

Hackbridge Primary School

Passivhaus Plus and Carbon Zero

Gareth Selby, Architype













Architype

Established 1984

3 Offices – London, Hereford, Edinburgh

62 members of staff

50:50 Male:Female

61% Passivhaus projects













Architype's approach

Throughout Architype's 30 year history we have attempted to design and specify responsibly:

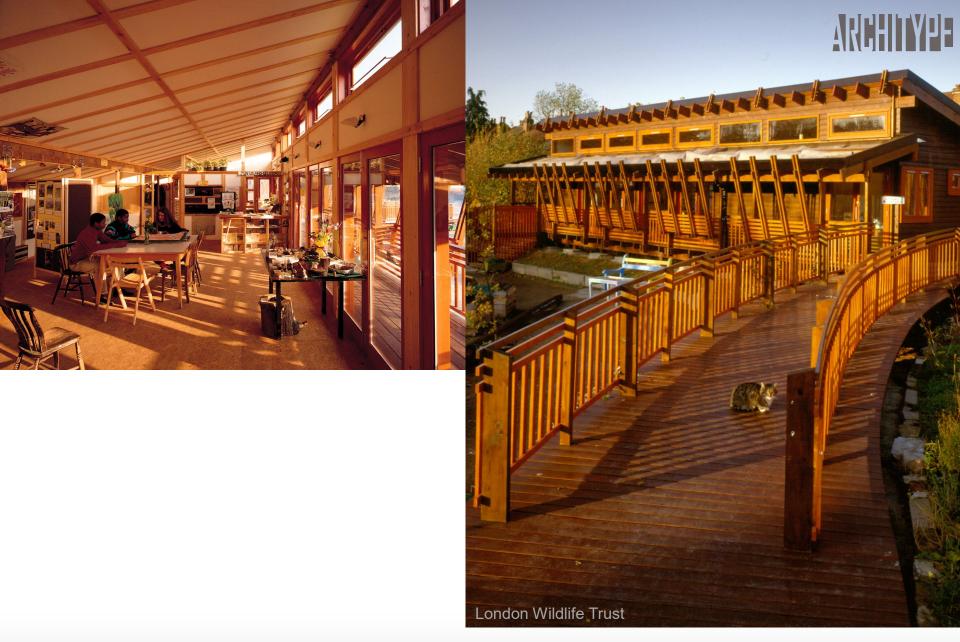
- To minimise operational carbon
- To minimise embodied carbon
- To minimise environmental impact through resource efficiency, using bio-based renewable, recycled or reclaimed materials
- To promote health and well-being through careful design and selection of materials
- Thorough client engagement and consultation





















#UKPHC18

























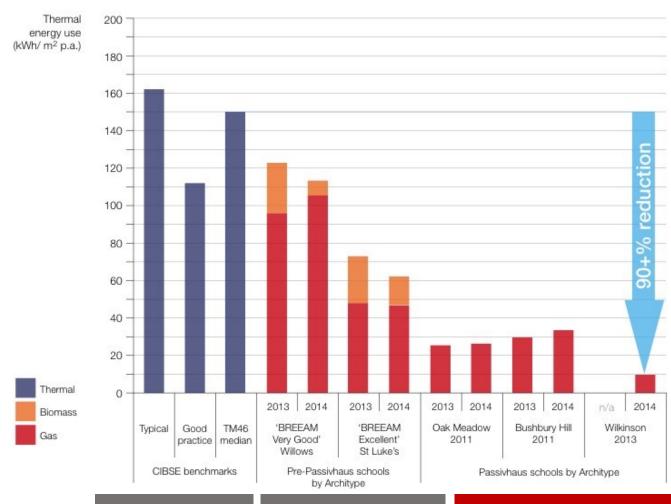








Recorded thermal energy consumption





Regs/BREEAM

Passivhaus



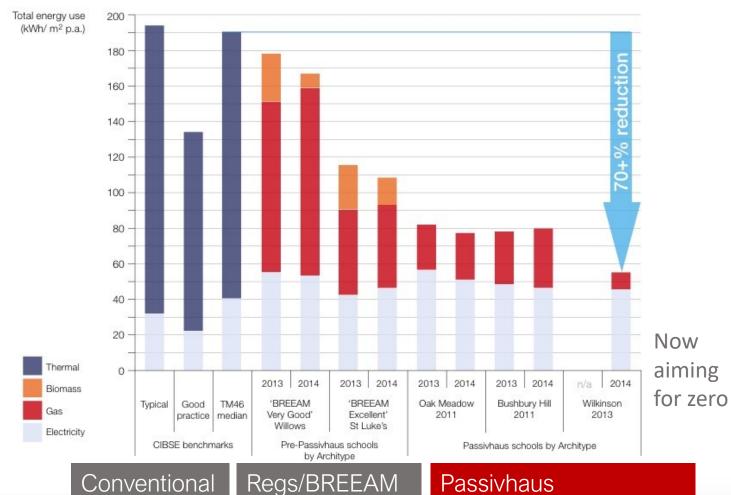








Recorded total energy consumption



Regs/BREEAM







Passivhaus





Project Intro







ARCHITYPE



















Why Passivhaus + and Carbon Zero?

- Response to London Borough of Sutton's 'One Planet Living' vision
- Passivhaus vs. BREEAM
- Energy Standard but more critically a Comfort Standard
- Low operational cost and environmental impact
- Metropolitan Open Land
- Adjacency to BedZed







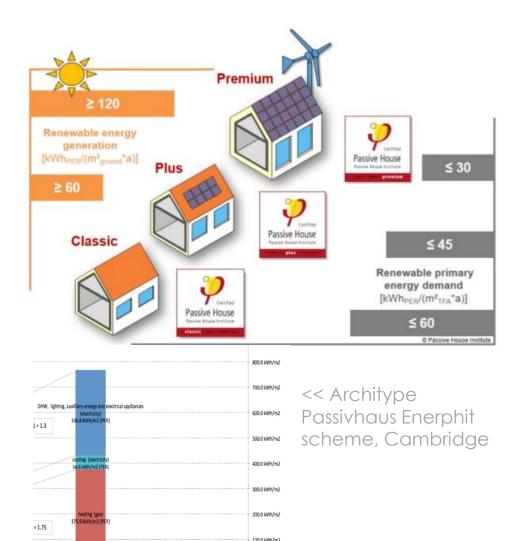






What is Passivhaus +?

- Passivhaus Plus and Premium allow for the inclusion of renewables
- Future grid scenarios are used to evaluate storage losses associated with energy demand
- Passivhaus Plus = effectively net carbon zero
- Passivhaus Premium is genuine carbon zero including storage losses



0.0 kWh/m2











Concept Design



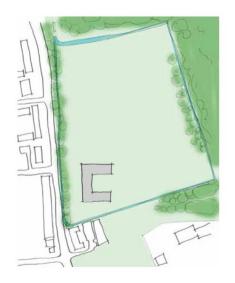




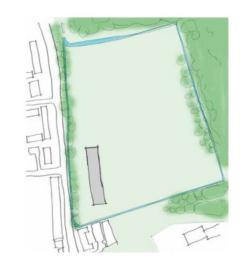


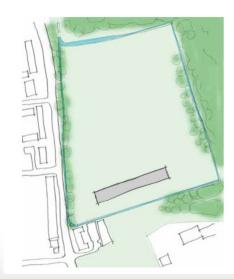


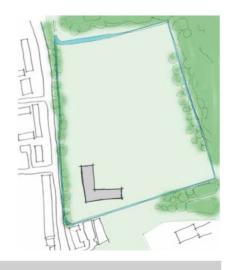
Orientation and Form



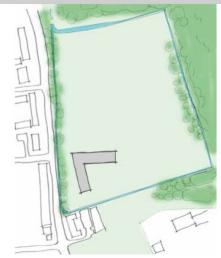
Form chosen for good orientation and to complement the urban planning of BedZed >>







Preferred option - taken forwards

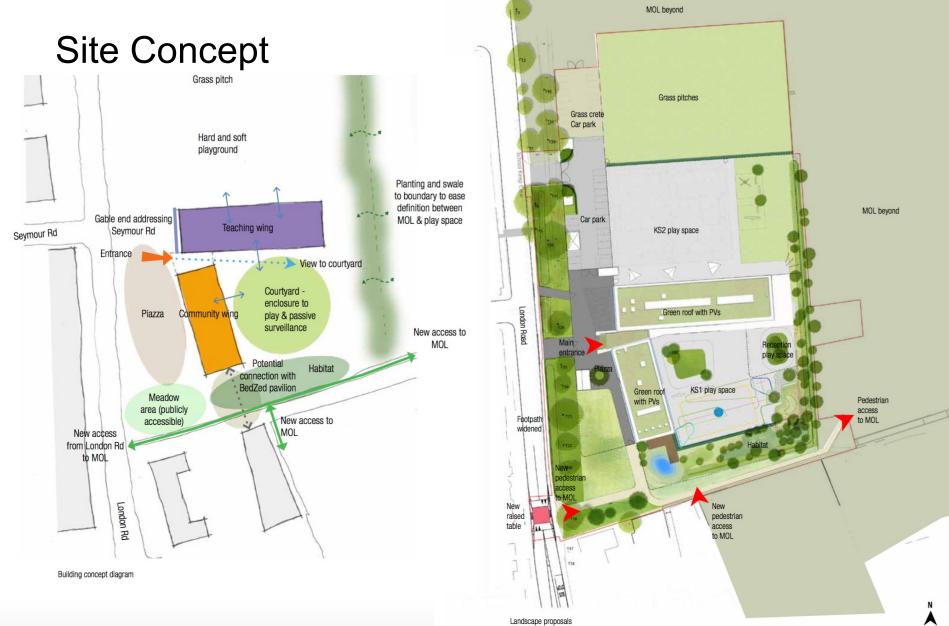












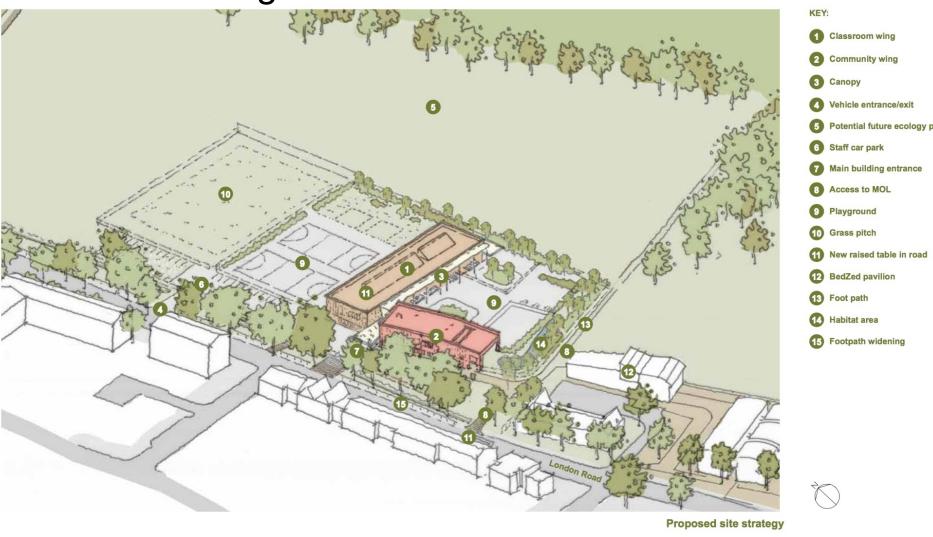








Final Massing











Potential future ecology park

<< Primary accommodation on North South Axis for easier solar control















Fabric First



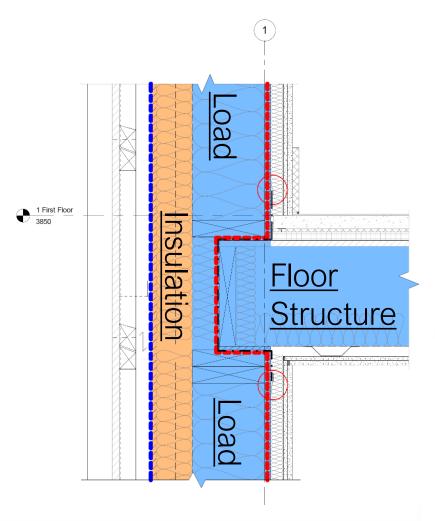


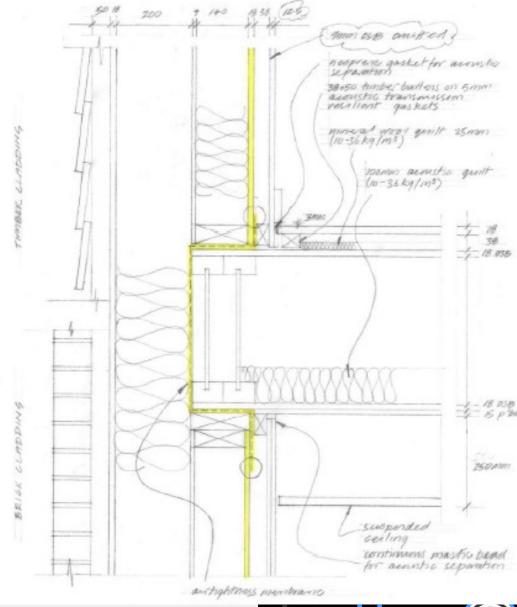






Airtightness





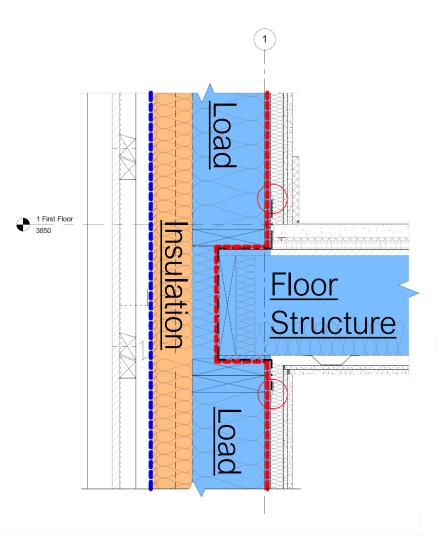


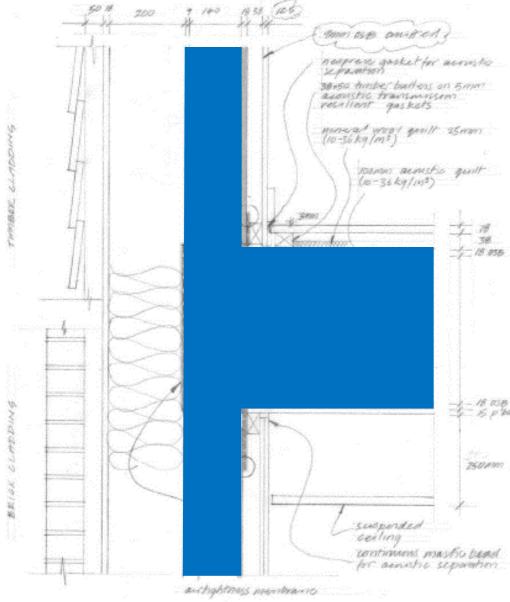






Structure







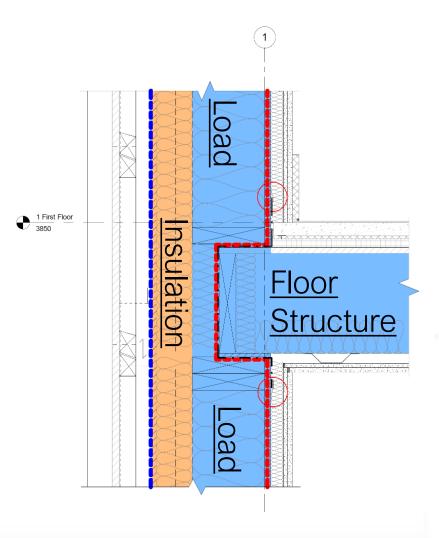






Thermal Layer

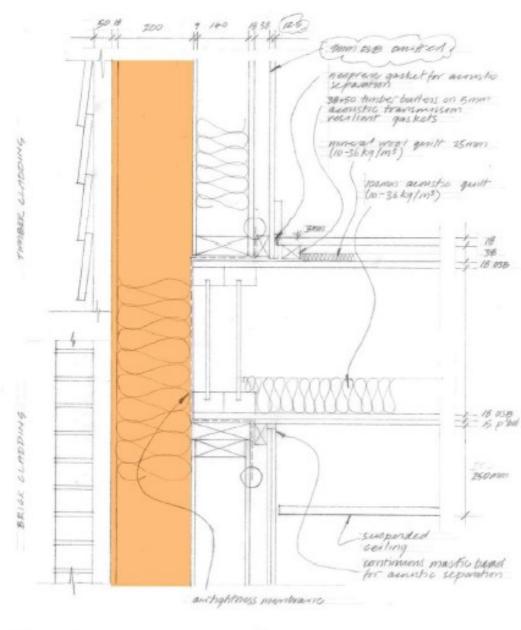
Duvet Layer







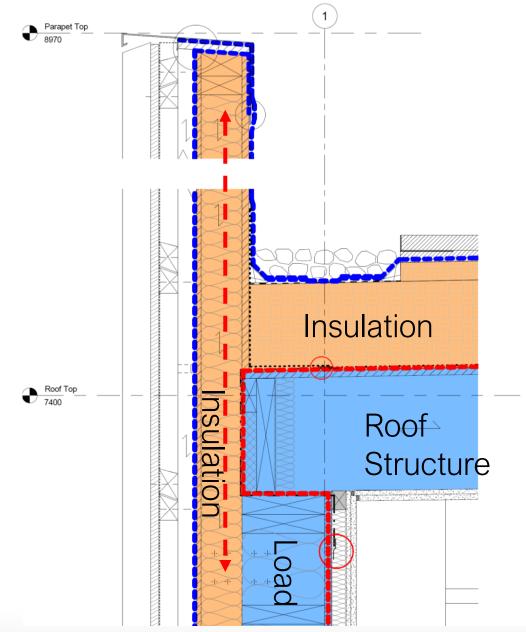




MOTO :
Shown with part timber cladding part book cladding
TYPICAL SUNCTION FIRST FEETE | EXTERNAL WALL . FOR LOWSTRUCTION



Parapets













Mechanical Design



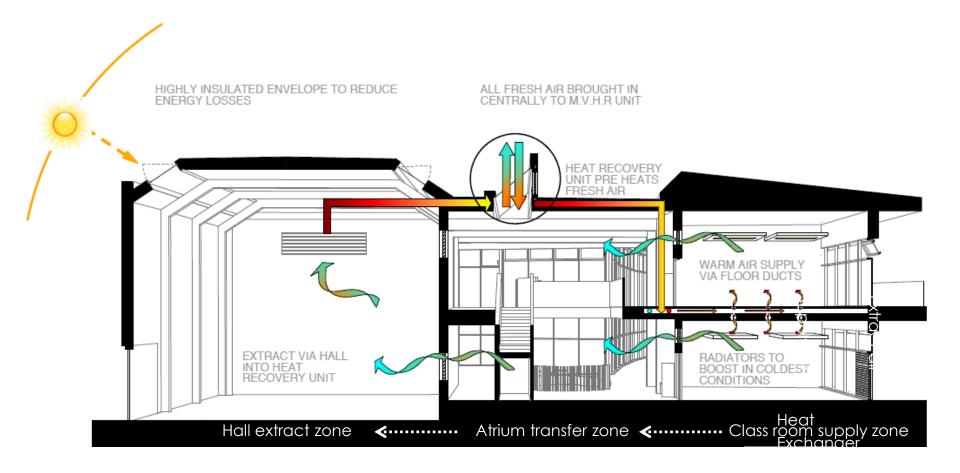








Efficient Ventilation

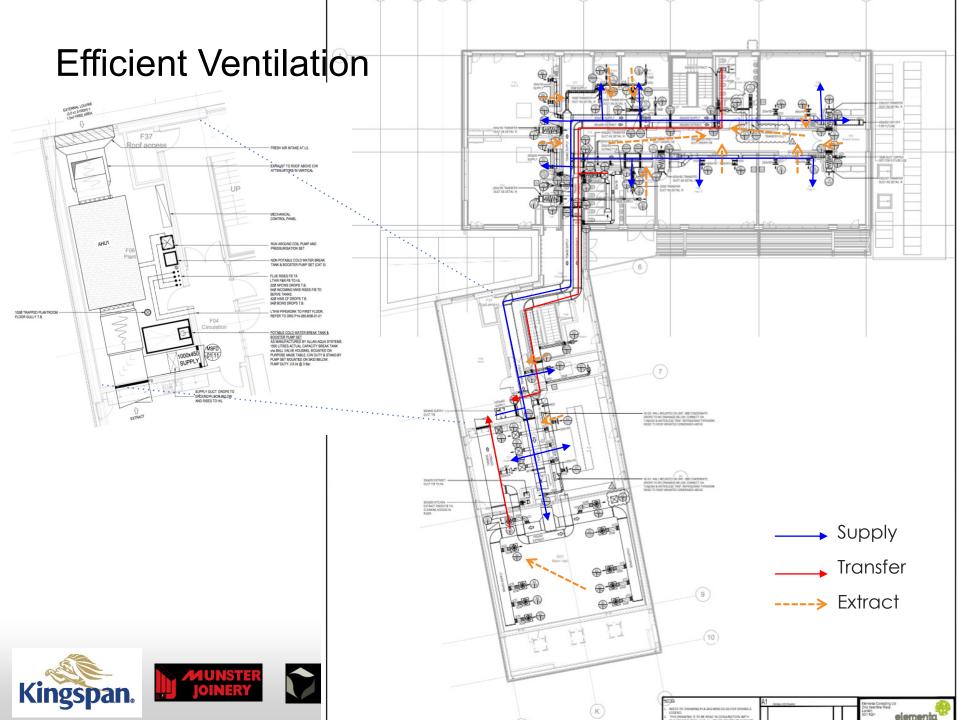














LZCs







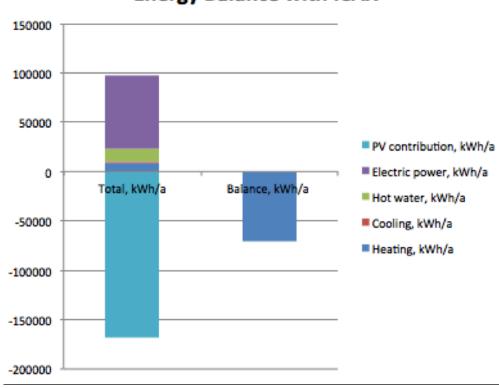




Energy Positive (SBEM)

- Once fabric first exhausted LZCs are added
- According to SBEM it is energy positive
- According to PHPP it is net zero

Energy Balance with ICAX



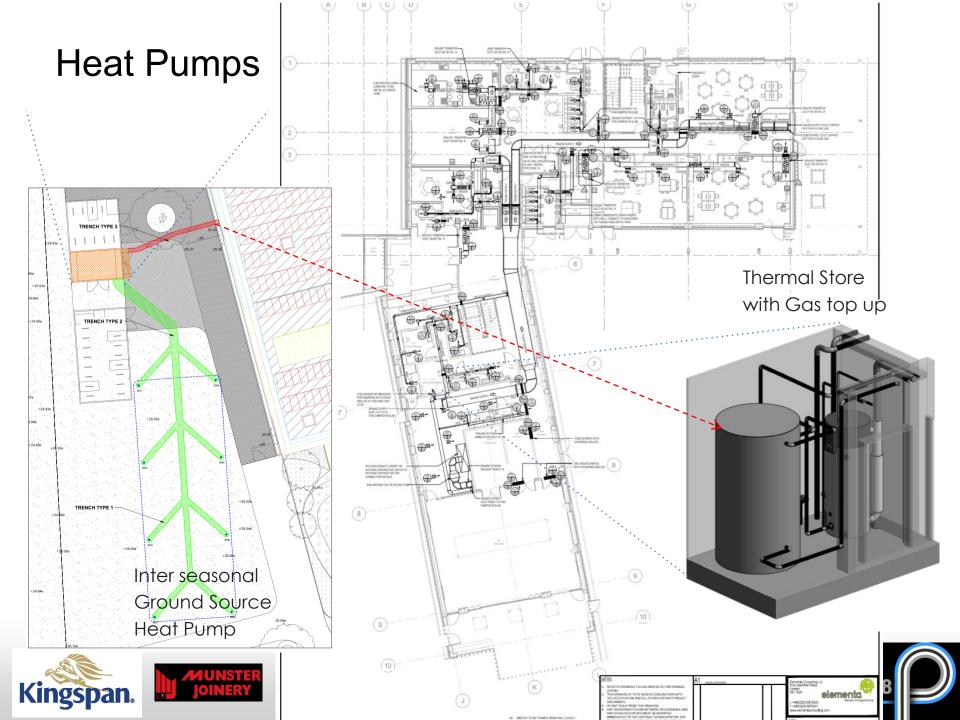
<< Energy balance according to SBEM



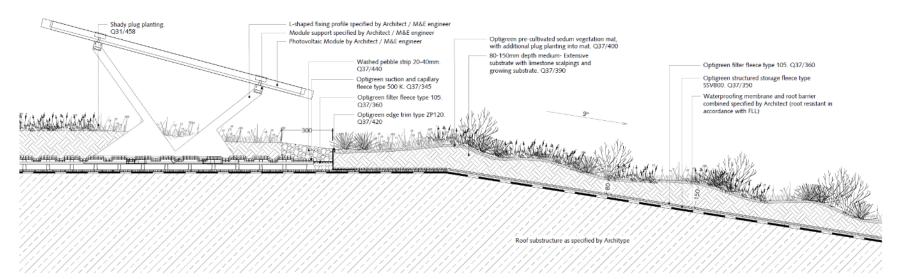






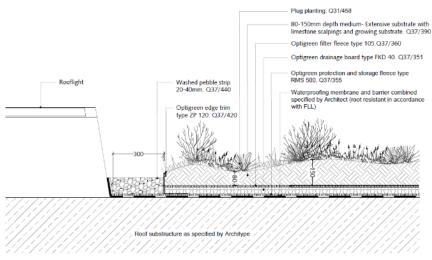


Biodiverse Roof With Photovoltaics

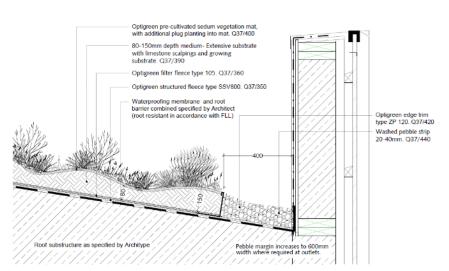


02. Indicative Section B-B

Scale 1:10



03. Indicative Section C-C Scale 1:10



04. Indicative Section D-D Scale 1:10









Biodiverse Roof With Photovoltaics Analysis Grid [No Data Available] White Range: 0 - 3000 (c) ECOTECT v6

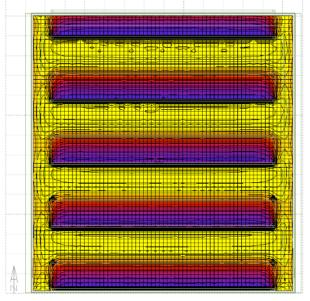
02. Plant Schedule



PLANTING AREA A Interim Phase Area	686m2					
Deep shade, dry & semi-dry Q31/458		%				
Polypodium vulgare	Common polypody	12				
Asplenium scolopendrium	Hart's tongue fern	12				
Pulmoraria angustifolia	Blue cows/ip	12				
Dryopteris dilatata	Broad buckler	12	BB not ring	Blanted of 16/m2 Substrate		

Analysis Grid

RAD Daylight Factors
Contour Range: 0.0 - 80.0 %DF
In Steps of: 5.0 %DF
ecotective



Average Value: 58.64 %DF Visible Nodes: 4690

Geramom praterise	Priesdow Carie S-bit	1 2	and bug bans		
Leucanthemum vulgare*	Ox-eye Daky	4	1		
Linaria vulgaris	Common Toadflex	4	1		
Origanum vulgare	Marjoram	4		Planted at 8/m2. Planted	
Helianthemum nummularium	Common Rockrose	4]	through base sedum mat*	
Leontodon hispidus	Rough Hawkbit	4	1	covering entire sloped roof.	
Sangukorba minor	Salad Burnet	4	1		
Scabiosa columbaria	Small Scabious	4]		
Silene vulgaris	Bladder campion	4			





01. Roof Plan Scale 1:200







Current Progress





















Stepping up a Scale

The UK's First Passivhaus Secondary School, Sutton



View of the external dining area from East

New Sutton Secondary School

Client: London Borough of Sutton

Contractor: Willmott Dixon

End user: Harris Academy

Budget: £35 million

GIA: 10,625m²

1,275 pupils: Six form entry & 6th form

Work Stage: Construction





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New Sutton Secondary School

- > Existing Sutton hospital site
- > First component of the wider London Cancer Hub masterplan
- > World-class campus for cancer research & treatment
- > Health care, residential & education





