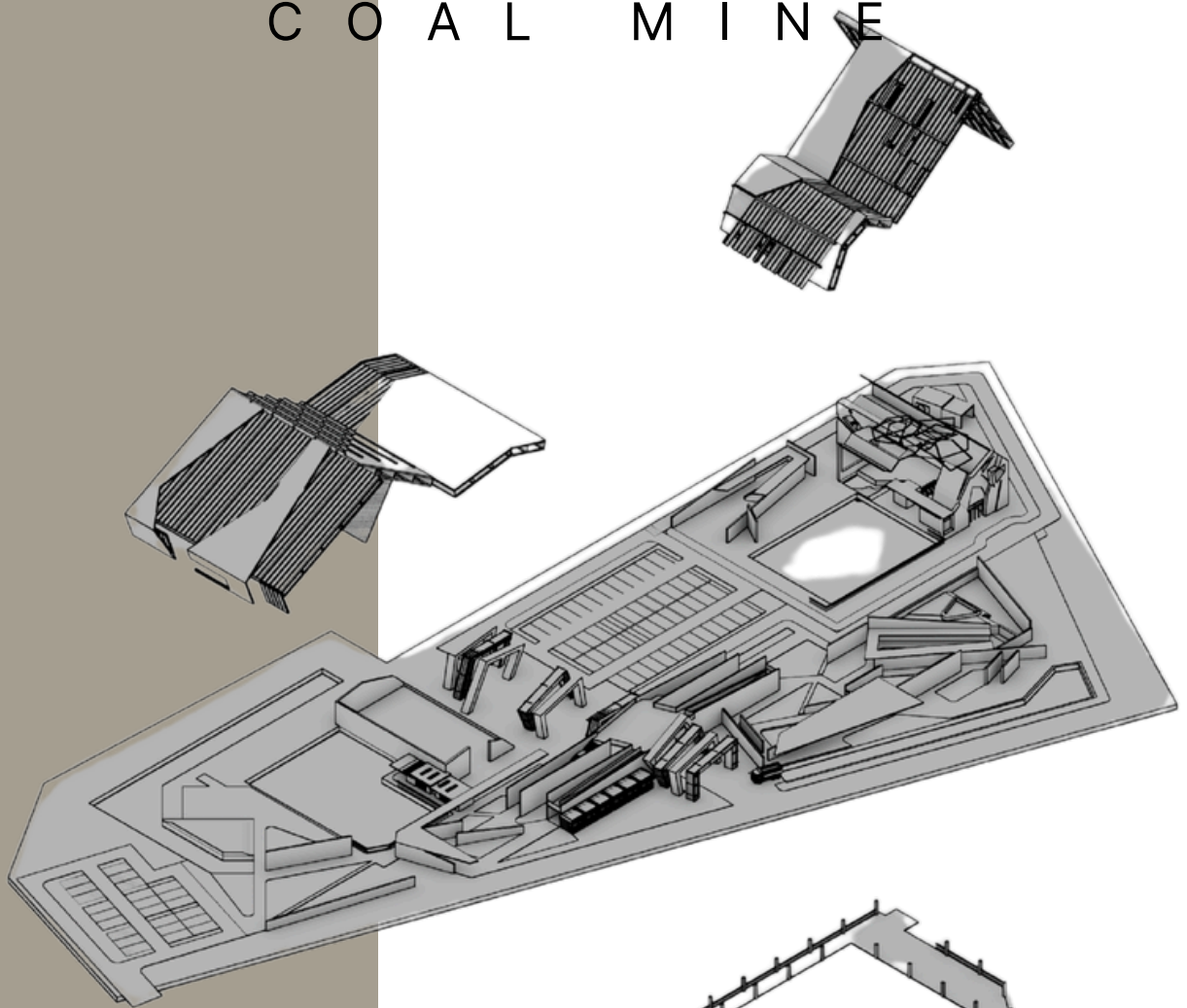
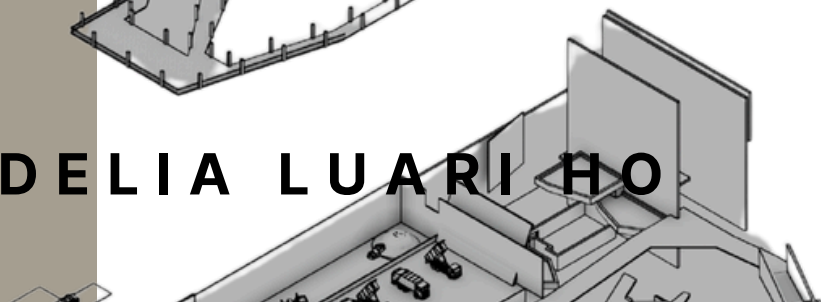


T H E
DESCENT

C O A L M I N E



O D E L I A L U A R I H O



Acknowledgement

I would like to thank the lecturer at City University for the drive and passion that pushed me to complete the architecture boards and the report. Special thanks to the studio master of Studio 5, Sir Mohammad Amirshah Bin Sharuddin for his belief in the student's ability. Thanks to your knowledge, I could handle the research and showcase results.

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Table of Contents

1.0 INTRODUCTION	2
1.1 Background and personal information	2
1.2 Objectives of the project	2
1.3 Project location and its cultural significance	3
1.4 Project timeline overview	4
2.0 INITIAL TOPIC EXPLORATION	8
2.1 Introduction to the three options: Manufacturing, Agriculture and Mining	8
2.2 Why Coal Mining?	9
2.2.1 Personal interest	9
2.2.2 Cultural richness	9
2.2.3 Relevance to Batu Arang’s tourism identity	9
2.3 Preliminary research on Coal Mining	10
2.3.1 Origin and history	10
2.3.2 Coal Mining in Malaysia and Batu Arang	10
2.3.3 Coal Mining process	10
3.0 CONCEPTUAL PHASE	12
3.1 Introduction to “Subtractive Massing” as design approach	12
3.2 Idea behind “Subtractive Massing” concept	13
3.3 Key components of the regeneration center	17
3.4 Industrial spaces	19
3.5 Activity flow and spatial zoning ideas	21
4.0 SITE ANALYSIS	24
4.1 Site location: Batu Arang	24
4.2 Accessibility and transportation	26
4.3 Topography and terrain analysis	28
4.4 Climate and sun orientation	29
4.5 Wind direction and ventilation	30
4.6 Views and context (natural and built environment)	31
4.7 SWOT analysis of the site	32
4.8 Design implications from site findings	33
5.0 DESIGN DEVELOPMENT OF THE CENTRE	35
5.1 Form discovery process	35
5.2 Zoning layout on the site	36
5.3 Programmatic distribution	38
5.4 Massing development	40
5.5 Inspiration and architectural language	42
5.6 Reference projects	43
5.7 Modern architecture	45

6.0	FINAL DESIGN	47
6.1	Site plan	47
6.2	Ground/Floor plans	48
6.3	Elevations	51
6.4	Sections	52
6.5	Perspective views (3D renderings/sketches)	54
6.6	Material palette and local relevance)	57
6.7	Sustainability and passive design features	58
6.8	Cultural storytelling through architecture	60
7.0	CENTRAL LIGHT WELL	62
7.1	Introduction to Light Well	62
7.2	Design inspiration	64
8.0	REFLECTION	66
8.1	Challenges faced	66
8.2	How I overcame them	66
8.3	Personal growth as a designer	67
8.4	What I would do differently or improve	67
9.0	CONCLUSION	69
9.1	Summary of the project's purpose and design journey	69
9.2	Final thoughts on the importance of cultural preservation through architecture	69
10.0	APPENDIX	71
10.1	Working drawings	71

CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

1.1 BACKGROUND AND PERSONAL INFORMATION

With the many choices of sites and industries, a historical coal mining town called Batu Arang stood out the most. The beginning of the semester started with three industries being presented to the studio: Manufacturing, Agriculture and Mining. Based on the previous projects done circulating around agriculture, I spread my wings into the Mining industry. Each site presented with a different mineral or rock. Compared to the tin and limestone, coal had unfamiliar usages, history and local identity. A material that most people knew on the surface level but I believed I could dig out the rich emotions and spirit of coal specifically related to the Batu Arang region.

This project presented the opportunity for me to learn more about construction related to brutalist or industrial architecture, deviating from the usual timber structures. It challenges conventional perceptions by turning industrial facilities into community-oriented spaces. It was important to find the balance of preserving the local history yet creating inspiration and awareness for the newer generation. Coal mining is a topic related to the industrial revolution of the entire world. It comes with victorious and hard to swallow memories. I am honored to present this topic through the language of built environment.

1.2 OBJECTIVES OF THE PROJECT

The following are the project's main goals

- Transform mining history into an educational and spatial experience
- Link past of coal extraction to future innovation of waste regeneration
- Convert waste into energy without combustion for a sustainable approach to waste management
- Reduce noise, odor, and visual disruption
- Employ passive environmental systems such as natural ventilation and daylighting
- Incorporate historical sensitive design based on region
- Guarantee accessibility so everyone regardless of status, age and wellbeing can immerse

1.3 PROJECT LOCATION AND ITS CULTURAL SIGNIFICANCE

Batu Arang, a heritage town known for its coal mining history, is the focus for the project. During the British Rule, Batu Arang was one of the busiest towns in Selangor, Malaysia. It was once the second largest town in the Gombak district. In the 1900s, Batu Arang rose up in the industrial revolution. The evidence of this history remains in the form of past mining sites, lakes and artifacts. The land itself has been filled with soil to counter past surface mining activities. This industrial heritage provides a strong foundation for a design concept.

The cultural significance of the site lies in its identity as a coal extraction area. It played a huge economic role for the region due to the energy-producing capabilities. This project reinterprets that legacy through a sustainable method with current world problems. This forms a dialogue between the past and present.

HISTORICAL TIMELINE

Coal found by **Haji Abdul Hadi** while he was prospecting for tin near Rawang.

1908

A study revealed that mining was commercially viable.

1910

Town was founded.

1911

Rawang Federated Malay States Coal Syndicate was the first company to mine coal.

1913

British coal miner, John Archibald Russell, formed the Malayan Collieries Ltd to start mining operations.

Rawang Federated Malay States Coal Syndicate was sold to MCL.

1915

The Kuang-Batu Arang railway system linking Batu Arang and Kuang was built to transport coal to the rest of the country.

MCL produced bricks and clay supplies, opening a sawmill, plywood mill and a cement factory.

1920

Batu Arang grew rapidly with new shops, schools, and residential areas to accommodate the growing population.

MCL also built amenities for workers such as a hospital and

Batu Arang became the major economic centre in Malaya.

1930

Earned the nickname "Mini Gold Hill".

Coal production peaked when Batu Arang produced 781,509 tons of coal.

1936

Workers went on strike and 6000 people demonstrated in public.

1937

Miners managed to retake control of the mine from the British masters for a short time.

1942

Japanese occupation during World War II.

Mining halted under British rule; rail and power infrastructure are damaged.

Japanese forces repair and restart mining but focus only on surface mining.

1950

Decline in demand for coal due to the rise of petroleum as a cheaper fuel source.

1960

Mining operations ceased permanently.

2011

Granted heritage town status.

CURRENT

1.4 PROJECT TIMELINE OVERVIEW

The development of this project follows from conceptual to the final architectural drawings. It is a gradual process of 18 weeks of the semester. The lecturer gave benchmarks for us to achieve with three crits. It is a gradual process of discovery through site analysis, research, conceptual exploration and massing development. Subsequent stages include spatial planning, technical solving and integration of sustainable systems. Final stages develop the idea into architectural drawings, visual perspectives and comprehensive design proposal.

Week	Progress
Week 1	Introduction to the Studio 05 Design Brief, followed by the formation of teams of two to share and analyse a common site.
Week 2	Conducted extensive preliminary research on project issues, supported by ten butter paper studies and documentation of local authority planning guidelines to establish regulatory context
Week 3	Developed large-scale research outputs, including A0 boards on coal mining history and site analysis of Batu Arang, later printed in A3 format for review and feedback.
Week 4	Constructed a physical site model of Batu Arang and produced multiple site analysis diagrams to better understand spatial and environmental conditions.
Week 5	First design critique (Crit 01), receiving feedback that informed subsequent improvements in concept development and spatial clarity.
Week 6	Briefing for Crit 02, focusing on advancing design development and refining project direction.
Week 7	Initiated space planning through bubble diagrams, establishing relationships between key programme components.
Week 8	Explored design concepts through the production of 14 conceptual mock-ups and one spatial planning model to test form and massing strategies.
Week 9	Developed technical drawings using AutoCAD alongside a 3D model in SketchUp to visualise spatial configurations.
Week 10	Conducted interim consultations for design refinement and technical coordination.
Week 11	Second design critique (Crit 02), focusing on spatial resolution and overall project development.
Week 12	Briefing for Crit 03, outlining final expectations and presentation requirements.
Week 13	Introduction to fire safety design principles, including compliance with relevant regulations and integration into the project.
Week 14	Completed working drawings for floor plans and elevations.
Week 15	Completed sectional drawings and detailed blow-ups to illustrate construction and spatial relationships.
Week 16	Prepared fire safety (BOMBA) drawings, ensuring compliance with regulatory requirements.
Week 17	Drafted two A0 presentation boards, consolidating all design information and visual outputs.
Week 18	Finalised and completed the two A0 boards for final submission and presentation.

Final Presentation Board

THE DESCENT
A Subterranean Exploration of Coal, Profit and Regeneration

CONCEPT
The project is a subterranean exploration of coal, profit and regeneration. It is a multi-story building with a large, open-plan interior space, designed to be a hub for the community and a place for people to work, live and play.

MATERIAL
The building is designed to be a hub for the community and a place for people to work, live and play. The materials used are concrete, brick, wood, and metal.

ANALYSIS
The building is designed to be a hub for the community and a place for people to work, live and play. The analysis includes site analysis, conceptual drawings, and floor plans.

CONCLUSION
The building is designed to be a hub for the community and a place for people to work, live and play. The conclusion includes a site plan, a conceptual drawing, and a floor plan.

FOR THE FUTURE
The building is designed to be a hub for the community and a place for people to work, live and play. The future includes a site plan, a conceptual drawing, and a floor plan.

SUSTAINABLE DESIGN
The building is designed to be a hub for the community and a place for people to work, live and play. The sustainable design includes a site plan, a conceptual drawing, and a floor plan.

SOCIAL REGAIN DIAGRAM
The building is designed to be a hub for the community and a place for people to work, live and play. The social regain diagram includes a site plan, a conceptual drawing, and a floor plan.

COAL HISTORY IN MALAYSIA
The building is designed to be a hub for the community and a place for people to work, live and play. The coal history in Malaysia includes a site plan, a conceptual drawing, and a floor plan.

COAL MINING OPERATIONS
The building is designed to be a hub for the community and a place for people to work, live and play. The coal mining operations include a site plan, a conceptual drawing, and a floor plan.

COAL TREATED RESIDUE
The building is designed to be a hub for the community and a place for people to work, live and play. The coal treated residue includes a site plan, a conceptual drawing, and a floor plan.

CONCEPT
The building is designed to be a hub for the community and a place for people to work, live and play. The concept includes a site plan, a conceptual drawing, and a floor plan.

MATERIAL
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Final Presentation Board

3D CUTAWAY: A detailed perspective view of the building's structure, showing the roof, interior spaces, and surrounding landscape.

ELEVATIONS:

- HIGH ELEVATION #1:** Shows the building's profile against a sky with clouds.
- HIGH ELEVATION #2:** Another view of the building's exterior.
- LOW ELEVATION #1:** A closer view of the building's facade.
- LOW ELEVATION #2:** Another view of the building's facade.

SECTIONS:

- TYPICAL SECTION:** A cross-section showing the building's internal structure and roof.
- SECTION A-A:** A section through the building, showing the interior and roof.
- SECTION B-B:** Another section through the building.

DIAGRAMS AND PLANS:

- VEGETATION:** A diagram showing the placement of trees and plants around the building.
- ROOF CONSTRUCTION:** A detailed diagram of the roof's structure and materials.
- PROGRAM DISTRIBUTION:** A diagram showing the layout of different rooms and spaces.
- VISION JOURNEY DIAGRAM:** A diagram showing the path of a person's view as they move through the building.
- AXONOMETRIC NIS:** A 3D axonometric view of the building's structure.
- FLOOR PLANS:** A series of floor plans for different levels, including Ground Floor, 1st Floor, 2nd Floor, 3rd Floor, 4th Floor, 5th Floor, 6th Floor, 7th Floor, 8th Floor, 9th Floor, 10th Floor, 11th Floor, 12th Floor, 13th Floor, 14th Floor, 15th Floor, 16th Floor, 17th Floor, 18th Floor, 19th Floor, 20th Floor, 21st Floor, 22nd Floor, 23rd Floor, 24th Floor, 25th Floor, 26th Floor, 27th Floor, 28th Floor, 29th Floor, 30th Floor, 31st Floor, 32nd Floor, 33rd Floor, 34th Floor, 35th Floor, 36th Floor, 37th Floor, 38th Floor, 39th Floor, 40th Floor, 41st Floor, 42nd Floor, 43rd Floor, 44th Floor, 45th Floor, 46th Floor, 47th Floor, 48th Floor, 49th Floor, 50th Floor.
- MEKA REQUIREMENTS:** A diagram showing the requirements for the building's design.
- FIRE SAFETY:** A diagram showing the fire safety measures for the building.
- DRINKING WATER:** A diagram showing the drinking water supply system.
- SEWER:** A diagram showing the sewerage system.

ACTIVITY SPACES: A grid of images showing various activities taking place in different parts of the building.

DESIGN MISSION: A list of design goals and objectives for the project.

CHAPTER 2

INITIAL TOPIC EXPLORATION

2.0 INITIAL TOPIC EXPLORATION

2.1 INTRODUCTION TO THE THREE OPTIONS: MANUFACTURING, AGRICULTURE AND MINING

Three thematic directions were introduced at the start of the semester: manufacturing, agriculture, and mining. Each theme had a subtopic and its own site exploring production-based or extraction-based architecture. The general idea looked at how built environments supported processes, systems and community engagement.

Manufacturing: Manufacturing emphasized craftsmanship. The subtopic given was clay, *songket* and wood carving. These have an existing artistic identity. They represent Malaysia's regional culture, generational legacy and pride. It is not just art but a stand on tradition. Some of these crafts have faded away with more efficient industrialization methods. However, preservation becomes a resistance against loss of heritage.

Agriculture: This industry started alongside the vernacular villages of Malaysia. It grew alongside and has expanded into many other uses rather than just food production. Rather, it developed into a multi-functional economic and cultural landscape. The options for this industry were palm oil, rubber plantation and *kopi tenom*, each representing unique typologies. All three serve a purpose economically, contributing to local livelihoods and national prosperity. So much so, some of them are exported.

Mining and quarrying: Exploring the extraction process, mining deeply affects landscape, history and future direction of a place. It shapes terrain, redefines ecological systems and leaves behind imprinted memories into locals. Abandoned sites can be repurposed into spaces for regeneration, homage and adaptive reuse.

Although each of the three choices had unique architectural requirements, they all presented interesting stories and spatial possibilities. The rationale behind selecting coal mining as the project's focal point will be covered in the following section.

2.2 WHY COAL MINING?

The selection of coal mining was due to the familiarity with coal at a shallow standpoint. Most understand coal as a combustible product but yet to explore coal in the context of its past timeline. Unlike manufacturing and agriculture, coal mining can physically and emotionally affect the identity of a site. It has the potential to generate a meaningful unique architectural narrative.

2.2.1 PERSONAL INTEREST

Considering my previous projects related to agriculture, I desired a challenge. Coal itself can derive many forms and design elements. It is jagged, dark in color and rough in texture. These qualities translate into an architectural vocabulary of fragmentation, contrast and tactility. I considered how to connect something perceived as harsh and industrial could tell a narrative and connect culturally.

2.2.2 CULTURAL RICHNESS

Coal mining pushed the entire world into an industrial revolution. It carries significance in being the fuel for creativity. Currently, when people see electricity, they think of unsustainable practices. On the other hand, when people saw coal, they think about the hard work of the miners. The cultural richness of coal lies in its ability to represent both human resilience and industrial ambition.

2.2.3 RELEVANCE TO BATU ARANG'S TOURISM IDENTITY

Particularly in Batu Arang, mining activities played a crucial role in shaping the town's development, economy, and identity. Miners during British rule did surface mining and underground mining which impacted the land, from open excavated terrains to concealed subterranean networks. This duality between surface and underground conditions contributes to the cultural richness of the site, where visible scars of extraction coexist with hidden histories. As such, Batu Arang represents a story shaped by labour, resilience, and transformation. By focusing on mining, the project contributes to this vision by creating an architectural platform that attracts visitors while educating them about the site's history and its transformation into a sustainable future.



2.3 PRELIMINARY RESEARCH ON COAL MINING

Preliminary research was conducted to understand coal mining as both a historical industry and a technical process. As stated before, this research was done in week 2 and written in butter papers. The research gave inspiration to the concept of the project as well as the potential activities hosted on site. It also deepened the relation of coal in context to Malaysia and Batu Arang.

2.3.1 ORIGIN AND HISTORY

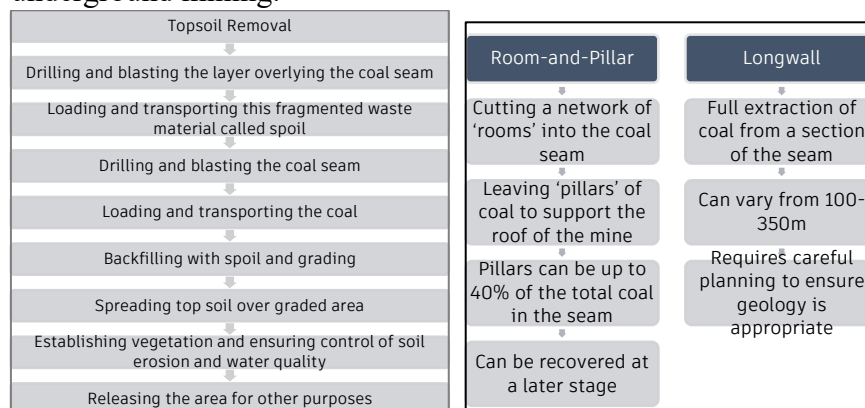
Coal is a fossil fuel formed from the remains of plant material subjected to heat and pressure over 290 to 360 million of years. This began during the carboniferous period where oxygen levels were double. Plant material was buried in stratified layers within the earth. The first record of coal being used was by cavemen for heating. In the 1900s, coal has been a major source of energy during industrial development, driving economic growth and urban expansion.

2.3.2 COAL MINING IN MALAYSIA AND BATU ARANG

In Malaysia, coal mining was primarily concentrated in Batu Arang, which became a key mining town. The site was developed with extensive infrastructure, including railway connections and worker settlements, reflecting its importance as an energy-producing hub. Over time, mining activities declined, leaving behind a landscape marked by lakes, open pits, and underground tunnels, which now serve as historical and environmental features.

2.3.3 COAL MINING PROCESS

Coal extraction typically involves two methods: surface or open-cast mining and underground tunnelling. Open-cast mining removes surface layers to access coal seams, resulting in large excavated landscapes, while underground mining involves the creation of tunnel networks to reach deeper seams. Batu Arang employed both of these. In the diagram below, the left indicates the steps of surface mining and the right lists the two options for underground mining.



These processes informed the architectural approach of the project, particularly in the use of excavation, layering, and spatial compression to reflect the experience of mining.

CHAPTER 3

CONCEPTUAL PHASE

3.0 CONCEPTUAL PHASE: PROGRAMMING SUBTRACTIVE MASSING

These terms of form before function or function before form can be found in architecture. Most of my projects will automatically go to function before form. Compare it with “Bongkah” which focuses on adding to the form-making, Subtractive Massing is driven by removal and carving of mass to emerge spaces. This approach prioritizes clarity, efficiency, and logical planning, ensuring that the architecture performs effectively before it performs visually. The spaces carved out are already developing the design that is both conceptually driven and spatially responsive.

3.1 INTRODUCTION TO “SUBTRACTIVE MASSING” AS DESIGN APPROACH

The project adopts a subtractive massing approach, where the architectural form is generated through the removal of volumes from a primary mass. Instead of adding elements, the design is shaped by carving into the ground, creating voids, light wells, and spatial connections.

This approach is particularly relevant to the context of Batu Arang, as it reflects the processes of excavation and extraction associated with coal mining. The building is therefore conceived not as an object placed on the site, but as a transformation of the ground itself.

This activity taught me to:

- Interpret site conditions as a design driver rather than a passive backdrop
- Translate conceptual ideas into real plans for buildings and spaces
- Develop the shape of a building through controlled removal and layered digging
- Understand how void, light, and spatial hierarchy in shape user experience
- Integrate local stories into physical form-making to create a design that belongs

The Subtractive Massing functioned to materialize spaces before they became detailed with design elements to become a proper form.

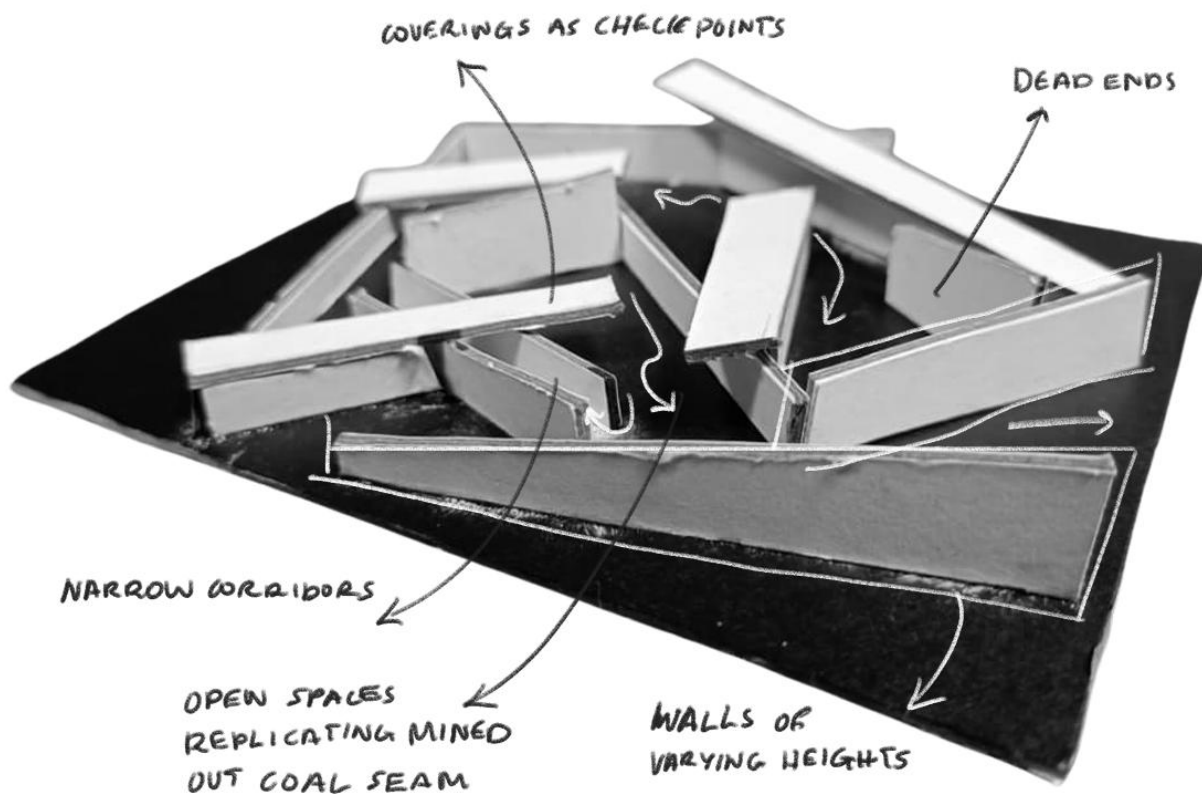


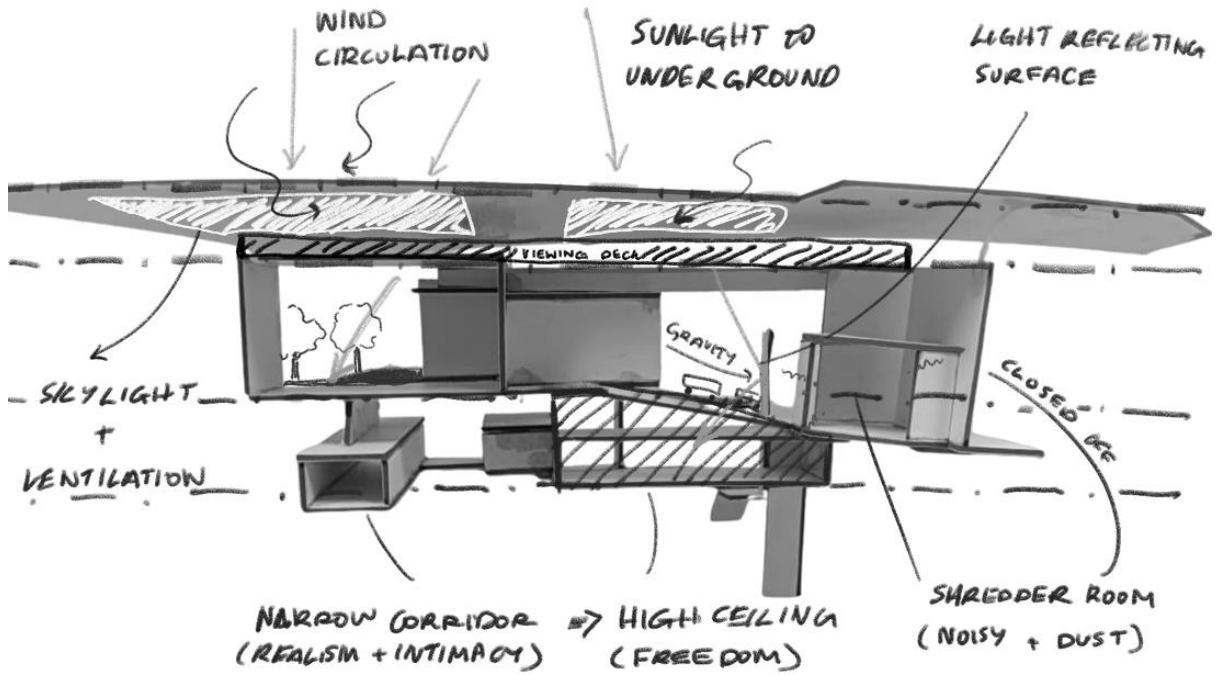
3.2 IDEA BEHIND “SUBTRACTIVE MASSING” CONCEPT

The concept is derived from the physical and spatial qualities of coal mining, where material is removed to reveal hidden layers beneath the surface. This idea is translated with the carving of volumes to create a sequence of spaces that connect accordingly.

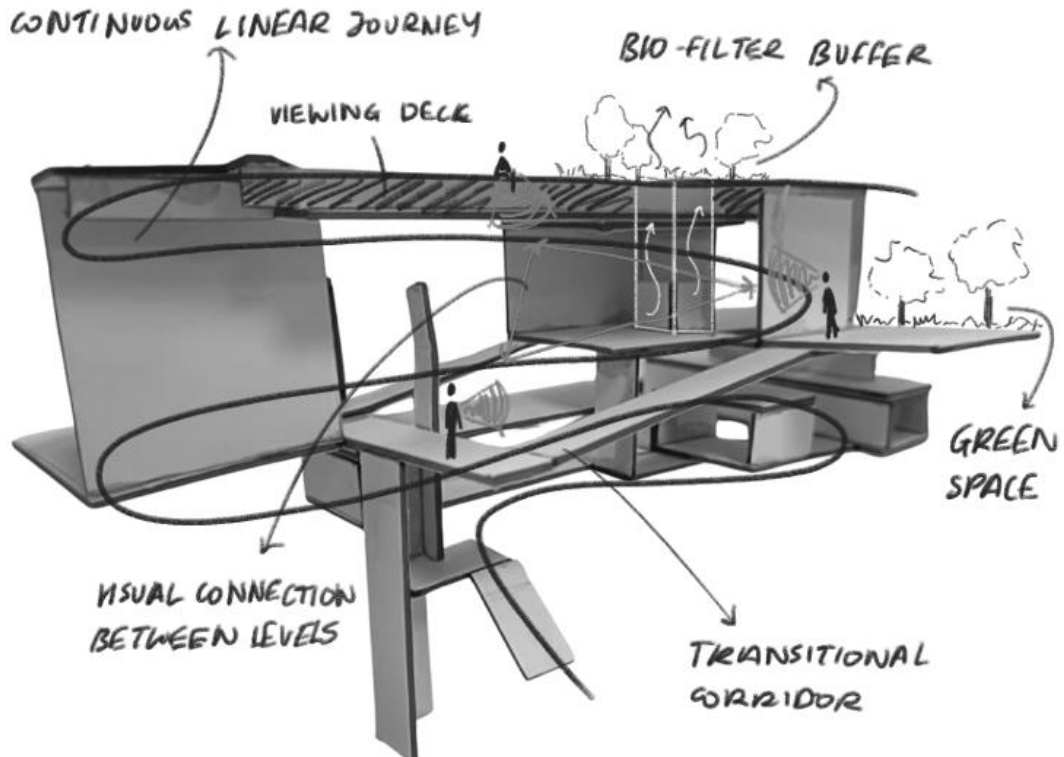
Important conceptual components:

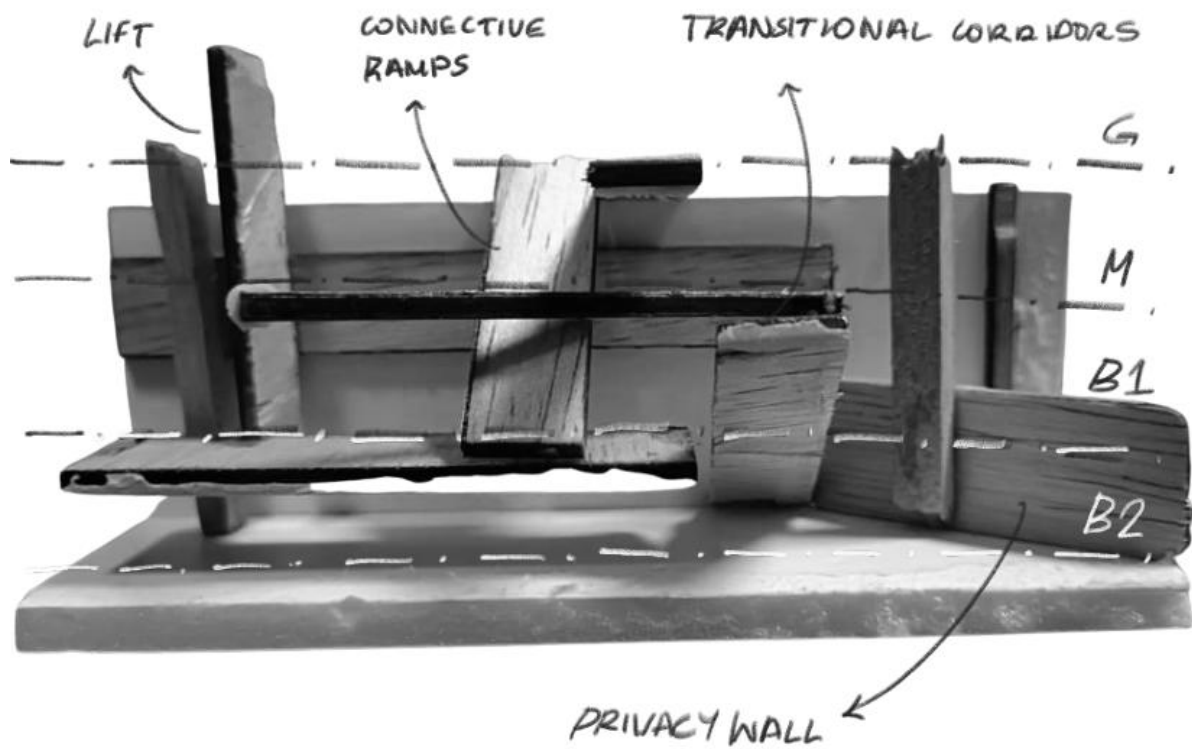
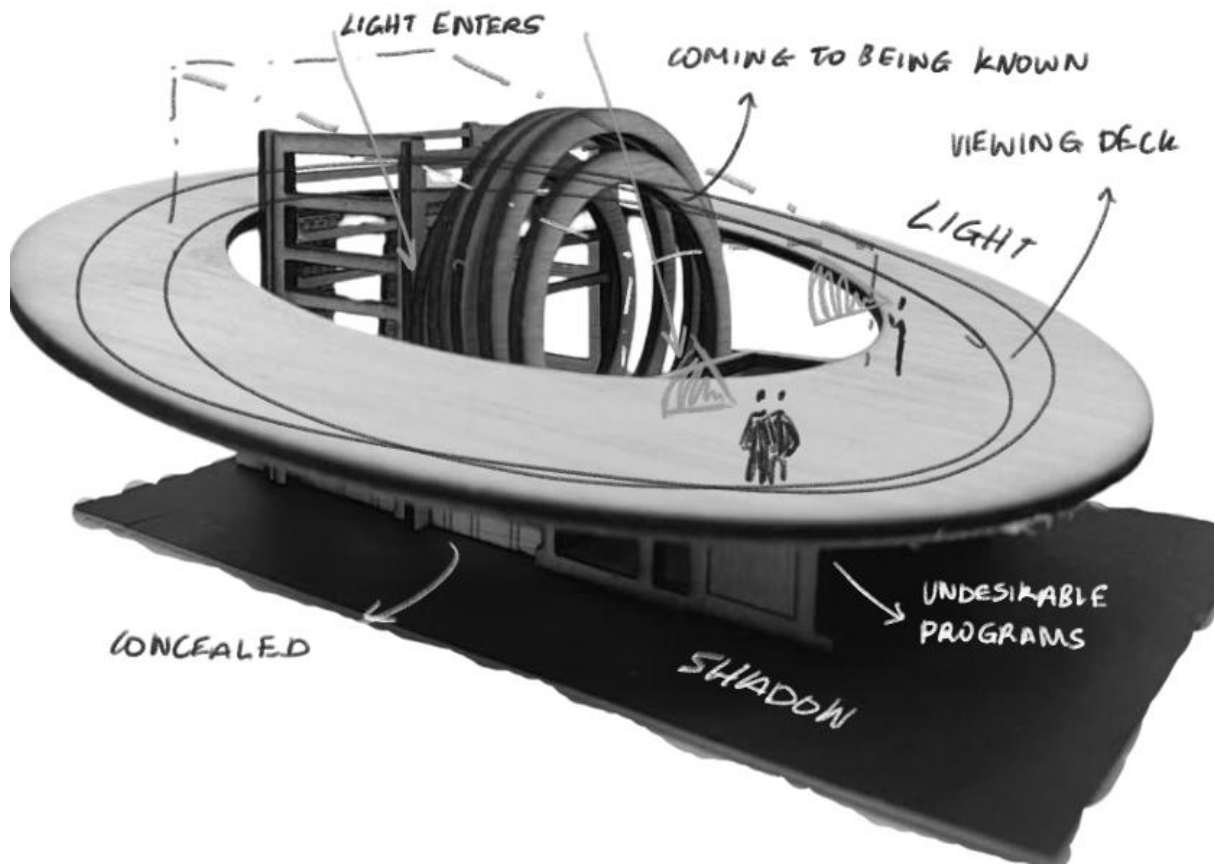
- **Layering of Spaces:** The subtractive massing strategy generates a narrative by going deeper and deeper through the layers of soil underground. Spaces are revealed progressively and they range from open, light-filled voids to more compressed and enclosed zones. This excavated sequence that reflects depth, transition, and discovery. Much like how coal was formed through time, each layer is carved to expose different atmospheric conditions, providing a unique experience.
- **Void as Spatial Expression:** Instead of focusing on surface decoration, the design emphasizes the architectural power of absence. This aligns with the local’s wishes of keeping the town peaceful and not disruptive. Voids, cuts, and carved-out areas become the primary design language. Here, light, shadow, and emptiness define the space. These voids provide physical connections to overlapping programming, vertically and horizontally. This also allows in natural light throughout the building.
- **Process and Journey:** The circulation within the subtractive mass is conceived as a linear journey. Movement through the building is intentionally places in a specific flow. The story told involves intentional compression and release in one direction. They travel to experience RDF process and the coal mining systems, each space gradually unfolding the narrative. So, architecture becomes easy to understand. Users can experience the narrative without backtracking or feeling confused.

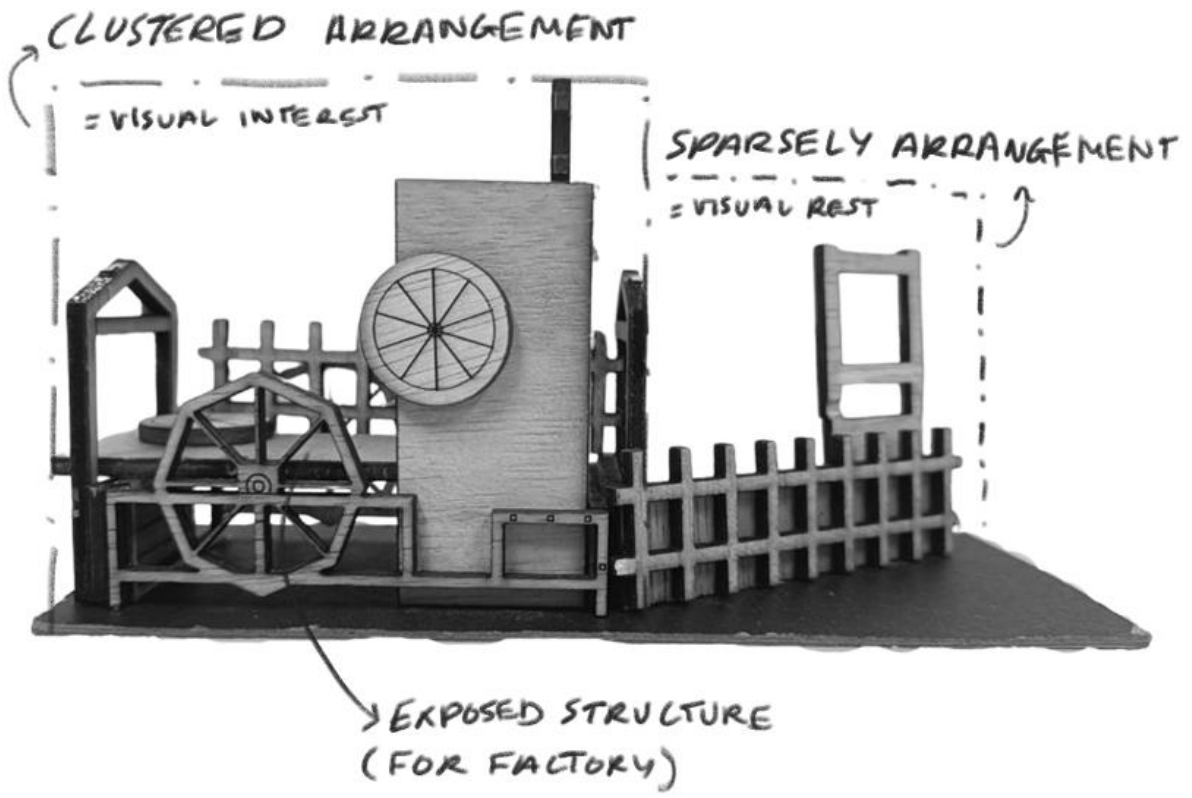
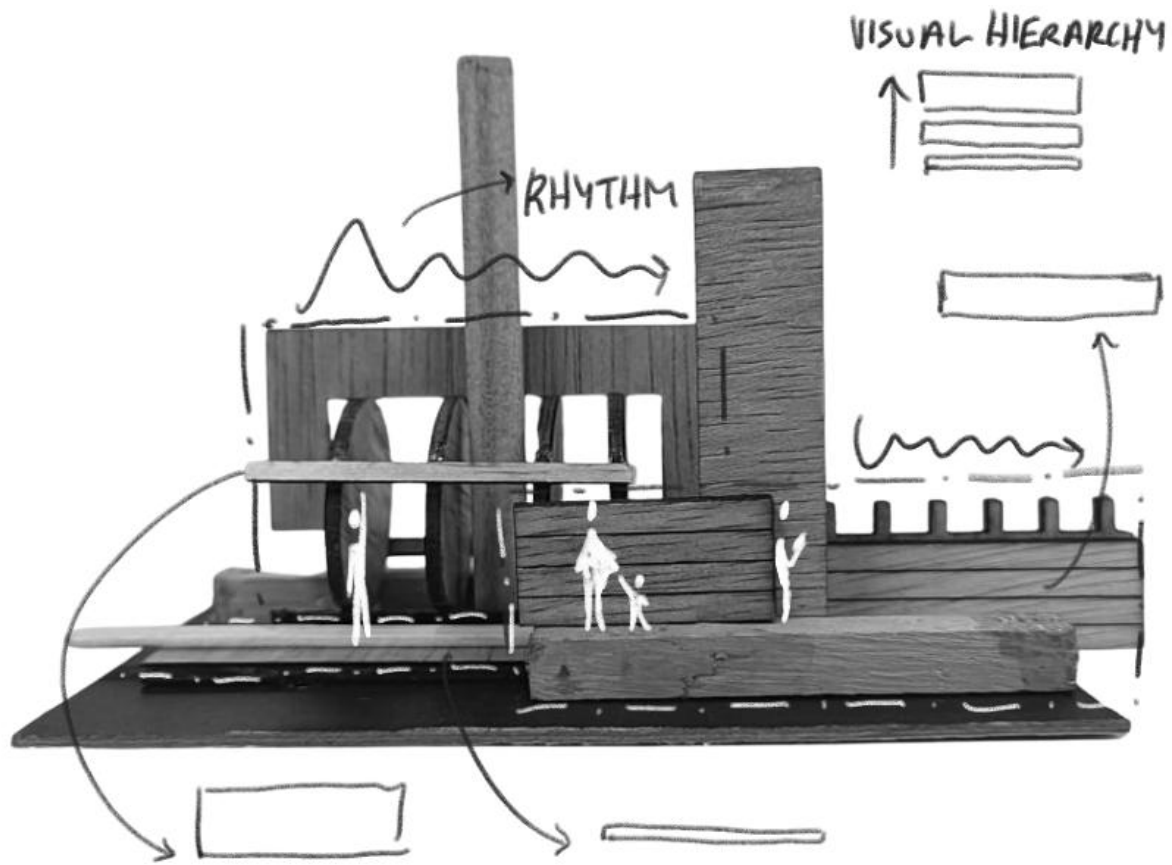




AWE





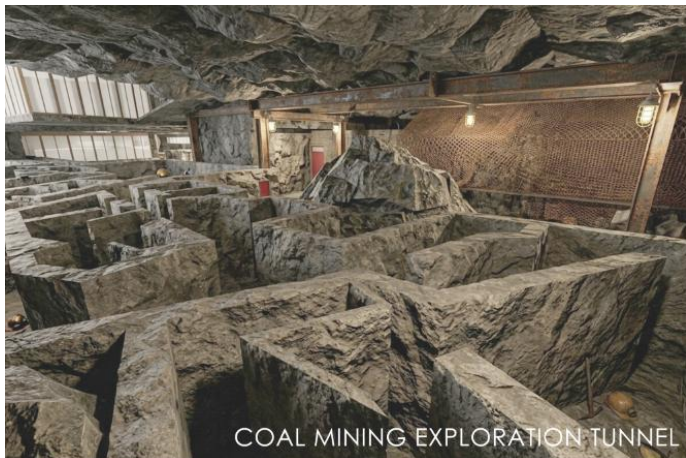


3.3 KEY COMPONENTS OF THE REGENERATION CENTER

The regeneration center is organized into several key components that collectively support both industrial and public functions. These include the RDF processing zones, coal exhibition spaces, public amenities, and supporting facilities.

The following are the main elements of the center's program:

1. Park: A landscaped green space for people to walk, sit and rest. It integrates food kiosks operated by local vendors, strengthening community engagement and supporting micro-economies.
2. Event Space: A dedicated multi-purpose venue for local performances and talks, enclosed with acoustic treatment to protect town's peace and tranquility. It allows cultural expression.
3. Public Lobby: The primary arrival and transition space to guide users into the vertical connectors. None of the RDF centre or exhibition spaces with large crowds are at the surface. Users have to take vertical connectors to the lower levels.
4. Viewing Deck: A hanging observation platform that provides a direct visual connection to the RDF process, allowing users to witness industrial operations as part of the educational narrative.
5. RDF Workshop: Trainees manually sort mixed municipal solid waste that can be employed in their own homes. Waste is put into a smaller machine for shredding then waste gets air dried. After, waste is processed into pellets.
6. Coal Formation Gallery: An interpretive exhibition space that explains the geological processes behind coal formation, presenting deep-time narratives through spatial storytelling.
7. Coal Development Timeline: A sequential display that illustrates the evolution of coal usage, tracing its role from natural resource formation to industrial application at the global scale.
8. Coal Type Display: A curated exhibition showcasing different classifications of coal, highlighting variations in texture, density, and energy potential as material evidence.
9. Audio-visual Theatre: An immersive multimedia space that communicates the formation of coal and Batu Arang's history through cinematic projection, sound, and atmospheric staging.
10. Batu Arang History Timeline: A chronological exhibition documenting the historical development of the site, linking industrial activity to social and spatial transformation.
11. Heritage Gallery: A curated space displaying historical mining machinery and tools, complemented by an interactive surface mining sandbox for children.
12. Cosplay Studio: Visitors can dress as miners and participate in staged photographic environments, offering a performative interpretation of mining identity and history.
13. Exploration Tunnel: Sequence designed to simulate the confined conditions of historical mining environments. While inspired by underground spatiality, it is carefully arranged ergonomically to ensure user comfort and avoid extreme physical restriction. It is a controlled representation rather than literal replication.
14. Souvenir Shop: A retail space featuring locally crafted products, reinforcing community participation and extending the cultural narrative into tangible artefacts.
15. Sunken Garden Courtyard: Void travels all the way underground to provide some light and sense of awe, easy to regain senses into present while travelling into the past.



COAL MINING EXPLORATION TUNNEL



BATU ARANG HISTORY TIMELINE



Two primary extraction methods were used in Batu Arang: open-cast mining, where coal was extracted from the surface, and underground tunnelling, which created an extensive network of subsurface passages.



DISPLAYED ITEMS

Mining machines are displayed in the exhibition gallery. These machines are huge in size which is why they are put in the room with the tallest ceiling for basement 2.

A sculptural representation of Batu Arang's underground coal mine network is integrated within the exhibition, allowing visitors to understand the complexity and spatial extent of the subsurface tunnelling systems.

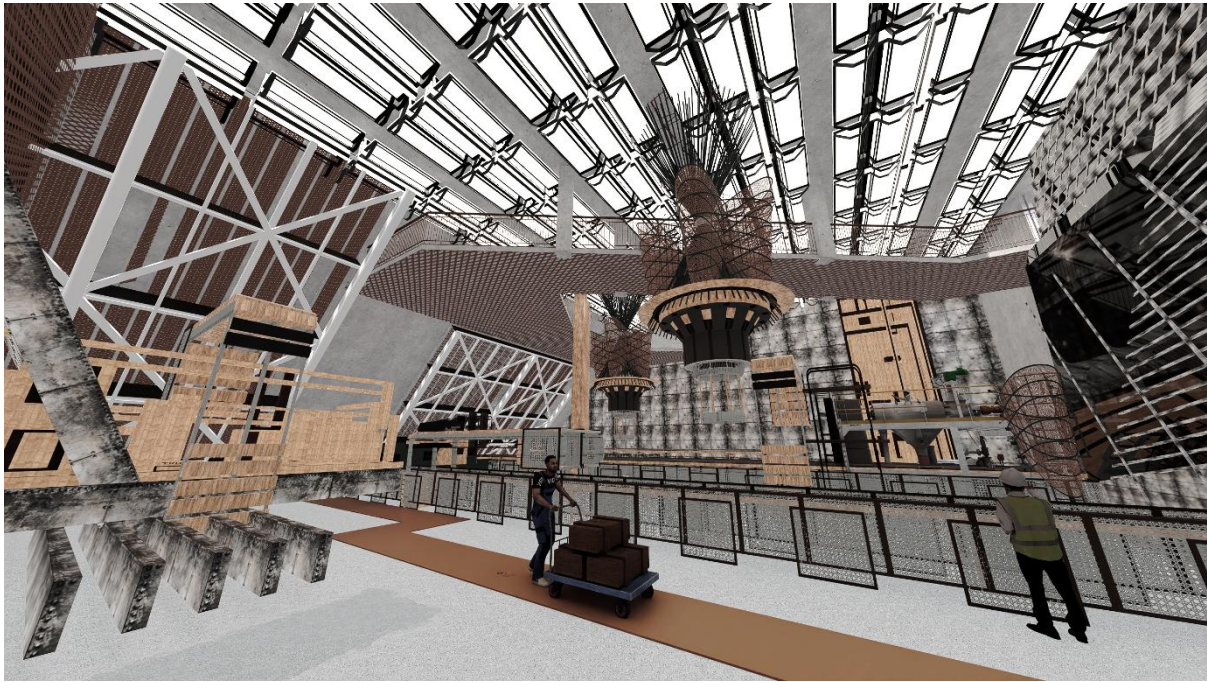
3.4 INDUSTRIAL SPACES

The main benefit of this development is actually the RDF center. The RDF component focuses on waste processing and energy generation, while the exhibition spaces provide educational and historical narratives related to coal mining and sustainability. Public areas such as the park and lobby serve as transitional spaces that connect users to the deeper programmed below. Together, these components create a hybrid site that integrates infrastructure with community engagement.

The following are the main elements of the center's program:

1. Staff Carpark: A dedicated parking zone for staff members to ensure efficient access and separation between public and truck circulation.
2. Staff Lobby: A controlled entry point for staff to enter RDF zones.
3. Office: Administrative workspace that manages daily operations, coordination, and facility management activities within the center. Also has an area dedicated to the break room.
4. Truck Circulation: Service route designed to accommodate heavy vehicle movement, ensuring efficient flow for waste delivery and material distribution. Importance lies in not causing traffic on the roads.
5. Tipping Floor: A primary unloading zone where municipal solid waste is deposited. This space is the first stage of the RDF process.
6. Shovel Floor: A handling zone with a machine to support the continuous but manageable flow of waste within the operational system.
7. Sorting Room: Waste is manually and systematically separated according to material type, and removing non-combustible materials like glass and metal.
8. Shredder Room: Mechanical shredding equipment mutilates the waste to size for further treatment and transformation.
9. Drying Room: A processing chamber where shredded materials undergo moisture reduction through controlled air-drying systems then left to air dry with the void above, ensuring optimal conditions for palletization.
10. Pellet Machine: A space where dried waste materials are compressed and formed into uniform RDF pellets, transforming processed waste into a usable energy product.
11. Package Assembly: Pellets are packaged and organised for storage, and transport ready distribution.
12. Storage: A final holding zone for processed RDF materials, designed for efficient stacking, inventory management, and logistical dispatch.

Positioned strategically between public and industrial zones, the RDF center act as a bridge between observation and providing benefits to other industrial factories.



TIPPING FLOOR

Trucks enter to the underground by the ramp. Large entrances greet the trucks into the tipping floor. Here, trash is disposed to a lower half floor where most of it gets shoveled by a hauler.



DRYING ROOM

The waste material is then dried, reducing moisture content. This ensures a uniform composition. So, the fuel will be dependable.



PACKAGE ASSEMBLY

As the workers package the RDF, they do a quality check. Parameters such as moisture content, ash content, and calorific value must meet specific values.



SORTING & SHREDDING ROOM

Trash then gets sorted. It goes through conveyor belts that separates the large, non-combustible and harmful materials. The sorted waste is then put to shredders into smaller consistent sizes.



PELLET MACHINE ROOM

Because the end use has to be transported, the processed material goes through machines to be packed as dense pellets. The pellets not more than 1x4cm. They can be shoved into an incinerator.



STORAGE

This area remains dry always to prevent degradation and maintain the energy content before combustion. The storage is right beside the truck's circulation route. This means a collector truck can come by to collect with ease.

3.5 ACTIVITY FLOW AND SPATIAL ZONING IDEAS

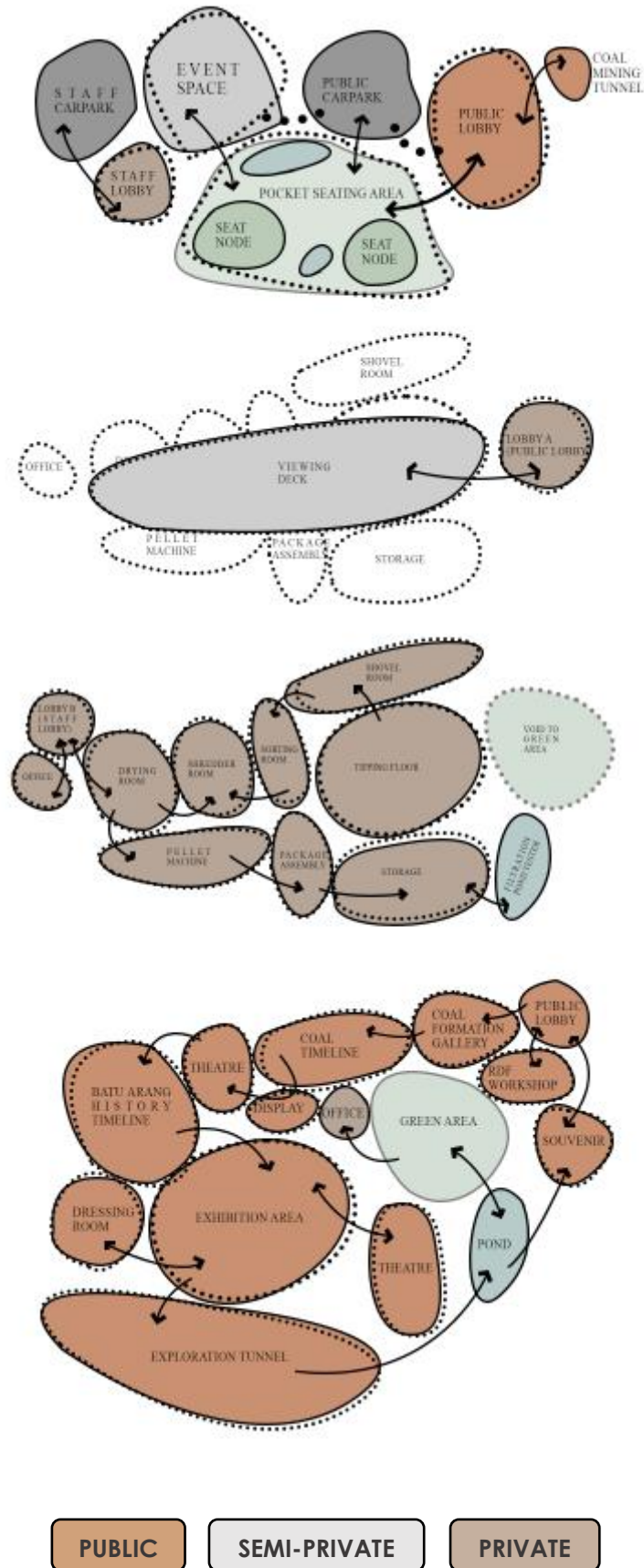
The spatial organization of the project is guided by a clear division and logical order of activities, ensuring efficiency and easy navigation. Industrial processes are located within controlled zones, while public and exhibition spaces are arranged to allow safe and meaningful interaction. The goal is to make the most of the space while keeping efficiency and safety in mind.

1. Zone of Arrival: Welcome and Orientation
2. Introduction Zone: Information panels and exhibition displays introducing RDF systems, coal formation processes, and site history
3. Observation Zone: Viewing deck and controlled visual access to operational RDF processes
4. Engagement Zone: Interactive spaces such as the RDF workshop and hands-on waste sorting activities
5. Immersion Zone: Exploration tunnel and compressed spatial sequences simulating mining conditions and underground spatial experience
6. Reflection Zone: Gallery spaces, historical timelines, and experiential exhibits for interpretation and contemplation
7. Completion Zone: Souvenir shop and exit spaces showcasing locally crafted products and educational takeaways

Depending on their interests, visitors can either follow the full linear sequence of the experiential journey or skip straight to the coal exhibition. However, the overall design encourages a guided directional flow to maintain narrative clarity and progressive learning through the spatial experience.

Zoning was also carefully structured to enhance functional and experiential clarity:

1. Public versus operational zones (separating visitor spaces from RDF processing and staff areas)
2. Clean versus industrial zones (separating exhibition environments from waste handling and mechanical processes)
3. Compressed versus expanded spatial conditions (contrasting tight experiential tunnels with open galleries and viewing spaces)



CHAPTER 4

SITE ANALYSIS

4.0 SITE ANALYSIS

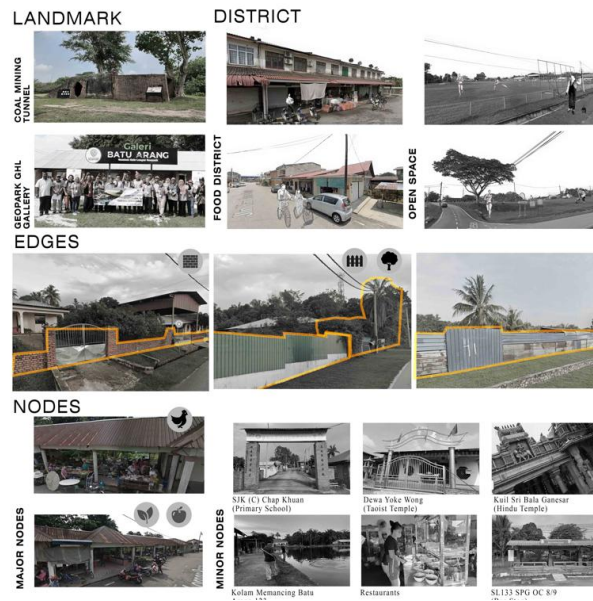
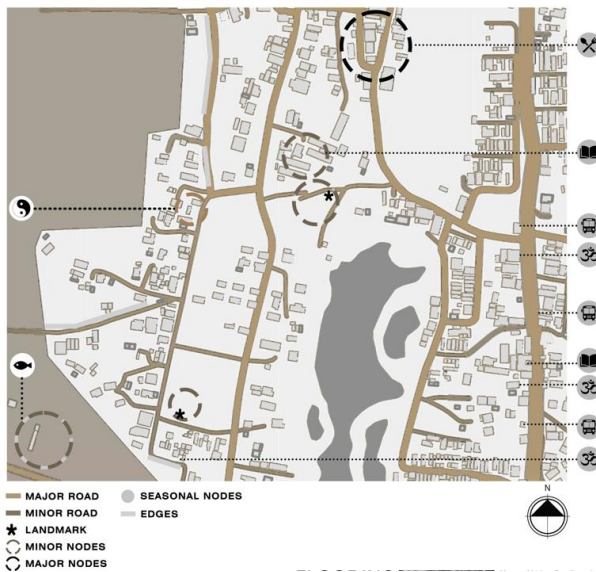
The site analysis forms the critical foundation on the project's development. It decides where the concept will derive from. It involves the systematic study of site characteristics such as topography, access, surrounding land use, circulation patterns, climate conditions, and existing infrastructural networks. Through this research, constraints and opportunities appear.



4.1 SITE LOCATION: BATU ARANG

The proposed site is located in Batu Arang, a town historically known for its coal mining industry. The area is characterized by a mix of low-density residential zones, remnants of industrial activity, and natural features such as former mining lakes. Its historical significance as an energy-producing landscape provides a strong contextual foundation for the project, allowing the design to reinterpret the legacy of coal mining through a contemporary regenerative approach.

IMAGEABILITY STUDY



Important contextual features of the site consist of:

1. Post-Industrial Landscape: The former coal mining area has remnants of mining land conditions and underground tunnel systems remain. These provide a strong historical and geological foundation.
2. Low-Rise Residential Context: The surrounding area is primarily composed of low-rise residential developments, creating a calm and modest built environment. This condition allows the proposed development to integrate sensitively into its design. The design can stand out but must incorporate local elements such as the iconic red bricks from the original houses built during the coal mining period.
3. Sparse Vegetation and Open Terrain: Scattered vegetation and partially exposed land conditions reflect natural regrowth. This tells us to keep transitional green buffers that soften the industrial character of the site.
4. Existing Coal Mining Tunnel System: A significant contextual feature of the site is the presence of existing coal mining tunnel, which form a hidden underground network beneath the surface. These networks go as far as 300 metres into the soil.

This location can serve as a link between community engagement, historical coal mining, tourism, local business and education.

4.2 ACCESSIBILITY AND TRANSPORTATION

A key importance of promoting tourism and local involvement is the site's accessibility. The site is accessible via existing road networks, including Jalan Stesen, which serves as a primary route connecting the area to surrounding regions. Most of the minor roads surrounding the development are informal roads made by the locals. So, the presence of Jalan Stesen has to be emphasized to enhance visibility and accessibility to the users.

Circulation is carefully considered to separate public access, staff movement, and truck operations, ensuring efficient flow while minimizing disruption to the surrounding residential areas.

Important points:

1. By Car: Jalan Stesen is accessible through the main road network connecting to Rawang and surrounding townships. The site can be reached within a short driving distance from nearby urban centres such as Rawang and Selayang, making it reasonably connected through arterial roads while still retaining a semi-remote character.
2. By Bus / Public Transport: Access by public transport is available through nearby Rawang Bus Terminal. From there, local taxis or ride-hailing services such as Grab are typically used for the final 30-minute journey.
3. By Rail: The nearest KTM Komuter station is KTM Rawang, which serves as a key transit node linking Batu Arang to Kuala Lumpur and other major towns. From KL Sentral to Rawang Station, it takes about an hour ride. From the station, the site can be reached via road travel.
4. Nearest Airport: The nearest airport is KLIA which is 75km away and takes about 1.5 hours depending on the traffic.

The easiest way to get to the site is through car. Because Batu Arang is a rural town, it has weak public transport connectivity. Most of the locals rely on bikes and cars to move around.

Considerations for on-site access and circulation:

1. Public Vehicular Access: Public cars are able to use the designated vehicular entry and drop-off points.
2. Staff Circulation and Parking: Staff cars have a separate parking area that is away from the main Jalan Stesen road view. It maintains a clear distinction between public-facing and back-of-house circulation systems.
3. Service and Truck Access: Trucks can enter through a singular access point opposite from the public car park to ensure no traffic or interruptions.
4. Pedestrian Connectivity: Foot traffic from locals and students is encouraged by the pedestrian connectivity from the surrounding residential and schooling area.

4.3 TOPOGRAPHY AND TERRAIN ANALYSIS

The site exhibits relatively varied terrain influenced by past mining activities, including excavated landforms and uneven ground conditions. These characteristics present both challenges and opportunities for design intervention.

The project responds by adopting an underground approach, embedding the building within the ground to mitigate visual impact. The terrain of the land has already been changed due to previous landfilling after mining activities. The project employs the same technique by excavating all the land. Most of the soil mass will be relocated to designated landscape mounds or assist in contouring lower zones within Batu Arang.

Ultimately, the design treats the site not as a fixed surface to conserve but as a dynamic geological condition. Excavation becomes a required strategy.

Important topographical observations:

1. Steep Longitudinal Slope: On the East of Jalan Stesen, a noticeable slope descends from west to east.
2. Existing Roadside Drainage System: Drainage infrastructure is already present along the adjacent road network, effectively managing surface runoff from the site edges. This existing system provides a baseline concept of allowing retention to support controlled water management within the development.
3. Healthy Grassland Condition: The site currently consists of well-maintained grassland, indicating a stable ground condition that has been maintained by locals. This green coverage can be retained and integrated into the design as open green buffers, transitional zones, and a public park for the mass.
4. Tree Clusters: Approximately 3–4 mature trees are located at the corners of the site. These trees are retained as key landscape elements and reinforce the continuity of the site's natural identity within the proposed intervention. There is *Samanea Saman*, *Phoenix Roebelenii* and *Mangifera Indica* trees.



4.4 CLIMATE AND SUN ORIENTATION

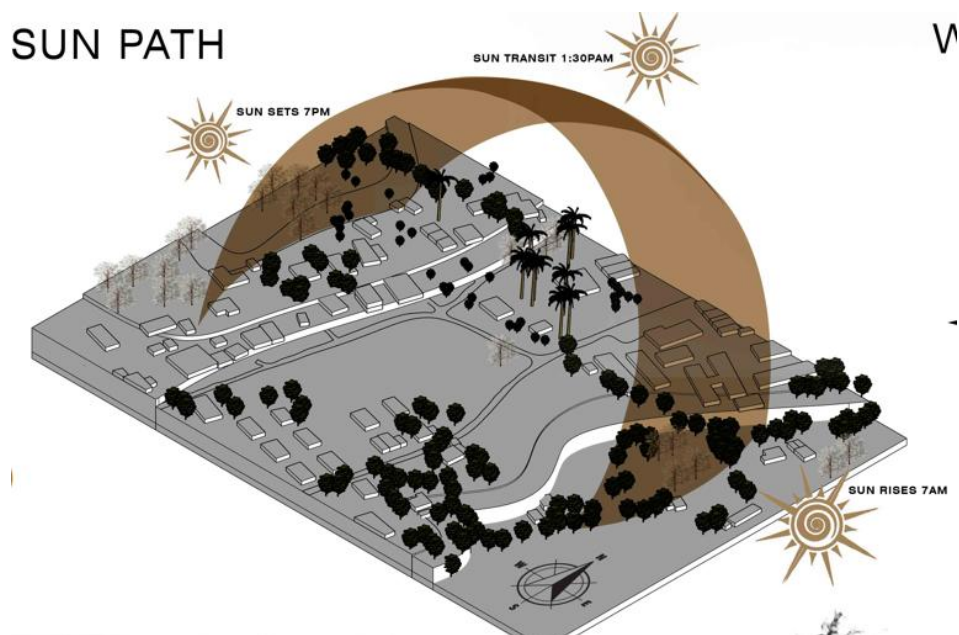
Like the rest of Malaysia, the site experiences a tropical climate with consistent rain throughout the year. The development's passive design depends on the building placement, facade treatment, and the introduction of shading strategies in regards to sun path and rain.

Due to Batu Arang being a small town, there are no official datasets like the Meteorological Department records. However, Batu Arang sits within central Selangor so we can reference nearby climatic ranges such as Rawang.

Important Climate Factors to Consider:

1. **Temperature:** The site experiences a typical Malaysian equatorial climate, with average daytime temperatures ranging approximately between 26°C to 33°C. This consistently warm environment can allow passive open-air circulation. To prevent harsh lighting thorough, it is important to implement passive shading devices with the roof.
2. **Rainfall and Monsoon Influence:** Northeast Monsoon period (November to March) brings frequent and intense rainfall events. Annual rainfall in the broader Selangor inland region typically ranges around 2,000 mm to 2,800 mm per year. This climatic condition directly informs design decisions. For example, the roof slope, surface runoff control, and integrated drainage systems.
3. **Humidity:** Relative humidity levels range between 75% to 90% throughout the year, which is quite high. So, continuous air movement strategies must be employed to mitigate moisture retention, condensation, and long-term material degradation.

Openings and voids are positioned to allow controlled daylight penetration into deeper spaces while minimizing excessive heat gain, particularly in exposed areas.



4.5 WIND DIRECTION AND VENTILATION

Prevailing wind directions are utilized to enhance natural ventilation across the site. The design incorporates vertical voids and openings to facilitate stack ventilation, allowing warm air to rise and exit while drawing cooler air into lower levels.

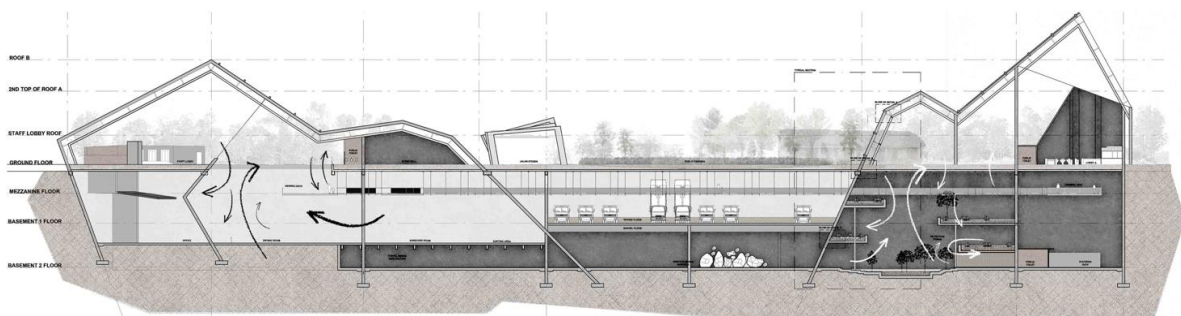
This strategy is particularly important for the subterranean spaces, ensuring adequate airflow and improving indoor environmental quality.

Important wind observations:

1. **Main Wind Direction:** The wind is most often from the South for approximately 4.6 months, from May 6 to September 23, with a peak percentage of around 65% on July 21. This situation really benefits from the consistent flow of air. It provides thermal comfort in open areas such as courtyards.
2. **Secondary Wind Orientation:** The wind is most often from the East for approximately 3.2 months, from December 21 to March 28, with a peak percentage of 45% on January 1. This requires adaptive facade responses and flexible shading systems to moderate airflow and solar exposure.

Ventilation Strategy:

- Stack ventilation (central light well system) was applied through a continuous vertical void that connects underground spaces to the surface park. The warm air rises through the area where the light comes in and it goes out at the top. At the time the cooler air sinks to the bottom. This makes the air circulate through the underground areas.
- Underground thermal buffering was achieved by putting major programmatic spaces below ground level, utilizing the earth's stable temperature to reduce external heat gain. This reduces reliance on mechanical cooling and improves indoor thermal comfort.
- Landscape buffers with trees and softscape cool down incoming wind and reduce heat before it enters spaces.



4.6 VIEWS AND CONTEXT (NATURAL AND BUILT ENVIRONMENT)

The site is surrounded by a combination of natural and built elements, including forested areas, residential neighborhoods, and open landscapes. Views towards the forest provide a sense of immersion and natural connection, while views towards the residential areas require sensitivity in terms of privacy.

The design responds by orienting key public spaces towards favorable views while controlling exposure towards residential zones. The residential zones become the view for staff who are most likely locals anyway. This ensures a balance between openness and contextual respect.

Constructed Surroundings: The surrounding context of Batu Arang is composed of low-rise rural residential houses, characterised by simple one-storey brick construction. Many of these dwellings have been personally modified with metal roofing in blue and red tones. It clashes with the original red brick materiality. The absence of strict planning control or a fully gazetted local plan results in a relatively informal built environment, where architectural coherence is limited.

SITE PLAN nts
 Contributes to economic vitality by generating employment opportunities, activating heritage tourism, and introducing a new sustainable industry within Batu Arang.

DEWA YOKE WONG

SJK (C) CHAP KHUAN

PUSAT JAGAAN SEJAHTERA

SHAN YUAN TANG

COAL MINING TUNNEL

SITE VIEW AND SITE PLANNING STRATEGIES

<p>NORTH ROAD VIEW TO SITE</p> <ul style="list-style-type: none"> - Potential for truck circulation due to two-way 	<p>SOUTH ROAD VIEW TO SITE</p> <ul style="list-style-type: none"> - Potential of wider visual exposure to entire massing 	<p>VIEW TO EAST</p> <ul style="list-style-type: none"> - Potential facade/lobby placement 	<p>EXISTING WASTE DUMP ON LAND</p> <ul style="list-style-type: none"> - Potential problem to solve using waste as generator 	<p>EXISTING SITE PROGRAMMING</p> <ul style="list-style-type: none"> - Using existing maintained grassland for public park 	<p>NEARBY NEIGHBORHOOD</p> <ul style="list-style-type: none"> - Potential activities that are calm and pedestrian friendly
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4.7 SWOT ANALYSIS OF THE SITE

Strengths

1. Strong historical identity as a former coal mining town, giving the site high cultural and heritage value.
2. Large underutilised land parcels and leftover industrial landscapes, suitable for redevelopment and adaptive reuse.
3. Presence of natural elements such as vegetation enhance spatial and experiential quality.
4. Low-rise surrounding context allows for clear visibility, natural daylighting, and strong landscape integration opportunities.

Weakness

1. Lack of formalised planning framework in certain areas, resulting in fragmented and inconsistent development patterns.
2. Informal road conditions and limited infrastructure quality reduce accessibility efficiency.
3. Residual ground conditions from previous mining activities may present stability and soil challenges for construction.
4. Limited existing public facilities and amenities reduce immediate pedestrian activity and urban vibrancy.

Opportunities

1. Potential to transform into a heritage and environmental education destination centred on coal mining history and regeneration.
2. Opportunity to introduce innovative hybrid programmes such as RDF (Refuse-Derived Fuel) facilities combined with public exhibition spaces.
3. Ability to activate local tourism by reconnecting historical mining narratives with contemporary sustainability practices.
4. Chance to engage local communities, including retired mining workers, as knowledge holders and cultural contributors.

Threats

1. Public sensitivity towards industrial or waste-related developments, particularly RDF facilities, may lead to resistance.
2. Environmental risks related to legacy mining conditions such as land instability or underground voids.
3. Competition from more established urban heritage or tourism destinations within Selangor and surrounding regions.
4. Balancing industrial operations with residential proximity may create concerns regarding noise, traffic, and perception of safety.

4.8 DESIGN IMPLICATIONS FROM SITE FINDINGS

The site presents several strengths, including its historical significance, accessibility, and availability of large land area. However, it also faces challenges such as potential ground instability due to previous mining activities and sensitivity to nearby residential zones.

Opportunities include the potential for heritage tourism and environmental education, while threats involve public perception of industrial functions and possible environmental concerns. These factors collectively inform the design strategy and decision-making process.

The findings from the site analysis directly influence the overall design approach. The decision to locate the building underground is driven by the need to minimise visual and environmental impact while responding to the historical context of mining. Circulation strategies are developed to separate public and industrial flows, reducing conflict and improving safety. Environmental considerations such as sun orientation and wind direction inform the placement of voids and openings to enhance natural lighting and ventilation. Overall, the design translates site constraints and opportunities into architectural strategies that support both functional efficiency and experiential quality.

1. **Terrain and Topography:** The existing slope will be removed because of the soil mass removal. This approach reflects the idea of excavation, where spaces are carved rather than built up.
2. **Climate and Ventilation:** The hot, humid equatorial climate, together with seasonal wind variations dominated by southern and eastern airflow patterns, informed a strong passive environmental strategy. The design incorporates a park with lots of green spaces to cool the air and a central sunken garden courtyard with a void.
3. **Accessibility and Circulation:** Public, staff, and service routes are separated to ensure functional efficiency, while pedestrian connectivity from nearby residential areas and schools is encouraged. Within the park is stone pavements for walking, riding bicycles and pushing strollers.
4. **Sun and Wind Orientation:** Development has walls and roofs facing the East to West orientation to prevent direct sunlight to hit. Most of the structure is left open air to maximize natural ventilation.
5. **Views and Integration:** The layout frames the existing grassland area. Users are constantly engaged with both built and natural elements.
6. **Contextual Respect:** Locals have made it clear before they desire a peaceful and quiet neighborhood. To keep their comments in mind, the massing and form of the center creates a landmark with its huge scale but the visual-permeable edges still allow the skyline to be seen. It establishes a balanced architectural presence.



CHAPTER 5

DESIGN DEVELOPMENT OF THE CENTRE

5.0 DESIGN DEVELOPMENT OF THE CENTRE

This chapter presents the progression from function into form. It focuses on translating subtractive massing into an architectural building language. Rather than repeating theoretical principles, this stage emphasizes the evolution of design decisions over time, demonstrating how site conditions, narrative intent, and functional requirements come together for a cohesive architectural outcome.

5.1 FORM DISCOVERY PROCESS

The form discovery process began with an analysis of coal. Beginning with a primary solid cluster of masses, each space has its own function. The function could require a small, medium or large volume that would create a variety of shapes. Some volumes symbolize voids to create negative space. This method carves the form.

To further enhance the spaces, the volumes convert into angular shapes copying the irregular fragmented structure of coal itself. Here, surfaces are no longer purely flat but shaped by tension, breakage, and directional cuts. Slanted walls and planes subtly direct circulation, leading users along intended paths without the need for explicit signage.

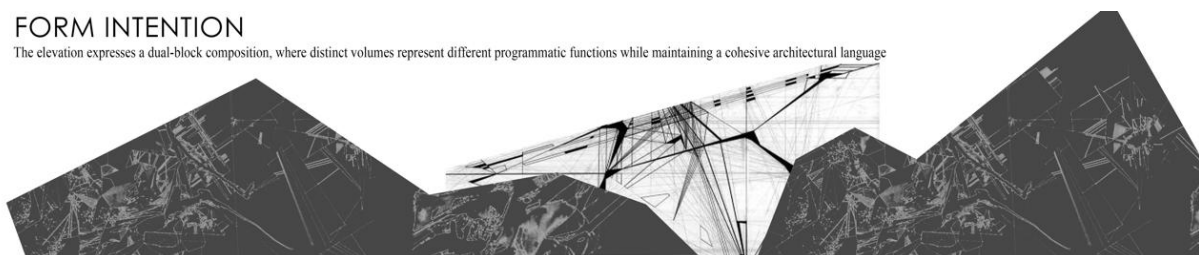
As the design progresses, the relationship the spaces are connected. Pathways allow circulation to emerge. There are three types of circulation: public pedestrian, staff pedestrian and truck circulation. Each has their own rules to follow. The public pedestrian had routes for stairs, lifts and ramps for wheelchair users. The ramps creates more visual connectivity between levels.

Further refinement introduced rhythm to space the flow of the crowd. This rhythm is defined through key architectural design principles such as repetition, variation, and hierarchy, allowing users to intuitively navigate the building without relying solely on signage. Within the development, there are angled horizontal and vertical elements. They present a dynamic and expressive form.

Two primary formal conditions emerge from this process. The first consists of angular, triangular volumes that project above ground, acting as visible markers of the development and establishing a strong architectural identity. The second is the excavated form below ground, where spaces are carved into the terrain to create immersive, subterranean environments. Both conditions are interconnected through a system of vertical and angled walls and slabs, forming a continuous spatial network that links above and below, solid and void, surface and depth.

FORM INTENTION

The elevation expresses a dual-block composition, where distinct volumes represent different programmatic functions while maintaining a cohesive architectural language



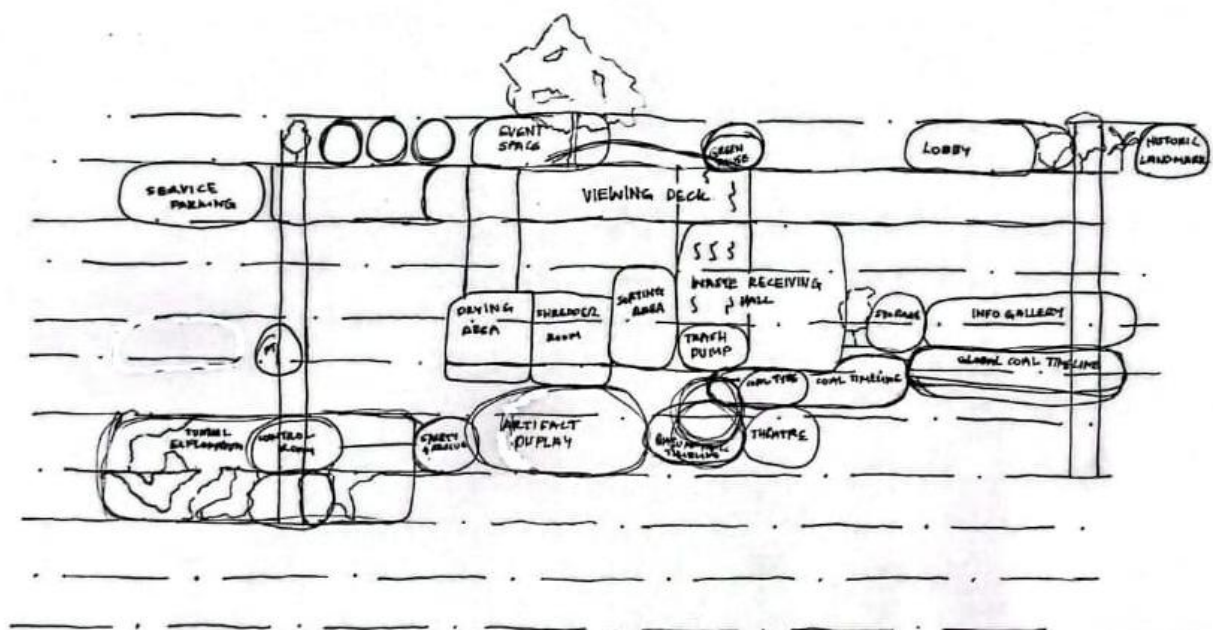
5.2 ZONING LAYOUT ON THE SITE

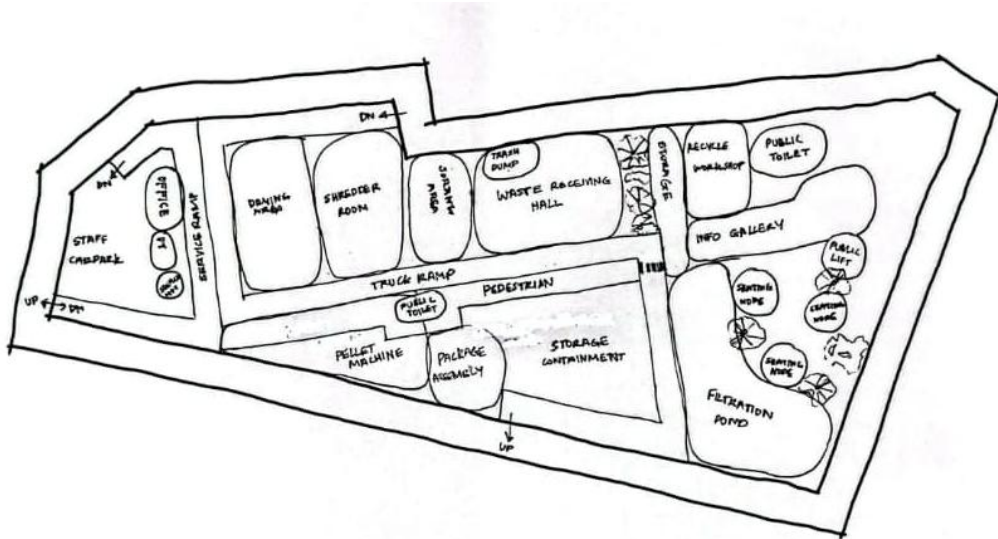
The site is organized into distinct zones to ensure clarity of function and efficiency of use. Public zones, including the park, lobby, and exhibition areas, are positioned for easy access and visibility. Semi-public zones such as workshops act as transitional spaces between public and controlled environments. Industrial zones, including the RDF processing areas, are located within restricted areas to ensure safety and operational efficiency. This zoning strategy ensures minimal conflict between user groups while maintaining a coherent spatial organization.

Zoning Strategy:

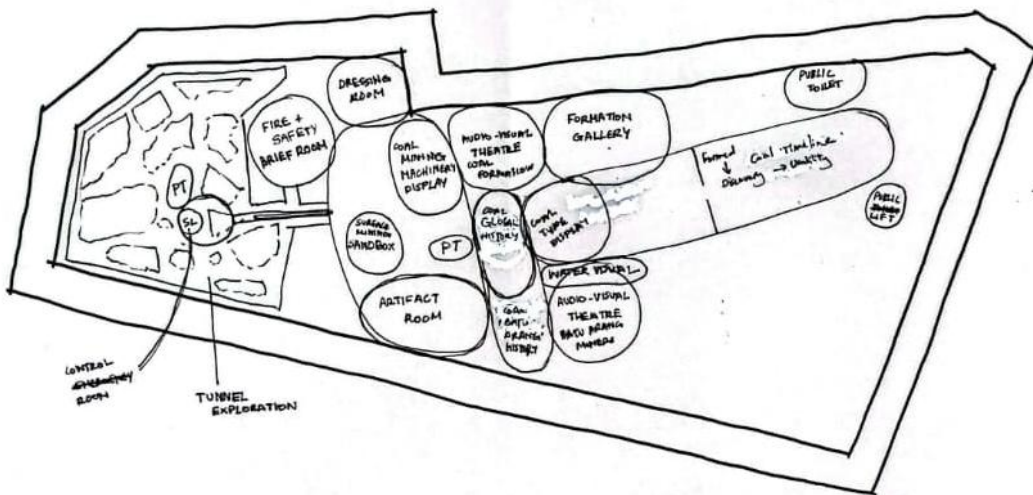
1. Public Zone (Front of the Site):
 - Public Car Park
 - Public Lobby
 - Located near the main entrance along Jalan Stesen, establishing a clear transition from the external environment into the structured narrative of the centre.
2. Educational & Interpretive Zone (Central Core):
 - Coal Formation Gallery
 - Coal Development Timeline
 - Coal Type Display
 - Audio-Visual Theatre
 - Positioned centrally within the layout, act as a narrative hub to give context to visitors.
3. Experiential & Immersive Zone (Middle to Rear at Underground):
 - Exploration Tunnel
 - Batu Arang History Timeline
 - Heritage Gallery
 - Cosplay Studio
 - Located deeper within the excavated mass, enhances a sense of descent.
4. Interactive & Processing Zone (Controlled Access Area):
 - Viewing Deck
 - RDF Workshop
 - Surface Mining Sandbox
 - Positioned in a controlled area for designated viewing points.
5. Recreational & Public Open Zone:
 - Park and Landscape Areas
 - Food Kiosks
 - Sunken Garden Courtyard
 - Open spaces at ground level provide areas for rest, social interaction and informal activities.
6. Retail & Exit Zone (End of Journey):
 - Souvenir Shop
 - Located towards the end of the circulation sequence, allows visitors to conclude in a more relaxed setting.
7. Private & Operational Zone (Peripheral / Back-of-House):
 - Staff Lobby

- Office
 - Truck Circulation and Service Access
 - Positioned at the periphery of the site, this zone ensures that operational activities remain efficient and segregated from public areas.
8. Circulation & Transition Spaces:
- Pedestrian Pathways
 - Ramps, Stairs, and Vertical Connections
 - Pause Areas
 - These connective spaces are distributed throughout the site to link all zones into a coherent sequence.





BASEMENT 1 (REGENERATION LEVEL)



BASEMENT 2 (COAL EXHIBITION LEVEL)

5.4 MASSING DEVELOPMENT

The massing strategy is derived from a subtractive approach, where a primary volume is carved to create voids, light wells, and spatial connections. For the surface, the form was derived from the fragmented shape of coal itself.

Process of Developing Form:

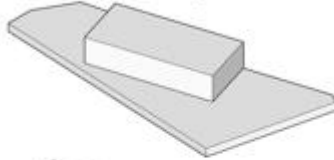
1. **Site Response:** The site presents an irregular and elongated geometry, offering flexibility for many spaces of various shapes and sizes. Its scale allows the architecture to be developed as a system rather than a single object.
2. **Basic Mass:** A primary solid cuboid is introduced as the initial architectural gesture as with any other project. This simple, monolithic volume establishes a clear spatial presence and provides a foundational reference for subsequent transformations and subdivisions.
3. **Transformation Gallery:** The development evolves from an initial solid form into two primary blocks, reflecting the separation of public and operational functions. This phase establishes the early framework for program separation and experiential sequencing.
4. **Vertical Zoning:** The mass is duplicated vertically. The upper level accommodates RDF-related processes, while the lower level is dedicated to coal exhibition and interpretive spaces. This vertical separation strengthens both functional clarity and narrative depth.
5. **Height Manipulation:** Spatial volumes are adjusted according to programmatic intensity. RDF spaces are given greater vertical height to accommodate machinery, operational flow, and a sense of spatial expansion. In contrast, exhibition spaces are compressed to evoke the confined conditions of underground mining environments, reinforcing the historical narrative of coal extraction.
6. **Subterranean Integration:** All these spaces are moved underground to prevent disruption to the neighborhood
7. **Surface Volumes:** A duplicate of the underground mass on the surface acts as a structure guideline to mark the entry. The left volume accommodates staff access, while the right volume serves as the main public entrance, clearly distinguishing operational and visitor circulation.
8. **Void Carving:** Strategic subtraction is applied to the mass to introduce vertical voids that bring natural light back into deeper levels. These carved spaces also establish visual connections between different programmatic layers, enhancing spatial awareness and reinforcing the concept of depth and transparency within the built form.
9. **Landscape Integration:** The ground plane with the surface volumes is transformed into a public park that integrates pedestrian circulation and communal space. This green layer functions as a regenerative surface, symbolizing environmental recovery and the transition from extractive industry to public-oriented ecological space.

MASS PROCESS



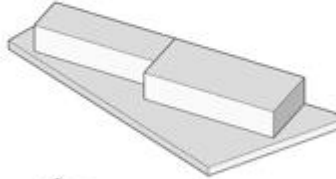
SITE RESPONSE

The site is abnormally shaped. Due to the sheer size, many designs could be applied.



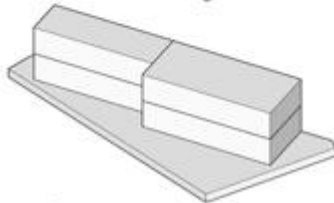
BASIC MASS

A single solid cuboid is introduced. It establishes a strong foundational volume.



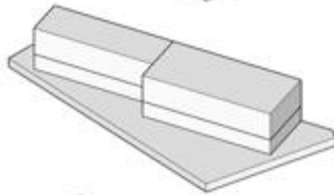
TRANSFORM GALLERY

The abnormal site dimensions allows two general masses to determine the boundaries of the spaces.



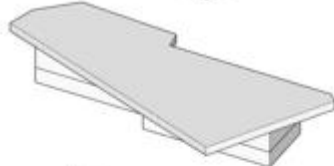
VERTICAL ZONING

Mass is split into two primary volumes. The RDF floor on the top and the coal exhibition area at the bottom.



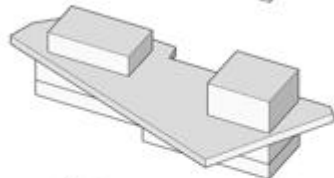
HEIGHT MANIPULATION

The RDF has taller ceilings to create a sense of awe. The exhibition areas are compressed to connect with the historical symbol of coal. It gives the sensation of coal mining.



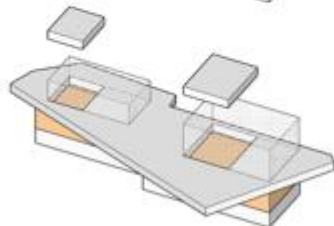
SUBTERRANEAN INTEGRATION

The noise, dust and truck movement can be concealed. The coal archive underground reinforces the underground mining narrative. As a result, there is minimal disturbance while creating strong identity.



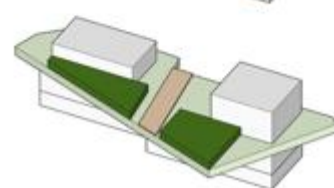
SURFACE VOLUMES

Both are entrances to the underground. They function as lobbies or entry markers. The volume on the left for staff and the volume on right for public.



VOID CARVING

Strategic subtraction of mass. Introduces natural light into RDF level and creates vertical visual connections.



LANDSCAPE INTEGRATION

Ground floor is transformed into a public park. It provides community spaces and pedestrian connectivity. It symbolizes regeneration over extraction.

5.5 INSPIRATION AND ARCHITECTURAL LANGUAGE

Batu Arang's history with coal carries a heavy weight and impact. Yet, the memory should be kept for generations to come so that there can be a cultural pride. Rather than a museum, this center draws out the spatial atmosphere. It gives hope while reminiscing.

The expression of the building is grounded in a monolithic and carved aesthetic, where heavy solid forms are contrasted with precise spatial voids. This is a strong unique architecture identity that feels grounded, stable, and embedded within the site. The openness permeability through carefully positioned cuts and openings gives a sense of humanity.

The architectural language is informed by the physical and conceptual qualities of coal, including its density, stratification, and fragmented nature. These characteristics are translated into a design language of solid masses, carved voids, and layered compositions.

Overall, the architectural language is defined by restraint, mass, and spatial clarity, where the design communicates through proportion and experience rather than literal storytelling. The result is an environment that feels grounded in its context, yet expressed through a contemporary and disciplined architectural approach.

Inspiration Sources:

- Coal as Industrial Memory: The building mimics the process of coal mining with breaking, layering and fracturing
- Subterranean Mining Experience: Designed with compressed circulation routes, sudden spatial releases, and vertically connected voids
- RDF Process as Spatial Sequence: Sorting, processing, and output stages are translated into a linear spatial narrative
- Post-Industrial Landscape of Batu Arang: A contemporary interpretation of industrial regeneration.
- Controlled Industrial Aesthetic: Language that is functional, minimal, and structurally honest, where form is derived from operational logic.
- Light, Void and Excavation: Guiding users through a layered experiential environment.

Architectural Language Key Elements:

- Form: Fragmented roof spaces embedded into terrain to seem like emerging out. A contrast between above ground light open spaces and underground heavy solid masses.
- Materials: Weathering steel panels for shading (industrial expression)
 - Cement render or exposed brick for grounded, monolithic feel
 - Exposed structural steel reflecting industrial influence
- Textures & Motifs: Perforated panels at an angle to create shadows and light reminiscing of rough texture of coal.
- Natural Light & Ventilation: Lightwells and open courtyards bring in indirect light.
- Journey & Rhythm: Spaces are designed with a narrative rhythm, just like how RDF and coal mining process has a set of rules to follow. Visitors journey from dark to light, enclosed to open, quiet to interactive.

5.6 REFERENCE PROJECTS

Several reference projects were studied to inform the design approach, particularly those that integrate industrial functions with public engagement and utilize subterranean strategies. These precedents provided insights into spatial organization, environmental strategies, and the balance between functionality and experience.

Lessons from these projects were adapted to suit the specific context of Batu Arang, ensuring that the design remains relevant and site-responsive.

1. BIG Designs Danish Recycling Center

- Relevance: Showcases how to keep local connectivity with industrial programming.
- Takeaway: Use of light wells and interaction with greenery and landscaping.



2. OKE by aq4 arquitectura

- Relevance: It is a culture house in a former mining area of Vizcaya. Utilizing industrial materials in a modern construction
- Takeaway: Perforated weathering steel panels and concrete



5.7 MODERN ARCHITECTURE

The project drew inspiration from principles of modern architecture, where clarity of form comes from identifying spatial function. The design adopted a rational approach while keeping sustainable methods in mind.

A key influence is the modernist emphasis on truth to materials, where structural and surface materials are left exposed to express their inherent qualities. Most of the time, these elements are covered up. However, the use of concrete, steel, and brick in their raw state communicates strength, permanence, and industrial authenticity. The absence of unnecessary ornamentation reinforces a focus on material honesty and spatial clarity.

The project draws inspiration from local architectural principles, particularly in terms of climate responsiveness and material use. Elements such as shading, natural ventilation, and the use of technology like heat-sensors ensures the building performs effectively. This reflects a shift from purely formal modernism to a more context-aware and sustainable architectural expression.

CHAPTER 6

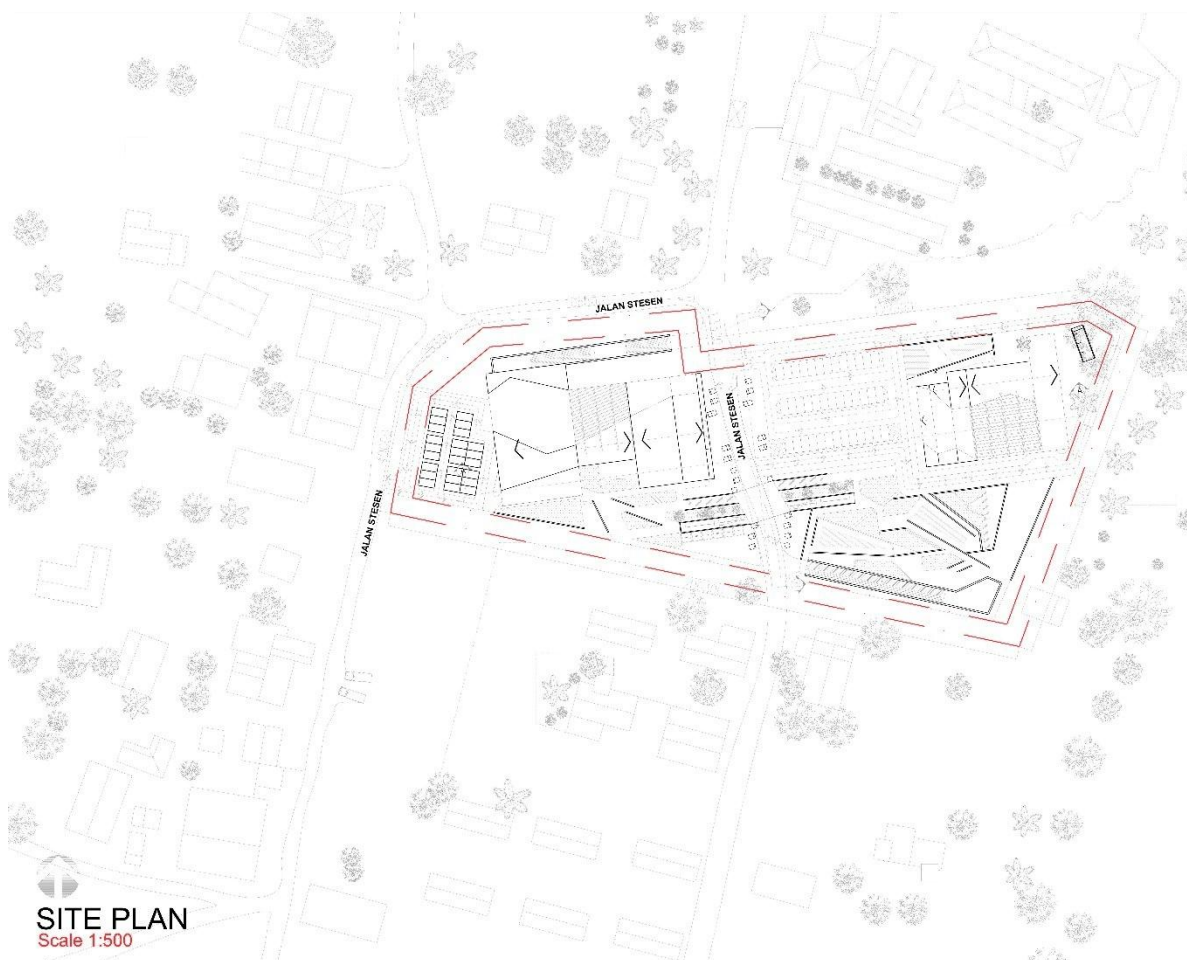
FINAL DESIGN

6.0 FINAL DESIGN

The final design absorbed all the information fed and turns it into a conceptual, spatial, and technical development of the project. It merges the connections between environment, social and programmatic functionality. It integrates industrial processes, public engagement, and historical narrative into a cohesive architectural proposal.

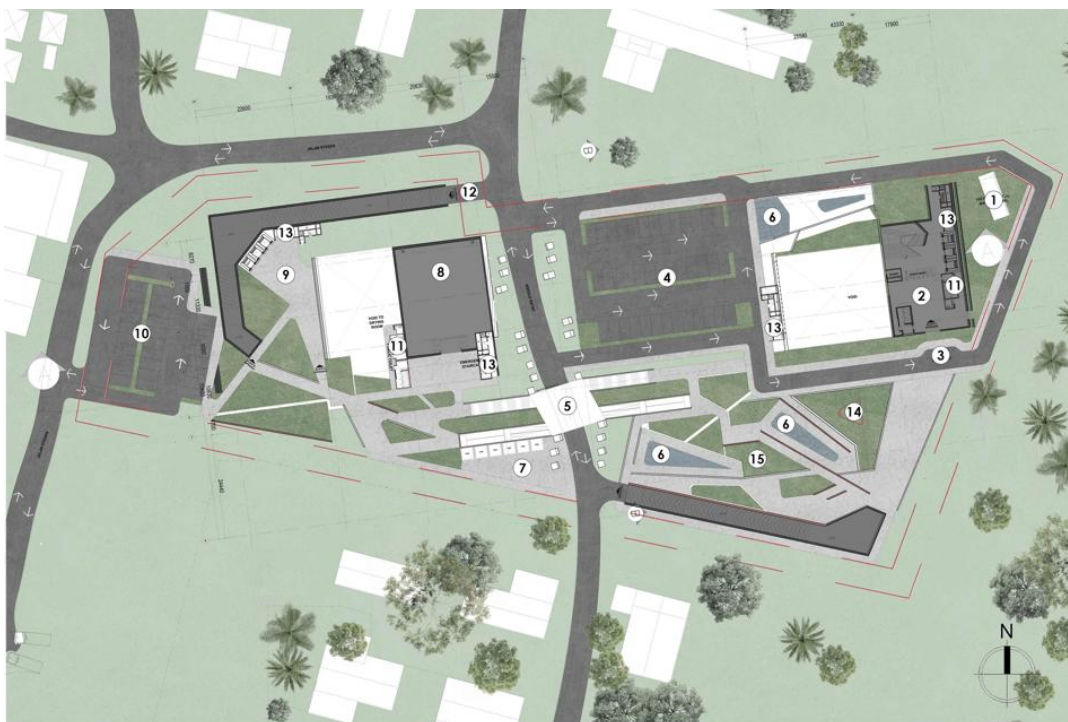
6.1 SITE PLAN

- The site plan captures the overall organization of the development in relation to its surrounding context, along Jalan Stesen.
- Design Highlights:
 - Most of the building mass is underground.
 - Park is visible.
 - Circulation paths are carefully structured to connect the main entry, public zones, event space, food kiosks, and parking.
 - Placement of structures respects sun orientation, wind flow, and existing vegetation or views.
 - Incorporates sunken courtyards, open landscape zones, pedestrian pathways, and shaded transitional spaces.
 - Clear separation is maintained between public circulation, staff access, and truck movement.



6.2 GROUND/FLOOR PLANS

- The floor plans demonstrate the spatial organization and functional distribution of the project.
- Plan Features:
 - Public spaces such as the lobby, exhibition areas, and park are positioned for ease of access, while industrial zones are located within controlled environments to ensure safety and efficiency.
 - Clear workflow path for RDF Centre:
 1. Waste Reception
 2. Separation
 3. Size Reduction
 4. Drying
 5. Pelletizing
 6. Packaging
 7. Storage
 - Incorporation of passive design features such as shaded corridors, light-sensitive roofs and stack ventilation voids.
 - Activity zones display space usage.
 - Spaces are travelled in a linear direction

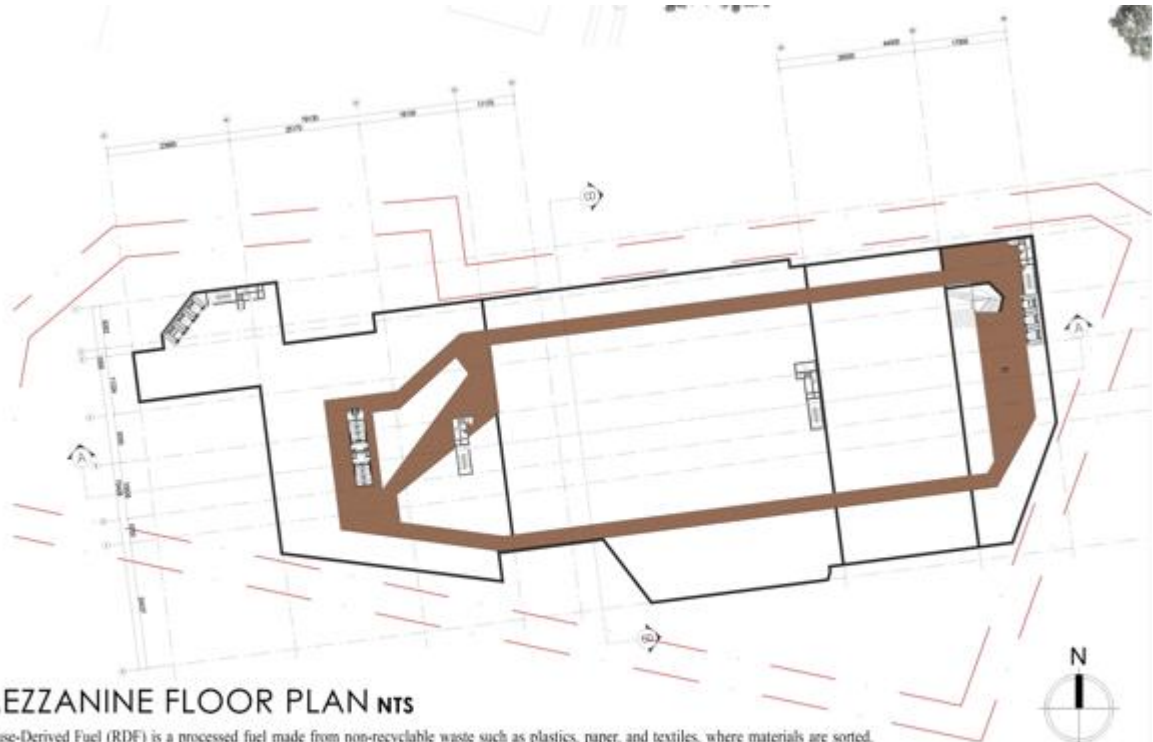


GROUND FLOOR PLAN NTS

Refuse-Derived Fuel (RDF) is a processed fuel made from non-recyclable waste such as plastics, paper, and textiles, where materials are sorted, shredded, dried, and compressed into a combustible energy source.

LEGEND

1 HISTORICAL COAL MINING TUNNEL	6 PONDS
2 LOBBY A (PUBLIC LOBBY)	7 FOOD KIOSKS
3 CAR DROP-OFF	8 EVENT SPACE
4 PUBLIC PARKING	9 LOBBY B (STAFF LOBBY)
5 PEDESTRIAN BRIDGE	10 STAFF PARKING
	11 PUBLIC W/C
	12 TRUCK ENTRANCE
	13 FIRE STAIRCASE
	14 TERRACED LANDSCAPE STEPS
	15 POCKET SEATING AREA

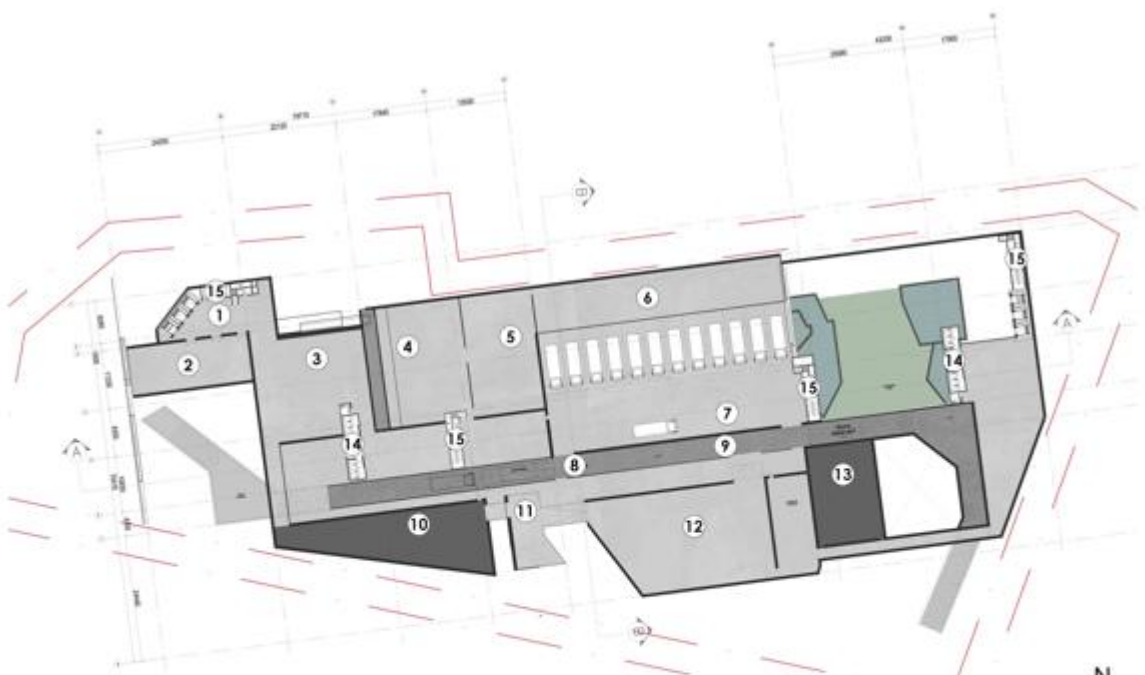


MEZZANINE FLOOR PLAN NTS

Refuse-Derived Fuel (RDF) is a processed fuel made from non-recyclable waste such as plastics, paper, and textiles, where materials are sorted, shredded, dried, and compressed into a combustible energy source.

LEGEND

- 1 LOBBY A (PUBLIC LOBBY)** **2 VIEWING DECK** **3 PUBLIC W/C** **4 FIRE STAIRCASE**

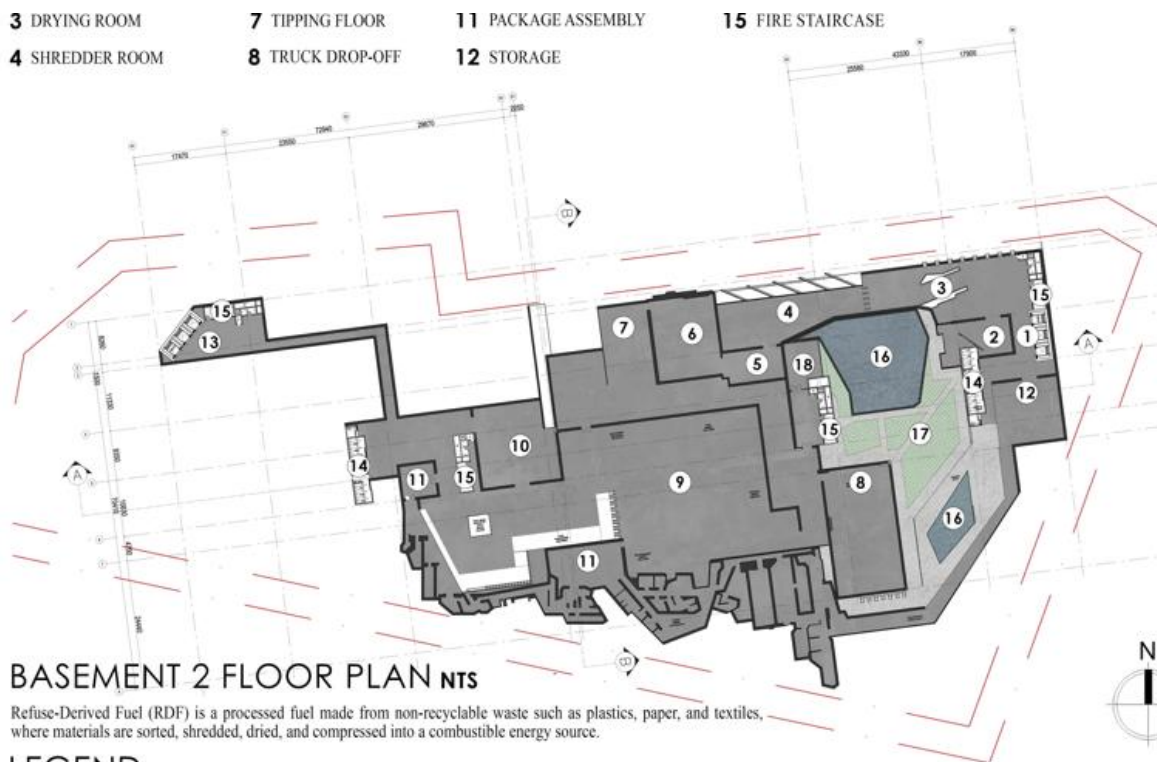


BASEMENT 1 FLOOR PLAN NTS

Refuse-Derived Fuel (RDF) is a processed fuel made from non-recyclable waste such as plastics, paper, and textiles, where materials are sorted, shredded, dried, and compressed into a combustible energy source.

LEGEND

- 1 LOBBY B (STAFF LOBBY)** **5 SORTING ROOM** **9 TRUCK PICK-UP** **13 FILTRATION POND TESTER**
- 2 OFFICE** **6 SHOVEL FLOOR** **10 PELLET MACHINE** **14 PUBLIC W/C**
- 3 DRYING ROOM** **7 TIPPING FLOOR** **11 PACKAGE ASSEMBLY** **15 FIRE STAIRCASE**
- 4 SHREDDER ROOM** **8 TRUCK DROP-OFF** **12 STORAGE**



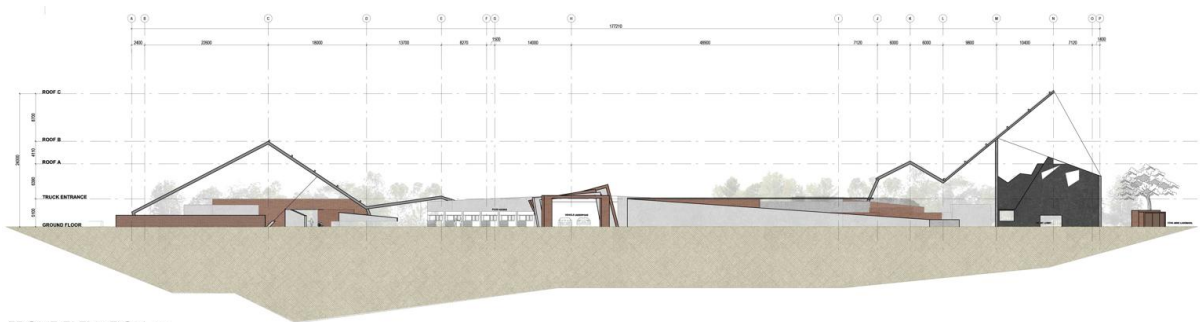
LEGEND

- | | | | |
|--|--|-----------------------------------|-----------------------------------|
| 1 LOBBY A (PUBLIC LOBBY) | 7 BATU ARANG HISTORY TIMELINE | 11 EXPLORATION TUNNEL | 15 FIRE STAIRCASE |
| 2 RDF WORKSHOP | 8 AUDIO-VISUAL THEATRE (BATU ARANG HISTORY) | 12 SOUVENIR | 16 RETENTION POND |
| 3 COAL FORMATION GALLERY | 9 HERITAGE GALLERY | 13 LOBBY B (SERVICE LOBBY) | 17 SUNKEN GARDEN COURTYARD |
| 4 COAL TIMELINE | 10 COSPLAY STUDIO | 14 PUBLIC W/C | 18 MANAGEMENT OFFICE |
| 5 COAL TYPE DISPLAY | | | |
| 6 AUDIO-VISUAL THEATRE (COAL FORMATION) | | | |

6.3 ELEVATIONS

- The elevations provide a view of the building’s exterior form. It shows, variations in height, openings, and material articulation.
- Key Elements Shown:
 - Triangular structural roof that makes the development a noticeable landmark
 - Use of regional materials like brick
 - Use of reinforced materials for building scale like concrete, steel, weathering steel
 - Shaded devices such as light-detecting weathering roof panels and overhangs to reduce solar gain and glare
 - Elevation shows

Each elevation responds to its surrounding context, addressing roads, residential areas, and natural landscapes with appropriate levels of openness and control.



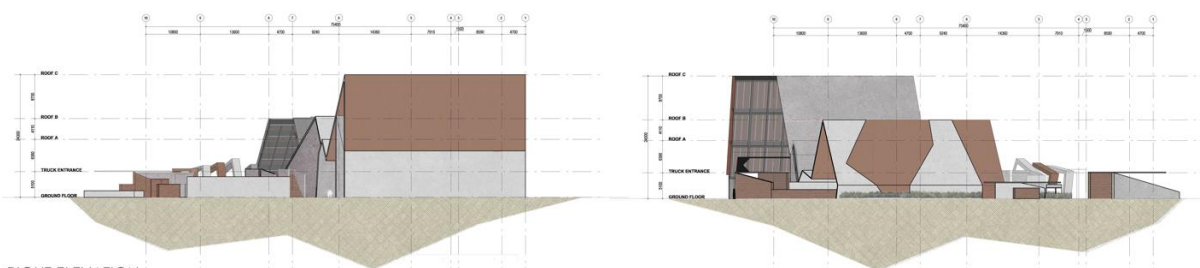
FRONT ELEVATION NTS

The front elevation acts as a landmark facing the northern approach, establishing the development as a highly visible and recognisable structure for users travelling along the main direction of movement. Its prominence is further reinforced by the proximity of food kiosks along the roadside, activating the frontage as a lively public interface.



REAR ELEVATION NTS

The rear elevation addresses the open-air public car park, providing direct and convenient access to the main entry points of the building. This side also accommodates the truck entrance, ensuring a clear separation between public arrival and RHP operational logistics.



RIGHT ELEVATION NTS

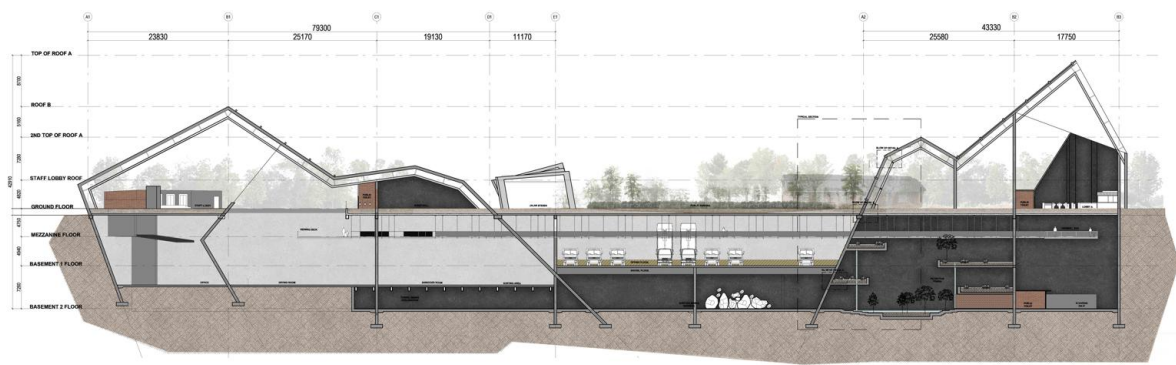
The right elevation faces the adjacent forested landscape, with no direct road connectivity, creating a more isolated and natural edge condition. This elevation highlights the vertical relationship between the elevated park and the main building mass, emphasising the contrast in scale and reinforcing the layered spatial composition.

LEFT ELEVATION NTS

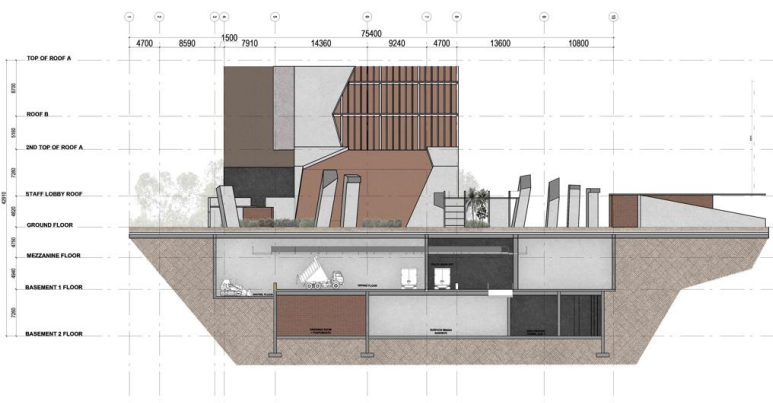
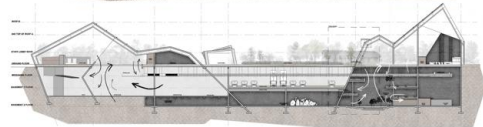
The left elevation addresses the residential edge, where a passing road defines a quieter contextual condition. Staff parking is strategically located on this side, allowing local staff access while minimising disturbance to public circulation zones. This arrangement ensures operational efficiency while maintaining sensitivity to the surrounding neighbourhood.

6.4 SECTIONS

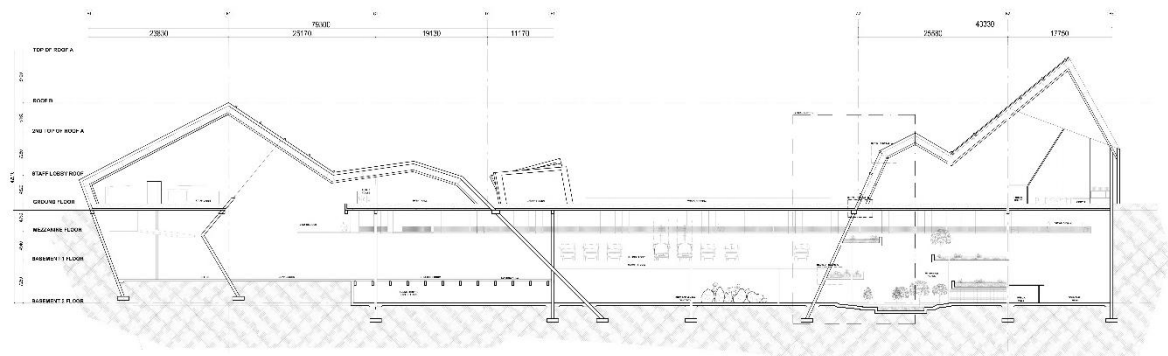
- The sectional drawings reveal the vertical organization of the project, highlighting the relationship between surface-level public spaces and the subterranean programmed below.
- Design Aspects Shown in Sections
 - Level transitions and how the development is embedded into the ground
 - Tripple-height volumes for some RDF processes to allow truck dump and offer better ventilation for hot spots
 - Sunken garden courtyard serves as light well and breezeways
 - Interaction between spaces
 - Compression and release of spatial volumes along circulation route
 - Separation of clean and industrial operational layers
 - Sectional expression of narrative journey from surface to depth



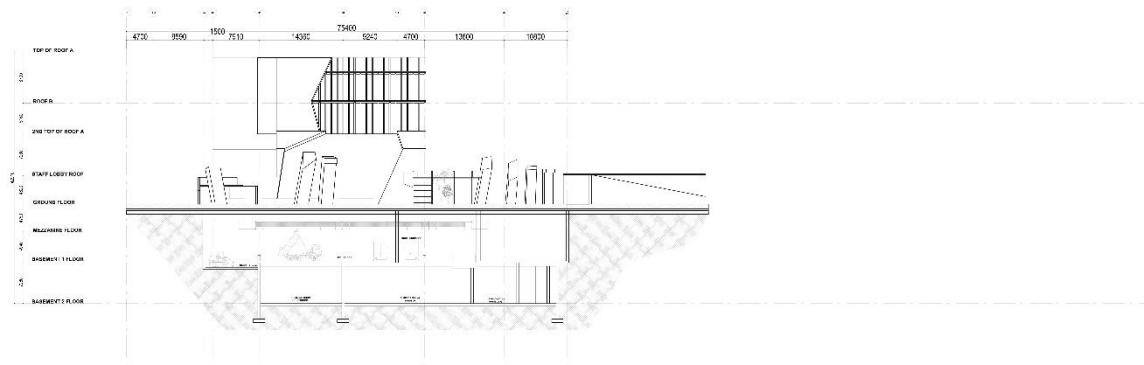
SECTION A-A
 Section A-A reveals the vertical layering of public, exhibition, and industrial spaces, interconnected through curved voids that introduce natural light, ventilation, and visual continuity across levels. The section also expresses the material composition of the building, where brick, weathering steel, and pigmented concrete are articulated to form a cohesive and grounded architectural palette. Structurally, the development is supported by reinforced concrete columns on pad foundations, enabling the large spans required for the subterranean spaces.



SECTION B-B
 Section B-B demonstrates the spatial sequencing of the exhibition, where compression, controlled lighting, and varied volumes recreate the experience of underground mining. The section also reveals the RDF tipping floor, where waste is discharged into a sunken collection zone for processing, illustrating the operational workflow within the facility. Additionally, the section highlights the relationship between the subterranean volumes and the structure above ground, emphasising the building's integration into the landscape while maintaining functional efficiency.



SECTION A-A
Scale 1:300



SECTION B-B
Scale 1:300

6.5 PERSPECTIVE VIEWS (3D RENDERINGS/SKETCHES)

- Perspective views provide a visual representation of the spatial experience, capturing the atmosphere, scale, and materiality of the project.
- Key Perspectives Included:
 - Killer Perspective: Shows the view of the park and how it is exposed to the surrounding site while the truck entrances are hidden away
 - Close-up: The structure of the unique weathered steel roof combined with concrete finishes
 - Road Framing: Jalan Stesen has a bridge passing over it for pedestrians to cross from one block to another
 - Circulation Experience: Walking through corridors framed by concrete walls, perforated bricks and ponds.
 - RDF Interior: Highlights the exposed ceiling, open layout and repetitive motifs
 - Museum Interior: Integration of display walls within carved massing







6.6 MATERIAL PALETTE AND LOCAL RELEVANCE

- The material palette is carefully selected to reflect the industrial heritage and environmental context of Batu Arang.
- Material chosen is dependent on:
 - Cultural relevance
 - Environmental sustainability
 - Textural storytelling
- Material Selections
 - Exposed red brick: Relates to Batu Arang historical narrative of producing bricks
 - Pigmented concrete: Introduces tonal variation that enhances spatial depth and differentiates spaces
 - Weathering steel: Natural oxidation reinforced narrative of time and industrial revolution while being durable and perforated
 - Structural Steel: Used for long span elements like the roof, allowing angled and dynamic geometries
 - Timber: Introduced in selected interior spaces for warmth and tactility
 - Glass: Selectively used to prevent rain from entering dry spaces while still allowing light and visual connectivity
 - Stone and Aggregates: Used in external landscaping and ground treatment to reinforce raw geology
- Local Relevance:
 - Reinforce Batu Arang's industrial and geological identity
 - Earthy, raw, and textured finishes reflect the concept of coal formation and extraction
 - Construction techniques use excavation and long span construction
 - Sustainability is achieved through natural lighting with windows and thermal massing with concrete

These materials not only reference the texture and tone of coal and mining infrastructure but also ensure longevity and suitability within the tropical climate.

MATERIAL

CONCRETE	BRICK	WEATHERED STEEL	STEEL	CONCRETE
Exposed concrete forms the primary structural system, providing durability and mass while evoking the solidity and permanence of the underground mining environment.	Brick reflects the historical fabric of Batu Arang, reinterpreted through a controlled and contemporary application to development with the present architectural language.	Perforated weathered steel panels are used to allow ventilation and filtered visibility, balancing enclosure with permeability in industrial zones.	Steel elements are introduced for long spans and elevated walkways, offering structural efficiency and a lightweight contrast to the heavy concrete base.	Dark pigmented concrete is used to reference the visual depth of coal, reinterpreted through a refined surface finish that balances industrial character with contemporary spatial quality.

6.7 SUSTAINABILITY AND PASSIVE DESIGN FEATURES

The project incorporates a range of passive design strategies to enhance environmental performance.

Passive Cooling Techniques:

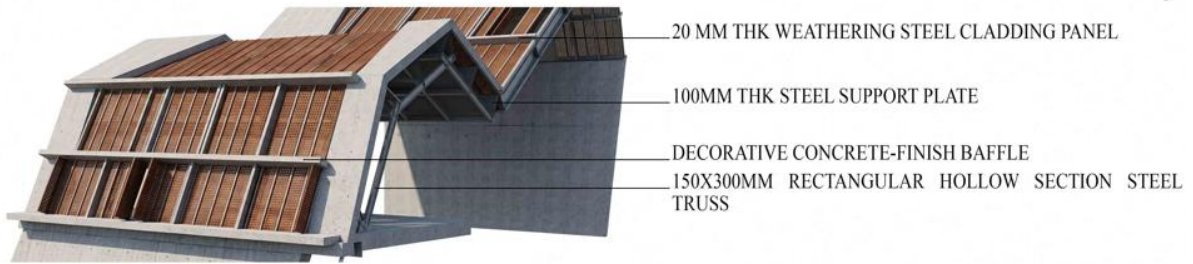
- Natural ventilation through stack effect
- Daylight penetration via carved voids
- Use of thermal mass from the surrounding earth to regulate internal temperatures
- Height ceiling heights to create more freedom for airflow so no stuffy feeling
- Shaded outdoor zones for comfort against sun
- Open plan with linear paths for natural air flow and circulation
- Optimised building orientation responding to prevailing wind directions for improved natural airflow

Sustainable Strategies:

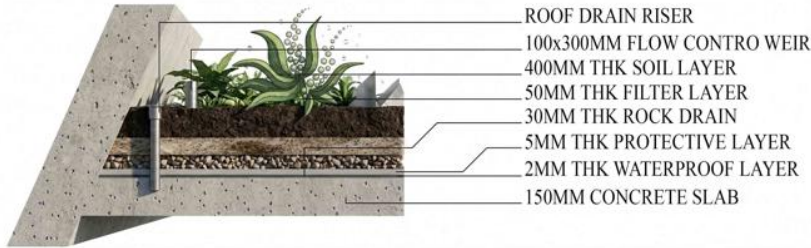
- Rainwater harvesting and vegetated filtration systems contribute to resource efficiency.
- RDF process recycles municipal waste into RDF pellets that can be used in steel factories.
- Roof has heat-sensors to recognize which areas to shade

BLOW UP DETAILS

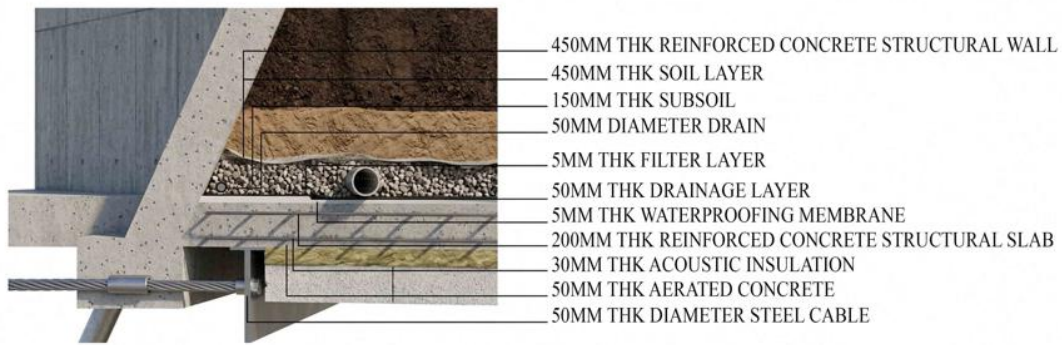
A



BLOW UP DETAIL A



BLOW UP DETAIL B



BLOW UP DETAIL C



6.8 CULTURAL STORYTELLING THROUGH ARCHITECTURE

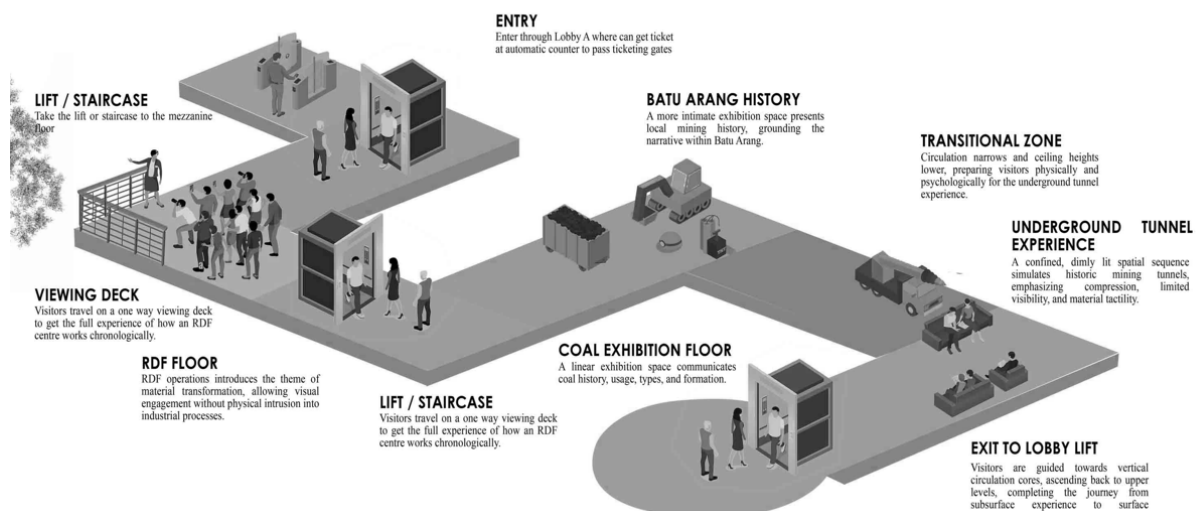
Good architecture should tell a story. The design reiterates the history of coal mining into spatial and architectural experiences. The act of descent into the building reflects the process of underground extraction.

Key Storytelling Elements:

- The subtractive massing concept reflects the nature of coal formation. It is layered, compressed, fragmented over time.
- Spaces are organized according to the RDF and waste transformation sequence: collection, sorting, shredding, drying, palletization, packaging and storing.
- Circulation is designed as a controlled linear journey, echoing industrial workflow and mining descent.
- Material expression reinforces industrial authenticity.
- Light is treated as a narrative device, entering through vertical cuts and sunken voids to mark key moments in the experiential sequence.
- The relationship between above-ground and underground spaces symbolizes duality. It compares surface knowledge to hidden industrial processes beneath the terrain

The overall architectural language communicates transformation from waste to resource, from ground to void, from solid mass to experiential space. By combining heritage interpretation with modern sustainable practices, the project creates a narrative that connects the past, present, and future of Batu Arang.

VISITOR JOURNEY DIAGRAM



CHAPTER 7

CENTRAL LIGHT WELL

7.0 CENTRAL LIGHT WELL

The central light well is a key spatial and environmental element within the project, acting as a vertical connector that brings natural light, air, and visual continuity into the underground levels. It links the public realm above with the industrial and exhibition spaces below, reinforcing the overall narrative of descent and regeneration within the development located in Batu Arang.

As the void descends, there are cantilevered filtration ponds sticking out of the walls. They hold the rainwater that falls from the sky. After, the aquatic plants filter the water so it can be used as greywater for public amenities. These stepped terrace ponds offer interesting visual depth. This system transforms the light well into a living infrastructural element, where water, light, and landscape operate as part of the architectural system.

Beyond that, the central light well offers views from the bottom for visitors to appreciate the surface. It creates the feeling of life is always greener on the other side. From the top, curiosity follows of what is below. From the bottom, the light from the top makes for a glorious sight to behold. Therefore, creating a memorable visual experience. The design harmonizes the large industrial scale concrete walls with the softness of nature.

7.1 INTRODUCTION TO LIGHT WELL

Light wells can be roofed or unroofed external spaces within the volume of a large building. They bring daylight and breeze into lower-lying rooms like basements. A similar word is skylights but skylights are openings in the roof that allow light to enter into a room while lightwell is an open shaft going through the entire building. Some light wells can be referred to as an atrium.

The advantages of light wells are that they can reduce the electric lighting requirements of a building, as well as providing an open space that can be used as an outdoor area or garden. Users are able to perceive the full depth of the building through this void, reinforcing spatial awareness and strengthening the experience of movement. It creates a feeling of awe.





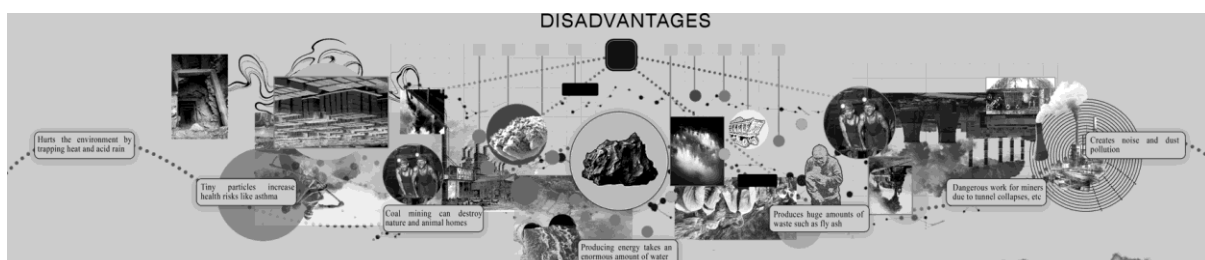
7.2 DESIGN INSPIRATION

The design of the light well is inspired by the geological and industrial conditions of coal mining, where vertical shafts and excavated voids define underground spatial systems. This concept is translated into architecture as a carved void within the building mass, symbolizing both extraction and exposure. The idea of revealing hidden layers beneath the ground reinforces the project's narrative of transformation and regeneration.

The greenery against the concrete symbolizes the meeting between nature and industrial memory. It expresses a dialogue between regeneration and extraction. It provides the awareness that even within a post-industrial landscape, natural systems continue to reclaim, soften, and transform the environment over time. It also serves as a reminder for the future to preserve our environment even in the midst of ground-breaking innovation.

Coal mining, while being historically significant, also significantly impacted the environmental and social network. The large-scale extraction that occurred back in the day resulted in land degradation, soil instability, and long-term scars to the topography. To mine, the vegetation on the surface would be removed, resulting in loss of habitats and reduced biodiversity.

In addition, coal mining contributes to air and water pollution. Many of the effects can be seen by the mining workers. Mining releases dust and methane that can affect breathing. When rain reaches these dug out sites, contaminated runoffs can affect nearby agriculture. Burning coal itself, which was how electricity came, release greenhouse gasses like carbon dioxide. In Batu Arang, there used to be a coal powered railway that did these such things.



CHAPTER 8

REFLECTION

8.0 REFLECTION

This project was a fulfilling learning curve to grow my personal creativity, skills and problem-solving. The challenges faced and the solutions found have contributed to my personal and professional growth. This will join me in my journey of personal and professional growth. This project in particular emphasized architecture in conjunction with history, environment and industrial systems.

8.1 CHALLENGES FACED

One of the main challenges was balancing the coexistence of industrial RDF functions with public and exhibition spaces within a single integrated system. Additionally, ensuring safety, circulation clarity, and functional separation while maintaining a coherent architectural narrative required multiple iterations.

1. Limited availability on information relating to Batu Arang
 - The Special Area Plan for Batu Arang was requested through an email but never received a response
2. Intense research required for more spaces due to sheer size of site
 - Each space had to contribute a function without being too cliché. There was a lot of underused spaces
3. Hard to visualize connectivity between levels for sectional drawing
 - Since most of the walls were diagonal and the structure was long span, there was confusion on the realistic construction methods to be used.
4. Above-ground form development
 - The form had to respect the local environment while signifying something as jarring as coal

8.2 HOW I OVERCAME THEM

These challenges were addressed through iterative design development and continuous feedback from critiques. Spatial zoning was refined to clearly separate public, staff, and industrial circulation, while still allowing controlled visual connections.

1. Guidance from Studio Master and Peers
 - With teachings from my lecturer, the design process was made quicker through discussions and critiques. The collaboration process ensured the final proposal remained unique and responsive to the concept
2. Expert Assistance for Spatial Organization
 - My lecturer encouraged me to research more about RDF process and utilize my research about coal to generate new spaces not used in normal museums or exhibitions.
3. Creative Problem Solving and Iterative Design Exploration
 - To find my form, a process of iterative experimentation was adopted, involving continuous testing of ideas through sketches, diagrams, and model studies. It also helped me visualize my spaces better.

8.3 PERSONAL GROWTH AS A DESIGNER

With the limited time given each semester, I learned that managing time is not by making more free time available but by planning the available time. Design decisions were made through clear stages of exploration, refinement, and resolution.

I gained a greater understanding for brutalist and modern architecture. Engaging with these styles challenged me to think in terms of mass, proportion, structure, and spatial hierarchy, rather than surface aesthetics alone. Something I am not used to. I now feel more confident to design more complex structures for my next and final semester.

This experience has taught me that the process will always have tweaks and changes. It is important to be open to it and keep moving forward. If stuck, maybe follow the advice learned from the building and look for green areas to regain productivity. Adjustments are part of the resolved outcome.

This project has significantly developed my ability to think spatially and conceptually at the same time. I have learned how to translate abstract ideas into architectural strategies, particularly through massing, circulation planning, and sectional thinking. It has also strengthened my ability to justify design decisions based on site conditions, programmatic requirements, and environmental considerations, rather than purely aesthetic choices.

8.4 WHAT I WOULD DO DIFFERENTLY OR IMPROVE

I would have liked to visit Batu Arang and get knowledge from the locals. They seem to have a very quiet lifestyle. The only drastic thing I could see was their petition against the waste-to-energy incinerator. Direct engagement with residents could have provided a deeper understanding of their perspectives, memories, and relationship with the post-mining landscape, which would have strengthened the contextual grounding of the design.

If given more time, I would further refine the relationship between the industrial RDF operations and public exhibition areas to create even stronger spatial integration.

I would have also liked to create physical site model. This would have allowed for a more tangible exploration of the excavated and embedded architectural form. However, due to technical limitations this semester, particularly the unavailability of the laser cutter, the development of a detailed physical model was not possible.

CHAPTER 9

CONCLUSION

9.0 CONCLUSION

This project concludes as an exploration of how architecture can reinterpret an industrial past into a spatial and educational experience. Through the development of a subtractive massing approach, the building is not treated as an object placed on site, but as an intervention into the ground that reveals space through excavation, layering, and void formation. The concept successfully translates the narrative of coal mining and RDF processing into a structured architectural journey that moves from surface understanding to deeper spatial immersion.

9.1 SUMMARY OF THE PROJECT'S PURPOSE AND DESIGN JOURNEY

The project began with an exploration of three thematic directions: manufacturing, agriculture, and mining. I selected mining as the primary subject due to its familiarity and yet a deep historical relevance. Through extensive site analysis, conceptual development, and iterative design processes, the project evolved into a subterranean architectural system that integrates public park, RDF processing, and coal exhibition.

The final design reflects a progression from abstract conceptual ideas such as subtraction and layering, into a resolved architectural proposal that balance function, experience, and environmental response.

The design process has strengthened my understanding of how the function and circulation and structure of the spaces all depend on each other to create an experience. The integration of industrial processes with public exhibition spaces required careful balancing for a meaningful visitor experience. This relationship became the core driver of the project, shaping how spaces are arranged, connected, and experienced.

Overall, the project demonstrates how a post-industrial site like Batu Arang can be reimaged as a place of learning, reflection, and transformation. It shows that even spaces associated with extraction and waste can be reinterpreted into architecture that carries educational and cultural value. Through this process, I have developed a stronger ability to think spatially, conceptually, and critically, while also improving my confidence in handling large-scale and multi-layered architectural programmes.

9.2 FINAL THOUGHTS ON THE IMPORTANCE OF CULTURAL PRESERVATION THROUGH ARCHITECTURE

This project highlights the role of architecture as a medium for cultural preservation and reinterpretation. By introducing the narrative of coal mining into spatial experience, the design allows users to engage with the historical identity of Batu Arang in a more understandable way through experience.

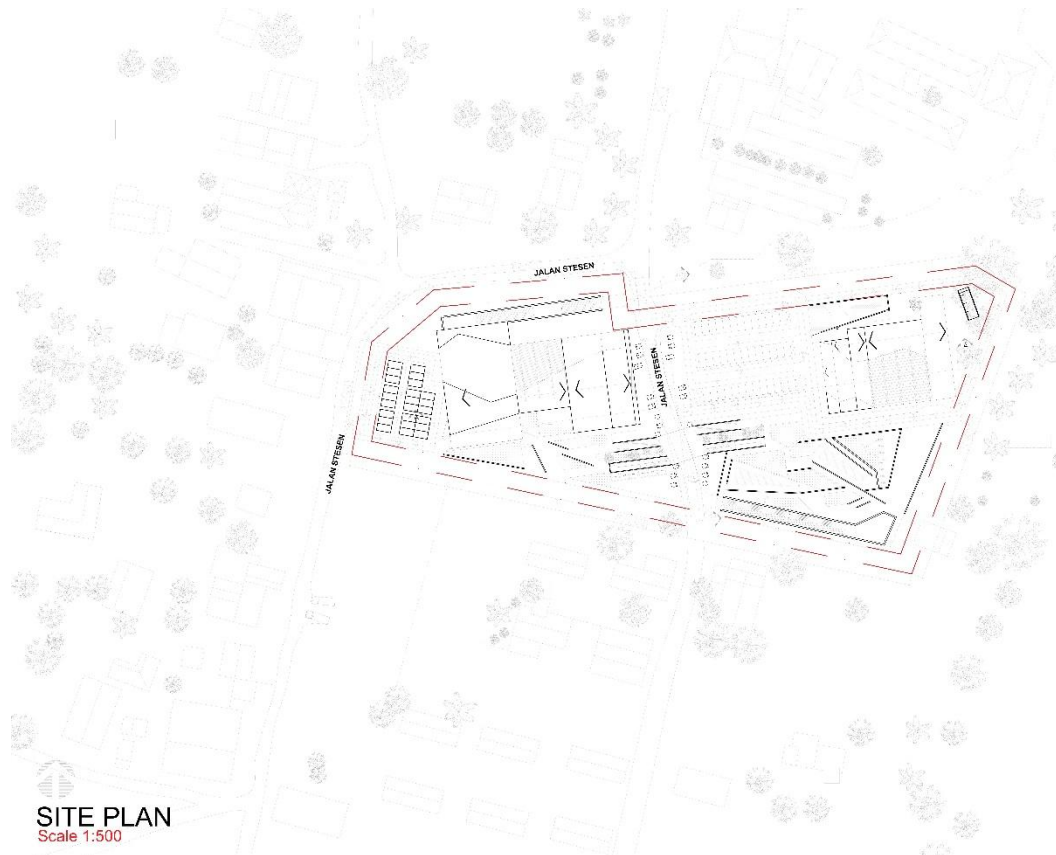
Rather than treating history as a static record, the project revives it through spaces, circulation, and material expression. In doing so, it demonstrates how architecture can bridge the past and future, transforming industrial heritage into a living and evolving public experience.

CHAPTER 10

APPENDIX

10.0 APPENDIX

10.1 Working drawings



NOTES :

UNIVERSITY LOGO :

CITY UNIVERSITY
MALAYSIA

STUDENT NAME :
ODELIA LUARI HO
STUDENT ID :
202209020001

COURSE :
BACHELOR OF SCIENCE
(HONS) (ARCHITECTURAL
DESIGN)

SUBJECT CODE :
BAAD2093

BATCH :
220209

DRAWING TITLE :

THE DESCENT
SITE PLAN

DRAWING NO :
03

DRAWN BY :
ODELIA LUARI HO

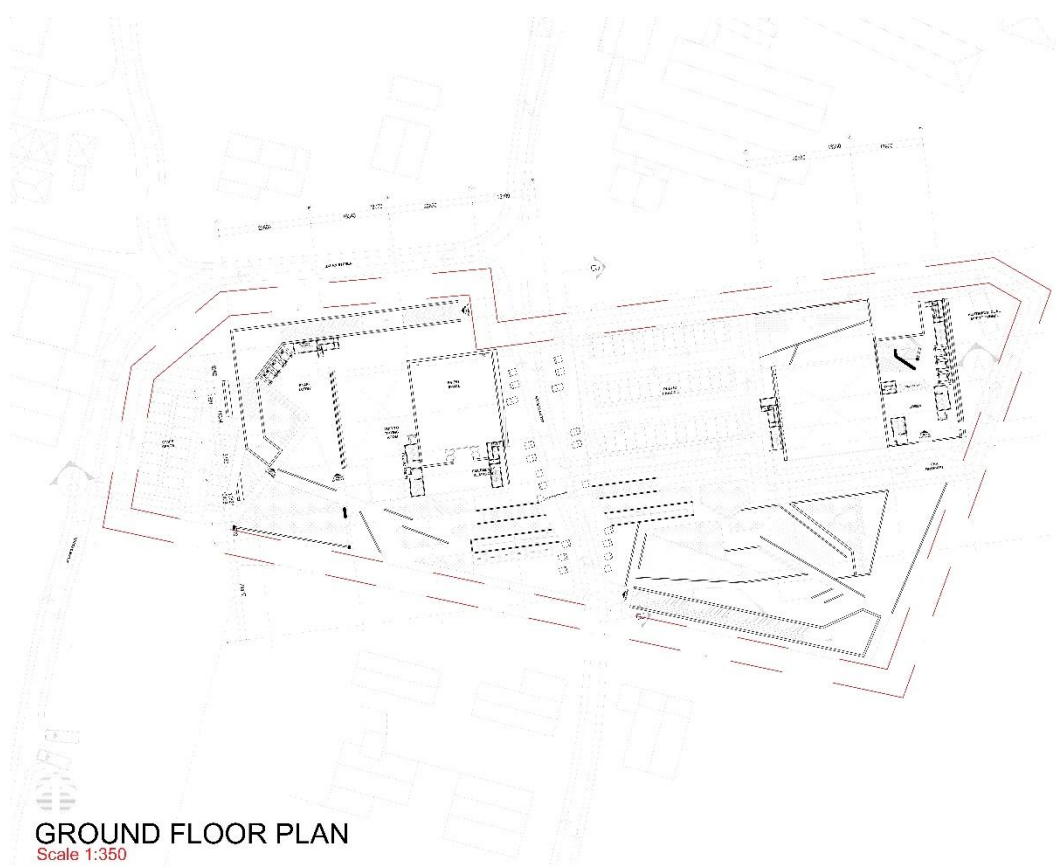
DATE :
7/5/2026

CHECKED BY :

DATE :

SHEET SIZE : SHEET NO :
A1 02

NOTES :



UNIVERSITY LOGO :

CITY UNIVERSITY
MALAYSIA

STUDENT NAME :
ODELIA LUARI HO
STUDENT ID :
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COURSE :
BACHELOR OF SCIENCE
(HONS) (ARCHITECTURAL
DESIGN)

SUBJECT CODE :
BAAD2073

BATCH :
220209

DRAWING TITLE :

THE DESCENT
GROUND FLOOR PLAN

DRAWING NO :
05

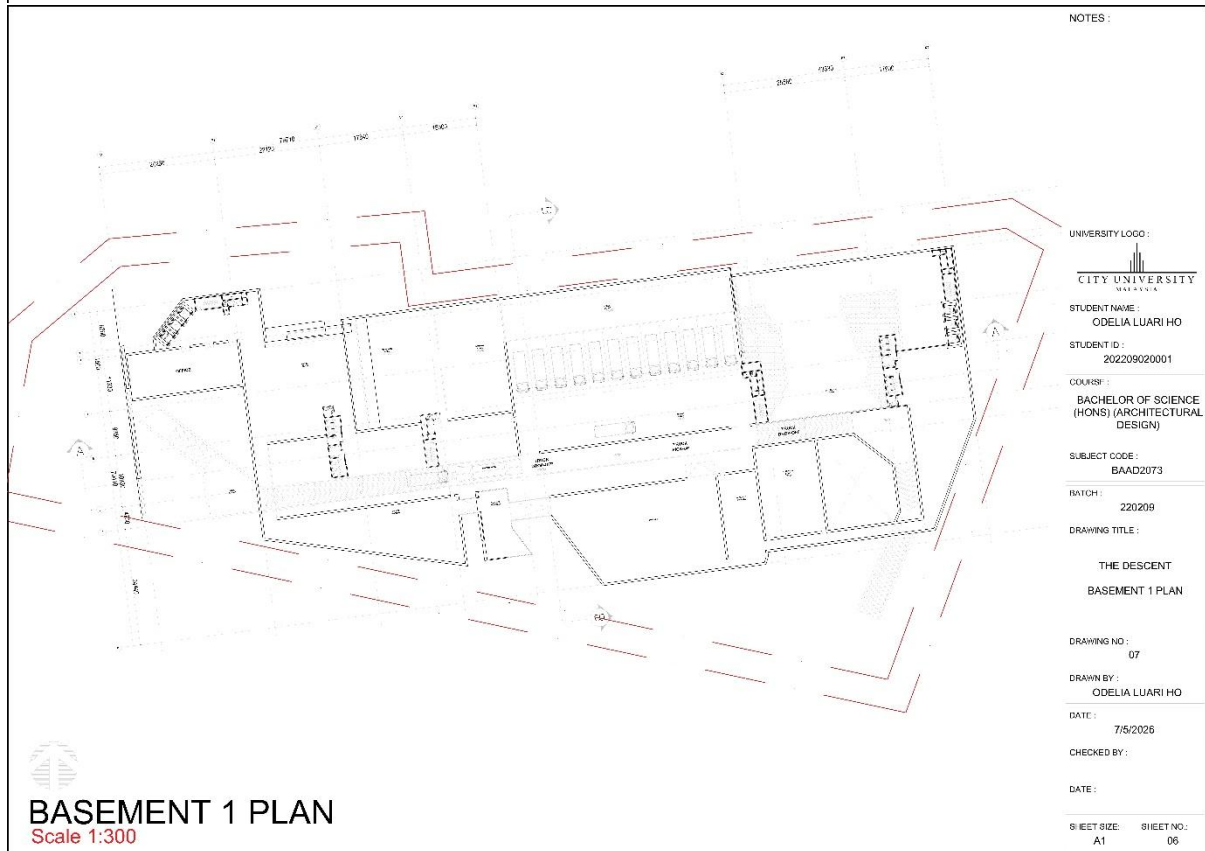
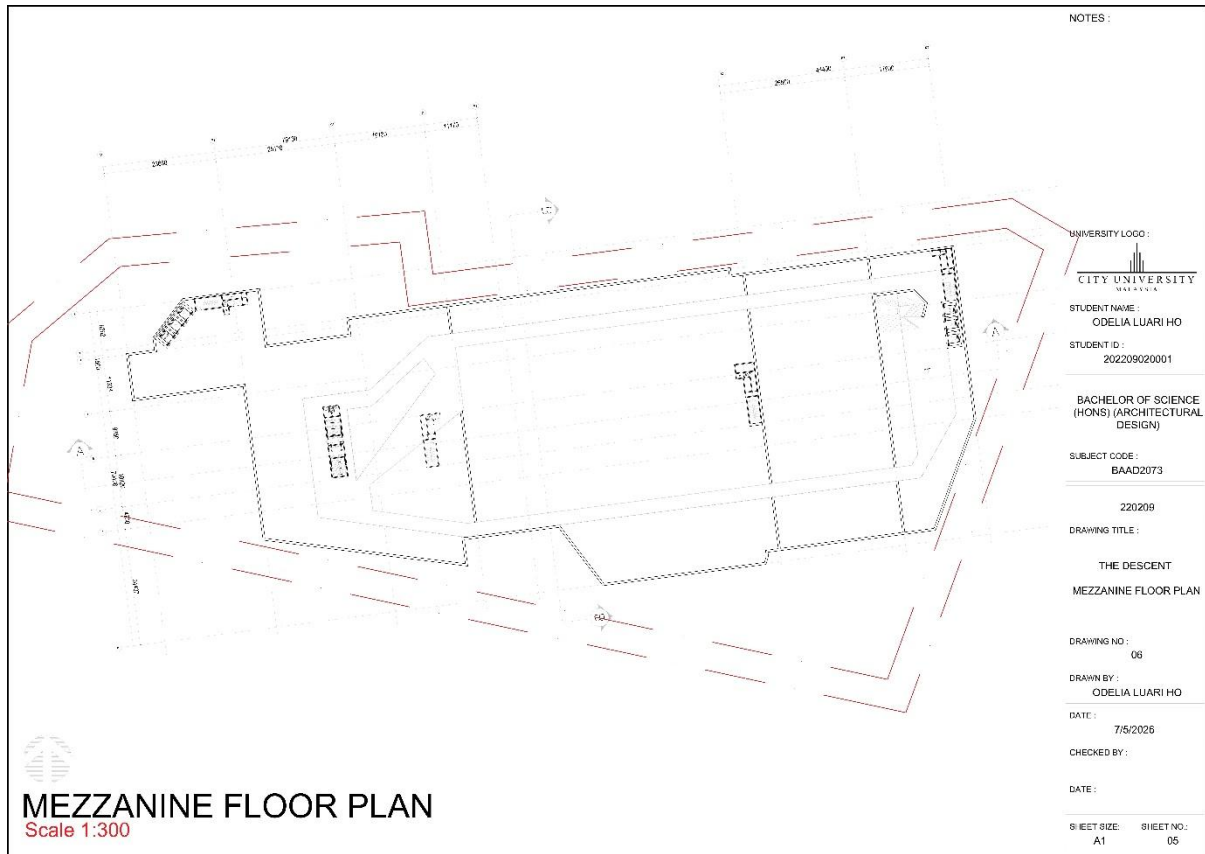
DRAWN BY :
ODELIA LUARI HO

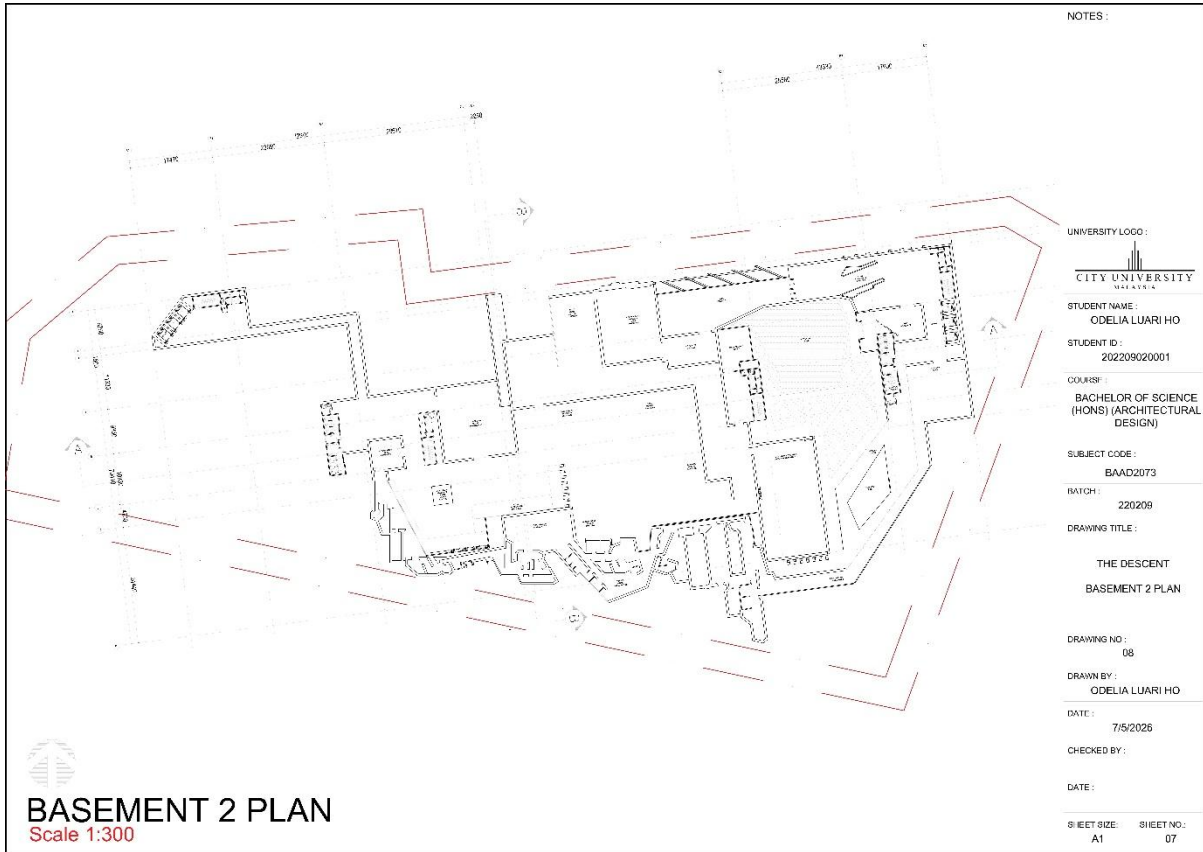
DATE :
7/5/2026

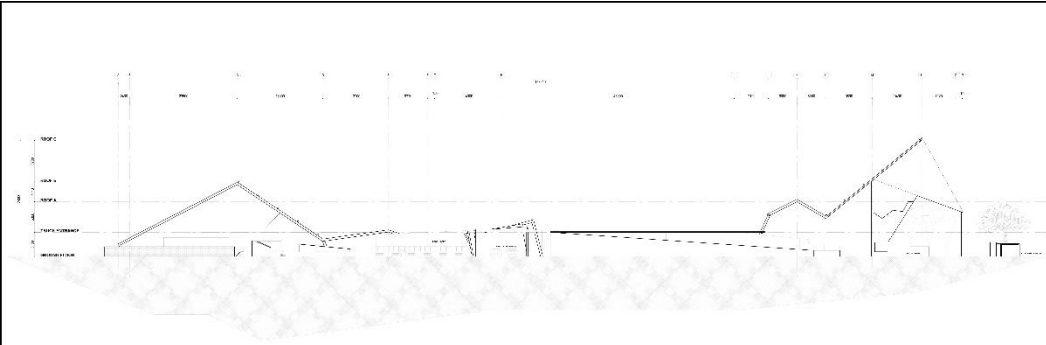
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DATE :

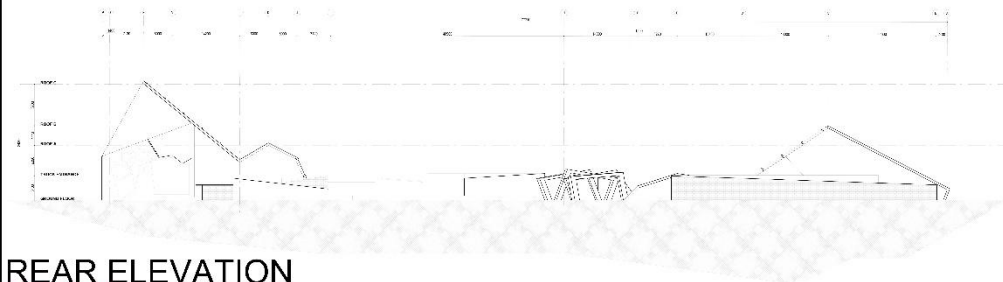
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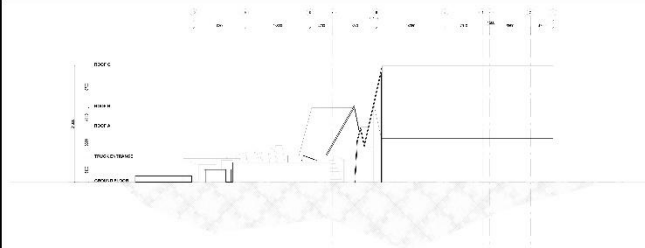




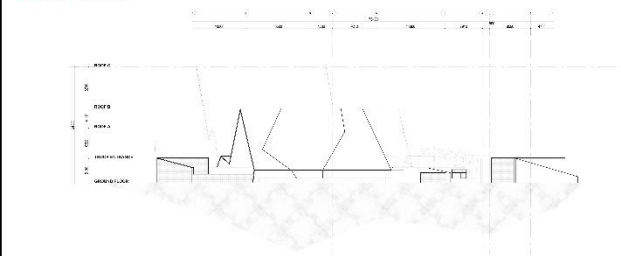
FRONT ELEVATION
Scale 1:300



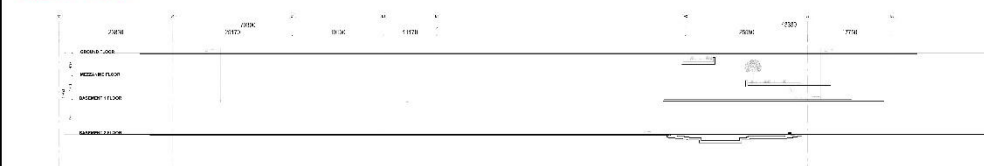
REAR ELEVATION
Scale 1:300



RIGHT ELEVATION
Scale 1:300



LEFT ELEVATION
Scale 1:300



WATER SUPPLY
Scale 1:300

NOTES :

UNIVERSITY LOGO :



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SUBJECT CODE :
BAAD2093

BATCH :
220209

DRAWING TITLE :

THE DESCENT
FRONT ELEVATION
REAR ELEVATION

DRAWING NO :
11,12

DRAWN BY :
ODELIA LUARI HO

DATE :
7/5/2026

CHECKED BY :

DATE :

SHEET SIZE : SHEET NO :
A1 09

NOTES :

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DESIGN)

SUBJECT CODE :
BAAD2093

BATCH :
220209

DRAWING TITLE :

THE DESCENT
RIGHT ELEVATION
LEFT ELEVATION
WATER SUPPLY

DRAWING NO :
13,14,15

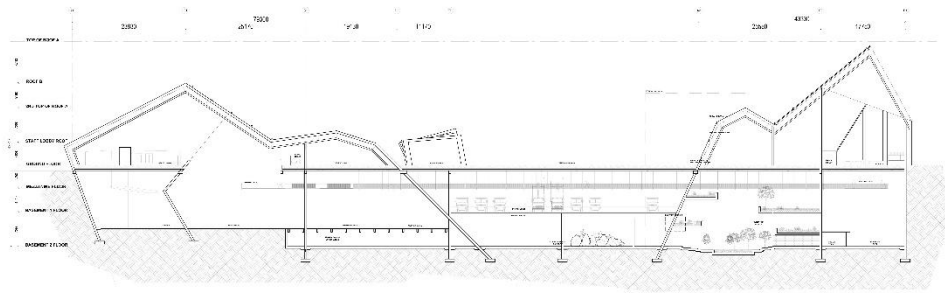
DRAWN BY :
ODELIA LUARI HO

DATE :
7/5/2026

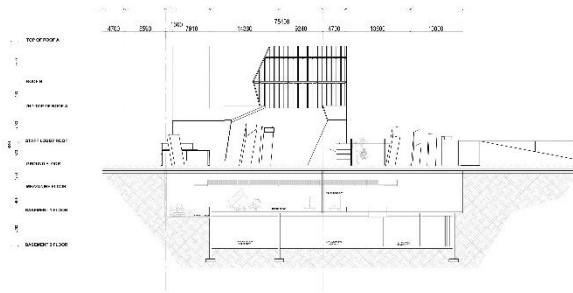
CHECKED BY :

DATE :

SHEET SIZE : SHEET NO :
A1 10



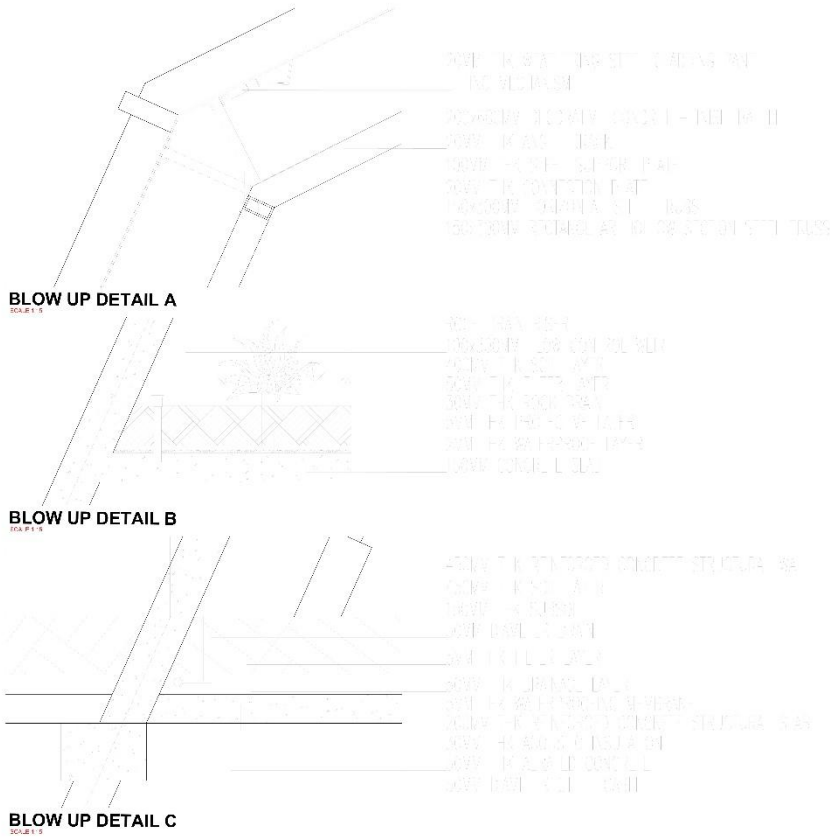
SECTION A-A
Scale 1:300



SECTION B-B
Scale 1:300

NOTES :

UNIVERSITY LOGO :
 CITY UNIVERSITY
 STUDENT NAME :
 ODELIA LUARI HO
 STUDENT ID :
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 COURSE :
 BACHELOR OF SCIENCE
 (HONS) (ARCHITECTURAL
 DESIGN)
 SUBJECT CODE :
 BAAD2093
 BATCH :
 220209
 DRAWING TITLE :
 THE DESCENT
 SECTION A & B
 DRAWING NO :
 09.10
 DRAWN BY :
 ODELIA LUARI HO
 DATE :
 7/5/2026
 CHECKED BY :
 DATE :
 SHEET SIZE : SHEET NO :
 A1 08



BLOW UP DETAIL A
SCALE 1:15

BLOW UP DETAIL B
SCALE 1:15

BLOW UP DETAIL C
SCALE 1:15

NOTES :

UNIVERSITY LOGO :
 CITY UNIVERSITY
 STUDENT NAME :
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 202209020001
 COURSE :
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 (HONS) (ARCHITECTURAL
 DESIGN)
 SUBJECT CODE :
 BAAD2093
 BATCH :
 220209
 DRAWING TITLE :
 THE DESCENT
 BLOW UP DETAIL
 DRAWING NO :
 06.07
 DRAWN BY :
 ODELIA LUARI HO
 DATE :
 20/9/2025
 CHECKED BY :
 DATE :
 SHEET SIZE : SHEET NO :
 A1 03

