



Connecting Hatfield

Gateway to Seamless Mobility

DPD 801

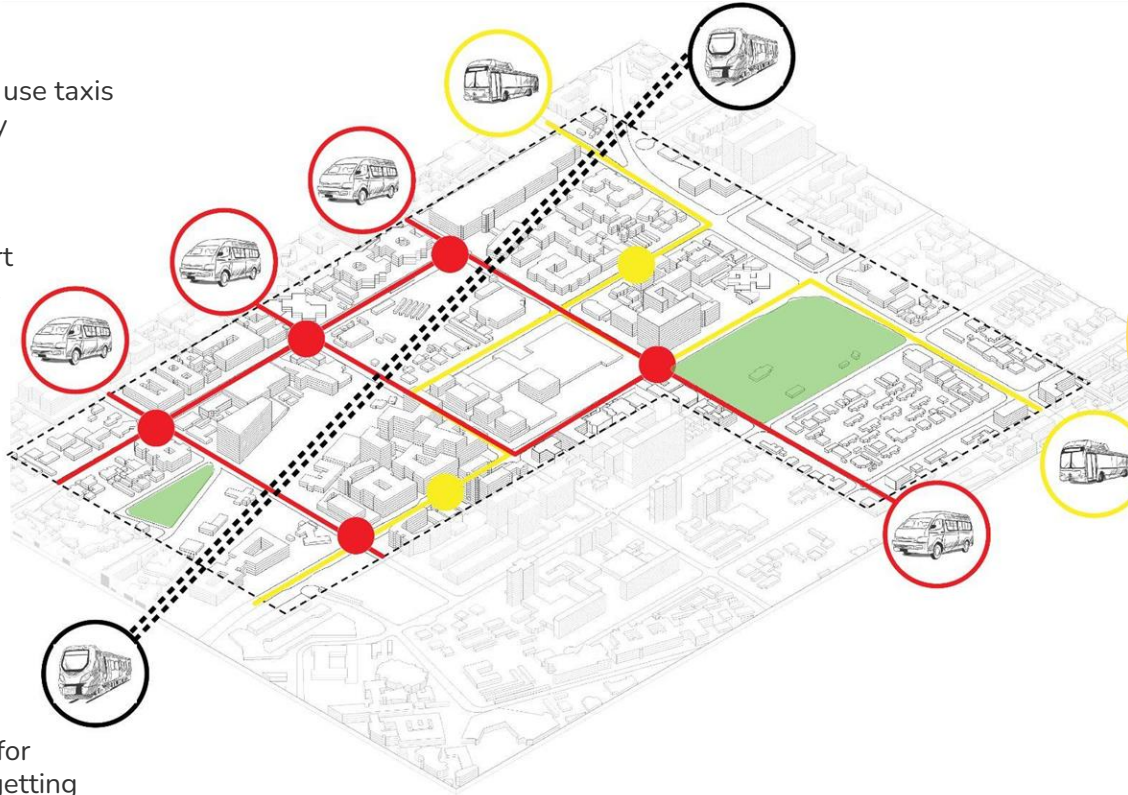
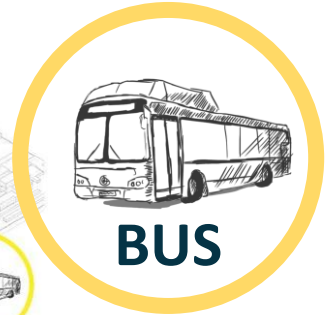
Supervisor: Calayde Davey

Kithue Masu





**How do you get to
Soshanguve from
Hatfield?**


Public Transport



 10,7 million individuals use taxis in South Africa everyday

 Travel to work
43,5% private transport
35,0% public transport.
~20,3% walking

 Facilities at the taxi rank remained the highest reason for dissatisfaction with minibus taxi services among South African households.

 Main purpose of travel for most households was getting to education institutions

Urban mobility



Movement of **goods** and **people**

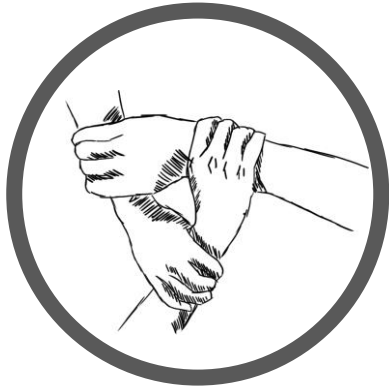


Connectedness to different **human networks** and **social spaces**

Design Question

How can we achieve **spatial integration** of **public transport systems** in Hatfield that promotes the development of **strong social capital**?

Social Capital



Networks



Norms



Shared Beliefs

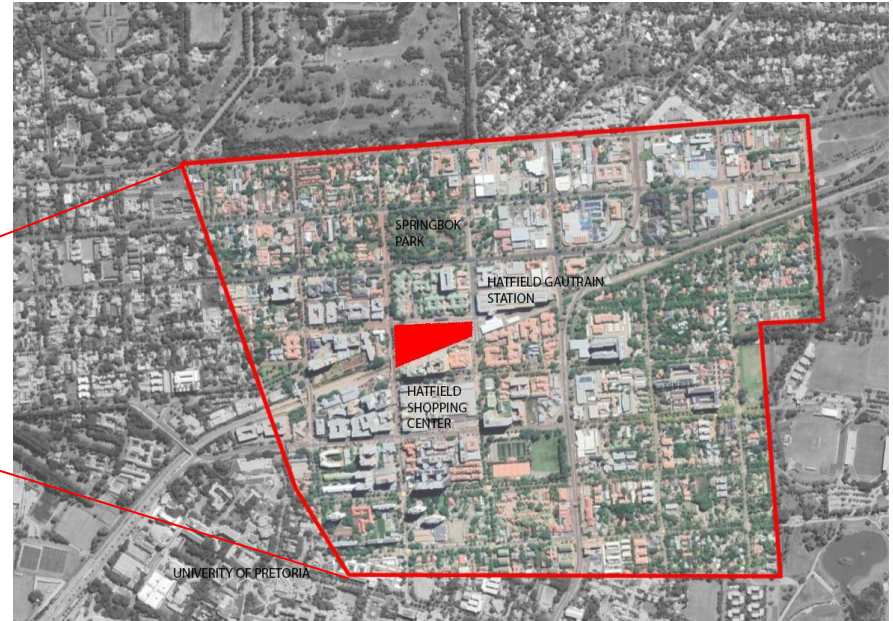
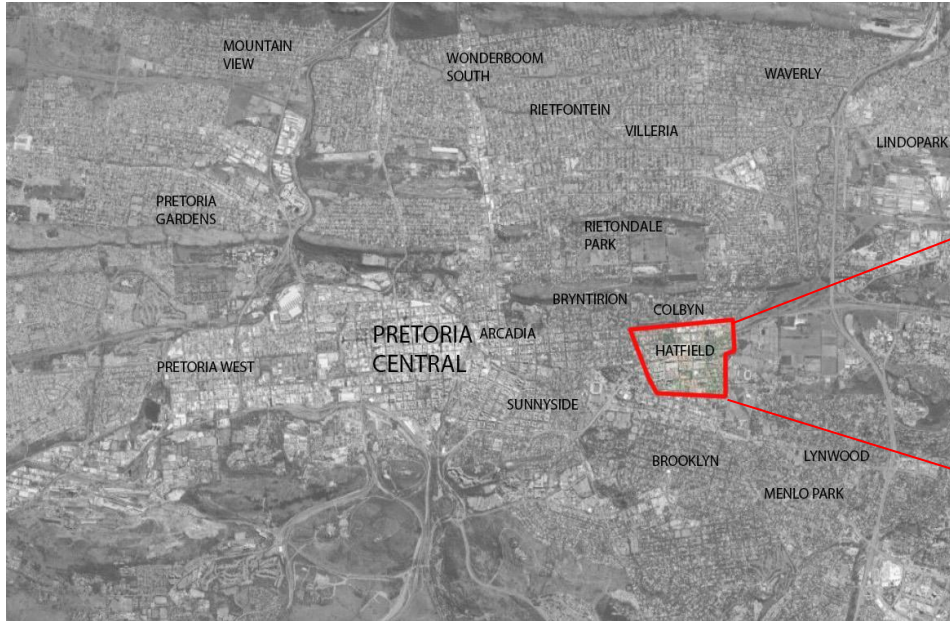


Relationships

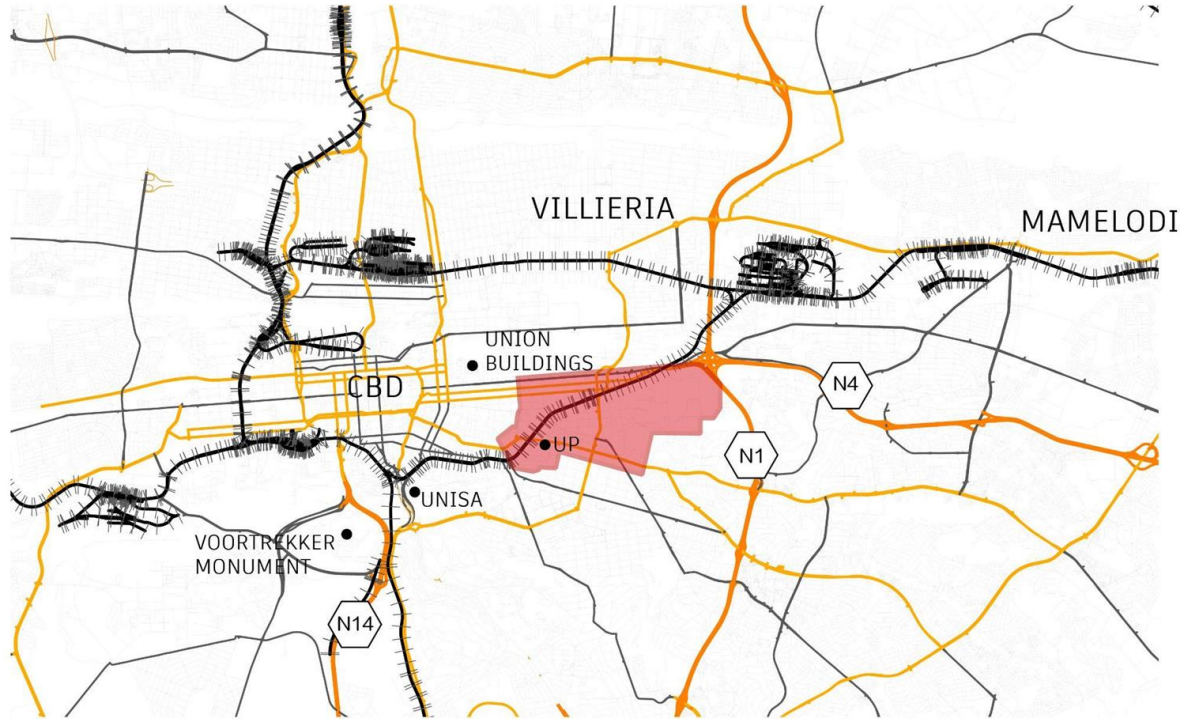
Social capital is defined as the networks, norms, shared beliefs, relationships that facilitate cooperation and collaborative action for mutual benefits (Bhandari and Yasunobu 2009)

Hatfield

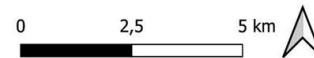
Context



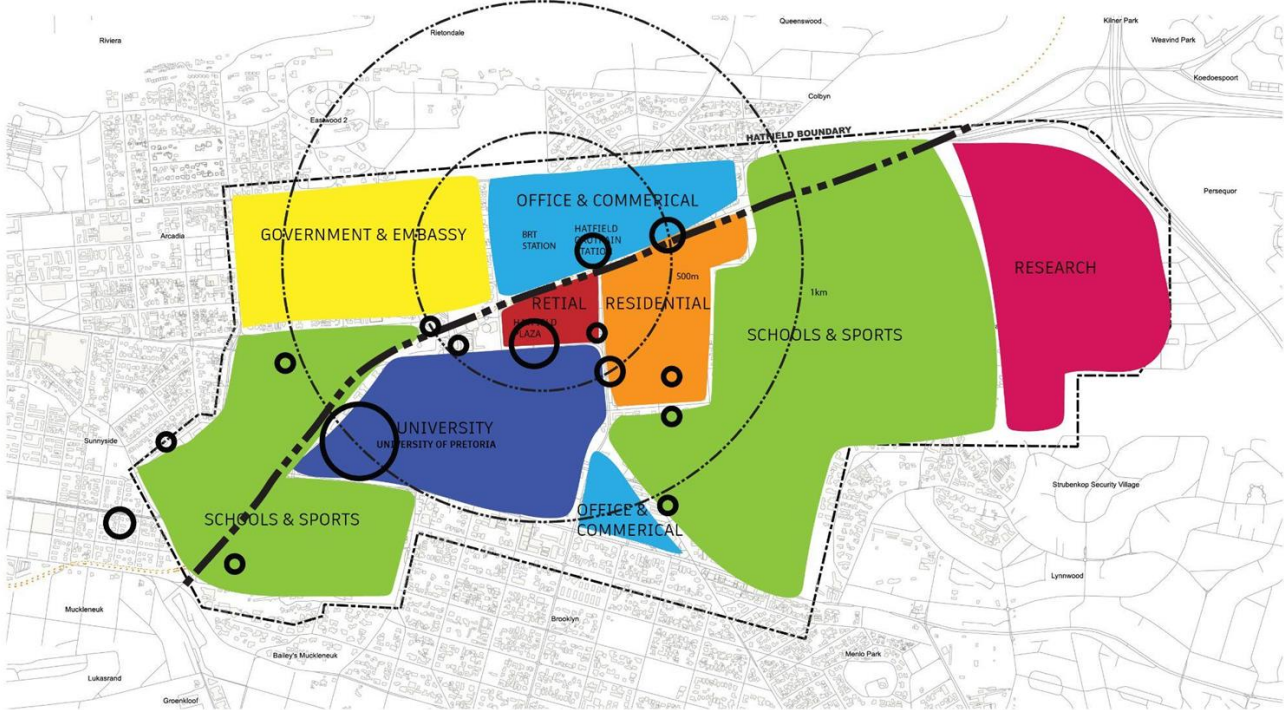
Regional context map



 HATFIELD



Character Zones

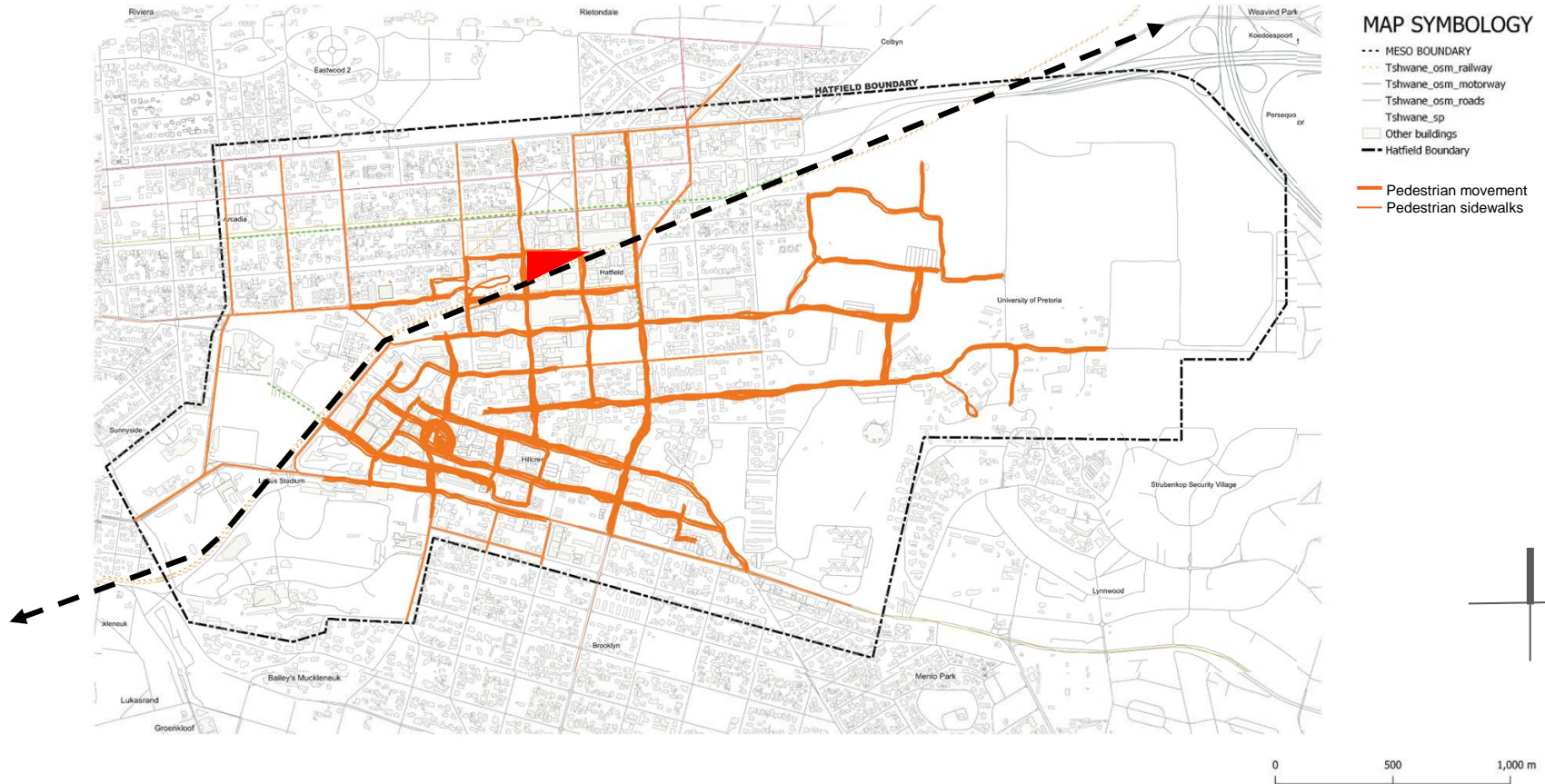


MAP SYMBOLOLOGY

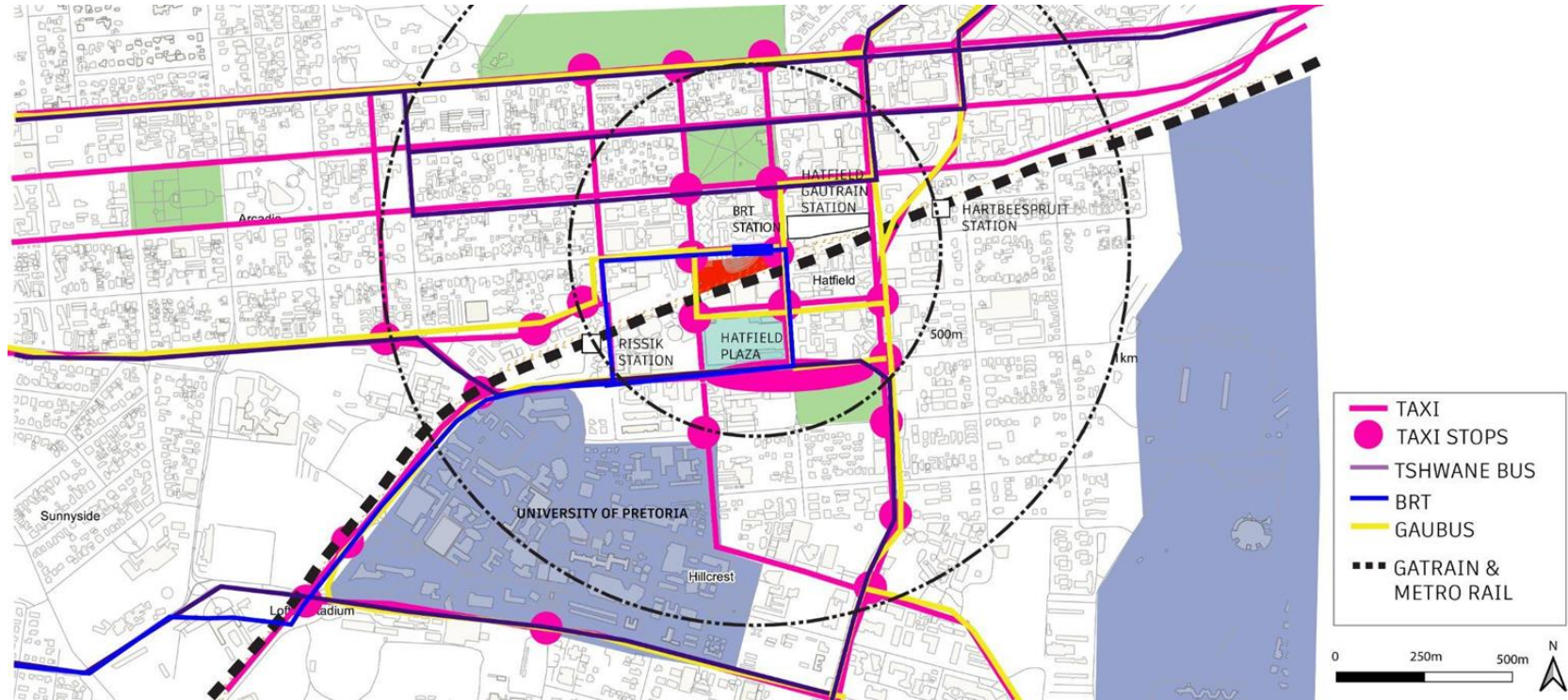
- Tshwane_osm_railway
- Tshwane_osm_roads
- Tshwane_sp
- Other buildings
- Hatfield Boundary
- GAUTRAIN & METRO RAIL
- NODES OF ACTIVITY



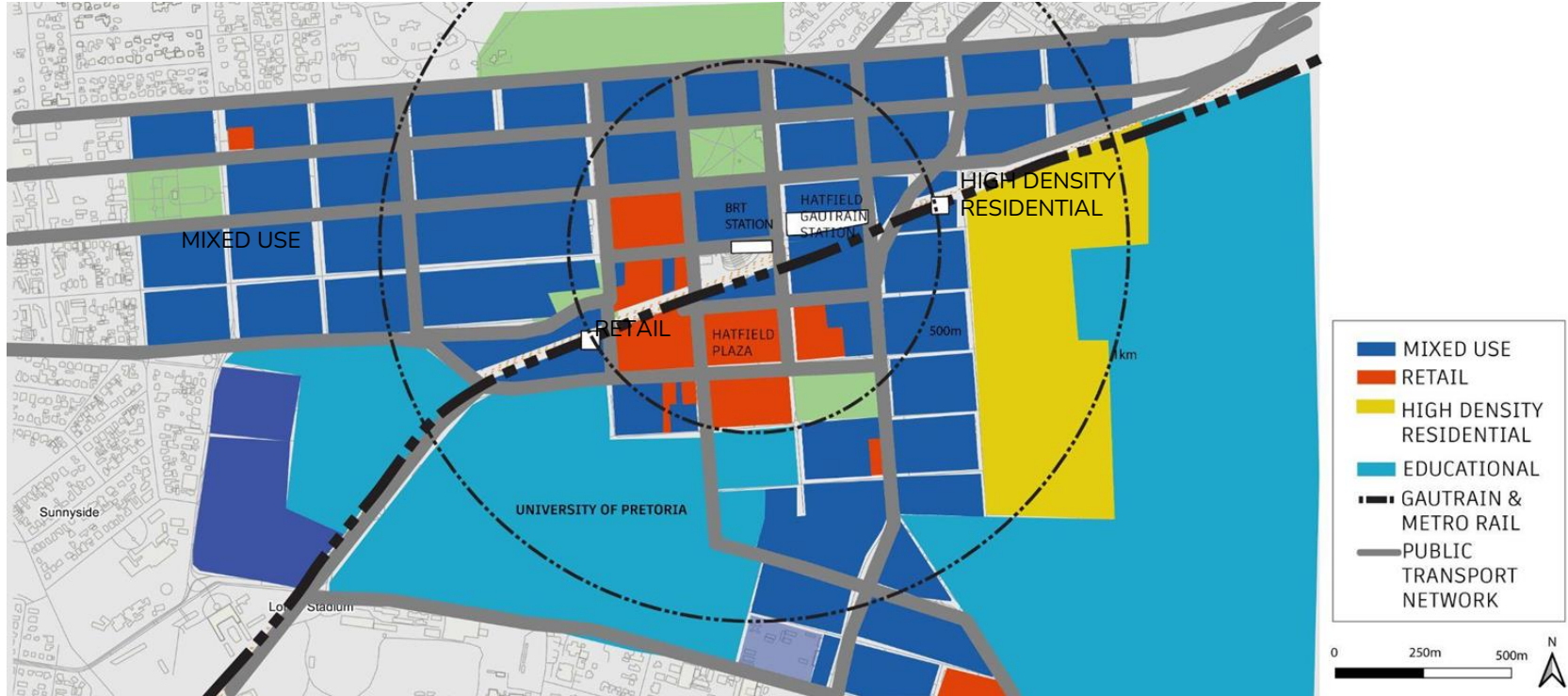
Pedestrian movement



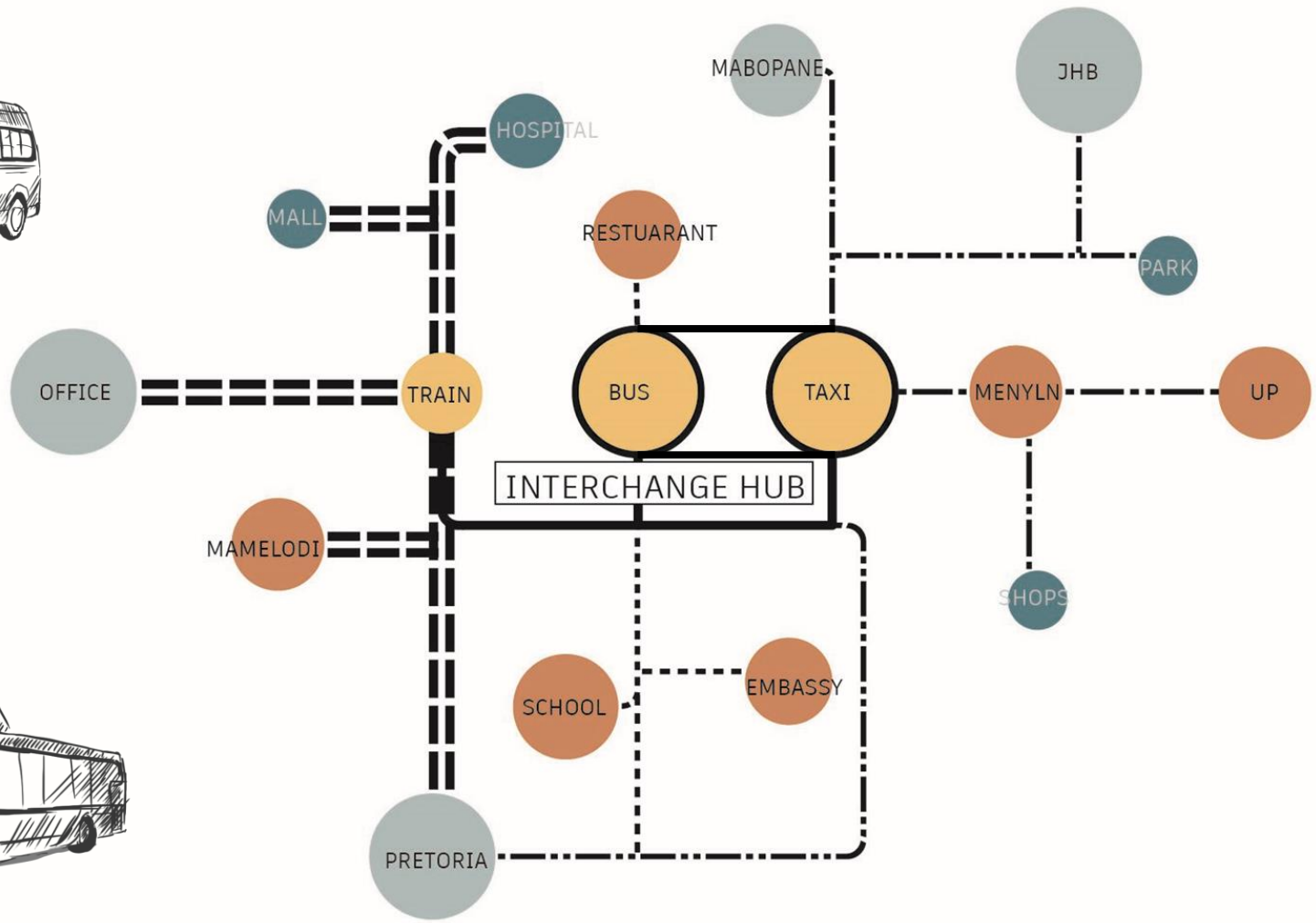
Public transport



Tshwane Vision



Proposal



Urban integration

Conceptual framework strategy

CONNECTING HATFIELD
KITHUE

1

2

HATFIELD CULTURAL CENTER
MOYO

3

FOODSCAPE
KYLAH

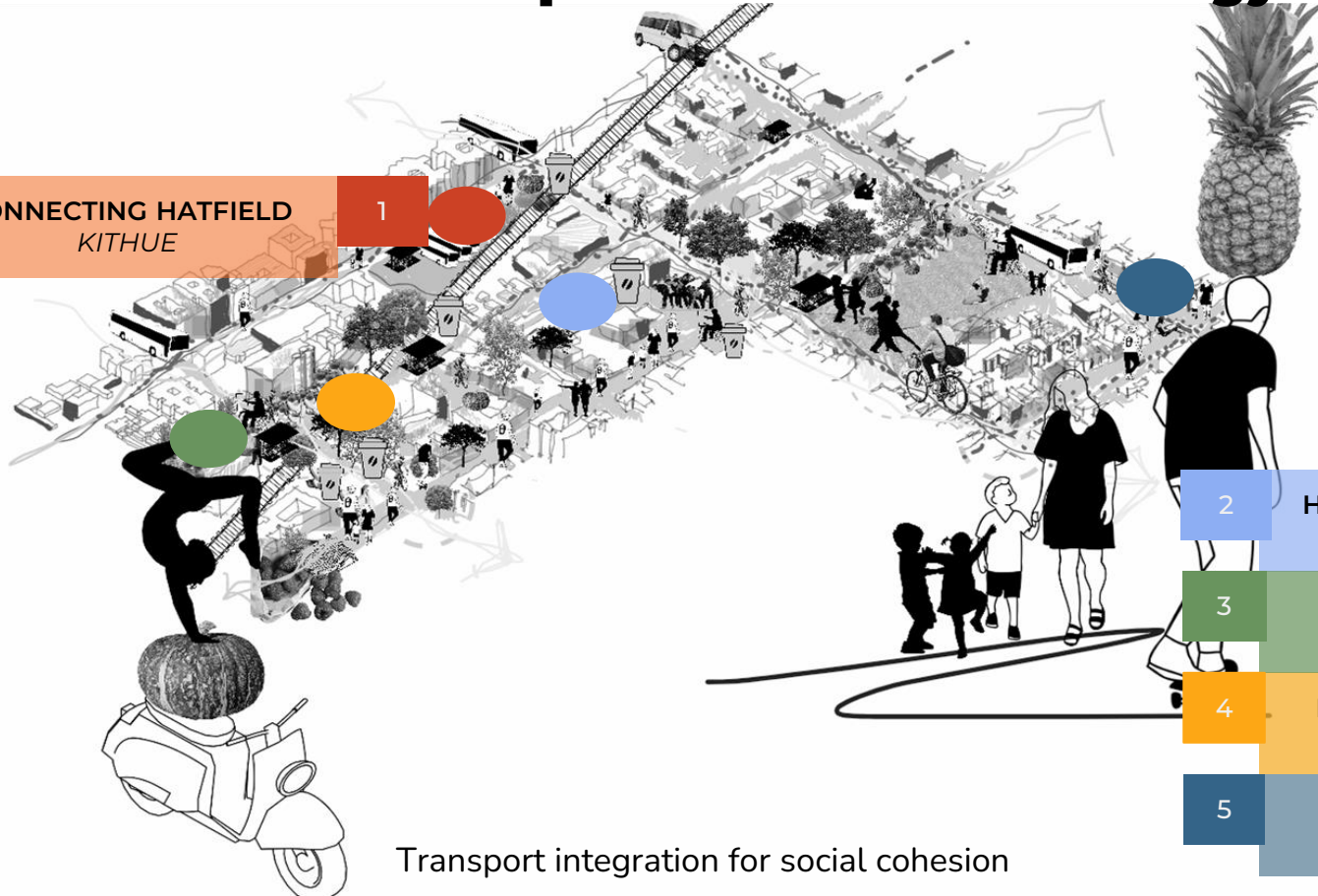
4

INTERCONNECTED MARKET
NATASHA

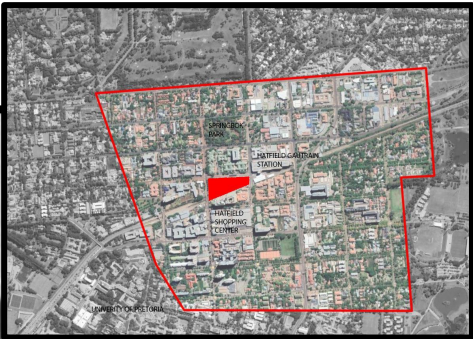
5

THE LABORATORY
TANA

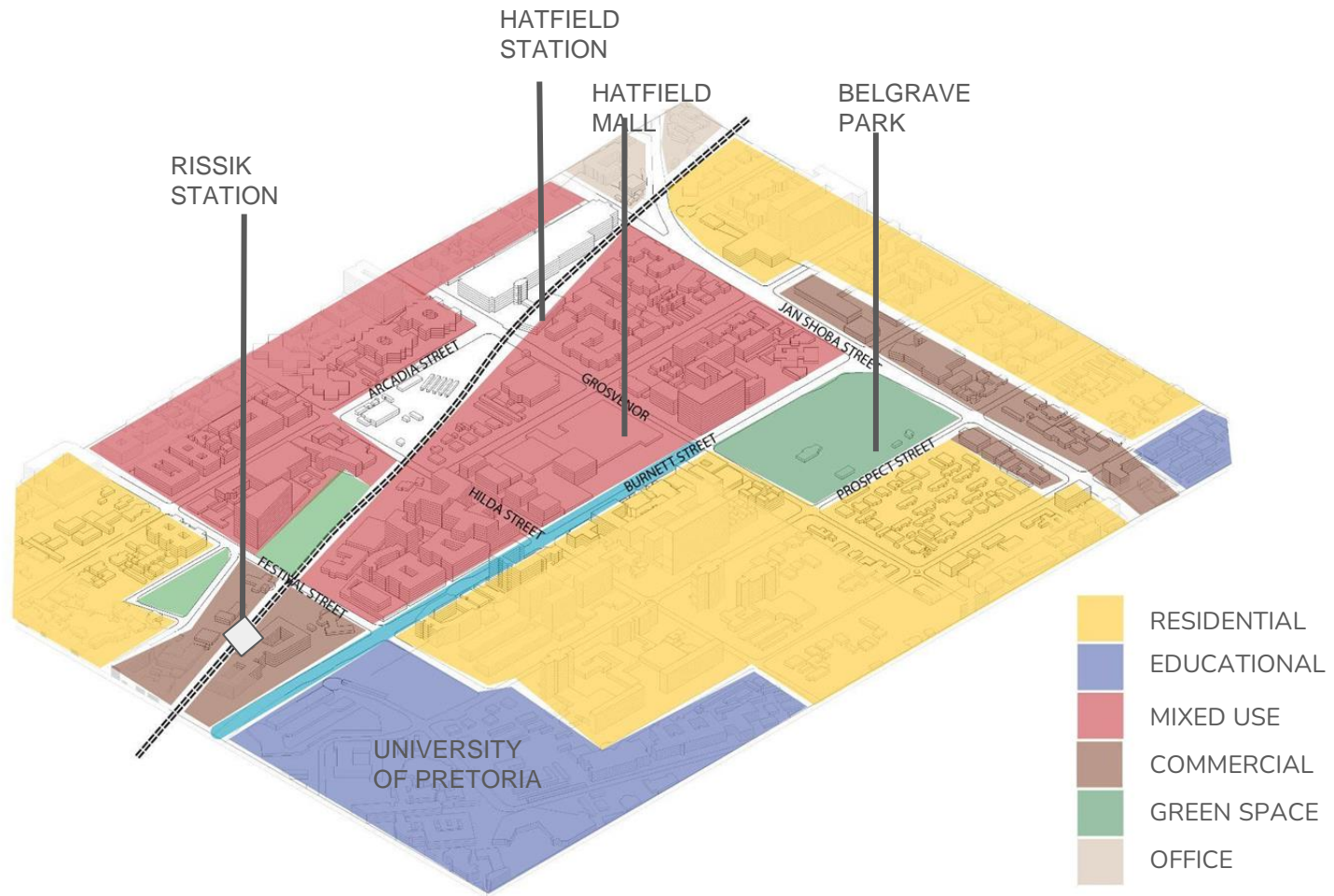
Transport integration for social cohesion

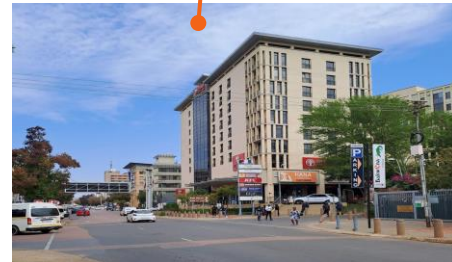


Site



SITE: 20 410.40SQM
ZONED: SPECIAL + RAILWAY





Site analysis



LEGEND

- OFFICES
- RESIDENTIAL
- GOVERNMENT
- CHURCH
- INSTITUTIONAL
- PEDESTRIAN MOVEMENT
- GAUBUS
- TAXI
- BRT
- RAILWAY LINE
- TREES
- PLANTING
- PERMEABLE
- IMPERMEABLE

Predominantly offices and government buildings with a few high rise residential buildings

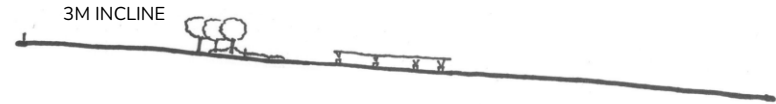
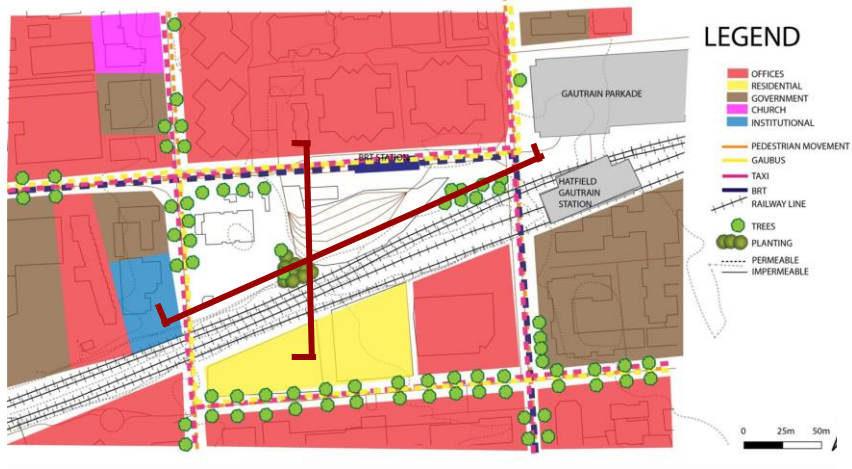


LEGEND

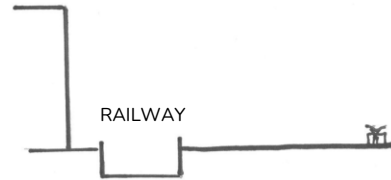
- OFFICES
- RESIDENTIAL
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- GAUBUS
- TAXI
- BRT
- RAILWAY LINE
- TREES
- PLANTING
- PERMEABLE
- IMPERMEABLE



Site analysis



LONGITUDINAL SECTION



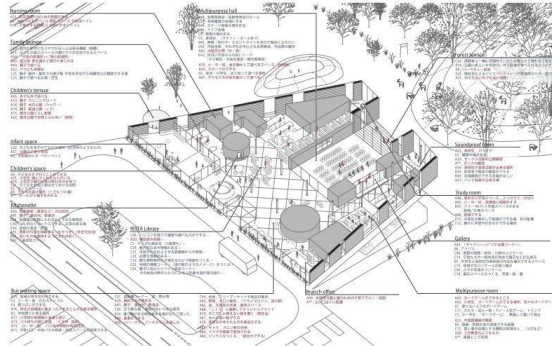
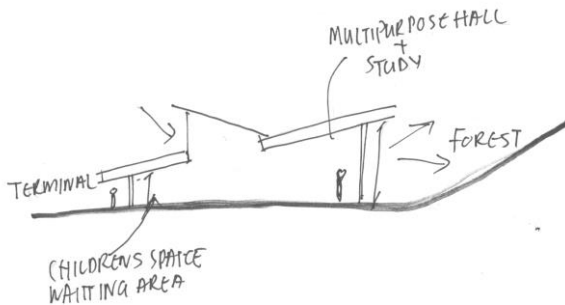
CROSS SECTION

Precedent

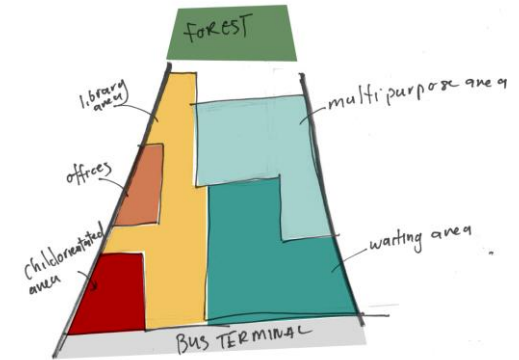
Yubari City Community Base Complex



(Ikuyasasaki Photography no date)



(Archdaily 2021)



Floor area diagram

Intermodal Station Dome and Felipe VI Park



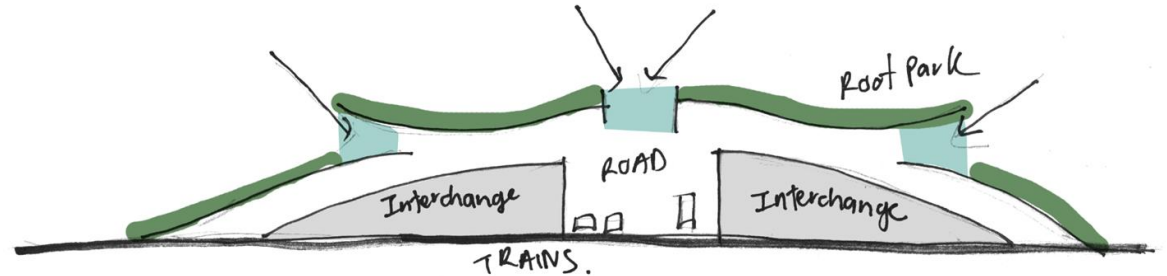
(Archdaily 2023)



(Archdaily 2023)



(Archdaily 2023)



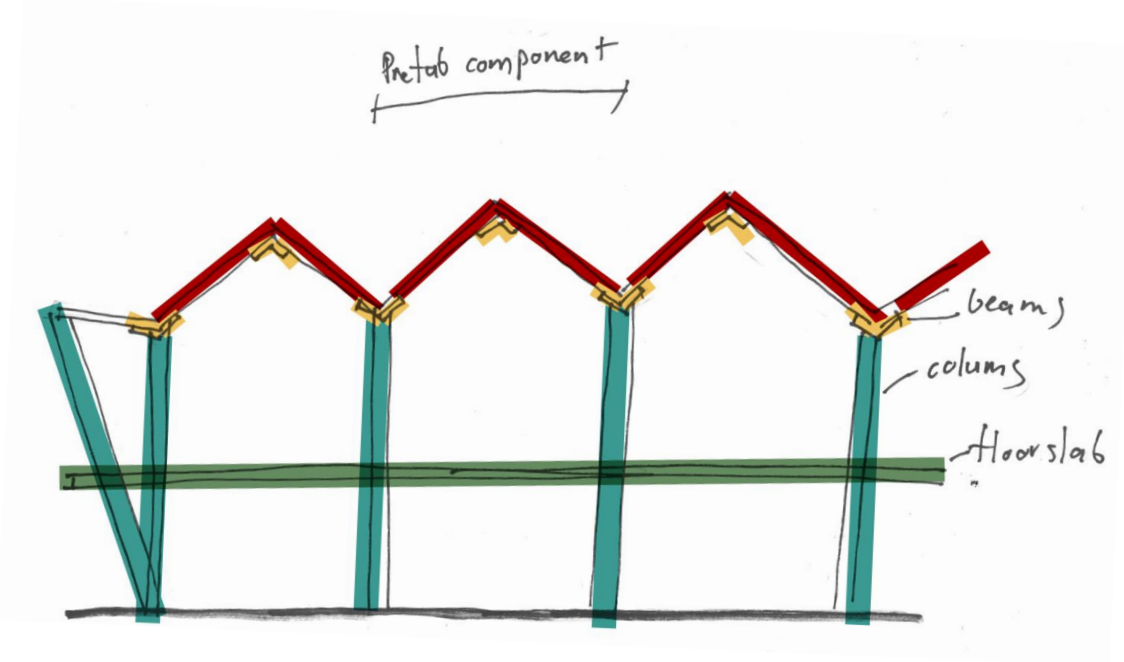
DCPL Southwest Neighborhood Library



(Archdaily 2023)



(Archdaily 2023)



Concept

Choreography of Movement

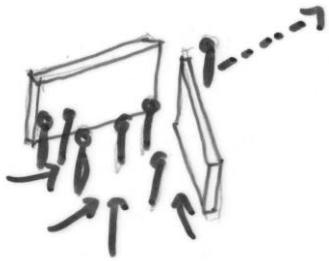


Architecture can express movement, without actually moving.

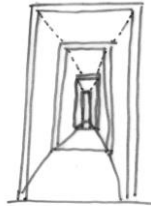
Design informants

MOVEMENT

**SOCIAL
CAPITAL**



PHYSICAL

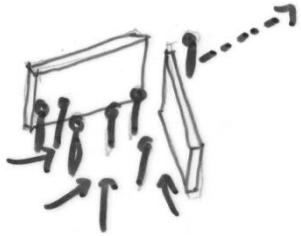


VISUAL



PLACEMAKING

Movement

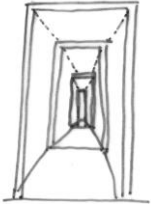


PHYSICAL
MOVEMENT



How a person
moves through a
space

what they see, hear, touch,
and feel can ultimately be
controlled by deciding how
a person moves through or
uses a space.



VISUAL
MOVEMENT

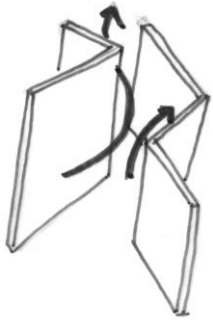


Perception of
movement in
the architecture

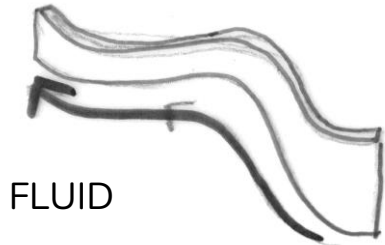
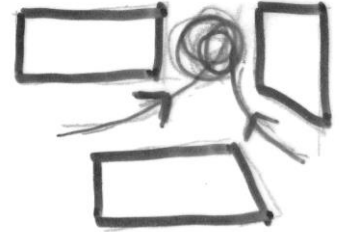
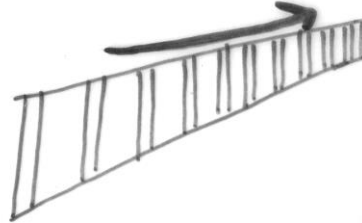
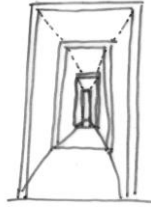
Creates the illusion of the
architecture moving.
User perceives themselves
moving through the space

Principles

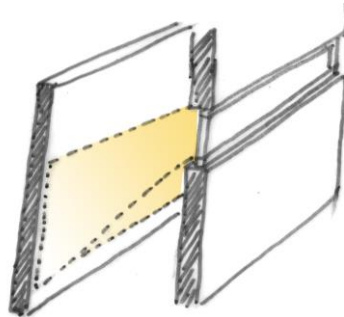
DYNAMIC



REPETITION/RHYTHM



FLUID



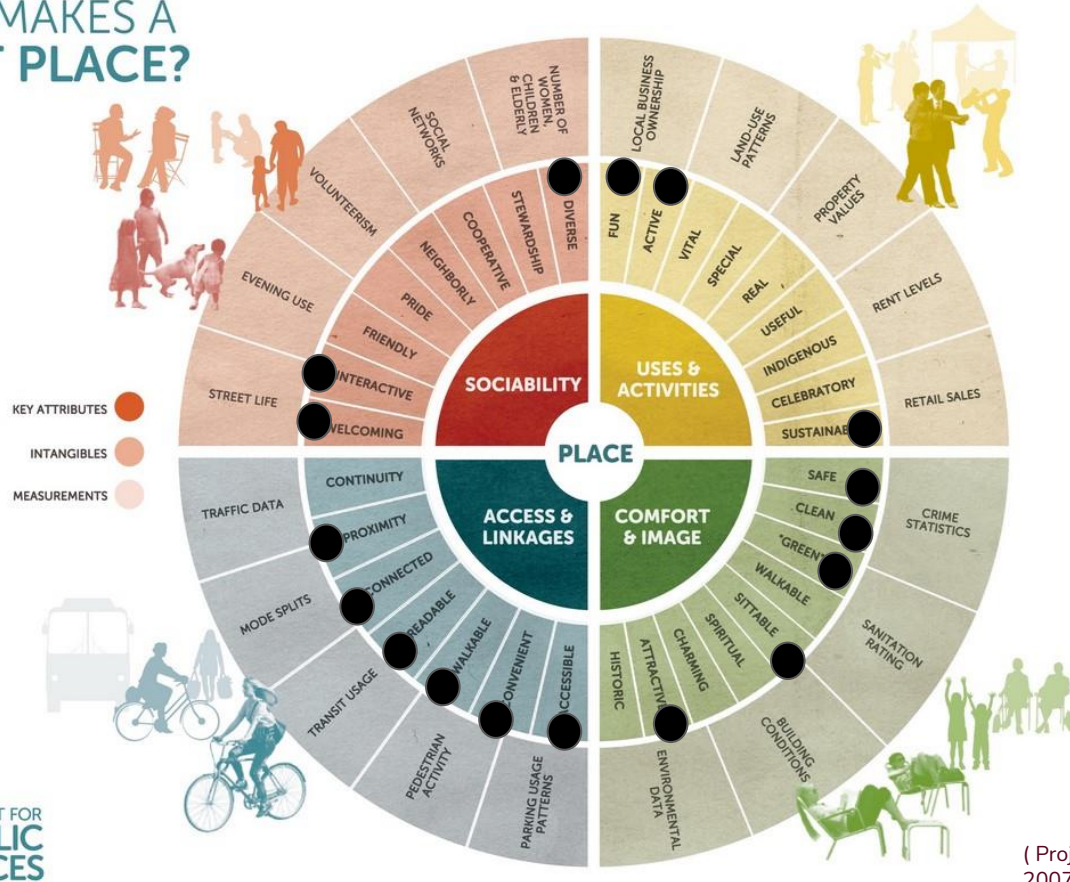
LIGHT

ever-changing.

constantly changing nature throughout the day prompting changing perceptions of the structure

Social capital

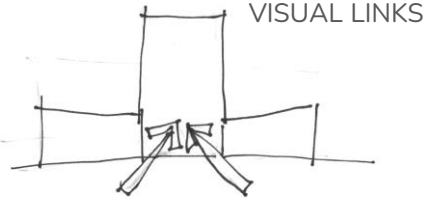
WHAT MAKES A GREAT PLACE?



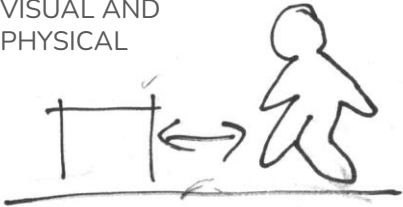
Principles



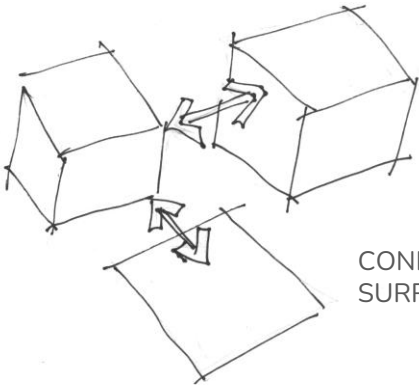
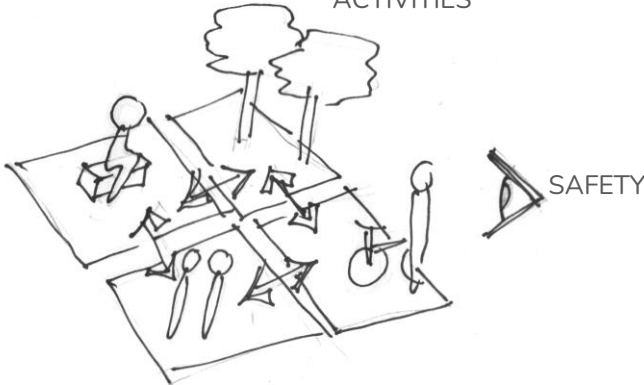
SENSE OF PLACE



ACCESSIBILITY
VISUAL AND
PHYSICAL



DIVERSE RANGE OF
ACTIVITIES



Rituals

REST

REFRESH

MOVE

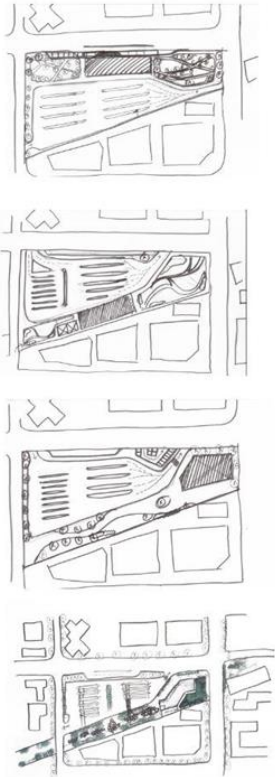
INTERACT



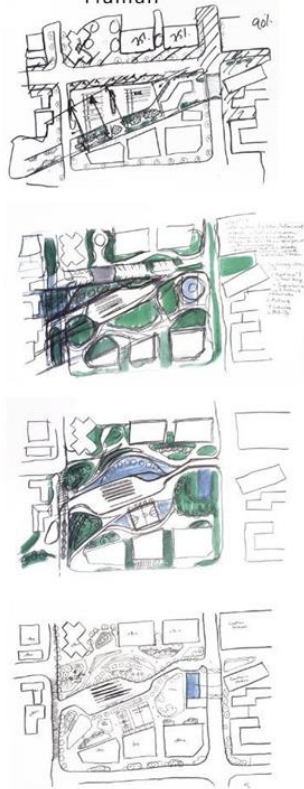
Urban design

Design process

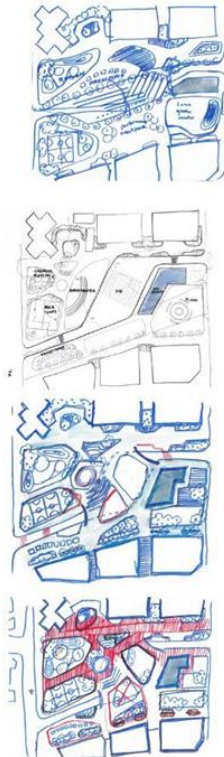
Vehicle



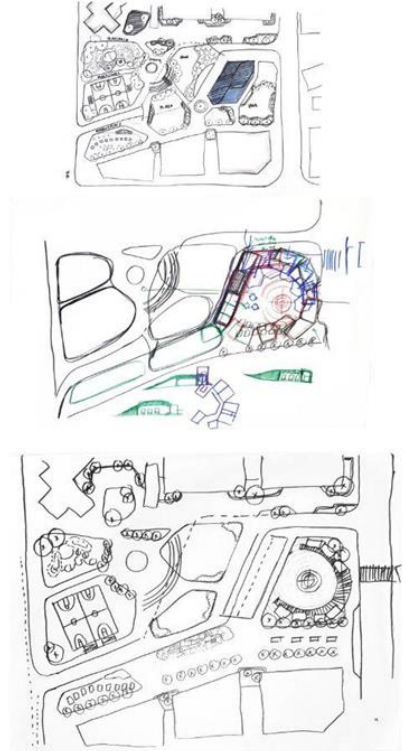
Human



Park



Final



Site plan

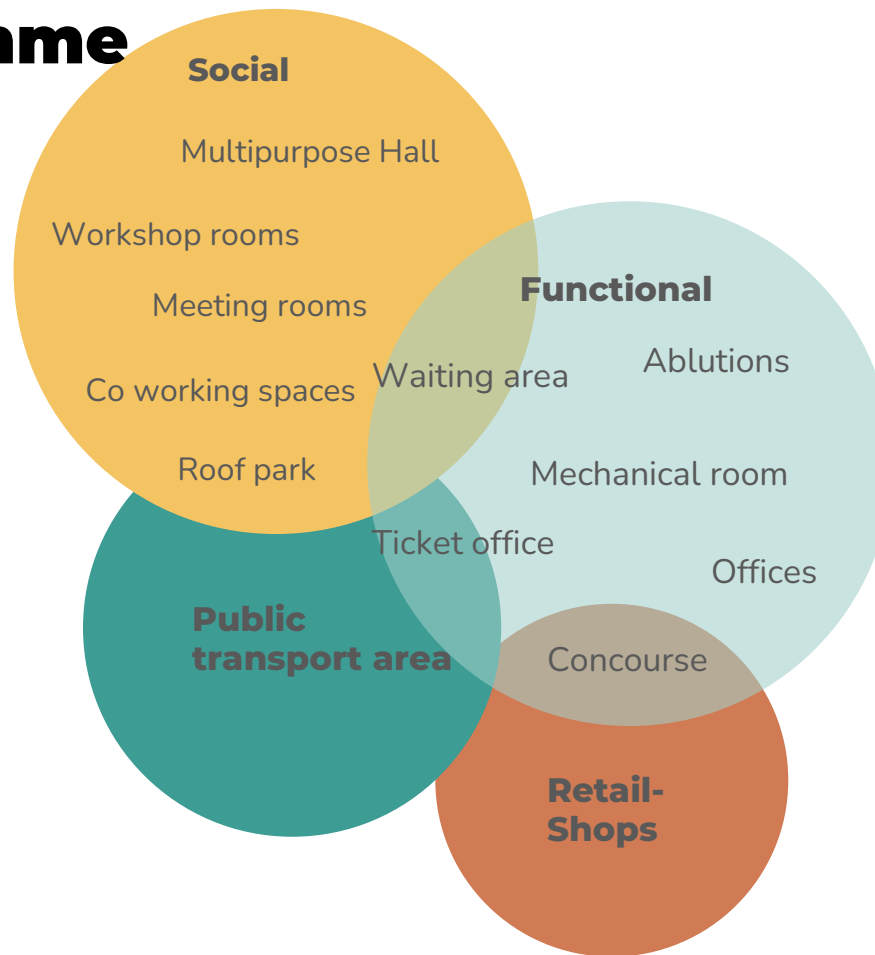
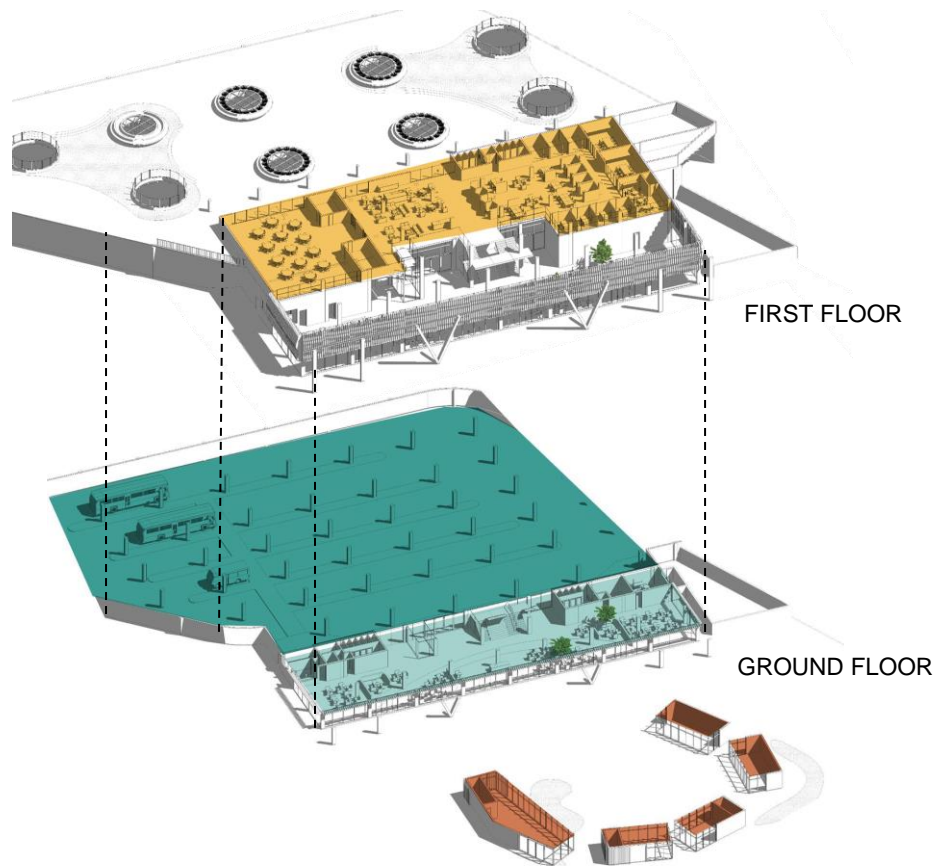






The interchange

Programme



Users



Residents

People who live within Hatfield or close proximity to the interchange hub



Students/Learners

Hatfield demographics much younger it has a large student population



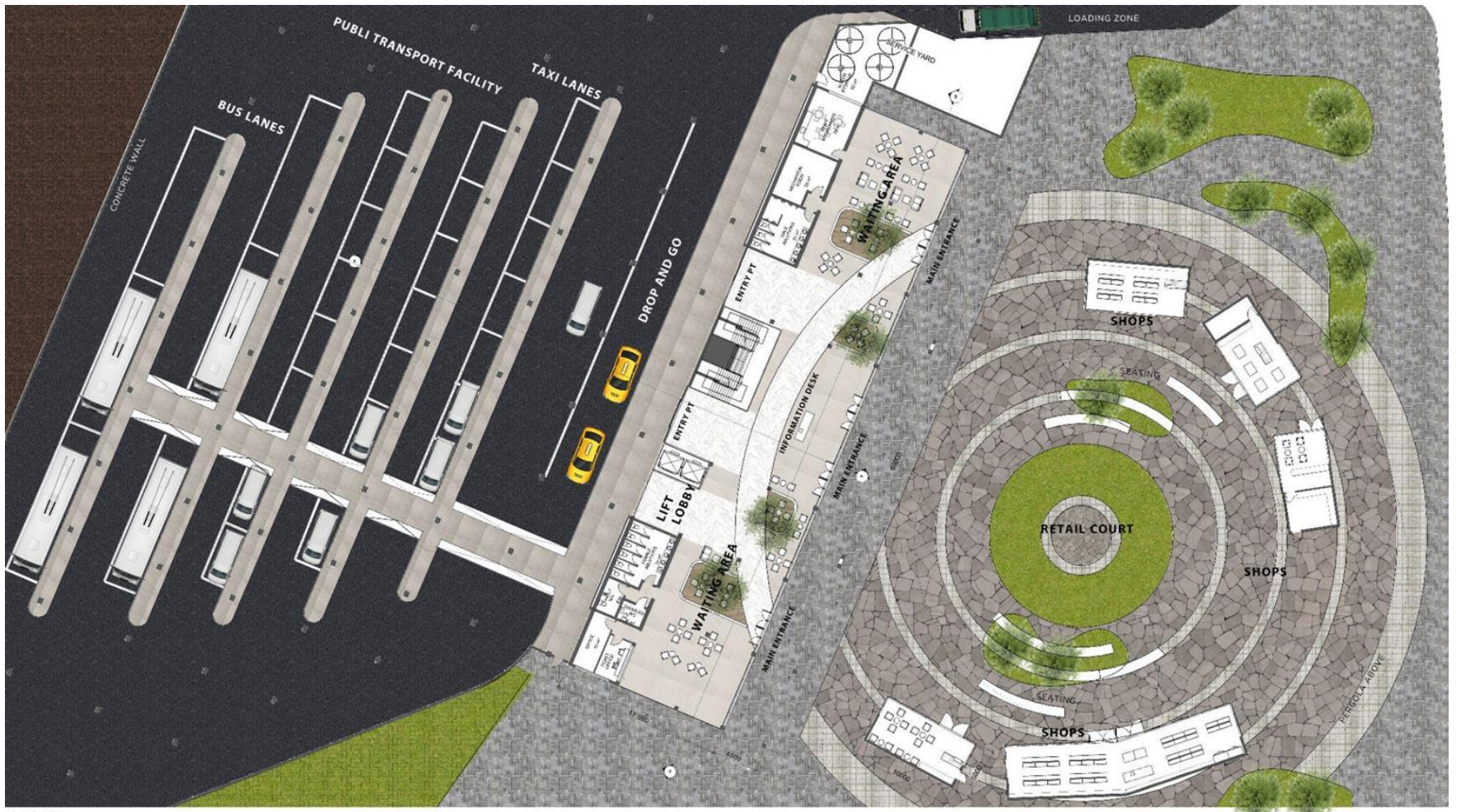
Travellers/ Tourists

People that are travelling to and from the area

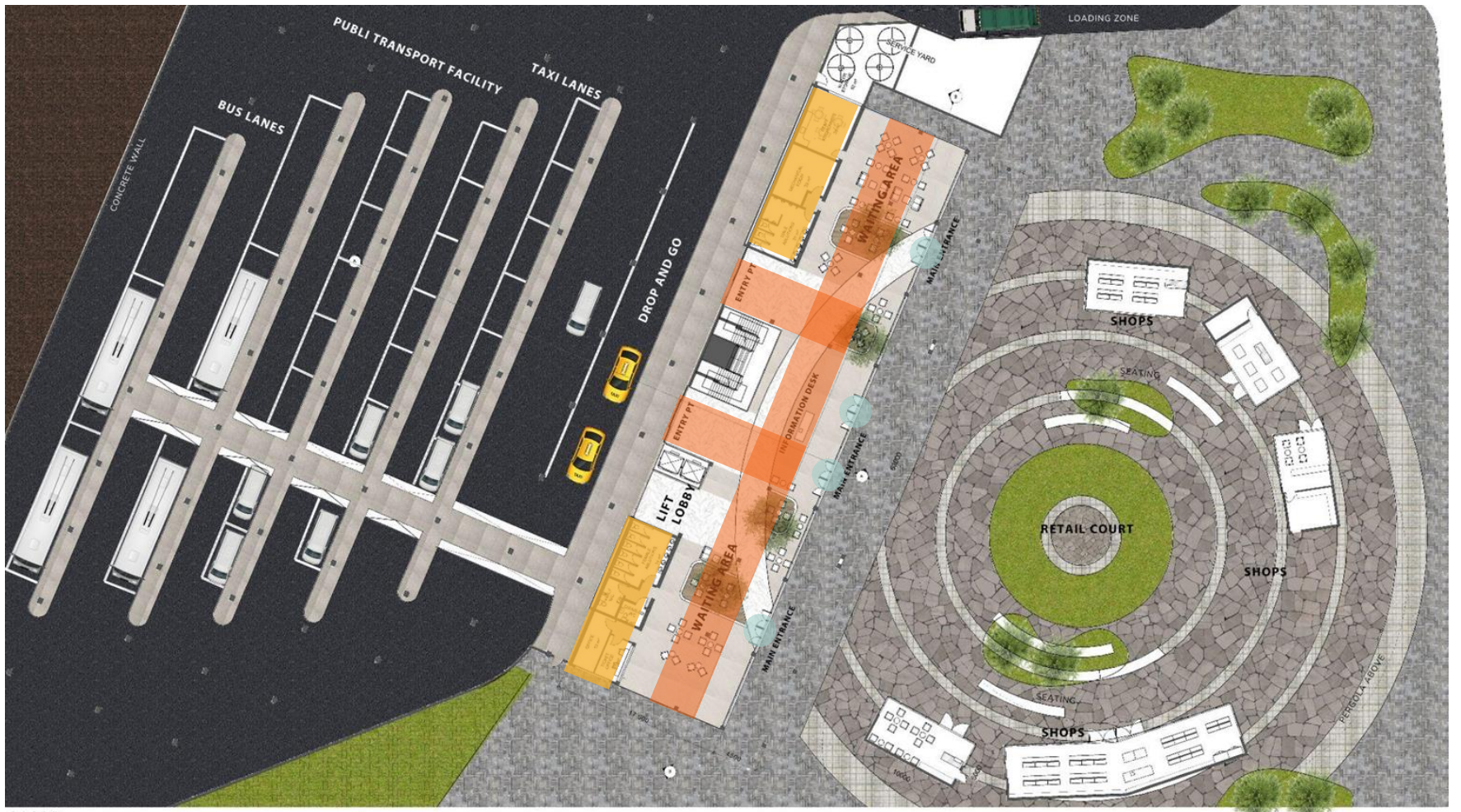


Employees

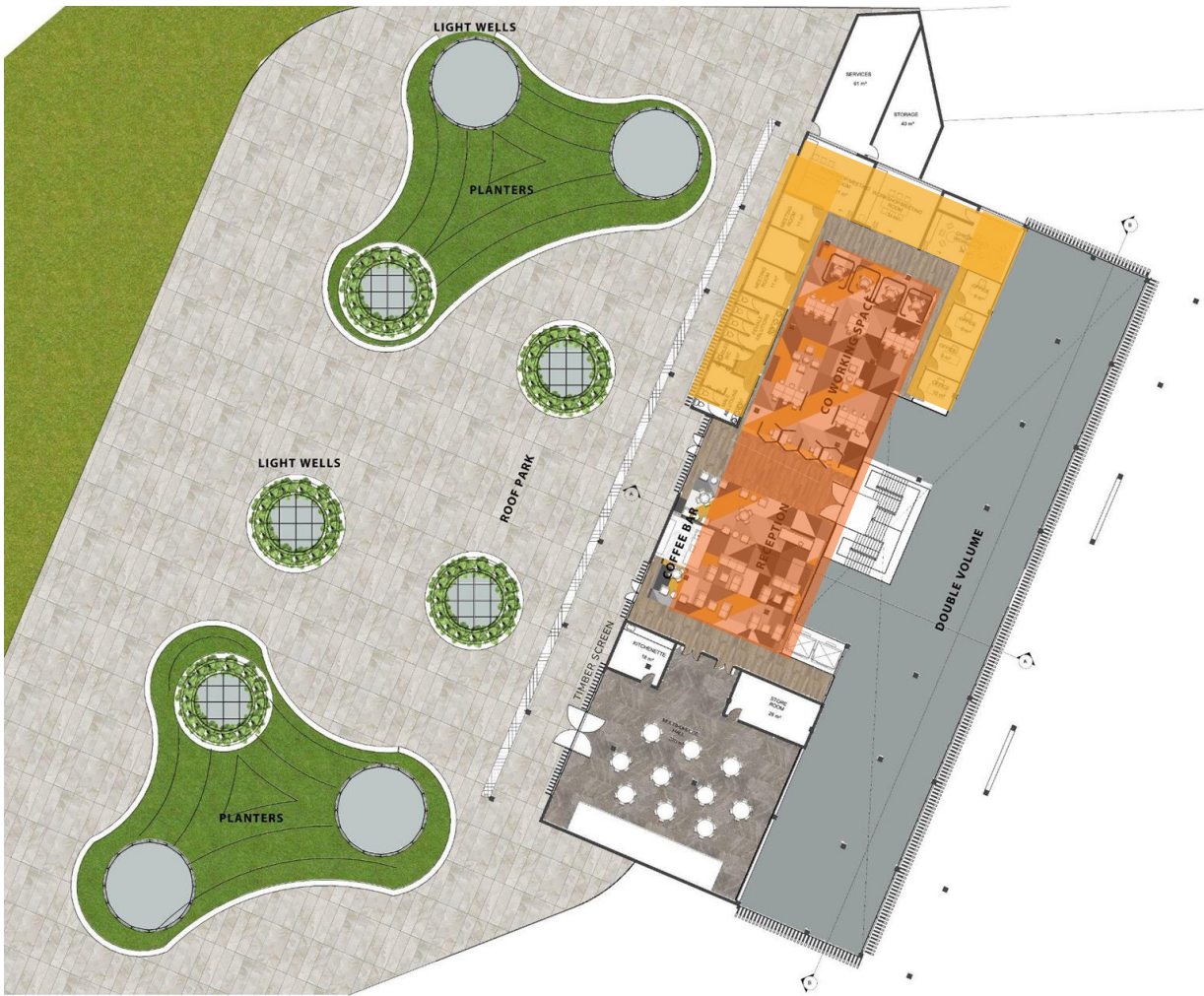
Hatfield is a significant employment area within the municipality, strongly in the retail, office, construction, transport, and service industry sectors



GROUND FLOOR PLAN

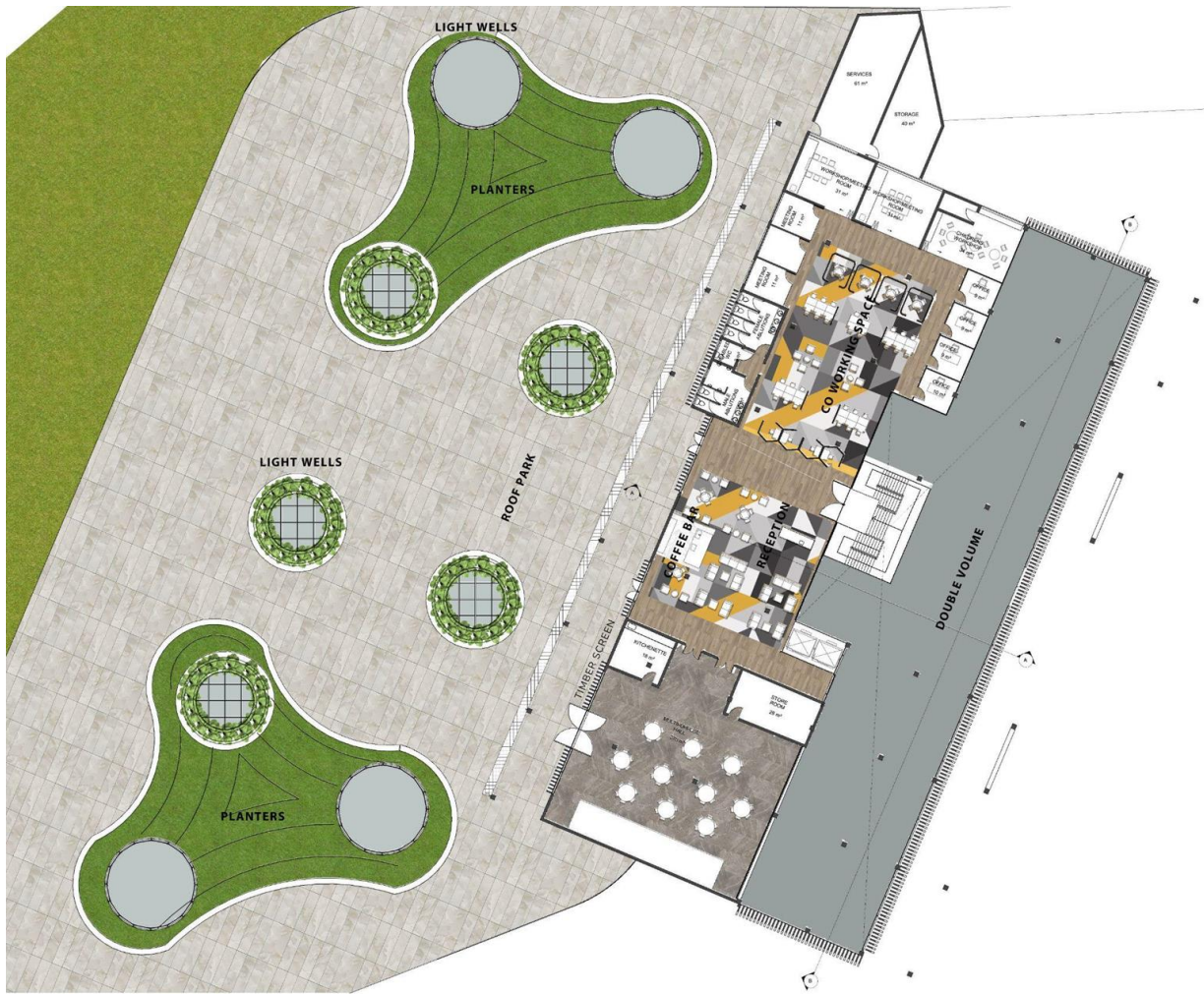


GROUND FLOOR PLAN



FIRST FLOOR PLAN

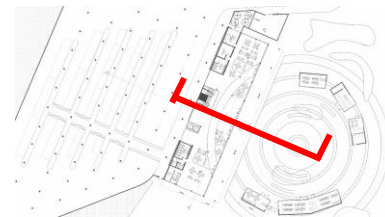




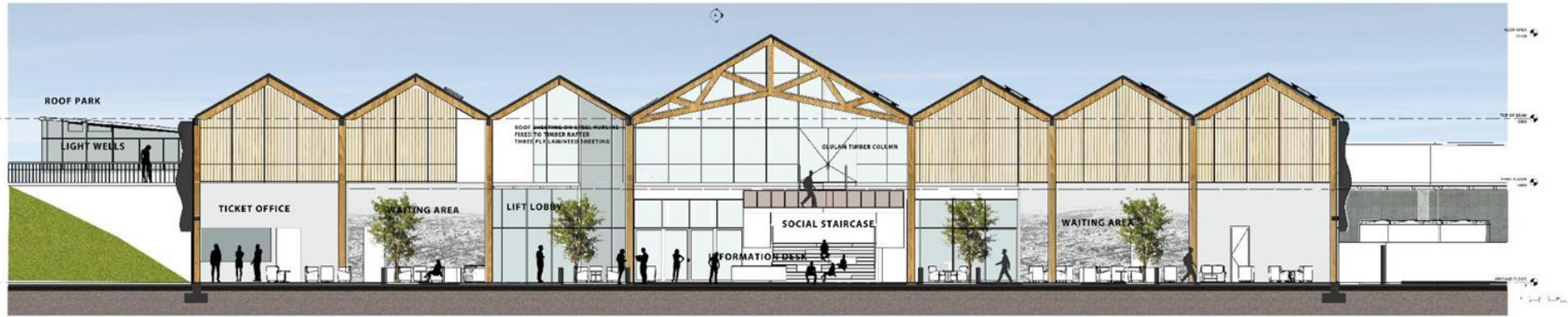
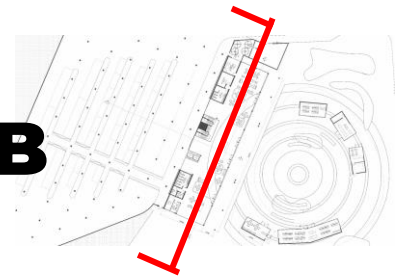
FIRST FLOOR PLAN



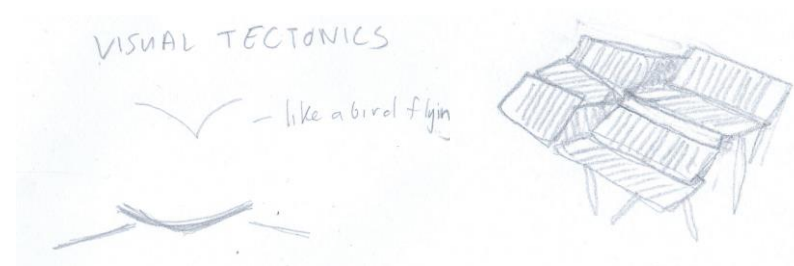
Cross Section A-A



Longitudinal Section B-B



North East Elevation

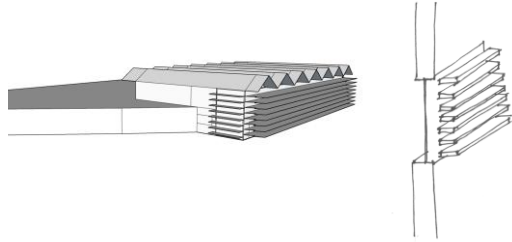


South West Elevation



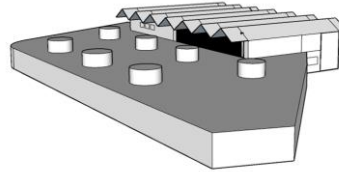
Energy Performance BASE MODEL SANS XA

Iteration 1 - Horizontal louvre

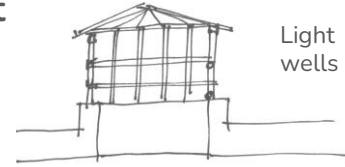


East solar cooling load reduced by 10%

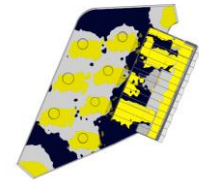
Iteration 3- Daylight, West facade



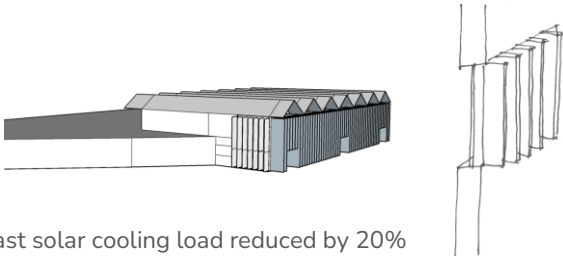
West solar cooling load reduced by 60%
Daylighting- from overlit to well lit



Light wells



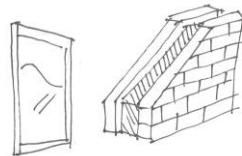
Iteration 2 - Vertical louvre



East solar cooling load reduced by 20%

Iteration 4- Materials

LOW-E GLASS



INSULATION



Materials with lower R values used

East and West cooling load reduced by 30%

Final iteration

- Iteration 1 - Vertical louvre
- Iteration 3- Daylight, West facade
- Iteration 4- Materials



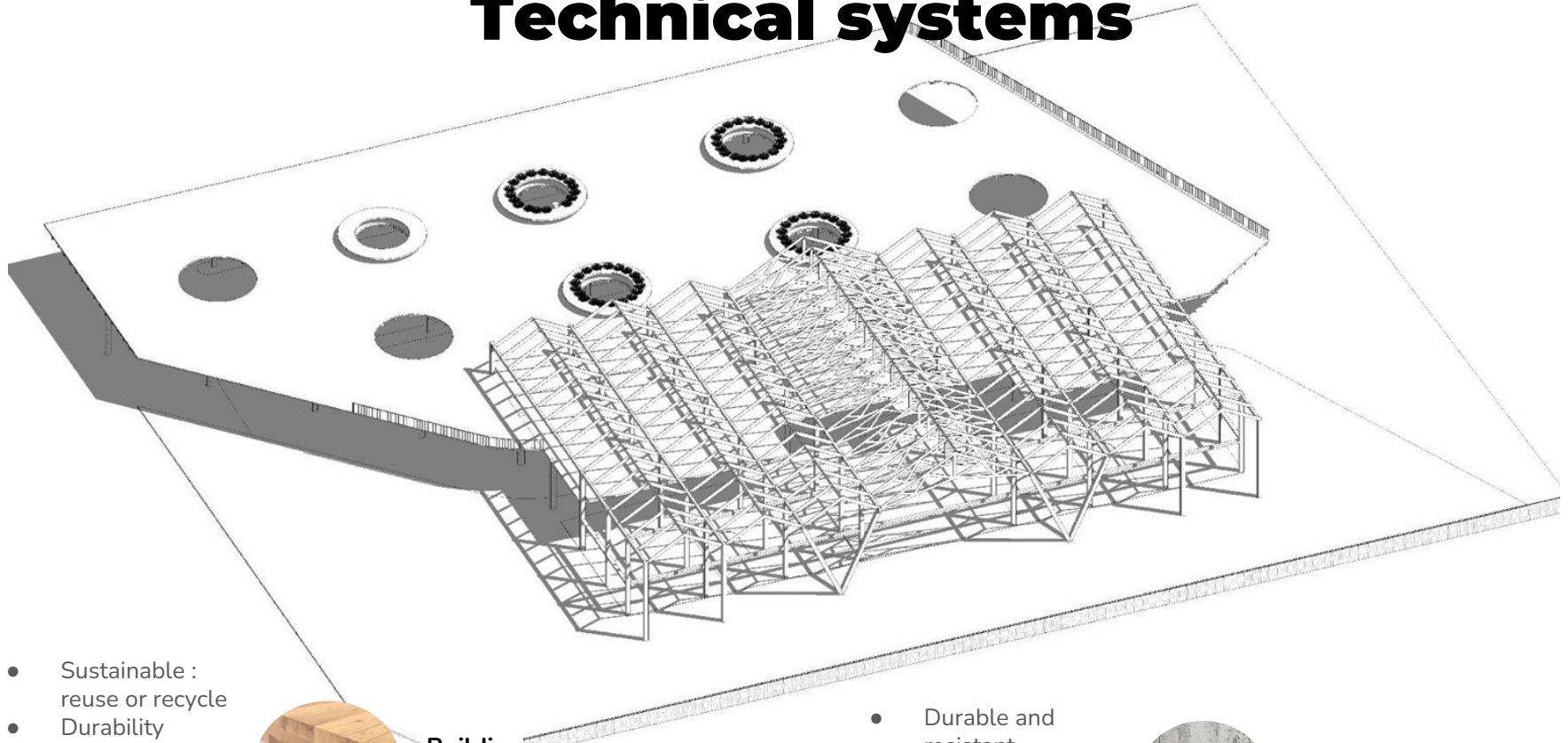
Solar cooling loads kWh/yr		
	East	West
Original	180.27	89.55
Iteration 1	162.48	89.5
Iteration 2	145.2	89.08
Iteration 3	174.85	34.55
Iteration 4	127.04	64.08
Final	113.162	64.08

Table 1: Seferia analysis, Solar cooling loads comparison

Energy intensity use (kWh/m2yr)	
Original	55
Iteration 1	56
Iteration 2	55
Iteration 3	53
Iteration 4	51
Final	49

Table 1: Seferia analysis, Solar cooling loads comparison

Technical systems



- Sustainable : reuse or recycle
- Durability
- Perform very well in fires

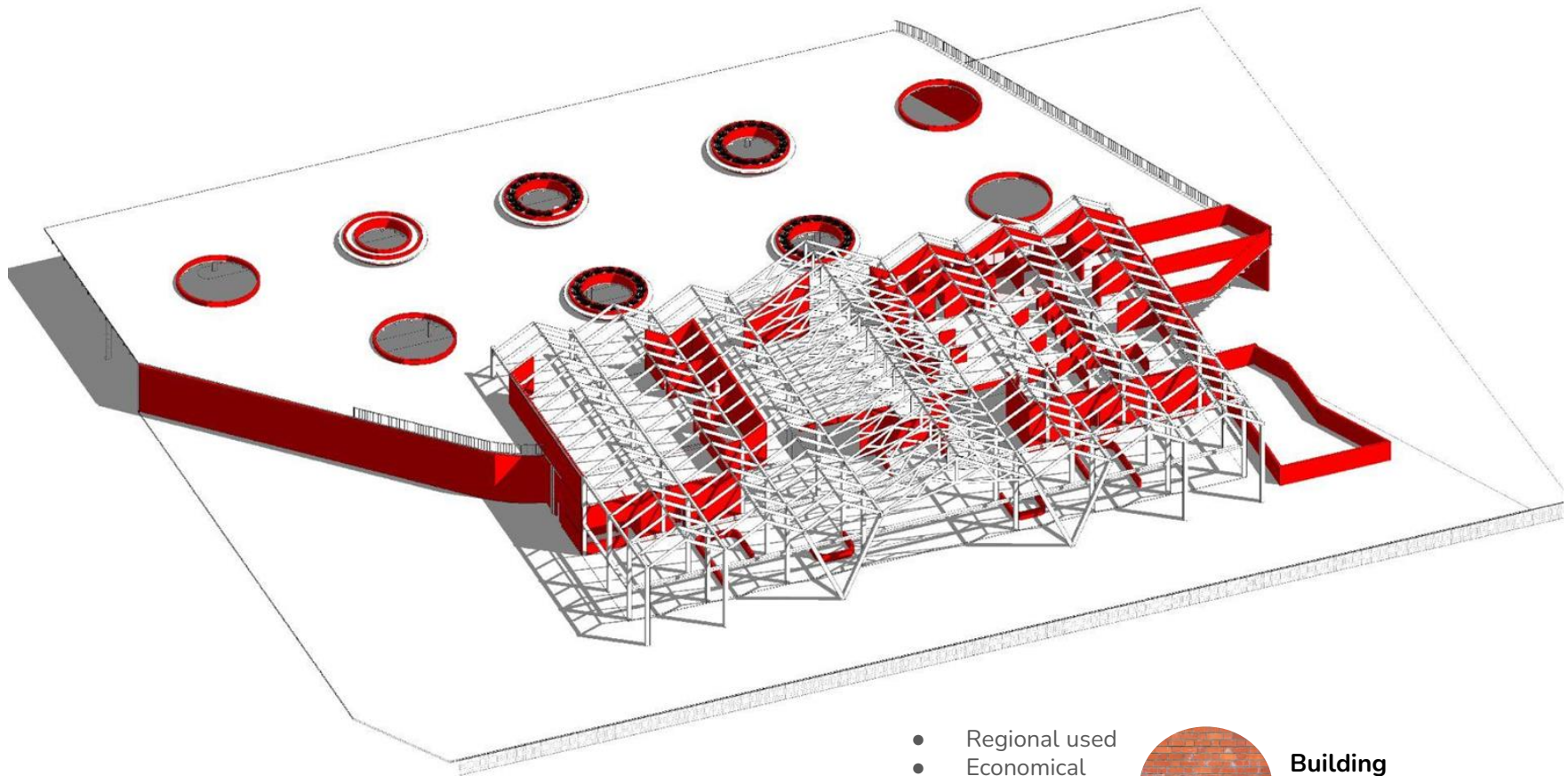


Building
Timber beams, columns,
rafters

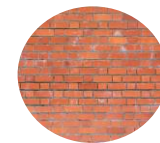
- Durable and resistant
- Good insulation
- Lower maintenance



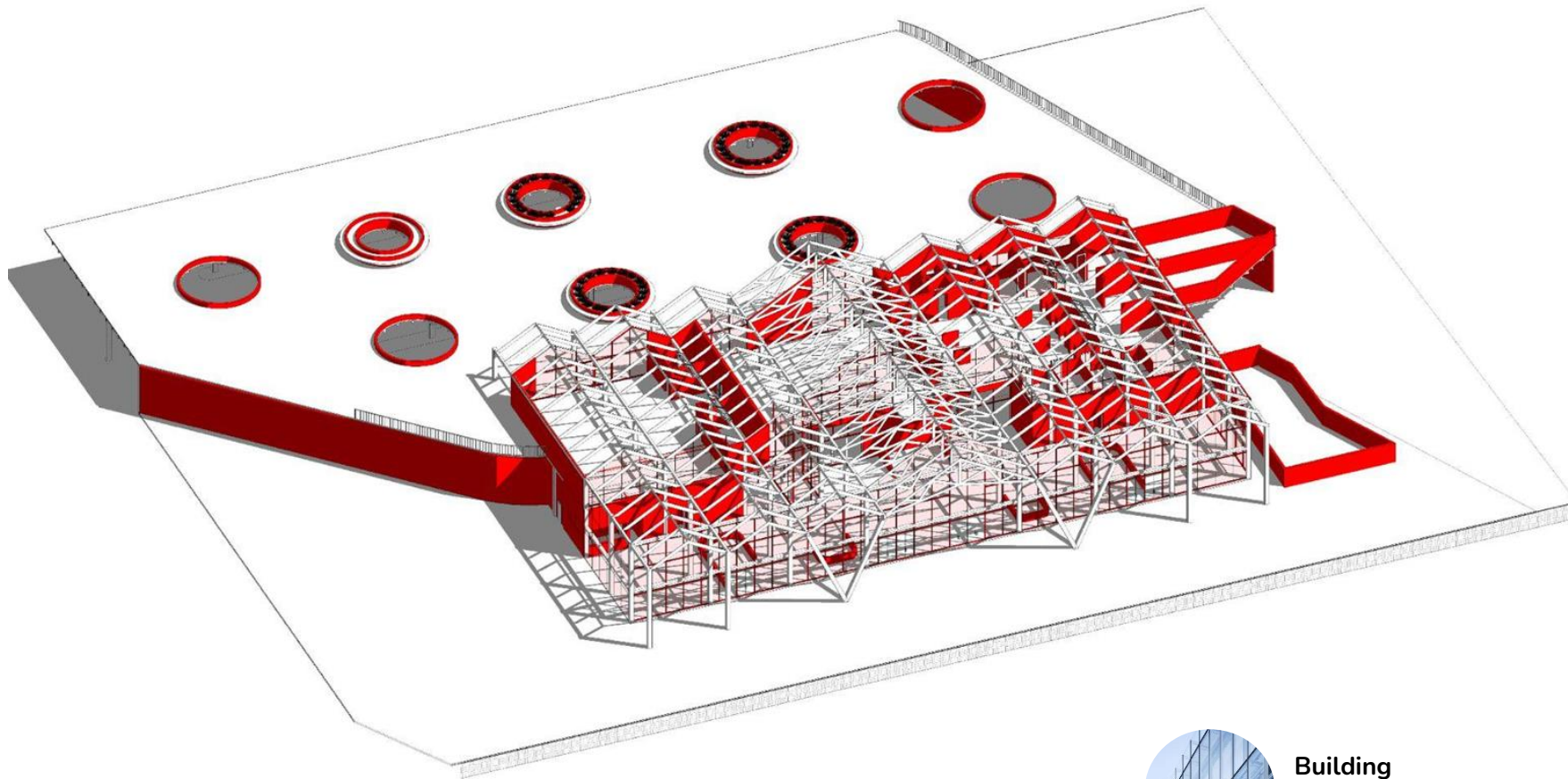
Public transport area
Concrete columns + slab
Concrete wall



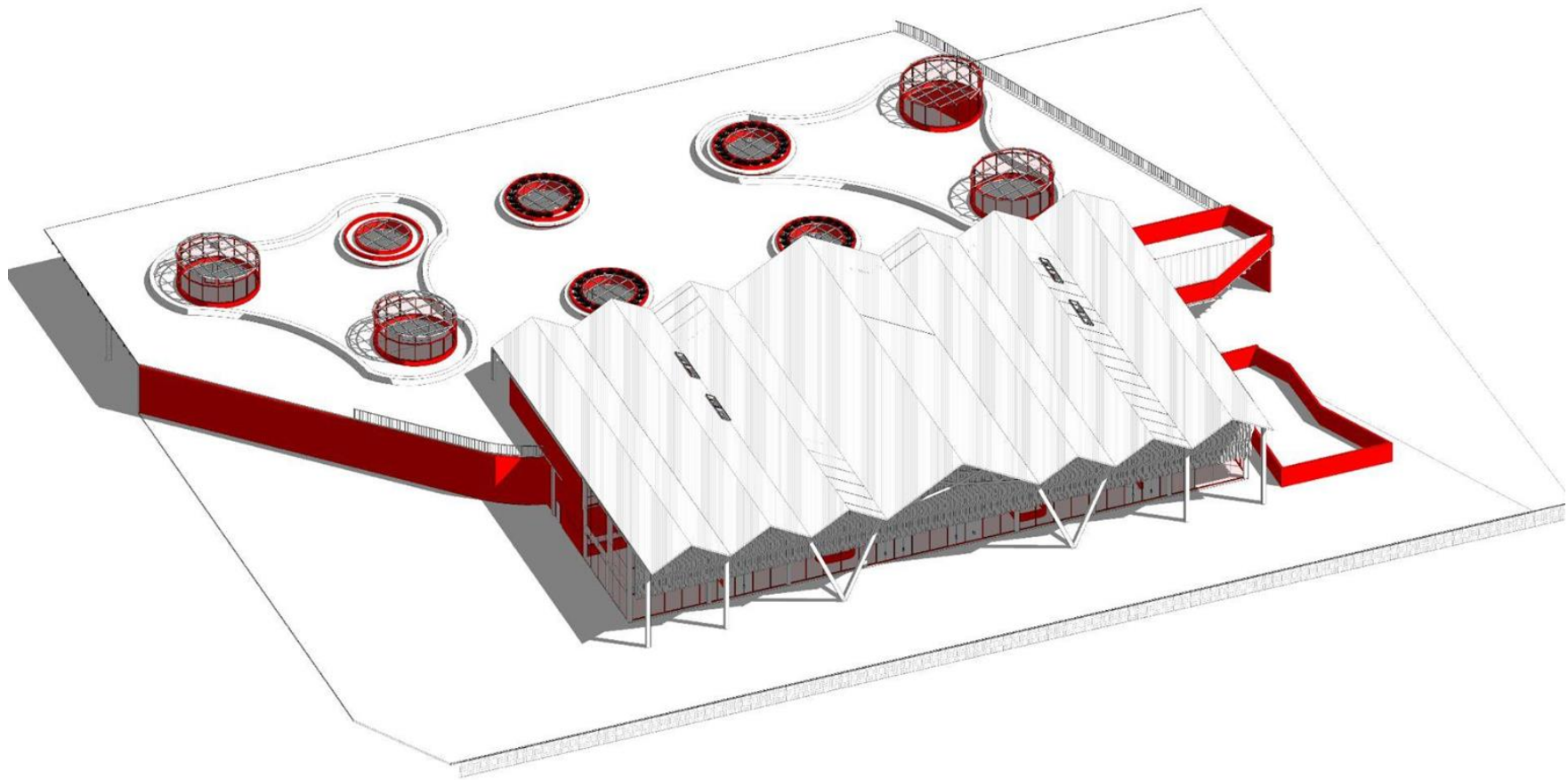
- Regional used
- Economical
- Reusable and Recyclable



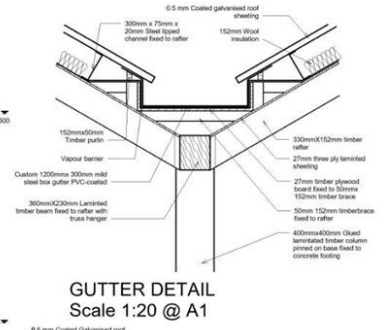
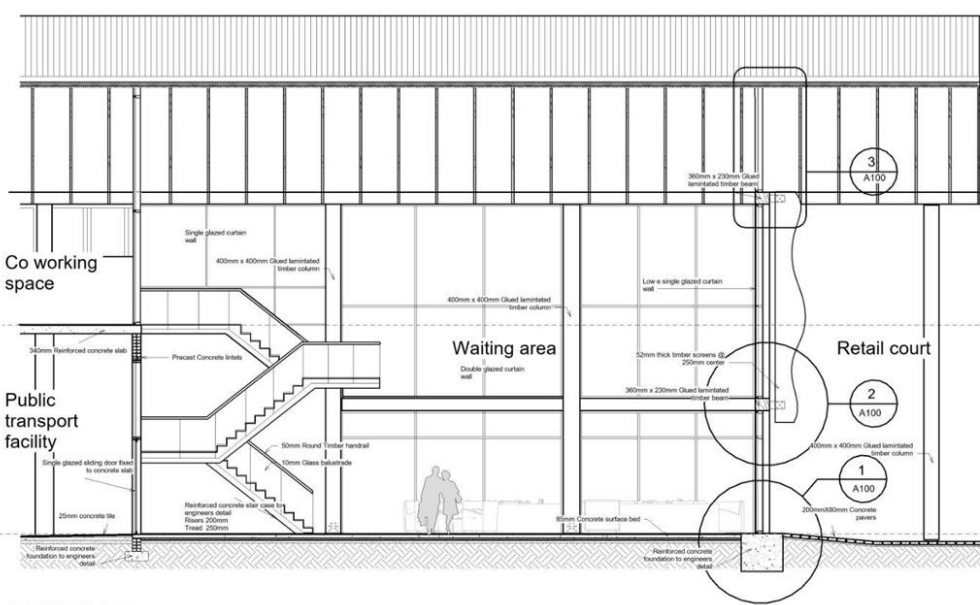
Building
Brick work infill + secondary



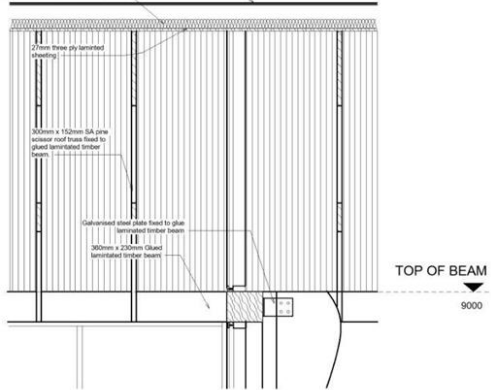
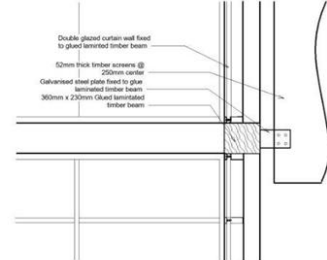
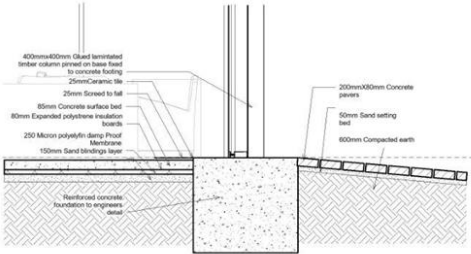
Building
Curtain wall infill



Technical details



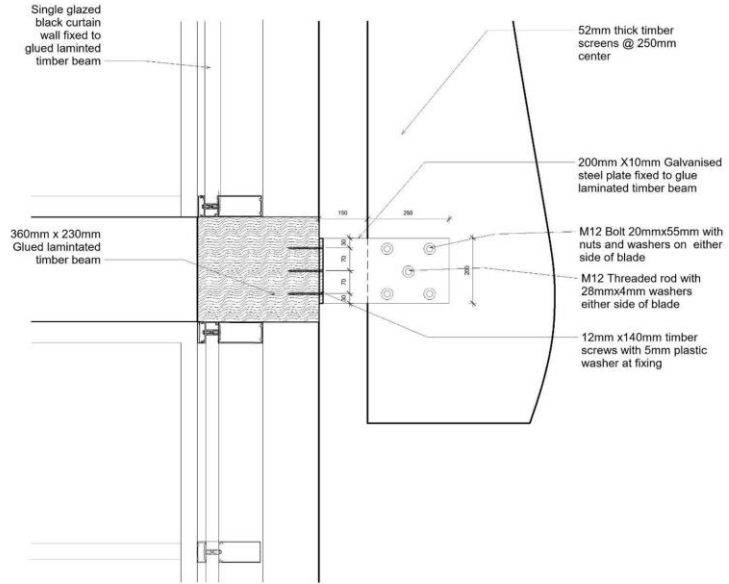
SECTION A-A
Scale 1:50 @ A1



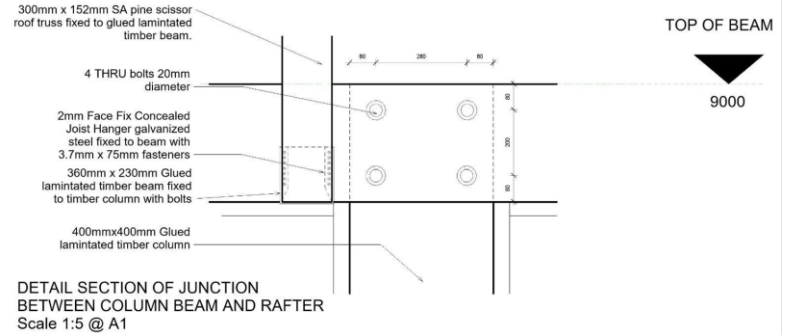
DETAIL SECTION 1
Scale 1:20 @ A1

DETAIL SECTION 2
Scale 1:20 @ A1

DETAIL SECTION 3
Scale 1:20 @ A1



DETAIL SECTION OF TIMBER SCREEN FIXED TO BEAM
Scale 1:5 @ A1

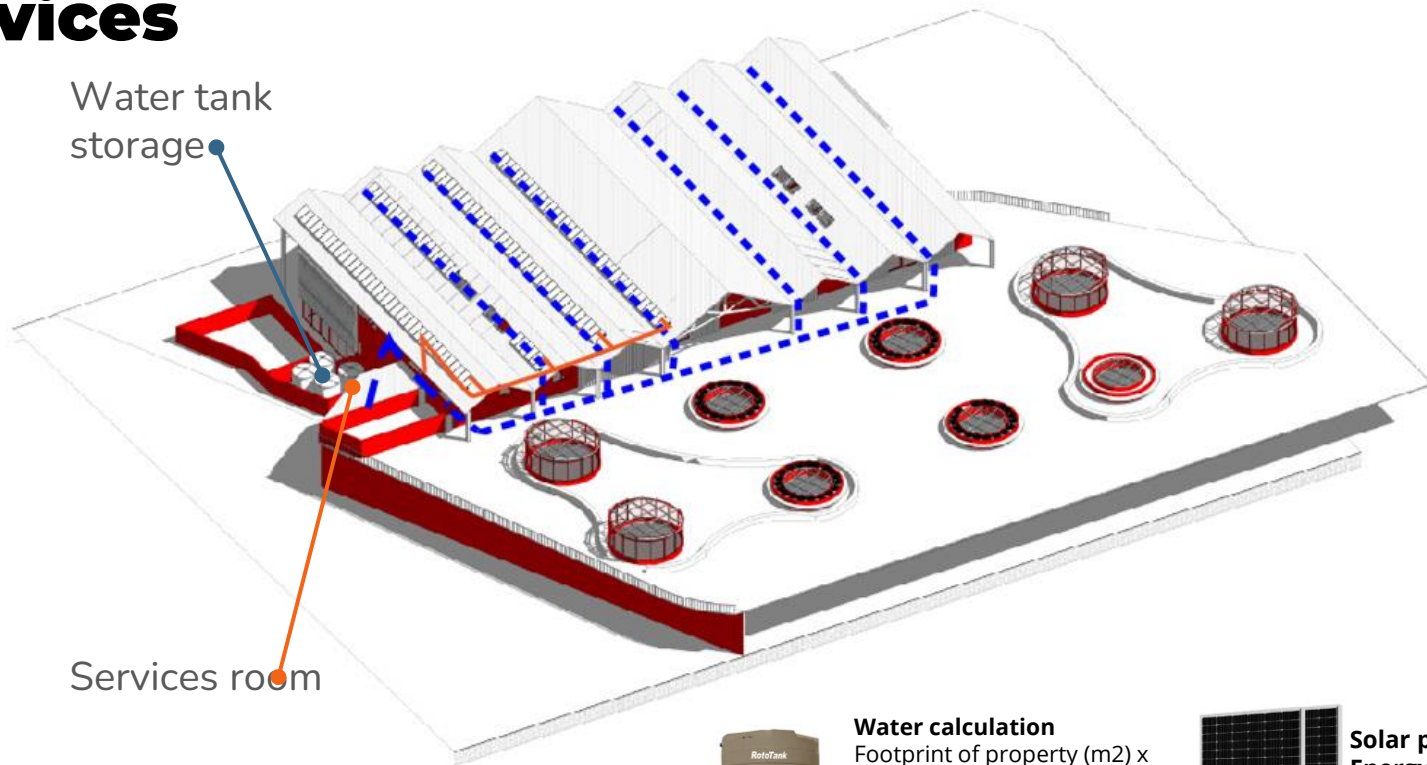


DETAIL SECTION OF JUNCTION BETWEEN COLUMN BEAM AND RAFTER
Scale 1:5 @ A1

Services

Water tank storage

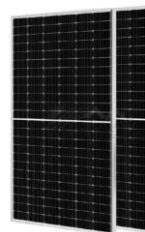
Services room



Water calculation

Footprint of property (m²) x
Drainage coefficient x filter
efficiency x annual rainfall x
0.05 = recommended tank size.

80 000L tank
4x 20 000l tanks



Solar panel calculation Energy consumption

30 7645kwh/yr
Solar size estimate 90.15kW
420 sqm area required

~300 panels

3Ds













How can we achieve **spatial integration** of **public transport systems** in Hatfield that promotes the development of **strong social capital**?

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