

# CHAPTER

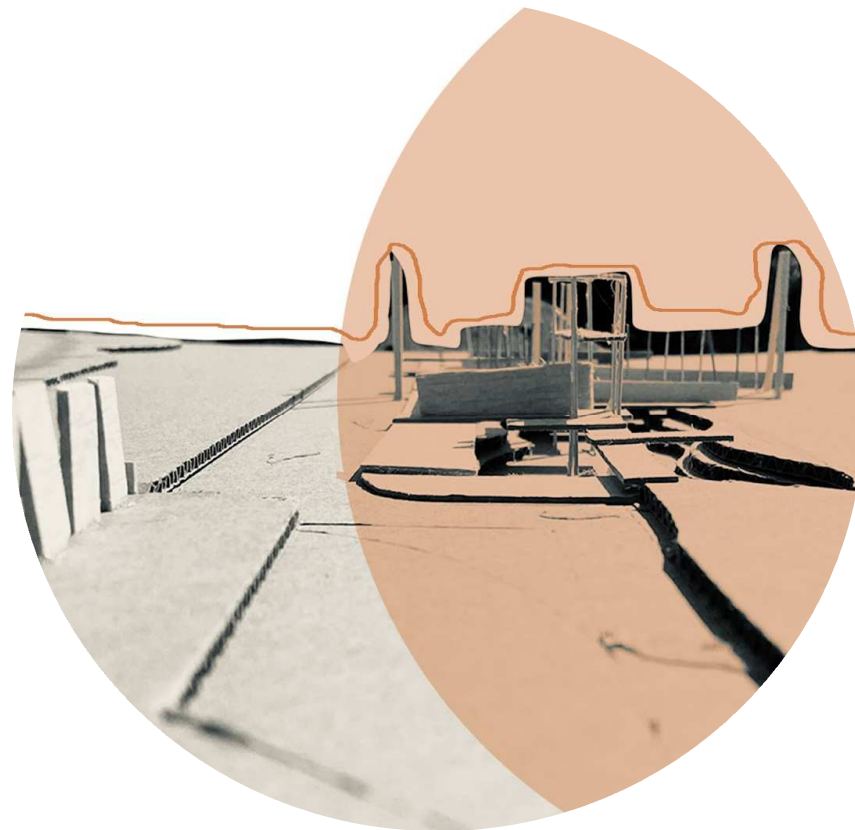
# 05

## TECHNÉ



### TECHNICAL INTENT

*Melusi, means Leader or Shepherd in Zulu*



Melusi is an African origin name usually to define a strong group of people or person. Melusi means “Shepard” in Shona language and “Leader” in the Zulu language. The name of this community inspired the technical concept development (Names.org nd).

During fieldwork in the community, COPC researchers mentioned to the Reality Studio students that there is a strong sense of community and pride for Melusi and we could really feel the emotional connection the community have for their home. The technical concept is based on the principles of a leader and a shepherd or the backbone of the community. The project responds to the fact that there is already an emotional connection to Melusi but not a physical connection or intervention that the community really can rely on.

The following leader principles have been identified and how these personifications manifests into the technical principles, methods, and materiality.

Figure 5.1: Concept model built by Author (2021), Illustrating the bridging (nexus) over the quarry hole.

**A** Technical Intent

**D** Precedent studies

**B** Structural Intentions

**E** Systems

**C** Materiality

**F** Details

### TECHNICAL INTENT

*Melusi, means Leader or Shepherd in Zulu*



Figure 5.2: Backbone of Melusi diagram (Author 2021).

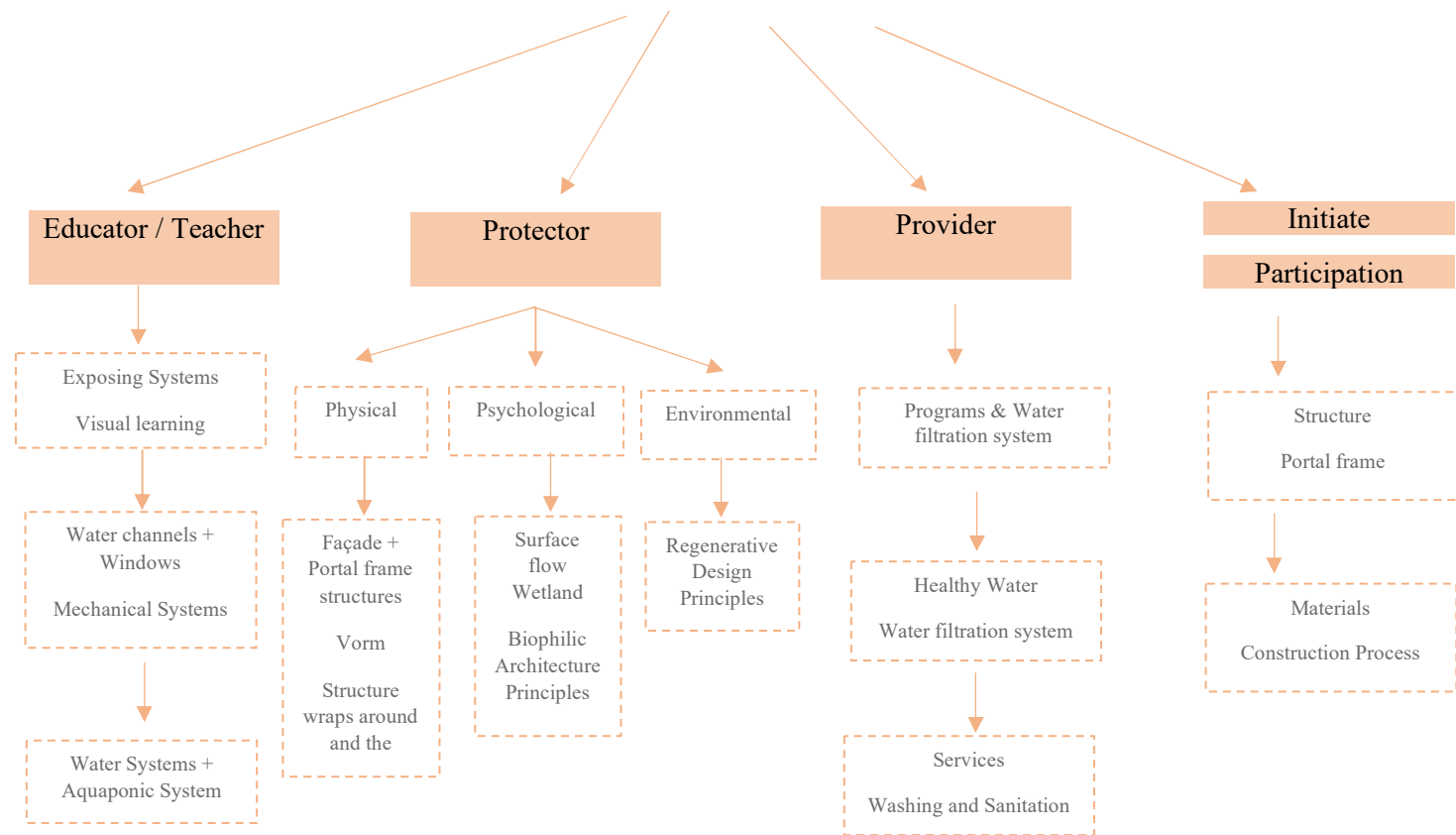


Figure 5.3: Diagram illustrates the technical concept being personified as a Leader or Shepard (Author 2021).

### TECHNICAL INTENT

*Melusi, means Leader or Shepherd in Zulu*

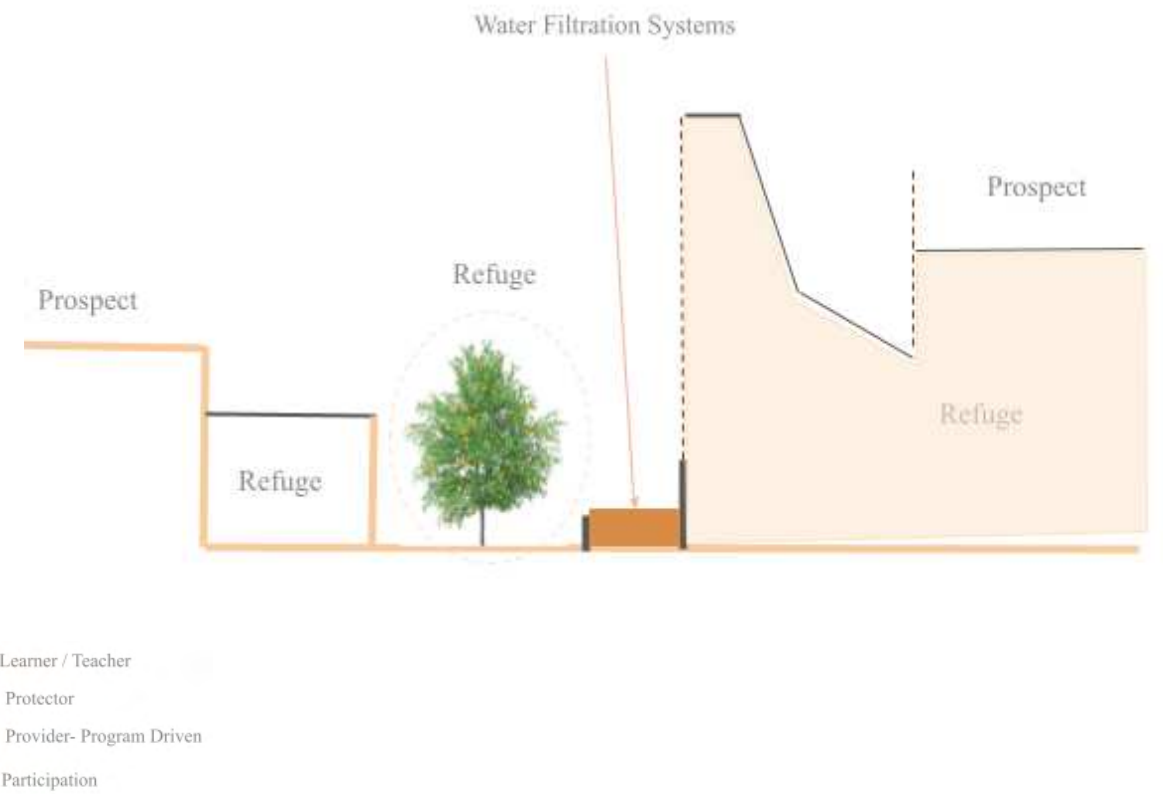


Figure 5.4: Illustrate the Technical intentions manifested (Author 2021).

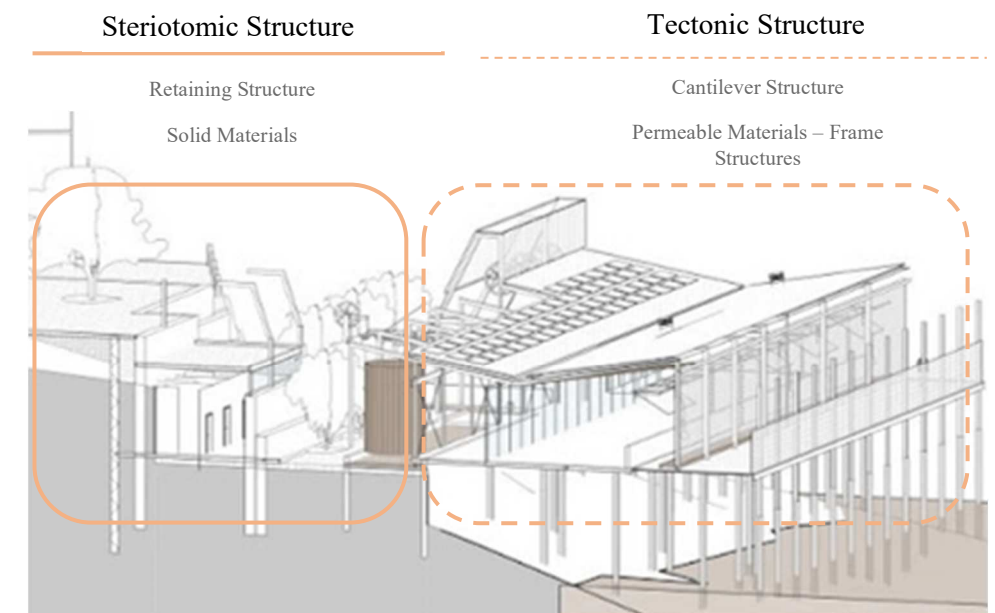


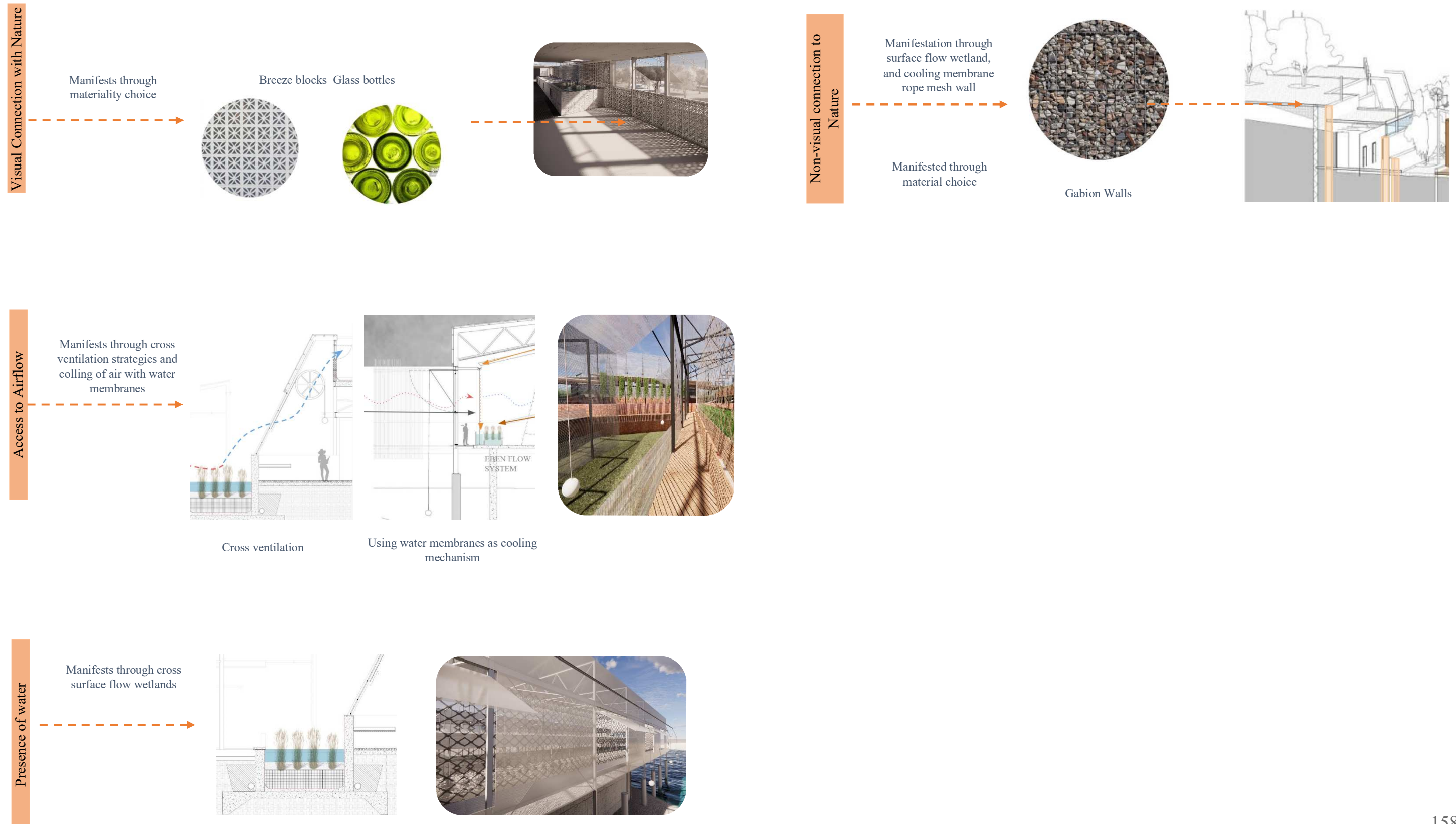
Figure 5.5: Illustrate the integration of seriocomic structure merges into Tectonic structure as the intervention stretches over the quarry hole (Author 2021).

## TECHNICAL INFORMANTS

### BIOPHILIC ARCHITECTURE PRINCIPLES

The following biophilic architecture principles manifests in the Melusi waterfront based on (Soderlund & Newman 2015).

#### PHYSICAL INFORMANTS



# B

## STRUCTURAL INTENTIONS

*Nexus ad structure bridging*

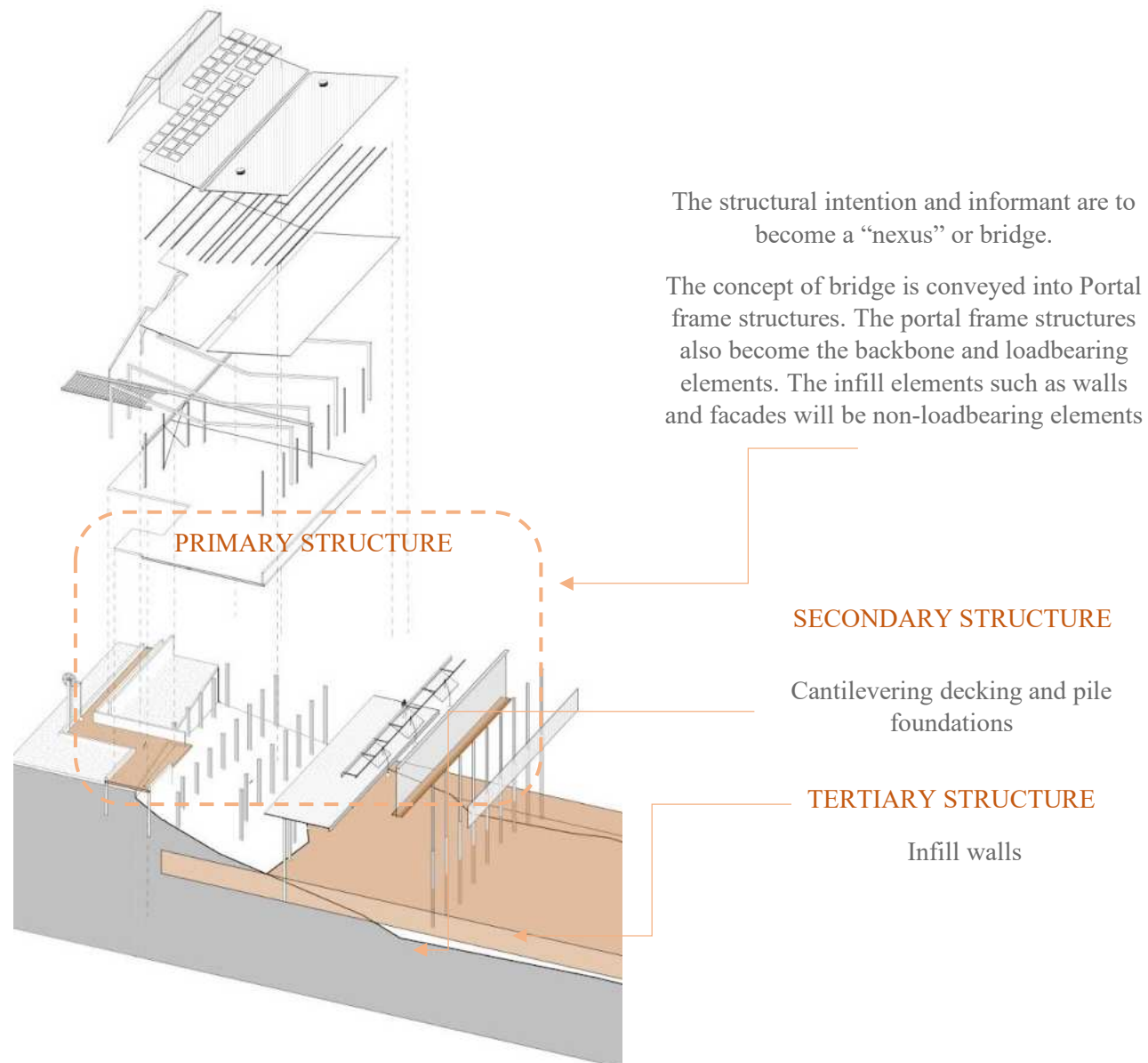


Figure 5.6: Extruded structural intention (Author 2021).

## STRUCTURAL TIMELINE & PROCESS

*Phases of construction*

### PHASE 1

Due to the scale of this intervention and its location in a community with limited financial resources (funded by the Municipality) it is proposed to have a phased approach with the implementation. The ideal is to focus on the main design intentions in the first phase. The proposed process will be as follow:

Phase 1: The phase will focus to make the existing dangerous steep quarry edge a safer public space. Construction of the main walking decks as well as the Aquaponic farm, admin building and the services. The first phase will also implement all the water filtration systems as seen in figure 5.7.

# 01

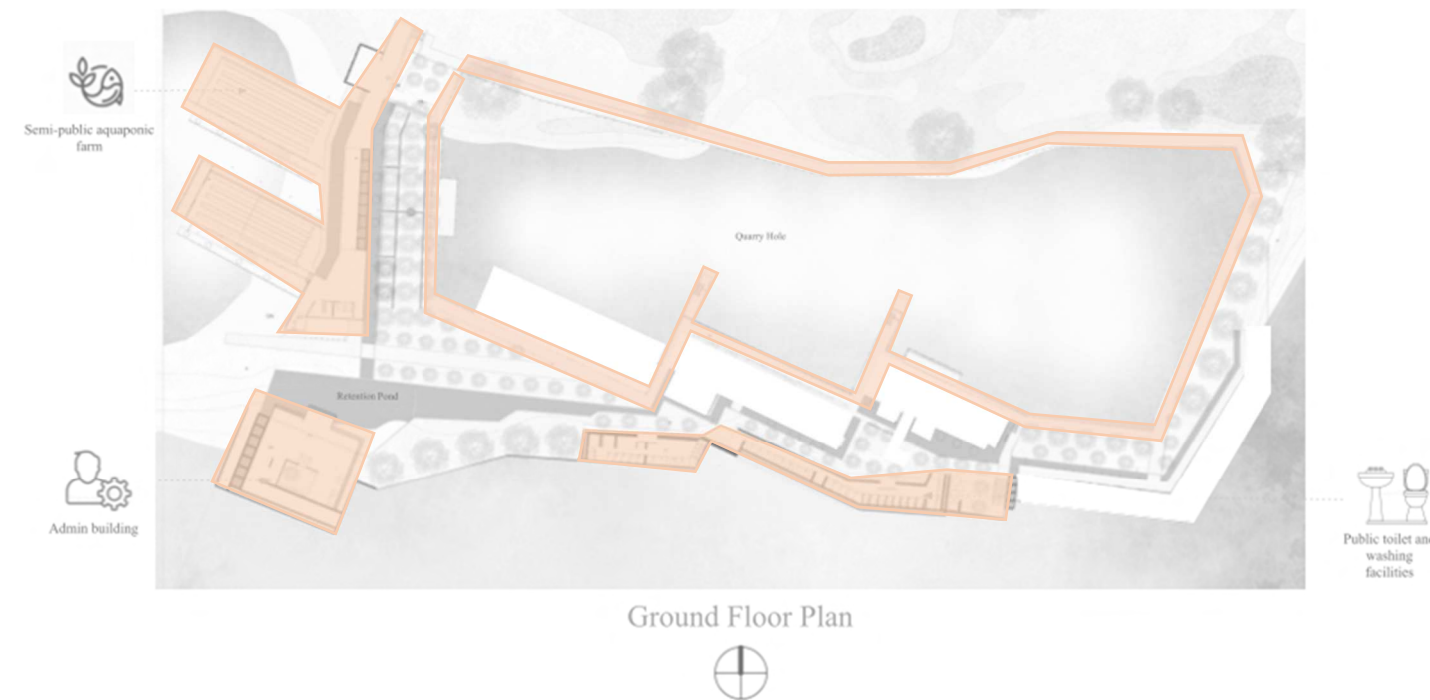


Figure 5.8: Floor plan Illustrate the first phase of construction (Author 2021).

02

Phase 2: The construction of the working spaces where the cleaning of fish (produce and storage facilities will be located. The storage facilities will store the produce produced by the aquaponic farm. This facility will supply multiple work opportunities.



Figure 5.9: Floor plan illustrate the second phase of construction (Author 2021).

04



Figure 5.11: Floor plan Illustrate the fourth phase of construction (Author 2021).

03

Phase 3 will entail the construction of the biodegradable soap factory. The factory aims to supply the community with soap which enables the community to recycle grey water.



Figure 5.10: Floor plan illustrate the third phase of construction (Author 2021).

Phase 4: This phase will entail the construction of the laundry facility as seen in figure 5.11.

Phase 5: The final phase will entail the construction of the market space as seen in figure 5.12.

05















Figure 5.12: Floor plan illustrate the five phases of construction (Author 2021).





Figure 5.13: Nexus between materials available on site and materials prefabricated off site towards co-evolution and co-existence (Author 2021).

**MATERIALS**  
Structural materials

	STRUCTURE TYPE	FUNCTION	ENABLES CO-EVOLUTION	
 Steel portal frame structure Prefabricated	Tectonic structure	Load bearing Cantilever over		
 Gabion Structure	Stereotomic structure	Retain slope Enhance Community participation		
 Off shutter concrete retaining walls	Stereotomic structure	Retain slope		
 Eco-bricks Retaining walls	Stereotomic structure	Retain slope		




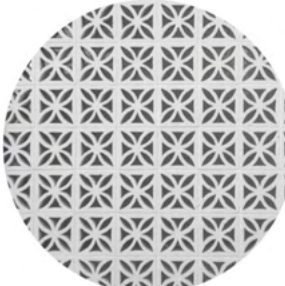





New introduced materials      Available materials

Figure 5.14: Illustrate how the structural materials are mostly from practices and technology from professionals to ensure structural stability (Author 2021).




It is visible in figure 5.14 that the gabion walls and the eco-bricks retaining walls aims to increase community participation during construction process.

## MATERIALS

### Infill Materials

	STRUCTURE TYPE	FUNCTION	ENABLES CO-EVOLUTION
 Red Clay Bricks	Stereotomic structure	Infill walls	  Newly introduced Available materials
 Precast Breeze blocks	Permeable Structure	Infill walls and Natural ventilation	  Newly introduced Available materials
 Recycled Wine Bottles	Tectonic Structure	Infill walls and natural daylight	  Newly introduced Available materials

### Exterior floor materials

 Composite Decking	Tectonic Structure	Cantilever over Quarry hole	 
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## MATERIALS

### Roof Materials




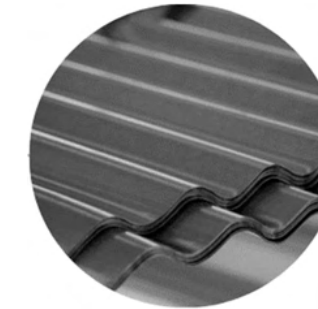





	STRUCTURE TYPE	FUNCTION	ENABLES CO-EVOLUTION
 Polycarbonate corrugated sheeting	Tectonic structure	Let in Natural Day light	 
 Corrugated Sheeting	Tectonic structure	Span distances	 
<h3>Interior materials</h3>			
 Red Clay Bricks	Stereotomic Structure	Extending streetscape to interior. Reduce maintenance	 

Figure 5.15: Material palette (Author 2021).

**MATERIAL USAGE**

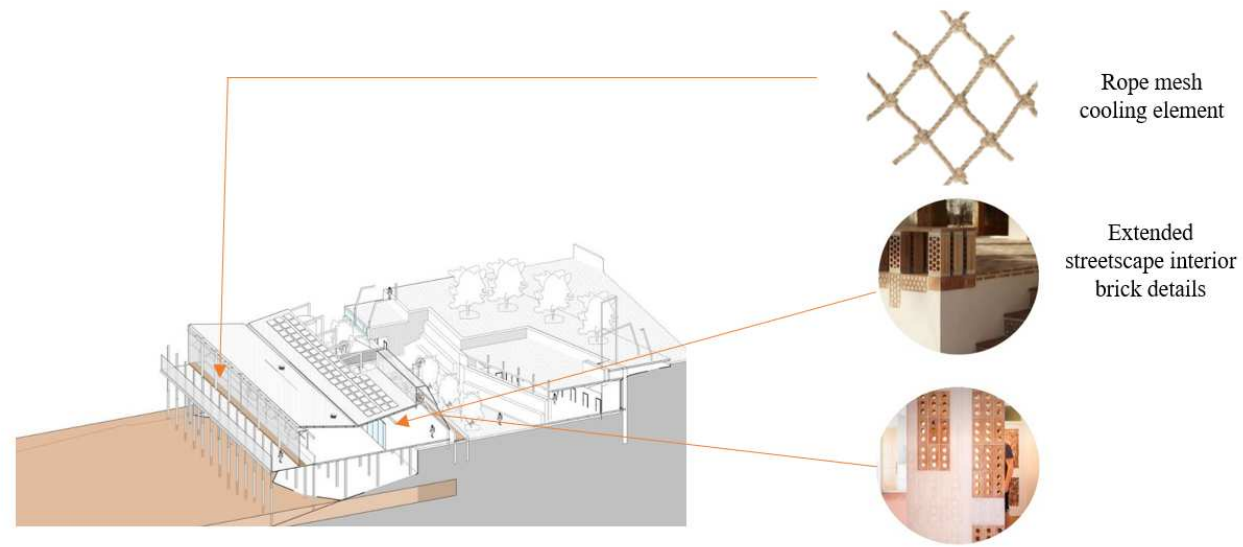


Figure 5.16: Axonometric cut through the Northern Slope of the Quarry edge indicating the main road (Author 2021).

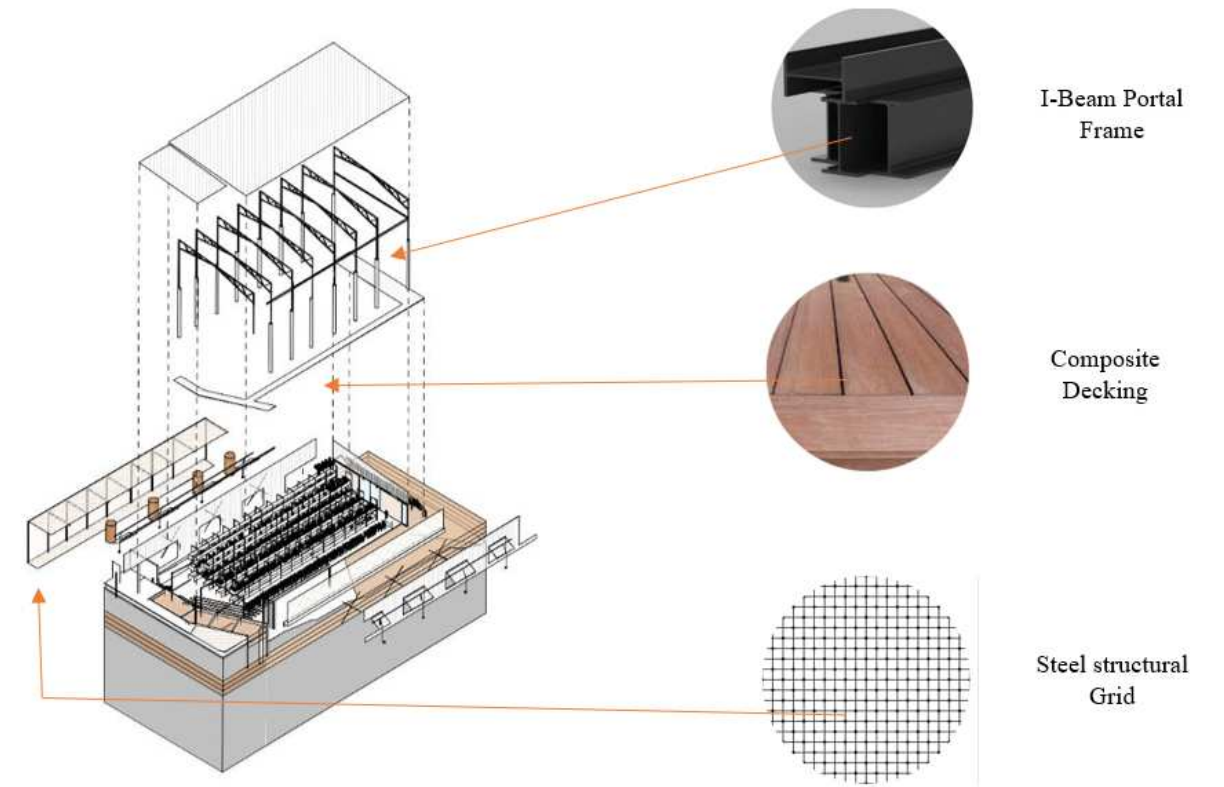


Figure 5.18: Axonometric of the aquaponic structure showcasing the portal frame structure (Author 2021).

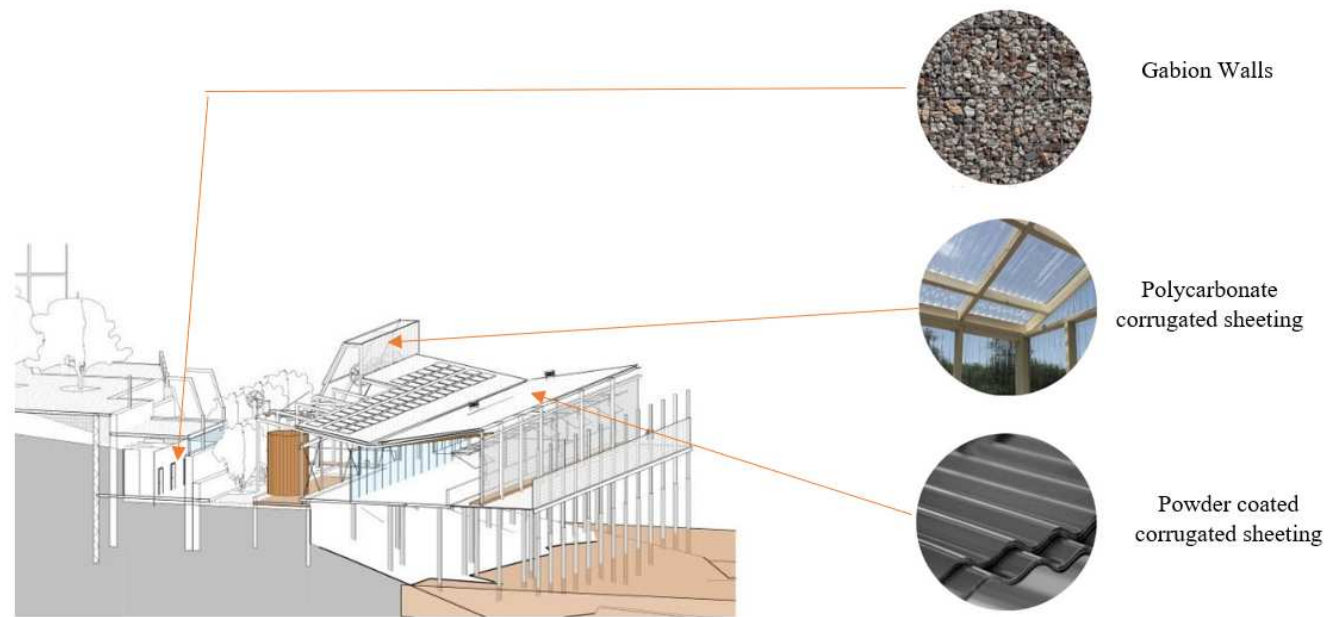


Figure 5.17: Axonometric cut through the Biodegradable soap factory illustrating the cantilevering structure over the quarry (Author 2021).

### STRUCTURE INTENTION IN TERMS OF PROCESS AND PARTICIPATION

The structural intention aims to always protect the user by utilising a portal frame structure with the potential to add to the structure to adapt to alternative conditions or uses. This will be achieved through infill non-loadbearing walls making it possible for community participation and co-construction to ensure successful transference of ownership. This process will work as follows: The portal frame structures will be designed and manufactured by engineers to ensure the structural safety and well as with the implementation and installation on site leaving the “Backbone” for the community to construct all the infill panels and walls. The steel portal frame makes it to add light weight layers to the primary structure. This ensured that the intervention function as a living organism, functioning as a closed loop system growing, moving, and changing when users interact with the intervention see figure 5.18.

### STRUCTURAL INTENTION IN TERMS OF PROVIDER

The structure encapsulates into the role of the provider by accommodating growing and cooling membranes implemented in the intervention. The gabion walls retaining the upper walkway acts and become a planter wall for herbs and flowers needed in the biodegradable factory for aroma scents. The intention is to introduce an indoor-outdoor working condition extending the factory towards the outdoors where employees must harvest the fresh herbs and flowers to make the soaps. The structure also provides in terms of the programs chosen for this intervention. The structure also provides for optimal natural light especially on the southern façade as seen in figure 5.20. The chimney façade that wraps around the edge of the roof allows for natural sunlight to enter the building.



Figure 5.19: Site section through the laundry facility (Author 2021).

### STRUCTURAL INTENTION IN TERMS OF PROTECTOR

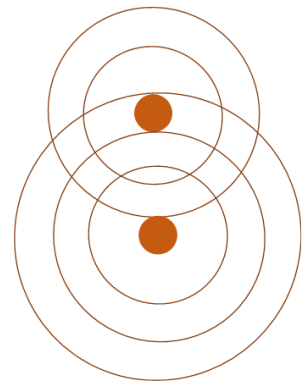
The structure needs to protect not only inhabitants physically but also emotionally. Biophilic architecture design principles will be implemented to ensure well-being (Abdelaal & Soebarto 2018), as per discussed in chapter 1 and in figure 1.54-1.55. It is also the role of the architecture to protect the environment through responsible regenerative design principles to reduce the resources needed to operate as well as to ensure for optimal indoor comfort see figure 5.46-5.49.

### STRUCTURAL INTENTION IN TERMS OF EDUCATOR

The intention is to expose most of the systems and how they function. As didactic systems inhabitants can observe and learn through observing them. Through teaching, it should inspire the viewer to apply mechanical systems and rain harvesting systems in their own structures in the community. It is also intended for the water channels to be exposed and by having mechanical channel openers for the community to participate in the stewardship of the community fruit trees.

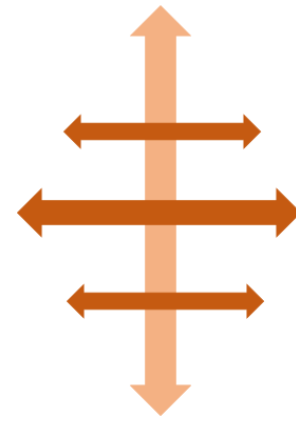
## HOW DOES THE TECHNICAL CONCEPT AID CATALYTIC NEXUS?

## TECHNICAL PARTI DIAGRAM



**CATALYST**

*(Momentum)*



**NEXUS**

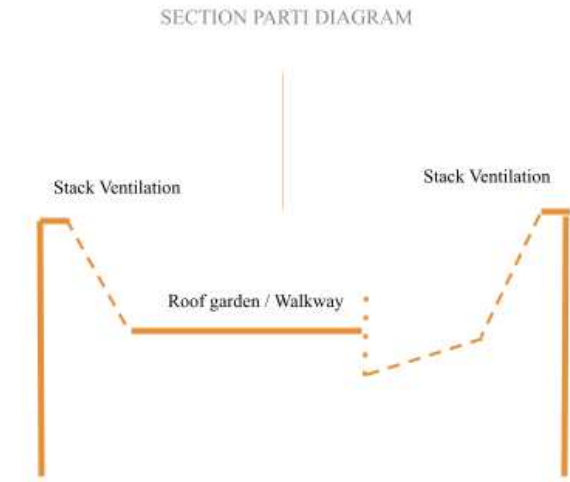
*(Bridge)*

**CATALYST**

The technical catalyst lies in the structure as an educator, where the exposed systems awaken enticement, curiosity, and mystery. This phenomenon provides a sense of being teased which allows the user to investigate the space with curiosity. When a space has mysterious loci, it provides the desire to move deeper within the space and restore cognitive restoration (Kaplan, 1995). This will be the start of the momentum towards more complex residences and informal structures slowly improving Melusi through new knowledge and skills learned during the construction process of Melusi waterfront. The community members will undergo multiple workshops prior to the construction process learning new skills such as how to make eco-bricks and how to construct with it. The second workshop will educate the members on how to construct with glass bottles and the third workshop will be on how to make biodegradable soap and why it is important to use the product to ensure healthy water recycling methods as mentioned in chapter 2 with the precedent analysis.

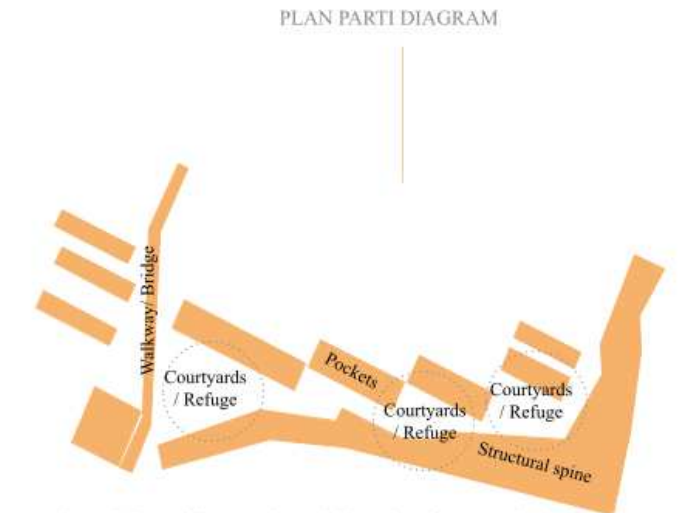
**NEXUS**

The technical Nexus lies in the physical bridge (north-south-axis) and in the threshold spaces where the structure integrates nature with the indoors, and through interior material choices. The intervention forms also a bridge between the community and the quarry hole. The bridge is articulated with permeable facades allowing the bridge to be visible and enable user interaction with the outdoors. One of the design intentions mentioned in chapter one stresses the need for safer and healthier public space, which is technically resolved by extending the exterior streetscape materials into the interior spaces.



The Parti section illustrates the multiple opportunities for this roof structure being a platform and the diagonal wrap structure opens up the opportunities for a roof garden and the structure that wraps over the edges of the flat roof becomes the balustrade.

Figure 5.20: Parti section diagram (Author 2021).



The Parti diagram illustrates the spatial intention of a structural spine that merges with the existing street and the smaller pockets that feeds from the spine which cantilevers over the water body.

This spine and pocket layout also creates possibilities of internal courtyards between the spine and the pockets.

Figure 5.21: Parti plan diagram (Author 2021).

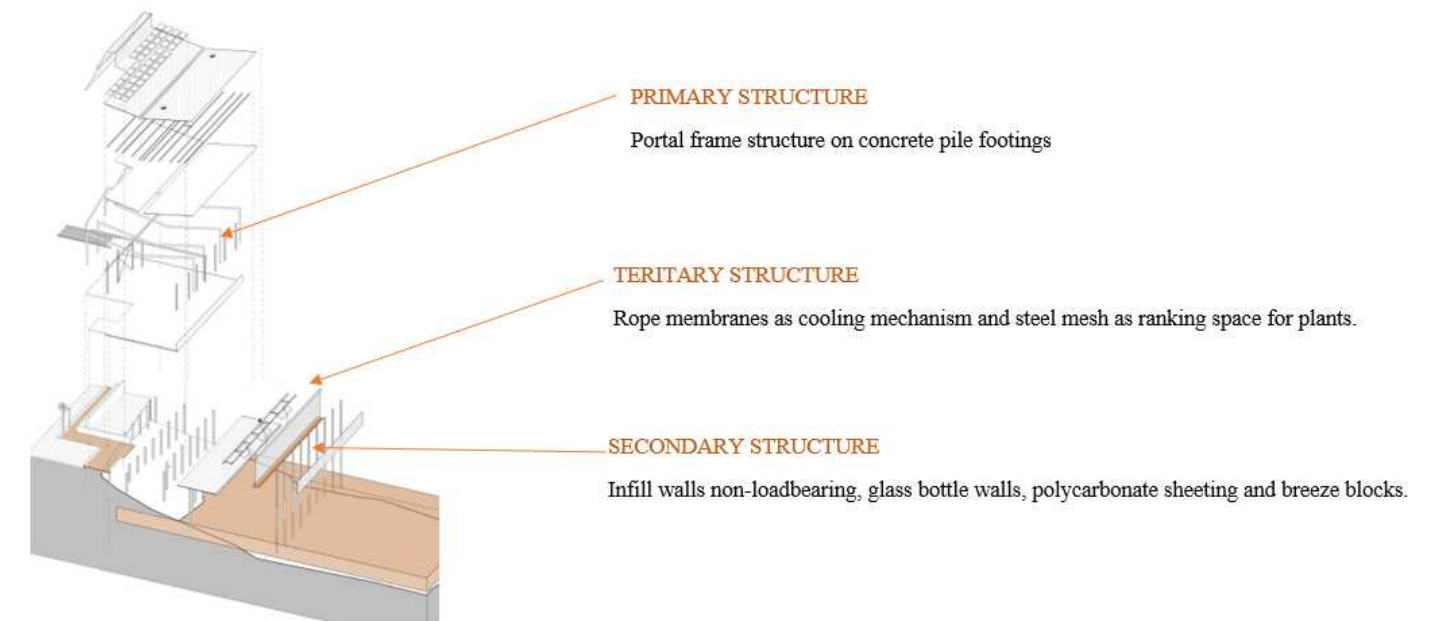


Figure 5.23: Axonometric of the structural configuration (Author 2021).

# D

## PRECEDENT STUDIES



Figure 5.24: Karoo Kafee aquaponic fish tanks (Author 2021).

## PRECEDENT STUDIES

### KAROO KAFEE- LYNWOOD ROAD PRETORIA

*(Precedent for aquaponic systems)*



Figure 5.25-5.26: Illustrates the natural fall of pumped water breaking the surface of the water which is the only way oxygen is achieved in the fish tanks. Photo by Author 2021 (Author 2021).

The author visited the Karoo Kafee Aquaponic Farm on 13 September 2021. This design informed the system proposed for Melusi Waterfront due to the minimal resources used to operate, sustain, and maintain the intervention. This entire system functions on gravity except for one regular pool pump. The pool pump pumps the water back to the top into the Tilapia fish tanks. Natural ways of putting oxygen into the water are visible in how the water falls onto the surface of the water as seen in figure 5.25-5.26. Another interesting fact learned was that their biggest client are shebeens located in townships for the Tilapia fish. Another benefit from this way of farming is that it has 8-week turnaround time to harvest crops. The business model is a linear system because profit can be received through the fish and the harvested vegetables and greens.

This system was also exposed the viewer could easily follow the process by only following the piped system see figure 5.27-5.28.



Figure 5.27: Illustrates the breeding fish tanks where smaller fish are carefully monitored and placed in new tanks once the fish grow. It is important to put fish of the same size in a tank because bigger fish will eat the smaller fish (Author 2021).

Figure 5.28: Illustrates the bottom planter which is an even flow (Author 2021).

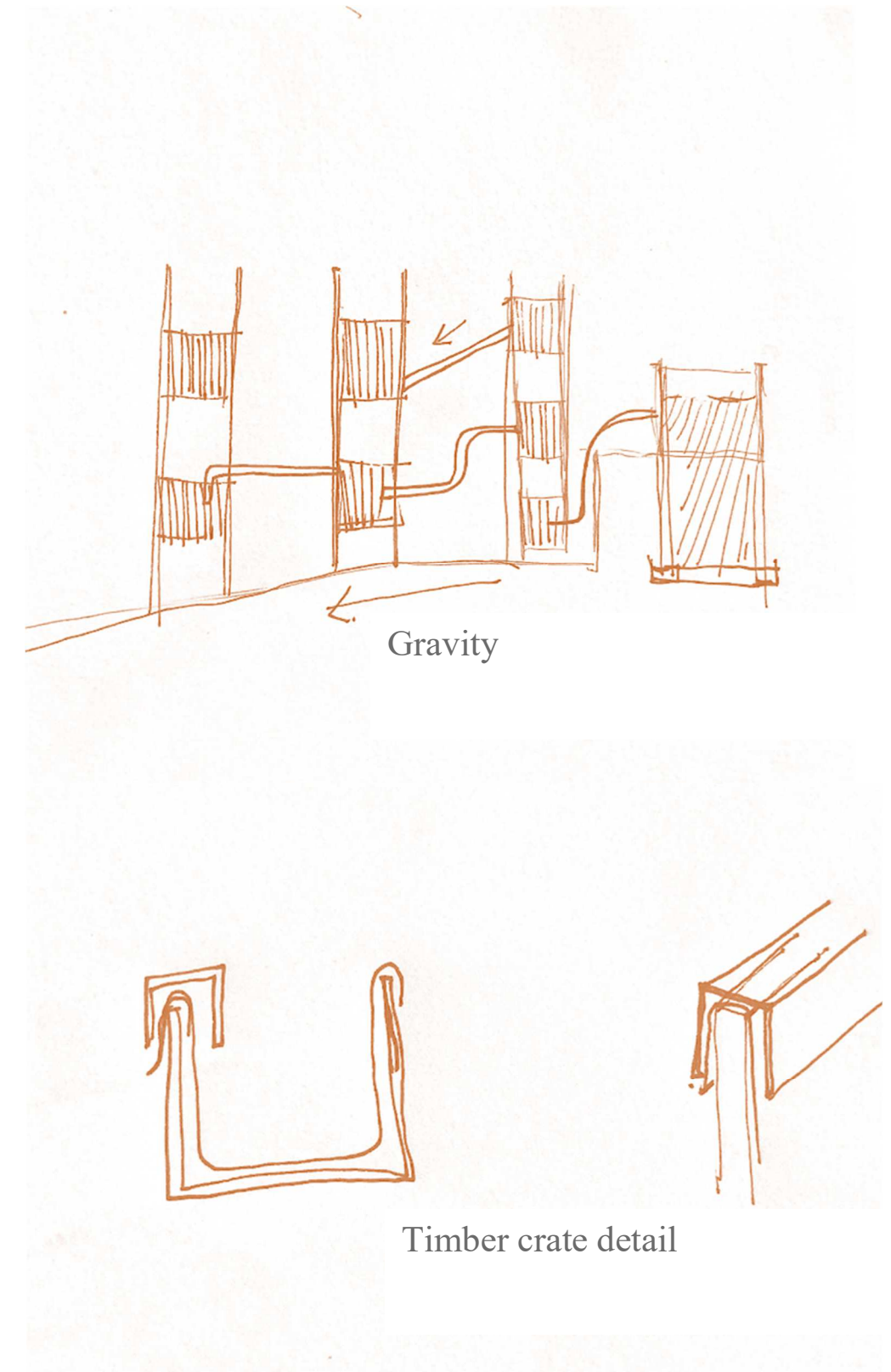


Figure 5.29: Concept drawing of the Karoo Kafee Aquaponic Farm (Author 2021).

GALLERY 242 STATE STREET- OLSON KUNDIG

(Precedent for Mechanical systems)

RONDE SIRKEL VAN MECHANICAL SYSTEMS



Figure 5.29-5.30: Illustrates the Mechanical system which becomes a design feature (ArchDaily 2021).

This Gallery is a multifunctional space and by extending the interior to the exterior the architects replaced the front facade with a double- height floor to ceiling window which can be lowered and raised depending upon the need of the user (ArchDaily 2021). The wall is operated by a mechanical system and engine. This way of exposing systems will be applied in the Melusi Waterfront but will not be functioning with an engine but with a counterweight system where human power and movement will be needed to open windows.

Mechanical details will be used in the intervention to educate the community on how systems work and to keep the community engaged in the harvesting and growing of the fruit trees.

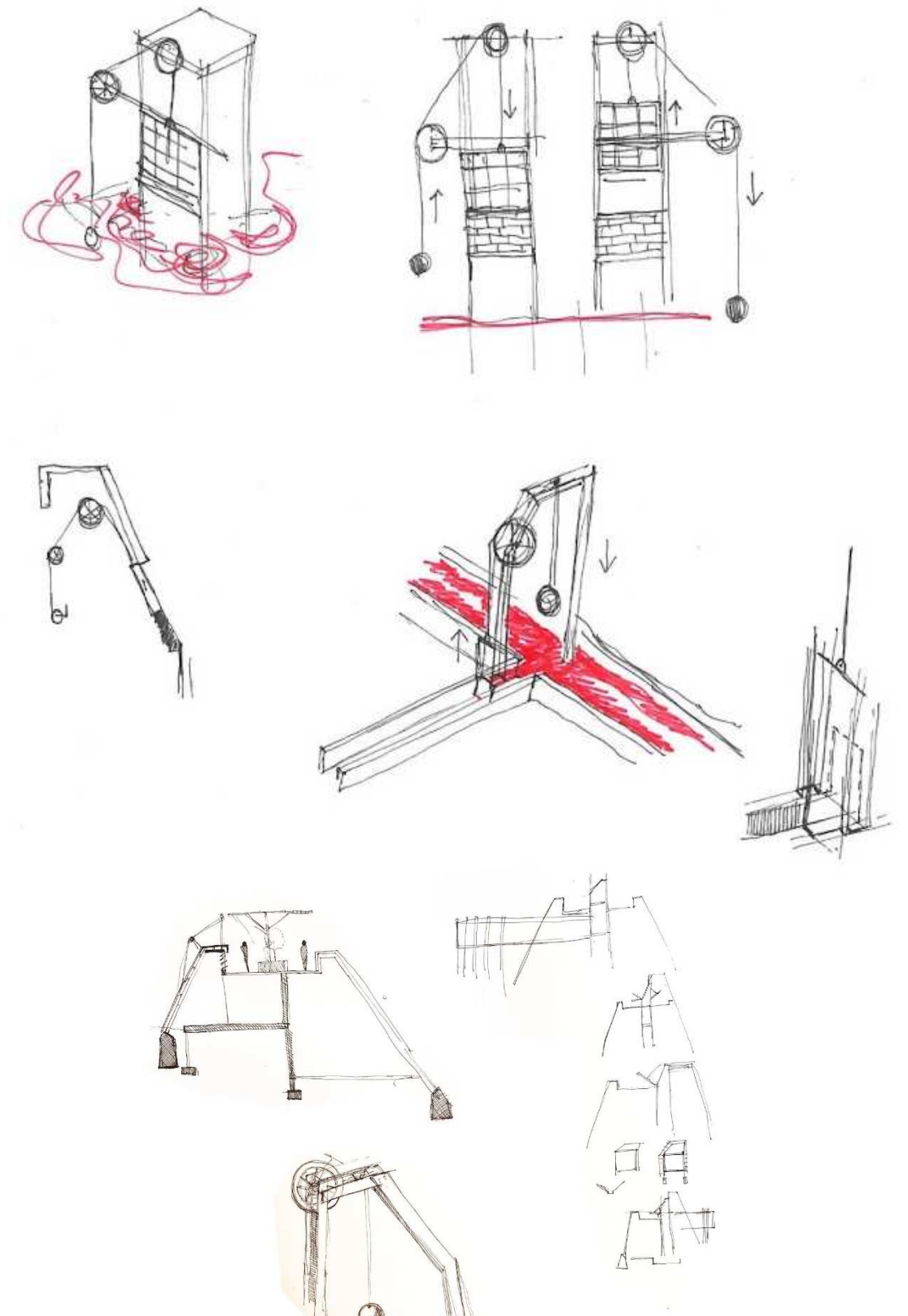


Figure 5.31: Concept drawing of mechanical system (Author 2021).

SILINDOKULE CRESH, GQEBERHA  
*(Precedent for infill non-loadbearing walls)*



Figure 5.32: Illustrates the beautiful natural light the glass bottles give to the interior quality (Chapman 2019).

Figure 5.33: Timber portal frame structure filled with glass bottles (Chapman 2019).

This crèche inspired Melusi waterfront to non-loadbearing walls which is also called infill walls which contributes to community participation and community engagement. This will also lower the construction cost due to the use of recyclable materials. This method of construction is a good balance between the community and the construction team contributing to the process.

Portal frame structure with infill walls

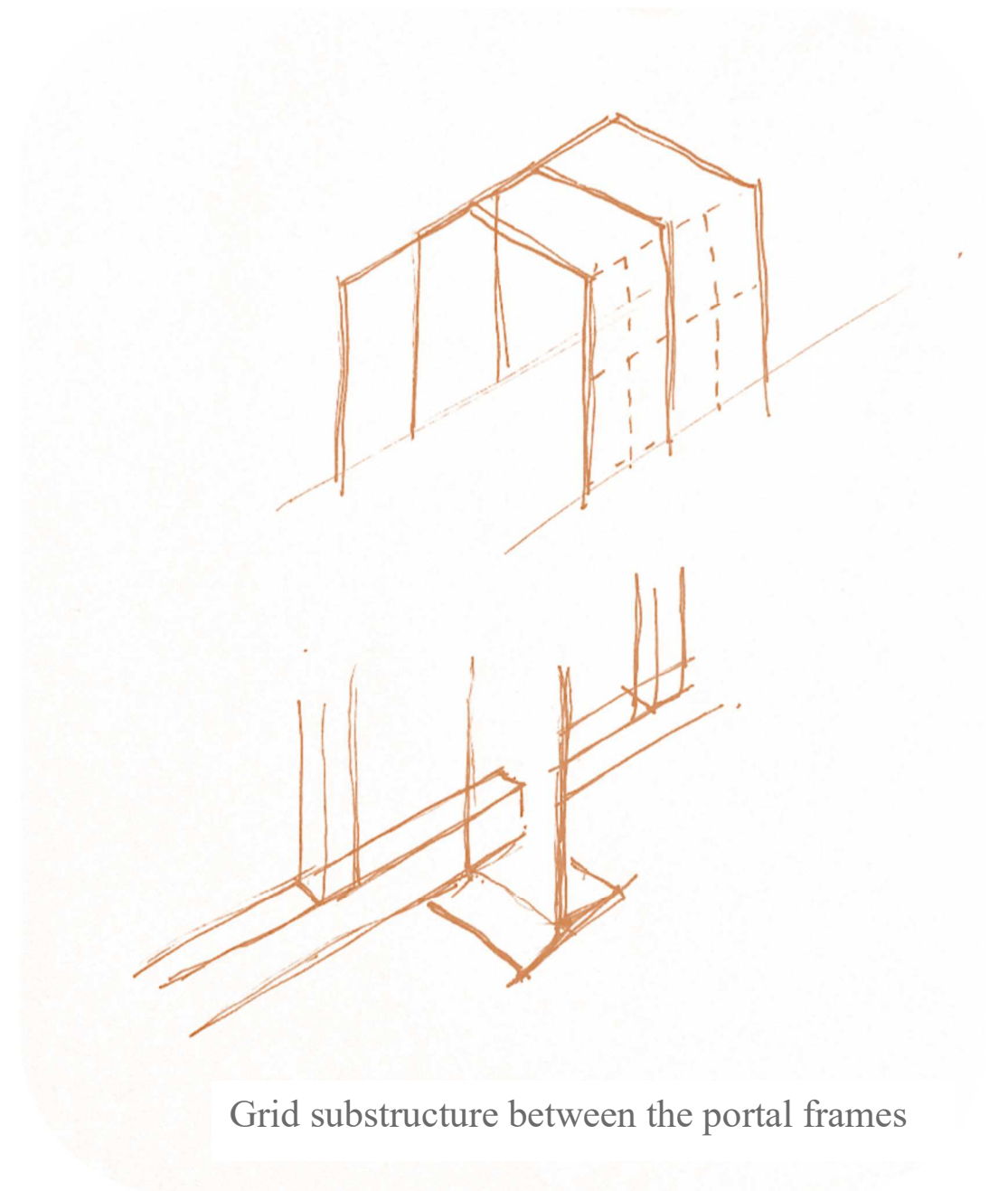
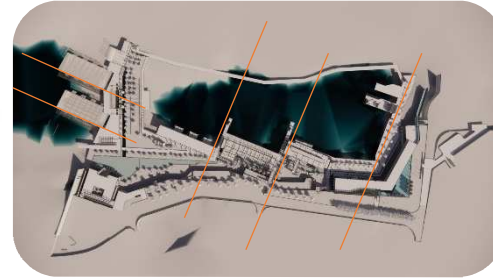
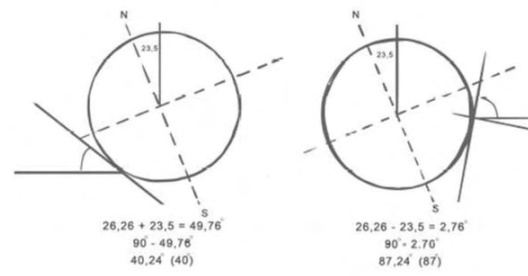


Figure 5.34: Concept detail of portal frames and glass bottles (Author 2021).

**SITE INFORMANTS**

Orientation and Solar Angles

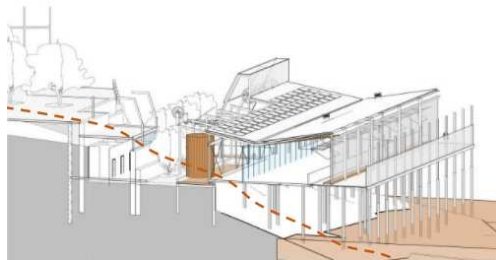
Manifestation through building orientation



Building is tilted 15 degrees towards East for optimal solar radiation

Slope of site

Manifests in the cut and fill site results in terraced intervention



Water Levels

Due to the uncertainty of the water level fluctuations the structure cantilevers over the quarry hole

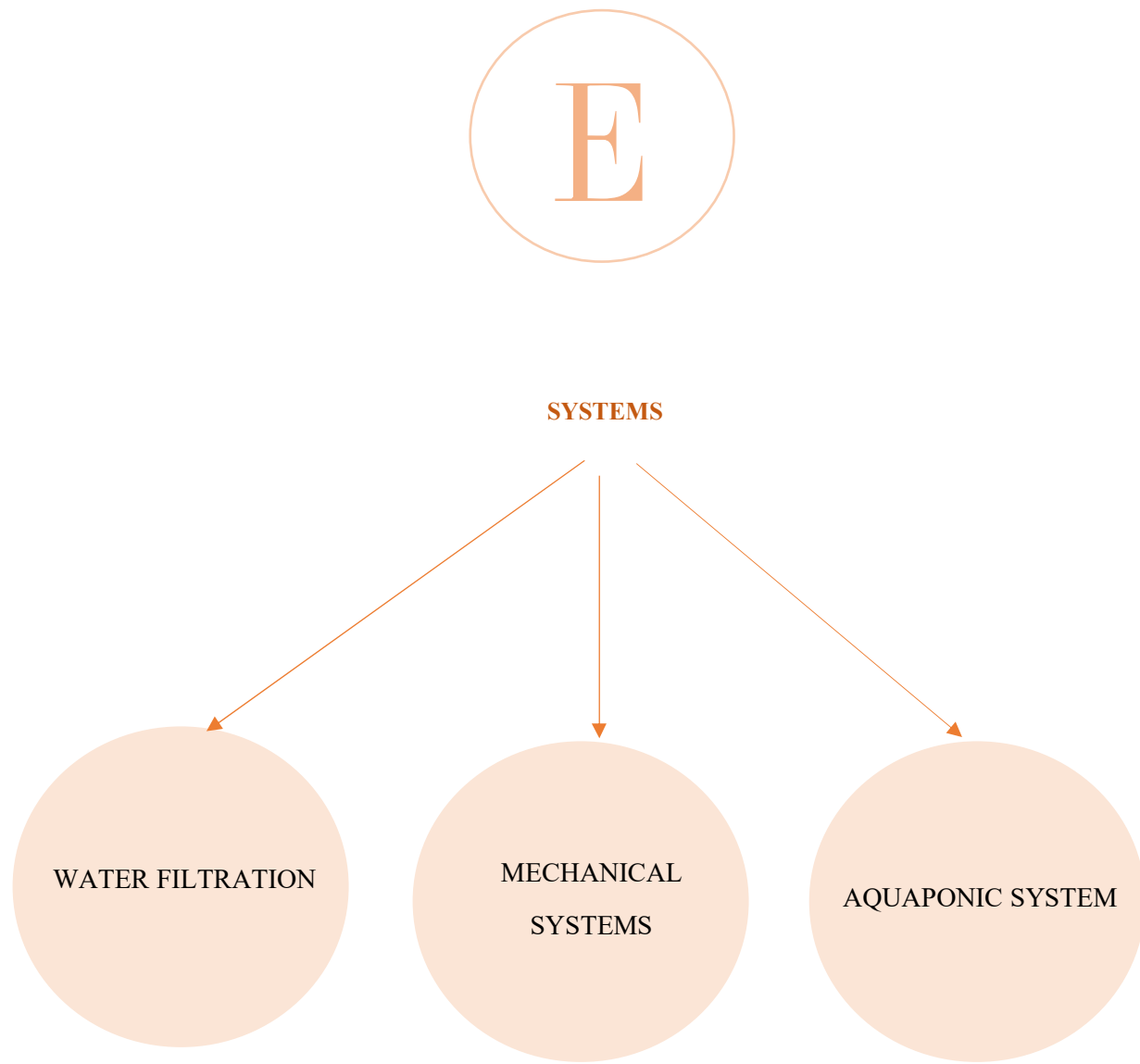


Island in Quarry

The quarry consists out of an island which makes it possible for intervention stretching over the quarry hole

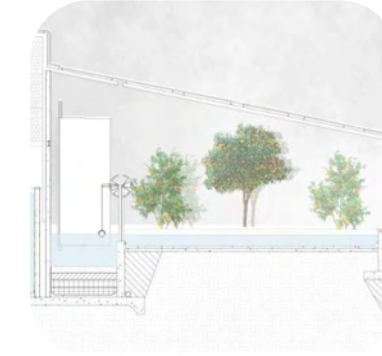


Figure 5.35: Site informants incorporated into the design (Author 2021).



Water Filtration system  
(Vosloo 2017)(Touter & Mauck 2017)

Surface flow wetlands



Mechanical Systems  
(ArchDaily n.d)

Counterweight pulley systems



Aquaponic system  
(De Kock 2015)

Counterweight pulley systems



Figure 5.36: Mechanical systems manifested in the intervention (Author 2021).

WATER FILTRATION SYSTEM



1 Water is pumped from the quarry to the admin building filtration Reed bed

2 UV Irradiation water flows in two directions into surface flow wetlands using wetland plants

3 Filtered water are pumped into tanks to be used in the aquaponic system where only a 3% top up is needed with fresh water every month.

- A** Reed bed
- B** UV Irradiation
- C** Surface Flow wetland
- D** Clean water pumped into storage tanks to be distributed to the soap factory
- E** Clean water pumped into storage tanks to be used by the laundry facility
- E** Clean water pumped into storage tanks to be used by the laundry facility
- F** UV Irradiation
- G** Water pumped into tanks for drinking water
- H** Water pumped to reed bed

Figure 5.37: Top view of Melusi Waterfront filtration process (Author 2021).

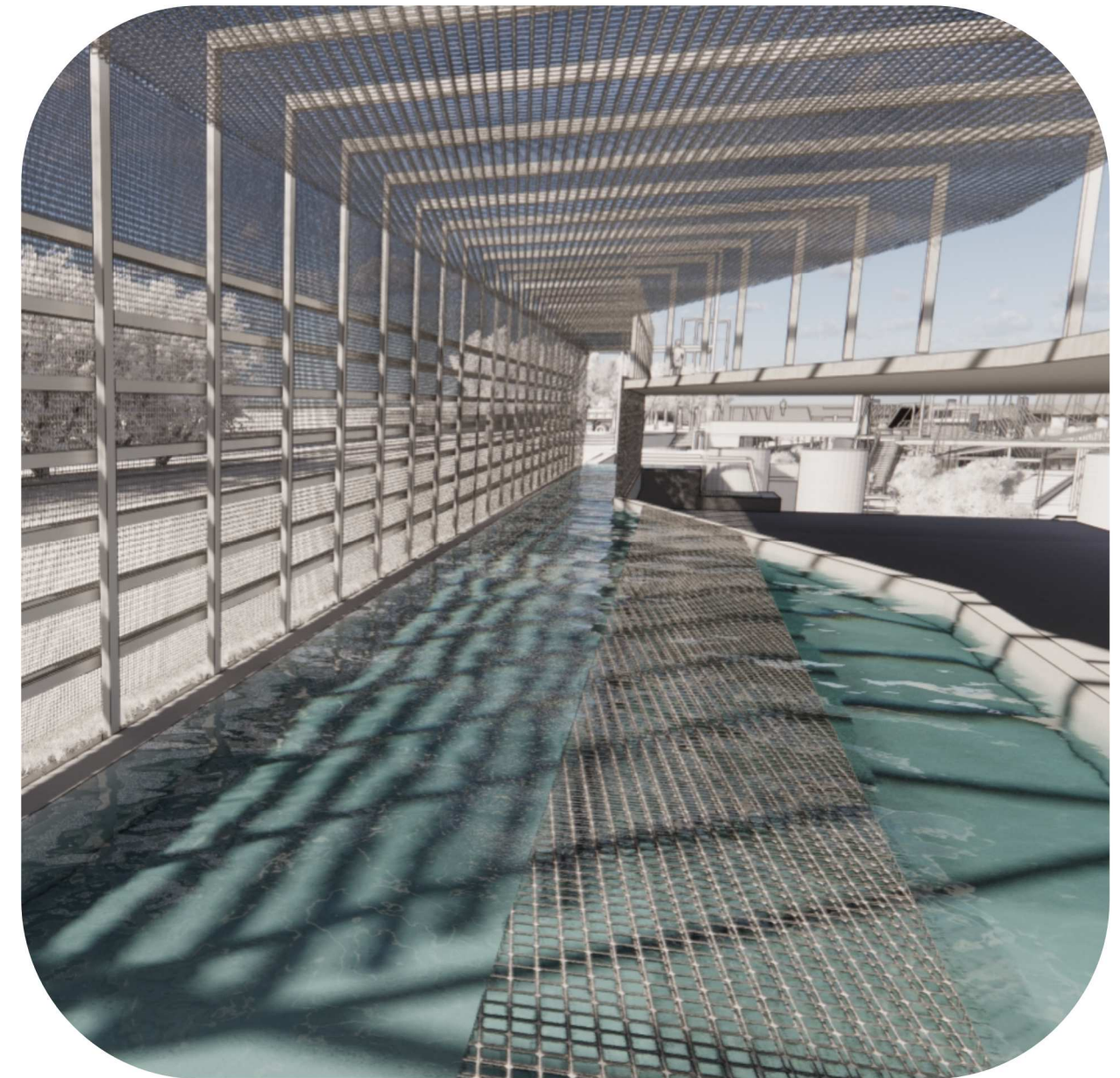
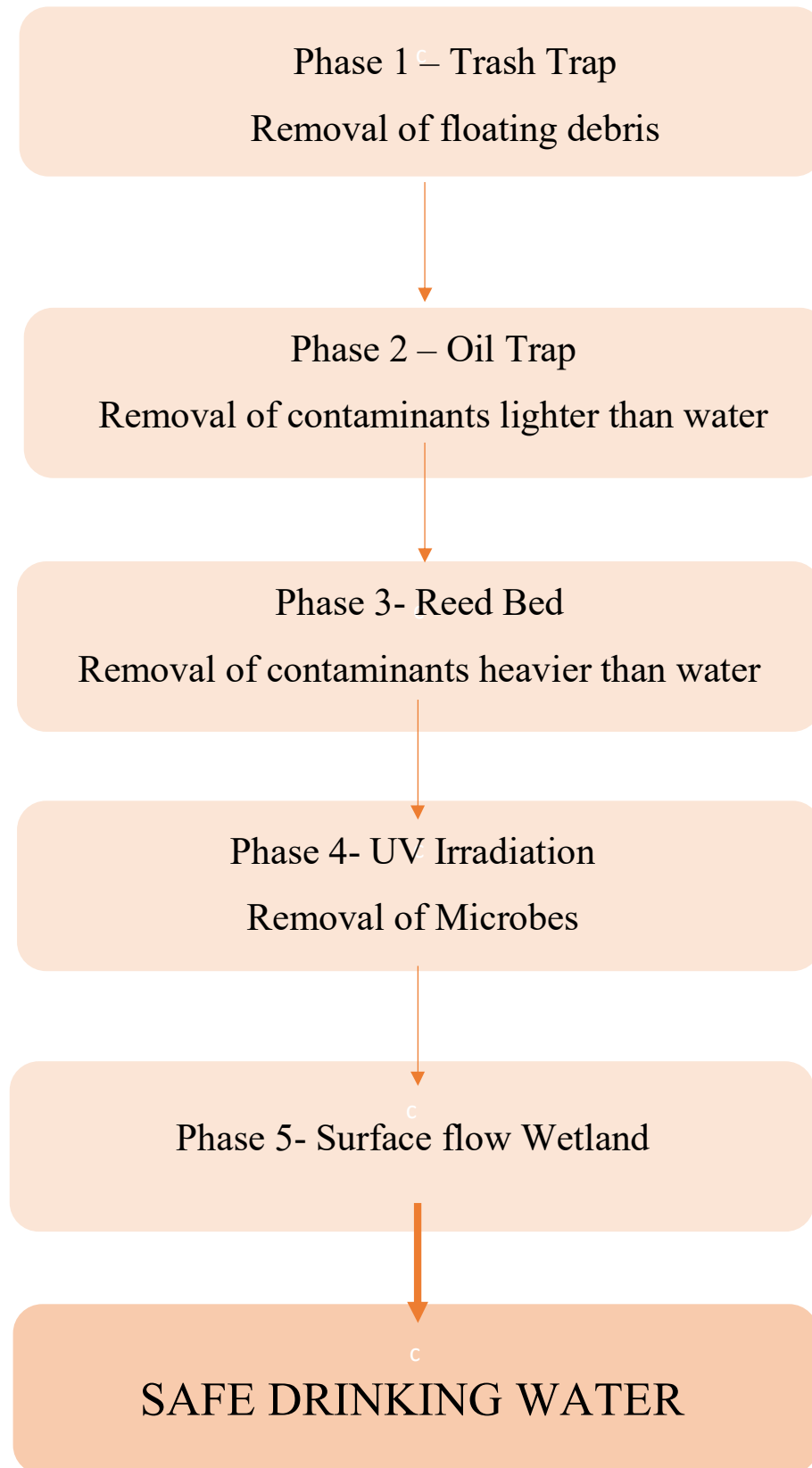


Figure 5.38: Diagrammatic representation of the water filtration system (Smit 2018).

Figure 5.39: Diagrammatic representation of the stormwater catchment system (Author 2021).

The water filtration system is the main system of this intervention. The intention is to expose the water filtration system for passive education and observation. The water filtration system runs through the entire site linking in with the other programs supplying the program with fresh water. The smaller buildings supply the water filtration system with grey water. Rainwater is also connected to the water filtration system. The Filtration system starts at point A as per figure 5.37. The filtration process starts with a reed bed where the water then undergoes UV radiation. The water flow splits into two directions. The first direction is north, flowing towards the aquaponic system. The water flows slowly across the surface flow wetland until the water gets pumped into the water tanks. These water tanks supply the freshwater tilapia fish of new fresh water as needed. The water in the surface flow wetland is also used for the watering of the fruit trees through the mechanical channels.

The second route is as follows: The water runs slowly on the surface flow wetland towards the biodegradable soap factory where the fresh water then gets pumped into tanks and is used to make soap. The surface flow wetland also supplies the laundry facility of fresh water to wash clothes. The grey water used by the laundry facility is stored in a tank and pumped back to the reed bed starting point of the water filtration system. The end point of this water filtration system is point G, which is the water collection point, which is safe to drink.

#### STORMWATER HARVESTING SYSTEM

The service road makes it possible to catch stormwater in a channel that feeds into an oil trap removing all oils and then feeds into the reed bed filtration system as seen in figure 5.40.



Figure 5.40: Top view of Melusi Waterfront showcasing the stormwater catchment system (Author 2021).

#### SANITATION SYSTEM



Figure 5.41: Illustrate the location of the conservancy tanks in the retained soil near the bathrooms for easy access to be pumped out by municipal sewage works (Author 2021).

Due to no municipal connection to the mainstream sewage lines conservancy tanks will be used to store the sewage. The municipality will have to empty the tanks regularly due to the high traffic users. The service road makes it possible for a truck to empty the tanks. Only the brown water will be linked with the conservancy tanks, the hand wash basins, showers, and bathtubs (grey water) will be connected to the water filtration system. Biodegradable soap will be used at all facilities, such as laundry and bathroom facilities, which allows the water to be recycled.

## WATER CALCULATIONS

### Yield Water Calculations

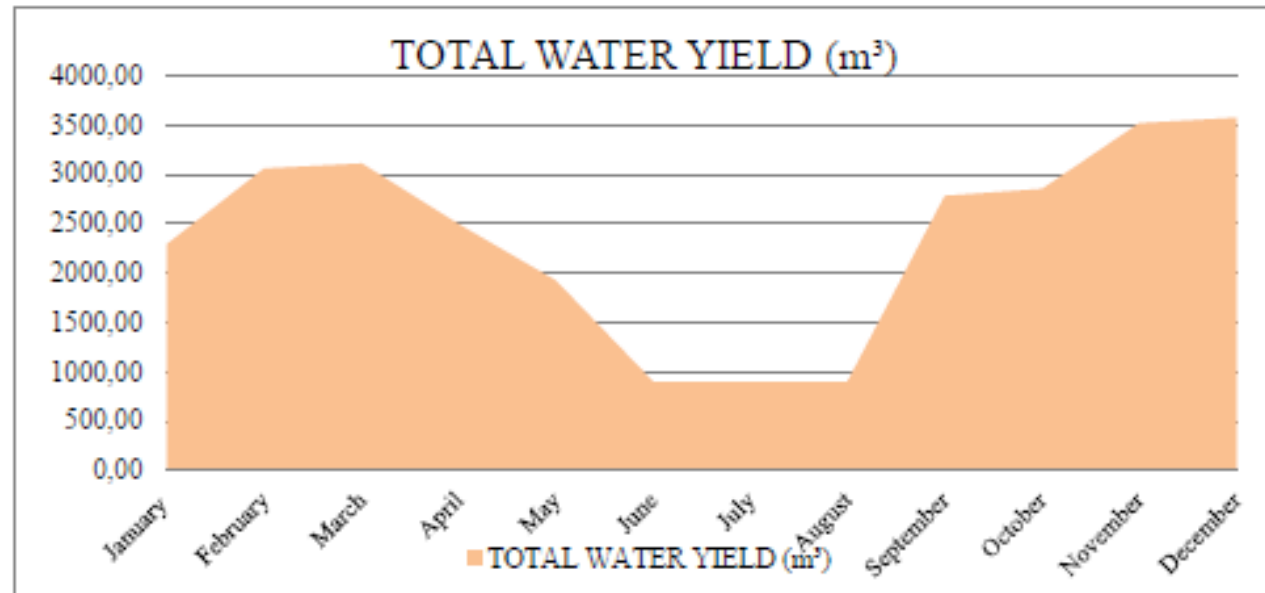


Figure 5.42: Yield calculations of proposed intervention (Author 2021).

### Demand Water Calculations

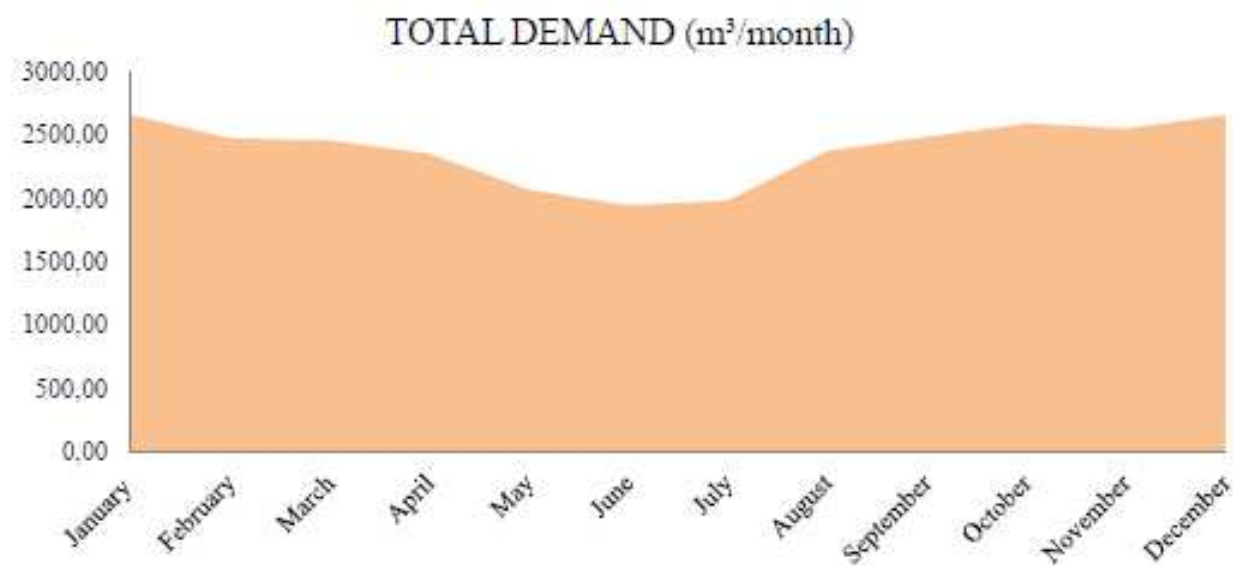


Figure 5.43: Demand water calculations for proposed intervention (Author 2021).

## WATER CALCULATIONS

### Water Budget Calculations

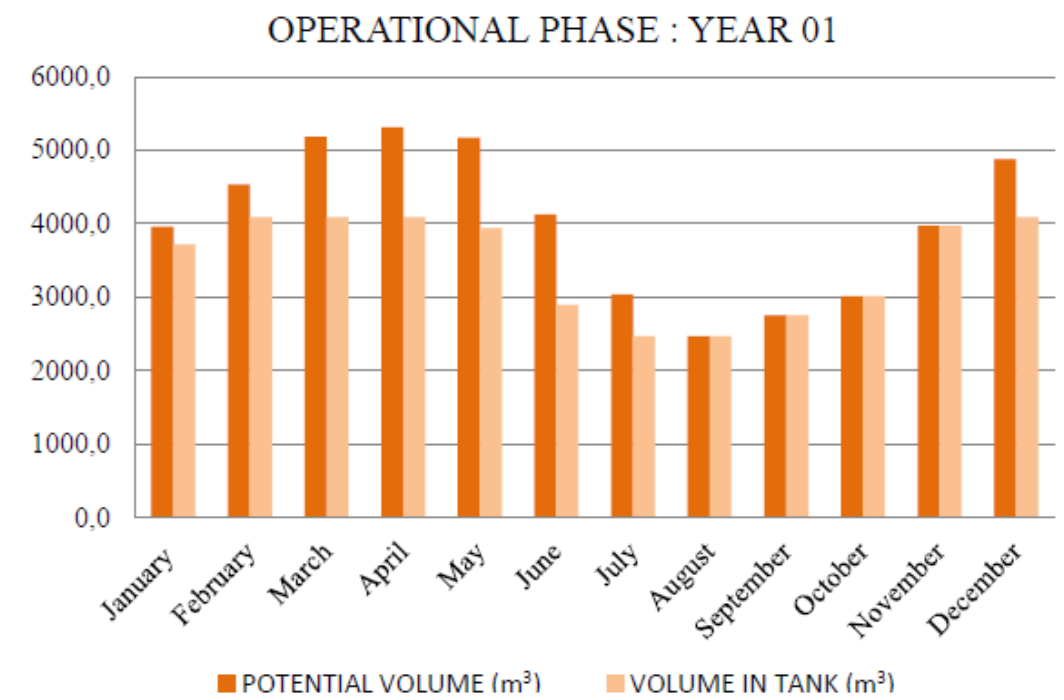
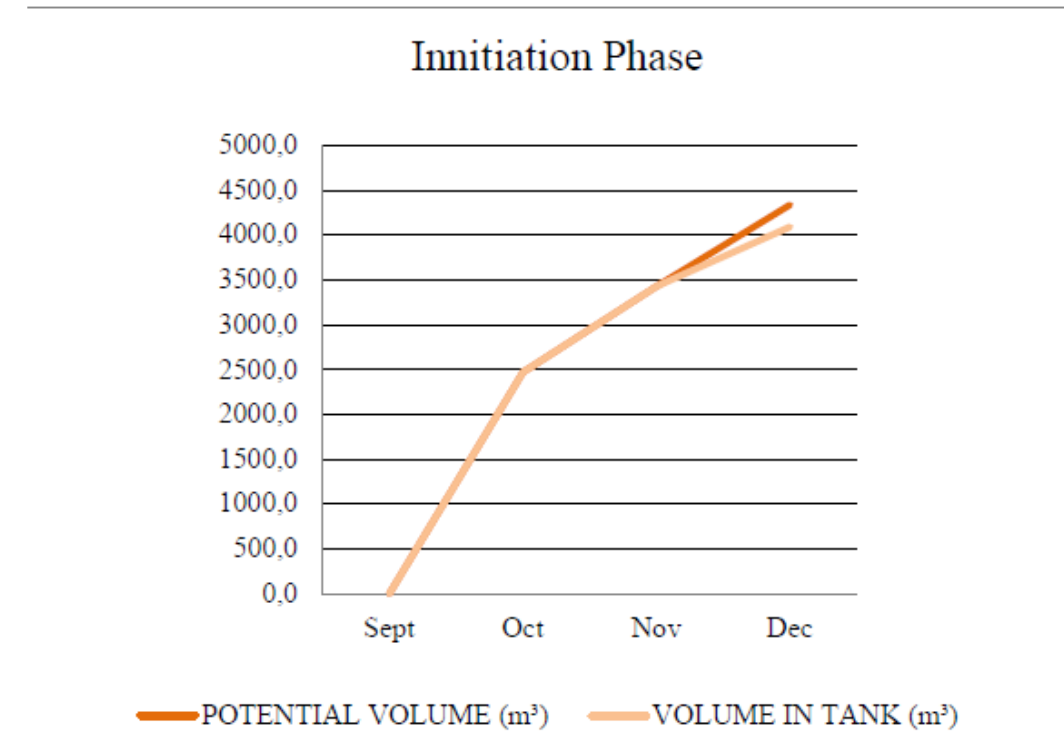


Figure 5.44: Water budget calculations for proposed intervention (Author 2021).

## CONCLUSION

In conclusion, the water calculations confirm that rain water harvesting will mostly be sufficient to sustain the intervention in a sustainable manner. As seen in Table C2 (figure 5.44) one can see that the water collected from the site will provide 58% of the water use. Therefore it is proposed to use from the quarry hole's water to fill up the tanks during the winter period with limited available water. The demand is not extensively more than the yield and therefore can be solved by filtering quarry hole water into safe drinking water and be stored into emergency storage tanks.

\*Please read this conclusion in conjunction with Annexure A.

## SUSTAINABLE BUILDING ASSESSMENT TOOL

Melusi Waterfront rated a 3.9 / 5 on the SBAT (Sustainable Building assessment Tool) see figure 5.45. Categories such as reducing transport, water efficiency, inclusion, education, health and resource use all rated above 4/5. Other categories still need more attention in future projects in Melusi.

## SEFAIRA DAYLIGHTING

The Sefaira tool have been used to determine the effect of a southern tower to the indoor quality. Due to the nature of the facility only operating in normal office hours (8:00-17:00) the maximum daylight is needed to illuminate the interior to reduce alternative resources such as artificial lighting. The basecase indicated that the interior quality would be mostly underlit and in the tower profile the interior is mostly overlit see figure 5.46-4.49. Therefore the tower profile has been selected. This profile also improves natural ventilation through stack ventilation.

## SUSTAINABLE BUILDING ASSESSMENT TOOL RESIDENTIAL 1,04

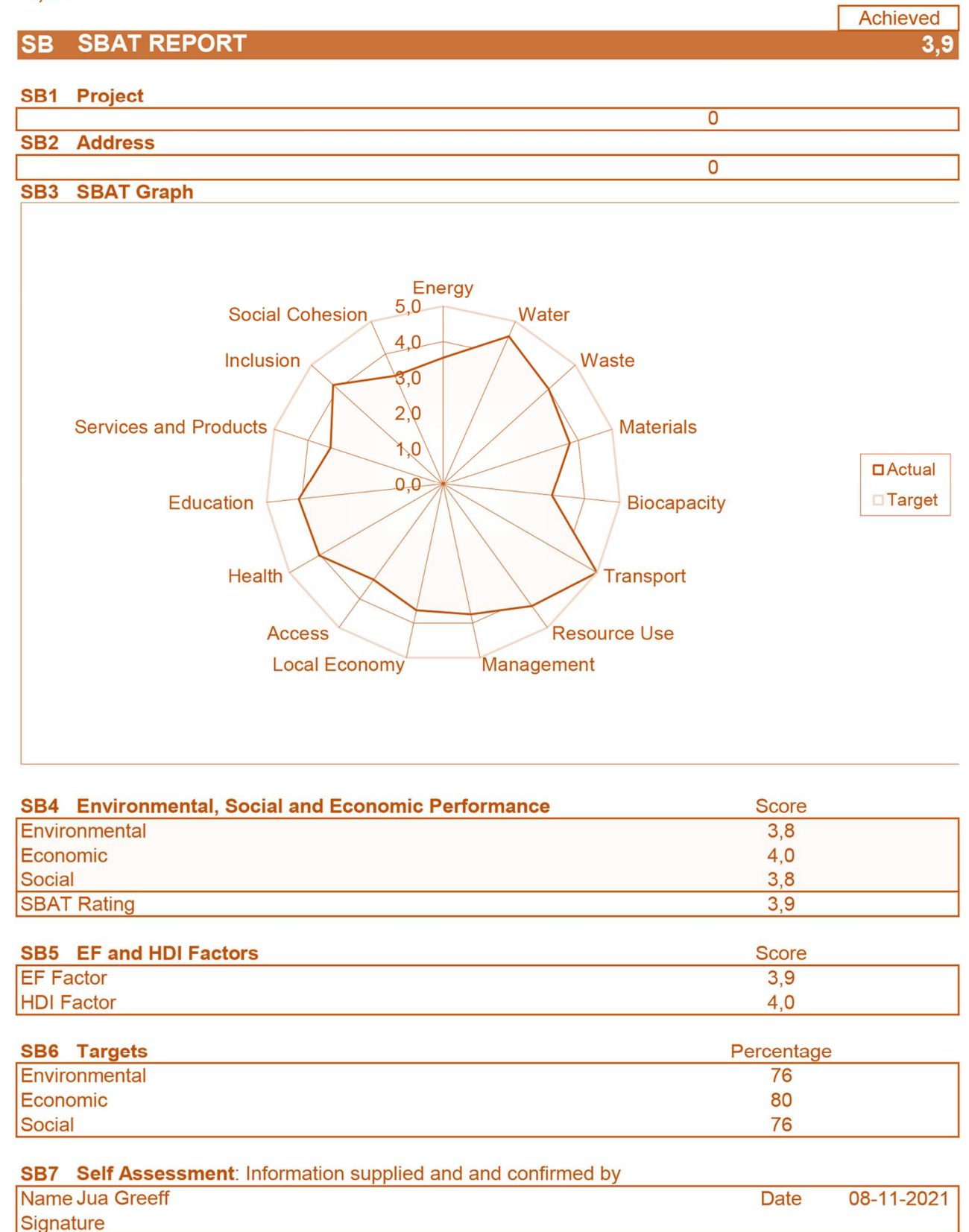


Figure 5.45: SBAT rating for the new intervention (SBAT 2021).

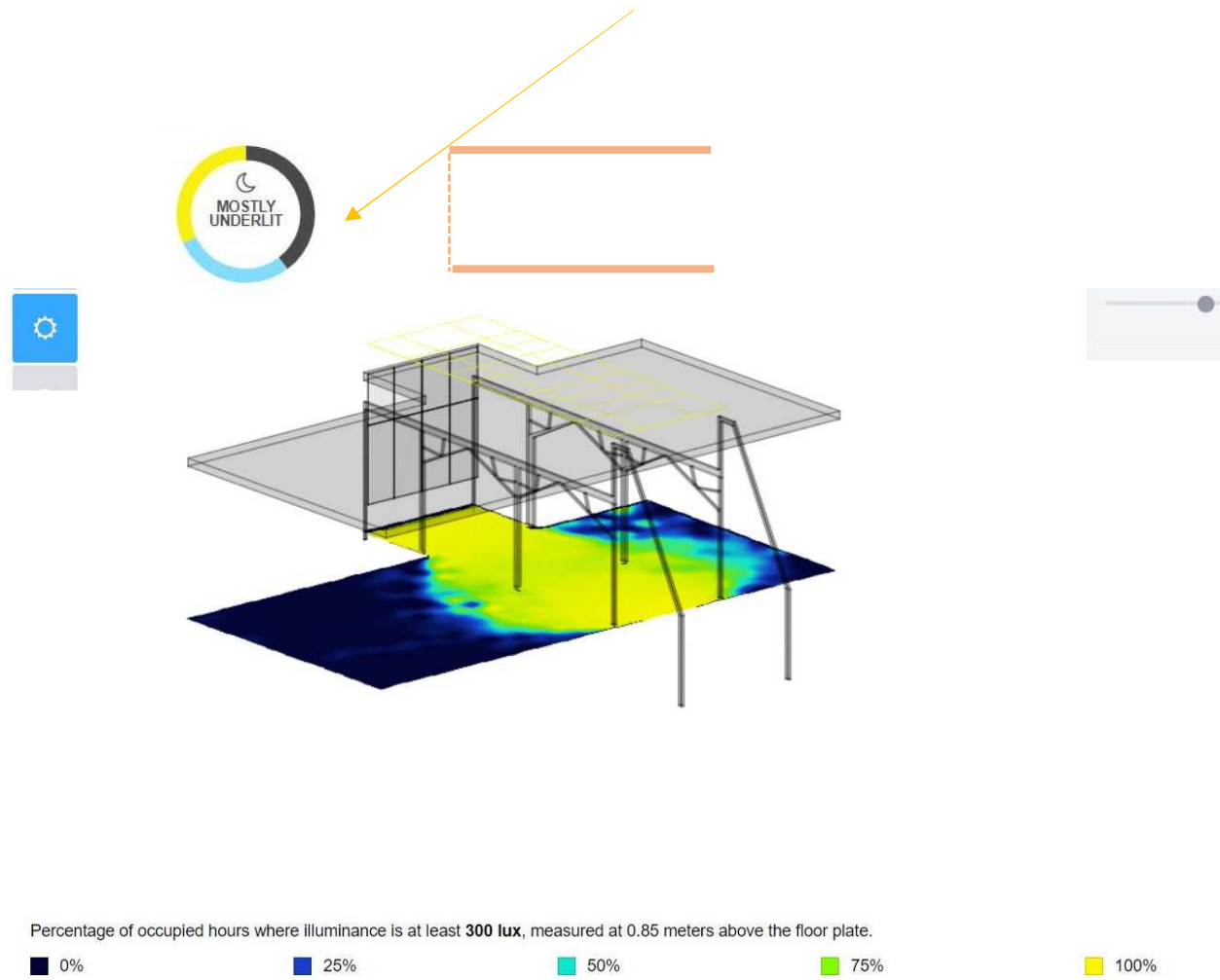


Figure 5.46: Sefaira base case illuminance rating (Sefaira 2021).

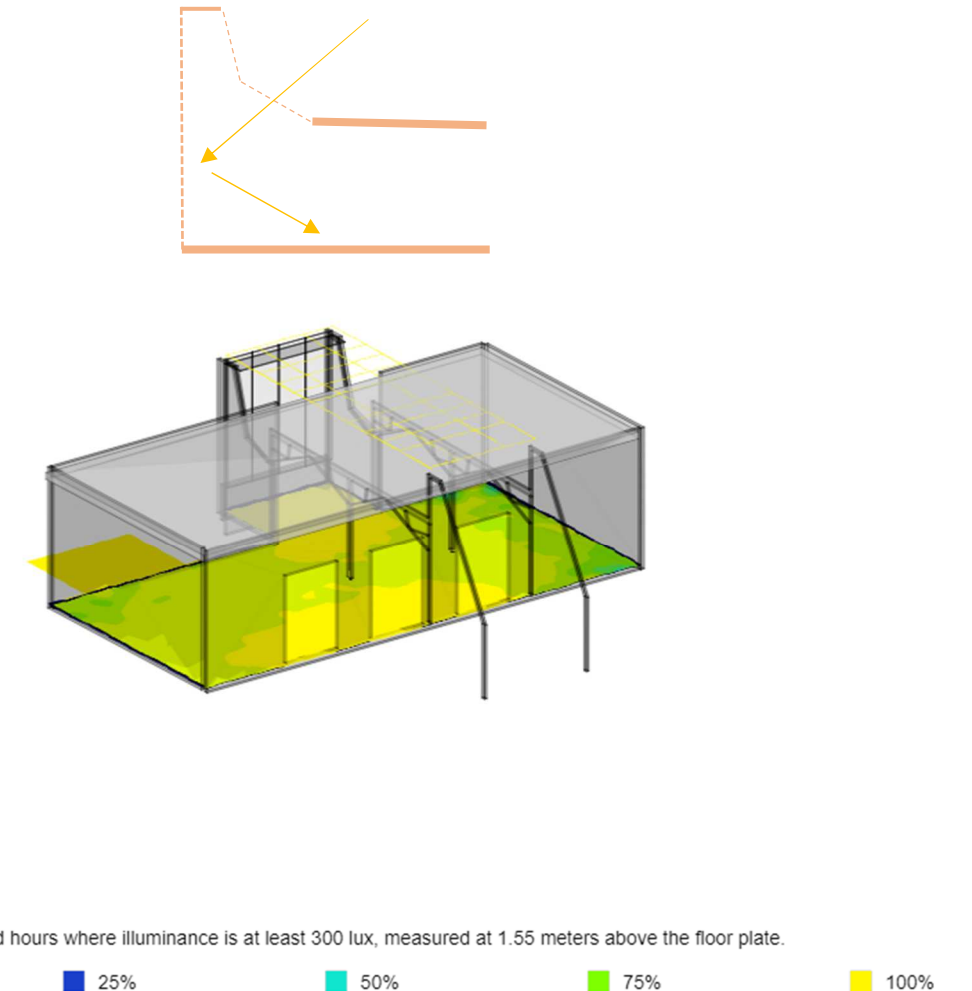


Figure 5.48: Sefaira altered profile illuminance rating (Sefaira 2021).

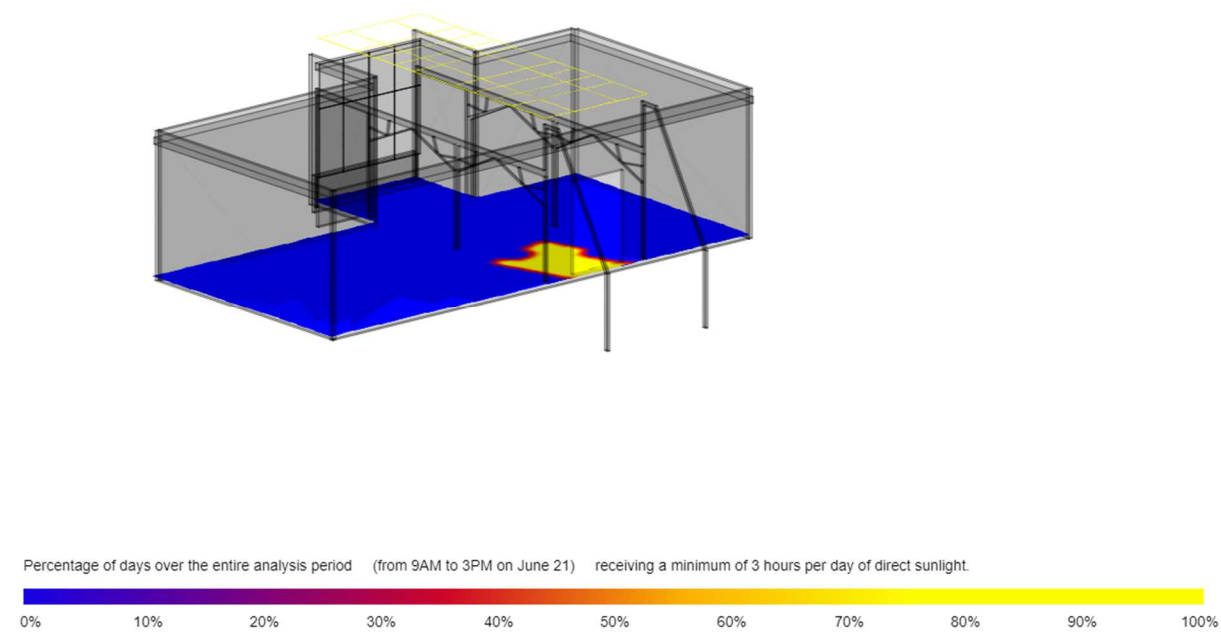


Figure 5.47: Sefaira base case direct sunlight (Sefaira 2021).

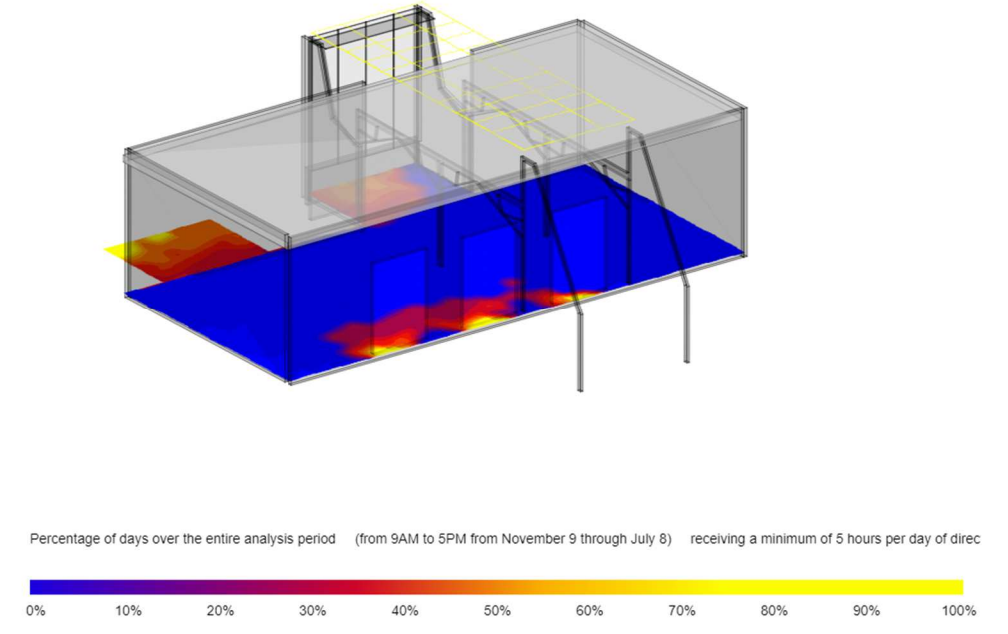


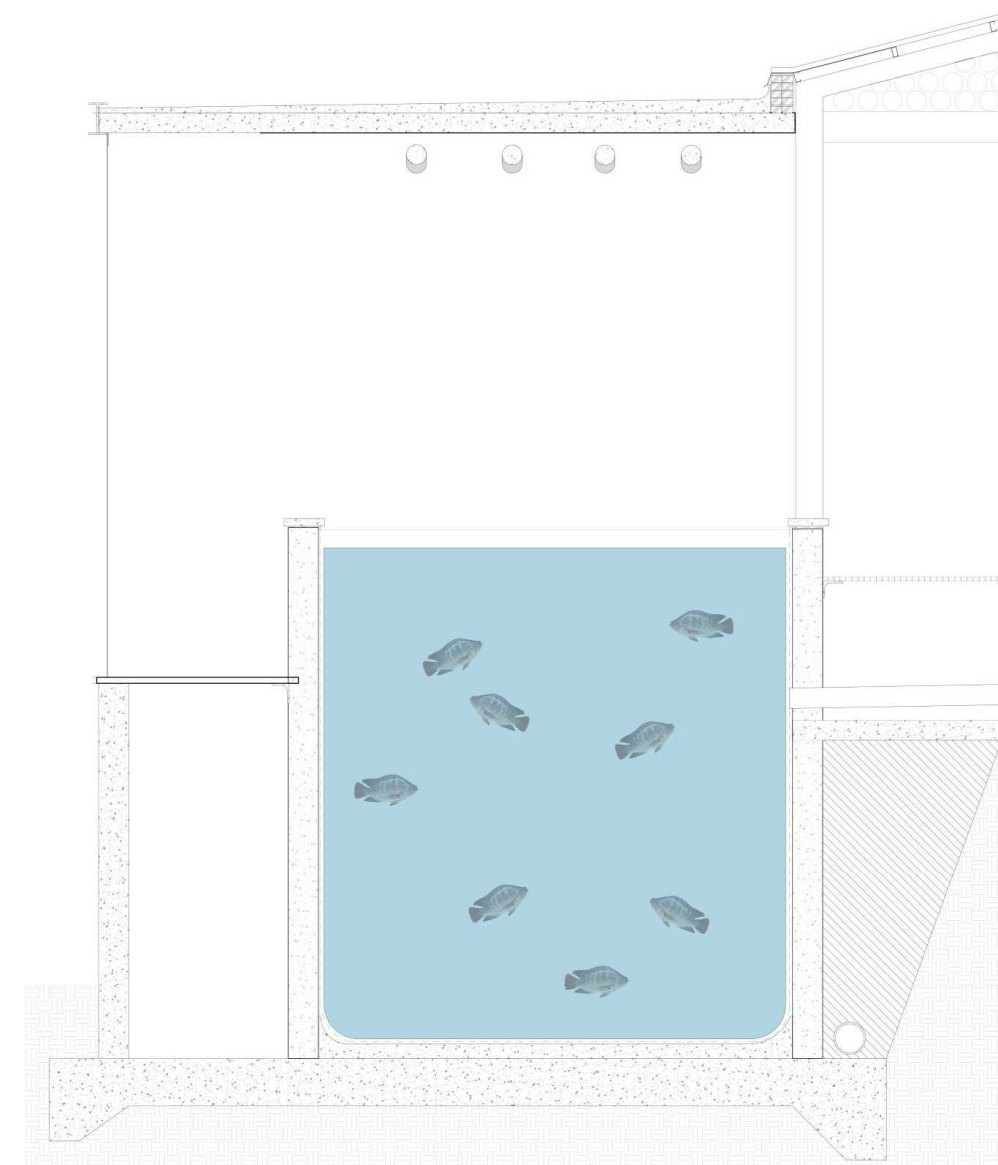
Figure 5.49: Sefaira altered profile direct sunlight (Sefaira 2021).



DETAILS



Figure 5.50: Ground floor section of Melusi waterfront (Sefaira 2021).



Custom made powdercoated steel flashing fixed to purlin and wraps over the double brick layer with bent drip.

70 x 70 mm powdercoated hot rolled steel frame (1000 mm x 1000 mm) with glass wine bottles stacked onto each other like brickwork using grade 2 mortar as per engineers design and specifications.

Polycarbonate corrugated sheeting @ 63 deg. fixed to 100 mm x 50 mm x 20 mm colled rolled steel lip channel-purlins at 1000 mm c/c in strick accordance with manufacturer's specifications by an approved structural engineer

100 mm diameter PVC pipes with 10 mm holes dripped into the pipe at 300 c/c. The PVC pipe is slanted at a 5 degree angle and hangs from the concrete roof

170 mm In situ off shutter concrete slab to engineers design and specifications, grey torched-on spray-on waterproofing on a min of 30 mm screed with 1:200 slope.

400 x 400mm solar light fitted composite decking boards fixed to the concrete footing and an steel angle as per engineers specifications

Custom made precast concrete coping, bedded and jointed in class 2 mortar with drip joints

1000 x1000 mm panels of 50 mm x 50 mm grating size heavy dutystainless steel vitagrid grating panels fixed onto a steel angle fixed to the concrete walls of the fish tanks

100 mm dia PVC pipe slanted at an angle from one fish tank to another using gravity.

Rubble fillinh behind the retaining wall

100 mm Geopipe as per engineers's design and specifications

Reinforced in-situ concrete raft foundation specified by the engineer to carry the weight of the water tanks.

5 mm Thick Bentofix geosynthetic clay liner waterproofing membrane. Laid with 300 mm longitudinal overlap and 500 mm cross overlap under the pre-cast concrete coping

Figure 5.51: Section A-A Submission for technical crit (Author 2021)

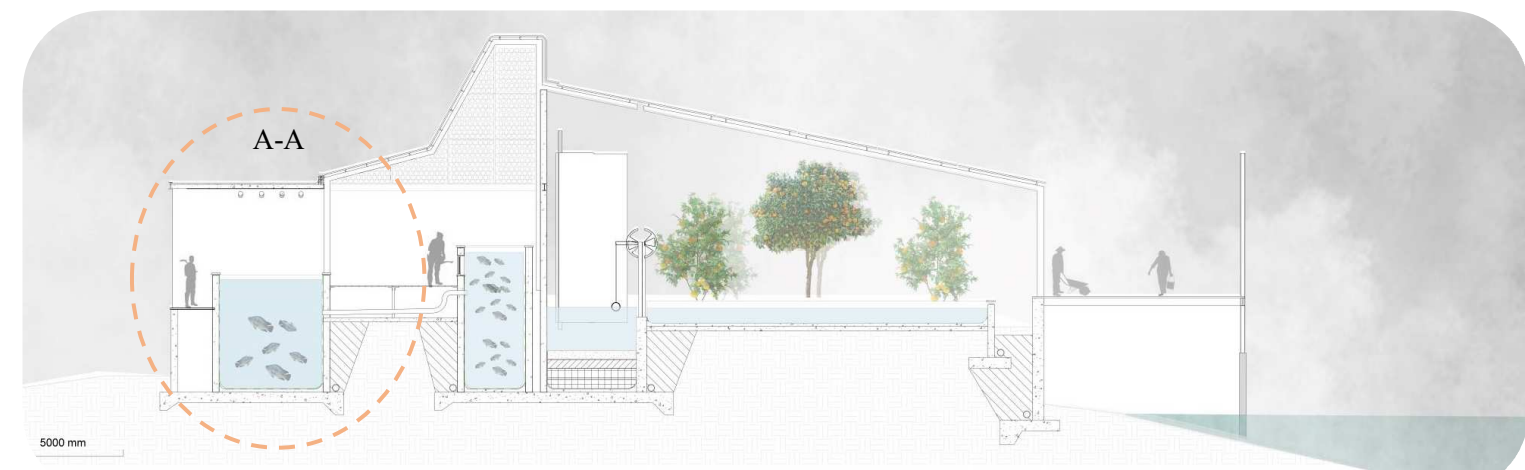


Figure 5.51: Section A-A Submission for technical crit (Author 2021)

## AQUAPONIC SITE SECTION ACROSS THE QUARRY

*Aquaponic Farm cantilevering over the Quarry Hole*

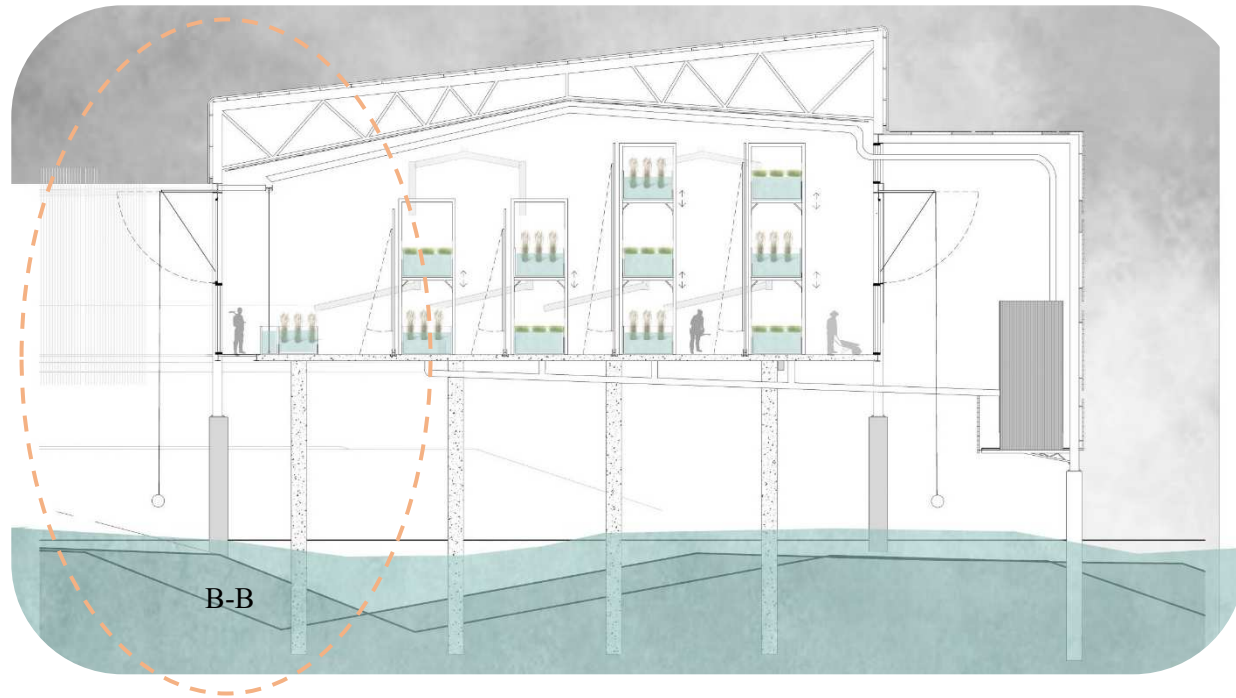


Figure 5.52: Site section through the Aquaponic farm for technical crit submission (Author 2021).

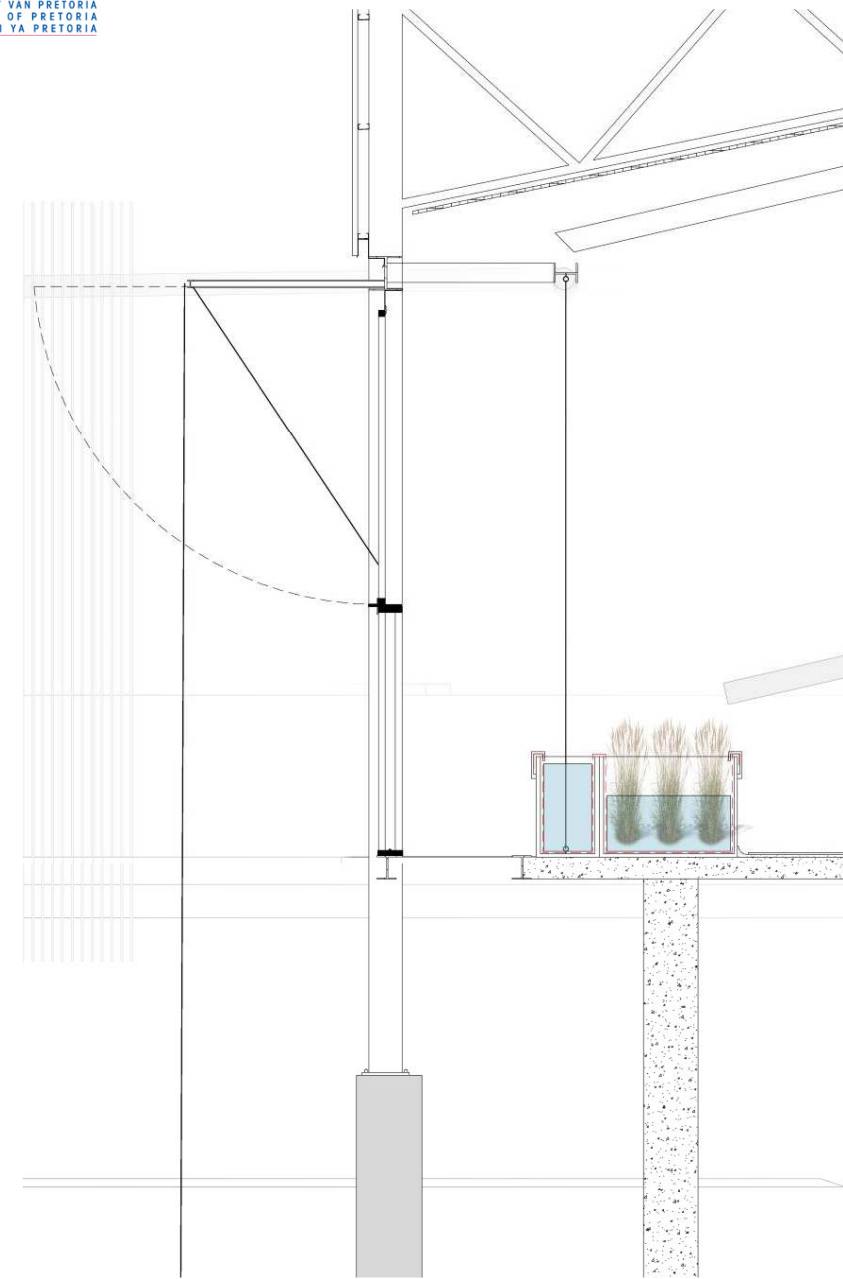


Figure 5.53: Detail B-B submission for technical crit (Author 2021).

Polycarbonate corrugated sheeting fixed to 100 mm x 50 mm x 20 mm colled rolled steel lip channel purlins at 1000 mm c/c in strick accordance with manufacturer's specifications and approved by and engineer.

1000 x 1000 mm panels of 50 mm x 50 mm grating size light duty aluminium vitagrid grating panels fixed and bolted to the portal frame trusses as per engineers specifications.

Aluminium frame with polycarbonate corrugated sheeting within the aluminium frame fixed with a hindge system to a steel plate welded to the 203 x 203 mm H-section beam. The moveable panel opens and closes with an counter weight precast concrete ball as per engineers design and specifications

100 mm diameter PVC water pipe connected to an 100 mm diameter flexi pipe.

25 x 30 mm diameter HDPE 100 x 100mm woven mesh rope fixed to the galvanised steel hooks fixed to the bottom of the timber crates.

30 mm thick timber crates built by community members with a 4mm thick waterproofing membrane glued onto the internal timber box.

500 mm x 500 mm white mat vinyl composite tile glued onto the reinforced concrete slab.

200 mm thick in situ reinforced concrete slab on the 5m interval concrete columns.

50 mm thick aluminium frame with an fixed exterior polycarbonate corrugated sheeting with a 60 mm air gap and on the interior have a Ethylene Vinyl Acetate sheeting. A strip LED light in the cavity as per electrician and engineers specifications.

203 x 203 mm H-profile beam bolted to the 305 x 165mm I-section portal frame supporting the 400 x 400mm solar light fitted composite decking boards.

305 x 165 mm I section portal frame structure fixed and bolted to a round reinforced concrete footing with a pile foundation as per engineers design and specifications

Reinforced concrete pile foundation and upstand every 5m as per engineers design and specifications



Recycled wine Bottles



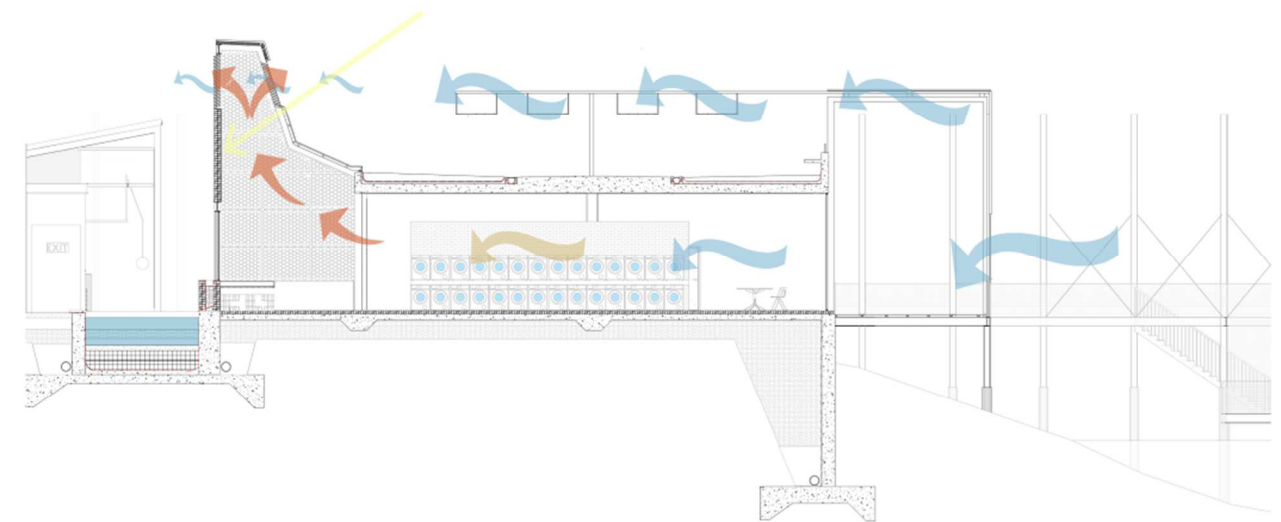
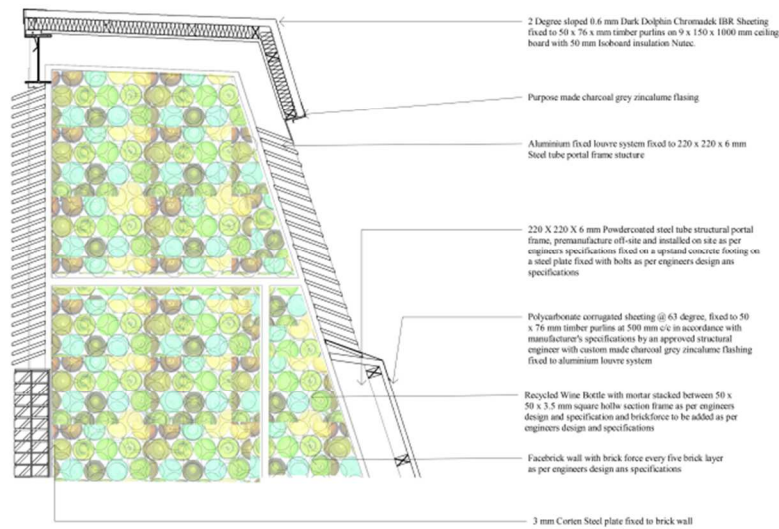
Red Facebrick



Polycarbonate Sheeting



Chromadek IBR Sheeting



## DETAIL A

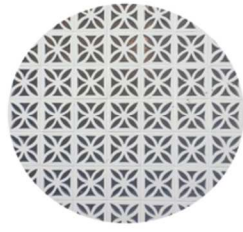
Laundry facility Stack Ventilation Tower

1:25

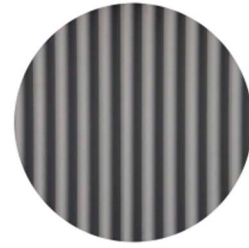
## STACK VENTILATION

Laundry facility

Figure 5.54: Detail A-A poster for Exam purposes 15 December 2021 (Author 2021).



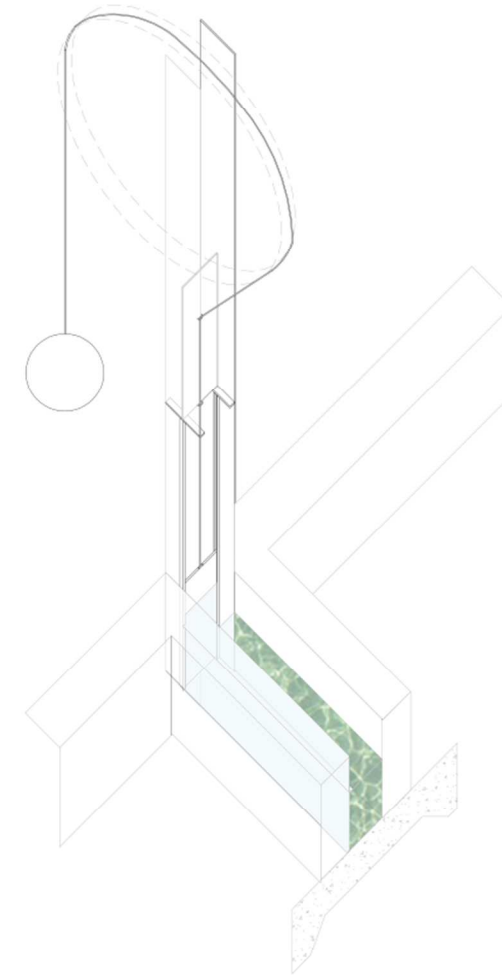
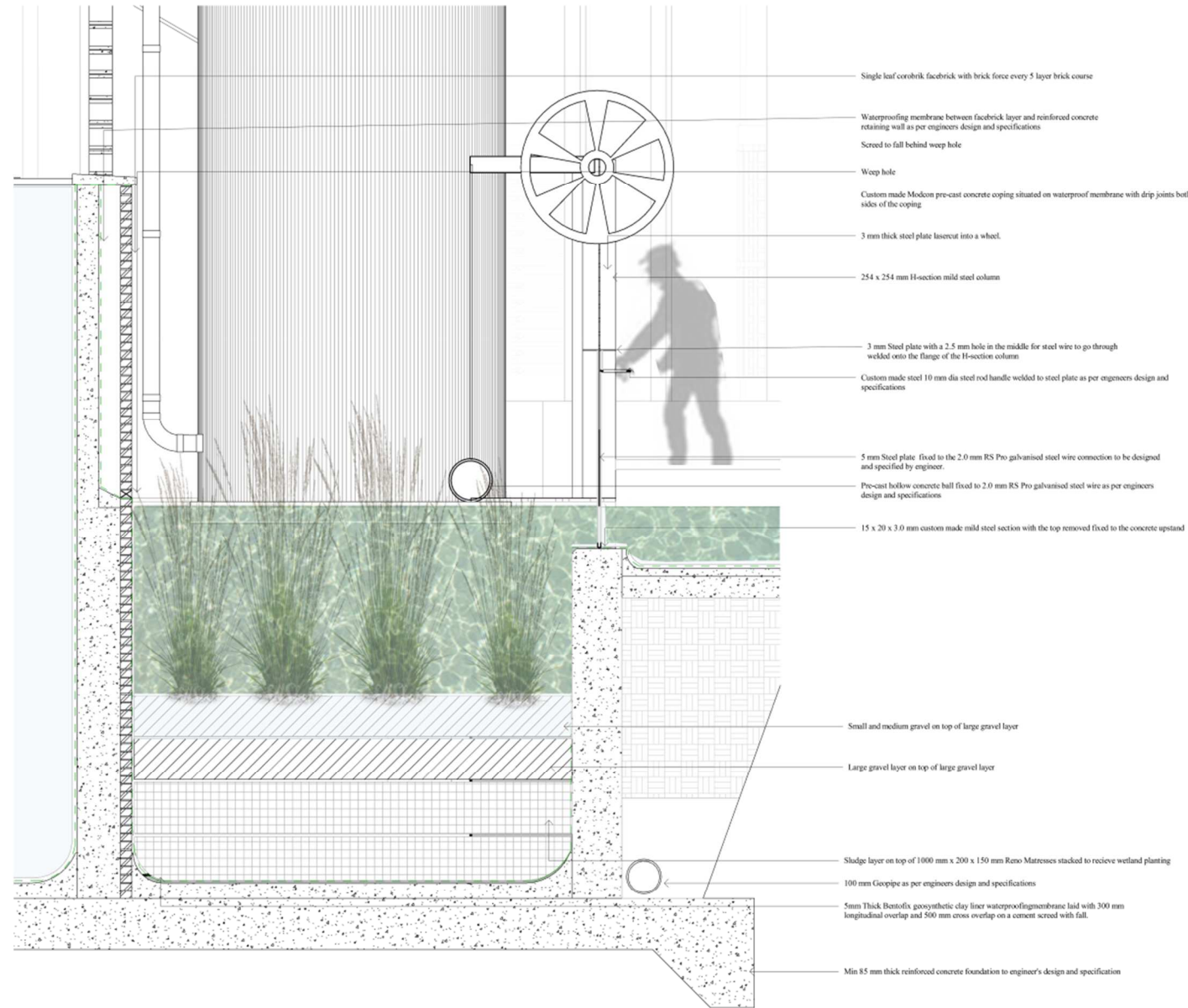
Pre-cast Concrete  
Breeze Blocks



Corrugated Sheet piling



Off-shutter  
Reinforced Concrete



## DETAIL B

Surface Flow Wetland & Water Channel

1:25

## AXONOMETRIC DETAIL B

Fruit Tree Water Channel

1:10

Figure 5.55: Detail B-B poster for Exam purposes 15 December 2021 (Author 2021).



Recycled wine Bottles



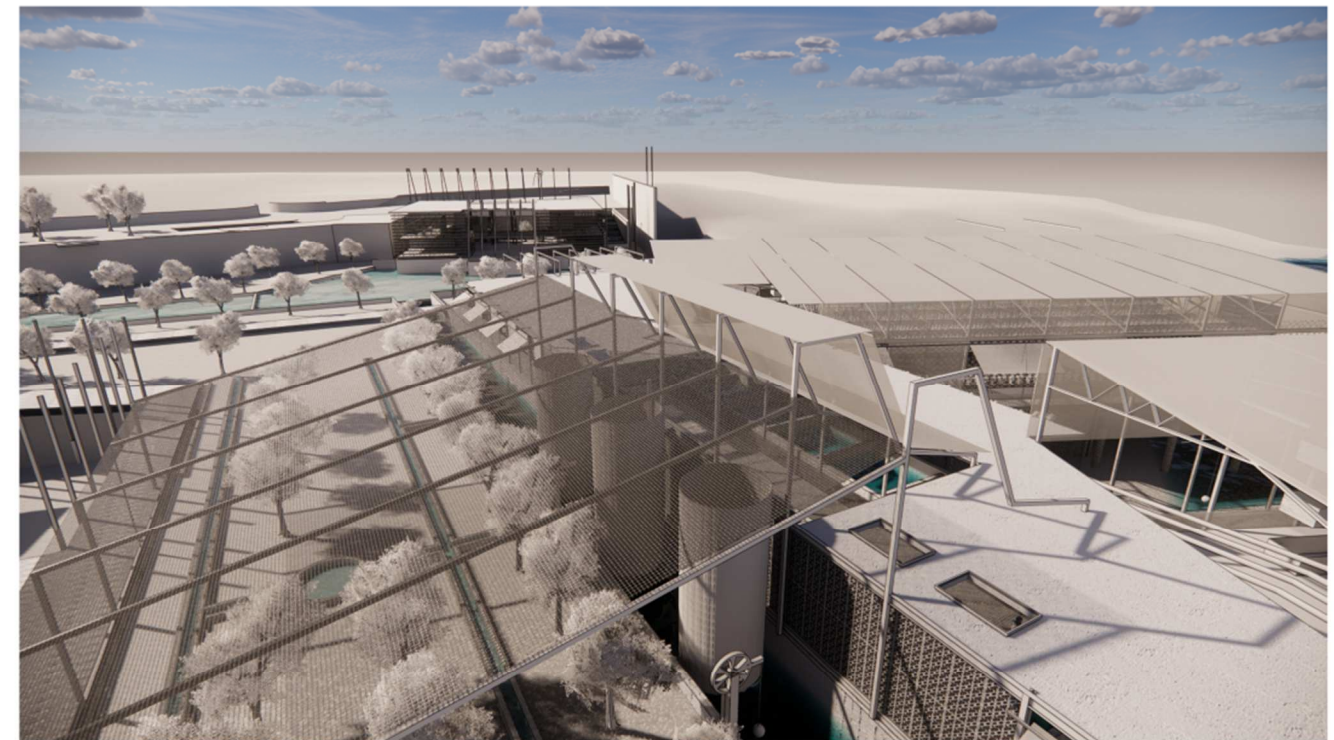
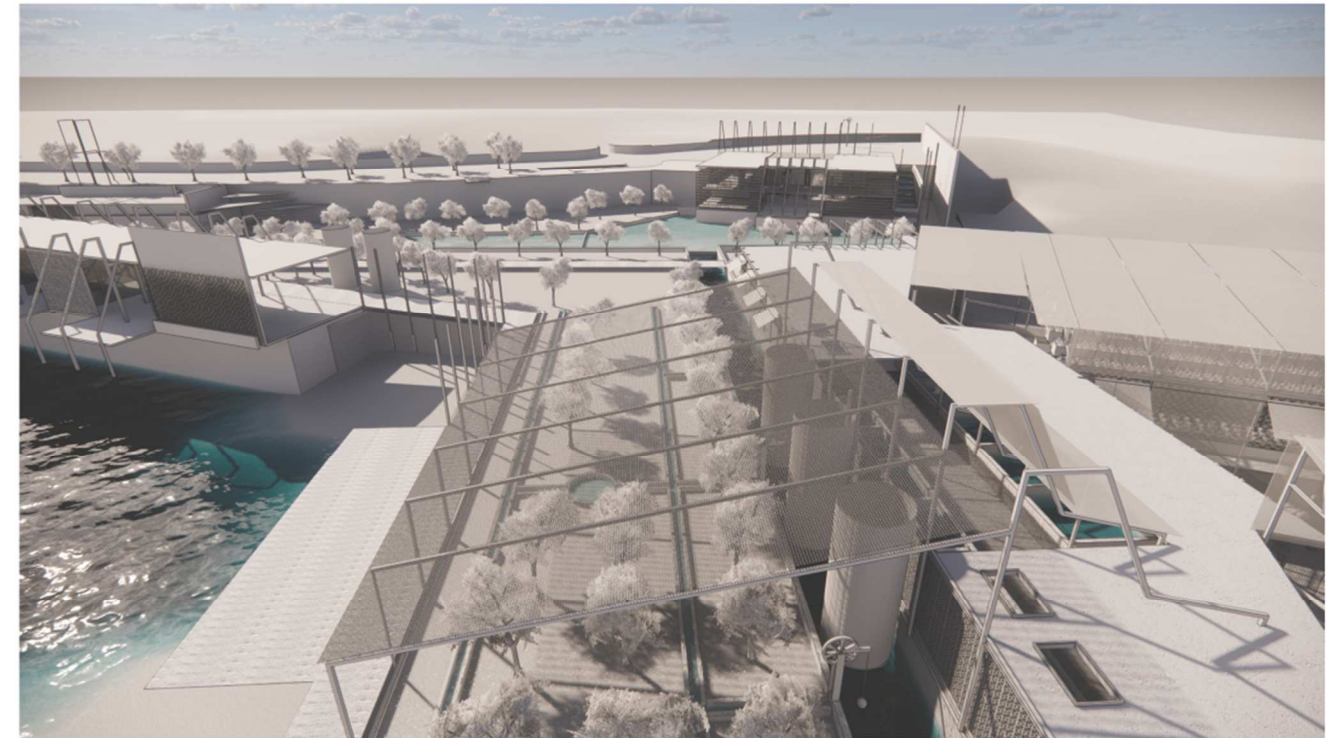
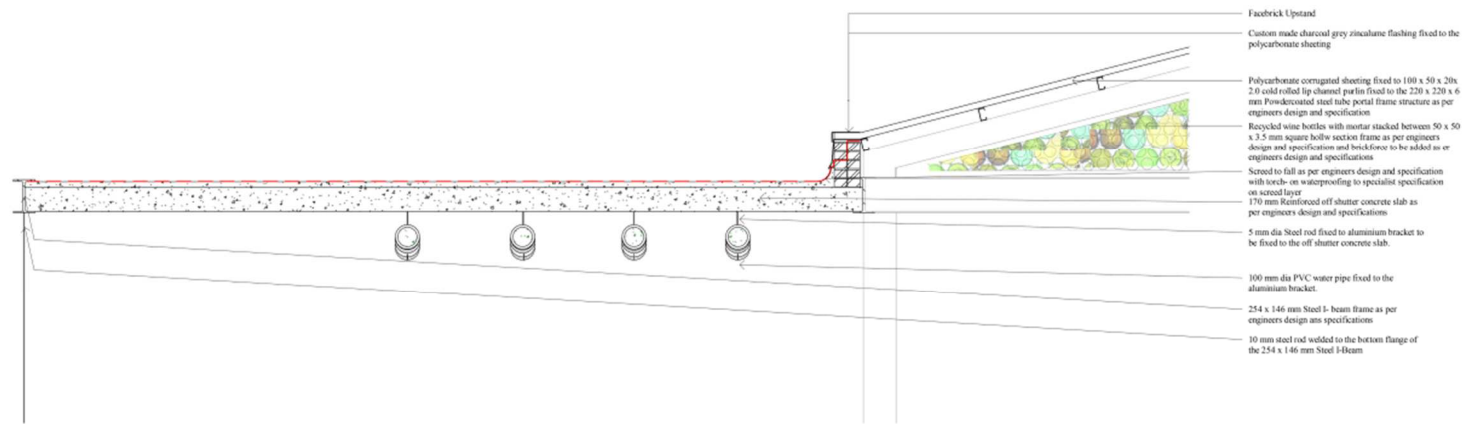
Red Facebrick



Polycarbonate Sheeting



Off shutter concrete



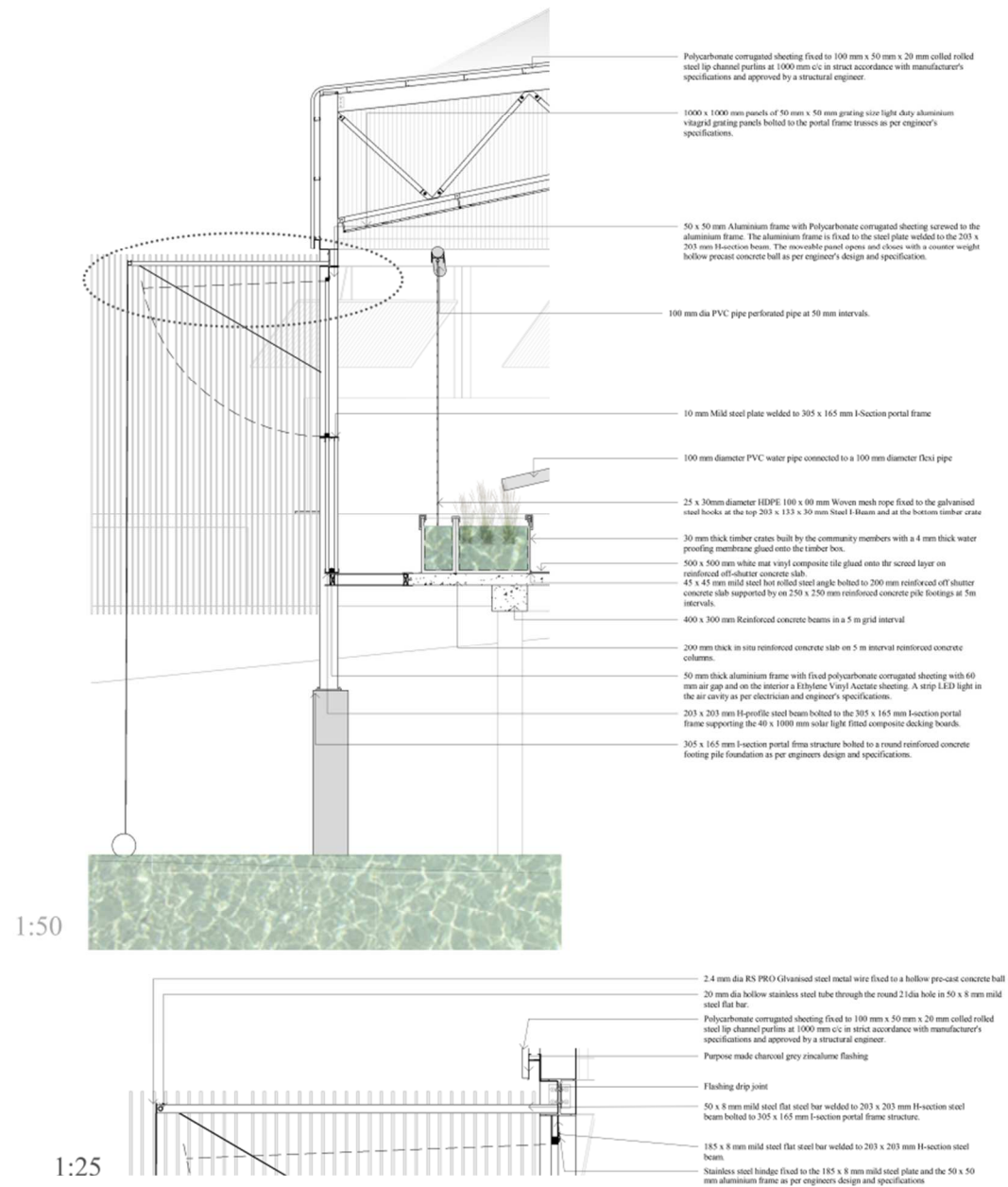
## DETAIL C

*Aquaponic roof and water aerate system*

1:25

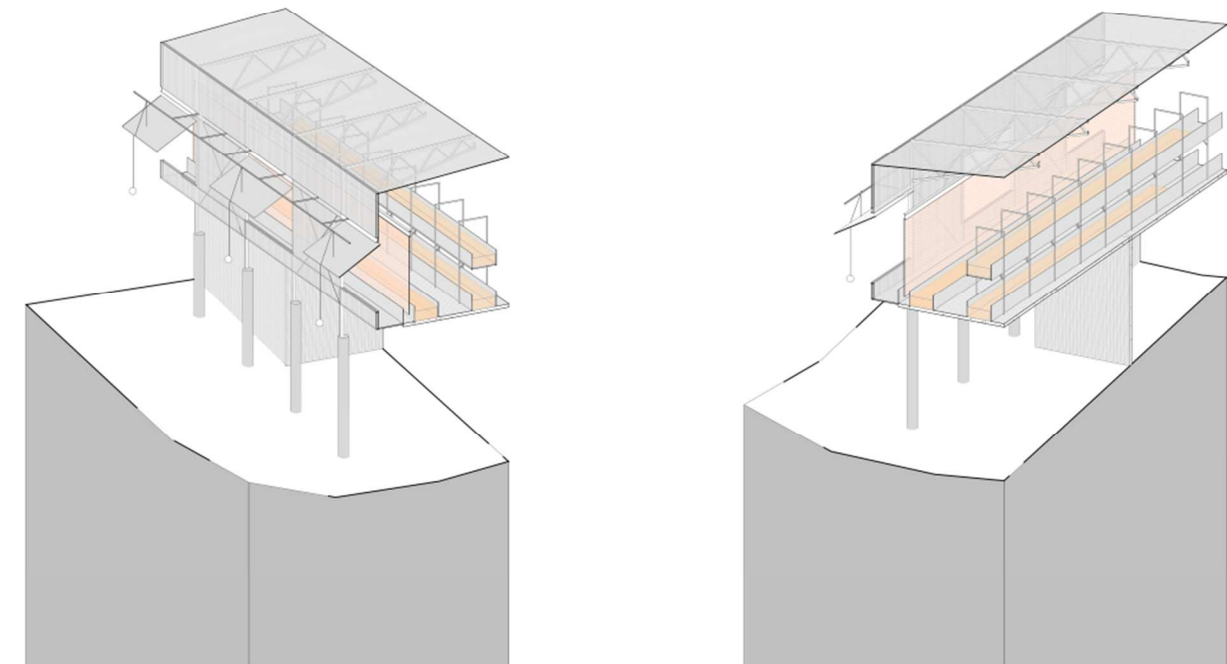
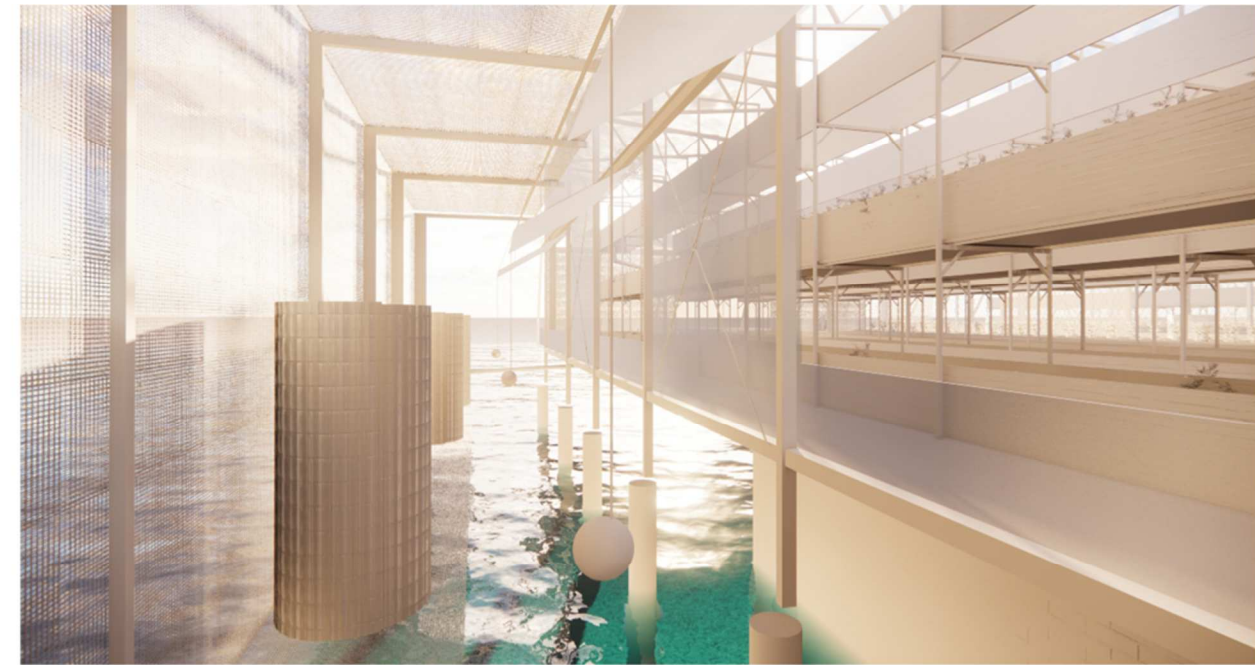
## ROOF PERSPECTIVES

Figure 5.56: Detail C-C poster for Exam purposes 15 December 2021 (Author 2021).



## DETAIL D

Counterweight Panels Aquaponic Facility



## AXONOMETRIC DETAIL D

Aquaponic Facade

Figure 5.57: Detail D-D poster for Exam purposes 15 December 2021 (Author 2021).

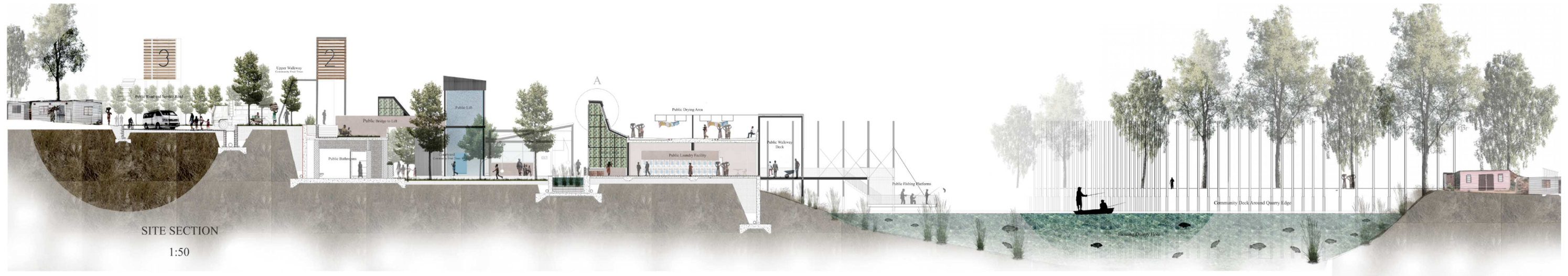


Figure 5.58: Site section for Exam purposes 15 December 2021 (Author 2021).



Figure 5.59: Section A-A for Exam purposes 15 December 2021 (Author 2021).



Figure 5.60: Section B-B for Exam purposes 15 December 2021 (Author 2021).



Figure 5.61: Ground floor plan for Exam purposes December 2021 (Author 2021).



Figure 5.62: First floor plan for Exam purposes December 2021 (Author 2021).

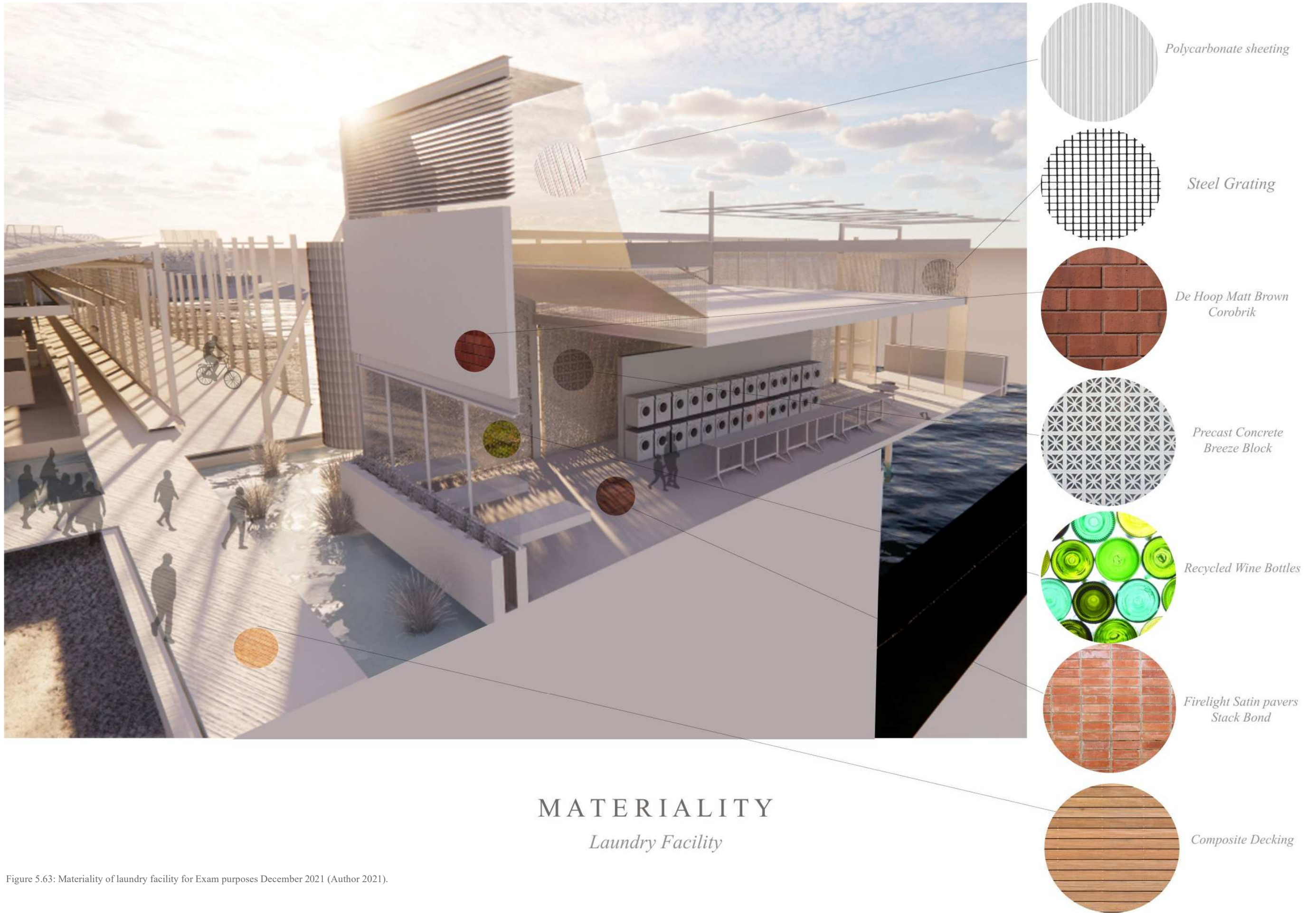
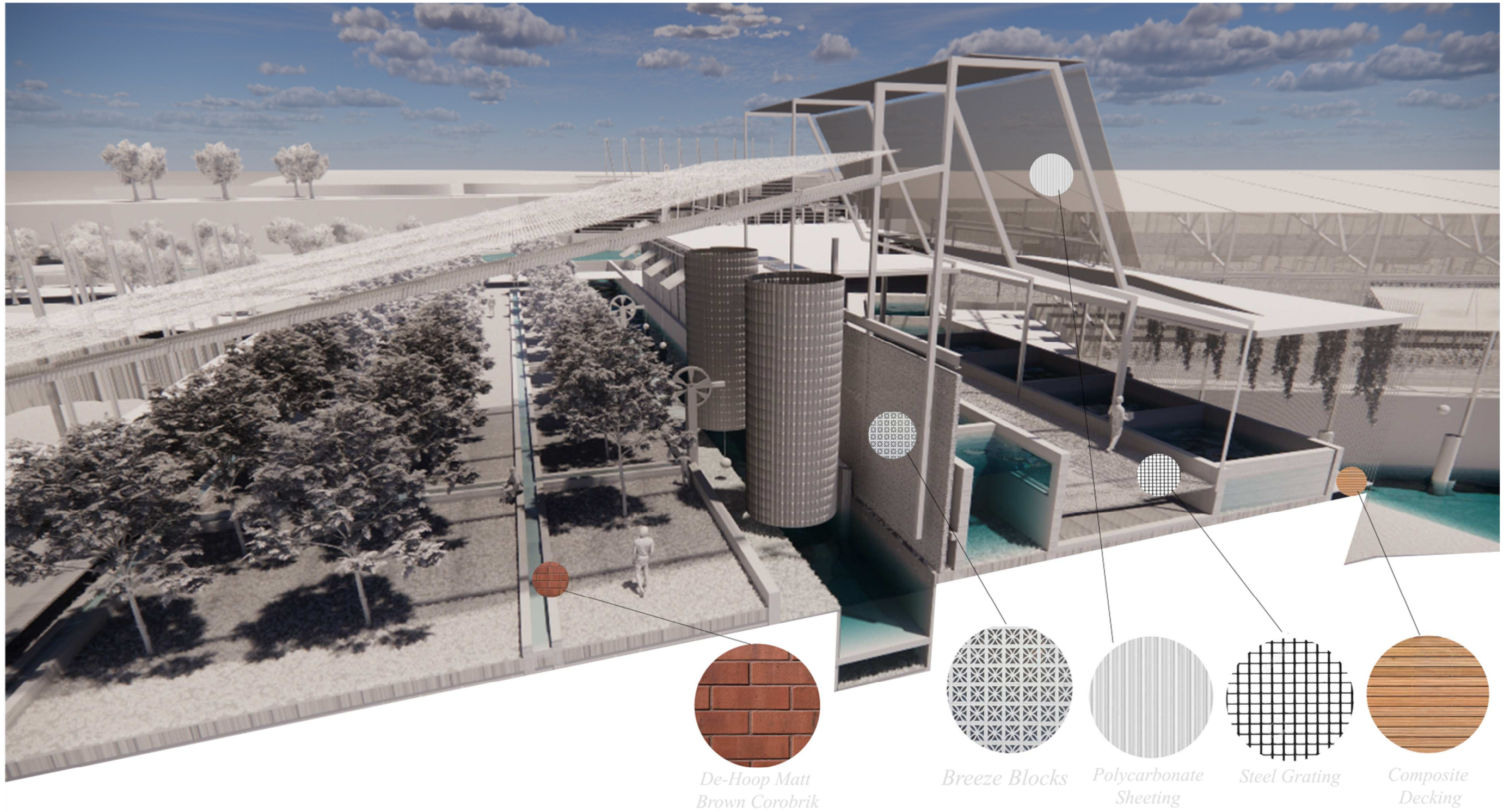


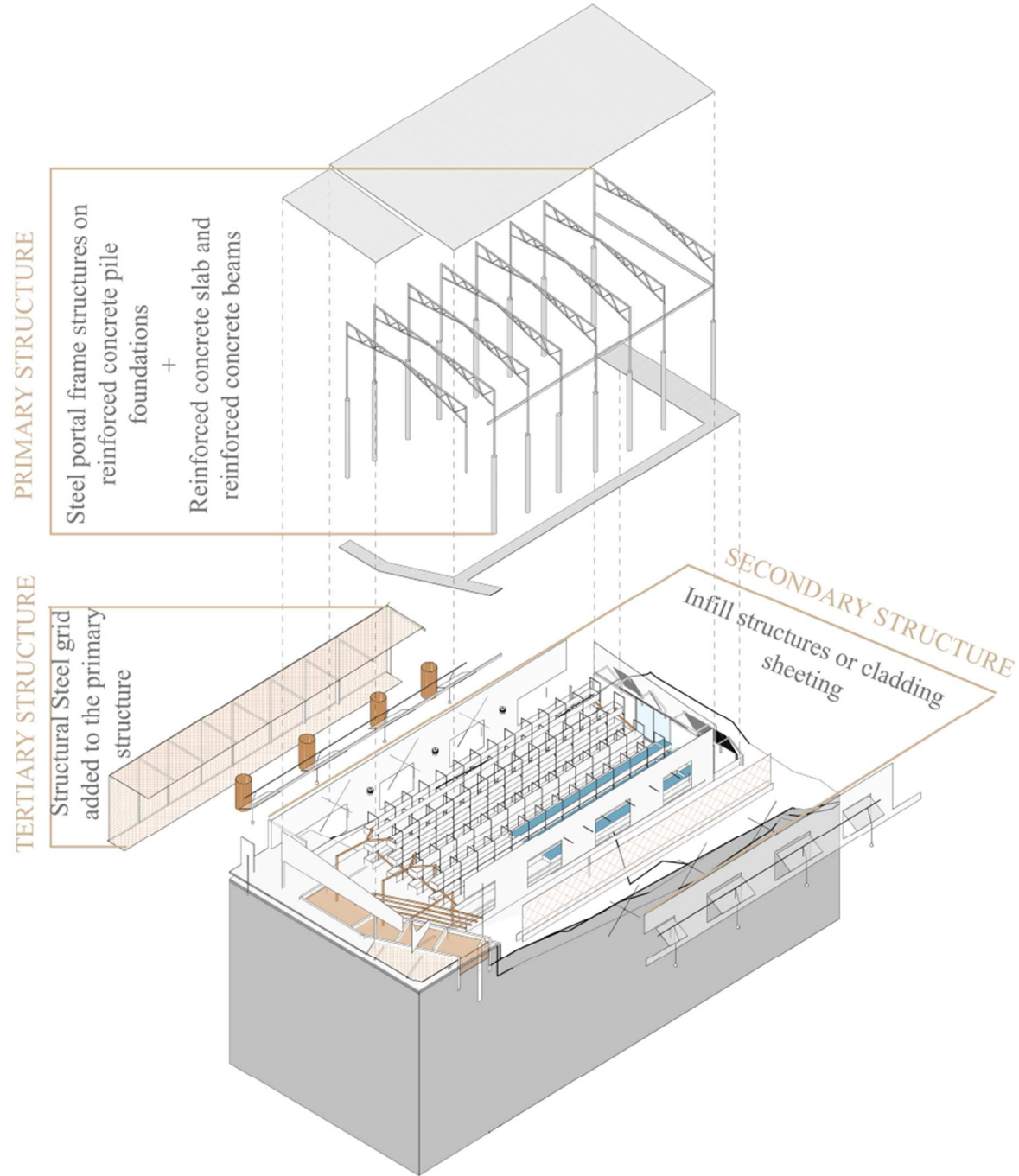
Figure 5.63: Materiality of laundry facility for Exam purposes December 2021 (Author 2021).



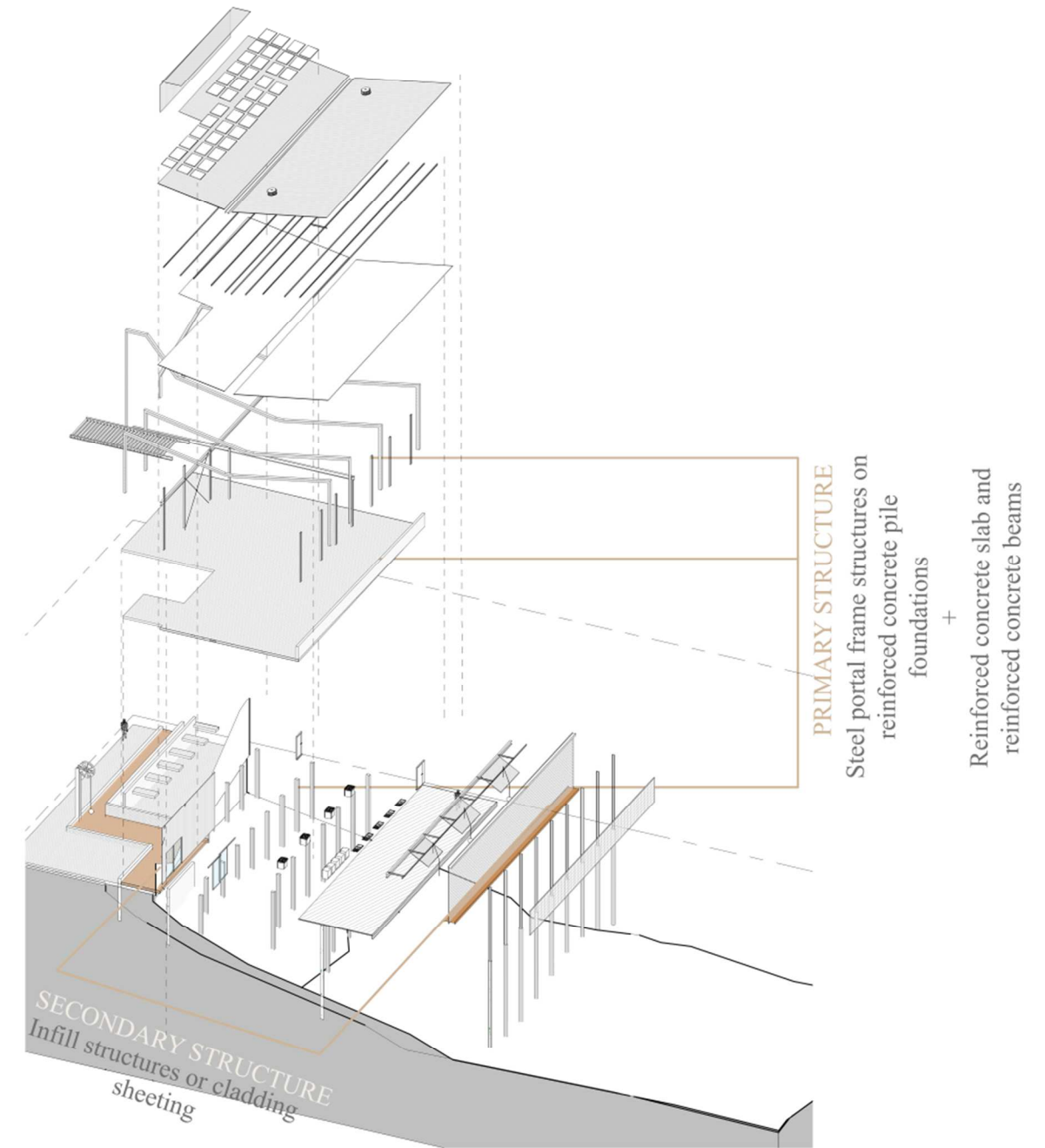
## MATERIALITY AQUAPONIC FACILITY

*Controlled Access*

Figure 5.64: Materiality of aquaponic facility for Exam purposes December 2021 (Author 2021).

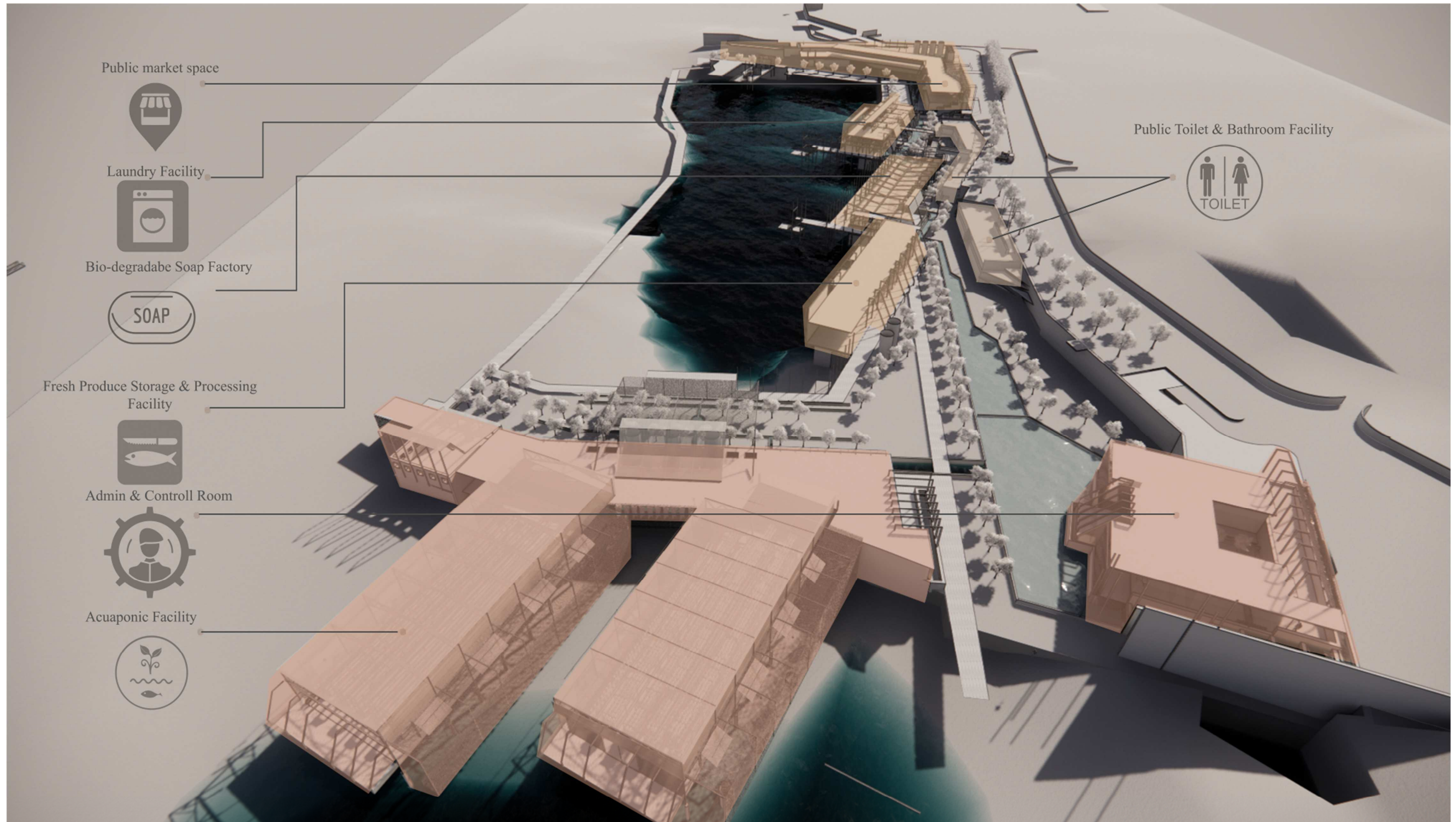


**STRUCTURE**  
*Aquaponic facility*



**STRUCTURE**  
*Biodegradable soap Factory*

Figure 5.65: Structural composition for Exam purposes December 2021 (Author 2021).



■ Semi-Public  
■ Public

## FACILITIES

*Public & Private Spaces*

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Figure 5.66: Allocation of the multiple facilities on site for Exam purposes December 2021 (Author 2021).



## Views

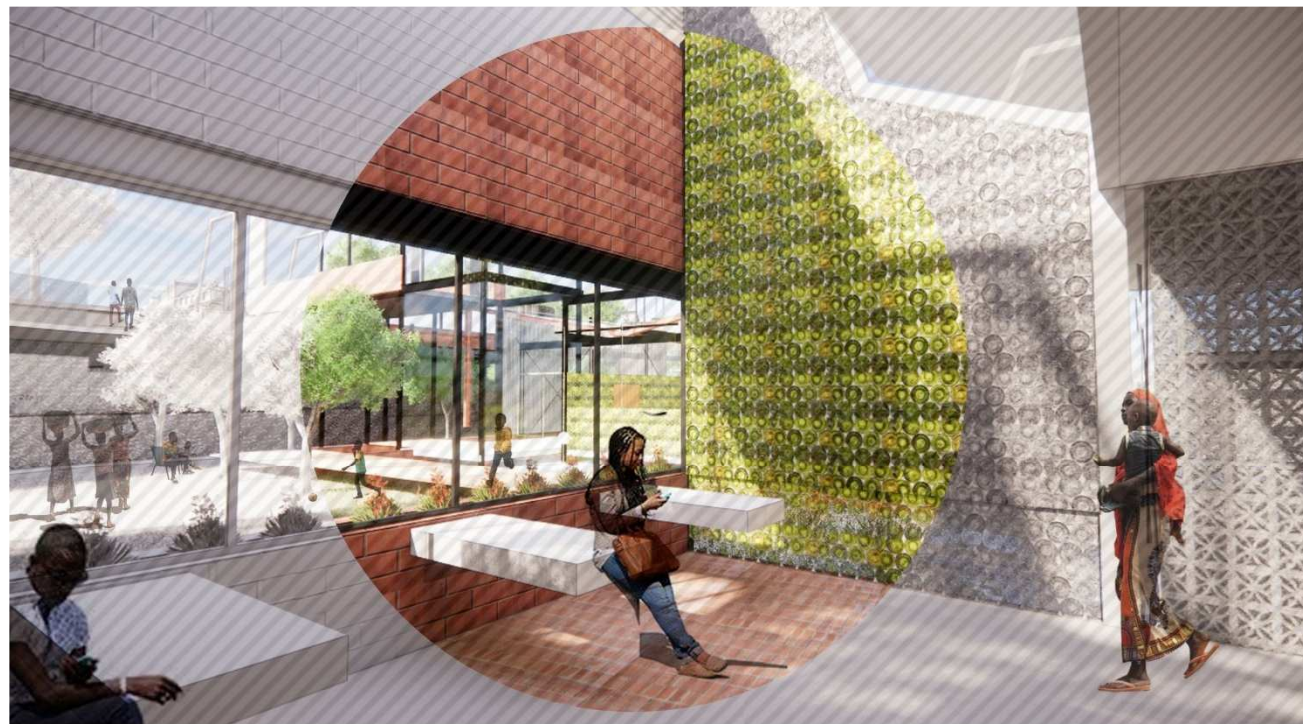
Figure 5.67: Location of views taken on site for Exam purposes December 2021 (Author 2021).



View A  
LAUNDRY ACCESS TO ROOF  
*Public Area*



View C  
LAUNDRY WAITING AREA EXTERIOR  
*Public Area*



View B  
LAUNDRY WAITING AREA  
*Public Area*



View D  
BIODEGRADABLE SOAP FACTORY  
*Public Area*

Figure 5.68: Views A-D for Exam purposes December 2021 (Author 2021).



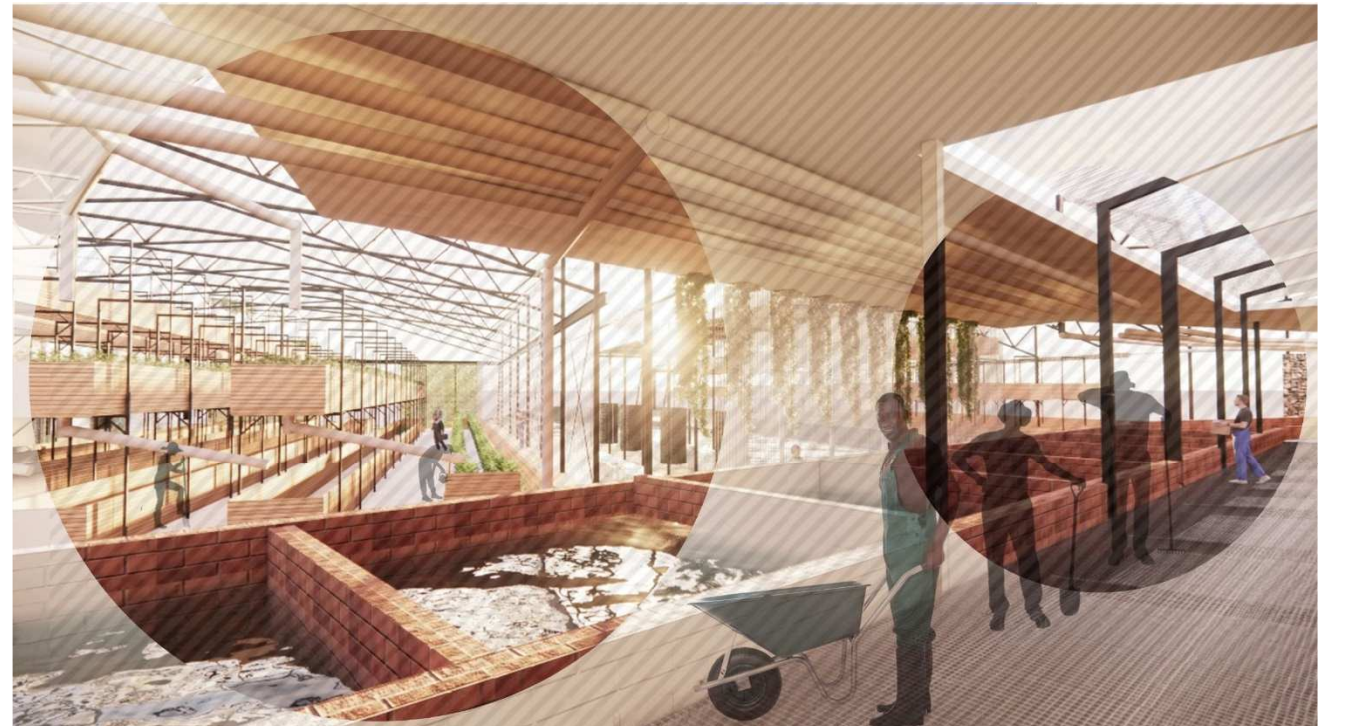
View E  
COURTYARD  
*Public Area*



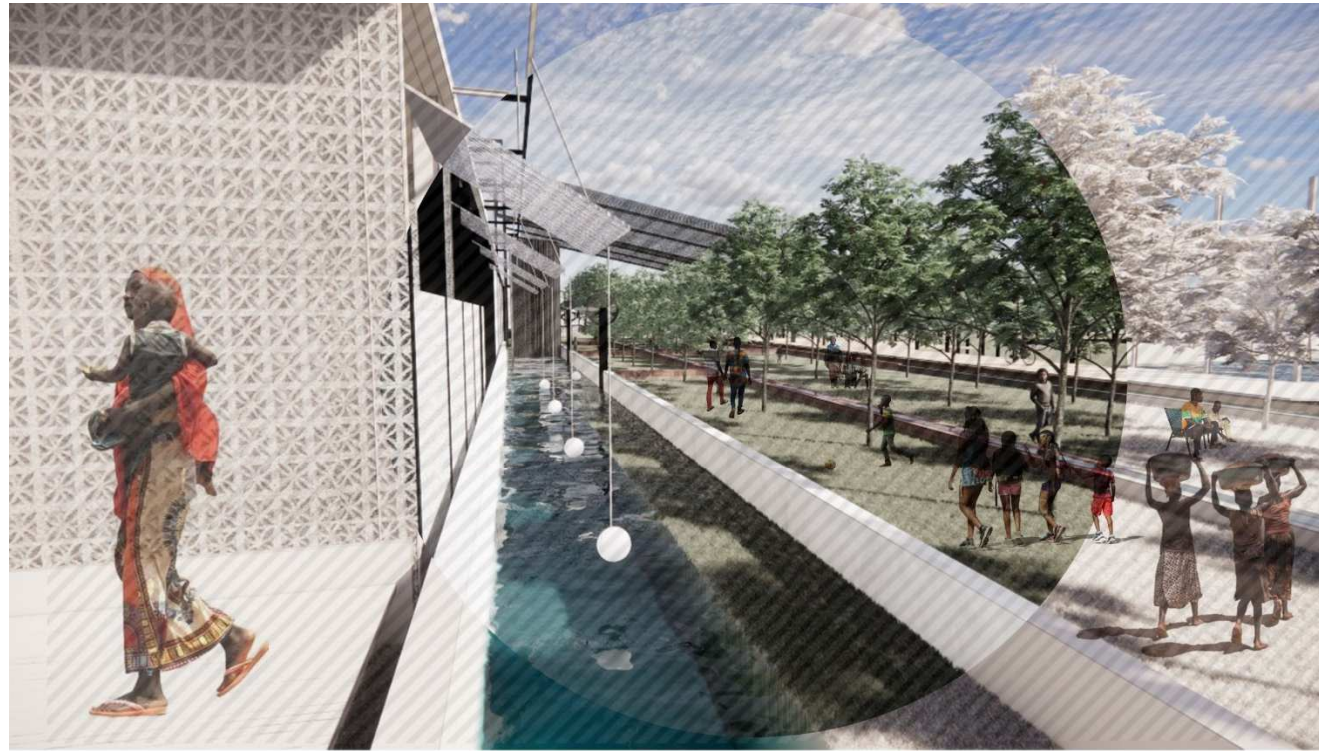
View G  
LAUNDRY FACILITY  
*Public Area*



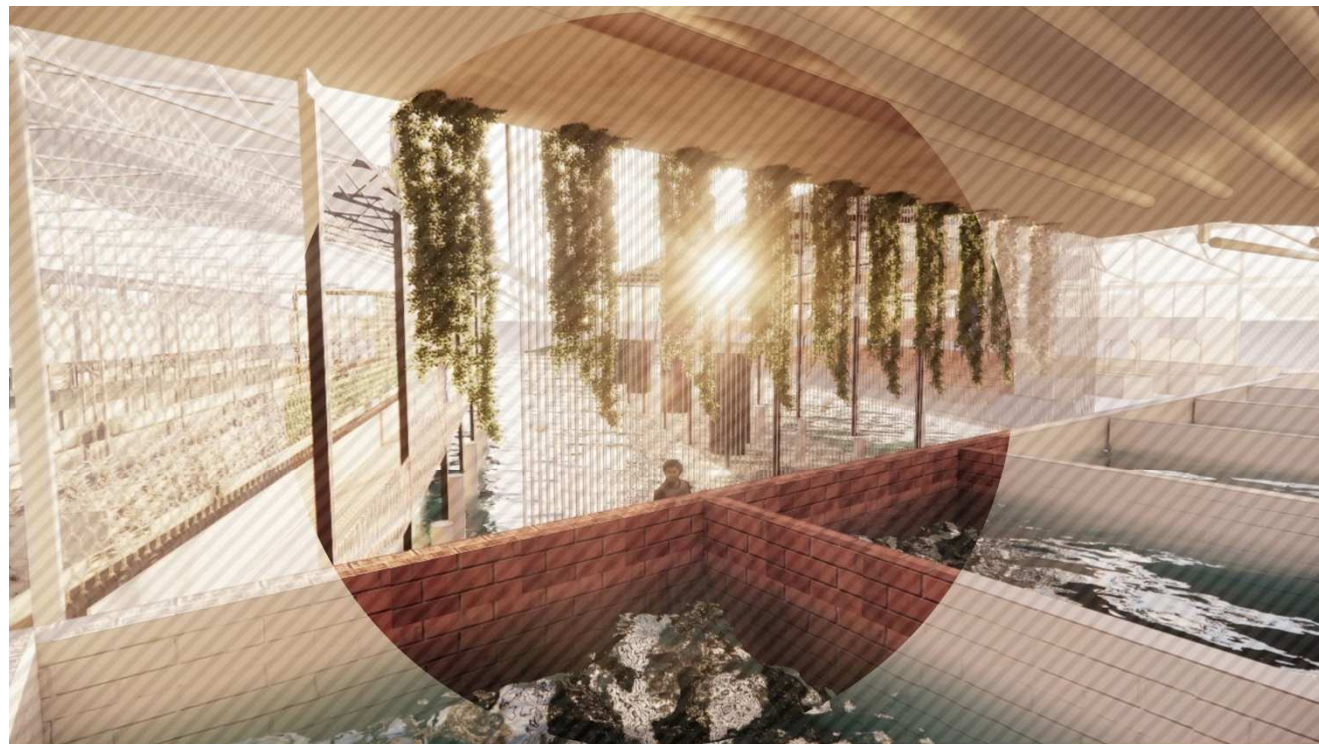
View F  
PUBLIC BATHROOMS ENTRANCE  
*Public Area*



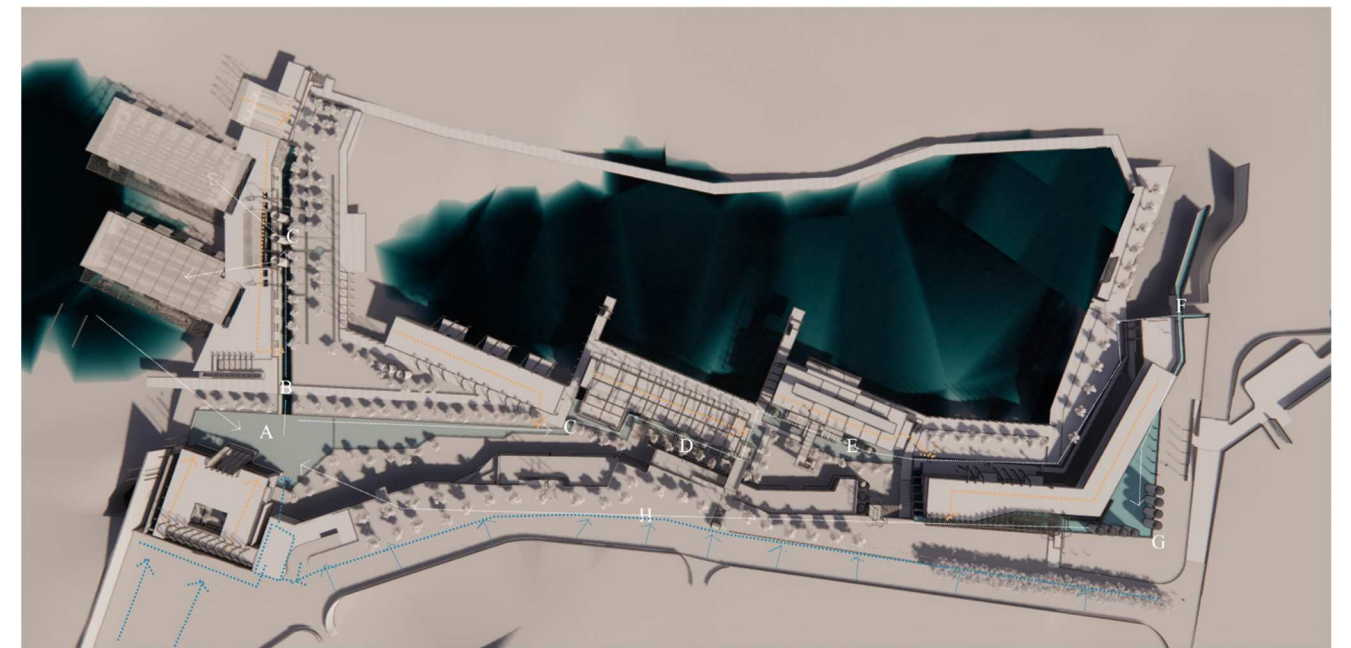
View H  
AQUAPONIC FACILITY  
*Semi-public Area with Controlled Access*



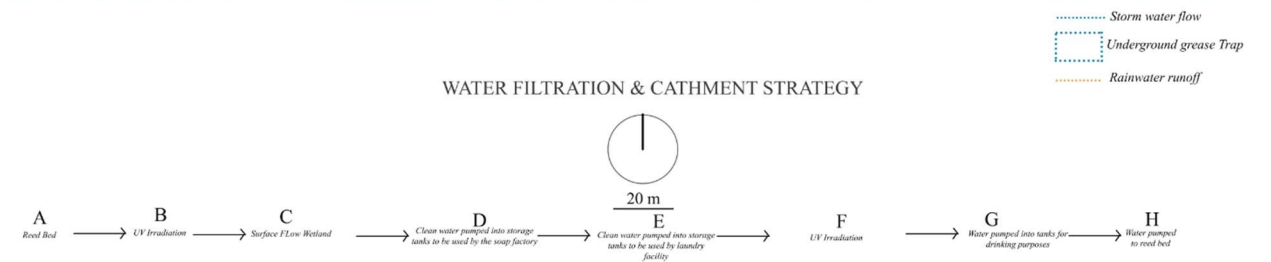
**View I**  
**PUBLIC FRUIT TREES**  
*Public Area + Bridge over the quarry*



**View J**  
**AQUAPONIC FACILITY**  
*VIEW*



**WATER FILTRATION & CATHMENT STRATEGY**



**GREY WATER & BLACK WATER MANAGEMENT SYSTEM**

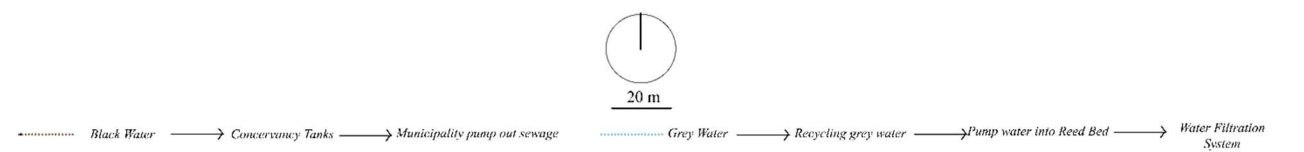


Figure 5.70: Views I-J for Exam purposes December 2021 (Author 2021).

Figure 5.71: Water management schemes for Exam purposes December 2021 (Author 2021).



Figure 5.72-5.75: Photographs of final Exam 15 December 2021 (Author 2021).