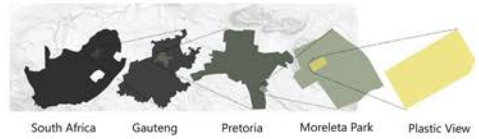
Figure 9.0: Final Presentation, Photograph, Author (2016)

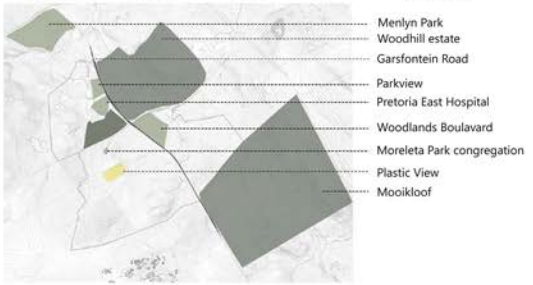
9 Final Presentation

Common Ground

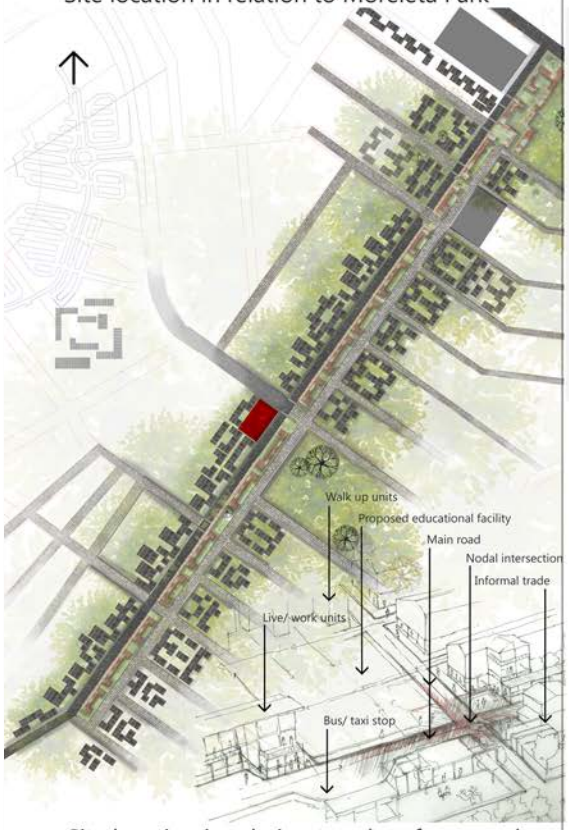
Finding commonality in an integrative communal educational environment

Site location



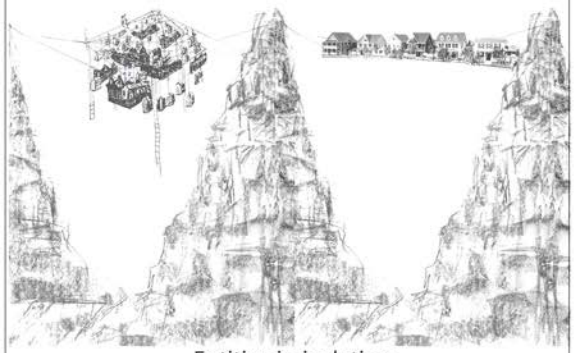


Site location in relation to Moreleta Park

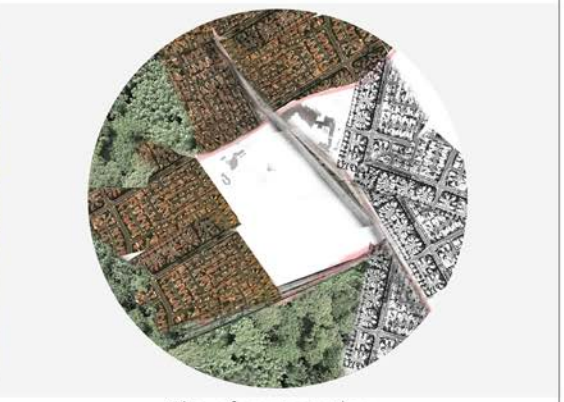


Site location in relation to urban framework and surrounding fabric

Issues



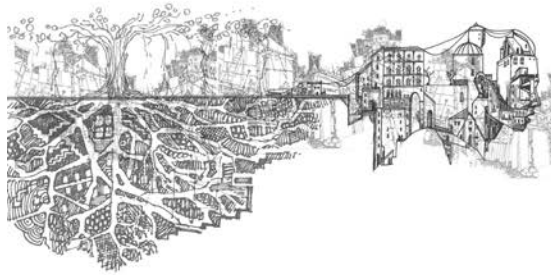
Entities in isolation



Site of contestation

Lack of access to basic amenities

Urban Intentions



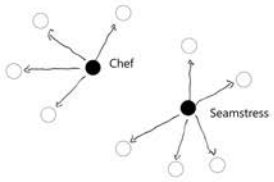
Integration of entities

Site of conciliation

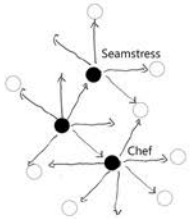
Access to basic amenities

 Figure 9.1: Final Presentation page 1, Author (2016)

Project Intentions



Current learning networks



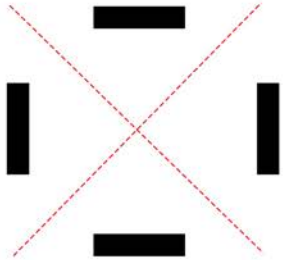
Finding commonality in a place of learning

Strengthen currently active learning networks

Components organised in extended school to form architectural unity

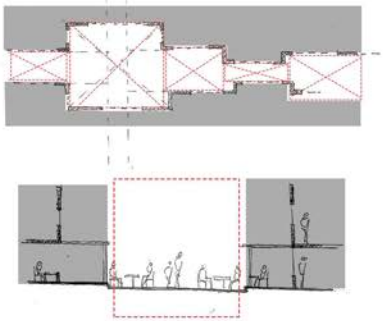
Space that permits common use | Components accessed from communal space | And take on the character of a central square

Community school integrated within environment



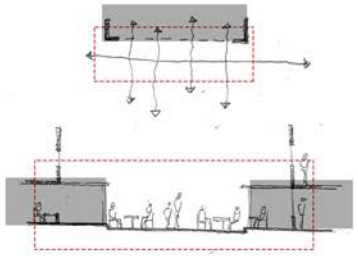
Extroverted educational approach

Programmatic Intentions



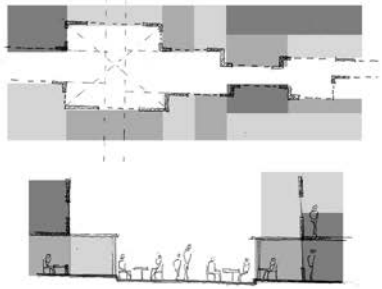
The programmes frame in-between space where interaction between the learners and community can take place

Spaces of interaction



Local amenities are situated on the main axis in order to create an accessible environment which caters for the needs of the whole community

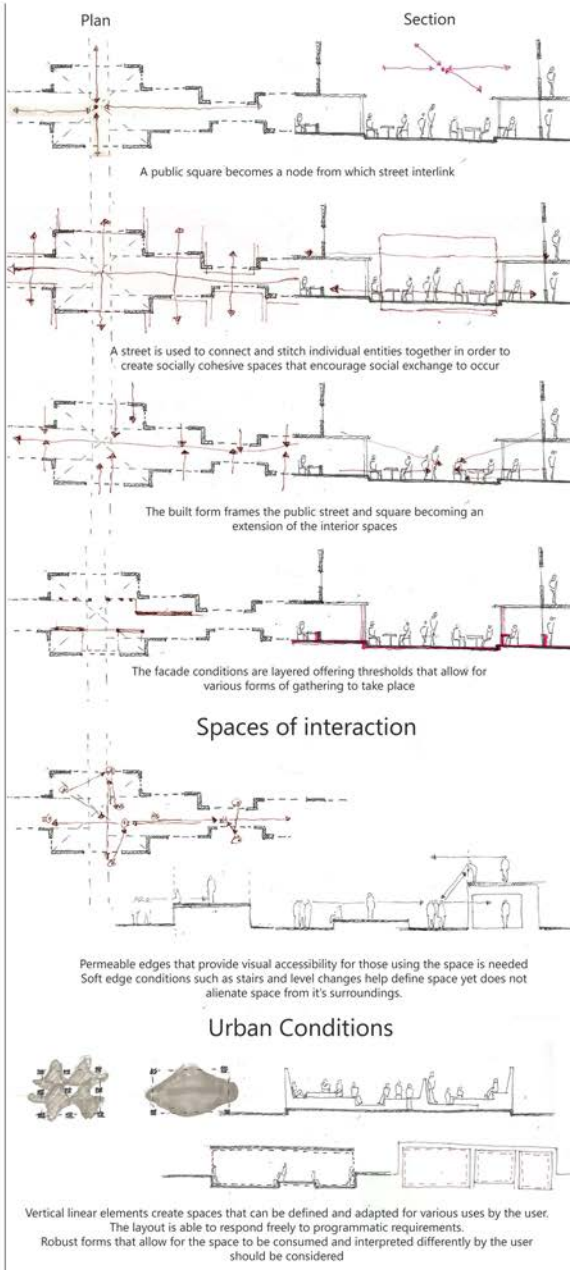
Urban Conditions



The programmes need to be able to be adapted and transformed in oder to suit the needs of the community

Multifunctionality

Architectural Intentions



Contextual informants

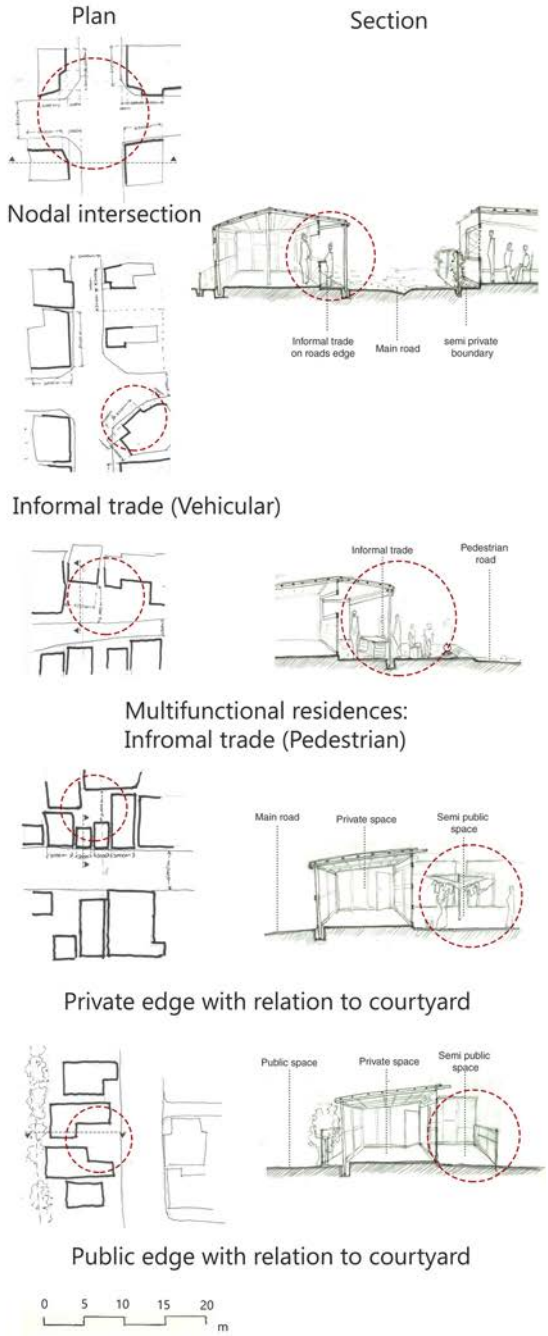
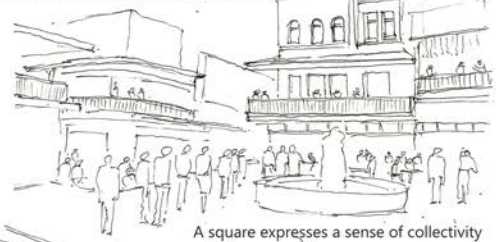


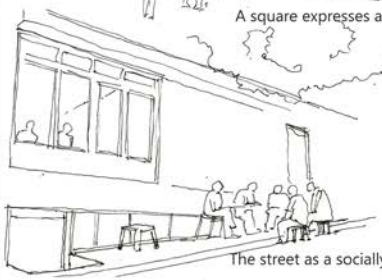
Figure 9.2: Final Presentation page 2, Author (2016)

Theoretical support and conceptual development

The street as a socially cohesive element



A square expresses a sense of collectivity



The street as a socially interactive element

Learning environment seen as a mico city

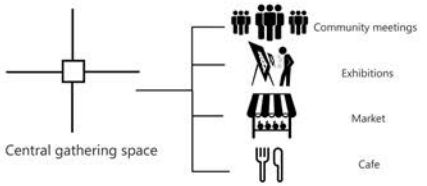
Street in Alaska, Mamelodi

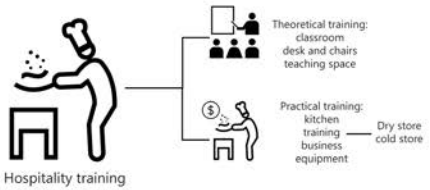
Street in Plastic View, Moreleta Park

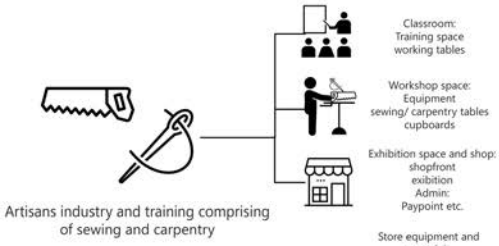
Learning street

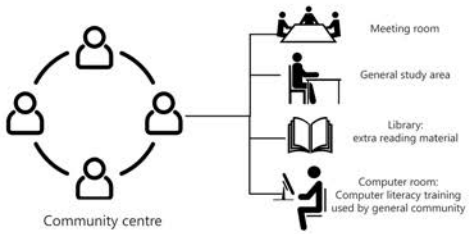
Educational facilities should consist of both streets and squares forming a small city which encourages the greatest amount of social contact between people. (Hertzberger 2008:123)

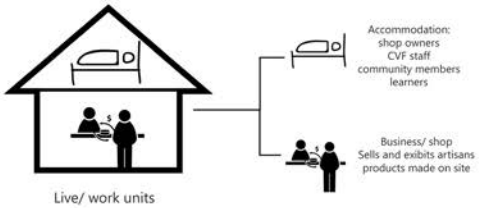
Programmatic approach: first design proposal

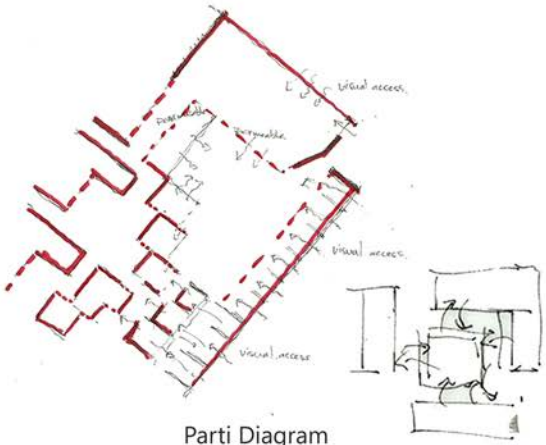




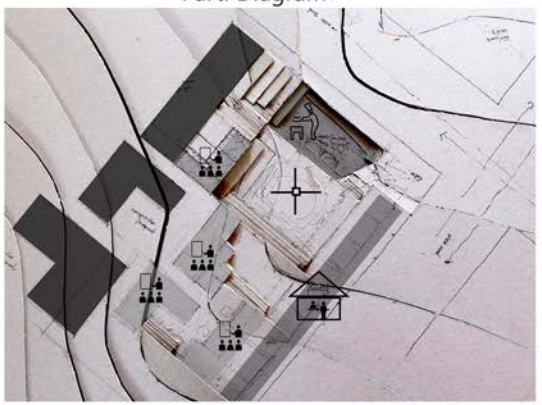




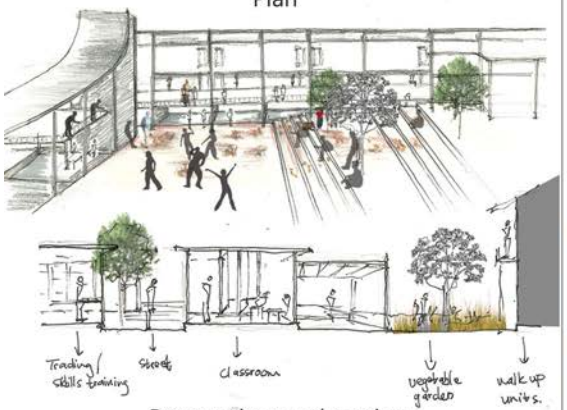




Parti Diagram



Plan

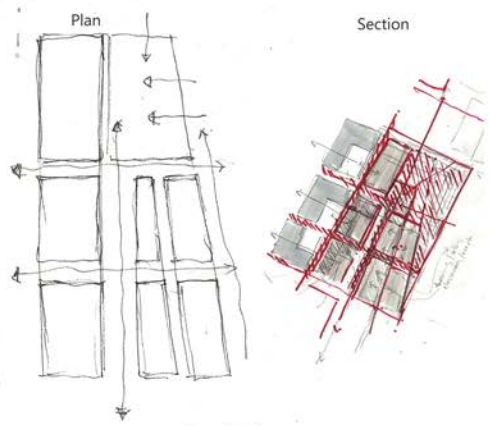


Perspectives and section

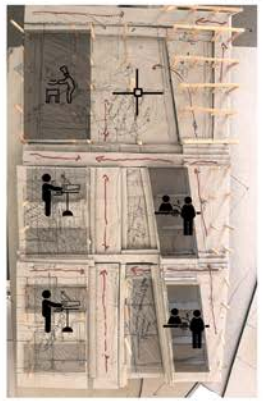
The first design proposal was an intuitive reaction to initial theory by Hertzberger (2008). It responds to the notion that public meeting spaces can act as a catalyst in order to find common ground between the users of the building and the surrounding community.

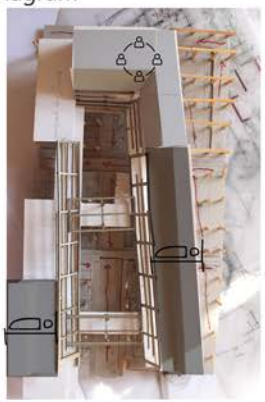
The model begins to explore how the in-between space can be framed by walls and columns, level differences and thresholds thus spatially exploring how a building frames negative space. The model also investigates how the edge conditions can be activated in order to draw people onto the site.

Design Iteration 1



Parti Diagram





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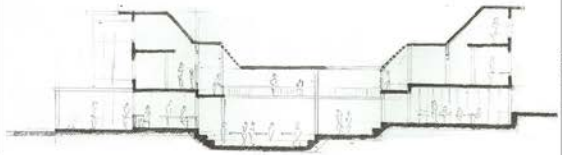
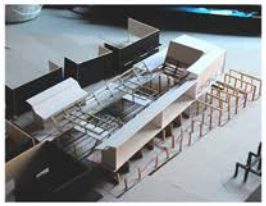
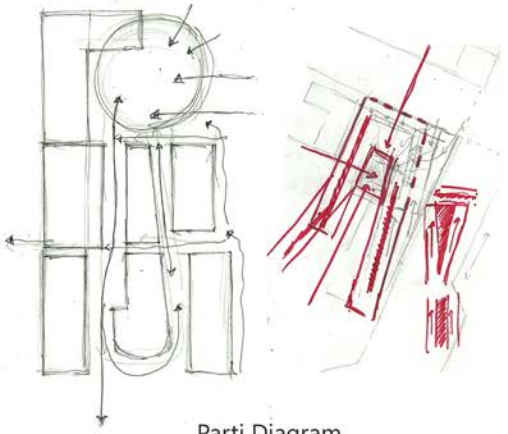




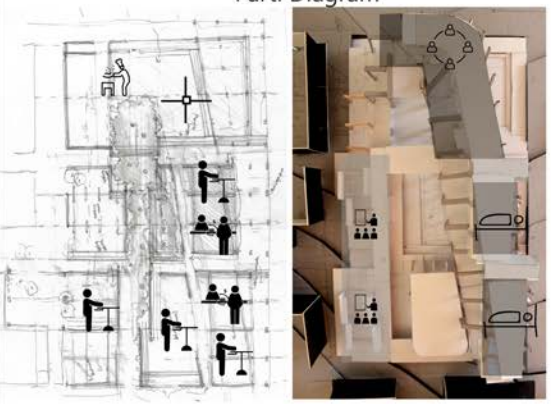
Section and model

A rudimentary approach to this iteration was taken as the architectural intent was still being explored and discovered. This proposal explores how the roof can become a defining element. The roof is interpreted as an element which moulds and defines spaces where interaction can take place between people which relates back to theory on an extended school approach (Hertzberger's 2008).

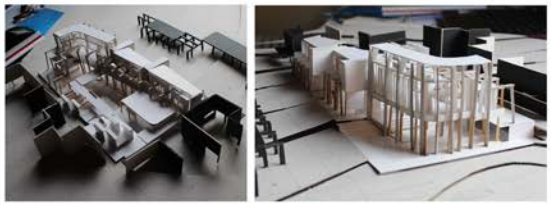
Design Iteration 2



Parti Diagram



Plan

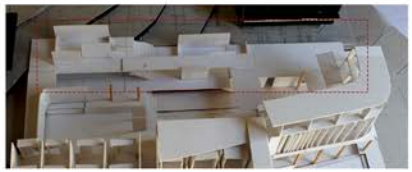


Sketches and model

In support of considering the facade of the building as a defining element, a relation is drawn to Lefebvre's (1987) theory on the production of space. Lefebvre (1987) suggests that people shape space naturally, socially and simply by how they use it every day. It is then intended that the architectural form explored defines space and programme well not limiting the extent to which the structure can be inhabited, changed and appropriated by the users. Lefebvre's (1987) theory of how space can be perceived supports the notion of the facility as a microcosm of society where people are able to socially interact with one another in society.

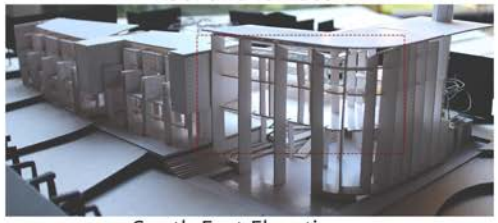
Model Development

Accommodation units



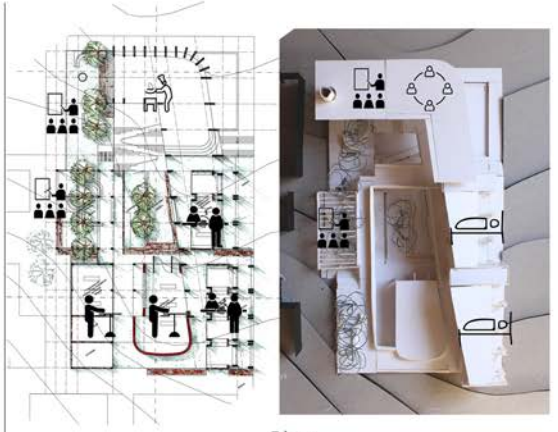
Theoretical training

Roof and furnace



South East Elevations

Design Iteration 3

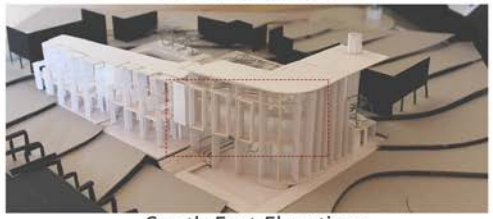


Plan

Accommodation units

Theoretical training

Roof and furnace

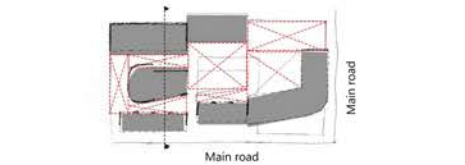


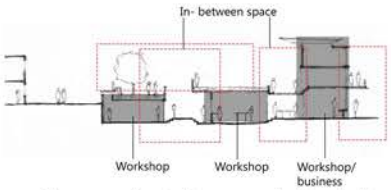
South East Elevations

Figure 9.3: Final Presentation page 3, Author (2016)

Figure 9.4: Final Presentation page 4, Author (2016)

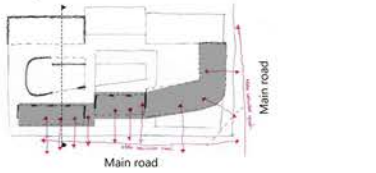
Programmatic Reflection

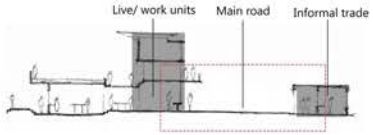




The programmes frame in-between space where interaction between the learners and community can take place

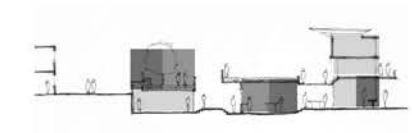
Spaces of interaction





Local amenities are situated on the main axis in order to create an accessible environment which caters for the needs of the whole community

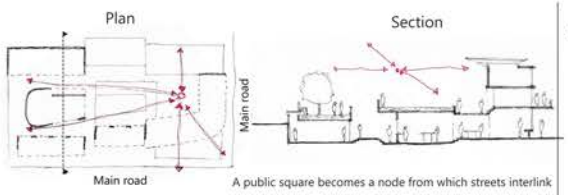
Urban conditions

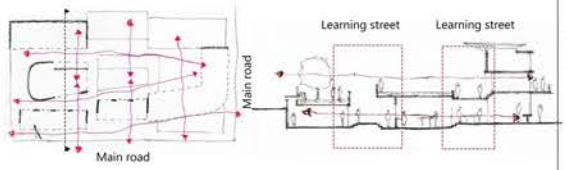


The programmes need to be able to be adapted and transformed in order to suit the needs of the community.

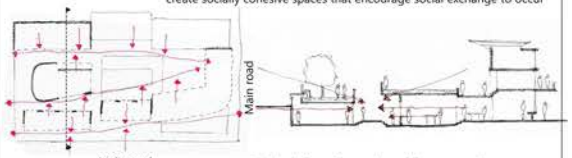
Multifunctionality

Architectural Reflection

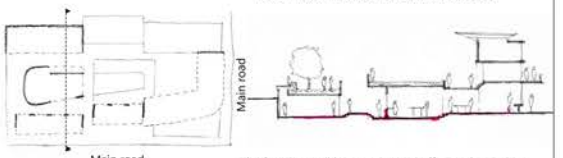




A street is used to connect and stitch individual entities together in order to create socially cohesive spaces that encourage social exchange to occur

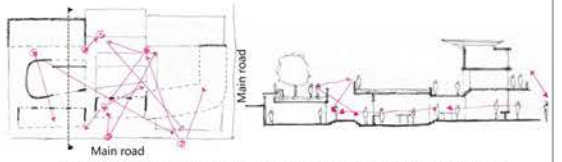


The built forms frame the public street and square becoming an extension of the interior spaces



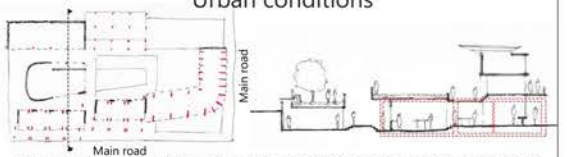
The facade conditions are layered offering thresholds that allow for various forms of gathering to take place

Spaces of interaction



Permeable edges that provide visual accessibility for those using the space is needed.
Soft edge conditions such as stairs and level changes help define space yet does not alienate space from its surroundings.

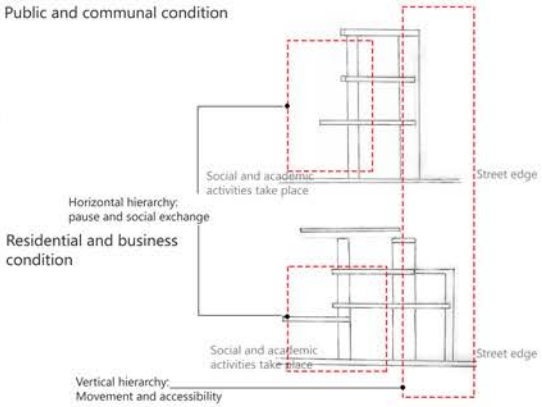
Urban conditions



Vertical linear elements create spaces than can be defined and adapted for various uses by the user.
The layout is able to respond freely to programmatic requirements.

Multifunctionality

Structural intent

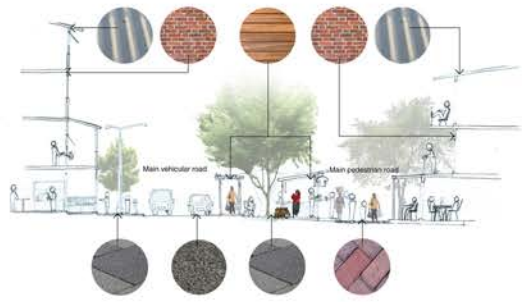


Structural intent

Exposed frame and infill

Hidden frame and infill

Contextual informants



Urban framework materiality

Structural Composition

Horizontal and vertical structural components:

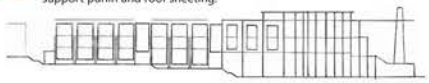
_Vertical structural concrete column sizes: 300x2000mm, 300x1000mm and 300x300mm. With an off shutter concrete finish.
_Horizontal 255mm reinforced concrete floor slabs are cast in place. The slab is either power floated or a 25mm screed is put on top of concrete surface with flooring material as a finish.

Concrete roof (Resource centre)

_255mm reinforced cast in place concrete roof with 80mm "lambda board" insulation layer, followed by screed to fall min 25mm, a "Torch on" waterproofing layer on top of screed, the entire waterproofed area to have a crushed stone overlay.
_500mm Reinforced cast in place concrete up stand beam on inner concrete roof edge, with precast concrete coping over concrete up stand.

Light weight roof structure (Accommodation)

_"Klip-lok" 406 profile roof sheeting @ min 2 degree pitch with global coat finish
_150x75x20x3.0 Cold formed lipped channel purlins that offer support for the roof sheeting, 80mm structural "lambda board" insulation to be installed over the purlin.
_305x165 Galvanized mild steel parallel flange section with tapered ends used to support purlin and roof sheeting.



Primary Components

Brick in fill:

_ Non load bearing 230mm brick walls to acts as infill structure.
_ Face brick Roan travertine red brick, stretcher bond, racked joint finish.

Secondary components

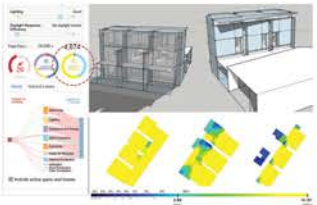
_ Precast concrete seating with intermediate concrete support
_ Brick on edge stair nosing
_ Intensive green roofs are used that act as roof insulation as well as help dampen sound produced in the workshops.

Tertiary components

Figure 9.5: Final Presentation page 5, Author (2016)

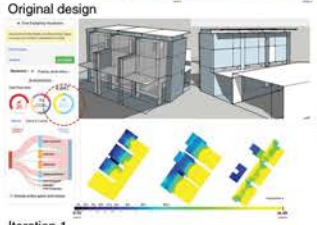
Figure 9.6: Final Presentation page 6, Author (2016)

Sefaira



Daylight factor over 5% causing glare in internal spaces

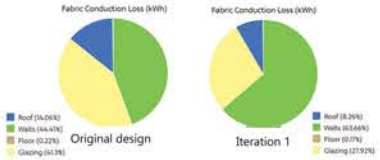
Original design



Daylight factor of above 2% and below 5% indicating they are well lit

Iteration 1

Daylight factor

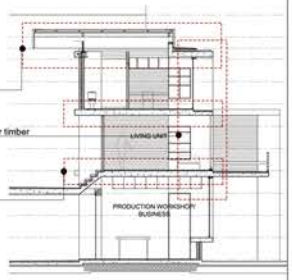


Minimising heat loss

- Minimise roof conduction loss
SANS 10400: Min roof R-Value 3.2 m2K/W
Additional insulation needed min R= 2.85 m2K/W
80mm lambda board insulsiton used R= 3.33 m2K/W

- Minimise glazing conduction loss:
uPVC frames are used as they are more air tight than aluminium or timber frames.
low-E glass is used.

-Minimise floor conduction loss (on first and second floor):
SANS 10400: min floor R- value 1 m2K/W.
255mm concrete slab R= 0.17m2K/W.
Additional 25mm insulation (lambda board) R=1.04 m2K/W
Total R- value= 1.21 m2K/W

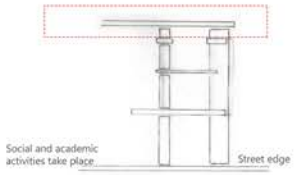


Section of accommodation

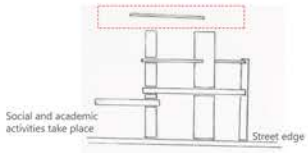
Sefaria, which is a performance based analysis, was used to pick up problem areas in the design. Sefaria is used to measure interior daylight factors, the energy usage and whether or not it is a cool or heat dominated space. The accommodation units which face an undesired South East and North West angle were analysed further.

Structural Iteration 1

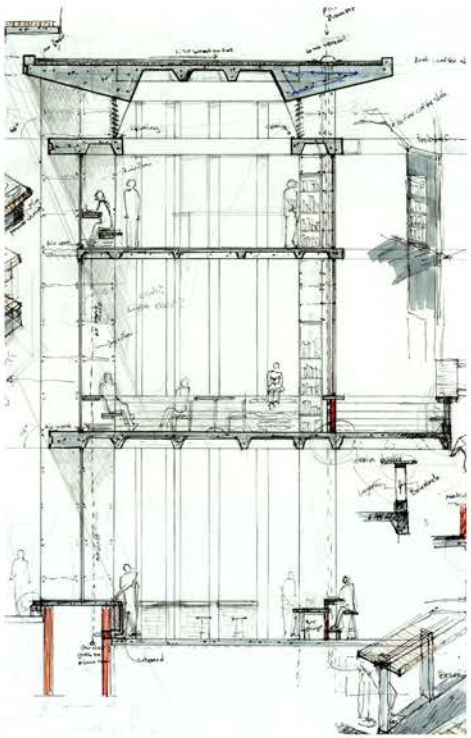
Public and communal condition



Residential and business condition



Structural intent



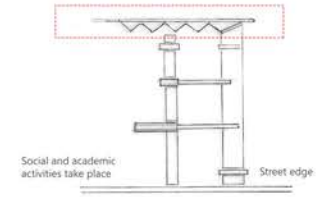
Section scale 1:50

Coffer slabs were used throughout the design in order to express the design and structural intent, which was to frame and define space through the structure. The idea was that the coffer slab could be manipulated to shape space.

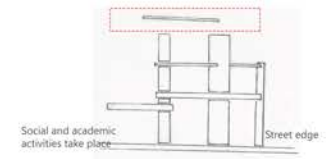
The critique received highlighted that the concrete coffer roof slab made the spaces feel unnecessarily heavy and that a light weight roof structure should be considered.

Structural Iteration 2

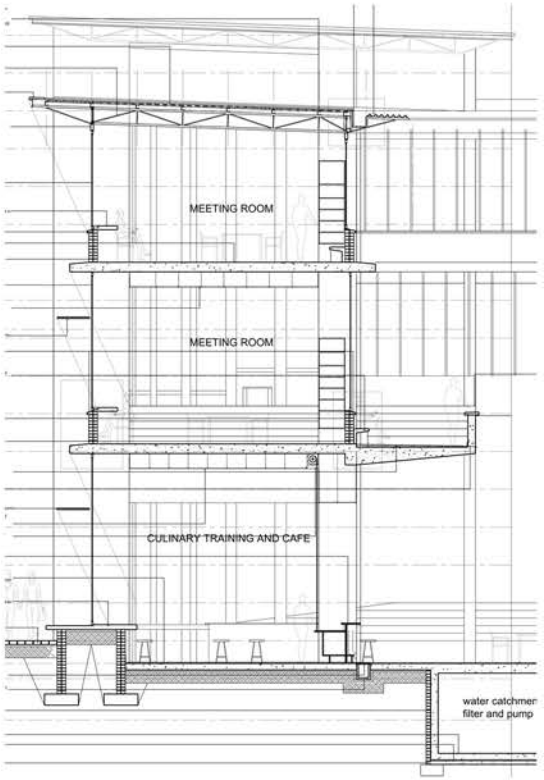
Public and communal condition



Residential and business condition



Structural intent



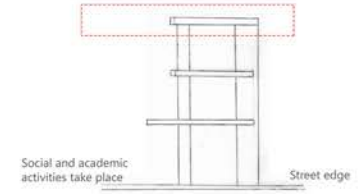
Section scale 1:50

A Circular Hollow Section (CHS) light weight roof structure and space frame structure were considered in this iteration. The light weight steel structure allowed more freedom with regards to the design of the roof.

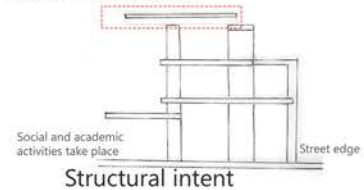
The CHS light weight roof truss proved to be problematic at junctions where the internal structure needed to be closed from external conditions as thermal bridging would occur. It was proving difficult to fix components, like lipped channel purlins to the CHS frame structure.

Structural Iteration 3

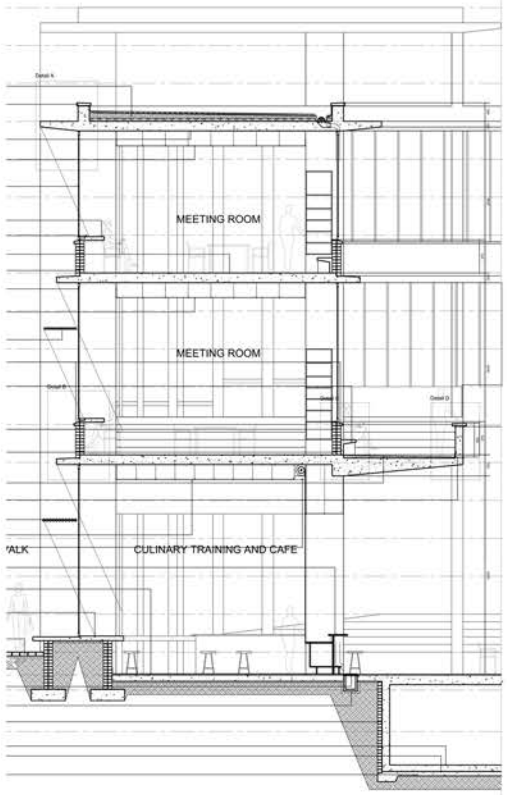
Public and communal condition



Residential and business condition



Structural intent



Section scale 1:50

The architectural language of the CFV explores the idea of repetition and order throughout the facade, this repetition of elements signifies social cohesion. Therefore a roof that acts as a unifying element is not needed as the ordered facade condition does this already. The roof becomes an extension of and ends off the facade of the building by expressing the individual components that make up the whole. The concrete roof, in the future, can also become a floor slab to a new level if more space is required.

Systems Calculations

Rainwater harvesting capacity: Roof: 745 m2x 90% = 670.5 m2
Paving: 961 m2 x 80%= 770 m2 lawn: 772 m2 x 10%= 72 m2
Total catchment area: 1513 m2
Annual rainfall: 573mm x 1513 m2 = 870 000 L

Grey water:
150L + 280L + 400 = 830 L per day
Toilets require 450 L of the grey water per day.

Water consumption:

Water consumption device	Water consumption (L)	No. of uses per day	Water consumption (L)
Flush toilet	9	50	450
Hand basins	3	50	150
Shower	40	7	280
Washing/ cleaning	20	20	400
		Consumption per day	1280
		Consumption per month	38 400

Rain water harvesting tanks:
Required capacity: No. of month low/no rainfall: 5 x 38 400 = 192 000 L
(2): Tank size = 8m x 8m x 2m
(3): Tank size= 4mx4mx3m

Water

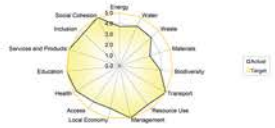
Total electricity demand a day: 253 kwh
Manure: 500 (amount of people use ablutions per day) x 0.7 = 0.35 m3
Urine: 500 x 1 = 0,5 m3
Kitchen: 0.404 m3

Total waste produced daily: 1,254 m3 per day
Kitchen: 0.5 x 0.404 = 20.2 m3
Manure: 350 x 0.078 = 27 m3

Total gas produced daily: 47.5 m3
If 1m3 of gas gives you 9 kwh:
Total energy produced per day: 47.5 x 9 = 427.5 kwh
Thermal energy 60% = 258 kwh
Mechanical energy 40% = 172 kwh

Grid electricity needed: 253-172= 81 kwh per day
Tank size (7 x 7 x 2m)
Because waste is wet 1:1 ratio, volume of daily waste: 2,508 x 40 = 100 m3

Energy

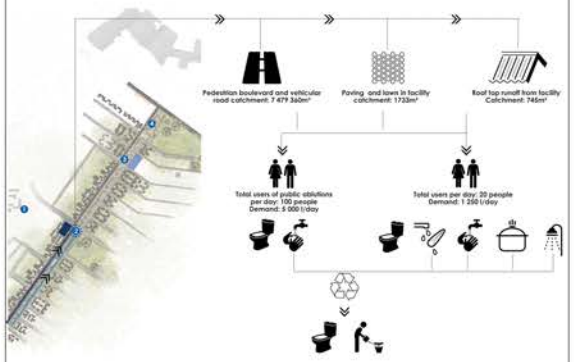


SBAT rating

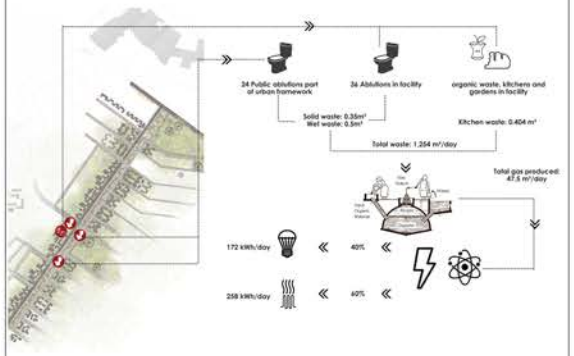
Programme	M2	Building classification	Sans 10400	Users according to SANS	Male wc	Female wc
Formal shops	210	F2	1 person/10m2	21	1 wc 1 uri 1 whb	2 wc 1 whb
Public space	100	A1	1 person/1m2	100	3 wc 5 uri 4 whb	7 wc 4 whb
Admin	20			2	2wc 1hwb	
Kitchen	130			14	1 wc 1 uri 1 whb	2 wc 1 whb
Restaurant	200		No. of fixed seats			
Library	167	C2	1 person/20m2	10		
Places of instruction	480	A3	1 person/5m2	60	2wc 3 uri 3 whb	5 wc 3 whb
Residential accommodation	420	H3	2 person per bedroom		1 wc 1whb	
Storage		J2				

Accommodation schedule

Urban framework strategy



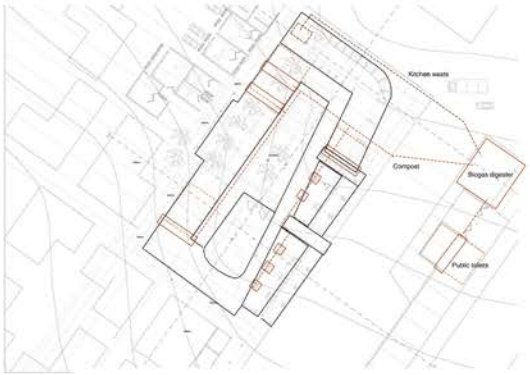
Water



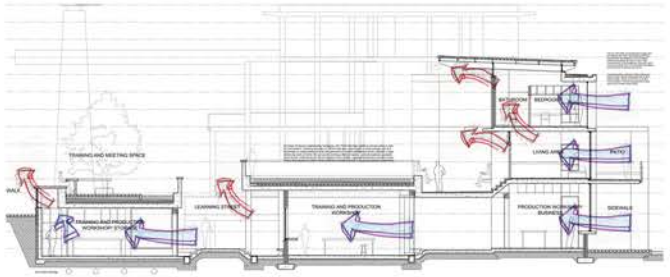
Energy

On site strategy

Water



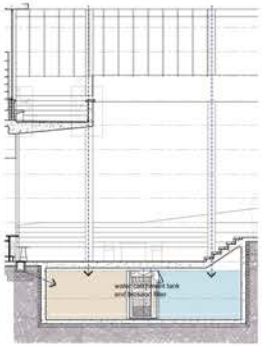
Energy



Natural Ventilation

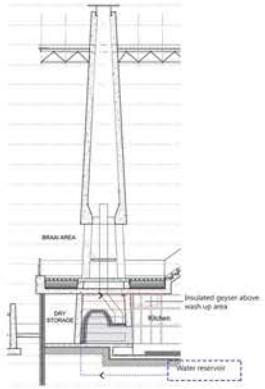
Application

Grey water strategy

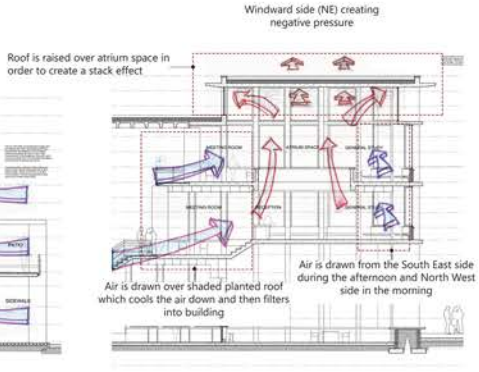


Water catchment tank

Water



Heating water by means of the furnace



Stack Ventilation

206 Figure 9.7: Final Presentation page 7, Author (2016)

 Figure 9.8: Lower ground floor plan, Author (2016)

Figure 9.9: Ground floor plan, Author (2016)

 Figure 9.10: First floor plan, Author (2016)

Figure 9.11: Second floor plan, Author (2016)

South East Elevation
Scale 1:200

North East Elevation
Scale 1:200

North West Elevation
Scale 1:200

Figure 9.12: Elevations, Author (2016)

 Figure 9.13: Section 1, Author (2016)

Section 1
Scale 1:50

216 Figure 9.14: Section 2, Author (2016)

Section 2
Scale 1:50

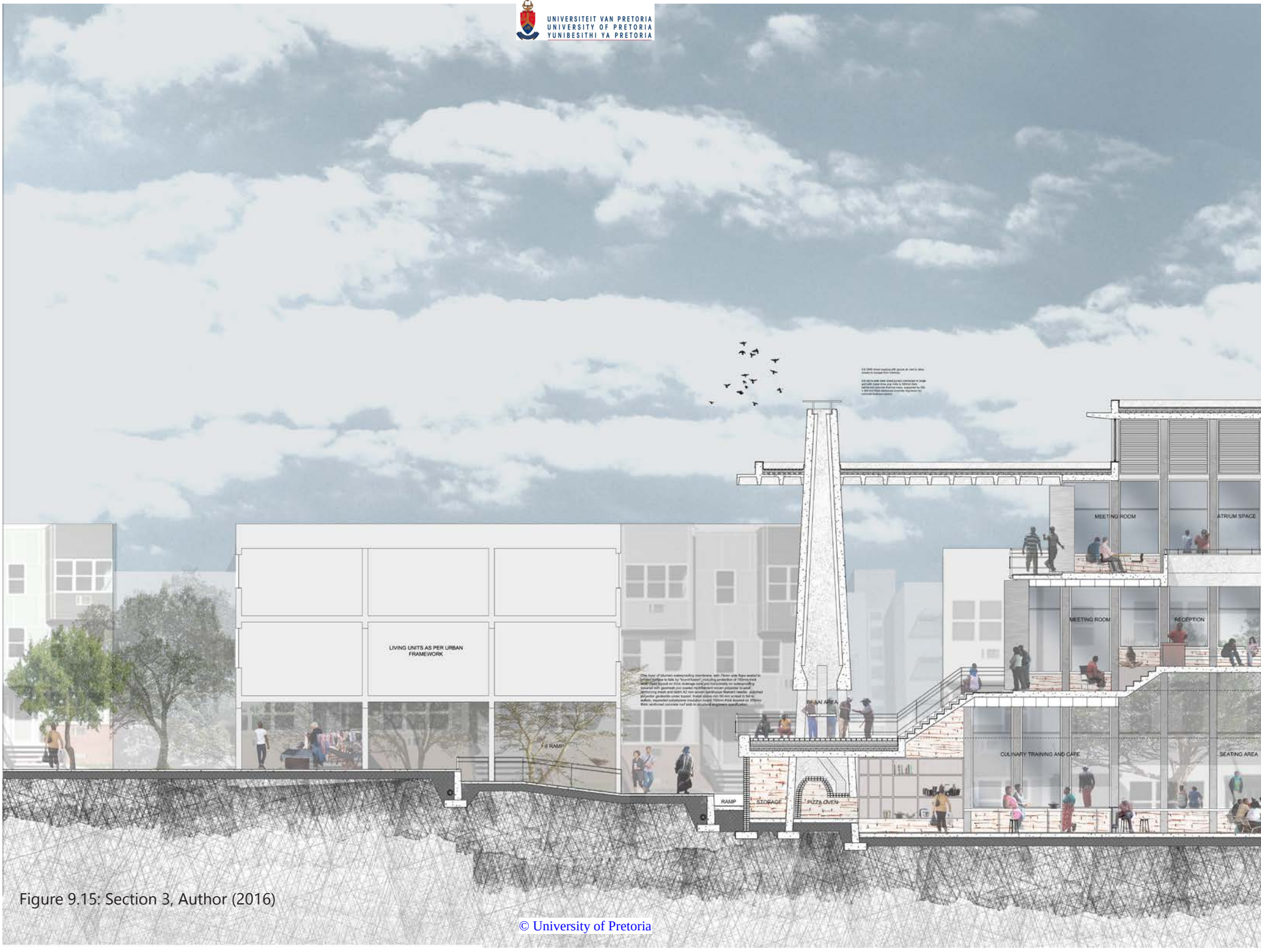


 Figure 9.15: Section 3, Author (2016)

Section 3
Scale 1:50

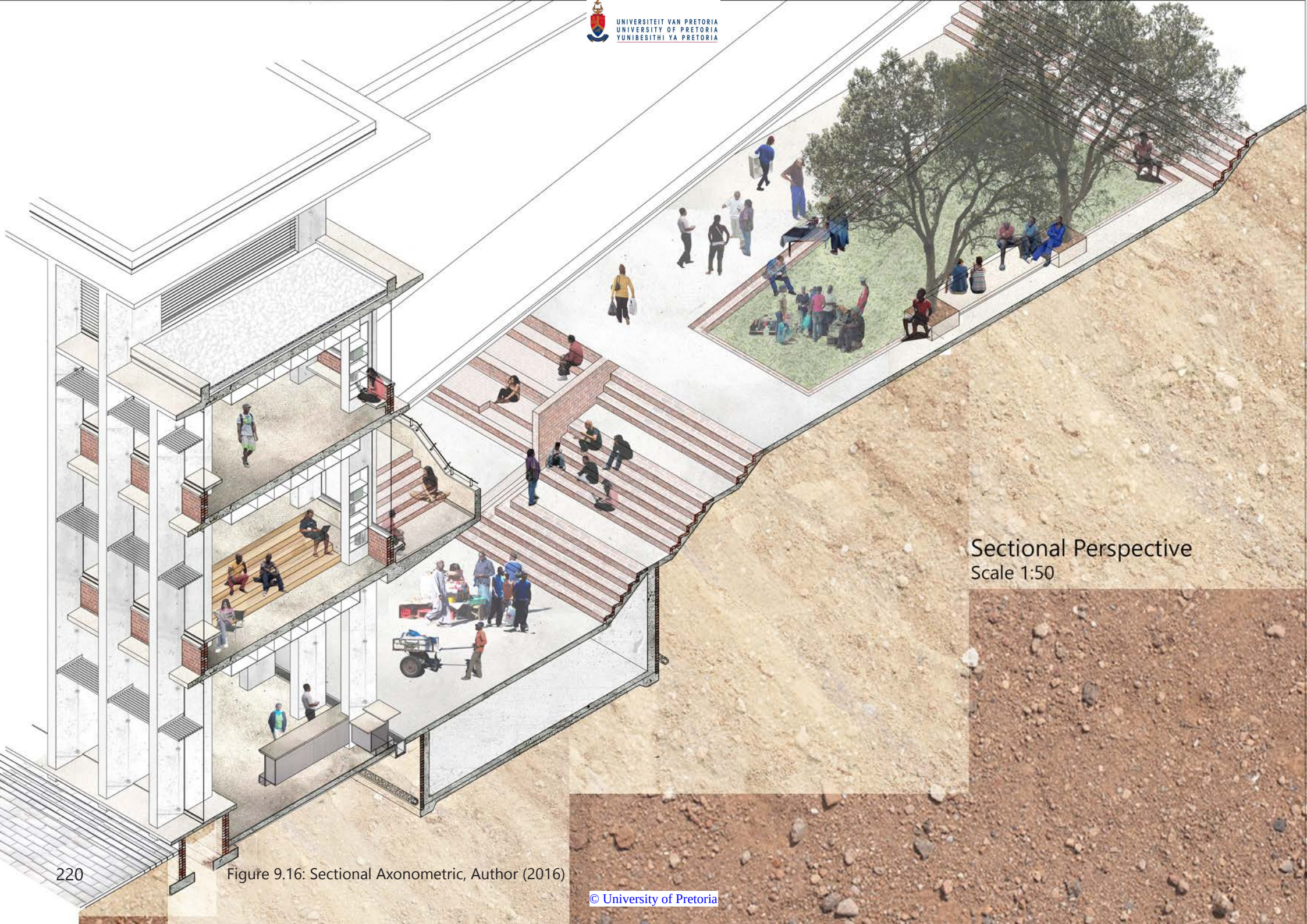
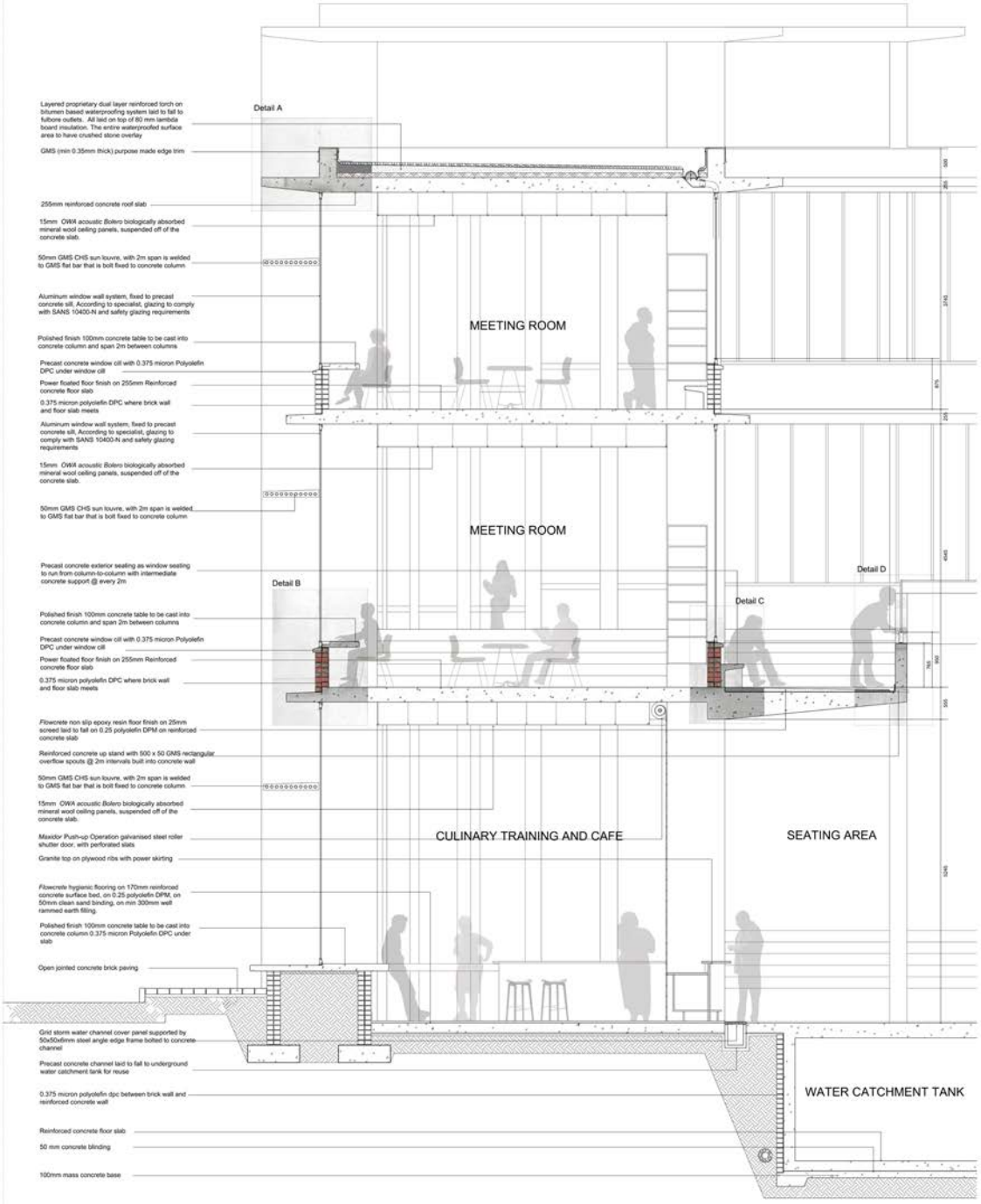
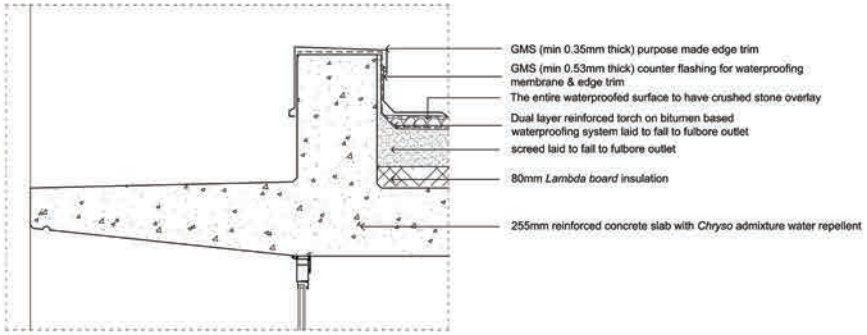


Figure 9.16: Sectional Axonometric, Author (2016)

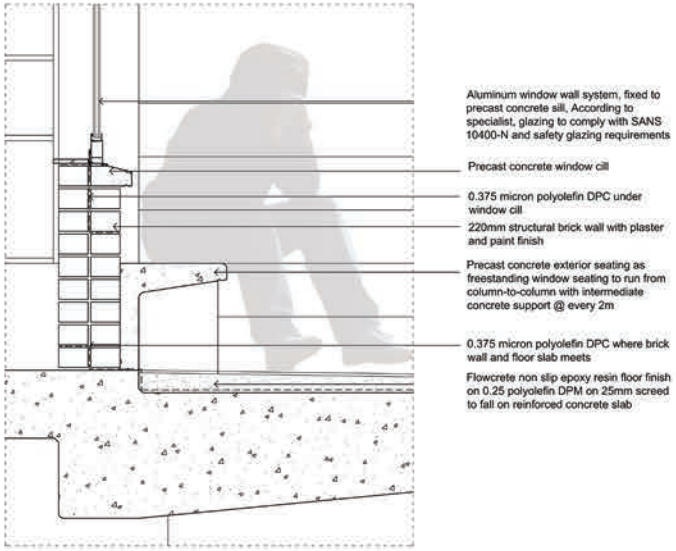


1:20 Se

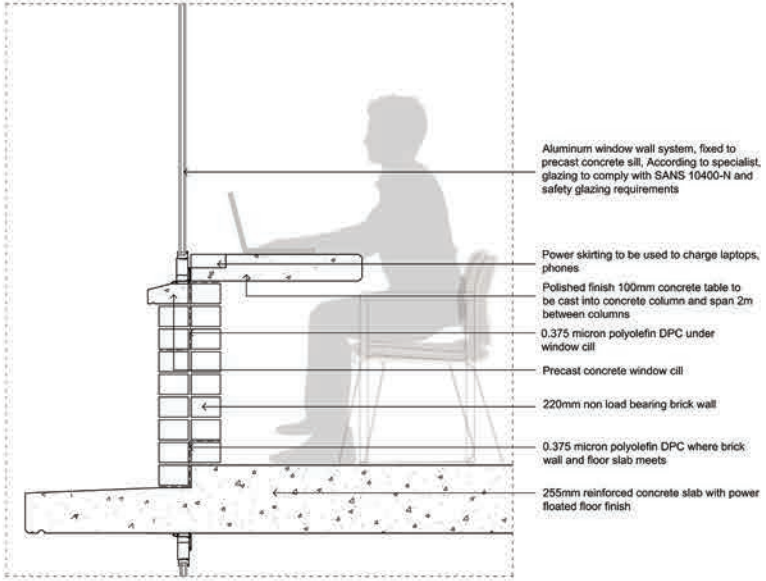
Figure 9.17: 1:20 Section, Author (2016)



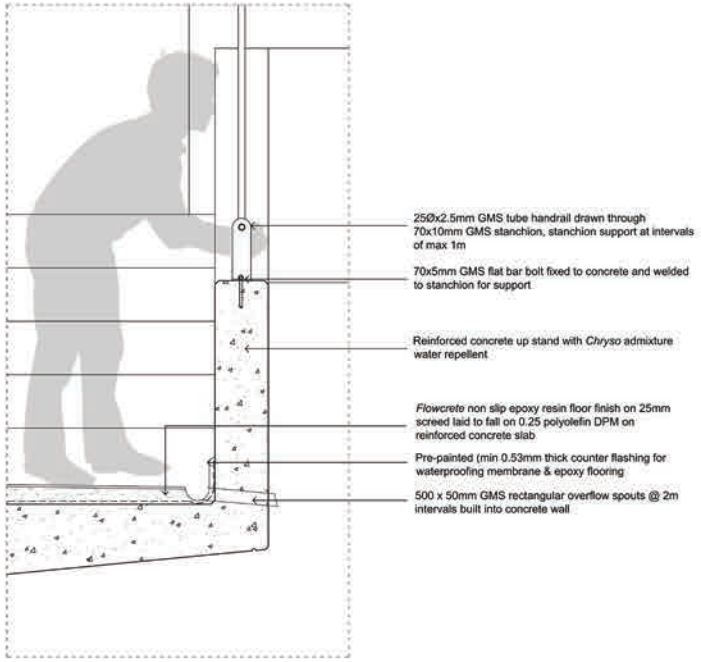
1:10 Detail A
Concrete roof and upstand detail



1:10 Detail C
Detail of public seating



1:10 Detail B
Desk and wall connection

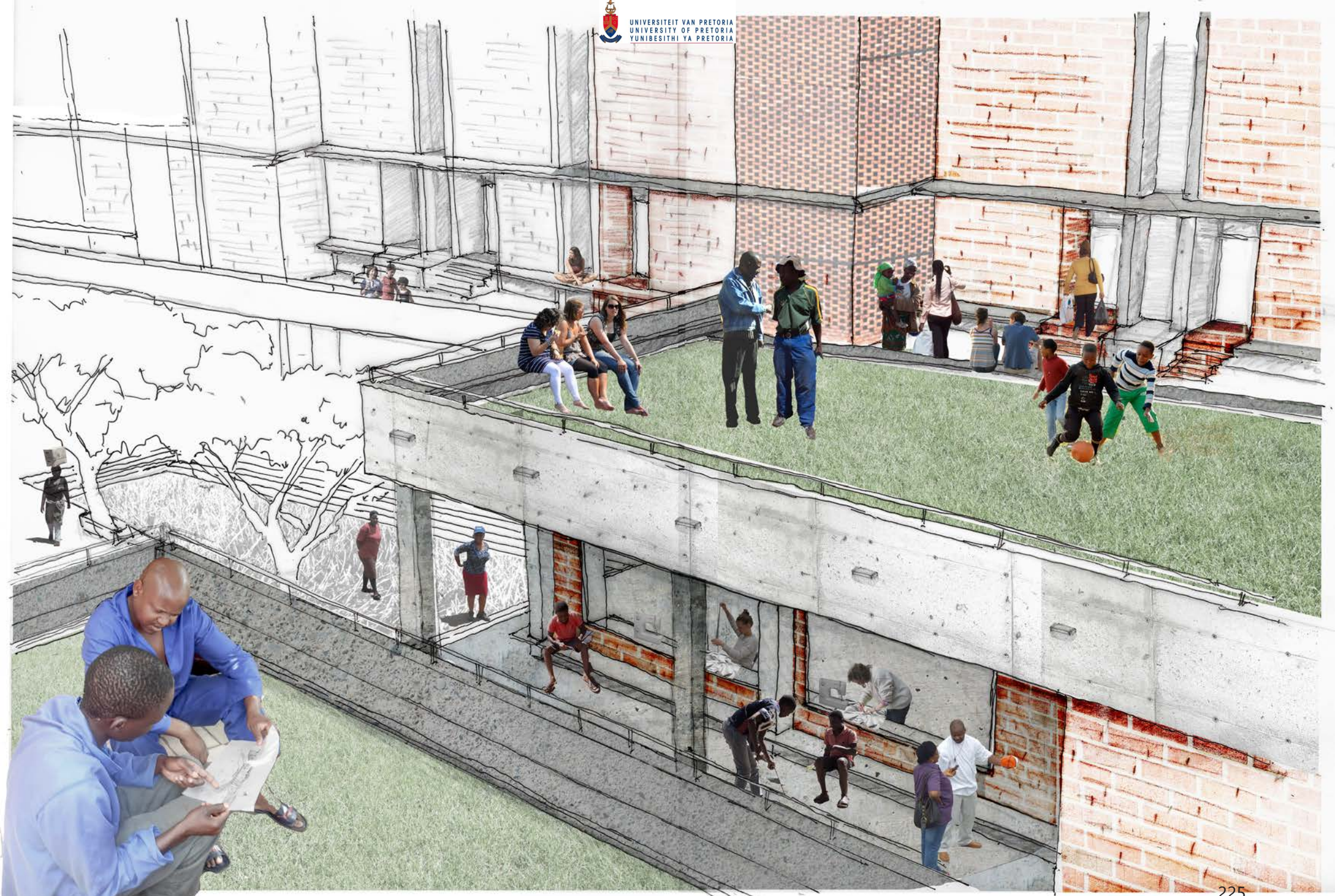


1:10 Detail D
Parapet balustrade and walkway gutter

Details

222 Figure 9.18: Details, Author (2016)

View of the CVF from the main road



View of green roof, accommodation and workshop spaces

View of kitchen training/cooking and cafe area

View of workshops and courtyard space

Resource centre/ meeting space

 Figure 9.25: Final model, Photograph, Author (2016)

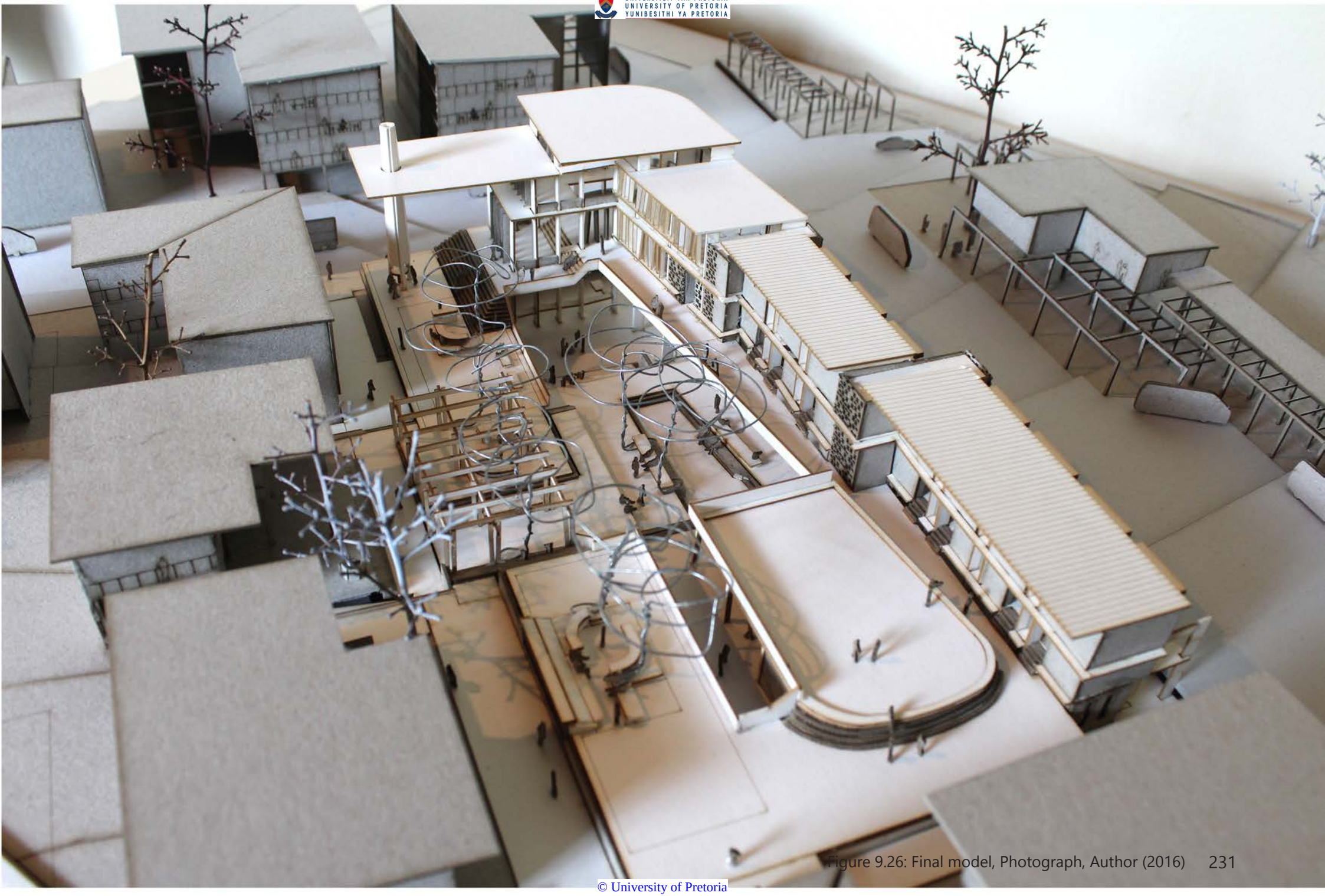


Figure 9.26: Final model, Photograph, Author (2016)

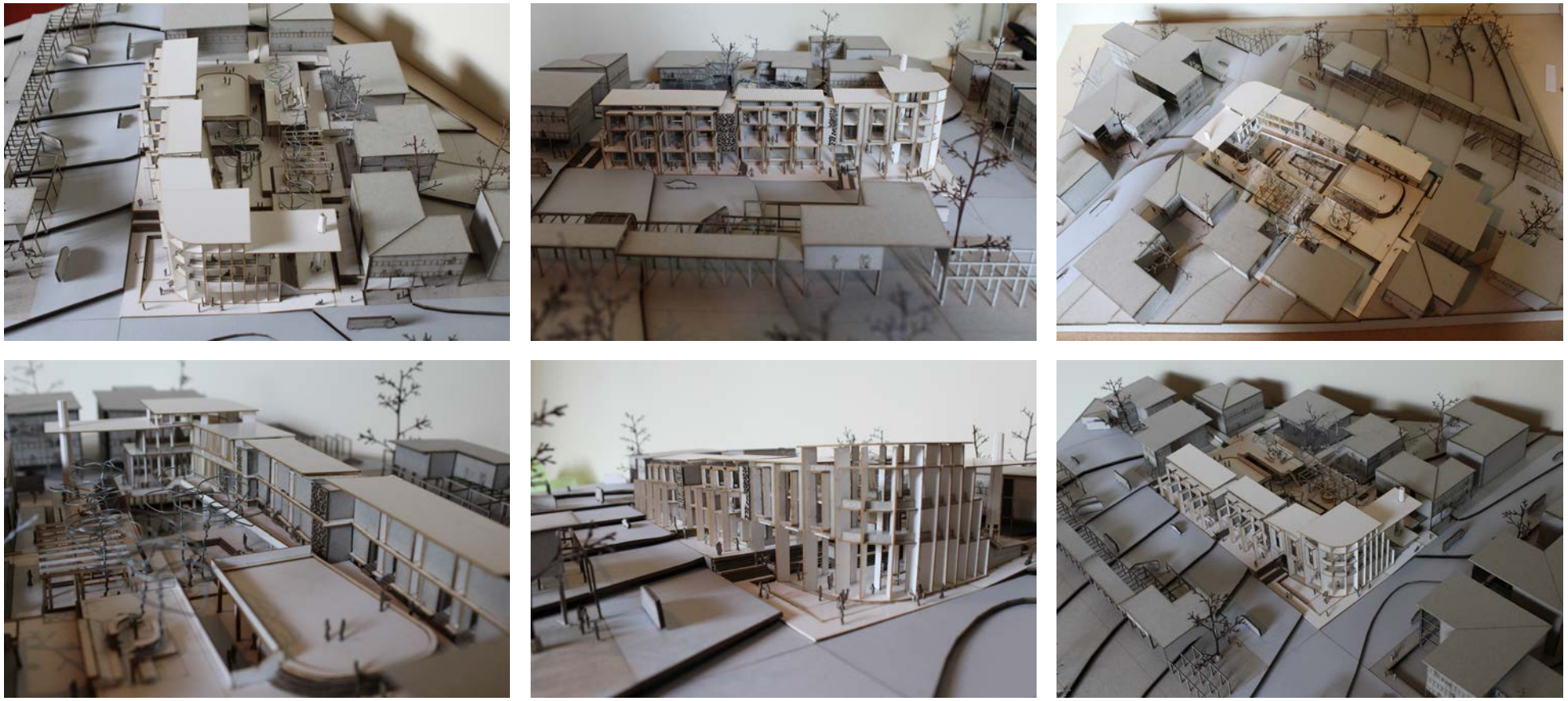
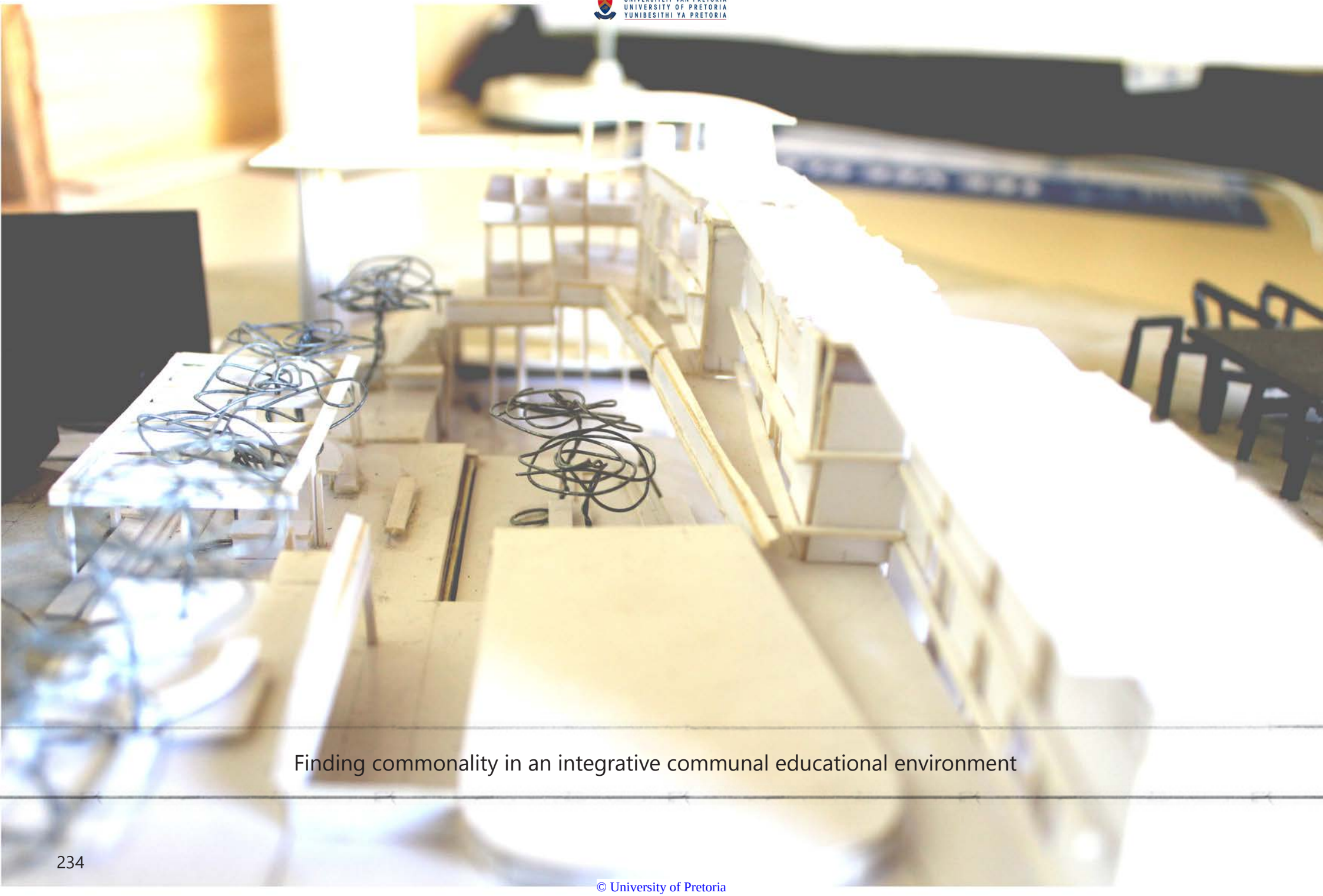


 Figure 9.27: Final model, Photograph, Author (2016)

Figure 9.28: Final presentation, Author (2016)

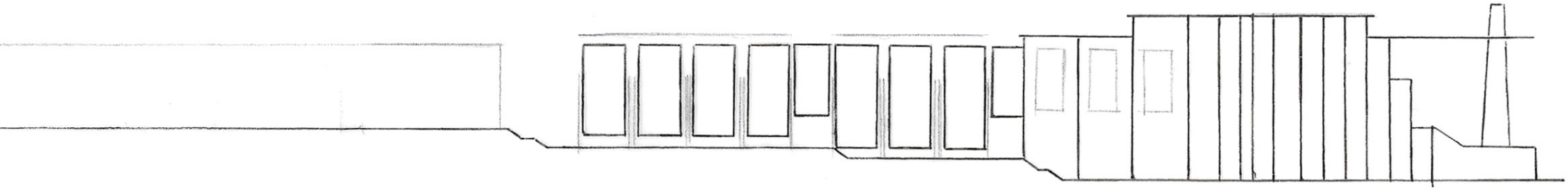


Finding commonality in an integrative communal educational environment

Conclusion

The dissertation concludes that an educational environment can be integrated within a public, mixed-use environment that encourages interaction and engagement to occur between learners and community. By creating an interactive and integrative learning environment, social cohesion and commonality between one another is proposed.

It is essential that citizenship education becomes a key component of the educational curriculum. The dissertation suggests an approach to how this policy can be implemented spatially, this is done by spatially and programmatically addressing and considering three main principles which include: spaces of interaction, the urban condition and multifunctionality. These principles would allow for the facility to merge with and form part of the community, while not limiting education to a formal learning environment but encouraging active community engagement.



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