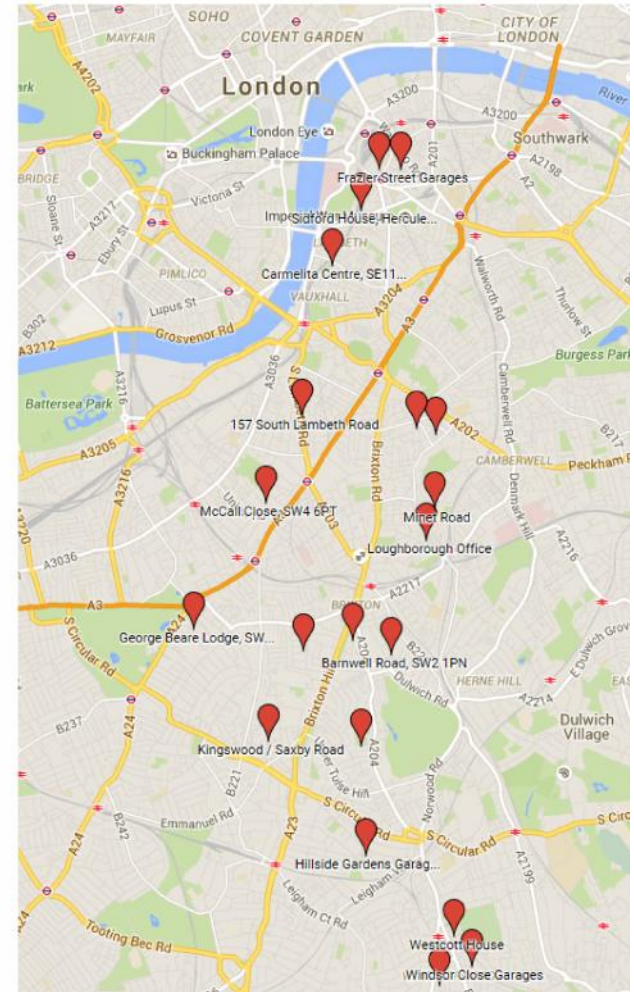
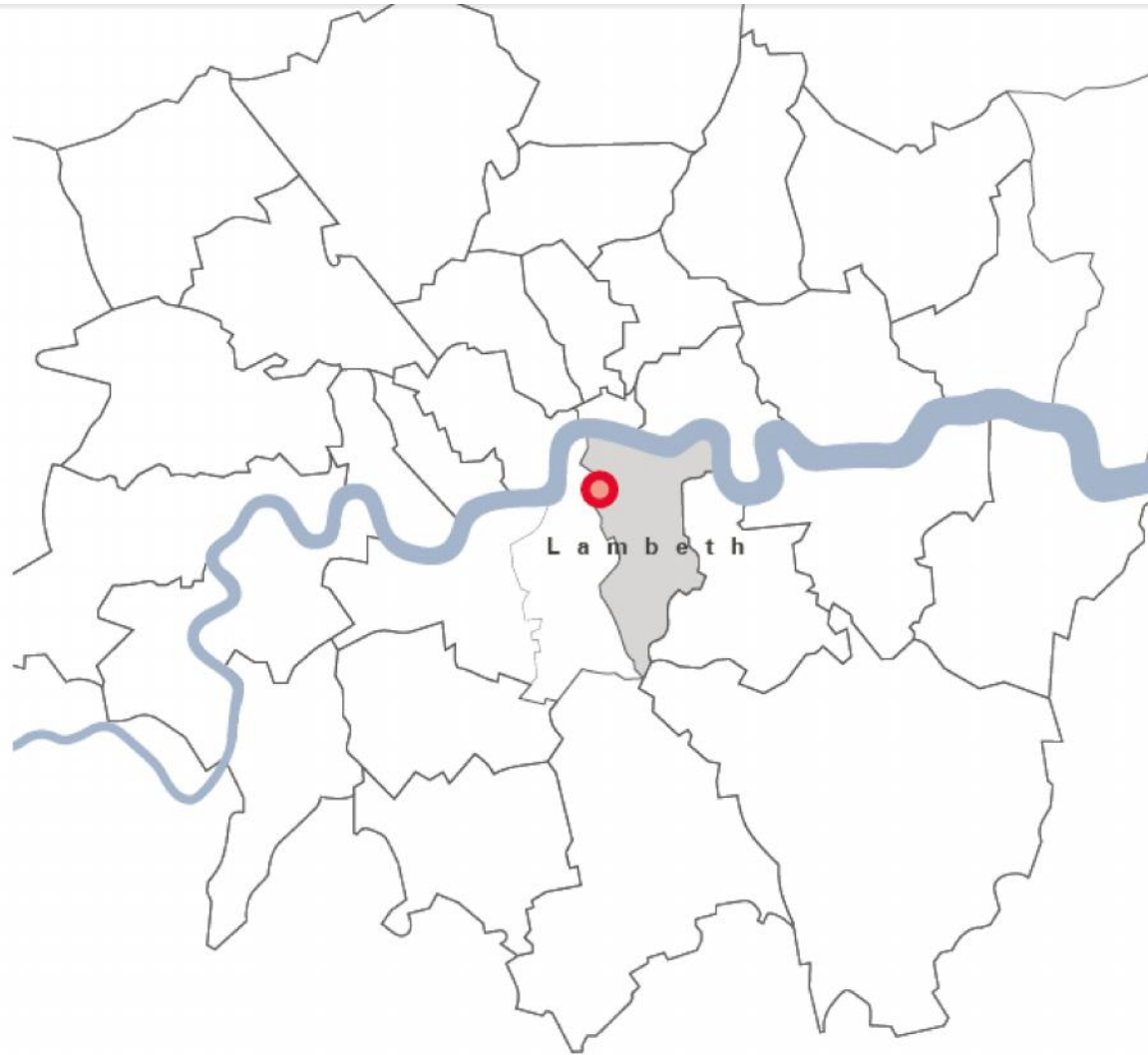




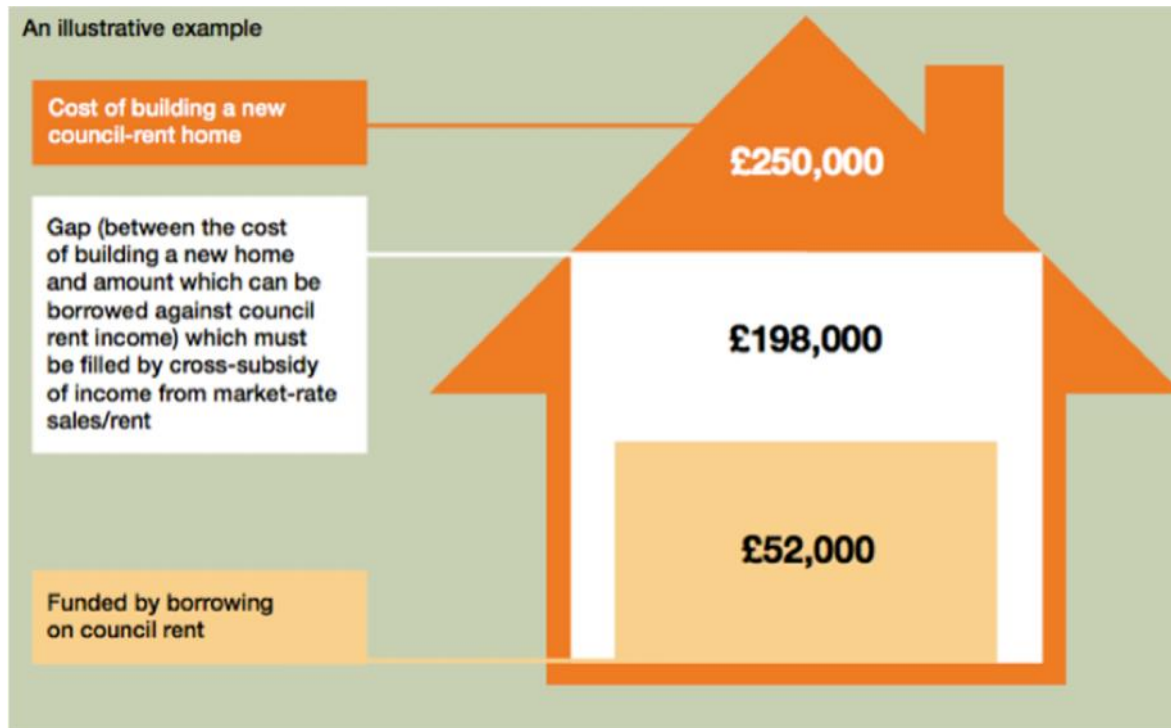
Delivering Passivhaus – A client's perspective

Huw Jones
Housing Development Manager,
London Borough of Lambeth



What is Homes for Lambeth?

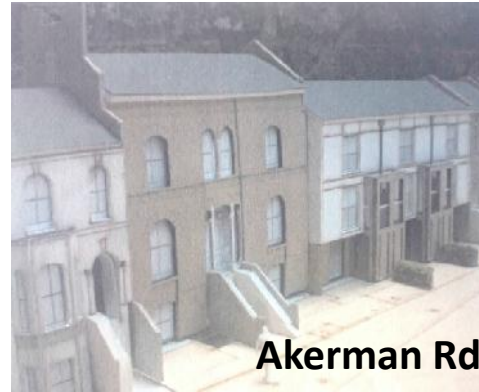
Homes for Lambeth will be a new company set up by Lambeth Council to deliver much needed housing.



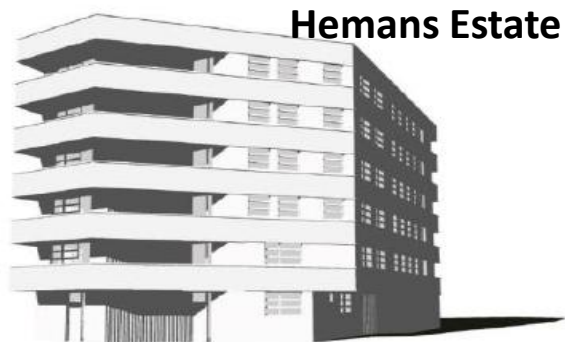


Estate Regeneration

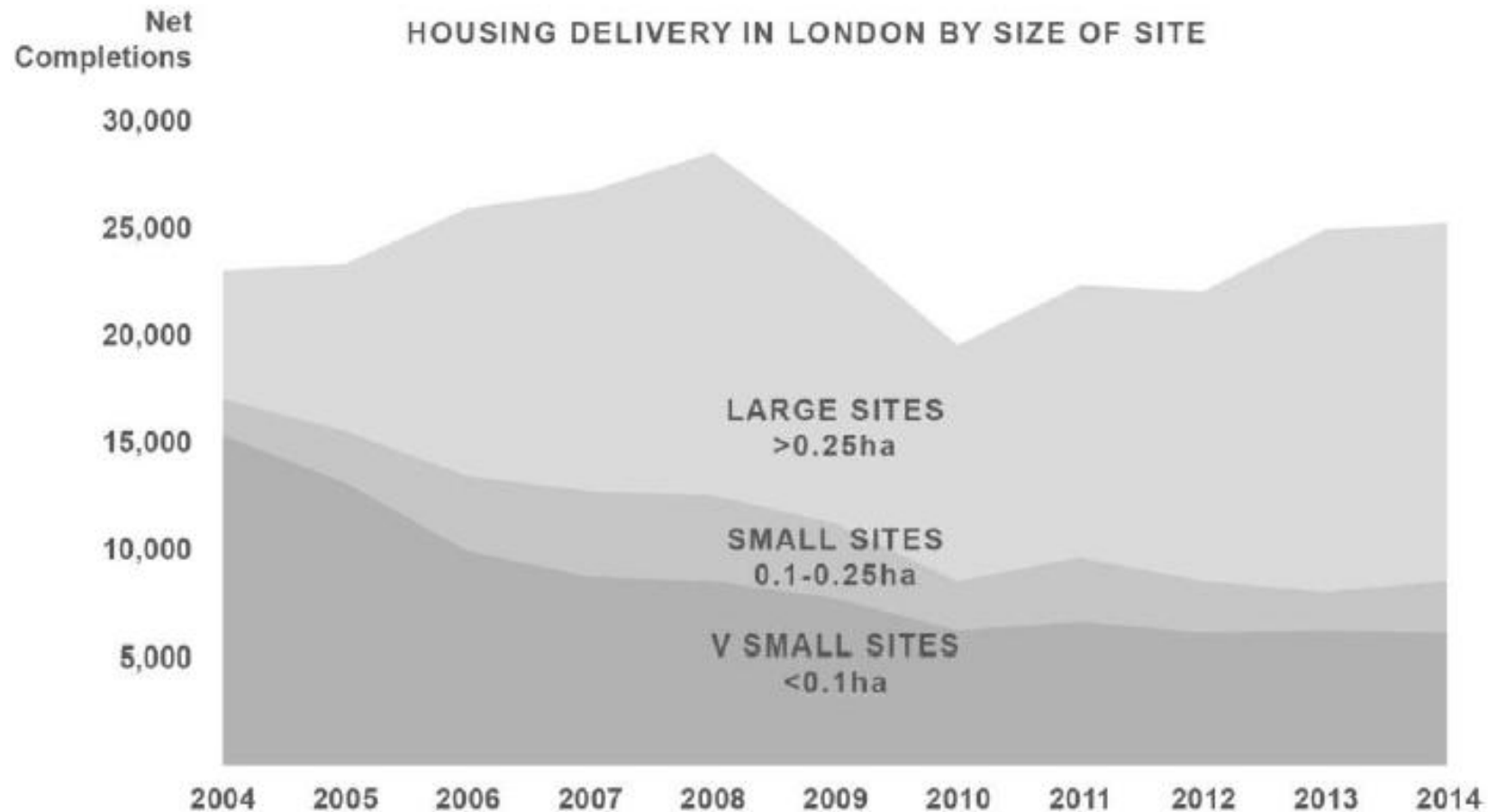




Infill Projects



Small sites, big ambitions



Akerman Road, SW9



Developer – Lambeth

Architects – Anne Thorne
Architects / Prewett Bizley:

M&E – Alan Clarke

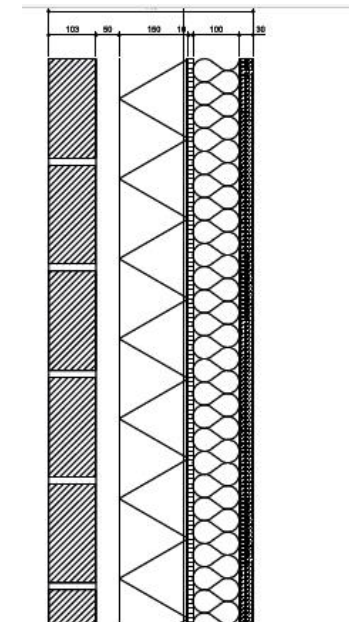
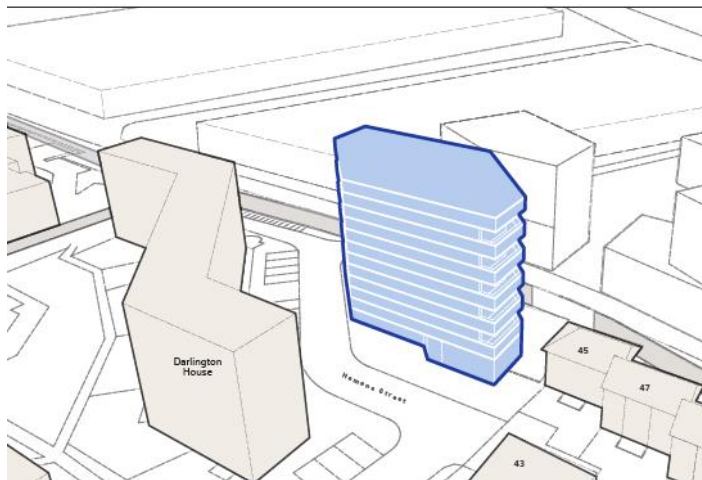
Employers Agent – Artelia UK

Contractor – Sandwood Design
and Build

Development Cost - £2.2m

Newbuild cost - £1800/ m²

Hemans Street, Vauxhall



Typical external wall construction

- 2 layers 15mm plasterboard
- Vapour control layer
- 100mm metal stud with mineral wool infill
- 10mm sheathing board
- Breather membrane
- Rigid insulation (thickness TBC)
- 50mm void



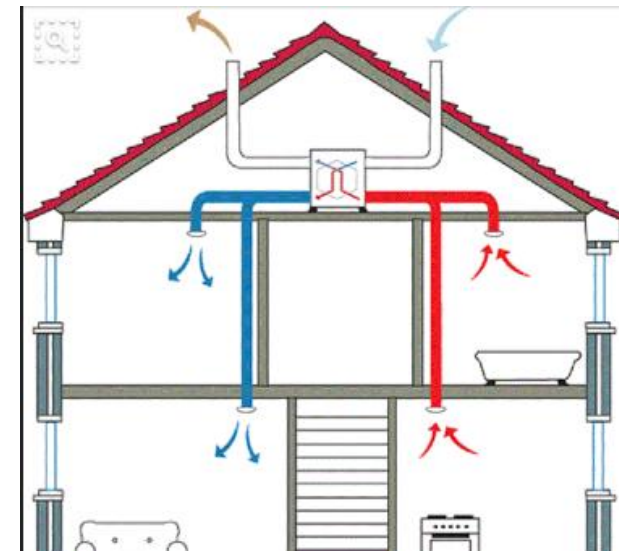
Fabric First - Business Case



- What are the benefits? Do we gain more than it costs?
- Councillors and senior staff
- Architects and design teams
- Residents and local communities
- Education and myth busting
("you can open windows!")

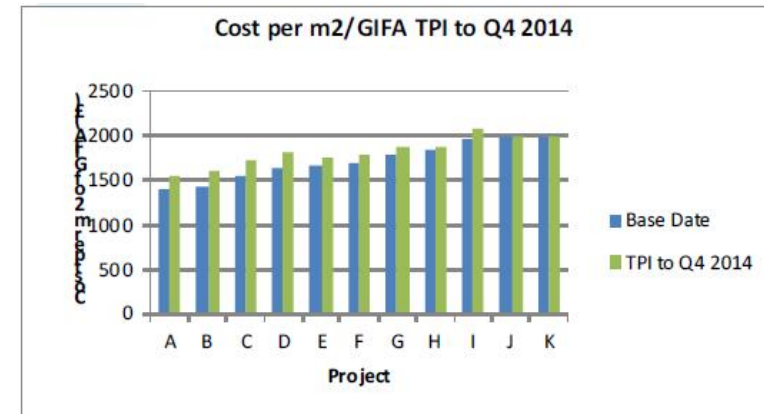
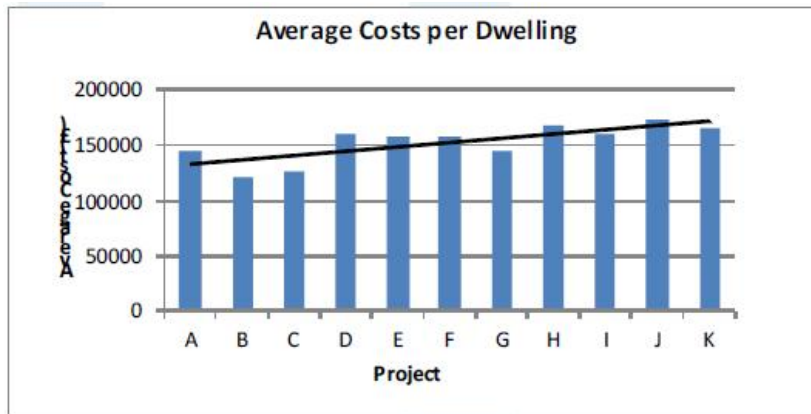
MVHR

- Benefits;
 - Improves indoor air quality and reduces instances of mould and damp
 - Should improve the health of occupants especially where they have existing respiratory problems
 - Reduces urban noise— focusing on airtightness and high performing windows and doors makes buildings quieter and they can be used like this in urban areas with windows closed.



Cost

- Mixed picture – PH Trust / AECOM report (Jan 2015)
 - In Germany uplift is 3-8% / In the UK 0-30%!
 - What does this mean – uplift over what?
 - Building Regulations are moving towards Zero Carbon
 - More data needed looking at specific markets (eg. apartment blocks)
- Passivhaus components – will be more expensive, also higher quality
- Passivhaus design costs
- Contractor “risk premium”
- Savings - Heating specification reduced, building form simplified



Planning considerations



Energy Strategy Policy Drivers

The [London Plan](#) - From October 2016, all new developments are required to be “zero carbon”. This is defined as 35% carbon emission reduction compared to 2013 Building Regulations requirements.

Remaining emissions are off-set either through offsite generation or through a cash in lieu payment

- Be Lean: placing a first emphasis on energy demand reduction measures such as insulation
- Be Clean: requiring the viability of district heating and CHP to be assessed
- Be Green: requiring a feasibility study into the potential for on-site renewable / low carbon generation.

Quality Control

Bridging the performance gap

The industry is in denial, buildings should perform as expected all the time.

PHPP (Passivhaus Planning Package)

Quantity	Description	Deviation from north	Angle of inclination from the horizontal	Orientation	Window rough openings		Installed in	Glazing	Frame	g-Value	U-Value		Ψ Glazing edge
					Width	Height					Perpendicular radiation	Glazing	
		Degrees	Degrees		m	m	Selection from 'Areas' worksheet	Selection from 'Components' worksheet	Selection from 'Components' worksheet	-	W/(m ² K)	W/(m ² K)	W/(mK)
1	Bedroom 3 fix	354	90	North	0.616	1.046	4-North Exterior Wall	02ud AGC Stratobel (6.3 Top	03ud Nordan NTech Passive	0.44	0.60	0.84	0.028
1	Bedroom 3 sash	354	90	North	0.603	1.046	4-North Exterior Wall	02ud AGC Stratobel (6.3 Top	03ud Nordan NTech Passive	0.44	0.60	0.96	0.028
1	Bathroom fix	354	90	North	0.616	0.810	4-North Exterior Wall	02ud AGC Stratobel (6.3 Top	03ud Nordan NTech Passive	0.47	0.60	0.85	0.028
1	Bathroom sash	354	90	North	0.603	0.810	4-North Exterior Wall	02ud AGC Stratobel (6.3 Top	03ud Nordan NTech Passive	0.47	0.60	0.96	0.028
1	Kitchen fix	84	90	East	0.642	1.046	1-East Exterior Wall	01ud AGC Planibel (4 Top N+16/4/16/Top N	03ud Nordan NTech Passive	0.44	0.60	0.84	0.028
1	Kitchen sash	84	90	East	0.625	1.046	1-East Exterior Wall	02ud AGC Stratobel (6.3 Top N+16/4/16/T	03ud Nordan NTech Passive	0.44	0.60	0.96	0.028
1	Dining el fix	84	90	East	1.010	1.640	1-East Exterior Wall	03ud AGC Stratobel (6.3 Top N+16/6.3) Ar	04ud Nordan solid panel door	0.44	0.60	0.84	0.028
1	Dining er fix	84	90	East	1.010	1.640	1-East Exterior Wall	03ud AGC Stratobel (6.3 Top N+16/4/16/Top	09ud AGC Tri door (6.3 Top N+16/4/16/Top	0.44	0.60	0.96	0.028
1	Dining sl fix	84	90	East	1.010	1.640	1-East Exterior Wall	03ud AGC Stratobel (6.3 Top N+16/4/16/Top	10ud Nordan enhanced solid panel door	0.44	0.60	0.96	0.028
1	Dining sr fix	84	90	East	1.010	1.640	1-East Exterior Wall	32ud Einfachverglasung	03ud Nordan NTech Passive	0.44	0.60	0.84	0.028
1	Dining tr fix	84	90	East	1.010	1.640	1-East Exterior Wall	02ud AGC Stratobel (6.3 Top	03ud Nordan NTech Passive	0.44	0.60	0.84	0.028
1	Dining tl fix	84	90	East	1.010	1.640	1-East Exterior Wall	02ud AGC Stratobel (6.3 Top	03ud Nordan NTech Passive	0.44	0.60	0.84	0.028
1	Dining tr sash	84	90	East	0.625	0.810	1-East Exterior Wall	02ud AGC Stratobel (6.3 Top	02ud Nordan NTech Passive	0.44	0.60	0.96	0.028
1	Dining tl sash	84	90	East	0.625	0.810	1-East Exterior Wall	02ud AGC Stratobel (6.3 Top	02ud Nordan NTech Passive	0.44	0.60	0.96	0.028
1	Solar bl fix	84	90	East	1.010	1.310	1-East Exterior Wall	02ud AGC Stratobel (6.3 Top	03ud Nordan NTech Passive	0.44	0.60	0.85	0.028
1	Solar sash	84	90	East	1.010	1.310	1-East Exterior Wall	02ud AGC Stratobel (6.3 Top	01ud Nordan NTech Passive	0.44	0.60	0.96	0.028
1	Solar r fix	84	90	East	1.010	2.490	1-East Exterior Wall	02ud AGC Stratobel (6.3 Top	03ud Nordan NTech Passive	0.44	0.60	0.83	0.028
1	Dining sl fix	174	90	South	0.990	1.640	2-South Exterior Wall	02ud AGC Stratobel (6.3 Top	03ud Nordan NTech Passive	0.44	0.60	0.84	0.028
1	Door 5	174	90	South	1.028	2.108	2-South Exterior Wall	03ud AGC Stratobel (6.3 Top	05ud Nordan double glazed	0.52	1.10	1.52	0.151
1	Dining sr fix	174	90	South	0.990	1.640	2-South Exterior Wall	02ud AGC Stratobel (6.3 Top	03ud Nordan NTech Passive	0.44	0.60	0.84	0.028
2	Gnd fl l sash	174	90	South	0.625	1.046	2-South Exterior Wall	01ud AGC Planibel (4 Top N+	01ud Nordan NTech Passive	0.47	0.60	0.96	0.028
2	Gnd fl c fix	174	90	South	0.660	1.046	2-South Exterior Wall	01ud AGC Planibel (4 Top N+	03ud Nordan NTech Passive	0.47	0.60	0.84	0.028
2	Gnd fl r sash	174	90	South	0.625	1.046	2-South Exterior Wall	01ud AGC Planibel (4 Top N+	02ud Nordan NTech Passive	0.47	0.60	0.96	0.028
1	Solar el fixed	174	90	South	0.885	2.000	2-South Exterior Wall	02ud AGC Stratobel (6.3 Top	03ud Nordan NTech Passive	0.44	0.60	0.84	0.028

Design considerations

- Get the right team(s)
- Choose the right project!
- Projects are more likely to be suitable where they have a relatively simple form with a compact form-factor
 - Avoid where possible basements, overhangs, complex junctions and unusual shapes.
- Start early – much easier to design to Passivhaus from the outset rather than “retrofit” to later design
- Designs should aim to de-risk construction where possible.
- Noise and overheating

Design considerations

Wall width and construction method

- Most methods of construction are suitable for Passivhaus with some care.
- Using prefabricated systems and frames may assist with quality control but is not essential.
- Wall width can be crucial on smaller sites and where smaller numbers of individual homes are proposed
- Systems which combine insulation and structure can help reduce external wall widths but are more challenging on multi-storey apartment blocks

Procurement

- Procurement routes
 - Traditional vs Design and Build
 - Importance of design
 - Risk allocation
- Experience, buy-in, attention to detail (airtightness champion)
- Key point – reducing contractor risk
 - Airtightness
 - Simplicity
 - Build-ability / 2 stage tenders
- Contractor frameworks and
- Allowing sufficient client resources for monitoring (clerk of works, M&E clerk of works, retained passivhaus certifier, consultant or architect)

Learning lessons

- Educate residents – Detailed Home User Guide
- Speak to residents – What works? What doesn't?
- Notable defects
- Technical Post Occupancy Evaluation
 - Energy bills data
 - Air quality (CO², humidity)
 - Surface temperature and internal comfort
- Learn from other organisations who are delivering similar projects

St Loyes, Exeter

50 self contained extra-care units

Exeter City Council, Gale and Snowdon Architects



Wansey Street, Southwark

15 private sale homes

Lendlease, MacCreanor Lavington Architects



Chester Balmore, Camden

53 homes

Camden Council, Rick Mather Architects,





Delivering Passivhaus – A client's perspective

Huw Jones
Housing Development Manager,
London Borough of Lambeth