



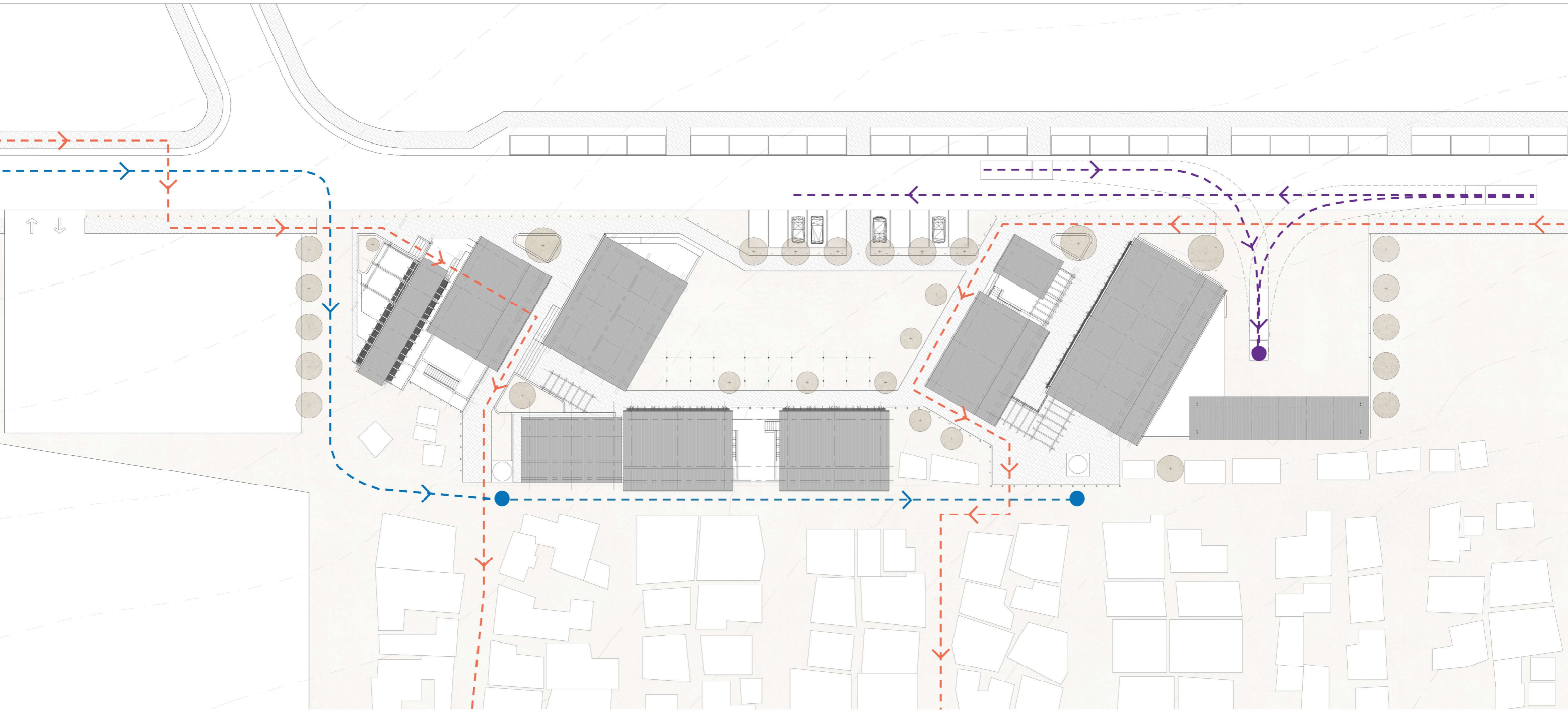
CHAPTER

07

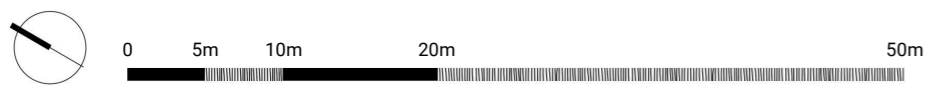
ANNEXURE



Figure 7.1. Design render 1 (Author 2021)



# SITE PLAN



- Water truck route
- Pedestrian thoroughfare
- Delivery truck dropoff

Figure 7.2. Site plan (Author 2021)





Figure 7.3. Ground floor plan (Author 2021)

## GROUND FLOOR PLAN







**Privacy levels**

- Private
- Semi-private
- Public



**Ownership levels**

- Individual
- Shared
- Public

**GROUND FLOOR PLAN  
SITE PORTION A**

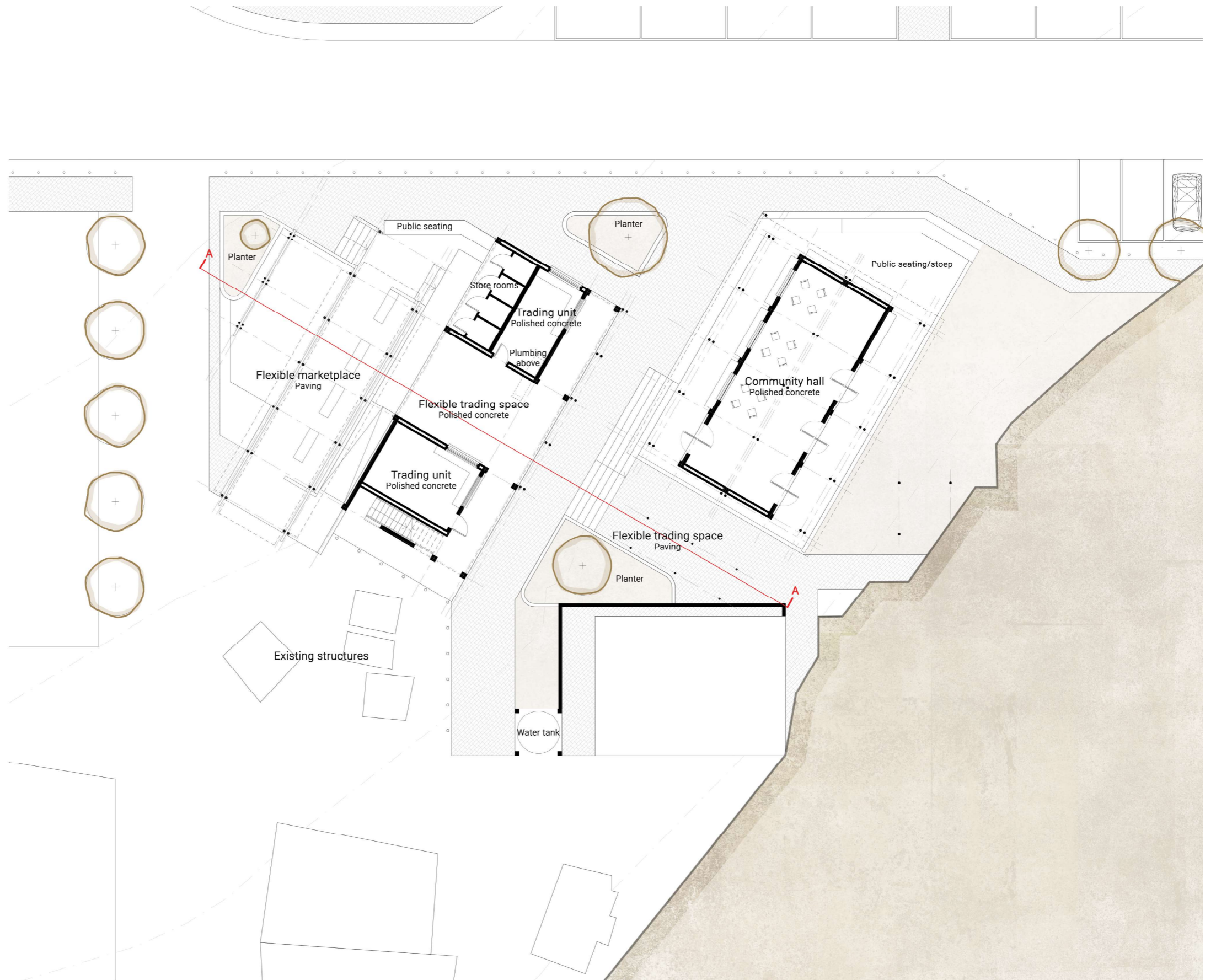
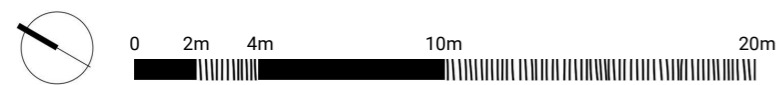
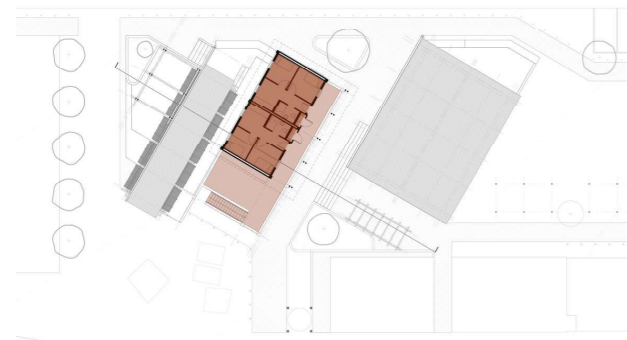


Figure 7.4. Ground floor plan A (Author 2021)

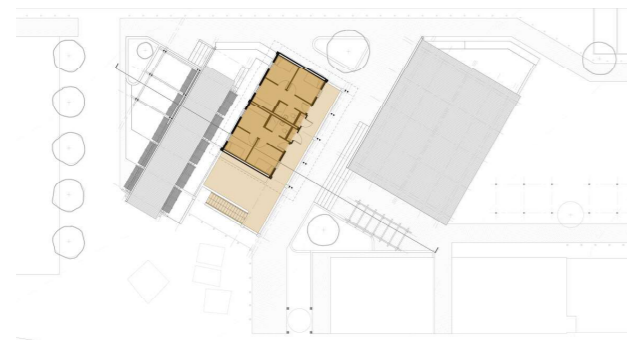






**Privacy levels**

- Private
- Semi-private
- Public



**Ownership levels**

- Individual
- Shared
- Public

FIRST FLOOR PLAN  
SITE PORTION A

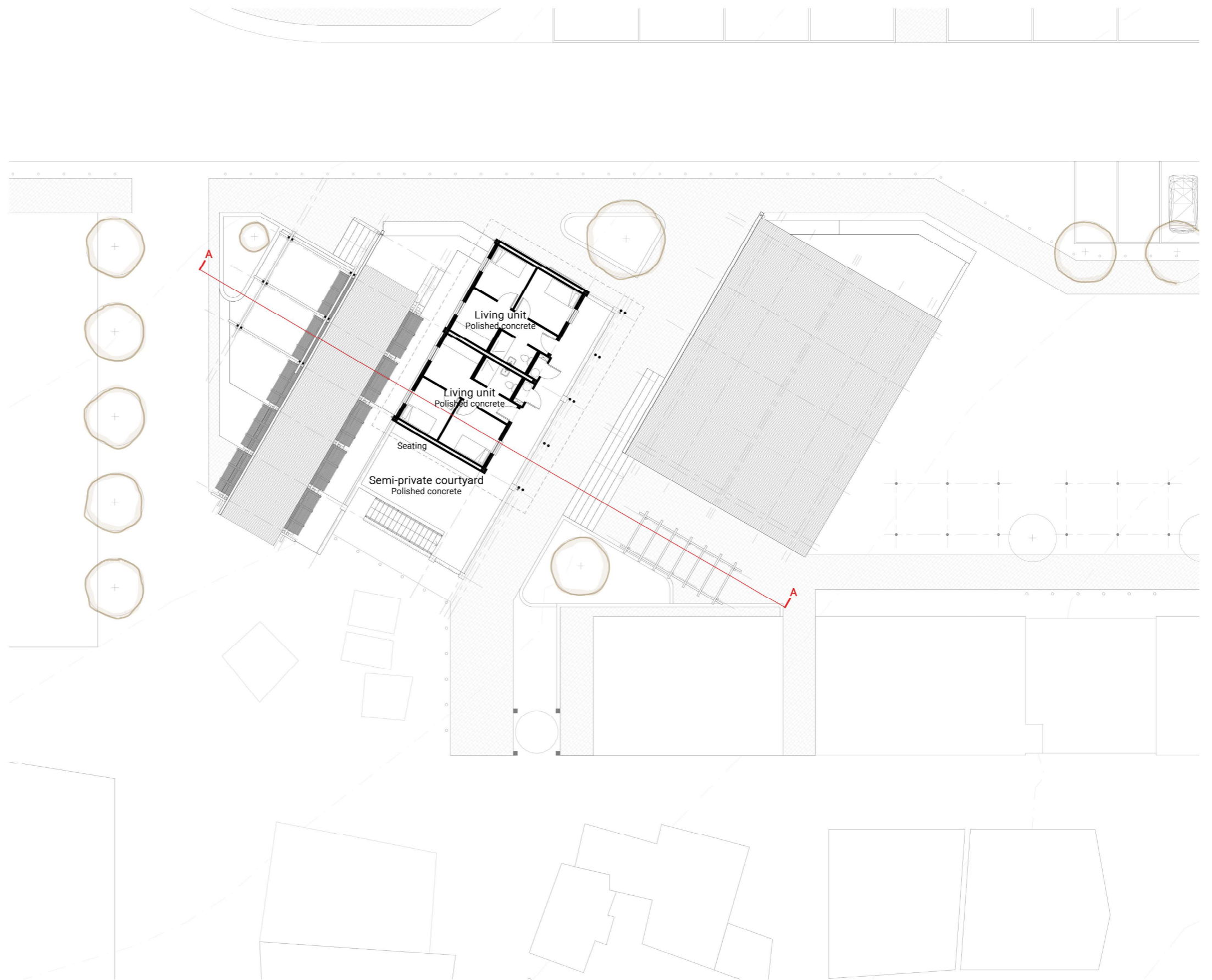


Figure 7.5. First floor plan A (Author 2021)







Figure 7.6. Render 2 (Author 2021)



Figure 7.7. Render 3 (Author 2021)



NORTH ELEVATION  
SITE PORTION A

Figure 7.8. Elevation A (Author 2021)





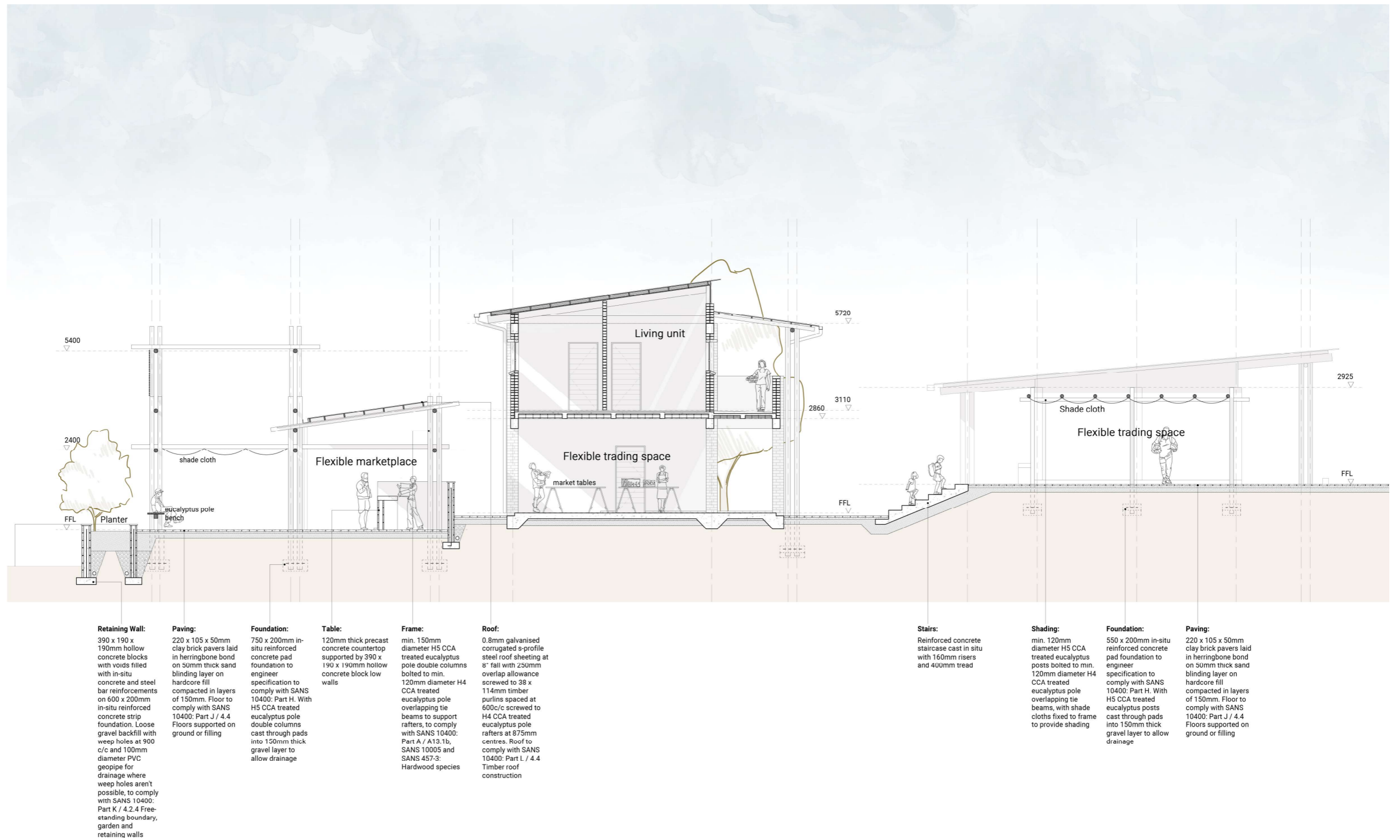
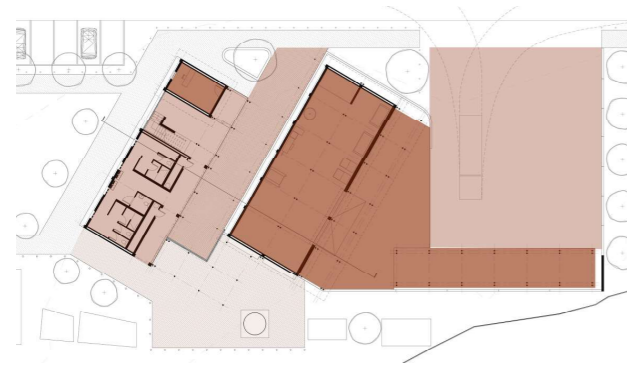


Figure 7.9. Section A-A (Author 2021)

SECTION A-A

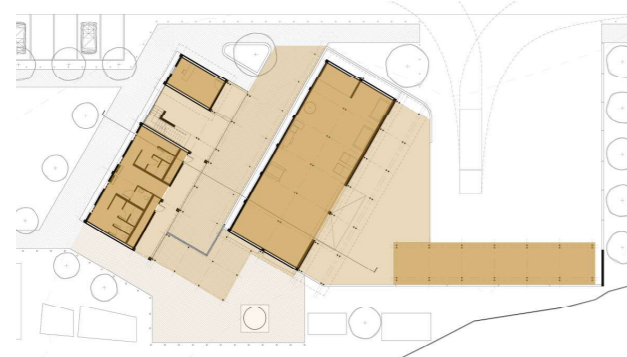






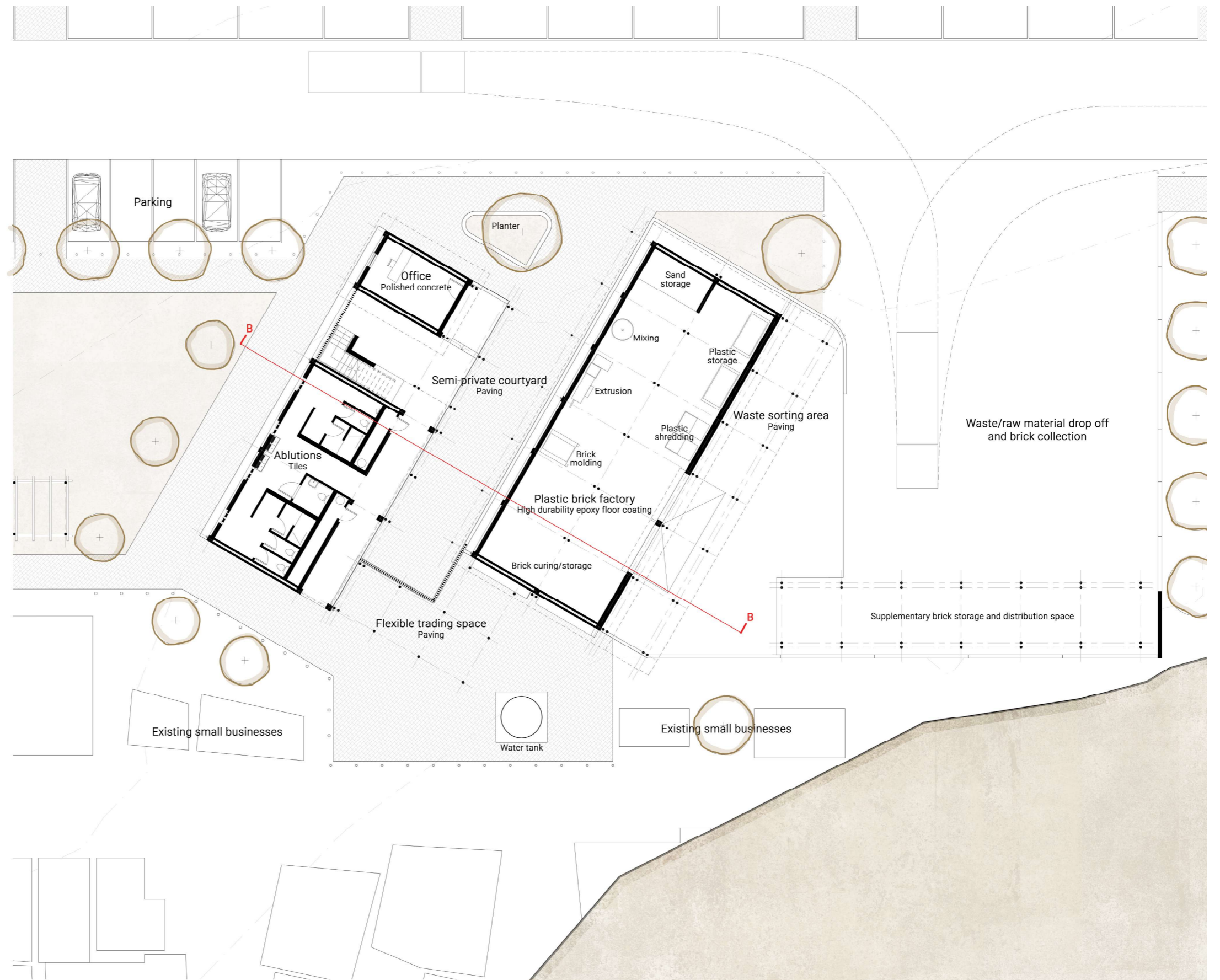
**Privacy levels**

- Private
- Semi-private
- Public



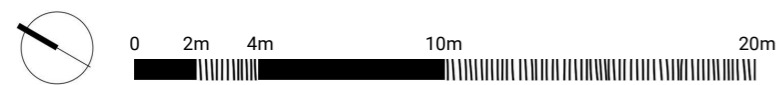
**Ownership levels**

- Individual
- Shared
- Public

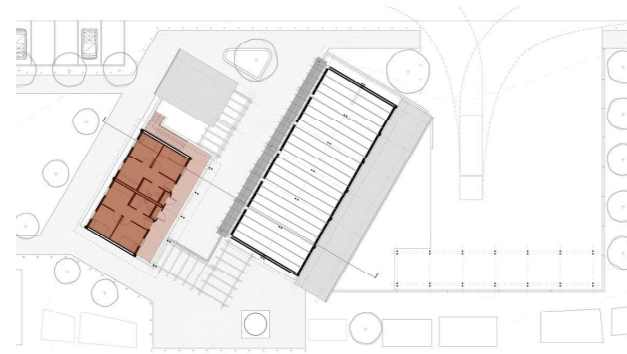


**GROUND FLOOR PLAN  
SITE PORTION B**

Figure 7.10. Ground floor plan B (Author 2021)

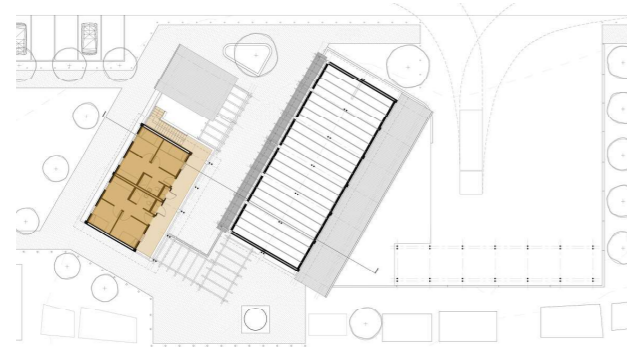






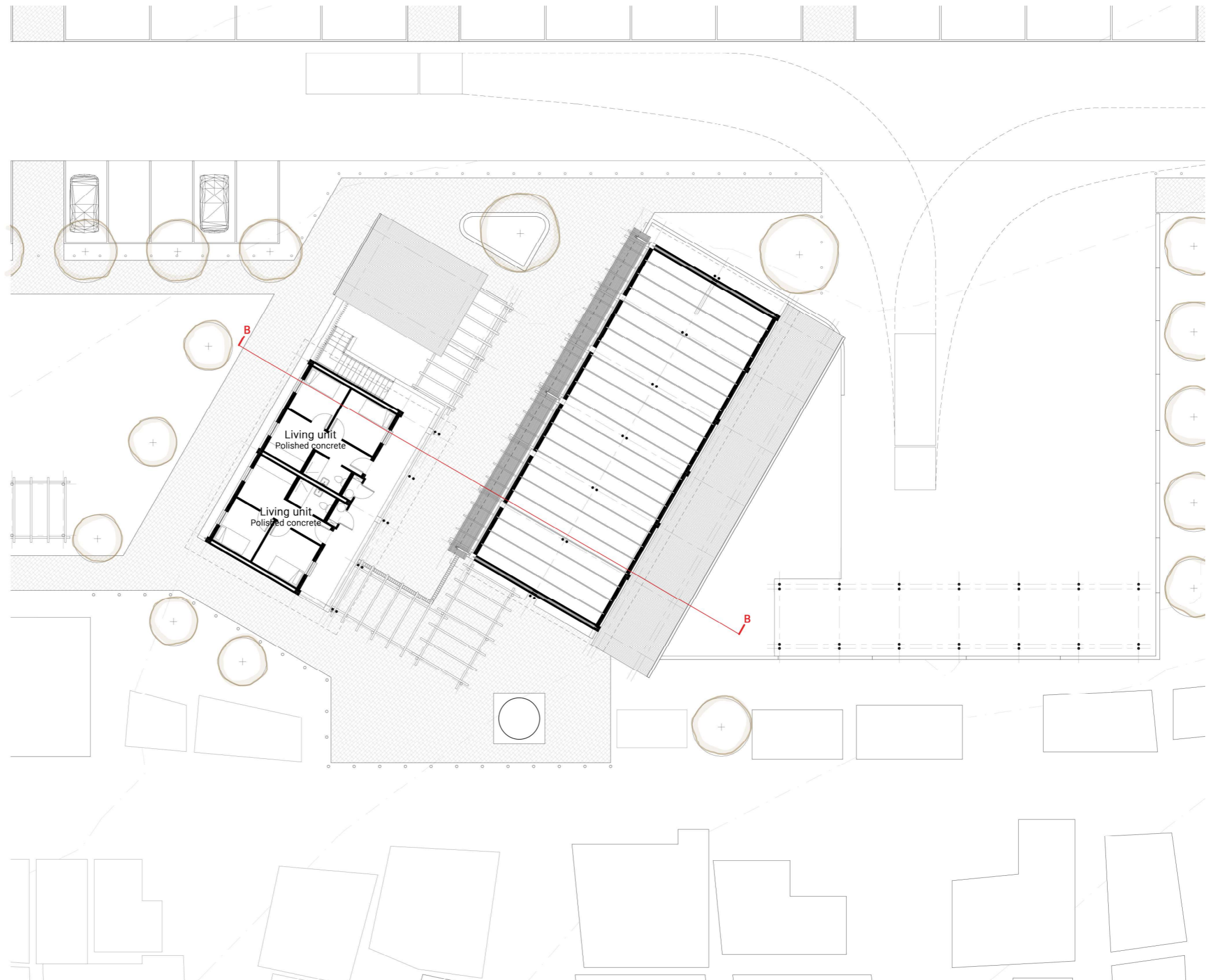
**Privacy levels**

- Private
- Semi-private
- Public



**Ownership levels**

- Individual
- Shared
- Public



FIRST FLOOR PLAN  
SITE PORTION B

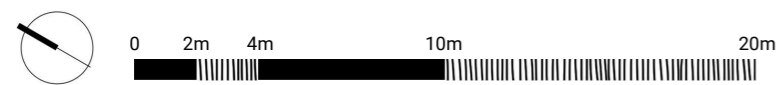


Figure 7.11. First floor plan B (Author 2021)





Figure 7.12. Render 4 (Author 2021)



Figure 7.13. Render 5 (Author 2021)

SOUTH ELEVATION  
SITE PORTION B



Figure 7.14. Elevation B (Author 2021)

0 1m 2m 5m 10m



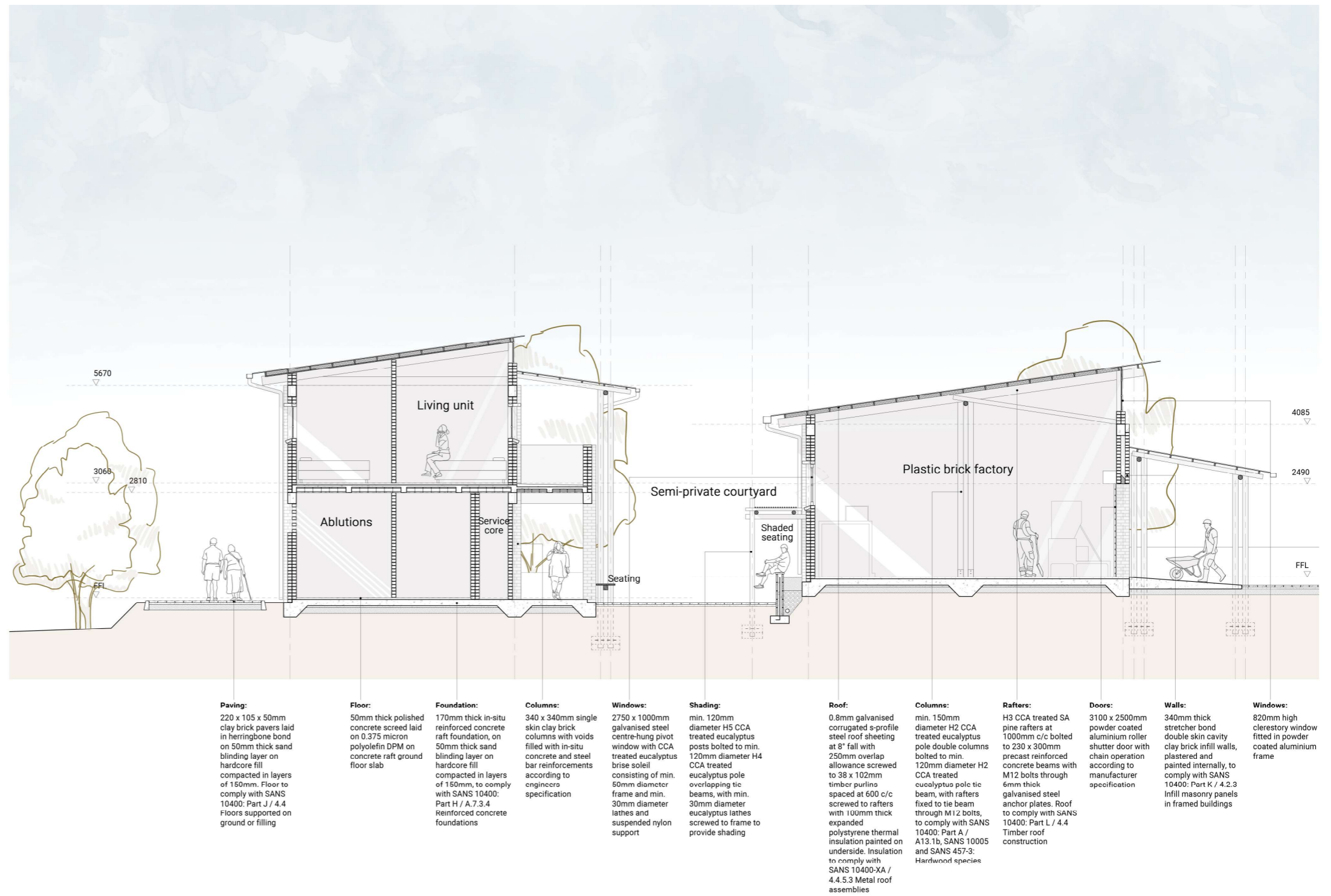
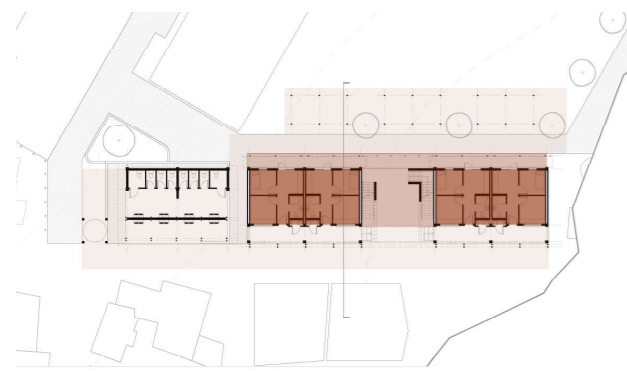


Figure 7.15. Section B-B (Author 2021)

SECTION B-B

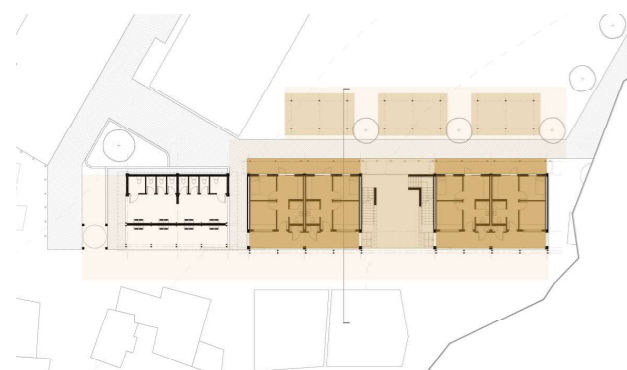






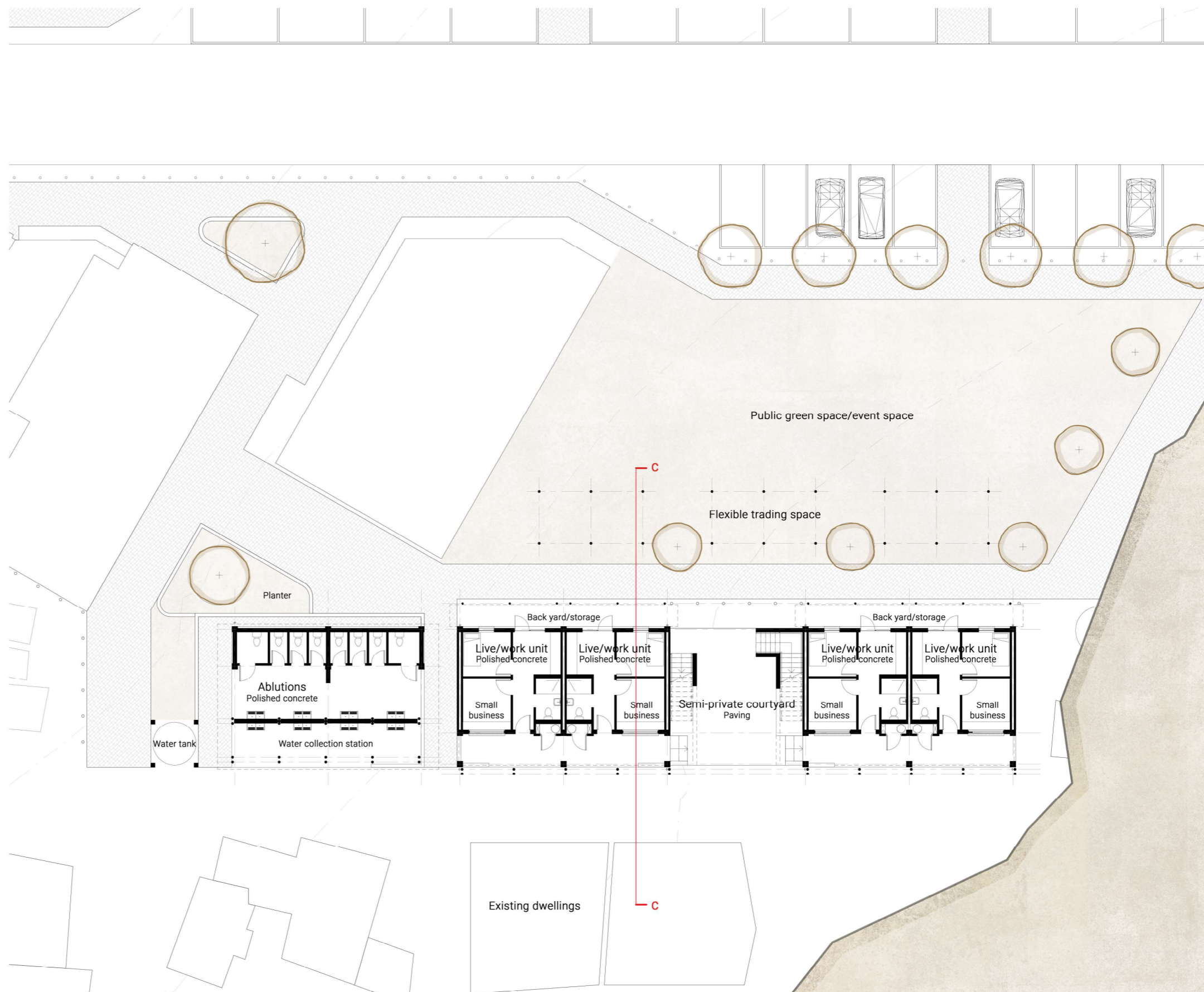
**Privacy levels**

- Private
- Semi-private
- Public



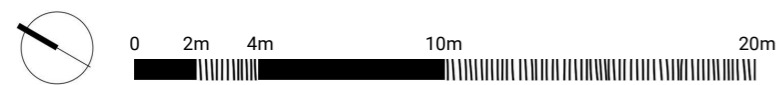
**Ownership levels**

- Individual
- Shared
- Public

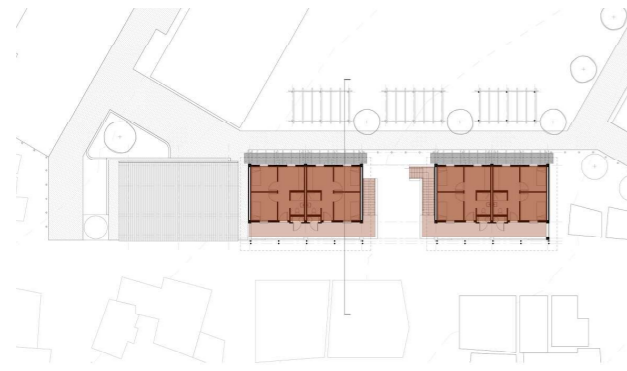


GROUND FLOOR PLAN  
SITE PORTION C

Figure 7.16. Ground floor plan C (Author 2021)

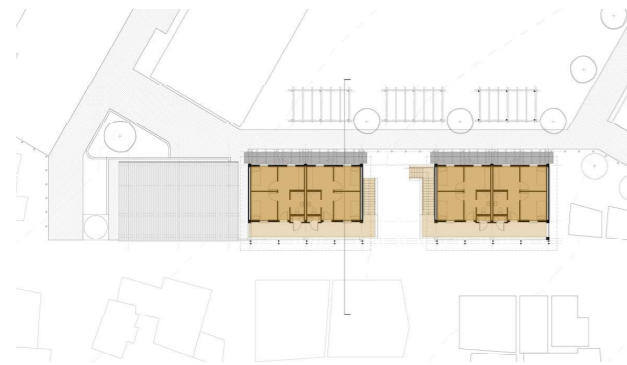






**Privacy levels**

- Private
- Semi-private
- Public



**Ownership levels**

- Individual
- Shared
- Public

FIRST FLOOR PLAN  
SITE PORTION C

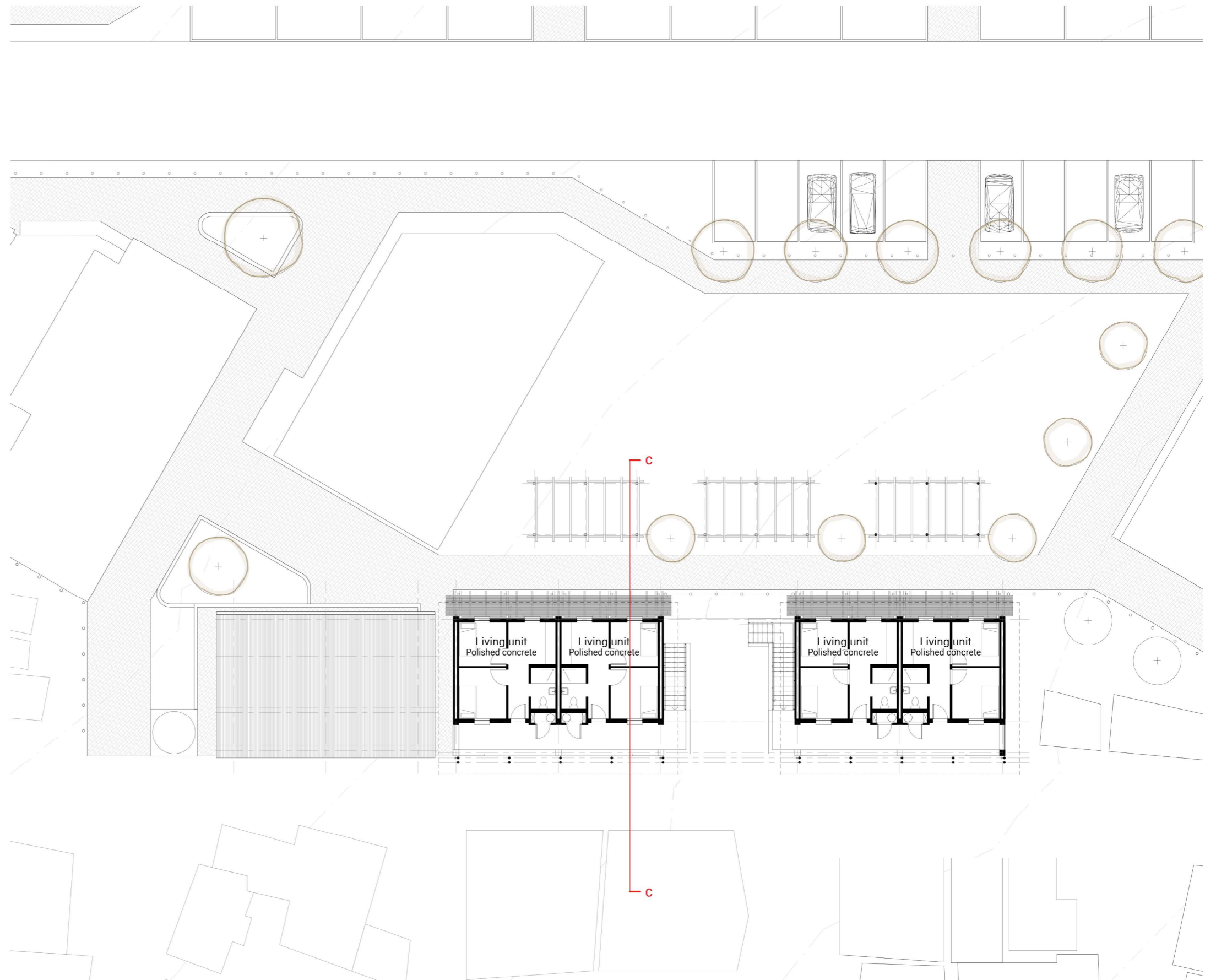
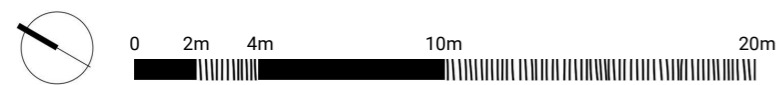
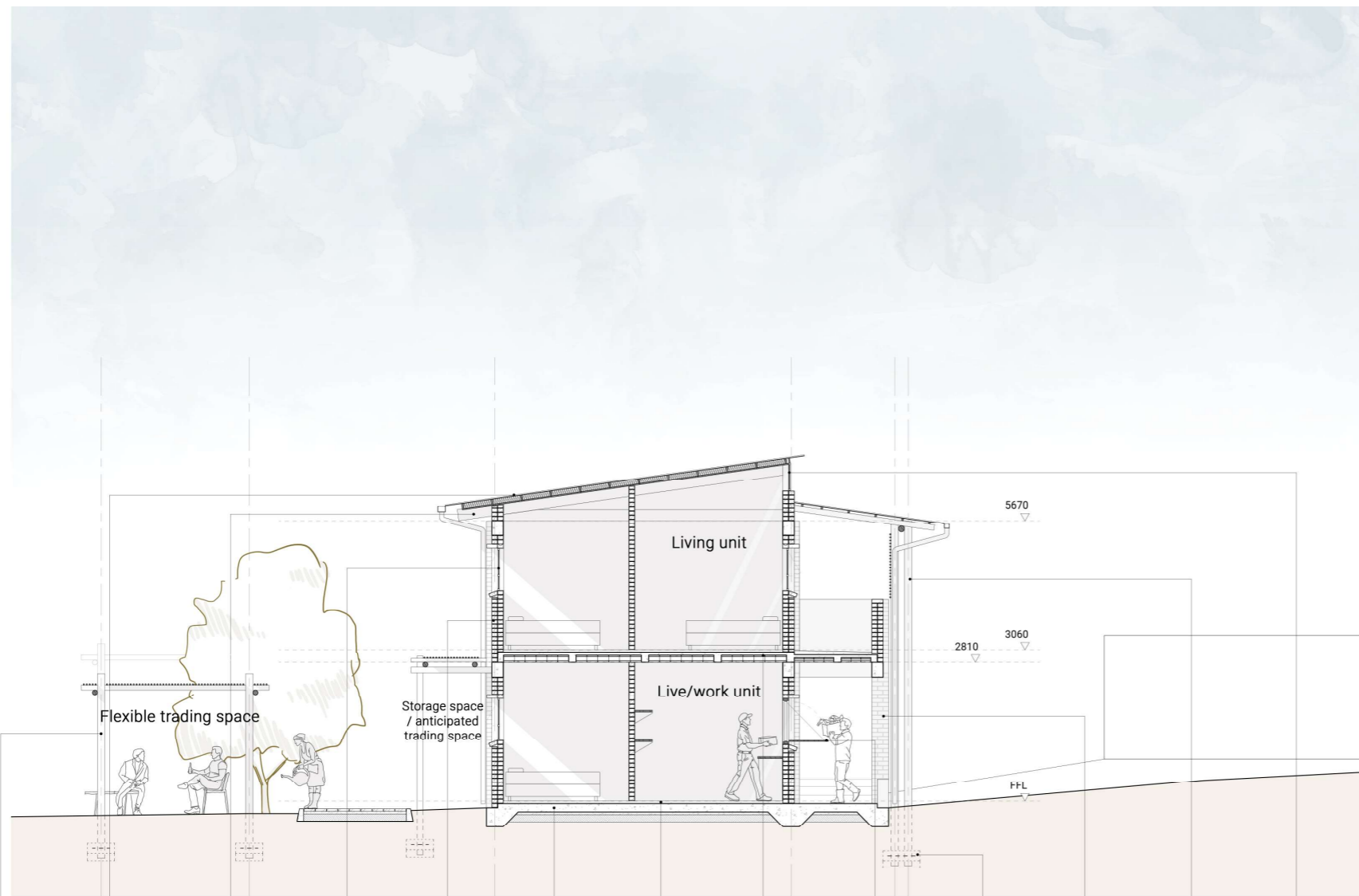


Figure 7.17. First floor plan C (Author 2021)







- Shading:**  
min. 120mm diameter H5 CCA treated eucalyptus posts bolted to min. 120mm diameter H4 CCA treated eucalyptus pole overlapping tie beams, with min. 30mm diameter eucalyptus lathes screwed to frame to provide shading
- Roof:**  
0.8mm galvanised corrugated s-profile steel roof sheeting at 8° fall with 250mm overlap allowance screwed to 38 x 102mm timber purlins spaced at 600 c/c screwed to rafters with 100mm thick expanded polystyrene thermal insulation and 25 x 114mm timber panel ceiling screwed to purlins between rafters. Insulation to comply with SANS 10400-XA / 4.4.5.3 Metal roof assemblies
- Rafters:**  
H2 CCA treated SA pine rafters at 1000mm c/c bolted to 230 x 300mm precast reinforced concrete beams with M12 bolts through 6mm thick galvanised steel anchor plates. Roof to comply with SANS 10400: Part L / 4.4 Timber roof construction
- Opening:**  
900 x 900mm top hung powder coated aluminium window frame with 6mm glazing to comply with SANS 10400: Part O / 4.3 Ventilation and SANS 10400-XA / 4.4.4 Fenestration
- Walls:**  
230mm thick stretcher bond double skin upcycled plastic-sand brick infill walls, plastered and painted internally, with two precast concrete lintels laid column to column at height of 2100mm above FFL to allow anticipated adaptation of dwellings. Walls to comply with SANS 10400: Part K / 4.2.3 Infill masonry panels in framed buildings
- Floor:**  
170mm thick in-situ reinforced concrete raft forming ground floor slab, with min. 300 x 750mm concrete edge beams, on 50mm thick sand blinding layer on hardcore fill compacted in layers of 150mm, to comply with SANS 10400: Part H / A.7.3.4 Reinforced concrete foundations
- Floor:**  
50mm thick polished concrete screed laid on 0.375 micron polyolefin DPM on concrete raft ground floor slab
- Floor:**  
50mm thick polished concrete screed laid on 0.375 micron polyolefin DPM on 200mm thick reinforced rib and block slab according to engineers specification, on 230 x 300mm precast reinforced concrete beams. Floors to comply with SANS 10400: Part J / 4.2 Water-resistant floors
- Opening:**  
Timber door rotated 90° to act as bottom hung opening for shopfronts, with suspended nylon support
- Foundation:**  
750 x 200mm in-situ reinforced concrete pad foundation to engineer specification to comply with SANS 10400: Part H. With H5 CCA treated eucalyptus pole double columns cast through pads into 150mm thick gravel layer to allow drainage
- Columns:**  
340 x 340mm single skin clay brick columns with voids filled with in-situ concrete and steel bar reinforcements according to engineers specification
- Columns:**  
min. 150mm diameter H5 CCA treated eucalyptus pole double columns bolted to min. 120mm diameter H4 CCA treated eucalyptus pole overlapping tie beam, with rafters fixed to tie beam through M12 bolts, to comply with SANS 10400: Part A / A13.1b, SANS 10005 and SANS 457-3: Hardwood species
- Windows:**  
600mm high clerestory window fitted in powder coated aluminium frame

Figure 7.18. Section C-C (Author 2021)



Figure 7.19. Render 6 (Author 2021)



Figure 7.20. Render 7 (Author 2021)

## SECTION C-C

0 1m 2m 5m 10m



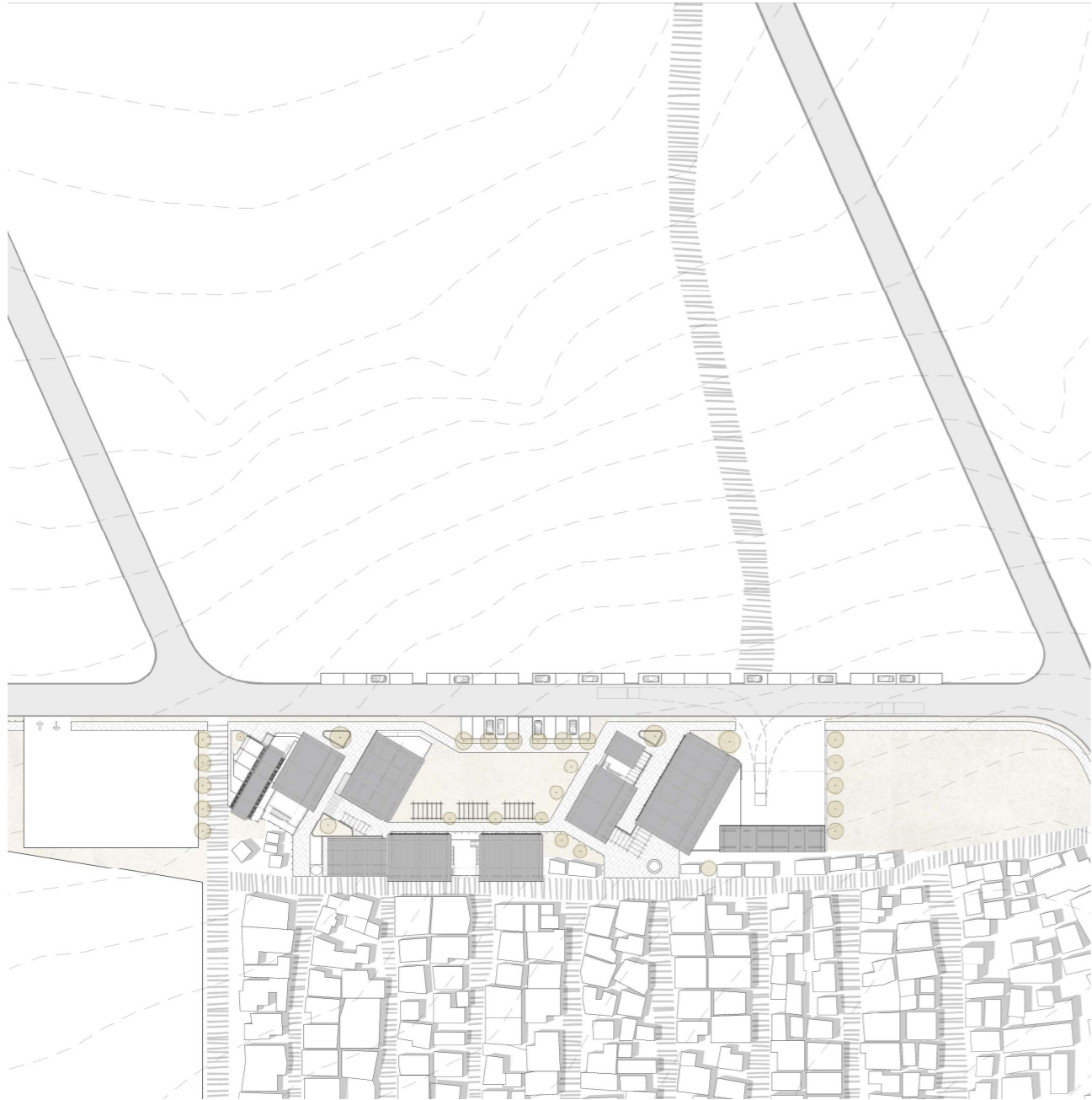


Figure 7.21. Site plan post intervention (Author 2021)

## SITE PLAN (POST INTERVENTION)



Figure 7.22. Site plan post expansion (Author 2021)

## SITE PLAN (POST EXPANSION)







Figure 7.23. Render 8 (Author 2021)



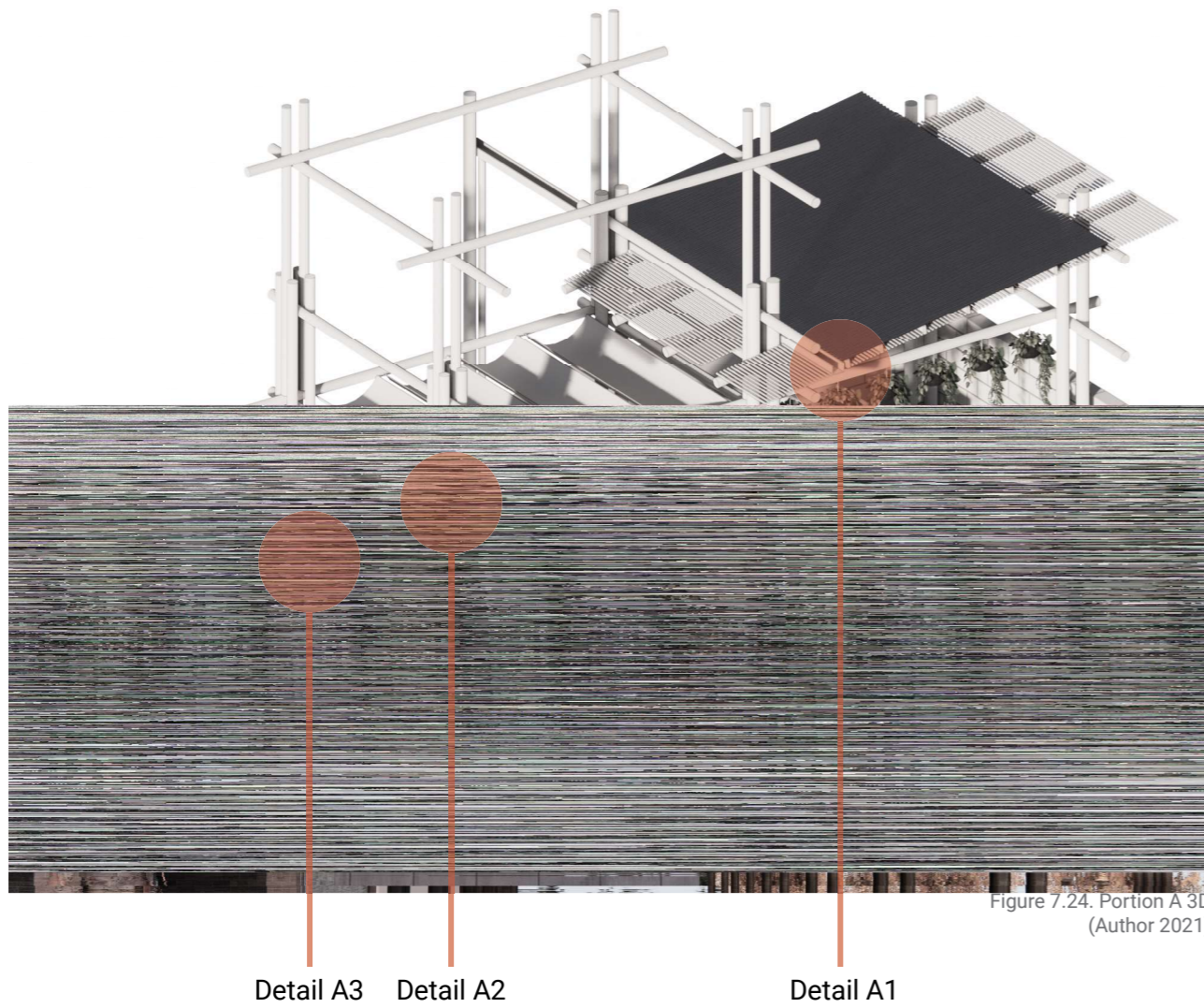


Figure 7.24. Portion A 3D (Author 2021)

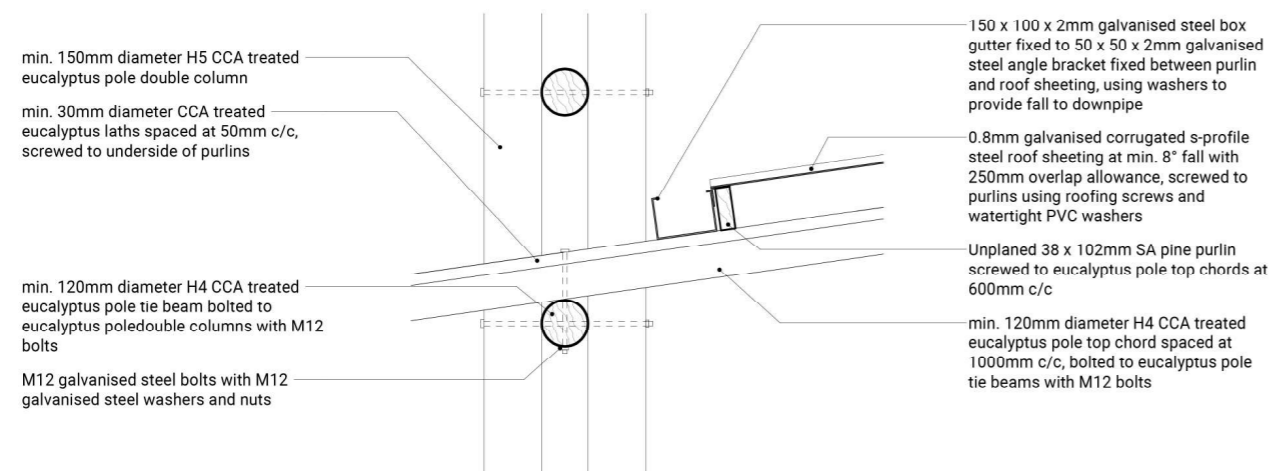


Figure 7.25. Detail A1 (Author 2021)

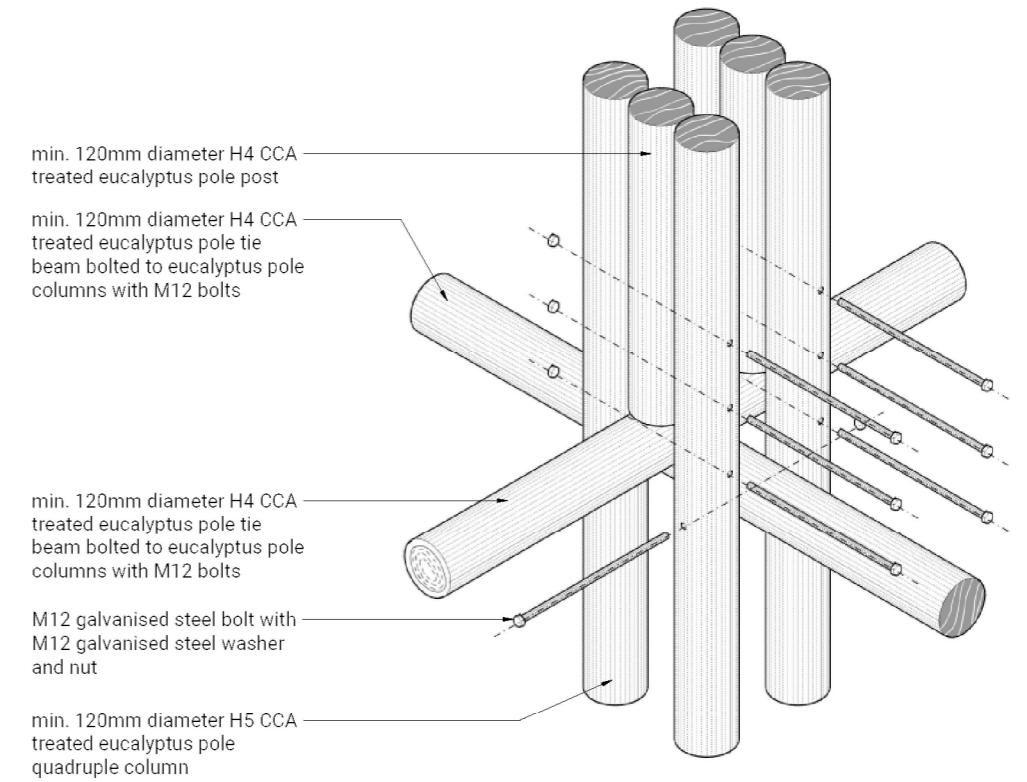


Figure 7.26. Detail A2 (Author 2021)

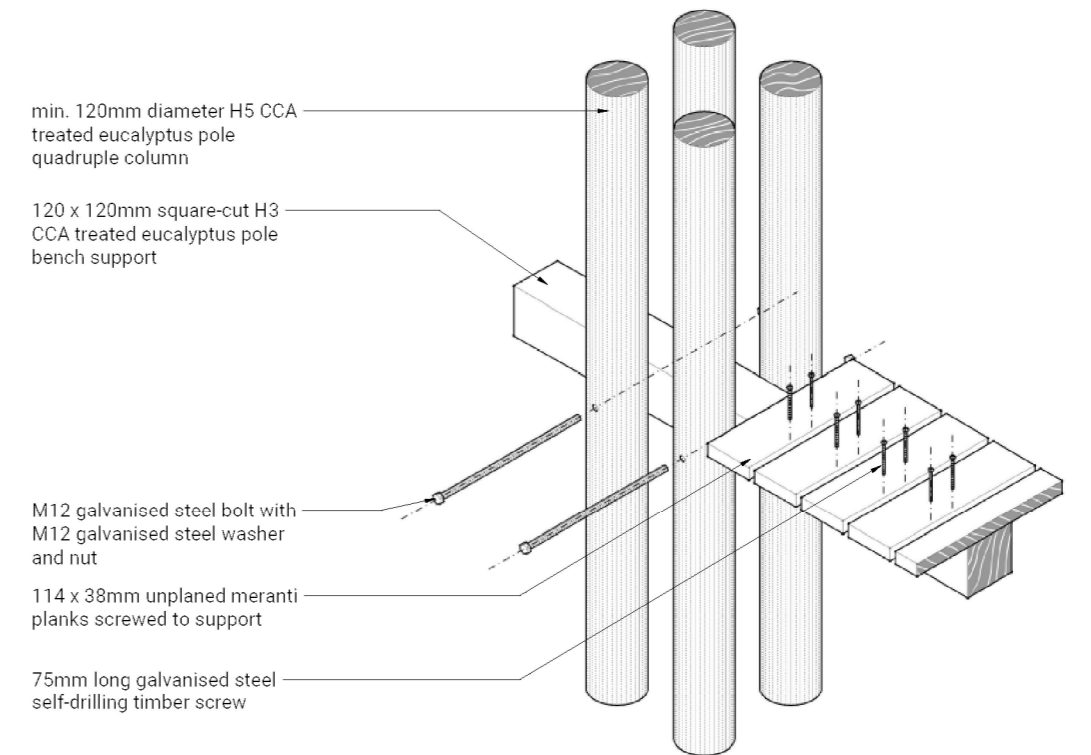
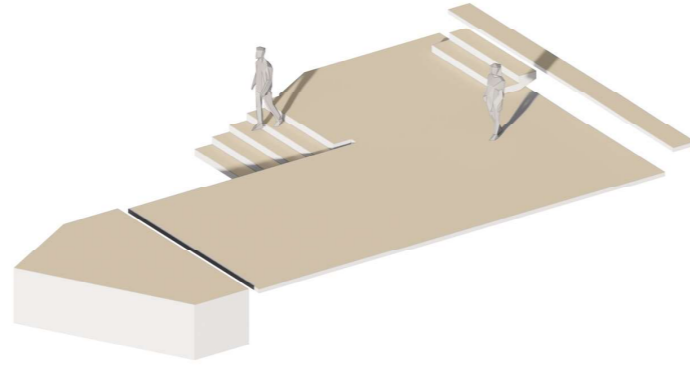


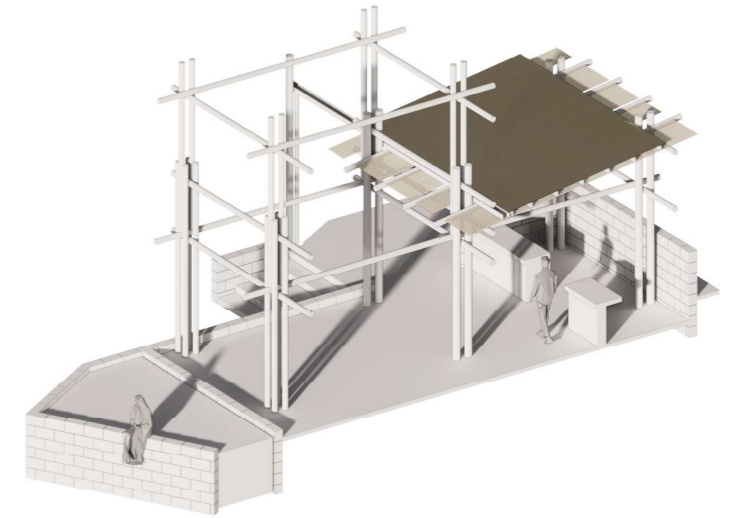
Figure 7.27. Detail A3 (Author 2021)



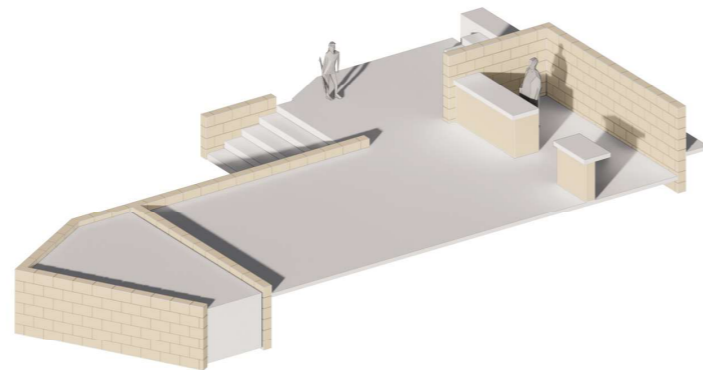
1 - Horizontal planes



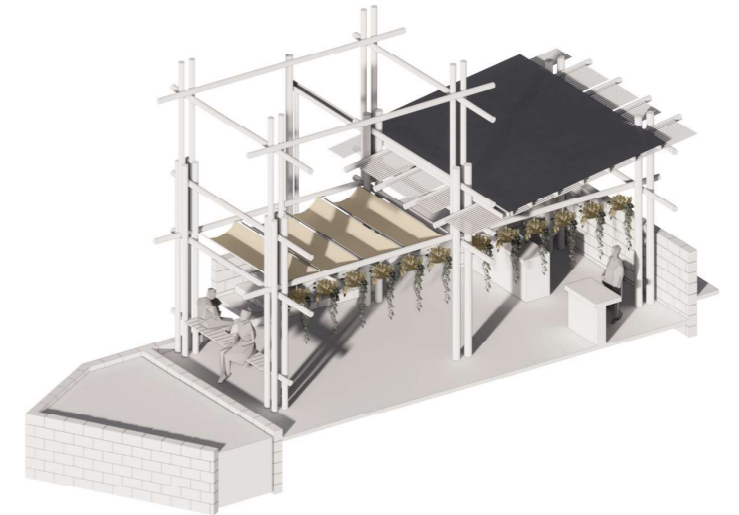
4 - Covering



2 - Concrete block retaining walls



5 - Attachment and ownership



3 - Eucalyptus pole frame

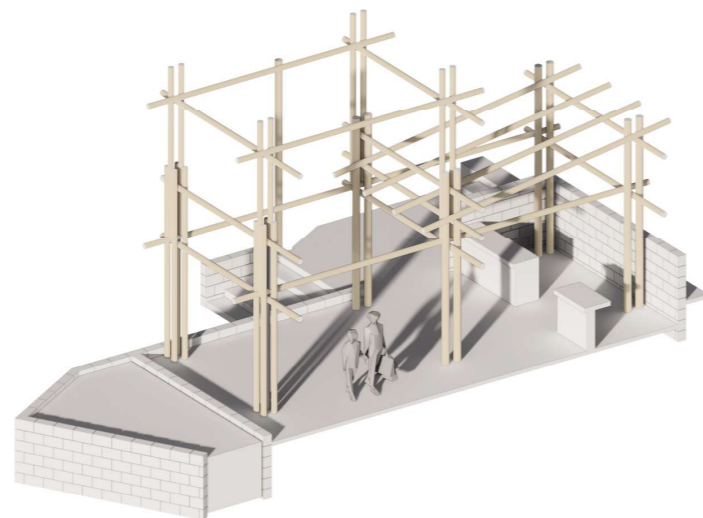


Figure 7.28. Structural appropriation A (Author 2021)



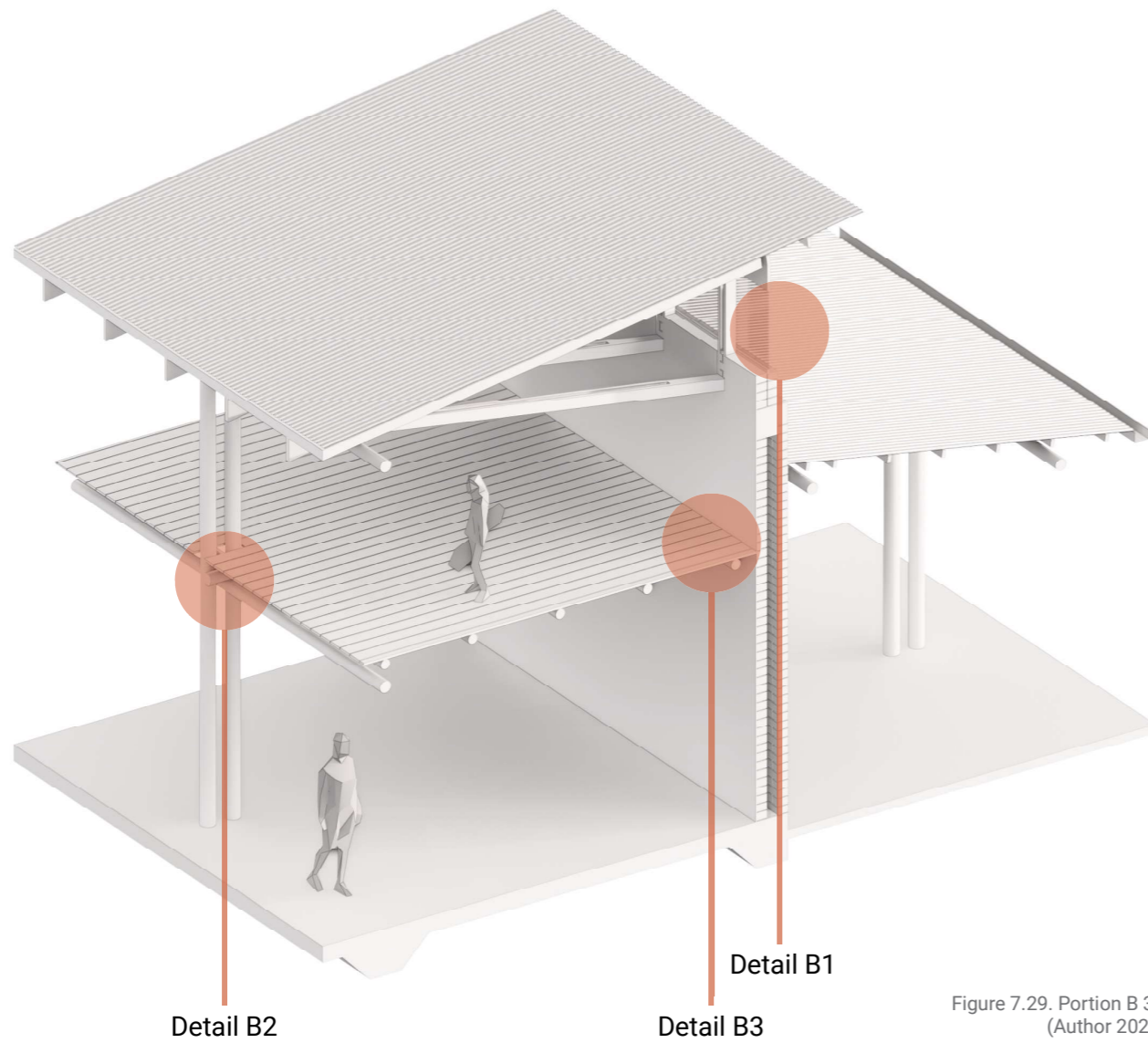


Figure 7.29. Portion B 3D (Author 2021)

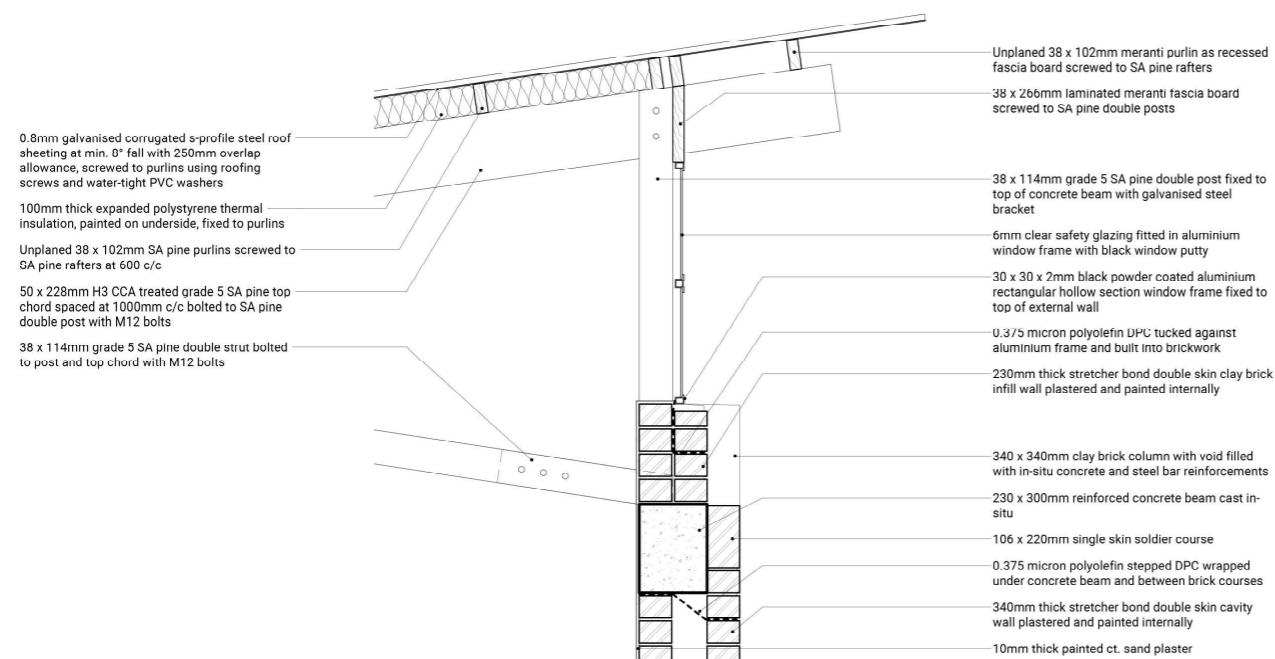


Figure 7.30. Detail B1 (Author 2021)

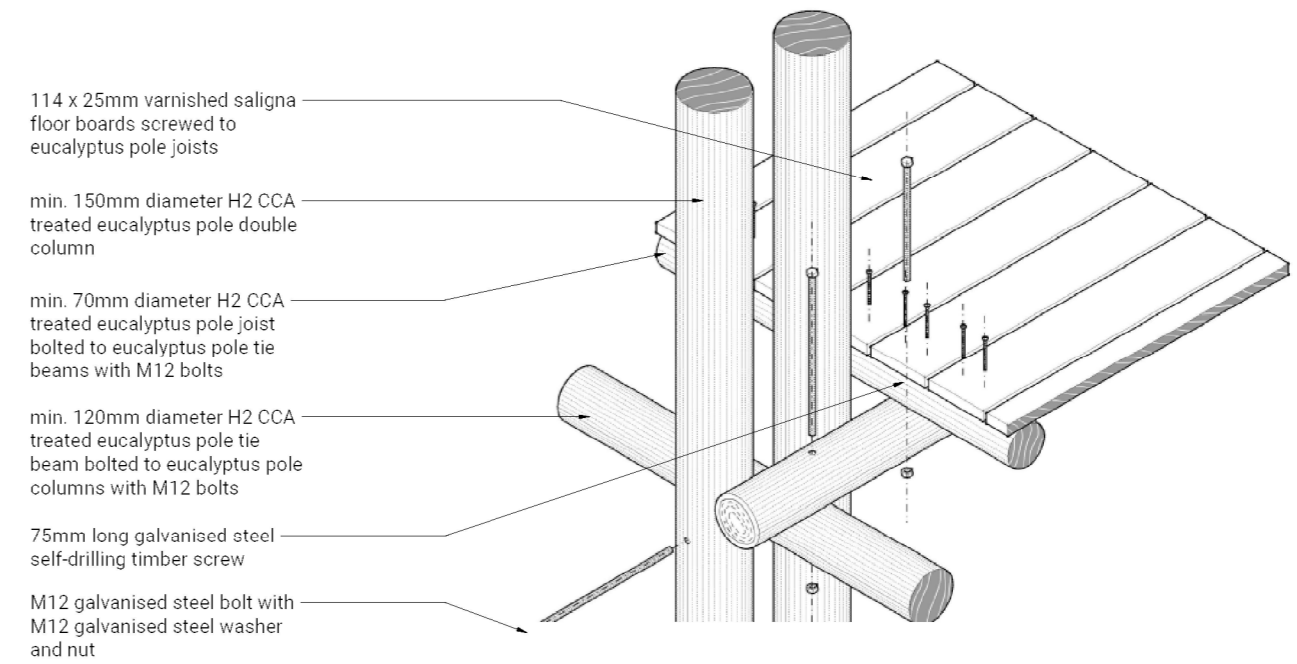


Figure 7.31. Detail B2 (Author 2021)

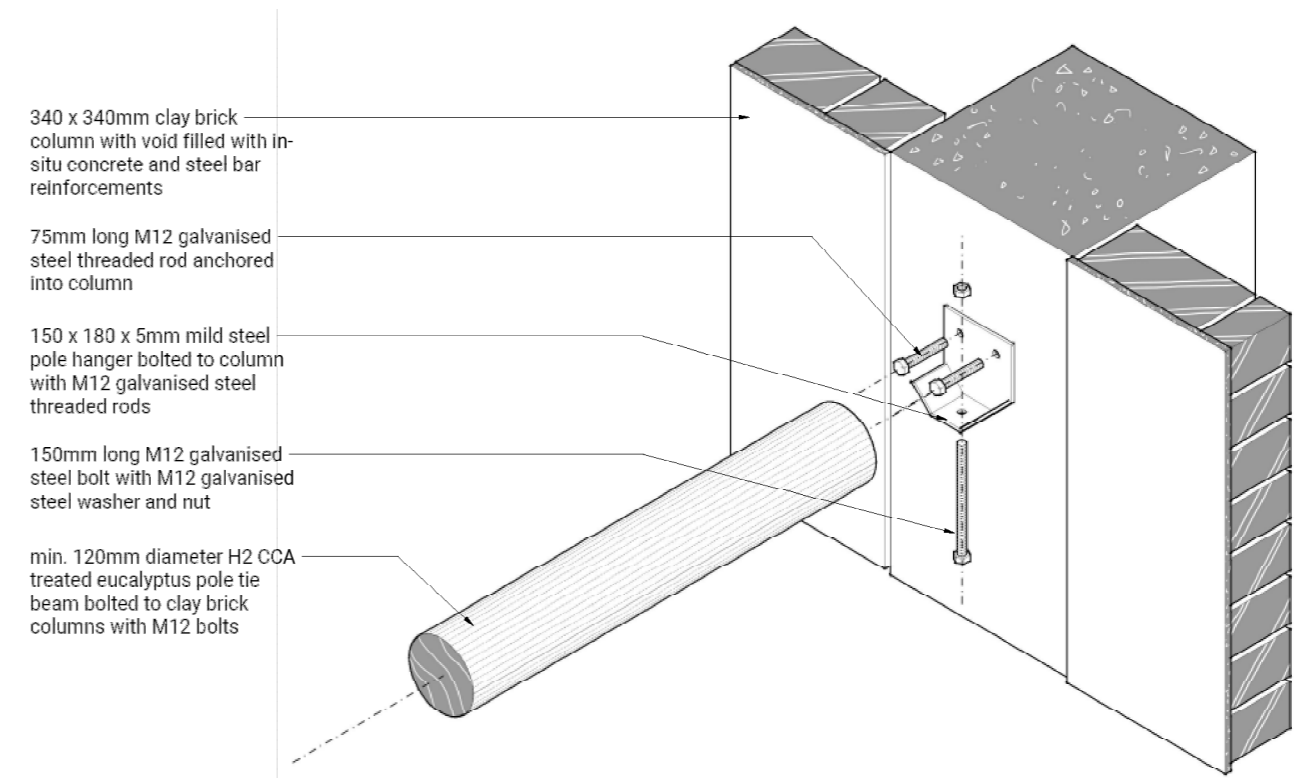
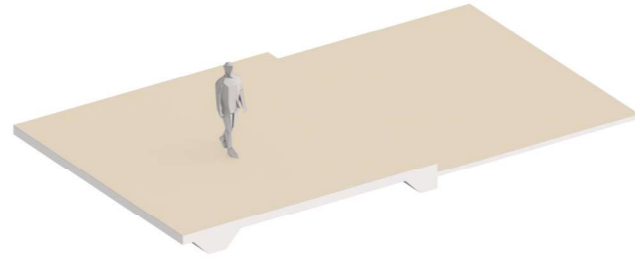


Figure 7.32. Detail B3 (Author 2021)



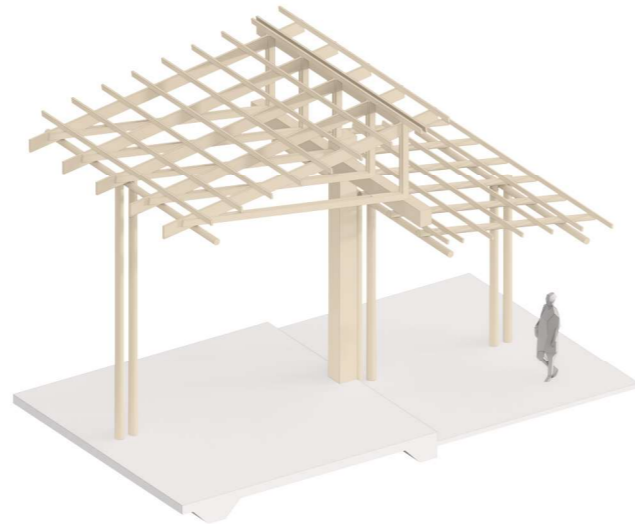
1 - Horizontal planes



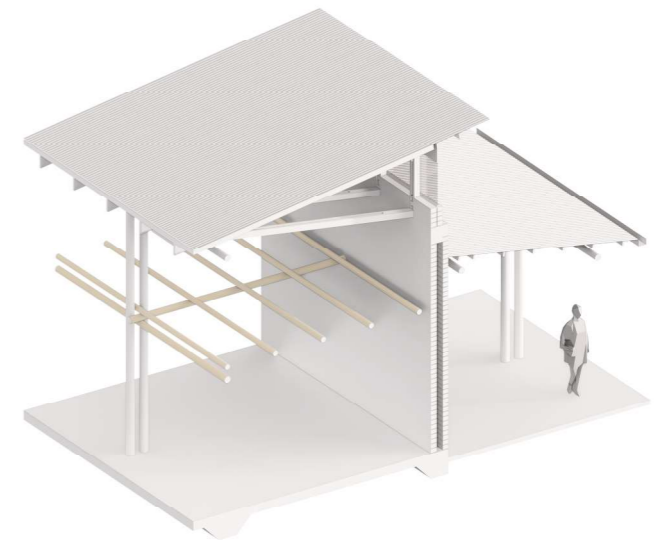
4 - Clay brick infill walls



2 - Concrete and timber frame



5 - Additional mezzanine frame



3 - Covering



6 - Mezzanine platform

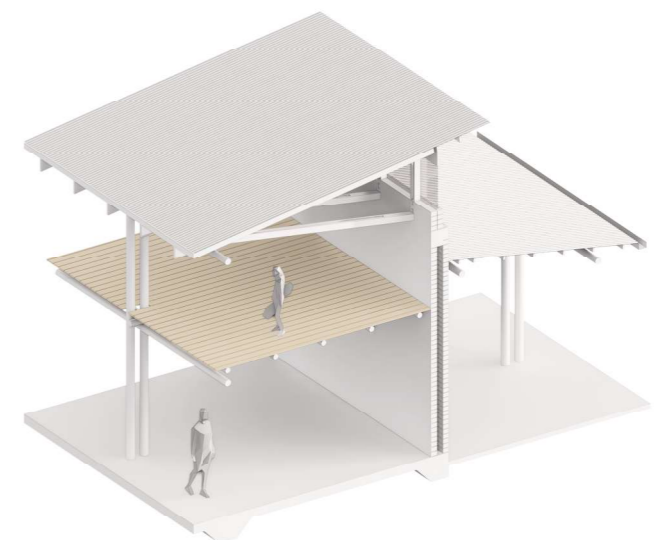


Figure 7.33. Structural appropriation B (Author 2021)



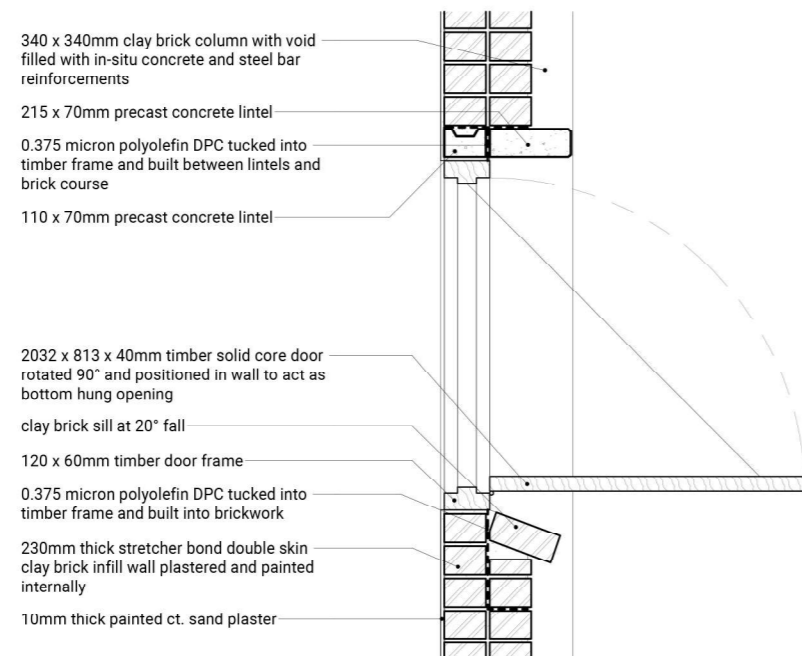
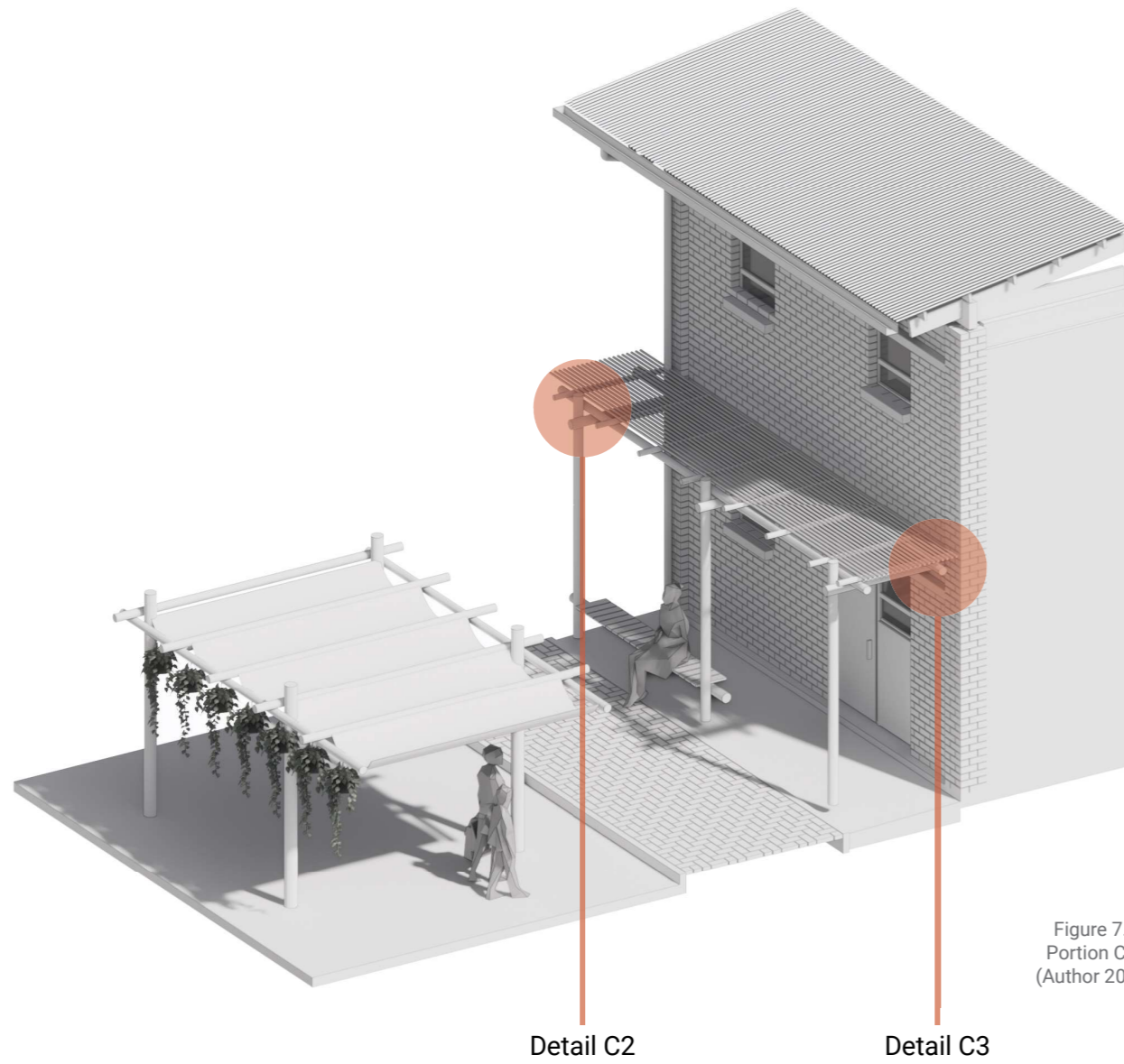


Figure 7.35. Detail C1 (Author 2021)

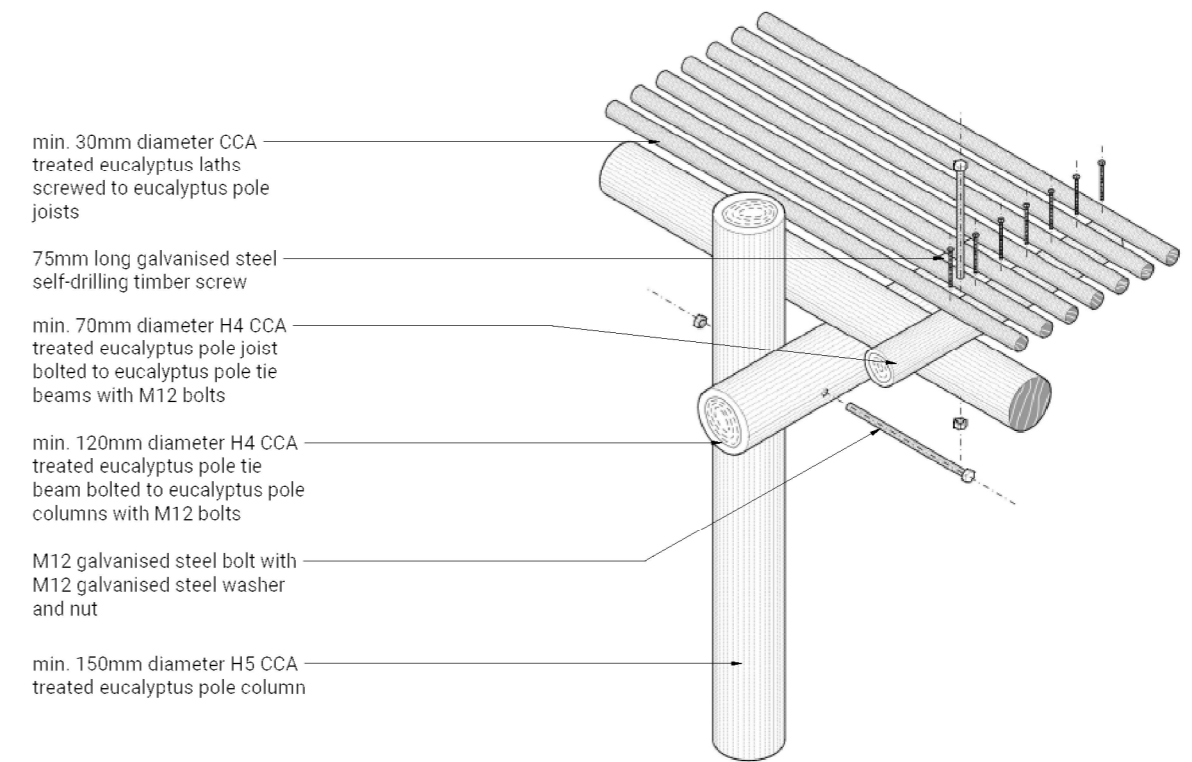


Figure 7.36. Detail C2 (Author 2021)

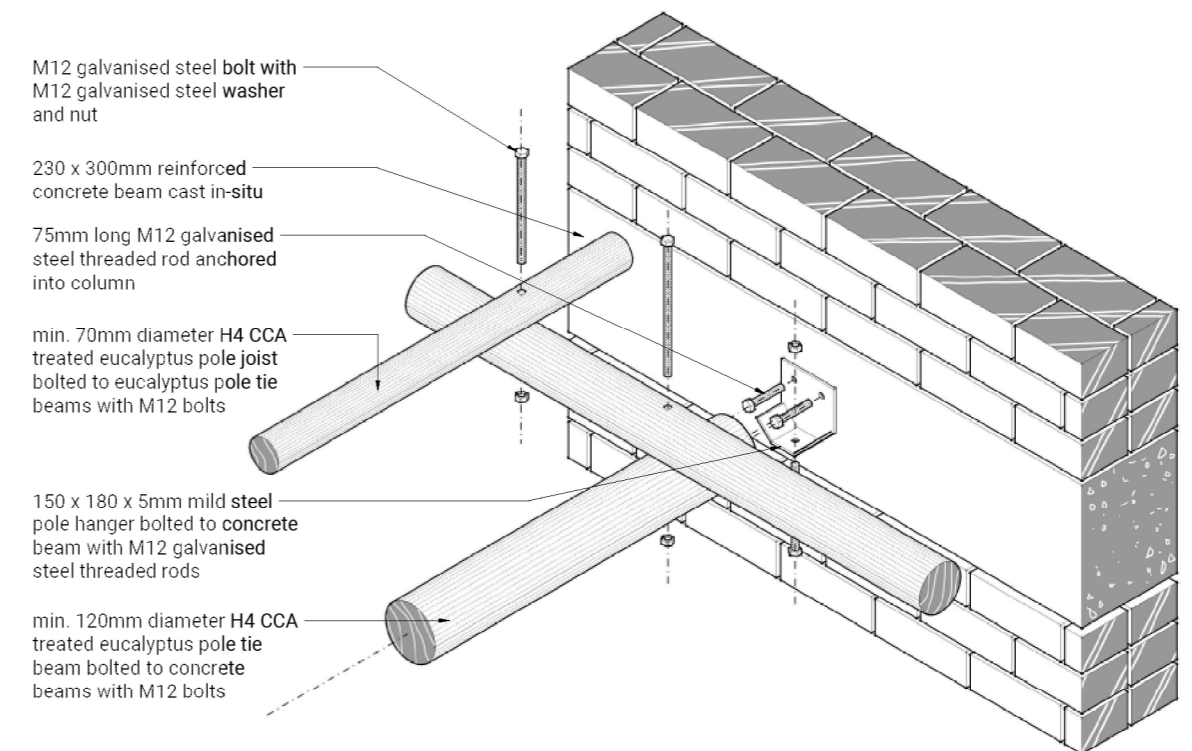
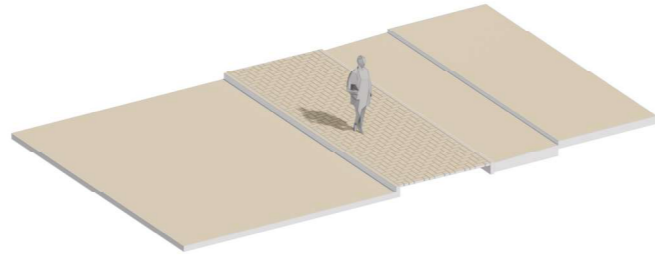


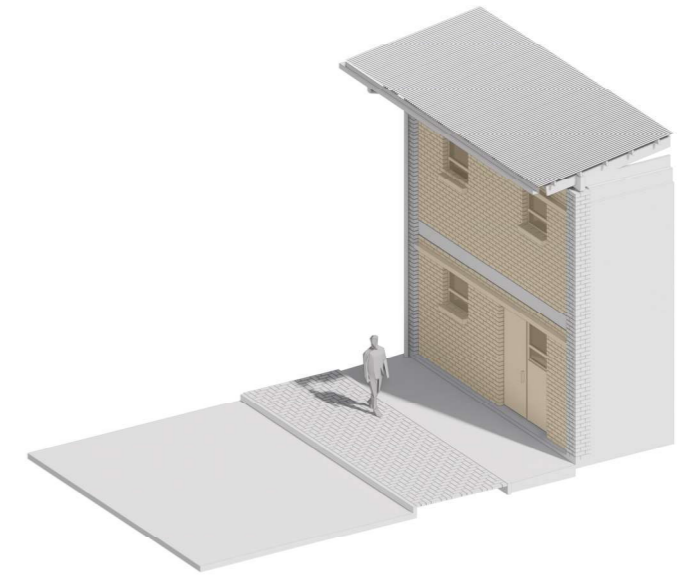
Figure 7.37. Detail C3 (Author 2021)



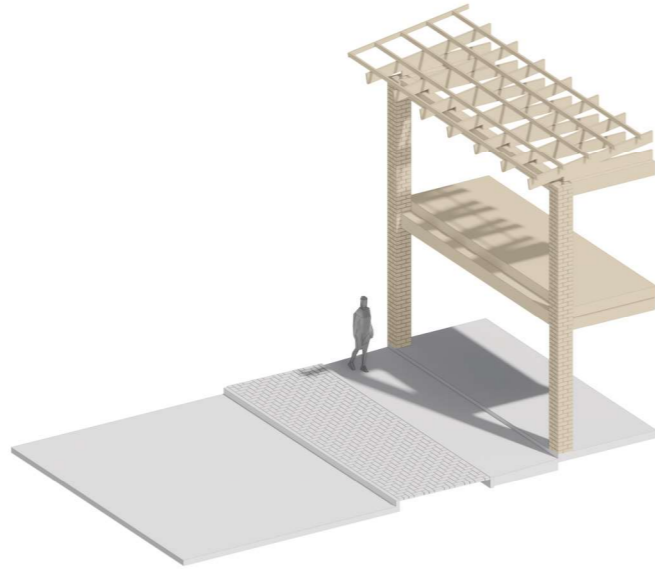
1 - Horizontal planes



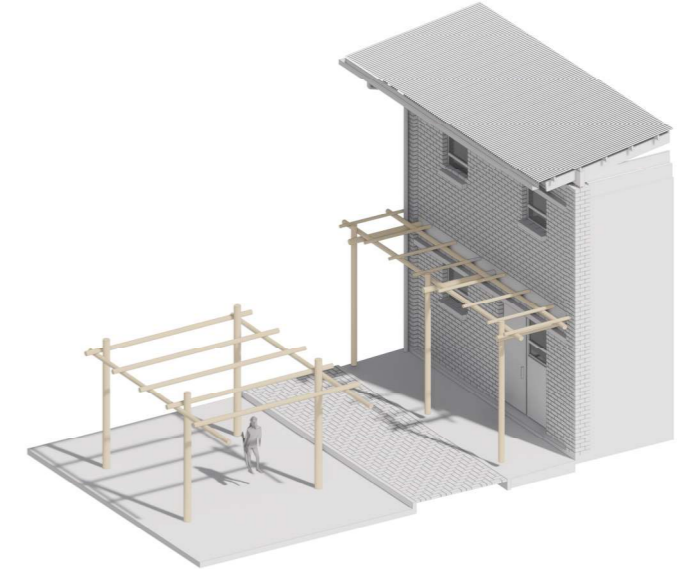
4 - Plastic brick infill walls



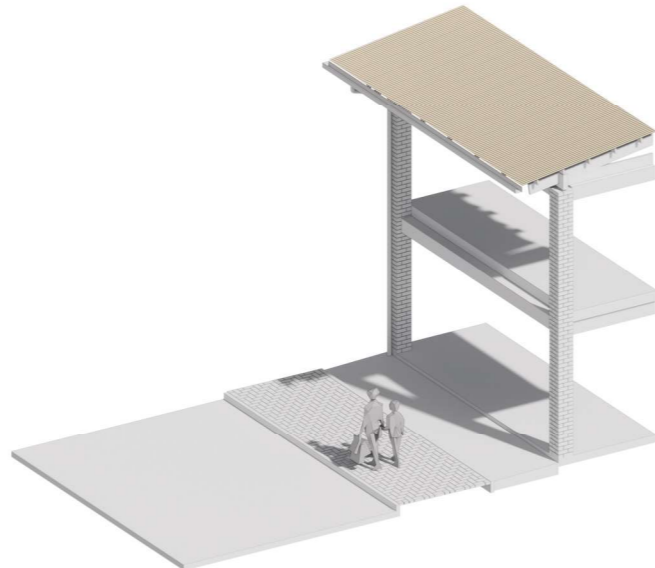
2 - Concrete and timber frame



5 - Additional frame



3 - Covering



6 - Additional covering

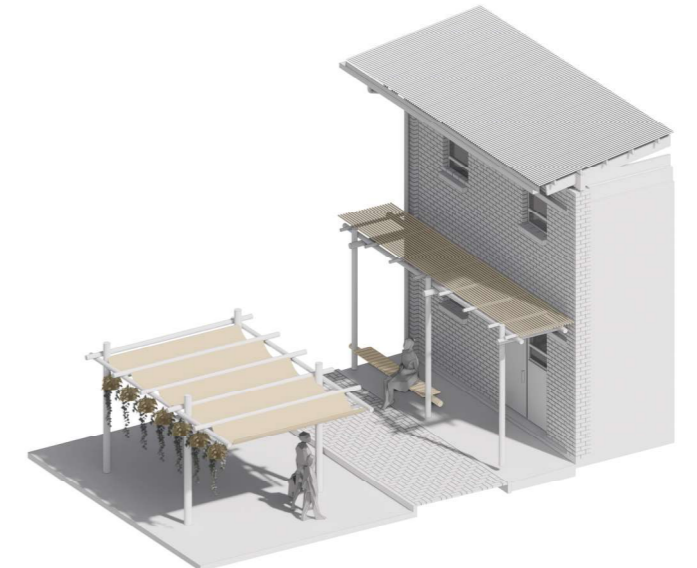


Figure 7.38. Structural appropriation C (Author 2021)



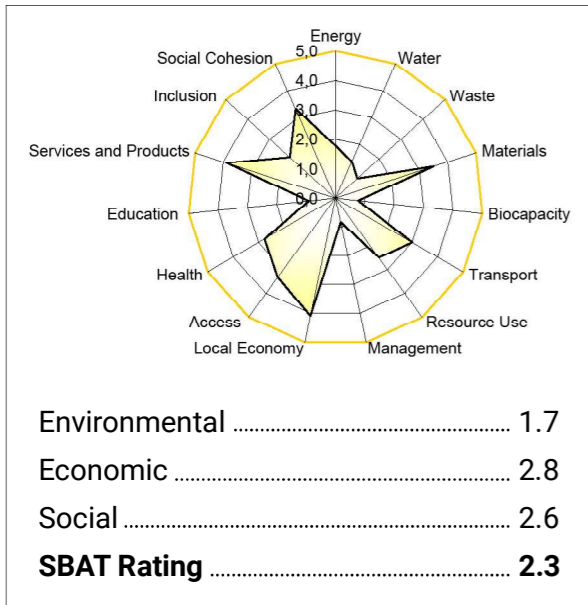


Figure 7.39. SBAT analysis of site pre-intervention (Author 2021)

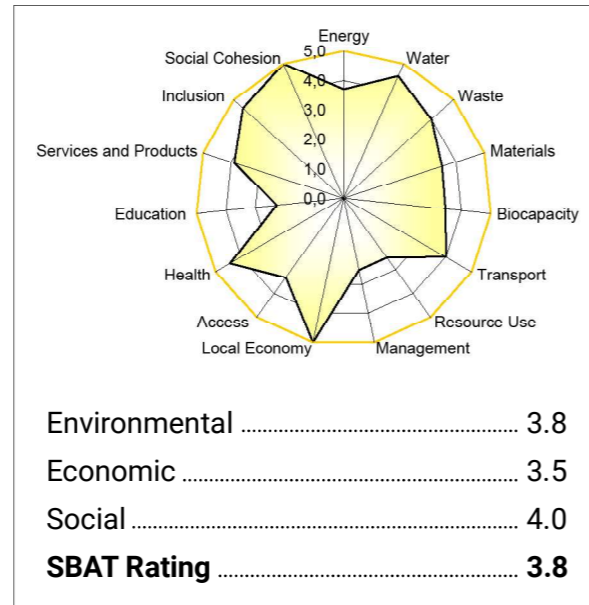


Figure 7.40. SBAT analysis of site post-intervention (Author 2021)

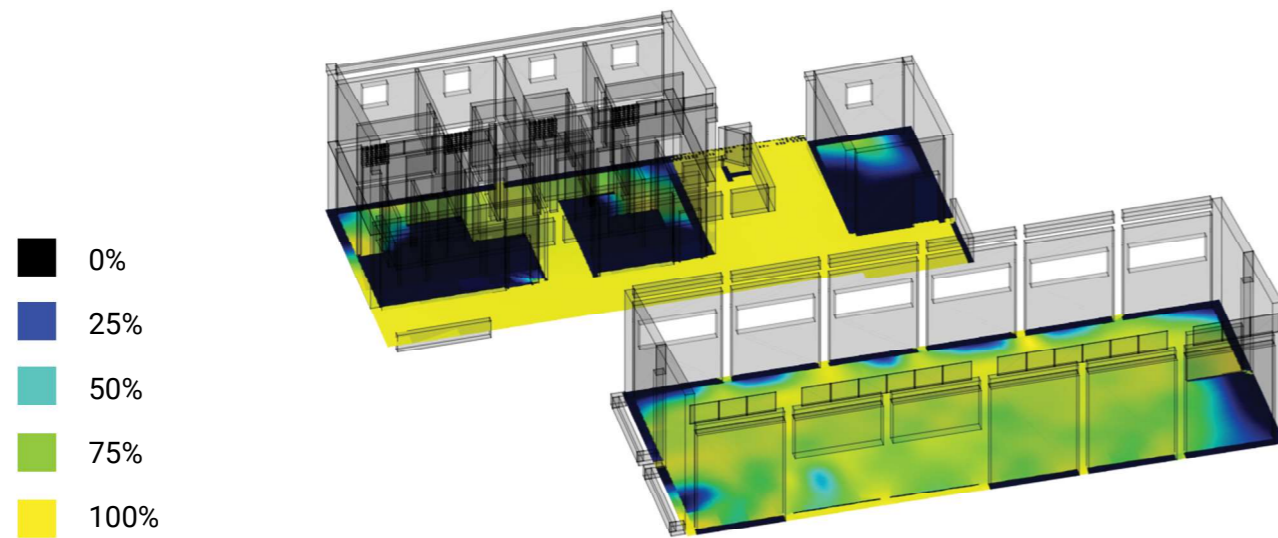


Figure 7.41. Daylight visualisation (Author 2021)

01 Catchment Area	
Surface	Area (m <sup>2</sup> )
Pitched roofs	1463
Permeable paving	1124
Total possible catchment area	2587
Runoff coefficient	0.9
Effective catchment area	2328.3

02 Rainwater yield		
Month	Av. rainfall (m)	Yield (m <sup>3</sup> ) (Yield = P*A)
January	0.12	279.396
February	0.106	246.800
March	0.091	211.875
April	0.033	76.834
May	0.022	51.223
June	0.006	13.970
July	0.01	23.283
August	0.021	48.894
September	0.07	162.981
October	0.12	279.396
November	0.14	325.962
December	0.12	279.396
Annual average yield	0.072	166.667

Building & site water consumption						
Fixture	Quantity	Usage (l)	Times used per day per fixture	Total daily usage (l)	Daily 1000 litres (m <sup>3</sup> )	Monthly 1000 litres (m <sup>3</sup> )
Toilet	24	2	5	240	0.24	7.32
Handwash basins	22	0.5	3	33	0.03	1.01
Showers	14	30	2	840	0.84	25.62
Subtotal				1113	1.11	33.95

Irrigation consumption				
Season	Area (m <sup>2</sup> )	Coefficient	Daily 1000 litres (m <sup>3</sup> )	Monthly 1000 litres (m <sup>3</sup> )
Summer	560	0.125	0.07	2.135
Winter	560	0.16	0.09	2.7328
Subtotal				4.8678
Total system demand				38.81

Water budget (accumulative)				
Month	Yield (m <sup>3</sup> /month)	Demand (m <sup>3</sup> /month)	Monthly Balance (m <sup>3</sup> )	Volume in tank (m <sup>3</sup> )
January	279.396	36.085	243.311	1146.108
February	246.8	36.085	210.715	1356.823
March	211.875	36.085	175.79	1532.613
April	76.834	36.683	40.151	1572.764
May	51.2223	36.683	14.540	1587.304
June	13.97	36.683	-22.713	1564.591
July	23.283	36.683	-13.400	1551.191
August (Start month)	48.894	36.683	12.211	0
September	162.981	36.683	126.298	126.298
October	279.396	36.085	243.311	369.609
November	325.962	36.085	289.877	659.486
December	279.396	36.085	243.311	902.797
Annual average	166.667	36.384	130.284	

Figure 7.42. Water harvesting calculations (Author 2021)





## Faculty of Engineering, Built Environment and Information Technology

Fakulteit Ingenieurswese, Bou-omgewing en  
Inligtingtegnologie / Lefapha la Boetšenere,  
Tikologo ya Kago le Theknolotši ya Tshedimošo

Reference number: EBIT/259/2020

Dr C Combrinck  
Department: Architecture  
University of Pretoria  
Pretoria  
0083

Dear Dr C Combrinck

### **FACULTY COMMITTEE FOR RESEARCH ETHICS AND INTEGRITY**

Your recent application to the EBIT Research Ethics Committee refers.

Conditional approval is granted.

This means that the research project entitled "Urban Citizen Studios: Public Interest Design" is approved under the strict conditions indicated below. If these conditions are not met, approval is withdrawn automatically.

#### **Conditions for approval**

Conditional approval on the understanding that:

- Applications from each student (including application forms and all necessary supporting documents such as questionnaire/interview questions, permission letters, informed consent form, researcher declaration etc) will need to be checked internally by the supervisor. A checklist will need to be signed off after the checking.
- All of the above will need to be archived in the department and at the end of the course a flash disc / CD clearly marked with the course code and the protocol number of this application will be required to be provided to EBIT REC administrator.
- Any personal and demographic data (eg gender, income, education) have provided the motivation that is acceptable based on the supervisor's evaluation.
- Students using organizations data not publicly available or collecting data from employees have the permissions in place.
- No data to be collected without first obtaining permission letters. The permission letter from the organisation(s) must be signed by an authorized person and the name of the organisation(s) cannot be disclosed without consent.
- Images and observation of people will require consent. Images and observation of minors are prohibited.

This approval does not imply that the researcher, student or lecturer is relieved of any accountability in terms of the Code of Ethics for Scholarly Activities of the University of Pretoria, or the Policy and Procedures for Responsible Research of the University of Pretoria. These documents are available on the website of the EBIT Ethics Committee.

If action is taken beyond the approved application, approval is withdrawn automatically.

According to the regulations, any relevant problem arising from the study or research methodology as well as any amendments or changes, must be brought to the attention of the EBIT Research Ethics Office.

The Committee must be notified on completion of the project.

The Committee wishes you every success with the research project.

#### **Prof K.-Y. Chan**

Chair: Faculty Committee for Research Ethics and Integrity  
FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY