



Chapter 6

Design Development

06 Design Development

Application of design informants

The coal to gas process played an important part in the value of this part of South Africa's industrial heritage, therefore the new programme responds to this by adhering to the same directional flow as the original programme (see Fig. 6.2). The new structure is also positioned to the south of the existing retort in order to create the critical dialogue between the old structure, which was designed to be unresponsive to and dominating over the landscape surrounding it, and the new structure. The new structure in the form of a dye house and workshops is in stark contrast to the old retort house. The new dye house assumes its position as part of the landscape and starts to distort the line between industry and nature.

Instead of the new dye house adhering to the patterns of conventional industries by polluting the surrounding water sources and landscapes, the new dye house exposes the purification process of the water used

in the dye process and also exposes its dependency on nature to feed the process. This is achieved through the new building forming a type of infrastructure for the plants needed in the natural dye process to grow on. The old powerhouse is also transformed into a terrarium where plants are grown to be used in the dye process.

The linearity of the new plan responds to the opposing linear form of the existing retort house. However, the new building breaks away from its linear nature as it reaches the tea house. This is to indicate a new approach in industrial architecture, where the structure directs itself parallel to the contours and becomes completely enveloped in the landscape.

The design is developed in such a way that the users experience a form of progression as they move from the entrance, which is more technological and rectilinear in form, to the outside

Figure 6.1. Left: CWG Plant (Author 2017)

Historic flow of process

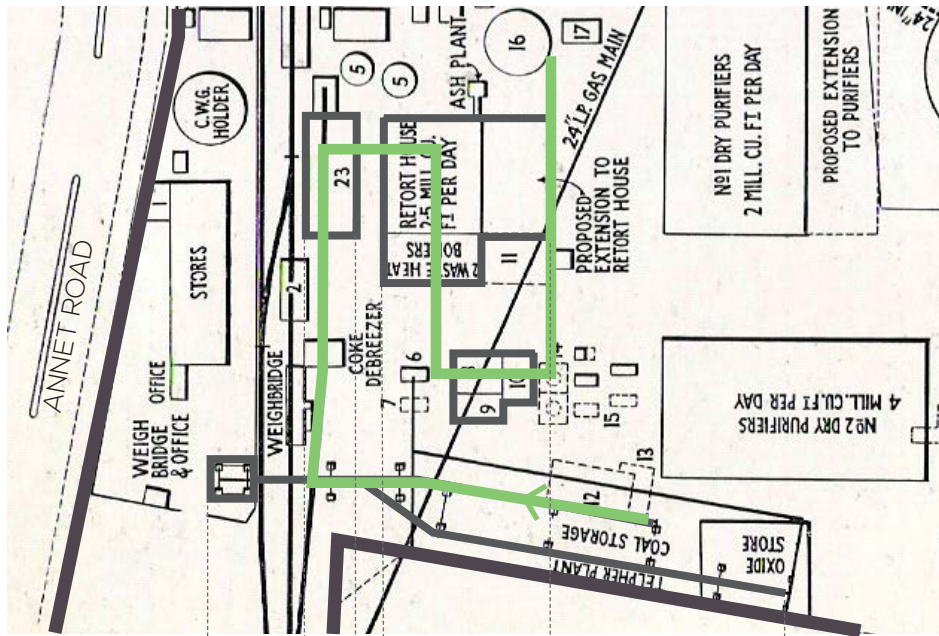
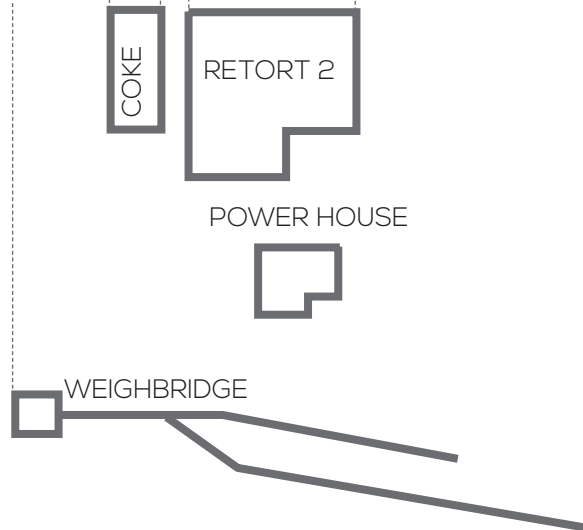


Figure 6.2: Historic flow of process (City of Johannesburg Gas Department 1954, edited by Author)



Dialectical relationship between old & new

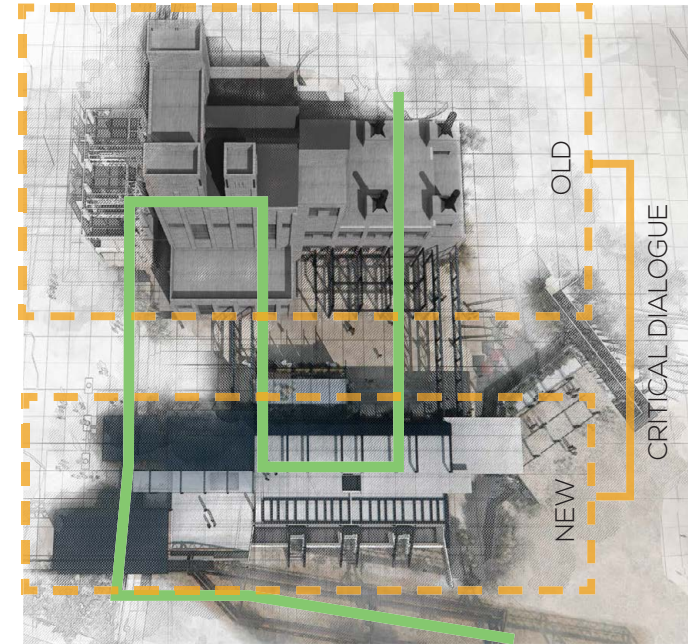
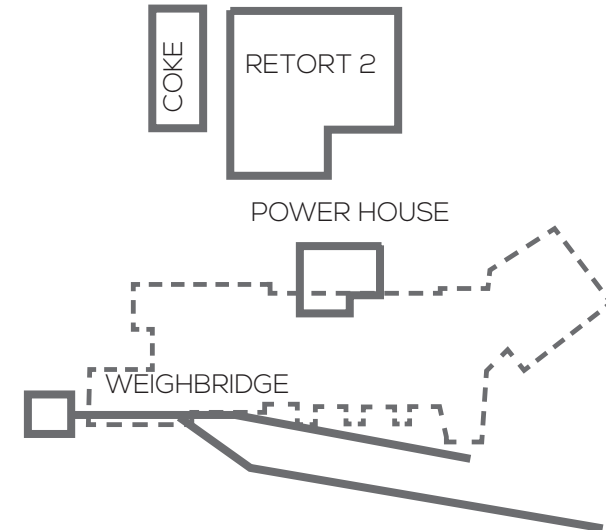


Figure 6.3: New intervention responding to heritage flow of process (Author 2017)



How memory and heritage is approached in the design

market space between the retort house and the new dye house, which becomes more phenomenological as the processes of weaving and dyeing are metaphorically presented in the structures and landscape.

The goal is to design a place where the culmination of the whole process can be experienced and the new relationship between industry and nature can be observed and appreciated. This also creates a stronger connection between the process and the final product as the dye house is placed directly opposite the market space where the finished textiles are sold.

Unfortunately all machinery used in the coal to gas process was stripped from Retort 2 during the 1992 partial demolition of the Gasworks. The only remnants of the industrial process can now be found in historical photographs, a few industrial artefacts still present in the landscape and ambiguous records. In an attempt to retain and expose the memory of the industrial heritage, the new process of intervention will adhere to the same directional flow as the original process. The entrance where coal was brought to the site by rail, will remain the main entrance serving the new intervention. Visitors to the market will enter the retort house on the same edge where coal entered the retort. The new proposed walkways connecting the heritage building to the new intervention signify a material manifestation of the industrial memory.

How philological restoration is approached in design

Apart from the adopted heritage approach, the reasoning behind minimal alteration to the existing retort house is to preserve the epoch of the building in order to create a dialectical relationship between the existing retort house, representing past industrial approaches, and the new juxtapositioned building representing a different approach to industrial architecture which allows for interaction between nature and industry to occur in a mutually beneficial manner.

Simitch and Warke (2014:130) suggest in their book *The Language of Architecture* that systems of movement have the ability to mediate between past and present conditions. Modes of movement often guide humans into the liminal space that exists between these two opposing conditions “*establishing a critical dialogue that allows one to be understood from the lens of the other*” (Simitch and Warke 2014:130).

Design precedent

Artspark Performing Arts Pavilion by Morphosis

Morphosis [sa] describes the conceptual design of the 1989 Artspark Performing Arts Pavilion as an architectural expression, blurring the boundaries between architecture and the landscape.

The focus of the project was to insert man-made objects within a suburban park. The motivation behind the submerged nature of the building (see Fig. 6.5) was to achieve compatibility with the context.

Morphosis exposed articulated structural (see Fig. 6.7-6.8) elements to entice passersby to explore the building further. Inspiration was drawn from the subliminal nature of the arts by focusing on the rituals that take place in the spaces and that which occurs at a deeper level. Elements assumed the role of “*kinetic sculptural pieces emerging from the earth to begin to reveal what lies below*” (Morphosis [sa]).

The landscape was seen as an overlay to exert the character of the architecture rather than the form throughout the remaining part of the site. This created the opportunity to design small objects which obscures the boundaries between architecture and the landscape.

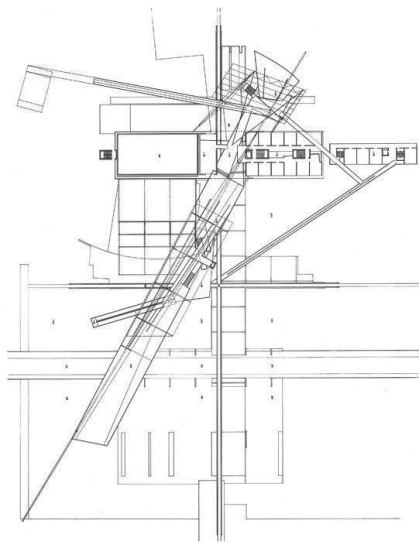


Figure 6.4: Artspark Plan
(Morphosis 1989, edited by Author)



Figure 6.5: Artspark section illustrating submerged nature of building (Morphosis 1989)

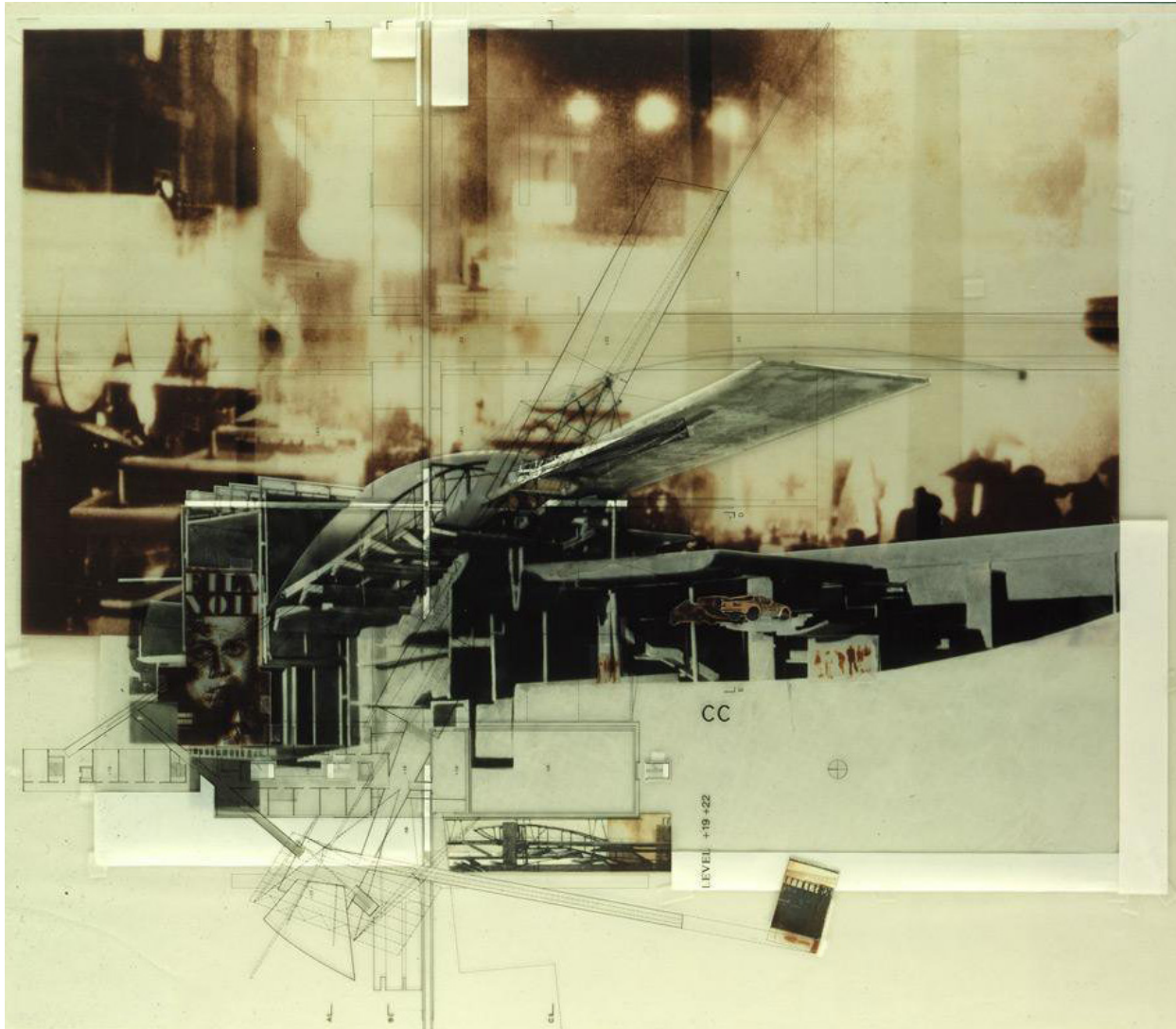


Figure 6.6: Artspark conceptual representation (Morphosis 1989)

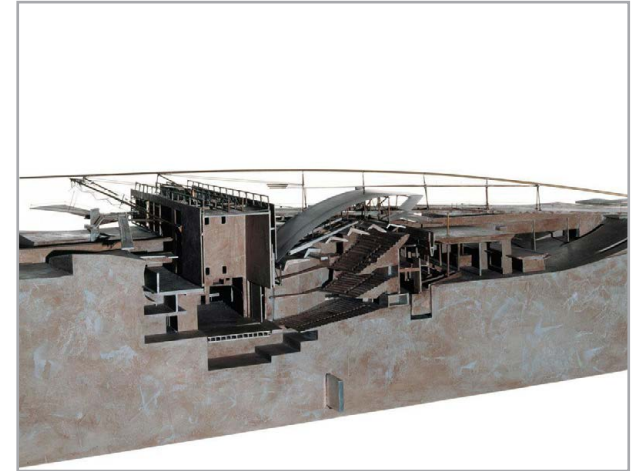


Figure 6.7: Artspark section illustrating sculptural elements protruding from landscape (Morphosis 1989)

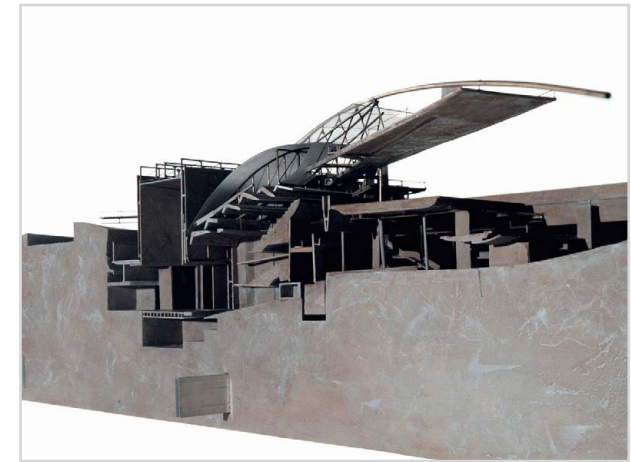


Figure 6.8: Artspark Sculptural elements (Morphosis 1989)

Design Iterations

Maquette - Iteration 1

Iteration 1 explored the development of a new tectonic architectural language to oppose the stereotomic nature of the existing retort.

Critique: The New addition's response was too tectonic in nature, very linear and did not create a strong enough relationship with the surrounding landscape in order to strengthen the concept of mediation between the landscape and industry.

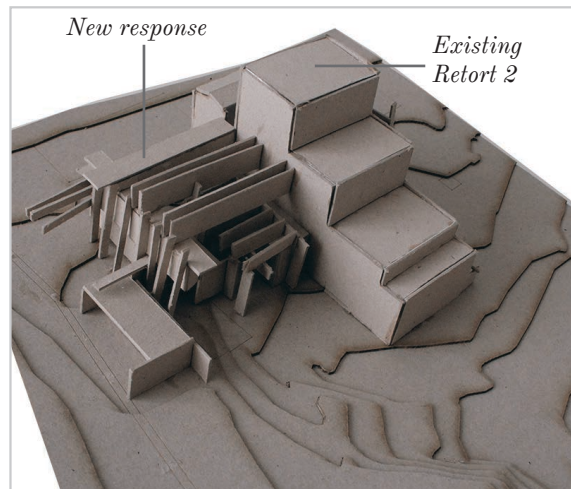


Figure 6.9: Iteration 1 Maquette view A
(Author, April 2017)

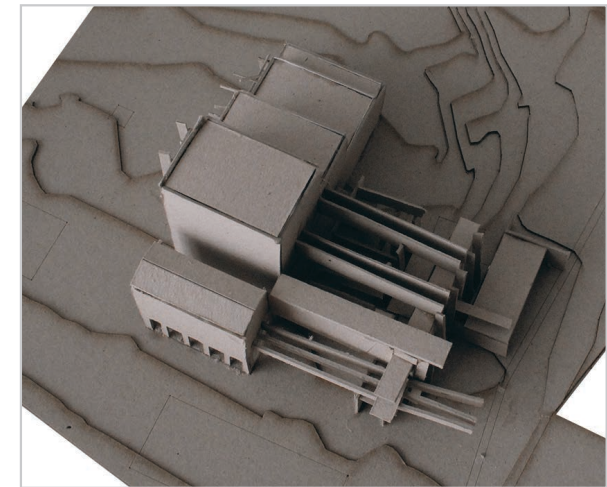


Figure 6.10: Iteration 1 Maquette view B
(Author, April 2017)

Maquette - Iteration 2

Iteration 2 explored the notion of directing the new building away from the existing one by following the direction of the existing contours to signify the establishment of a new industrial typology that is completely different from the historic industry.

Critique: This iteration lacked the necessary response to the existing structure as well as a relationship with the landscape. The new structure was too ornate, creating a confused architectural language.

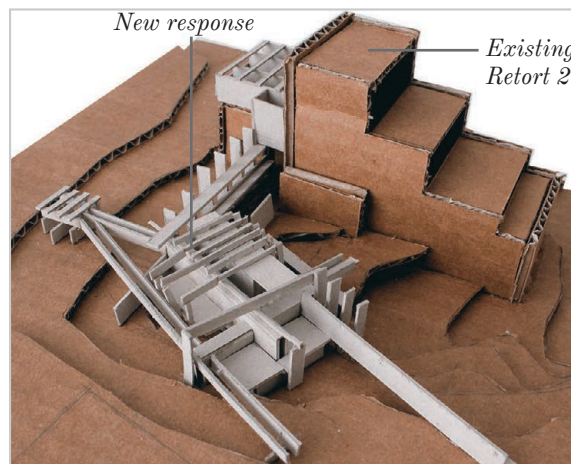


Figure 6.11: Iteration 2 Maquette view A
(Author, May 2017)

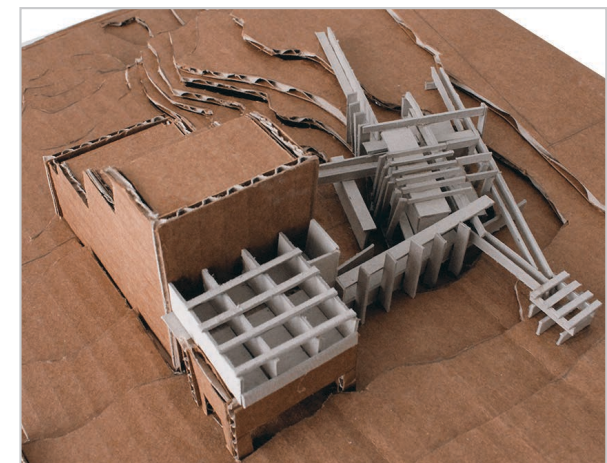


Figure 6.12: Iteration 2 Maquette view B (Author, May 2017)

Maquette - Iteration 3

Iteration 3 focused on strengthening the connection to the existing retort through the insertion of a very strong, linear connection in the form of a walkway. The structure was simplified and lifted from the ground, in order to create a sensitive architectural approach.

Critique: The architectural language of the new structure was too stereotomic in nature, not providing enough opportunities for the mediation of industry and nature as the structure spoke a very similar language as the existing retort. Elevating the structure from the ground also created a detached relationship between the building and the landscape, making interaction between the two difficult.

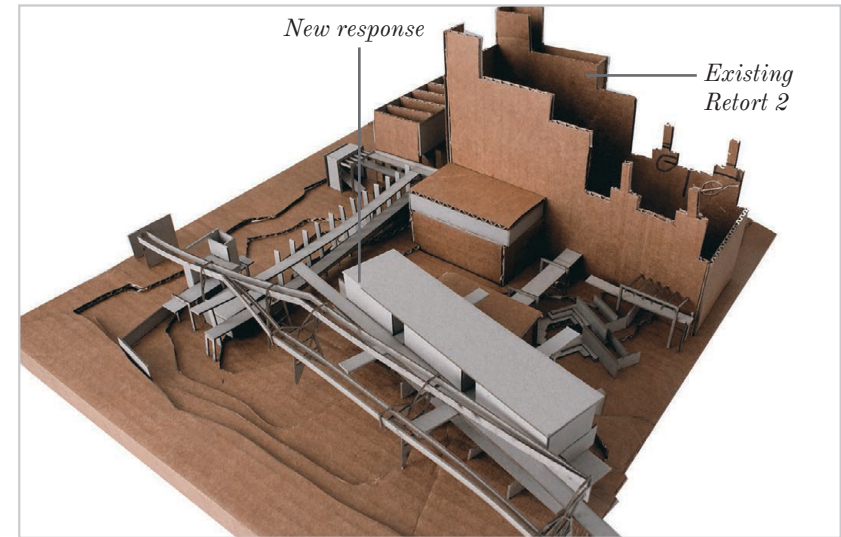


Figure 6.13: Iteration 3 Maquette view A (Author, May 2017)

Maquette - Iteration 4

Iteration 4 focused on creating a stronger connection between building and landscape, by embedding the structure within the landscape and making use of strong structural elements to anchor the roof of the new building to the landscape. This provided many more opportunities for mediation between the building and nature, as well as between industry and nature to occur.

Critique: Although iteration 4 created a much stronger relationship between the new building and the landscape, it did not form any relationship with the existing heritage fabric.

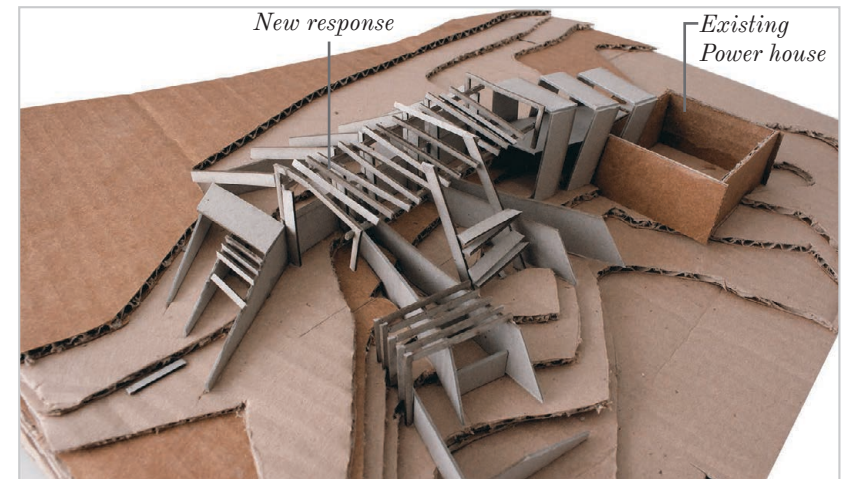


Figure 6.14: Iteration 4 Maquette view A (Author, June 2017)

Iteration 5

Iteration 5 explored the spatial implications of the programme on plan as well as the conceptual approach on section. The rentable studio spaces were placed along the eastern edge of the site, with the dye house and dye laboratory assuming the central position on the ground floor plan. The first floor plan consisted of the workshops and an office.

Section A-A expresses the connection between the studios and the landscape, almost embedding the studios in the landscape and allowing for the building to break away from the landscape as it moves towards the existing retort. Section B-B illustrates the connection between the proposed new building and the existing retort. The two buildings are connected by walkways that form part of the memory of the old process, while providing process routes for the new programme.

Critique: The studios were too detached from the rest of the design and the tea house was too small. Spaces were purely functional and lacked experiential quality. The outdoor market space remained unresolved as well as the interior space of the retort.

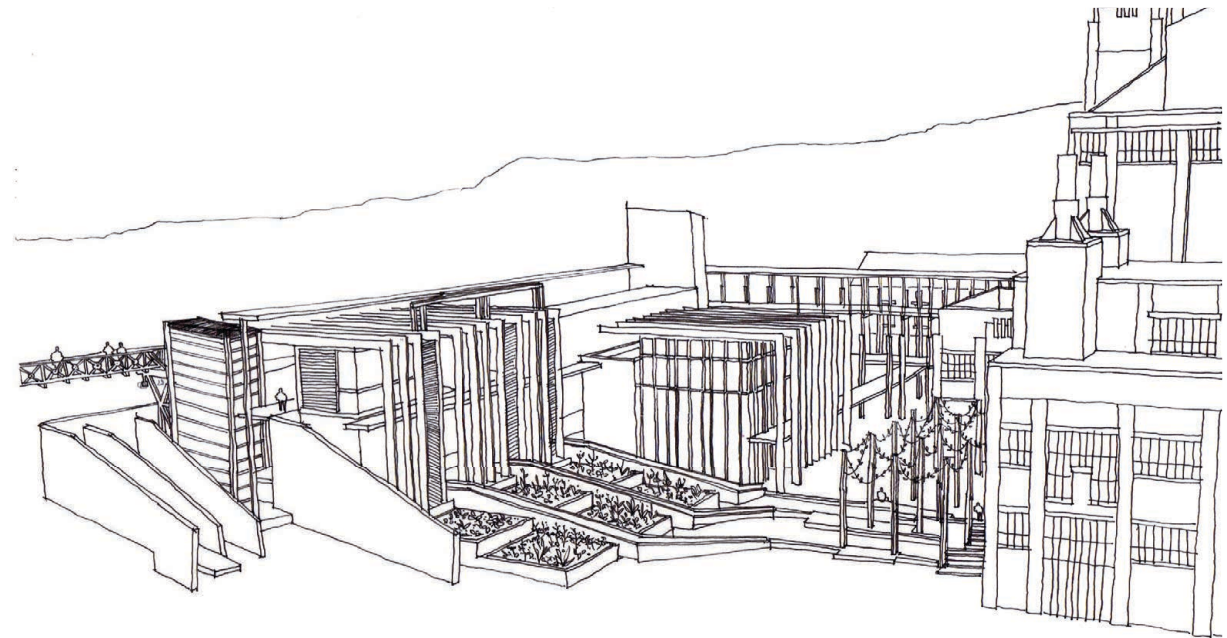


Figure 6.15: Perspective 1 (Author, July 2017)

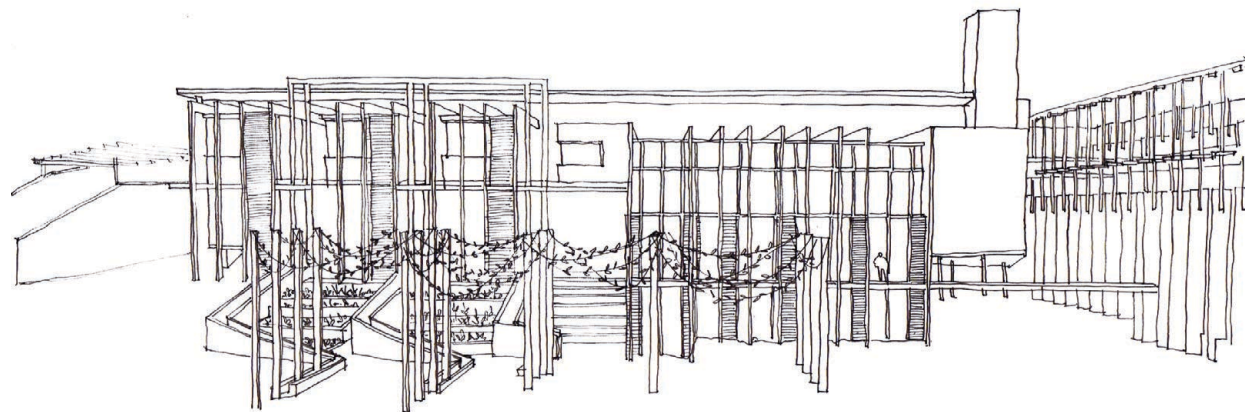


Figure 6.16: Perspective 2 (Author, July 2017)

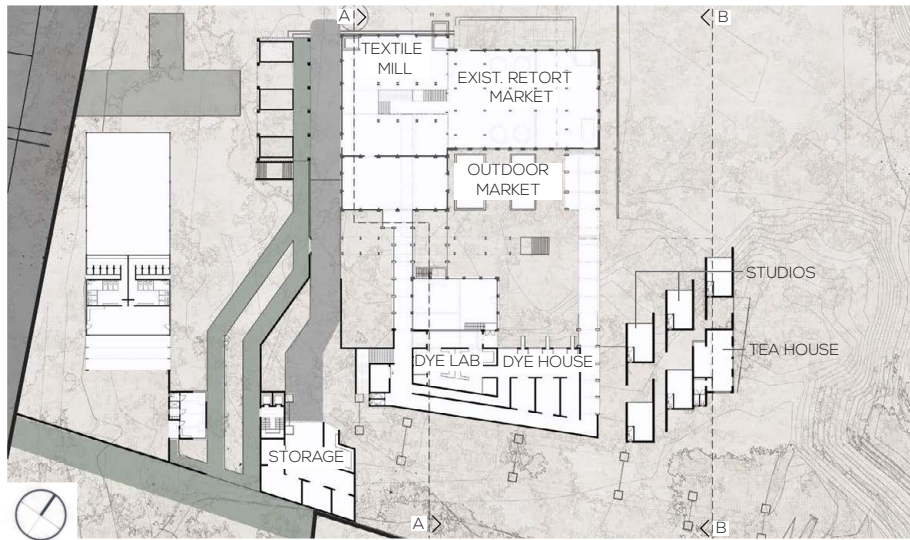


Figure 6.17: Iteration 5 Ground Floor Plan - June crit (Author 2017)

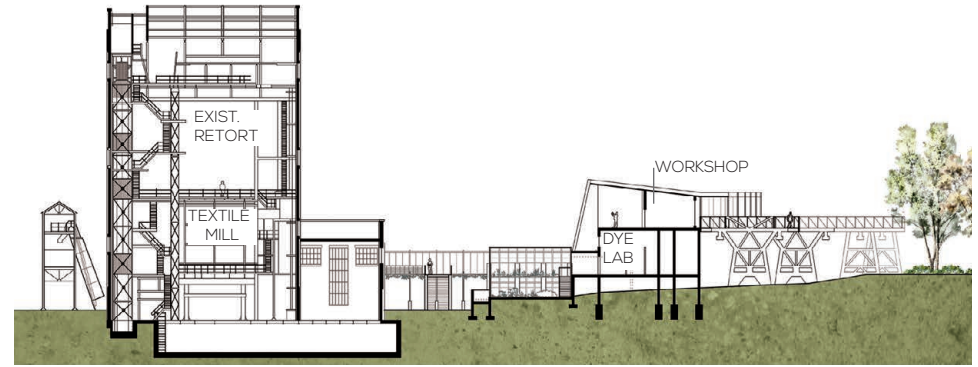


Figure 6.19: Iteration 5 Section A-A - June crit (Author 2017)

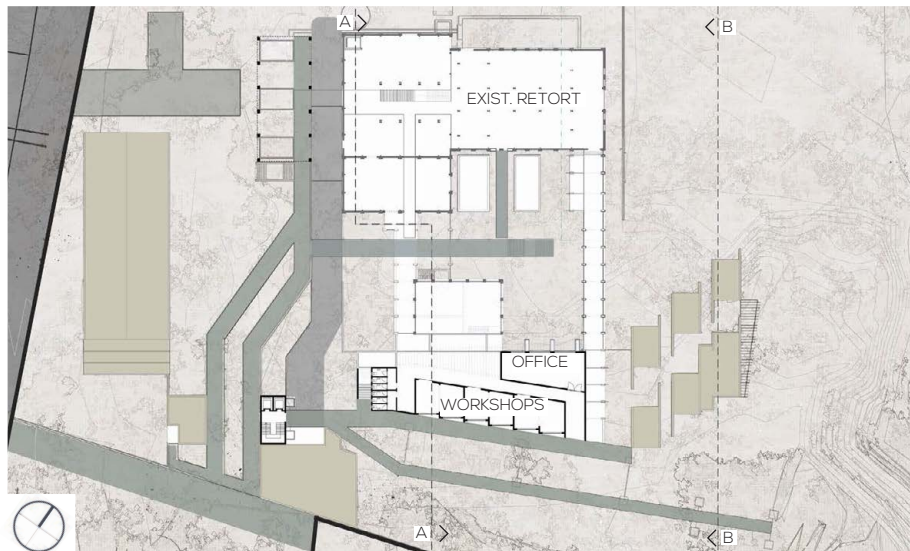


Figure 6.18: Iteration 5 First Floor Plan - June crit (Author 2017)

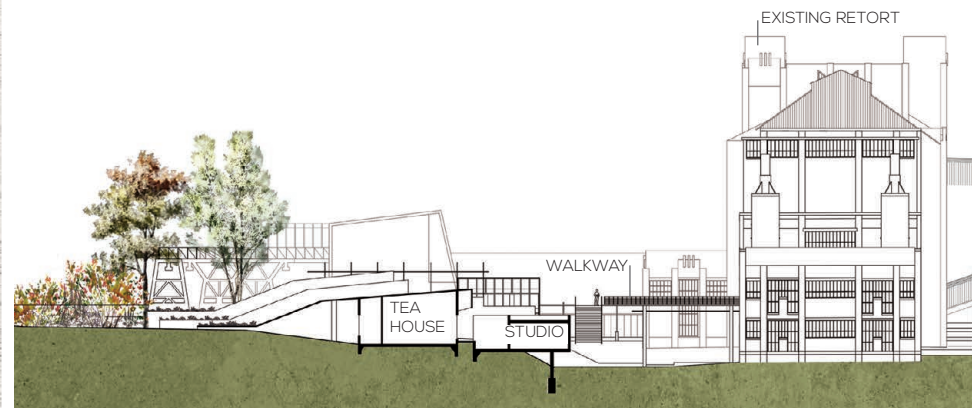


Figure 6.20: Iteration 5 Section B-B - June crit (Author 2017)

Iteration 6

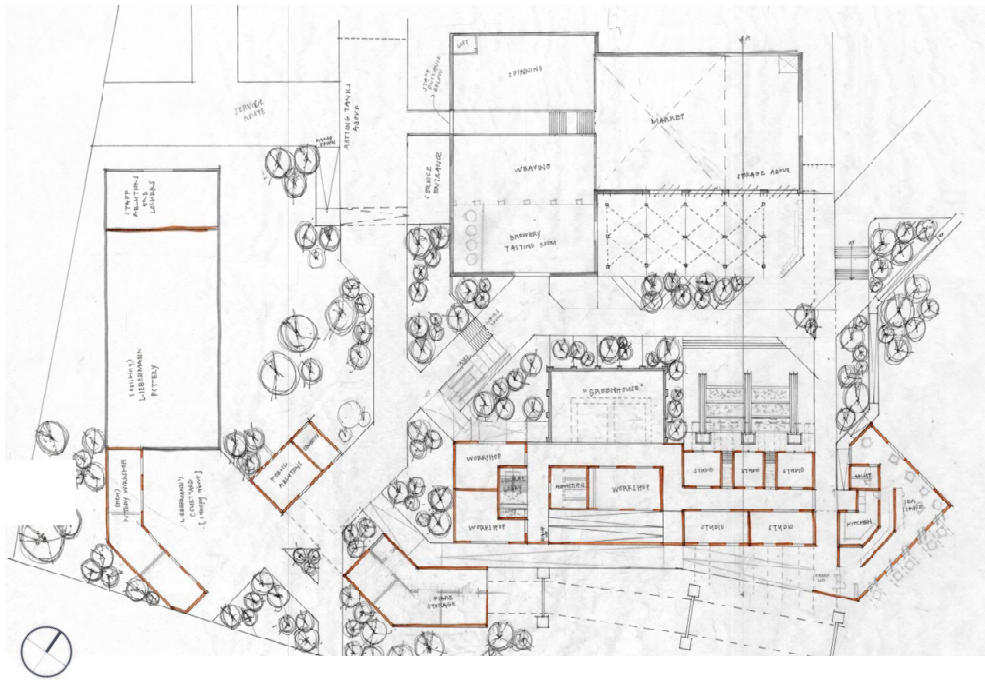


Figure 6.21: Iteration 6 Ground Floor Plan - August (Author 2017)

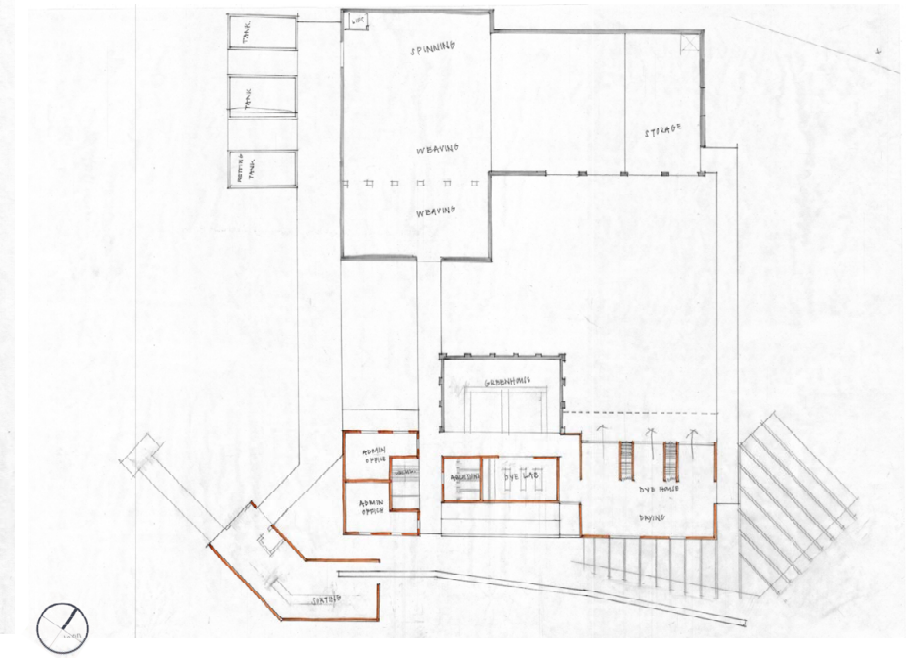


Figure 6.22: Iteration 6 First Floor Plan - August (Author 2017)

Iteration 6 attempted to create a more coherent design by moving the studios to the southern and northern edge on the ground floor of the new building and transforming the eastern edge of the building into the tea house. In order to create a stronger connection between landscape and building and to allow for interactions between industry and nature

to occur, the tea house was sunk into the landscape. The dye house was placed on the first floor with drying to the south, workshops to the west and a ramp on the southern edge.

Critique: The position of the ramp on the southern edge of the building resulted in the studios and workshops not utilising

the much needed southern light for ideal working conditions. The service connection of the tea house was placed on the northern edge of the building, exposing it to the public courtyard. The tea house design was still very disjointed from the rest of the design.

Iteration 7

Iteration 7 attempted to create more coherent connections between the interior spaces and their functions as well as a better connection between the dye house and the tea house. Moving the dyeing and drying section of the design to the northern façade, allowed for better interaction between industry and the public, as the dye house faces the outdoor market. On section, iteration 7 started to explore environmental systems in the form of ventilation.

Critique: Although better spatial connections were established, the position of the tea house was still slightly disjointed from the rest of the building. On section the ventilation system was unnecessarily complicated and did not contribute to the overall spatial quality of the spaces it was serving.

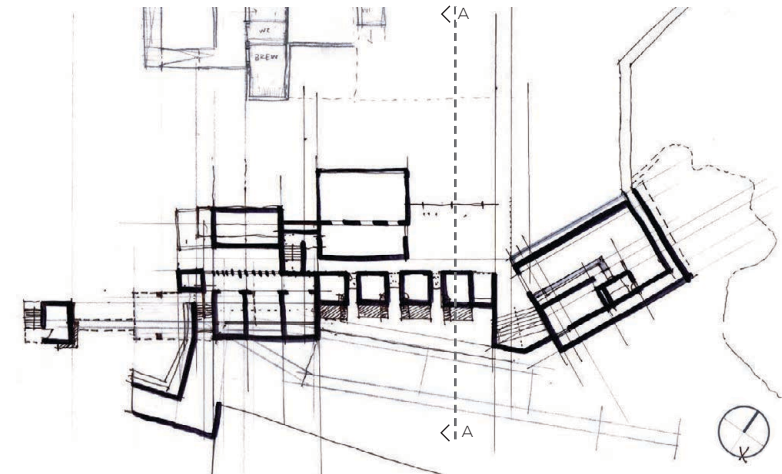


Figure 6.23: Iteration 7 ground floor plan (Author 2017)

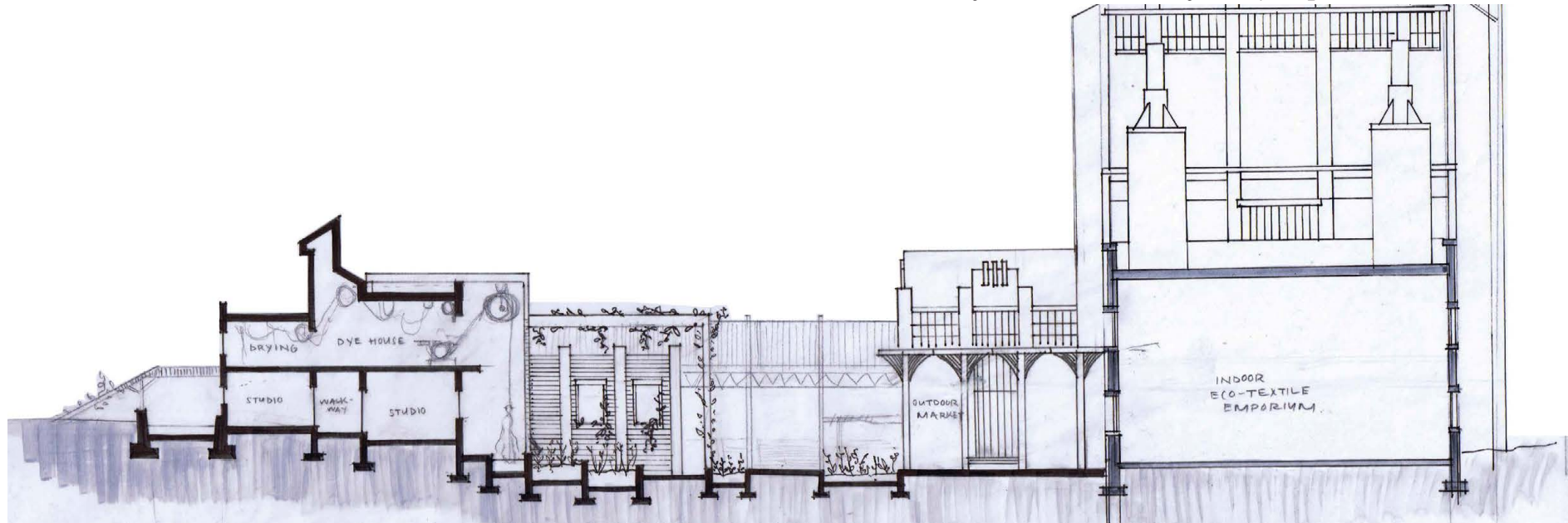


Figure 6.24: Iteration 7 Section A-A (Author 2017)

Iteration 8

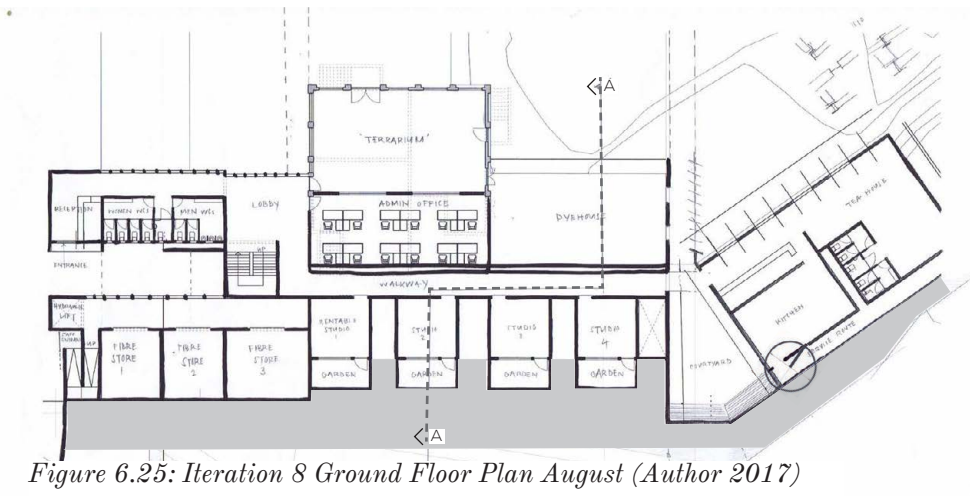


Figure 6.25: Iteration 8 Ground Floor Plan August (Author 2017)

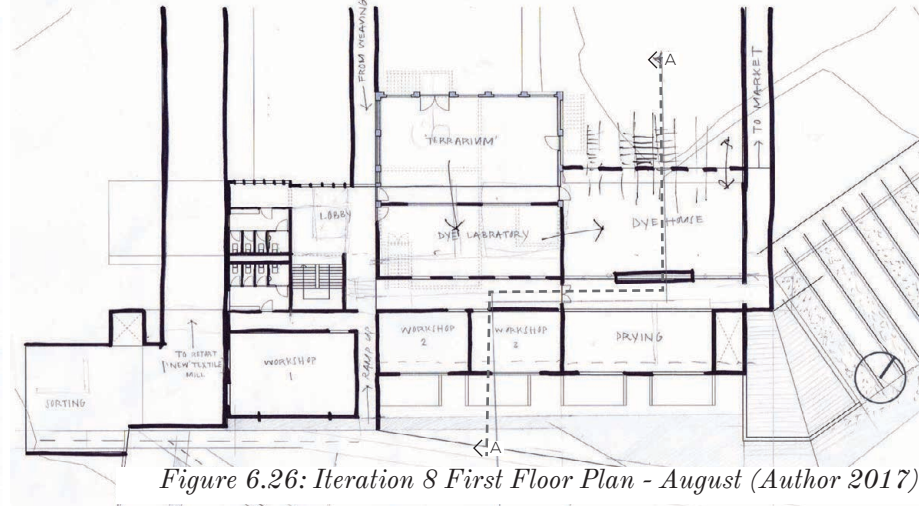


Figure 6.26: Iteration 8 First Floor Plan - August (Author 2017)

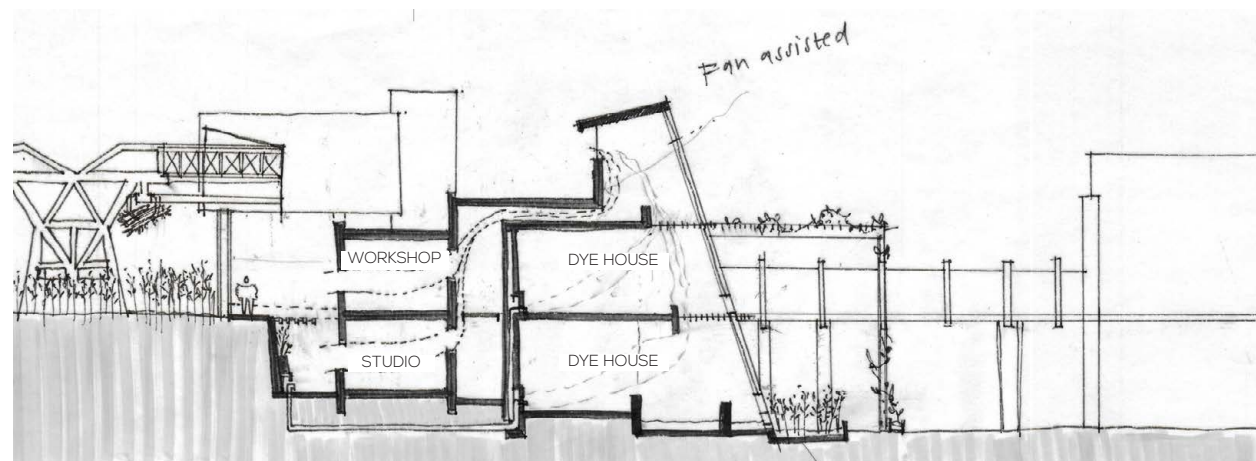


Figure 6.27: Iteration 8 Section A-A - August (Author 2017)

Iteration 8 & 9 started to address the proposed systems in a more simplistic manner by utilizing the northern solar heat gain to aid in the stack ventilation of the new building. Attention was given to defining the studio spaces more and in providing them with a small relaxation space which is engulfed by nature due to the structure being submerged into the landscape. In iteration 8 the drying area for the textiles was moved to the northern façade in order to expose the process to the public square instead of concealing it and also to allow the heat from the north to dry the textiles quicker.

Critique: The section needed further resolution as the use of two roof slabs to channel the hot air was identified as wasteful and unnecessary.

Iteration 9

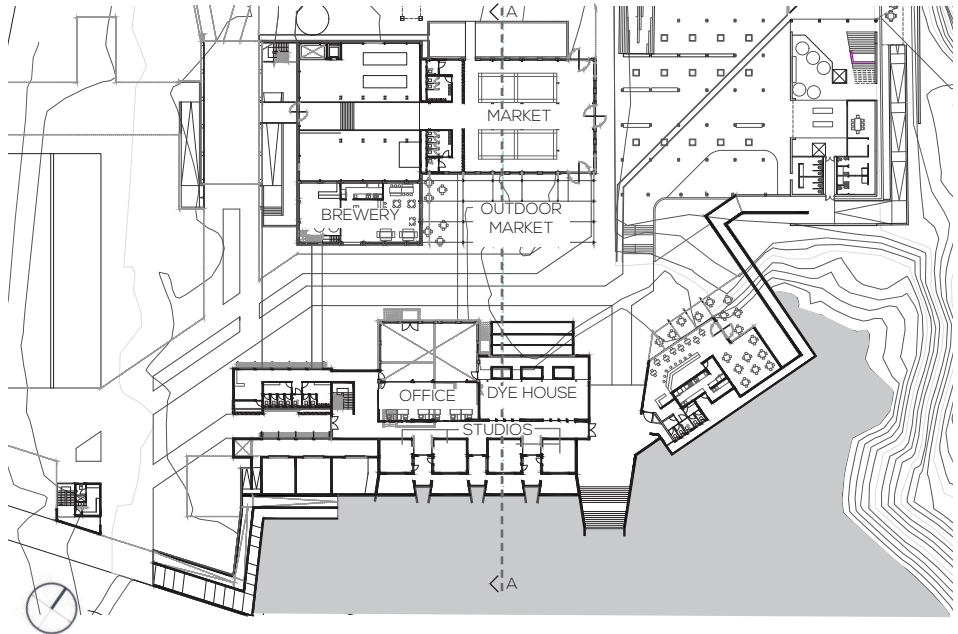


Figure 6.28: Iteration 9 Ground Floor Plan - August (Author 2017)

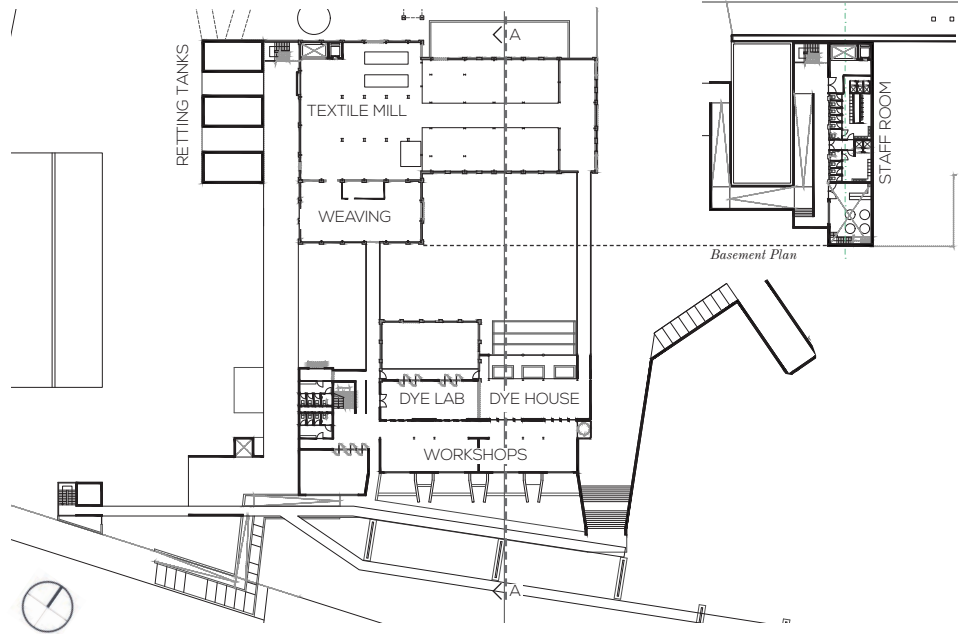


Figure 6.29: Iteration 9 First Floor Plan - August (Author 2017)

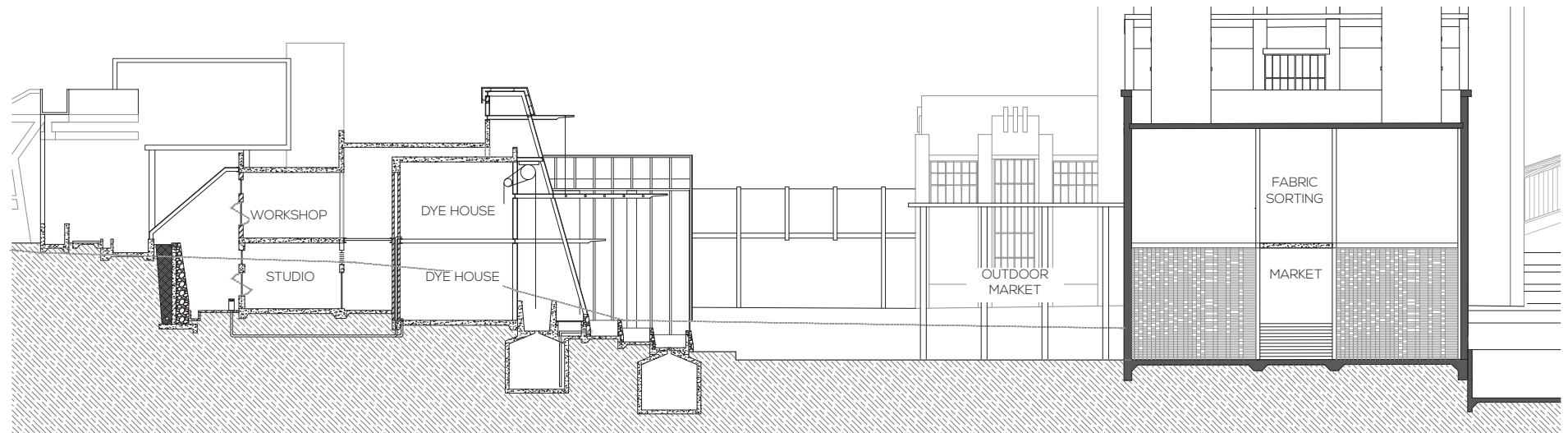


Figure 6.30: Iteration 9 Section A-A - August (Author 2017)

Iteration 10

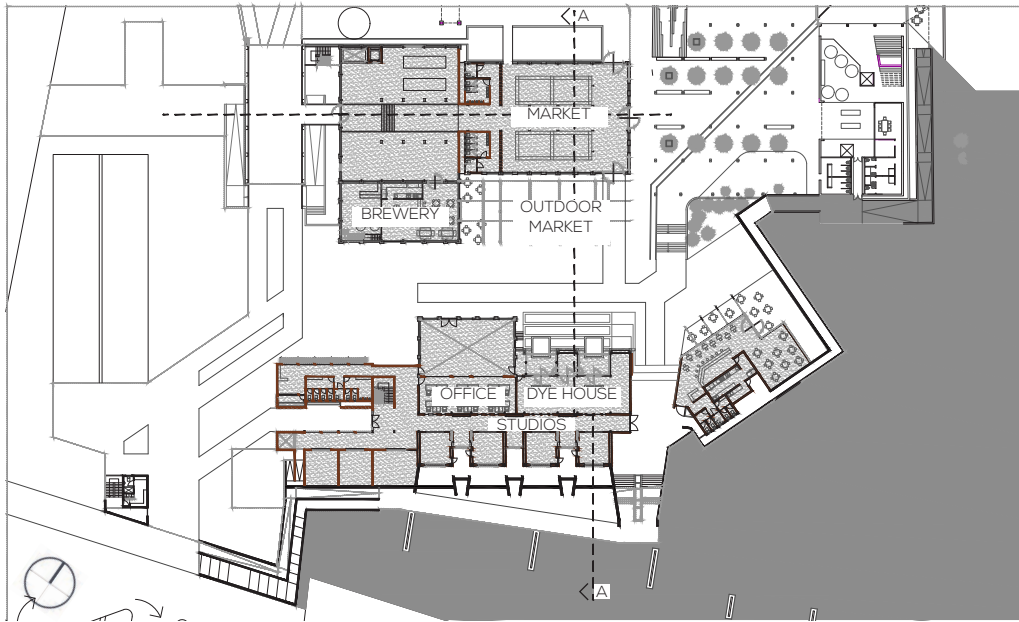


Figure 6.31: Iteration 10 Ground Floor Plan - September (Author 2017)

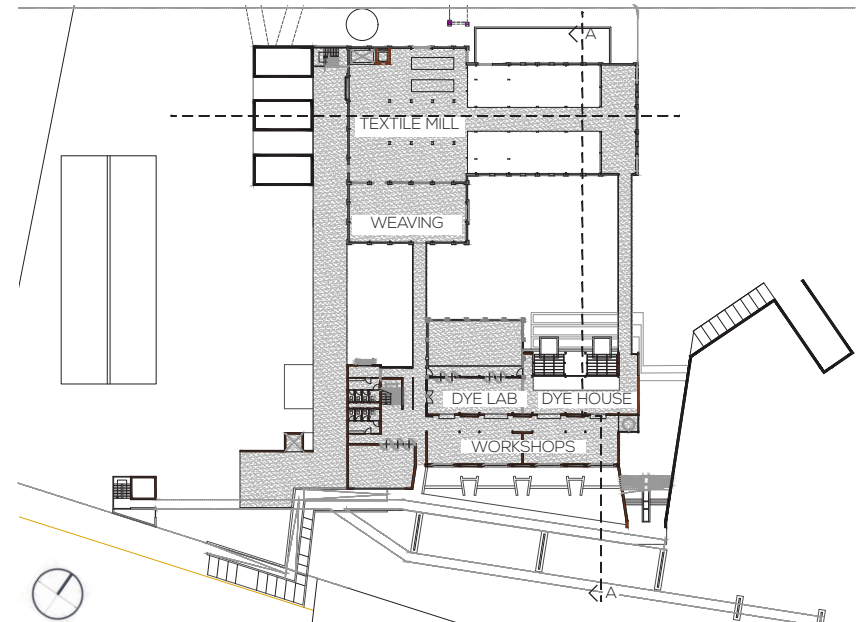


Figure 6.32: Iteration 10 First Floor Plan - September (Author 2017)

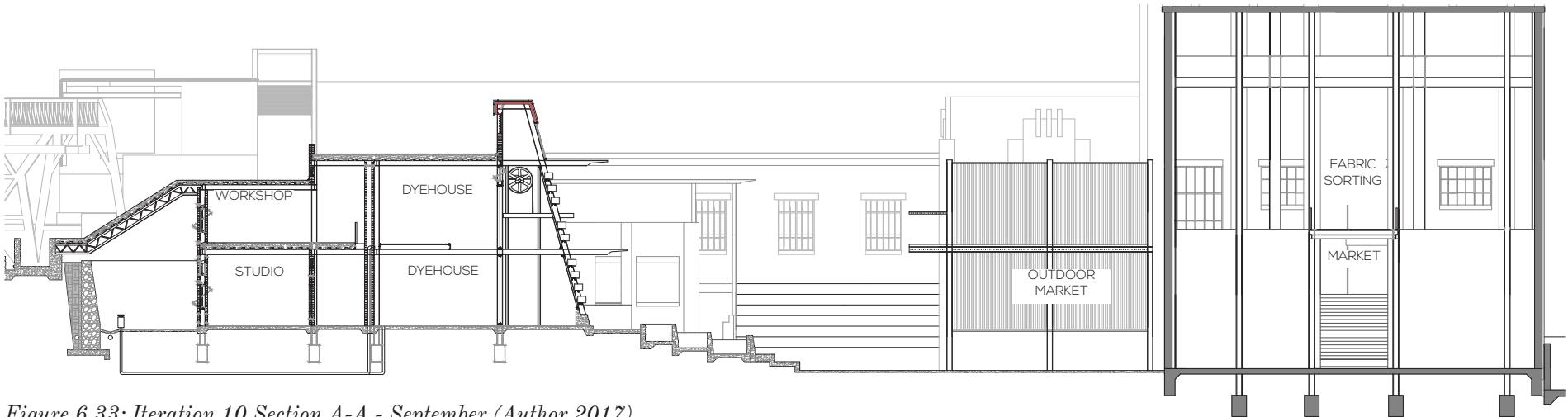


Figure 6.33: Iteration 10 Section A-A - September (Author 2017)

Final design maquette

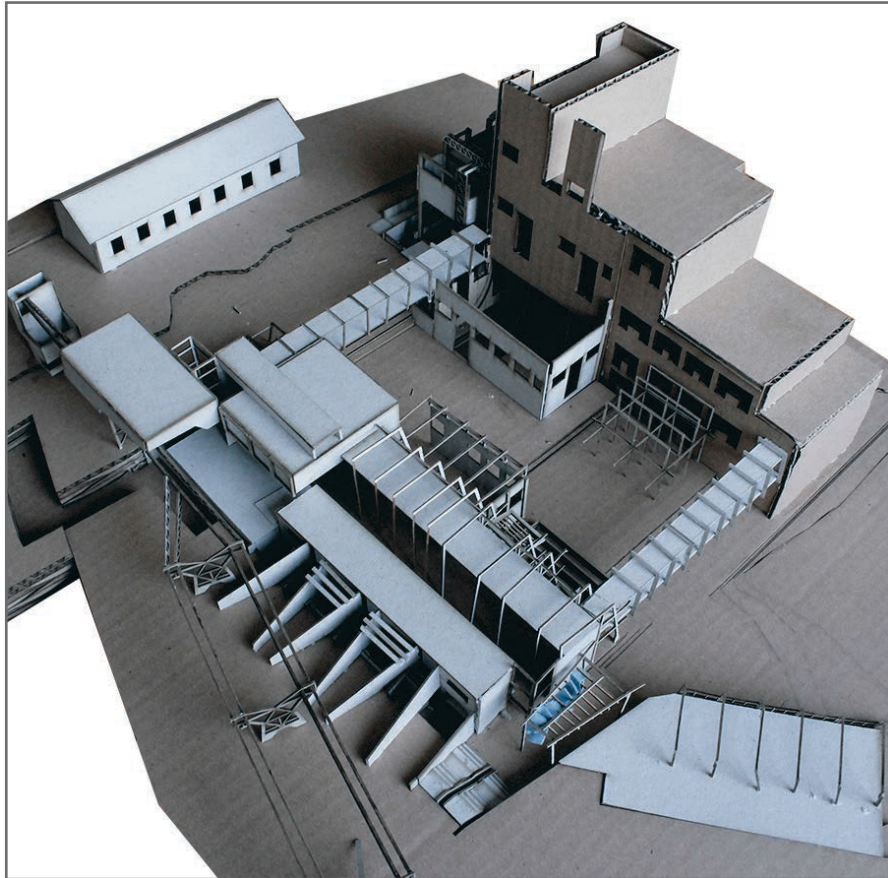


Figure 6.34: Final design maquette view 1 - September (Author 2017)

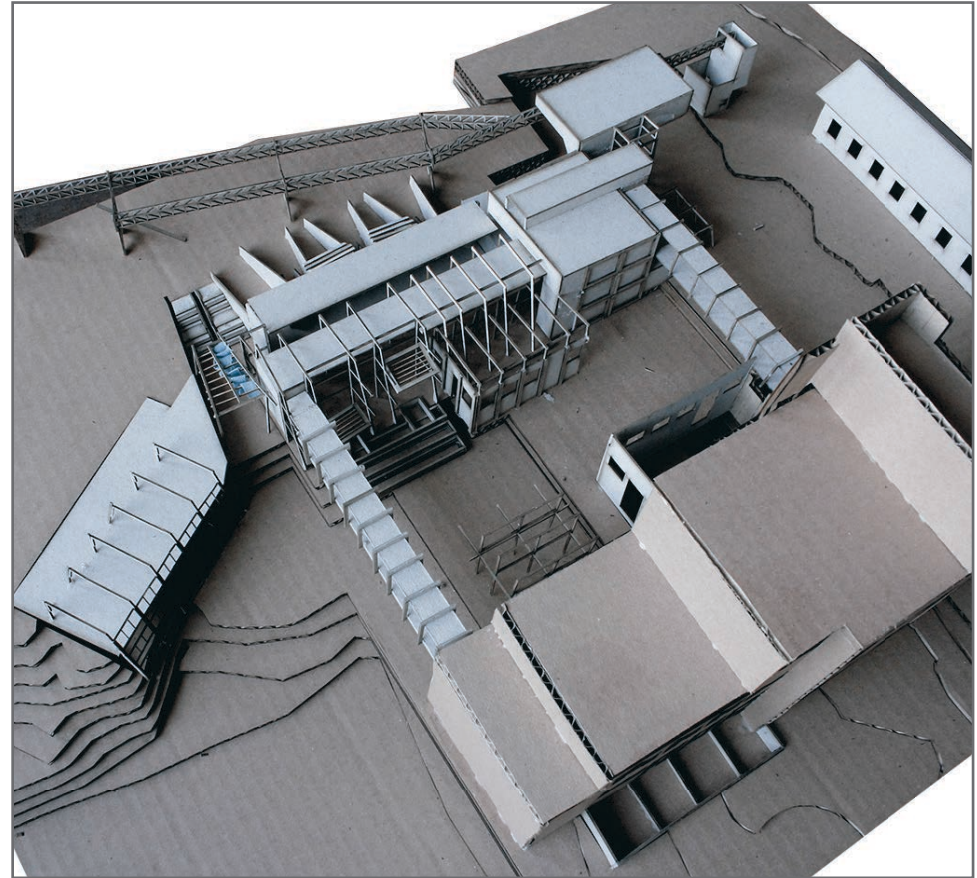


Figure 6.35: Final design maquette view 2 - September (Author 2017)

Understanding the design

Existing & New

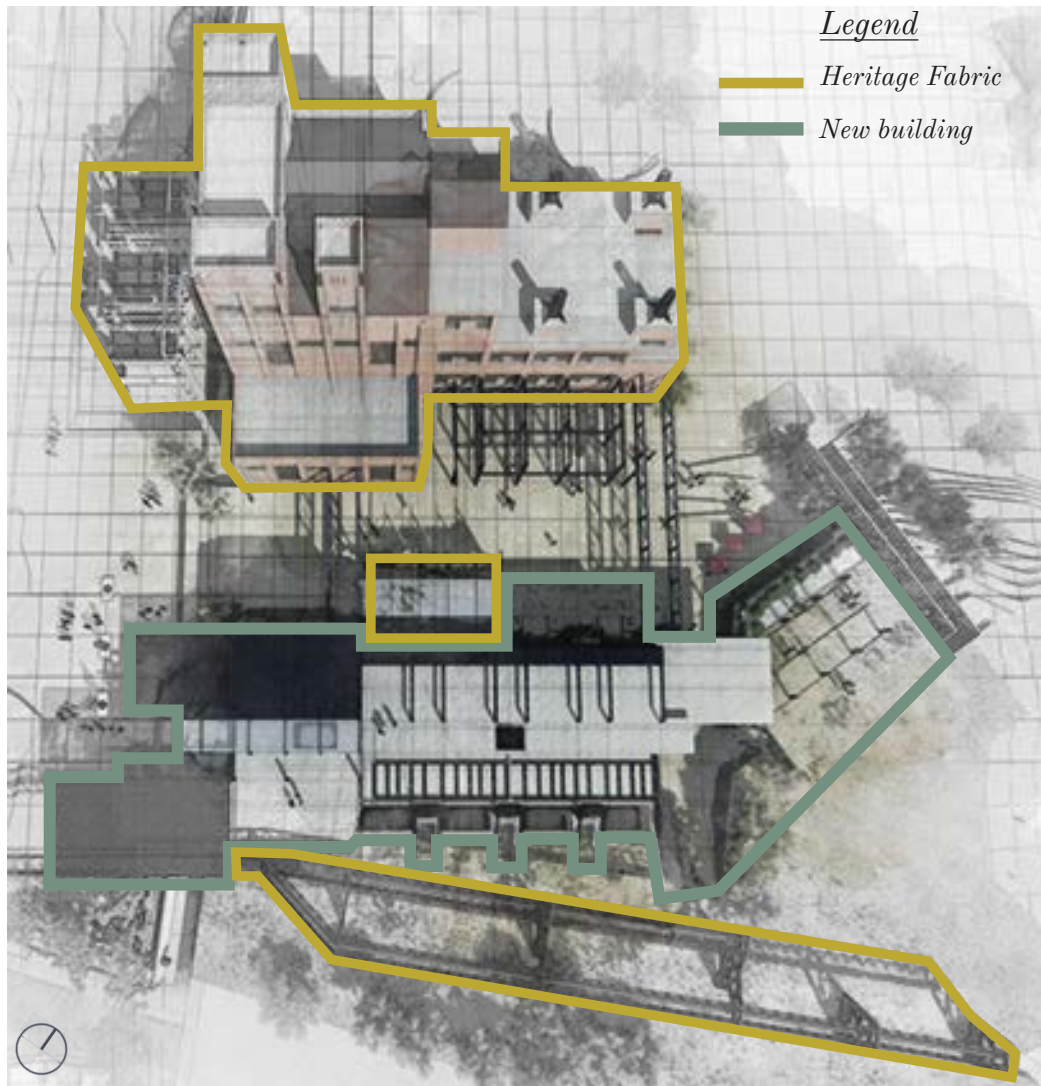


Figure 6.36: Site plan illustrating old vs. new - September (Author 2017)

Circulation / Movement

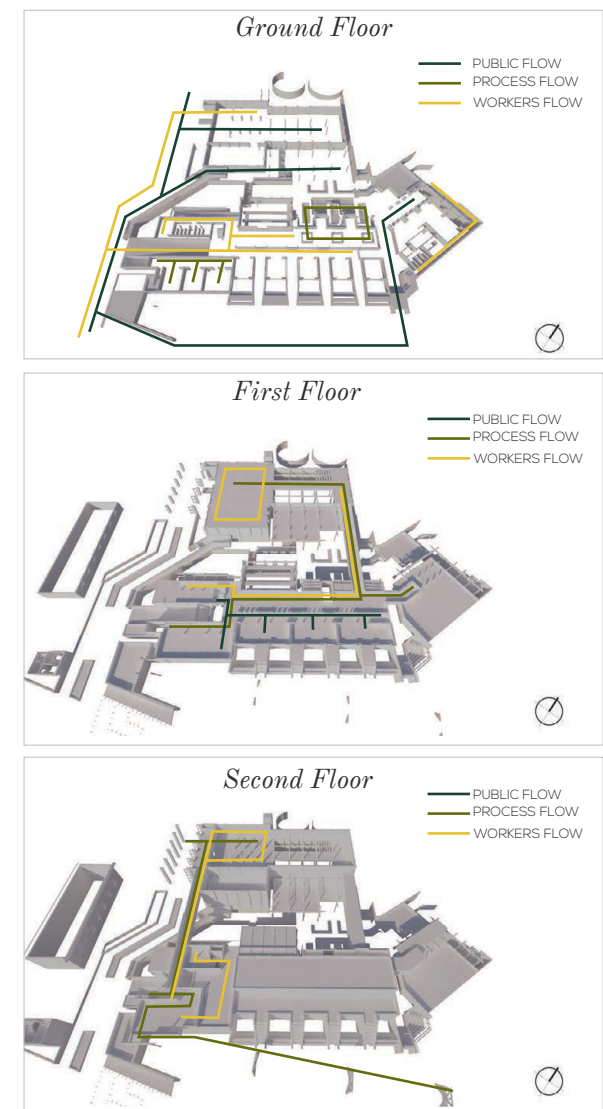
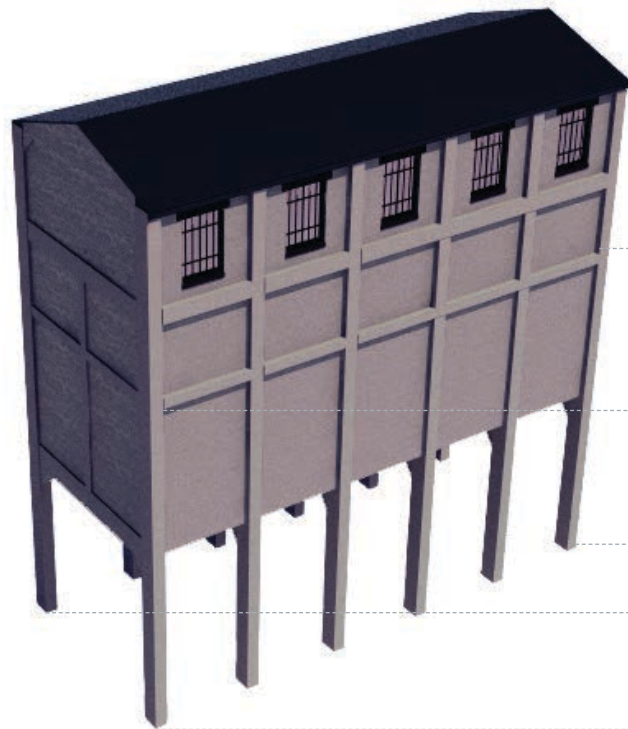


Figure 6.37: Flow of movement (Author 2017)

Changes to heritage fabric

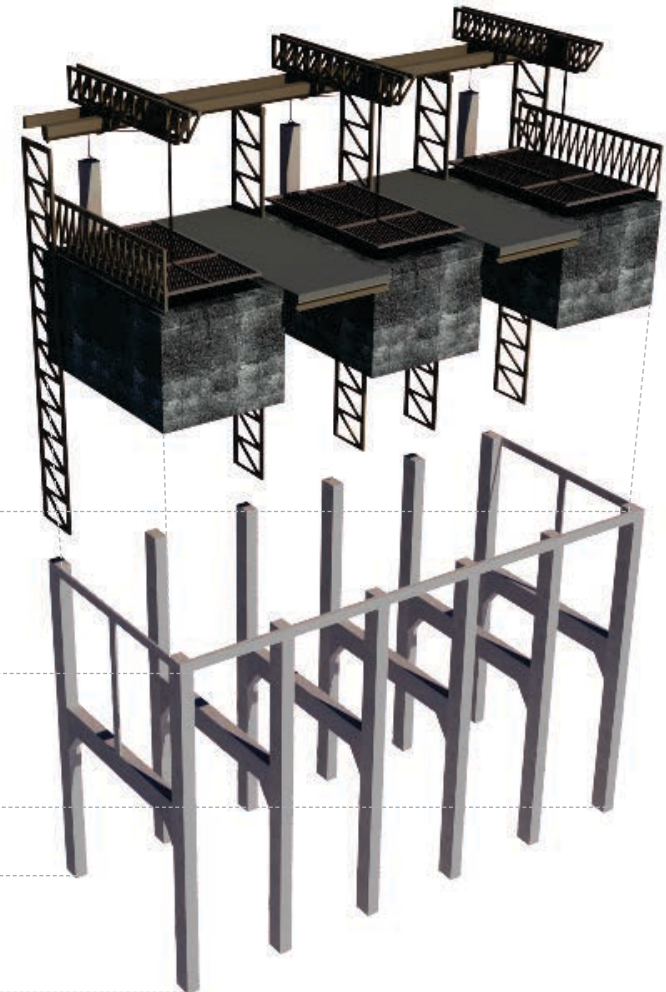
Coke storage bunker



Before

Previous use: Coke storage

Figure 6.38: Coke storage before intervention (Author 2017)



After

New proposed use: Retting tanks for textile mill

Figure 6.39: Coke storage after intervention (Author 2017)

Power house



Figure 6.40: Power house before intervention (Author 2017)

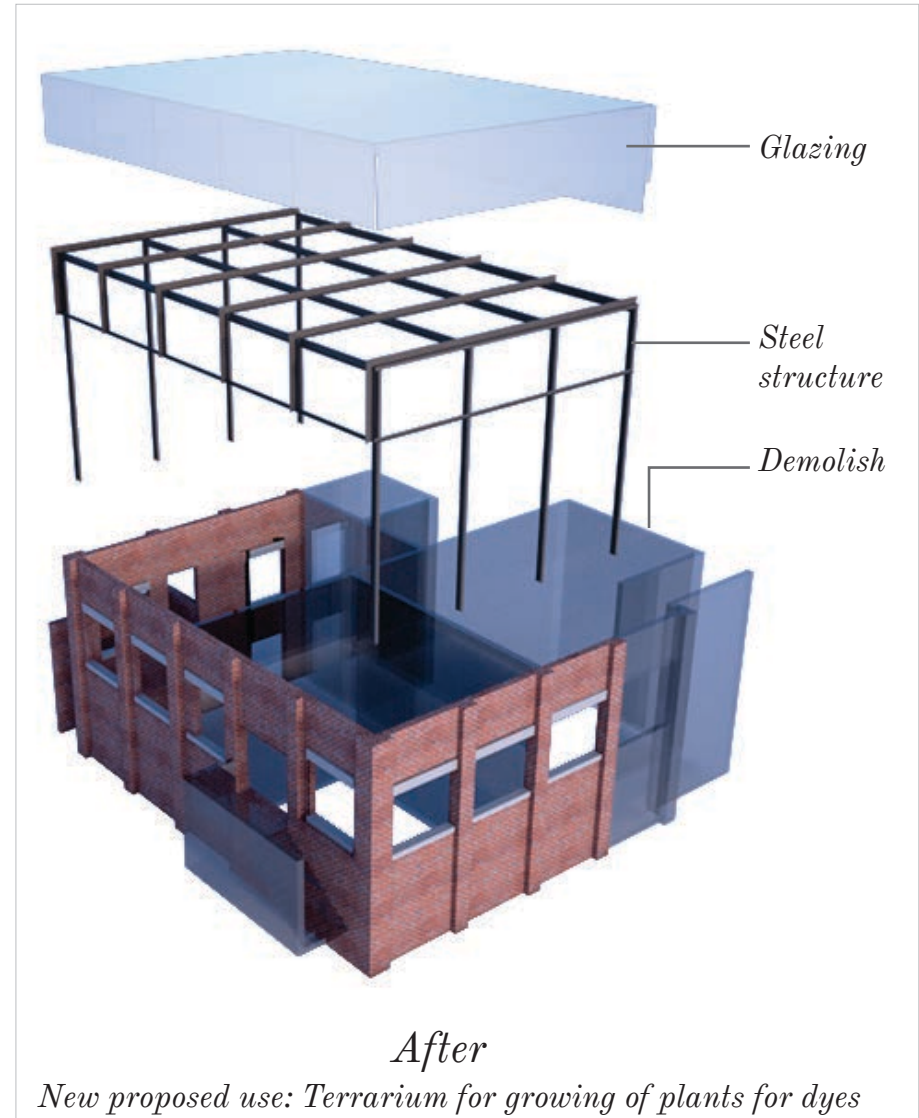


Figure 6.41: Power house after intervention (Author 2017)

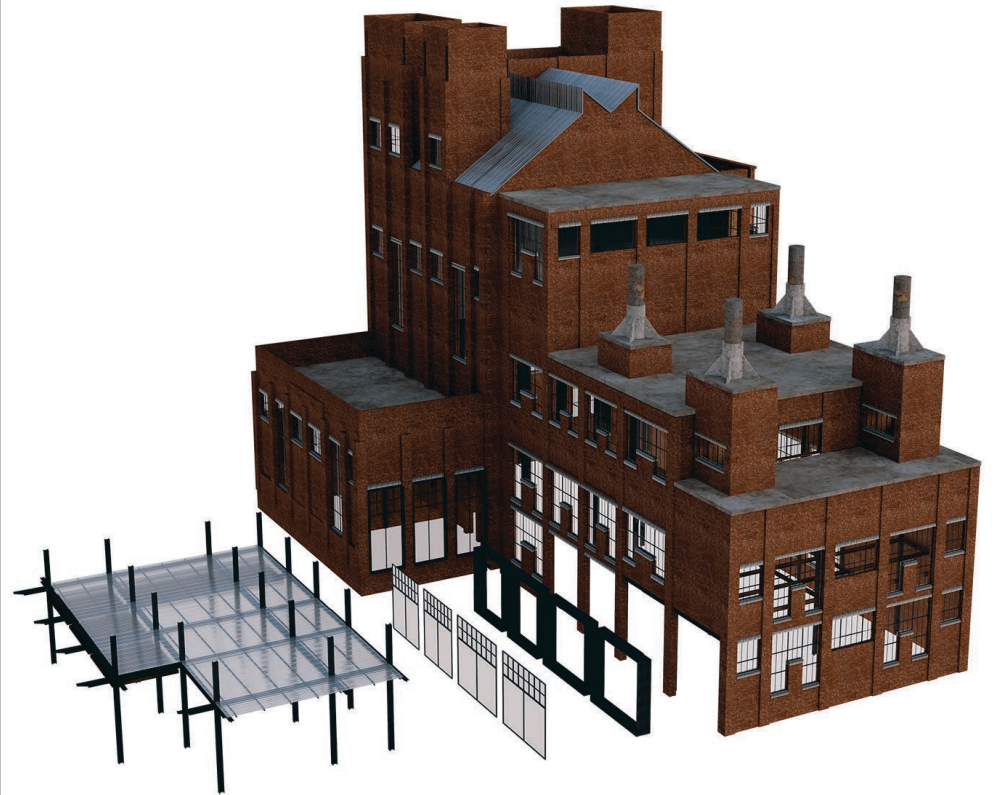
Retort house



Before

Previous use: Coal to Gas production

Figure 6.42: Coke storage before intervention (Author 2017)



After

New proposed use: Eco-textile Mill & Textile Market

Figure 6.43: Coke storage after intervention (Author 2017)

Final design

Site plan

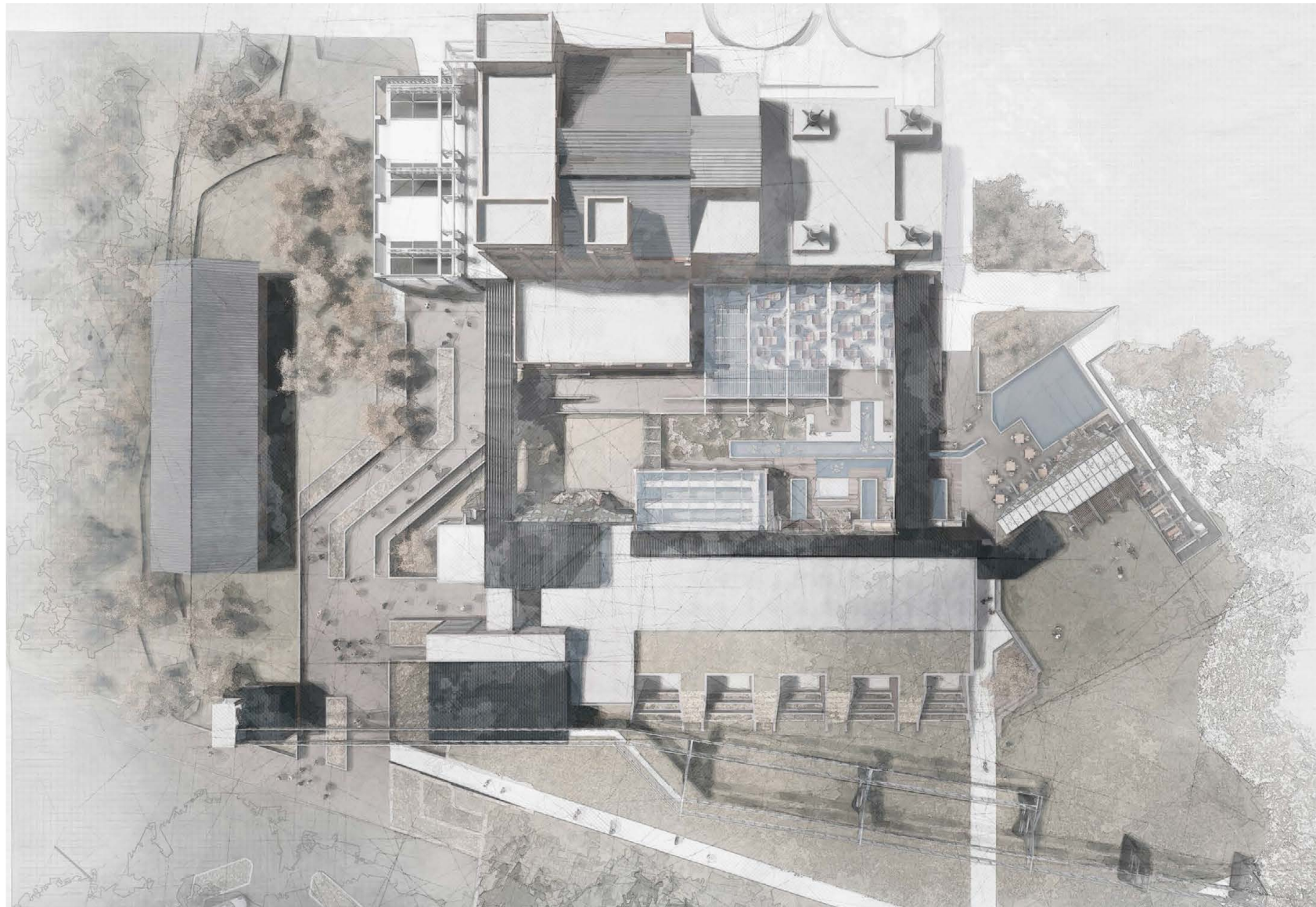


Figure 6.44: Final Design Site Plan (Author 2017)

Ground Floor Plan

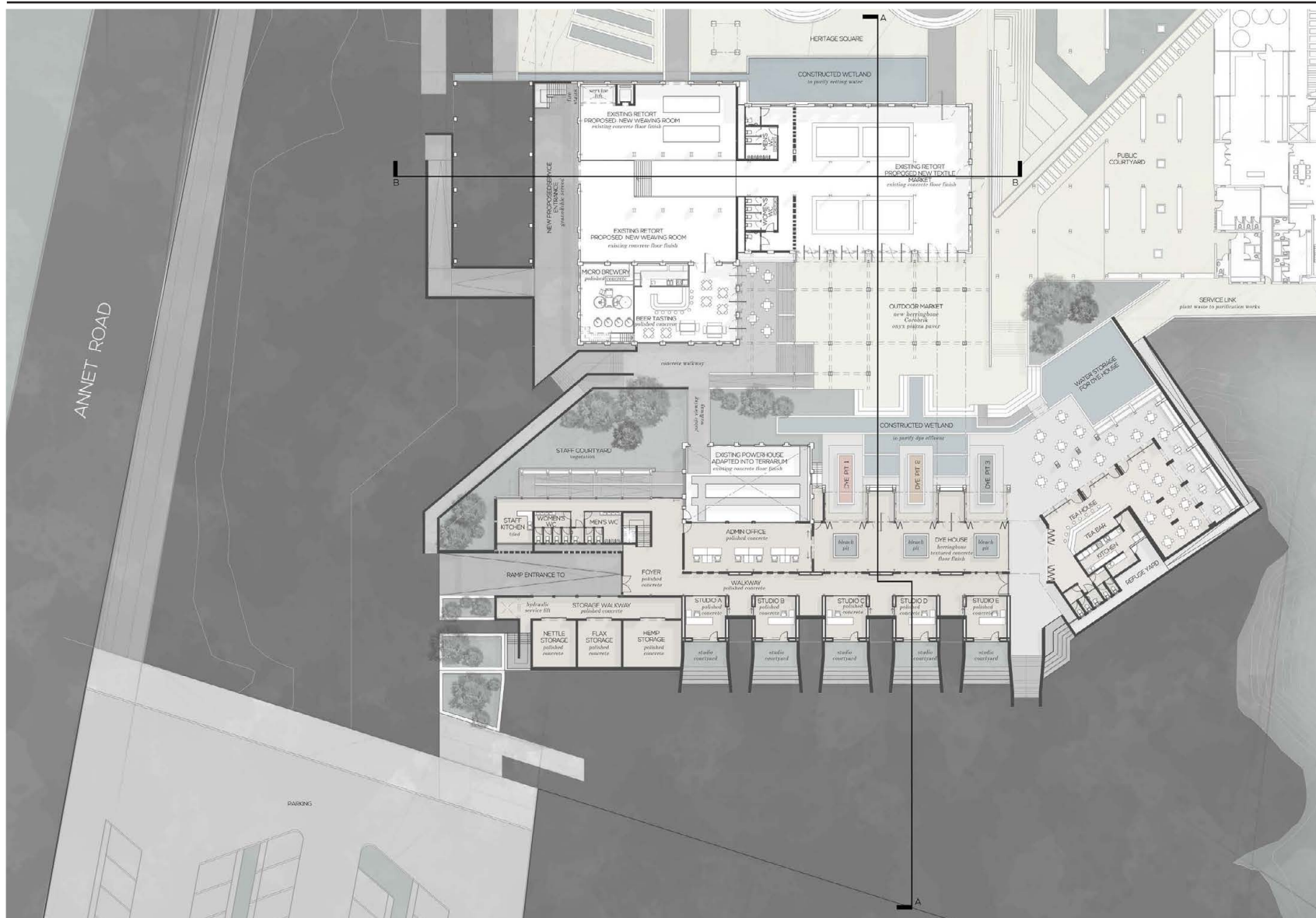


Figure 6.45: Final design Ground Floor Plan (Author 2017)

First Floor Plan

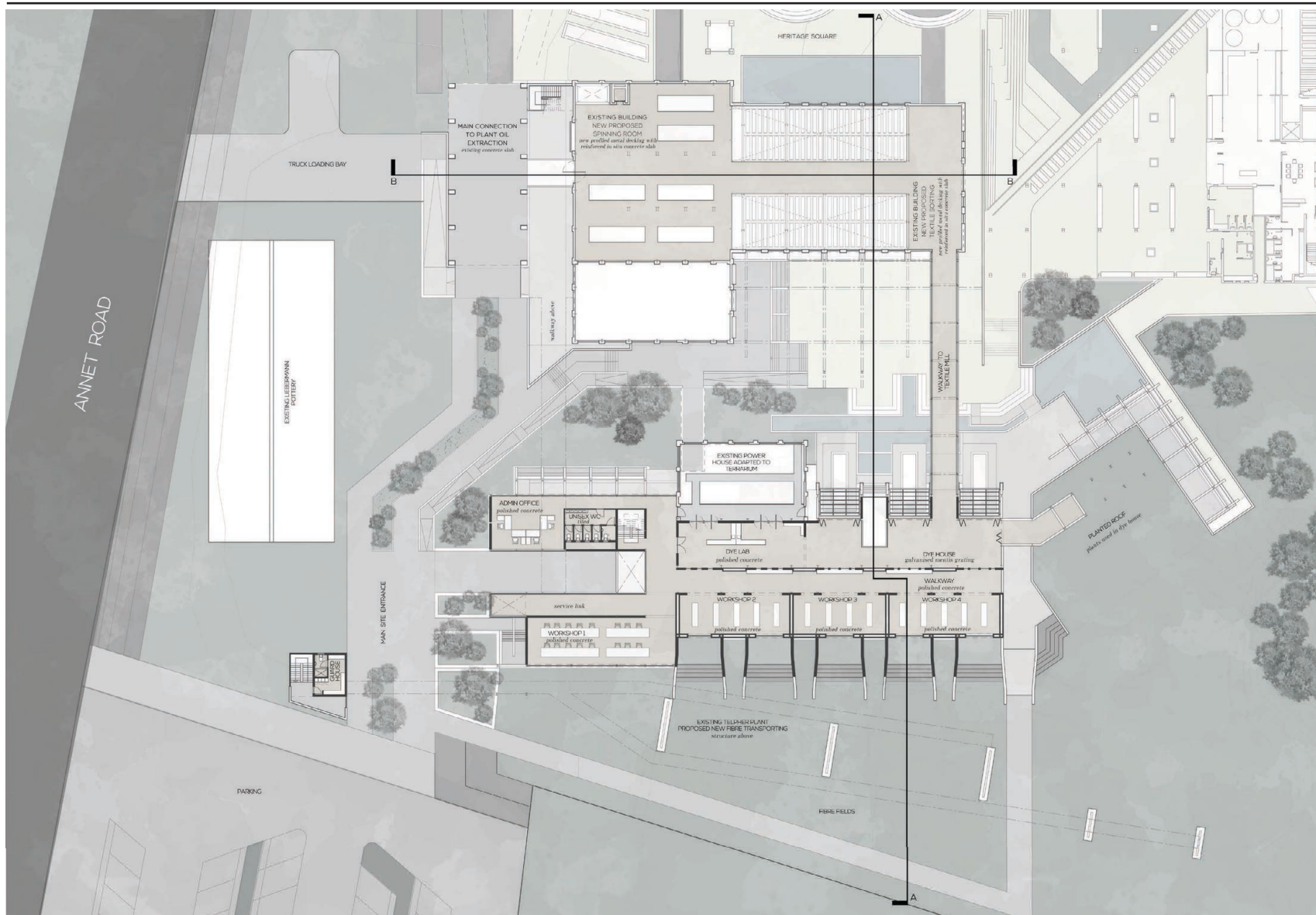


Figure 6.46: Final design First Floor Plan (Author 2017)

Second Floor Plan

Basement Floor Plan

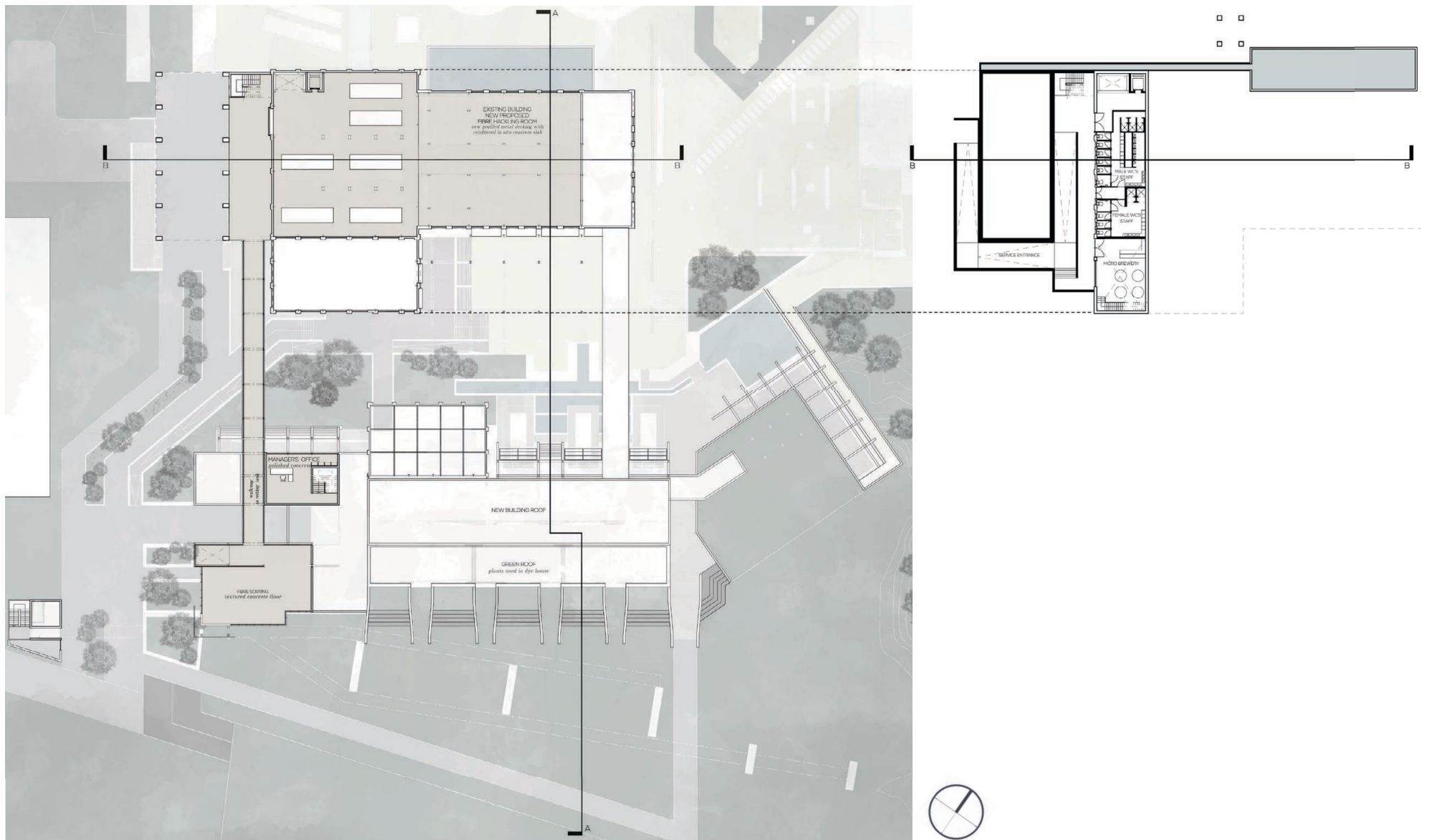


Figure 6.47: Final design Second & Basement Floor Plan (Author 2017)

Section A-A

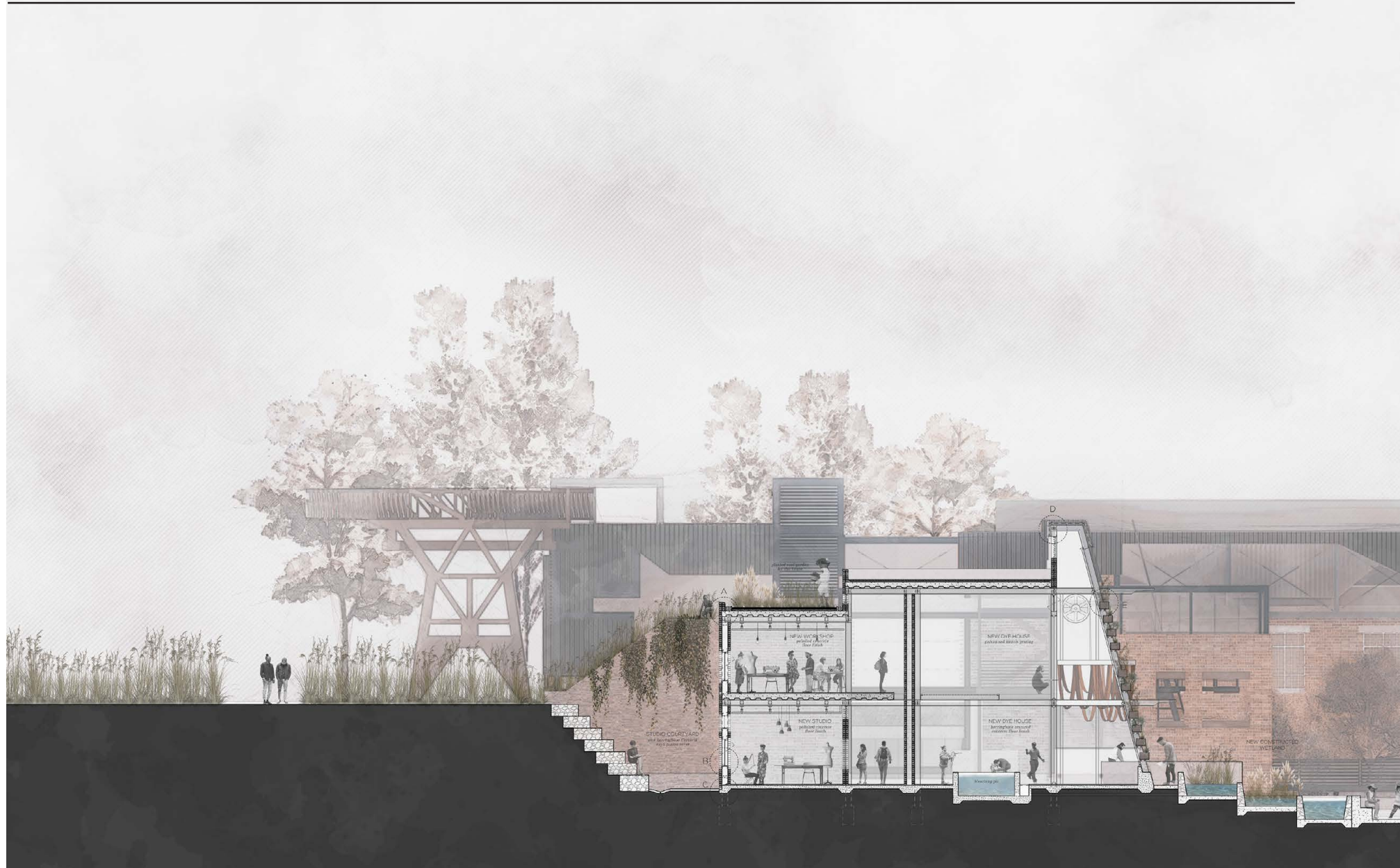


Figure 6.48: Final design section A-A (Author 2017)



Section B-B

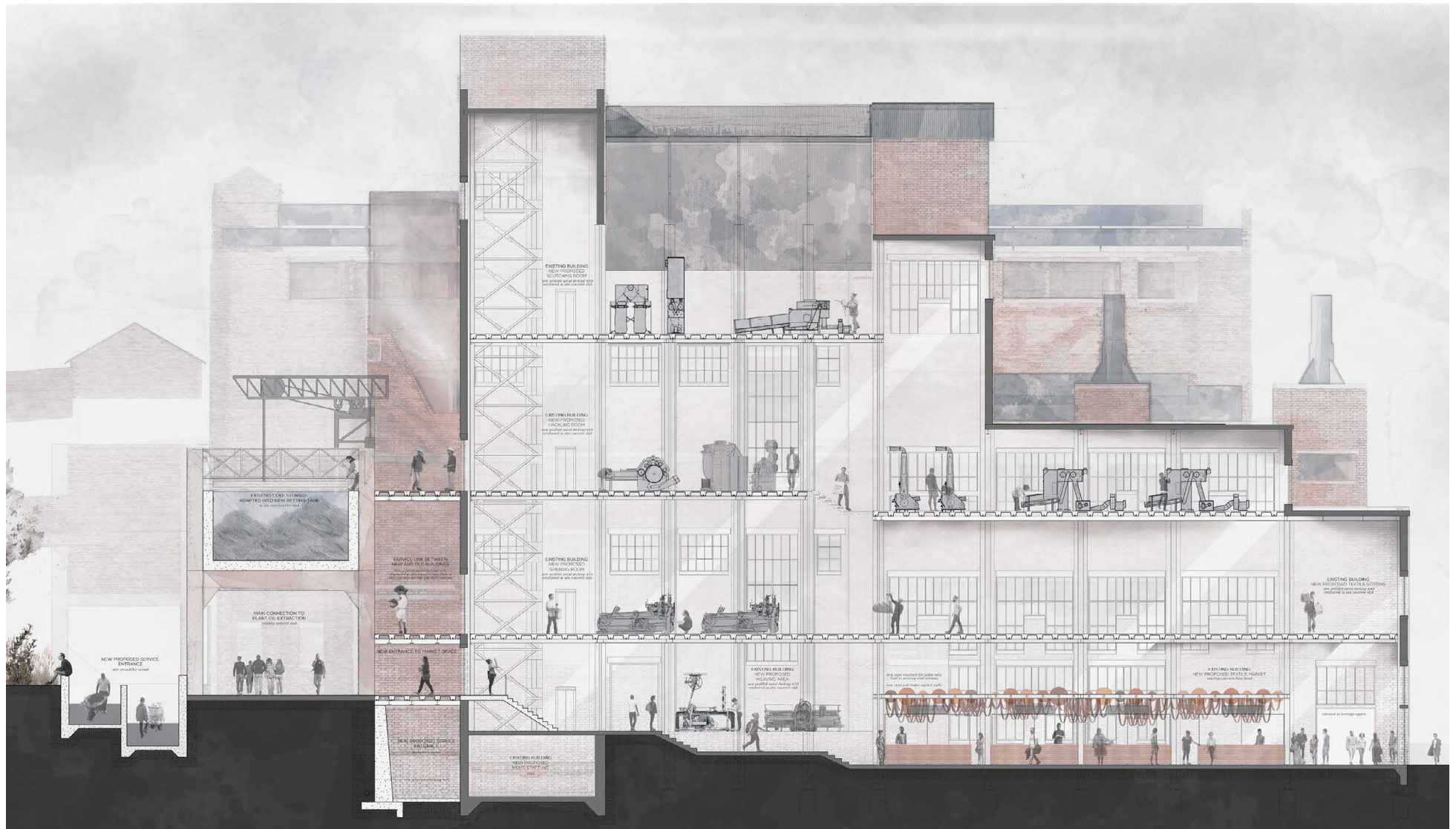
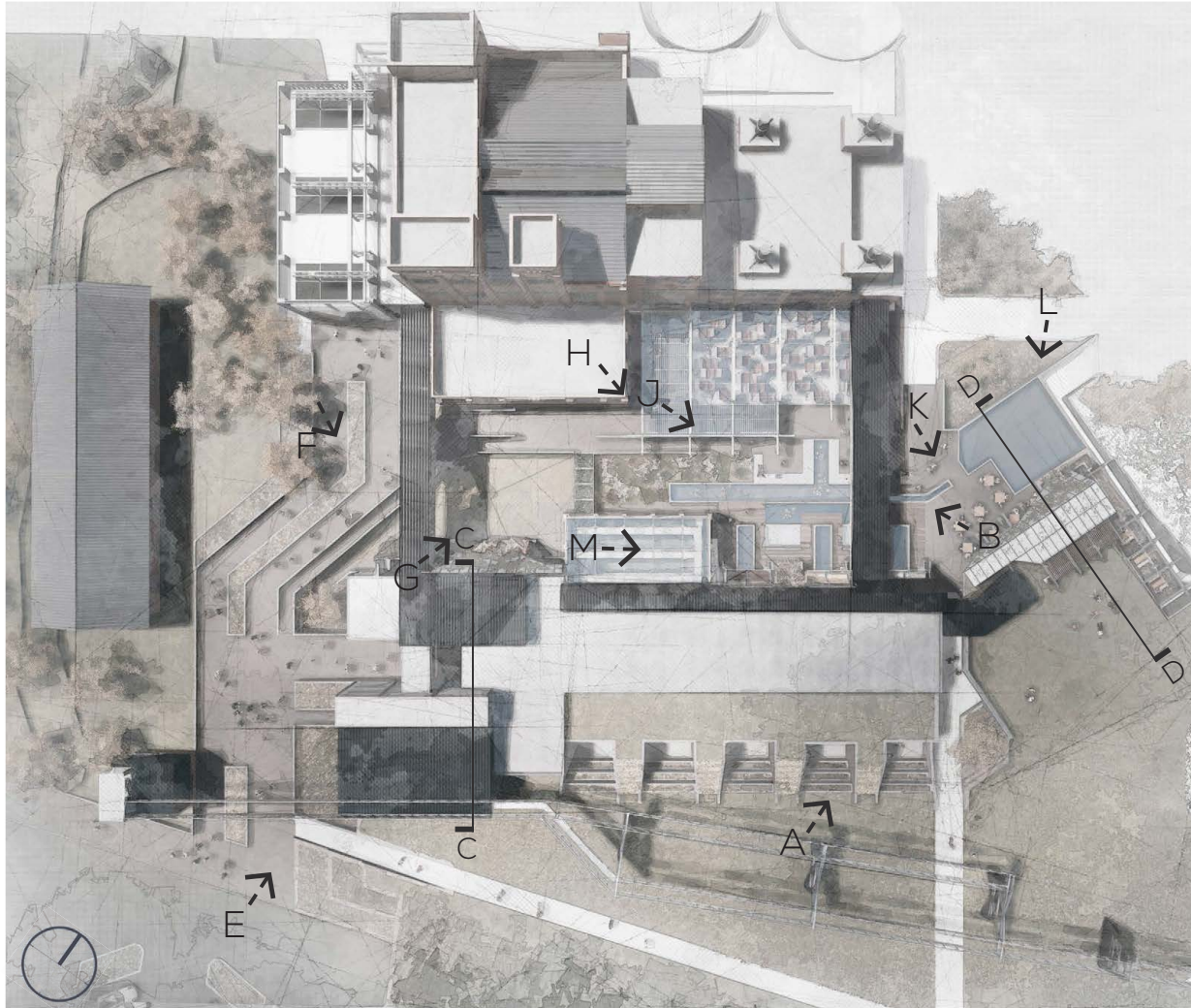


Figure 6.49: Final design section B-B (Author 2017)

Views on site



Key site plan

Figure 6.50: Key site plan (Author 2017)



View A towards studios

Figure 6.51: View A (Author 2017)



View B from tea house towards market space

Figure 6.52: View B (Author 2017)

Sectional perspective C-C through sorting & offices



Figure 6.53: Sectional perspective C-C (Author 2017)

Sectional perspective D-D through tea house



Figure 6.54: Sectional perspective D-D (Author 2017)

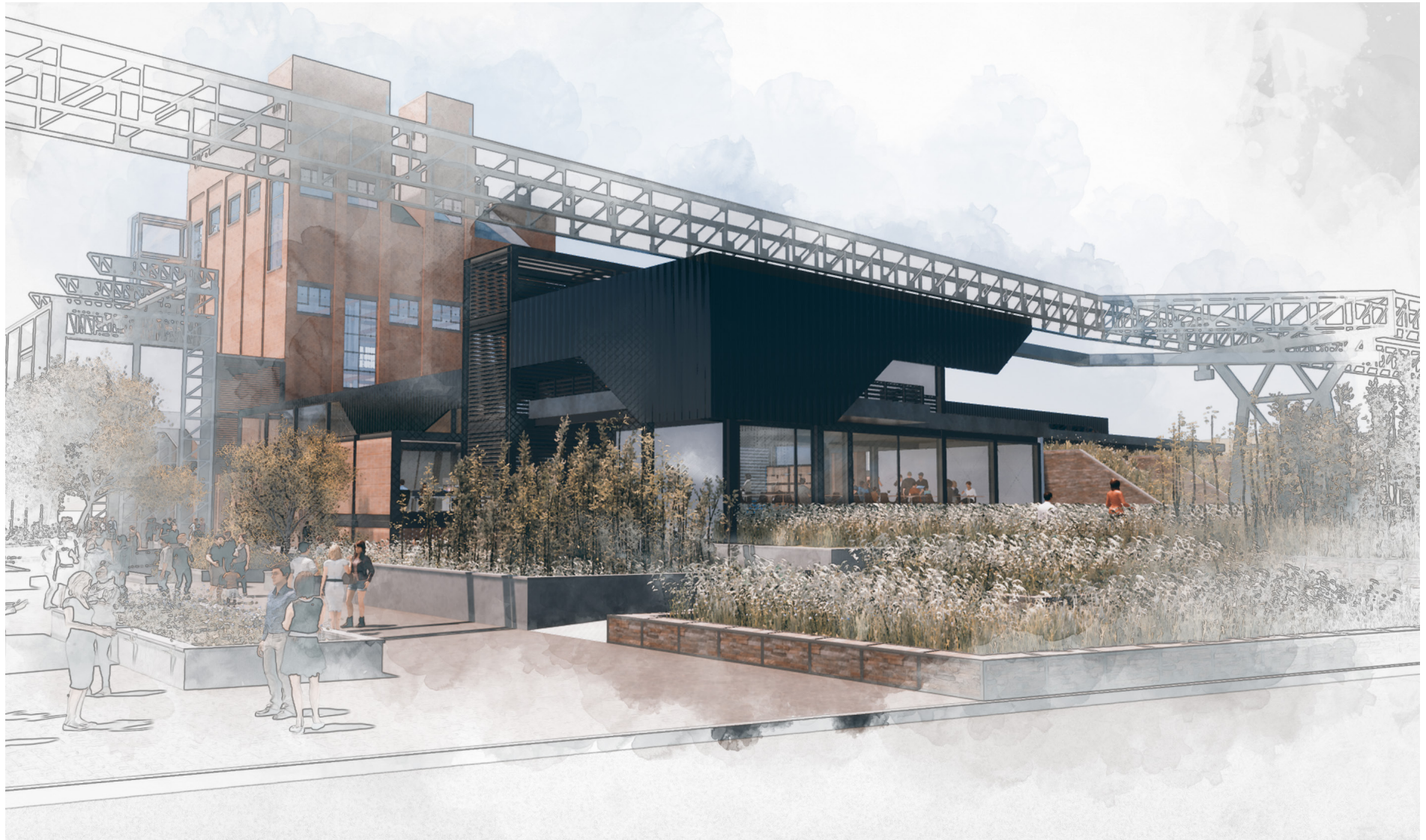


Figure 6.55: View E (Author 2017)

View E
Entrance to site



View F - View of sorting facilities
Figure 6.56: View F (Author 2017)



View G - View towards market
Figure 6.57: View G (Author 2017)



View J - View from market towards dyehouse
Figure 6.58: View J (Author 2017)



View K - View from market towards tea house
Figure 6.59: View K (Author 2017)



Figure 6.60: View H (Author 2017)

View H

View from retort 2 towards dyehouse



Figure 6.61: View L (Author 2017)

View L

View towards tea house



Figure 6.62: View M (Author 2017)

View M

View inside terrarium



Figure 6.63: Bird's eye view of site (Author 2017)

Bird's eye view of site
Looking towards new intervention