

Apertures, Reflection, Light:  
A Pavilion for Re-imagining the World around Us  
at the Distant Edge of Ottawa, Canada

By  
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Master of Architecture

Carleton University  
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## ABSTRACT

*Apertures, Reflections, Light* investigates the social, economic, and ecological complexities intertwined within the expansion of the urban boundary of Ottawa, Canada in the specific context of the suburb of Barrhaven. The boundary – an ephemeral line sometimes a place of competing forces – is a focal point for meditations on the nature of suburban expansion, and human impact on the natural realm. The architecture seeks to unearth questions, shortcomings, and hopes that exist in current and future visions of suburbia. Connecting with existing pockets of wilderness, the Apparatus is set deep within the landscape. Spaces of darkness and spaces of light – seen as places of natural phenomena – not only shift the gaze of visitors but also move their soul. Culminating in a photogrammetric chamber the architecture of the Apparatus hopes to re-frame the viewer’s relationship to their everyday surroundings, instilling a sense of agency over their inhabited public spaces.

## ACKNOWLEDGMENTS

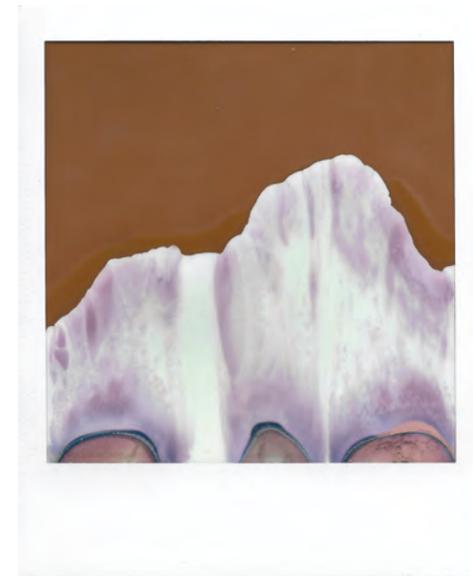
Throughout the process of bringing this project to life I have received a great deal of support and assistance.

I would first like to thank my advisor, Inderbir Riar who has continually brought my work to a higher level. Thank you for your patience and insight, and pushing me towards a project focused on gentleness. My work is so much more beautiful because of your wisdom and guidance.

To all my wonderful friends, my work is richer for having known you. Each of you continually inspires me to reach farther than I think I can. Thank you for all the hours spent listening and the always insightful counsel.

Andrew, thank you for the time and space and home in which to create. Every moment in the sun is better beside you.

To my parents, thank you for my education, the gardens and the mud pies, the adventures and the majesty of the world you have shown me through your eyes. This is for you.



*Figure 1: Polaroid Malfunction, South Nepean, Area 1.*

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## PREFACE

One of my earliest memories of living in Ottawa is stopping for cattails on the side of the road with my siblings and Mum. Growing in a roadside storm water drainage ditch in the middle of nowhere, their round bodies were soft and sleek – like the toes of our cat. After petting them to find the softest, we took cuttings to place in a vase at home.

My most cherished summers have been spent camping across the country, stuffed into the back of the family minivan with my siblings. Even when at home we were outside: either making up our own imaginative landscapes in the forests and fields of brush behind the house, or helping (as enforced volunteers) in my Mother's garden. When we first moved to Stittsville – originally a small town, now a growing suburb on the urban edge of Ottawa – our house was the third one built on the first street of an entirely new subdivision. Over the course of my life, I have watched whole neighborhoods spring up around my parent's house, and the wild places of my childhood fade away.

The loss of treasured spaces in the name of development coupled with ineffective to non-existent public transportation that often left me feeling landlocked made my return to the suburbs of Ottawa at the end of the past summer tumultuous. Moving from Centertown to Barrhaven with my partner, this drastic change in location was spurred by the primal need for outdoor space; a hunger for a garden of our own to dig and plant. This urge proved stronger

than the looming threat of longer commutes and impoverished walk-ability (further emphasized by the refusal to own a car).

Now, in March, as the blankets of snow slowly recedes from the edges of our lives the worst of Barrhaven emerges, leaving behind the refuse of an entire winter. Like children who cannot be bothered to clean our rooms, we have swept so much garbage beneath the proverbial rug. As snowbanks shrink and brown grass is revealed, so too is our carelessness. Fast-food wrappers and cups that we were too lazy to discard in a trashcan, miniature candy wrappers left behind from Halloween, fliers and bits of cardboard blown from recycling bins put out before the truck arrives, and plastic. So much plastic. In all its shapes and types and colors and uses, scattered over pavements and lawns, half-buried in snow, and submerged in puddles. The little magic of snow is that it is a collection of all the precipitation of an entire season, there on display in the backyard to see. Each day climbing higher until competes against the height of the fence. One of the most saddening facets of snow is that, on spring days when the world begins to wake up, it also shows to us – just a little – how wasteful and careless we are with our world. Imagine what our landfills must look like.

In examining my relationship to the city and world around me the process of creating this project has underlined that the purest joy in my life comes from the simplest things in nature: new buds in the spring, birdsong, the fresh breath of air taken just after a sunrise. The gift I would like to give through this project is a landscape that frees the imagination from its mundane surroundings. That the architecture and the site can be a place where after visiting the mind is free to wander, seeing its surroundings in enchanting new ways. Vacant parking lots can become wind-swept tundras, lumpy snow-covered fields an expansive desert, a puddle – through its reflection of the sky – an ocean.



Figure 4: Photograph of Rideau River, Southern end of the Chapman Mills Conservation Area Walk



## INTRODUCTION

Figure 5: (Opposite and following page) Photographs taken throughout Barrhaven.

“The West of which I speak is but another name for the Wild; and what I have been preparing to say is, that in Wildness is the preservation of the World.”

Thoreau

Much of this project was conceived out-of-doors compulsively seeking encounters with hidden pockets of wilderness throughout Barrhaven. This search led to interrogations of subconscious beliefs that cloud the already complicated task of defining what a suburb is, finding that Barrhaven *does* have much to offer.<sup>1</sup> Interlaced with the residential neighborhoods are a myriad of bike and walking paths connecting parks of all sizes. The largest parks hold sporting fields, community and recreation centers, and regularly abut one of many local schools. From these excursions through the strange and often alien landscape of rumpled lawns, lonely trees, and vast parking lots grows a project that is deeply concerned with the health of the Barrhaven landscape. It is imperative to *Apertures, Reflections, Light* that the preservation and cherishing of local wildlife is of equal importance to the creation of engaging human experiences.

<sup>1</sup> “The population in low density auto suburbs and exurbs is still growing five times faster than inner-cities and inner-suburbs across Canada. Despite their inner-city condo booms, even the Toronto and Vancouver metropolitan areas saw 3.4 and 2.4 times as much population growth in auto suburbs and exurbs compared to active cores and transit suburbs. Canada is a suburban nation, and its population became more suburban from 2006–2016, despite the planning policies of most metropolitan areas.”

Gordon, David L.A. “Still Suburban? Growth in Canadian Suburbs, 2006 - 2016.” Queen’s University, Canada: Council for Canadian Urbanism, August 2018. p.5



*Apertures, Reflections, Light* proposes a pavilion embedded within a site that will return the residents back to their landscape. The project stands as the starting point of a new Greenbelt surrounding Ottawa, Canada. This future infrastructure is meant to protect and reassert the natural landscape by containing the growth of the suburb Barrhaven. The architecture – called the Apparatus – will be the epicenter for the growth of future pavilions and wild places in and around the suburb. These elements will work together simultaneously as a boundary and refuge to their surroundings.

The Apparatus is an giant underground camera and dark room for re-imagining the world around us. In a world increasingly shaped by fast roads, big box stores, and tract houses the Apparatus reintroduces us to the incredible diversity of flora and geology alive in suburbia but overlooked, even neglected. Through its optical and photogrammetric devices, it shows us that nature is never far away.

The spirit of the Apparatus originates from my experiments exploring, measuring, and perceiving the site. Starting with walking adventures my experience of the site evolved through its imagining while developing images in a dark room. In the same way, visitors will venture into the site along walking paths in search of encounters with darkness and silence. Along the journey visitors are encouraged to gather objects to create photograms within the Apparatus. Like the simple act of taking a pebble from the ground, placing it in your pocket, and carrying it home these artifacts transform places passed through into dwellings of memory. Through this subterranean adventure visitors engage in a communal act of home-making.

The terrain of *Apertures, Reflections, Light* is as varied and layered as the land on which it rests. Barrhaven is a land seemingly without history, yet it is a place defined by a vast array of laws and regulations. The site currently sits at a unique juncture of time: while it is still very much an urban landscape most characterized by its blandness, change is in the wind. Parking lots in front of warehouse sized stores are being filled in with smaller shops, townhomes reign supreme

in new developments, and the “15-minute neighborhood” has become the planning standard.<sup>2</sup>The City of Ottawa will table a new Official Plan to in the coming year, and at the same time finalize an expansion of the urban boundary line.<sup>3</sup> As Ottawa’s population continues to grow decisions are being made about where and how that growth will take place that have the potential to shape the form of the city for the coming century. *Apertures, Reflections, Light* questions if the assumptions being made by planning to expand the urban boundary line really reflect the goals and values professed by the city.

It remains to be seen if humanity will be able to shift the weight of our current systems in time to save the planet for our own survival, or if humanity has sacrificed its home in pursuit of profits. This may be the decade that humanity looks back on from space and wishes we had done something differently (although most of us will not be able to afford an escape to space). If, in the end we are not going to survive the impending climate catastrophe of our making, perhaps the most graceful way to disappear is to heal some of the deep wounds we have cut into the earth as we go. It is undeniable that the lifestyle a sprawling, largely affluent, North American suburb like Barrhaven promotes is one of consumption and waste; whose global impacts extend far beyond the people and ecosystems it physically encompasses. While these heavy debts will need to be addressed in full one day, the scope of this project can only begin to contend with them at the intimate scale of the local. Within the extents of Barrhaven, the ramifications of climate change effecting the human population are relatively scarce; the most gravely injured parties here are flora and fauna displaced and eventually eradicated to make way for homes, roads, and shopping centers.

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<sup>2</sup> Andrea Steenbakkers, “Intensification in Barrhaven’s Core,” BarrhaveBia (blog), April 13, 2018, <https://barrhavenbia.ca/2018/04/13/intensifyingcore/>

City of Ottawa, “The 5 Big Moves,” The New Official Plan, August 2019, [https://engage.ottawa.ca/the-new-official-plan/news\\_feed/the-5-big-moves](https://engage.ottawa.ca/the-new-official-plan/news_feed/the-5-big-moves)

<sup>3</sup> Approved February 2021.

City of Ottawa, “Council Approves Additional Land for Urban Boundary,” Council Updates, February 10, 2021, <https://ottawa.ca/en/news/council-approves-additional-land-urban-boundary>

Foundational texts that have helped guide the direction and aim of the project included the dignifying writings on the everyman by De Certeau in *The Practice of Everyday Life* (2013), and the aesthetic philosophies of Mark Foster Gage in *Designing Social Equality* (2019). Dissections of the human relation to nature from were of equal importance ranging from broader North America in William Cronon’s *Uncommon Ground* (1996) to distinctly Canadian perspectives such as Leo Bratishenko and Mirko Zardini’s *Its All Happening So Fast* (2016), and incorporating often radical perspectives on environments including Gilles Clément’s theory of “the third landscape”.

In the past section, and many sections to come, much has been said about *nature, landscapes, and wilderness*. It would have been preferable to avoid words so fraught with layered meaning that they border on unintelligible.<sup>4</sup> However, there is such a poverty in the English language for words to describe the vast world of trees and rocks, water and sky, in all their essences - both physical and ephemeral. We must contend with the scientific, political, social, and philosophical meanings of these words at the same time that we engage with the memories of inhabiting the environs of our planet.

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<sup>4</sup> “Nature is perhaps the most complex word in the language. It is relatively easy to distinguish three areas of meaning: (i) the essential quantity and character of something; (ii) the inherent force which directs either the world or human beings or both; (iii) the material world itself, taken as including or not including human beings. ... A full history of the uses of nature would be a history of a large part of human thought... the complexity of the word is hardly surprising, given the fundamental importance of the processes to which it refers. But since nature is a word which carries, over a very long period, many of the major variations of human thought - often, in any particular use, only implicitly yet with powerful effect on the character of the argument - it is necessary to be especially aware of its difficulty.”

Raymond Williams, *Keywords: A Vocabulary of Culture and Society*, Rev. ed (New York: Oxford University Press, 1985).

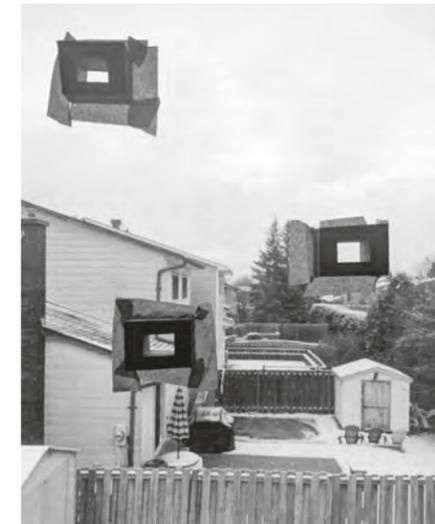


Figure 6: *Angled frames on office window. Cardstock, glue, masking tape, and window glass.*

## FRAMES

*Apertures, Reflections, Light* begins looking out a second story window of a house. The window overlooks the backyard of the house, and several neighboring backyards recede into the distance. Three elements seen within the windowpane inspired attempts to frame the view: the sky above, a maple tree in the right-hand corner, and large pine trees centered far to the back. The addition of the frames within the window was an attempt to direct the gaze around the private clutter of ordinary backyards towards selected elements. Could one construct a window through which only the splendor of natural elements of the view are seen? While unsuccessful, because the frames were unable to break free from the flatness of the window pane, this experimental inquisition of observing has grown into the collection of photos, devices, artifacts, drawings, and exploration sites that make up the project.

Figure 7: *(Opposite) Photographs taken through frames throughout the project process.*



*Figure 8: Polaroid of Strandherd Drive, South Nepean, Area 7.*

## BARRHAVEN: THE SITE AT LARGE

## PART I: BEGINNINGS

Figure 9: (Opposite) Geological Survey of Barrhaven in the context of the City of Ottawa.

The *past* is an infinitely broad subject when applied to the site, even when it feels like it doesn't exist here. For the purposes of this project the past is divided into three sections: there is the near past, the far past, and then further still the deep past, extending far out beyond the human perception of time. Each of these different pasts come to bear on the present – in varying degrees - regardless of their distance.

In the deep past the shifting of tectonic plates and the creeping flow of vast glaciers created the land formations and mineral deposits that would later become the topography of today. Remnants of these monumental events can be seen not only in the undulations of the terrain, but also in current soil composition and drainage basins flowing into the Jock and Rideau Rivers. The majority of Barrhaven rests on Plain Glacial Till deposits and Nearshore Champlain Sea Sediments with pockets of Drumlinized Till. Paleozoic Bedrock thrusts from above through the north-western portion of the suburb (where the first neighborhoods of the suburb began).<sup>1</sup> This soil is a living organism that takes hundreds of years to form into a life sustaining medium. When the ground is sectioned each region reveals a unique soil profile.<sup>2</sup> This

1 Geological Survey of Canada. "Map 1506A - Surficial Geology - Ottawa, Ontario." Map. Accessed December 14, 2020. <https://geoscan.nrcan.gc.ca/starweb/geoscan/servlet.starweb?path=geoscan/fulle.web&search1=R=109231>.

Geological Survey of Canada. "Map 1492A - Surficial Geology - Kemptville, Ontario." Map. Accessed December 14, 2020. <https://geoscan.nrcan.gc.ca/starweb/geoscan/servlet.starweb?path=geoscan/fulle.web&search1=R=119038>.

2 National Resources Conservation Services Soils, "A Soil Profile," United States Department of Agriculture, [https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/edu/?cid=nrcs142p2\\_054308](https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/edu/?cid=nrcs142p2_054308)



profile, composed of multiple soil horizons - bands of soil with distinct textures, colors, and material compositions from surrounding layer - not only looks backwards through time, but can be used to project into the future: what life can the soil sustain? What will grow here? What can be built here? Refreshingly, the current urban expansion deliberations consider the value of soil when determining the viability of land parcels for inclusion within the boundary line.<sup>3</sup>

What is defined as the *far past* hovers in the furthest periphery of the site's memory. Although significantly closer in time than deep geological pasts, it often seems to be less directly connected to current residents of Barrhaven than intricacies of terrain and soil composition. The unceded land on which Barrhaven sits was long inhabited by Indigenous Peoples, predominantly from the Ho-de-no-sau-nee-ga (Haudenosaunee), Anishinabewaki, and Omàmiwininiwag (Algonquin) nations.<sup>4</sup> Colonized by European settlers, the land upon which Barrhaven sits spent much of the 19th century as farmland until the first residential development was started by Mel Barr (Barrhaven's namesake).<sup>5</sup> A conscious connection to this past is relatively non-existent in the physical landscape of Barrhaven today: it is impossible to tell if the current landscape retains any semblances of its past self. The Jock and Rideau rivers, while constantly in motion, are the most permanent elements of the landscape, traveling through time as well as the landscape. Once vital modes of transportation flowing towards the Ottawa River, today access to their banks continues to be a treasured and alluring features of the landscape.

Established in the 1960s as a satellite suburb outside of the Greenbelt this Barrhaven

<sup>3</sup> In the current land evaluations for urban boundary expansion, all agricultural land was excluded from consideration, which was not the case in previous urban boundary expansion in 2009. "In 2009, city council voted to expand the boundary by just 230 hectares, about a quarter of the 850-hectare expansion recommended by staff, and a tenth of the additional land sought by developers." Due to a change in the bylaws the most recent motion to expand is unable to be appealed. "Ottawa Boundaries Expansion Ordered." CBC News, June 7, 2011. <https://www.cbc.ca/news/canada/ottawa/ottawa-boundaries-expansion-ordered-1.976213>.

<sup>4</sup> Especially when engaging with the concept of cultural relationships with the land we live in it is imperative to recognize that all of the land this project concerns itself with is unceded territory. Although this project is theoretical and unbuilt by virtue of being a thesis the implications of yet another solitary white voice asserting itself upon this land weighs on my mind. While this must be negotiated with the fact that I too am now an inhabitant of this land, the project and its dialogue with the terrain will ultimately be inadequate without the collaboration and centering of indigenous voices.

Native Land Canada. "Native Land." 2020. <https://native-land.ca/>.

<sup>5</sup> Bob Blake, "A Little Bit of Barrhaven's History," Bob Blake (blog), <https://www.bobblake.ca/blog/a-little-bit-of-barrhavens-history-720>

looked exactly the same, and yet nothing like the Barrhaven of today.<sup>6</sup> While various forms of rail transportation (either for goods or people) have made use of the tracks that diagonally bisect the northern neighborhoods (Old Barrhaven), this suburb's heart has always belonged to the automobile. Like many Canadian suburban developments of the same time period Barrhaven was born – in part – from the exponential population growth following the Second World War. Unlike other Canadian cities, Ottawa after the Second World War also had to reconcile its muddy and raw sewage spewing reality with the fact it was the national capital of a new world power.<sup>7</sup> Commercial growth was slow to arrive in Barrhaven, with only one grocery store serving the area before 1991, when the Barrhaven Town Complex was opened, which today features the big box stores that characterize the suburb.

In the nearest past growth has been spurred by the (relatively) low cost of home ownership and the population growth of the city, which has led to spreading patterns of horizontal growth.<sup>8</sup> Whatever the reasoning behind each individual's choice to call Barrhaven home, it is clear that regardless of the urban planning issues the suburb suffers from, it continues to grow because it meets a need (or needs) that are highly prioritized when choosing where to live that cannot be fulfilled elsewhere (either because the option does not exist, or it is too expensive). As we move forwards into a world that must change or perish in the face of climate change, suburbs like Barrhaven have the opportunity to play increasingly prominent roles in the shaping the cities of our futures, owing to their status as epicenters of development and population growth.

<sup>6</sup> The 1950 Plan for the National Capital: General Report, commonly known as the Greber Plan, introduced the concept of the Greenbelt to the City of Ottawa. Jacques Gréber, Plan for the National Capital- General Report, (Ottawa, ON: National Capital Planning Service, 1950), pg .228

Barrhaven's (short) architectural lineage can be seen in the houses that trace their designs back to the CMHC pattern books for new homeowners introduced in the 1940's. Catherine Jill Wade, "Wartime Housing Limited, 1941 – 1947; Canadian Housing Policy at the Crossroads," (masters thesis, University of British Columbia, 1984). <https://open.library.ubc.ca/media/download/pdf/831/1.0096317/1>

<sup>7</sup> David L. A. Gordon, Town and Crown: An Illustrated History of Canada's Capital (Ottawa: Invenire, 2015), Chapter 12.

<sup>8</sup> Gordon, David L.A. "Still Suburban? Growth in Canadian Suburbs, 2006 - 2016." Queen's University, Canada: Council for Canadian Urbanism, August 2018. p.7



Figure 10: Polaroid of Parking Lot on Strandberd Drive, South Nepean, Area 7.



Figure 11: Polaroid of Walmart Parking Lot, South Nepean, Area 7.



Figure 12: Polaroid of Strandberd Drive, South Nepean Area 7. Dusk.



Figure 13: Polaroid of Wild Roses, South Nepean, Area 7.

## PART II: THE EXPANDING SUBURB

On May 27, 2020, the City Council voted to expand the urban boundary line by 1350 to 1650 hectares by the year 2046. Of the added land, 1281 hectares would be devoted to residential land, the remainder to employment land. Taking into consideration the projected growth of the city over the next twenty-six years – an added 402,000 residents – almost half of the new homes needed will be added outside of existing communities and infrastructure.<sup>1</sup>

“The urban boundary defines the area that is already serviced or may be serviced with major roads, transit and piped sewer water services. ... Decisions about when and where to extend these boundaries have major implications for public spending on infrastructure, for impact on resources and for the structure and character of communities. Assessing the adequacy of the current supply to meet this demand and the need for additional land requires consideration of several factors, in addition to supply and demand. For instance, the quantity of land required for different uses will depend on the average density of development and the mix of land uses achieved over time. [Amendment #150, May 1, 2018]<sup>2</sup>

The current condition of the City of Ottawa follows the 2001 amalgamation of eleven urban and rural municipalities. The *City of Ottawa Official Plan* was introduced on May 14, 2003 following the amalgamation.<sup>3</sup> The *Official Plan* works in parallel with multiple supporting plans.

<sup>1</sup> Kate Porter. “Ottawa Looks to Add up to 1,650 Hectares to Its Suburbs: Amount Recommended Far Exceeds What Community Groups Wanted.” CBC News. Accessed October 13, 2020. <https://www.cbc.ca/news/canada/ottawa/ottawa-urban-boundary-staff-recommendation1.5543765#:~:text=20,The%20City%20of%20Ottawa's%20planning%20department%20wants%20to%20add%20up,2046%2C%20requiring%20195%2C000%20more%20households>.

<sup>2</sup> “City of Ottawa Official Plan: Part 1, Consolidation.” City of Ottawa, 2003. p. 2-8

<sup>3</sup> The first Official Plan adopted by the municipal government was the road diagram from the Greber Plan (1950), adopted in 1951. David L. A. Gordon, *Town and Crown: An Illustrated History of Canada's Capital* (Ottawa: Invenire, 2015), pg. 218

The main supporting plans are the *Transportation Master Plan*, the *Infrastructure Master Plan*, and the *Greenspace Master Plan*. The *Official Plan* has been amended 243 times by the City Council since 2011. Supplementing the *Plan* for the suburb of Barrhaven is the *South Nepean Secondary Plan*, and the *Barrhaven Downtown Secondary Plan*. The *South Nepean Secondary Plan* divides Barrhaven into thirteen different areas for greater control and nuance in planning and development. Through various schedules and land designations each of the thirteen areas are further divided into land uses that are then regulated through the City of Ottawa by-laws. Of greatest interest when exploring Barrhaven as a site were areas listed as *Environmental Protection* land used designation.<sup>4</sup> Tucked into back corners of neighborhoods - among residential zones, schools, bland parks, and commercial zones - the *Environmental Protection* lands are stunning moments of biodiversity. The majority of these areas are unfortunately concentrated in the oldest neighborhoods of Barrhaven – most likely indicating a shift in planning policy rather than a lack of ecosystems worth protecting in the newest areas of development.

The language in which the *Official Plan* and *South Nepean Secondary Plan* is written, when read with a relatively optimistic architectural imagination, is one that brings visions of a sub-urban paradise.

“The Plan shows how the City will manage growth so that the development is compact and land within the urban boundary is used efficiently. This pattern reduces impacts on agriculture land and local food production and helps preserve the biodiversity and eco-system health of natural areas... The Plan supports sustainable, liveable and resilient communities and the quality of life of all residents.”<sup>5</sup>

4 Lands designated “Environmental Protection” are mandated to have “no development, except for a low impact trail network, interpretation features.” City of Ottawa “Official Plan Volume 2a: South Nepean Secondary Plan” City of Ottawa, 2021-2001. <https://ottawa.ca/en/planning-development-and-construction/official-plan-and-master-plans/official-plan/volume-2a-secondary-plans/former-nepean/south-nepean-urban-area/>.

5 “City of Ottawa Official Plan: Part 1, Consolidation.” City of Ottawa, 2003. p. 1-5

However, the character and quality of the neighborhoods that are developed, particularly most recently, manifest a lack of luster homogeneity that seems to ignore the city’s push to implement compact, autonomous neighborhoods.<sup>6</sup> Barrhaven has not even reached the self-sufficiency of communities outside the Greenbelt described in the 1950 Greber Plan.<sup>7</sup> While the Ottawa of today and the Ottawa of the future have no obligation to continue to follow planning documents from the 1950s, the retention of the Greenbelt in the structure of the city demands a revisiting – if not honoring – of its original vision for Ottawa suburbs.

The Greenbelt’s influence is clear in the Planning Committee’s 2020 proposal of a Goldbelt along the newly expanded urban boundary line, and both plans face similar levels of backlash. In 1950 the expropriation of lands by the Federal Government for the creation of the Greenbelt was met with outrage and noncompliance from the Gloucester and Nepean townships.<sup>8</sup> Many of the complaints back then, echo in the complaints of citizens today. Private landowners and developers are outraged at the loss of possible profits, and citizens are worried about accessibility and the cost of housing once the urban area is permanently hemmed in.

The argument really boils down to a single question: is it better for the government to make unilateral decision in the interest of the entire city, or should the rights of the individual be respected? *Apertures, Reflections, Light* lands squarely on the side of the former. Only a small percentage of citizens own land from which they would stand to profit through land speculation

6 Explained in Policy Direction 3: Build walkable, 15-minute neighborhoods, Big Move 4: Climate, Energy, and Public Health City of Ottawa, “The 5 Big Moves,” The New Official Plan, August 2019, [https://engage.ottawa.ca/the-new-official-plan/news\\_feed/the-5-big-moves](https://engage.ottawa.ca/the-new-official-plan/news_feed/the-5-big-moves)

7 “What is important is that, outside the limits so defined, there be maintained a rural belt, subjected to control, to the end that the periphery of the urban area is protected against all undesirable or linear subdivisions or developments... If in the future the need of the urban extension became such that the provisions now adopted from studies made of the urban evolution have to be exceeded, tentacular extensions, similar to those which have formally developed around the initial urban core and which with adjustments we have had to incorporate within the general layout of the ultimate urban zone, would be thus made impossible through the controls referred to.

Exterior to the rural greenbelt and at a sufficient distance therefrom to ensure the permanency of a rural frame to the future Capital, other nuclei of populations could be established in the rural zone in the form of complete self-contained communities comprising from 20,000 to 25,000 inhabitants, similar to the towns of Buckingham, P.Q., or Smith Falls in Ontario.”

“Plan for the National Capital: General Report.” Ottawa, Canada: National Capital Planning Committee, 1950. p. 191

8 David L. A. Gordon, *Town and Crown: An Illustrated History of Canada’s Capital* (Ottawa: Invenire, 2015), Chapter 12.

should the land be rezoned within the urban boundary. The rights that would be respected in the latter case only belong to a few, while the many residents of the city who have not had the good fortune to own land in fortuitous locations – or own land at all – continue to be (dis)served by a city overrun with developers.<sup>9</sup>

<sup>9</sup> Naama Blonder, “Ottawa Following Tired Path in Expanding Urban Boundaries,” Real Estate News Exchange, May 27, 2020. <https://renx.ca/ottawa-follows-tired-well-worn-path-in-expanding-urban-boundaries/>



Figure 14: Polaroid of Apparatus Site, winter.

PHOTOGRAMS FROM SITE COLLECTIONS



Figure 15: Photogram from Area 1 Site Collection, phone flashlight exposure.

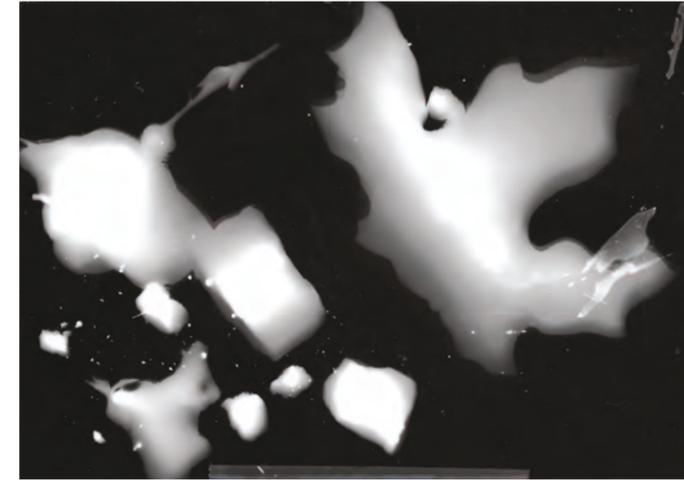


Figure 17: Photogram from Area 1 Site Collection, 2 sec. exposure, bathroom light.



Figure 16: Photogram from Area 1 Site Collection, 10 sec. bathroom light exposure.

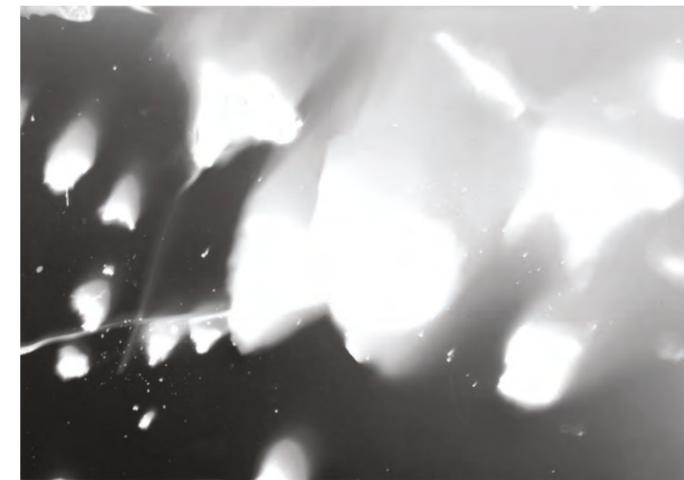


Figure 18: Photogram from Area 1 Site Collection, 15 sec. exposure, candlelight.



Figure 19: *Photogram of dessicated leaf, Ken Ross Park Collection, bathroom light exposure.*

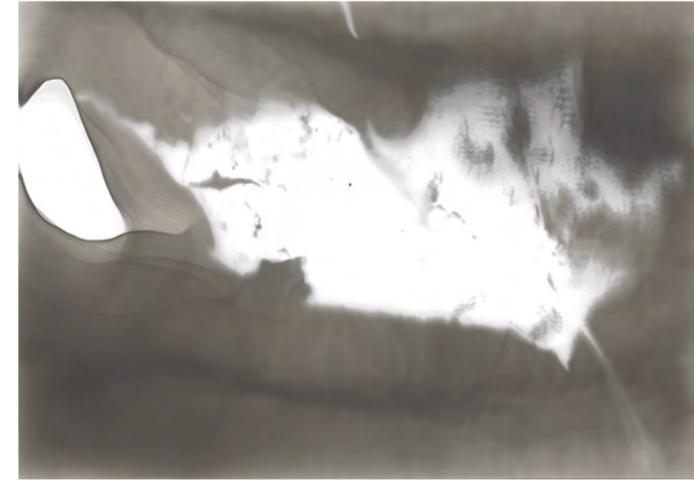


Figure 20: *Photogram of maple leaf, Ken Ross Park Collection, bathroom light exposure.*



Figure 21: *Photogram of maple leaf, Ken Ross Park Collection, bathroom light exposure.*

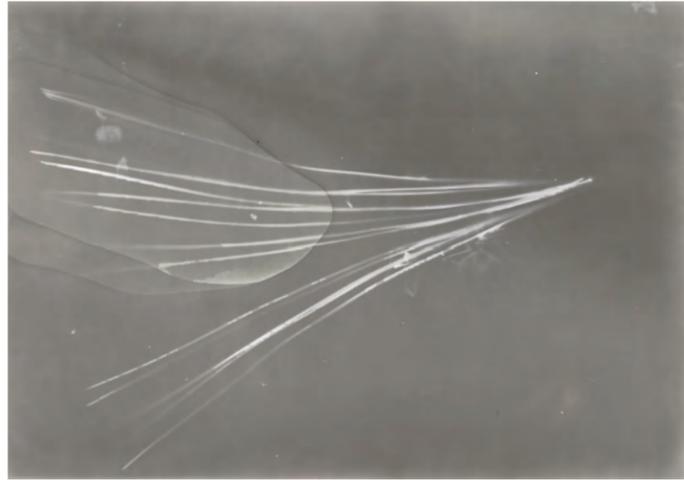


Figure 22: Photogram of pine needles, Chapman Mills Conservation Area Collection, bathroom light exposure.



Figure 23: Photogram of fluff, Ken Ross Park Collection, bathroom light exposure.



Figure 24: Photogram of birch bark, Ken Ross Park Collection, bathroom light exposure.

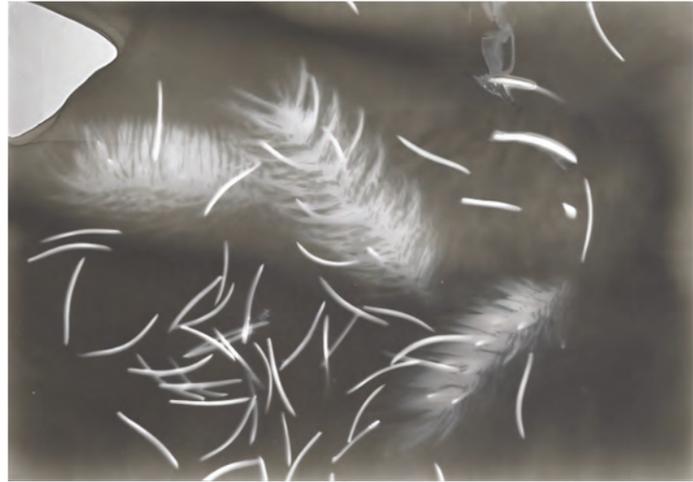


Figure 26: *Photogram of pine needles, Ken Ross Park Collection, bathroom light exposure.*



Figure 25: *Photogram of brambles, Chapman Mills Conservation Area Collection, shorter bathroom light exposure.*

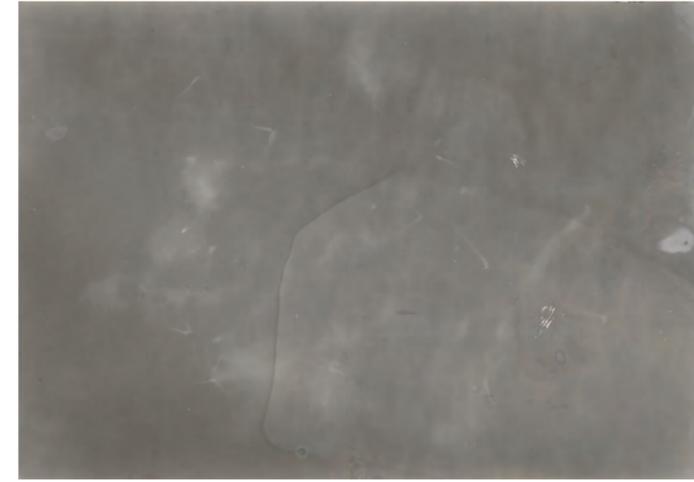


Figure 27: *Photogram of brambles, Chapman Mills Conservation Area Collection, longer bathroom light exposure.*



Figure 28: *Photogram of charcoal, Chapman Mills Conservation Area Collection, bathroom light exposure.*

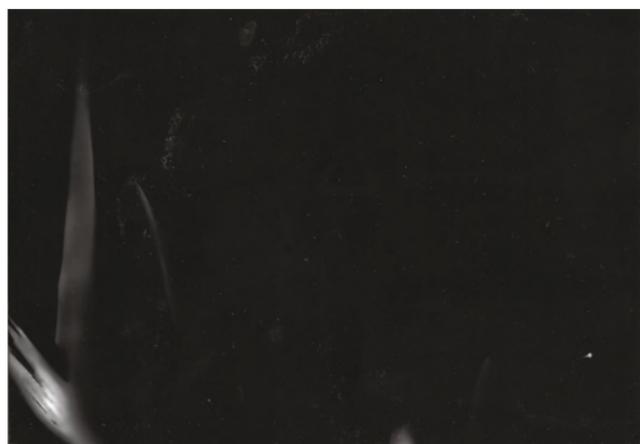


Figure 29: Photograms of dried grass, Apparatus Site Collection, bathroom light exposure



Figure 30: Photograms of dried grass, Apparatus Site Collection, bathroom light exposure

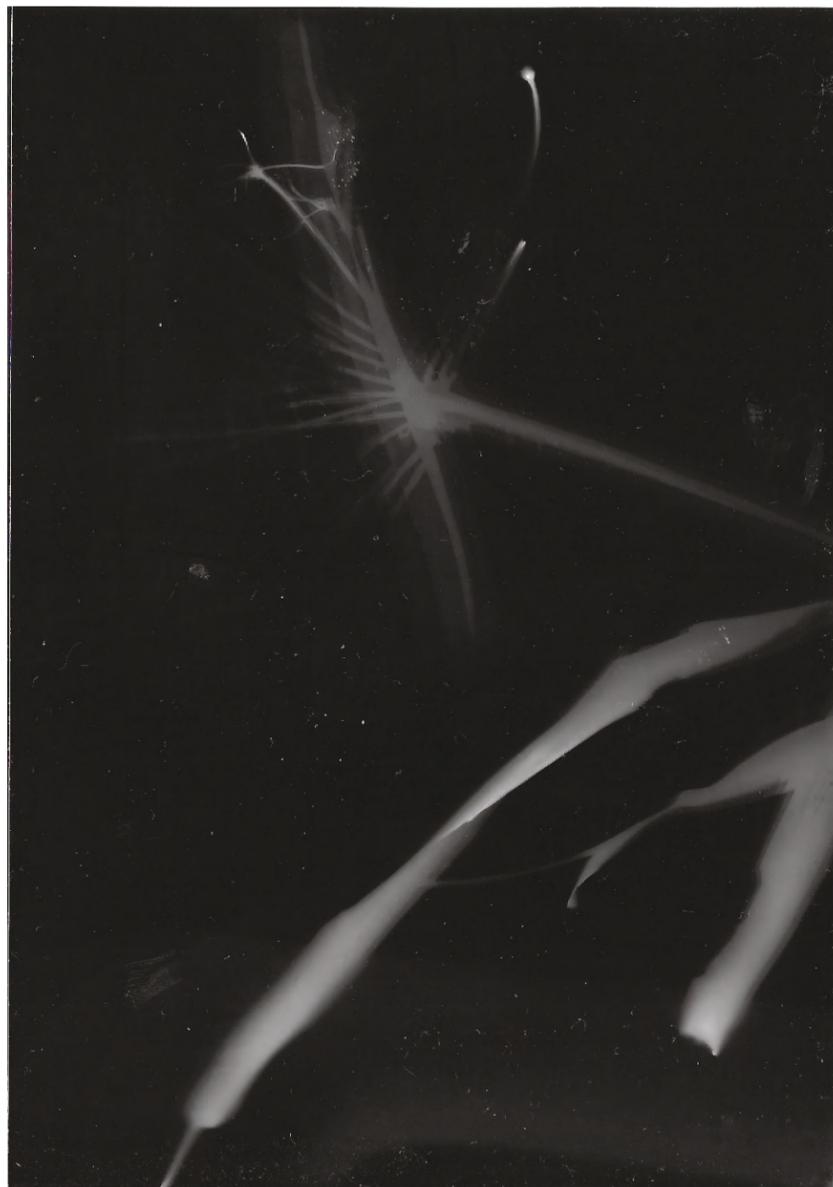


Figure 31: *Photograms of dried grass, Apparatus Site Collection, bathroom light exposure*

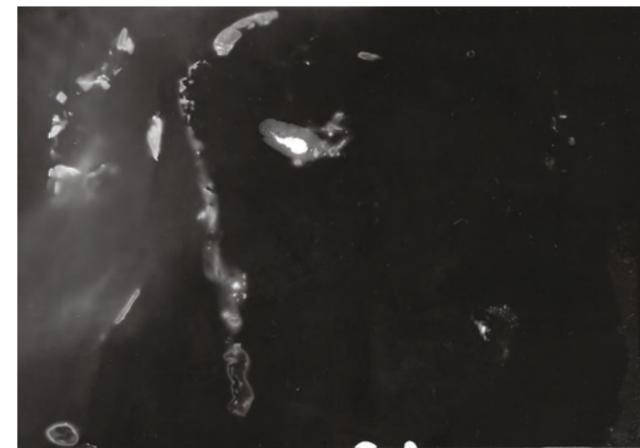
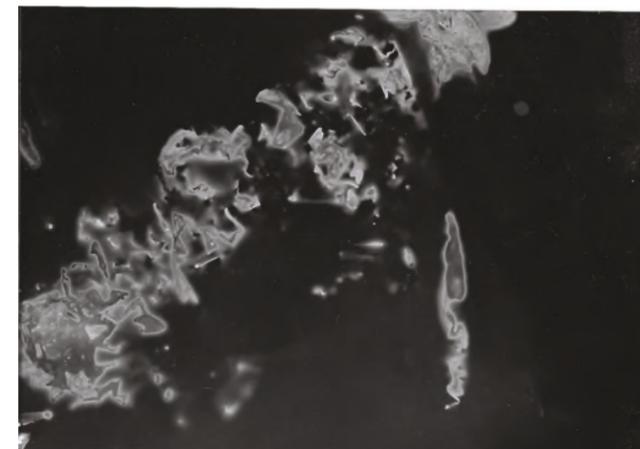


Figure 32: *Photograms of plastics from spring than, bathroom light exposure*

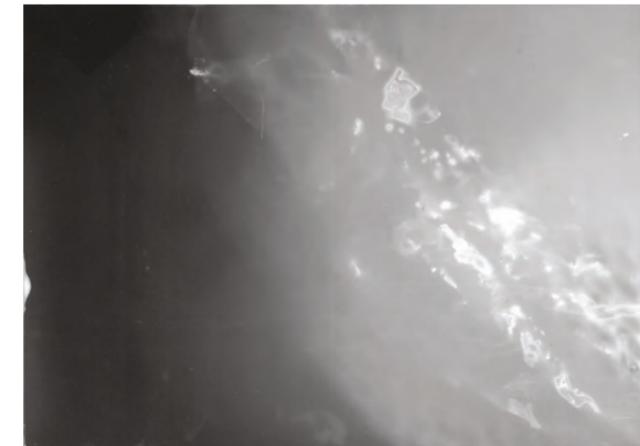
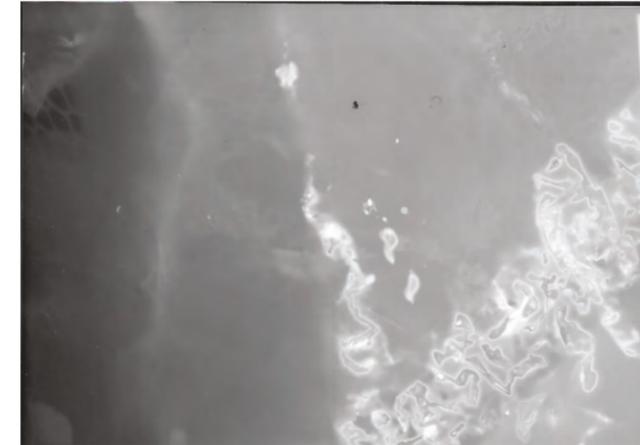
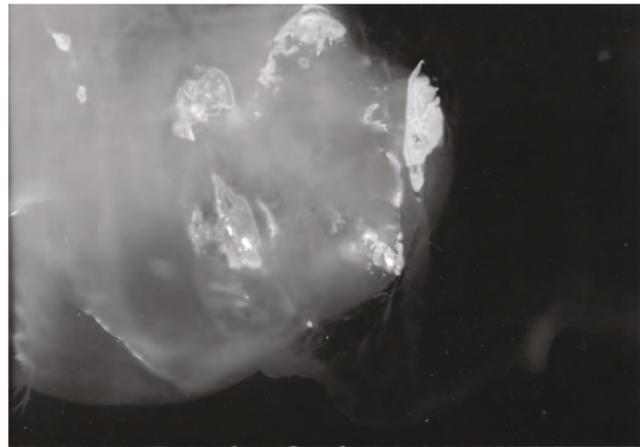
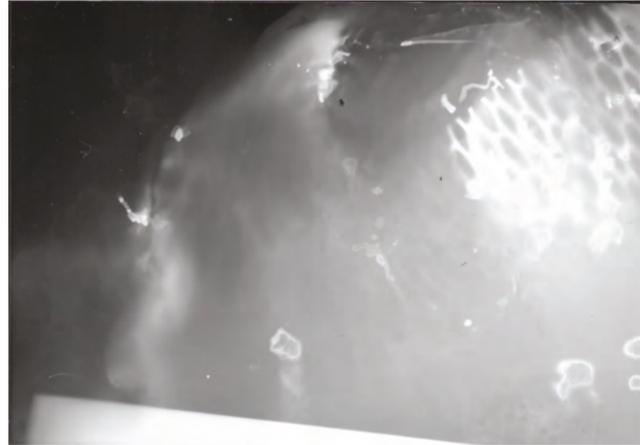


Figure 33: Photograms of plastics from springaban, bathroom light exposure



THE THINGS THAT MADE THINGS  
THE WAY THEY ARE

*Figure 34: Photograph of bridge in Barrhaven Creek Valley Forest, South Nepean, Zone 5.*

## OPTICAL DEVICES AND OBSERVERS

The initial frame experiments led to questioning ways we see, and ways we capture what we see. Looking led to queries, which led to tinkering with optical devices, which then led to explorations of analog photographic techniques. Resulting experiments dissolved the assumption that photography would only be a means of documenting the site. Instead, the means of recording the site when exploring also became an attempt to dissect the relationships between the observer and the object as well as between spaces seen and spaces inhabited.

Explorations of analog photogrammetric techniques began with a pinhole camera that folds into a book.<sup>1</sup> The first constructed views of the site are a series of photographs attempting to capture moments of quiet splendor.<sup>2</sup> While wonderfully compact the camera only holds a single 3.5" x 5" sheet of photographic paper at a time. After each exposure, the camera must be brought back to a dark room to exchange - and develop - the exposed paper with a fresh sheet. Each exposure is therefore carefully chosen for significance to the site and composition. Long exposures layer complexities: each page no longer holds a single frame of reality, but a continuum of moments and light; reality folded back upon itself, compressed onto a single sheet of paper.

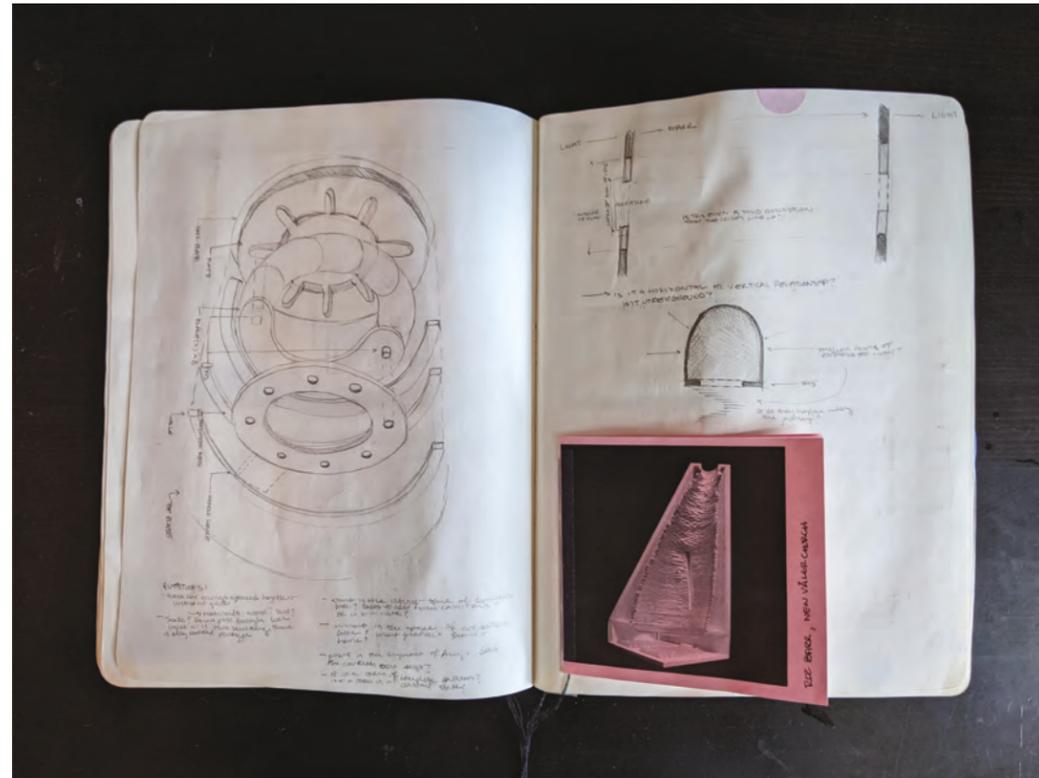


Figure 35: Sketchbook pages, left page depicts exploded assembly of iris aperture in graphite.

1 Anderson, Kelli. *This Book Is a Camera*. 2015. Paper, 7" x 9" x 5.5". <https://kellianderson.com/books/thecamera.html>.

2 See Appendix A section on Pinhole Photographs for full collection.

The resulting images have more in common with the camera obscura than the lineage of digital photography. The art historian Jonathan Crary explains that:

“this highly problematic object was far more than simply and optical device. For over two hundred years it subsisted as a philosophical metaphor, a model in the science of physical optics, and was also a technical apparatus used in a large range of cultural activities. For two centuries it stood as a model, in both rationalist and empiricist thought, of how observation leads to truthful inferences about the world; at the same time the physical incarnation of that model was widely used as a means of observing the visible world, and instrument of popular entertainment, of scientific inquiry, and of artistic practice.”<sup>3</sup>

In this spirit, the pinhole camera photographs and resulting experiments are concerned with the body and its physical involvement with the act of looking. In what way does the act of observing move the body? How then can a device we look through make tangible the connection of our gaze between the body and the subject? When we are made aware of this active connection, does that influence or change the ways in which we observe? Can changing the ways we observe alter the ways we choose to interact with our environment? Specifically, when observing nature, when the positions of observer and subject are made explicit will we be able to re-evaluate our subconscious assumptions about humanity’s relationship with nature?

As much as observation and gazing is about unearthing and examining things within ourselves, it is also about creating imaginary worlds and fictions. It is not just about laying things bare in the bright light of day. As Mark Foster Gage queries “perhaps instead of acting to demystify the world that surrounds us through claims to the absolute, yet as we have seen, significantly edited and fictional, understandings of reality, architects might use such fictions in another way – towards the world’s re-enchantment and production of allusions to the unknown to which we all have, by definition equal access.”<sup>4</sup>

<sup>3</sup> Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge, Mass: MIT Press, 1990).

<sup>4</sup> Mark Foster Gage, *Designing Social Equality: Architecture, Aesthetics, and the Perception of Democracy* (New York: Routledge, 2019). Pg. 30



Figure 36: Negative, Pinhole photograph of backyard, South Nepean, Area 1.



Figure 37: Positive, Pinhole photograph of backyard, South Nepean, Area 1.



Figure 38: *The Darkroom (bathroom).*

## EXPERIENCING DARKNESS

The heart of this project – both in its creation and its ultimate architectural expression – is the experience of darkness. An unusual amount of time over the life of the project has been spent alone in a dark bathroom. Working with photographic mediums requires a darkroom, and thus, the retreat to the light proof bathroom. These moments alone in the dark during the process of development became the fundamental experience of silence the architecture of the project is built around. Meditating on the nature of silence George Prochnik observes that “... silence is the state in which we find ourselves taking in the most varied array of sounds possible. In this sense silence would be the particular equilibrium of quiet and sound that allows us to relax our resistances and maximize our connection to the world around us.”<sup>1</sup> Each step, each movement through space along the descent within the Apparatus is a ritual to prepare visitors for the volume and silence of darkness, and the alchemy of development. In rich black silence the mind finds fertile ground for the seeds of transformation.

<sup>1</sup> George Prochnik, “Silence,” *Emergence Magazine*, accessed September 22, 2020, <https://emergencemagazine.org/story/silence/>.

*I open my eyes and there is no difference from when they were shut. Empty air takes on physical form, pressing back against my pupils as they search for stray particles of light. Darkness like this – so complete that I can pretend it is the void of space – is not as lonely as I would have imagined.*

*First, silly thoughts of monsters and fears flicker through my mind. Prickling across my skin, shivering down my spine. Then, time persists and the walls of the room give way into expansive black: lush velvet currents undulate. My mind floats away on a soft dark river leaving me alone with my breath.*

*Inhale.                      Exhale.*

*Inhale.                      Exhale.*

*The longer I remain suspended in this stillness, the more even my breath begins to fade. The borders between myself and the darkness blur as silence pervades; not the total absence of sound, but the relinquishing of control. I disassemble my self, move aside, make room, and let the sounds that have been rushing beneath my periphery flood in. In silence I become a vessel and voyager, brushing up against the shores of new worlds.*

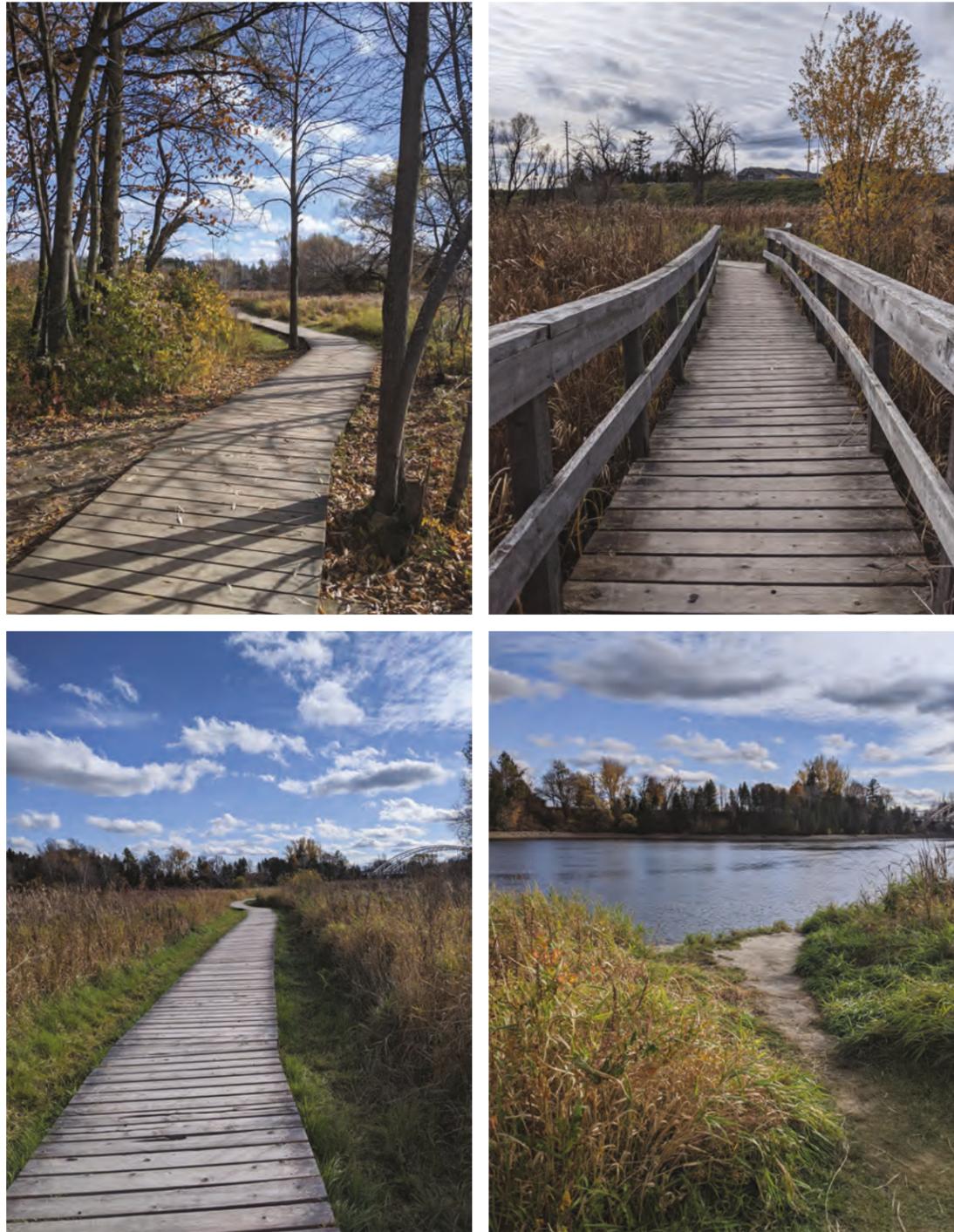


Figure 39: Photographs of boardwalks and pathways from portions of the Chapman Mills Conservation Area.

## THE LANDSCAPES THROUGH WHICH VISITORS WILL TRAVEL

The lives of trees impact the lives of humans far beyond the creation of oxygen, and the richness of their lives extends far outside the realm of human perception. Trees are incredibly social creatures, and within a forest form complex networks of support and resource distribution.<sup>1</sup> While home to a complex ecosystem of wildlife, a forest is a living organism in its own right. We can feel the power of its life force deep beneath the whispering ocean of leafy canopies: a powerful humming almost too delicate to hear. To have visitors love forests, and by extension the planet, as living beings is the seed planted in the dark womb of the Room of Development. The site plan for the project will react to this, dedicating the majority of surface area to landscapes populated with native species, in some places able to accommodate the movement of humans through them, and some instances meant to practice the act of observing a landscape without entering it.<sup>2</sup>

There are few, if any, opportunities in the city of today to make lasting physical impressions in public spaces without approvals from governing bodies: planted flowers are mowed down; art becomes graffiti to be painted over; and physical alterations become vandalism to be prosecuted. We move through our cities as ghosts, and ghosts have no need to care for the lives of trees. Through acts of physical and metaphysical transformation during the process of creating photogrammetric artifacts while journeying into the earth the ordinary resident will

<sup>1</sup> Wohlleben, Peter, Jane Billingham, and Peter Wohlleben. *The Hidden Life of Trees: The Illustrated Edition*, 2018. Chapters 1-4

<sup>2</sup> Gilles Clément et al., eds., Gilles Clément, Philippe Rahm: *environ(ne)ment: manières d'agir pour demain, approches for tomorrow*, 1st ed (Milano : Montréal : New York: Skira ; CCA ; Distributed in North America by rizzoli, 2006). Pg 94.

no longer be a transient being passing through the world without leaving a mark, but a person engaged in the shaping of their public spaces.<sup>3</sup>

Embedded within the wilderness sanctuaries that dominate the site is an architectural frame for human relations with nature - the Apparatus. The emphasis of the spaces within the Apparatus is placed on action. The aim of the architecture is beyond a walk in the forest, or the simple contemplation of landscapes (although both are of the utmost importance to the human condition).<sup>4</sup> The aim is a bodily engagement with visitors' physical surroundings resulting in the creation of artifacts that tie each visitors' inner experience of the architecture and site to the physical realm.

It is illogical to assume all potential visitors will be of the same mindset in which the project has been conceived. As seen in Watter's Wood – a small environmental protection zone tucked into a North-Eastern neighborhood of Barrhaven - it is possible to have a transcendent moment at the exact instance someone else is walking their dog.<sup>5</sup> Therefore, the site and the Apparatus will take visitors on a journey that emulates the internal process through which the project was created. By the time visitors are submerged in the darkness in the deepest reaches of the Apparatus, the previous moments will have sufficiently prepared them to encounter the darkness in silence.

Traveling deeper underground visitors become increasingly aware of the weight of the earth, and feel the substantive thickness of the concrete that holds it at bay. Doorways and thresholds become short passageways that transgress the thickness of the walls. Alcoves and

punctures carve walls into inhabitable spaces. Encounters with darkness and silence are countered with a return to sparkling light and sound at the end of the path, terminating in a meadow.

Through performing the process of photographic development, we ourselves are transformed, and so too our view of the world is re-framed. Emerging back into the world we find that the Apparatus has preformed what simple frames on window glass could not: now all we see is the beauty at the heart of all things. This beauty is more precious because it does not exist in contrast, or in spite of its surroundings. We have reshaped the way we see what we see.

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<sup>3</sup> Rosalind H. Williams, *Notes on the Underground: An Essay on Technology, Society, and the Imagination*, New ed (Cambridge, Mass: The MIT Press, 2008). Chapters 1-2

<sup>4</sup> Sturm, Virginia E., Samir Datta, Ashlin R. K. Roy, Isabel J. Sible, Eena L. Kosik, Christina R. Veziris, Tiffany E. Chow, et al. "Big Smile, Small Self: Awe Walks Promote Prosocial Positive Emotions in Older Adults." *Emotion Advance online publication* (2020). <https://doi.org/10.1037/emo0000876>.

Amy Fleming, "'It's a superpower': how walking makes us healthier, happier and brainier", *the Guardian*, July 28, 2019, <https://www.theguardian.com/lifeandstyle/2019/jul/28/its-a-superpower-how-walking-makes-us-healthier-happier-and-brainier>

<sup>5</sup> See Appendix B: Detailed Examinations of Watter's Wood



*Figure 40: Polaroid from Chapman Mills Conservation Area, South Nepean, Area 4, 5, & 6.*



*Figure 41: Polaroid of Confluence of Rideau and Jock Rivers, South Nepean, Area 8.*



*Figure 42: Polaroid of Jock River, South Nepean, Area 8.*



## DRAWN EXPLORATIONS DELVING INTO EARTHLY DEPTHS AND REPRESENTATIONAL TECHNIQUES

Figure 43: Sketchbook, right hand page: preliminary sketches of inhabitable optical devices.



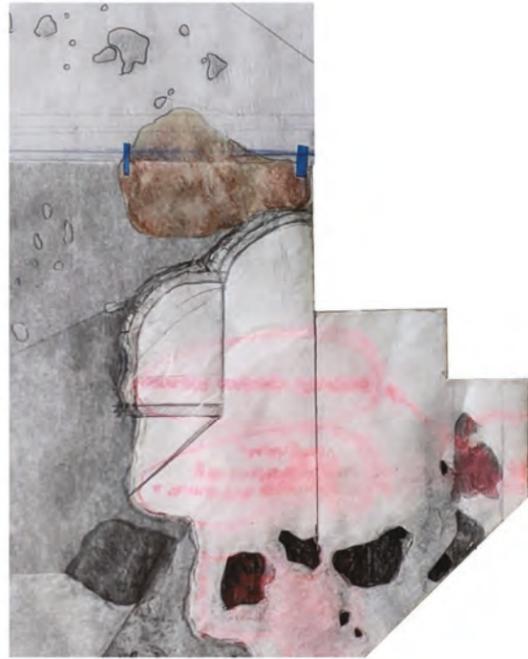
Figure 44: Photogram composite that is the base of the ideogram.

Figure 45: (Opposite) Section Exploration "Ideogram" based on a photogram composite, layered with CMHC housing plans, and excerpts from "Encyclopédie".

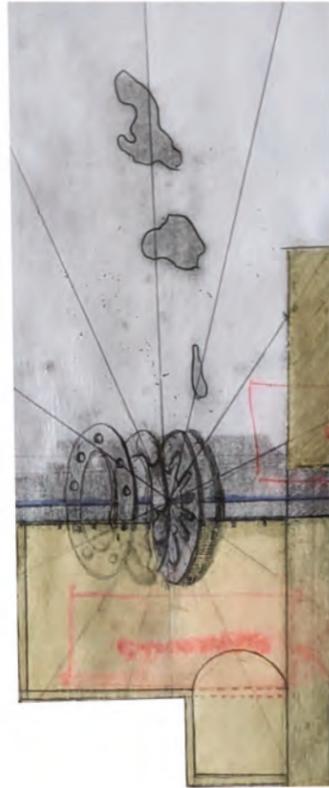


Figure 46: (Opposite) Section Drawing exploring the form of the main pavilion (later to become the Apparatus)

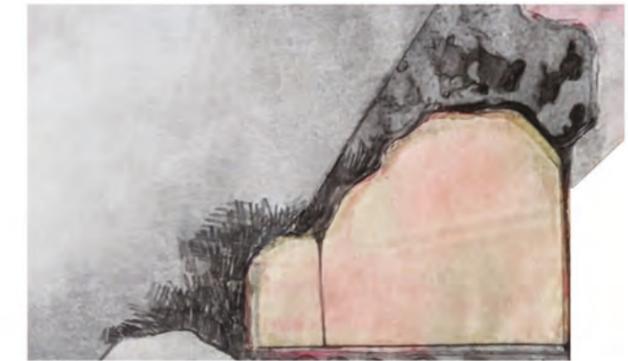




Initial impression of the Room of Light, located below the washroom.



Left: Detail of the Washrooms (in yellow) and an Aperture Gateway. Retaining wall bordering on the right. Right: The Ramp forms the spine of the pavilion, facilitating vertical and horizontal movement through the ground and varying chambers.



Detail of the Room of Darkness. Situated at the greatest depth underground the chamber houses silence, darkness, and a room for the development and transformation of images.

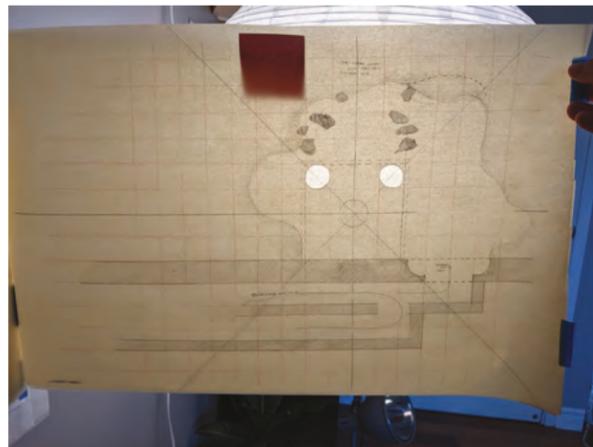
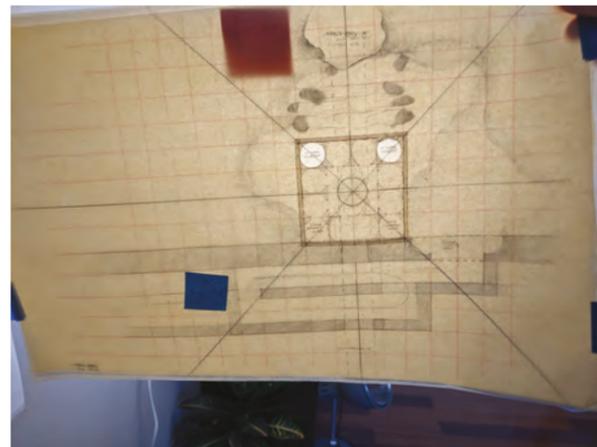
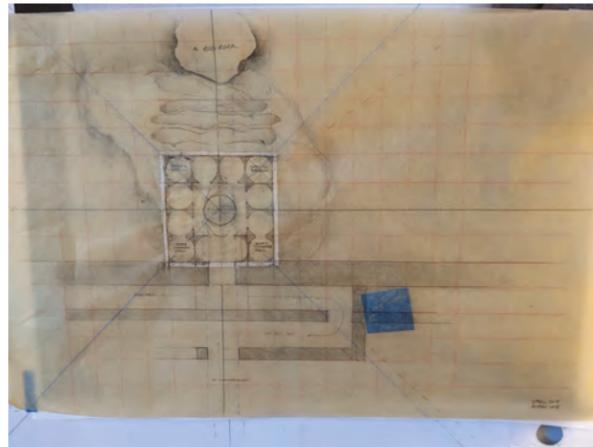
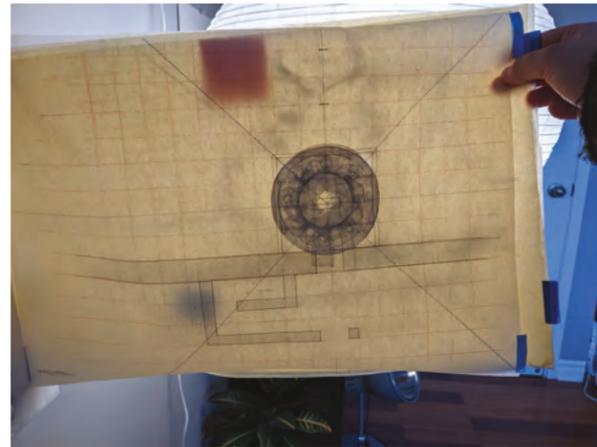
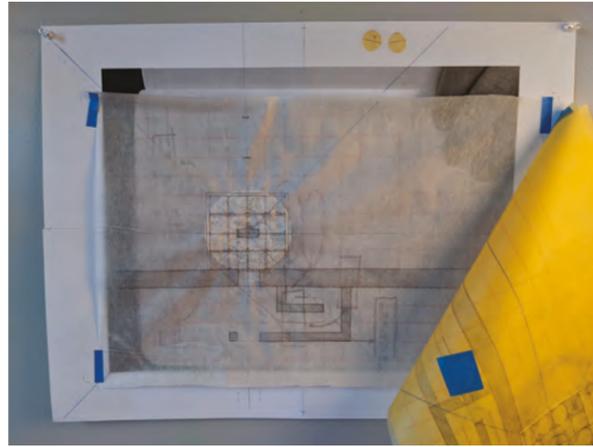


Figure 48: (Next Page) Axonometric exploration of washrooms. Graphite and colored pencil on tracing paper.

Figure 47: Early plan explorations of main pavilion. Graphite, pencil crayon, tape, & glue on white and yellow tracing paper.

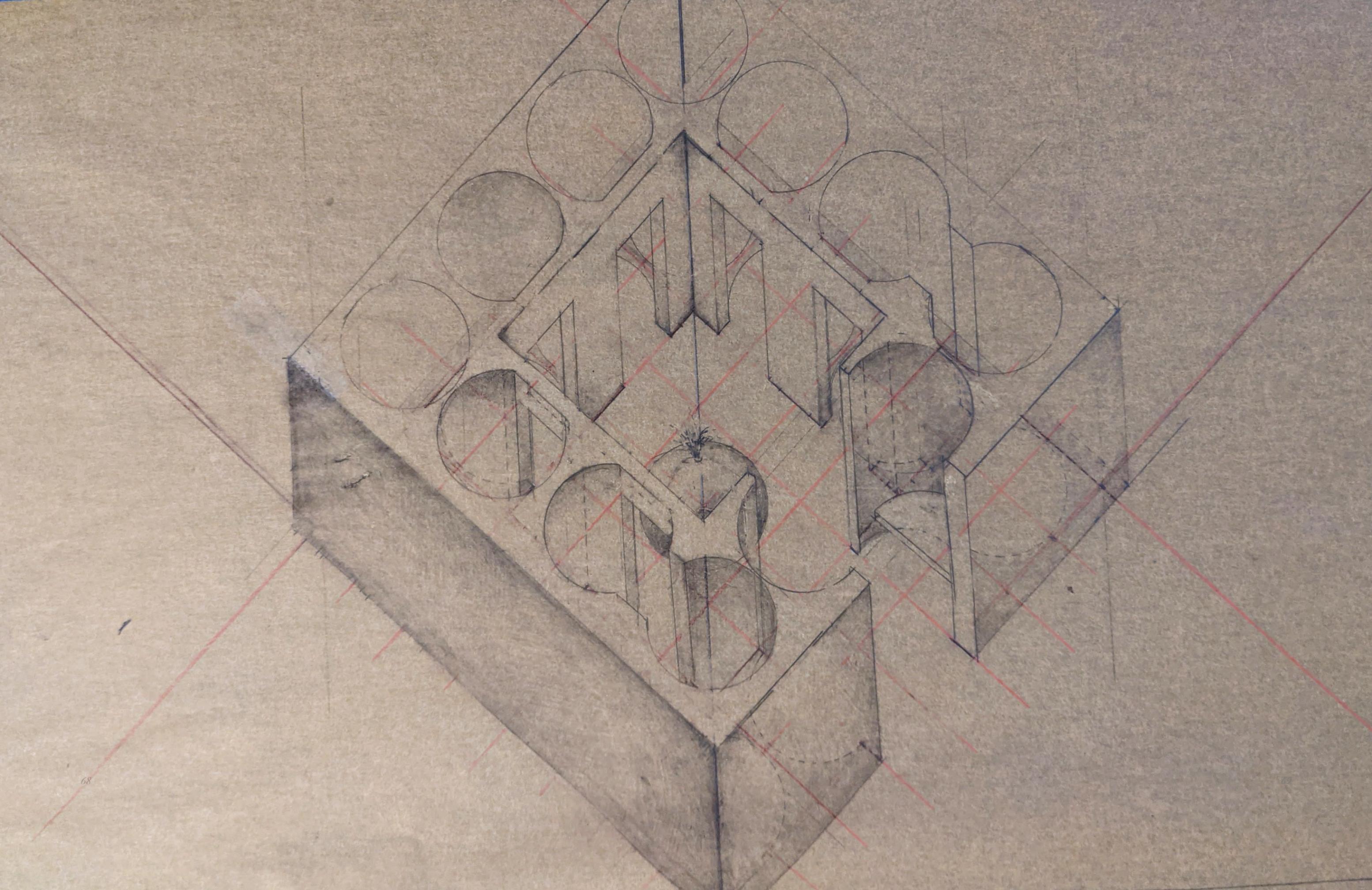




Figure 50: Section drawing of ramp from main pavilion used to develop ramp slopes, scale, and number of runs. Graphite, conte, and marker on trace paper. Mounted on cardboard with masking tape.



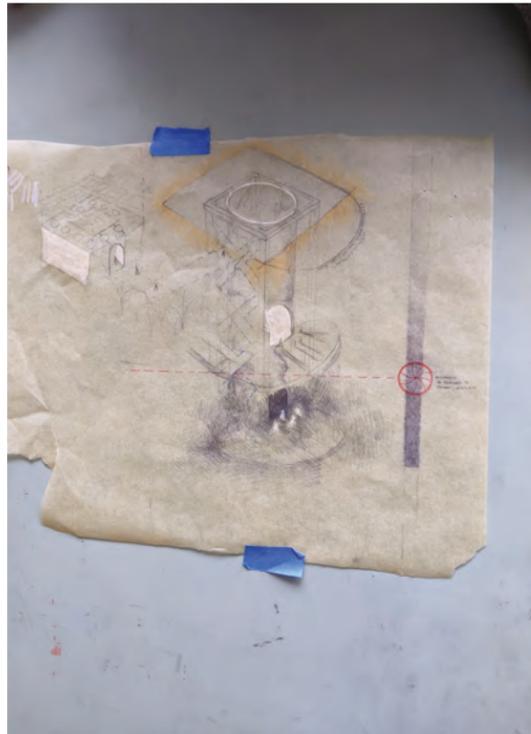


Figure 51: Axonometric study of relationship between the Shaft, Ramp, Grotto, and Washrooms. Graphite, marker, and colored pencil on trace paper.



Figure 52: Sectional study of relationship between the Shaft, Ramp, and Iris Aperture. Graphite, marker, and colored pencil on trace paper.

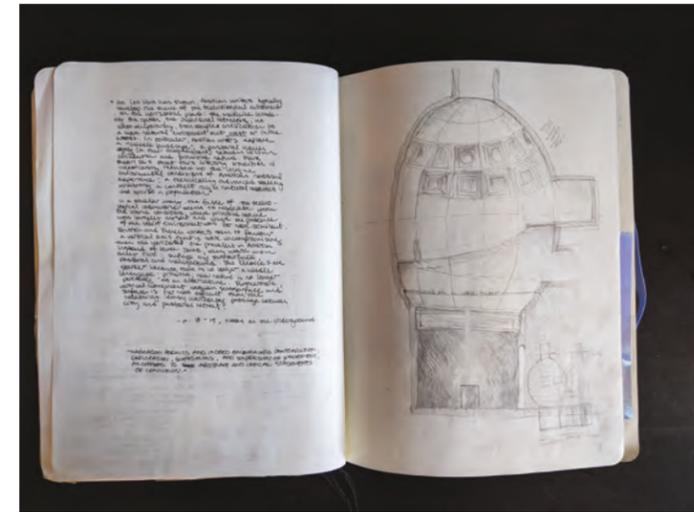


Figure 53: Sketchbook, right hand page: exploration of the relationship between spaces of light and spaces of darkness within the Apparatus.



Figure 54: Sketchbook: Studies of relationship between the Ramp and the Shaft of Light.

*Figure 55: Transverse Section through Room of Development, draft. Graphite, marker, and glue on paper laser-jet printed with images. Joined with masking tape. Original scale: 1:100*





Figure 56: Detail of Transverse Section through Room of Development draft showing Grotto underneath Shaft of Light to the left of the Ramp. Graphite, marker, and glue on paper laser-jet printed with images. Joined with masking tape.

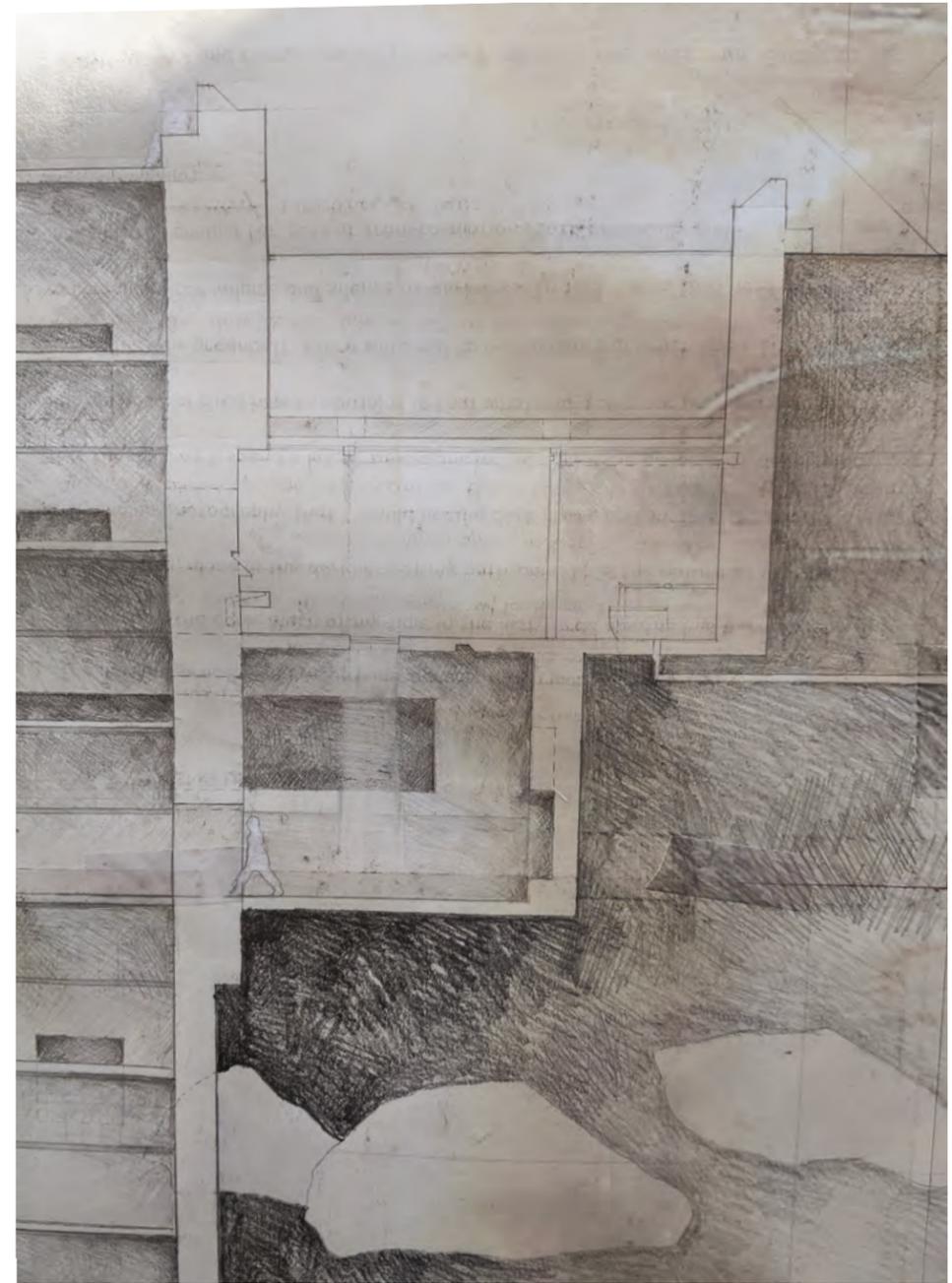


Figure 57: Detail of Transverse Section through Room of Development draft showing Exhibition Space (to become Airing Hall) and Washrooms. Graphite, marker, and glue on paper laser-jet printed with images. Joined with masking tape.



Figure 58: Study model of the Apparatus.  
Cardboard, paper, Styrofoam, balsa wood, hot glue, and marker.

THE APPARATUS, SITE, AND ORDINANCE

Figure 59: Site Map of Barrhaven showing paths of explorations throughout the suburb.  
Graphite and gold leaf on paper.  
Original scale: 1:18,000



The proposed site and architectural pavilion is paired with an ordinance to ensure the growth and care taking of future sites into a new Greenbelt for the suburbs of Barrhaven. The ordinance guides the planning of the original site, while using its pavilion – the Apparatus – as a generator for future pavilions and sites to come.

### ORDINANCE FOR THE LIVING INFRASTRUCTURE OF BARRHAVEN

This ordinance stems from the imperative that the native environment gracing Barrhaven should be protected to the fullest extent of our abilities as a city in the hope that it will continue to flourish in future lifetimes. The majority of surface area of sites will be covered in native vegetation with sections planted along a spectrum between untouched wilderness and maintained gardens. This gradient in planting schemes operates in tandem with a mirrored spectrum of human interaction with landscapes; ranging from structured architectural spaces and maintained pathways to inaccessible brush, meadows, and forests. Intersections and large roads through or near sites will be covered to allow humans and wildlife alike free range of movement over the site, unobstructed by automobiles. While sites immediately after construction will be a type of “pseudo-wilderness”, manufactured by the human hand to take on certain characteristics, careful maintenance and protection over many generations will allow the wild life to re-inhabit these spaces as they would like, in some places completely unrestrained by man.

Following the Apparatus (the first pavilion), future pavilions will remain largely underground, delving into the ground at varying scales and complexities, and present minimal

elevations above ground. They will move visitors through inhabitable ocular devices, rooms of darkness, spaces of light, and gardens. Connection of multiple sites will lead to the future creation of a greenbelt running in and around Barrhaven that not only creates opportunities for active engagement with each resident’s environment, but also protects the integrity of existing and regenerating habitats.

All spaces surrounding and enclosed within architectural pavilions should be designed in such a way that everyone has the opportunity to encounter them at the same pace and with the same ease typically attributed to walking regardless of their mobility requirements. Being able to move through the world at a human scaled pace and experience one’s surroundings to the fullest extent of one’s sense situates visitors in a position receptive to the architecture and beauty of the site. Works like Thoreau’s *Walking* or the paintings of the Group of Seven show us that wilderness is sought with a uniquely human hunger time and again. However, wilderness is one of the least universally accessible environments to humans. There are several facets of inaccessibility that will need to be addressed in the landscaping and architecture of sites to consider projects successful: terrain, distance, safety, and shelter.

### TERRAIN

Only the most physically capable among us are able to navigate the most challenging of terrains that nature can present. This immediately necessitates the creation and maintenance of a pathway: not only for those of us who cannot walk, but for those who have difficulty walking, those who cannot walk for long periods of time, and those who need wayfinding or guidance from the physical environment. The pathway should be wide (to facilitate multi-directional travel), carefully graded to meet accessibility requirements, finished in an easily traversable material that does not contaminate run-off water, and be maintained year-round.

#### DISTANCE

By its very nature wilderness implies a quality of remoteness. Remoteness often limits access to the site for different modes of transportation, particularly limiting access for those without personal motorized vehicles. Remoteness also requires a certain amount of time to journey to the site. This layers concerns of distance with questions of means. Do visitors have enough money and space to own and maintain a vehicle? Do visitors have enough money to afford transportation to the site? Are the visitors financially stable enough to allot time to visit a remote site? The fact that not all members of any community are able answer these questions affirmatively requires that portions, if not all, of the project site be close to home. The new wild spaces created and preserved by this new greenbelt cannot be simply strung along the periphery of Barrhaven. Portions must penetrate to the heart of the community, interconnecting with the pre-existing walking and bike paths, as well as public transit. From these more centralized points of connection the depth of the experience within the project is then left to the discretion of each visitor. This constraint to the project is by far the most exciting: it creates the obligation to reintroduce truly diverse ecosystems back amongst the sterility of suburban spaces.

#### SAFETY

Venturing out of the house into the wilderness exposes visitors to varying degrees of dangers associated with encountering wilderness: including but not limited to falls, falling trees, rocks and debris, weather events, various visibility and lighting conditions, bodies of water, and predatory animals. While these dangers can be largely mitigated by the architectural elements encompassed within pavilions and accessibility requirements for the site: railings, ramps, paths, signage, and proximity to urban areas or transportation. Where applicable, greater consideration to safety features in design will be applied. For example: when in close proximity to bodies of water, within flood plains, on steep inclines, and when the chosen site presents aggressive changes in elevation.

#### SHELTER

While the programs of pavilions should not be solely about enclosure or creating respites along paths, their placement within the site will take this into consideration, remedying any concerns for shelter. Essential to the concept of shelter within the site is accessibility to washroom facilities. Like a washroom at a trail-head, the inclusion of washrooms within the design of the largest pavilions, and at comfortable distances between smaller pavilions, ensures unhurried and prolonged forays into the site. In this way, the network of washrooms created between sites will keep expansions of the future greenbelt – while at times vast in total scale – in touch with the human scale of interaction.

Figure 60: Site Plan.  
Graphite on paper.  
Original Scale: 1:4000



## PHYSICAL AND EXPERIENTIAL PROJECT DESCRIPTIONS

The site of the Apparatus - which is currently a driving range and new residential growth at the center of Barrhaven - is dominated by large swathes of vegetation - meadows, forests, and flowing seas of native grasses. The larger portion of the site, to the west of the intersection between Greenbank road and Strandherd road – multi-lane and heavily trafficked arteries that form major axes in Barrhaven – is bisected by a cliff-like cut into the site sloping up from the Jock river to the South, towards the Northern boundary of the site which is bordered by the large box stores of the Barrhaven Town Center. On the Eastern side of this bisecting line, running the full length of the site to the Jock River waterfront is a meadow, traced with light footpaths. On the Western side of the cliff is a meadow dedicated to the local flora and fauna – protected along all borders from human intrusion.

Running along the borders of the site are buffers of thick vegetation, trees and in some instances Ha-Has. These buffers act to close off the site from the surrounding human-made environments – particularly where roads, cars, and commercial centers abut the site without the use of hard boundaries that interrupt the full extent of the gaze. The buffers become more physically porous around the residences and public school that face into the site. The treatment of Greenbank road in these areas encourages pedestrians the transverse its boundary, re-asserting the pedestrian's right of way over the landscape. On the smaller portion of the site to the East of Greenbank the meadow undulates with small hillocks, rising into large berms as it reaches the edge of the OC Transpo (the municipal bus service) rest stop. Leaving this road open to the

site and sky, the site's eastern extremity is covered with a dense forest. This forest is planted in all manner of native trees, emphasizing density of vegetation, and limiting human access points. It is imperative that these trees are undisturbed: after planting becoming a wildlife reserve kept in trust for the survival of local plant and animal species, and future generations of humans.

The Apparatus lies at the apex of the cliff's elevation. This architectural pavilion is composed of eight distinct elements:

- The pathway (1)
- The Wall (2)
- The Airing Hall (3)
- The Shaft of Light (4)
- The ramp (5)
- The washrooms (6)
- The Room of Development (7)
- The Grotto (8)

The Path (1) begins at the first step out of every visitors' door.<sup>1</sup> To begin: simply leave your house, walk down the street, and head towards the trees. In these crucial first encounters with the out-of-doors take time to smell the air, listen for what sounds you can hear, and gently attune to the world around you as the pace of your mind slows. Along your way collect objects of interest like small rocks, fallen leaves, or photographs. The Path is the least structured element of the Apparatus – but the most essential. All things begin and end with the visitors' journey upon it. At times the pathway is formalized by physical elements, specifically connecting the site to the broader context of Barrhaven, and at other times its form is only created through the visitors' mental link to the site.

Approaching the site from the Barrhaven Town Center to the North,<sup>2</sup> the pedestrian

<sup>1</sup> Before you leave, prepare for adventure by packing some water, a light jacket or umbrella if the weather necessitates, and perhaps a snack for you or the birds.

<sup>2</sup> While the following journey though the Site follows the order in which the specific spaces of the Apparatus were conceived to relate to one another, the spaces can be encountered in part, in whole, in reverse, or in any fashion visitors should choose.

follows existing sidewalks. As the sidewalks begin to rise up, meeting the landscape Greenbank road dips down into the earth, eventually sliding beneath its surface entirely. Over top of this land bridge the narrowness of the sidewalks widens into a broad pathway. Facing South, visitors view a panorama: expansive sky over a sea of grass. Splitting down the middle, the terrain to the left of center begins to slope downwards towards the river, while to the right the meadow remains high, basking in the sun upon the ridge. Cutting across the view from the right is a low wall (2), gently rising as it approaches the center cliff, and then falling over its edge, protecting the meadow beyond from human intrusion. Hovering over the Wall is form made of glass and wood, sunlight dancing upon its features. Balancing over the landscape this box – the Airing Hall (3) – comes to rest on top of a thick concrete block rising parallel and to the North of the Wall.

The Path leads visitors towards this structure, running beneath the Airing Hall towards the Wall. Accessed through a separate ramp the Airing Hall is a space to display photograms created within the Apparatus and unique objects collected throughout the landscape. Projecting over the Wall, Ramp, and lip of the Shaft of Light (4) it is also a unique vantage point from which to observe the Apparatus as it sits embedded in the landscape.

Moving through the depth of the Wall visitors exit onto a landing, facing South. Approaching the balustrade and peering over, visitors gaze into the Shaft of Light (4). The sloping concave form is vast and alien as it funnels into the earth, terminating at its deepest point in a small aperture. Opening to the South and West its smooth concrete faces warm in the sun.

Turning left, the descent begins. As concrete walls rise overhead, eyes are drawn to the sky – crisp against the solid concrete enveloping the Ramp (5). The Ramp is distinct from the pathway by virtue of its descent beneath the earth; a structured corporeal experience from light into the mysteries of darkness. Making eight full rotations in total, the Ramp cuts deeply through the geology of the site.

After one and a half rotations down the Ramp, there is a doorway in the right-hand wall of the landing. Beyond the doorway is simple rectangular chamber. On the opposite wall, at the opposite end of this chamber is another doorway, through which gentle light filters.

Beyond this second doorway are the Washrooms (6). Featuring a long communal sink, the main space of the universal washroom facility is open directly to the sky through a central, slender rectangular cut. Each of the eight cylindrical stalls reaches up to puncture the horizon as well; individual skylights bathe the curving concrete walls in a symphony of refractions.

Moving beyond the washroom landing the descent continues. The light begins to fill with shadows as the sky is truly left behind. The chasm of the ramp begins to echo with the steps and voices of other visitors above and below as the last whisper of the wind fades away.

After four more rotations of the Ramp there is another doorway on the southern face of the landing. Beyond the doorway the passageway curves back horizontally along the length of the Ramp. To the left, the Ramp continues on deeper underground.

Passing through the right-hand doorway the curving hallway leads to the Room of Development (7). The hallway terminates at another doorway, this time with a recessed sliding door. Beyond the door is a small antechamber framed on either side by wide benches meant for resting and waiting. In line with the first doorway is a second, again with a sliding door.<sup>3</sup>

Passing through this final doorway visitors arrive in the Room of Development. The chamber is substantially taller than the antechamber and hallway, rising up to meet the aperture

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<sup>3</sup> The doors here are meant to act as a “light-lock” to maintain the integrity of the lighting conditions within the Room of Development.

at the bottom of the Shaft of Light. The Room of Development, bathed in red light, is twice as long as it is wide, with the longest side orientated perpendicular to the entrance. After the doorway two large concrete forms, rising floor to ceiling, angle from the edge of the room towards the center, guiding visitors towards the Exposure Table. Centered with both the doorway and the iris aperture connecting the Room of Development and the Shaft of Light, the Exposure Table is a cylindrical plinth on which to expose photograms.

Facing visitors upon entry are two shelves cut into the tall, angled concrete forms holding the photographic papers and instructions to create photograms from objects collected along the Path. On the opposite side, facing the development table, two workbenches cut into the concrete. These alcoves house the chemicals and water needed to complete the development process after exposure. Recessed at the top of these alcoves are the red-light fixtures lighting the room. Housed in the threshold between the Shaft of Light and the Room of Development is a mechanical iris aperture four meters in diameter. Composed of sixteen curved blades this mechanism is activated by a counter-weighted pulley system, letting in daylight to expose the visitors' photograms.<sup>4</sup> The gears, pulleys, counterweights and turning handle hang along the back wall of the Room of Development, hanging in a shaft which allows the visitors to observe their movement without risking injury. After creating their photograms visitors are free to exhibit them in the Airing Hall or take them home for personal display. If displayed in the Airing Hall they will enter into the collective archive of this communal project. The beauty is that the visitor is free to choose whichever way is most meaningful, and maintains the most intense connection to the site and their journey through it.

Leaving the Room of Development, the Ramp billows in shadows. Enough light to see filters gently from unseen sources, minimizing cast shadows from visitors. The echoes of the ramp soften, the texture of sound becoming a rich velvet. This deep, the distance between visitors has lengthened, making each turn of the Ramp more intimate than the last. The wide

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4 Configured in a dual-plane iris to ensure no light passes through the iris when it is closed.

landings and gentle turns allow for rest, but no further distractions as the ramp pushes deeper into the earth: closer to darkness.

At the bottom, the Ramp simply terminates in a small landing. To the left there is a solitary doorway. The doorway cuts through a wall so thick it becomes a passageway. The room beyond, in the absence of visitors, is filled to the brim with darkness.<sup>5</sup> The right-hand wall curves sharply towards the left of the room, guiding visitors towards the main chamber of the Grotto (8). Cut into this curved wall is an arched alcove and bench.

Passing through the next door frame, visitors move into the central chamber of the Grotto. Ringed by small seating alcoves on three sides, and abutting the wall encasing the Ramp on the fourth, the room is cut almost in half by a solitary slash of light – at times a dull red glow, at others a bright flash of sunlight. This cut of light is the shaft that houses the iris opening mechanisms in the Room of Development directly above. Revealed only through the light from the Room of Development is an array of columns populating the chamber. They hover between architecture and stalactites.

Leaving the chamber through the doorway on the Eastern wall visitors travel through the final series of chambers, expanding and contracting as the path finally ascends back towards the exterior.

Passing through the final doorway visitors are returned to the sunlight made anew. Transformed within the depths of the soil into a being looking upon the wilderness of the world with fresh eyes of wonder.

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5 Within the seating alcove there are light sources that are only activated by prolonged human proximity.

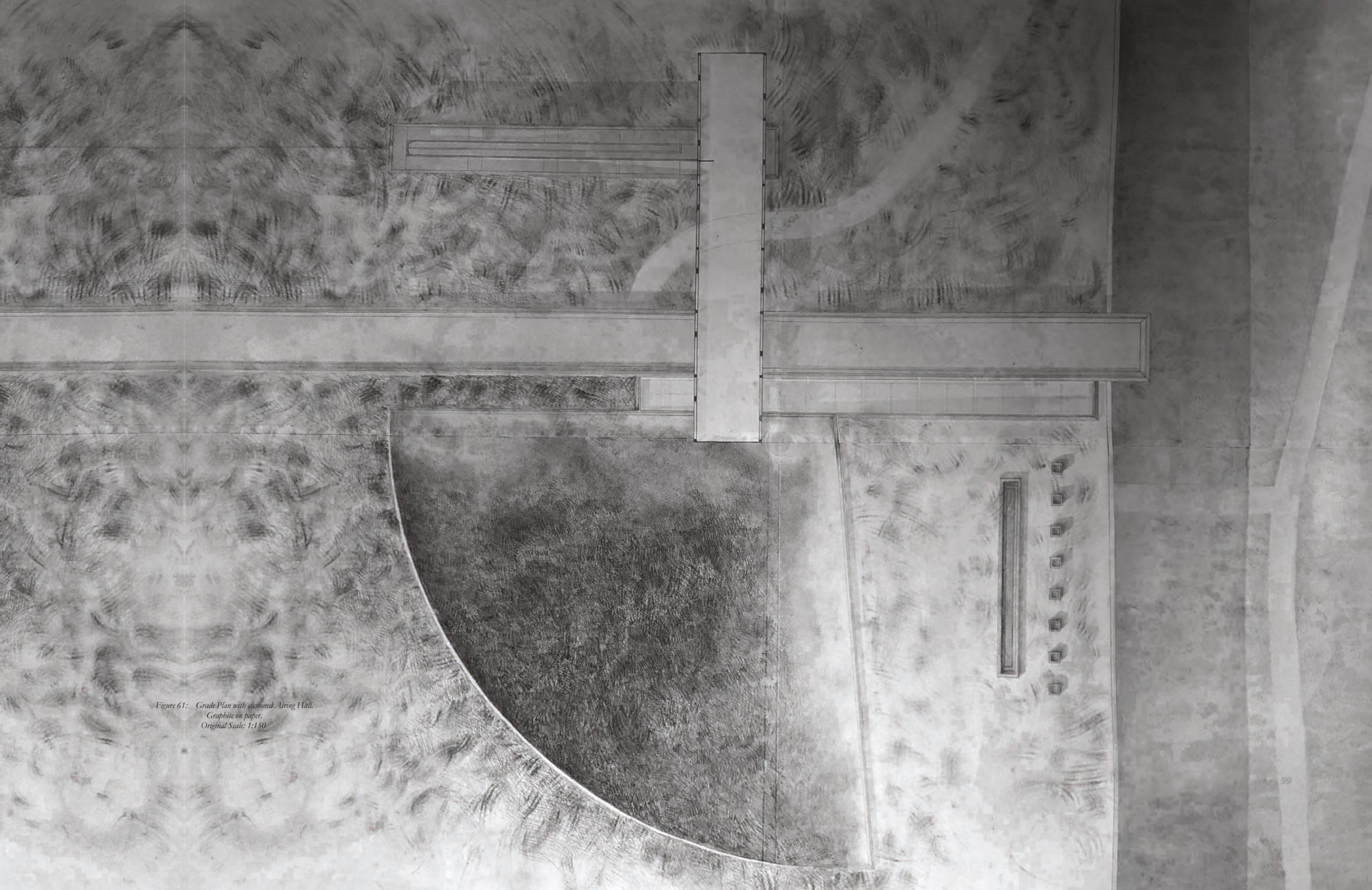


Figure 61: Grade Plan with sectioned Airing Hall.  
Graphite on paper.  
Original Scale: 1:150

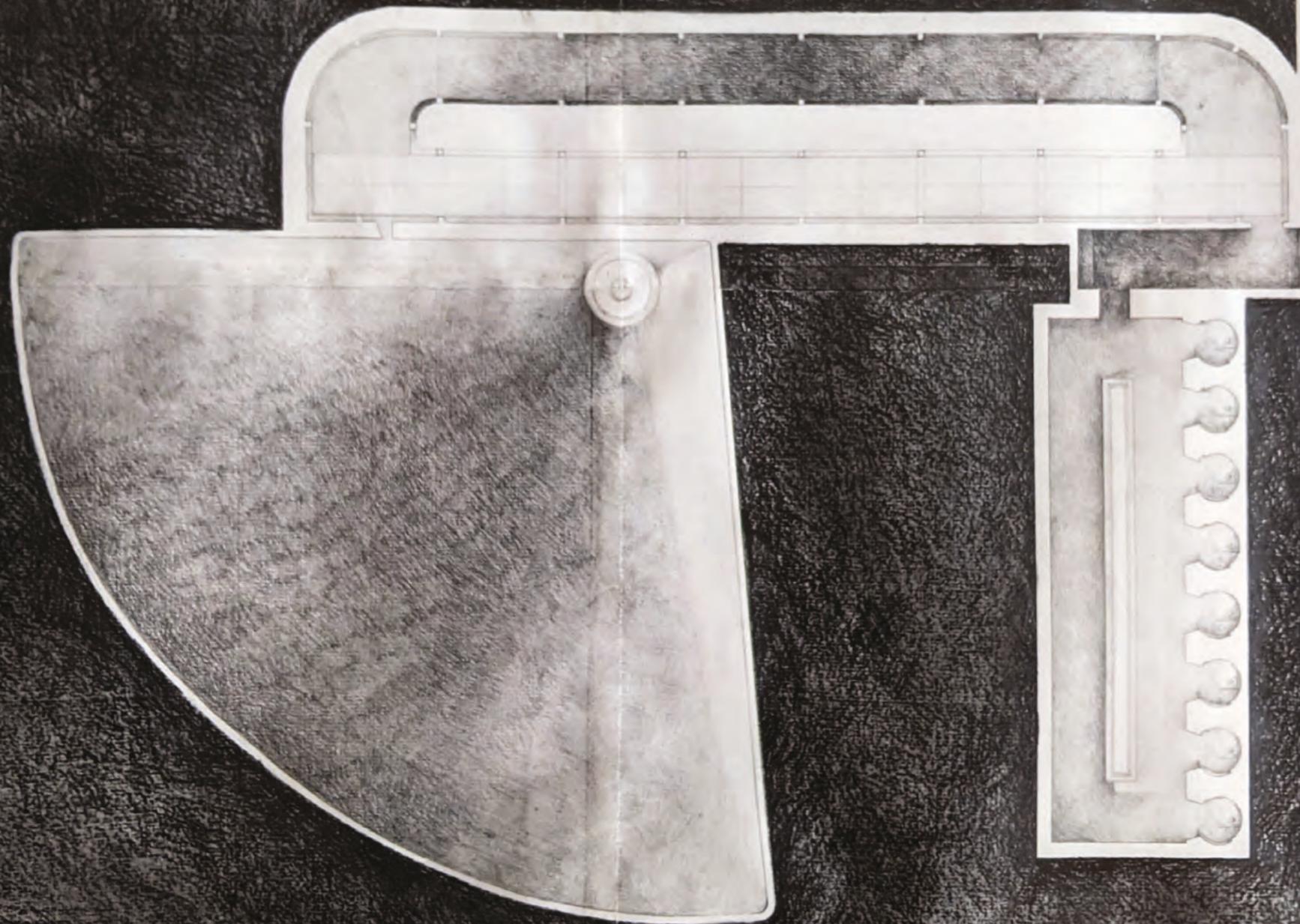


Figure 62: Washroom Level Plan.  
Graphite on paper.  
Original Scale: 1:150

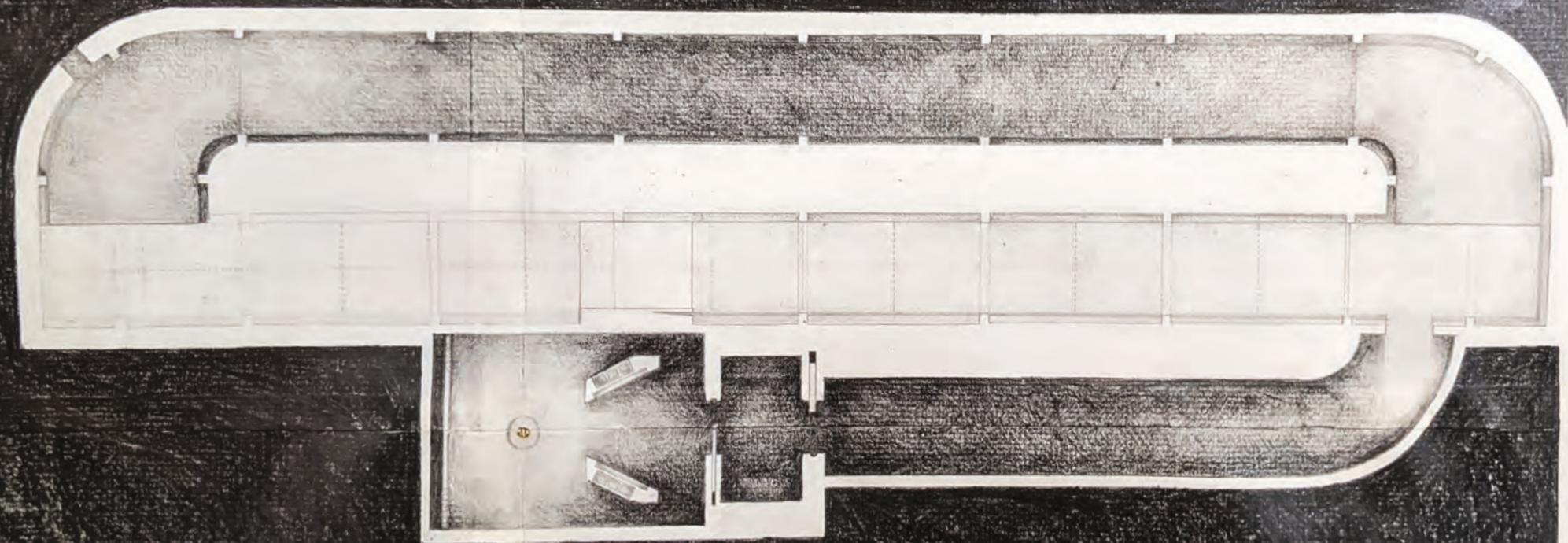


Figure 63: Room of Development Level Plan.  
Graphite and gold leaf on paper.  
Original Scale: 1:150

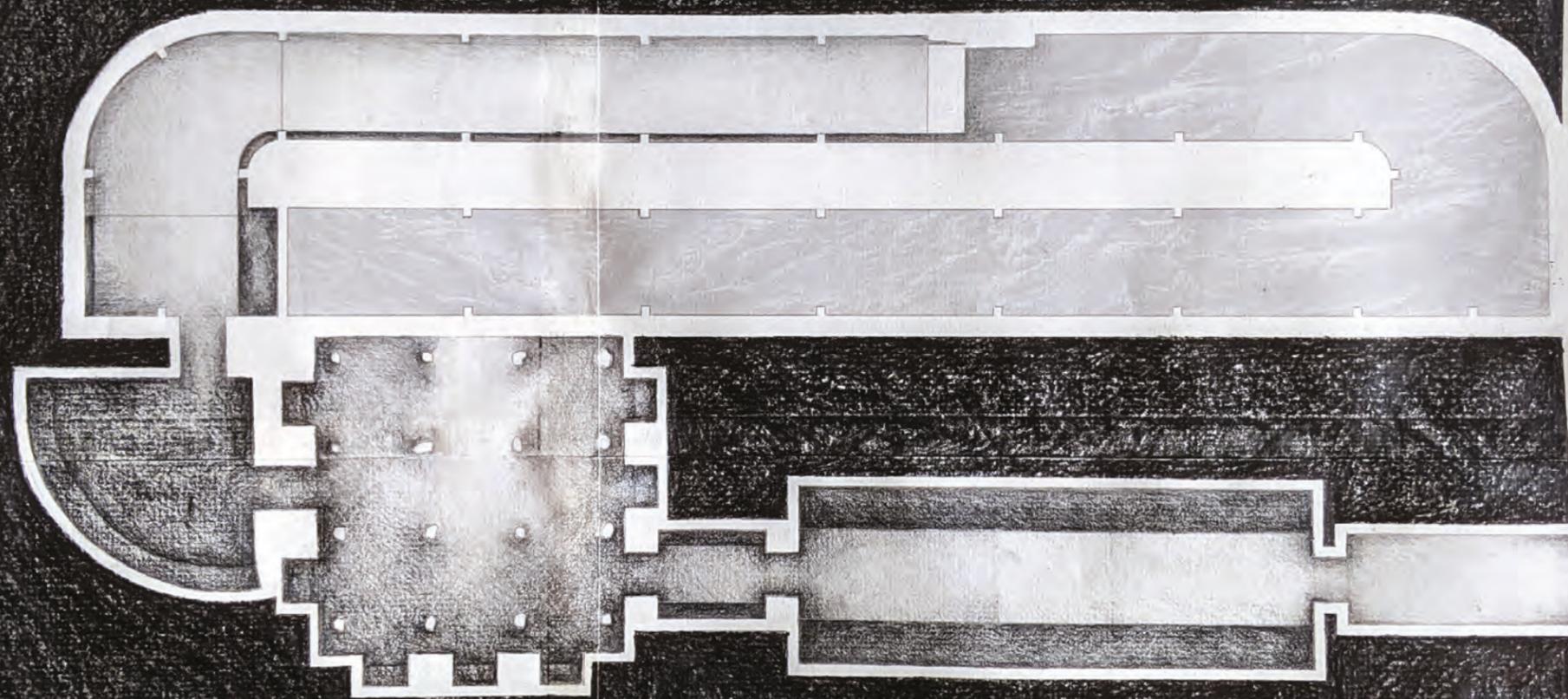


Figure 64: Grotto Level Plan.  
Graphite on paper.  
Original Scale: 1:150

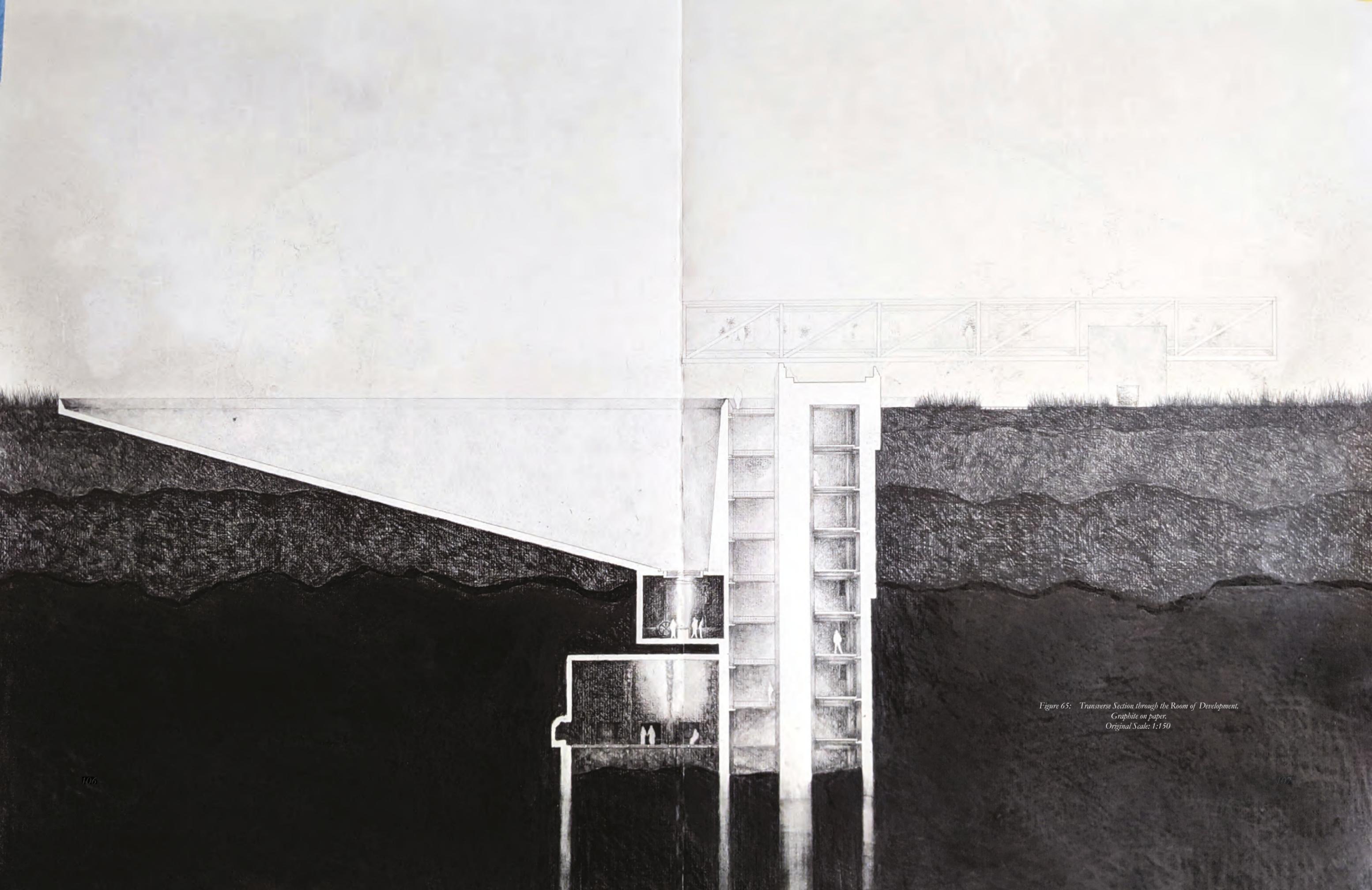


Figure 65: Transverse Section through the Room of Development.  
Graphite on paper.  
Original Scale: 1:150

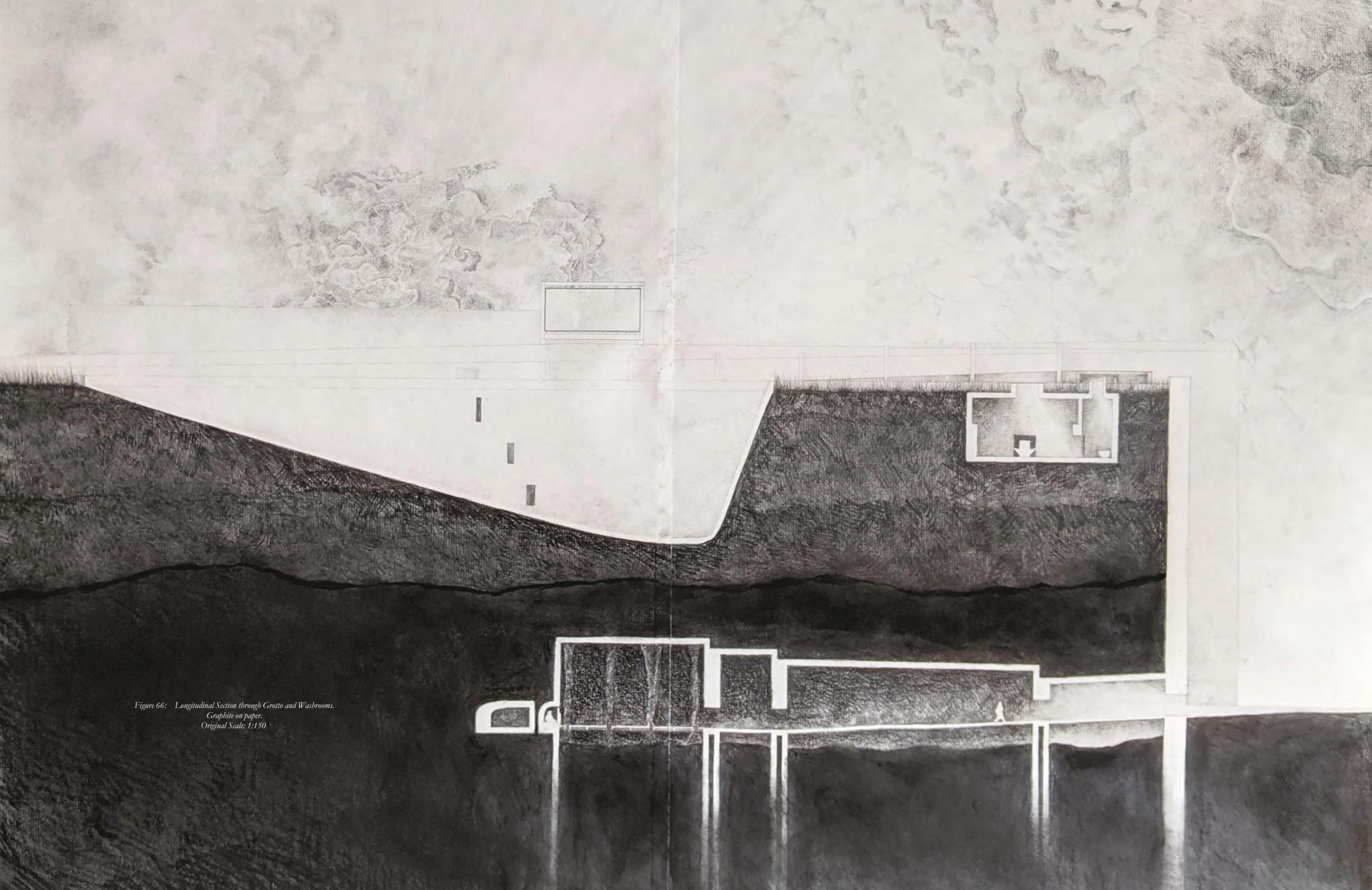


Figure 66: Longitudinal Section through Grotto and Washrooms.  
Graphite on paper.  
Original Scale: 1:150

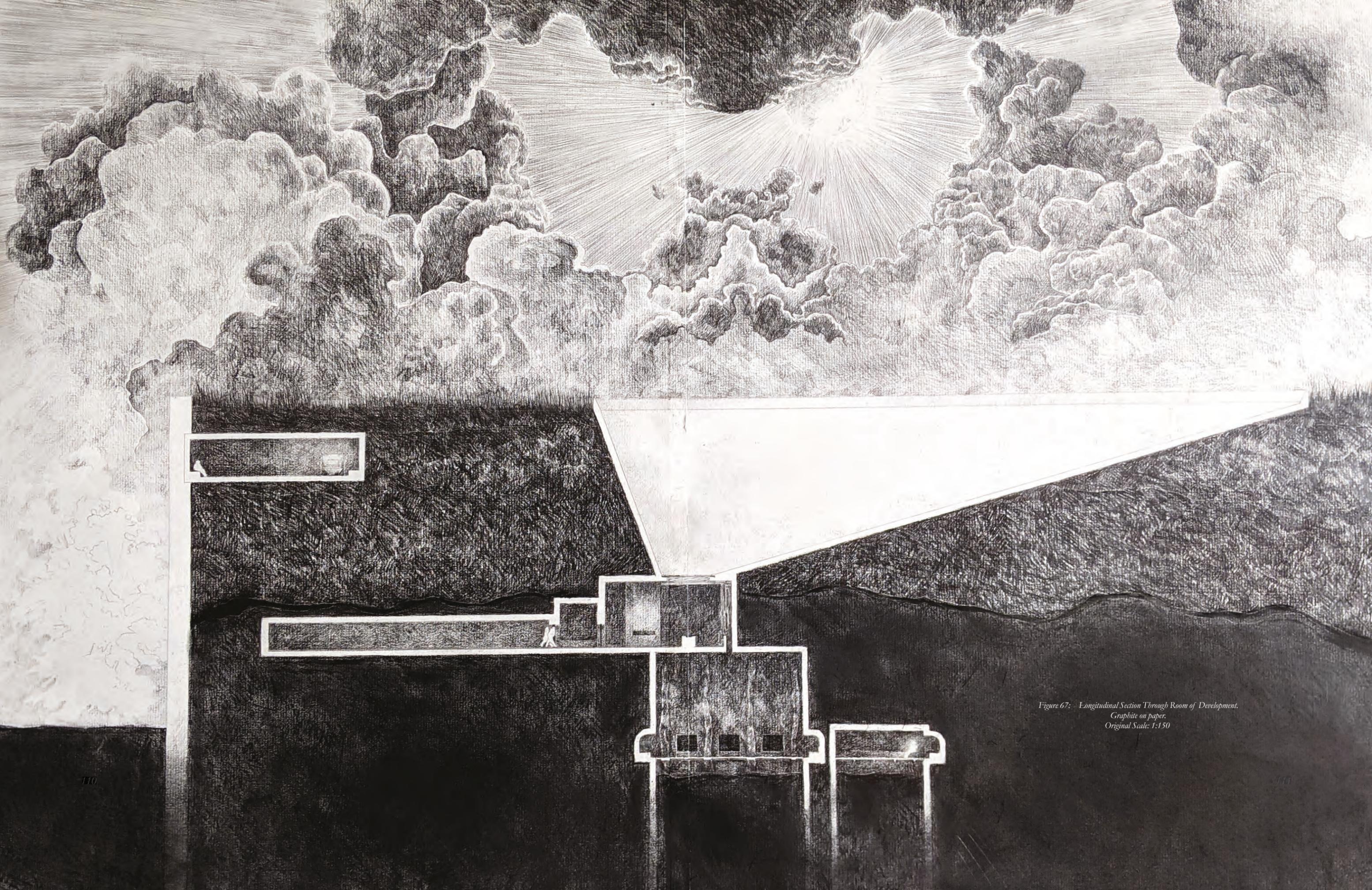


Figure 67: Longitudinal Section Through Room of Development.  
Graphite on paper.  
Original Scale: 1:150



Figure 68: Photograph of cattail collected along Greenbank Road, February, 2021.

## CONCLUSION

As this project concludes, the ground begins to thaw, and construction is heavily underway in Barrhaven. Bulldozers and backhoes have returned to build more houses, more strip malls. The last open spaces at in the middle of Barrhaven are being filled. While I have been rambling through the suburb, collecting leaves, enjoying the breeze, capturing places of beauty in homemade cameras, and imagining fantastical futures for Barrhaven, the machines of development have been churning away, planning and dividing the land into units to be sold. This unavoidable reality, this difficult contrast, lies under the entire project like slick clay under an unsuspecting foundation. While I have inhabited the world of *Apertures, Reflections, Light* these past months, moving dream-like within the project everything I leave my front door, the world outside has continued turning, unawares. And so, a project of grand intentions finishes as a melancholy vessel for a fragile hope. Still, I hope that there is room for architecture to suggest ways for people to be re-enchanted by the world around them. *Apertures, Reflections, Light* reflects my belief that we should work in the world we know best. By bringing people together to re-imagine their surroundings through photography and hands-on crafts, a new greenbelt – and the ensuing new suburban vision – is still an achievable opportunity.

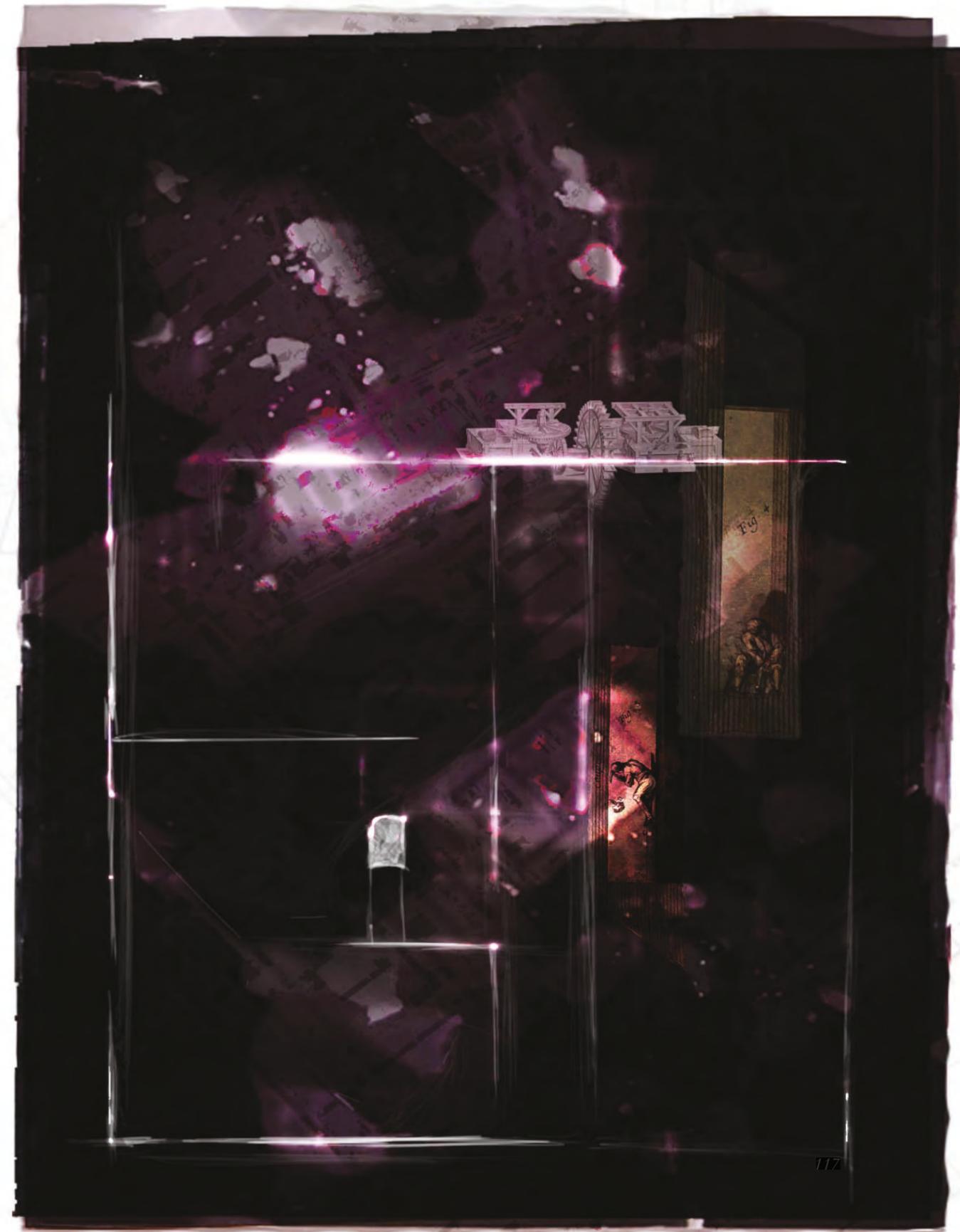
Moving through the Apparatus it is not only the photographic paper that is transformed. Re-emerging from deep within the earth the visitor has also undergone a process of development, facilitated through the movement of the body within the architecture, and the natural phenomena of light and darkness. We re-examine the ordinary surroundings of daily life through a new lens, rejoicing in the gift of the living leafy beings that surround us.

## APPENDIX A

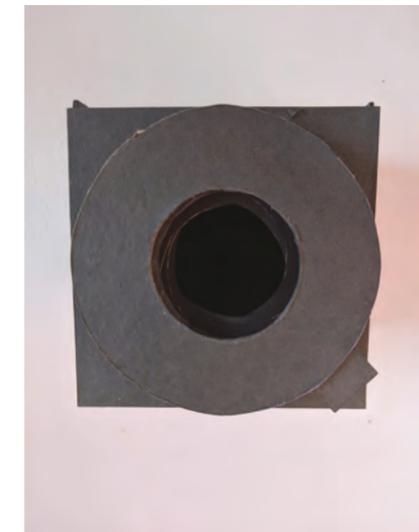
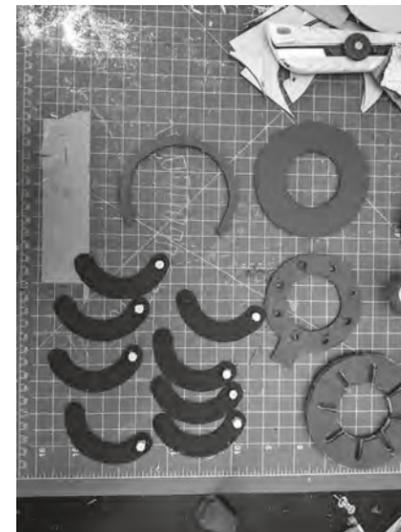
### EXPERIMENTS IN CATALOGUE, ALPHABETICAL

The Full Sequence of Experiments: Frames led to periscopes which later led to the Fake Microscope (or Little Box for Looking at Things). Digital site documentation transitioned to Polaroid's which led to pinhole photographs. From this point the experiments branch off in two directions. In one train of thought the pinhole photographs then led to building a mechanical iris, which then led to the creation of the *Little Box for Looking at Darkness*. In the other train of thought, the pinhole photographs, exposed onto photographic paper, led to experiments with photograms (using organic materials collected from exploration sites across Barrhaven), which then led to composite images created from the original photograms. From select photogram composites came attempts at ideograms as a method for drawing generation. The ideogram experiment then became the basis for the initial drawing exploration of the main pavilion in section. Simultaneously, representative explorations into Watter's Wood occurred, spawning new distinctive experiments. See Appendix B.

IDEOGRAM



OPTICAL DEVICES



*"Little Box for Looking at Darkness"*

*Cardstock, paper, magazine cuttings, wooden dowels and water based glue.*

*Figure 69: Above: interior view.*

*Figure 70: Bottom Left: Assembly progress*

*Figure 71: Bottom Right: Top view.*



Figure 72: First Periscope Experiment.  
Cardstock, water based glue, mirrors. 1:60 scale pigs inside.

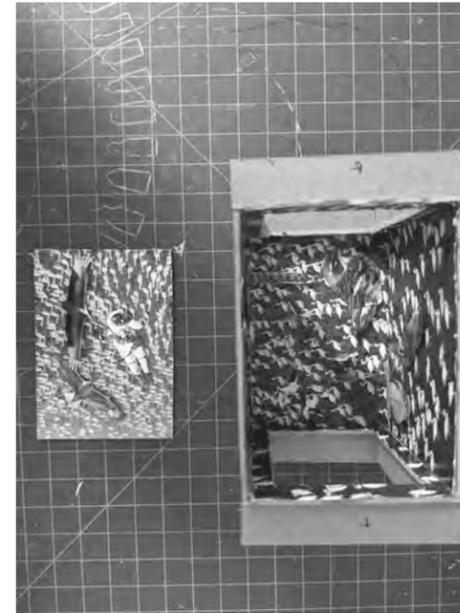


Figure 73: Bird Room Periscope (second periscope experiment)  
Cardstock, magazine cuttings, water-based glue, and mirrors.



Figure 75: Space Room Periscope (third periscope experiment)  
Cardstock, magazine cuttings, water-based glue, and mirrors.



Figure 74: Bird Room Periscope (second periscope experiment)  
View through interior.

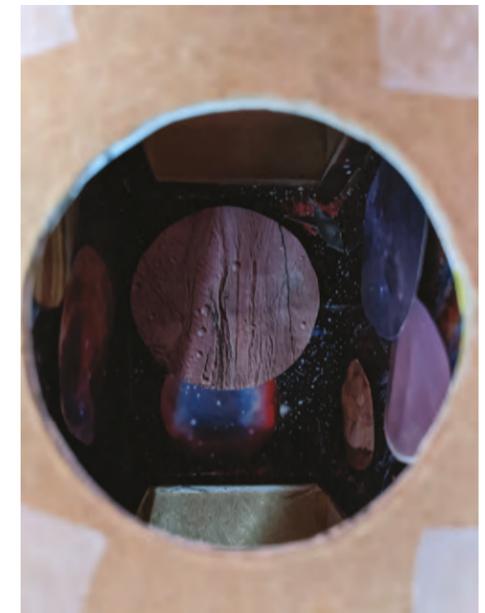
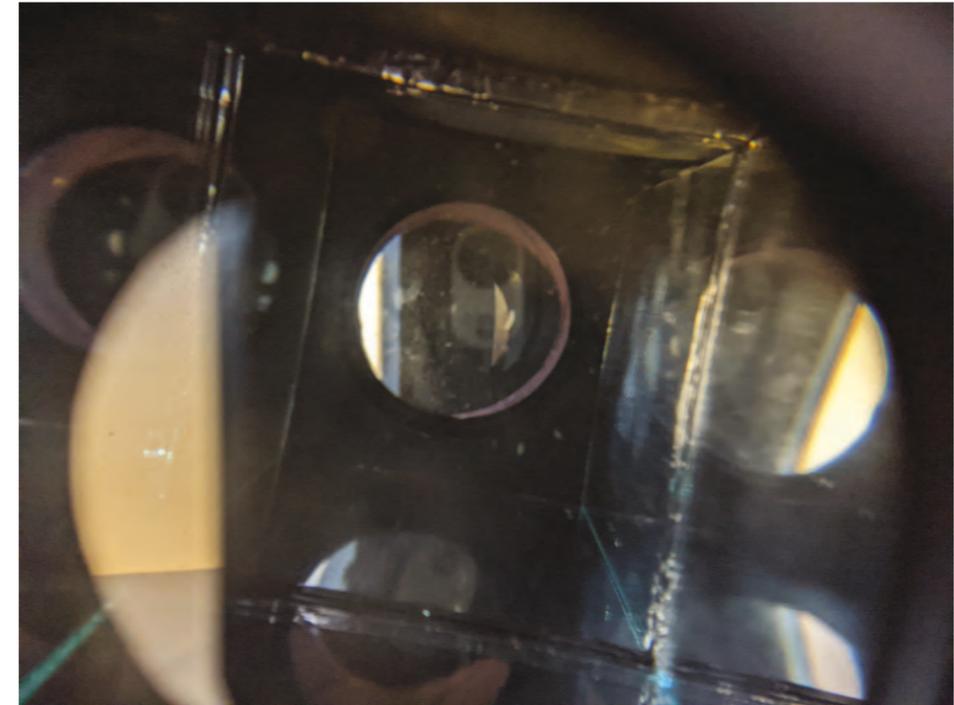
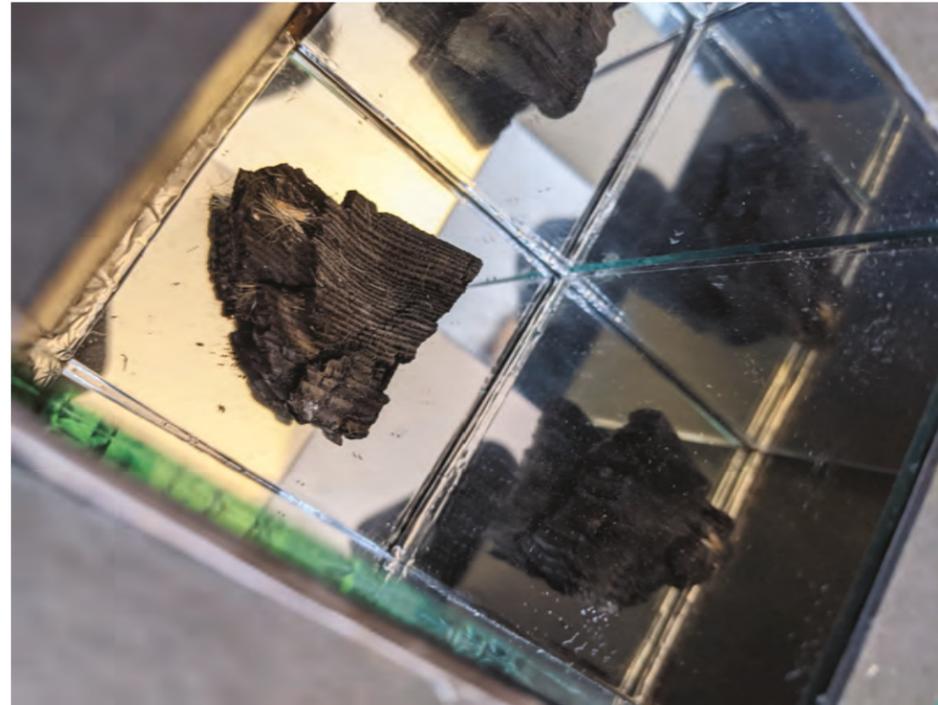


Figure 76: Space Room Periscope (third periscope experiment)  
View through ceiling aperture.



*"Little Box for Looking at Things (or a Fake Microscope)"*

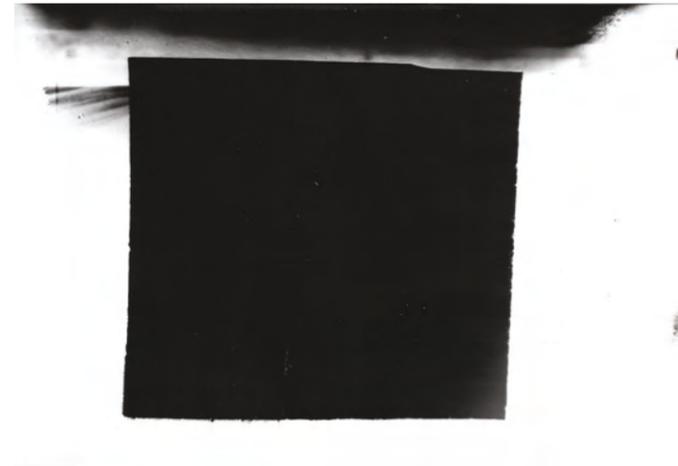
*Cardstock, paper, wooden dowels, wooden blocks, water based glue, mirrors, and magnifying lens.*

*Figure 77: Top Left: Interior view with top removed*

*Figure 78: Top Right: View through magnification lens*

*Figure 79: Bottom Row: Construction process photos*

PINHOLE PHOTOGRAPHS



*Figure 80: Negative, Pinhole photograph test.*



*Figure 81: Positive, Pinhole photograph test.*



Figure 82: Negative, Pinhole photograph test.



Figure 83: Negative, Pinhole photograph of backyard, South Nepean, Area 1.



Figure 84: Positive, Pinhole photograph of backyard, South Nepean, Area 1.



Figure 85: Negative, Pinhole photograph of confluence of Rideau and Jock rivers.



Figure 87: Negative, Pinhole photograph of toboggan hill, South Nepean, Area 1.



Figure 86: Positive, Pinhole photograph of Confluence of Rideau and Jock Rivers, South Nepean, Area 8.



Figure 88: Positive, Pinhole photograph of toboggan hill, South Nepean, Area 1.



Figure 89: Negative, Pinhole photograph of Greenbank Park Play structure, South Nepean, Area 1



Figure 90: Positive, Pinhole photograph 5 of Greenbank Park Play structure, South Nepean, Area 1.

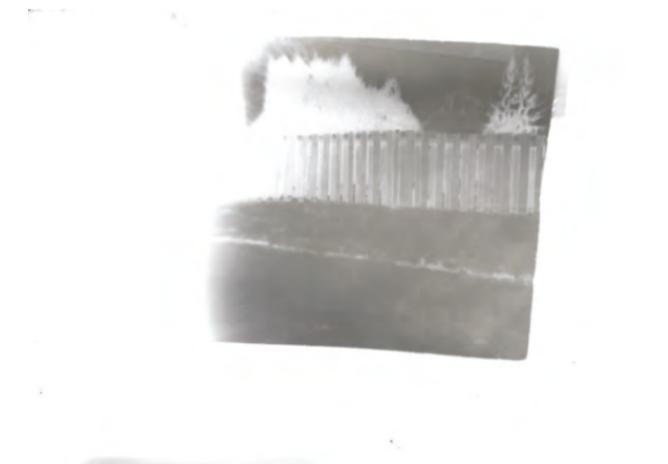


Figure 91: Negative, Pinhole photograph of backyard on the first snow, South Nepean, Area 1.



Figure 92: Positive, Pinhole photograph of backyard on the first snow, South Nepean, Area 1.



*Figure 93: Negative, Pinhole photograph of Jock River, winter.*



*Figure 94: Positive, Pinhole photograph of Jock River, winter.*

PHOTOGRAMS



Figure 95: Photogram from Area 1 Site Collection, phone flashlight exposure.

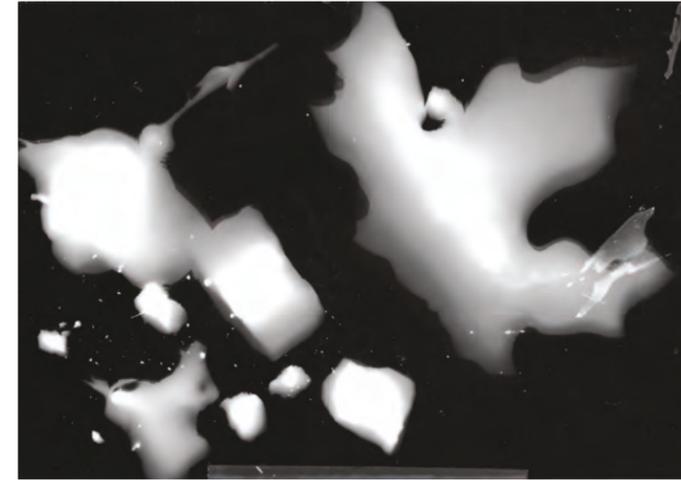


Figure 97: Photogram from Area 1 Site Collection, 2 sec. Exposure, bathroom light.



Figure 96: Photogram from Area 1 Site Collection, 10 sec. Bathroom light exposure.

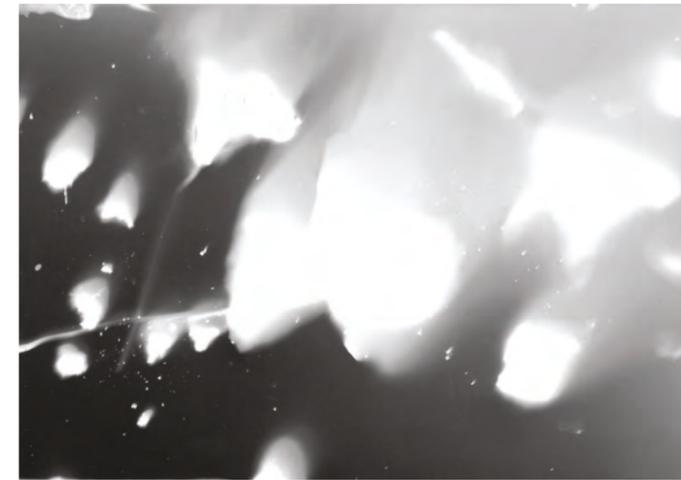


Figure 98: Photogram from Area 1 Site Collection, 15 sec. exposure, candlelight.



Figure 99: Photogram of desiccated leaf, Ken Ross Park Collection, bathroom light exposure.

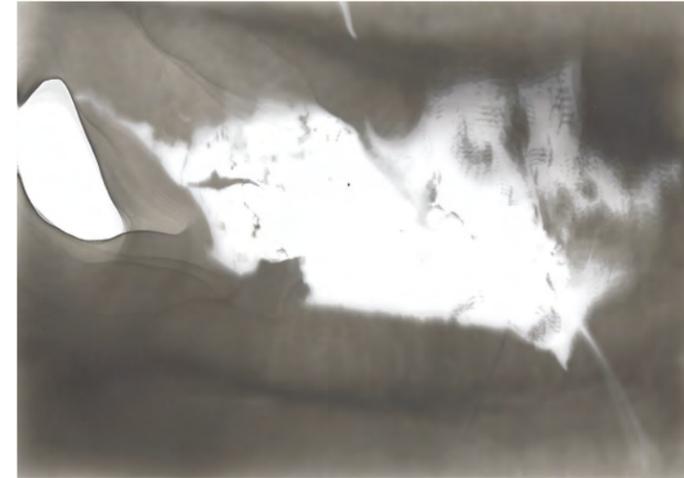
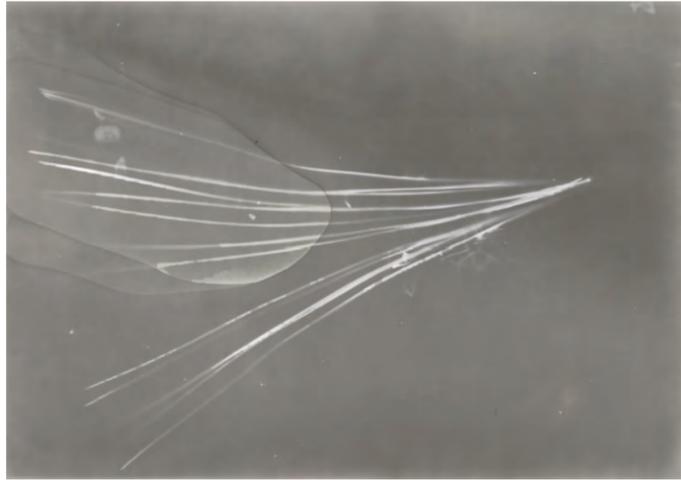


Figure 100: Photogram of maple leaf, Ken Ross Park Collection, bathroom light exposure.



Figure 101: Photogram of maple leaf, Ken Ross Park Collection, bathroom light exposure.



*Figure 102: Photogram of pine needles, Chapman Mills Conservation Area Collection, bathroom light exposure.*



*Figure 103: Photogram of fluffs, Ken Ross Park Collection, bathroom light exposure.*



*Figure 104: Photogram of birch bark, Ken Ross Park Collection, bathroom light exposure.*



Figure 106: Photogram of pine needles, Ken Ross Park Collection, bathroom light exposure.



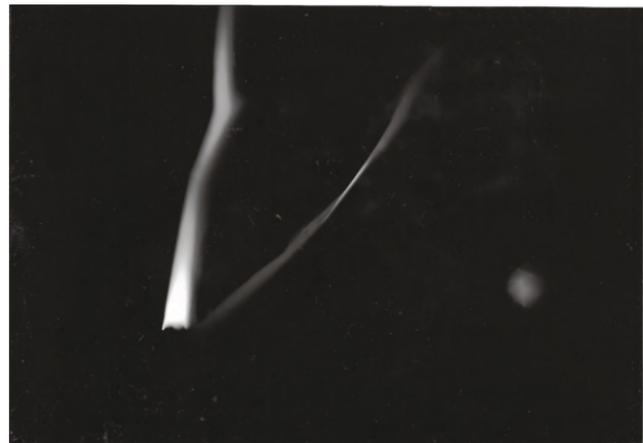
Figure 107: Photogram of brambles, Chapman Mills Conservation Area Collection, longer bathroom light exposure.



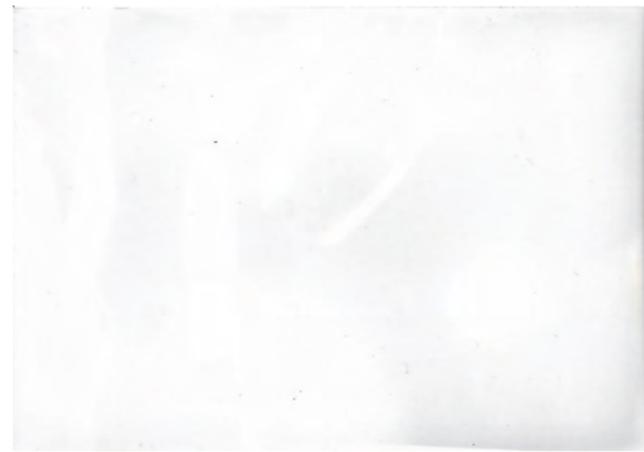
Figure 105: Photogram of brambles, Chapman Mills Conservation Area Collection, shorter bathroom light exposure.



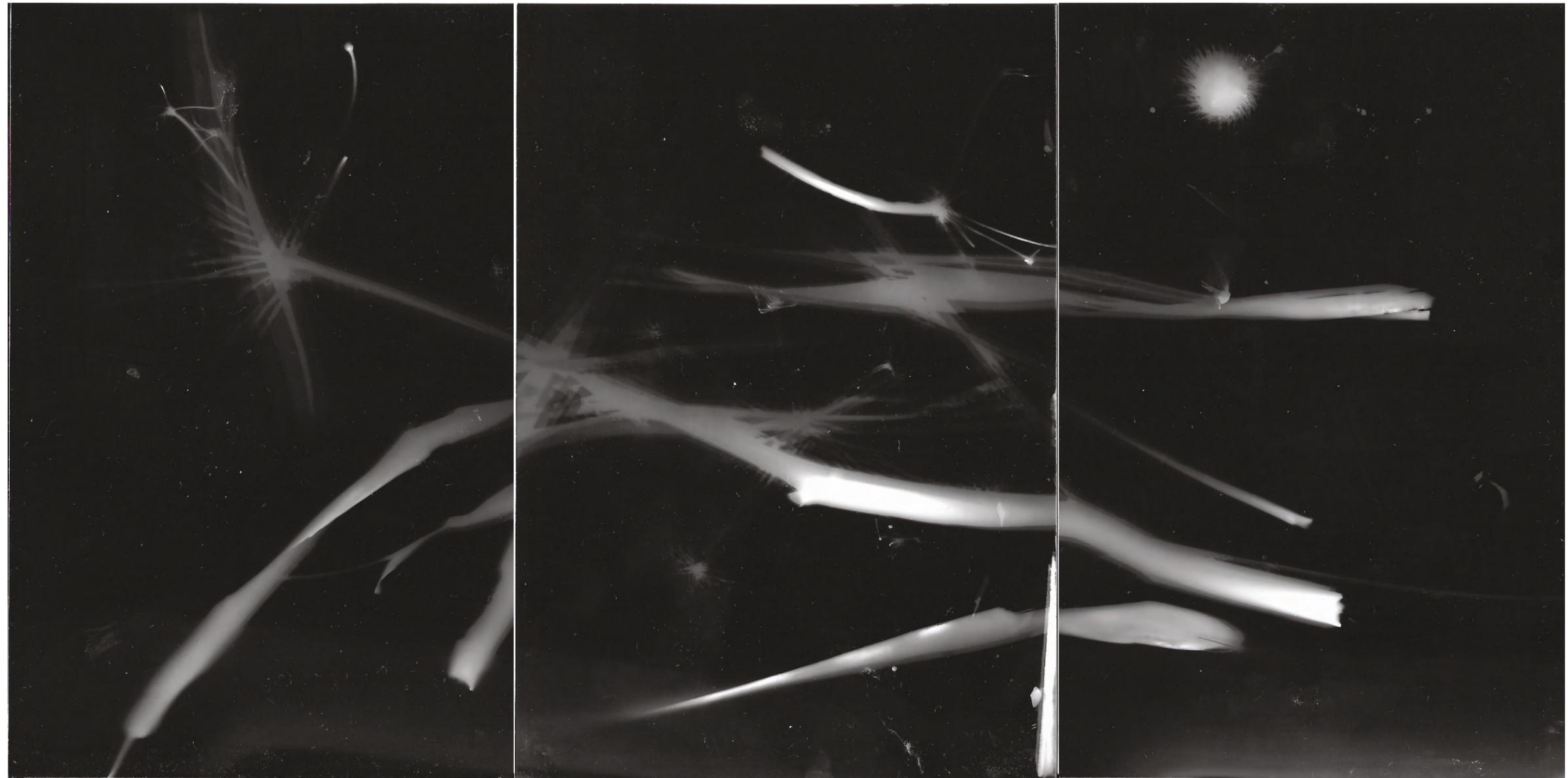
Figure 108: Photogram of charcoal, Chapman Mills Conservation Area Collection, bathroom light exposure.



*Figure 109: Photograms of dried grass, Apparatus Site Collection, bathroom light exposure*



*Figure 110: Photograms of dried grass, Apparatus Site Collection, bathroom light exposure*



*Figure 111: Photograms of dried grass, Apparatus Site Collection, bathroom light exposure*

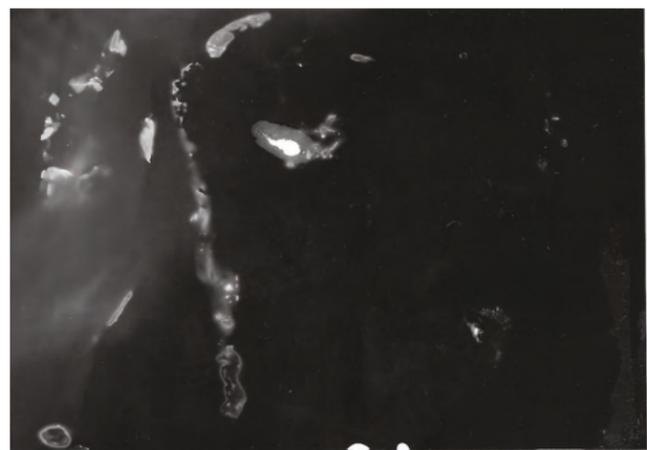
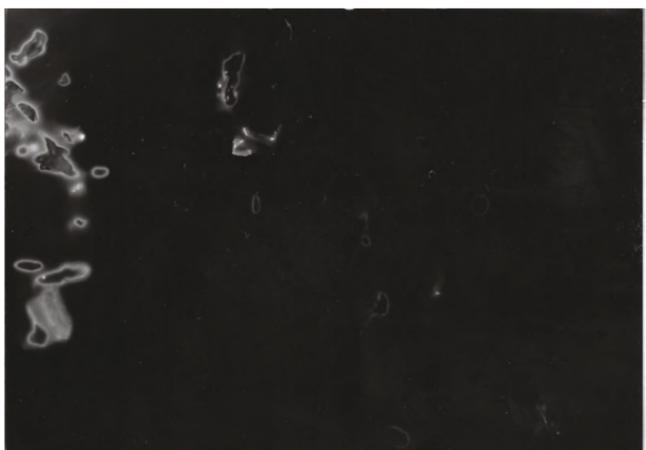


Figure 112: Photograms of plastics from spring thaw, bathroom light exposure

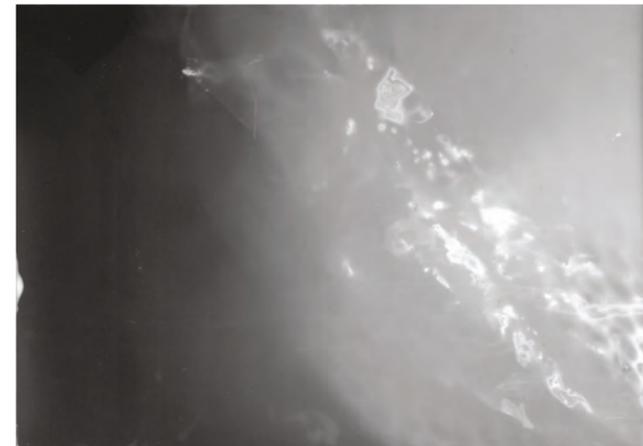
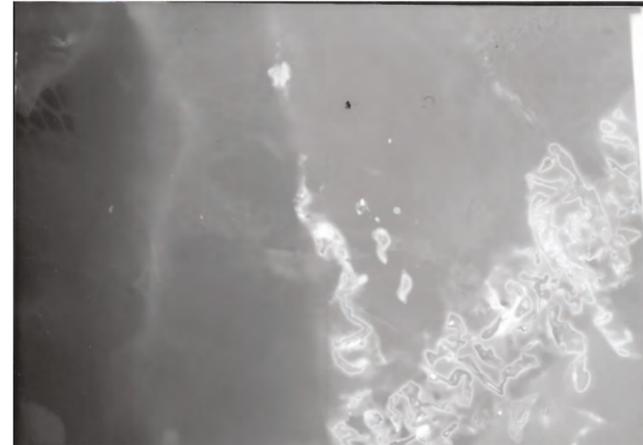
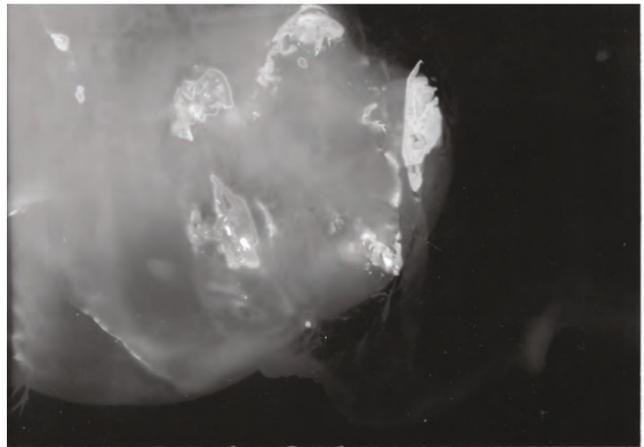
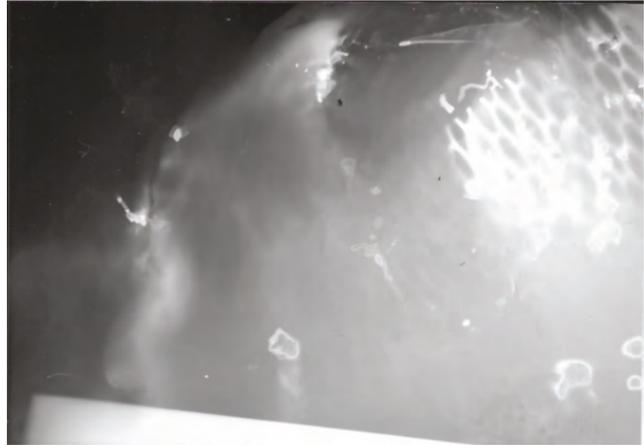


Figure 113: Photograms of plastics from springaban, bathroom light exposure

PHOTOGRAM COMPOSITES



*Figure 114: Photogram Composite from Ken Ross Park collection photograms.*



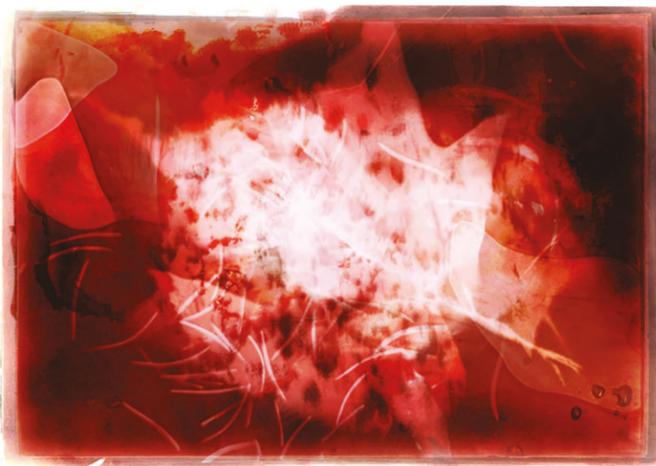
*Figure 115: Photogram Composite from Ken Ross Park collection photograms.*



*Figure 116: Photogram Composite from Ken Ross Park collection photograms.*



*Figure 117: Photogram Composite from Ken Ross Park collection photograms.*



*Figure 118: Photogram Composite from Ken Ross Park collection photograms.*



*Figure 119: Photogram Composite from Ken Ross Park collection photograms.*



Figure 121: Photogram Composite from Area 1 collection photographs.



Figure 122: Photogram Composite from Chapman Mills Conservation Area collection photographs.



Figure 120: Photogram Composite from Chapman Mills Conservation Area collection photographs.



Figure 123: Photogram Composite from Ken Ross Park collection photographs.



*Figure 124: Photogram Composite from Area 1 collection photograms.*



*Figure 125: Photogram Composite from Area 1 collection photograms.*

## POLAROID PHOTOGRAPHS



Figure 126: Polaroid of Strandberd Drive, South Nepean, Area 7.



Figure 127: Polaroid of Strandberd Drive, Area 7. Dusk.



Figure 128: Polaroid of Walmart Parking Lot, South Nepean, Area 7.

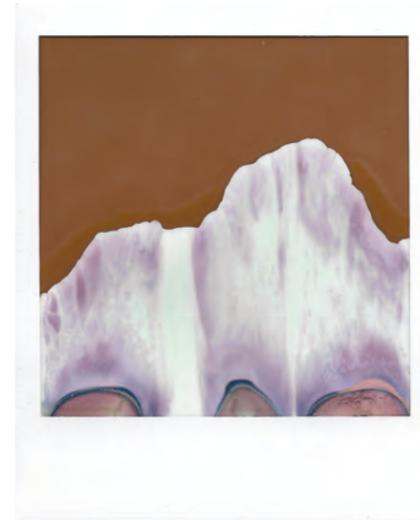


Figure 129: Polaroid Malfunction, South Nepean, Area 1.



Figure 130: Polaroid Malfunction, South Nepean, Area 1



Figure 131: Polaroid of Parking Lot on Strandherd Drive, South Nepean, Area 7.



Figure 132: Polaroid of Wild Roses, South Nepean, Area 7.



Figure 136: Polaroid of Watter's Wood foliage, South Nepean, Area 1,2,3



Figure 137: Polaroid of Jock River, winter.



Figure 139: Polaroid of Ken Ross Park.



Figure 133: Polaroid from Chapman Mills Conservation Area, South Nepean, Area 4, 5, & 6.



Figure 134: Polaroid of Confluence of Rideau and Jock Rivers, South Nepean, Area 8.



Figure 135: Polaroid of Jock River, South Nepean, Area 8.



Figure 138: Polaroid of Apparatus Site, winter.



Figure 140: Polaroid malfunction.

SITE COLLECTIONS



*Figure 141: Site Collection from Area 1*



*Figure 142: Site Collection from Ken Ross Park*



*Figure 143: Site Collection from Chapman Mills Conservation Area.*



*Figure 144: Site Collection from Site of Apparatus*



Figure 145: Final Site Collections during snow melt, March.

## APPENDIX B

### DETAILED EXAMINATIONS OF WATTER'S WOOD



Visiting Watter's Wood is simultaneously transcendent and mundane. Located in the Longfield's neighborhood it is almost perfectly centered between the train tracks and the Rideau river on a North-West to South-East axis. Measuring only 11,248m<sup>2</sup>, this tiny forest is powerful beyond its size. Bisected by a short, forked path, it is possible to sit at the center of the wood and still see the surrounding houses through the trees, watching people walk their dogs, smoke cigarettes, take phone calls, or unload groceries from a car across the street. This proximity to the banal does not diminish the power of the trees in the slightest. Simply stepping off the sidewalk onto the gravel path beneath their outermost branches is a potent atmospheric change, owed exclusively to the living breathing power of the forest.



*Figure 146: Polaroid of Watter's Wood, South Nepean, Area 1. and,  
Figure 147: Digital Photographs*

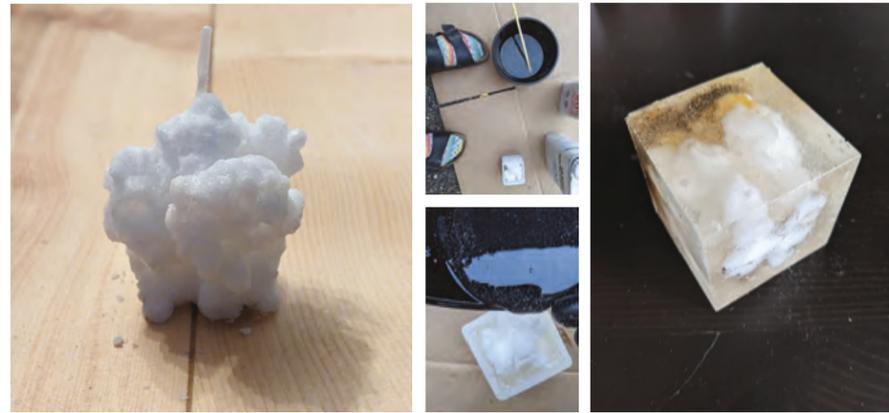


Figure 148: Carving and Casting of Wax Model in Epoxy.  
 From left to right: Candle wax carving, epoxy mixing, epoxy pouring, completed casting of wax model.

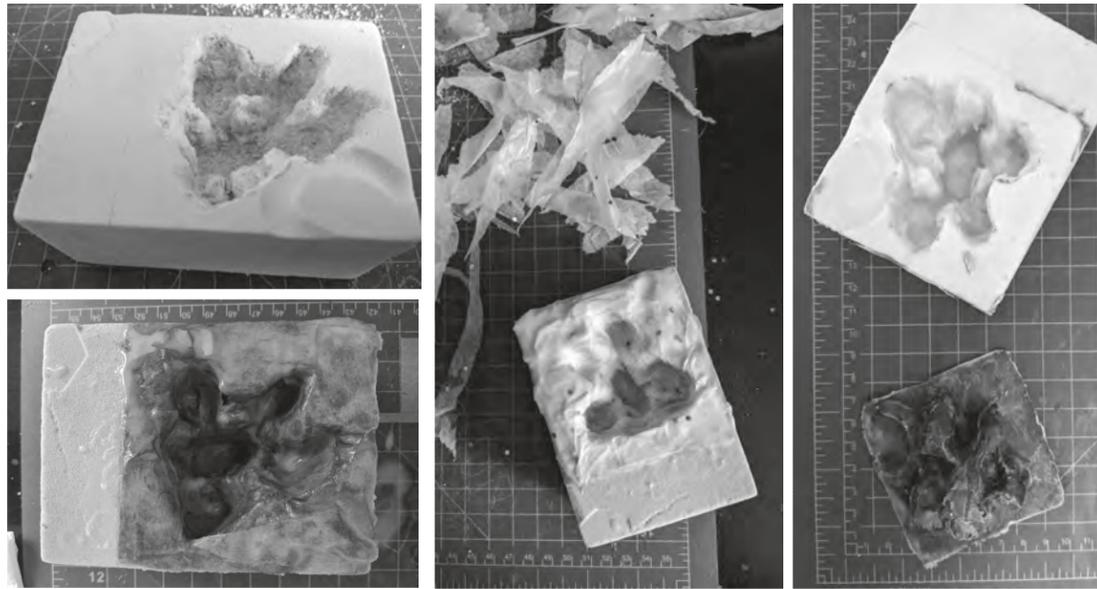
The first exploration of Watter's Wood was a sculptural study in candle wax of the forest which was then cast in epoxy. The aim was to then burn the candle to reveal the negative, cavern like form - which was ultimately unsuccessful. The epoxy cube was then used to create photograms, from which to create drawings, and then served as formal inspiration for an exercise in creating an asymmetrical roof structure.



Figure 150: Video Still from burning the wax candle carving within the cast epoxy cube.

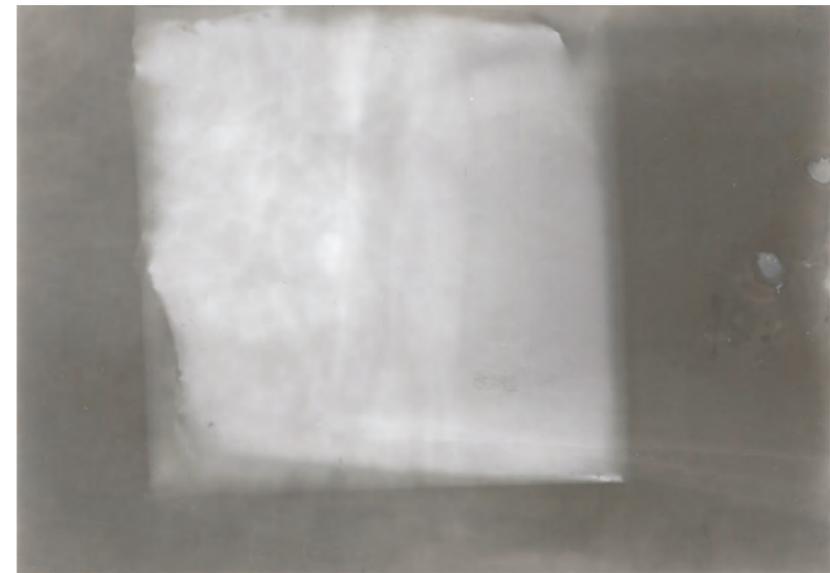
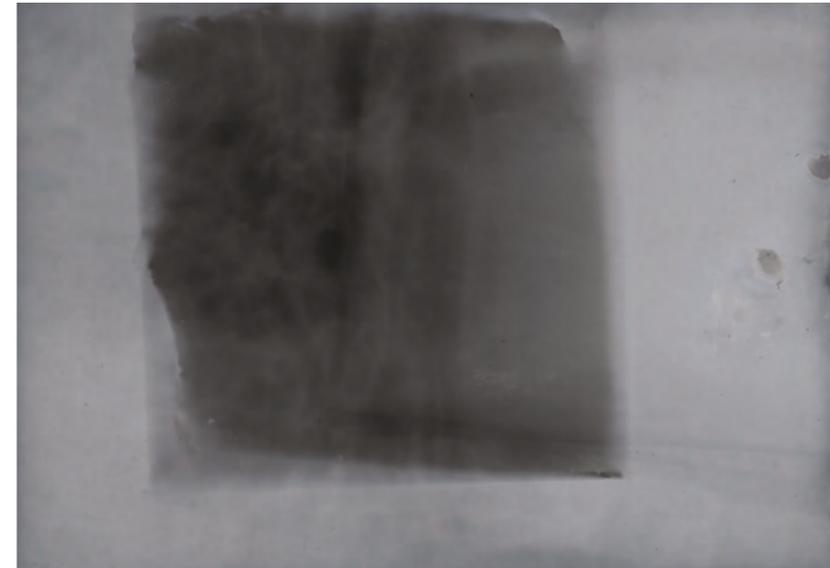


Figure 149: Interior view of roof membrane model lit from above.

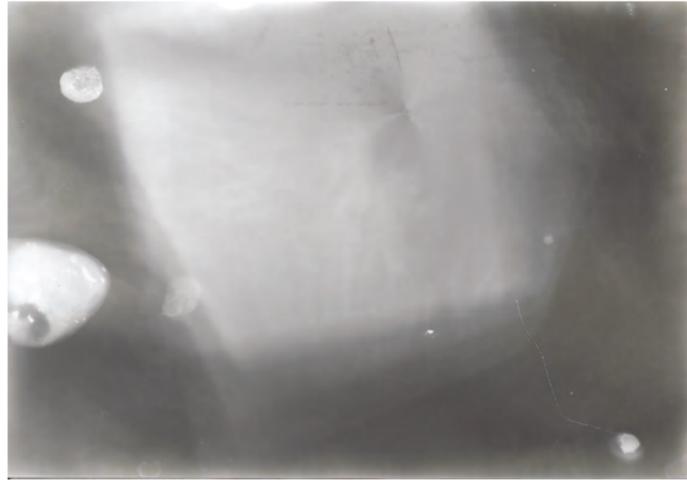


*Figure 151: Carving and molding of roof membrane based on the wax carving of Sach's forest. Mold: 15lb high density foam, Vaseline.  
Roof Structure: White glue, water, craft paper, tissue paper.*

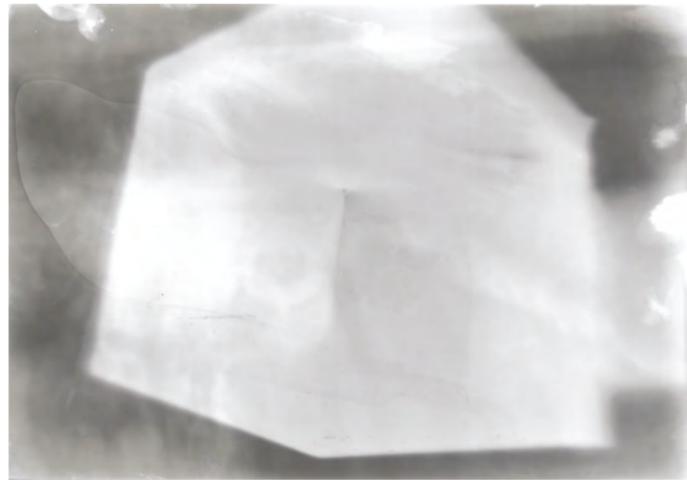
The final evolution of the Watter's Wood experiments photograms on the following pages. While the exposures of the roof model were cast in plan or top view. However, the final artifacts work best viewed as experiences of lightness in elevation.



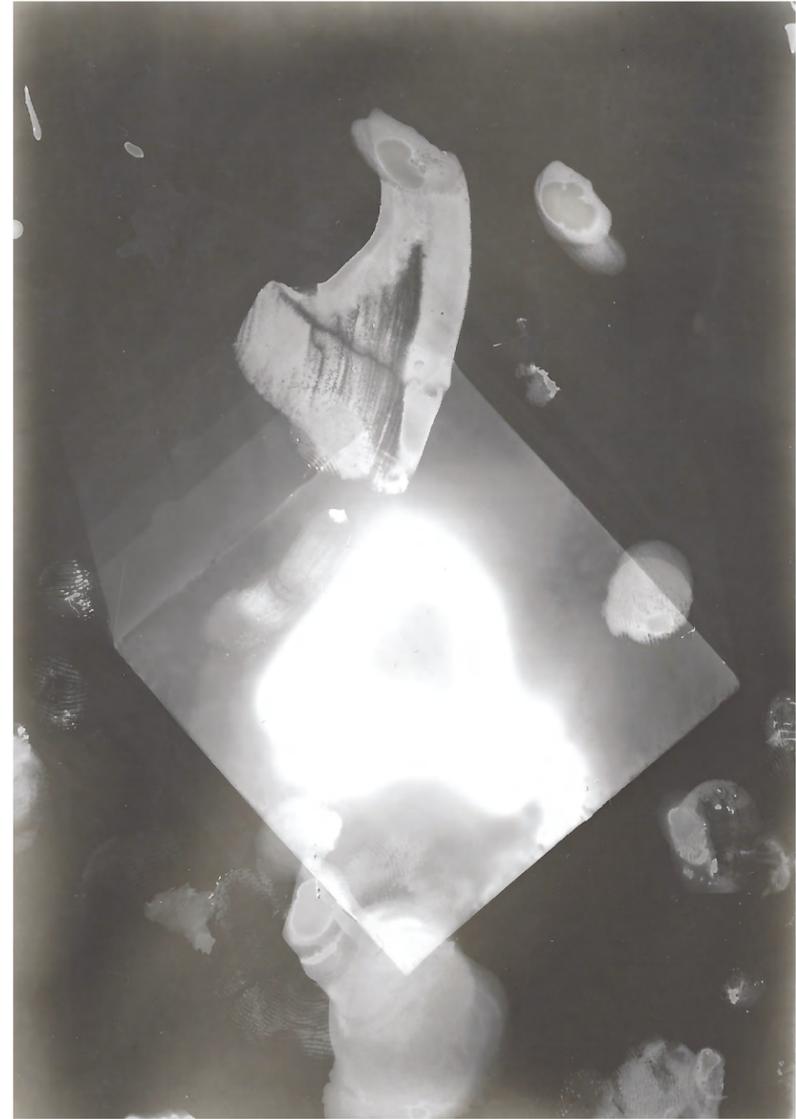
*Figure 152: Negative.  
Figure 153: Positive  
Photograms cast from roof model, long exposures using bathroom light.*



*Figure 154: Photogram of Sachs Forest Cube, lighter flame exposure.*



*Figure 155: Photogram of Sachs Forest Cube, lighter flame exposure.*



*Figure 156: Photogram of Sachs Forest Cube, Top, bathroom light exposure.*

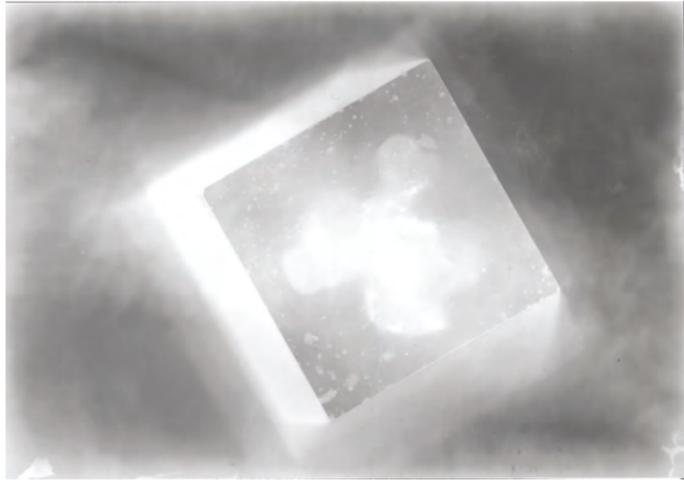


Figure 158: Photogram of Sachs Forest Cube, Plan, lighter flame exposure.

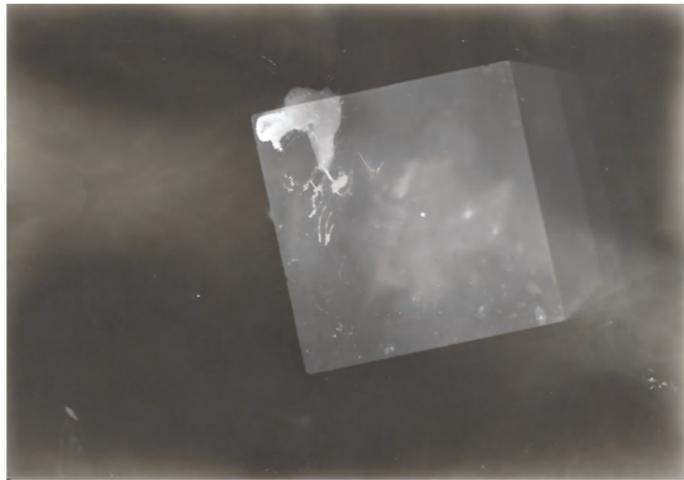


Figure 157: Photogram of Sachs Forest Cube, Plan, bathroom light exposure.



Figure 159: Sketches of pavilion derived from photograms of cube (used as plan). Graphite on trace paper.

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