



Architecture

Urban Design

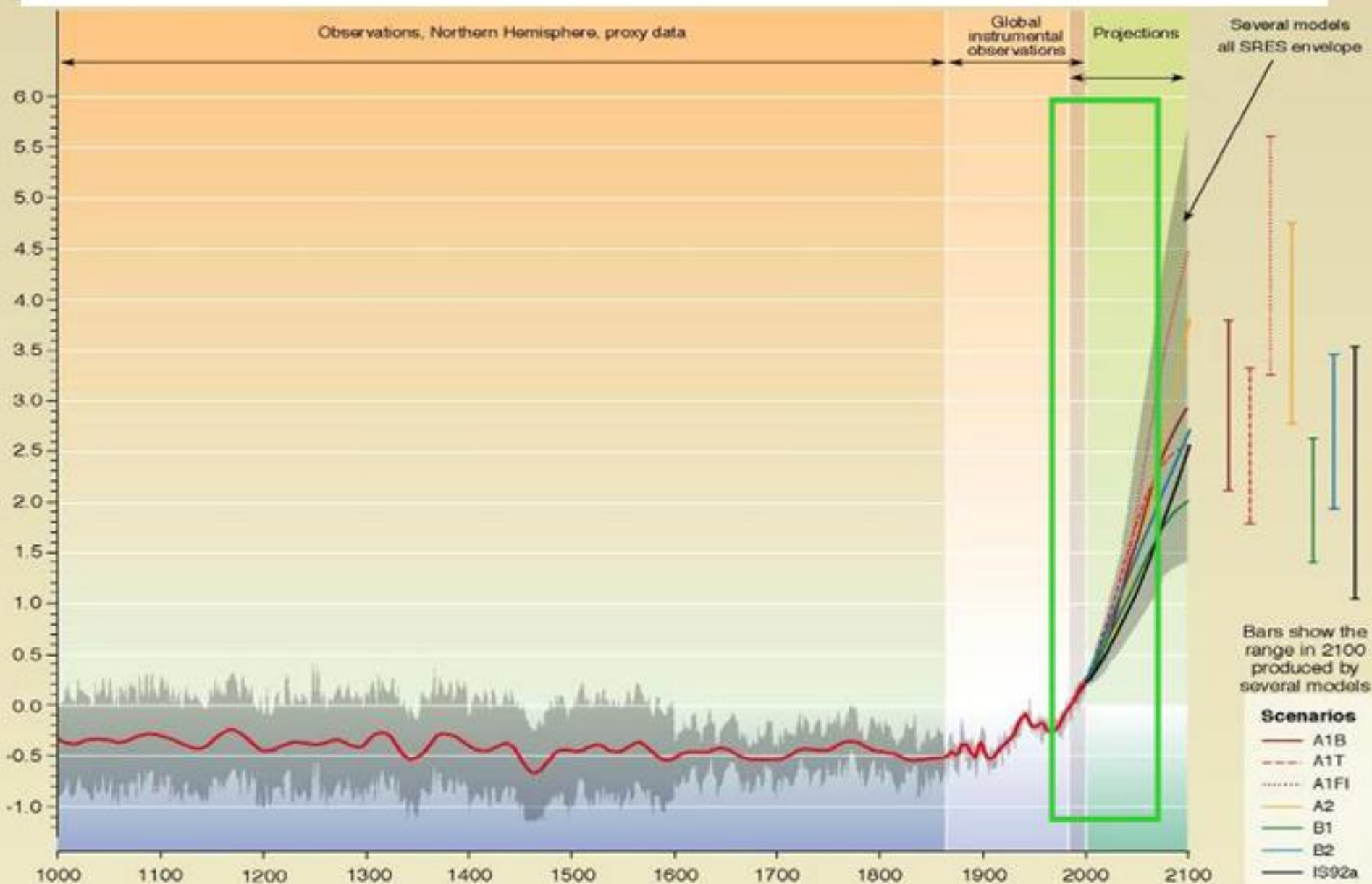
Planning

Interiors



# Variations of the Earth's surface temperature: 1000 to 2100

Observations, Northern Hemisphere, proxy data



With weather experts warning that Britain faces an era of colder winters...

# Is this the dawn of a new Ice Age?



by  
**Michael  
Hanlon**

chilly weather have led to widespread talk of a 'new Ice Age'.

Again (naturally), global warming is blamed. But how could it possibly cause a new Ice Age? Surely Geoff Jenkins and his colleagues have promised us a future of

winter temperatures on Canada's East Coast, in Labrador and Newfoundland (which are on the same latitude as Britain), regularly plunge below minus 30C — a temperature never recorded here.

If the Greenland meltwater



**'ENVISIONING, IMPLEMENTING & MEASURING SUSTAINABILITY'**

**SUSTAINABLE DESIGNER OF THE YEAR 2005**

- Sustainability fully integrated into office procedures – ISO 9001
- Sustainability fully integrated into premises procedures – ISO 14001







## Passive Design

Orientation

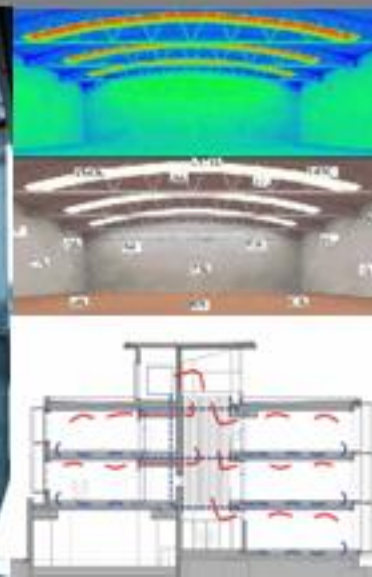
Passive solar gain (winter)

Solar shading & control

Maximise daylight

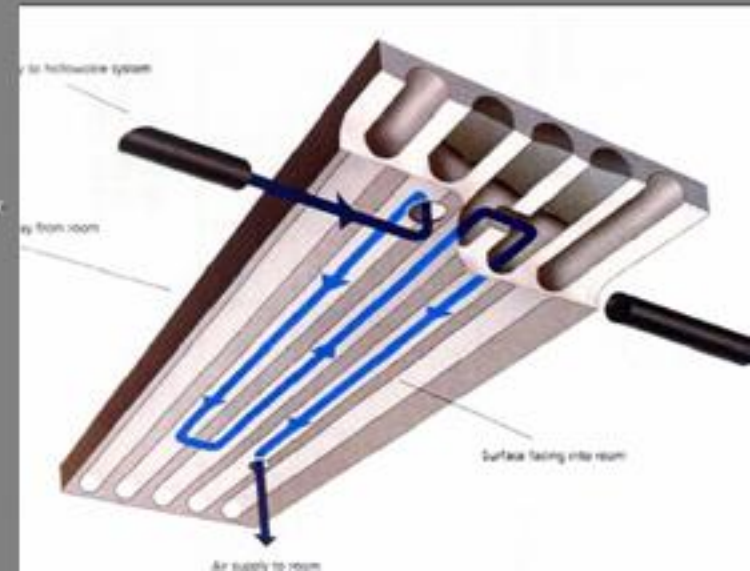
PIR lighting control

Thermal mass & night time cooling



# Active Cooling

Chilled Beam  
Comfort Cooling  
Desiccant Wheel  
Fuel Cells  
CHP

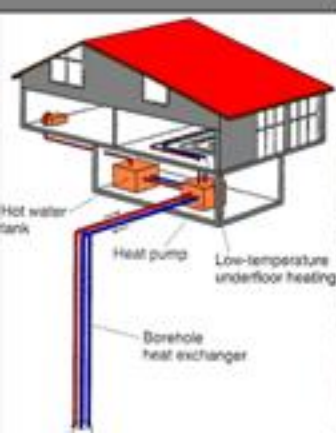




# Renewable Energy



**Wind**  
**PV Cells**  
**Solar Collectors**  
**Biomass – Biogas – Bio energy**  
**Geothermal**  
**CHP**  
**Fuel Cells**



# Water



**Rainwater harvesting**

**Sustainable Drainage**

**Irrigation**

**Green Roofs**

**Biodiversity**

**Grey Water Recycling**

**Low Flush Toilets**

**Boreholes**



# Materials

Green guide to specification  
Recycled materials

Timber & stone from sustainable sources

Linoleum instead of vinyl

Soft wood not MDF

Aluminium from hydro powered plant

Minimise waste & packaging



# SixtyK House

Environmentally Engineered | Design Directed | Flexible Futures

Competition background

Housing Design Approach

Competition winning entry for Rowan Road, London Borough of Merton

Prototype House Store Street

**Speaker: Alan Shingler - Partner**



# SixtyK House

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**Speaker – Alan Shingler**



# DESIGN FOR MANUFACTURE COMPETITION



**£60,000 = 2 Bed House or Flat,  
76.5sqm**



# DESIGN FOR MANUFACTURE

**SixtyK**  
Consortium

•Crest Nicholson

•Kingspan

•Sheppard Robson

•Arup

•MacFarlane Wilder

•Davis Langdon

Stage 2 submission Oxley Park, Milton Keynes



## COMPETITION STAGES

Stage 1 – Prequalification

Stage 2 – Competition Designs for Oxley Park

Stage 3 – Consortia Bids

Sites won by **SixtyK**  
Consortium

Renny Lodge,  
Newport Pagnell – 68 homes

Former Linton Hospital  
Coxheath, Kent – 148 Homes

Rowan Road, Mitchem  
London Borough of Merton – 248 Homes





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Britain

...











Britain

...

## PUBLIC PERCEPTION OF MMC





# INVISIBLE STANDARDISATION



# ADDRESSING FUTURE TRENDS IN HOUSING



## Flexibility

- Avoid mediocrity
  - Context, Planning
  - Regional demand
  - Design Codes
  - Information
- Technology  
& Communications
- Demographic changes
  - Concept model for living  
capable of being applied  
across 3 types of housing



## Technological Capabilities

- Improved design & delivery process
- Buildability & accuracy
- Information Technology & Communications



## Effect of Climate Change

- Hottest days in the UK are currently at 30°C BUT are likely to jump to 40°C.
- Thermal mass is critical to stabilise the internal temperature & minimise mechanical cooling or air conditioning



## Consumer Demand

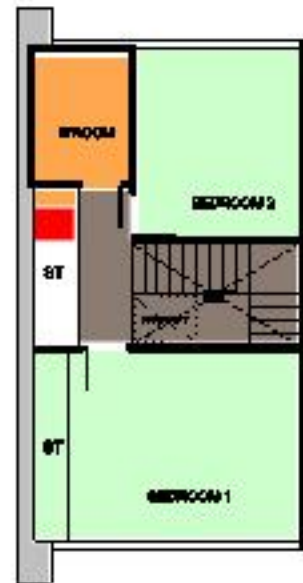
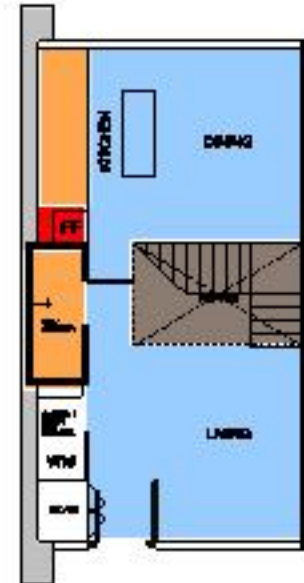
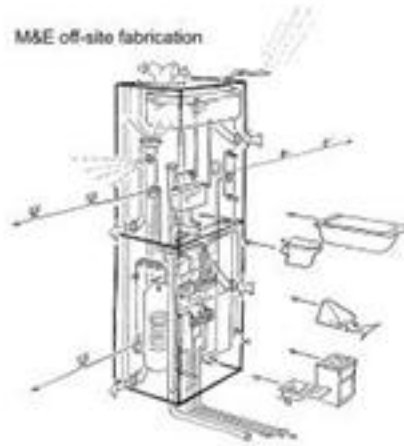
- Demand for consumer choice is likely to grow rather than decline
- Availability & affordability (£60,000 home)
- Future government policy is to create greater flexibility in tenure and ownership



## Mortgage, Warranty & Insurance

- Perceptions,
- Accreditation

# SERVICE WALL : SixtyK



-Volumetric Service Wall

-Volumetric Bathroom Pods

# FLEXIBLE LIVING SPACE : SixtyK



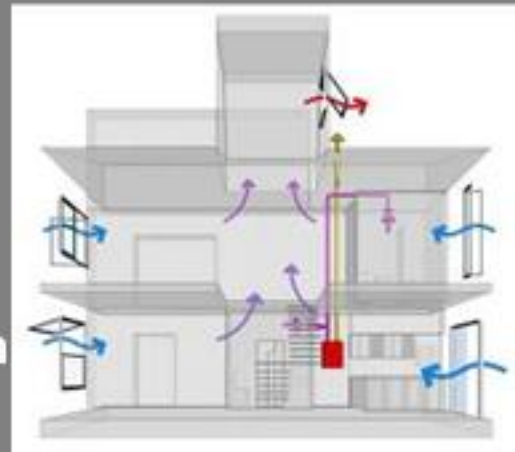
1

- Fire Sprinklers allow open plan living
- 3 Dimensional appreciation of volume allowed through stair void

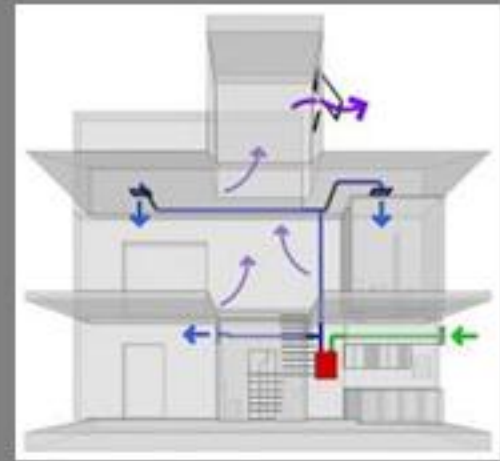


## PASSIVE DESIGN : SixtyK

- Secure night ventilation
- Selective thermal mass
- Whole House Ventilation System
- Heat Recovery
- Low air changes in winter



Day



Night

3

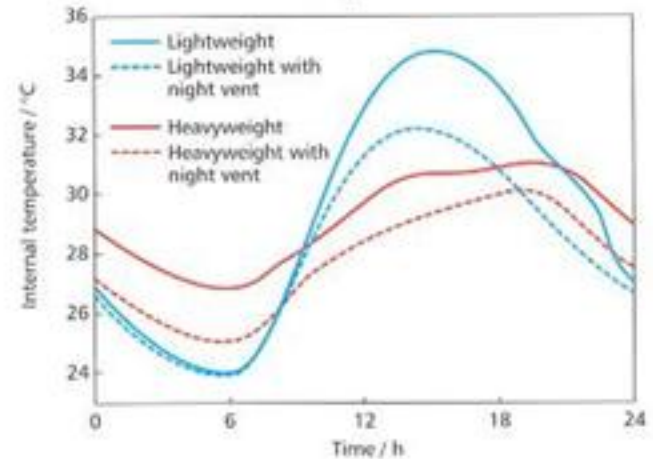


Figure 2.5 Effect of thermal mass and ventilation rate on peak indoor temperature<sup>(10)</sup>

Solar gain  
Ventilation  
control  
Thermal mass



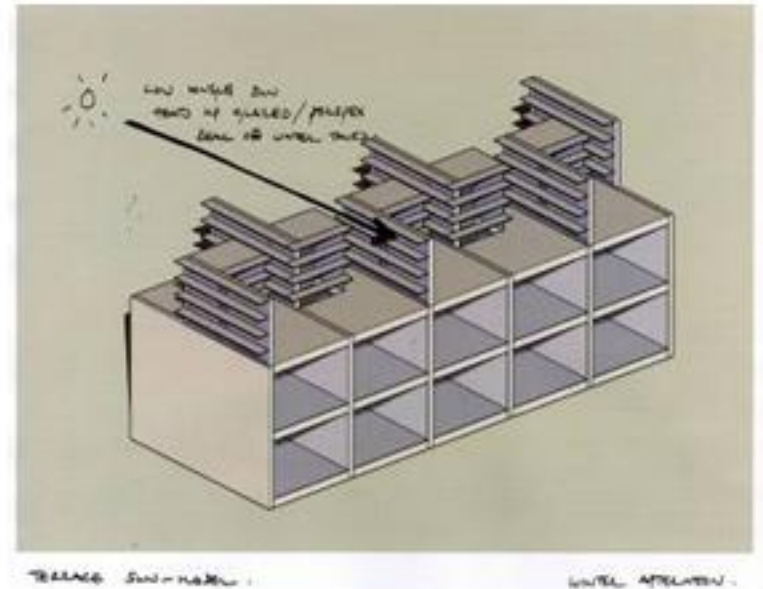
Effectiveness

## CONTROL SOLAR GAIN : SixtyK

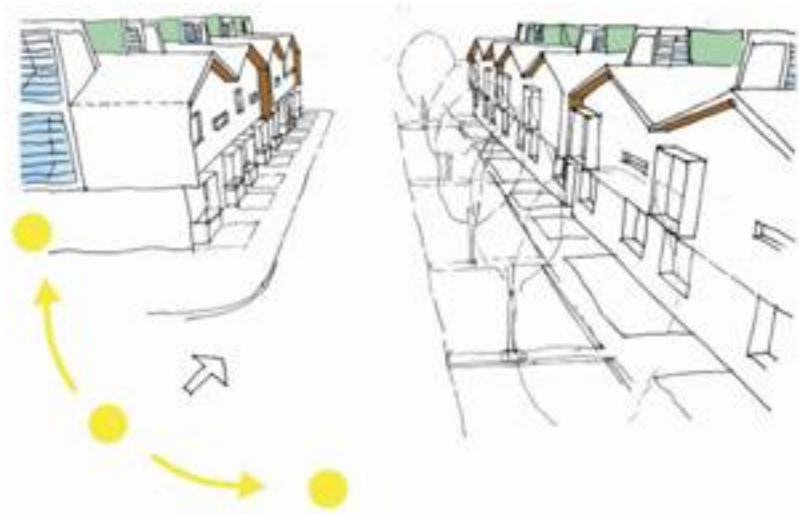


5

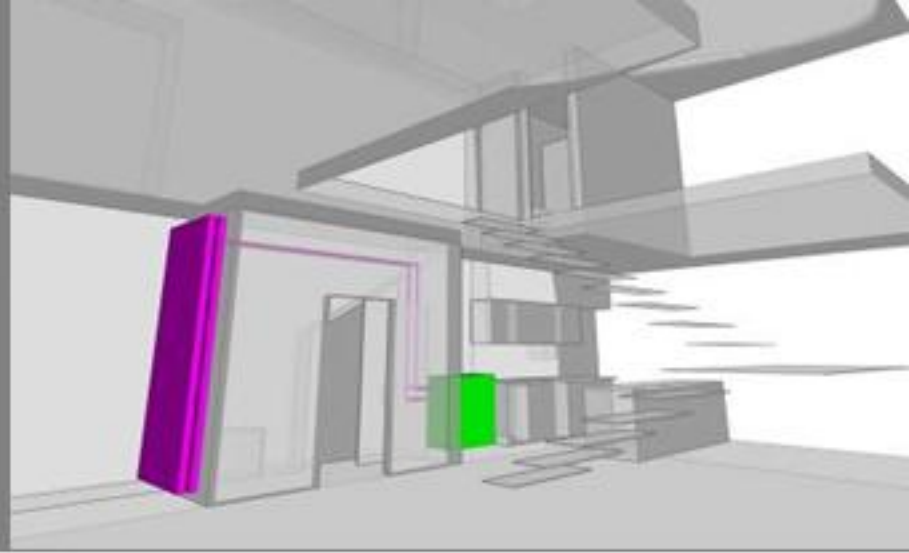
- Roof lantern provides solar gain to any orientation without compromising masterplan
- Maximise daylight & views to living areas
- Minimise glazing to bedrooms
- North light from lantern penetrates centre of house



**ORIENTATION** : SixtyK



**HIGHLY INSULATED SHELL** : SixtyK



**-Highly Insulated envelope  
minimises heat loss**

**- Highly Insulated envelope  
minimises heat gain**

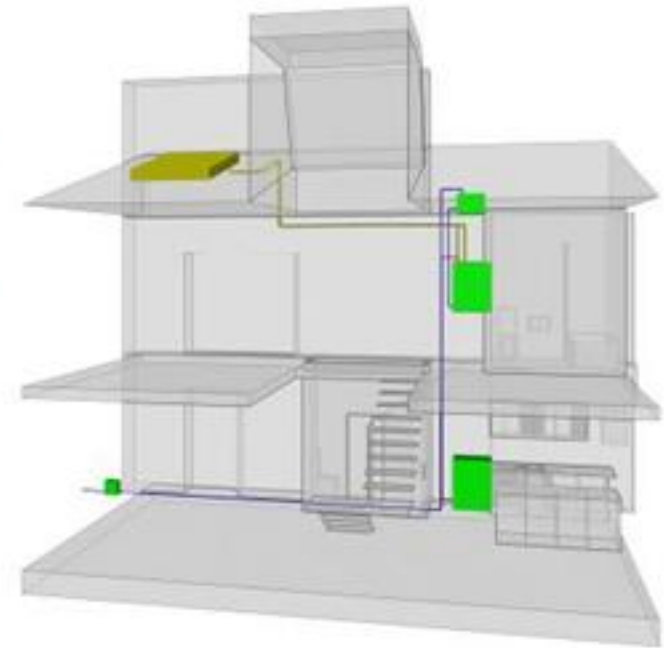
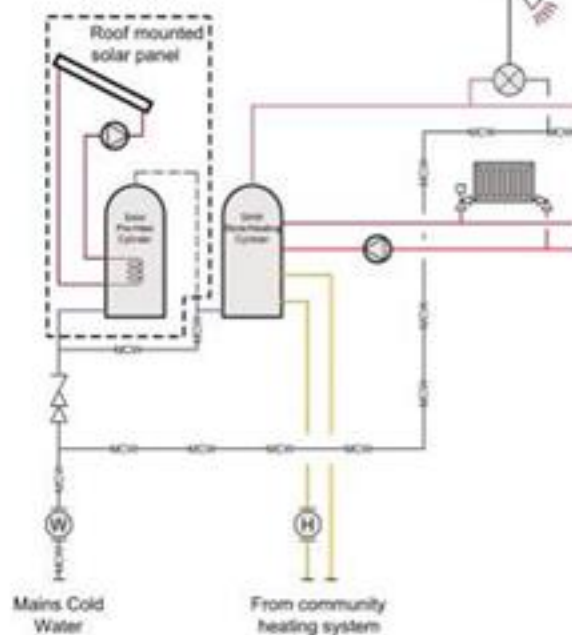


## FUTURE PROOFING

- Optional sedum roof encourages natural habitat
- Rainwater harvesting & grey water recycling
- Integration of renewable energy sources
- Community boiler



### Optional Solar Thermal





# KINGSPAN TEK

## Service Integrated Insulated Structure

Current System



Proposed System





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Housing Design Approach

Stage 3 - Competition winning entry for Rowan Road, London Borough of Merton

**Speaker – Alan Shingler**



# Rowan, Mitcham // London

Office of the Deputy Prime Minister & English Partnerships

DESIGN FOR MANUFACTURE COMPETITION // STAGE 3

June 2006

Submission A: Development Proposal



DAVIS LANGDON



MACPARKLAND WILDER

URBAN & ENVIRONMENTAL LAND PLANNING

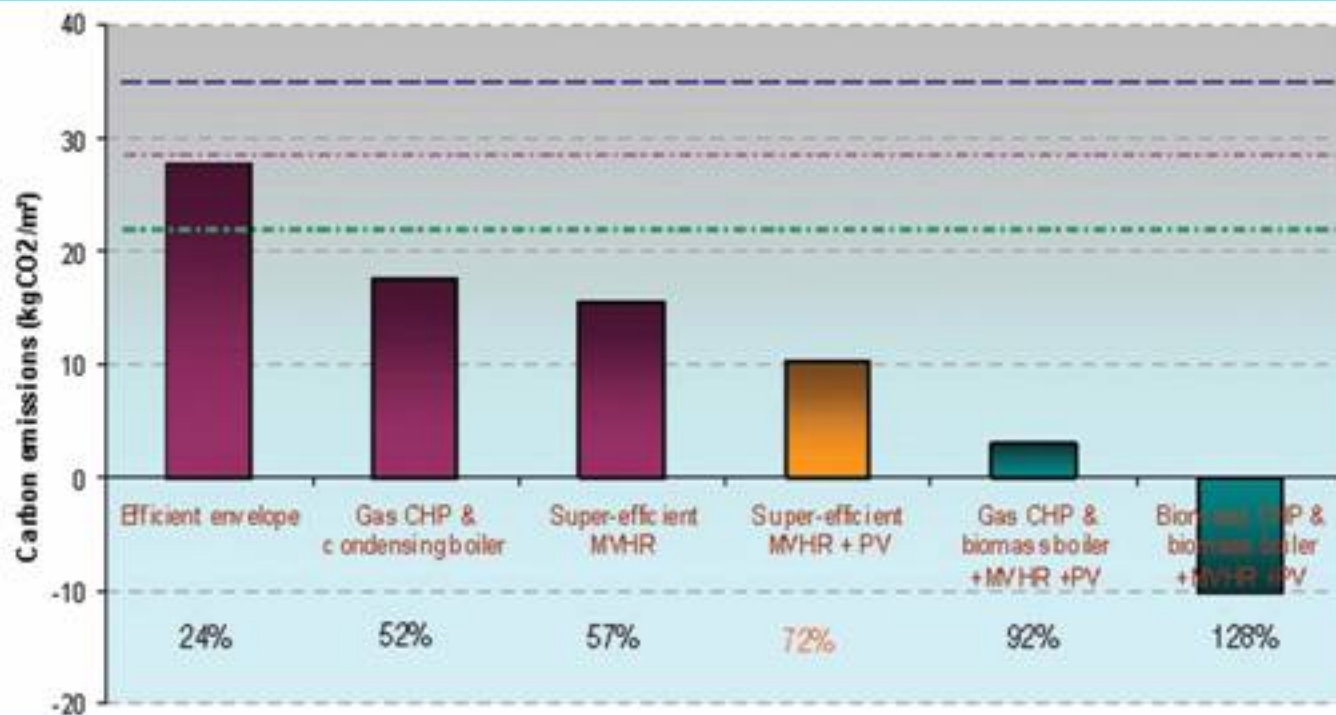
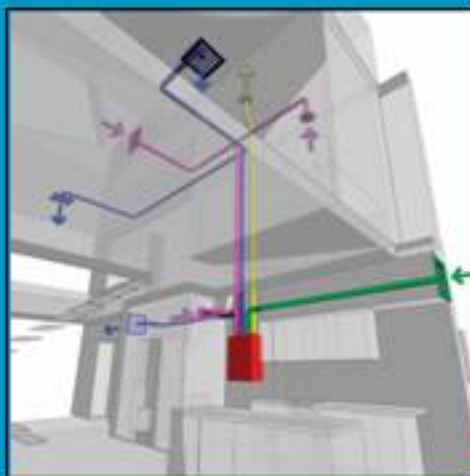


ARUP

# Capacity Study



# Carbon emission benchmarking

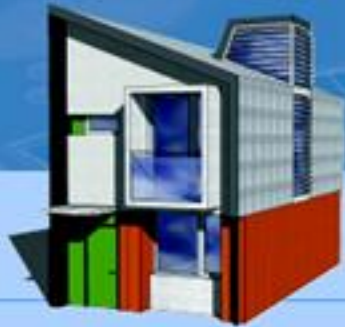


36: 2002 baseline emissions for £60k house

29: 2006 compliance (-20%)

22: 2010 compliance est. (-40%)

% reduction relative to 2002 baseline



# Home Performance Ratings

Energy Use & CO<sub>2</sub> Emissions p/a Comparison: Rowan, Mitcham // London

## HOUSE TYPE: PERKIN'S PREMIERE

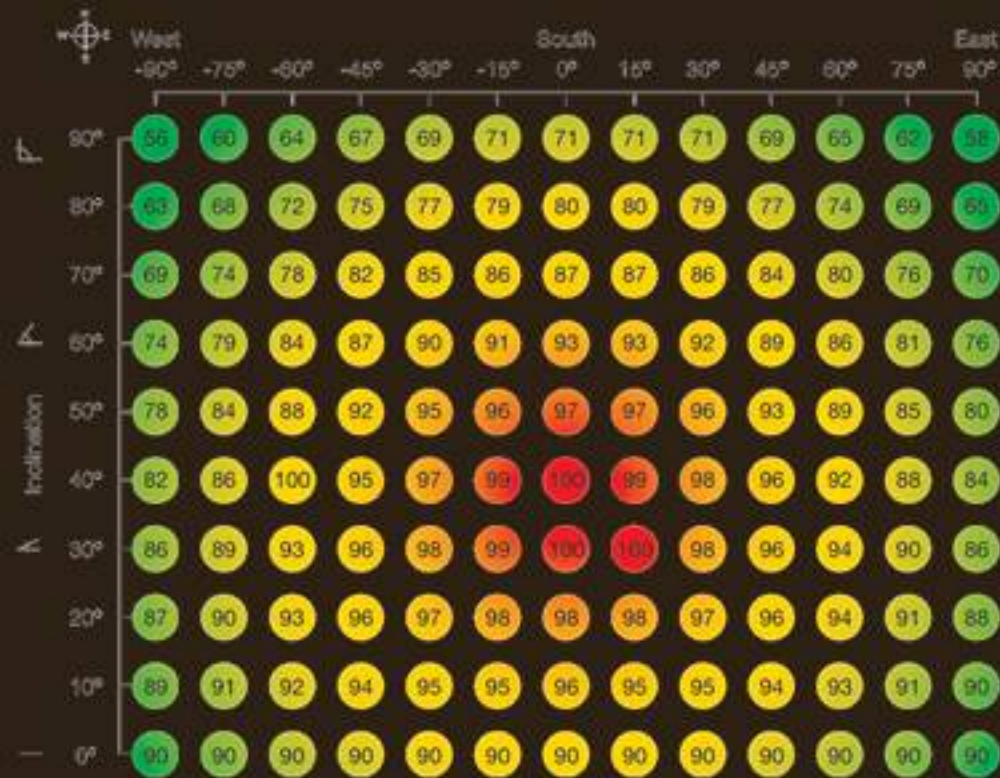
	Rowan Bid Dwelling		Building Regulation Compliant Dwellings Comparison		
	with PV	without PV	2002	2006	2010**
CO <sub>2</sub> Total (kg/year)	54.74	926.34	2,075.89	1,660.71	1,245.53
CO <sub>2</sub> Rate (kg/m <sup>2</sup> /year)	0.72	12.11	27.14	21.71	16.28
Environmental Impact Rating	99.40	89.78	77.10	81.68	86.26
Environmental Impact Band	A	B	C	B	B
Primary Energy (kWh/year)	2,317.33	6,613.93	12,616.60	10,085.22	7,569.91
Primary Energy (kWh/m <sup>2</sup> /year)	30.29	86.46	164.92	131.83	98.95
SAP Rating	93.52	86.73	77.76	82.29	83.17
SAP Band	A	B	C	B	B
<b>TOTAL ENERGY COST* (£/year)</b>	<b>94.93</b>	<b>159.93</b>	<b>245.67</b>	<b>202.34</b>	<b>161.00</b>

\* Excludes cooking and appliances.  
 \*\* 2010 figure is based upon the 2010 rating - 20% CO<sub>2</sub> emissions.

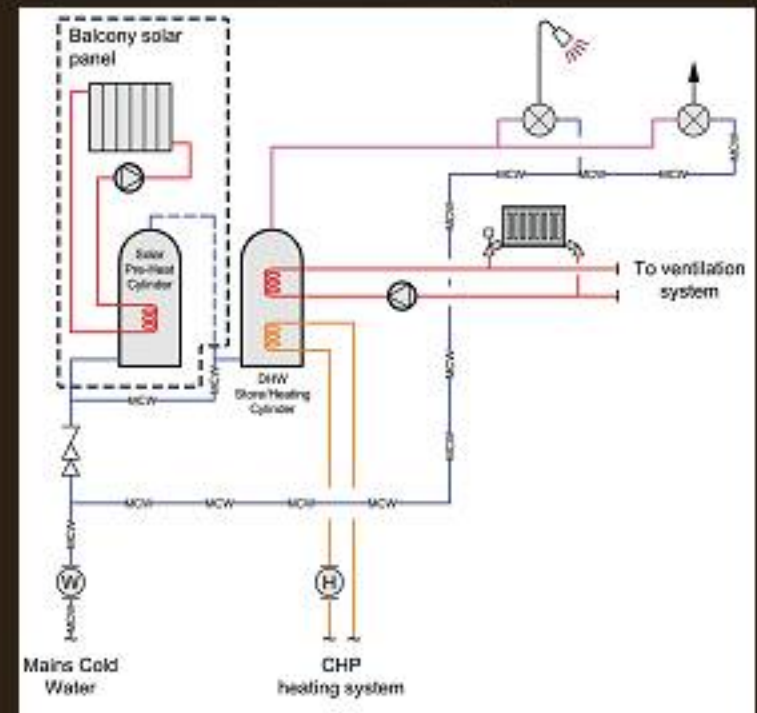
**SUSTAINABLE & FUTURE-PROOFED**







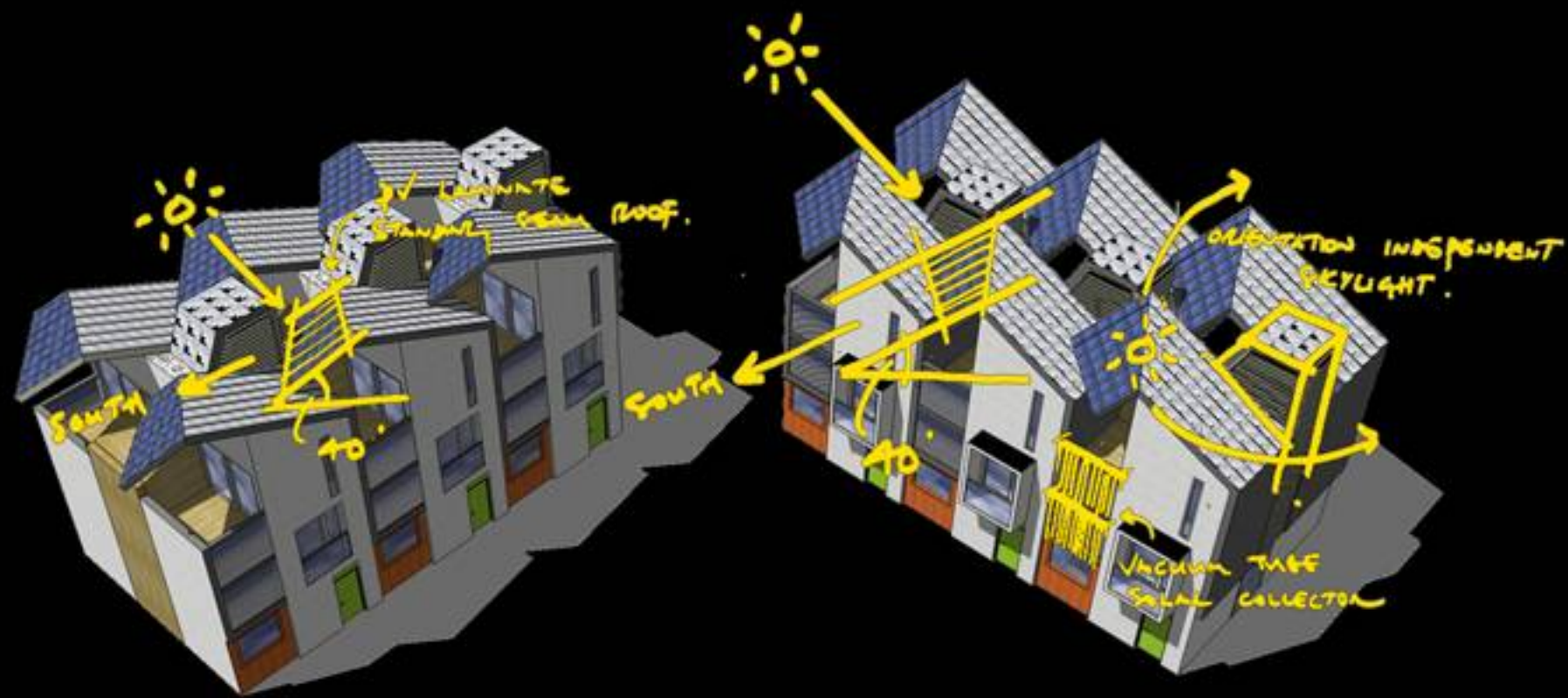
# 10% Renewables



# PVs Integrated into architecture



- Distinctive architectural form
- Solid spine
- Progressive element
- Unites the site
- Defines space
- Photovoltaic roof form



# Site

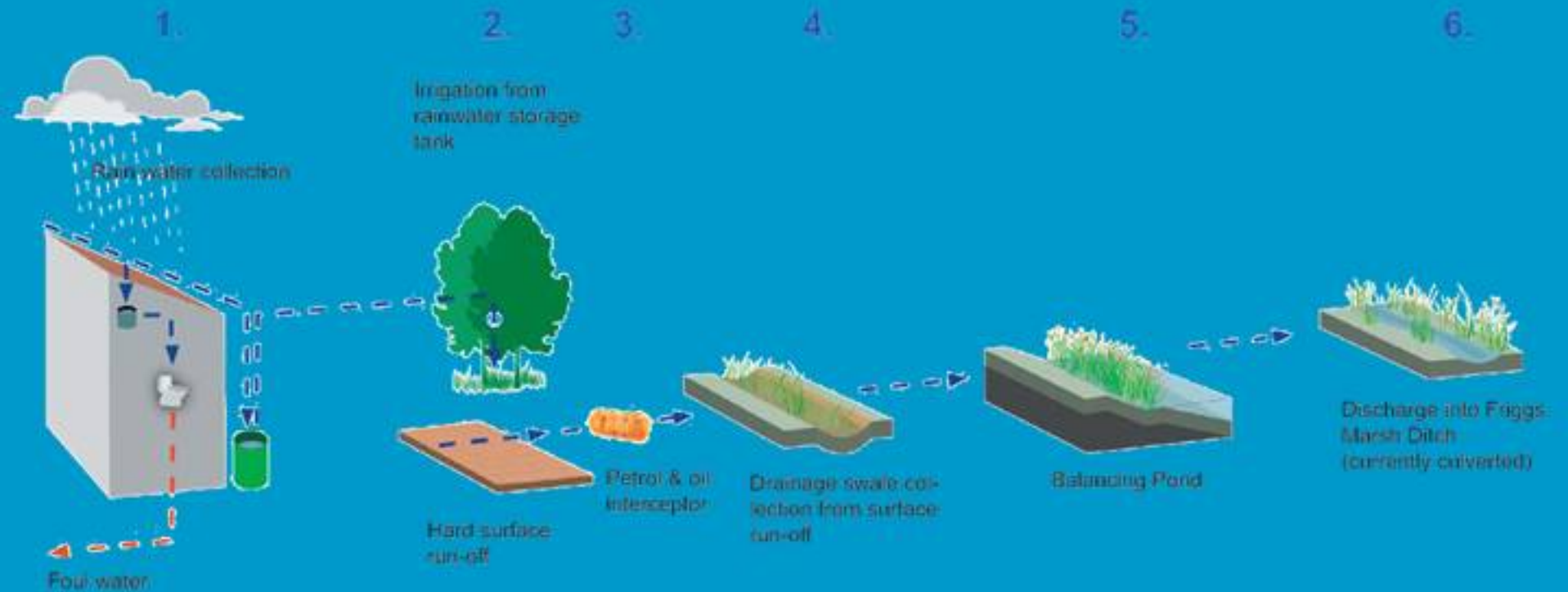


# Water conservation

2005-6 Driest winters since 1927



# 1. Water Management





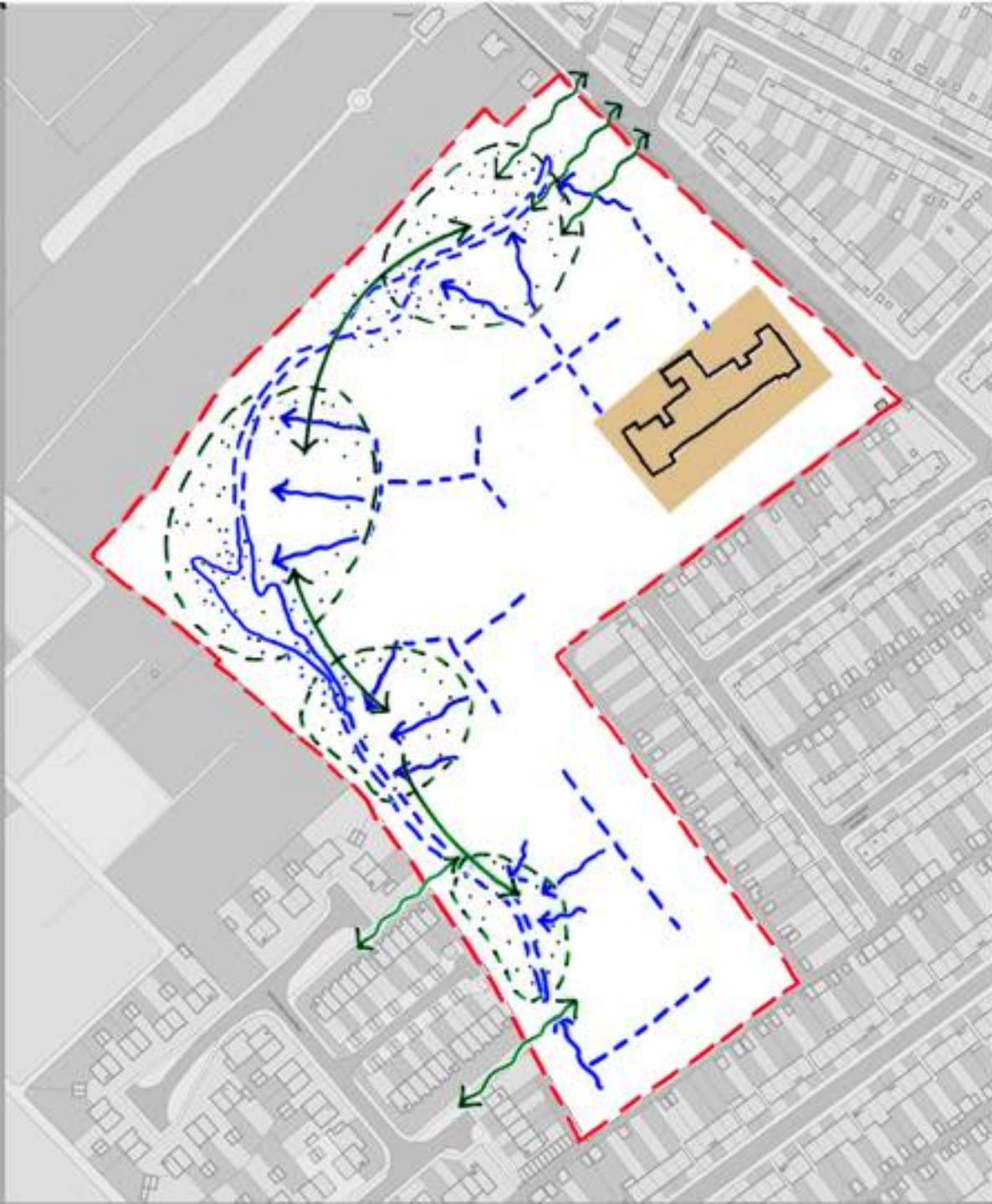
- **Water Management**

- **Roof collection**
- **Re-use**
- **Irrigation**
- **SUDS**
- **Swales**
- **Balancing ponds**
- **Attenuation ponds**
- **Outlet choke**
- **Biodiversity**
- **Education**

# 1. Water Management

- Roof collection
- Re-use
- Irrigation
- **SUDS**
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## 1. Water Management

## 2. Green Space

- **Space sub-division**
- **Interconnected spaces**
- **Pedestrian permeability**
- **Community accessibility**
- **Variety of routes**
- **Education trail**
- **Cycle access**
- **Rowan Road presence**



## 2. Green Space



WETLAND CROSS SECTION (Scale 1:150)



The balancing pond provides a number of functions for the sustainable drainage strategy including filtration and attenuation. It also provides the parkland with an amenity which is a valuable wildlife habitat. Shallow reed planting shelves provide shelter for wading birds and marsh inhabitants such as Heron and Reed Warblers, whilst deeper parts of the pond provide refuge for Ducks and Moorhen. The pond shallows provide a thriving environment for insects and aquatic invertebrates, and the possible inclusion of a pond dipping platform would provide the opportunity for children to explore nature up close under the guidance of teachers or parents.



- 1. Water Management**
- 2. Green Space**
- 3. Community square**

- Entrance space
- Rowan Road presence
- Quality Hard Landscaping
- Presence of the school
- Nodal space
- Views and Glimpses
- 'Urban' heart

# 3. Community Square



## MOOD IMAGES



The park adjacent to the community hall would provide a small area of lawn that is framed by tree and hedge planting. The area which would be well connected to all parts of the development would provide a soft central hub and materials such as self-binding gravel would be used to emphasise the soft nature of the space. Seating would be provided to take advantage of the screening offered by hedges and a monument or public art installation would provide a focal point to the space.

## LIGHTING



S1

### LIGHTING - STREETSCAPE

Lighting columns at 8m intervals to Highways Agency standards with integral low energy luminaires.



S2

### LIGHTING - COURTYARDS

Lighting columns at 10m intervals with integral low energy luminaires.



G1

### IN-GROUND LIGHTS

Low level drive-over lighting units as way point markers to internal courtyard areas with energy efficient luminaires.



G2

### IN-GROUND UPLIGHTERS

Buried in-ground uplighters with an asymmetrical beam angle positioned under each tree to light the canopy.

## STREET FURNITURE



F1

### LITTER BIN

Timber clad litter bin with galvanised steel receptacle and front entry access for removal of litter.



F2

### SEATING

Slatted timber park bench with back, secured to concrete in situ foundation.



1. Water Management
2. Green Space
3. Community Square
4. Armature

- Distinctive architectural form
- Solid spine
- Progressive element
- Unites the site
- Links surrounding areas
- Defines space
- Photovoltaic roof form

## 4. Armature





1. Water Management
2. Green Space
3. Hard Landscape
4. Armature
5. Crescents

- Softer
- Tactile
- Park relationship
- Space forming
- Surveillance





**1. Water Management**

**2. Green Space**

**3. Hard Landscape**

**4. Armature**

**5. Crescents**

**6. Body**

- Block formers
- Define public and private space
- Neutral architectural style
- Mediate between the Armature and Crescents



## 6. Body





1. Water Management
2. Green Space
3. Hard Landscape
4. Armature
5. Crescents
6. Body



**MASTERPLAN**

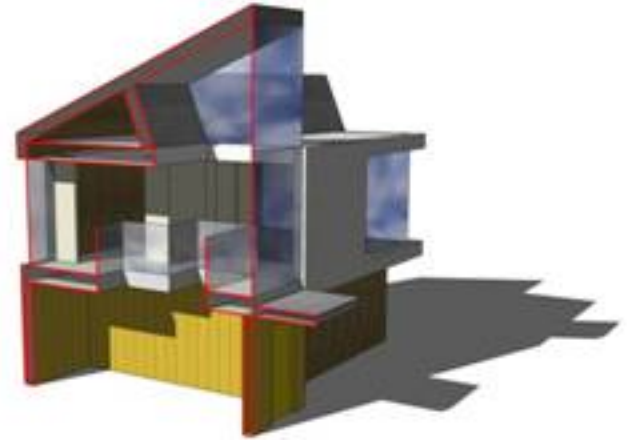


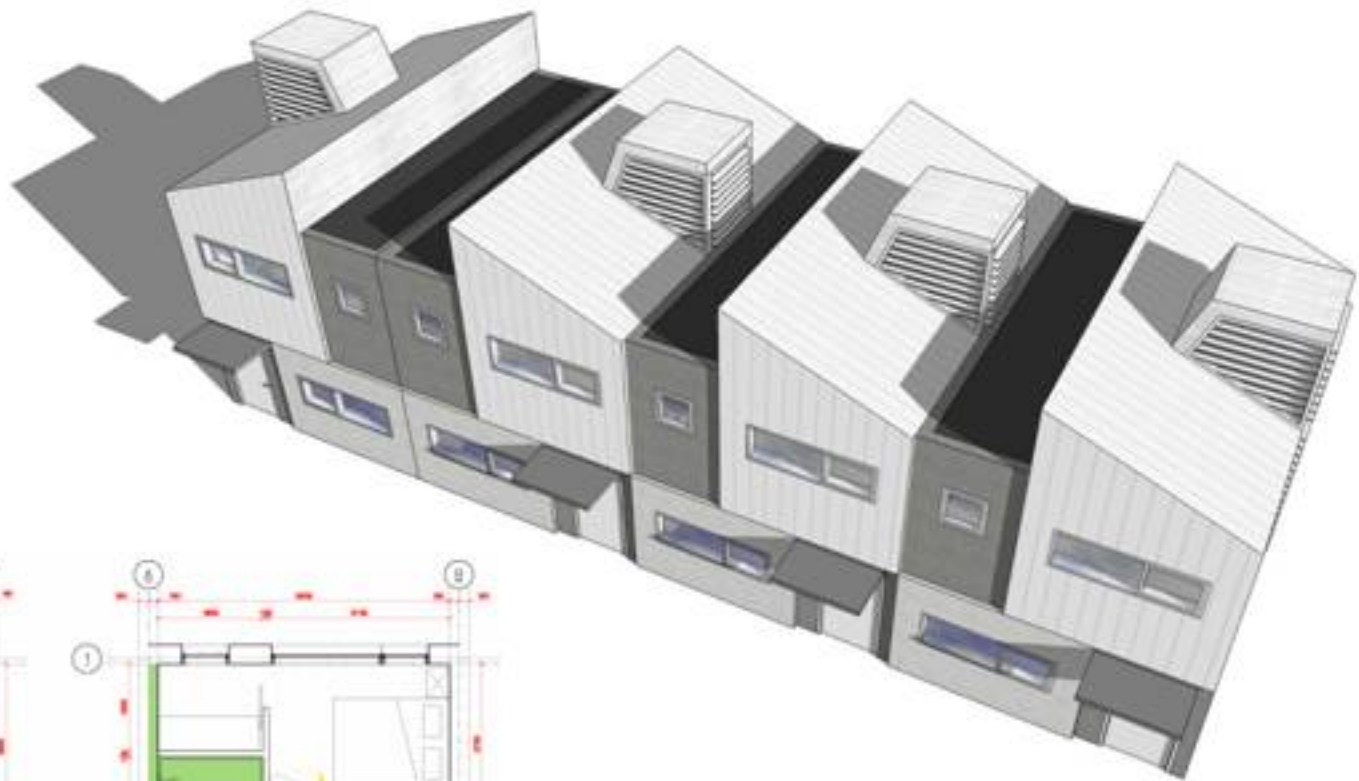
2 Bed / 2 Person / Flr  
Type: F1d  
Area: 57.5 sqm





2 Bed / 1 Person Flat  
 Type F2c  
 Area: 76.5 sqm  
 Materiality: Fibre cement weatherboard - Cedar boarding - Fibre cement slate - Poroplastic



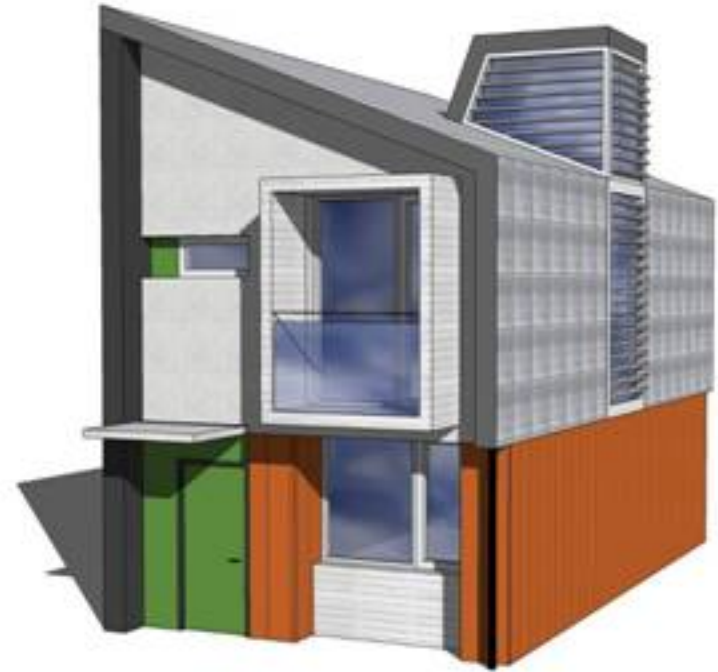
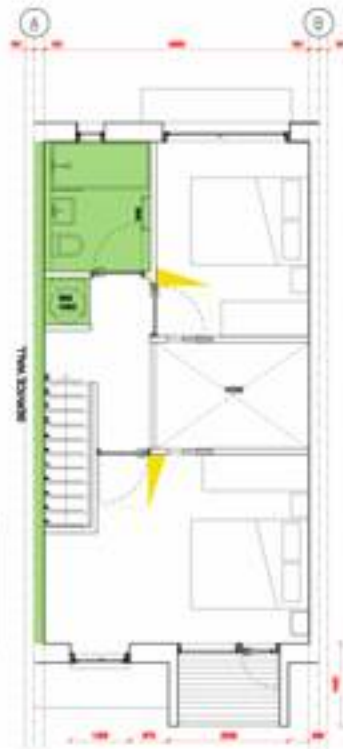


3 Bed / 5 Person Terrace House

Type: H3F

Area: 76.5 sqm

Materiality: Fibre cement board - Fibre cement slate - Aluminium composite panel - Photovoltaics





GROUND FLOOR PLAN - END OF TERRACE / DESIGNER TERRACE SETTING OUT

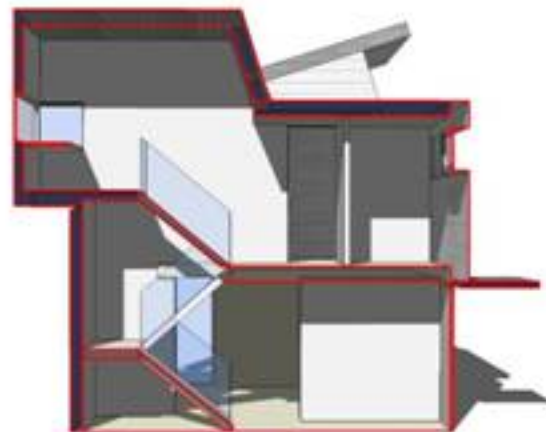
FIRST FLOOR PLAN - END OF TERRACE / DESIGNER TERRACE SETTING OUT

2 Bed / 5 Person Terrace / Semi-detached House

Type: H3b

Area: 58 sqm

Materiality: Fibre cement weatherboard - Sander - Fibre cement slate - Photovoltaics



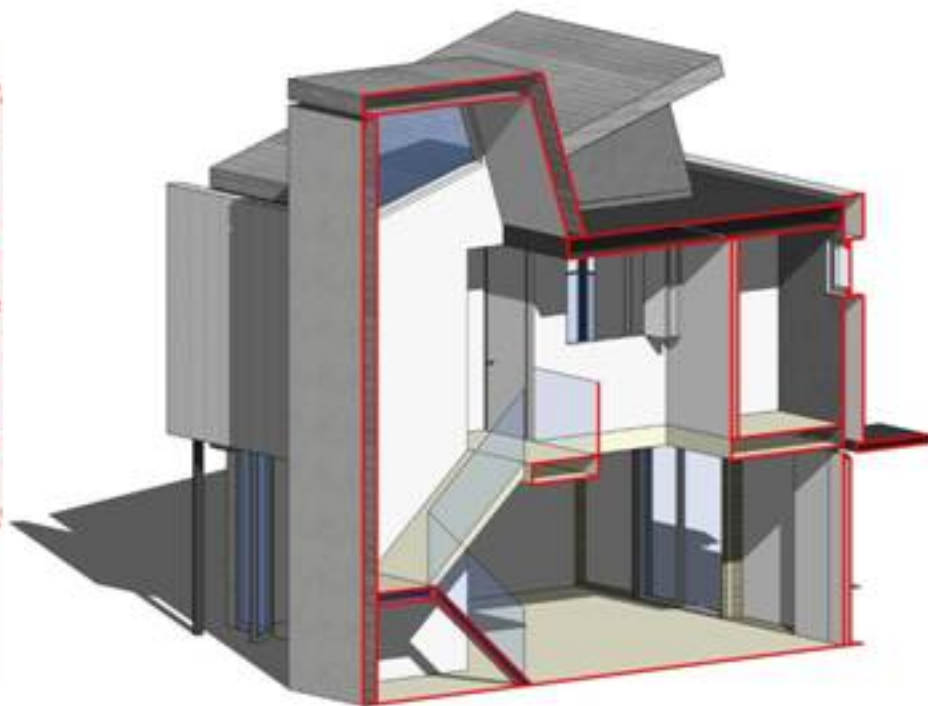


4 Bed / 7 Person Semi-detached / Detached House

Type: HAa

Area: 112 sqm

Materiality: Render - Fibre cement slabs - Aluminium composite panel - Photovoltaics

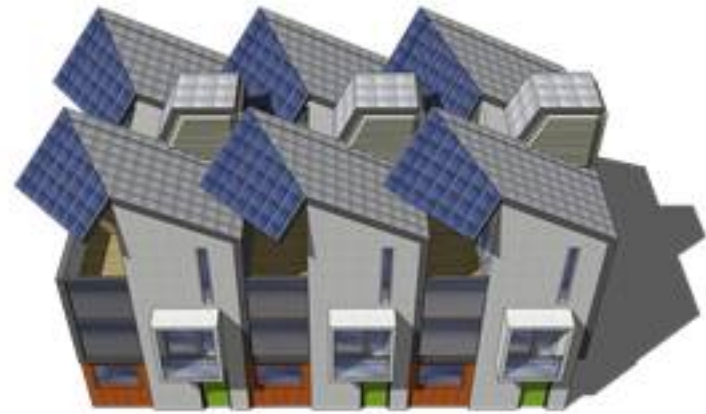
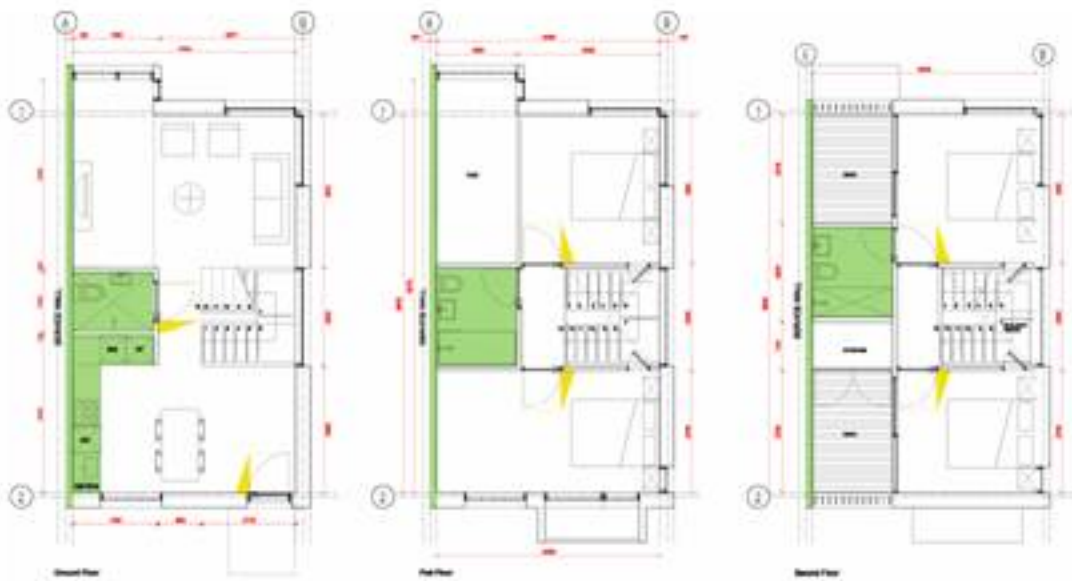






2 Bed / 4 Person, 4 Bed / 8 Person Terrace House  
Type: H2q and H4b  
Area: 765 sqm and 112 sqm  
Materiality: Fibre cement board - Cedar boarding - Photovoltaics





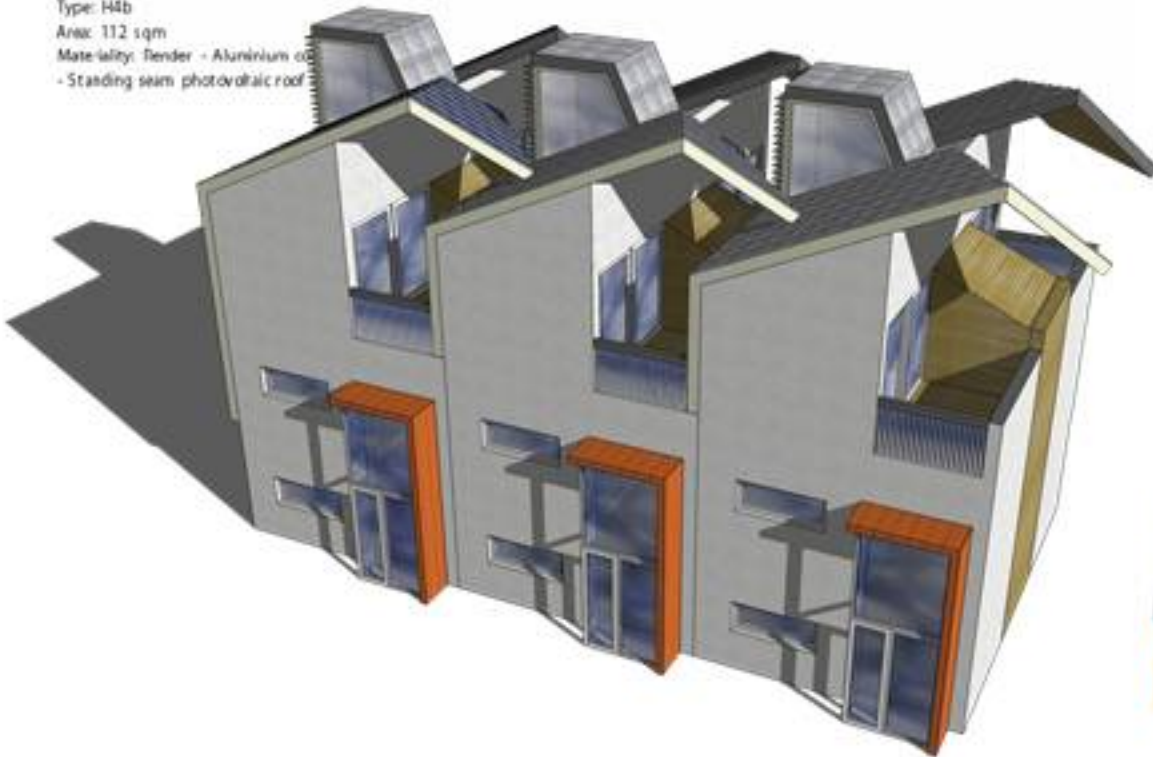
4 Bed / 8 Person Terrace / Semi-detached House

Type: H4b

Area: 112 sqm

Materiality: Render - Aluminium cladding

- Standing seam photovoltaic roof



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Prototype house Store Street

**Speaker: Alan Shingler - Partner**





LINDO'S CAFE

K661  
MGJ  
L

L655  
DVT  
L

W125  
HPS  
L

W125  
HPS  
L

W125  
HPS  
L

W125  
HPS  
L

W125  
HPS  
L

W125  
HPS  
L



LINDY'S CAFE

KB57  
MGJ

LD55  
DYP

LD55  
DYP

LD55  
DYP

LD55  
DYP

LD55  
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DYP

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DYP













# Summary



# SixtyK House

Environmentally Engineered | Design Directed | Flexible Futures

## Thank you

**Speaker: Alan Shingler - Partner**



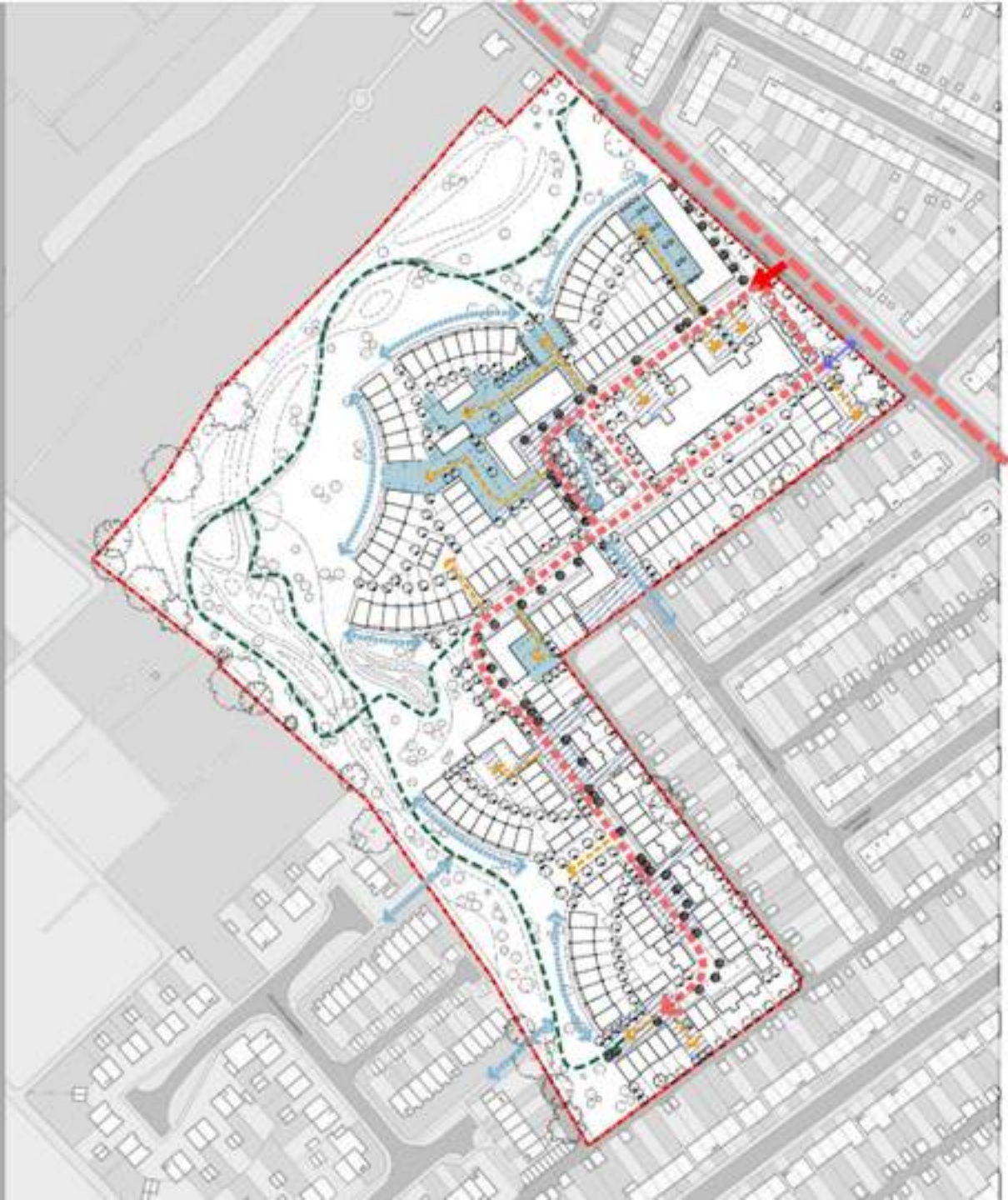
ARCHITECTURE URBAN DESIGN PLANNING INTERIORS



- Key**
- - - Site boundary
  - Block structure defined by the built form
  - Mews spaces within the block structure
  - Homezone
  - Well defined public spaces
  - Green space
  - main proposed interlinked spaces
  - ↔ Notional linkages between spaces
  - Surrounding existing buildings
  - Proposed buildings within the block form

## Spatial Strategy





- Key**
- Site boundary
  - Rowan Road - main road
  - ← Main vehicle site access point
  - Main development loop road
  - Parking court/ mews access
  - Emergency only and pedestrian/ cycle access
  - Park, pedestrian/ cycle routes
  - Pedestrian only access
  - Homezones
  - Mews/ parking courts

## Movement and Access



- Key**
- Site boundary
  - Block structure defined by the built form
  - Mews spaces within the block structure
  - The main well defined publicly accessible spaces
  - Interlinked publicly accessible spaces
  - Visual sequence of linkages between spaces
  - Long straight views into the site
  - Surveillance provided by neighbouring buildings overlooking adjacent car-parking courts
  - Surveillance provided by neighbouring buildings overlooking adjacent publicly accessible spaces
  - Surrounding existing buildings
  - Proposed buildings within the block form

## Visual Strategies

