Low-rise, medium-density residential development

Lucia Melchiors

Term 2 –

Design a low-rise, medium-density residential development (architecture) /

Design a public space (landscape)

Architecture students: will design a medium-density residential development (LOW-MD-MIX), between **3 to 6 floors**, with a ***variety of unit sizes and types***.

The design challenge of this project:

1. Contextual relationships – respond strategically to urban issues, such as contextual relationships, links with other sites/buildings, access/circulation, the relation of your buildings with the street, the orientation of building block to sun and views, public spaces, natural features, contours, etc.
2. Functionality – investigate layout, the relationship between internal spaces, the relationship between internal and external spaces, the orientation of individual apartments to sun and views, dimensions of internal spaces, access/circulations, privacy between unities and within apartments, exploration of common areas and of private external spaces (balconies, terraces), etc.
3. Structure – define the structural system of the building through diagrammatic analysis.
4. Climate Change & Mana Whenua – explore strategies to develop a building that can manage 'its own infrastructure', in an effort to create a self-sufficient design (responding to solar orientation, passive design, winds patterns, water consumption, sanitation and energy use). Acknowledge Te Aranga Principles.

- **Initially (Week 7),** individually, students will select an area from the masterplan and design, in more detail, its mass configuration to accommodate the LOW-MD-MIX. During this first stage you are going to deal with the contextual relationships. At this stage it is important to:
- Select case studies from different apartment blocks (or relevant projects) within New Zealand or internationally - ideally from apartment complexes designed by prominent designers. Your task is to examine the volumetric composition of these blocks and the apartments within them, evaluating its Contextual relationships, Functionality, Structure and Environmental sustainability (refer to topics 1, 2, 3 and 4),
- Use site plan, cross sections, sketches, diagrams, volumetric models to show the mass configuration of your city block;
- **After this (Week 8-12),** you will develop the design for the LOW-MD-MIX, which should be environmentally responsive to the site and to the local users' needs (topics 1, 2, 3, and 4).

Landscape architecture students: will develop a public space as part of the overall Maybury Street masterplan. The public space must ameliorate the site flooding as well as provide a civic space for the residents, workers and visitors
The design challenge of this project:

1. Climate Change – You will explore strategies to develop a public space will be resilient to the effect of climate change, primary hydrological, pluvial flooding but also to other effects such a stormwater contamination and the urban heat island effect.

2. Mana Whenua – You will acknowledge the ambition of Mana whenua for the site at a range of scale through specific design moves.

3. Contextual relationships – You need to respond strategically to the urban issues that you developed in your group project such as.

- The contextual relationships to the larger landscape such as views to the maunga, waterfront connection to the Tamaki River, orientation to the sun and natural features, contours, etc.

- Links with other sites/buildings, access/circulation within the development site,

Initially (Week 7), Landscape students will start by spending a week on selecting an area from the masterplan to design in more detail. This task must be done in conjunction with the other members of the team. During this first stage you are going to consider contextual relationships by;

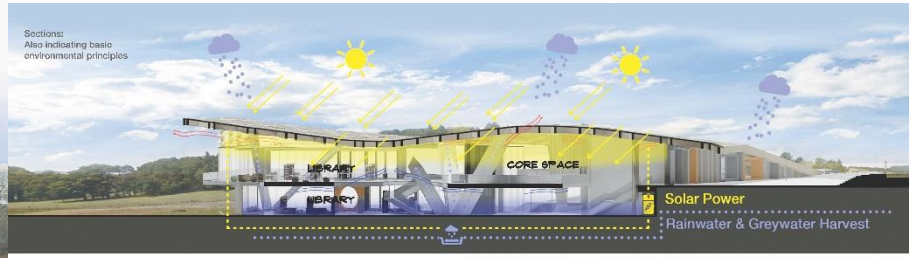
- Develop a site plan, cross sections, sketches, diagrams, and models to show the design development of your public space.

After this (Week 8-12), you will develop the design of a public space within the overall masterplan which should be environmentally responsive to the site and to the local users' needs.

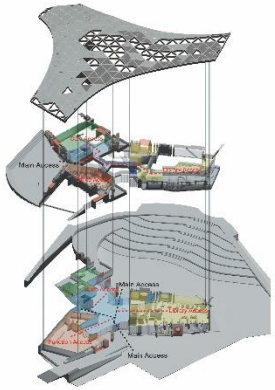
West Facade Perspective
showing public space/building interaction

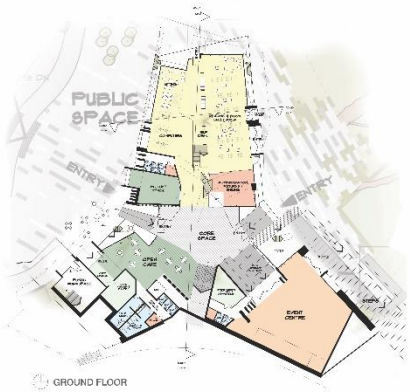
East Facade Perspective
showing public space/building interaction

Aerial Perspective

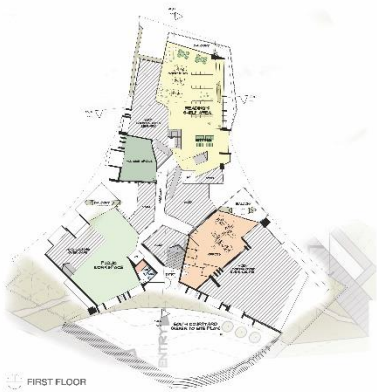


Exploded Axo





GROUND FLOOR



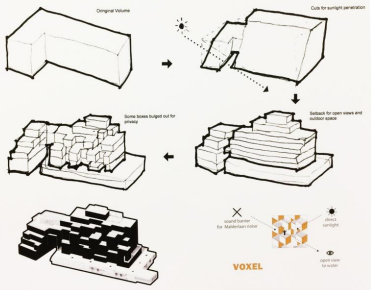
FIRST FLOOR

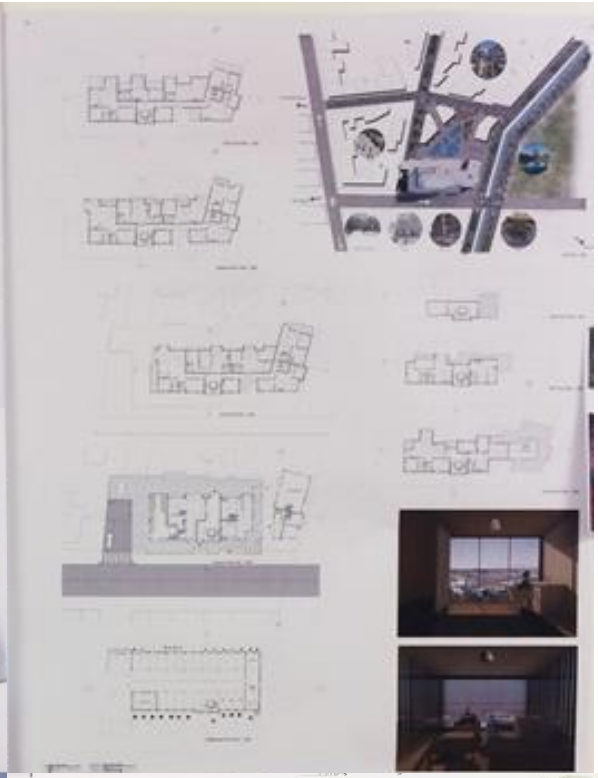
Floor Plans

Design of the open spaces should be radical in its focus on the social and environmental aspects of the urban environment allowing for the fullest integration and mitigation of the impacts of buildings.

Urban Apartment

Qiyuan Zhou 1461803

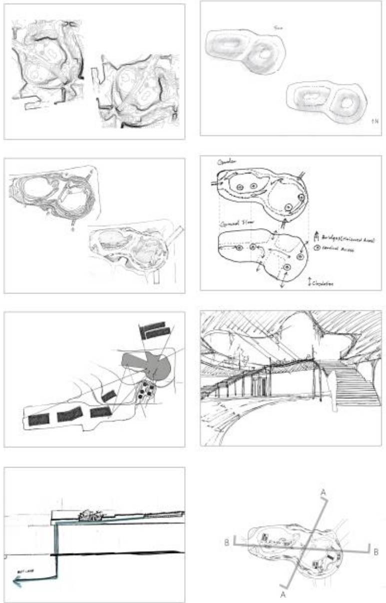


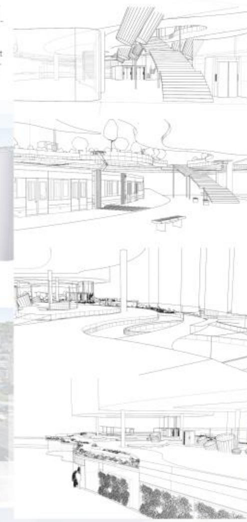


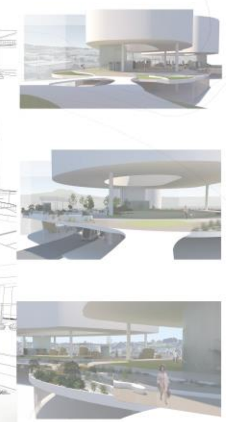
Suyi Gan 1476116 Studio 7

The concept of traditional Pā design were integrated in our stage 2 masterplan to celebrate the volcanic feature of the Onehunga Wharf site. Besides using the form of building group to mimic the shape of Te Hōpua ā Rangi tuff ring, we also proposed an elevated public corridor going between each buildings that correspond to climate change issue - remaining connection while sea level rise. To reinforce these concepts, the terrace form is being introduced to the landscape design onto the second floor of the buildings.

The terrace form of the sky garden is inspired by the natural landform of Te Hōpua ā Rangi to further acknowledge the historical and cultural heritage. By connecting all the buildings and extending bridges out to three different direction, the sky garden can act as a corridor for bicycle and pedestrian transit in and out of the site. Besides the transition functionality, the sky garden also provides a green space with natural materials to the building that is easily accessible that can enhance the living quality of the residents. With different planting combinations, the sky garden can also perform as green roof for stormwater mitigation and enhance building performance. As a planted airscape, the sky garden provides "environmental, social, and economic benefits and help build resilience" (European Commission, 2016).



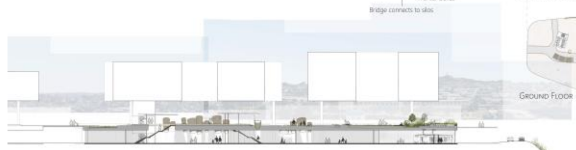




Section AA Scale 1:250@A0

Reference: European Commission. (2016). Nature-Based Solutions. Retrieved from: https://ec.europa.eu/research/environment/index.cfm?pg=nbs

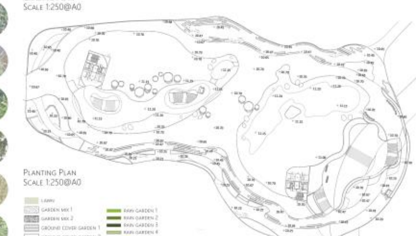
Masterplan
Scale 1:200@A0



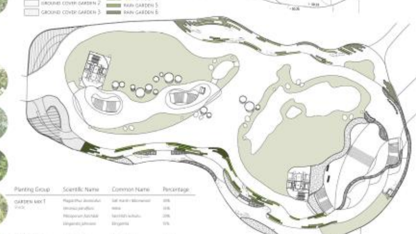
Section BB Scale 1:250@A0

Exploded Layers
Scale 1:125@A0

Grading Plan
Scale 1:250@A0



Planting Plan
Scale 1:250@A0

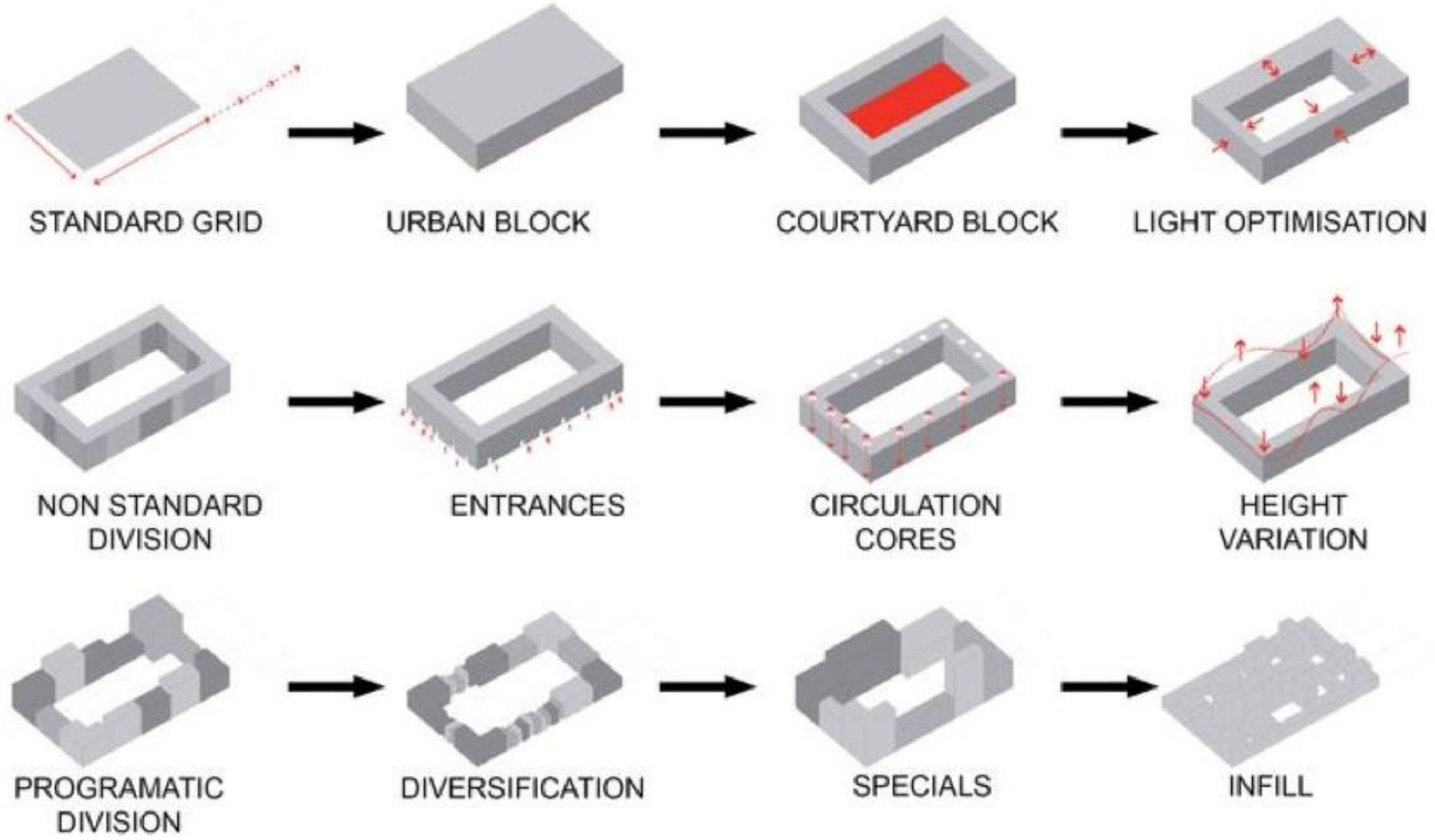


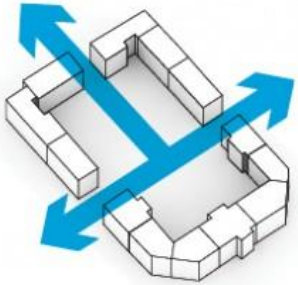
Planting Group	Scientific Name	Common Name	Percentage
Garden Mix 1 Shade	Plagianthus divaricatus	Salt marsh ribbonwood	[illegible]
	[illegible]	[illegible]	[illegible]
	Pittosporum fairchildii	Fairchild's kohuhu	20%
	[illegible]	[illegible]	[illegible]
Garden Mix 2 Shade	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	20%
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
Ground Cover Garden 1 Shade	[illegible]	Everlasting daisy	60%
	[illegible]	[illegible]	40%
Ground Cover Garden 2 Shade	[illegible]	Bachelors buttons	[illegible]
	[illegible]	[illegible]	[illegible]
Ground Cover Garden 3 Sun	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
	Fuchsia procumbens	Creeping fuchsia	[illegible]
Green Wall Sun	[illegible]	[illegible]	[illegible]
	Fuchsia procumbens	Creeping fuchsia	20%
	[illegible]	[illegible]	[illegible]
	[illegible]	New Zealand ice plant	[illegible]
	[illegible]	Marlborough rock daisy	20%
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]

Planting Group	Scientific Name	Common Name	Percentage
Rain Garden 1 Shade	Muehlenbeckia complexa	Scrambling pohuehue	[illegible]
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	25%
Rain Garden 2 Shade	[illegible]	[illegible]	[illegible]
	Muehlenbeckia complexa	Scrambling pohuehue	[illegible]
	Carex flagellifera	Glen Murray tussock	30%
Rain Garden 3 Shade	[illegible]	[illegible]	25%
	[illegible]	[illegible]	[illegible]
	Carex flagellifera	Glen Murray tussock	[illegible]
Rain Garden 4 Sun	[illegible]	[illegible]	[illegible]
	Arthropodium cirratum	Rengarenga	25%
	[illegible]	[illegible]	[illegible]
Rain Garden 5 Sun	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	30%
	[illegible]	[illegible]	[illegible]
Rain Garden 6 Sun	Arthropodium cirratum	Rengarenga	[illegible]
	[illegible]	[illegible]	35%
	[illegible]	[illegible]	[illegible]

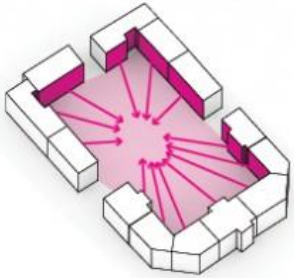
Sect

Review masterplan to adjust details for Term 2

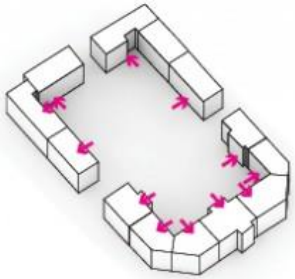

STANDARD GRID
URBAN BLOCK
COURTYARD BLOCK
LIGHT OPTIMISATION
NON STANDARD DIVISION
ENTRANCES
CIRCULATION CORES
HEIGHT VARIATION
PROGRAMATIC DIVISION
DIVERSIFICATION
SPECIALS
INFILL



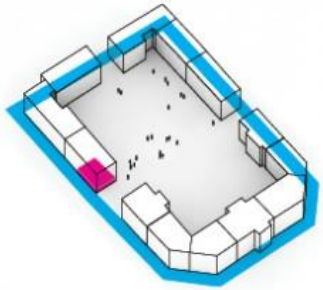
ACCESS GATES - DIRECTIONS THAT MIGHT GENERATE A VOLUME



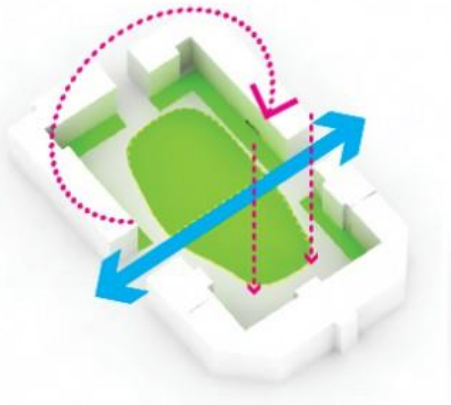
PRECINCT SURROUNDED BY ACTIVE ELEVATIONS - THAT NEED TO HAVE VISUAL CONTROL OVER THE PROPOSED SPACES



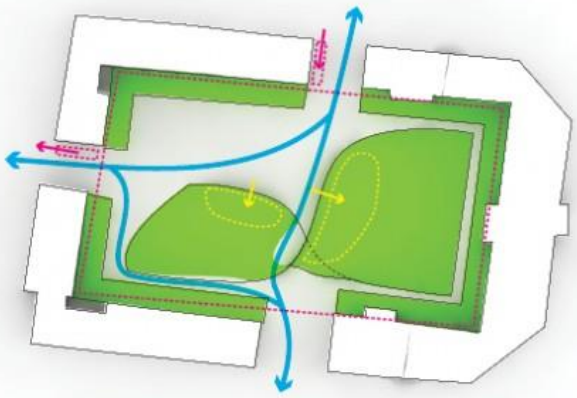
THE ACCESSES OF THE BUILDONGS BECOME PARAMETERS THAT GENERATE SPACE



THERE IS NEED FOR SPACES AT HUMAN SCALE, APARTMENT SCALE AND COURTYARD SCALE



TWISTING ONE END OF THE CENTRAL LANDSCAPE



THE RESULTED SHAPE RESPECTS THE ABOVE PARAMETERS. UNDER THE "HILLS" OF THE LANDSCAPE, FUNCTIONS ARE INTRODUCED

SITE PLAN

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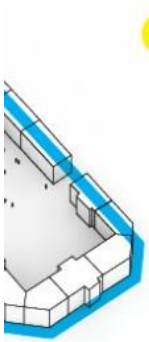
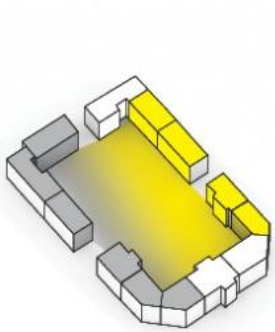
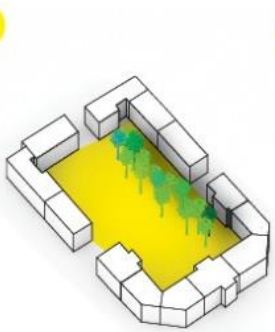


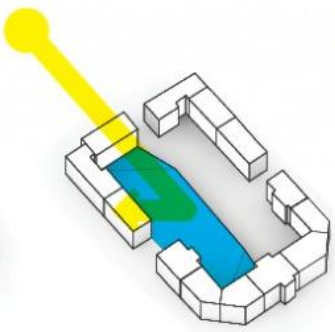
SPACES AT HUMAN SCALE AND COURT- CALE



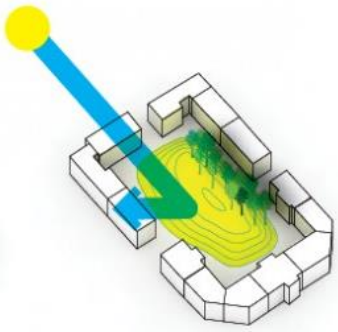
SOME SPACES ARE ALWAYS SHADED AND SOME ALWAYS SUNNY- THE SOLUTION NEEDS TO BE ADAPTED TO THIS CONDITION



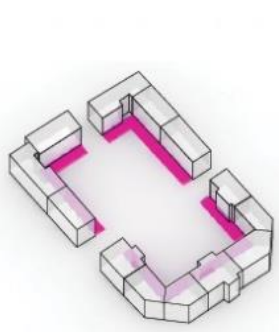
PLANTING HIGH VEGETATION WHERE THERE IS NEED FOR SHADOW AND PRIVACY



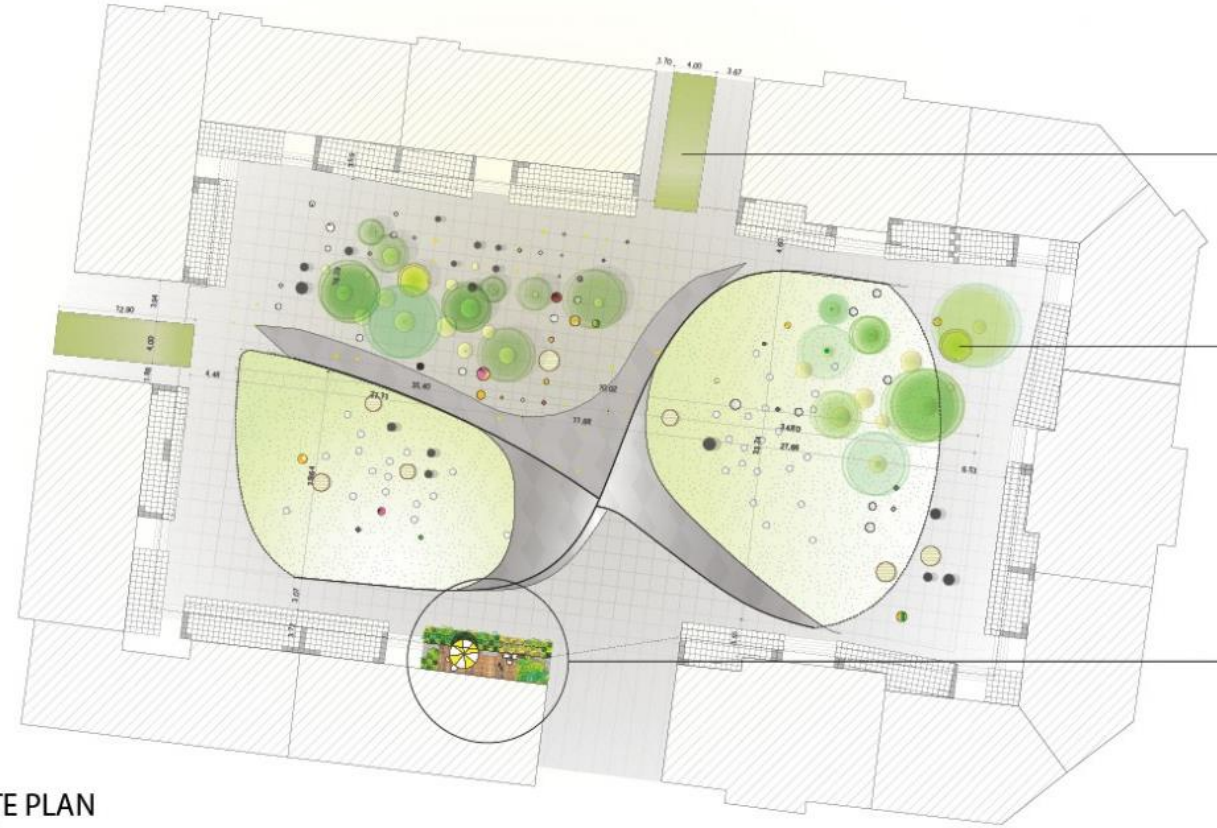
SLOPING THE PLAN OF THE COURTYARD IN ORDER TO OBTAIN MORE REFLECTIVE SUR- FACE FOR THE SHADED FACADES



COMBINING THE TWO PRINCIPLES



CREATING PRIVATE GREEN AREAS IN THE PROXIMITY OF THE APARTMENTS.



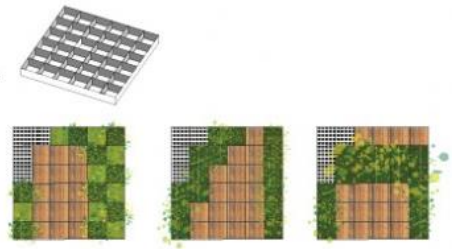
SITE PLAN

N

PARKING ACCESS FOR CARS

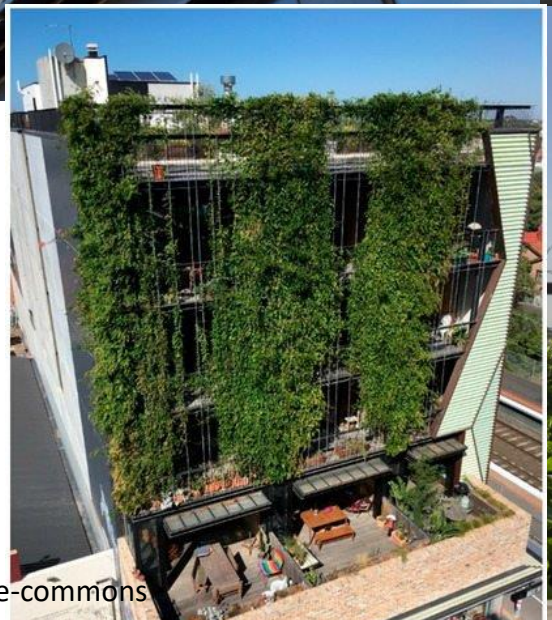
PARKING ACCESS

TERRACE STRUCTURE AND POSSIBILITIES OF USE



Architecture students: will design a medium-density residential development (LOW-MD-MIX), between **3 to 6 floors**, with a ***variety of unit sizes and types***.

… Concept ? …



Commons
Nightingale Housing
https://nightingalehousing.org/the-commons

… How your project respond to the local context?

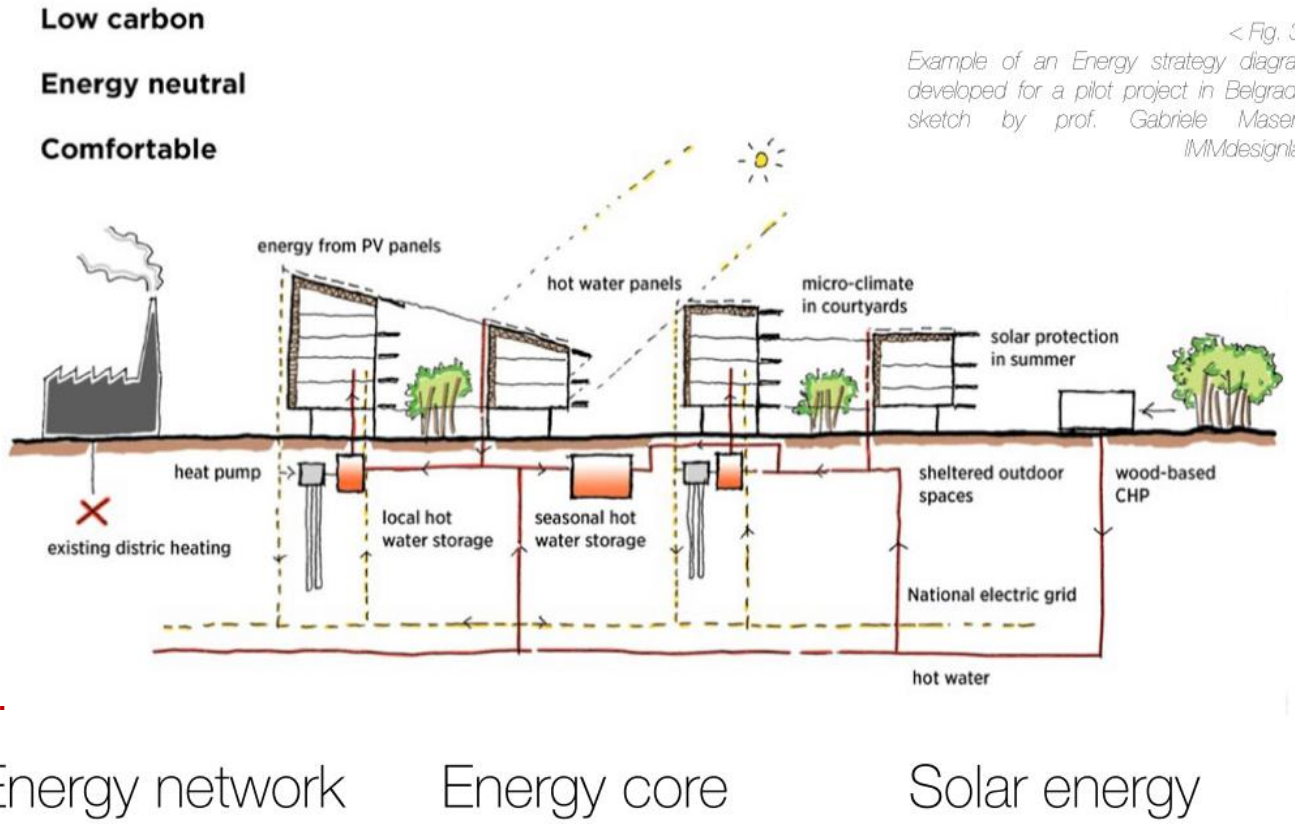
… How your project respond to climate change?

… Climate change? Sustainable Principles?

Cross-ventilation,
solar protection (north x southern orientation),
thermal mass,
using sustainable and local materials,
re-using, recycling…

Green strategies…
trees/greenery,
green roofs, terraces,
green facades…

Collect and re-use of water…
Solar energy…



https://www.unitec.ac.nz/epress/index.php/new-lynn-auckland-imm-case-study/

… Context? … Cultural aspects?

Site specific project: New Zealand – Auckland – Mangere – Street… (local culture, local population)

- **Auckland – uniqueness…**
- **Context of the area**
- **Visibility to Maori culture**
- **Respect for diversity – flexibility**
- **Te Aranga Principles**
- **Future generations**

Aria Apartments, Vinegar Lane, Auckland
TOA Arquitects
http://toa.net.nz/work/aria-vinegar-lane-and-lot-7/

… Context? … Cultural aspects?

Local population, Te Aranga Principles

Auckland, Wynyard Quarter, Auckland

Architectus - Chris Barton

https://www.architecturenow.co.nz/articles/happily-mewed-up-wynyard-central/

https://www.archdaily.com/922631/wynyard-central-east-2-apartments-architectus/5d4b87a6284dd1977900013a-wynyard-central-east-2-apartments-architectus-plans?next_project=no

… Context? … Cultural aspects?

Local population, Te Aranga Principles

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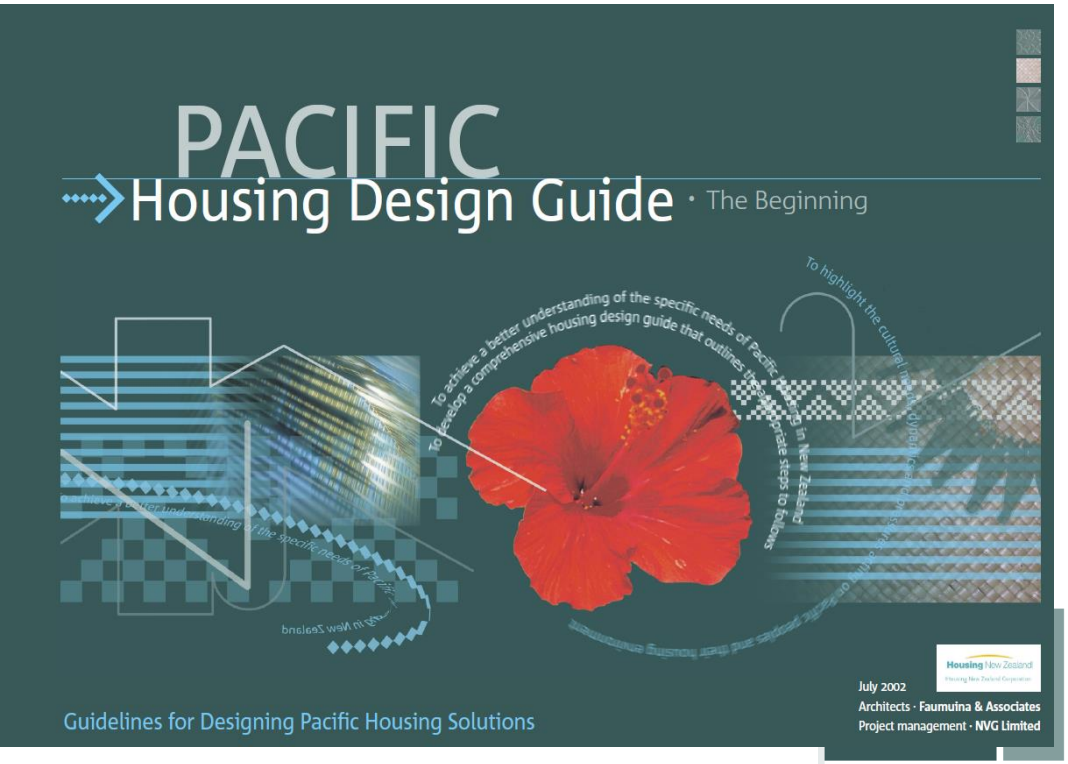


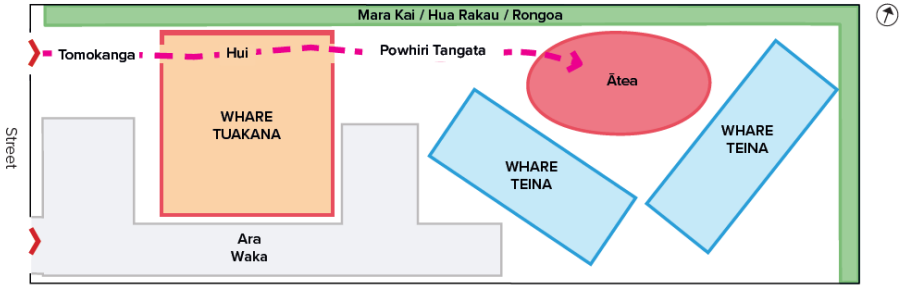
		Formal	Informal	Utility	Cooking	Personal	Sleeping	Outdoor
Main Entry		✔	•	•	✗	✗	✗	•
Formal	✔		✔	✗	✗	✗	✗	✔
Informal	•	✔		•	✔	✗	•	✔
Utility	•	✗	•		•	•	•	•
Cooking	✗	✗	✔	•		✗	✗	•
Personal	✗	✗	✗	•	✗		•	✗
Sleeping	✗	✗	•	•	✗	•		•
Outdoor	•	✔	✔	•	•	✗	•	

✔ **Essential**
spaces must be connected when designing a Pacific housing solution;

• **Acceptable**
spaces may be connected, but it is not essential in a Pacific housing solution;

✗ **Unacceptable**
avoid connecting these spaces.

TUAKANA/TEINA CONCEPT DETAILS



The site layout is influenced & developed through the Tuakana/ Teina concept.

Whare Tuakana
Existing house is reconfigured and a second storey added to create a main house with flexible spaces & guest accommodation.

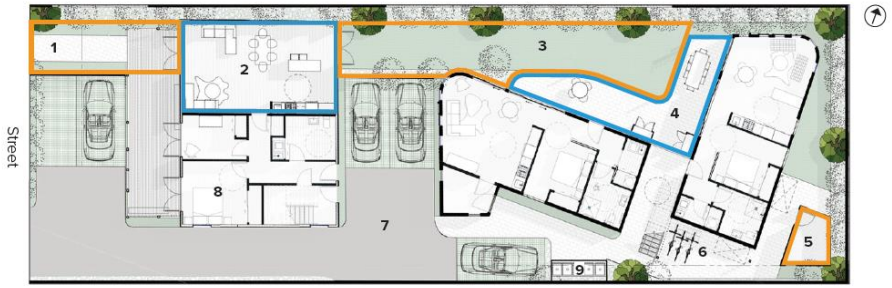
Whare Teina
Three storey modular housing added at rear of site. These homes can be reconfigured to meet the changing needs of whanau over time.

Tomokanga
Legible entry with accessible connections through the site

Hui / Pōwhiri Tangata / Ātea
Welcoming & gathering spaces

Ara Waka
Car access & parking space is minimised & separated from communal outdoor areas

INTEGRATION OF VALUES KOTAHITANGA (TOGETHERNESS)



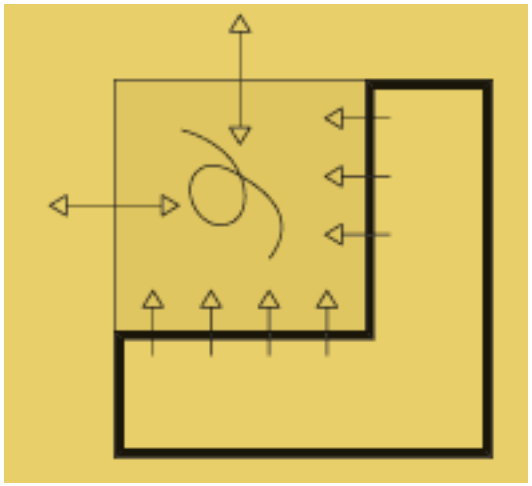
Communal Spaces
Communal spaces provide for gatherings & cultural practices, foster connections & improve quality of life.

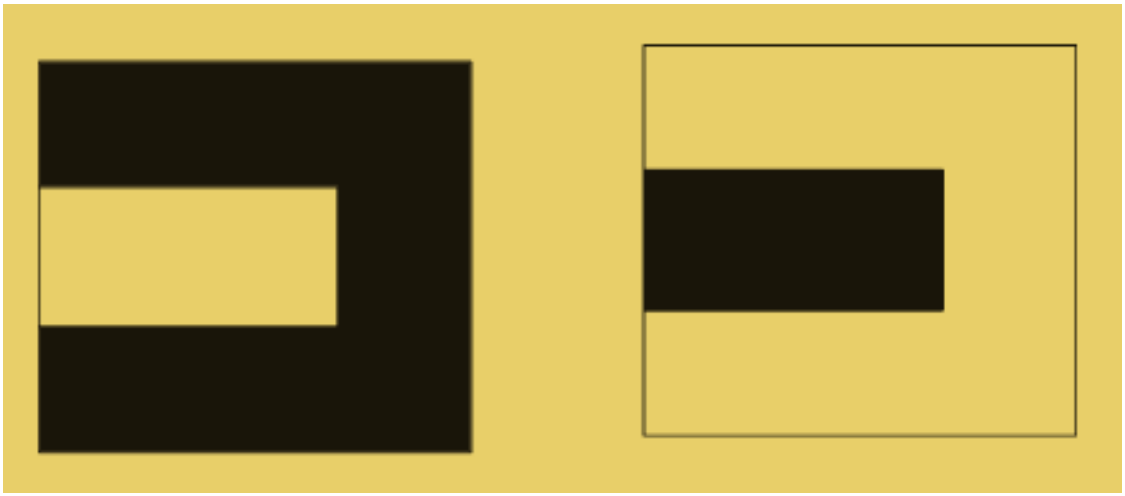
Flexible-use Spaces
Flexible spaces can be used as semi-private or communal areas as needed.

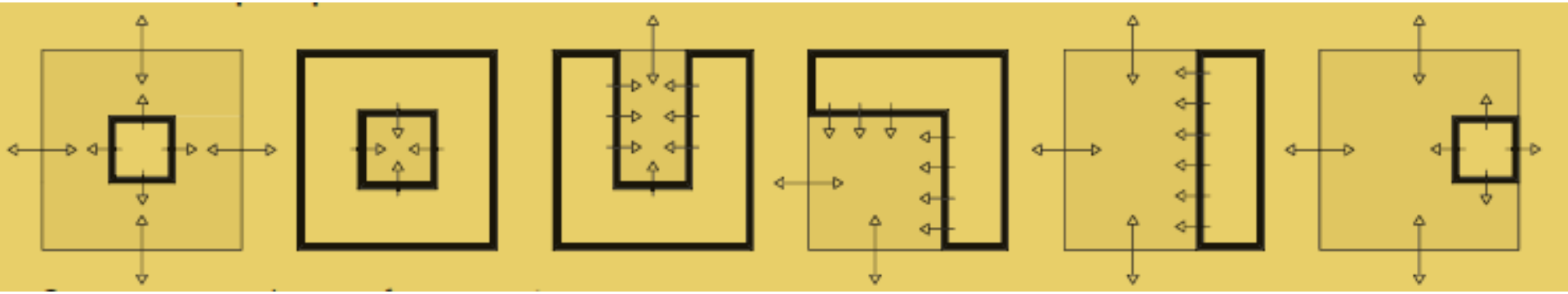
Private Homes
Comfortable homes for whanau that provide privacy and retreat.

Site Facilities
Onsite facilities support higher density living, mental & physical wellbeing, resource sharing & economic independence

1 Clear & welcoming entrance
2 Shared kitchen/lounge
3 Communal backyard
4 Covered outdoor dining area
5 Quiet office & project room
6 Bike parking
7 Five shared car parks
8 Optional guest rooms
9 Waste & recycling bin storage







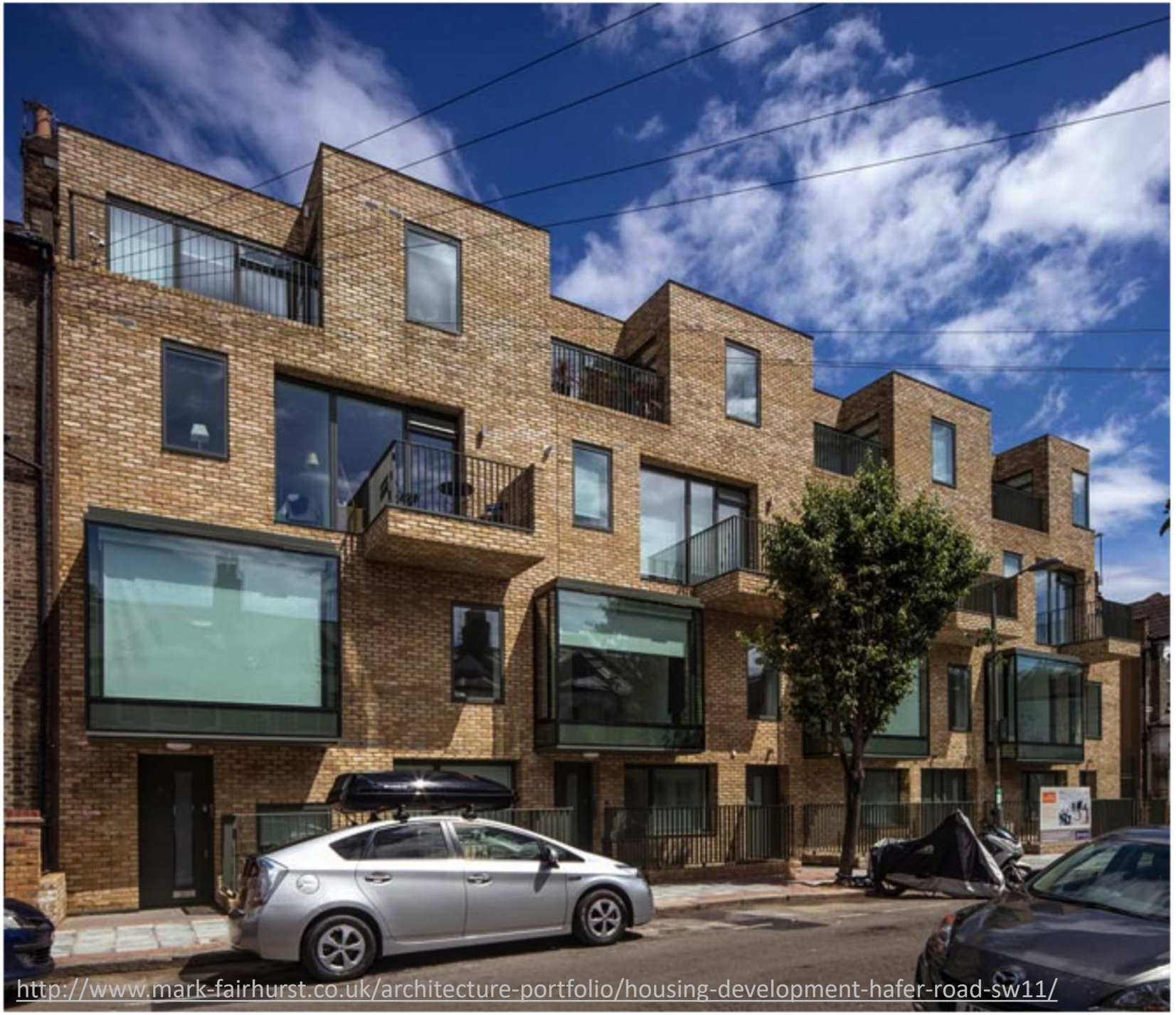
Views can be desirable in both directions.

Views are desirable in one direction only.

58 schitterend gelegen appartementen

in 6 typen met fraai uitzicht en perfecte bezonning

Woerden,
Roeleveld-Sikkes Architects



http://www.mark-fairhurst.co.uk/architecture-portfolio/housing-development-hafer-road-sw11/

De Halve Maen Apartment Building / Mecanoo
https://www.archdaily.com/871706/de-halve-maen-apartment-building-mecanoo

OOPEAA + Lundén Architecture Company Design Charred Timber Housing District in Helsinki

https://www.archdaily.com/902353/oopeaa-plus-lunden-architecture-company-design-charred-timber-housing-district-in-helsinki?ad_medium=gall%E2%80%A6

Building entrance
Vertical circulation
Bike storage

Commons - Nightingale Housing - https://nightingalehousing.org/the-commons

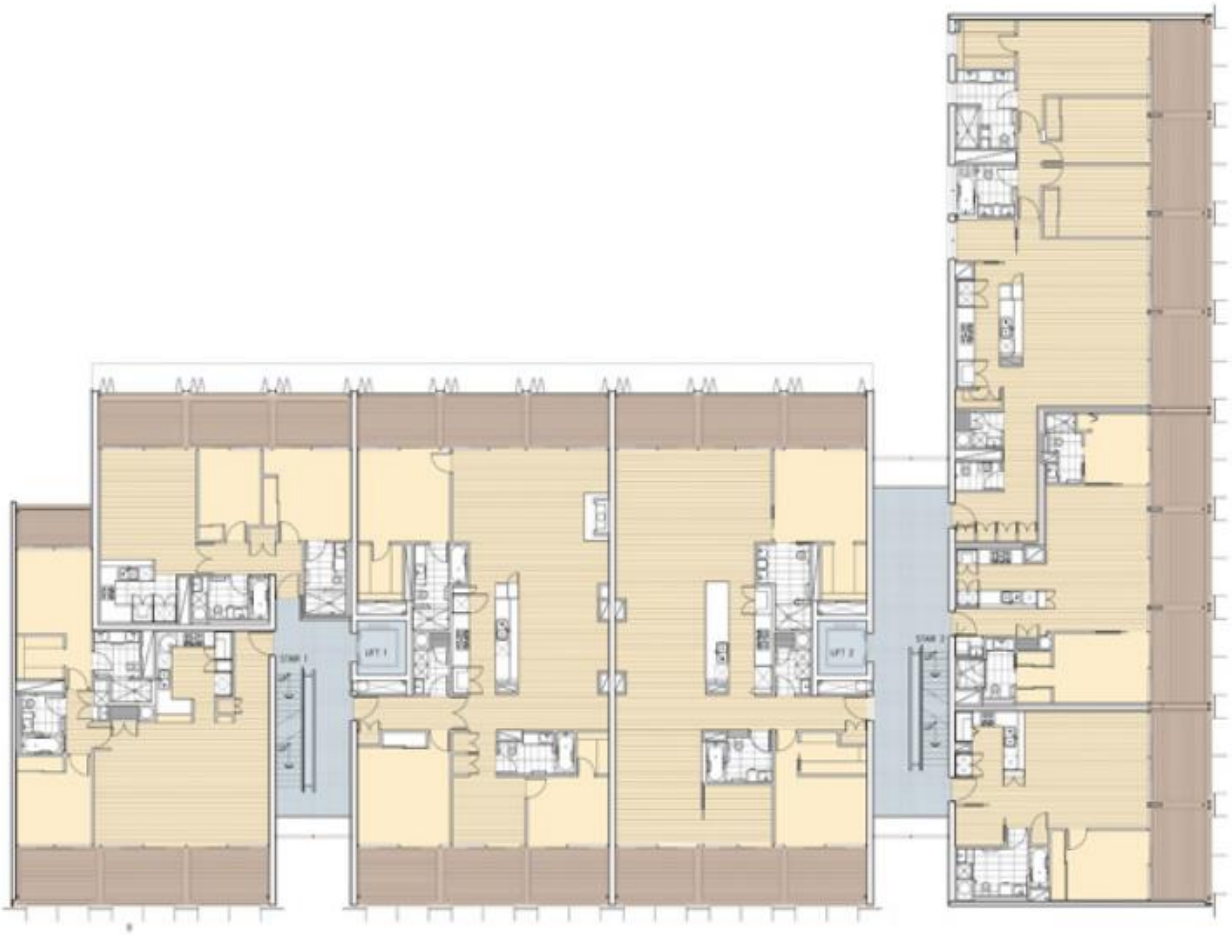
Quarter - Architectus - Chris Barton

Ground floor

Public space – building programme

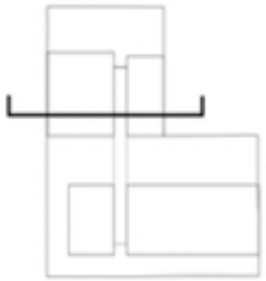
Ground floor level.

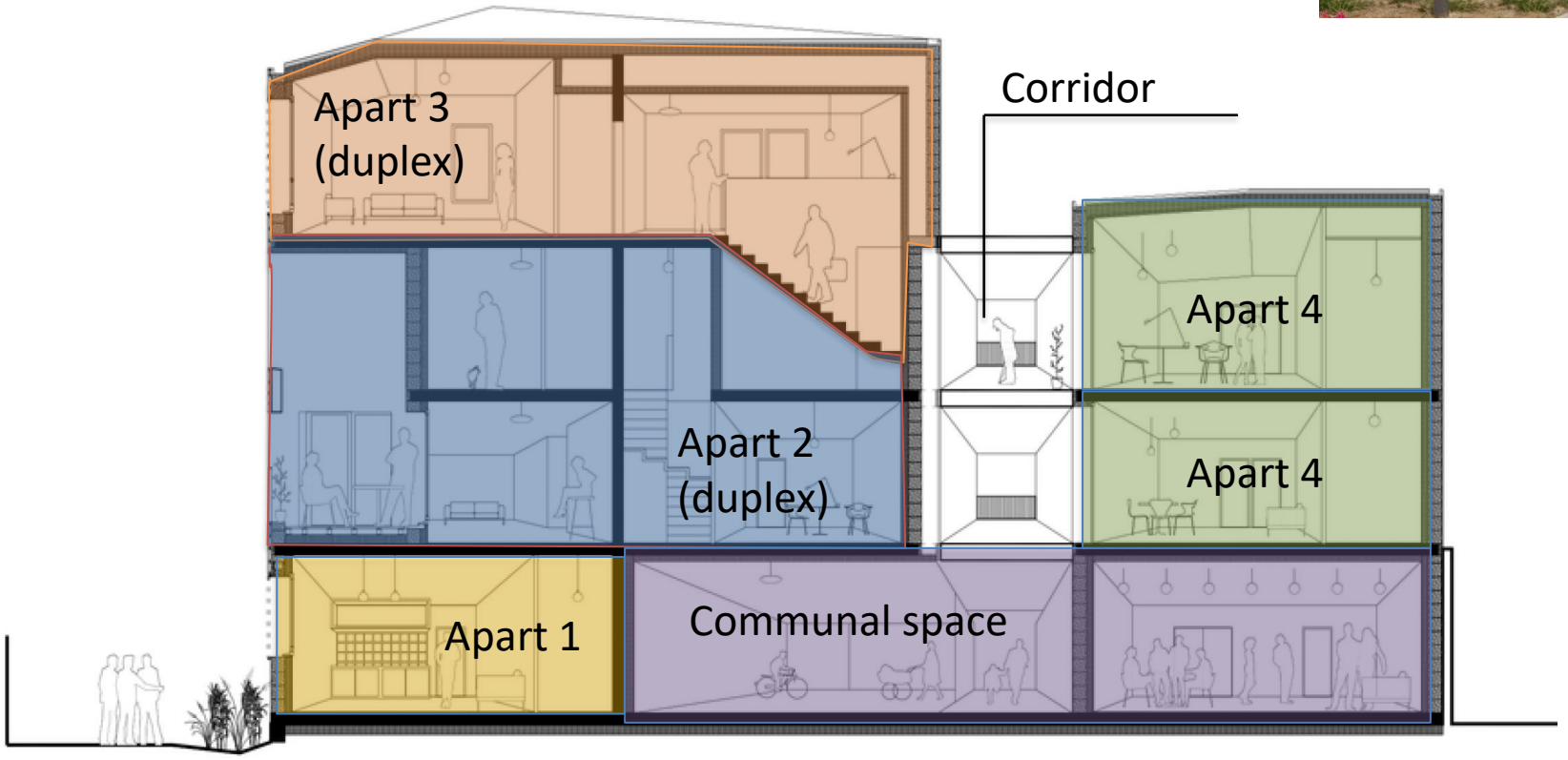
Trinity Apartments
Parnell, Auckland



First floor level.

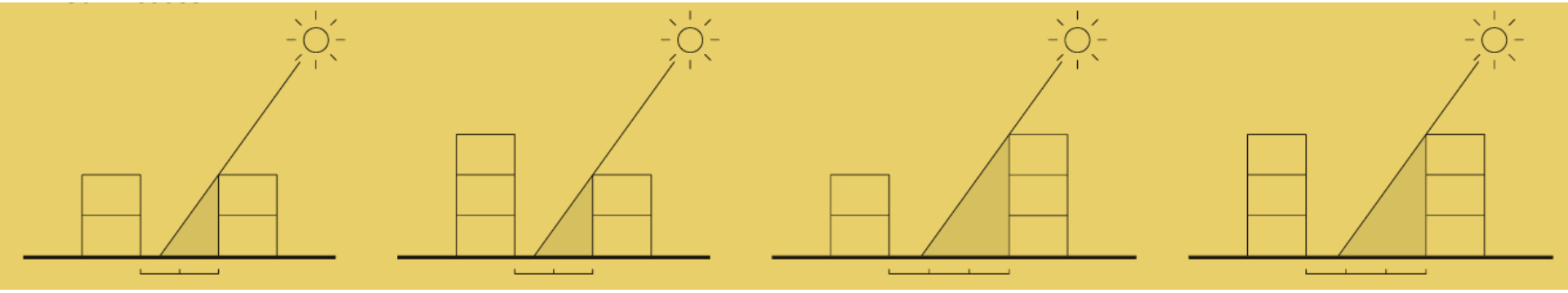
Trinity Apartments
Parnell, Auckland

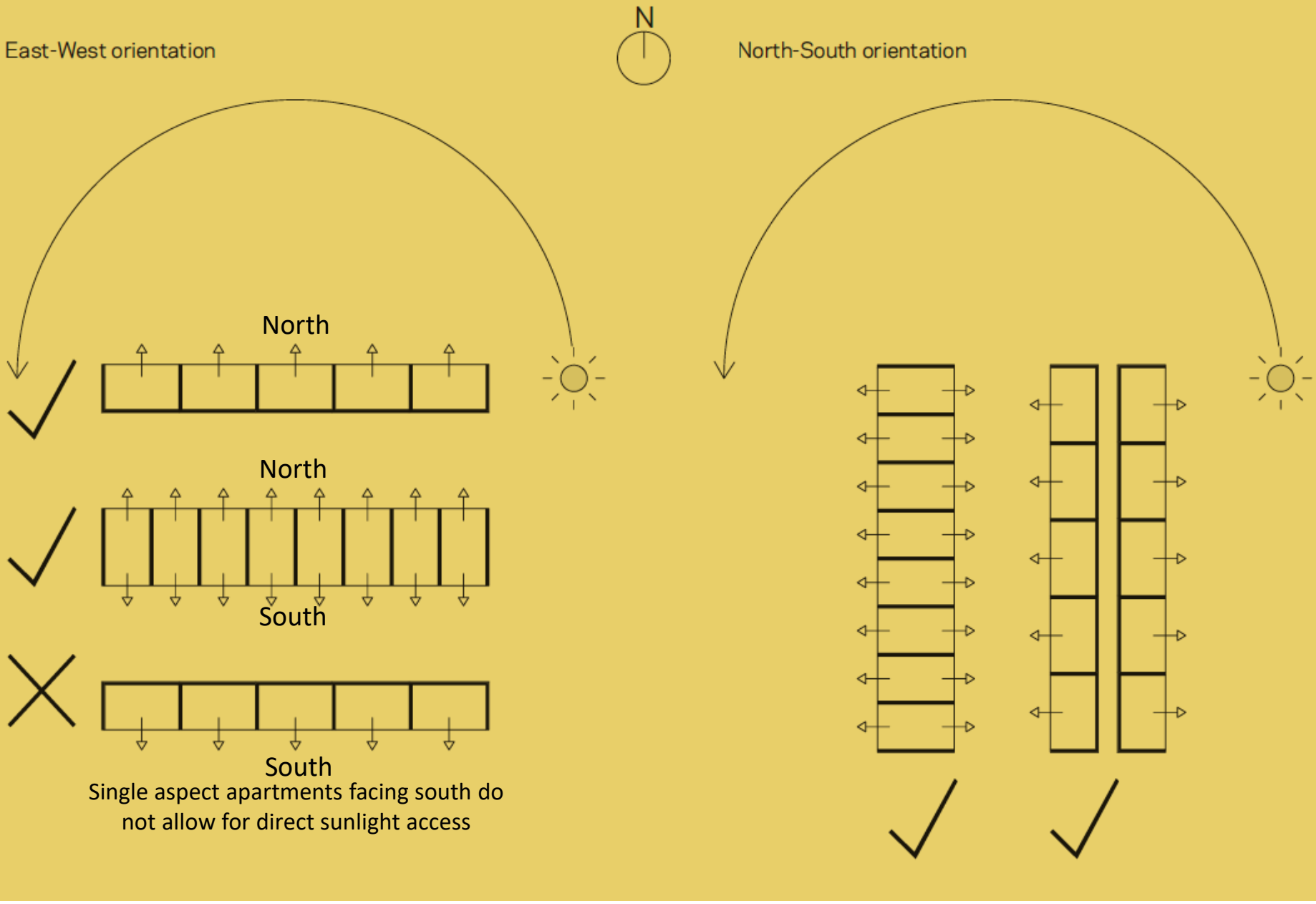




Nanterre Co-housing MaO Architectes + Tectone

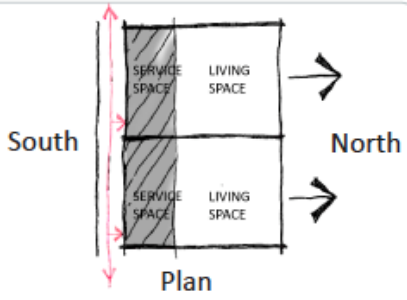
GOOD SOLUTIONS GUIDE FOR APARTMENTS

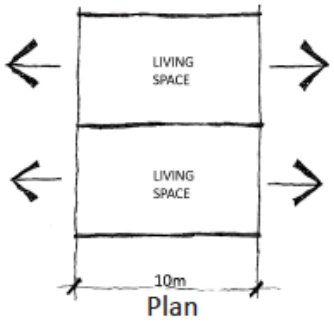


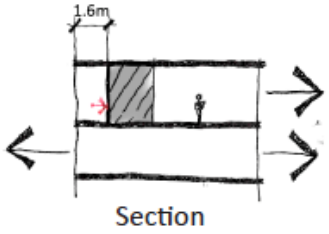


Single aspect apartments facing south do not allow for direct sunlight access

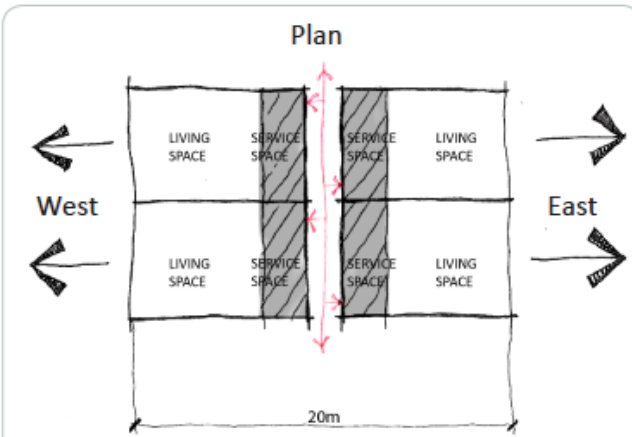
Duplex/ Dual Aspect Apartments with Single Loaded Corridor

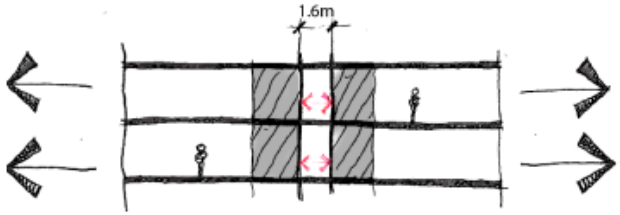






Single Aspect Apartments with Double Loaded Corridor





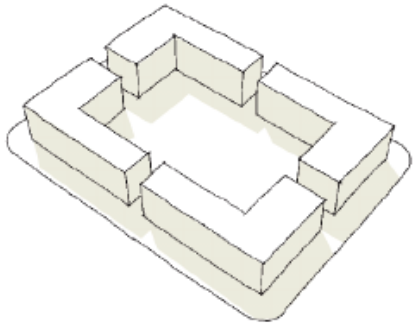


diagram 21
Basic courtyard development with access limited to pedestrians.

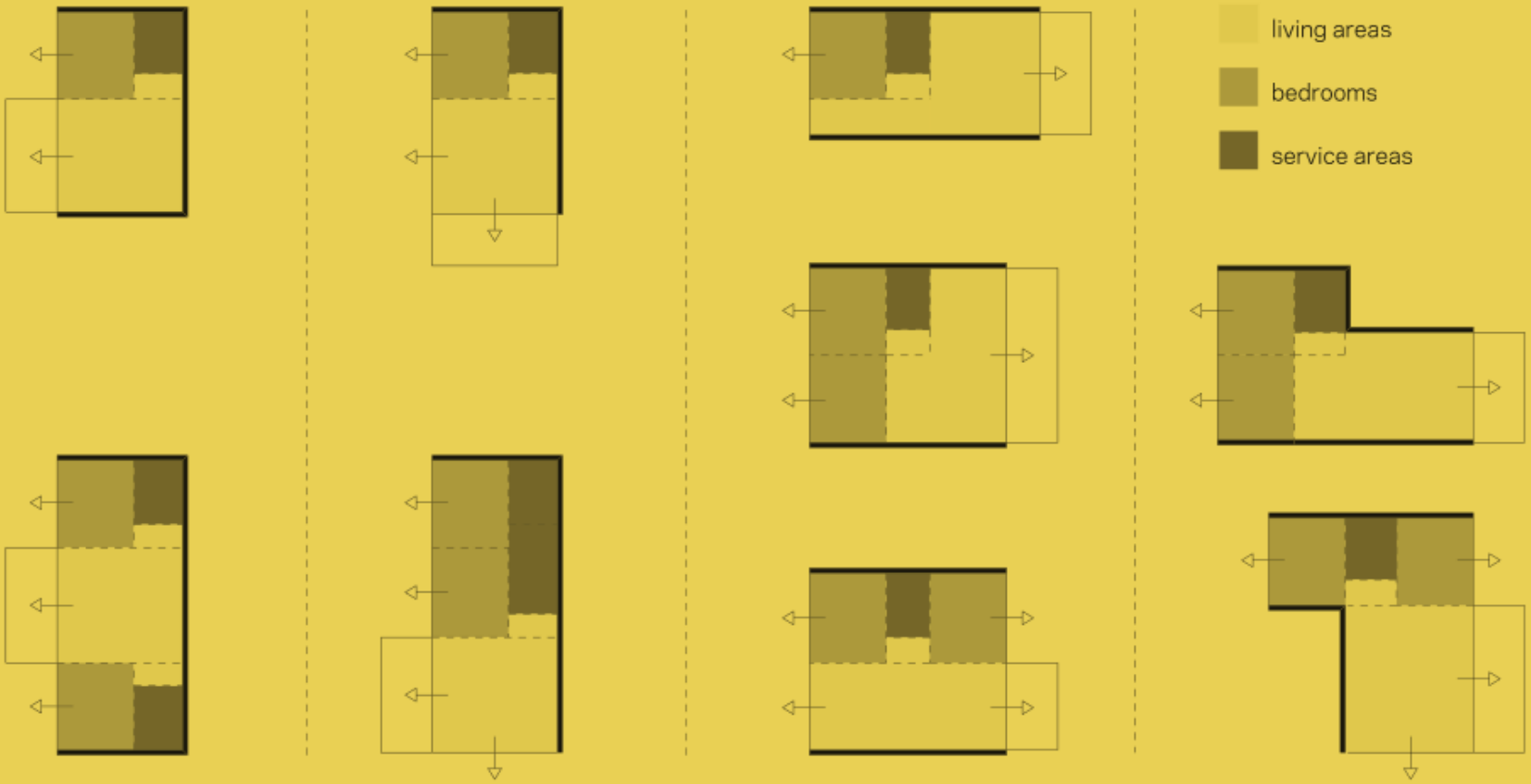
The following apartment mix will be used as a guide:

- One Bedroom (45m2) 20%
- Two Bedroom (70m2) 65%
- Three Bedroom (90m2) 15%

Duplexes
Live work
Single Aspect (East or West)
Double Aspect (North and South)

Apartment Planning Principles

Spatial arrangements must ensure all habitable rooms are on external walls.



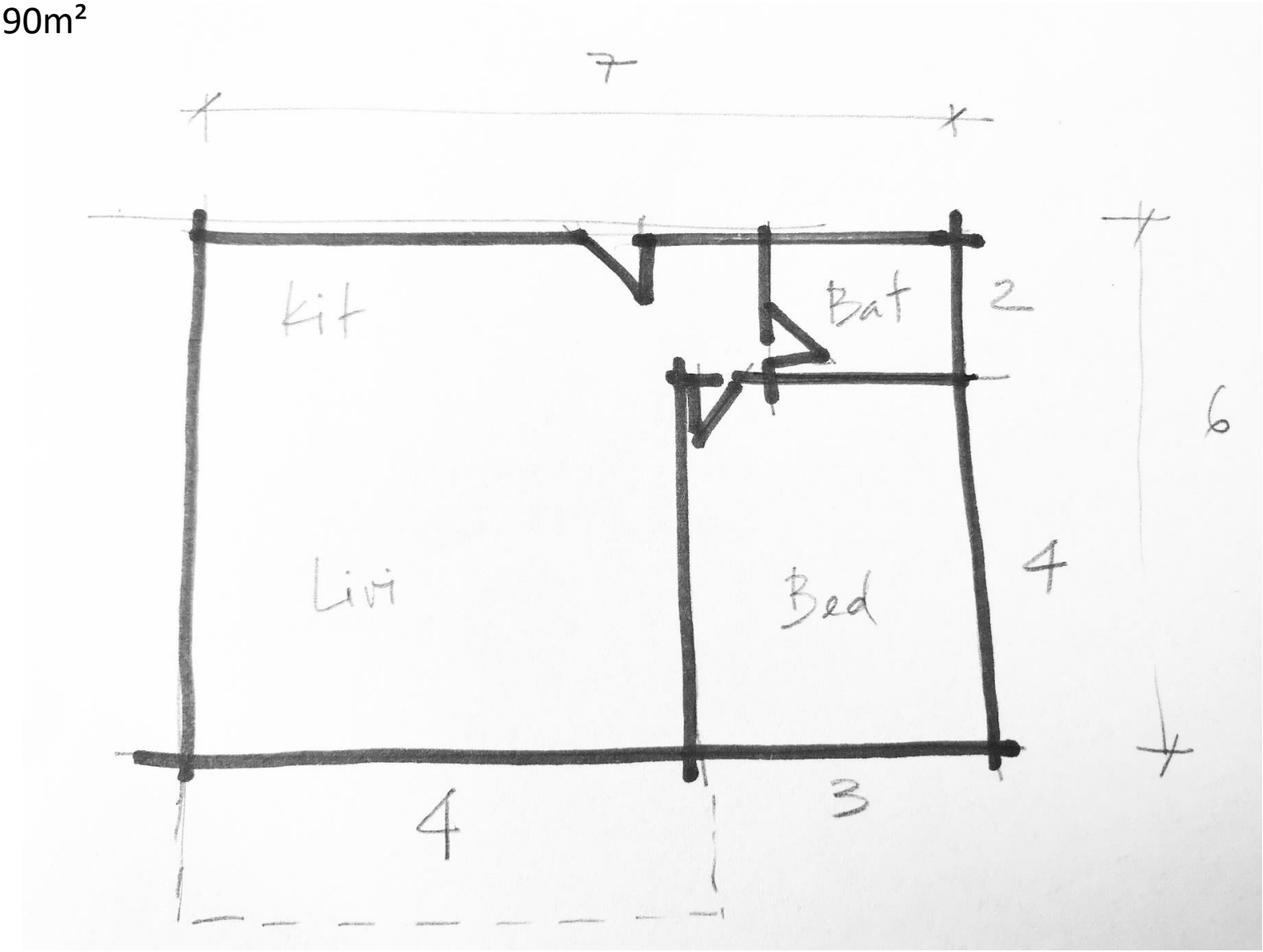
single aspect

corner aspect

dual aspect

mix of single, corner and/or dual aspect

01 Bedroom = 45 / 50m²
02 Bedroom = 70m²
03 Bedroom = 90m²



01 Bedroom = 45 / 50m²

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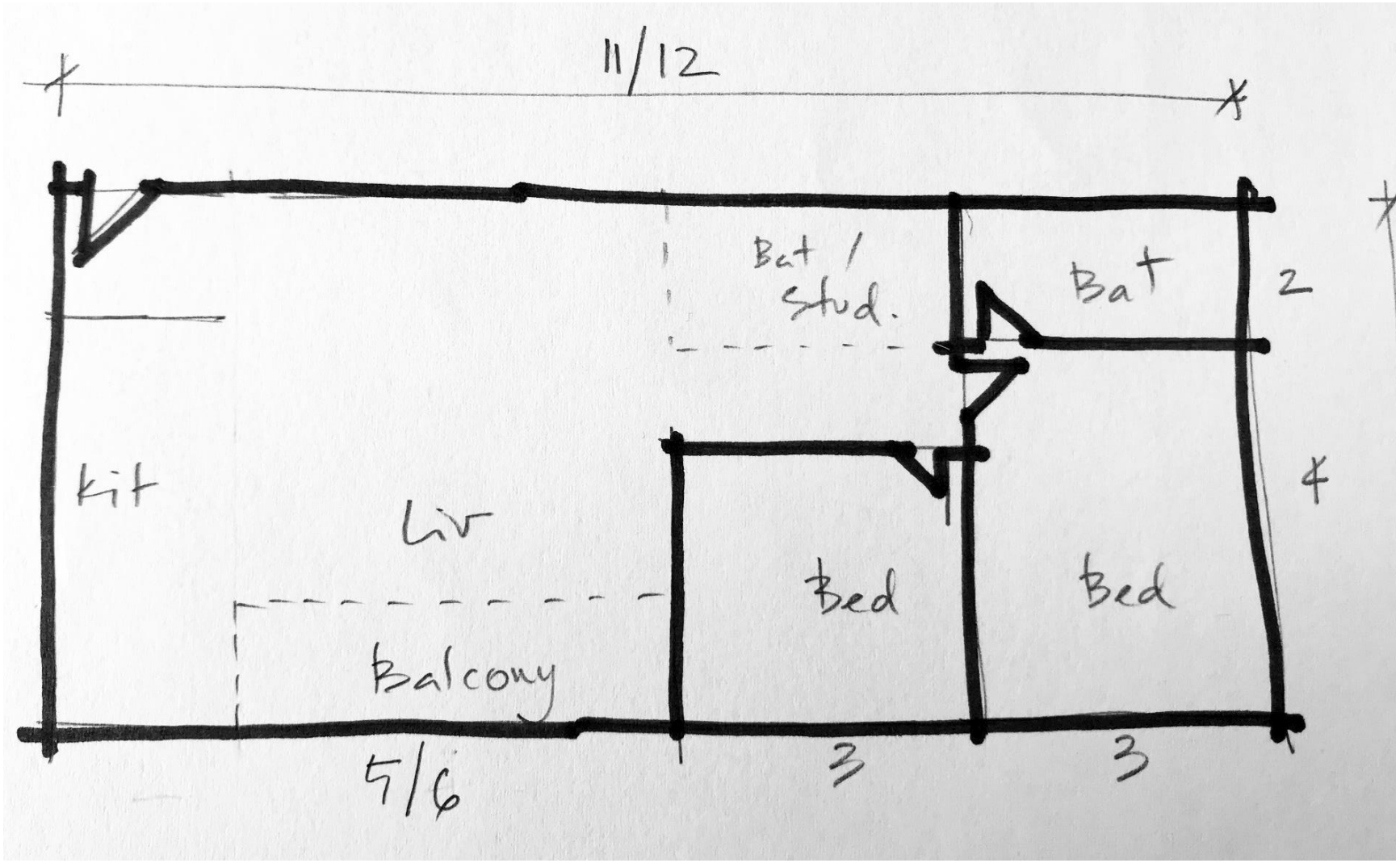
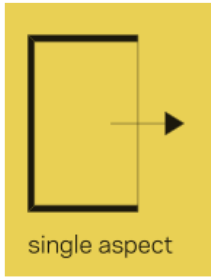
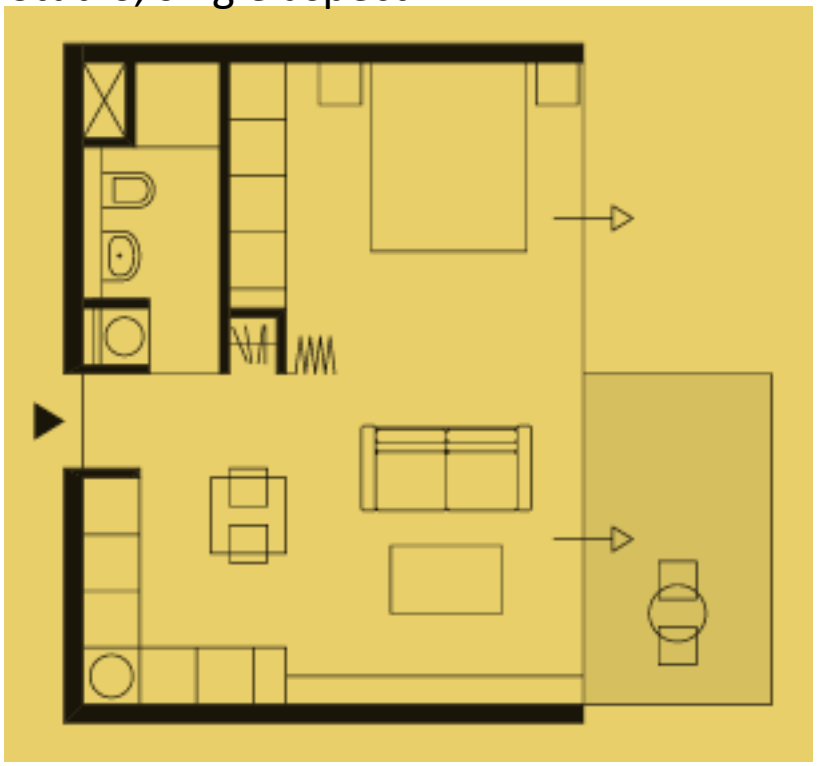
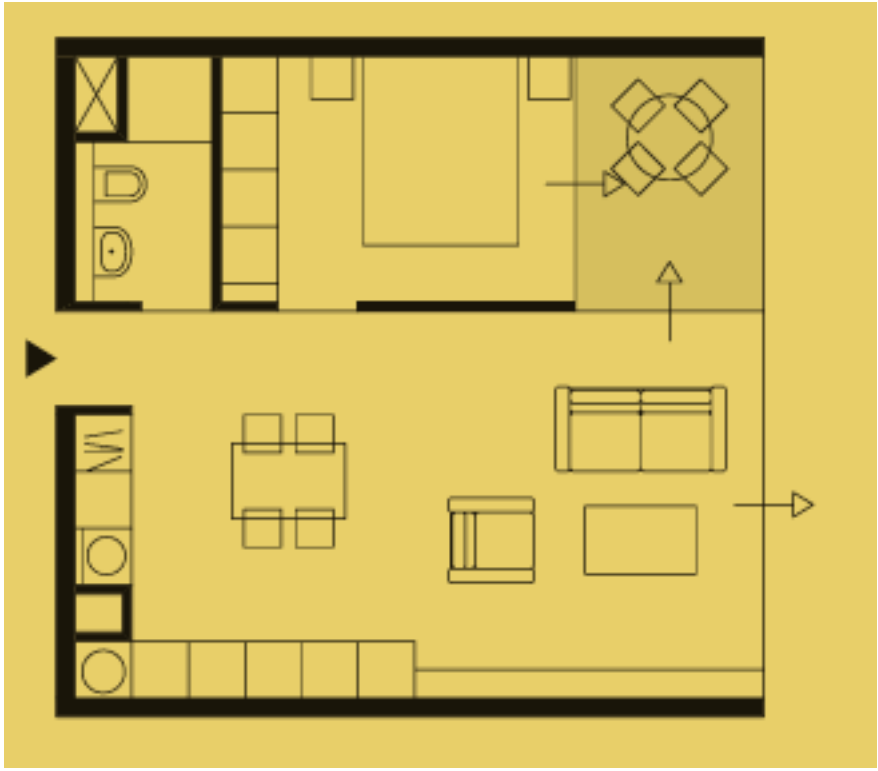


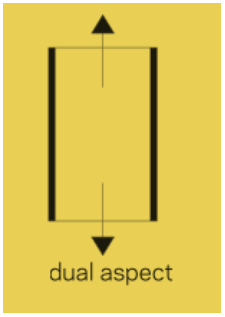


Studio, single aspect

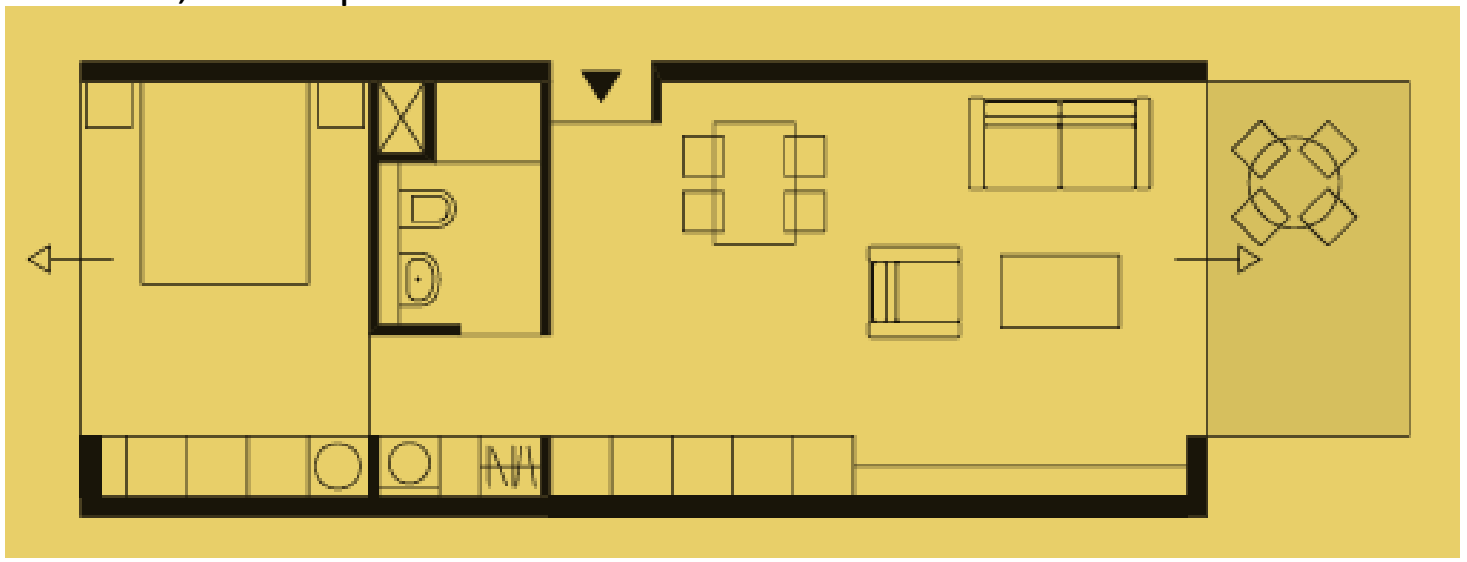


One-bed, single aspect

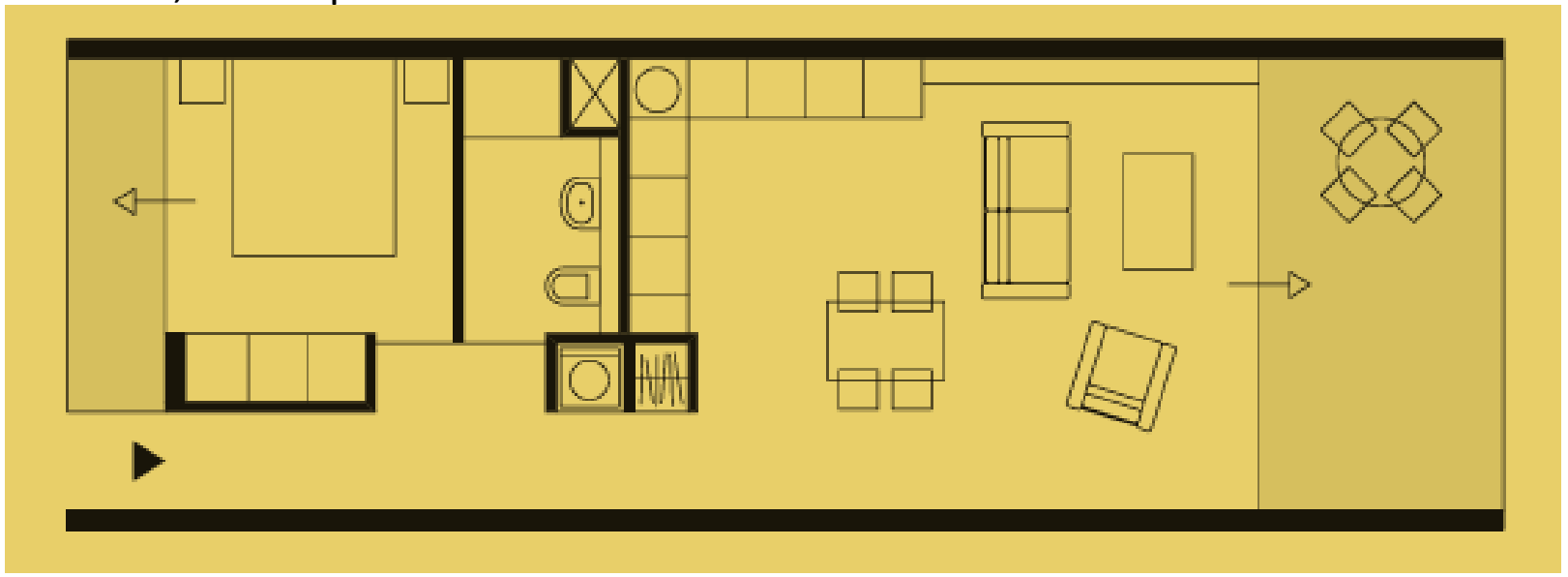


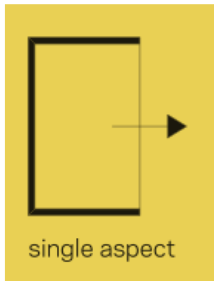


One-bed, dual aspect

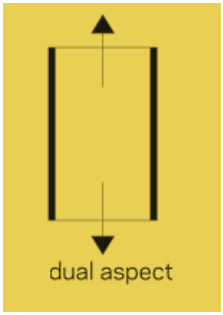


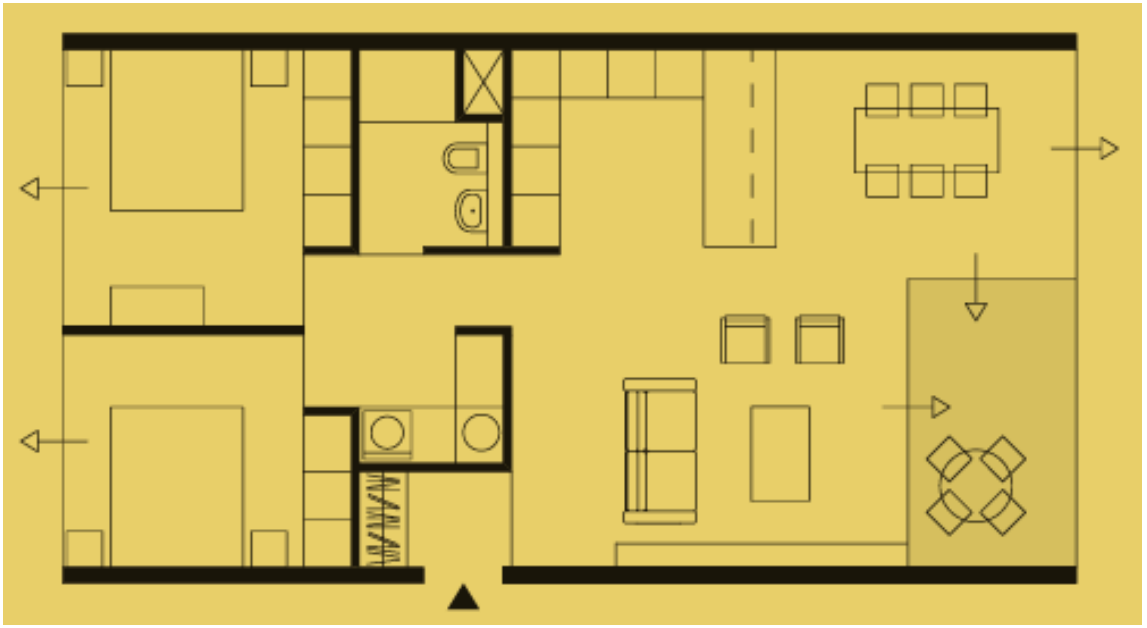
One-bed, dual aspect



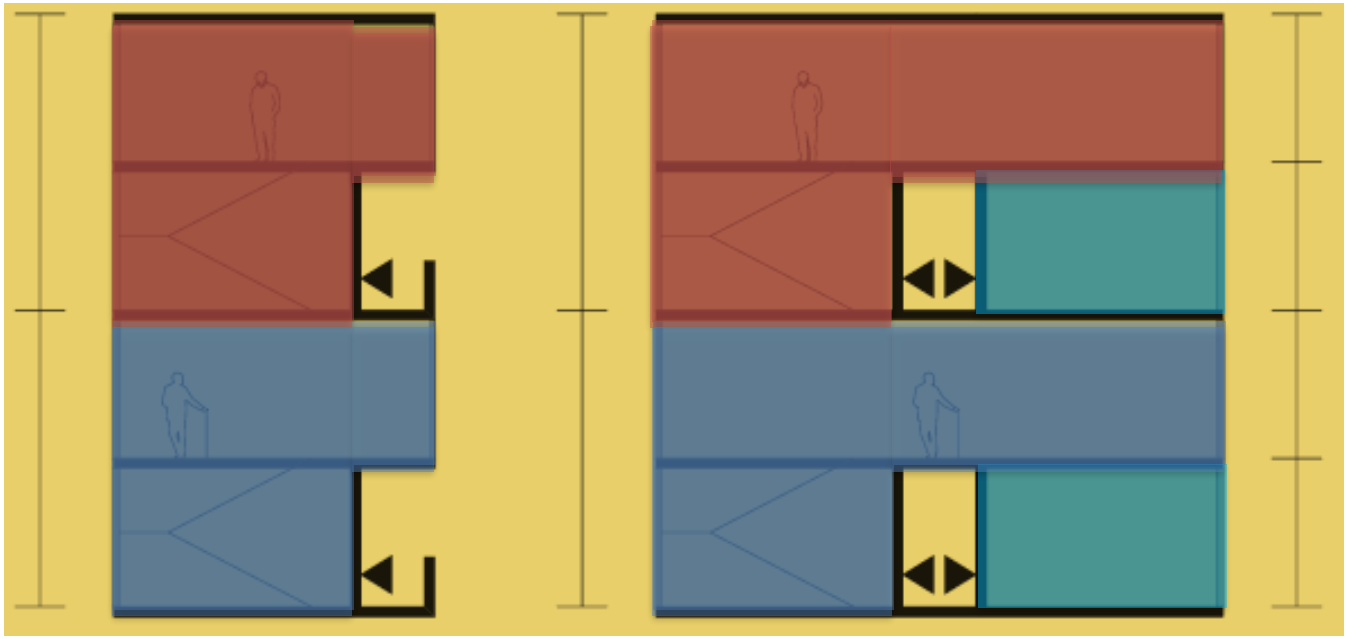


two-bed, single aspect

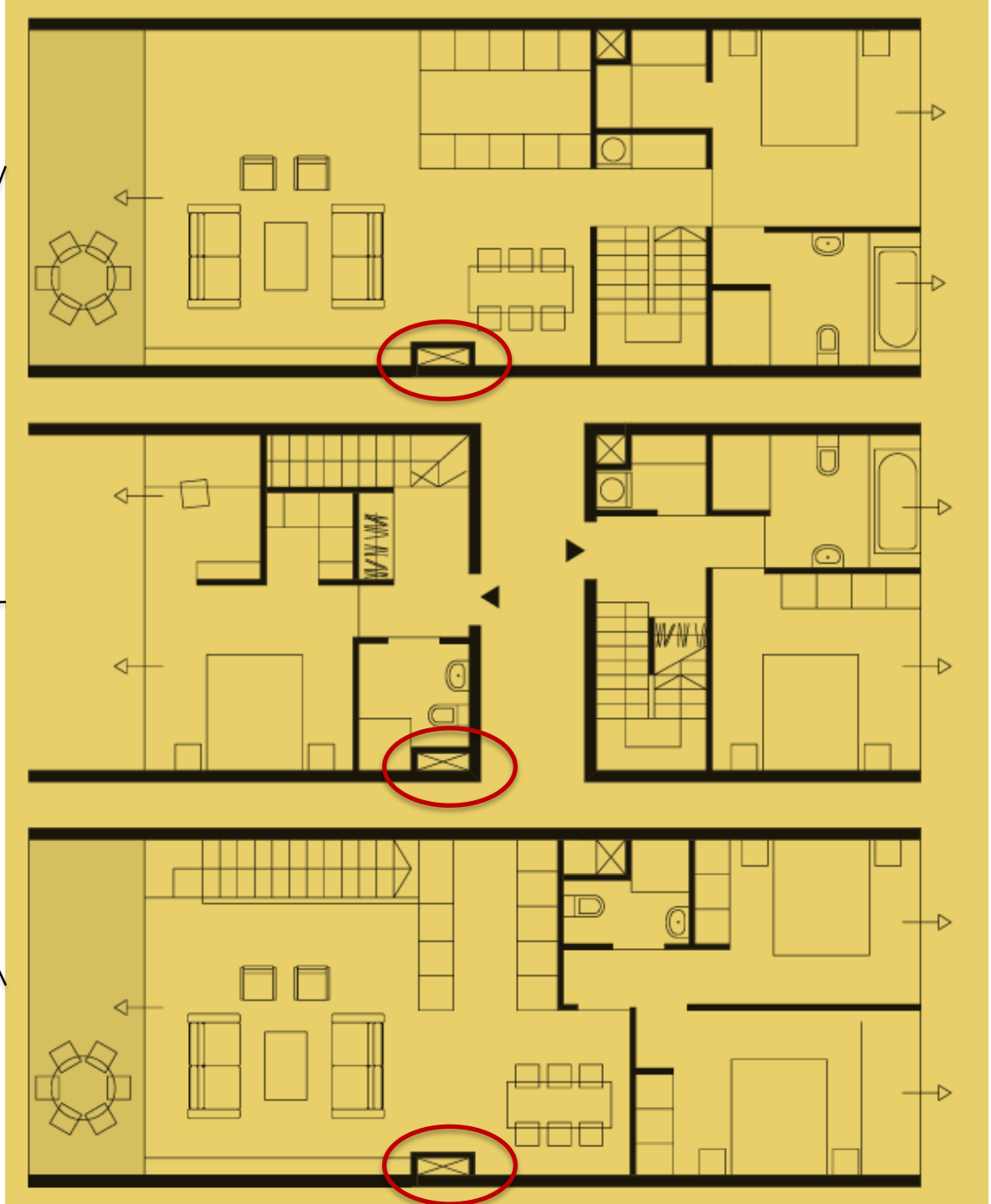




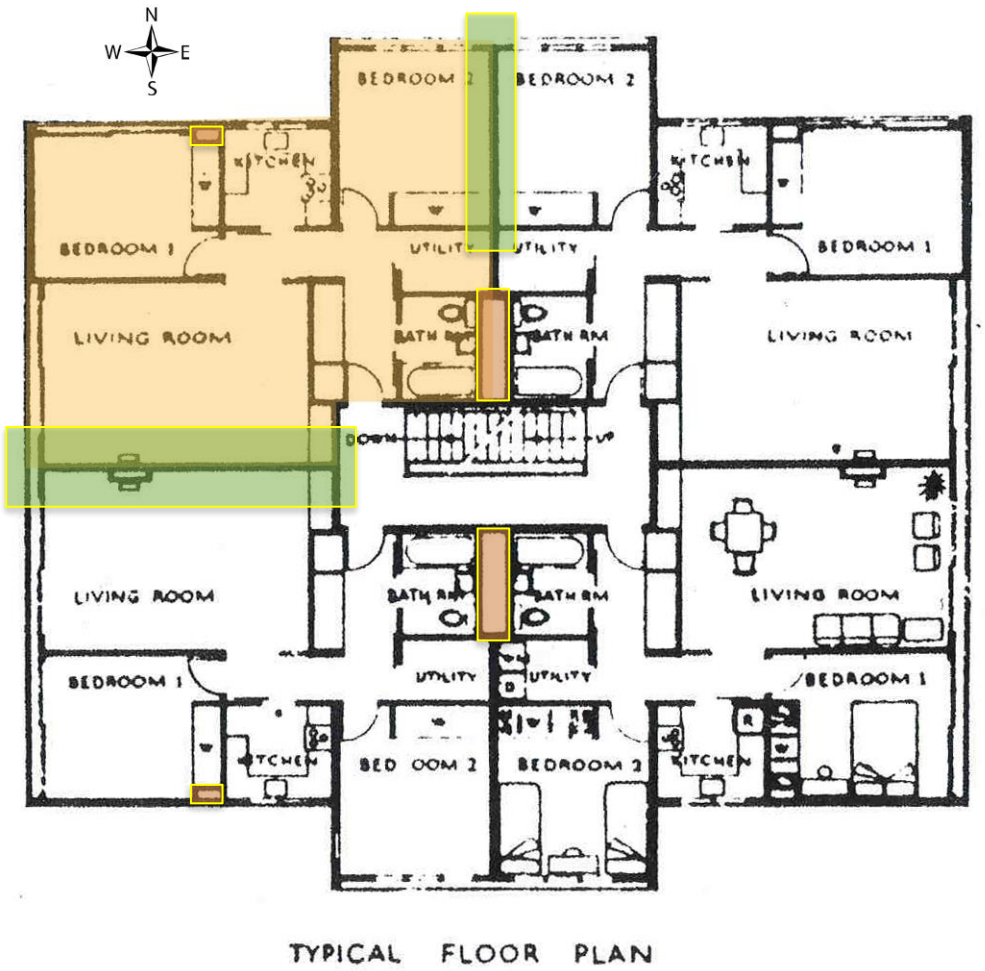
two-bed, dual aspect



Duplex “unite d'habitation” (Le Corbusier)



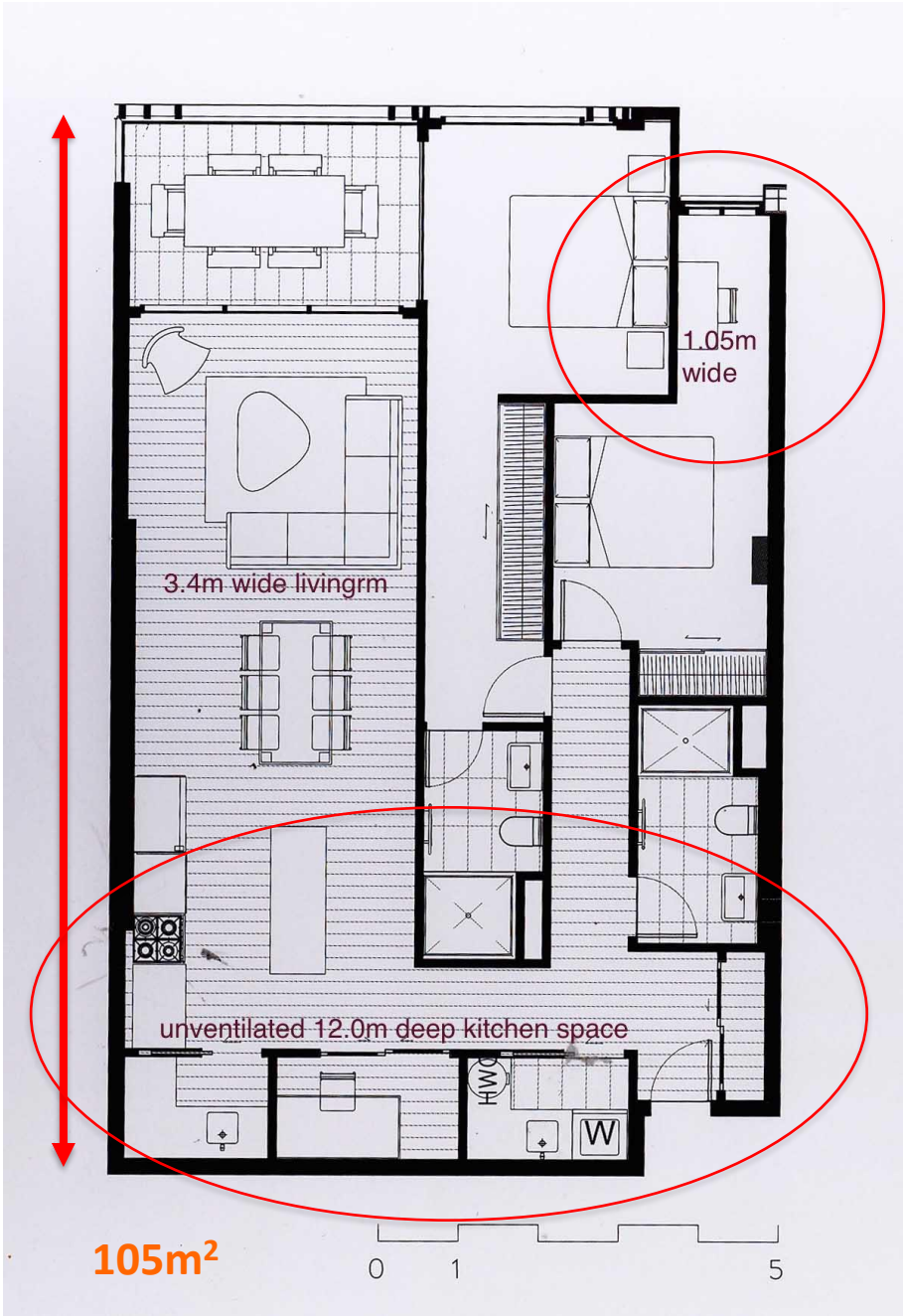
Duplex solution
“unite d'habitation”

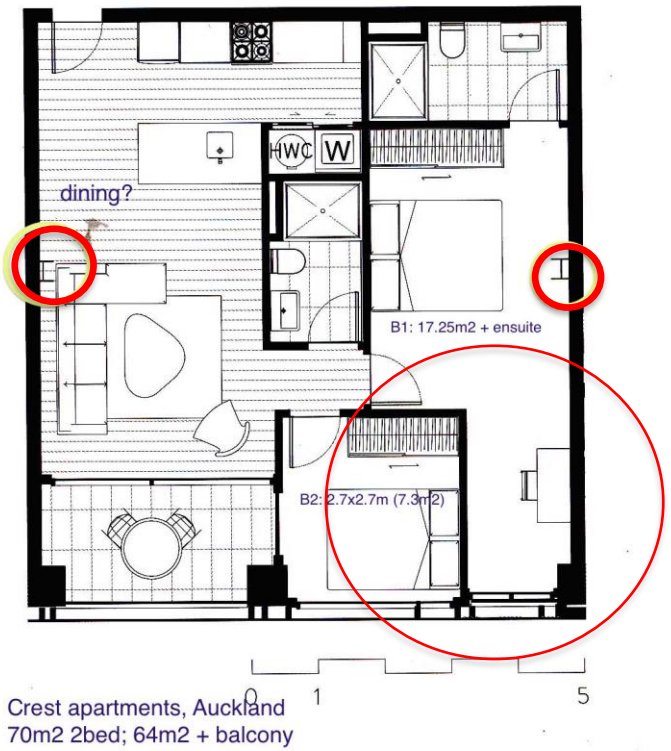


TYPICAL FLOOR PLAN

Start Blocks – typical floor plan

apply critique to every plan you see!

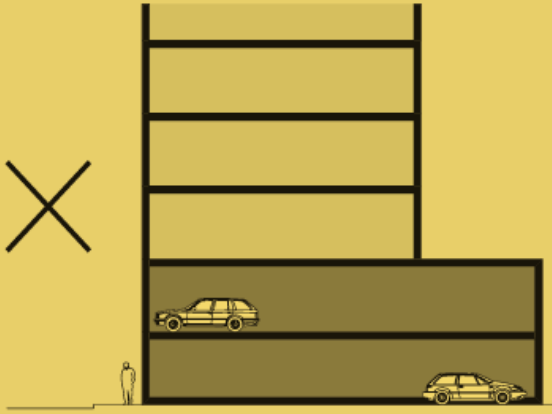




Typical plans, Auckland apartments: 2017

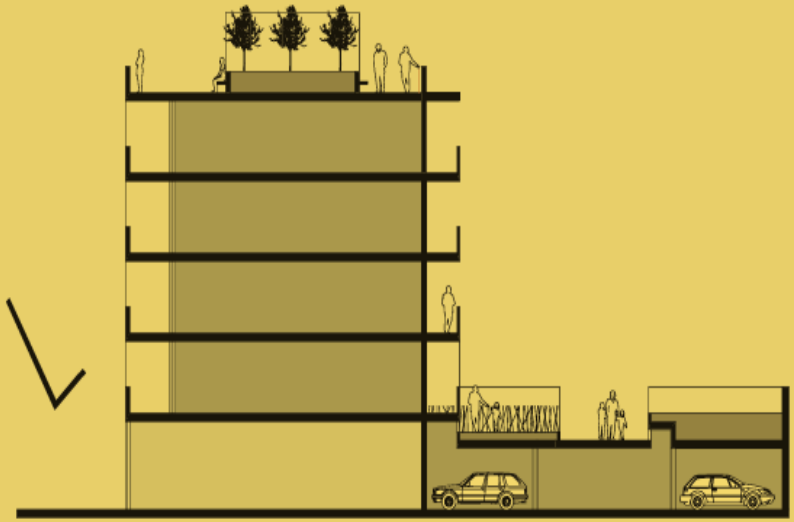
8.0m frontage will not provide light/vent for 2bed apartments

(Study by David Turner)



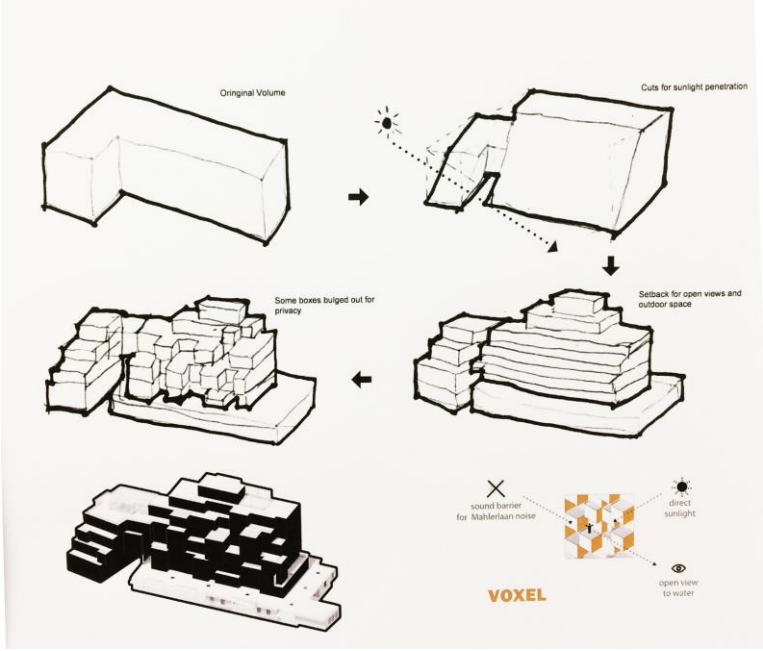
Buildings should provide active street frontages and contribute positively to the street. Car parking should never face directly onto the street.

Car parking should be either:
1. above – at least above the first two storeys,
2. behind
3. or below.

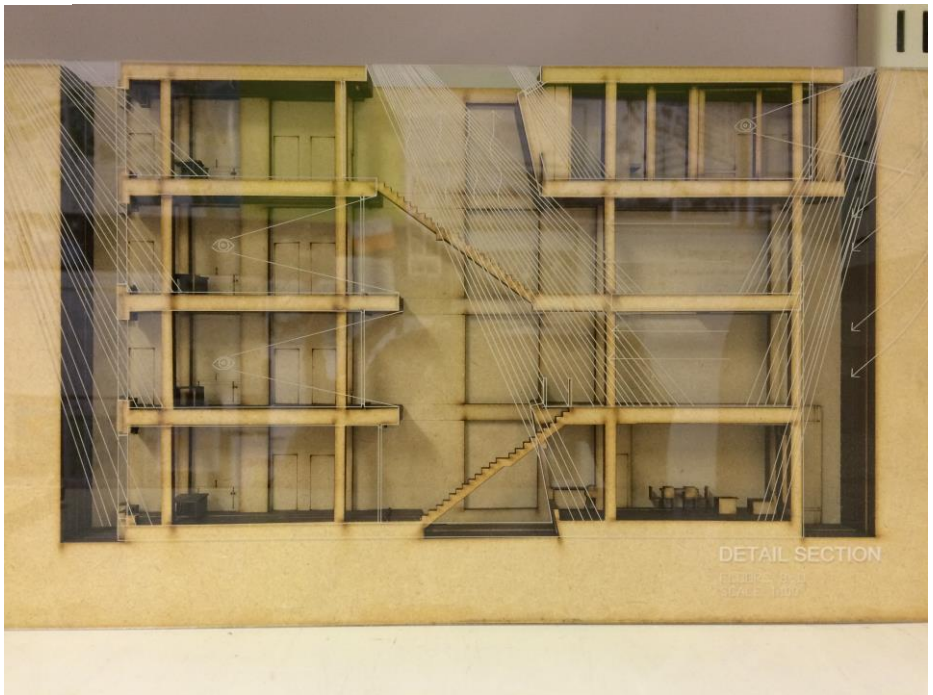


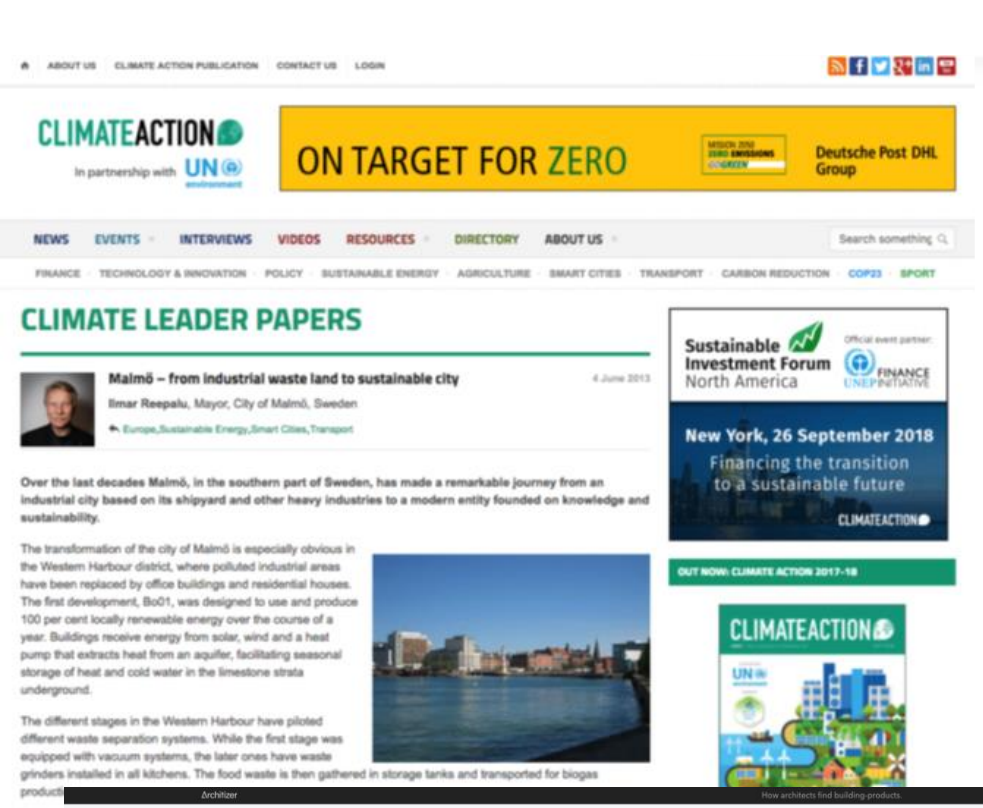
Design for people …

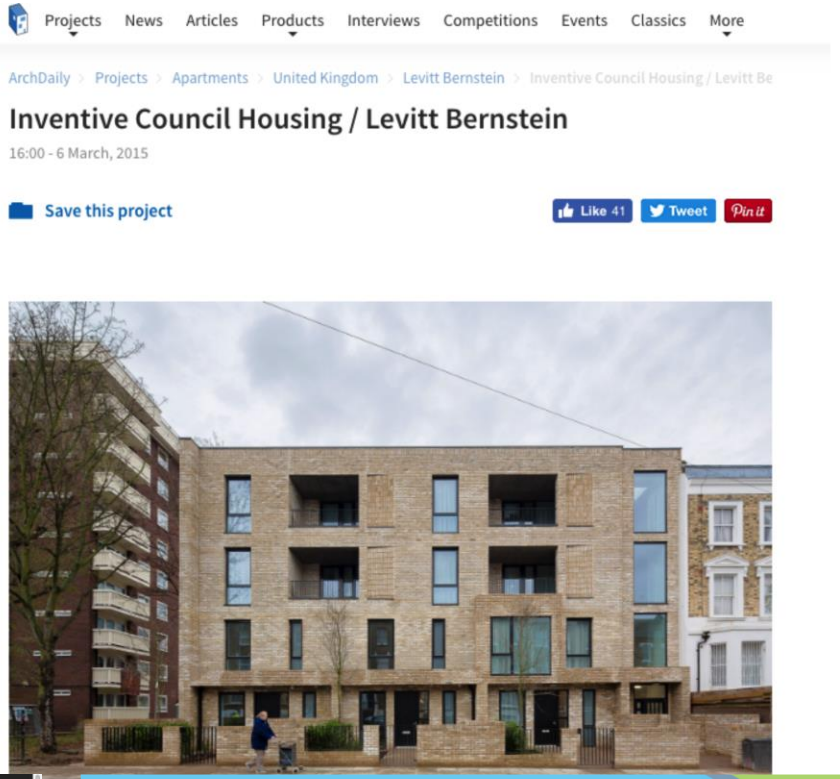
Commons - Nightingale Housing - https://nightingalehousing.org/the-commons

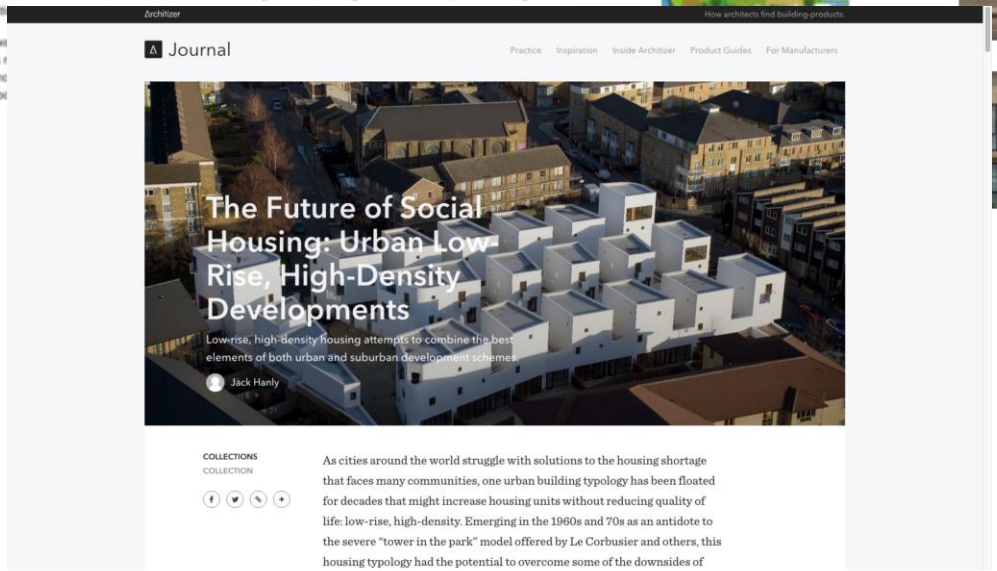


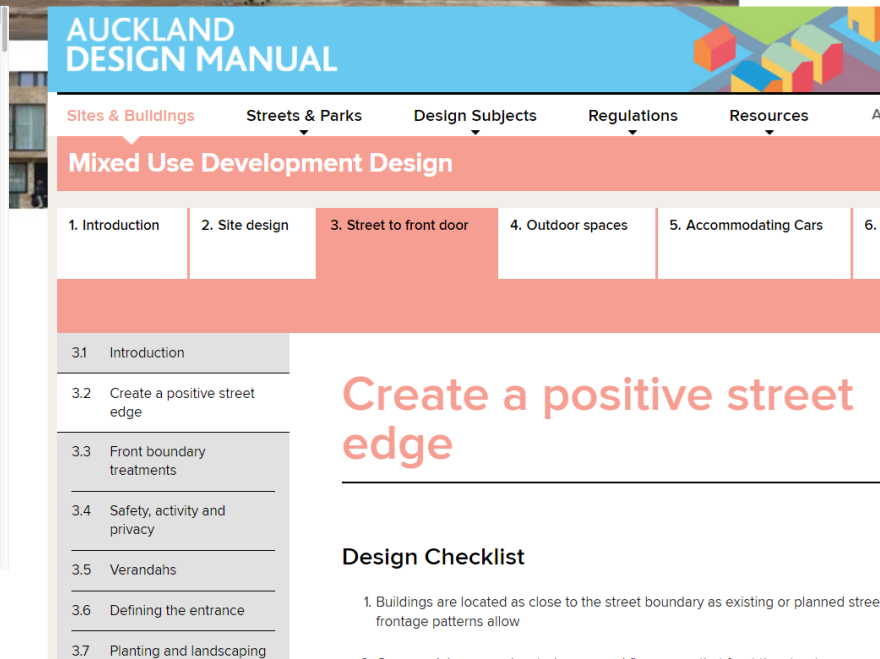
Use models, sketches… have fun











Resources - Moodle page