Site Analysis





Site's Urban Grain







Within the summer period, Porto has an average of 9.9 hours of sun per day. Whereas in the winter this then drops down to an average of 4.0 hours of sun per day.

The average temperature of the coldest month (January) is of 10.2 C, and the warmest month (August) is of 19.9 C.

Rainfall is quite abundant, it amounts to 1,255 millimetres per year. It ranges from 20mm in the driest month (July) to 195mm in the wettest one (December).

To the north of the site Sao Bento train station is situated. And to the south of the site is The Porto Cathedral (Se Do Porto).

Light and Noise Pollution Mapping

Site Photos













Brief Narrative









With the population increasing in addition to the lack of space, cremation



Global Population Growth

Porto's Population Growth

is becoming a more suitable and preferred method of honouring a lost loved one, where it's now being highlighted that there are methods of what you can do with those cremated ashes. Encouraging people and bringing more attention to the methods. However, this raises the question of the future of memorialising a person, such as through technology, considering its presence and how it's integrated into our day-to-day lives. But in general, the overall process of losing a loved one should be a more talked-about subject and treated as a celebration of life, rather than something taboo and avoidable.

I feel that if a building incorporated the visitor more into the process and experience of the celebration, it can become a beautiful celebration and personal experience catered to that person.

Design Development



Process of Death and after life memorialising





Space Translation Refined:

- 1 Open Spaces
- 2 Rooftop Garden
- 3 Core
- 4 Immersive Projection Room
- 5 Vinyl Workshop
- 6 Jewellery Workshop
- 7 Digital Walkways
- 8 Event Space
- 0 Cromotorius



9 - Crematorium

I wish to incorporate both physical workshop spaces where the visitor can be involved in the process of creating physical memorials of a loved one. In addition to being taken through a digital experience that takes you through that person's life and the things they loved. Using technology as a tool to best create and fully immerse the visitor into an atmosphere that can best capture that.

The memorial garden aims to encourage visitors to contribute and scatter ashes of a loved one in this beautifully maintained garden, which helps in the process of fertilizing the plants and creating a beautiful space to honour a loved one. My brief aims to provide a building that offers event services while incorporating the process of memorialising a person into the event and experience for the visitor.

Precedents



Art's Centre by Wutopia Lab, China

Wutopia Lab's Art Centre and the New Art Museum incorporate a mesh facade within their design, which is encased over a solid structure, creating a cloak-like appearance. Resulting in the structure looking more monumental. Which is what I aim to create within my design. Where I will have openings that leak light and space through the mesh facade to allow for windows and terrace openings to be created. Creating the perfect balance between privacy and open space.

For Lea's Field, the main building includes a foyer space, chapel, and crematorium, while in the wider site, a new memorial facility known as the 'remembrance court', which has incorporated the 'Book of remembrance' and 'Flowers Room'. The garden of remembrance is a communal garden open to all visitors. The visitors can scatter an amount of the ashes they have within a scattering area, which helps contribute to the fertilisation of the plants and helps return it to the earth.







New Art Museum / SANAA, New York

Lea Field's Crematorium, Lincolnshire, UK

Design Development



Axonometric of floor plates



Concept of floor plates

1. Memorial Gardens

- 2. Jewellery Workshop
- 3. Digital Memorials
- 4. Vinyl Workshop
- 5. Smaller Ceremonial Room 6. Larger Ceremonial Room
 7. Open Space
 8. Crematorium
- 9. Entrances

Planting

Ceremony Spaces

Design Development of Spaces

Physical Memorial **Open/**Public Workshops

Digital Memorials

Crematorium/ Entrances

As each floor plate progresses up, I have designed my building to have a corner of each floor sliced off as it moves upwards, which provides opportunities for terraces to open up the space more to its surroundings.

Contextual Aerial View (North East)





- Key: 1. Garden Entrance 2. Main Entrance / Atrium 3. WC 4. Core

- 5. Seating Area 6. Staff Room 7. Reflection Space 8. Crematorium

- 9. Ash Room 10. Storage Room 11. Vehicle Area 12. Upper Entrance/ Reception Area





Second Floor Plan (1:200)



Key:

1. Entrance 3 / Reception Area5. Waiting Area2. Disabled WC6. Workshop Space3. Core7. Ceremony Space

4. Digital Walkway

8. Terrace

9. WC





Fourth Floor Plan (1:200)



Key: 1. Digital Walkway 2. WC 3. Core 4. Waiting Area

5. Ceremony Space
6. Terrace
7. Workshop Space
8. Outside Seating Area





4. Rooftop Garden Space



East Section (1:200)



Longitudinal Section (A-A) Key: Rooftop Memorial Garden
Terrace

Ceremony Space
Digital Walkway
Reception Area/ Upper Entrance

6. Reflection Space
7. Seating Area
8. Main Entrance / Atrium

9. Garden Entrance



North Section (1:200)



Transverse Section (B-B) Key: 1. Rooftop Memorial Garden 2. Workshop Space

Ceremony Space / Terrace
Digital Walkway
Waiting Area

Opper entrance
Crematorium

8. Seating Area

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East Elevation (1:200)



North Elevation (1:200)



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Materiality and Embodied Carbon Calculation





Cross Laminated Timber



Render Finish



Stainless Steel Frame For Mesh Facade



External Timber Cladding

Rockwool Insulation



Triple Pane Windows



Green Concrete

Embodied Carbon Calculation (Global Standard EN15978) (Stages A1-A5)

	Embedied Option		Mahama of material Hand	
Material description	(kig/m3)	Embodied Carbon KgCO2e/m3	volume or material Used m3	TOTAL Embodied Carbon Materials
Aluminium (nolvester nowder costed)	2700	36484	0	0
Aluminium (virgin)	2700	31540	0	0
Aluminium (ceneral)	2700	22814	0	0
Brass	8700	22306	0	0
Glavinised structural steel	7850	17276	197626.88	3414288727
Aluminium (bar and rod)	2700	16636	0	0
Glass fibre Reinforced plastic (GFRP)	1500	14315	0	0
Glass fibre	2500	13327	0	0
Hot rolled structural steel	7850	11176	0	0
Intumescent paint for steel	50	5653	0	0
Zinc	7140	4340	0	0
PVC	1380	2814	0	0
Flat glass	2500	2823	1951.872	5510305
Clay Bricks	2400	1271	0	0
Viroc® Cement Bonded Particle Board	1350	948	0	0
MDF (without sequestration)	700	600	0	0
Granite/Basalt/Marble	2600	541	0	0
Concrete 40 Mpa (unreinforced)	2400	495	11498.08	5692686
Plywood (without sequestration)	620	410	0	0
Concrete Blocks 7.3MPa	2050	372	0	0
Bitumen Elastomer	1000	343	66.816	22934
Light concrete (autoclaved aerated)	1000	338	0	0
Plasterboard	720	298	0	0
Glulam (without sequestration)	500	256	0	0
Hardwood (without sequestration)	700	215	0	0
CLT (without sequestration)	470	205	0	0
LVL (without sequestration)	500	195	0	0
Limestone	2500	176	0	0
Natural Stone	2500	176	0	0
Sandstone	2400	171	0	0
Rigid Insulation	30	142	0	0
Vapour barrier (polyethylene)	900	128	6.7885056	870
Fiber Felt	25	118	0	0
Softwood (without sequestration)	420	110	0	0
Rockwool	45	35	1113.6	39267
Hempcrete	300	-110	0	0
Thermacork Insulation	115	-133	0	0
MDF (with sequestrtion)	700	-299	0	0
Plywood (with sequestration)	620	-377	0	0
Glulam (with sequestration)	500	-450	0	0
CLT (with sequestration)	470	-484	555784.74	-269090157
Softwood (with sequestration)	420	-430	0	0
LVL (with sequestration)	500	-650	0	0
Hardwood (with sequestration)	770	-700	0	0

In my design, I have reduced the carbon impact by designing my building's main structure to be CLT instead of steel or concrete. **CLT can reduce global warming by 26.5% compared to concrete.**

The framing for the mesh facade, which is made of stainless steel, can be recycled and reused.

Green concrete requires less energy for production, producing less carbon dioxide. More durable and requires less maintenance, increasing longevity. **Has a carbon footprint 90% lower than regular concrete.**

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Structural Strategy





Key: 1 - External Wall Layers 2 - Rooftop Garden Floor Layers 3 - Stainless Steel Frame 4 - Expanded Metal Mesh

Environmental Strategy



Axonometric Strategy Diagram



My planting can be used to help boost the biodiversity of both plants and habitats.

This is a known struggle for areas found within cities. The plants and building will also allow for rainwater harvesting. Using catchment drains underneath the planting and sloped coping on the roof allows the rainfall to fall and be collected in an underground storage tank. Which, when filtered can then be recycled and used within facilities such as the bathrooms. Creating a recycling and reuse system.

In addition, the pathway in my garden entrance is permeable paving allowing water to soak through the

surface.

The cremated ashes can be scattered in small amounts among the soil to help the fertilization process of plants. This process requires a formulated organic soil planting mixture that will lower the pH while safely diluting the sodium of the cremated ashes.



External View



Internal View



Internal View



External View



1:50 Model

My model demonstrates the expanded metal mesh materiality and the structure of my facade. While showing the relationship between the terrace and the facade.













1:50 Bay Study

Key:

1 - Aluminium Coping	9 - Tilt & Turn Window
2 - Facade:	10 - 300 mm CLT
- Expanded Metal Mesh Panels	11 - Fixed Lighting
- Fixed with stainless steel clips	12 - External Timber Slabbed decking
- 100 mm Mounting anchor and beam connector (Stainless Steel)	13 - Fire Stop every floor
- 100 mm Supporting Vertical Beam (Aluminium)	14 - Maintenance Area
3 - Timber Cladding	15 - LED Screen Wall
4 - Rooftop Garden Layers:	16 - Internal Flooring:
- 100 mm Soil Layer	- 50 mm Floor Panels
- 15 mm Sand Layer	- 200 mm Raised Access Floor
- 15 mm Polyethylene drainage mesh	- Height Adjustable Feet
- 30 mm Paver's to protect water proof layer	- Floor Grille
- 19 mm Sand Layer	17 - Brick
- X2 Layers heat welded bituminous water proof membrane	18 - Water Proof Layer
5 - 15 mm Render Finish	19 - Concrete Slab
6 - Fixed Window	20 - 50 mm Blinding
7 - Breathable Membrane	21 - 150 mm Hardcore
8 - 200 mm Bockwool Insulation	







1:50 Perspective Section (A-A) Key: 1 - Rooftop Memorial Garden 2 - Terrace 3 - Ceremony Space 4 - Digital Walkway 5 - Reception Area/ Upper Entrance 6 - Reflection Space 7 - Seating Area 8 - Main Entrance/ Atrium 9 - Garden Entrance