Futuristic impression of housing

Precedent Analysis

Semester 2: Stage 2

Garret greenhouse: Gaunt Francis

Home of the future-
Innovative Affordable Housing

BA (HONS) in Architectural Design
RIBA part 1

Garret Green House

Architect:
Gaunt FRANCIS

Award:
Home for the future

House type:
Zero carbon emission, code level 6 dwelling

Location:
BRE 'Innovative Park", Garston, UK.

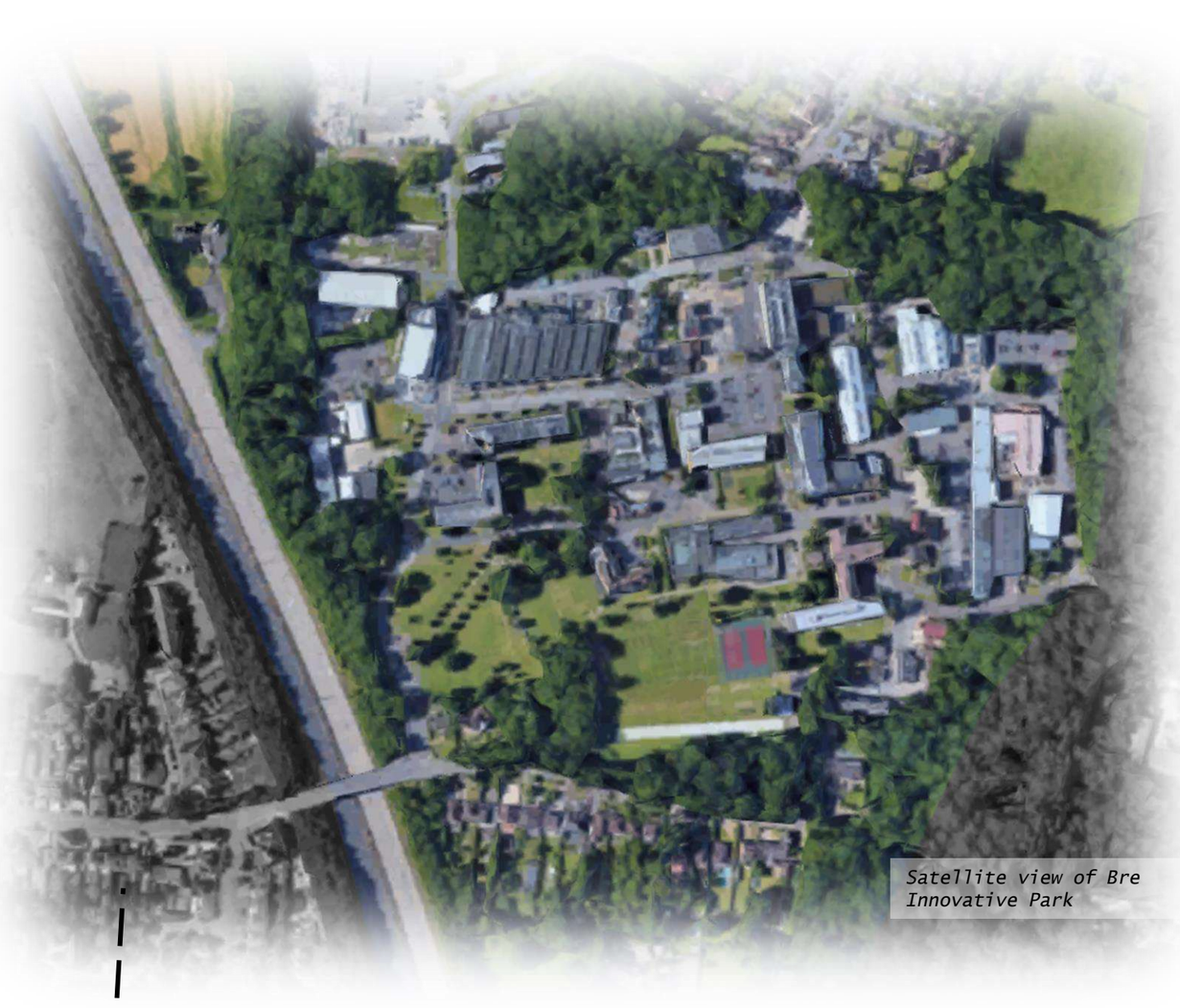
Bre Innovative Park

Design Overview:

The purpose of this house was to see if zero-carbon housing could ever be achieved **a) by a volume housebuilder**, and **b) whilst still being an attractive and inviting home.**

Inspiration for the house design was drawn from contemporary and historical housing in the UK and Europe, resulting in a home suitable for higher density urban or suburban living.

The Barratt Green House is a home that looks to the future. It is designed to be built as part of a cluster of homes connected to a district electricity generating/heating system. The materials used in the structure and high-performance insulation will help keep the house warm in winter and cool in summer. Feature doors and trims have been made from recycled plastics: yogurt pots and milk bottles Recycled furniture was used and given a new lease of life with fresh upholstery. Extensive use was made of recycled glass, from the chandelier over the dining table to vases in the master bedroom.


Satellite view of Bre Innovative Park

Map of Garston, UK

The most exciting aspect of the Barratt Green House is that it's not designed as a one-off: it was used as a prototype for testing to uncover what works and apply it to housebuilding across the country.
The interior space is flexible, allowing different permutations of layout to suit the changing needs of the occupiers.


Interior materiality.


Variations to the model Prototype.

Key Design Strategies

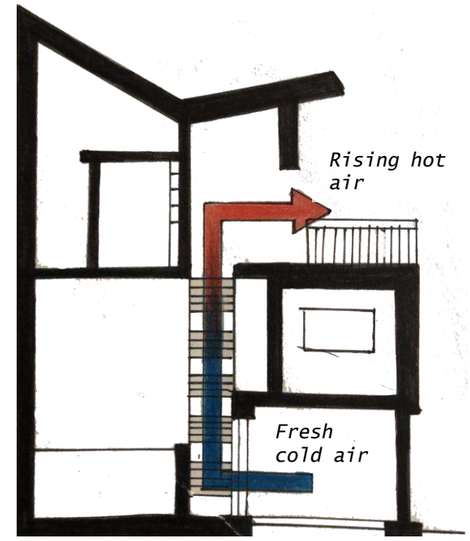
1. SOLAR POWER
Photovoltaic cells on south facing provide electricity to the house's equipment.

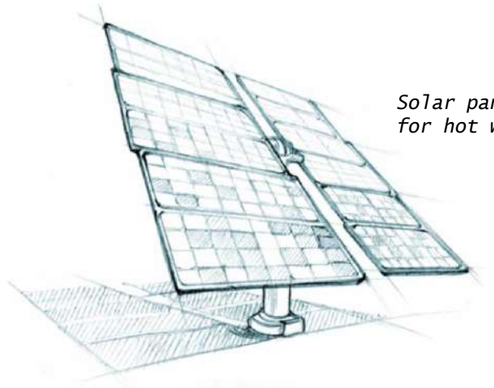
2. AUTOMATIC SHUTTERS
Computer controlled shutters close to limit heat build up due to strong sunlight in the summer

3. TRIPLE GLAZING
High performance glazing in insulated timber frames help keep the heat in, resulting in a light and airy home offering a comfortable living environment.

4. HEAVY FLOORS
Concrete floors with smooth ceiling finishes link the air to the mass of the house and keep moderate internal temperature fluctuations. Will reduce the need for cooling in the hotter summers anticipated in climate change predictions.

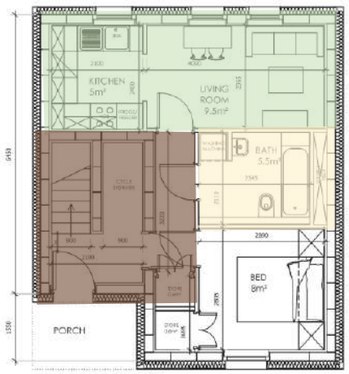
5. Ventilation System
A special ventilation system with heat recovery is installed. Incoming air from the outside is passed through a heat exchanger and warmed by heat captured from outgoing air being extracted from the building, then circulated to the rooms.



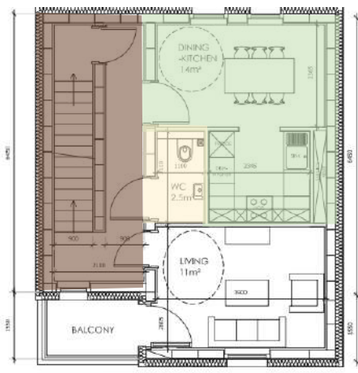


Construction

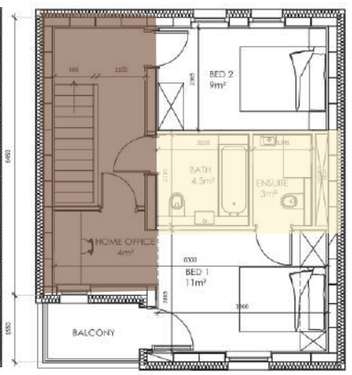
Key: Services Stairwell Kitchen/ Diner



Ground Floor

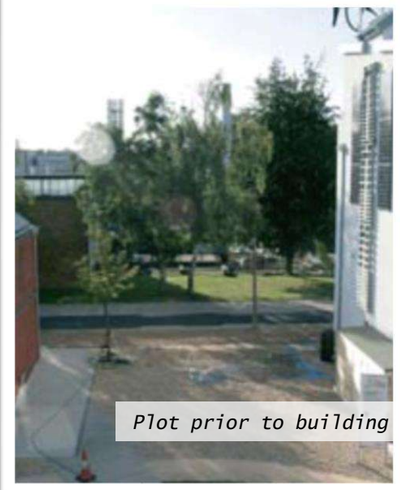


First Floor



Second Floor

Layout
Simplistic layout with few partitions.
Small modular rooms are easy to heat.
Services situated in the middle of building: easier for construction.
Open kitchen/diner to maximize space and flexibility. Bedrooms and balconies orientated towards views.
Kitchen at back of building for increased privacy.


Plot prior to building

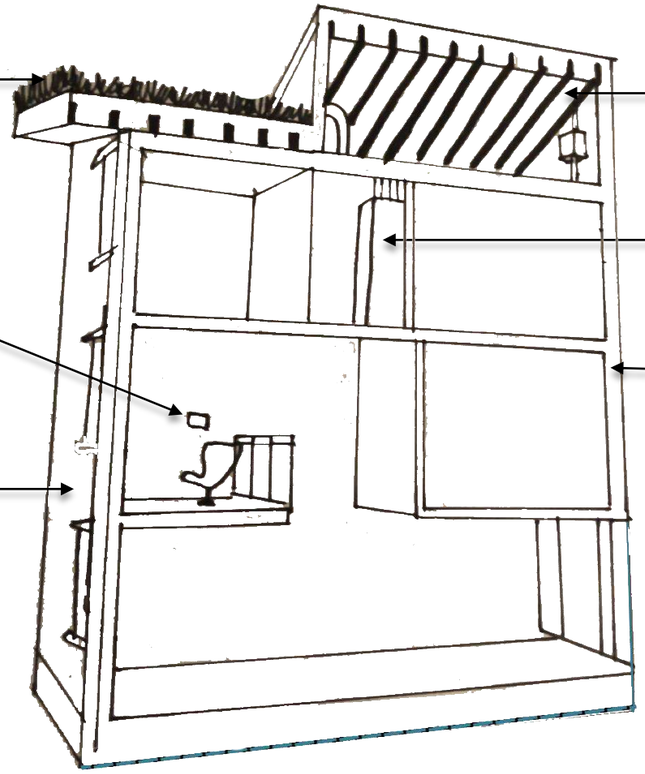

Thermal image of Barret House


Testing for air tightness

6. ROOFTOP PLANTING
North roof planted with vegetation enlarging the local ecosystem.

8. INTERACTIVE HOUSE
Power and data are distributed around the house using easily accessed routes under the floor. A computer control system ensures best operation of the systems with minimal owner input, and provides music and data central storage facility

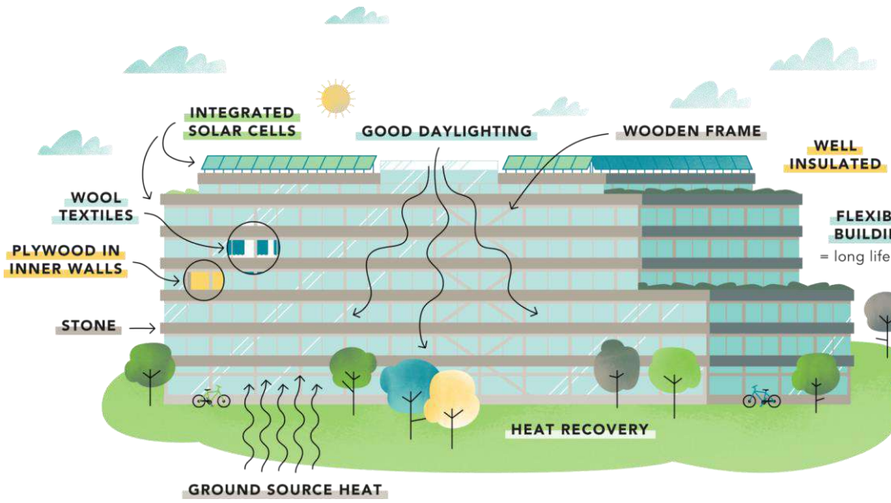
10. Rainwater system
To minimise water consumption, for example, a rainwater collection and re-use system will supply water for WCs and the washing machine.

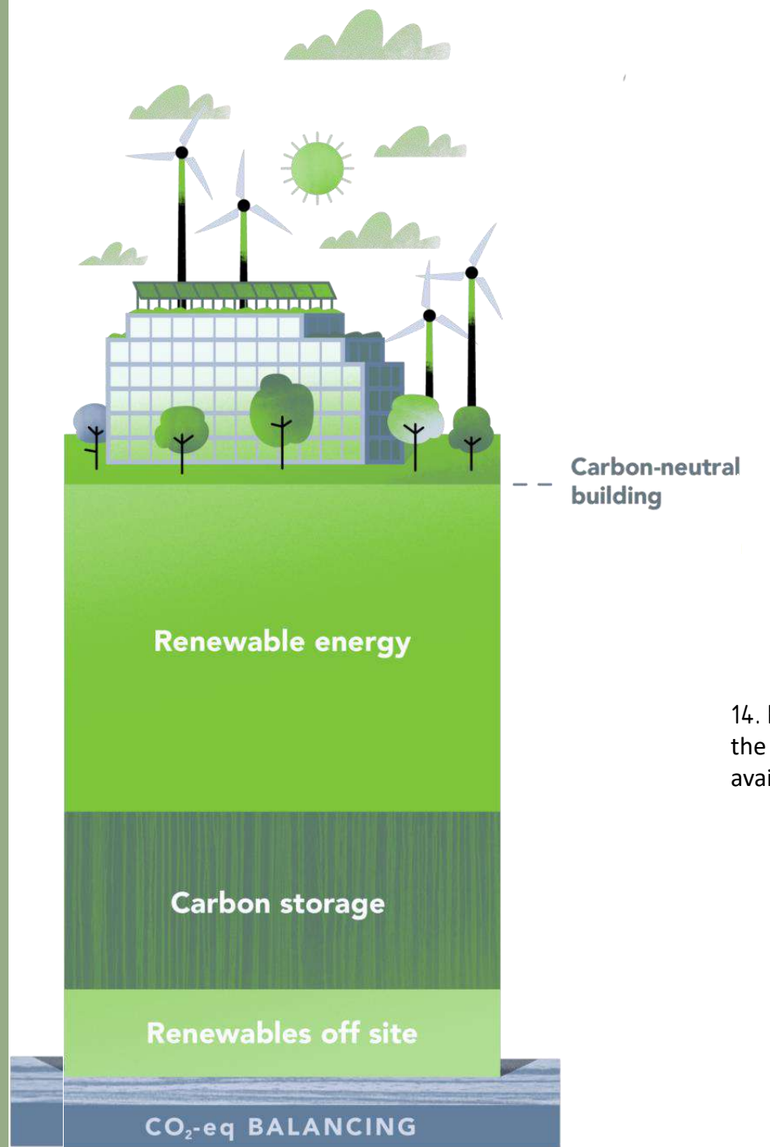


7. High levels of insulation Incorporated in the building's 'envelope', which provides Barratt with a sample of how to achieve Level 6 of the Government's Code for Sustainable Homes. The house walls are wrapped in 180mm of insulation to keep heat in.

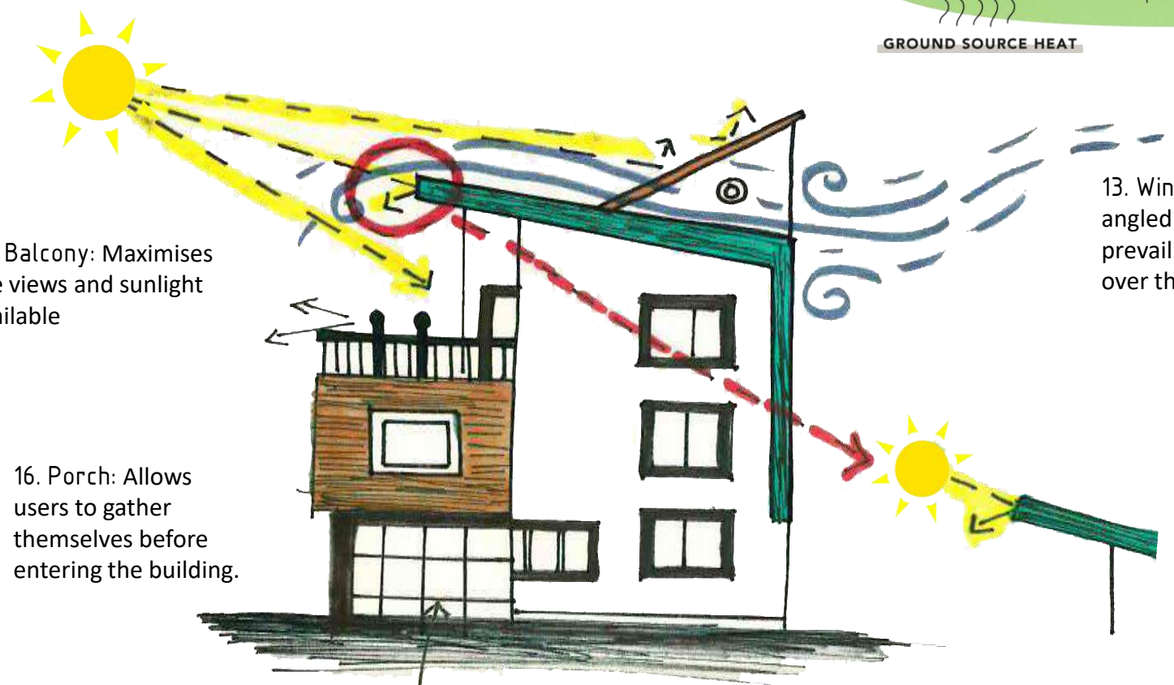
9. Air Source Heat Pump converts the energy of air from indoors or outdoors into heat, supplying the internal needs of the house. House doesn't need a tumble drier – clothes drying is achieved at the head of the stairs using warm air rising through the house.

11. Walls
Walls are constructed from aircrete masonry blocks with thin-joint mortar and concrete floor slabs, to provide a robust frame with high 'thermal mass'. This will help reduce any potential overheating problems within the finished house. House achieves air tightness levels ten times in excess of the current Building Regulations.





12 Angled roof: Aimed at preventing overheating in summer, yet still maximising the daylight which penetrates the building.



13. Wind breaks: The roof is also angled to act as wind breaks to prevailing winds. Wind naturally flows over the slopped building.

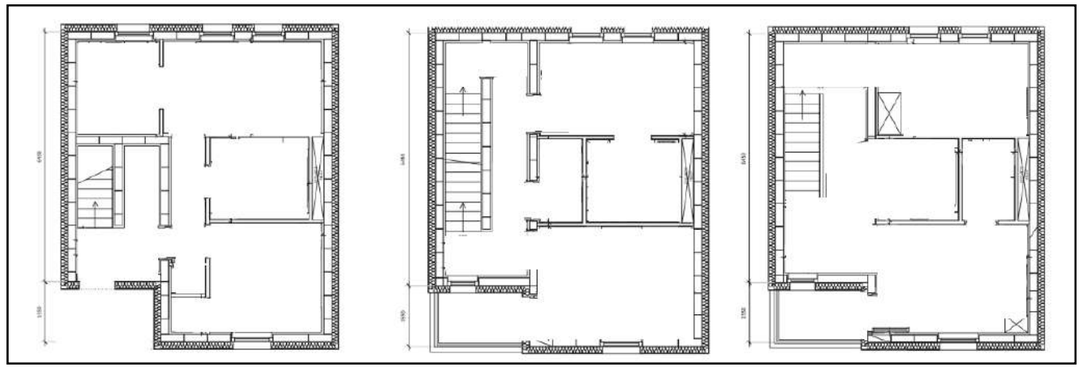
14. Balcony: Maximises the views and sunlight available

16. Porch: Allows users to gather themselves before entering the building.

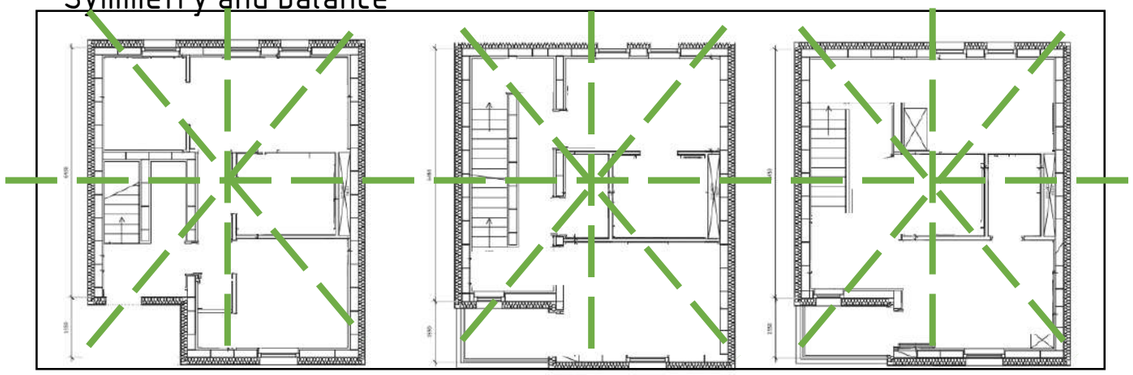
15. Extended eaves: Prevent overheating in summer (reflects it)

Analytical Diagramming *(Based upon the technique of Roger H. Clark and Michael Pause seen in Precedents in Architecture, Third Edition)*

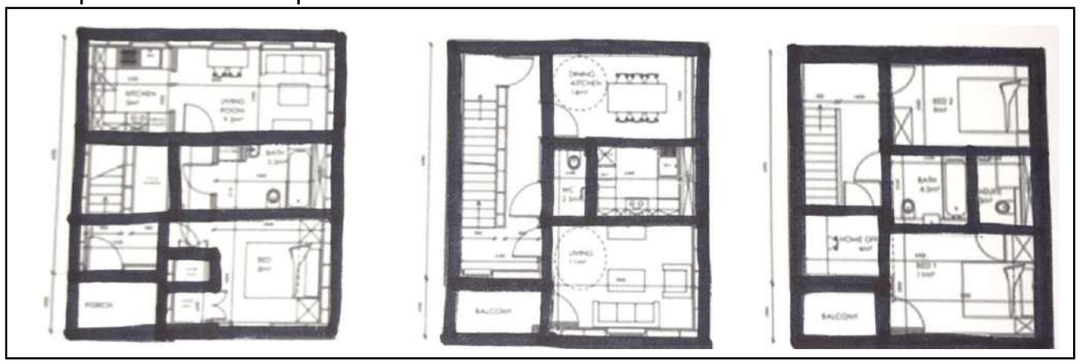
Structure



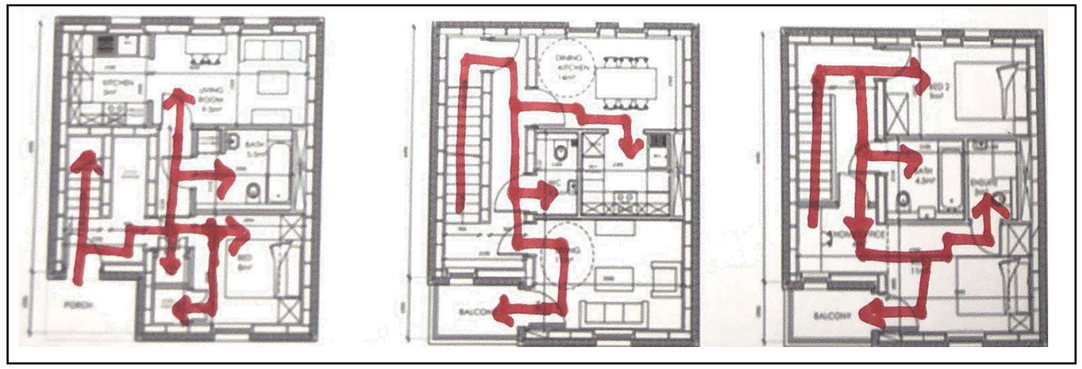
Symmetry and balance



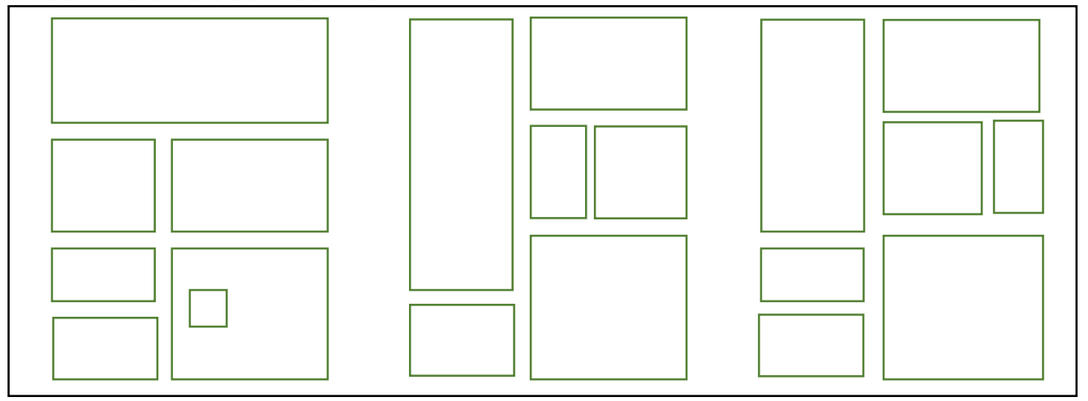
Repetitive to Unique



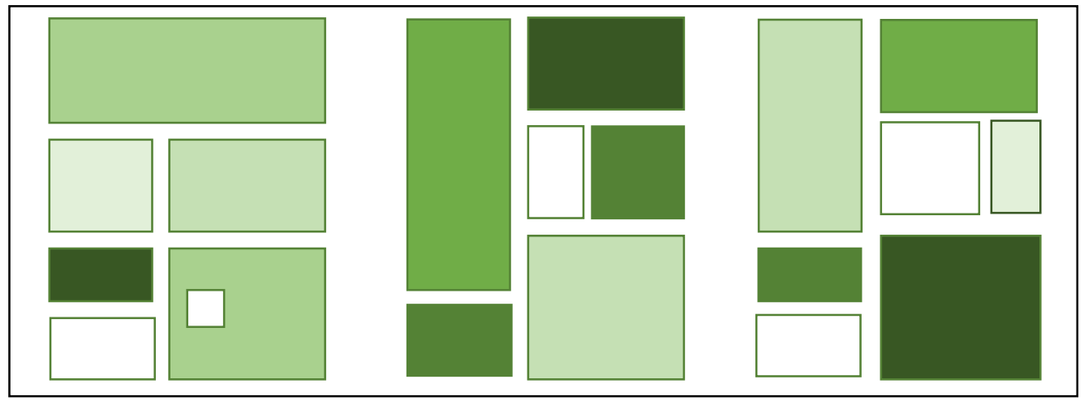
Circulation To use



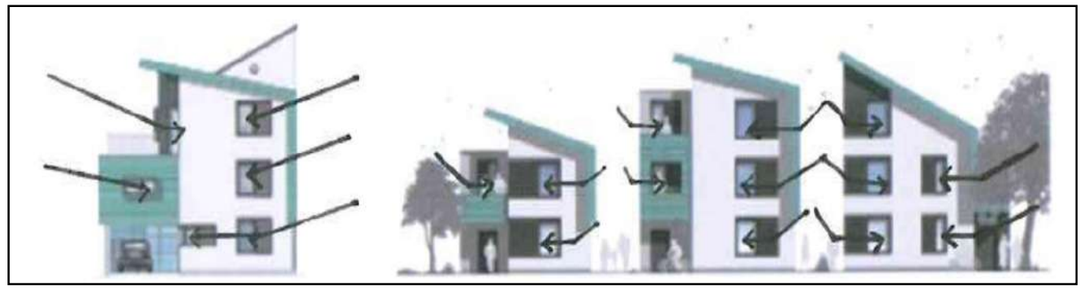
Additive and subtractive



Unit to whole



Natural LIGHT



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