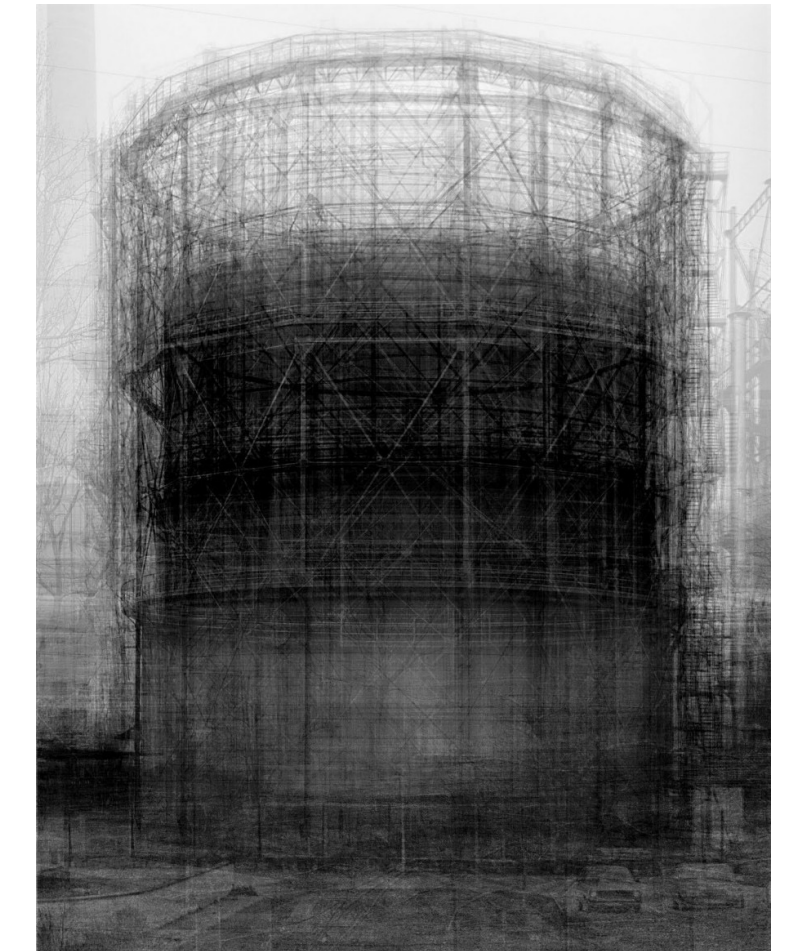


Fig. 7 *Homage to Bernd Becher*, 2007, Idris Khan



Fig. 8 Explosions demolish power station cooling towers in Kent

As objects transform and decay, their meaning may evolve. Yet, as we transition to new technologies and new sources of energy, these associated structures often become obsolete. Most are demolished, with very few examples of reuse or preservation. These human constructions are lost and increasingly recede from memory. Demolition also means sending millions of pounds of rubble to a landfill, a huge waste of potential resource. The investments of capital, materials, creative thought and ingenuity are simply thrown away.

In *Post-Industrial Landscape Scars*, Anna Storm, a researcher at Stockholm University, offers the scar as a metaphor in approach to deindustrialized sites. Post-industrial landscapes are places which have been marked in some way by the political, social, and economic forces of the past which at some point receded. Abandoned sites are often described as a ruined landscape but Storm prefers the scar metaphor in its ability to emphasize the

interconnectedness between the different layers of history in the landscape and need for reconstruction after acute or traumatic conditions, particularly in post-industrial places with chronic economic and social losses.⁸ As a ruined landscape, the Satsop site is presently stuck between the healing and scarring process, left as a temporal and physical void.

Retaining ruins holds both physical and cognitive value. In our society of ever-increasing rapid change, physical relics remind us of our collective memory and give meaning to life. However, the often inhuman scale and singular forms, along with negative industrial associations, pose a real challenge for reuse. And lacking familiarity and the linkage of personal memories, they seem less pressing as a focus of preservation. Each piece of obsolete industrial infrastructure poses an individual challenge if it is to continue to contribute to both our present and future.

III

FRONTIER OF TIMBER AND SEA



“The immensity of geological time is alien to the human mind but change is noticeable in small and scattered ways - a river cutting a new course, a swamp filling in, scree tinkling down a mountain slope. No landscape ever is formed, paste tense. All are forming at a slow, steady, unending pace.”⁹

Ruth Kirk, *Exploring the Olympic Peninsula*



Fig. 9 Satsop Vicinity Aerial



A History of the Chehalis Valley

The Satsop site can only be understood in a larger context of the Chehalis Valley, a rural landscape surrounding the winding Chehalis River punctuated by small towns, lying between the towering Olympic Mountains to the north, the Willapa Hills to the south, both of which are covered with dense forests.

Geological processes have shaped the complex physical landscape of the coastal Northwest, while migration of people, relationship to natural resources and industrial movements have shaped the cultural and socioeconomic landscape of the region as it is today. At the southern edge of the Olympic Peninsula, the Chehalis Valley offers a view of early settlement pioneer history and longstanding relationship with logging and the timber industry. The timber industry has been in decline in recent decades, presenting an uncertain future for a region historically dependent on a resource extraction economy.

Fig. 10 Chehalis Valley

Glacial Landform

Many aspects of the Pacific Northwest landscape were formed by glacial landforms and waterways of the region. In the last glaciation period, the Pleistocene Ice Age, the Cordilleran Ice Sheet advanced into the Puget Sound region out of western Canada and formed a glacial formation known as the Puget lobe. At glacial maximum around 14,500 yr B.P., the Puget lobe reached as far south as present-day Tenino and buried the region under several thousand feet of ice.¹⁰

As the climate warmed towards the end of the Pleistocene Ice Age and the Cordilleran Ice Sheet receded, glacial meltwater carved dozens of channels that flowed southwest where meltwater was eventually carried out to the Pacific Ocean. One of these stream channels formed the wide valley of the Chehalis River Basin.¹¹

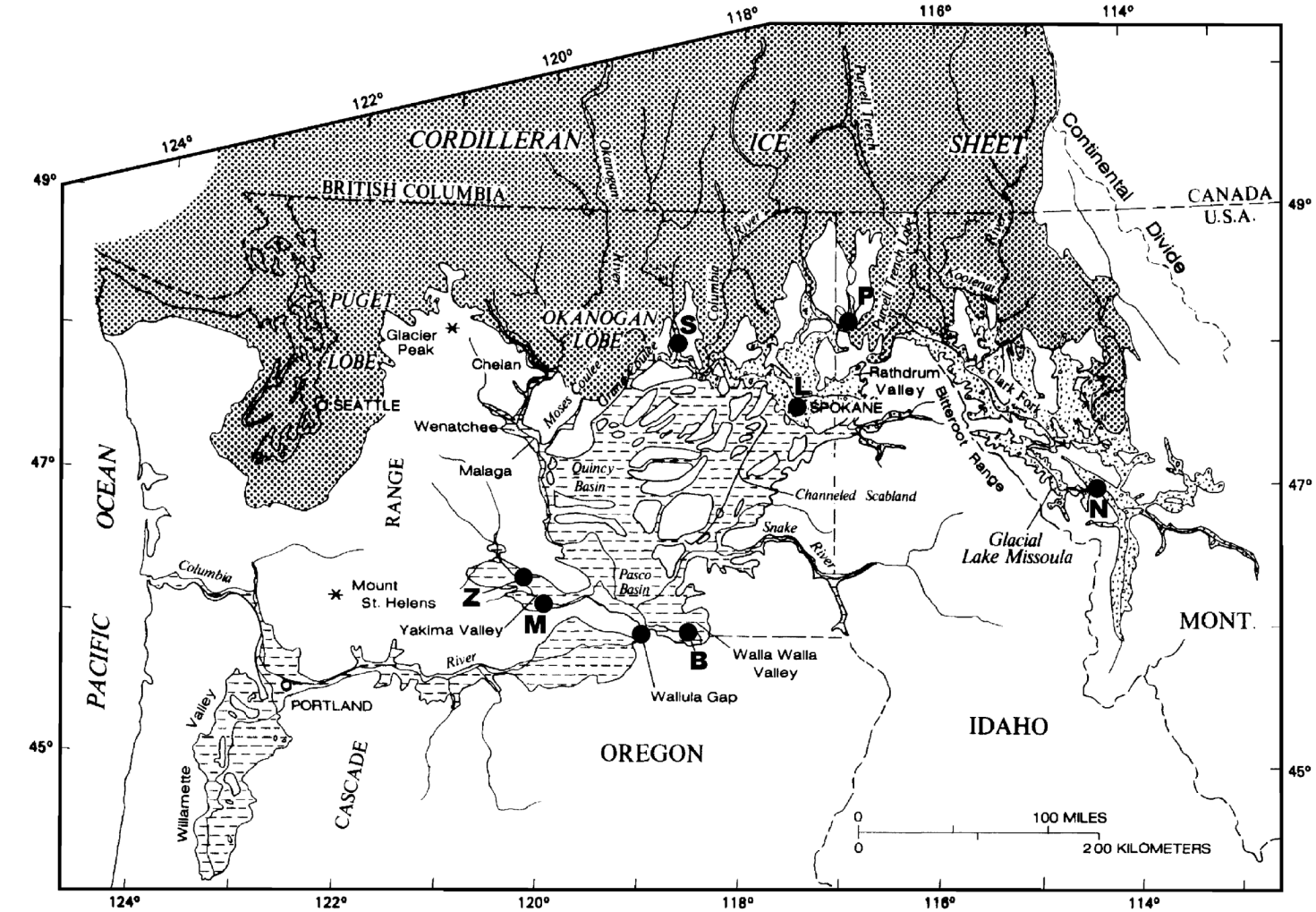
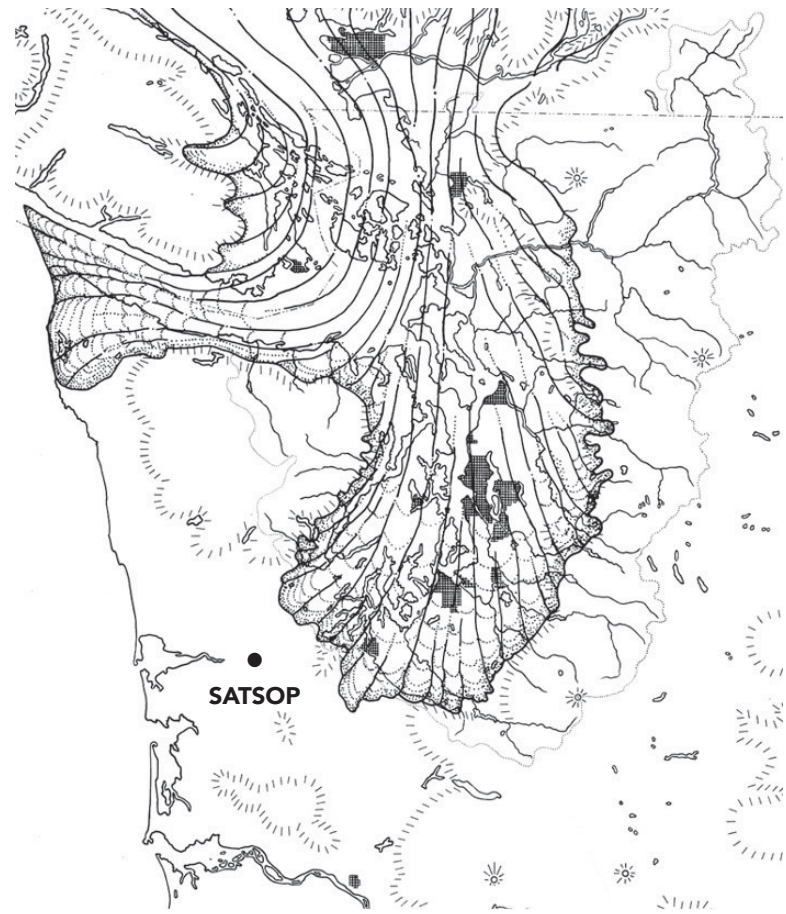


Fig. 11 Maximum extents of the Puget Lobe
 Fig. 12 Pacific Northwest Glacial Landforms

Land & Sea

The contest between ocean and rock is evident where the Pacific Ocean meets the Olympic Peninsula, with dark caves and tunnels, the ebb and flood of tides, and the continual shaping and reshaping of the earth. Land is constantly eroding into the sea, but is also rising up from it. Subduction forces the land upward to add layers of material from below while erosion carries away the oldest sediments from the top. As the coastal areas rise, sands shift and fill in the voids, causing the land at the coastline to grow outwards towards the sea in a perpetual coalescence of new land. Inland, the towering Olympic Mountains rise from the Pacific Ocean. Part of the Pacific Coast Range, the relatively young Olympic Mountains are craggy, not yet rounded by weathering and erosion. The mountains originate from sediment collected by the Juan de Fuca plate, scraped off with movement against the continental crust plate, rising to their highest elevation with Mount Olympus at 7,980 feet.¹²

The mountain range is bounded on three sides: the Pacific Ocean to the west, the Puget Sound to the east, and to the north the Strait of Juan de Fuca. Sustained by the enormous amount of rain released over the peninsula, glaciers and snowfields cover the higher peaks, flowing to the many rivers and tributaries that radiate outward from the range. Snowmelt streams flowing to the south run into the Chehalis Valley, where the Chehalis River eventually carries it to the Pacific Ocean at Grays Harbor.¹³



Fig. 12 Washington Coast on the Olympic Peninsula

Forest

Even before the last ice age, forests of evergreen cedar, douglas fir, spruce, and hemlock covered the region. As the peninsula landscape was deglaciaded during the late Pleistocene, park tundra vegetation invaded the newly uncovered landscape. After 10,000 B.P. the park tundra vegetation was replaced by forests with Douglas fir and alder, and later Western hemlock, Sitka spruce and Western redcedar.¹⁴ Today, the Olympic Peninsula supports remarkably lush forests, towering overhead evoking cathedral-like qualities both in monumental height and soft, billowing light. Ideal growing conditions have produced some of the largest trees in the world: in the protected Olympic National Forest conifers rise up to 300 feet high.¹⁵ The region's dominant game resources are deer and elk, while anadromous fish migrate through the Peninsula rivers, tributaries and ocean. Bald Eagles, while rare in much of the U.S., here soar beyond the mountains, valleys, and ocean watching for fish.

In contrast to the ancient forests of the Olympic National Park, with trees up to six hundred years old, the Chehalis Valley and surrounding area is today characterized by a patchwork of cutover timber hills. From a distance the forests read as a mosaic of harvest and replanting in various stages of regrowth.



Fig. 13 Western Hemlock in the Olympic National Forest

First People

Coast Salish tribes have fished, gathered, and hunted on the Olympic Peninsula at least since 2000 B.C.E. (and likely longer), thriving on a cultural symbiosis with natural resources and developing a rich tradition of ancestral storytelling. The Coast Salish comprises many tribes with distinct cultures and languages; however, trading between tribes and following seasonal rhythms were common practice.¹⁶

On the southern Olympic Peninsula, the Chehalis tribe once occupied a large area within the Chehalis River Basin reaching from the foothills of the Cascade Mountains to the Pacific Ocean. Traditionally called “People of the Sands,” the Salish-speaking Chehalis people thrived for many centuries living in cedar longhouses oriented towards the river from which they received a bounty of salmon and other river-based sustenance.¹⁷

They lived this way for centuries, until they were forced to give up their ancestral lands by white settlers. The Chehalis did not sign a treaty but in 1860 the Chehalis Reservation was established near Oakville, Washington along the upper Chehalis River. By the 1920s, relocation and assimilation efforts had impacted nearly every aspect of Chehalis life.¹⁸



Fig. 14 Chehalis Woman with basket weaving items

*“Many years ago, T’ist’ilal was a giant, a thunderbird that lived in an ice cave at the base of the Blue Glacier on Mount Olympus. This was the headwaters of the Hoh River. When this bird blinked, lightning flashed from its eyes. His wings were larger than two Hoh or Quillayute war canoes. He shook the mountains with the flapping of his wings. Thunderbird could carry a whale in his talons, and great battles waged between them in the ocean, on Mount Olympus and in the prairies along the Hoh and Quillayute rivers.”*¹⁹

Ten & Two Magazine, *The Hoh Forever*

The Chehalis people primarily shared their histories and traditions through storytelling. Oral traditions of the Chehalis and other Coast Salish people recount ancestral history and traditional ways of life using symbolism and memory devices such as rhyming in order to ensure these stories are remembered and retold for generations.

Fig. 15 Thunderbird on interior ceremonial screen

The stories often feature animal characters to explain natural phenomena, in line with the Coast Salish wisdom regarding their orientation to the environment and to each other. Through this rich cultural tradition of storytelling in carrying knowledge, stories relating to natural events could be traced to events as far back as a large Seattle fault earthquake around A.D. 900.²⁰ For example, tales of a great struggle between the Thunderbird and the Whale is considered a common native depiction of seismic activity throughout territories in the Pacific Northwest. The Thunderbird and Whale in Native American stories are usually creatures of supernatural size and power, and although native myths differ between tribes, the acts and power of these supernatural beings generally describes the effects of earthquakes or tsunamis. Recently, University of Washington research scientists in Earth and Space Sciences have found numerous instances where such native stories occur on or near sites of known seismic activity such as the Seattle fault and Cascadia subduction zone.²¹





The Frontier

As a prominent theme in American history, the *frontier* represents an edge between the known and unknown, the settled and the wild. The frontier can be a place, or possibly a mental realm about new ideas and new possibilities fueled by virtues of self-reliance. American settlers first arrived to the western frontier by way of the 1843 wagon train across Naches Pass towards a land of legend and mystery. Following the first Chehalis Valley settlement in the 1850s, various industries were tried without success. Settlers from the East and Midwest came to the unsettled land of the Pacific Northwest with agricultural aspirations but found the land covered by towering impenetrable forest. The timber at first was an obstacle to agricultural settlement, but settlers soon developed logging and mill operations making timber a valuable resource to an emerging industry.²² Early growth was largely dependent on the timber industry as settlers and immigrants carved a living from the forest.

Fig. 16 American Frontier

In 1877 the cannery industry was started on the Grays Harbor waterfront to exploit the abundance of salmon, and by 1884 sawmills had been started in Aberdeen, Cosmopolis and Hoquiam.²³ Early on, proximity to the sea facilitated shipping Pacific Northwest products including timber, canned fish, and coal, to markets in California, the East Coast, and Asia and the Pacific islands. Regional proximity to Grays Harbor meant jobs and promise of economic prosperity, drawing ambitious settlers to the Northwest. Migrants from Europe also arrived to the area by way of the coast in search of employment and opportunity. The abundance of extractive products led the region to develop an urban industrial identity more than the rural agricultural identity common to much of the western frontier.



Fig. 17 Sawmill at Montesano, Schafer Brothers Logging Company



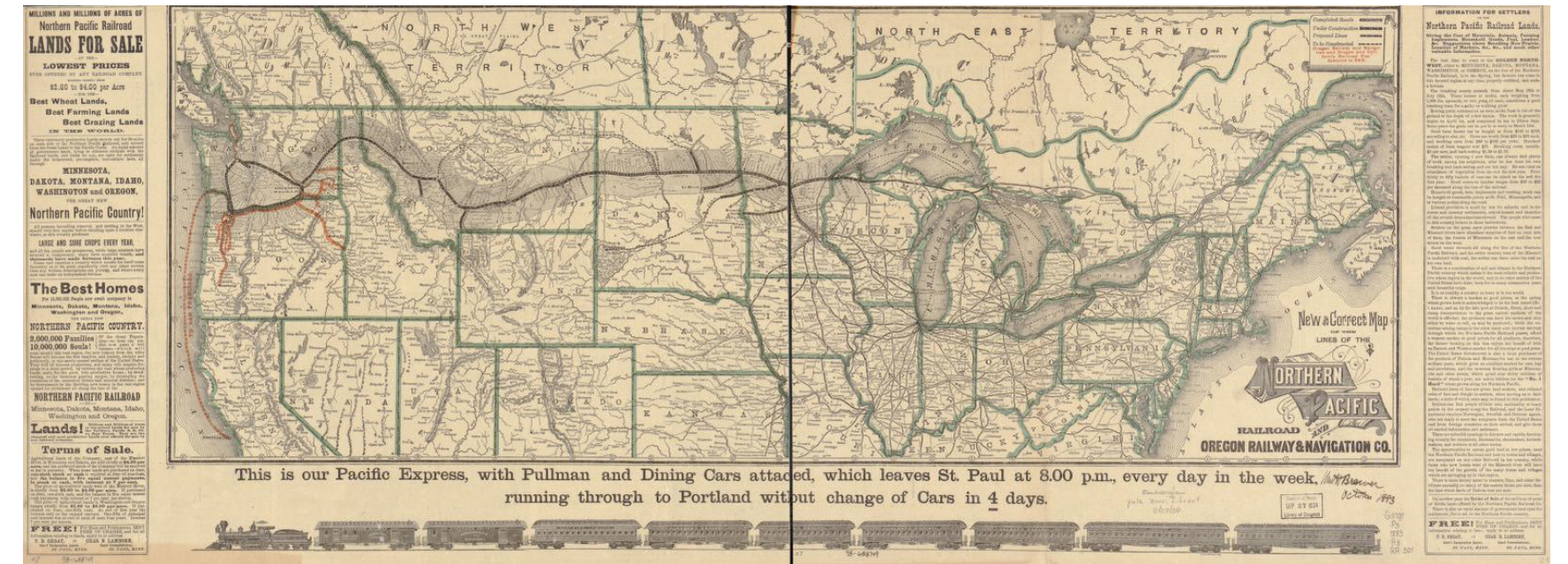
Fig. 18 Chehalis County, Washington Pamphlet Cover, 1909

Fig. 19 Northern Pacific Railroad Company Map, 1883

Boom and Bust

The early Chehalis Valley towns were connected by their industries but physically isolated without roads or rail. The Northern Pacific Railroad built a line from Chehalis to Grays Harbor in 1892 passing through the established mill towns to end at the new seaside town Ocosta, fostering speculative growth. Knowing the economic opportunities that came with the railroad, Hoquiam and Aberdeen residents and local logging companies banded together to construct a spur. By 1895 this homegrown line connected the Northern Pacific tracks to Aberdeen then to Hoquiam, enabling these towns to become commercial hubs.²⁴

In the early 1900s population soared in Grays Harbor County as towns with lumber mills multiplied and large regional mill operations were established (such as the Shafer Brothers Logging Company in Aberdeen) connected to major population centers by the new railroad line. Workers streamed in to work in the sawmills or canneries, or on the docks. By 1920 Grays Harbor boomed with mills, salmon and clam canneries, and shipbuilding yards.



As lumber became a global commodity, price instability caused mill owners to cut back production. At the same time, technological advancements beginning as early as the 1920s had reduced labor requirements. In the 1930s the Great Depression idled nine major Grays Harbor mills. As the economy recovered, timber companies began to develop diversified wood products, hoping to lessened the industry's stagnation, but the area never completely regained its early vigor.²⁵

While growth was the norm in nearby metropolitan areas of Seattle and Portland, the Chehalis Valley towns stagnated since the early industrial boom. Today, economic shifts and forest regulation has slowed timber activity further and extractive industries have dwindled. These rural towns seek to attract new commercial and industrial enterprises while remaining tied economically to the agricultural and timber industries. However, not long ago this region seemed to be on a different trajectory.

The Satsop Story

In the mid-20th century Washington State saw an exponential increase in energy needs due to population growth brought on by industrial development and the region's reputation for "livability." By the late 1950s and early 1960s, demand for energy in Washington was expected to triple between 1968 and 1990 and energy policy-makers began planning to increase energy production. Projected growth in demand appeared to correlate with national trends, as generating capacity in the United States grew from about 1.2 million kilowatts in 1902 to 291 million kilowatts in 1968.²⁶ The Pacific Northwest has a generous source of energy in the Columbia and Snake River River dams, but hydroelectric development potential culminated in the 1960s as the rivers' capacity for dam construction was maximized.

However, by this time nuclear energy was seen as an emerging power source with seemingly limitless potential. In 1958 the Shippingport Atomic Power Station on the Ohio River in Pennsylvania opened as the first commercial nuclear power plant in the United States as part of President Dwight D. Eisenhower's Atoms for Peace program, and public and industry leaders began proposing nuclear plants across the United States.²⁷

The energy crisis of 1973 signaled a further shift in the nation's energy production. At the time, nearly one fifth of the nation's energy came from oil. With Project Independence, President Nixon led a movement away from foreign dependence on oil to focus instead on domestic coal and nuclear electricity production.²⁸ At the same time, amid growing conservation efforts of the mid-1970s, electricity plans and policies became politicized in debates on production methods, resources, conservation and projected growth.

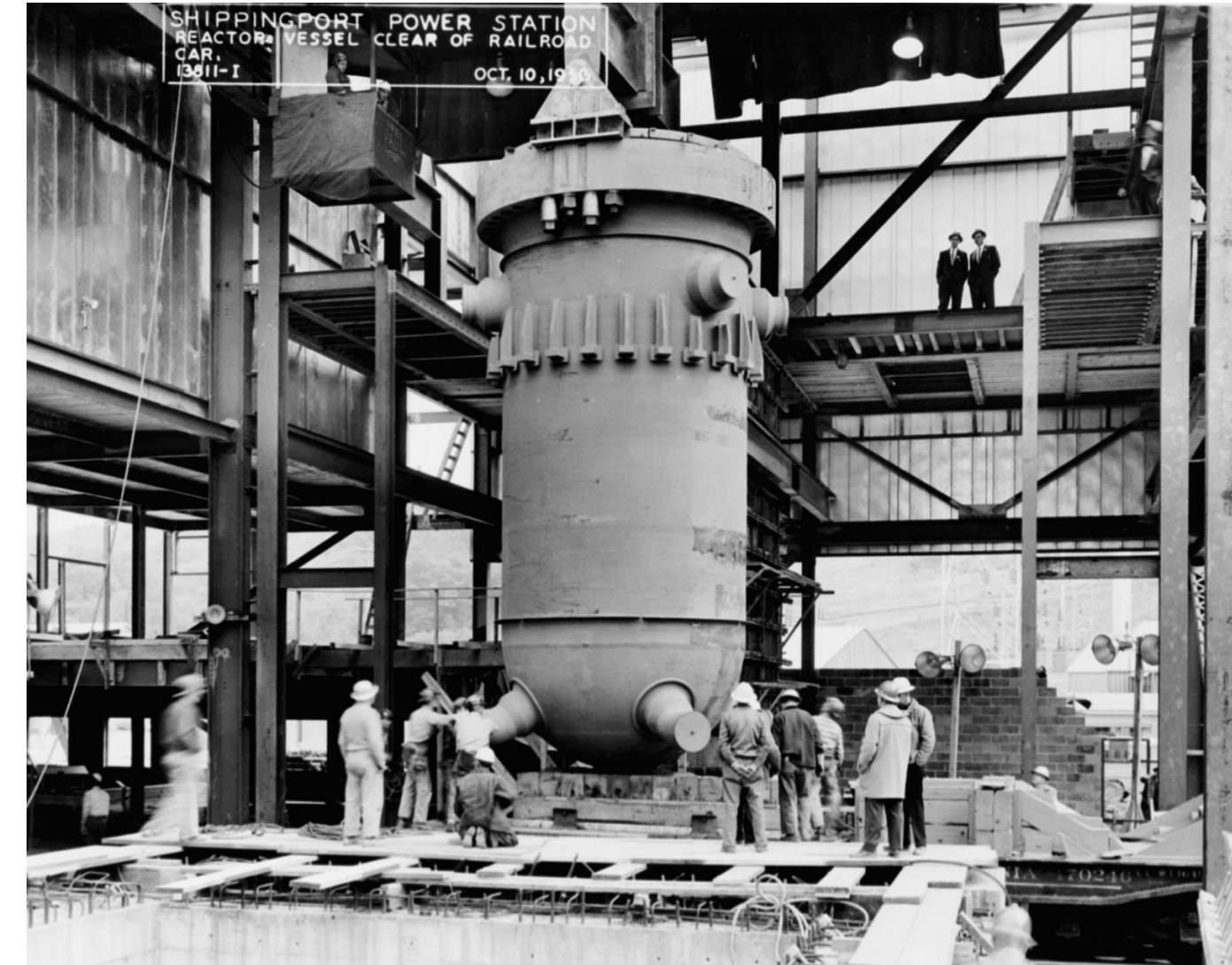


Fig. 20 Reactor Vessel at Shippingport Atomic Power Station, 1956



Fig. 21 Poster for 1948 Atomic Frontier Days

Locally, the Washington Public Power Supply System (WPPSS) made plans in 1972 to build five nuclear reactors at two sites on either side of the Cascades. Hanford was chosen for three reactors because it was already producing nuclear weapon material for the Cold War. A site near Satsop in the Chehalis Valley was selected for two of the nuclear reactors, known as Project 3 and Project 5. These reactors were projected to bring hundreds of jobs, cheap electricity, and make the Chehalis region known across the Northwest.

Through a complex unfolding of mismanagement and changing economic and political conditions in the 1980s, most of the proposed nuclear plants were mothballed or cancelled mid-construction. Only one plant in Hanford was ever opened in Washington. Both Satsop reactors remain unfinished today. The WPPSS failure became the largest bond default in US history and remains as a cautionary tale in public infrastructure investments.²⁹



Fig. 22 Satsop project collapse news clip, June 20, 1983



Fig. 23 Satsop nuclear power plant protest, Elma, July 16, 1977



Fig. 24 Satsop infrastructure

Nuclear plants were once expected to serve half of the nation's electricity needs by the year 2000; today they generate only about one fifth.³⁰ What remains in Satsop is the abandoned nuclear infrastructure, including the two 500-foot-tall empty cooling towers, representing an enormous unfulfilled promise. The empty towers loom over the surrounding forest and mark the region's troubled history.

Rather than taking on site restoration at Satsop, a difficult and expensive venture, the WPPSS transferred its assets from the abandoned Projects 3 and 5 to the Grays Harbor Public Development Authority as the Satsop Redevelopment Project, where they attempted to create a business and industrial park.³¹ Today the site offers a mix of leasable manufacturing and warehouse spaces, but it does not generate a significant economic basis for the area. At the same time, the empty towers continue to draw interest, even serving as an occasional film location, but their future remains uncertain.



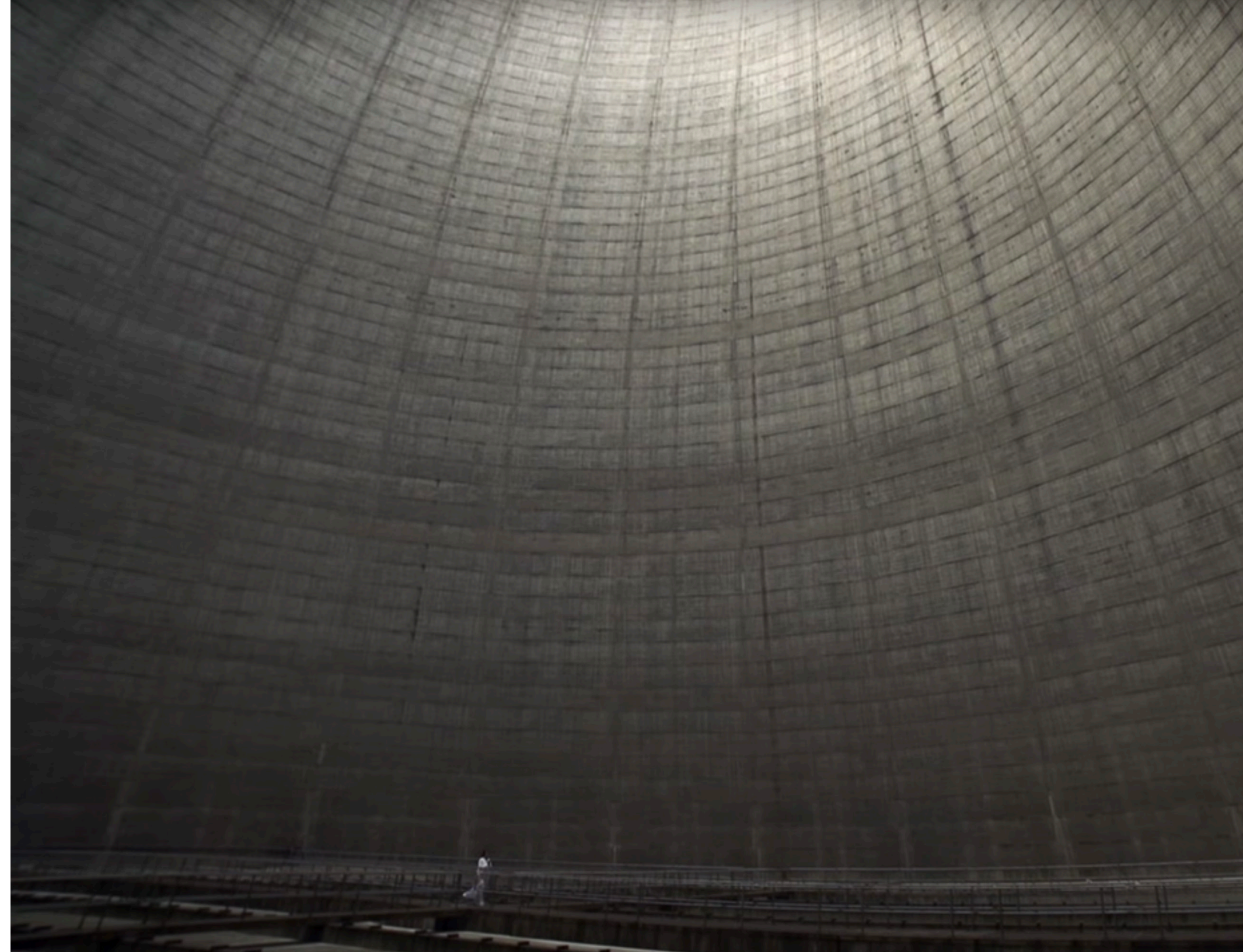
Fig. 25 Satsop cooling towers over hills

IV EXPERIENTIAL QUALITIES

The uninhabited shells of the Satsop Towers stand as an enduring symbol of the site's original function and place in society, while they also have a gravitational pull as countless photographers, performers and sound artists have tried to represent this place over the past decades. While the unique history of this place offers potential as a regional destination, their gigantic and incomprehensible forms make them challenging candidates for any kind of reuse.

In considering the future of these towers, it is the extraordinary experiences they offer that might be enhanced or captured or revealed that should shape their design futures.

Fig. 26 Echo at Satsop, Etsuko Ichikawa



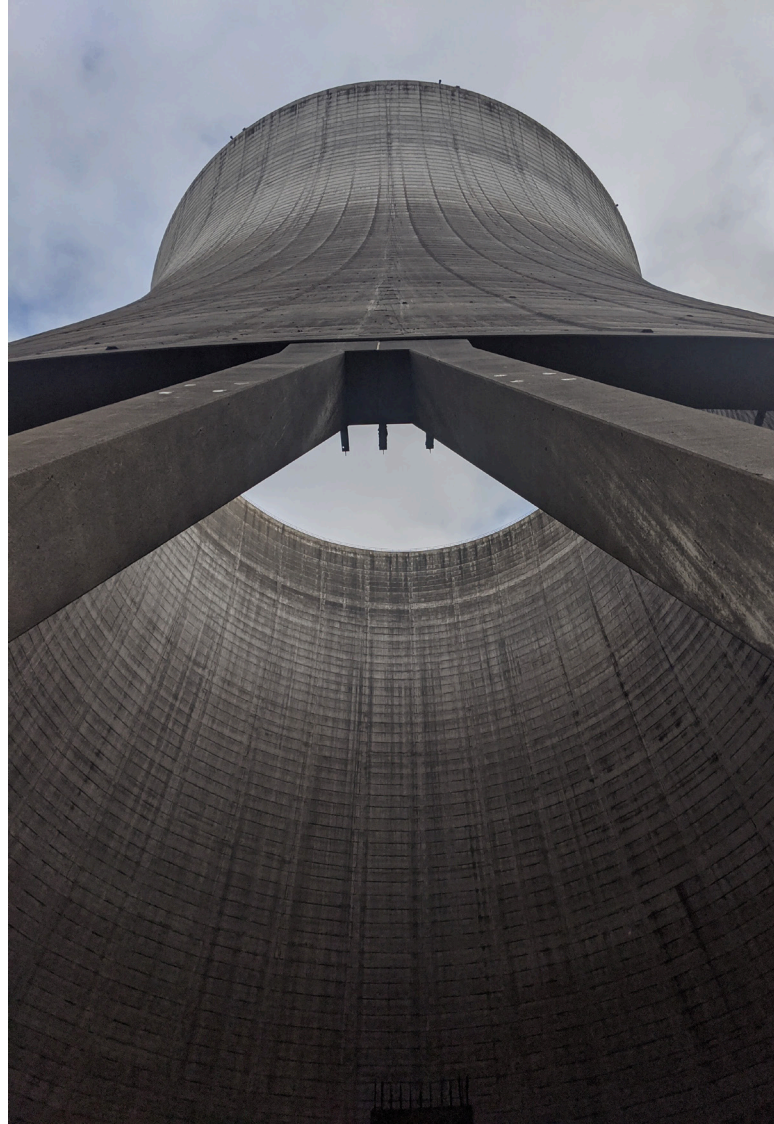


Fig. 27 Empty shell of Satsop cooling tower

Ambiguity

The scale of the cooling towers is unimaginable. There are no human scale references inside and only a narrow metal stair on the outside (which is only perceived from limited vantage points). This vacancy creates an illusion of scale with an immediate vastness, a bodily disorientation. As the curving tower surface is perceived equivalently from both within and outside of the tower, a spatial ambiguity emerges between interior and exterior space.

Framing

The towers have a specific spatial character that creates powerful light conditions, somewhat like artist James Turrell's "skyspaces." The central oculus frames the sky, giving an immediate connection to above, while collapsing the vertical depth. The sun's path throughout the day can be measured by framed light and shadows moving across the concrete surface.

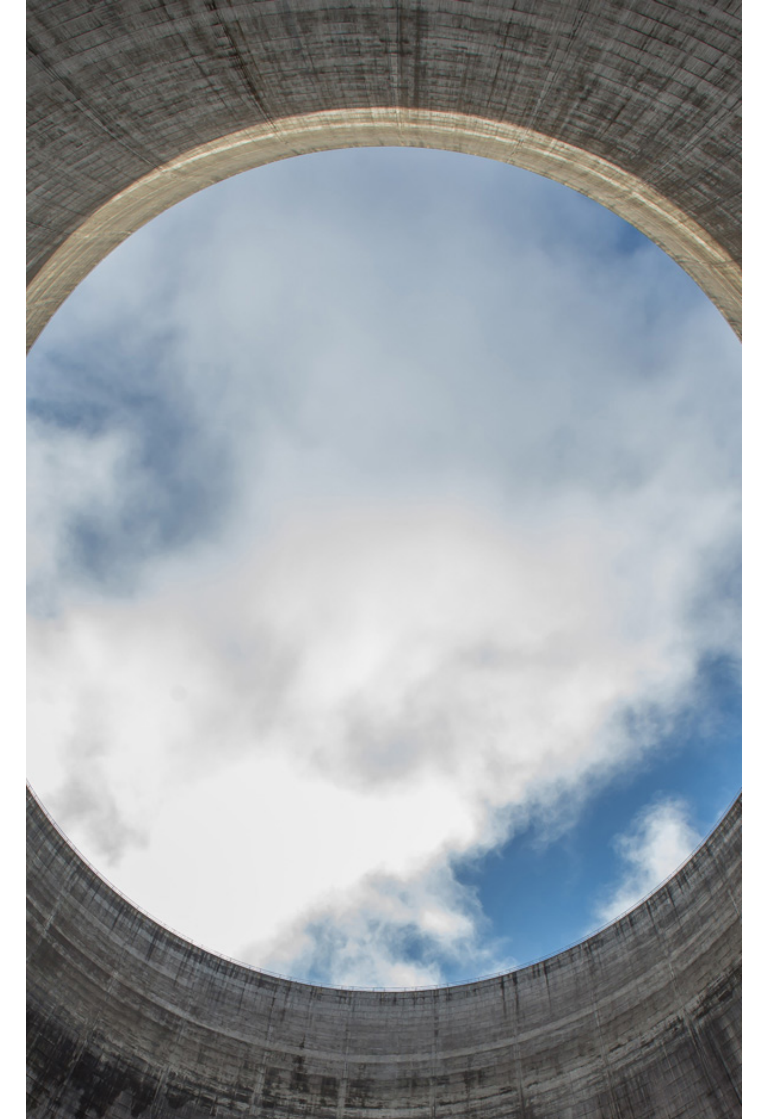


Fig. 28 Tower opening



Fig. 29 Inside Satsop cooling tower

Resonance

The towers act as a delicate instrument of voices, reverberating sounds of the body, magnifying echoes. This resonance of sound is due to the tower form, barely noticeable at the perimeter but increasingly amplified toward the center. A simple clapping of hands at the most central point sends echoes that amplify outward like booming thunder.

Amplification

The towers appear to concentrate any breeze and their reverberant forms amplify sound and wind. The enormous curvature of the surface captures and guides wind from outside the tower up through the opening above, an affect intended for the towers' original cooling function.

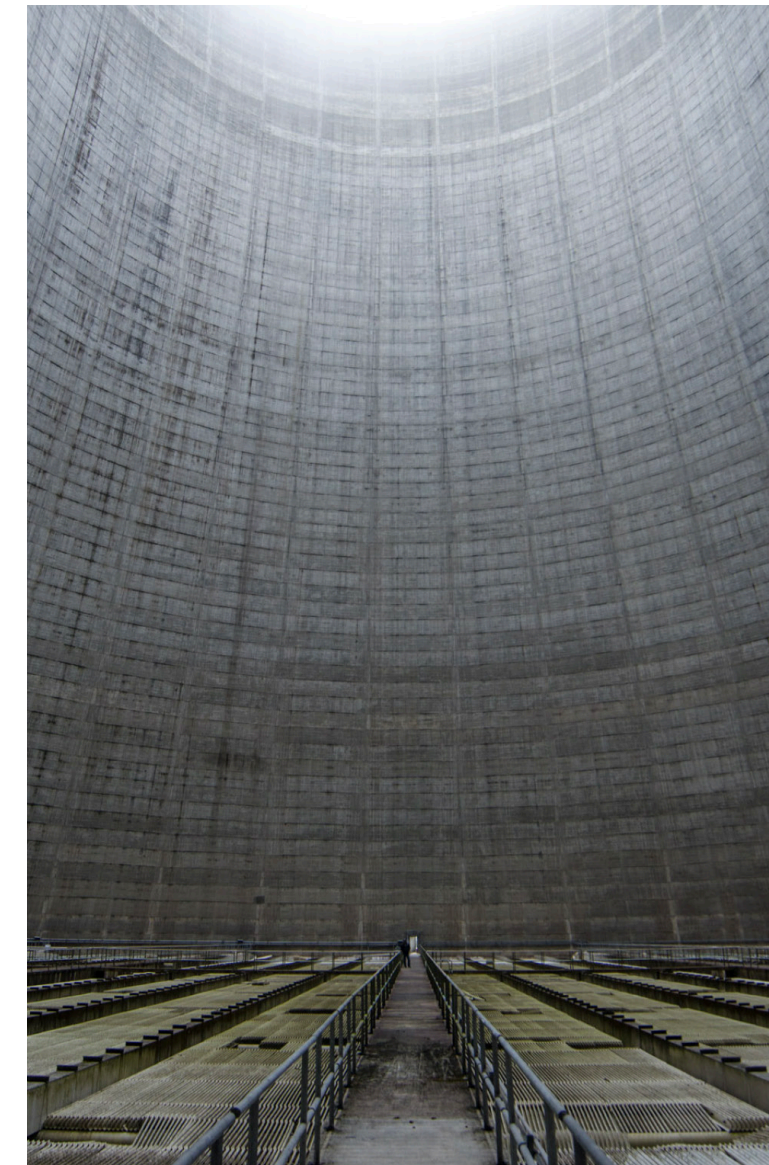


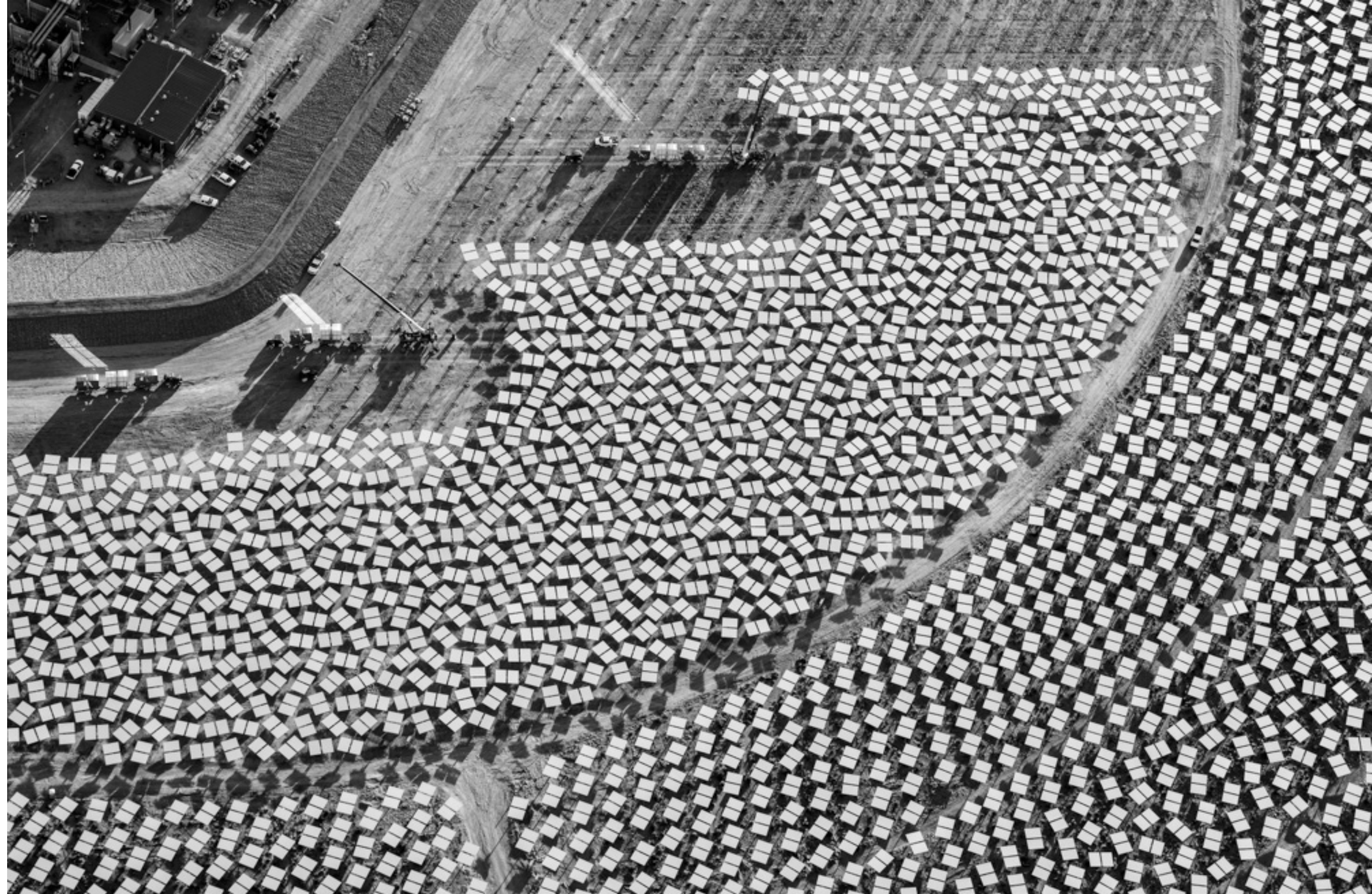
Fig. 30 Cooling tower curvature

IV TRANSFORMATION

Energy Futures

This project explores ideas of the natural and human transformation of place over time, both in reuse and decay, and proposes that architecture can emerge from extant conditions of a site to offer a reconciliatory conversation between circumstances of the future and the complex, often onerous, historical experiences which precede them. Ideally, the future of this aging and abandoned infrastructure can contribute to regeneration rather than deterioration of the environment. Through repurposing rather than demolishing, this thesis proposes a way to re-inhabit the Satsop site and transform it into an energy and tourism destination that fosters awareness, reconciliation, and protection of local and global ecosystems, while also preserving the memory of this place's past.

Fig. 31 Ivanpah Solar, Jamey Stillings



The Site

Renewable energy is no longer an emerging technology. It is now a major part of the energy market, and energy research continues to help it become more reliable and affordable. This thesis proposes an energy research facility for the Northwest at the site of the incomplete Satsop nuclear facility, retaining the memories of problematic past technology while pointing toward the renewable energy future.

The 440 acres of largely unused decaying structures are repurposed for research and tourism with research facilities, energy production, exhibits on the history and cabins for researchers and visitors. The site plan orients around reusing the original nuclear infrastructure, including the turbine building and reactor building. These two existing buildings transition into research facilities, positioned between the east and west cooling towers to form a spine of programmed spaces on the south edge of the site.

Approximately 400 acres of solar fields continue the site's original function of electrical energy generation.

At the Satsop entrance, views of the nuclear structures are obscured behind an expanse of solar fields. Relentless rows of solar panels line the main drive into the Satsop complex, recalling the agricultural fields in the surrounding Chehalis Valley.

The two towers remain as a remnant of what came before, a reminder of failed ambitions and a symbol of new technologies. To recall the historical narrative of the site and to project Satsop into the future, the design selectively reveals traces of the past but also fosters awareness through present-day experience.

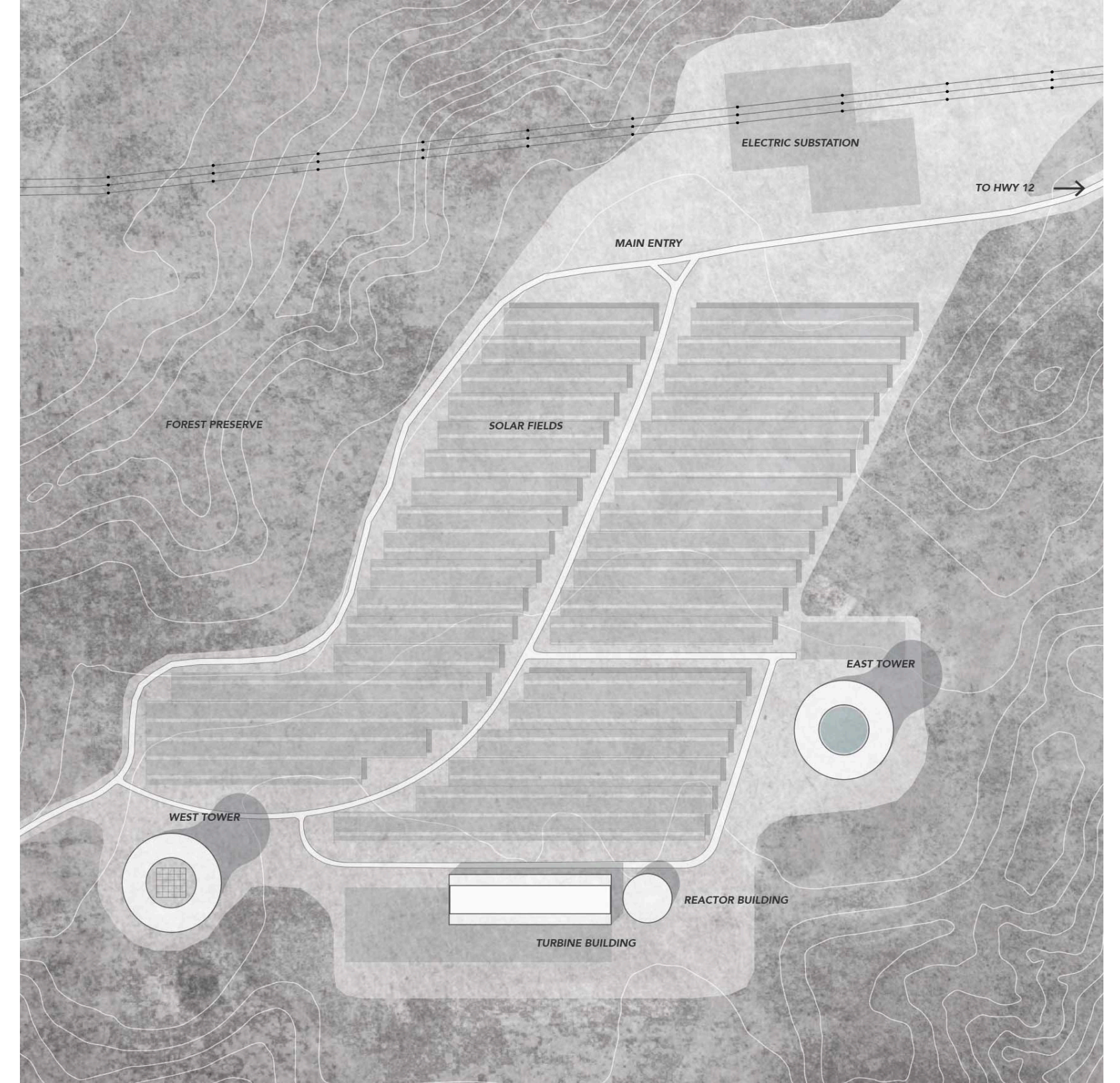


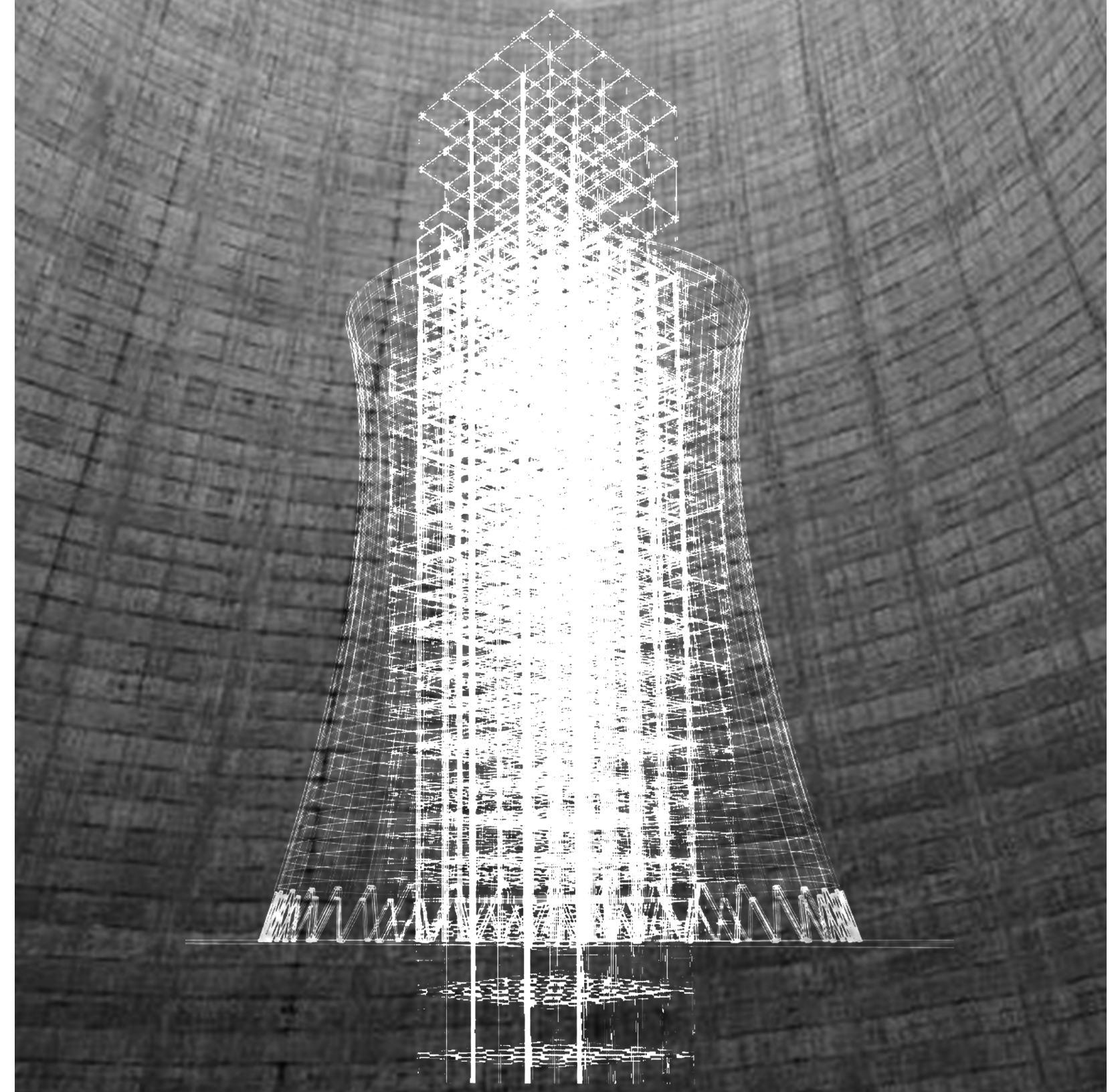
Fig. 32 Satsop Energy Campus Site Plan

Two Towers

The design is shaped by the physical duality of these two towers, but also the dual qualities of overwhelming inhuman scale and delicate phenomena. Sensorial perceptions are enhanced in different ways in the two towers and one may experience each alone or in contrast with each other. The west tower is the site for significant new construction. A repetitive rectilinear timber frame is an insertion that contrasts with the physical reality of the concrete tower. The different spaces on different levels allow us to experience its height in different ways. This design provides reuse, addresses the physical qualities of scale and of contrasting geometries and materials. From a distance the east tower may seem unchanged. The new constructions that are added consist of a single pool and a narrow diving tower. These provide for an entirely different set of experiences, a transcendental quality, a light touch, creating a place of isolation and reflection.

The thesis design offers a series of cinematically and psychologically immersive experiences that unfolds in space and time. It emphasizes the duality of light and of dark, both within each tower and between the two. The design merges history and perceptual qualities of scale, sound and light. Variations in material, of concrete, timber, and glass reveal the passage of time, acknowledging the past, present and future. New memories and experiences in this place join the past memory of abandon. What is too often stigmatized or hidden is accepted, but also understood as a potential creative source. By inhabiting this place in a new way, this design accepts the experience of loss presented by abandoned nuclear infrastructure, but allows for its transformation as new experiences provide a foundation for a new future.

Fig. 33 West tower concept drawing



The experience of Satsop begins long before arriving at the site. The way to Satsop is by car, along highway 12 through the pastoral Chehalis Valley, surrounded by patchwork fields and rolling hills blanketed with timber. Reaching the site involves an immersion in the surrounding landscape and sense of journey. It is revealed first in glimpses as two strange towers peak over the forested hills in the distance, standing in contrast to the landscape and alluding to their industrial history.

Fig. 34 Traverse along Highway 12



Approaching Satsop, a bending road weaves through solar fields until finally the towers are slowly revealed in a sequence of discovery. The seduction of the omnipresent towers is countered by a horizontal expanse of solar fields. The journey becomes saturated in a landscape of new technology and decaying ruins.

Fig. 35 Approach to Satsop as seen from the main entry road



At first, the immediate scale and strangeness of this place might be overwhelming. The tower itself is monolithic, ominous, and almost incomprehensible in scale. It is made approachable by a small pavilion at the base where visitors are oriented. The pavilion leads to the tower interior by its frame structure which is a continuation of the structure still concealed within the tower.

Fig. 36 West Tower Entry Path



A heavy timber frame forms a repetitive three-dimensional grid that supports a mix of uses as it rises to the full 500 feet of the concrete tower. On the lowest floor, at grade, a visitor's center, registration space and entry structure support the activities above. The square rectilinear frame plays against the relentless circular geometry of the cooling tower.

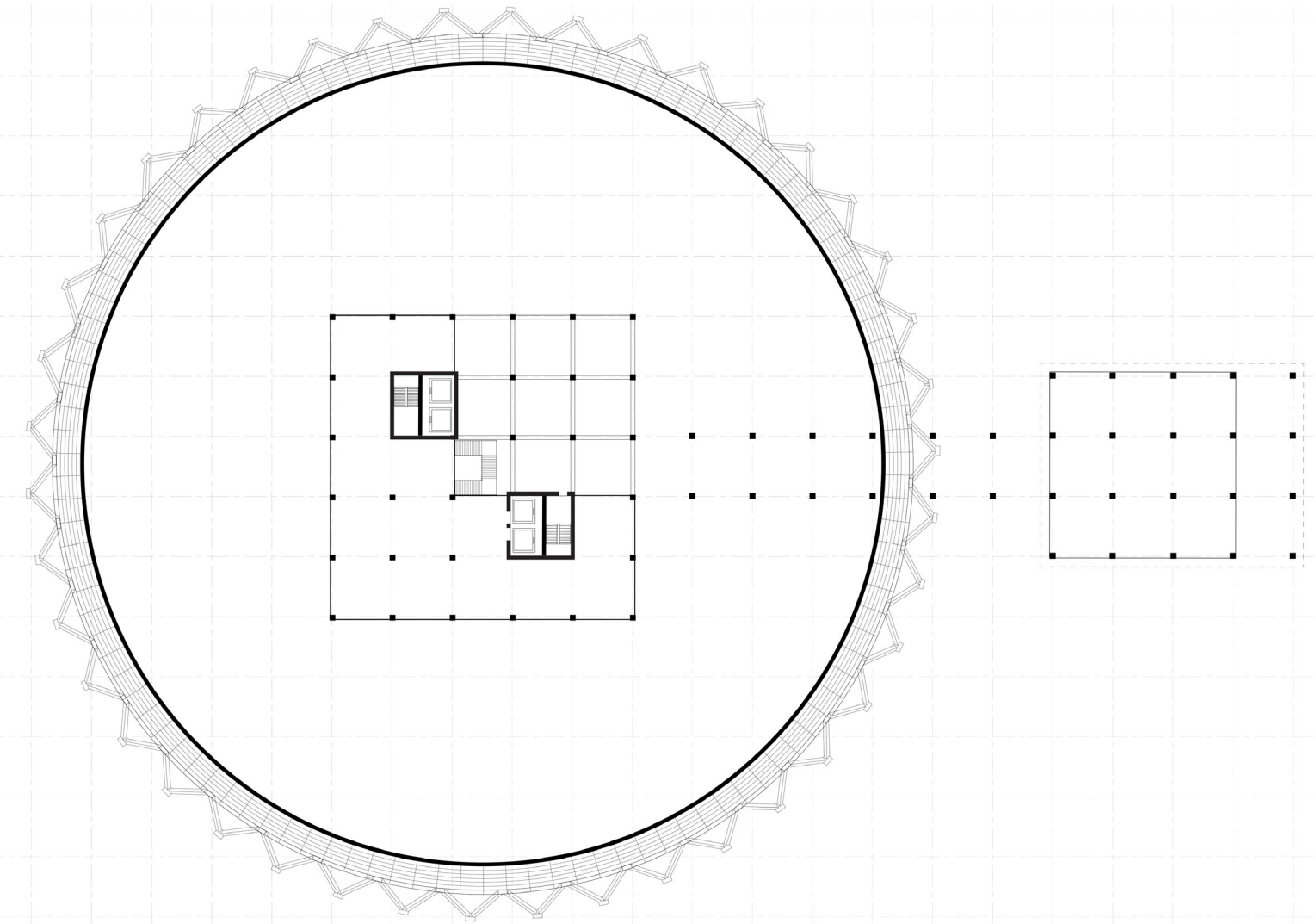
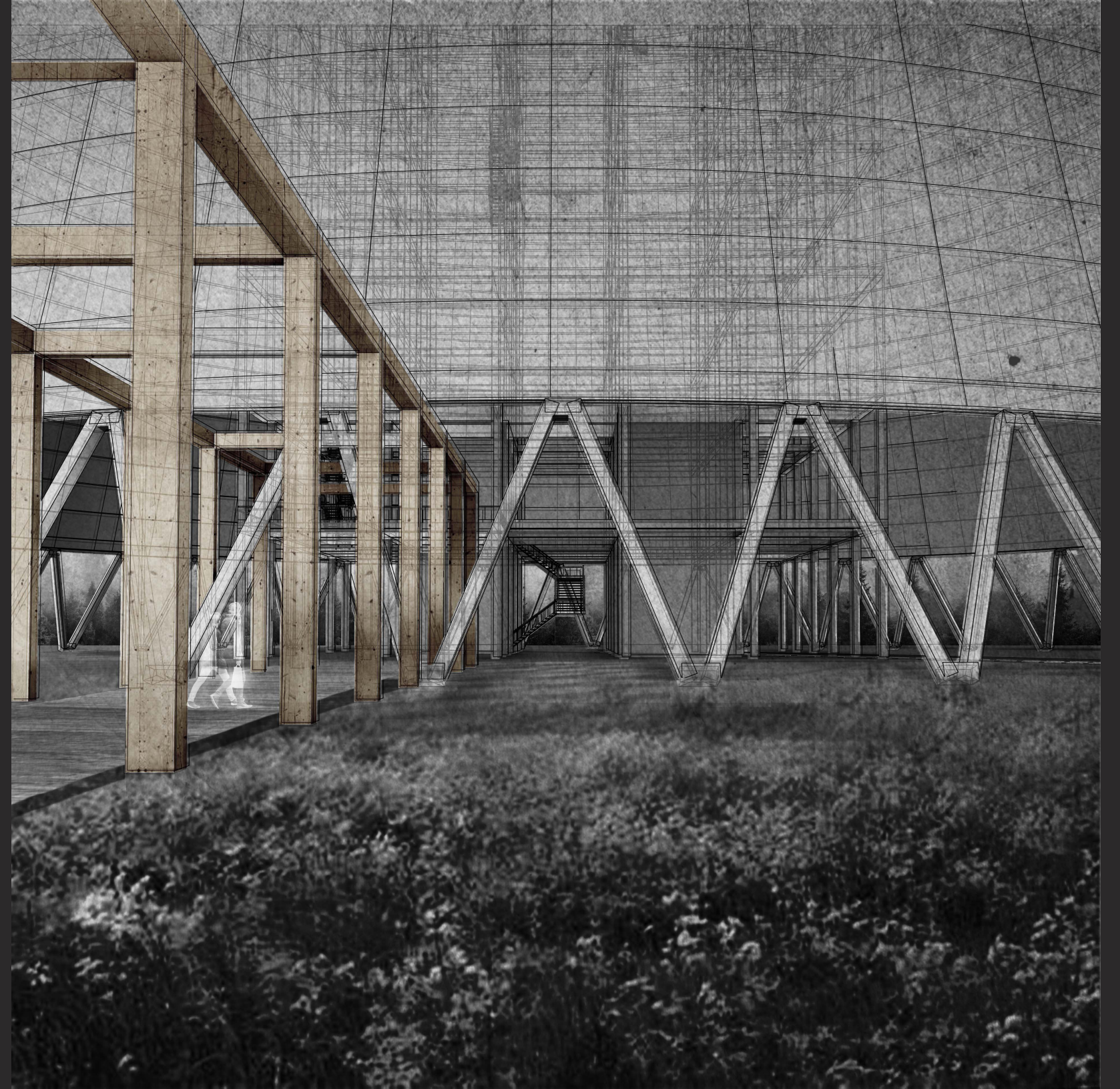


Fig. 37 West Tower Ground Plan

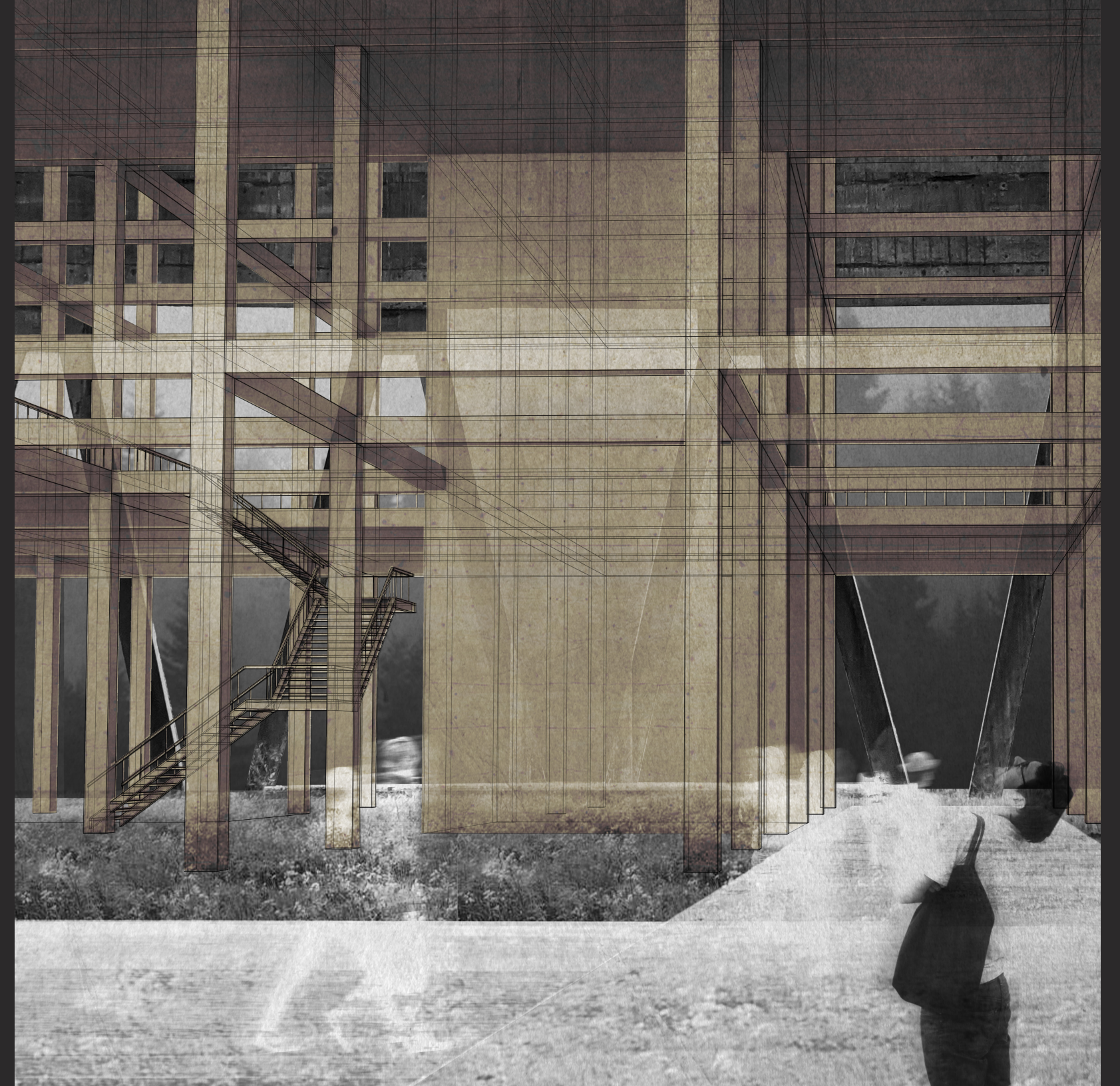
Here, the warm, familiar timber structure extends out, hinting at what is concealed within. The view becomes a layered field of repetitions: concrete diagonal tower supports, internal timber frame and forest beyond.

Fig. 38 View from Pavilion



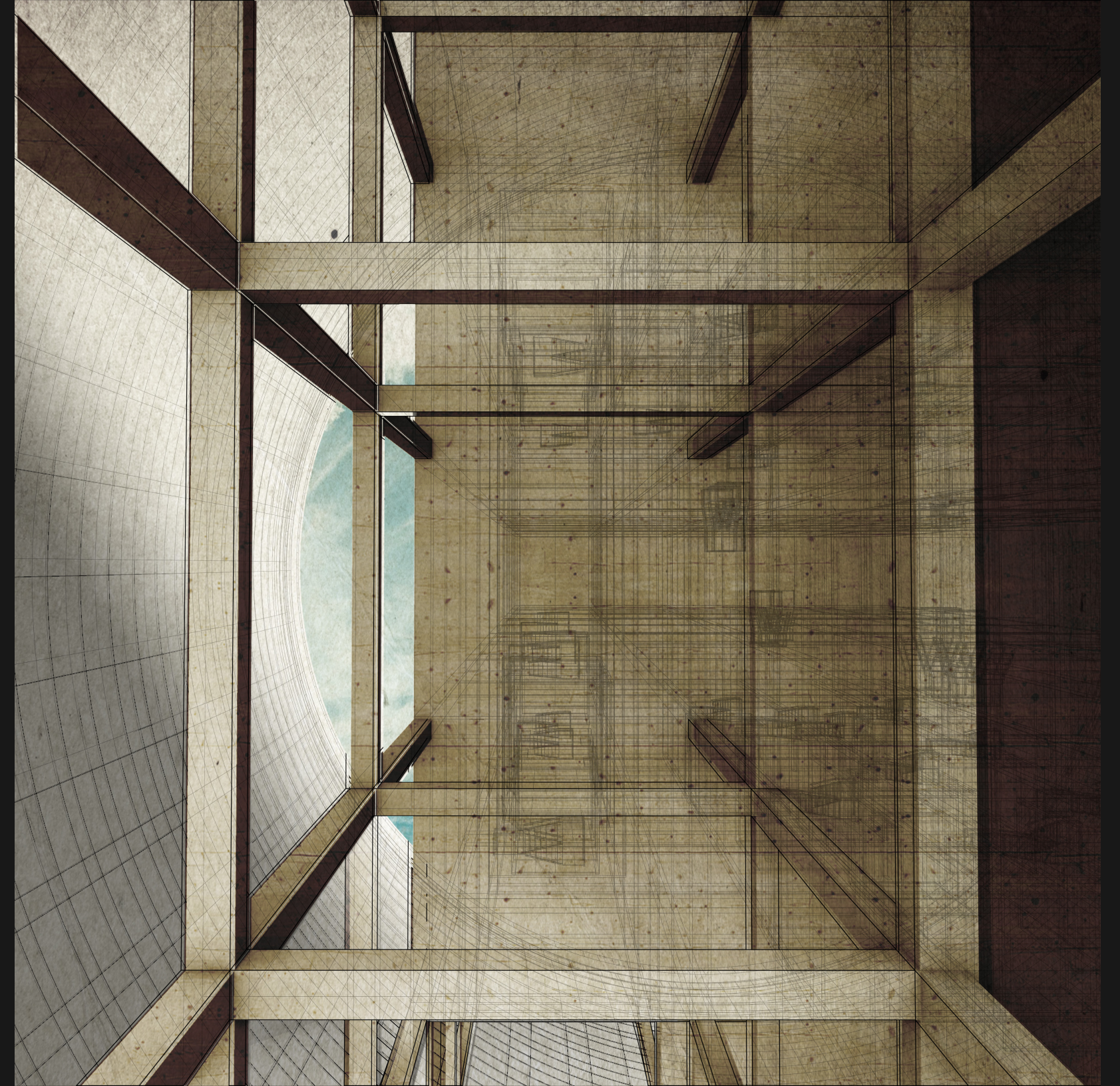
The orthogonal frame insertion creates a sense of duality as its redundant, modulated construction contradicts the highly specific form of the cooling tower. What once seemed singular and monolithic from afar becomes an assembly of many fragments.

Fig. 39 Tower Interior at ground level



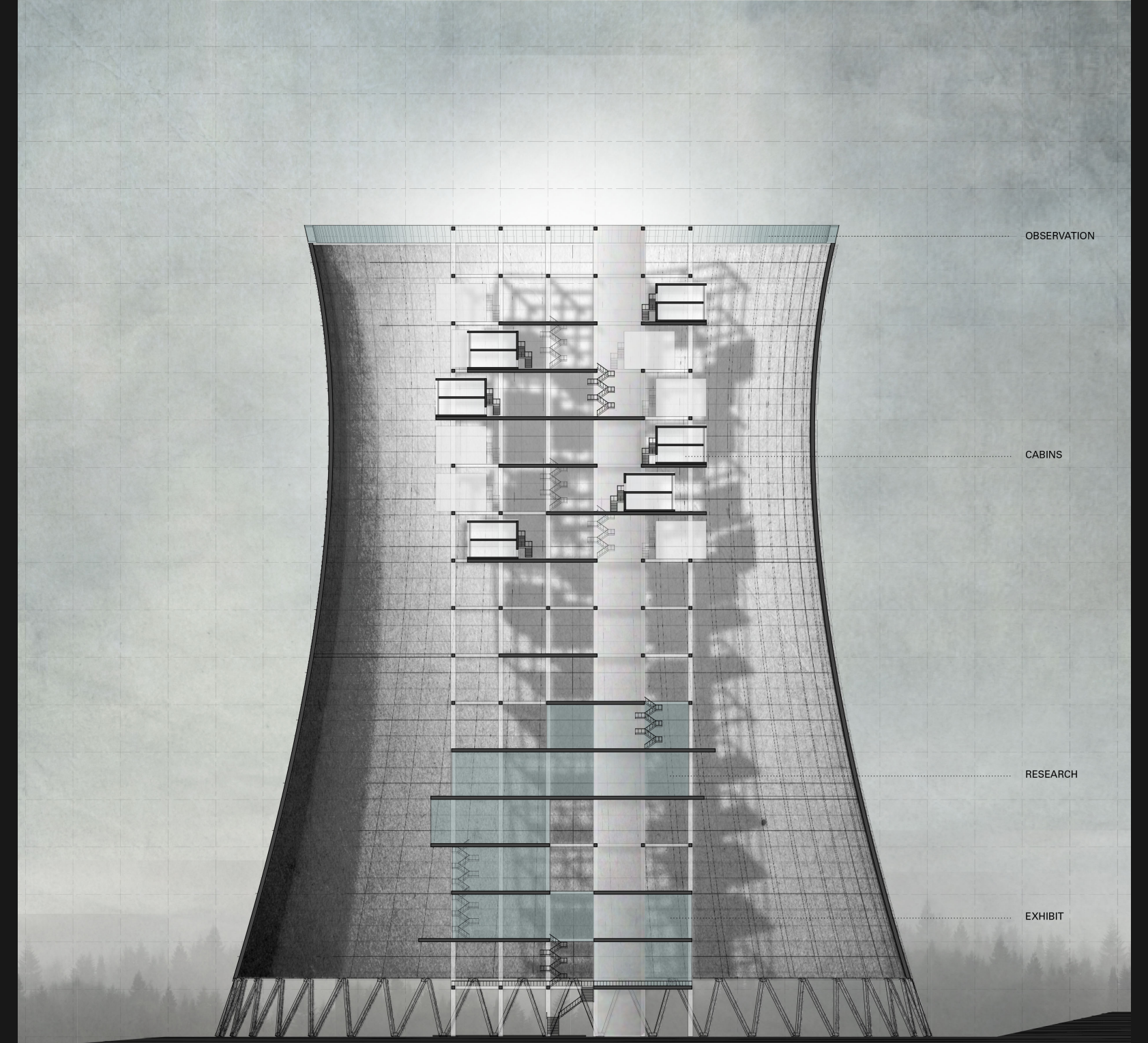
This rectilinear timber frame expands skyward, seemingly infinite, highlighting the verticality of the space and providing places to experience the height, enclosure, and texture in different ways. The mass timber comes from local forests and recalls the regional timber industry while contrasting with the decaying concrete shell.

Fig. 40 Looking Up



Inside the West Tower is a mix of exhibit spaces, research offices, dining, and lodging. Spaces are more enclosed near the bottom, and less enclosed above allowing light to penetrate below. The framework is part of the tower's preservation as it laterally reinforces the decaying concrete shell. It is a tower within a tower, where views to the surroundings are withheld and an ambiguity emerges between interior and exterior.

Fig. 41 West Tower Section



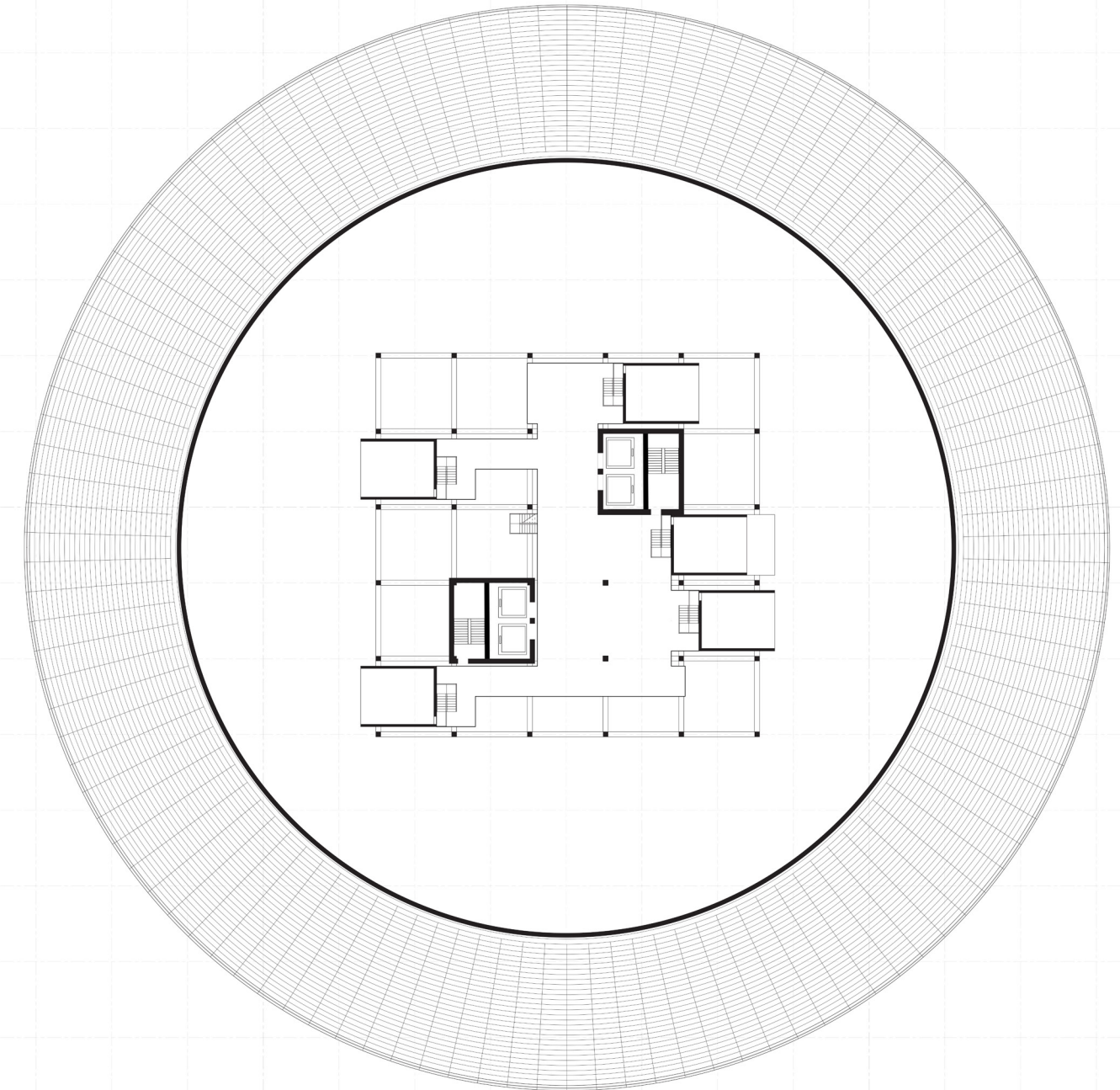
The repetitive frame registers the human scale and provides a means of occupation and discovery as the experiences shift with movement up and through the tower.

Fig. 42 Exhibits Level



Above, small modular cabins are staggered within the frame, much like a treehouse but still enveloped by the concrete shell and woven together by the framework. Here, researchers and visitors perceive the space as it passes over time, hundreds of feet above the ground at a vantage previously beyond reach.

Fig. 43 Cabins Level Plan



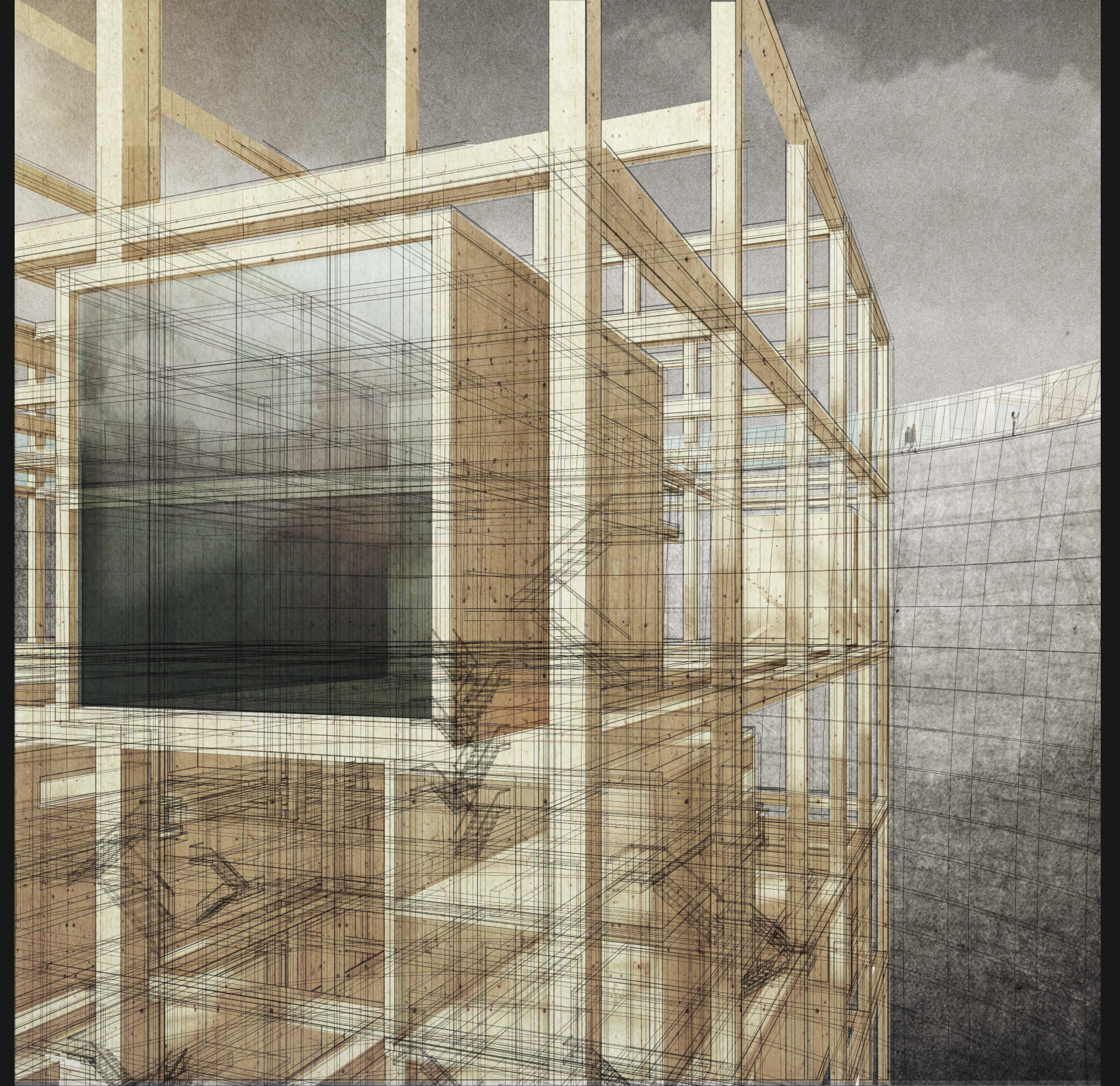
The cabins are introverted spaces for contemplation and refuge, animated by light washing down the tower surface outside.

Fig. 44 Cabin Interior



The frame ultimately leads to a glass enclosed observation walk at the tower rim. Here, the glass is an ephemeral counterpoint to the concrete shell, perhaps reflecting the sky in it's constant state of change or glowing like a lantern as dusk approaches.

Fig. 45 Cabins at Tower Rim



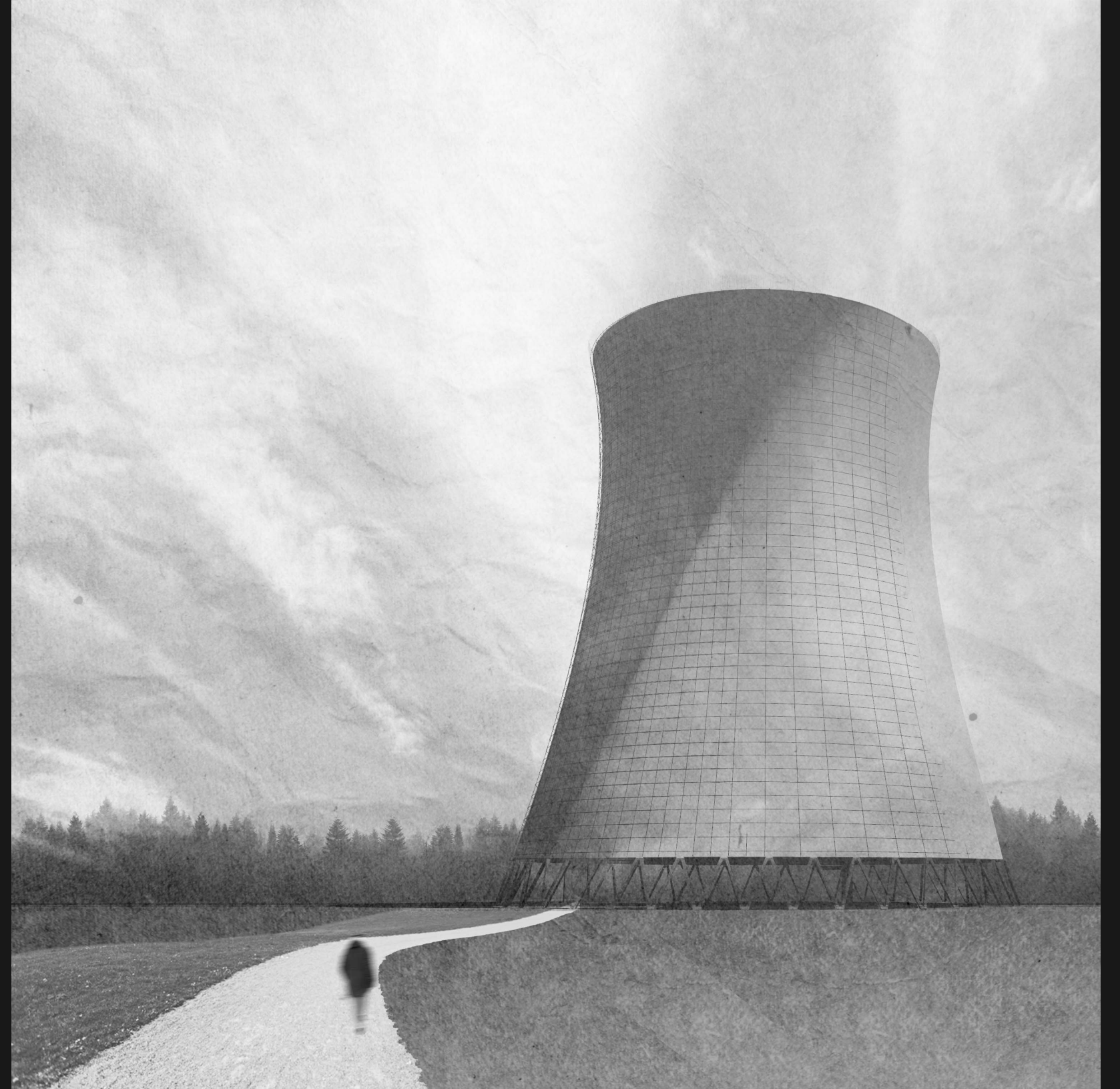
Circulating around the tower rim, secure behind glass walls but fully aware of the 500 feet below, views spread across the sprawling landscape of solar fields, farms, towns, timber lands, and mountains. From up here even the pacific ocean is not so far away. The light and view is all encompassing.

Fig. 46 Tower Rim



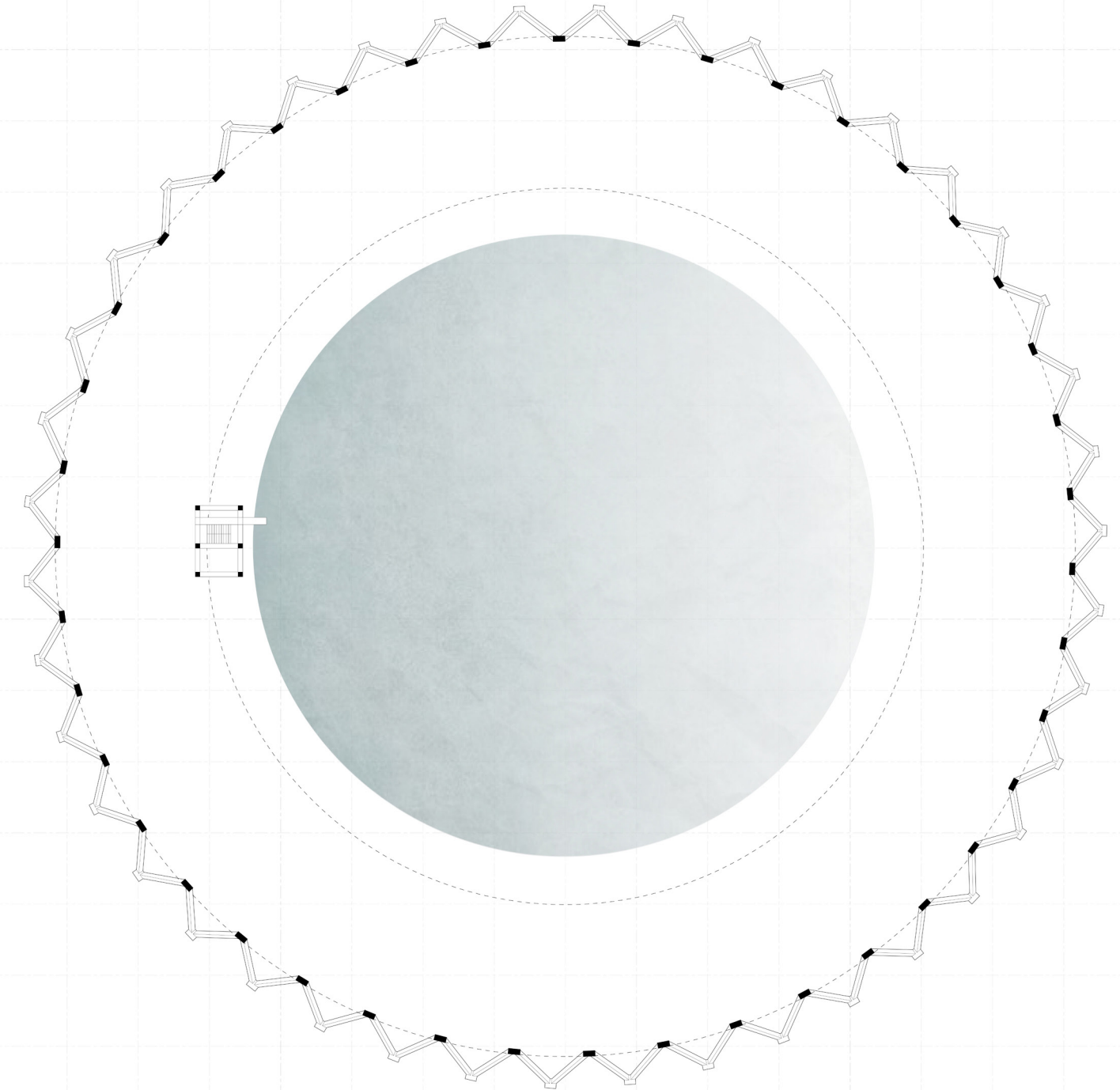
The journey returns to the second tower. While the West Tower is about insertion, vertigo, and getting up close, the East Tower takes a minimal approach leaving room for the remarkable sensory experiences of the existing space. It is an isolated experience.

Fig. 47 Path to East Tower



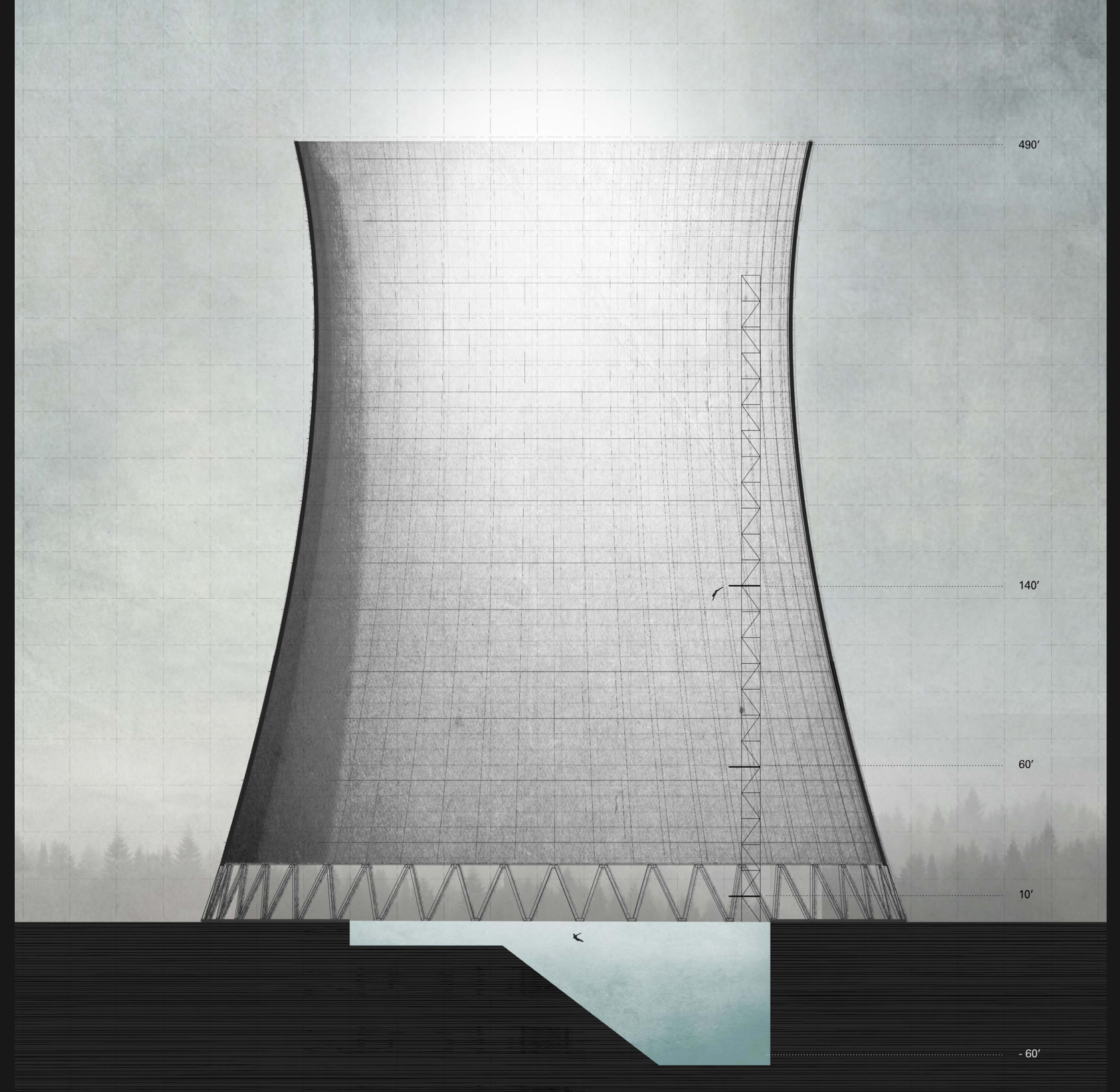
The interior is vacant except for a circular pool in its center and a single slender diving tower. Without a sense of scale inside, the vastness simultaneously expands and contracts.

Fig. 48 East Tower Plan



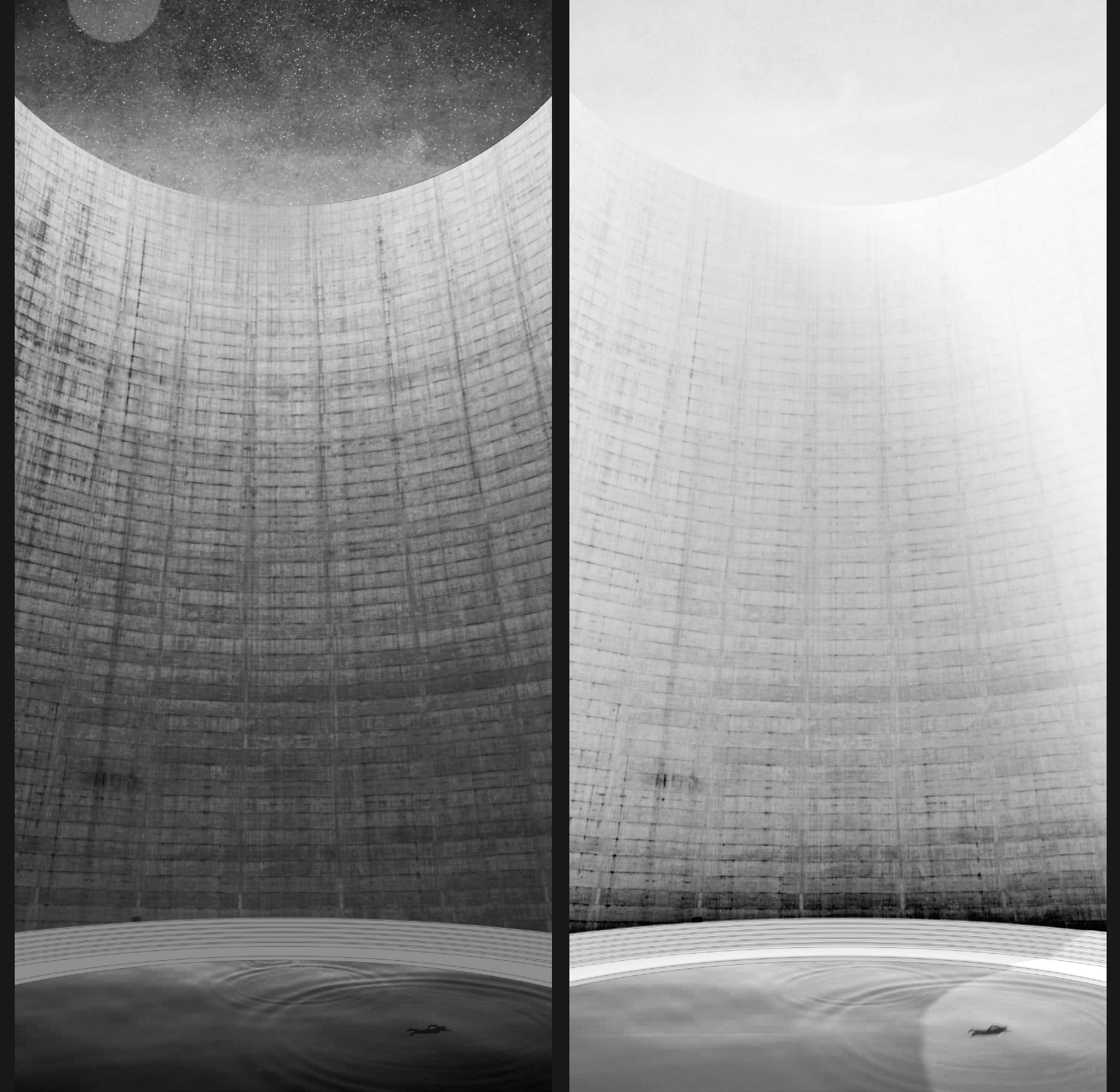
Here, experience is absorbed by sensations of water on the body, temperature, reverberating sound, cooling wind, heft of the concrete, and framing of the sky where rain or sun might reach the pool below.

Fig. 49 East Tower Section



At dawn, a lone swimmer might be greeted by moonlight grazing the water's surface, reflections of the sky gently rippling with movement. Or on a summer day, the tower might be flooded with echoes of splashing and laughter.

Fig. 50 Pool Interior



The interior's sheer size evokes awareness of bodily inhabitation. Looking up, wind and sound sweep up through the tower as the surface curvature captures and guides the air, an effect intended for its original cooling function.

Fig. 51 Reverberations

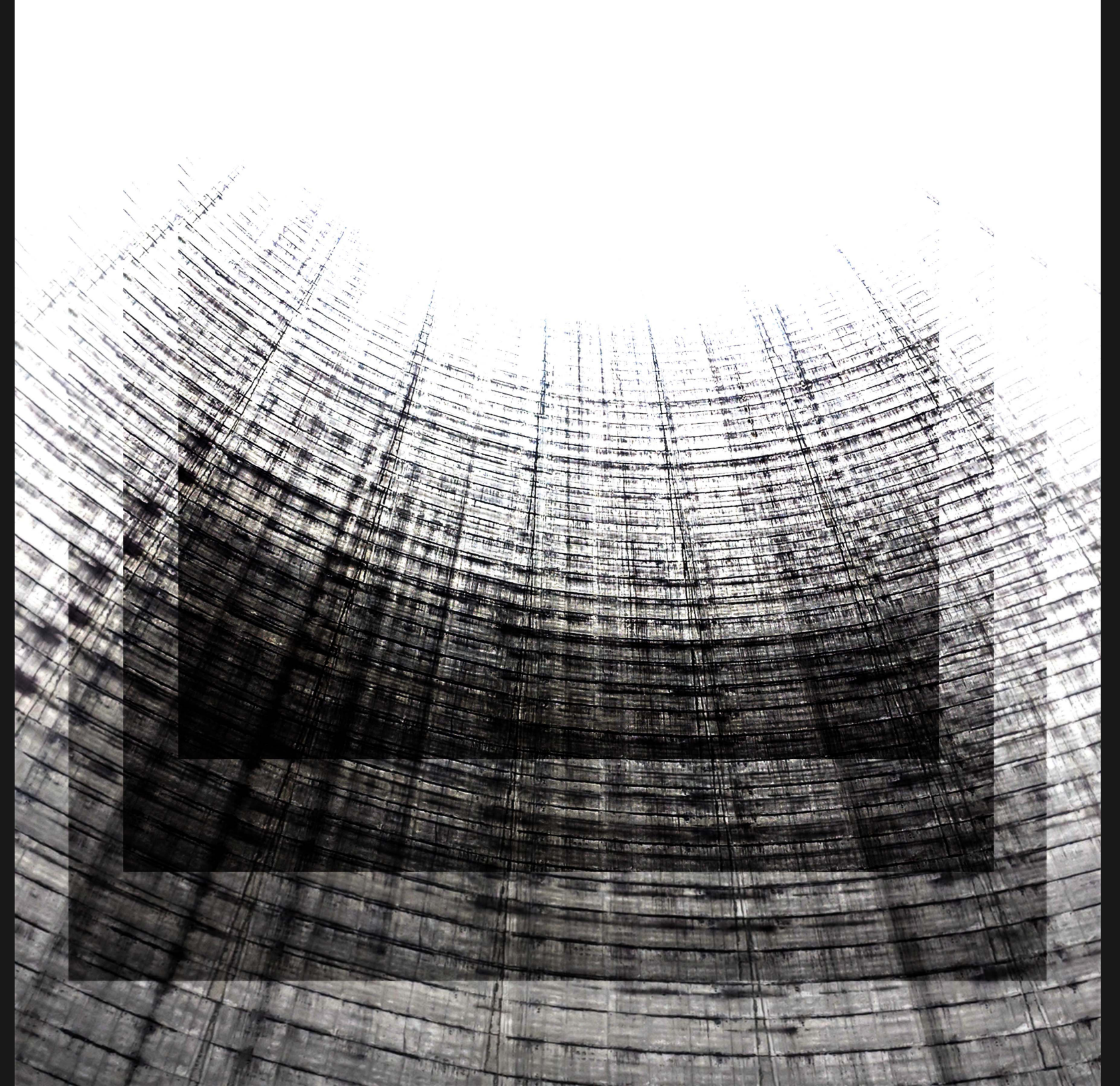
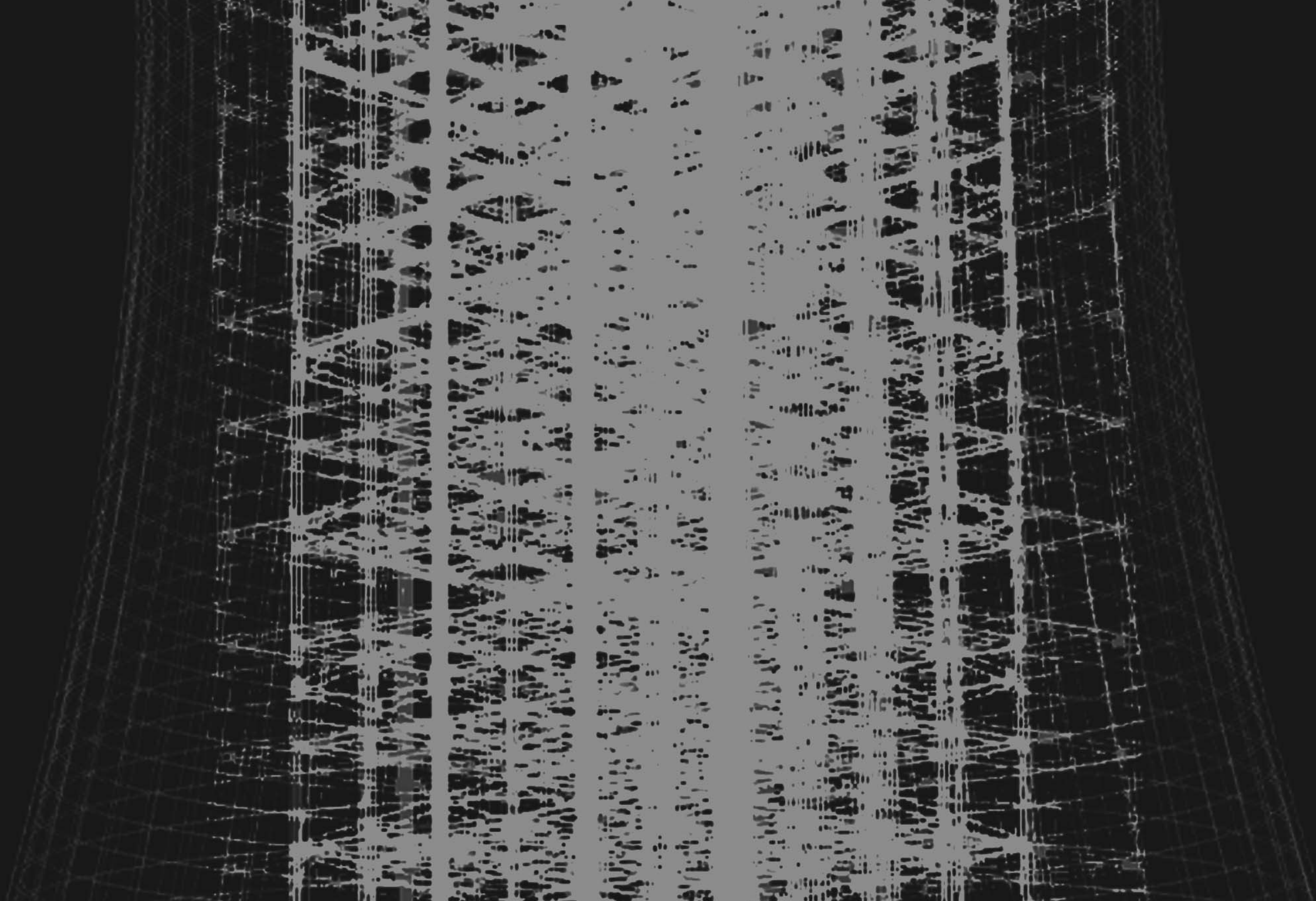


Fig. 52 Concept Drawing

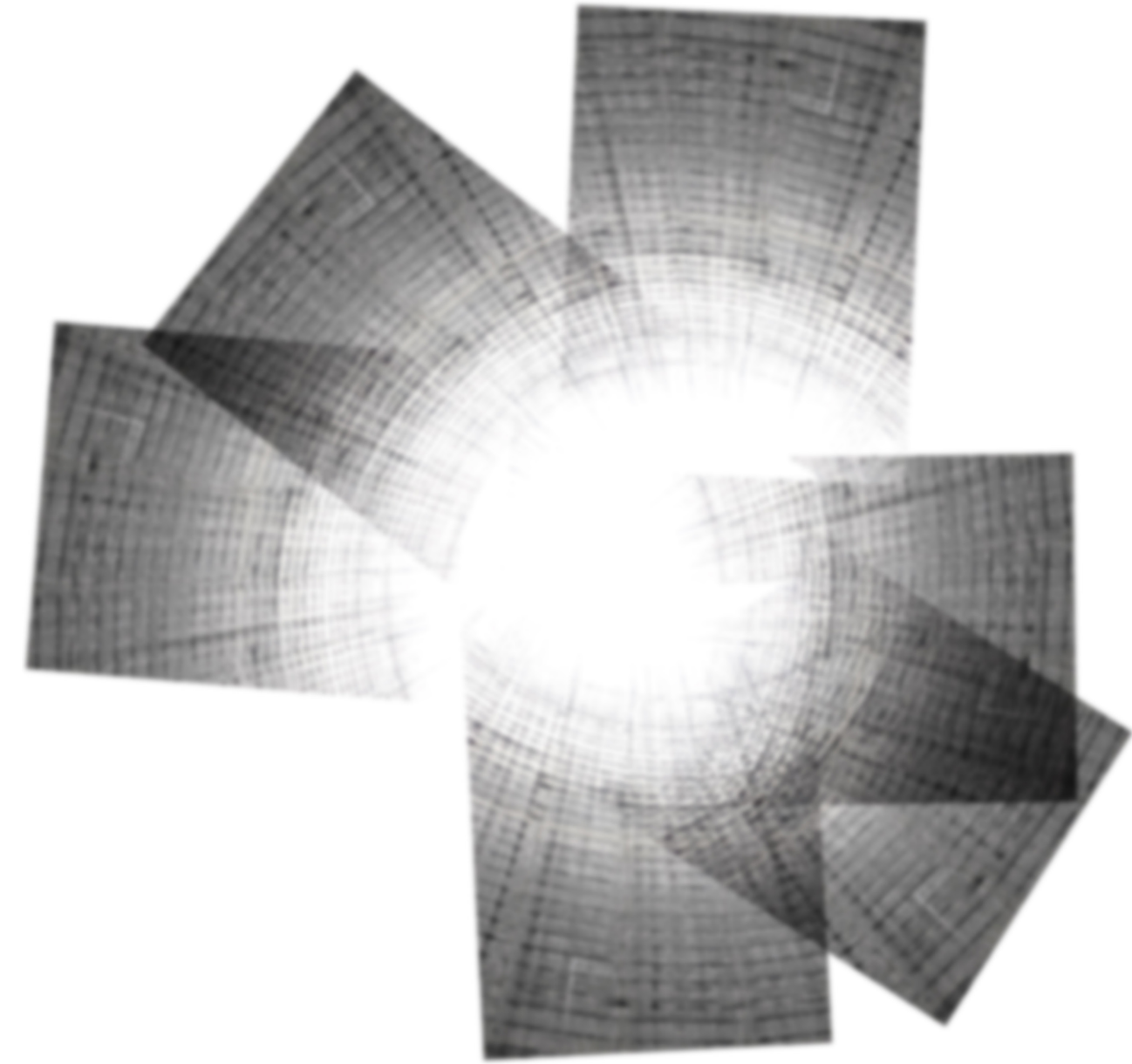


VI REFLECTIONS

This thesis embraces a challenging, powerful piece of an industrial ruin and enhances its value while also providing a way to experience the interior space from multiple perspectives. Architecture's narrative role is at the center of this approach. The primary goal of this thesis was to address questions about abandoned or underutilized remains of the built environment through highly experiential means. The design offers material compositions that enhance the encounter between person and space, between the senses and the external world. The design suggests a paradigm shift in our relationship to industry and to rural lands by revealing histories and suggesting possible futures. Considering both past and future through this design intervention is a way of rethinking the built environment's future position in an uncertain and rapidly advancing society. Rather than proposing *tabula rasa* architectural solutions, this thesis offers discovery through engagement with what already exists.

Fig. 53 Tower experience collage

My thesis process has been a search for a personal approach to design that grows from the imagination, but is grounded in the reality of climate change, aging industrial infrastructure, and struggling rural regions. With ephemeral glass, familiar wood, decaying concrete, and empty space, the project draws connections to historical and cultural heritage, reuses the past but looks toward the future, responding to what was and suggesting what will be. My interventions represent a selection in a field of infinite possibilities. By revealing the latent value in disregarded structures, preservation and reuse is an avenue which brings us closer to symbiosis with past and future. After all, our technological and sustainable future is one of coexisting.



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APPENDIX



The Narratives

Designers often initiate design with an objective description of program and frame their designs in terms of the physical elements that sum up the visible whole. In this thesis that aimed to align ephemeral and physical expression, it proved essential to utilize the power of story, role and identity to uncover possible meanings of place and project potential future experience. In the design process I generated the three following narratives as an instrument of imagination to describe the site in a way that humans can connect with and to introduce emotions, resonance and empathy into the design. These narratives were imagined and written before the design coalesced; they provided one way to see the imagined project before it took form--a way to “tease out” experiences that the design could produce, and thereby help me to visualize what might be but what I had not yet actually designed. The design solutions in this project were thus both discovered and invented.

Daring Child

The back of the van smells like rotting milk and dog breath, and I can start to feel the bile creep up the back of my throat as my motion sickness takes over. I can’t believe we’re going to another dusty old nuclear junk pile in Washington. I wanted to go to Wild Waves but of course no one listened to me. And that last stop in Hanford was just a real creepy place in the middle of nowhere. Dad loved it. Couldn’t stop talkin about the engineering, plutonium half life, storage tanks. Whatever. Dad’s always been obsessed with this nuclear stuff. At least this place is near the ocean. Maybe Mom will just drop Dad off and we can go ride sand bikes and climb those big beach rocks I heard about in Washington Traveler.

Woah, what is that huge concrete tube?! “Look honey, they have an exhibit where you can climb up inside one of the cooling towers.” Okay, I’m getting out for this part.

I climb about fifty sets of stairs and I’m really starting to get tired. Most of the rooms are just boring energy history stuff Dad would love, but I see these nets way above that look pretty interesting. Then I get to this bridge and walk out and theres this big platform where you walk through the tower and you’re outside on a ledge way way above the trees. I wonder if you could skydive from up here.

Maybe this road trip isn’t so bad after all.

Future Researcher

I have to squint at the piercing blue sky as I walk to my car from the labs. They say the skies in Dehli used to be so thick with smog it obscured the sun. It was just always like that. What a strange word anyway - smog. It even sounds toxic. A hundred years later, and they're still dealing with the nuclear waste contamination over at Hanford.

But ever since Terra developed the battery technology to store and redistribute renewables, polluted air is just a tale we will recount to future generations - a chapter in history books following the industrial era. When I started in the industry I thought I would be apologizing to my children for leaving them with a poisoned planet and an uncertain future. Tears of relief fill my eyes as I think about that memory which will never come. Now, I walk past the campus garden and playground sitting right in this giant energy park. The readings on the solar tracking boards are especially high today with this early season sunny weather.

It's amazing we used to burn rocks and sludge for energy when energy from the sun, the wind, the ocean, the earth was there all along. I mean all we had to do was take one look at plants to know what a symbiotic life cycle looks like. "Beep, beep" ... shoot, I've been sitting in this parking slot for a while and didn't see that other driving pod waiting. "Alexa, start my ride home to Aberdeen."

Weary Local

There's a knot deep in my stomach as we first spot the cooling towers in the distance. I've been avoiding the new energy park since it opened but today I guess it's time to face the music. My son and his family showed up for spring break and all my granddaughter could talk about was how she wanted to go ride the windmills and climb the treehouse tower at the new park down the road. I guess the farm becomes less exciting once you're in junior high.

When I worked on the Satsop plant back in the 70s the excitement of nuclear energy was infectious. It was all the town talked about - a future of cheap electricity, abundant jobs, technological prowess in our rural community. And putting up the formwork for those towers 500 ft up in the air - boy I haven't had an adrenaline rush like that since. It took decades to recover after the project was slammed to a halt halfway through. Then those towers haunted our valley for decades, imposing tombstones of Satsop's big half-baked promise.

Darla says we've been seeing a lot of new tourists come through the shop lately. And its early. The season usually doesn't start til the kids get out of school in June, but in town we've been getting dozens of passers through every weekend since that new park opened.

"Grandpa, we're here!" Wow, I saw the windmills in the distance but I didn't know all this solar was out here too. What a sight - row after row of silicon grids lined up like a field of mechanical soldiers. I've never seen solar fields up close like this before. Strangely, they remind me of the corn fields back home.