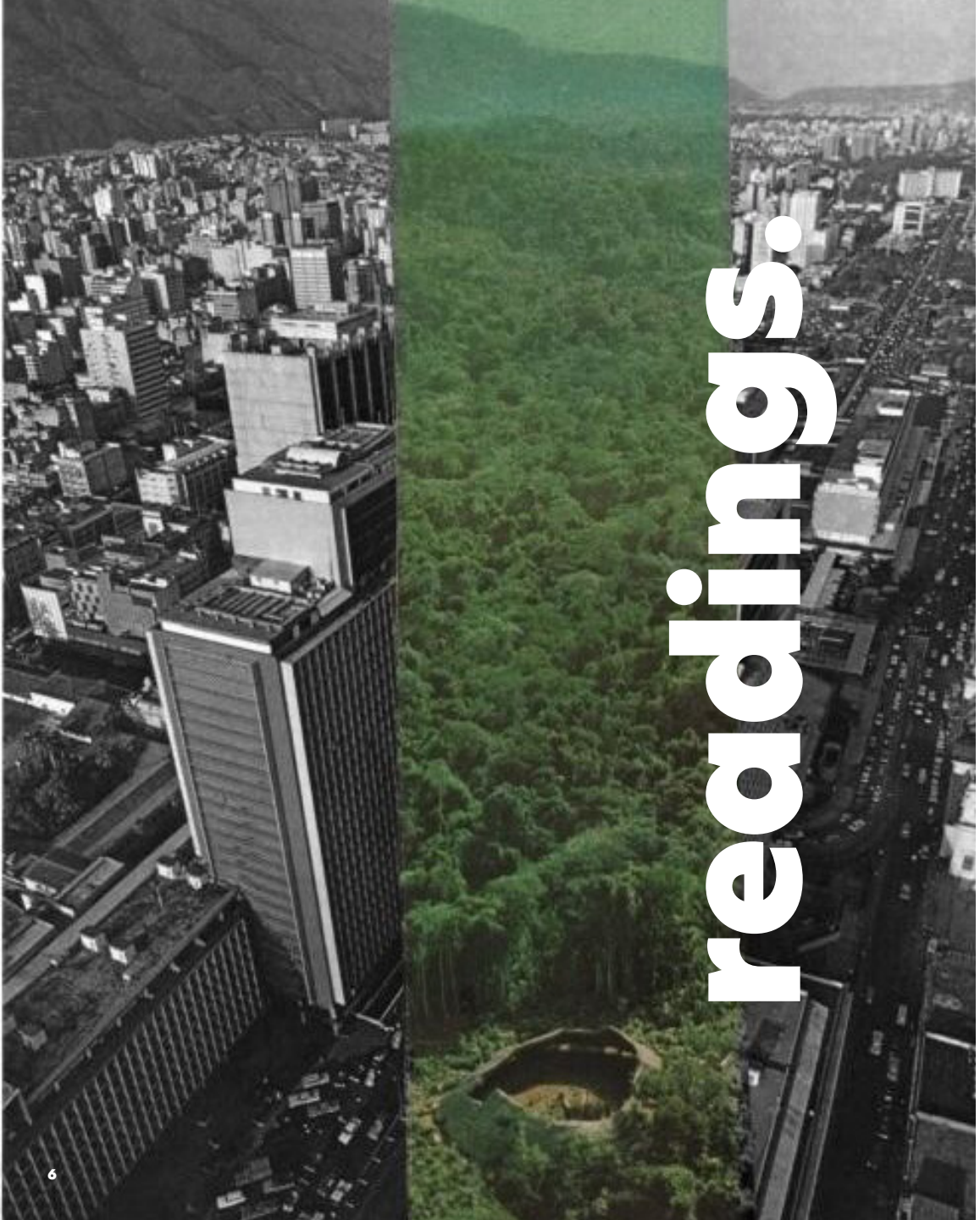
# thinking green

# intro.

*As cities grow and environmental issues intensify, the need for sustainable concepts capable of pushing sustainability in the city has grown increasingly important. This thesis delves into green roofs not just as building design elements with a purpose but as regenerative measures and adaptive reuse options beyond their traditional functions.*

# contents.



# readings.

**01**

Planning, Designing, & Managing Green Roofs & Green Walls for Public Health

**02**

Delirious New York A Retroactive Manifesto for Manhattan

**03**

Understanding Sustainable Architecture

01

Ecosystem Services Provided by Green Infrastructure: Green roofs and walls offer air purification, temperature regulation, and noise reduction

Impact on Mental Health: Exposure to green spaces is associated with improved mental well-being and increased opportunities for social interaction

Biodiversity Support: Can serve as habitats for various species, promoting urban biodiversity

Design Considerations: Selection of appropriate plant species, ensuring structural support, and considering maintenance needs

Integrating green infrastructure into urban planning: Collaboration, and public engagement in order for it to be purposeful

# 02

Manhattanism & the Culture of Congestion: Koolhaas uses the word "Manhattanism" to describe urban conditions. He talks about how the city's grid system and verticality create a unique "culture of congestion"

Coney Island as a Laboratory for Urban Fantasy: Koolhaas describes Coney Island as a testing ground for the ideas that later defined Manhattan's architecture

The Skyscraper as a Device for Urban Transformation: How the skyscraper is more than just a tall building by expanding its programs upwards

The Downtown Athletic Club & the Vertical City: Koolhaas uses the Downtown Athletic Club as a case study of how vertical architecture reshapes our human behaviour

- A "Retroactive Manifesto" for New York: Reflecting on the city's past, interpreting its chaotic and unplanned developments as a coherent, emergent urban theory. The book argues that Manhattan's architectural evolution was not driven by a single master plan but by a collective ambition for density and spectacle.

03

Defining Sustainability in Architecture: The book critiques common misconceptions about sustainable architecture and emphasizes the need for a clear and rigorous definition of sustainability in design

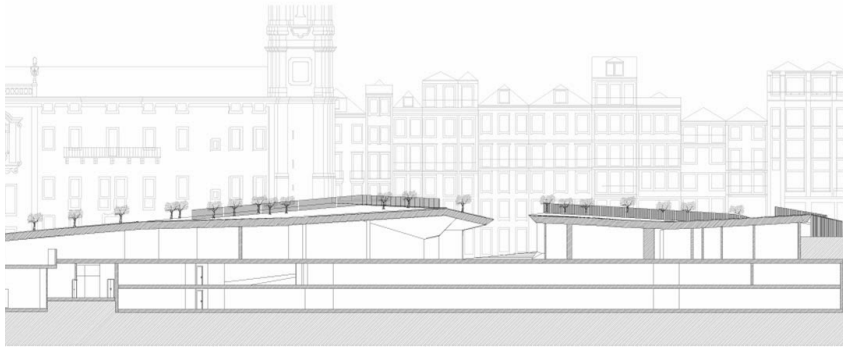
Theoretical Framework: It argues that sustainable architecture must be rooted in a well-defined theoretical framework, rather than relying solely on technical solutions or environmental checklists

Ethical and Cultural Considerations: The authors explore the ethical responsibilities of architects and the cultural implications of sustainable design, stressing that sustainability extends beyond environmental concerns to social and economic factors

Critical Evaluation of Green Design: The book challenges the assumption that all "green" design strategies are inherently sustainable, advocating for a more analytical approach that assesses their real impact.

Integration of Sustainability in Architectural Practice: It provides insights into how sustainability can be meaningfully incorporated into architectural education and professional practice, ensuring that it is more than just a trend.

# reflection.



My research is centred around sustainable environmental design and architecture. I am interested in the impact of green infrastructure on the built environment. Over the past three years at OCAD U, I have designed spaces that incorporate green infrastructure for useful purposes mostly in the likes of parks and community spaces. The implementation of greenery in architecture for me is something that I want to delve deeper into. We humans are polluting and slowly destroying our homes. Although newer, greener and more environmentally friendly ar chitecture might not have a huge impact on our natural environment, it helps with quality of life and sustainability for the future. Plants and nature have been around long before us, the least we can do is implement them more in architecture and the built environment as a whole. In tole, this will provide us with a deeper connection to our roots and help create resilient and adaptive environments that foster community and biodiversity. I chose to be a part of this group because urbanism as a whole is something that interests me, more specifically in a recent trip to Portugal this past summer I visited the city of Porto, the architecture and built environment there was truly beautiful. One key project that I felt inspired by was the Praça de Lisboa, which is a market that you can walk through that features a green roof space where people can interact with a rooftop patio. I was completely blown away by just how perfectly it fits in its location acting as a social space where people can interact while also making deeper meaningful connections to nature and Portuguese history.

# reference projects.

**01**

Canoe Landing
Recreation & Community Centre

**02**

Praça de Lisboa

**03**

Park ‘n’ Play

# CANOE LANDING CENTRE

ANALYSIS

01

## LOCATION

45 Fort York Blvd, Toronto Ontario

## YEAR

2020

## ARCHITECTS

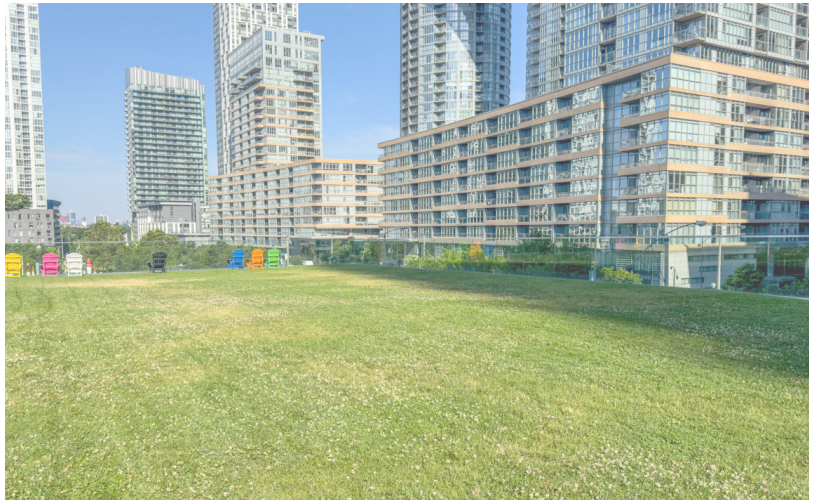
ZAS | Architects + Interiors

## TYPE OF ARCHITECTURE

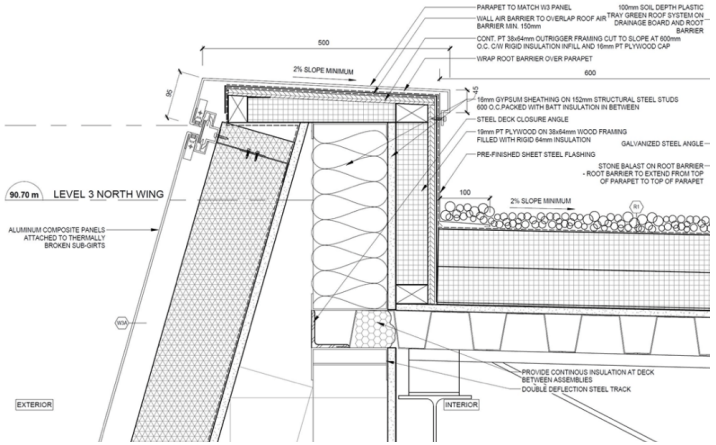
Contemporary | Modernist & Urban

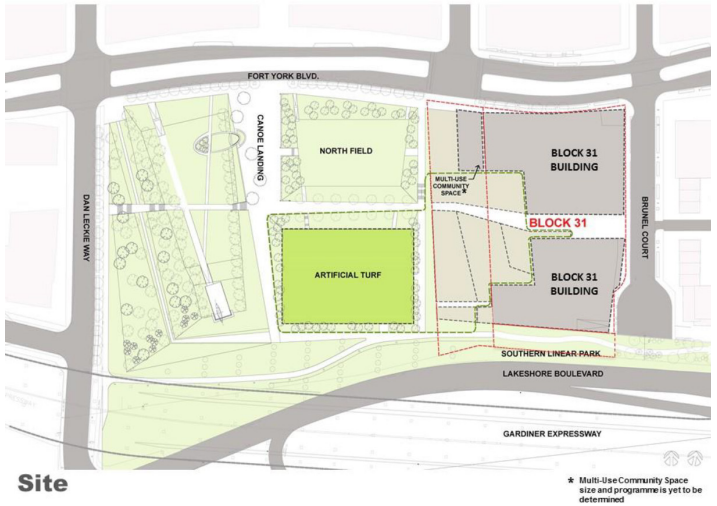
# relevance.

This project is relevant to my research as it explores the use of green space in conjunction with community spaces. Its complexity makes it unique from its surroundings and it is environmentally friendly. People can interact with the space as a park, community hub and it also serves as a school.



drawings.


PARAPET TO MATCH W3 PANEL
WALL AIR BARRIER TO OVERLAP ROOF AIR BARRIER MIN. 150mm
CONT. PT 38x64mm OUTRIGGER FRAMING CUT TO SLOPE AT 600mm O.C. C/W RIGID INSULATION INFILL AND 16mm PT PLYWOOD CAP
WRAP ROOT BARRIER OVER PARAPET
100mm SOIL DEPTH PLASTIC TRAY GREEN ROOF SYSTEM ON DRAINAGE BOARD AND ROOT BARRIER
500
2% SLOPE MINIMUM
600
16mm GYPSUM SHEATHING ON 152mm STRUCTURAL STEEL STUDS 600 O.C.PACKED WITH BATT INSULATION IN BETWEEN
STEEL DECK CLOSURE ANGLE
19mm PT PLYWOOD ON 38x64mm WOOD FRAMING FILLED WITH RIGID 64mm INSULATION
GALVANIZED STEEL ANGLE
PRE-FINISHED SHEET STEEL FLASHING
STONE BALAST ON ROOT BARRIER - ROOT BARRIER TO EXTEND FROM TOP OF PARAPET TO TOP OF PARAPET
100
2% SLOPE MINIMUM
90.70 m
LEVEL 3 NORTH WING
ALUMINUM COMPOSITE PANELS ATTACHED TO THERMALLY BROKEN SUB-GIRTS
PROVIDE CONTINOUS INSULATION AT DECK BETWEEN ASSEMBLIES - DOUBLE DEFLECTION STEEL TRACK
EXTERIOR
INTERIOR


FORT YORK BLVD.
CANOE LANDING
NORTH FIELD
BLOCK 31 BUILDING
MULTI-USE COMMUNITY SPACE *
BLOCK 31
DAN LECKIE WAY
ARTIFICIAL TURF
BLOCK 31 BUILDING
BRUNEL COURT
SOUTHERN LINEAR PARK
LAKESHORE BOULEVARD
GARDINER EXPRESSWAY
Site
* Multi-Use Community Space size and programme is yet to be determined

# PRAÇA DE LISBOA

ANALYSIS

02

## LOCATION

41°08'46.3"N 8°36'53.5"W Porto, Portugal

## YEAR

2013

## ARCHITECTS

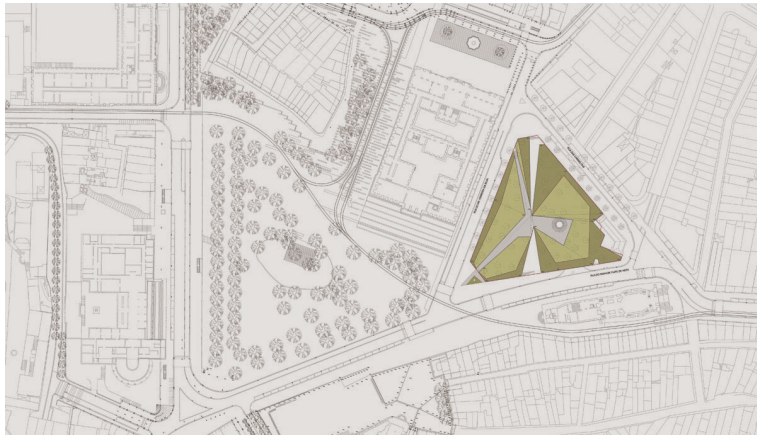
Pedro Balonas | Balonas & Menano

## TYPE OF ARCHITECTURE

Commercial › Retail Landscape +
Planning › Public Park

# relevance.

This project is relevant to my research as it explores the use of green space with retail spaces. Its complexity makes it unique from its surroundings and it is ienvironmentally friendly. People can interact with the space as a park or retail space and it also serves as a passage for foot traffic through the area.

# PRAÇA DE LISBOA

drawings.


# PARK 'N' PLAY

ANALYSIS

03

## LOCATION

2150 Copenhagen, Denmark

## YEAR

2016

## ARCHITECTS

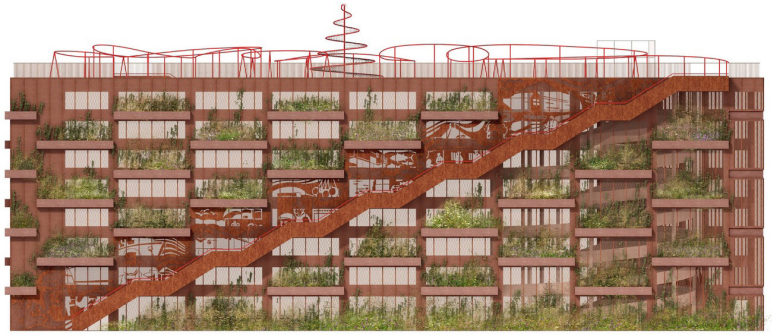
JAJA Architects

## TYPE OF ARCHITECTURE

Contemporary | Modernist & Urban

# relevance.

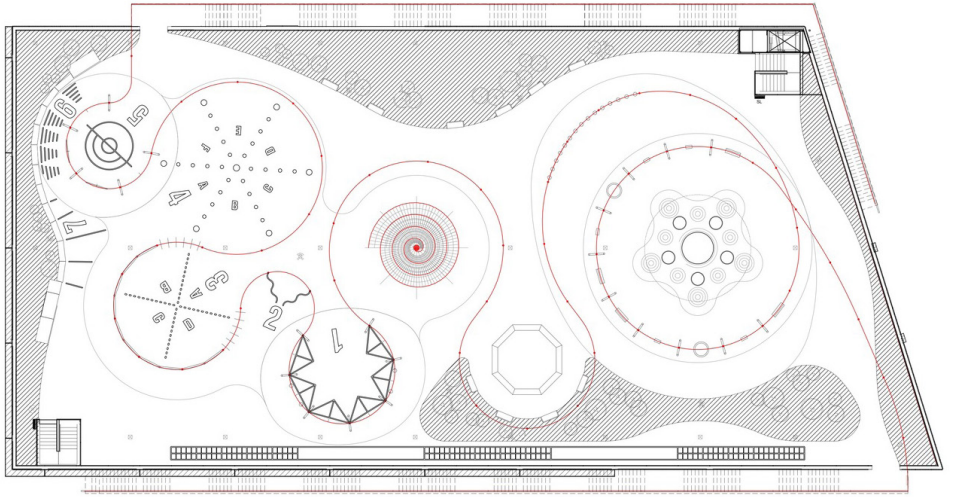
This project is relevant to my research as it explores the use of green space and public space. Its complexity makes it unique from its surroundings and although it is a parking garage its secondary purpose is for people to interact with the roof top park. this project is i environmentally friendly of cource with there being walls with greenery all over. People can interact with the space as a park or parking lot and it also serves as a passage for foot traffic through the area if people want to interact with the roof.

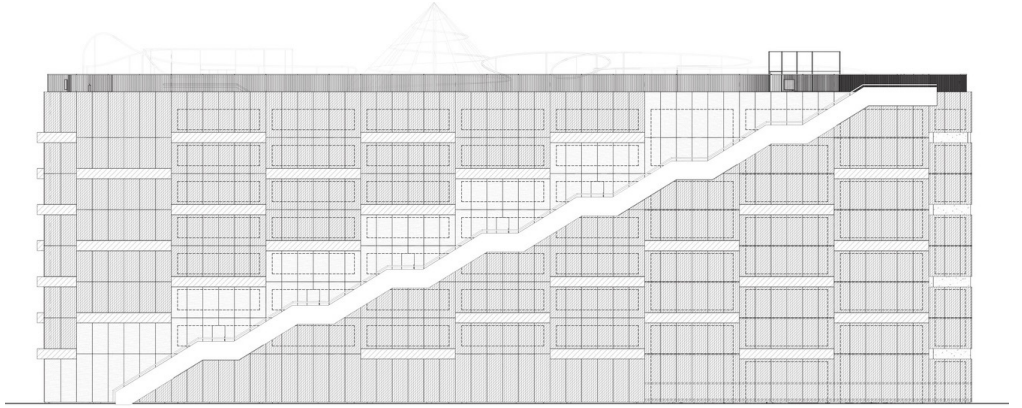


**JAJA ARCHITECTS**
PROJECT TITLE: EN: Park 'n' Play

# PARK 'N' PLAY

drawings.





# typology.

**01**

Green Roofs & Renewable Energy

**02**

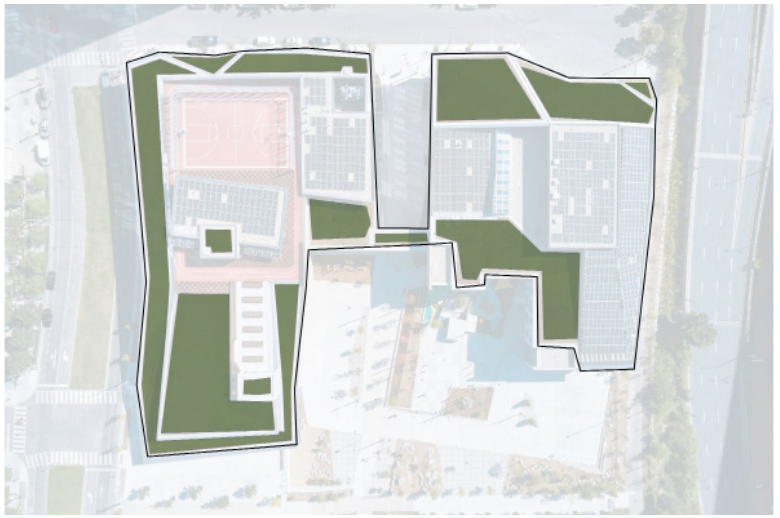
Light, Form & Agriculture

**03**

Circulation & Facade

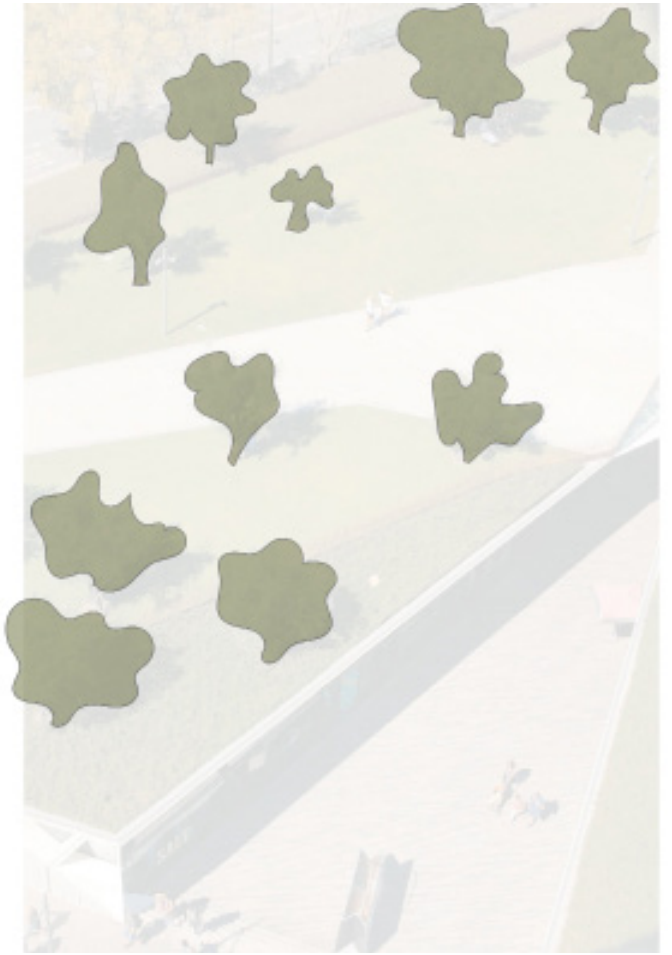
# green roofs & renewable energy.

01



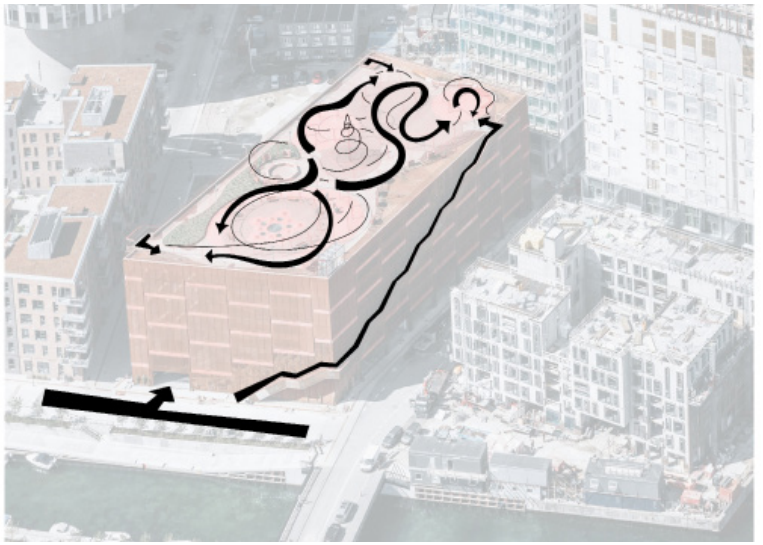
# light, form & agriculture.

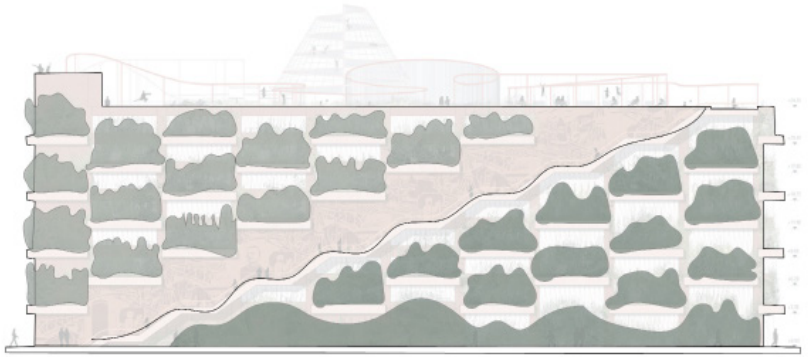
02



# circulation & facade.

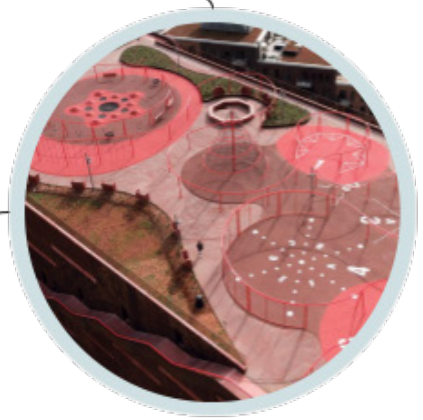
# 03





Green Roofs

Public Space



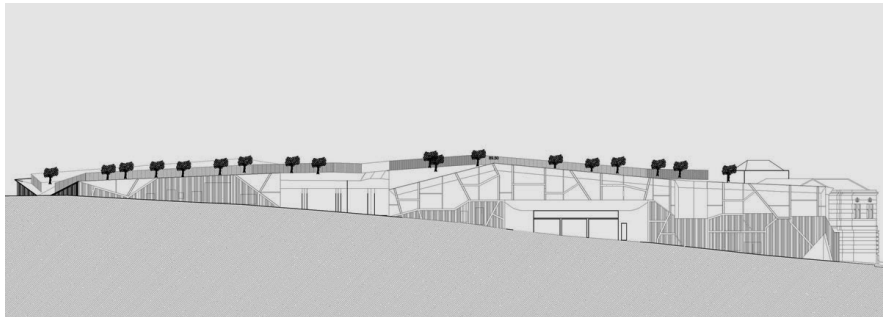
The exploration of Green Infrastructure

Vegetation

Sustainable

Retail Spaces

# critical stance.



As cities become more dense, the built environment generally prioritizes efficiency over ecological concerns, with buildings being constructed without our environment in mind. These mass structures lack green spaces and prioritize cheap and easy construction methods and materials, which lead to an increase in urban heat and agricultural loss. My thesis will examine green roofs as a regenerative strategy and adaptive reuse that extends beyond their conventional use. Green roofs are normally recognized for their environmental benefits whilst their integration into urban infrastructure often remains superficial. The main question is: How can green roofs be designed as multifunctional urban spaces that enhance both environmental and social factors? Instead of being used as plain green surfaces, they can serve as active infrastructures by supporting biodiversity, urban agriculture, public engagement, and climate adaptation. Studies have shown that green roofs can reduce heat island effects, reduce pollution, and even improve energy efficiency of buildings. I'm interested in the adaptive reuse of building rooftops and how they could be transformed into a usable space and something that heals our environment and betters the lives

# thesis diagram.

My thesis diagram represents green roofs with the lines above imaginary buildings, representing the use of green spaces and how it has significant ties with nature and pulls back a bit from the built environment, which seems to be becoming more and more dull as the years go by. The line above covering the buildings is there to represent that these green roofs can truly blend the built environment and urban architecture with nature as a whole, whist being a very sustainable option for rooftop design.

# thesis statement.

## *My thesis*

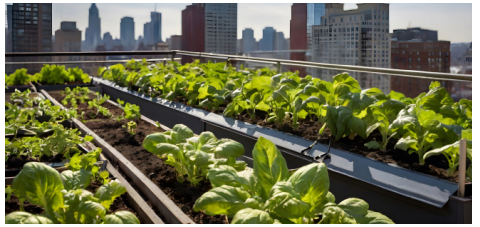
*will examine green roofs as a regenerative strategy and adaptive reuse that extends beyond their conventional use.*

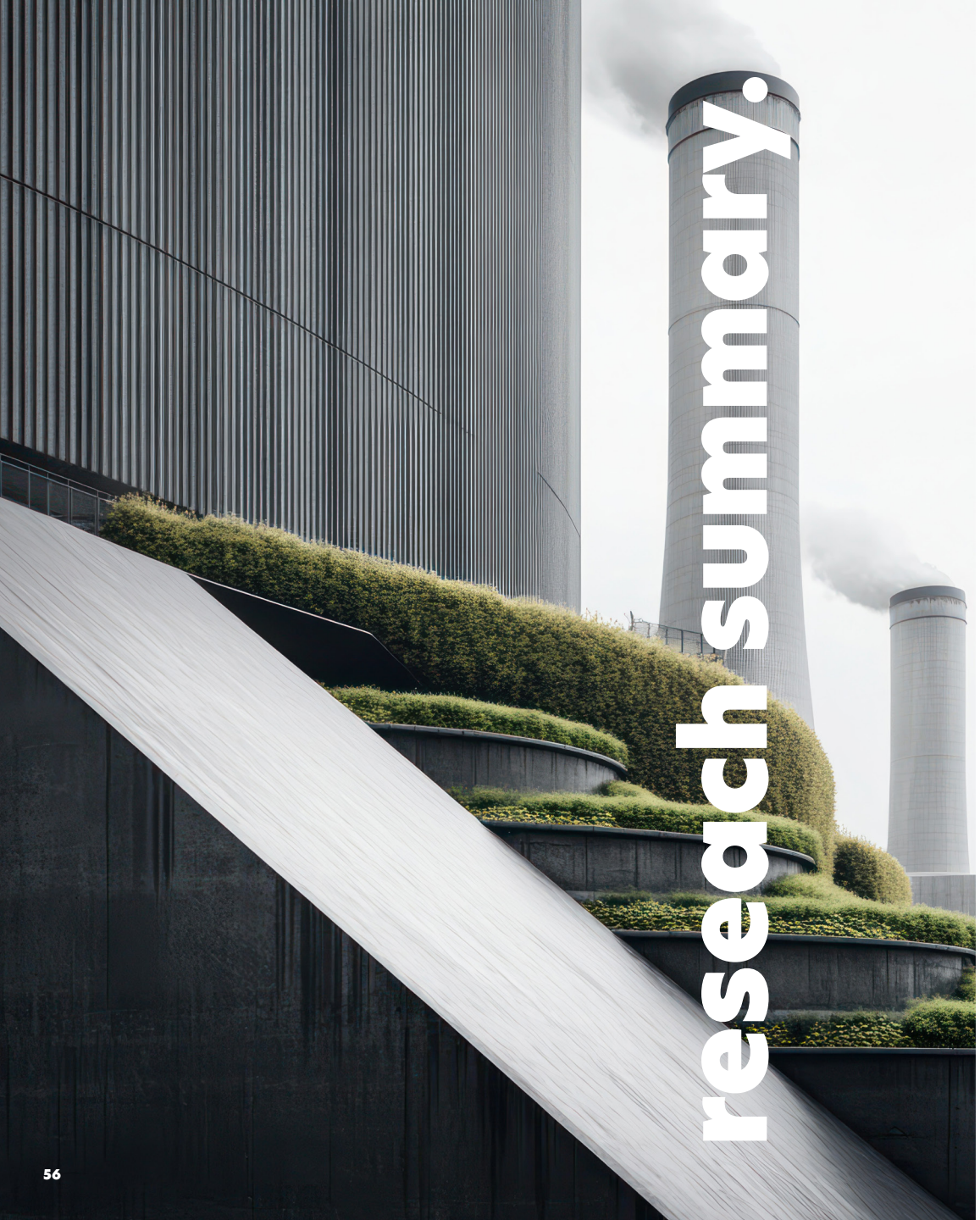
# design intent.

## *My design intent*

*is to reuse building rooftops, implementing greenery in the form of parks, rooftop gardens & crop farms to help foster an environment that brings communities closer to nature & will ultimately help better the built environment.*

# visual essay.





# research summary.

Initially, I was interested in urban spaces with green initiatives in mind. This interest led to a deeper search into green roofs. With technological advancements in our urban environments, there has been an increase in the use of green spaces to counteract the lack of biodiversity that exists in these dense urban cities all over the world. Efforts around the world from the likes of small architects or larger architecture firms are becoming more common, and each year there is an increase in the number of green roofs in dense urban cities. These green roofs have many different use cases. Some roofs are designed for the sole purpose of helping with rainwater management, and some are designed with athletics and human usability in mind. The projects in which I have researched have shown that these different use cases can be adapted into existing or new buildings. The project by Pedro Balonas | Balonas & Menano has been a major inspiration for me throughout our thesis development journey. The project was built to be used as a public space in Porto, Portugal, where people can interact with local markets in the bottom portion of the building or enjoy the grass rooftop, where there is a patio and olive trees which are spread all over the rooftop. After visiting this location in real life, the goal of the project was very clear: the redesign of this block, which is now the Praça De Lisboa, was designed as a cultural homage to the numerous amounts of olive trees and the flea market which was once there. The project in itself was designed to stand out from its surroundings whilst still giving back to the environment and the surroundings of its location. By researching projects like this, I realized just how important the connection between us and our surroundings is. The greatest and longest connection we humans have to our surroundings is nature. Nature can be seen as the greenery around us this can be from the likes of a park, garden or rooftop filled with grass. Anything green, anything to do with nature, in conjunction with design, connects us on a deeper level with our surroundings. In recent times, our built environment has become very dull, and to help with that, I have considered designing adaptive reuses of built environments that implement green spaces in the form of parks, grass patches or even gardens. The end goal is to mitigate the pollution on our environment, the use of gardens, green parks and grass patches on rooftops would help foster biodiversity and ultimately reduce the carbon footprint of these said buildings while providing a greater, deeper interdisiplinary connection between our built environment and nature as a whole.

# bibliography.

## Living Architecture Monitor.

*Olive, A. N. (2021, June 29). A historic square revitalized with an olive grove green roof in Porto, Portugal. Living Architecture Monitor. https://livingarchitecturemonitor.com/articles/a-historic-square-revitalized-with-an-olive-grove-green-roof-in-porto-portugal-su21*

This article explores the transformation of a historic square in Porto, Portugal, through the implementation of a green roof designed with olive trees. The project emphasizes the integration of ecological design with cultural heritage, highlighting how green infrastructure can enhance urban spaces both aesthetically and environmentally. It also illustrates how such interventions contribute to urban biodiversity, climate resilience, and community well-being. This article was used as for information regarting the cite context, architects, and year built and also served as a source for a succesful adaptive reuse of historic urban site.

## Praça de Lisboa
## by Balonas & Menano.

*Balonas & Menano - Architectural and Urban Concept. (2013). Praça de Lisboa. Architizer. https://architizer.com/projects/praca-de-lisboa/*

This project by Balonas & Menano focuses on the revitalization of Praça de Lisboa in Porto, Portugal. The design introduces a new topography that integrates an urban garden ontop of a semi-covered commercial street, effectively connecting different levels of the cityscape. The green roof, with olive trees, pays homage to the historical "Porta do Olival" (Olival Gate), blending cultural heritage with modern urban design. This project was used for cite contexts, drawings & information on the olive trees.

## Planning, Designing & Managing Green Roofs.

*Balonas & Menano - Architectural and Urban Concept. (2013). Praça de Lisboa. Architizer. https://architizer.com/projects/praca-de-lisboa/*

This article presents a review examining the relationship between green roofs & green walls. The authors identify key ways through which these green infrastructures contribute to urban well-being, including temperature regulation, air pollution reduction & noise mitigation. This resource was used to gain further insight on green roofs for urban design used to enhance public health and the overall outcomes and quality of spaces.

**JAJA Architects**
**Park ‘n’ Play, ArchDaily.**

*JAJA Architects. (2017, December 7). Park ‘n’ Play. ArchDaily. https://www.archdaily.com/884956/park-n-play-jaja-architects*

This publication by ArchDaily covers Park ‘n’ Play, a creative project by JAJA Architects in Copenhagen that turns an ordinary parking garage into something much more exciting. The building features a playful green façade made up of plant boxes and a rooftop space that’s open to the public. this cite was used for photos, architect information, year built and location.

**ZAS Architects**
**Canoe Landing Community Centre.**

*ZAS Architects. (2017). Canoe Landing Campus: Community Centre, Elementary Schools, Childcare. ZAS Architects + Interiors. https://www.zasa.com/canoe-landing-project*

This publication shows the Canoe Landing Campus in Toronto, a medium scale multi million dollar project designed by ZAS Architects to address the need for social and educational infrastructure in the city's downtown core. The campus integrates a community recreation centre & elementary schools within a single innovative complex. Developed through collaboration between the City of Toronto and two school boards, the project emphasizes community engagement, urban design excellence, and sustainability throught green rooftop spaces and solar. This source was used to research the Canoe landing project and what it was built for aswell as photos.

## Delirious New York
## A Retroactive Manifesto for Manhattan.

*Koolhaas, R. (2009). Delirious New York: A Retroactive Manifesto for Manhattan. https://monoskop.org/images/8/81/Koolhaas_Rem_Delirious_New_York_A_Retroactive_Manifesto_for_Manhattan.pdf*

In Delirious New York, Rem Koolhaas takes a deep and imaginative dive into the history of Manhattan, framing the city as a kind of accidental laboratory for urban experimentation. He looks at everything from the chaos of Coney Island to the rise of the skyscraper, arguing that the city's density gave birth to a unique architectural culture he calls "Manhattanism." this source was uses as a reading activity throughout the first few weeks of class also served as a introduction to key consepts.

## Understanding Sustainable Architecture.

*Bennetts, H., Radford, A., & Williamson, T. (2002). Understanding Sustainable Architecture. Taylor & Francis. https://ebookcentral.proquest.com/lib/oculocad-ebooks/reader.action?docID=180763&ppg=2*

In this book, the authors delve into the key concepts of sustainable architecture these concepts provide knowledge that inform the design of sustainable buildings and other sustaiable developments. They argue that for sustainable architecture to be truly meaningful, it must be rooted in a solid theoretical framework. This book was used to further learn the theoretical frameworks of sustainable architecture as a whole.

# photo bibliography.


*Adobe Stock.* (n.d.). ***Pollution and green roofs*** [Photograph]. Adobe Stock. https://stock.adobe.com/ca/images/pollution-and-green-roofs/1312618546

*Adobe Stock.* (n.d.). ***Sky garden on private rooftop*** of condominium or hotel high-rise architecture building with tree, grass field, and blue sky [Photograph]. Adobe Stock. https://stock.adobe.com/ca/images/sky-garden-on-private-rooftop-of-condominium-or-hotel-high-rise-architecture-building-with-tree-grass-field-and-blue-sky/483600500?prev_url=detail

*Adobe Stock.* (n.d.). ***Lisbon square*** seen from bell tower of Clerigos Church in Porto, Portugal [Photograph]. Adobe Stock. https://stock.adobe.com/ca/images/lisbon-square-seen-from-bell-tower-of-clerigos-church-in-porto-portugal/603508962?prev_url=detail

*Adobe Stock*. (n.d.). ***Aerial view of modern buildings*** with green roofs and solar panels promoting sustainable architecture and urban living [Photograph]. Adobe Stock. https://stock.adobe.com/ca/images/aerial-view-of-modern-buildings-with-green-roofs-and-solar-panels-promoting-sustainable-architec-

*Adobe Stock.* (n.d.). ***New York skyline in grey scale*** [Photograph]. Adobe Stock. https://stock.adobe.com/ca/images/new-york-skyline-grey-scale/307130625

*Gire*, D. (2011). ***Tree factory*** [Digital artwork]. DeviantArt. https://www.deviantart.com/dustingire/art/Tree-Factory-216679407

*Google Images.* (n.d.). ***New York with green strip***[Photograph]. Retrieved Month Day, Year, from https://images.app.goo.gl/r6rSkK8dSx51XaxJ9

# thinking green