

THE RECIPROCITY OF INTERSPECIES LIVING

An Exploration Of Multispecies Design Through A
Steiner Primary School

ELLEN BRIEN

CONTENTS

Acknowledgements.....	03
An Account of My Daily Commute Through Dublin City.....	04
Introduction.....	05
01 Thesis & Research:	
Polder Reclamation.....	07
Architecture and Ecological Agenda.....	09
Sustainable Hedonistic Architecture.....	11
Non-human Centric Design.....	13
02 Project & Design:	
Thesis Project Concept.....	15
Theme of Urgency.....	16
The Site.....	17
The Brief.....	26
The Design.....	29
Conclusion.....	49
References and Bibliography	
Written References.....	52
Image References.....	53
Bibliography.....	53
Appendix	
Public Consultation.....	55
Additional Thesis Research Chapters.....	56
Additional Information.....	59
Natural Light Study.....	60

Acknowledgements:

I would like to thank my tutors who have supported me throughout the years, especially to Sarah Sheridan, Cian Deegan and Johanna Cleary for your continued motivation this year and for guiding me throughout this project.

To my friends and classmates, thank you for the memories, the support and the laughs as we all navigated the past five years together.

And to my family, thank you for your support, your space and your encouragement throughout my college years.

An Account of My Daily Commute Through Dublin City

I step off the Luas and enter the hustle and bustle of the morning rush in the city, I suddenly get a sense of uneasiness. I try to move quickly, to reach my destination as soon as possible. As I cross O'Connell bridge, I look down at the Liffey in its vastness as it moves slowly down through the city, trapped by the concrete and stone walls, ignored by the people on their commute to work. As I walk, I am stepping across various forms of hard surfaces, always careful of my footing in fear of tripping on uneven pavement or stepping on chewed gum. Some paving has been lifted by tree roots trying to break free from the conforms and constrictions in which it has been placed. Sporadically, I glance up from my feet to the buildings around me, each day noticing more grime or new materials on the buildings under construction. Upon arrival at my destination, I am relieved by the silence as I walk through the doors. My plant sits neatly on my desk, and it is the first time I see soil since stepping off the Luas.

INTRODUCTION

My thesis subject of interest arose from a reflection on the differences in my emotional and physical reactions to my surroundings when comparing a journey through a human-made, constructed landscape to one through a natural landscape. In comparison to the feeling of dissatisfaction I get from a walk through a dense urban space that lacks vegetation, that of a natural environment, whether constructed or natural, has always left me more fulfilled mentally and physically as I experience other forms of life through my senses, leaving me more energetic and content. (Refer to the above extract - An Account of My Daily Commute Through Dublin City). This prompted me to begin my thesis research paper by investigating the impact of human activities on landscape, nature, and the non-human - specifically flora, animals, and insects, with an intention to explore an alternative mindset where we, as architects, value the non-human equally to the functionality or integrity of a building. Also to demonstrate, through my architectural intent, a method of thinking and engaging with a wider landscape in an urban environment.

In the first section of this thesis, I will include extracts from my thesis research paper, this consists of a brief introduction into polder reclamation in the Netherlands and the physical toll that it has taken on humanity and the earth. The research then investigates new ways of thinking, particularly ideas of Hedonistic Sustainability and non-human-centric design, to support an argument that sustainable design and living with the non-human can equal a higher quality of life and more pleasure for the human species. The paper briefly reflects on some of the early signs of an ecological agenda in architecture, exploring the radical early works of SITE and MVRDV, followed by the more recent works of BIG Architects and MVRDV. The first section of this paper will conclude with research completed on the importance of interspecies living and how it can contribute to hedonistic pleasures and what that could look like in our current ecological era, also known as the Anthropocene.

In the second section of this thesis I will conclude my Architectural response to this research, discussing the process of the design, the brief, the site, the strategy, key design decisions and the end result to determine this thesis hypothesis of, 'Can architecture be used as a vessel to provide hedonism for humans and refuge for non-human life while addressing increased flooding and loss of biodiversity in Tolka Valley?'. Through this project I hope to justify that with radical thinking and transformative action we can help repair and restore the earth from human and climate destruction while securing the future for human and non-human hedonistic habitats.



Throughout history humans have transformed the natural landscape through deforestation, agricultural methods, infrastructure, and the built landscape. For example, dam construction, roadways, mines, tunnels, quarries, and other human activities have had an impact on the natural environment and nature. This period, which began in the early twentieth century, is known as the 'Anthropocene,' because it has seen the greatest human impact on the Earth's system. (Sabine, 2018). It is distinguished by human impact on chemical production and waste, habitat loss, and animal extinction in addition to our impact on climate change and our landscapes. This new era is apparent in a physical layer in the rock strata of the earth with a presence of radioactive particles and microplastics, which future civilizations will use to mark of this period in history (National Geographic Society, 2022). The author of the article 'Transformation of Landscapes' assesses W. G. Sebald's novel 'The Rings of Saturn (1992). He describes Sebald's account of the characters experience of the terrain in The Netherlands as "a completely desolate piece of Earth altered by human activity" and how the effect of this landscape is "a form of destruction" both physically and mentally on Sebald's character (Sabine, 2018). It can be presumed that the characters experience is a reflection on the polder reclamation in the Netherlands that has reshaped the natural landscape of the country. The architect, Raoul Bunschoten, discusses the process of reclaiming land from the sea in his article 'Spinoza's Garden'; "The urban development which follows is a sad example of fast internal colonization. The 'pristine' land is covered with an infrastructure borrowed from the surroundings, its purpose being to achieve the utmost economic and social efficiency" (Bunschoten, 1986). Bunschoten's opinion on the Netherlands polder reclamation is not dissimilar to Sabald's characters account, both insinuating that the human interference on the landscape was for the benefit of the human species and only that, but both Sebald and Bunschoten have implied that the transformation has not entirely benefitted humanity as it has left a scar on its landscape which has not yet healed the destruction it caused to the environment and its native species, which to them perhaps, cannot be unseen.

The Netherlands has undergone many phases of land reformation and, because of this, has suffered destruction of its native species. The lower river catchment areas' marsh forests were converted into wet grasslands, while the native forests and peat bogs were turned into dairy farmland. To provide more food for the nation's expanding population, natural diversified habitats were destroyed and replaced primarily with common grasslands. Due to the regulation of water levels, birds including the Great White Egret, Squacco Heron, Night heron, and Dalmatian Pelican lost their habitats, widespread natural vegetation was destroyed, and flooding incidents decreased. Because a large portion of the polders are used for agriculture, improvements in farming circumstances, including pesticides,



the reduction of water levels, the use of artificial fertilizer, and the reallocation of farmland resulted in more productive farming but also caused more biodiversity destruction. From an ecological standpoint, this is particularly apparent in the decline in the populations of meadow birds, White storks, rails, and birds of prey such as harriers, as well as a decline in the floral diversity (de Jong & Wiggers, 1982).

In Dr M Vannucci's assessment of polder construction she discusses the importance of analysing all factors carefully as the long-term consequences of polder construction are inevitable and may cost a serious environmental impoverishment:

"Almost all life support systems, almost everywhere in the world, are nowadays under stress, if the building of polders is carried out with a single purpose in mind, as for instance added space for man, or economic development through industrial growth, it could become a disastrous enterprise. Monotonous ecosystems are fragile, it is diversity that gives stability to ecosystems, whether natural or manmade."
 – Dr M. Vannucci (Vannucci, M, 1982)

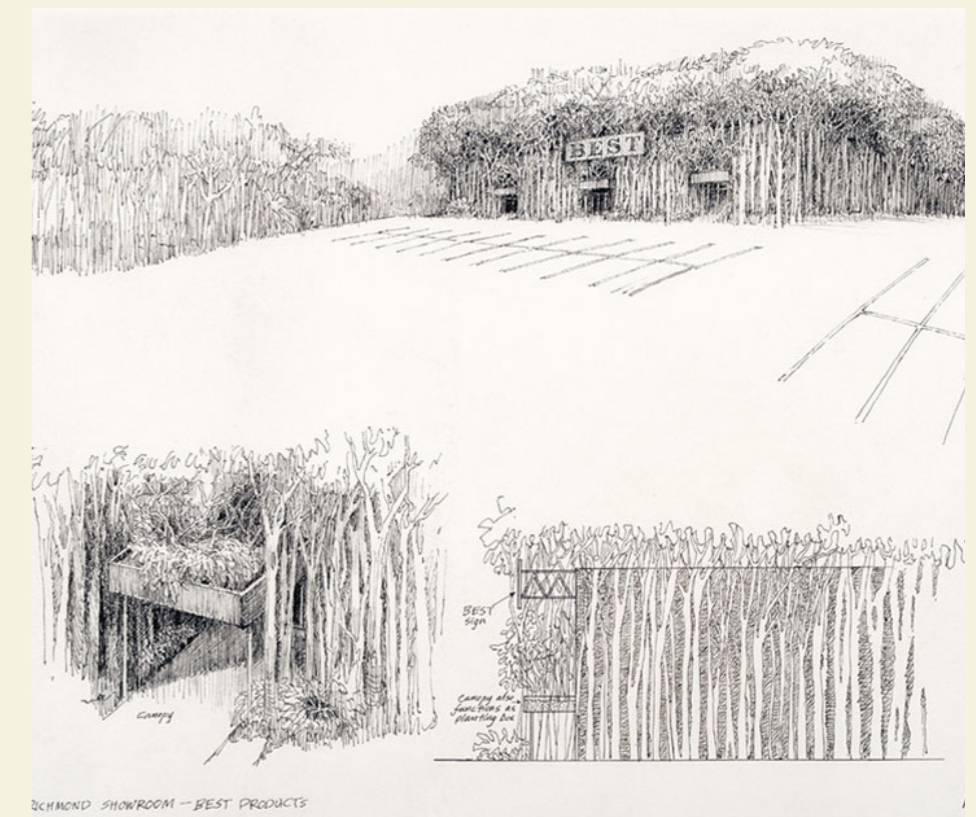
The polders were reassessed as a result of two major floods in 1993 and 1995 where over 200,000 people were displaced with large numbers of farm animal deaths (McVeigh 2014). Traditionally water has been pumped from the land, but in 2007 the 'Room for the River' initiative was developed which aimed to restore the rivers' natural flood plains to improve resistance due to climate change (Room for the river programme, 2019). The Room for the River program's primary measures include deepening the river channel, lowering floodplains and groynes, dike reallocation, and allowing excess water to be stored in lakes (Holmes, 2017). The steps taken to ensure safety will also enhance the river region's overall environmental quality and recreational, ecological, and aesthetic values (Room for the river programme, 2019) (Holmes, 2017). Additionally, the design carefully considers the conditions for sedimentation and erosion processes, which will eventually replenish a variety of ecosystems unique to the river landscape (Holmes, 2017). These initiatives result in positive outlooks on the future of our landscapes, they show that it is possible to enforce positive changes to human interventions that had caused so much environmental destruction.

Left; (Fig.1 & 2) Before and After 'Room for the River', Nijmegen, The Netherlands (Holmes, 2017).

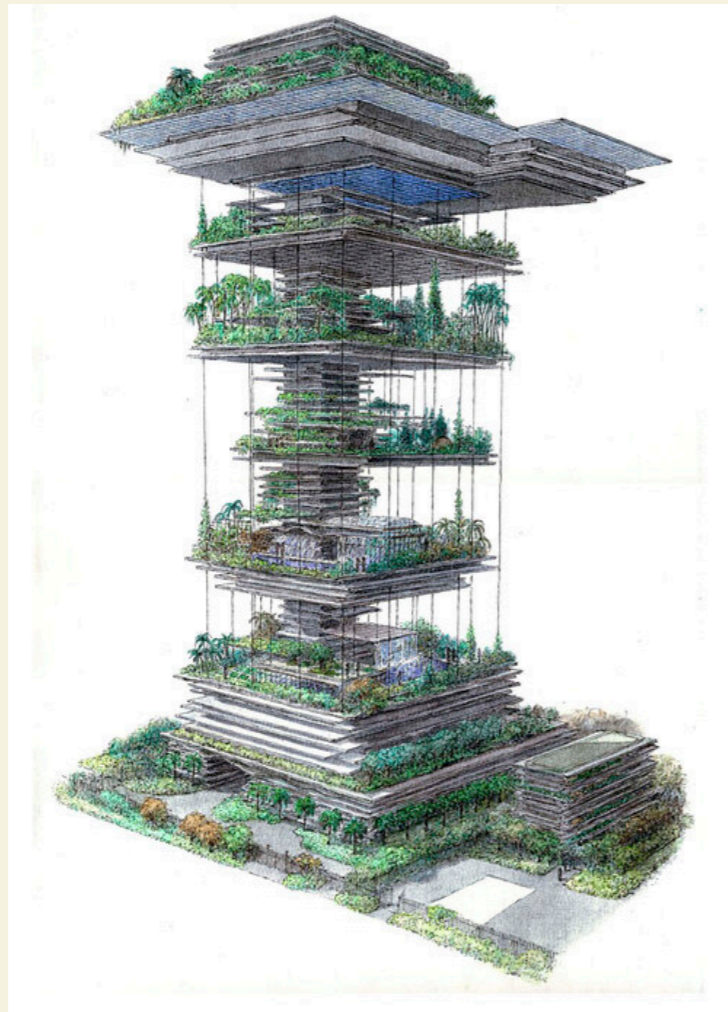
ARCHITECTURE AND ECOLOGICAL AGENDA

Projects from companies such as MVRDV and SITE have used innovative design to create projects that consider the crossover between ecosystems, landscape, and architecture.

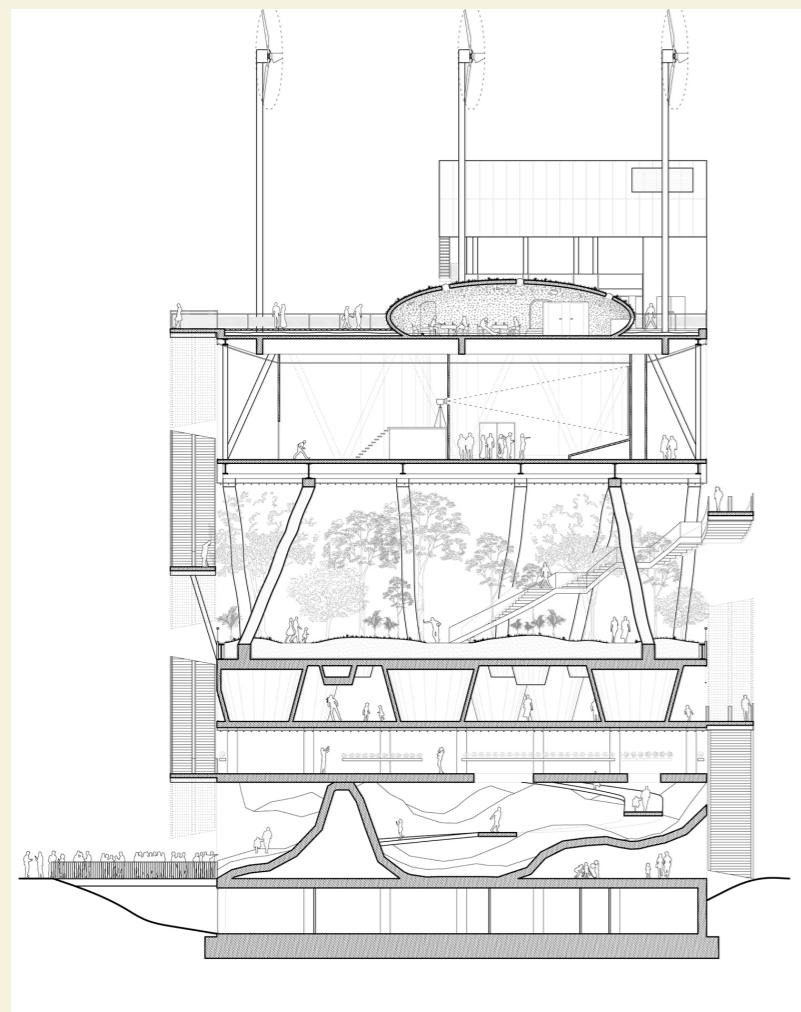
Forest Building (1980) in Richmond by SITE Architects, founded by James Wines, is an early example of architecture integrated with nature. Wines attempted to incorporate the landscape of the site into the design as an extension of the structure. The site was covered in mature trees and lush planting, so the structure was divided in two, enabling existing oak trees and a layer of vegetation to enter through the opening, allowing the forest and flora to invade the showroom. The vegetation and landscape enclose the building and obtrude on the structure, suggesting a retaliation of nature (Frac Centre-Val de Loire, 2022).



(Fig. 3, 4& 5) Forest Building', Richmond, USA by SITE (Frac Centre-Val de Loire, 2022).



MVRDV Architects, founded by Winy Maas, Jacob van Rijs, and Nathalie de Vries, are known for their radical solutions to contemporary architectural and urban issues. The Netherlands Pavilion by MVRDV at the 2000 World Expo in Hannover had the subject "Holland generates Space," which aimed at highlighting a nation making the most of its limited space, as a response to growing populations. The design took the form of an independent eco-system consisting of six Dutch landscape types layered on top of each other. The ground level blends in with its surroundings, like a continuation of the existing landscape, with the layers symbolising its artificiality (MVRDV, 2022). This stacked form uses resources like energy, water, time, and infrastructures more effectively while also saving space (Expo 2000 Netherlands Pavilion, Hannover 2022). SITE had a similar approach to MVRDV's new thinking around connected ecosystems with their project Antilia Vertiscape Tower in 2003. Although never constructed the project offers a different perspective of constructed landscape illustrating a series of vertically stacked public gardens, each tier supporting the earth's elements of earth, water, air, and fire with residency on the top layer (SITE, 2022). Both projects offer a new way of thinking around connected ecosystems and use of space. The pavilion by MVRDV is assumably a response to the country's historical use of polder reclamation to provide for its growing population, presenting a new perspective.



Top:
(Fig. 6) 'Antilia Vertiscape Tower' 2003 by SITE (SITE, 2022).
Bottom;
(Fig.7 & 8) 'Holland generates Space' Danish Expo 2000 by MVRDV (MVRDV, 2022).

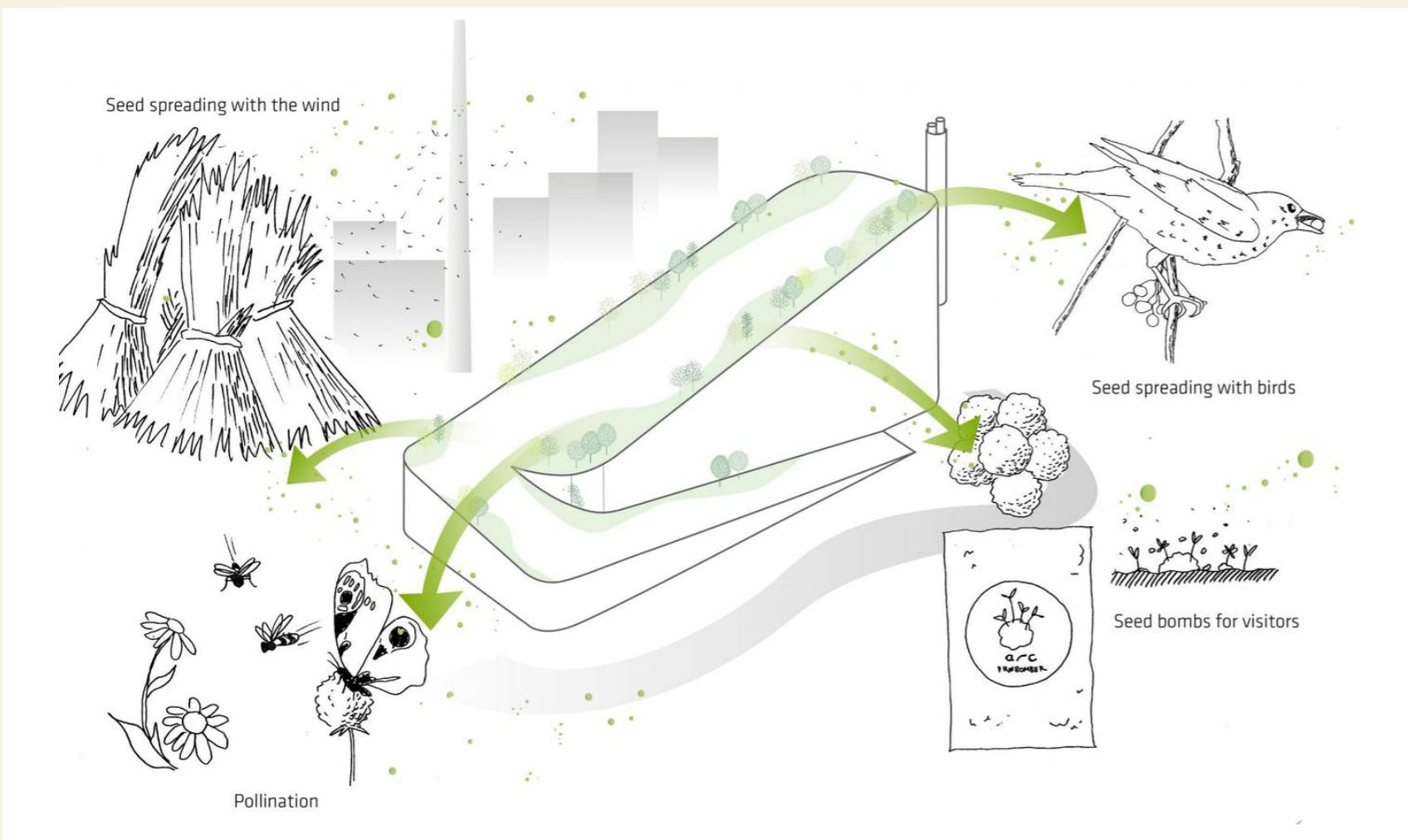
SUSTAINABLE HEDONISTIC ARCHITECTURE

“Nature was an ideal image, a self-contained form suspended afar, shimmering and naked behind glass like an expensive painting” – Timothy Morton (Morton, 2010).

Just as MVRDV and SITE have achieved through their work, the existing natural ecosystems should and can be included in urban sustainability strategies. Green spaces in our built environment have been proven to have multiple benefits not only for biodiversity and a city's environment such as reducing urban heat and managing storm water, but they also have been found to enhance human quality of life providing benefits for mental, physical, and social health (Mohtadi, 2016). These holistic qualities can contribute to hedonistic pleasures.

The urban environment is frequently perceived as the opposite of nature and an obstruction to sustainability (Mohtadi, 2016), with the sustainability debate often emphasizing changes in personal lifestyles as well as functionality and sacrifice (Bjarke Ingels, 2011). However, recognition of the multiple benefits of nature in our cities and architectural advancements have recently redefined sustainability in terms of not only the environment but also the standard of living and enjoyment of its residents. This approach to our built environment embodies hedonistic sustainability (Mohtadi, 2016). Architect Bjarke Ingels, founder of Bjarke Ingels Group (BIG Architects), has popularised this notion of hedonistic sustainability. This concept combines sustainable ideas and human enjoyment, which results in ‘a sustainability without compromise’ (Goodman, 2018). Ingels believes that sustainability can and should be pleasurable (O’Dea, 2021), “it (sustainability) can’t be a moral sacrifice, it has to be a design challenge” (Ingels, 2011). The interaction between individuals and their surroundings, as well as the function of sustainability within this connection, is captured in hedonistic sustainability (Mohtadi, 2016).

Copenhagen, Denmark is a city centred on hedonistic qualities. In 1947 the city designed urban strategies which ensured suburban connectivity, adequate public transport, and generous green spaces, known as the ‘five finger plan’. Since the 1980s, the city promoted its cycling culture by providing initiatives to encourage the use of the bicycle including free bike sharing services, bike infrastructure, and a traffic system which aided cycling making it more efficient and quicker. In the 1990s the city needed an updated plan due to large population and economic growth. The ‘Loop city’ master plan included expanded rail infrastructure, smart energy grids, and waste management plans which catered for a predicted growing population. Part of this plan included a new power plant for Copenhagen, which was designed by BIG Architects (Mohtadi, 2016). ‘CopenHill’ used its design of a power plant to create an artificial ski slope, hiking trail and climbing wall that sit on its sloped roof (Mehta, 2019). The plant is also educational, it displays its processes and carbon production through transparent lifts and a smoke ring which extrudes out of the



(Fig.9, 10 & 11) CopenHill', Denmark, 2011, by BIG Architects (BIG Architects, 2022)



chimney, representing one tonne of CO₂ (Mohtadi, 2016). It is an example of a piece of Architecture that has replaced the land it was built on with a service to the people and to the environment, a space that would otherwise be wasteful, capturing what hedonistic sustainability looks like in architecture. In an article by Meghna Mehta in 'Stir World' she describes the project as a "new social destination" that serves "the purpose of architecture where the building serves its function, belongs to the place and its people." (Mehta, 2019).

MVRDV's 'Shenzhen Terraces' (2019) also contains hedonistic elements. The design exemplifies the harmonious blending of landscape, recreation, business, and culture. Shenzhen Terraces' fundamental concept is to integrate the current landscape by employing stacked terraces for its varied buildings (see fig. 11). These terraces provide necessary shade along with areas for plants and water basins to cool the air and provide a climate controlling barrier for the interiors, but they also provide a network for public connectivity, interaction, and activity zones (Shenzhen terraces by MVRDV, 2020). These green facilities create a pleasurable experience for the users, encouraging the use of the outdoors and connection to flowing water and green spaces which contribute to hedonistic pleasures. The projects by BIG and MVRDV return to Burns', Maas' and Smithson's idea that constructed landscape can be new nature and show us that this new nature can create a positive impact on people and the climate.

Hedonism is a philosophy that regards pleasure and happiness as the most beneficial outcome of an action (The Ethics Centre, 2016). The living and non-living components of the human made environment directly influence our reactions to it, both subconsciously and consciously, forming its own ecosystem. These components are not only linked to one another, but they are also tied to the emotional, mental, and physical conditions of its residents (Mohtadi, 2016). Unpleasant urban surroundings can evoke negative mental responses, not unlike the emotions I felt in the opening paragraph 'My Commute Through Dublin City'. Projects like 'CopenHill' and 'Shenzhen Terraces' show us that sustainable architecture and human enjoyment are not mutually exclusive and can achieve a more hedonistic urban environment.

Left; (Fig.12 & 13) MVRDV 'Shenzhen Terraces', (2019), China Mainland (Shenzhen terraces by MVRDV, 2020



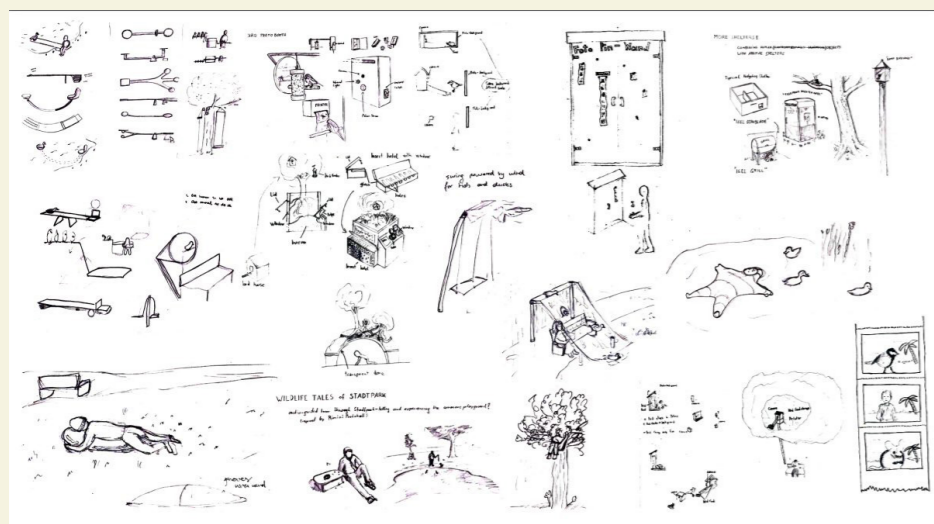
“How can we find a balance between human aesthetics and non-human needs?”

- Ellen Zoete, programme manager and co-creator of the exhibition (Kuitenbrouwer & Zoete, 2022).

Much like the early land artists, art is still used today to highlight environmental issues. The exhibition, ‘Have we met? Humans and non-humans on common ground’ encourages new perspectives on how humans, bacteria, other animals, and plants coexist on our world. The fundamental stance behind the display is to challenge the idea that the earth only exists for human exploitation (Kuitenbrouwer & Zoete, 2022) and could be considered an exploration of Timothy Morton’s question: “What would an ecological society look like?” (Morton, 2010). Through the tools and methods of design, art, science, and agriculture, the exhibition aims to open communication and increase human sensitivity to the needs of non-human life. ‘Have We Met’, therefore provides a base for organising the shared values of a civilization that includes multiple species (Kuitenbrouwer & Zoete, 2022).

“It really is about connecting the big issues in climate change as a design challenge there’s so many things that designers could contribute to and I think what we’ve tried to do is really pose a context that is resolved and in the manner of how humans and non-humans could collaborate and actually live together as real equals.” – Ellen Zoete, Programme manager and co-curator of the exhibition (Kuitenbrouwer & Zoete, 2022).

A project from the show entitled, ‘Interspecies Play’ is a project by Design Investigations students at the University of Applied Arts, Vienna. It investigates the concept of shared enjoyment between humans and non-humans. This proposal suggests urban wild spaces with interactive “games” like a bird or small mammal and human picture booth. Cities are home to many species, but they don’t share life. In the animal booth, a motion sensor flashes a light to take photos (see fig. 12). The resulting split screen shows the people and the animal together. (Kuitenbrouwer & Zoete, 2022). This project explores ways to improve human-animal relations and create a more inclusive multi-species society and urban environment (Kikuchi, Li, Sapp & Schiegl, 2021). While this project has no direct benefit for the non-human, I believe there is importance in bringing awareness to



one’s surroundings and the species living among us as it can provoke interest and care, with the added benefit of human pleasure and enjoyment, almost bringing a ‘zoo-like’ experience to the wild.

Another piece in the “Have We Met?” exhibition is the ‘Drilling Platform Off the Dutch Coast’ display by Fiona Middleton, a marine biologist (see fig. 13). Middleton has looked at ecological benefits of platforms, pipelines, and other offshore infrastructure in the North Sea (Regine, 2022). She has discovered that these rigs act as safe havens for the sediment below, help mammals and seabirds find their way, and provide surfaces and resources for marine life (Kikuchi, Li, Sapp & Schiegl, 2021). At the end of their economic life the rigs in their entirety are proposed to be taken away by the Convention for the Protection of the Marine Environment of the North-east Atlantic, however, Middleton’s research suggests that the structures could be repurposed as ocean reefs, thereby switching from human to non-human values without any required changes. (Regine, 2022).

Overall, the exhibition offers a positive reflection on the pressing need to include the viewpoints of non-human species in our understanding of the universe. ‘Have we met?’ investigates realistic prospects for interspecies partnerships while challenging our anthropocentric conception of a planet that only exists for human exploitation (Regine, 2022). In her critical essay, ‘Caring Architecture’, Joan C. Tronto reinforces the importance of a non-capitalist approach for design, she states: “For our broken planet, we now need architecture of care. Going beyond the ideas of ‘what the client wants’... an architecture that is sensitive to the values of repair, of preservation, of maintaining all forms of life and the planet itself” (Tronto, 2019). This exhibition adds to the increasing shift toward non-human-centric ideas, which adhere to the opinions of the land artists, and the critiques of the land reclamations. These ideas are required to ensure a more sustainable and regenerative future for all forms of life (DAMN Magazine, 2022).

(Fig. 14, 15 & 16) ‘Interspecies Play’, Have we met? Humans and Non-humans on Common Ground (Kikuchi, Li, Sapp & Schiegl, 2021).

(Fig. 17) ‘Drilling platform off the Dutch coast’, Have we met? Humans and Non-humans on Common Ground. Photo: Cristiano Corte (Regine, 2022).

THEME OF URGENCY

“We have lost time. We must act now”

– Robert Watson – Chair of IPBES (WWF, 2022).

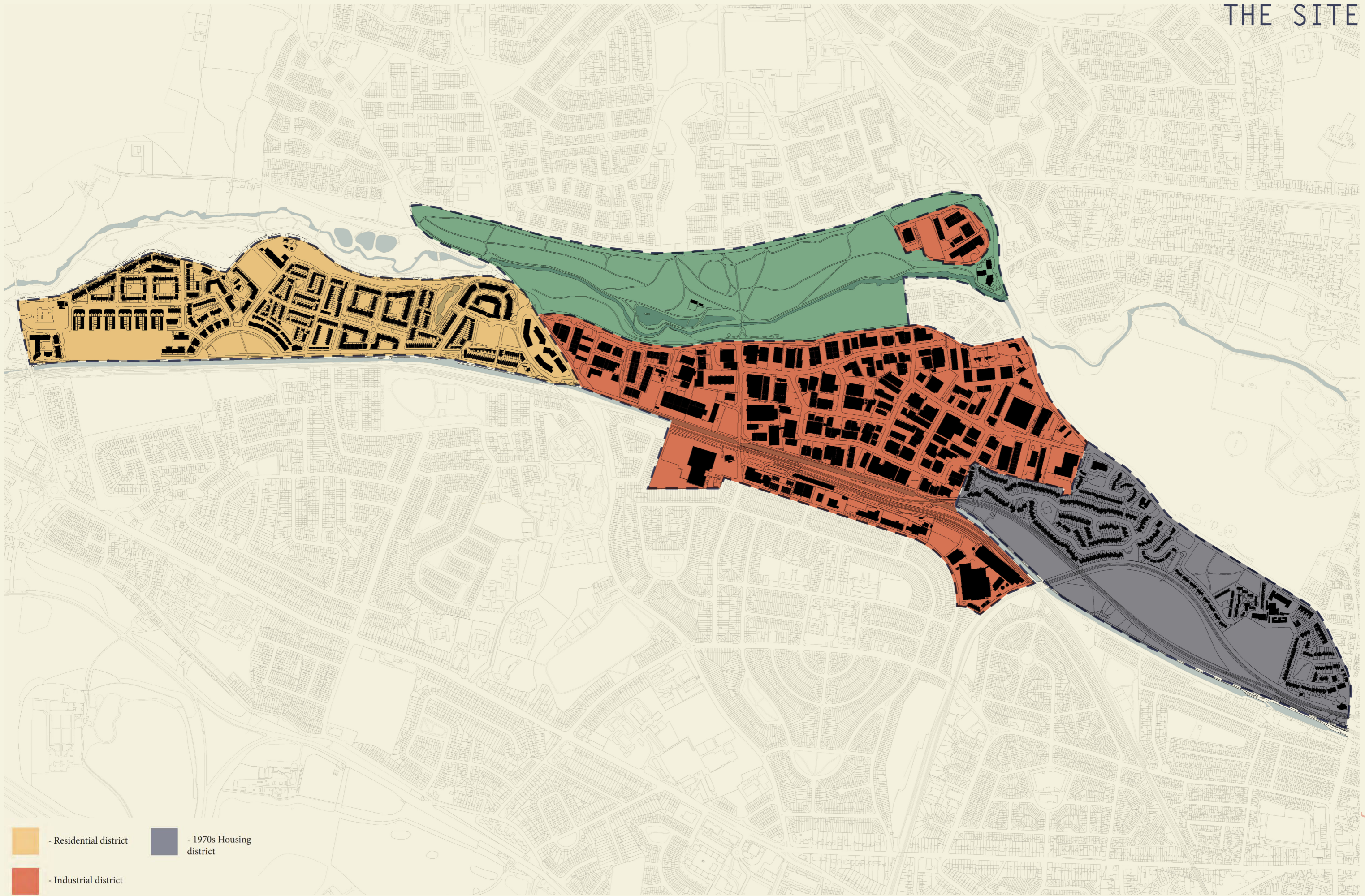
Biodiversity refers to the variety of life and the interactions between living things from genes, populations, species, and ecosystems situated on land, in water, in the sea, and in the air. Terrestrial, freshwater, and marine ecosystems supply critical human well-being services such as food, medicines and energy. Our climate, natural disasters, air quality, fresh water supply, pollination, seed distribution, soils, ocean acidification, etc, are all reliant on their health. Nature provides us with everything we need to survive (WWF, 2022).

The Intergovernmental panel on Biodiversity and ecosystem Service (IPBES) global assessment on the state of the worlds biodiversity shows that “nature is declining globally at rates unprecedented in human history — and the rate of species extinctions is accelerating, with grave impacts on people around the world now likely. The health of ecosystems on which we and all other species depend is deteriorating more rapidly than ever. We are eroding the very foundations of our and future generation’s economies, livelihoods, food security, health, and quality of life worldwide.”

In Ireland alone, of the 10% of our 31,000 plus species that have been assessed, one in every fifth species and one in every third species of bee is threatened with extinction, 37 species of bird are of high conservation concern, including species such as curlew, hen harrier, twite and yellowhammer. The corn bunting has become extinct, three of our prominent fish, the Atlantic salmon, European eel and angel shark have suffered catastrophic population declines there and has been a large decrease in the biomass of insect life (Lysaght, 2022).



Left:
(Fig. 18) Environmental campaigners from the Irish Wildlife Trust and Extinction Rebellion protesting outside the Government’s National Biodiversity Conference in Dublin Castle calling for legislation in the form of a Biodiversity Act. Photograph: Alan Betson (O’Sullivan, 2022)



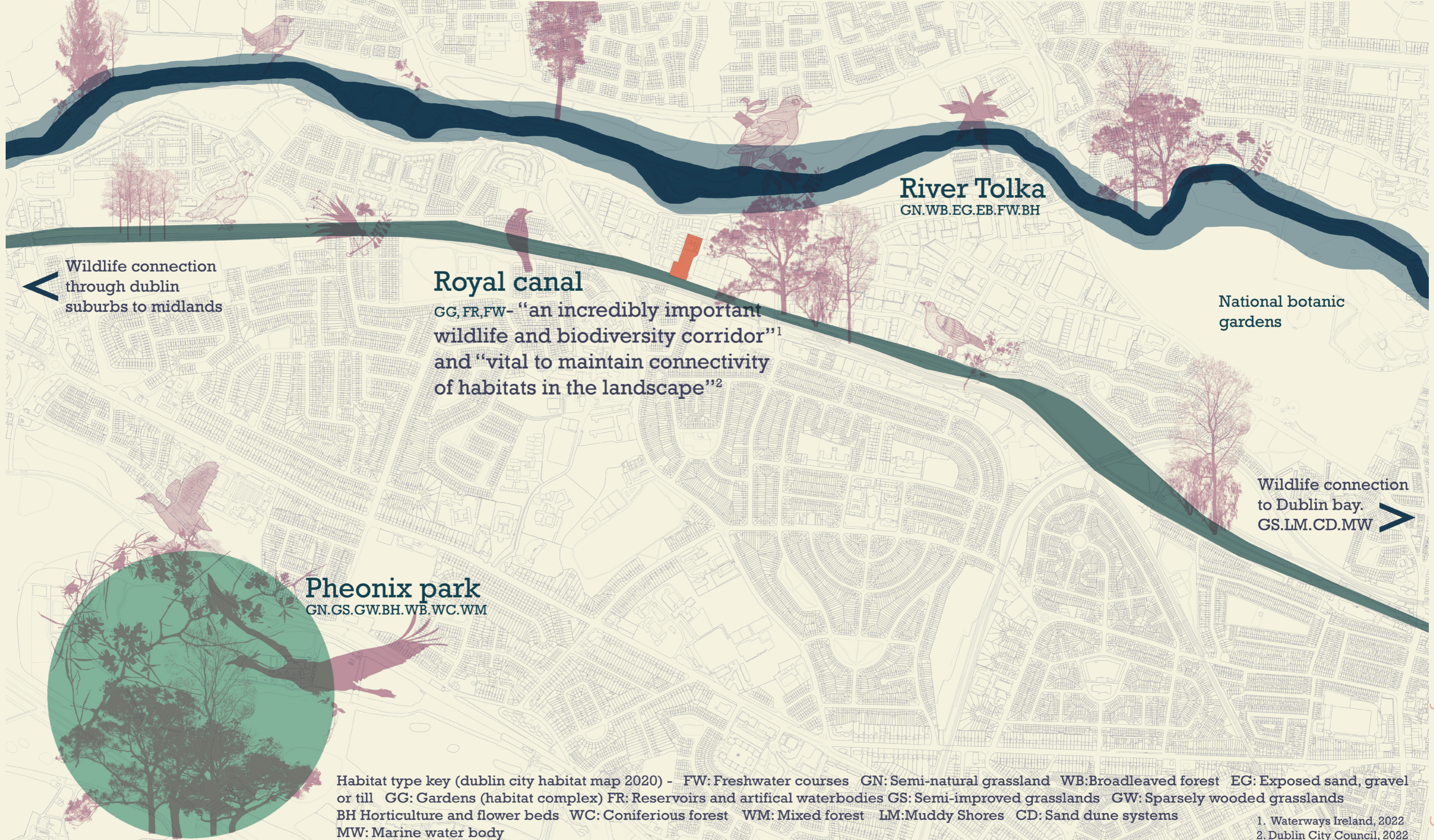
- Residential district
- Industrial district
- Park
- 1970s Housing district

Left:
Thesis area of study.
-Authors own

Below;
Tolka Valleys Wildlife corridors
-Authors own.

The process of choosing the site began by exploring the existing wildlife habitats in the wider Tolka Valley area, these include Phoenix Park to the south, the Royal Canal running through the heart and Tolka valley park and river to the north. A site along the Royal Canal became apparent as an area which could be improved on in terms of biodiversity and community engagement. Through research in semester one the canal way stood out as the most active area in terms of footfall and conversation, even though the developments along-

side it have not engaged with it and is separated from the industrial estate (Built Fabric and Space, 2022). The Royal Canal is considered "an incredibly important wildlife and biodiversity corridor" and "vital to maintain connectivity of habitats" in the Dublin landscape (Dublin City Council, 2022), therefore I believe that any developments alongside the royal canal should be sensitive to this important habitat and use their design choices to restore and enhance this corridor (refer to letter to Dublin city Council in the appendix).



Wildlife connection
through dublin
suburbs to midlands

Royal canal

GG,FR,FW- "an incredibly important wildlife and biodiversity corridor"¹ and "vital to maintain connectivity of habitats in the landscape"²

River Tolka
GN.WB.EG.EB.FW.BH

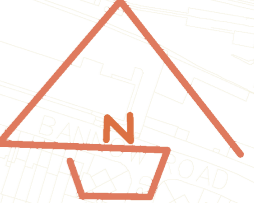
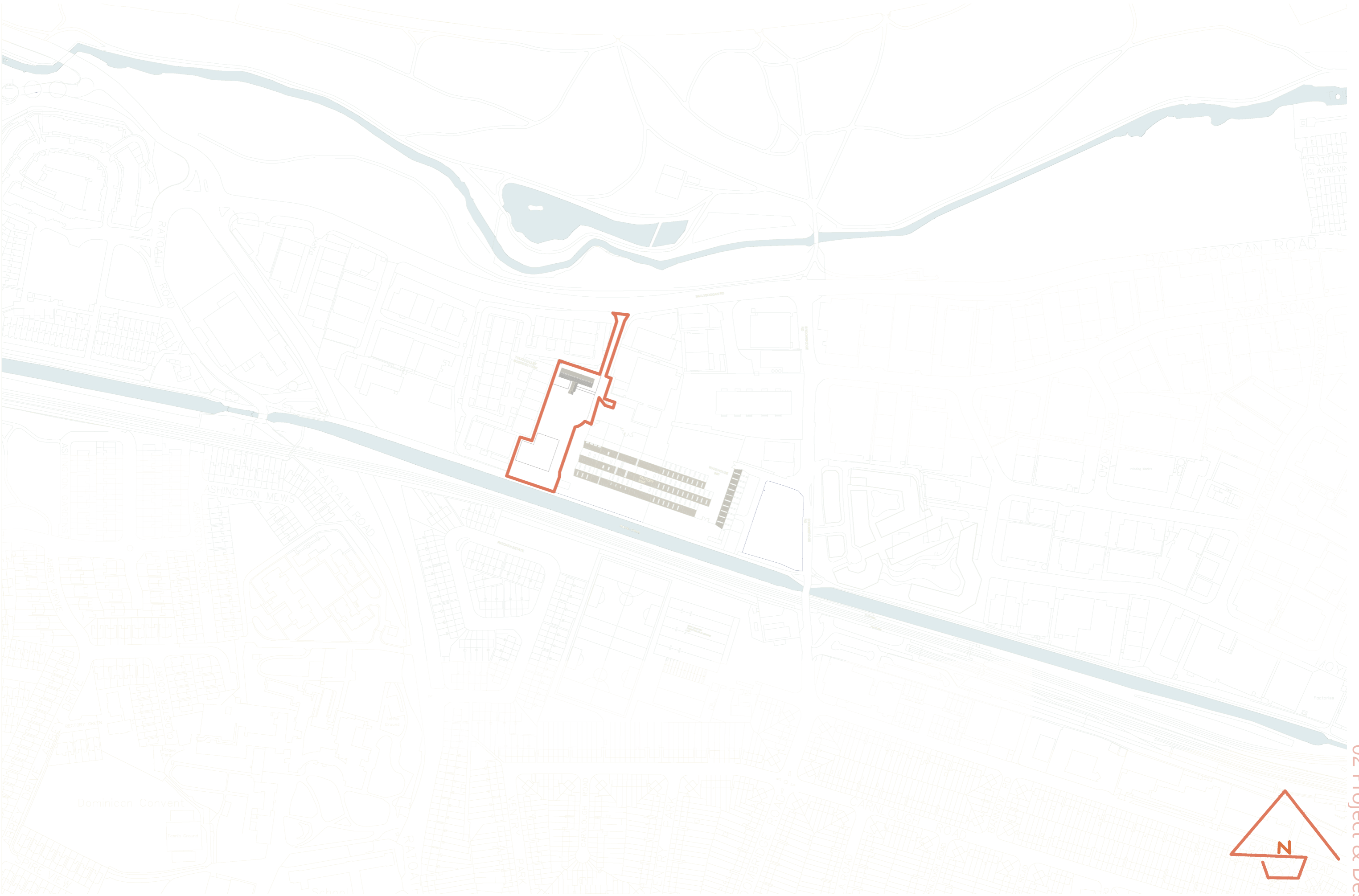
National botanic
gardens

Phoenix park
GN.GS.GW.BH.WB.WC.WM

Wildlife connection
to Dublin bay.
GS.LM.CD.MW

Habitat type key (dublin city habitat map 2020) - FW: Freshwater courses GN: Semi-natural grassland WB: Broadleaved forest EG: Exposed sand, gravel or till GG: Gardens (habitat complex) FR: Reservoirs and artificial waterbodies GS: Semi-improved grasslands GW: Sparsely wooded grasslands BH Horticulture and flower beds WC: Coniferious forest WM: Mixed forest LM: Muddy Shores CD: Sand dune systems MW: Marine water body

1. Waterways Ireland, 2022
2. Dublin City Council, 2022



My chosen site is a vacant plot with an existing derelict building in the industrial estate. It sits alongside the Royal canal just north of the proposed TU Dublin Broom bridge campus. It is largely covered in concrete surfacing due to a previous warehouse office building which once sat there and was destroyed in a fire. Due to the lack of human activity on the site, nature has begun to make its way into it. The derelict building has evidence of pipistrelle and leislers bat species activity according to bat surveys carried out in 2020 and 2021. According to bat conservation international "fragmentation of habitat, destruction of roosts, and mitigating human wildlife conflict are all causing a decline in bat populations". Due to bats heavy reliance on buildings for roosting for their conservation (Bat Conservation Ireland, 2023), retaining this derelict building in its original form is essential to this colony's survival, expansion, and growth. Alongside the existing building there are a variety of middle-aged trees mostly consisting of birch, alder, pine and silver birch. Many are deemed to be in poor condition, presumably due to their constrained concrete environment. The intention is to retain those in okay to very good condition and salvage as many as possible deemed very poor to poor (please refer to the Arboriculture assessment and impact report by CMK in the appendix).

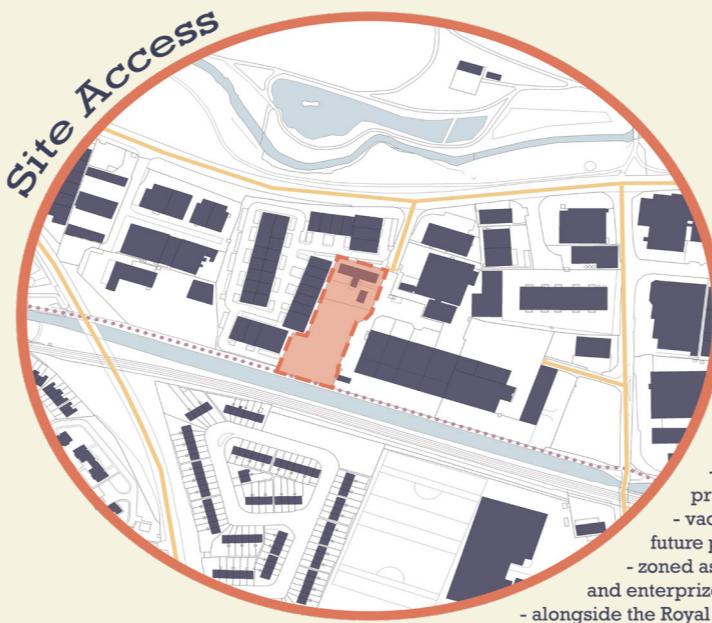
From further research conducted by the year in semester one the Tolka Valley industrial estate is shown to be changing rapidly with increases in large scale granted mixed planning developments replacing existing industry, and over 13 churches scattered throughout the estate in existing warehouse structures (Future proposals and Current Discourse, 2022). This vacant site has already had previous permissions where this existing building has been proposed to be demolished, therefore I felt that choosing this site would be an appropriate opportunity to make a stance for the existing habitats to futureproof their safety in a changing typology.



Left;
Existing Building Section , Bat Roosting
-Authors own.



Aerial view



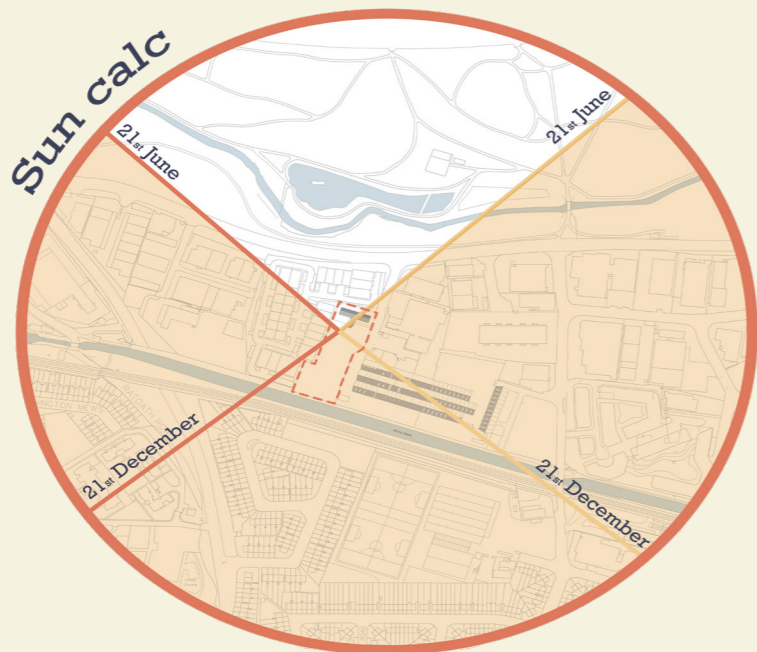
Site Access

- site area 6150 sqm
- located in Tolka valley industrial estate
- inaccessible privatised land
- vacant property with no future proposals
- zoned as Z7: light industry and enterprize
- alongside the Royal canal and 'greenway' and north of proposed TU Dublin broombridge campus

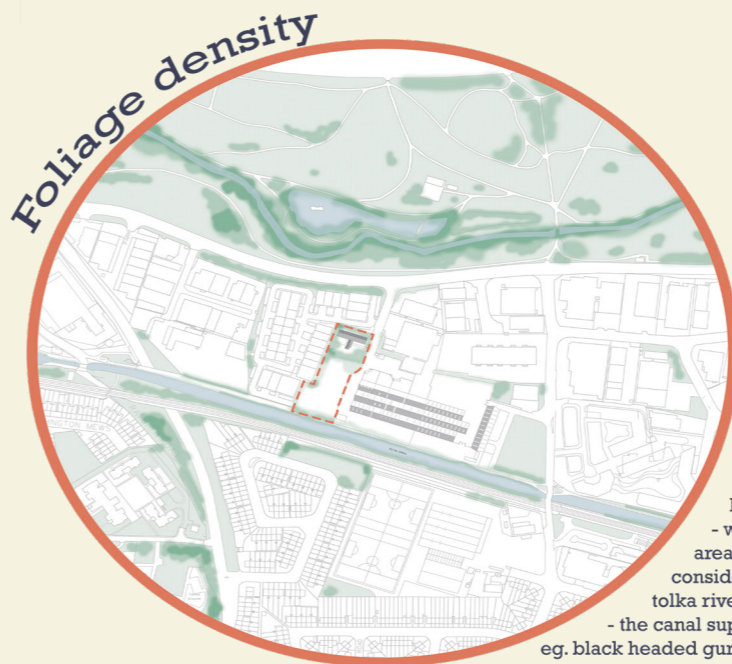


Soil sealing

- In the Tolka valley region studied;
- In 1952: 18% of the soil sealed
- In 1978: 29% soil sealed
- In 2022: 69% of soil sealed
- In 2022: excluding Tolka valley park 18% of the soil is sealed in the Tolka valley area
- Over 95% of the sites soil is sealed

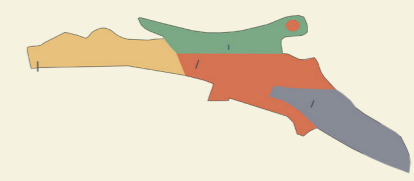


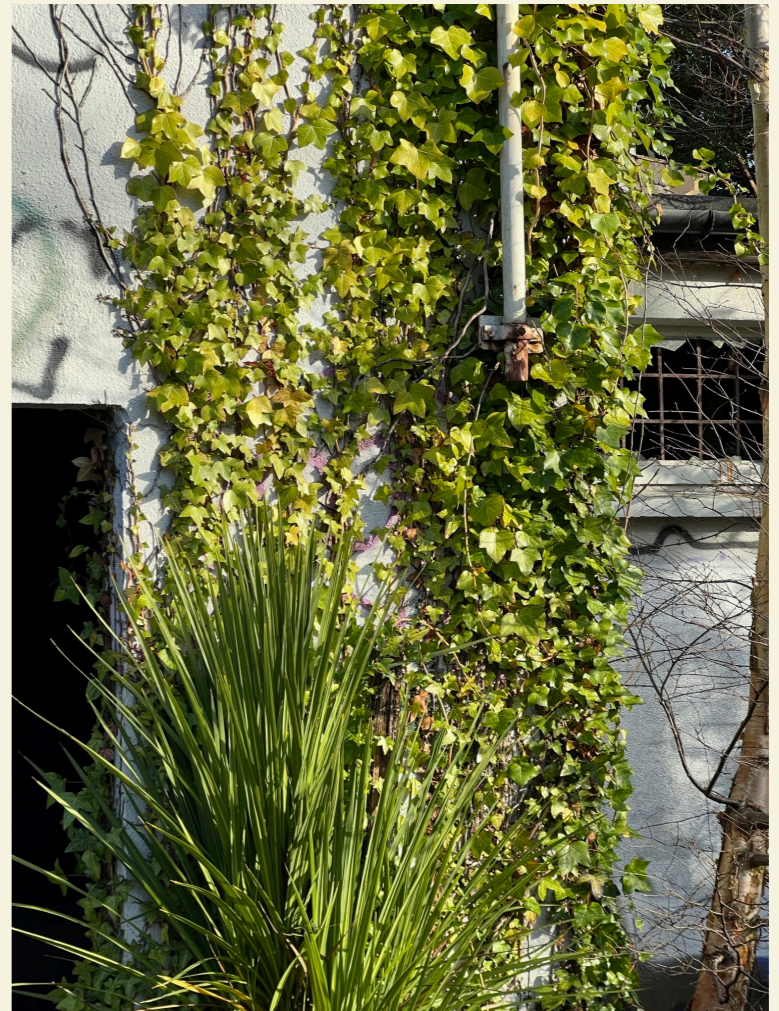
Sun calc

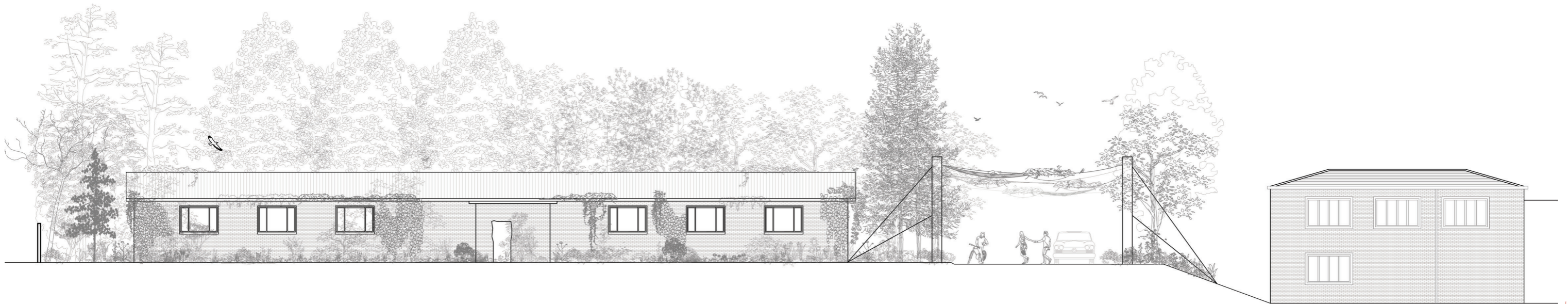
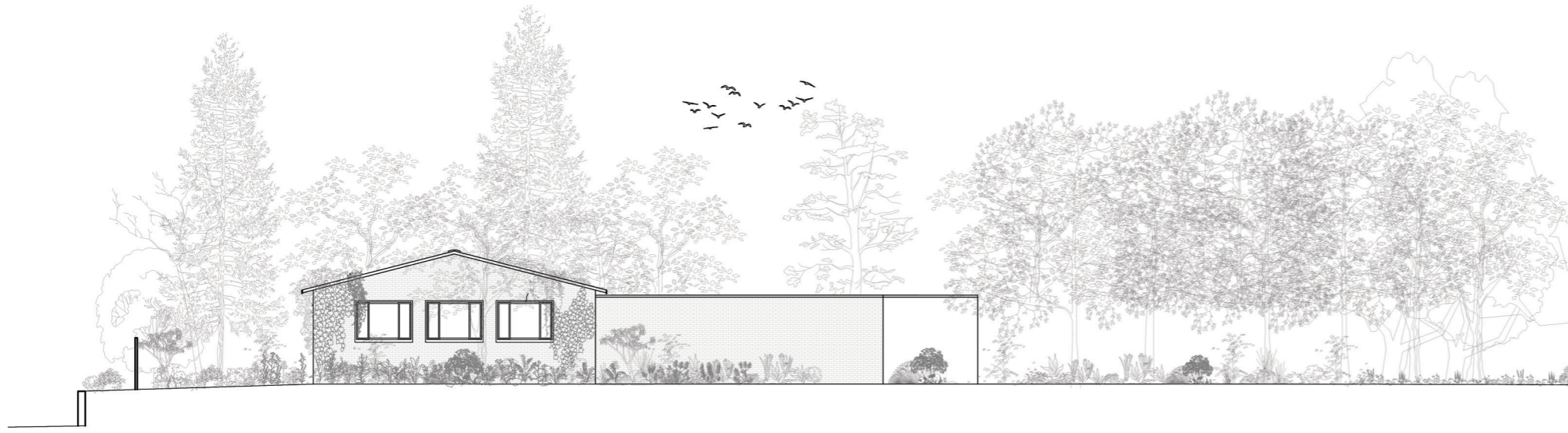


Foliage density

- the Royal canal is considered a 'wildlife corridor full of diverse habitats'
- water quality in the area: the canal is considered good while the tolka river is considered poor
- the canal supports many species; eg. black headed gurl, robin, swan, otter, pondweed, waterweed, bream, trench etc.







Top;
Existing Site Section North to South
Middle;
Existing Retained Building Western Elevation
Bottom;
Existing Retained Building Southern Elevation showing proposed green bridge
-All authors own

Fauna Data Sheet

Common and Soprano Pipistrelle bat



Leisler's bat



Arctic Tern

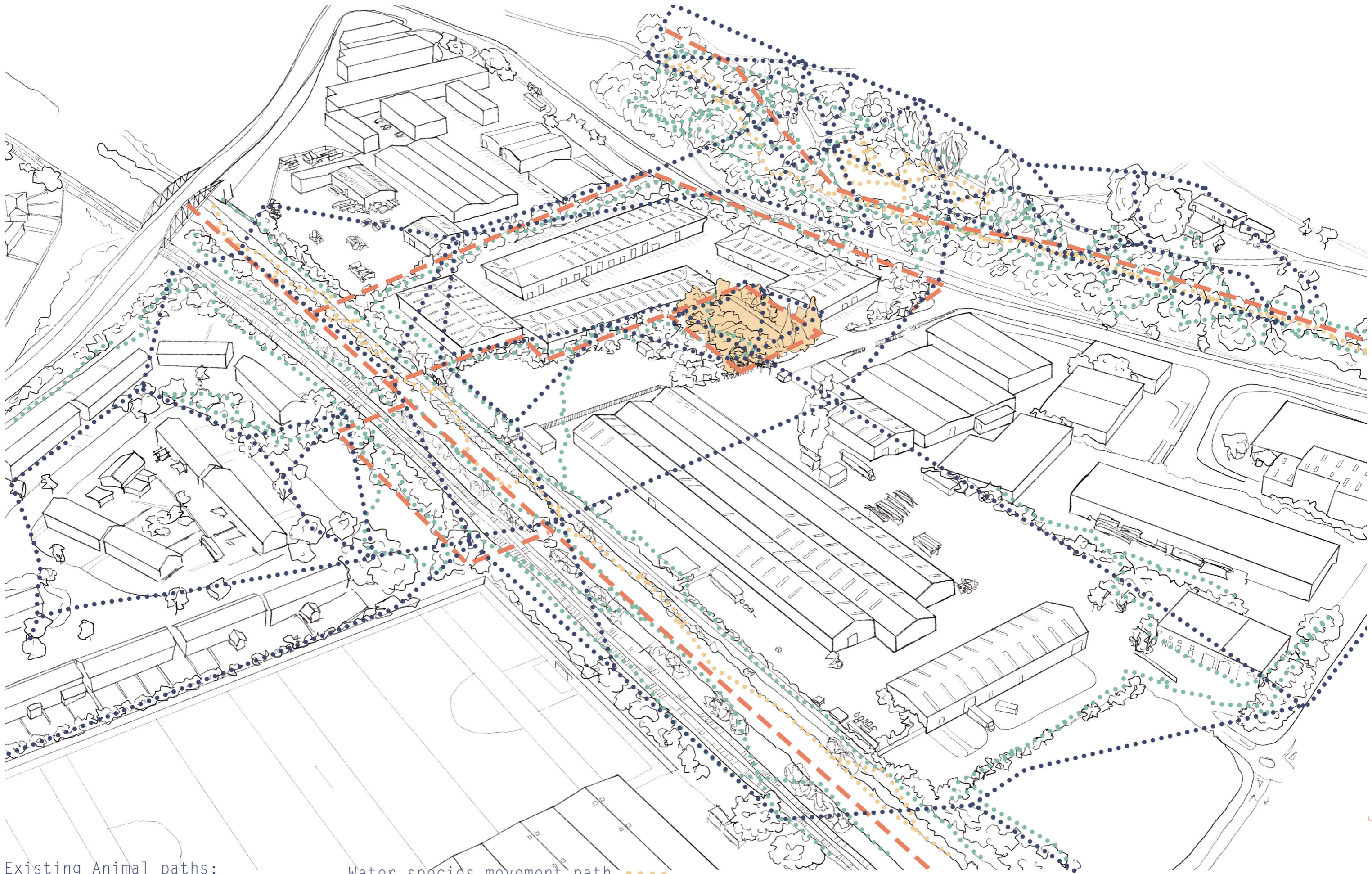


Black Headed Gull



Conservation Status	Size	Lifespan	Migration	Roost/Nest location	Hibernation period	Diet	Habitat	Notes
Protected under the wildlife act 1976/2000 (least concern)	Length: 3.5 - 4.5cm Wingspan: 20 - 23cm	4 - 5 years	—	Mostly within buildings old and new (roof spaces) & tree holes	Winter (November - April)	Flying insects (moths, midges) 3,000 in a single night	mostly urban areas near rivers, lakes, canals, forestry	there is an existing increasing population of common/ soprano bats on site with a total of 8 passes.
Protected under the wildlife act 1976/2000 (near threatened)	Length: 5 - 7cm Wingspan: 26 - 32cm	up to 9 years	—	Mostly within buildings (roof spaces) & tree holes	Winter (November - April)	Flying insects (yellow dungflies, caneflies, moths, midges, beetles, etc) 3,000 in a single night	pastures, rivers, lakes, canals, forestry, around floodlights	there is an existing increasing population of leislers bats on site with a total of 4 passes.
Protected under by national and European legislation (vulnerable)	Length: 28 - 41cm Wingspan: 64 - 76cm	20 - 30 years	winter	rocky/sandy ground near water (Dublin Bay)	—	marine fish, crustaceans and insects	nest in open areas and forage over streams, lakes, ponds, ocean etc	Forages along the royal canal and Tolka river during the summer months
Protected under by national and European legislation (near threatened)	Length: 37 - 44cm Wingspan: 94 - 110cm	up to 32 years	—	ground nesting inland among vegetation, wetlands, along river banks	mainly sedentary	insects (earthworms, crustaceans), domestic waste	pastures, rivers, lakes, canals, forestry, around floodlights	existing vegetation on site used by black headed gulls persumably while foraging along the Royal canal and the Tolka river

	Winter	Spring	Summer	Autumn	Edible Flora	Winter	Spring	Summer	Autumn
Fauna	Hibernation: Bats Bees Frogs Active: Fox Robin Black Bird Black headed gull	Active: Bats Bees Fox Robin Black Bird Black headed gull Arctic Tern	Active: Bats Bees Fox Robin Black Bird Black headed gull Arctic Tern Swifts	Active: Bats Bees Fox Robin Black Bird Black headed gull Arctic Tern	Edible Flora	Chives, mint, paisley, sage, thyme, peas, pumpkins, spinach, kale, potatoes	Chives, mint, paisley, corriander, beetroot, lettuce, cabbage, cauliflower, carrots, parsnips, leeks	Basil, peppermint, chives, rosemary, parsley, fennel, coriander, brocoli, cabbage, carrots, lettuce, scallions, cucumber, tomatoes	Apples, plums, pears, salad leaves, tomatoes, potatoes, radish, carrots, turnip, beetroots, spinach, aubergine, sweetcorn, mint, rosemary, thyme, sage.



Above;
 Existing animal movement patterns
 -Authors own

THE BRIEF

SETTING OUT

The Architectural intent to design a Steiner Primary school that is set in the context of an architecture that is not solely human-focused but also includes consideration for the non-human and uses these choices to create a more pleasurable space for the users. The Tolka valley area has a growing population with large residential projects taking place in recent years with planning continuing into the future (Future proposals and Current Discourse, 2022). There are currently only 7 Steiner Primary schools in Ireland with one located in Dublin. As of 2015 the Department of Education has given official recognition and funding to a Steiner school. As the future of our education methodologies are changing the demand for this type of education is likely to increase (Ryan, 2015). Therefore, it was important that my proposal reflected this demand and catered for as many students as possible while also finding a balance between space allocation for human and non-human. The final brief is for a 14 base classroom primary school (two classrooms per school year), with 7 subject specialty classrooms and adjoining ancillary spaces (see full programme list on page 35).

Due to limitations of the size of the site, the careful consideration of space allocation for the non-human and the plentiful supply of pitches in the area, I felt that there was no need for the conventional school basketball court or football pitch to be located onsite (Life and Society, 2022). Within a 10-minute walking threshold there are multiple pitch facilities belonging to Cabras Parkside Community sports centre, Tolka Valley park, St Dominic's College, St Catherines School and Colaiste Mhuire, which could be utilised when necessary.



Left;
Early conceptual interior and exterior window atmospherics
-Authors own

STEINER PHILOSOPHY AND NATURE

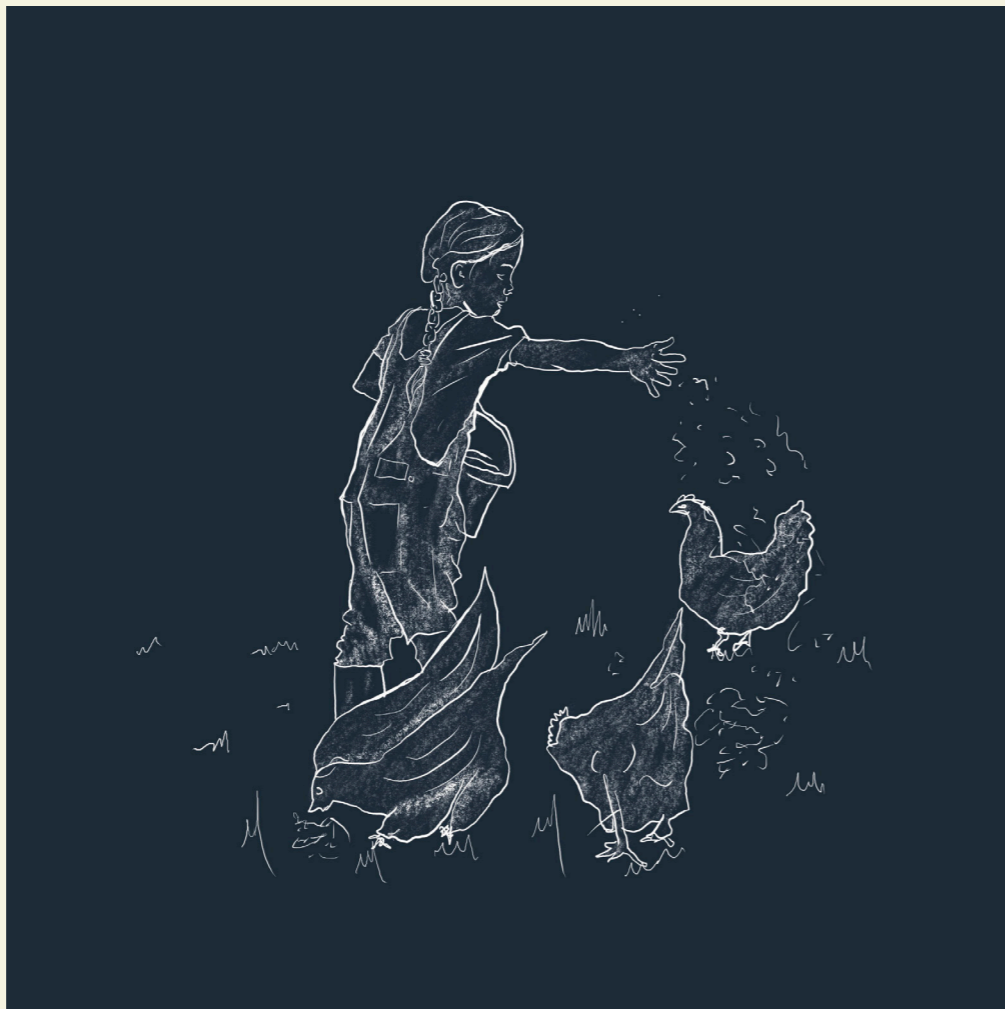
Through researching multiple types of primary education systems, those present in Ireland or elsewhere such as the activity based learning of Froebel, the outdoor nature of forest schools or the child centred principles of Montessori, it was Steiner/Waldorf's holistic approach to learning and teaching which stood out as the most appropriate fit to demonstrate my thesis. Through this pedagogy, my thesis ideas around non-human centric design and hedonistic sustainability could be an architectural solution to the Steiner philosophy. Through Steiner Primary schools, the architecture, materiality and site decisions can provide a means for the users to explore important teaching principles such as the natural rhythms of life, our kinship with all living things and potentially, reveal what nature can teach us.

Steiner or Waldorf pedagogy places a strong emphasis on education through nature with integrated nature studies in all subjects:

"the nature connection is also about showing children the natural rhythms of life and revealing our kinship with all living things. It is about careful observation to see what the natural world has to teach. And finally, it is about stewardship and understanding our place as humans collectively, and as individuals, who care take the natural realm." – Waldorf school of Philadelphia (Waldorf School Of Philadelphia, 2022)

The understanding of our communal and individual roles as humans who can help care for the natural world is important from a young age and for the future of our planet.(ARCH OF CARE). These factors influenced the programming throughout the site. Alongside the base classes, the extra subject classrooms include; a cooking classroom, a woodwork studio, an art room, a craft room, a library, a sensory and special needs room with a greenhouse, a chicken coop and beehives located on the second floor level.

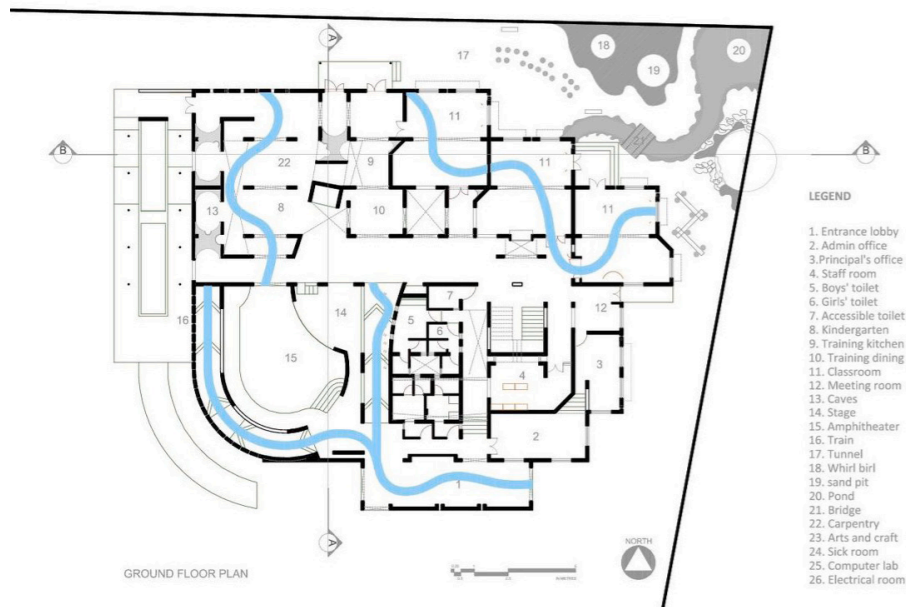
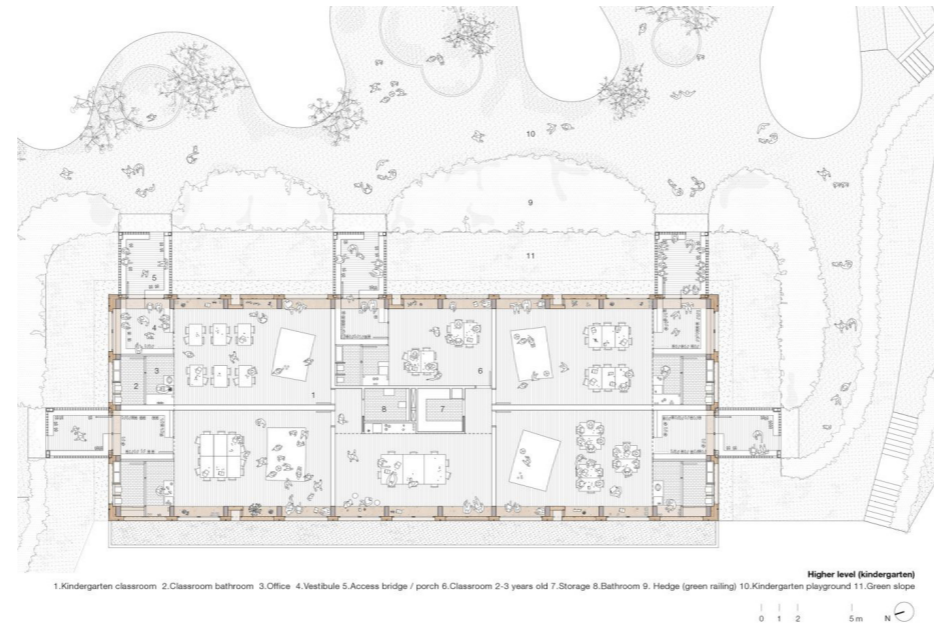
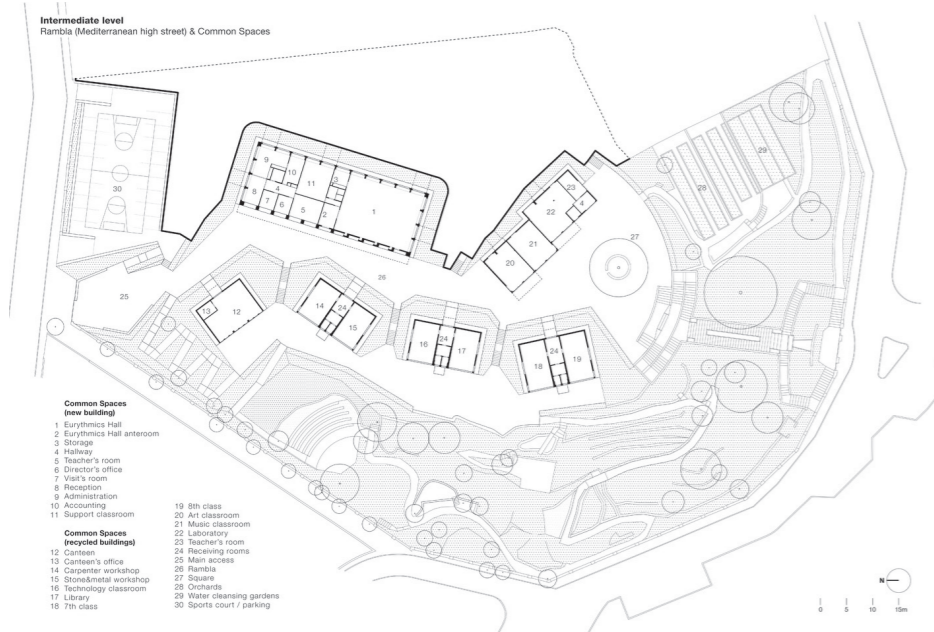
The new constructed landscape that surrounds the building units, the existing non-human residents and the proposed greenhouse, beehives, chicken coop and apple orchard is intended to be an important part of their school day. Observing and learning from plant growth on different site conditions, studying and surveying the bat colony in the existing building on site, contributing to developing habitats to keep these species returning to the site, observing frog colonys in the ponds, growing vegetables year-round in the greenhouse and on their classroom terraces, harvesting eggs from the chickens and honey from the bees, collecting apples and blackberries, all reinforces the relationship between humans and the 'other'.



PRECEDENTS

Name: The El Til-ler - Linden Tree- School
 Architect: Eduard Balcells + Tigges Architekt + Ignasi Rius Architecture
 Year : 2018

This precedent caught my eye early on as it reflected a fragmented plan with outdoor circulation that I was investigating into. While the outdoor circulation is vast the access to the classroom follows a spatial sequence: rambla – courtyard – porch - receiving hall - classroom. The classrooms being separated gives them varying light qualities and a sense of uniqueness. Another aspect of the classroom design which stood out to me was the concept of the view or horizon expanding as the child gets older and moves through the school. This direct thought behind the architecture reflecting a child scale, and that scale growing just as the child does was something I wanted to bring into my project (El Til-ler School / Eduard Balcells + Tigges Architekt + Ignasi Rius Architecture, 2021).

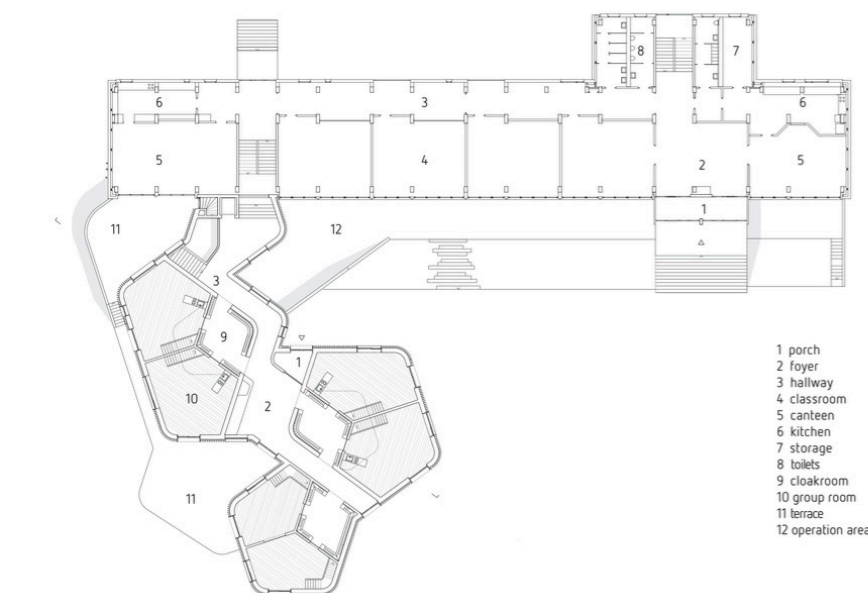


Yellow Train School
 Architect: Biome Environmental Solutions
 Year: 2013

This project incorporates the Steiner pedagogy into a space which has traditional classrooms by providing each classroom with 3 teaching spaces; a teacher led seating space, circled areas for group activity, and small nooks for individual learning. To reflect 'play' in the Steiner curriculum, indoor play spaces have been incorporated into the building including cave such as spaces, open air theatre and slides. (Yellow Train School / Biome Environmental Solutions, 2015).

Elementary & Middle School Berlin, Germany
 Architect: MONO Architekten
 Area : 785 m²
 Year : 2017

The unconventional classroom shapes in this extension project and use of natural and renewable materials both align with Steiner pedagogy philosophy and largely influenced my early design sketches for my project. The interior environment of the classrooms are healthy and fresh with the use of coloured clay plaster and timber floors. The structure is a timber frame with straw bale and cellulose used as insulators. The variety of roof levels and use of a green roof intrigued me as it appears as a constructed landscape that would be an enjoyable space to inhabit (After-School Care Centre Waldorf School / MONO Architekten, 2020).

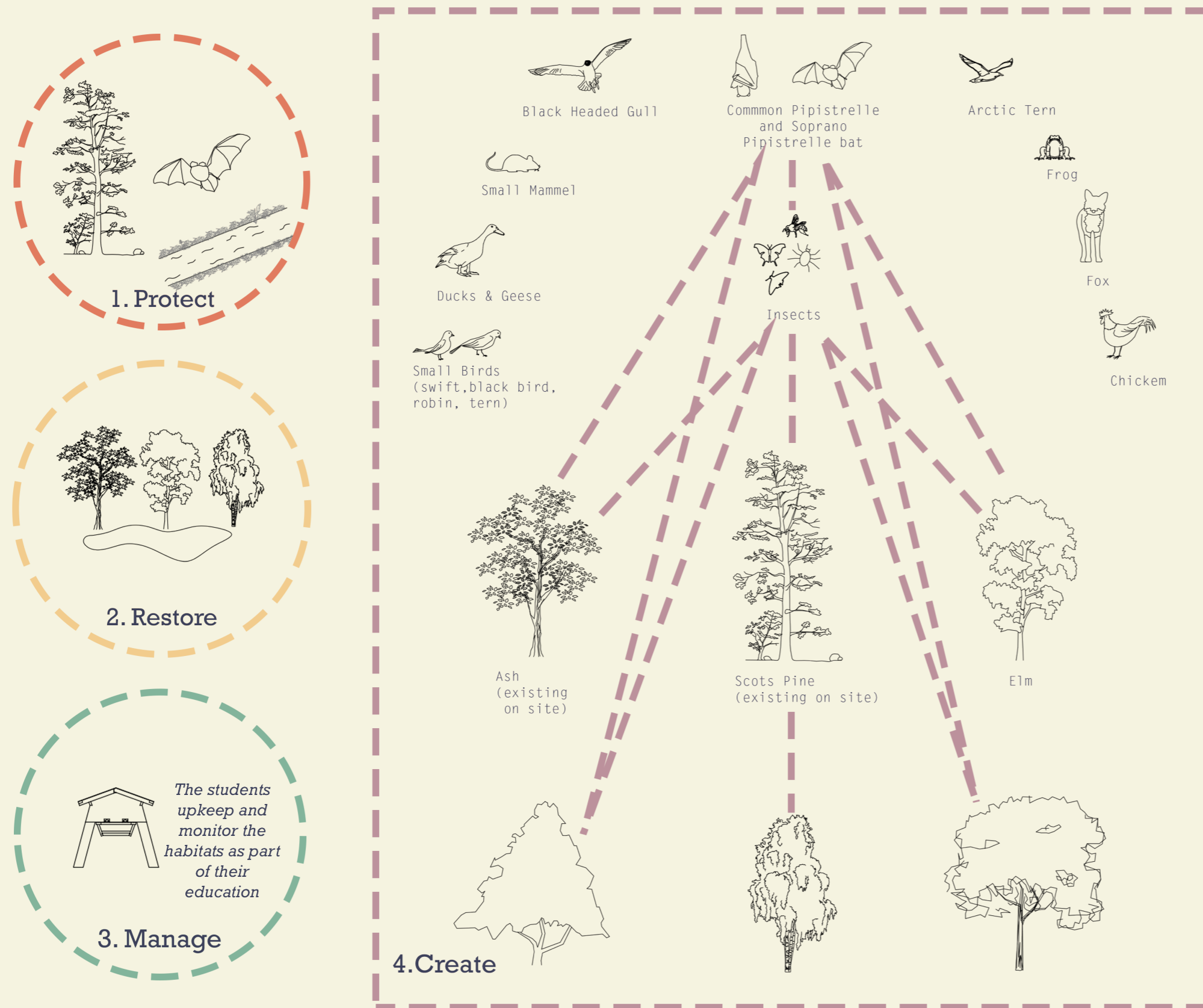


Top;
 (El Til-ler School / Eduard Balcells + Tigges Architekt + Ignasi Rius Architecture, 2021)
 Middle;
 (Yellow Train School / Biome Environmental Solutions, 2015).
 Bottom;
 (After-School Care Centre Waldorf School / MONO Architekten, 2020)

When approaching the site and its surrounding areas I looked at the current animal movement paths in and around the site such as the bats, birds, ground and water mammals (see page 25).

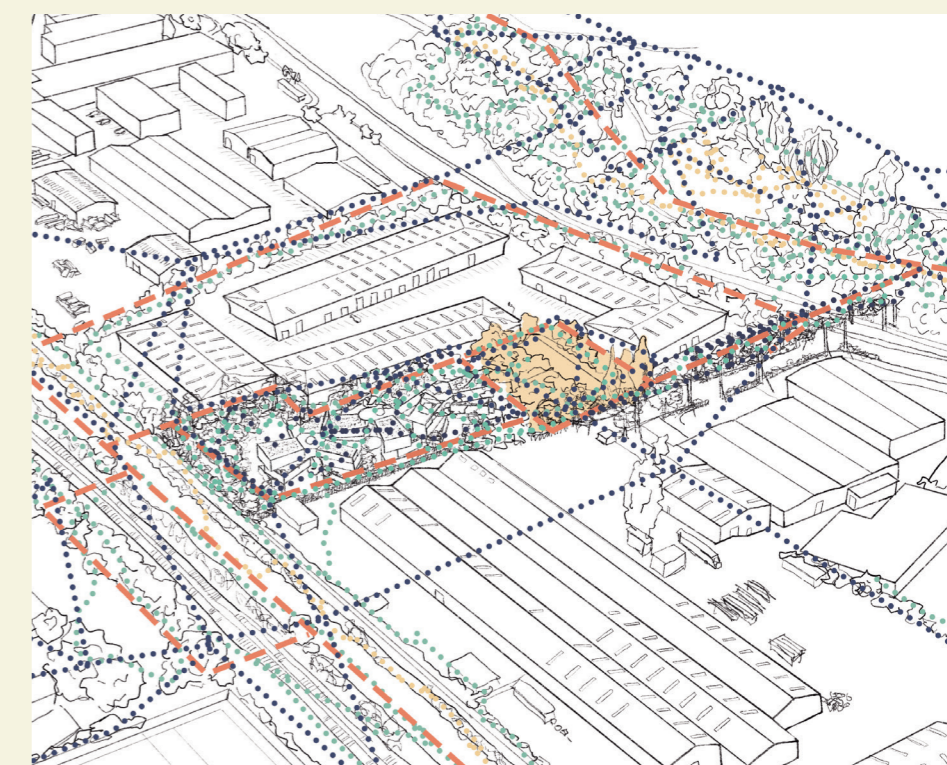
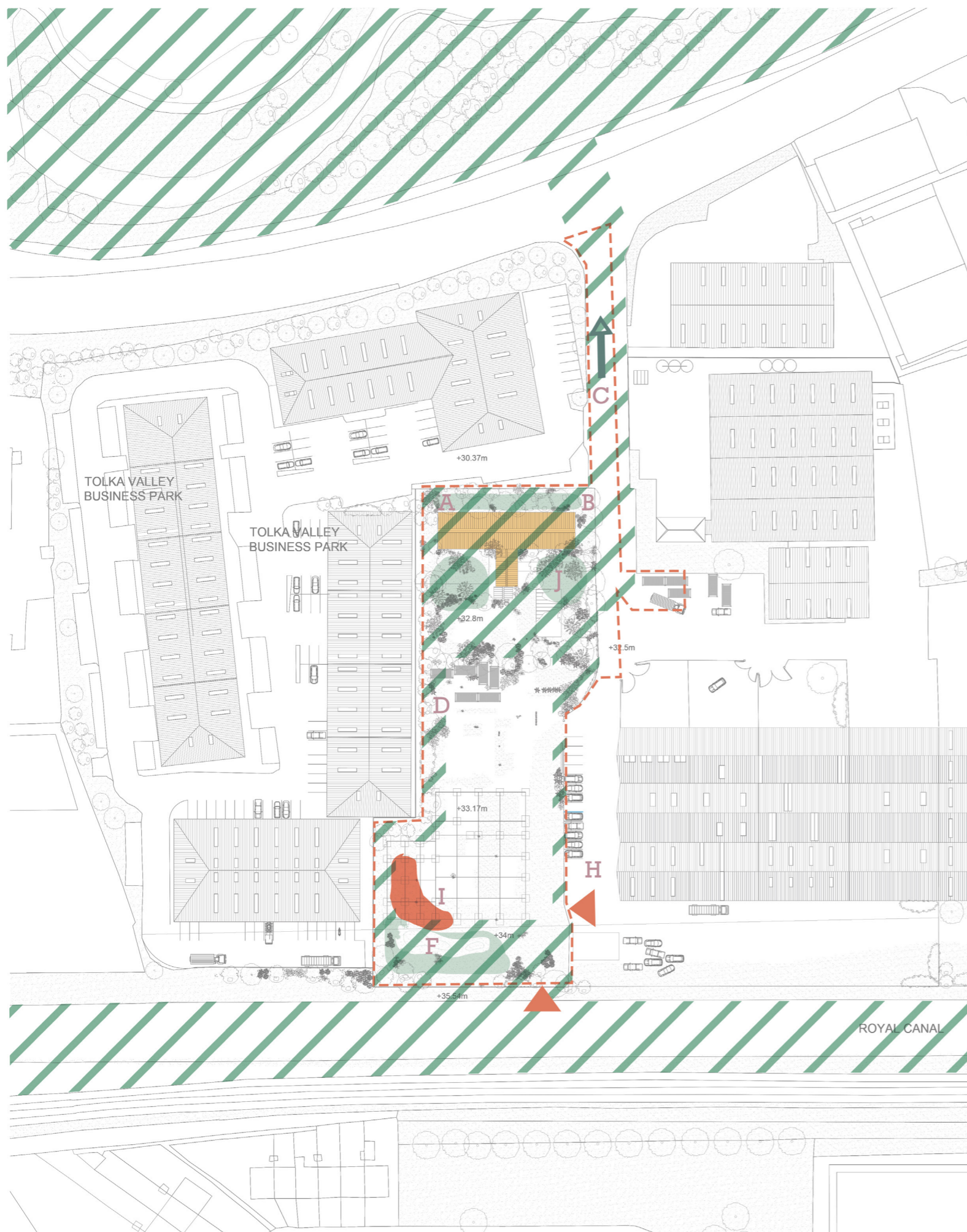
The biodiversity approach I have taken is based on the current European Environment Agency ecology recommendations and the mitigation hierarchy used in the UK to prevent the further loss of biodiversity (Howards, 2017). Strategy number 4 listed in the UK Mitigation Hierarchy is offset, instead I have replaced this with create. These are listed in order of priority beginning with;

1. **Protect:**
Protect the existing bat population by retaining the derelict building and existing trees in their originality.
2. **Restore:**
Improve the existing habitat for the bats by planting a variety of native plants such as Beech, Elm and birch trees which support pipstrelle and leisler bat populations. Restore linear dense upper and understory routes for bat navigation and foraging with an aim to attract more and develop this colony.
3. **Manage:**
The maintenance plan would involve the students who would upkeep and monitor the habitats as part of their education.
4. **Create:**
Alongside new planting and water features, to have an agenda to create a building that is permeable to animals to inhabit and allow space for them to occupy. Secondly to create an ecological connection between the Royal Canal and Tolka Valley park in through my site and using a lightweight green bridge connection over a shared pedestrian and car surface. This would hang and interweave between the edge of the site and the park to keep a continuous corridor. This is achieved by hanging baskets or canopies of lightweight climber and sedum vegetation connected via wires and ropes to large timber columns which are tied back to counterbalance. The baskets are connected via trellis rope and wire with climber plants stretching across from the baskets (see page 31).



The site strategy is as follows:

- A. Retain the existing building to support existing bat population.
- B. Retain the existing trees and vegetation where possible.
- C. Connect the canal way and Tolka Park for human and non-humans.
- D. Create linear dense upper and understory routes for bat navigation and foraging through a mixture of coniferous and deciduous vegetation.
- E. Outdoor circulation on all floors to allow animals to pass through the building.
- F. Create ponds to support a diverse range of species.
- G. Create 'play' and movement zones for school and public.
- H. Drop off point and accessibility parking.
- I. Apple orchard.
- J. Include non-human exclusive zones.



Top:
Proposed animal movement paths
Left:
Existing site plan & Site strategy
-All authors own

'Nature as an Educator, as an Escape, as an Asset'



It is important that this proposal has benefits for the Tolka Valley community. By choosing a site within the industrial estate it allows for an opportunity to open up a pedestrian and cycle route through. Currently, the industrial park is very impermeable and acts as a barrier between Cabra and Finglas. With development changes happening rapidly within the estate I saw an opportunity to take the road space which is part of my site and open it up into a shared surface which runs through my site to the canal, connecting the canal way to Tolka Valley park.

As I am proposing a new build, although it uses biobased and natural materials, its net gain vs carbon footprint must be considered carefully. With the proposal of facilities such as a cooking classroom, a woodworking studio, a library, an amphitheatre, a craft room, and an art room etc there is an opportunity for the wider community to use these facilities after school hours. After school activities and camps throughout the year can also take place here, and offer a different experience to those attending a more traditional urban school.

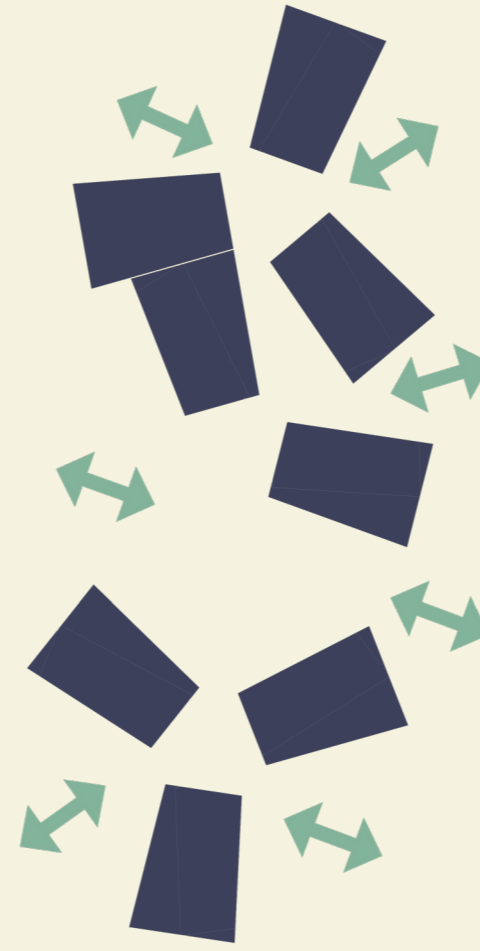


Top:
Proposed shared surface connection between Tolka Valley and the canal way
Bottom:
Community Strategy
-Authors own

1. Steiner Pedagogy Principles

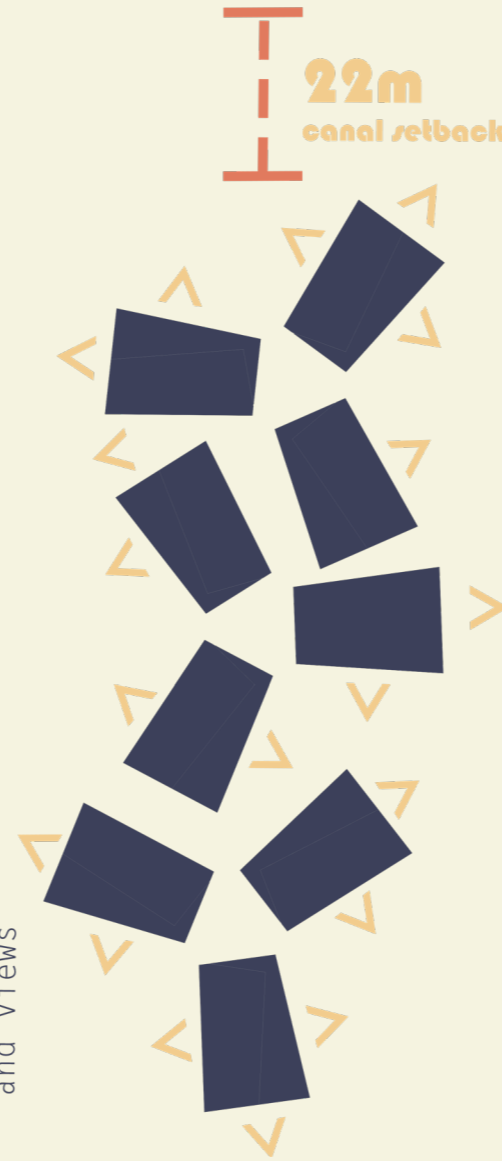


2. Non-human Access points

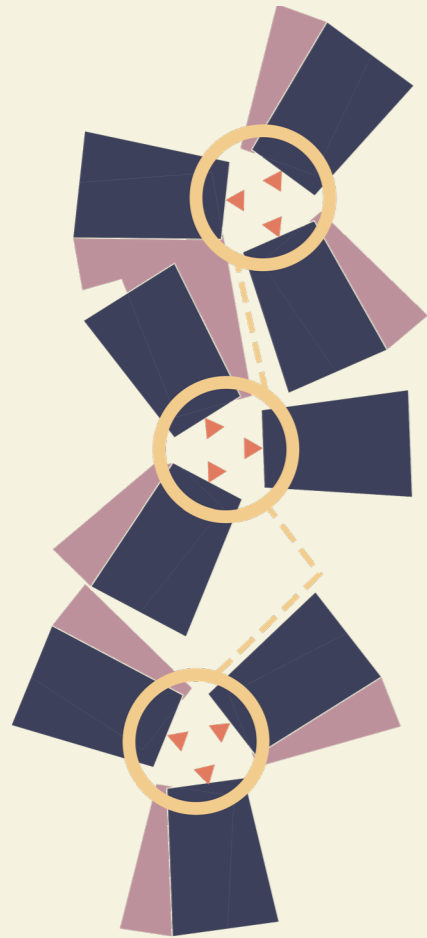


22m canal setback

4. Multi aspect facade for ventilation, light and views



3. Classroom Arrangement



1. To incorporate Steiner Principles into the design including activity, freedom in teaching, play, kingship to all living things and nature as an educator.
2. To have outdoor circulation routes and a fragmented plan to allow for animal access in and throughout the building, and more time spent outdoors for the users.
3. To have classrooms placed in a stacked unit arrangement. Each pod mainly consisting of 2 base classes, one subject specialty classroom and a private outdoor terrace teaching space per base classroom where planting can also be done alongside a third teaching space centrally where both classes can mix and gather.
4. To have each classroom have various forms of natural lighting, cross ventilation, and multi aspect views - whether that be looking out onto tree canopies or green roofs, giving the users the opportunity to observe and be aware of the nonhuman from their classroom.



The building has been arranged with an east to west orientation for optimal daylight. On the ground floor the majority of the communal spaces are located, these include; an outdoor amphitheatre, a library, administration and principle offices, a multifunctional and meeting room, a cookery classroom, a woodwork studio, a staff room and a sheltered outdoor hall. The youngest class, bridge, is also located on this floor as it is the class which will spend the most time outdoors. Entry to the south is within a closed external space where the reception, offices and library are located.

On the upper floors the remainder of the base classes and subject specialty classrooms are located with the eldest being on the top floor. Subject specialty rooms are located in the areas with the least favourable natural lighting conditions as the least amount of time per student group per day is spent in these spaces.

The building sits centrally on the site. This allows space on the northern end for the existing trees and shrubbery to be retained and provide a barrier from the new build to the existing derelict building with the bat roosting site. It is set back on the southern ends to allow the Royal Canal wildlife corridor to expand into the site. It also allows for a linear dense upper and understorey canopy to be created along the eastern and western boundaries. This is to permit safe bat and mammal foraging and navigation. This circular enclosure of the building with vegetation shields the views from the building of the industrial estate, as the atmospheric switches from a harsh concrete industrial landscape to a euphoria of nature.

Circulation:

There are two spiral staircases, one at the entrance and one in the centre and one lift in the building for vertical movement. The outdoor horizontal circulation is a timber structure that is decked and suspended from building to building to reflect a treehouse structure. Planters are located alongside these circulation routes to keep nonhuman inhabitants consistent throughout.

Accessibility:

Both access routes to the building are accessible, with accessible parking spaces located to the northeast of the site. An accessible WC is in each classroom. There is a lift for vertical circulation and any level change is supported by a ramp.

Bridge; "Children play outside, in natural vs. playground settings, in all weather and all seasons. Outside the classroom, children are encouraged to climb trees, play in gardens and creeks, and manipulate items like logs and mud. Inside the classroom, all natural materials are used for furnishings and toys, including wood, stone, pottery, cotton and silks"

Class 1 - 6; "Once students sense their own separation from the world, they study"..."nature, in an imaginative and observational way"..."While elementary (primary) students still play outdoors regularly, they shift now to also learning in and from nature with lessons about farming, gardening, animal studies, and earth science." (Waldorf School Of Philadelphia, 2022)



Left:
First Floor Plan
Right:
Second Floor Plan
-Authors own



PROGRAMME KEY

Ground Floor:

Principles Office	0.1
Reception	0.2
Administration office	0.3
Amphitheatre	0.4
Meeting room/multifunctional space	0.5
Store	0.6
Store	0.7
Library	0.8
Hall	0.9
Cooking classroom	0.10
Staff room	0.11
Bridge base class	0.12
Woodwork/metalwork studio	0.13
Bridge base class	0.14
Plant & Bin store	0.15

First Floor:

Class 3 base classroom	1.1
Class 3 base classroom	1.2
Support/sensory rooms	1.3
Class 2 base classroom	1.4
Class 2 base classroom	1.5
Art room	1.6
Class 1 base classroom	1.7
Craft room	1.8
Class 1 base classroom	1.9

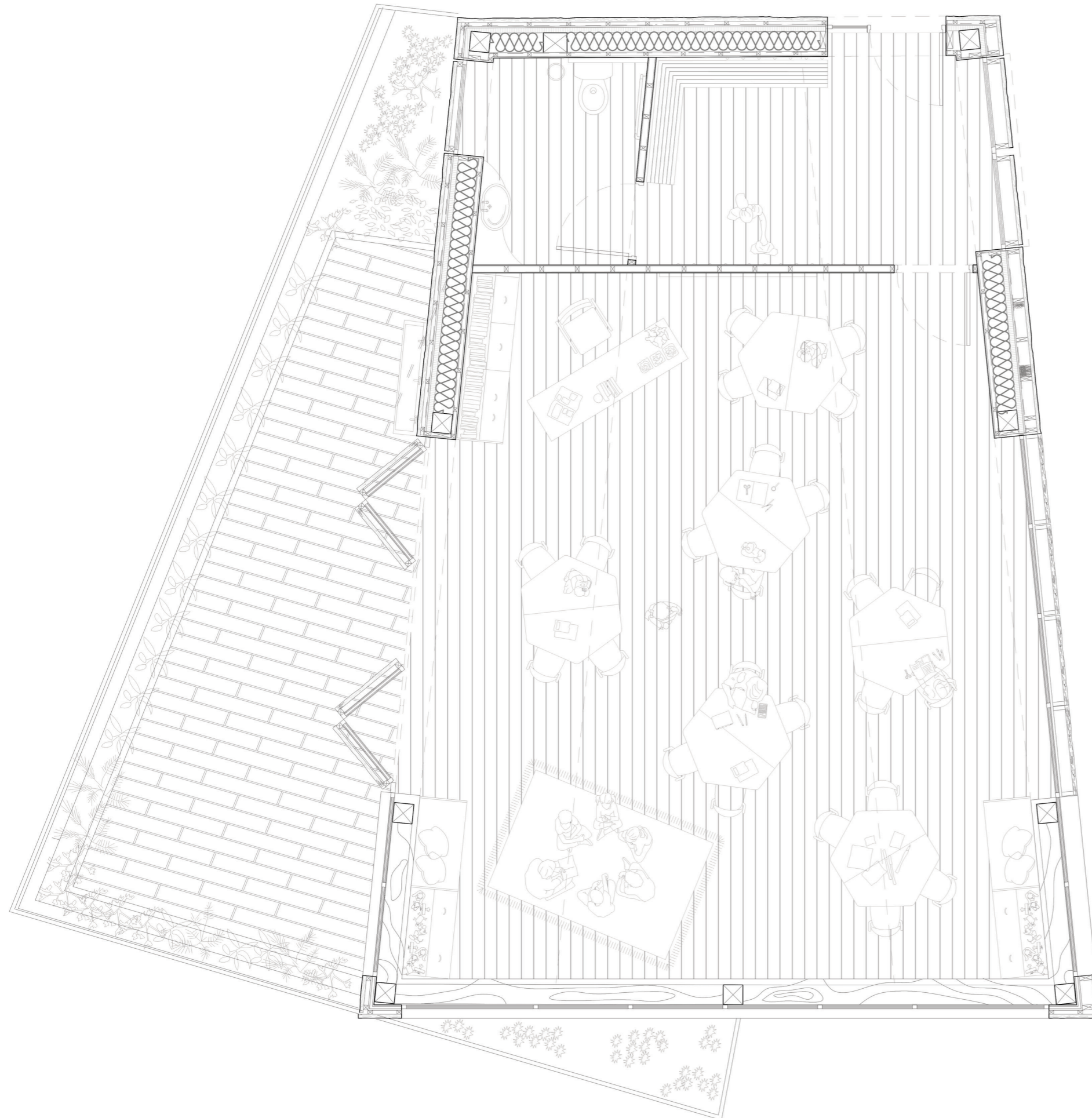
Second Floor:

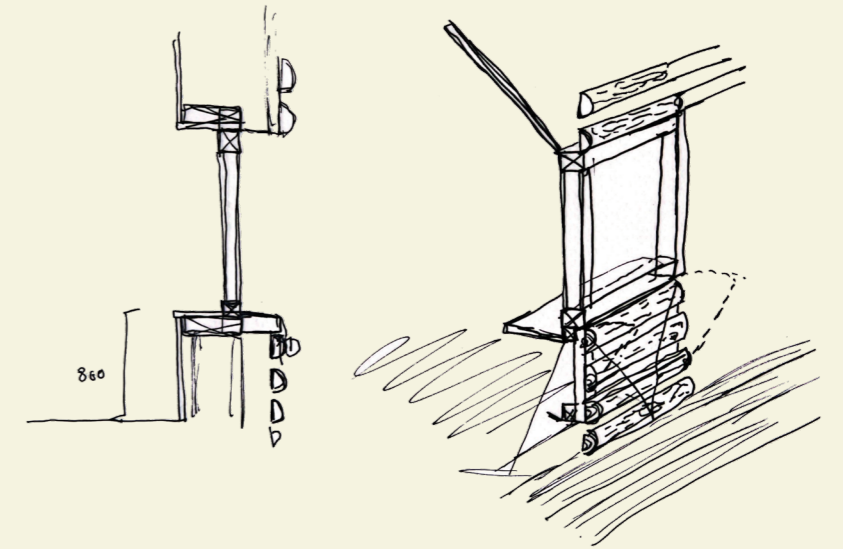
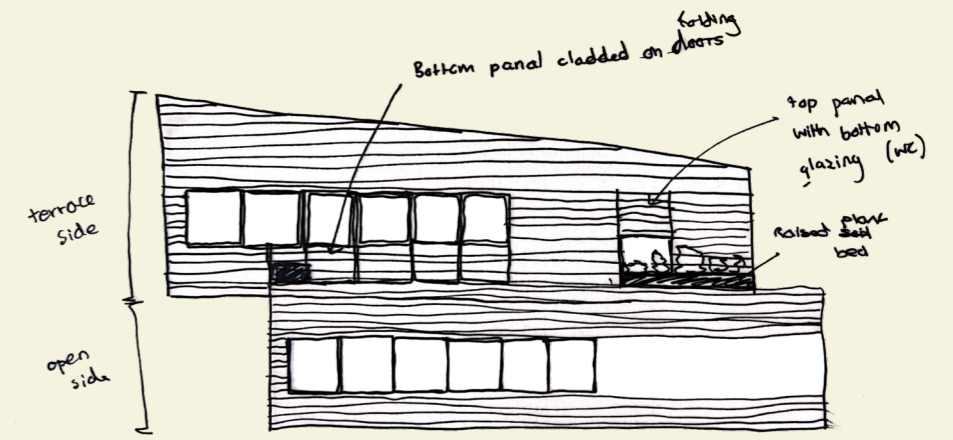
Class 6 base classroom	2.1
Greenhouse	2.2
Class 6 base class	2.3
Beehives	2.4
Class 5 base classroom	2.5
Class 5 base classroom	2.6
Chicken coop	2.7
Class 4 base classroom	2.8
Class 4 base classroom	2.9

The building has two clients, the human child users and the non-human residents existing on site. It is important in Steiner philosophy that the architecture of their schools adhere to it (Migliani, 2020) as Rudolf Steiner believed our buildings and environment can strongly affect and influence us. Steiner held a belief that that the best design is derived not only from structural and physical functions but should be “living forms” that connect with our “inner functions” such as emotions and mental wellbeing. A more organic architecture aligns with the Steiner pedagogy, which is an organically connected, mobile, and flexible thought-process (Adams).

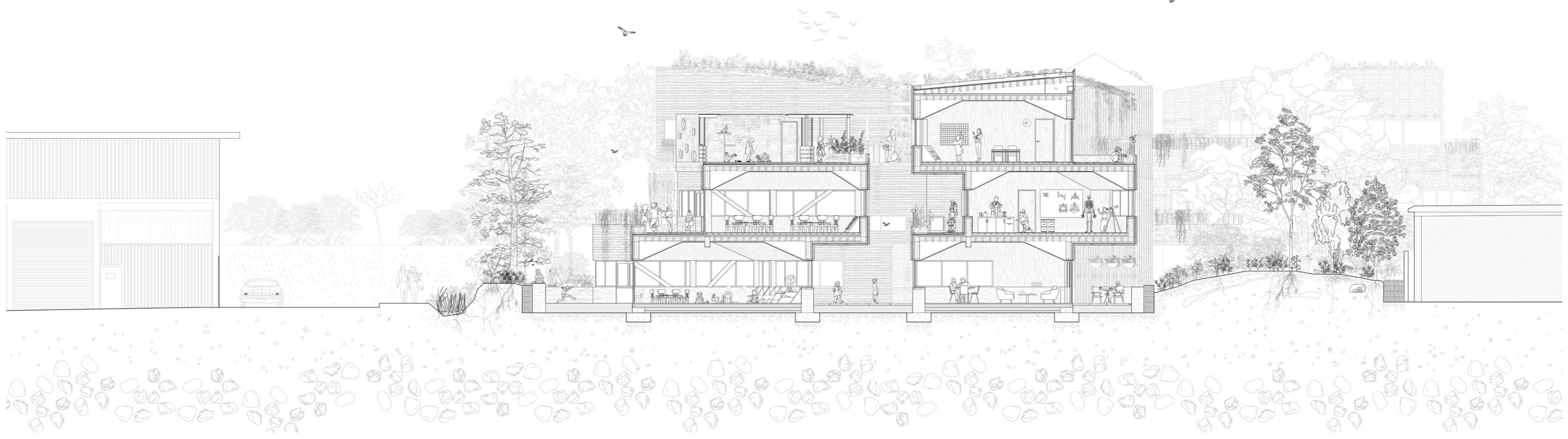
From this understanding I developed a trapezoidal classroom unit plans which are connected through loose, organic outdoor circulation spaces. This plan is stacked and rotated on the first floor level to allow for outdoor terraces on all levels. These terraces allow for flexibility in teaching and encourage non-human inhabitation throughout the building by providing green roofs and planting beds on each level. These terraces also keep the children close to nature with views onto understory plant life to tree canopies on all floors.

The ceilings also reflect the non-conventional trapezoidal plan shape and, in section, creates a trapezoidal volume. Each base classroom unit consists of a porch, an assessable toilet and a large classroom space which opens onto an outdoor terrace which has planting beds. A closed terrace with a green roof is provided for non-human life where there is a special/subject classroom. This classroom shape also improves the acoustics of the space as it diffuses reflections and creates a more live sound (Sound Assured, 2022). Fixed windows sit at 800mm high in the main classroom space with openable timber panels below in some instances. In the porch and WC fixed windows sit at floor level and go up to 800mm with openable timber panels above to offer a different exterior perspective view.





Left:
Southern elevation
right:
Process sketches
-All authors own

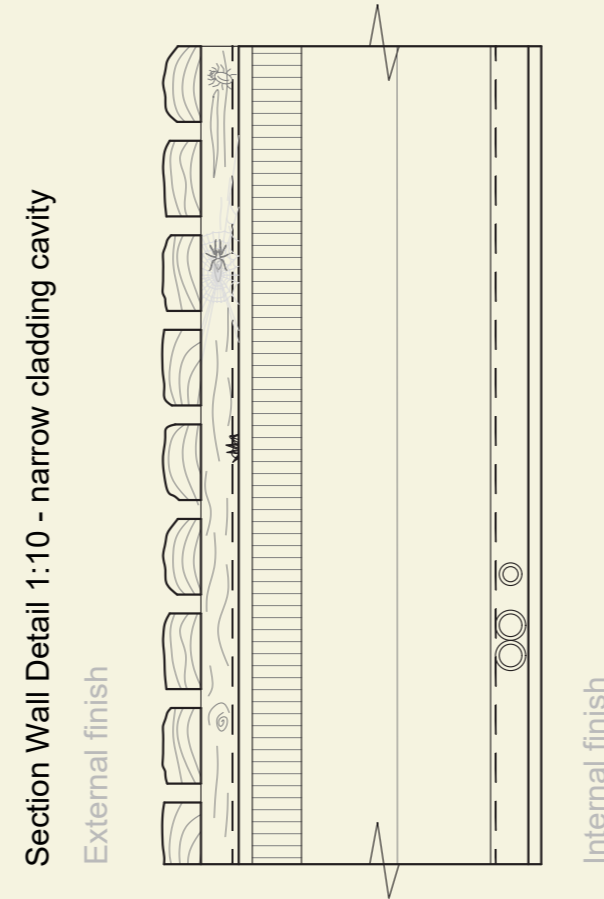
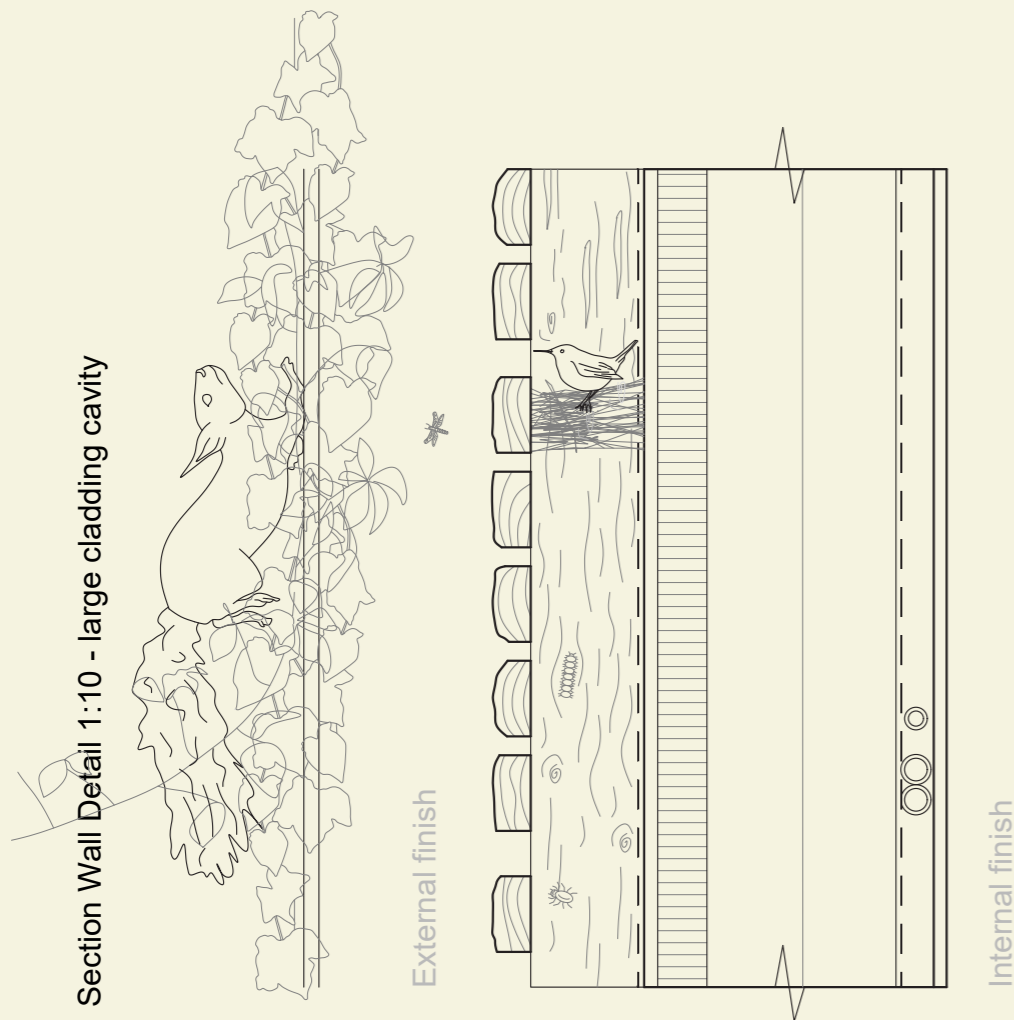


Top:
Section A
Bottom:
Section B
-Authors own

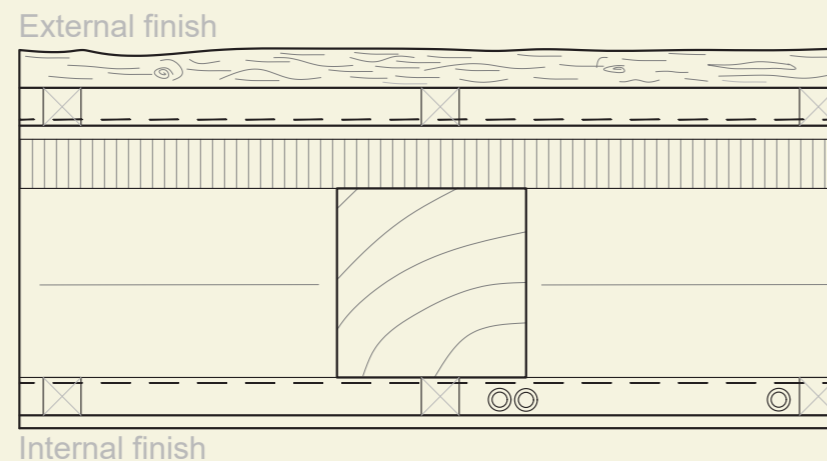
The intention is for the architecture and design to engage with multiple senses and to be a sensual experience for those inhabiting it. Backed up by Steiner philosophy, the building is largely made from biobased and natural materials. Timber forms the structure, the floors, the windows and doors, the internal linings, and the exterior cladding. Cellulose is used as the insulator and rammed earth as the grounding.

The structure of the building is a glulam frame which sits on a rammed earth base. This base sits on a rammed concrete strip foundation and extends 800mm into the ground floor level. This primary structure is braced to resist lateral forces and sustain the cantilevers. This frame is visible within the classrooms and sits in front of the glazing (see page 43 & 45). The intention is that the children visibly see how nature can become shelter for humankind.

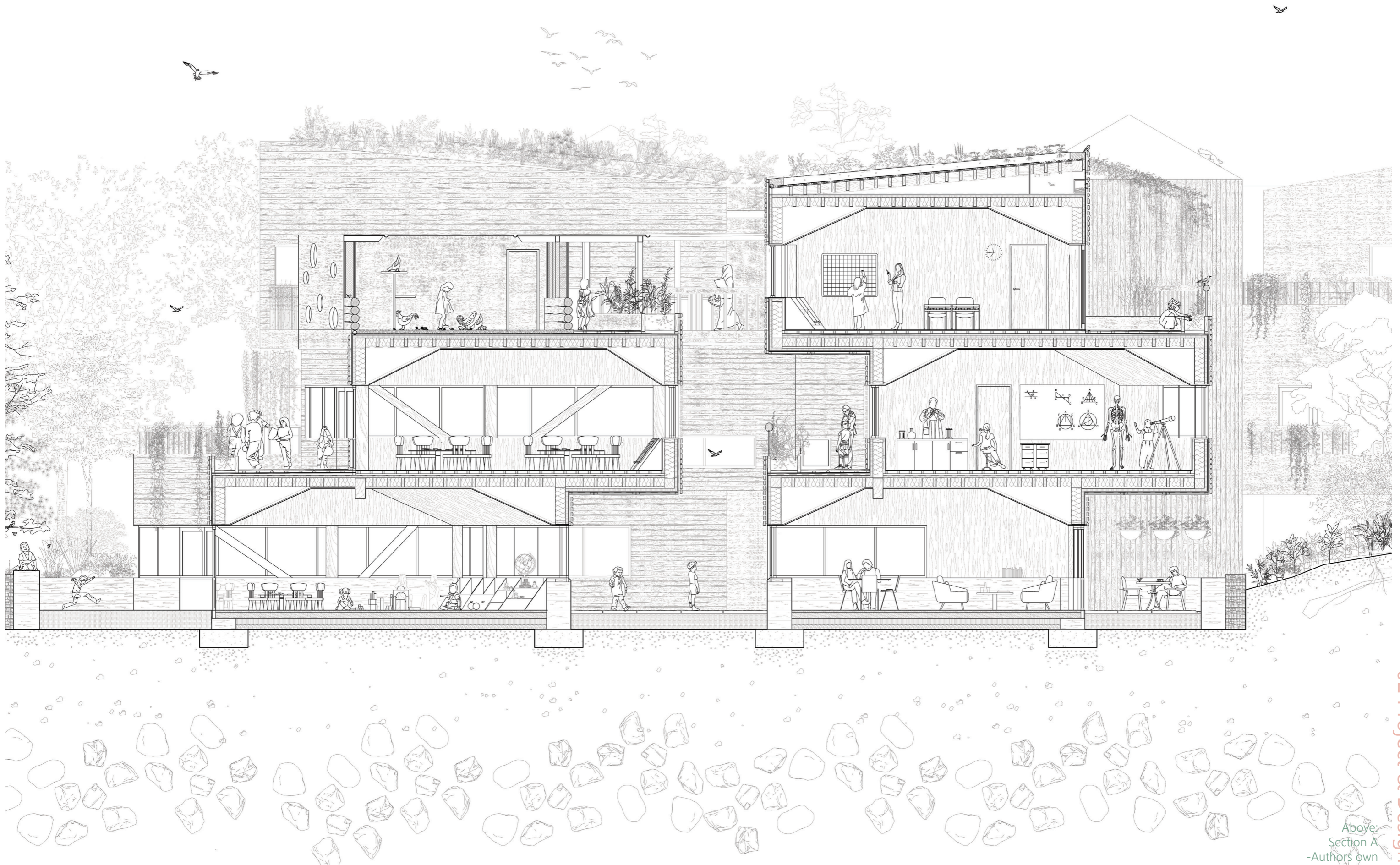
The process of refining the exterior skin and character has had its challenges. I have explored versions at the beginning where the exterior skin is a thick layer which is accessible to the non-humans, consisting of ideas around insect hotels and stacked gabions allowing ruderal growth, which stemmed from previous research and design in semester one. These ideas then formed into a thinner more traditional cladding finish of vertical timber boards on the ground and first floor and sleek cork finish on the first floor, with climber plants more restricted to vertical wiring and timber posts amongst the terracing and exterior circulation. For the final version I re-visited the original idea and explored another version of a lighter external skin which insects, birds, mammals or plants, may inhabit. This results in timber cut-offs in their originality, spaced apart between batons giving a finish that is more suited to its surroundings and one that truly becomes part of this new landscape. In contrast, the interior is much more minimal finished in timber boarding, presenting a cozy and calm feeling. Services run behind the timber finish, and elements of structural beams extend through the ceilings at times.



Plan Wall Detail 1/10



- Wall Build up (inside to outside);
- Timber Board Finish (18mm)
- Service Cavity (50mm)
- Vapour Barrier
- Cellulose Insulation between structure (250mm)
- Rigid Cellulose Insulation (65mm)
- Plywood (18mm)
- DPC
- Root Barrier
- Timber Battons (50mm x 50mm - 50mm x 150mm)
- Off-Cut Horizontal Timber Cladding Battons (50mm- varies)



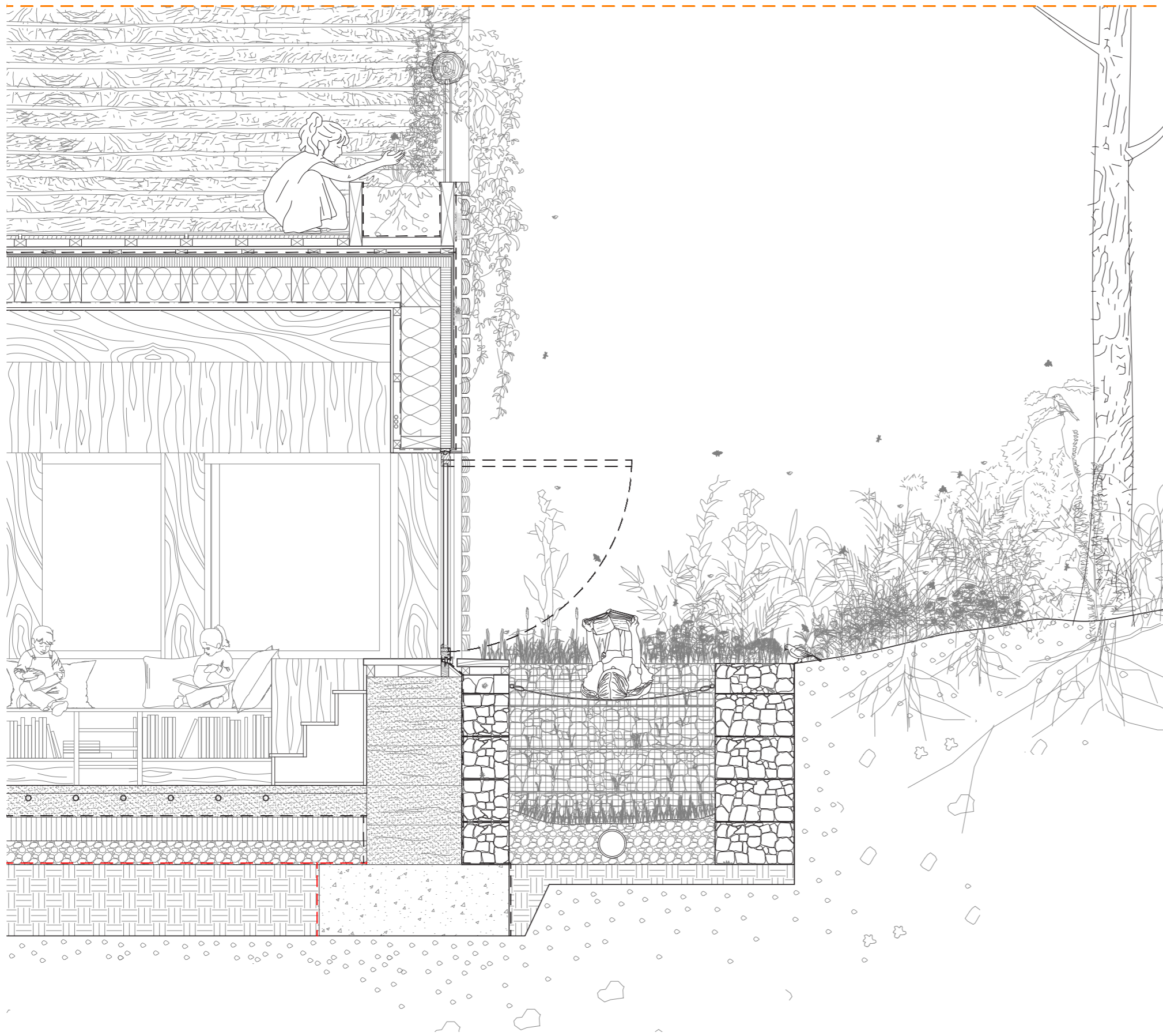


The roof is designed so that bats and birds can occupy the attic space. Over time the existing bat colony may decide to relocate to this new build which will allow the existing building to be repurposed for human or non-human needs.

The roofs over the outdoor circulation are lightweight and made from recycled corrugated steel cladding sheets. They have large deep gutters which are designed to release water slowly to attract birds and other creatures to bathe. The corrugated sheeting allows rainfall to be heard from below, reinforcing the delicate relationship between the human user and nature.

- Semi-Extensive Roof Build up;
- Soil (200mm)
- Filter Fabric
- Water Collection System (35mm)
- Roof Barrier
- DPC
- Plywood (18mm)
- Glulam Structure (250mm)

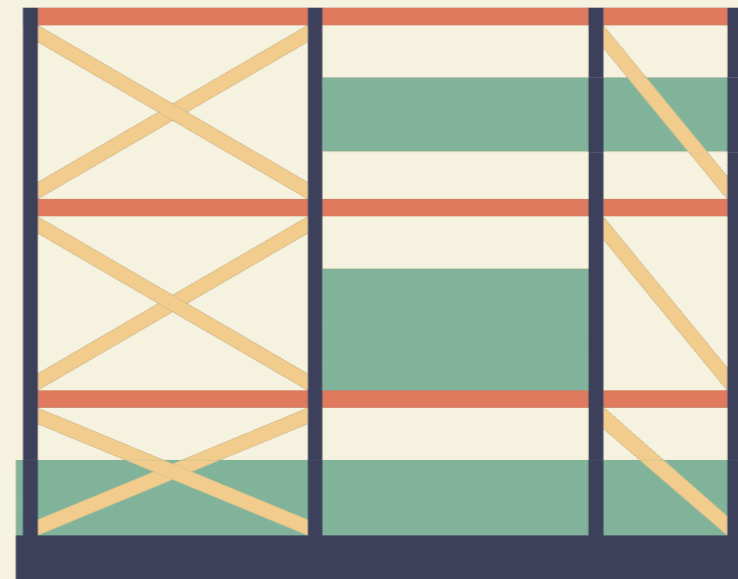
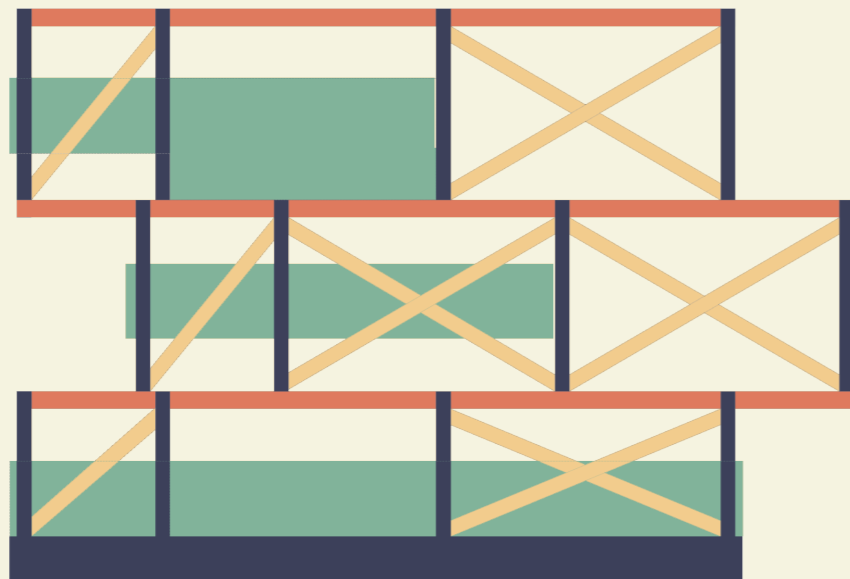
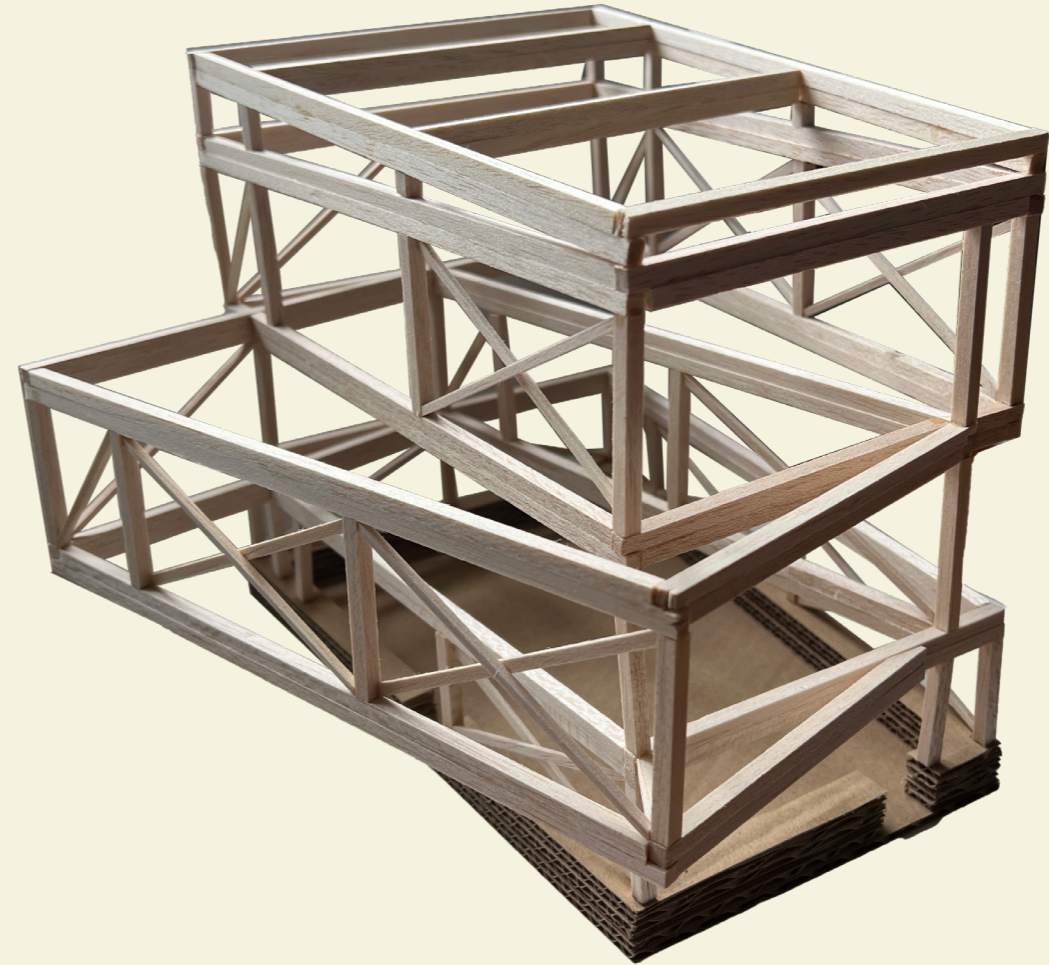
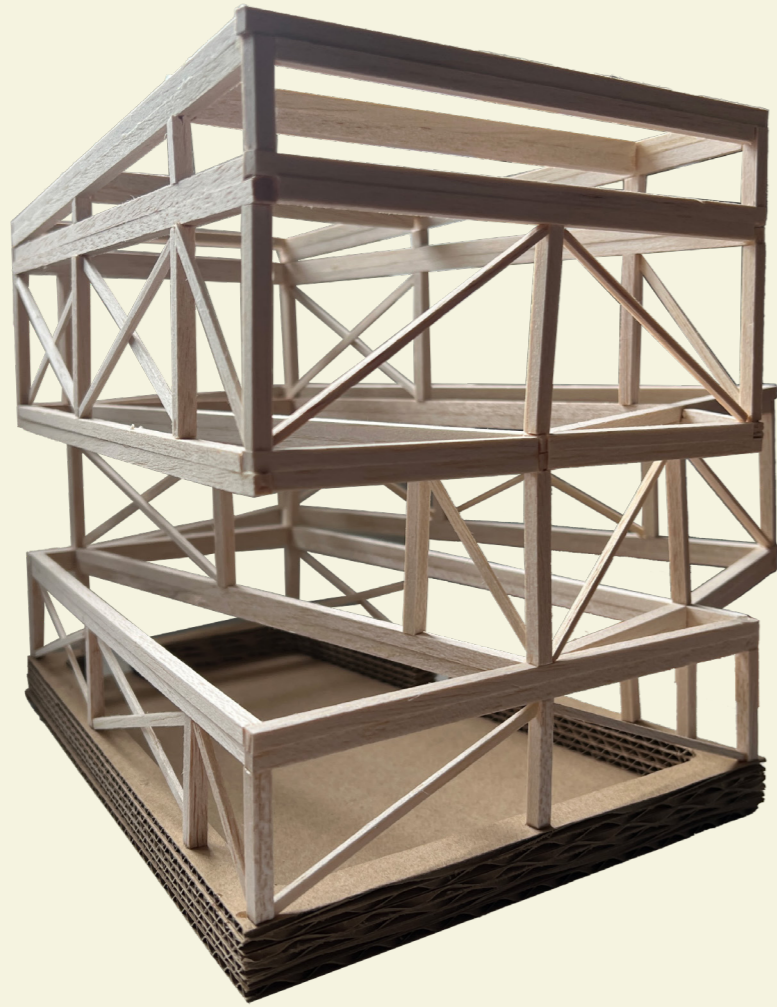
Above:
Roof detail section
-Authors own



The ground floor is sunken into the landscape which is reflected by the materiality. On the ground floor rammed earth walls extend 800mm. These walls also extend around the outdoor circulation blending the boundary between landscape and structure. They are protected from moisture by gabion walls and DPC. These walls are made up from the crushed concrete that was existing on site, they also act as insect hotels. This is finished by earthen floors on this level. Above this sits a glulam frame structure communicating a lighter structure as it sits above the landscape.

Interspecies relationships are also encouraged through the architectural details. On the ground floor, in both bridge classrooms and the library there are windows which are top hung and open outwards given direct access onto a section of landscaping, bringing the landscaping into the structure. Floor Hammocks are incorporated at each pod, and elsewhere, where children can lie out, read, nap, explore the sky and play (see page 44).

- Terrace Roof Build up (outside to inside);**
 - Timber Decking Boards (32mm)
 - Timber Battens (50mm x 75mm)
 - Fibreglass (20mm)
 - DPC
 - Plywood (18mm)
 - Rigid Cellulose Insulation (65mm)
 - Timber Joist with Cellulose Insulation (220mm)
 - Service Cavity (varies)
 - Timber Veiling Boards (18mm)
- Foundation Build up (inside to outside);**
 - Earthen Floor Finish (50mm)
 - Earthen Floor with underfloor heating pipes (150mm)
 - DPC
 - Rigid Insulation (150mm)
 - Root Barrier
 - Radon Barrier
 - Hardcore



Top:
Handmade structural model made at 1:50
Bottom:
Structural diagrams
-All authors own

WATER AND ENERGY STRATEGY

The main environmental objective of the project is to tackle the biodiversity crisis, due to the large amount of vegetation proposed on site and within the building a sustainable water strategy was deemed essential.

A total area of 600m² of the roof space is being utilised as a semi extensive green roof.

Water:

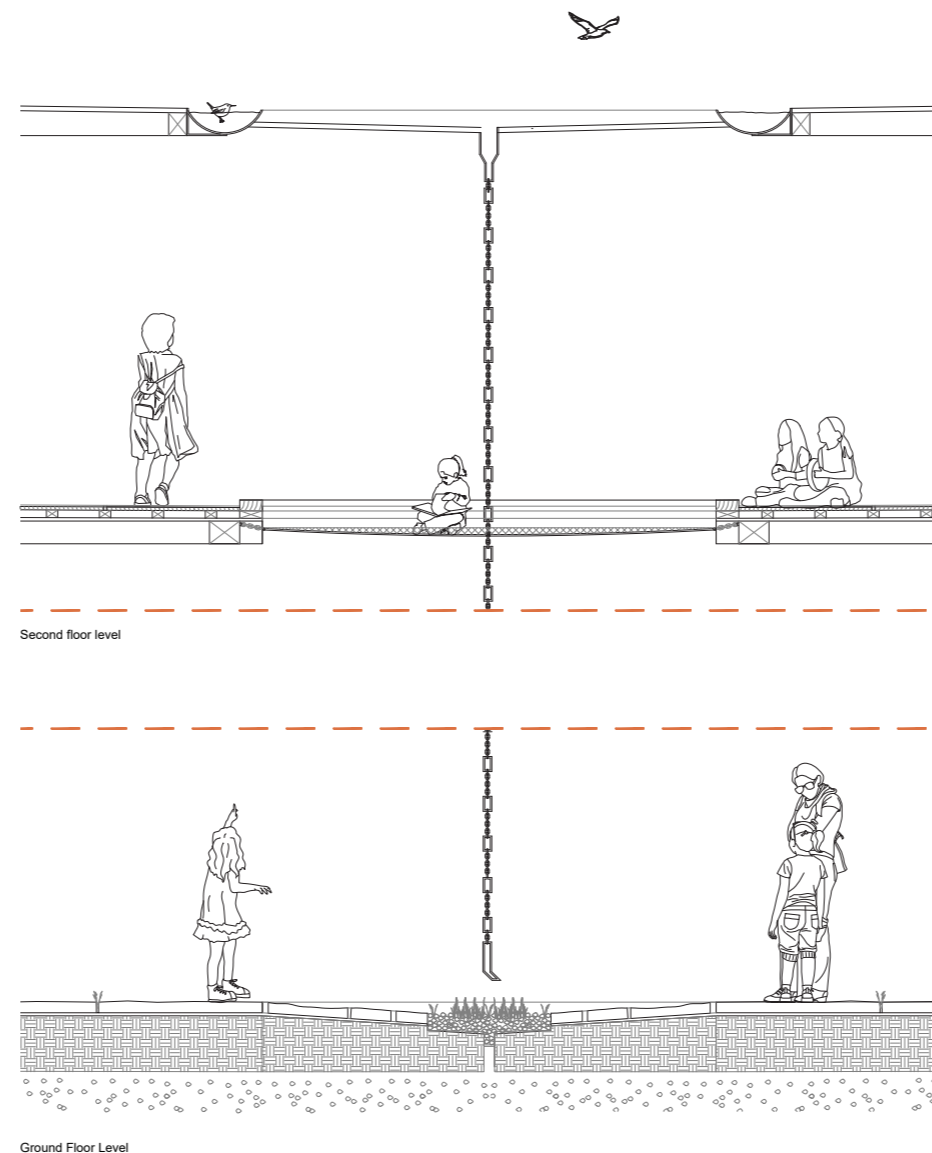
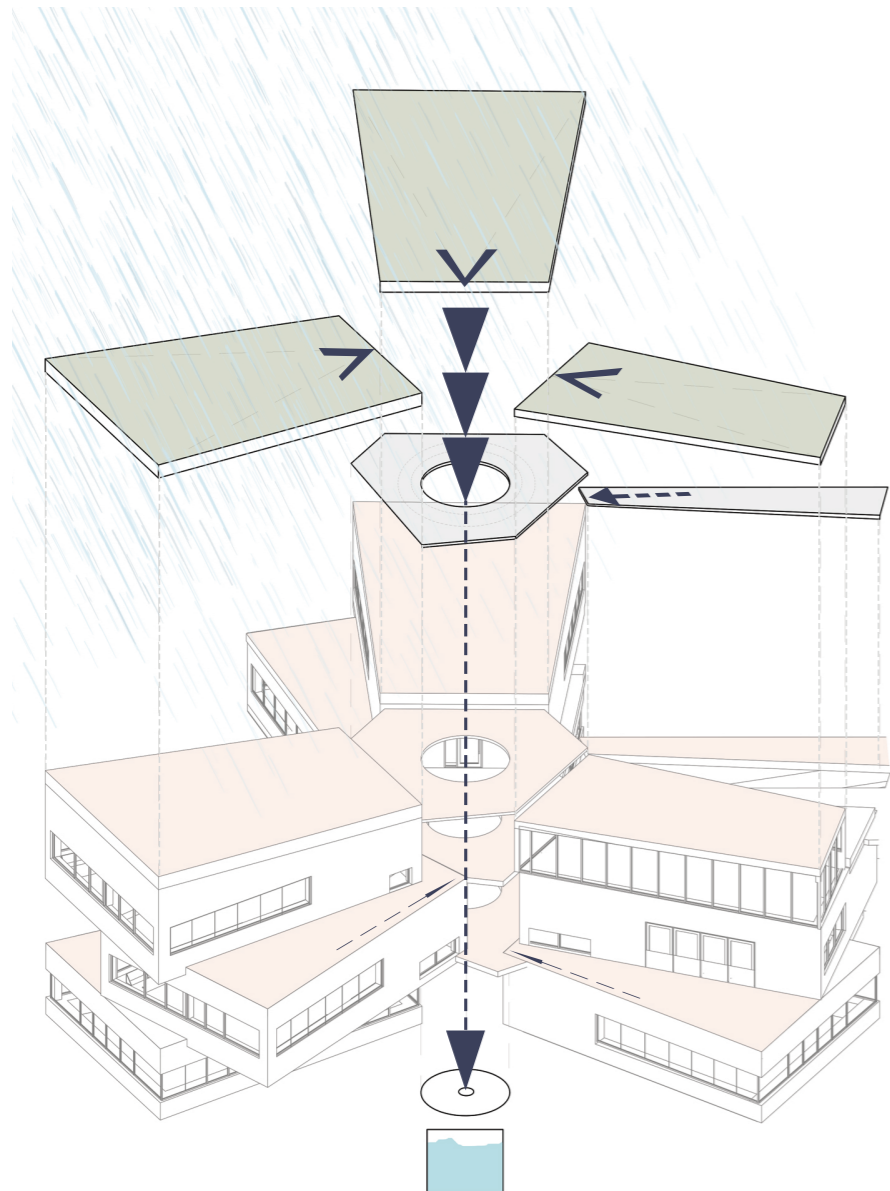
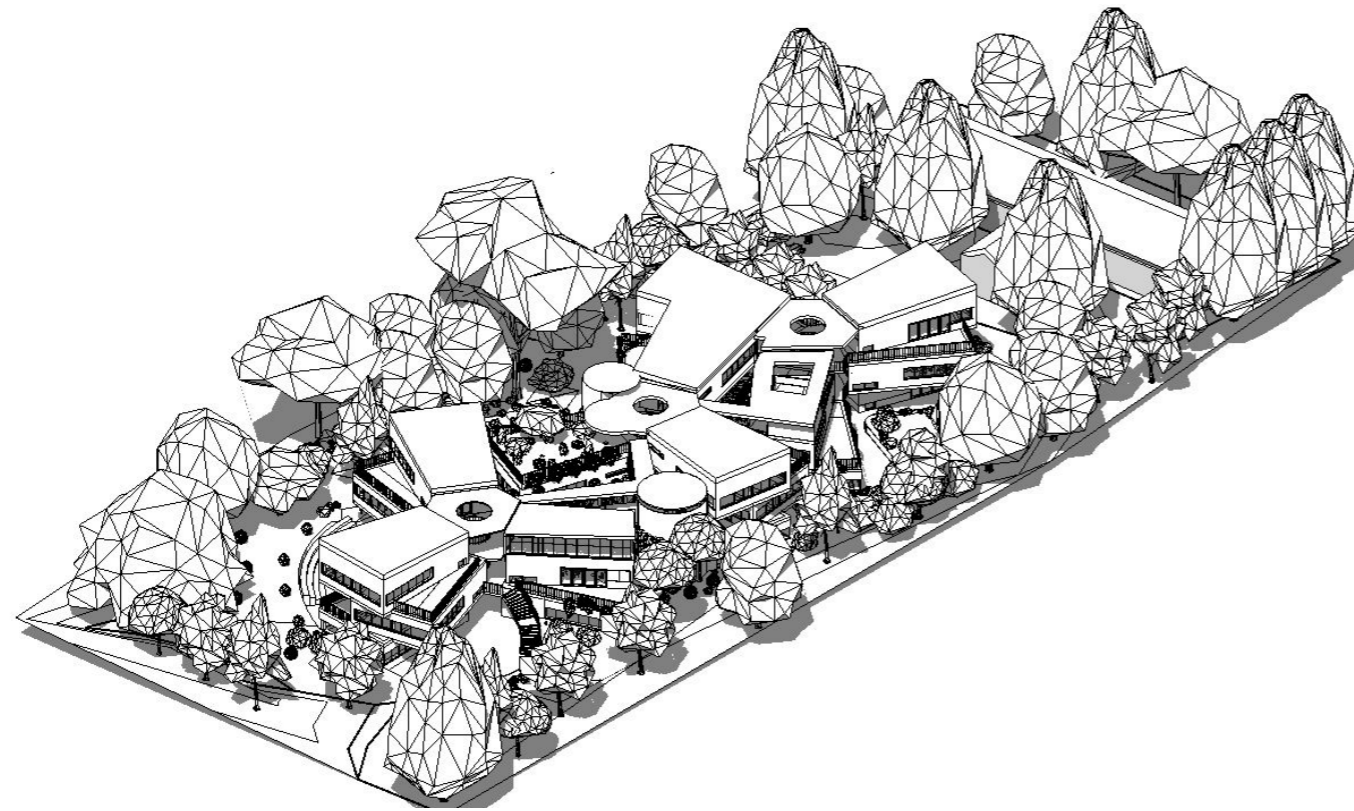
Excess water runoff from the green roofs, and water run off from the roofs over the outdoor circulation is directed towards the central point at each pod unit. This water is then drained downward through the open roofs/floors at each level and down into a storage tank where it will be filtered to a level where it can be used as brown water in the building and as irrigation for the planting. This drainage system is exposed to the users where the children can watch the water being drained and collected. Due to research and design carried out in semester one on naturally filtered water collection systems, specifically reed beds, I realised that due to the lack of space on the site that this wouldn't be feasible, therefore the collected water would be filtered underground directly from the storage tanks via a UV filter.

Roof catchment Capacity (Annual rainfall Dublin x Roof area m²) = 269,600L

Swales and water retention ponds are located throughout the site to deal with flash flooding and canal overflow.

Energy:

There is approximately 180m² provided in solar panels on the roofs above the outdoor circulation. 2 axis solar trackers are located on the cone roofs above the central staircase and lift.



Top: 3D view of building
 Left: Axonometric of a pod arrangement showing water strategy
 Right: Section through pod centre showing water strategy
 -Authors own



Above;
Interior classroom perspective first floor
-Authors own



Above;
Green bridge and sharded surface atmospheric
-Authors own



Above;
Exterior building atmospheric, first floor nodal point
-Authors own



Above;
Exterior building atmospheric, southern elevation from canal
-Authors own

CONCLUSION

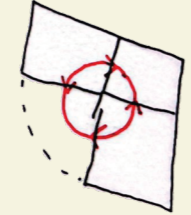
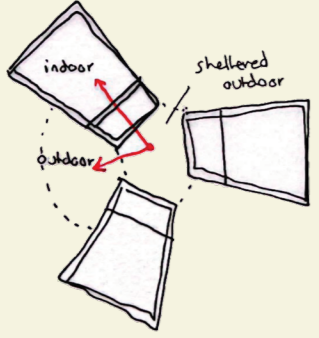
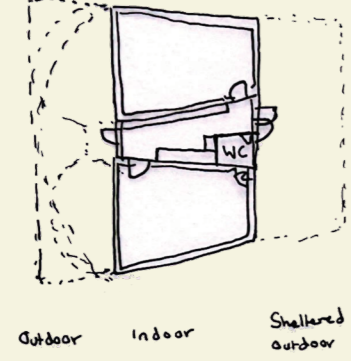
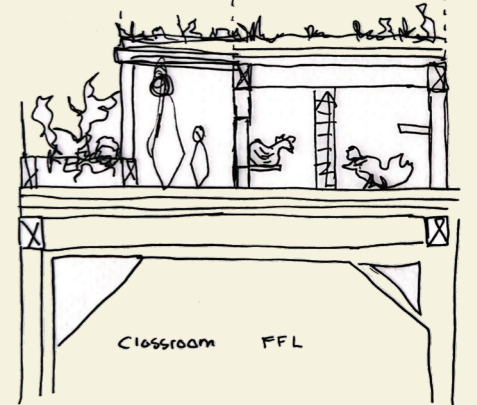
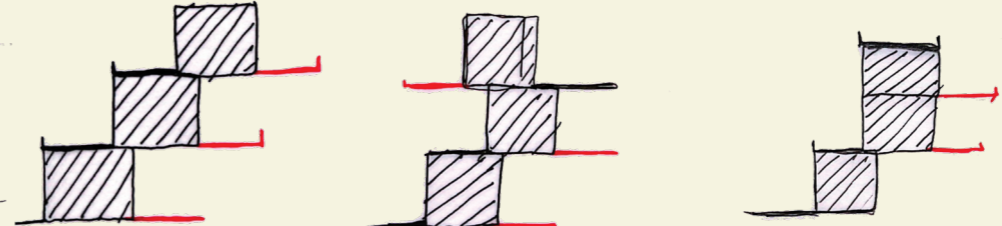
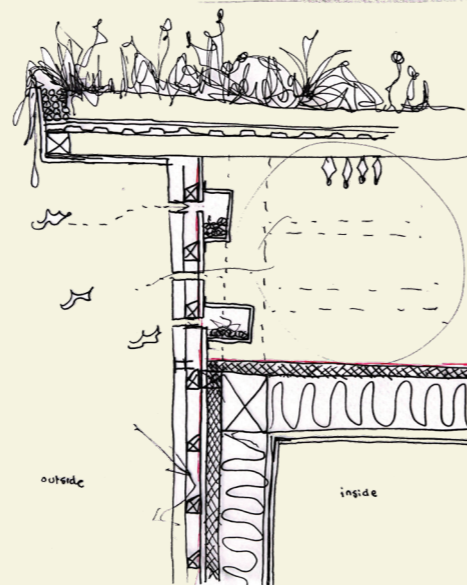
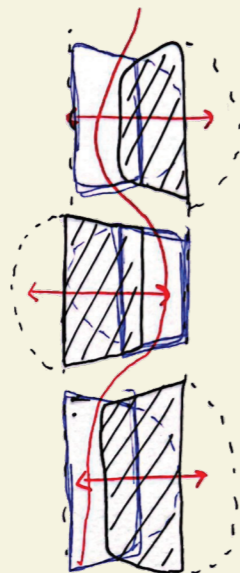
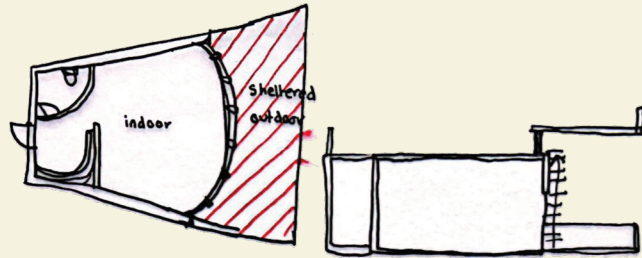
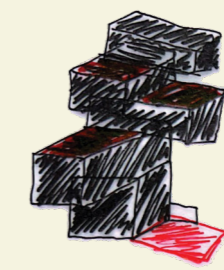
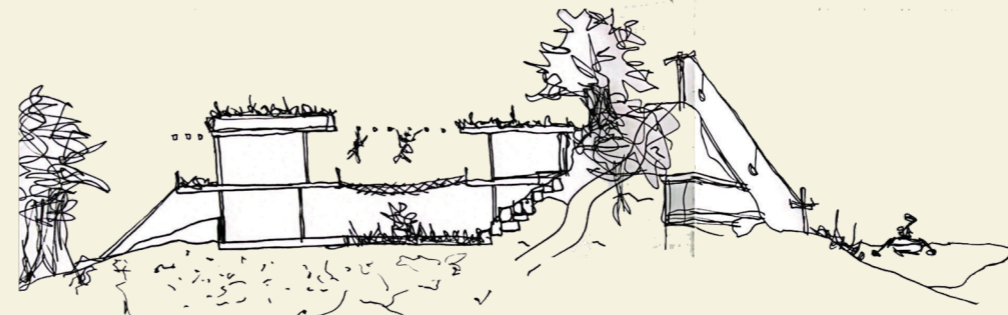
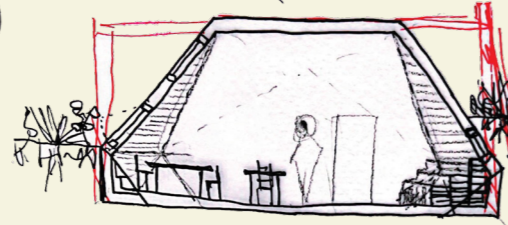
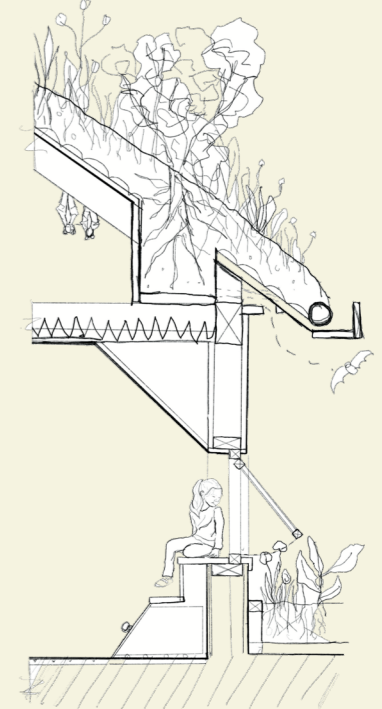
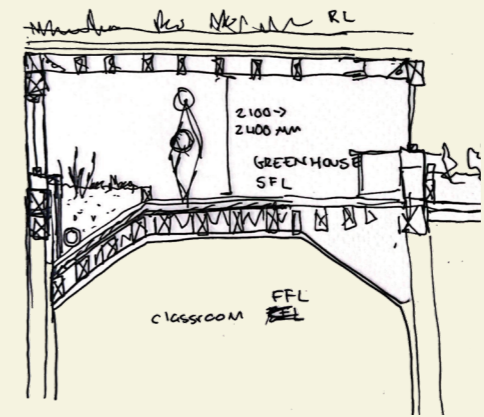
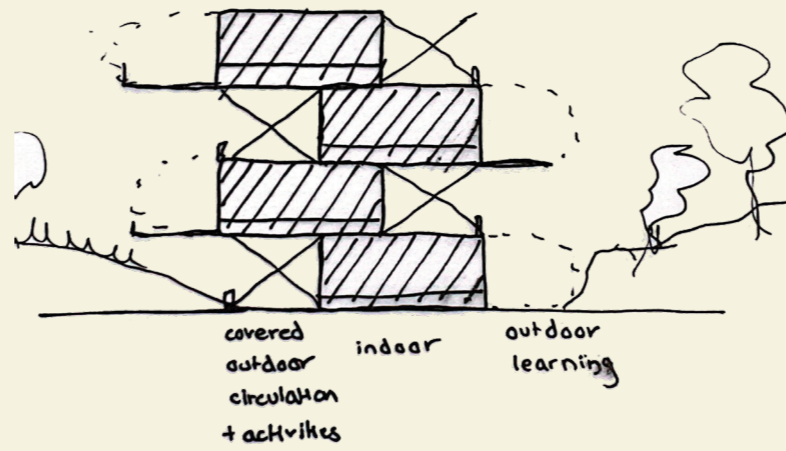
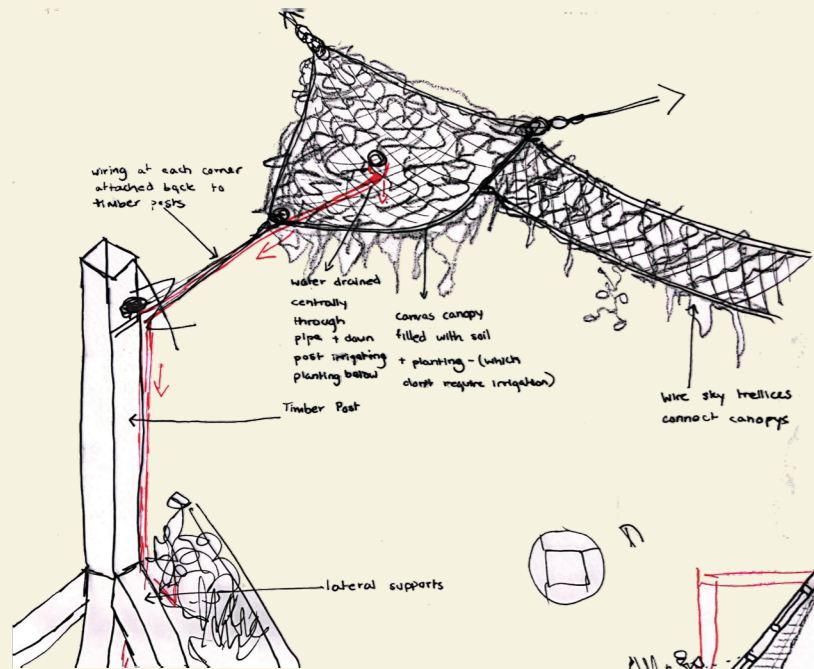
“We shouldn’t forget what we are here to do in the first place as architects and landscape architects. It’s to improve the quality of life for everyone and not at the expense of the quality of life for other people or other life forms”

-Bjarke Ingels, in an interview with Jared Green (Green, 2011).

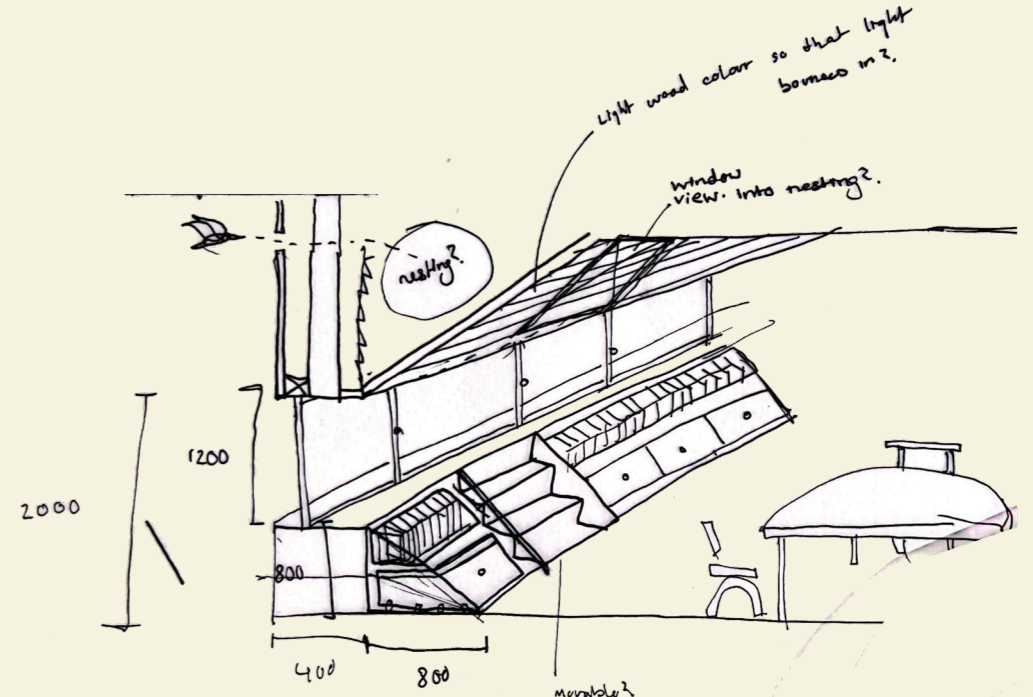
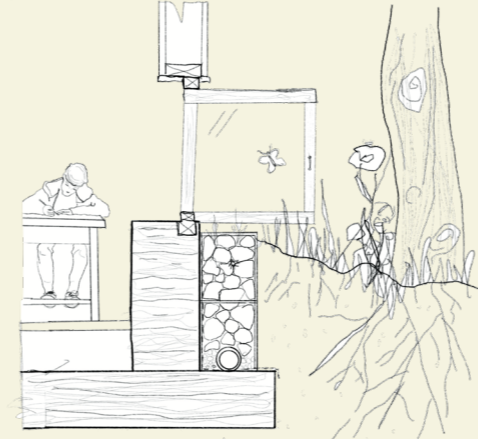
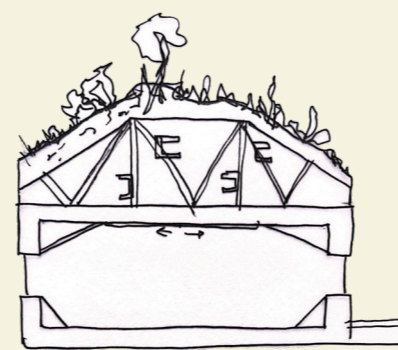
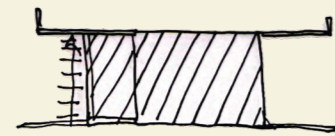
The evidence presented in the research paper and my own architectural exploration suggests that designing sustainably with all forms of life in mind, not just humans, is possible and can create spaces that increase quality of life and human enjoyment, providing an answer to the initial research question posed: ‘Can architecture be used as a vessel to provide hedonism for humans and refuge for non-humans while addressing increased flooding and loss of biodiversity in Tolka Valley?’

My Architectural project was an exploration of non-human centric design with an ecological agenda of integrating nature seamlessly into the design for the benefits of human and non-human life. Removing manmade boundaries which separate us from the other and re-establishing our delicate relationship can be of reciprocal benefit and result in a space where all forms of life can thrive.

Environmentally sustainable buildings and projects cannot sustain themselves in the long run if people don’t enjoy being in them, occupying them or experiencing them. The future of our cities needs to be a pleasurable experience for people, however it is essential to humanity that we not only create enjoyable spaces for people to occupy, work, play and reside in, we must also accommodate for other living forms, as our life is dependent on them, just as they are dependent on our voices for their rights.



stacked ecosystems



Above;
Select process sketches
-Authors own

REFERENCES & BIBLIOGRAPHY

- o Andrews, M. (1999) "Landscape into Land," in *Landscape and Western Art*. United States: Oxford University Press, pp. 201–223. Available at: <https://designinvestigations.at/projects/interspecies-play/>
- o Adams, D. (no date) 'Organic Functionalism: An Important Principle of the Visual Arts in Waldorf School Crafts and Architecture'. After-School Care Centre Waldorf School / MONO Architekten" 24 Jan 2020. ArchDaily. Accessed 18 May 2023. <<https://www.archdaily.com/932433/after-school-care-centre-waldorf-school-mono-architekten>> ISSN 0719-8884
- o Baker, A. (1981) "Smithson's site/Non-site: New York City Walk," Artforum. Available at: <https://www.artforum.com/print/198102/smithson-s-site-non-site-new-york-city-walk-35736> (Accessed: November 28, 2022).
- o Basulto, D. (2011) *Designing a Hedonistic and Sustainable Future*, Big Think. Available at: <https://bigthink.com/guest-thinkers/designing-a-hedonistic-and-sustainable-future/> (Accessed: November 2022).
- o Bunschoten, R. (1986) "SPINOZA'S GARDEN," AA Files, (11), pp. 54–57. Available at: <https://doi.org/https://www.jstor.org/stable/29543493>.
- o Carol J. Burns, (1991) "On Site: Architectural Preoccupations," in Andrea Kahn, ed., *Drawing, Building, Text: Essays in Architectural Theory* (New York: Princeton Architectural Press, 1991)
- o DAMN Magazine. (2022). DAMN Magazine. Retrieved December 27, 2022, from <https://www.damnmagazine.net/have-we-met>
- o de Jong, J. and Wiggers, A.J. (1982) "Polders of The World." Lelystad, pp. 221–245. Available at: <https://edepot.wur.nl/380818> (Accessed: November 27, 2022).
- o Dublin City Council (no date) '4.6.2 Biodiversity and Green Infrastructure', in Resources and Services. Available at: <https://www.dublincity.ie/dublin-city-parks-strategy/4-resources-and-services/46-natural-areas-biodiversity/462-biodiversity-and-green-infrastructure>
- o Expo 2000 Netherlands Pavilion, Hannover (2022) *Arquitectura Viva*. Available at: <https://arquitecturaviva.com/works/pabellon-de-los-paises-bajos-en-la-expo-2000-0> (Accessed: November 29, 2022).
- o "El Til-ler School / Eduard Balcells + Tigges Architekt + Ignasi Rius Architecture" 02 Jun 2021. ArchDaily. Accessed 18 May 2023. <<https://www.archdaily.com/918637/el-til-star-ler-school-eduard-balcells-plus-tigges-architekt-plus-ignasi-rius-architecture>> ISSN 0719-8884
- o Frac centre-Val de Loire (no date) Frac Centre. Available at: https://www.frac-centre.fr/_en/art-and-architecture-collection/rub/rub-317.html?authID=98&ensembleID=292 (Accessed: December 29, 2022).
- o Future proposals and Current Discourse, 2022, TU Dublin, Bachelor of Architecture Research
- o Green, J (2011). Interview with Bjarke Ingels. Available at: <https://www.asla.org/ContentDetail.aspx?id=33674> (Accessed December 28, 2022)
- o Holmes, D. (2017) Room for the river: Nijmegen, the Netherlands: H+n+s landscape architects, World Landscape Architect. Available at: <https://worldlandscapearchitect.com/room-for-the-river-nijmegen-the-netherlands-hns-landscape-architects/> (Accessed: December 30, 2022).
- o Howard, P. (2017) 'THE MITIGATION HIERARCHY NO NET LOSS AND NET POSITIVE IMPACT'. Fauna and Flora International. Available at: https://www.fauna-flora.org/app/uploads/2017/12/FFI_2015_The-Mitigation-Hierarchy.pdf
- o Kikuchi, T., Li, L., Sapp, F. & Schiegl, A. (2021), 'Interspecies Play', Design Investigations.
- o Kuitenbrouwer, K, Zoete, E (2022). Have we met? Humans and non-humans on common ground [Exhibition]. Het Nieuwe Instituut, Rotterdam, The Netherlands. Available at: <https://triennale.org/en/events/netherlands-have-we-met>
- o Kuspan, S. (2022) Time & Material: Land Art & Architecture, issue. Available at: https://issuu.com/sofiakuspan/docs/g03_sofia_kuspan_final_book (Accessed: November 28, 2022).
- o Life and Society, 2022, TU Dublin, Bachelor of Architecture Research
- o Lysaght, L. (2022) IPBES & Ireland's biodiversity crisis, Biodiversity Ireland. Available at: <https://biodiversityireland.ie/ipbes-irelands-biodiversity-crisis/> (Accessed: 2023).
- o Maas, W., Hackauf, U. and Haikola, P. (2014) *Green dream: How future cities can outsmart nature*. Rotterdam: NAI Publishers.
- o McVeigh, T. (2014) The Dutch solution to floods: Live with water, don't fight it, The Guardian. Guardian News and Media. Available at: <https://www.theguardian.com/environment/2014/feb/16/flooding-netherlands> (Accessed: December 30, 2022).
- o Mehta, M. (2019) Big's artificial ski slope atop a waste-to-energy plant opens to public in Copenhagen, STIRworld. STIRworld.com. Available at: <https://www.stirworld.com/see-features-bigs-artificial-ski-slope-atop-a-waste-to-energy-plant-opens-to-public-in-copenhagen> (Accessed: November 10, 2022).
- o Migliani, A. (2020) How to Design Schools and Interiors Based on Waldorf Pedagogy, Archdaily. Available at: <https://www.archdaily.com/935990/how-to-design-schools-and-interiors-based-on-waldorf-pedagogy> (Accessed: 2023).
- o Mohtadi, T. (2016) "The complementarity of improving quality of life and reducing environmental footprints in urban spaces: The argument for 'hedonistic sustainability,'" *Consilience*, 16(1) (2016), pp. 14–28. Available at: <https://www.jstor.org/stable/26188771> (Accessed: November 13, 2022).
- o Morton, T (2010) 1968. 'The Ecological Thought', Harvard University Press
- o MVRDV (2022) Expo 2000, MVRDV. Available at: <https://www.mvrdv.nl/projects/158/expo-2000> (Accessed: November 28, 2022).
- o National Geographic Society (2022) Anthropocene, National Geographic Society. Available at: <https://education.nationalgeographic.org/resource/anthropocene> (Accessed: January 2, 2023).
- o O'Dea, B, 2021, "Hedonistic Sustainability", Livsn. Available at: <https://www.livsndesigns.com/blogs/the-pipeline/hedonistic-sustainability> (Accessed November 30, 2022)
- o Organisation for Bat Conservation (no date) 'Threats to Bats: Habitat Loss'. Organisation for Bat Conservation. Available at: <https://dem.ri.gov/sites/g/files/xkqbur861/files/programs/bnatres/fishwild/outreach/critter-kits/bat-ex-threats.pdf>
- o Regine, 2022, "'Have we met?' A multispecies approach to the planet', We Make Money Not Art. Available at: <https://we-make-money-not-art.com/have-we-met-a-multispecies-approach-to-the-planet/>
- o Room for the river programme (2019) Dutch Water Sector. Available at: <https://www.dutchwatersector.com/news/room-for-the-river-programme> (Accessed: December 30, 2022).
- o Ryan, N. (2015) 'Ireland now has its first (official) Steiner National School', The Journal, 24 January. Available at: <https://www.thejournal.ie/steiner-national-school-first-recognised-ireland-1899270-Jan2015/> (Accessed: 25 March 2023).
- o Shenzhen terraces by MVRDV (2020) ITSLIQUID. Available at: <https://www.itsliquid.com/shenzhen-terraces.html> (Accessed: December 29, 2022).
- o Sound Assured (2022) The Best Room Shape for a Recording Studio: Learn About Room Shapes and Sizes, Sound Assured. Available at: <https://www.soundassured.com/blogs/blog/the-best-room-shape-for-a-recording-studio-learn-about-room-shapes-and-sizes> (Accessed: May 2023).
- o The Waldorf School Of Philadelphia (no date) Waldorf Education and the Nature Connection, The Waldorf School Of Philadelphia. Available at: <https://phillywaldorf.com/blog/waldorf-education-nature-connection> (Accessed: October 2022).
- o Tronto, J.C. (2019) "Caring Architecture," in A. Fitz, E. Krasny, and A. Wien (eds) *Critical Care: Architecture and Urbanism for a Broken Planet*. Cambridge, Massachusetts and London: The MIT Press, pp. 26–32.
- o Vannucci, M, (1982) "Polders of The World." Lelystad, pp. 245–255. Available at: <https://edepot.wur.nl/380818> (Accessed: November 27, 2022).
- o Waterways Ireland (2022) Education, Dublin Canals. Available at: <https://www.dublincanals.org/education> (Accessed: November 2022).
- o Wilke, Sabine. "Human-Nature Relations in German Literature: A Curated Stroll through a History of Entanglement." *Environment & Society Portal*, Virtual Exhibitions 2018, no. 4. Rachel Carson Center for Environment and Society. doi.org/10.5282/rcc/8150.
- o WWF (2022) Living Planet Report 2022 – Building a nature-positive society. Almond, R.E.A., Grooten, M., Juffe Bignoli, D. & Petersen, T. (Eds). WWF, Gland, Switzerland.
- o 'What is sustainability? definition, types and examples' (2022) What is sustainability, definition, types and examples | Santander Scholarships Blog. Santander Universidades. Available at: <https://www.becas-santander.com/en/blog/what-is-sustainability.html> (Accessed: November 27, 2022).
- o "Yellow Train School / Biome Environmental Solutions" 04 Nov 2015. ArchDaily. Accessed 18 May 2023. <<https://www.archdaily.com/776362/yellow-train-school-biome-environmental-solutions>> ISSN 0719-8884

Those not specified are authors own.

Fig. 1 & 2 'Before and After 'Room for the River', Nijmegen, The Netherlands'

o Holmes, D. (2017) Room for the river: Nijmegen, the Netherlands: H+n+s landscape architects, World Landscape Architect. Available at: <https://worldlandscapearchitect.com/room-for-the-river-nijmegen-the-netherlands-hns-landscape-architects/> (Accessed: December 30, 2022).

Fig. 3, 4 & 5 'Forest Building', Richmond, USA by SITE

o Frac centre-Val de Loire (no date) Frac Centre. Available at: https://www.frac-centre.fr/_en/art-and-architecture-collection/rub/rub-317.html?authID=98&ensembleID=292 (Accessed: December 29, 2022).

Fig. 6. 'Antilia Vertiscape Tower' 2003 by SITE

o SITE Architects (2022). Available at: <https://sitenewyork.com/>

Fig. 7 & 8. 'Holland generates Space' Danish Expo 2000 by MVRDV (MVRDV, 2022).

o MVRDV (2022) Expo 2000, MVRDV. Available at: <https://www.mvrdv.nl/projects/158/expo-2000> (Accessed: November 28, 2022).

Fig. 9, 10 & 11. 'CopenHill', Denmark, 2011, by BIG Architects

o BIG Architects, (2022). Available at: <https://www.big.dk/>

Fig. 12 & 13: MVRDV 'Shenzhen Terraces', (2019) China Mainland.

o Shenzhen terraces by MVRDV (2020) ITSLIQUID. Available at: <https://www.itслиiquid.com/shenzhen-terraces.html> (Accessed: December 29, 2022).

Fig. 14, 15 & 16: 'Interspecies Play', Have we met? Humans and Non-humans on Common Ground

o Kikuchi.T, Li. L, Sapp. F & Schiegl. A, (2021), 'Interspecies Play', Design Investigations.

Fig. 17: 'Drilling platform off the Dutch coast', Have we met? Humans and Non-humans on Common Ground. Photo: Cristiano Corte

o Regine, 2022, "'Have we met?" A multispecies approach to the planet', We Make Money Not Art. Available at: <https://we-make-money-not-art.com/have-we-met-a-multispecies-approach-to-the-planet/>

Fig. 18 'Environmental campaigners from the Irish Wildlife Trust and Extinction Rebellion protesting outside the Government's National Biodiversity Conference in Dublin Castle calling for legislation in the form of a Biodiversity Act'. Photograph: Alan Betson

O'Sullivan, 2022. 'All farmers must play part in tackling Ireland's biodiversity crisis – Minister Hackett', The Irish Times. Available at: <https://www.irishtimes.com/environment/2022/06/08/all-farmers-must-play-part-in-tackling-irelands-biodiversity-crisis-minister-hackett/>

o Alexander, C. (1965) "A City Is Not A Tree." Architectural Forum.

o Clemmensen, T.J, Daugaard, M & Nielsen, T (2010) Qualifying urban landscapes, Journal of Landscape Architecture, 5:2, 24-39, DOI: 10.1080/18626033.2010.9723436

o Inaba, J, (2013). 'Bjarke Ingels Back to the future'. Klat Magazine. Available at: <https://www.klatmagazine.com/en/architecture-en/bjarke-ingels-interview-back-to-the-future-05/33362>

o Jodidio, P. Green Architecture. Taschen, Bibliotheca Universalis.

o Latour, B. (2020) Critical Zones: The Science and Politics of Landing on Earth. MIT Press.

o The Harrison Studio (2022) A Manifesto for the 21st Century, The Harrison Studio. Available at: <https://www.theharrisonstudio.net/a-manifesto-for-the-21st-century> (Accessed: November 1, 2022).

o Wainwright, O. (2022) Demolition is an act of violence': the architects reworking buildings instead of tearing them down, The Guardian. Available at: <https://www.theguardian.com/artanddesign/2022/aug/16/demolition-is-an-act-of-violence-the-architects-reworking-buildings-instead-of-tearing-them-down> (Accessed: October 2022).

o Warner, J., van Staveren, M. and van Tatenhove, J. (2018) "Cutting dikes, cutting ties? Reintroducing flood dynamics in coastal polders in Bangladesh and the netherlands," International Journal of Disaster Risk Reduction, 32, pp. 106–112. Available at: <https://doi.org/https://doi.org/10.1016/j.ijdr.2018.03.020>.

o Webredactie Communication (2022) Five future strategies for the Dutch delta in 2120. Available at: <https://www.tudelft.nl/en/2022/tu-delft/five-future-strategies-for-the-dutch-delta-in-2120> (Accessed: October 2022).

APPENDIX

PUBLIC CONSULTATION

LETTER TO DUBLIN CITY COUNCIL

Dear Claire Byrne and fellow members of the DCC Strategic Policy committee for Climate Action, Environment and Energy,

I am writing to you in response to Chapter 10 'Green infrastructure and Recreation' of the Dublin City Council Development Plan 2022 – 2028. These observations are supported by research completed as part of my final year thesis project in Technological University Dublin's Bachelor of Architecture degree.

"the failure to enforce environmental laws, inadequate environmental assessment of projects and plans and poor mitigation measures are, on their own and cumulatively, leading to this poor outcome (increased and consistent biodiversity loss)." - Ms Oonagh Duggan, Head of Advocacy at BirdWatch Ireland (Joint Committee on Environment and Climate Action, 2022)

The anthropogenic nature of our urban centre is in part due to development mistakes of the past and lack of policy foresight and enforcement. Human need is and has been overly prioritised which has led to the destruction of our natural ecosystems in Dublin city and its suburbs. Though there is recognition in the Development Plan of the benefits that green spaces and biodiversity can have on our built environment such as storm water management, urban heat reduction and enhancement of human quality of life mentally, physically, and socially (Mohtadi, 2016), the language used ("urban greening" and "ecosystem services") demonstrates a lack of urgency towards the serious threat our biodiversity, native species and habitats are under. These "urban greening" and "ecosystem services" guidelines seen in chapter 10 of the development plan are curated for the benefit our human residents and not our non-human (native vegetation, animals and insects): "These benefits can be described as ecosystem services and can change over time, and may be potential or realised, depending on human needs" (Dublin City Council, 2022). This language and human superiority mindset are problematic as it falsely communicates the idea that the planet is for human consumption only, when non-human (flora and fauna) demands need to be of equitable importance and represented in our policies.

The Royal Canal Greenway

In chapter 10 of the development plan Dublin's canals and rivers are considered "vital to maintain connectivity of habitats in the landscape and provide for animal movement, seed and pollen dispersal, and plant migration", and according to 'Dublin Canals' educational resource the Royal canal is considered to be an "incredibly important wildlife and biodiversity corridor" with species such as ducks, moorhens, herons, mute swans and otters inhabiting it (Waterways Ireland, 2022). However, phase 1 and 2 of the Royal canal greenway have shown us that cycle and pedestrian lanes have been prioritised over the protection of existing habitats and the expansion of

these habitats. Through my research conducted at TU Dublin there is evidence to show that designing with equitable consideration and attention to our non-human residents will improve human quality of life and ensure the destruction to our environment is as minimal as possible, especially when it comes to such developments alongside or within green corridors which our vital to our city's ecosystem. Concise and clear guidelines on how to construct within sites of ecological importance should be provided to avoid potentially detrimental damage to these corridor habitats. Delicate treatment to the habitats and nonhuman life in these regions need to be strictly regulated and devoid of sole focus on the 'ecosystem services' they can provide for humans. As phase 4 of the Royal canal greenway is still in its planning stages there is opportunity to follow expert recommendations and to make relevant adjustments to the plans resulting in a route which adheres to the needs of the existing wildlife habitats. This will help achieve goals from the National Biodiversity Plan (2017- 2021) and the Dublin City Biodiversity Action Plan 2021-2025 and avoid repeating past mistakes.

G16 & G17

The same level of enforced guidance should be applied to sites of particular location importance for the city's ecological network such as those that are located along green corridors or at pivotal linking sites as is intended under policies G16 'new development/ New growth Areas' and G17 'Connecting Greening Elements in Site Design'. However, there needs to be more guidance on space allocation for new biodiversity and protection to existing non-human life within and outside their site boundaries in their environmental strategy to ensure this larger network of ecological connections can be maintained and rejuvenated, and to ensure sole focus is not on the human ecosystem service benefits that can be achieved. Such environmental strategies need to be adequately assessed during planning stages to ensure developments are enforcing guidelines. This would help the outlined 'core areas', 'hubs' and 'corridors' to efficiently be part of the larger Green Infrastructure strategy and force developers to dedicate care and attention to non-human life. Thus, what I am advocating for is a sizable consideration for the non-human voice in your guidelines and policies going forward, as it is of the interest of our citizens and the future of our planet. In particular developments alongside river banks, canal banks, and any green corridor habitats of ecological significance should be obliged to respect, develop and incorporate these habitats into proposed developments. As it is largely emphasised that nature or 'green services' have multiple benefits for humankind, we need to respect nature through our interventions. Policy has to be the voice to those who have none.

Yours faithfully,
Ellen Brien

THESIS RESEARCH ESSAY

ADDITIONAL CHAPTERS

LAND ART



Above;
'Markische Sand IV (1977)' by Anselm Kiefer

While both land art and architecture have spatial connections to a cultural understanding of the natural world, the 1960s land art movement was ahead of architectural practice in its early advocacy of ecological awareness, built form, and space building techniques. Architecture, tended to adhere to societal structures, responding to the needs of the clients and not the ecological agenda (Kuspan, 2022). Artists Robert Smithson and Anselm Kiefer displayed the complex relationships between humans and nature in their work.

Anselm Kiefer illustrates the destruction that war causes on humanity and on landscape in his series of books, 'Markische Sand IV (1977)', where he depicts German landscapes smothered in red sand symbolising the historical vandalism and Nazi spoliation of the land (Andrews, 1999). This piece reads as a violent act, not only on humanity but also on land. The damage of the war will always leave a scar on the land within the Anthropocene, despite the surface appearing healed. The violence on the German landscape portrayed is comparable to Sabine's account of human activity on the Netherlands and Bunschoten's opinion on the Netherlands polder reclamation.

Robert Smithson, one of the most accomplished Earth artists in the 1960s and 1970s, highlights the boundary or "dialogue" between the indoors and outdoors in his sculptures entitled 'Site/ Non-site', challenging the notion of a traditional 'site'. He describes 'site', being outdoor, as "the physical, raw reality – the earth or the ground that we are not really aware of when we are in an interior room" and non-site, being indoor. His earth sculptures sit in a gallery displayed alongside maps, facts, and photographs of the original sites, bringing the outdoors indoors with an artistic expression of natural materials (Andrews, 1999). Smithson's art is focussed on an 'over-used' landscape. His interest was not in 'untouched nature', as he believed every place was natural and apart of nature. He understood that areas "disrupted by industry, uncontrolled urbanization, or nature's own devastation" made for the finest locations for earth art (Baker, 1981).



Above;
'A-Nonsite', Franklin, New Jersey, 1968, by Robert Smithson

Carol Burns also challenges the idea of a traditional 'site' in her

seminal article 'On Site: Architectural Preoccupations'. She depicts the notion of a "cleared site" and a "constructed site", cleared site being the traditional view of a site, one awaiting architectural context. Yet she weighs importance on that fact that it is full of the earth's natural constructions such as vegetation, fauna habitats, wind patterns and water systems, and states that these constructions "are secondary to human constructions by architecture and the planning discipline". Adding a new building to these natural constructions will alter the sites microclimate, circulation, topography, etc., along with the neighbouring sites, in turn transforming the landscape (Burns, 1991).

The work of these land artists raises concern of how the concept of nature is defined: "is city the new nature?" A question posed by Winy Maas in his book 'Green dream', stating that "natural does not exist" (Maas, 2014). Through their work the land artists have highlighted their concerns about the damage to the Earth. Side by side, Smithson and Burns definitions of nature and human constructions blurs the lines between human and non-human habitats. While this argument supports multispecies living, Kiefer's work, and that of Sebald and Bunschoten reminds us that human activity can be destructive.

ARCHITECTURAL DESIGN STUDIO THESIS PROJECT SEMESTER 1

How can architecture be used as a vessel to provide hedonism for humans and refuge for the non-human while addressing increased flooding and loss of biodiversity in Tolka Valley? This question has emerged throughout this research, with answers beginning to arise through architectural design studio exercises.

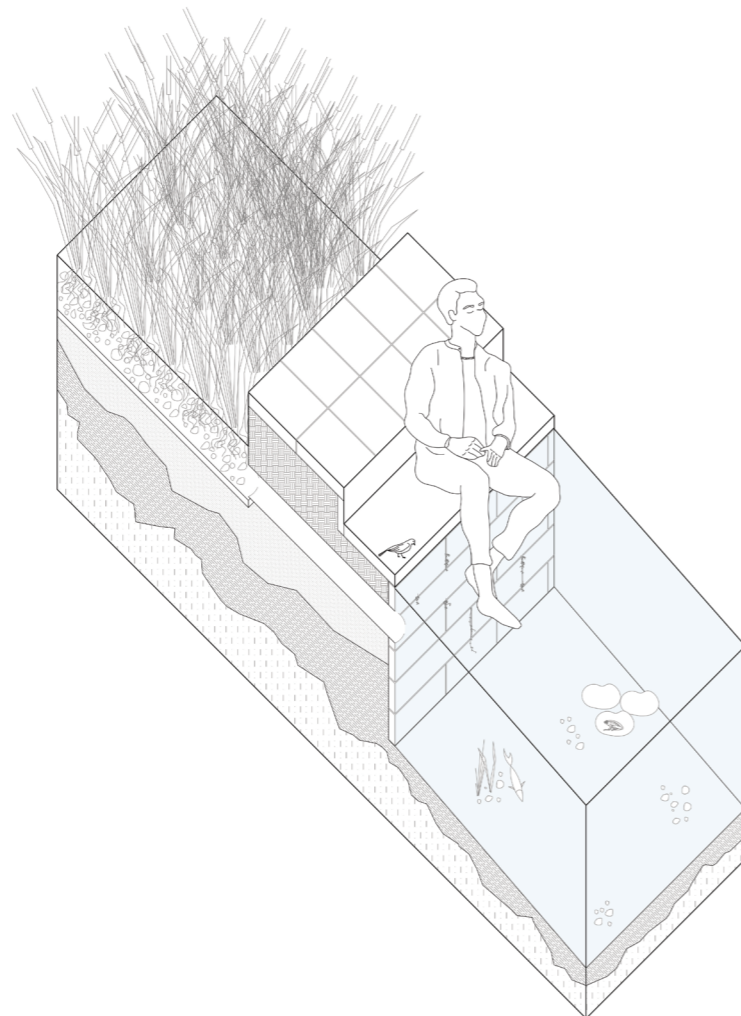
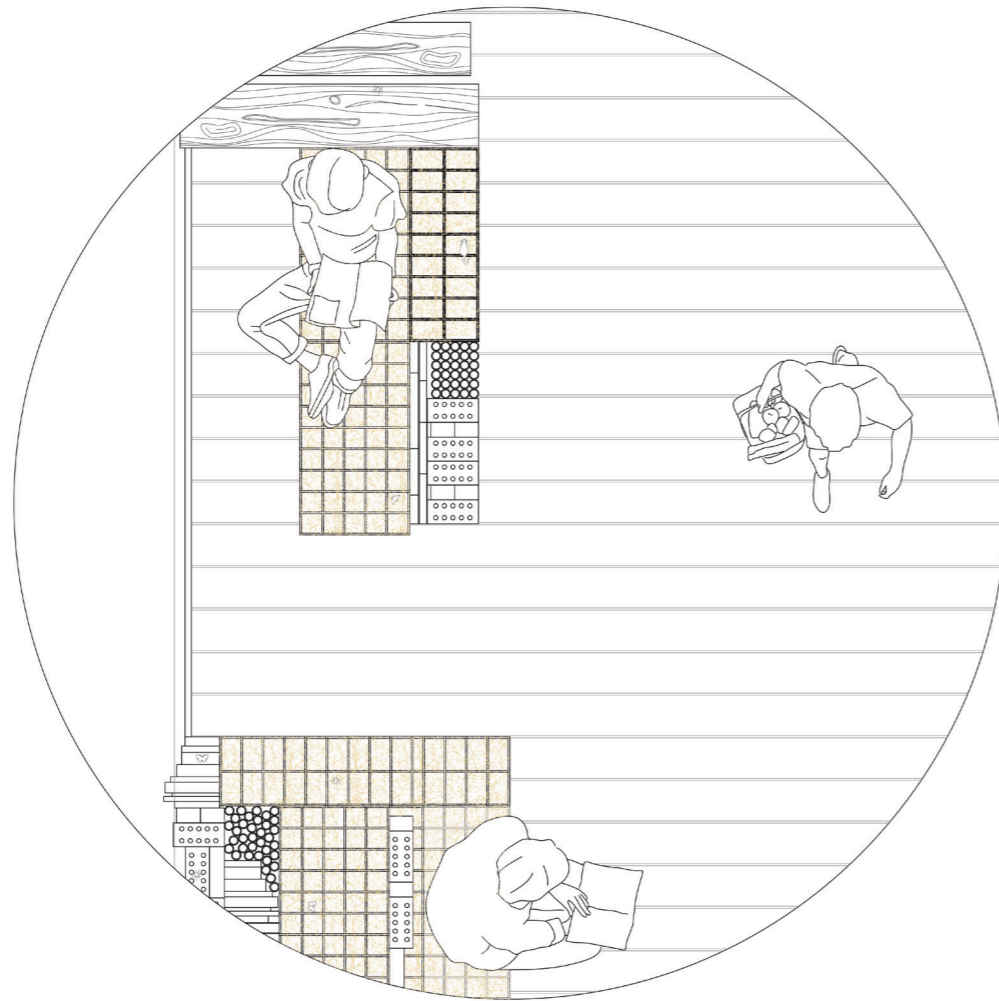
At the outset of our research in Tolka Valley we identified three main problems in the area, first being the discovery that the industrial estate is inactive after working hours and at the weekends, secondly the lack of public realm, and thirdly the discovery that along the canal was where the most human and non-human activity occurred. Through this early design exercise, we explored ideas around a radically transformed Tolka Valley industrial estate where we proposed expanding the canal into the industrial estate, converting roadways into canals to allow public activity to thrive. We also proposed developing public mixed-use structures along these new routes where day and night activities could take place, to encourage an active industrial estate and aid the use of this new public realm created by the canals. Not unlike the hedonistic projects discussed in this research such 'Copenhill' and the 'Room For The River' programme the project aimed to enhance the industrial estates overall environmental quality, recreational, ecological and aesthetic value and replace the roads with a service to the people in Tolka Valley.

Upon continuing my thesis research themes of transformed landscape, hedonistic sustainability, and non-human-centric design it inspired a brief which focussed on three main objectives:

- To ensure the site has its own ecosystem which sustainably deals with materials, wastewater and rainwater, contributes to its surroundings and encourages an increase in flora and fauna.
- To create a hedonistic experience for people through the use of materiality, landscape, views, experience and interaction with other species.
- To ensure the transformation of the site is a positive influence on the environment and its residents, human and non-human, specifically vegetation, animals and insects.

The site chosen to test this brief is located in the Tolka Valley industrial estate alongside the Royal canal and just north of the proposed TU Dublin Broombridge campus. The project is called the Rejuvenation Centre, it focussed on an aspect of hedonistic sustainability, as described by Dominic Basulto; "it (hedonistic sustainability) is what happens when you start thinking about buildings as structures and start thinking about them as ecosystems" (Basulto, 2011). Importantly, having learned from the mistakes of polder reclamation in the Netherlands, the 'earth's natural constructions' of the site, as described by Burns, needed to be considered carefully and with equity. These include the sites existing non-human aspects such as, vegetation, fauna habitats, wind patterns and water





How can architecture be used as a vessel to provide hedonism for humans and refuge for the non-human while addressing increased flooding and loss of biodiversity in Tolka Valley? This question has emerged throughout this research, with answers beginning to arise through architectural design studio exercises.

At the outset of our research in Tolka Valley we identified three main problems in the area, first being the discovery that the industrial estate is inactive after working hours and at the weekends, secondly the lack of public realm, and thirdly the discovery that along the canal was where the most human and non-human activity occurred. Through this early design exercise, we explored ideas around a radically transformed Tolka Valley industrial estate where we proposed expanding the canal into the industrial estate, converting roadways into canals to allow public activity to thrive. We also proposed developing public mixed-use structures along these new routes where day and night activities could take place, to encourage an active industrial estate and aid the use of this new public realm created by the canals. Not unlike the hedonistic projects discussed in this research such 'Copenhill' and the 'Room For The River' programme the project aimed to enhance the industrial estates overall environmental quality, recreational, ecological and aesthetic value and replace the roads with a service to the people in Tolka Valley.

Upon continuing my thesis research themes of transformed landscape, hedonistic sustainability, and non-human-centric design it inspired a brief which focussed on three main objectives:

- To ensure the site has its own ecosystem which sustainably deals with materials, wastewater and rainwater, contributes to its surroundings and encourages an increase in flora and fauna.
- To create a hedonistic experience for people through the use of materiality, landscape, views, experience and interaction with other species.
- To ensure the transformation of the site is a positive influence on the environment and its residents, human and non-human, specifically vegetation, animals and insects.

The site chosen to test this brief is located in the Tolka Valley industrial estate alongside the Royal canal and just north of the proposed TU Dublin Broombridge campus. The project is called the Rejuvenation Centre, it focussed on an aspect of hedonistic sustainability, as described by Dominic Basulto; "it (hedonistic sustainability) is what happens when you start thinking about buildings as structures and start thinking about them as ecosystems" (Basulto, 2011). Importantly, having learned from the mistakes of polder reclamation in the Netherlands, the 'earth's natural constructions' of the site, as described by Burns, needed to be considered carefully and with equity. These include the sites existing non-human aspects such as, vegetation, fauna habitats, wind patterns and water systems. Taking ideas from Smithson and Burns around blurring the lines between human and non-human habitats I proposed a bridge connection situated over a constructed wetland that serves both as

FURTHER INFORMATION TREE SURVEY

Tag No.	Species	Age Category	General Condition	Comments	Preliminary Recommendations	Landscape and Arboricultural Category	Useful Life Expectancy
34	Italian poplar Populus nigra 'Italica'	Mature	Good	A relatively short-lived species at its optimal stage of growth. Well developed with no visible defects.	No action necessary	B2	20
35	Silver birch Betula pendula	Young	Good	A well-developed slender specimen on eastern boundary. Crown slightly restricted toward west but not significantly so.	No action necessary	B2	30-40
36	Italian poplar Populus nigra 'Italica'	Mature	Good	A relatively short-lived species at its optimal stage of growth. Well developed with no visible defects.	No action necessary	B2	20
37	Scots pine Pinus sylvestris	Mature	Poor	Decapitated during a storm event.	Fell	U	0
38	Silver birch Betula pendula	Early-mature	Good	Located on eastern boundary. Trunk at an acute angle suggesting damage in the past with habit derived from reaction growth.	Fell	U	<10
39	Scots pine Pinus sylvestris	Early-mature	Good	A well-developed specimen located on eastern boundary. No visible defects.	No action necessary	B2	40
40	Silver birch Betula pendula	Early-mature	Good	A multi-stemmed specimen located toward the eastern boundary of the site. Unions between stems appear sound. Stem to north with a strong lean in this direction but this is unlikely to be significant. Canopy relatively well developed with no visible defects.	No action necessary	B2	40
41	Silver birch Betula pendula	Early-mature	Good	A relatively well-developed specimen. Two-stemmed with crown restricted toward east due to competition from neighbouring tree #40. No visible defects but unlikely to be suitable for isolation from neighbouring tree shelter.	No action necessary	B2	20
42	Silver birch Betula pendula	Early-mature	Very Poor	In a state of advantage decline	Fell	U	0
43	Ash Fraxinus excelsior	Early-mature	Good	Well developed with a wide spreading crown. Light tip dieback could be early stage ash dieback.	Monitor	C2	<10
44	Ash Fraxinus excelsior	Early-mature	Poor	Acute ash dieback	Fell	U	10
45	Silver birch Betula pendula	Early-mature	Good	A well-developed specimen located on eastern boundary. No visible defects.	No action necessary	B2	20-30
46	Grey alder Alnus incana	Mature	Very Poor	In a state of advanced decline	Fell	U	0
47	Silver birch Betula pendula	Young	Very Poor	In a state of advanced decline	Fell	U	0
48	Grey alder Alnus incana	Mature	Good	Relatively well developed though crown restricted toward south due to competition from neighbouring tree which is now dead	No action necessary	B2	20-30
49	Grey alder Alnus incana	Mature	Very Poor	In a state of advanced decline	Fell	U	0
50	Grey alder Alnus incana	Mature	Very Poor	In a state of advanced decline	Fell	U	0
51	Grey alder Alnus incana	Mature	Good	Relatively well-developed specimen with minor deadwood scattered throughout lower canopy. Unlikely to be indicative of decline.	Deadwood	B2	20-30
52	Grey alder Alnus incana	Mature	Very Poor	In a state of advanced decline	Fell	U	0
53	Grey alder Alnus incana	Mature	Good	A relatively well-developed specimen with minor deadwood scattered throughout upper canopy. Unlikely to be significant or indicative of decline.	No action necessary	B2	20-30
54	Grey alder Alnus incana	Early-mature	Poor	A sub dominant specimen in a state of decline	Fell	U	<10
55	Grey alder Alnus incana	Mature	Very Poor	Sparse crown indicative of a state of advanced decline	Fell	U	<10
56	Grey alder Alnus incana	Mature	Very Poor	Sparse crown indicative of a state of advanced decline	Fell	U	<10
57	Grey alder Alnus incana	Mature	Poor	Deadwood scattered throughout upper canopy indicative of decline	Fell	U	<10
58	Silver birch Betula pendula	Early-mature	Good	One of three trees in close proximity on western boundary. Relatively well-developed specimen with no visible defects	No action necessary	B2	20-30
59	Silver birch Betula pendula	Early-mature	Good	One of three trees in close proximity. Trunk with a strong lean toward east due to competition from neighbouring trees. Unlikely to be significant at present. Upper canopy relatively well developed	No action necessary	B2	20-30
60	Silver birch Betula pendula	Early-mature	Fair	Relatively well-developed specimen though minor deadwood in upper canopy may be indicative of early stage decline. Crown restricted toward north due to competition from neighbouring tree in group.	Deadwood	B2	10-15
61	Himalayan birch Betula ermanii	Young	Good	A two stemmed specimen at base of boundary wall. No visible defects	No action necessary	B2	40
62	Monterey pine Pinus radiata	Early-mature	Good	One of two specimens on southern boundary. Well developed with no visible defects though crown restricted toward east due to competition from neighbouring tree.	No action necessary	B2	40
63	Monterey pine Pinus radiata	Early-mature	Fair	A relatively well-developed specimen though crown restricted west due to competition from neighbouring tree and deadwood scattered throughout lower crown to east	Deadwood	B2	40



REVISIONS

REV	DATE	DESCRIPTION
A	10/01/21	REVISED LAYOUT & BOUNDARY LINE
B	17/02/21	REVISED BOUNDARY LINE
D	16/01/22	REVISED LAYOUT
E	27/01/22	REVISED LAYOUT

PROJECT: VACANT SITE ADJACENT TO TOLVA VALLEY BUSINESS PARK, MALLYBEGGAN ROAD, BROOMFIELD, DUBLIN 15

JOB NO: T100181

DRAWING: ARBORICULTURAL IMPACT

DATE: 27/01/22

SCALE: 1:1250 @ A1

DRAWN BY: CATHY KEATING

STATUS: PLANNING

DATE: 27/01/22

REVISION:

SCALE: 1:250 @ A1

CMK
Horticulture & Arboriculture



REVISIONS

REV	DATE	DESCRIPTION
A	10/01/21	REVISED LAYOUT & BOUNDARY LINE
B	17/02/21	REVISED BOUNDARY LINE
D	16/01/22	REVISED LAYOUT
E	27/01/22	REVISED LAYOUT

PROJECT: VACANT SITE ADJACENT TO TOLVA VALLEY BUSINESS PARK, MALLYBEGGAN ROAD, BROOMFIELD, DUBLIN 15

JOB NO: T100181

DRAWING: TREE SURVEY AND CONSTRAINTS

DATE: 16/01/22

SCALE: AS SHOWN

DRAWN BY: CATHY KEATING

STATUS: PLANNING

DATE: 16/01/22

REVISION:

SCALE: 1:250 @ A1

CMK
Horticulture & Arboriculture



Circulation @ Section A
April @ morning



Circulation @ Section A
April @ midday



Classroom 1.8 FFL
April @ evening



Classroom 1.8 FFL
April @ midday

