Thameside West

Energy and Sustainability Statement Addendum

May 2020

PREAMBLE

Silvertown Homes Limited (SHL) and Greater London Authority Land and Property (GLAP) have submitted a hybrid planning application to the London Borough of Newham (LBN) for the redevelopment of the Thameside West site, accessed off Dock Road in Newham (the Site).

SHL is a property development company and joint land owners of the Site. SHL has over 65 years combined experience at delivering high quality regeneration projects across London. GLAP is a subsidiary corporation of the Greater London Authority (GLA) and took over assets and liabilities from the London Development Agency (LDA) in 2012. GLAP is primarily focused on delivering genuinely affordable homes and jobs for London.

The proposal is to construct a new high-quality residential-led mixed-use development comprising new homes, new industrial floorspace, a new local centre, a new primary school and nursery school, new community facilities, a new public park (with associated outdoor play facilities), enhanced SINC and over 800m of new riverside walk along the River Thames with ecological / biodiversity enhancements. This development has been designed to focus its community hub around the delivery of a new Dockland Light Rail (DLR) station that is proposed to be constructed on the Site by Transport for London's (TfL) in 2023.

The proposals have been designed by Foster & Partners, John McAslan & Partners, Patel Taylor and the wider project team (listed, right) taking into account comments provided by local residents during summer and public exhibition events and comments provided during pre-application discussions with a variety of statutory and non-statutory interests, including LBN and its Design Review Panel (DRP), the Greater London Authority (GLA), Transport for London (TfL), Environment Agency (EA), Port of London Authority (PLA) and London City Airport (LCA).

This document is one of a suite of planning application documents submitted to LBN, including an Environmental Statement. The planning application is available to review at LBN's office or using LBN's online services:

Search for planning application reference number 18/03557/OUT at: https://pa.newham.gov.uk/online-applications/search.do?action=simple

The planning application can also be viewed on the GLA's website at: https://www.london.gov.uk/what-we-do/planning/planning-applications-and-decisions/public-hearings

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Thameside West

Energy and Sustainability Statement & Addendum

0035668

16 April 2020

Revision 05

Revision	Description	Issued by	Date	Checked
00	Issue for internal review	JG	05/11/18	GE
01	Updated responding to GLA comments and Solar PV	JG	15/11/18	JC
02	Final for issue based on legal review	JG	23/11/18	JC
03	Development description update and Addendum addition based on GLA comments	JG	16/05/19	JC
04	Scheme update and Addendum additions with second round of GLA comments	JG	24/06/19	JC
05	GLA submission and scheme update	JG	09/03/20	JC

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author	**Jon Gregg**
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date	09/03/20

BUROHAPPOLD ENGINEERING

Planning Addendum – March 2020

Project Thameside West
Subject Energy and Sustainability Statement Addendum
Project no 035668
Date 9 March 2020

Revision	Description	Issued by	Date	Approved
00	Draft for internal review	JG, LA, DC, EC, JC	29/03/19	
01	Updates based on architectural changes	JG	24/04/19	
02	Updates based on GLA responses to Rev 01 issue (GLA response in green, applicant response in blue)	JG, JC	16/05/19	
03	Scheme update and Addendum additions with second round of GLA comments	JG, JC	24/06/19	
04	GLA submission and scheme update	JG	16/04/20	

1 Introduction and application history

1.1 Previous submittals of this document

Amendments to the planning application were submitted to LBN on 17th May 2019 and include:

- Amendments to the external appearance of the Phase 1 development;
- Altering the phasing of the development to bring forward the industrial phase of the development into Phase 3;
- Altering the description of development in relation to the industrial use classes proposed; Updating the traffic modelling;
- Updating the noise and air quality assessments to include the scenario of the retention of the Thames Wharf Safeguarded Wharf and other neighbouring wharves;
- Updating the Chapters of the Environmental Statement (ES) to take account of the comments received by statutory consultees; and
- Other minor amendments.

The second set of amendments to the application were submitted to LBN on 28th June 2019 and included:

- Reducing the massing of buildings E and F and increasing the massing of the lower elements of buildings Q, R, S, T and U;
- Undertake amendments to the elevation treatment of buildings A and B (but no massing changes);
- Marginally increasing the height of building V;
- Alterations to the ancillary uses proposed at podium level in buildings A and B; and
- Alterations to the podium level and ground level landscaping within Phase 1.

1.2 Masterplan amendments for this submittal

LBN resolved to refuse the planning permission on 12th November 2019 for 15 reasons, subject to referral to the Mayor of London. On 2nd December 2019 the Mayor 'directed' that the planning application is determined by the Greater London Authority (GLA) as the new determining planning authority for the planning application. The GLA's planning and design teams have undertaken further discussions with the Applicant, with LBN observing, resulting in further amendments to the proposals. These amendments have result in massing changes to the schemes which has adjusted the amount of residential units and non-residential floorspace being delivered in each phase of the development. Set out in Figure 1—1 is an indicative 3D model to help you all understand how the massing of the scheme has been amended.

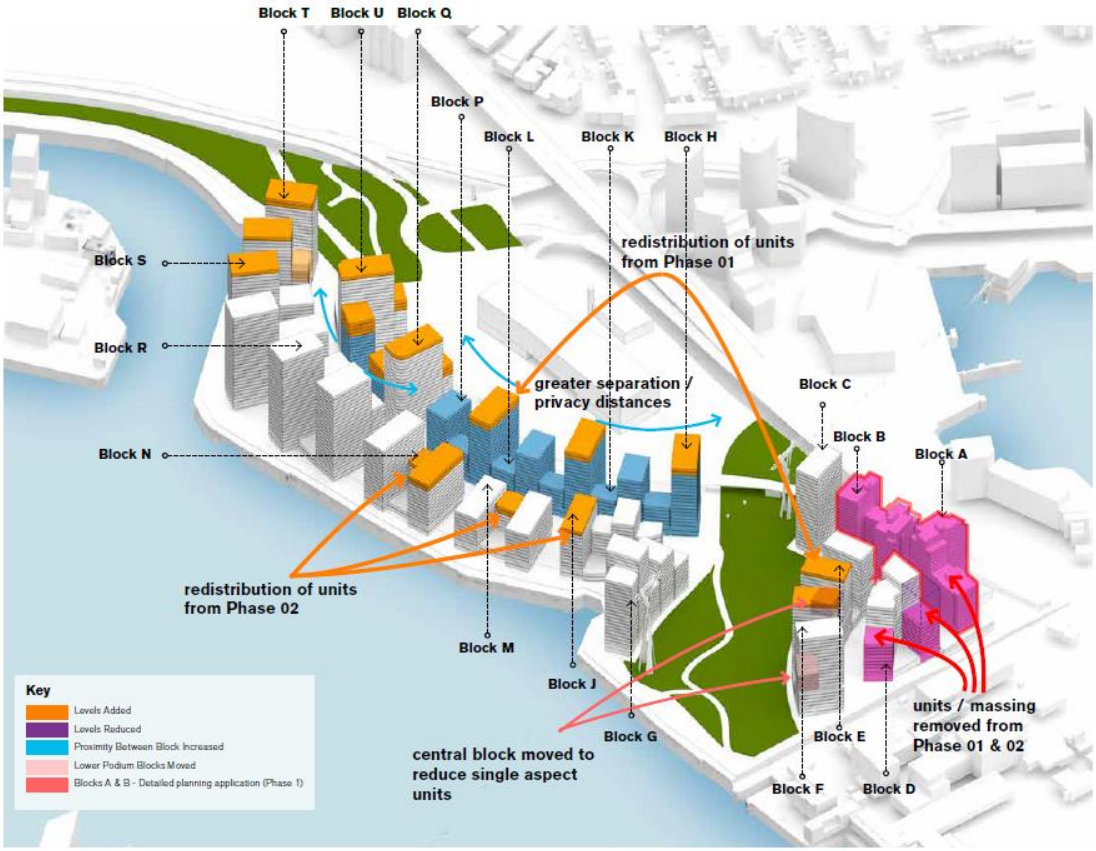


Figure 1—1 Masterplan massing updates for this (third) amendment to the application

A third set of amendments to the planning application will be submitted to the GLA during w/c 23rd March 2020. The amendments will comprise:

Significant reduction in the massing of Building A;

- Decreasing the overall height of Building B;
- Internal and external amendments to the Buildings A and B;
- Amendments to the landscape proposals and reduction in amount of car and cycle parking proposed for Buildings A & B;
- Decreasing the overall height of Building C;
- Reducing the massing of Building D (focusing on the wings adjacent to the Allnex site) to form a stepping down in massing and the massing redistributed to Buildings N, M and J;
- Adjusting the heights of Buildings E & F and the position of the lower podium to improve proximity between the buildings and to improve the outlook of residential units;
- Increased separation distances in Buildings H, K, L and P (Thameside Crescent) to ensure separation distances between habitable rooms for single aspect units achieve a minimum of 18m;
- Buildings S and T have increased in height;
- Increased separation distances between Buildings Q and U to improve views and access from the Station Square to the riverside walkway; and
- Reduction in height of lower parts of Buildings Q & U to increase separation distances.

2 Proposed Development

2.1 Development Description

The description of development was amended as part of the first set of amendments, but not the 2nd set of amendments. It will also change as a result of the third set of amendments, as follows (albeit that the overall amount of development has not changed – see section 4.0 below):

"Hybrid planning application comprising:

1. Detailed planning application for Phase 1 with works to include: The proposed demolition of existing buildings and structures, the erection of buildings, including tall buildings, comprising: ~~460~~ 401 residential Units (Use Class C3), 3,608 sqm (GEA) of flexible employment floorspace (Use Classes B1b, B1c, B2 (restricted) and B8); ~~162~~ 230 sqm (GEA) of flexible retail floorspace (Use Classes A1-A4); a new/altered access road from Dock Road/North Woolwich Road; new streets, open spaces, landscaping and public realm; car, motorcycle and bicycle parking spaces and servicing spaces; and other works incidental to the proposed development.
2. Outline planning application (all matters reserved) for the phased delivery of the balance of the site for the proposed demolition of existing buildings and structures; the erection of buildings, including tall buildings, comprising: a new local centre; a primary school (Use Class D1); residential and older person units (Use Class C3); flexible employment floorspace (Use Classes B1b, B1c, B2 (restricted) and B8); flexible employment floorspace (Use Classes B1c, B2 and B8); flexible retail floorspace (Use Classes A1-A4); community and leisure floorspace (Use Classes D1 and D2); the construction of a new flood defence wall and delivery of ecological habitat adjacent to the River Thames and associated infrastructure; streets, open spaces, landscaping and public realm (including new park and SINC improvements); car, motorcycle and bicycle parking spaces and servicing spaces; utilities including energy centre and electricity substations; and other works incidental to the proposed development."

2.2 Summary of Development

The summary of development was amended as part of the first set of amendments, but was not been changed as a result of the second set of amendments. Set out below is a comparison between the previous summary of development and the latest summary following the third set of amendments:

- Phase 1 only:
  - ~~460~~ 401 residential units
  - ~~3,417~~ 3,608 sqm (GEA) of flexible employment floorspace (Classes B1b, B1c, B2 (restricted) and B8)
  - ~~162~~ 230 sqm (GEA) of flexible retail floorspace (Classes A1 to A4)
  - ~~49~~ 44* car parking spaces (3 x commercial & 41 x residential)
  - ~~867~~ 753 cycle parking spaces (33 x commercial & 720 residential)
  - Max 21 storeys height ~~(77.6 max AOD)~~

- Phases 2 to 11 only:
  - ~~4,540~~ 4,599 residential units
  - 15,000 sqm (GEA) of flexible employment floorspace (Classes B1c, B2 and B8)
  - ~~1,024~~ 833 sqm (GEA) of flexible employment floorspace (Classes B1b, B1c, B2 (restricted) and B8)
  - ~~7,206~~ 7,138 sqm (GEA) of flexible retail floorspace (Classes A1 to A4)
  - 7,055 sqm (GEA) of community and leisure floorspace (Classes D1 and D2)
  - ~~480~~ 461* car parking spaces (26 x commercial & 435 x residential)
  - ~~8,945~~ 9,080 cycle parking spaces (653 x commercial & 8,427 residential)
  - Max 26 storeys height (97.90 max AOD)

  [Please note: * = Of the 44 car parking spaces within the Phase 1 site area temporary, 27 spaces are temporary. These 27 spaces will be re-located into the basement area of Phase 2. The 486 car parking spaces indicated for Phase 2 to 11 only do not include the 27 phase 1 spaces to ensure there is no double counting of these spaces]

- Total across the site:

  - 5,000 residential units
  - 15,000 sqm (GEA) of flexible employment floorspace (Classes B1c, B2 and B8)
  - 4,441 sqm (GEA) of flexible employment floorspace (Classes B1b, B1c, B2 (restricted) and B8)
  - 7,368 sqm (GEA) of flexible retail floorspace (Classes A1 to A4)
  - 7,055 sqm (GEA) of community and leisure floorspace (Classes D1 and D2)
  - 505 car parking spaces (29 x commercial & 476 x residential)
  - ~~9,812~~ 9,833 cycle parking spaces (686 x commercial & 9,147 x residential)
  - Max 26 storeys height (97.90 max AOD)

2.3 Phasing

The Phasing of the development was amended as part of the first and second set of amendments and has now also been changed as a result of the second set of amendments, as follows:

Phase	Blocks	Start on Site	Complete
Phase 1 • ~~460~~ 401 units • ~~3,417~~ 3,608 sqm GEA of industrial (B1b, B1c B2 (restricted) & B8) • ~~162~~ 230 sqm GEA of Retail (A1-A4)	A & B	~~May~~ Nov 2020	June 2022
Phase 2 • ~~537~~ 473 units • ~~1,024~~ 833 sqm GEA of industrial (B1b, B1c, B2 (restricted) & B8)	D & E	Feb 2021	May 2023
Phase 3 • 471 units • 15,000 sqm GEA of industrial (B1c, B2, B8)	C, F & V	Dec 2021	April 2024
Phase 4 • 320 units • ~~1,202~~ 1,247 sqm GEA of retail (A1-A4)	G	Sept 2022	Sept 2024
Phase 5 • ~~342~~ 361 units • ~~435~~ 414 sqm GEA of retail (A1-A4)	J & H	July 2023	July 2025
Phase 6 • ~~397~~ 412 units	M & K	June 2024	April 2026
Phase 7 • ~~493~~ 524 units • ~~620~~ 457 sqm GEA of retail (A1-A4)	N & L	April 2025	July 2027
Phase 8 • 542 units • ~~1,099~~ 1,084 sqm GEA of retail (A1-A4)	R	Feb 2026	May 2028

Phase 9 • ~~493~~ 498 units • ~~1,180~~ 1,729 sqm GEA of retail (A1-A4) • ~~1,800~~ 1,790 sqm GEA of community (D1/D2)	U, Q & P	Jan 2027	April 2029
Phase 10 • ~~567~~ 575 units • ~~2,170~~ 2,165 sqm GEA of retail (A1-A4)	S	Jan 2028	May 2030
Phase 11 • ~~378~~ 423 units • ~~500~~ 499 sqm GEA of retail (A1-A4) • ~~5,255~~ 5,265 sqm GEA of community (D1/D2)	T	April 2029	Feb 2031

The Phasing of the development was amended as part of the second set of amendments but has not been amended as a result of the third set of amendments (other than the quantum within each phase as demonstrated above). The phasing plan therefore remains the same.

3 Previous version of the energy and sustainability statement

The energy and sustainability statement has been updated to align with the amendments outline din the previous sections. This has been done through addendums. In addition to this, initial comments from the GLA have been responded to and also been provided as addendums to the document.

This report has been updated three times before this. The updates and reasons for these updates are outlined below.

1. **GLA responses to Rev 01 (written May 19)** – Original GLA comments and applicant responses
2. **GLA responses to Rev 02 (written June 19)** – Latest GLA comments and applicant responses
3. **Updates to the scheme second set of amendments to the application since original submittal (written June 19)** – outlines massing changes and the Phase 1 response

This latest addendum will not respond to these comments, only to state the changes to the application as a result of the third amendment to the application, as outlined in section 1.2 of this document.

The previous submittals have been included later within this document for the knowledge of the energy officer reviewing this document and outlined in reserve chronological order.

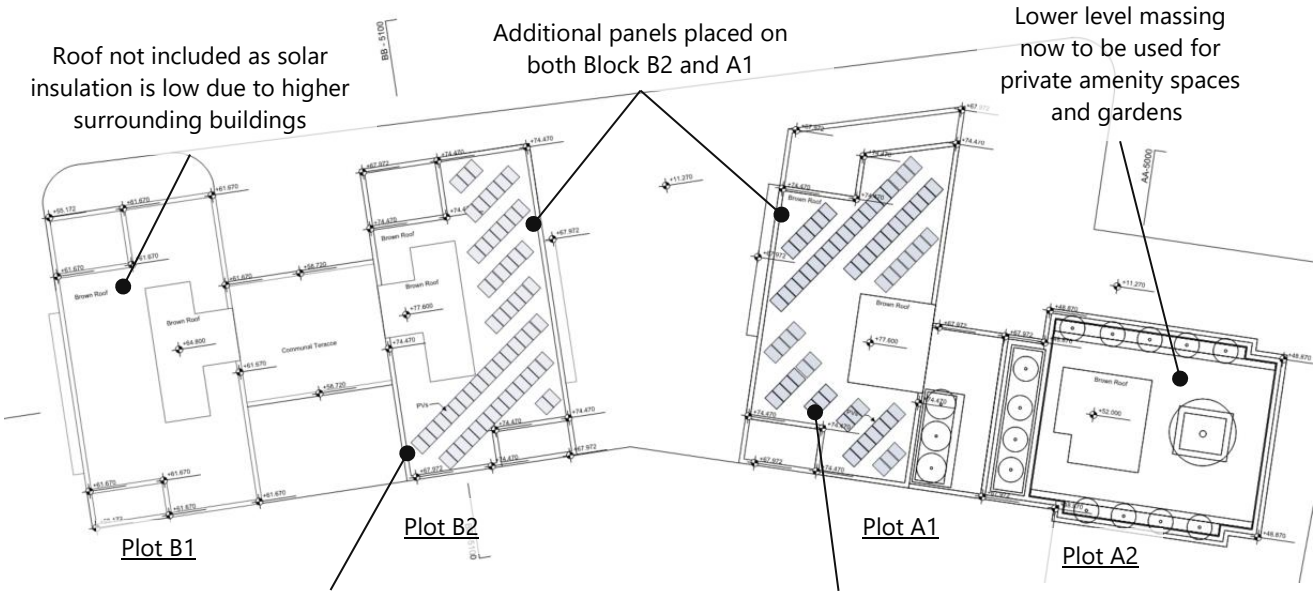
4 Impact on carbon emissions

4.1 Detailed Phase 1

This section outlines the impact on the energy commitments and design for the detailed phase 1 elements of the application. This includes design changes to Solar PV panels and updates to carbon emissions as result of massing changes.

4.1.1 Solar panels

The placement and number of solar PV panels has been updated as a result of the reduction in floors on Block A2. However, the total number of Solar PV panels has been maintained across both blocks at 131. This results in no material change to the energy production or kWp of the array to be installed. Figure 4—1 shows the detailed roof layout as suggested by the computer optimisation and Table 4—1 outlines the expected outputs.



Plot B
Panels – 61
kWp of panels – 15.25
kWh/ year expected – 15,600

Plot A
Panels – 70
kWp of panels – 17.5
kWh/ year expected – 17,860

Figure 4—1 the detailed PV layout for the roofs of plots A and B as based latest massing

Table 4—1 Specifications for panels over plot A and B

Development Phase	kWh produced per roof (kWh/yr)	kWp per roof	No of panels	Average kWh/kWp	Total PV Area
A1	17,867	17.5	70	1,021	100.8
A2	-	-	-	-	-
B1	-	-	-	-	-
B2	15,635	15.25	61	1,025	87.84
Total	**33,501**	**33**	**131**		**189**

4.1.2 Resulting emissions

The following tables outline the resulting update to the carbon emissions of detailed phase 1, due to the reduction in massing. These utilise Part L 2013 as they are connecting to an existing heat network.

Table 4—2 Residential CO2 emission reductions from application of the energy hierarchy – Detailed Phase 1 (Part L 2013)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baselinei.e.2013BuildingRegulations	424		
`Energy Efficiency	381	43	10%
CHP	245	137	32%
Renewable energy	229	15	4%
Total		195	46%

Table 4—3 Non-residential CO2 emission reductions from application of the energy\ hierarchy – Detailed Phase 1 (Part L 2013)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baselinei.e.2013BuildingRegulations	99		
Energy Efficiency	72	28	28%
CHP	70	1	1%
Renewable energy	70	0	0%
Total		29	29%

4.2 Outlines phases 2-11

The following tables outline the resulting update to the carbon emissions of detailed phase 1, due to the reduction in massing on phase 2 but the increase in massing on other future phases. Phases 2 and 3 utilise Part L 2013 as they are connecting to an existing heat network and Future phases utilise SAP 10 carbon factors.

Table 4—4 Residential CO2 emission reductions from application of the energy hierarchy – Outline Phases 2 & 3 (Part L 2013)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baseline i.e.SAP 10	871		
Energy Efficiency	786	86	10%
CHP	552	234	27%
Renewable energy	509	42	5%
Total		362	42%

Table 4—5 Non-residential CO2 emission reductions from application of the energy hierarchy – Outline Phases 2 & 3 (Part L 2013)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baseline i.e. 2013 Building Regulations	21		
Energy Efficiency	15	6.3	30%
CHP	14	0.4	2%
Renewable energy	14	0.0	0%
Total		6.8	32%

Table 4—6 Residential CO2 emission reductions from application of the energy hierarchy – Outline Phases 4-12 (SAP 10)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baseline i.e. SAP 10	2,993		
Energy Efficiency	2,622	371	12%
CHP	2,622	0	0%
Renewable energy	1,951	671	22%
Total		1,042	35%

Table 4—7 Residential CO2 emission reductions from application of the energy hierarchy – Outline Phases 4-12 (SAP 10)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baseline i.e. SAP 10	401		
Energy Efficiency	295	105.5	26%
CHP	297	0	0%
Renewable energy	282	15.0	4%
Total		119	30%

4.3 Offsetting

Table 4—8 outlines the expected updates to the carbon offset payment to the London Borough of Newham.

Table 4—8 Expected zero carbon cash in lieu payment quantum for Phase 1, 2 & 3 and 4-12

Element	Typology	CO_2 offset required (1 year)	Cumulative savings for off-set payment (30 years)	Equivalent offset payment to LBN
Phase 1 (Using Part L 2013)	Residential	229	6875	£412,525
	Non-residential	6	178	£10,700
Outline Phases 2 & 3 (Using Part L 2013)	Residential	509	15,282	£916,932
	Non-residential	0.6	18	£1,094
Outline Phases 4-12 (Using Part L at the time of RMA) (currently based on SAP 10)	Residential	1,951	58,527	£3,511,603
	Non-residential	119	639	£38,342

5 Impact on solar gain and overheating risk

This chapter sets out the impacts of the massing changes on potential overheating risk and if measures are required to reduce risk in line with previous masterplan iterations.

5.1 Previous masterplan iteration and proposed measures

To understand the link between solar gain and potential overheating risk for the massing, based on detailed Block A analysis, the previous IES model was analysed. The analysis was run for the 22nd of July, which is the peak overheating day for the CIBSE TM49 weather file.

Previous detailed overheating analysis indicated that solar gains received on floor 14 and higher could cause an overheating risk. The solar gains assessment run on the previous massing showed that floor 14 and up, top four floors, were expected to receive around ~3.2 kWh/m² solar gain. Figure 5—1 outlines the visual results of this analysis on Block A.

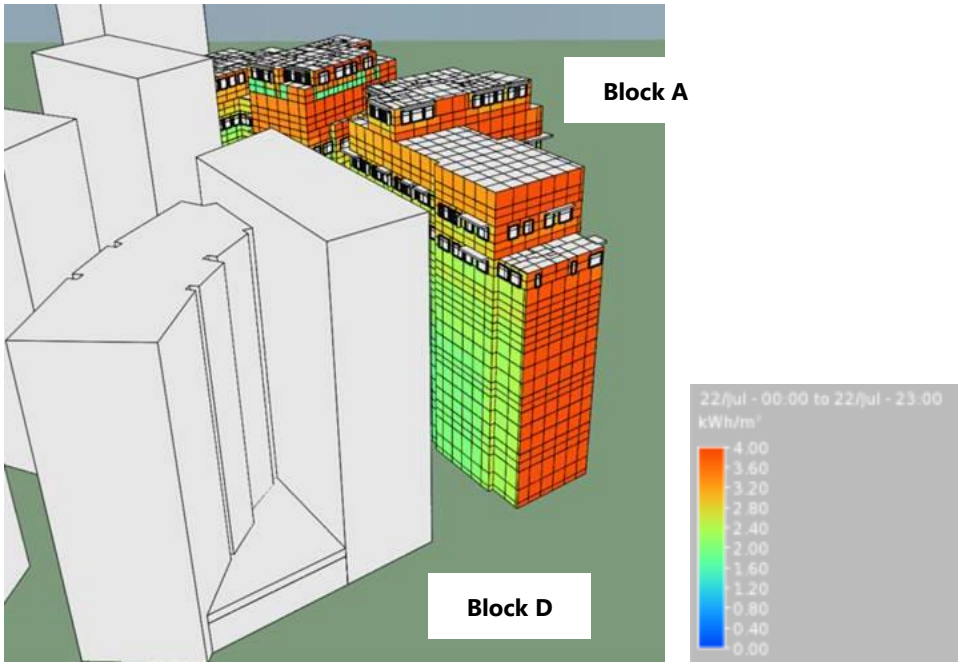


Figure 5—1 Solar Gains Analysis on previous massing model

Above this point additional sandwich panels are proposed to reduce excessive solar gains entering the spaces. See previous analysis later in this report for information. Below this point no sandwich panels would be required to reduce solar gains, as the surrounding buildings would shade block A.

5.2 Impact of reduced Block A and D massing

The reduced massing of blocks A and D were considered within the same IES model and solar gains analysed as per above. This was undertaken with a goal to identify any potential changes to the solar gains received on the façades of the Block A west façade flats.

Figure 5—2 visually shows there is limited change to the solar gains received on the West facades of the Block A massing. It shows that the West facades receive an estimated maximum of ~2. 8 kWh/m² in isolated locations.

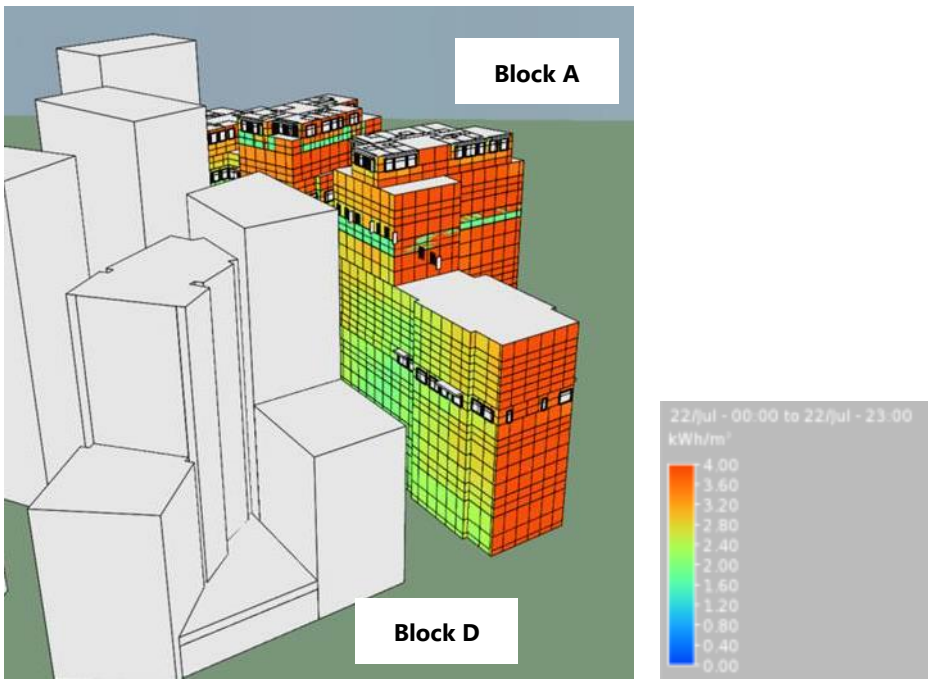


Figure 5—2 Solar Gains Analysis on updated massing model

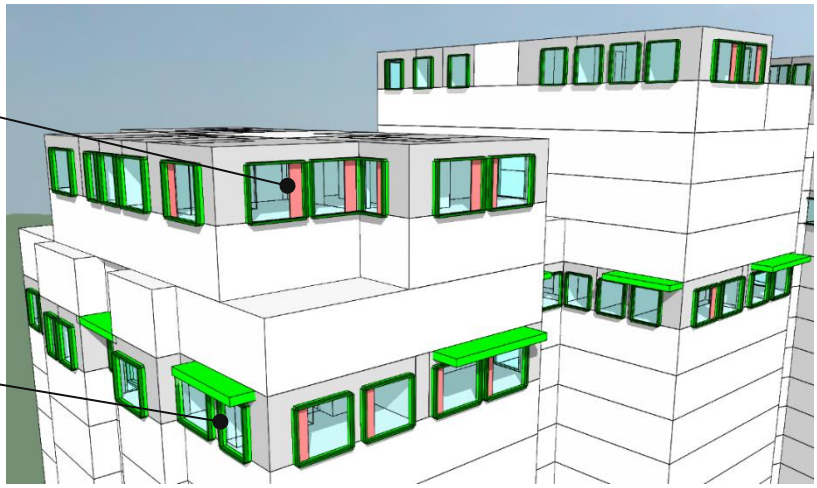
This indicated that the impacts of the reduced heights of Block A and D are expected to have minimal influence on the overheating strategy overall. The northern core of Block D still remains at the same height and this is expected to shade the lower levels of Block A from the late evening sun.

5.3 Resultant solar gains management strategy

As a result of the previous analysis, it is not expected that the West façades of the updated massing of Block A will not require additional sandwich panels to reduce overheating risk for TM59 compliance. Figure 5—3 shows the resultant locations for sandwich panels across the floors.

Modelled representatively with an external shading element to reduce solar gain without limiting key views out; whilst reducing low angle solar gains by ~25%.

External window reveal depth have been increased from 175mm to 315mm; reducing solar gain from both high and low angle sun throughout the day.



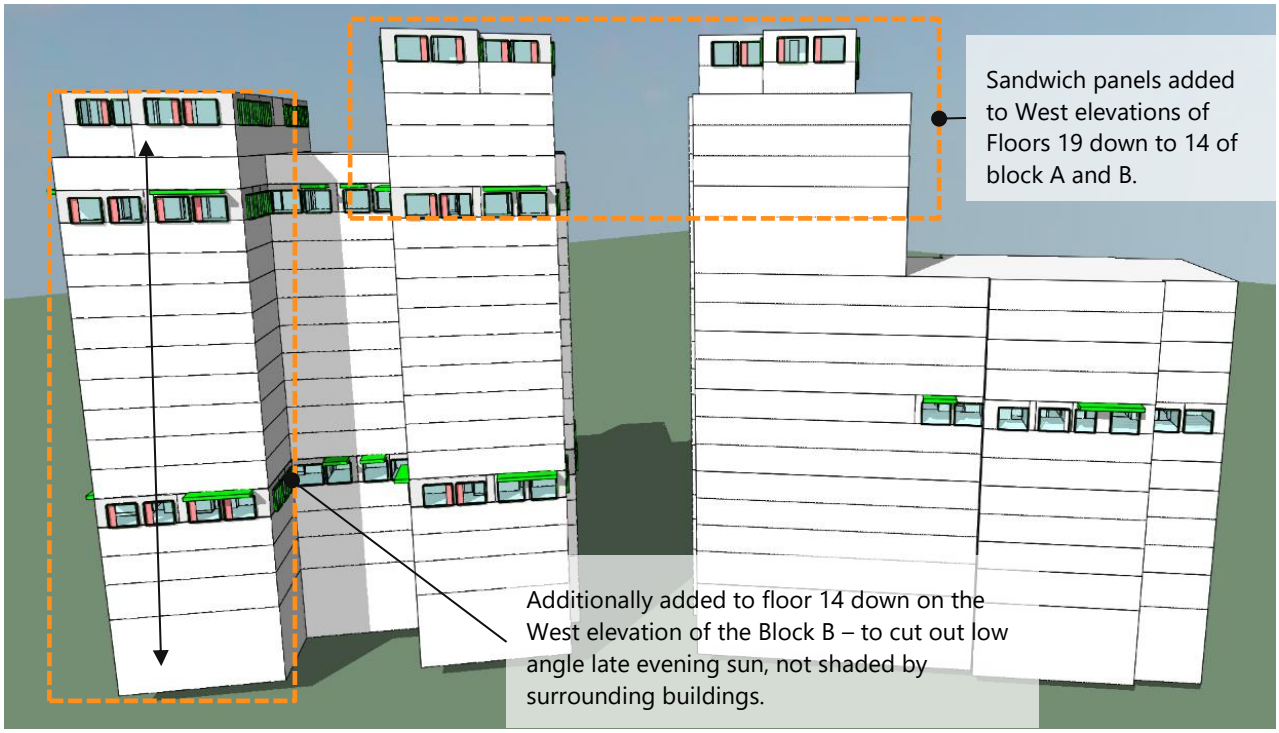


Figure 5—3 Sandwich panel addition strategy modelling IES

Detailed post planning analysis will need to finalise the overheating strategy, continuing to consider other factors such as external noise and air quality on occupants' ability to open windows. The applicant will finalise the overheating modelling and strategy through a condition, considering the GLA overheating hierarchy.

If risk cannot be reduced through passive measures and windows are not considered openable in line with AVO Guidance from the ANC, active cooling will be provided in units to mitigate overheating risk.

6 BREEAM Certification commitments

This section outlines the BREEAM strategy and the applicant commitment regarding certification.

6.1 Reason for Refusal No 8

Below outlines the reasons for refusal with regards to the previous application to London Borough of Newham:

8. The proposed development has failed to demonstrate that it will achieve a BREEAM rating of 'Excellent' as required by Policy SC1. The development's failure to achieve sufficient Building Performance Standards would conflict with the clear objectives of the Development Plan Framework seeking to respond to climate change within developments. This is contrary to:

- *the National Planning Policy Framework (MHCLG, February 2019);*
- *Policies 5.2 and 5.3 of The London Plan - The Spatial Development Strategy for London (GLA, consolidated with alterations since 2011 and published March 2016);*
- *Policy SI2 of the Draft London Plan: The Spatial Development Strategy for Greater London (Draft for Consultation December 2017 with minor suggested changes July 2018); and,*
- *Policies SC1 and SC2 of the Newham Local Plan (December 2018).*

LBN concerns – Set out in LBN's Committee Report, dated 12th November 2019: Not meeting BREEAM 'Excellent'.

6.2 Office/Industrial: BREEAM Pre-assessment Summary

Pre-Assessment & Results

A BREEAM pre-assessment has been carried out for a non-specific shell & core building type, using BREEAM 2018 New Construction, Shell and Core, Sector: Industrial (office), to identify the credit areas which are currently achievable, at risk and not currently targeted.

The Pre-assessment sets out an indicative route to achieving the target but that the developer is not committing to any specific route to gain the BREEAM Excellent rating. Based on the pre-assessment undertaken, a commercial unit would be expected to achieve ~56%. However there are several credits that could potential be gained if targeted. If these are targeted a score of 76% could be achieved. These results are displayed in Figure 6—1.

The scores stated are indicative and are subject to change based on detailed design. The pre-assessment results indicate that the proposed development is on target to achieve a 'Excellent' rating providing that at least the credit areas identified as low risk and targeted (green) will be challenging. It should also be noted that all credit areas identified as "minimum standards for a BREEAM 'Excellent' rating" have been identified as low risk. Credit areas identified as in the not targeted section (red).

BREEAM SCORE SUMMARY		
MINIMUM REQUIRED	70.0%	Excellent
LOW RISK	55.8%	Very Good
TARGETTED	76.4%	Excellent
NOT TARGETED	100.6%	
ACHIEVED	0.0%	

Figure 6—1 BREEAM pre-assessment results

The Applicant has requested a condition requiring BREEAM 'Excellent' certification to be included and commits to achieving this for commercial spaces.

BUROHAPPOLD ENGINEERING

Planning Addendum - June 2019

Project Thameside West
Subject Energy and Sustainability Statement Addendum
Project no 035668
Date 24 June 2019

Revision	Description	Issued by	Date	Approved
00	Draft for internal review	JG, LA, DC, EC, JC	29/03/19	
01	Updates based on architectural changes	JG	24/04/19	
02	Updates based on GLA responses to Rev 01 issue (GLA response in green, applicant response in blue)	JG, JC	16/05/19	
03	Scheme update and Addendum additions with second round of GLA comments	JG, JC	24/06/19	

1 Introduction and update

The below sections are an addendum to the originally submitted Thameside West application Energy and Sustainability statement, dated 23/11/2018, application reference PA/18/03557/OUT and GLA case number 4039c.

It includes three sections:

2. **GLA responses to Rev 01 (written May 19)** – Original GLA comments and applicant responses
3. **GLA responses to Rev 02 (written June 19)** – Latest GLA comments and applicant responses
4. **Updates to the scheme since original submittal (written June 19)** – outlines massing changes and the Phase 1 response

2 GLA responses to Rev 01(written in May 2019)

The following section addresses the comments outlined in the GLA Energy Memo: Stage I consultation, with each heading directly responding to each point made. The text provides either further explanation of the original submission or changes to the proposed commitments.

2.1 Paragraph 2 - GLA's Carbon Emission Reporting spreadsheet

2. The applicant has outlined the performance of the detailed element of the application against both SAP 2012 and SAP 10 carbon factors. They should use the GLA's Carbon Emission Reporting spreadsheet, which has been developed to allow the use of the updated SAP 10 emission factors alongside the SAP 2012 emission factors. The link to the spreadsheet can be found here: https://www.london.gov.uk/what-we- do/planning/planning-applications-and-decisions/pre-planning-application-meeting- service-0. This is encouraged to be submitted for review.

The applicant has completed the spreadsheet for the Detailed Phase 1 dwellings and non-residential areas modelled and this has been sent accompanying this document.

The sheet has been completed based on available data for a selection of 41 dwellings across the two blocks, as the spreadsheet is limited 50 dwellings. In total 78 unique dwellings were modelled for the initial submission, however 41 units input have been duplicated in the "Number of units" column to represent an averaged total number of units for Phase 1 to replicate the performance of the whole block.

2.2 Paragraph 5 – SAP 2012 and SAP 10 carbon emissions

5. For clarity, the applicant should state the performance of all phases against both SAP 2012 and SAP 10 carbon emissions factors. They should also separate out their carbon emissions reporting for all stages of the energy hierarchy into the following groups and separately for residential and non-domestic:

- *Detailed application Phase 1, based on connection to Excel heat network.*
- *Outline application Phases 2 & 3, based on connection to Excel heat network.*
- *Outline application Phases 4-12, based on connection to on-site energy centre.*

The applicant has updated the carbon emissions for all phases and has provided these within Section 2.19 Paragraph 38, 40, 42 & 45 of this report.

2.3 Paragraph 7 & 8 – Lean boiler efficiency

7. The applicant appears to have assumed gas boilers with gross efficiency of 95% for the Be lean modelling; they should use 89.5% for the domestic and 91% for the non- domestic in line with GLA guidance and they should report the revised carbon emissions for the Be lean stage of the energy hierarchy.

8. The applicant should revise their reported carbon figures as per item 5, and demonstrate that carbon savings have been made from energy efficiency alone compared to a 2013 Building Regulations compliant development. The applicant should note that the new draft London Plan includes a target of a 10% improvement on 2013 Building Regulations from energy efficiency which applicants should be aiming towards.

It is the applicants understanding that the evidence base developed for the Draft New London Plan Energy efficiency target within Policy SI2, was based on the use of varying and improved Lean boiler specifications. Section 32 on pages 35 outlines the Driving energy efficiency savings through the London Plan, Data Analysis report found here, outlines that the mean and median required boiler specification to meet the 10% lean reduction was a 95% boiler.

Additionally the boiler specification for the Phase 1 heating plant room meets and exceeds this standard. The proposed boiler model is the Hamworthy UF1050-3 which outlines a Part L gross seasonal efficiency of 96.9%. As a result a 95% efficiency this has been used within the Lean modelling for both residential and non-residential modelling, as this will be the installed specification, prior to a heat network connection.

	Boiler model	Units	UF1050-3
	No. of modules		3
Energy	Building Regulations Part L seasonal efficiency	% gross	96.9
	Building Regulations Part L seasonal efficiency	% nett	107.7
	Boiler output 80/60°C	kW	949.2
	Boiler output 50/30°C	kW	1046.7
	Boiler input gross (maximum)	kW	1082.5
	Boiler input nett (maximum)	kW	974.8
	Boiler output 80/60°C (minimum)	kW	63.3
	Boiler output 50/30°C (minimum)	kW	69.8

Figure 2—1 Hamworthy UF1050-3 manufacture data

2.4 Paragraph 9 - Lean TER/DER worksheets

9. The applicant has provided the 'be lean' DER and TER output sheets from the modelling software for three sample units; they should provide all the 'be lean' DER and TER output sheets that have been used to calculate the carbon figures reported.

Further worksheets can be provided in Appendix C of this document.

2.5 Paragraph 10 – Non-Residential lean carbon reductions

10. The applicant should revise their reported carbon figures as per item 5, and demonstrate that carbon savings have been made from energy efficiency alone compared to a 2013 Building Regulations compliant development. The applicant should note that the new draft London Plan includes a target of a 15% improvement on 2013 Building Regulations from energy efficiency which applicants should aim towards.

The applicant has updated the carbon emissions for all phases and has provided these within Section 2.19 Paragraph 38, 40, 42 & 45 of this report.

The applicant has fully explored the potential carbon savings at this outline stage of the design development process across non-residential elements. Further Lean savings will be driven by form, facade and systems design as well as the specification of spaces. As a result a commitment to achieve any further Lean savings is not possible at outline planning application stage, where none of the above elements are yet designed. However it is proposed that the Lean savings are reviewed in further detail at RMA stage. It is proposed that this is included within a condition.

Table 2—1 outlines the Lean carbon emissions savings on 2013 Building Regulations for detailed phase 1 & masterplan relating to non-residential elements only. It shows that all typologies are expected to meet the 15% target.

Table 2—1 Predicted Non-residential detailed phase 1 & masterplan Lean CO_2 emissions against Part L 2013

	Phase 1 & Masterplan				
	Baseline Regulated CO_2 Emissions		Lean Regulated CO_2 Emissions		
Typology	kg CO_2/m^2/year	Tonnes CO_2/year	kg CO_2/m^2/year	Tonnes CO_2/year	% improvement over Baseline
A1/A2/A3 - Retail	46.9	328.5	34.0	237.8	27.6%
B2/B8/B1a - Industrial	26.7	492.8	18.7	345.6	29.9%
Semi-Private	18.4	14.5	15.4	12.1	16.3%
D1/D2 - Community	18.4	48.8	15.4	40.8	16.3%
D1 - Education	18.4	74.3	15.4	62.2	16.3%
Non-residential Total		**958.9**		**698.5**	**27.2%**

2.6 Paragraph 12 – Cooling demands

12. The applicant has provided the predicted energy demand for the development following the energy efficiency measures, which is welcomed. However, in line with the latest GLA guidance (Table 8) the applicant should provide the energy demand in the form of "the delivered energy requirement at the point of use" for all categories. Currently, the figure reported for cooling appears to be the energy consumed by the plant .The applicant has updated the energy demand table showing the cooling the delivered energy requirement at the point of use, rather than the cooling electricity.

Table 2—2 Predicted site wide lean energy demand

	Lean energy demand (MWh/year)						
Typology	NIA (m^2)	Space Heating	Hot water	Lighting electricity	Auxiliary electricity	Cooling Thermal	Unregulated electricity
A1/A2/A3 - Retail	7,000	62.8	13.6	211.7	153.5	309.9	424.8
B2/B8/B1a - Industrial	18,485	37.5	80.8	455.8	119.3	202.2	614.0
Semi-Private	789	4.6	1.8	8.2	10.4	10.4	20.6

C3 - Apartments	327,435	4,758	9,475	1,400	543	-	1,943
D1/D2 - Community	2,655	15.4	6.0	27.6	34.9	35.0	69.3
D1 - Education	4,047	23.5	9.1	42.0	53.2	53.4	105.6
Total	360,410	4,902	9,586	2,145	915	611	3,177

2.7 Paragraph 13 – Fabric Energy Efficiency (FEE)

13. In line with the latest GLA guidance the applicant should report the overall Part L Fabric Energy Efficiency (FEE) performance of the development for both the baseline and the 'be lean' stages of the energy hierarchy in MWh/year and kWh/m2. The percentage of improvement (%) should also be provided.

Table 2—3 outlines the Dwelling TFEE and DFEE for the Phase 1 development.

Table 2—3 Detailed Phase Fabric Energy efficiency

	kWh/m2	**MWh/year**
Baseline (TFEE)	32.45	1065
Lean (DFEE)	31.44	1032

2.9 Paragraph 17 and 18 - External and internal shading devices

17. The applicant suggests the units failing DSY1 are exposed to direct solar gain in the late afternoon due to be being west facing, which coincides with assumed cooking times, and that the low sun angle does not shade allow for shading from balconies. They suggest that adding further shading would impact on the level of daylight in the units. However, they should consider the potential for and impact of further fixed or retractable external or internal shading devices for the affected rooms.

18. The applicant should consider further passive design measures in line with Policy 5.9, to reduce the reliance on blinds and mechanical ventilation and ensure all units pass the requirements with these features at a minimum. The applicant should confirm that any required blinds will be included in the base build and demonstrate that the blinds do not interfere with the effective opening area of windows.

2.9.1 Review of external and internal shading

The applicant has reviewed the GLA's proposal and has reviewed a series of options to the windows that receive the highest solar gains. The options reviewed are outlined in Figure 2—2 and they consist of:

- Across all options: Reveal depth on all windows increased from 170mm to 315mm
- Option 1 – 25% reduction in vision glazing with the introduction of a 650mm wide aluminium sandwich panel
- Option 2 – an 1375mm wide external louvered or mesh shade across 50% of the window area with a 50% free area
- Option 3 – Fritting to be added to 25% of the glazing area
- Option 4 – improved solar control blind specification and fit out

The options have been tested against the CIBSE TM59 guidance as per the originally submitted modelling, however with the addition of another floor on level 4 to understand overheating risk lower down the build. In total 185 habitable rooms have been tested across the two blocks.

Options 3 and 4 have been ruled out as they show limited impact on the overall risk profile beyond that outlined in the original design. Therefore option 1 and 2 have been explored further. These options show reduce risked risk to all units these measures are applied to and show very similar outcomes to each other.

As a result Option 1, change of a glazing pane to an aluminium sandwich panel, is proposed to be taken forward. This has been chosen over option 2, additional of an external shade, as option will have increased capital cost and additional maintenance requirements for the occupants. Additionally option 1 does not impact the aesthetic of the glazing across different levels of the building, providing the same fenestration design in areas of low daylight and overheating risk.

The reduction of glazing will help to reduce the reliance on internal blinds and mechanical ventilation to help reduce overheating risk.

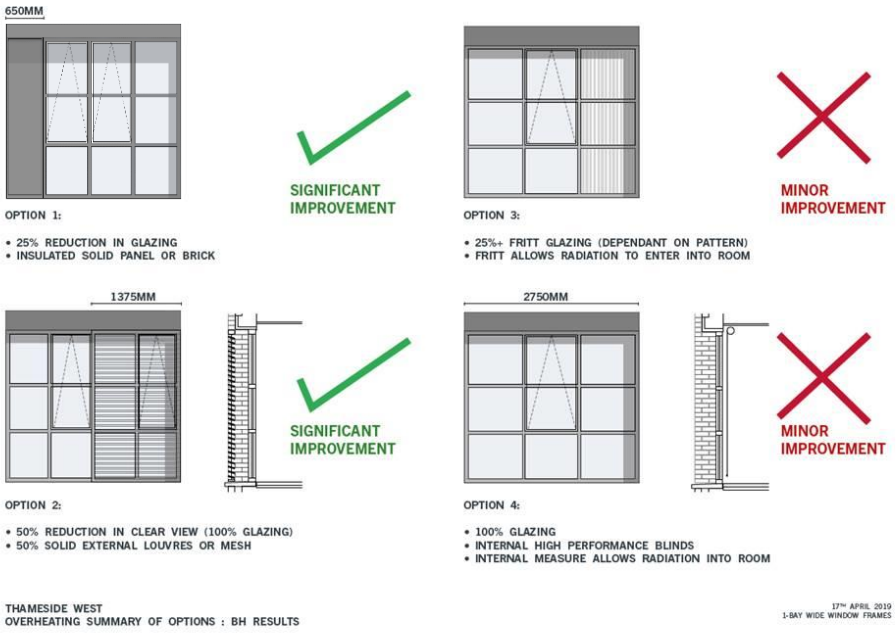
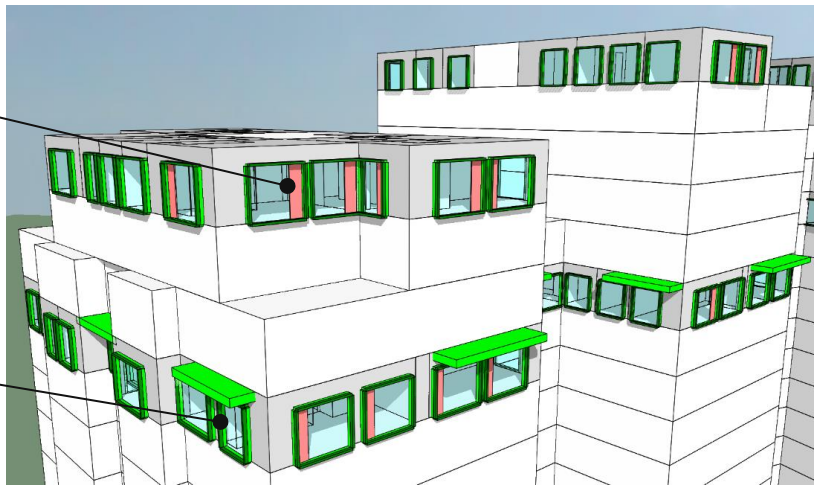


Figure 2—2 Measures to reduce overheating risk reviewed and the impact on dwelling modelling results

Modelled representatively with an external shading element to reduce solar gain without limiting key views out; whilst reducing low angle solar gains by ~25%.

External window reveal depth have been increased from 175mm to 315mm; reducing solar gain from both high and low angle sun throughout the day.



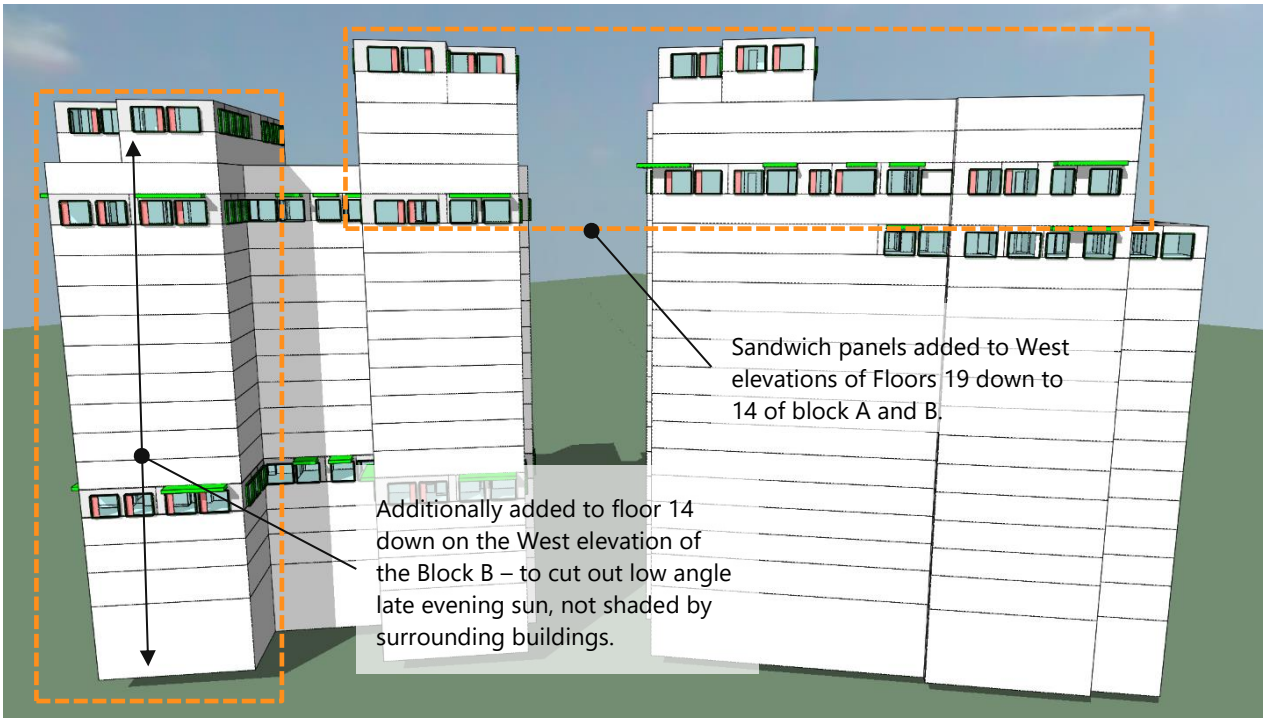


Figure 2—3 Sandwich panel addition strategy modelling IES

Dynamic overheating modelling has been updated based upon the sandwich panel and reveal depth additions. The units analysed were living rooms, kitchens and bedrooms, representing 180 habitable spaces across the two blocks of all orientations. Bathrooms, cupboards and corridors have been excluded from the analysis as they are unoccupied. Table 2—4 outlines different modelling runs which show the impact of different design measures in a cumulative effect, in order to effectively reduce overheating risk in the dwellings. Results for each of the three weather files (1976, 1989 and 2003) are presented, along with the results for the future projected weather files for reference.

The results show that the addition of the sandwich panels and deeper reveals are effective at reducing the resilience on internal blinds, with all but 14 spaces passing TM59 criteria without the use of internal blinds (Run 1), in the current 1989 weather file. Run 2 has modelled the use of internal blinds operated variability by the occupant, lowering the blind when solar irradiance is over 300W/m^2 onto the window. This allows for a more realistic operation scenario where occupants would close the blinds (partly or fully) when they found solar gains were too high.

The results show that all but two spaces pass with internal blinds being operated in this way (Run 2) and all spaces pass assuming blinds are fully down. The results for the future weather scenarios are similar, with all but four spaces passing in the 1989-2020 scenario.

Table 2—4 Results of TM59 assessment with scheme updates and addition of sandwich panel (180 habitable rooms modelled in total)

Iteration/Model number and inputs								Current Weather file			Future Weather file		
Run	Window g-value	Reveal depth	Blind type	Internal Blinds operation	window opening profile	Sandwich Panel 25% of structural opening	Night purge	1976-baseline	1989-baseline	2003-baseline	1976-2020	1989-2020	2003-2020
								Number of rooms failing CIBSE TM59 requirements			Number of rooms failing CIBSE TM59 requirements		
1	0.3	315mm	No Blind		(ta>to)	Yes	Yes	65	14	23	130	29	67
2	0.3	315mm	Cream linen blind (BRE)	Down incident irradiance>300, Up incident irradiance<200	(ta>to)	Yes	Yes	26	2	11	79	14	37
3	0.3	315mm	Cream linen blind (BRE)	Always Down	(ta>to)	Yes	Yes	12	0	4	35	4	16

Figure 2—4 Shows the location of the spaces that show an overheating risk from Run 2 in Orange and those that show residual overheating risk from Run 3 in Pink future weather 1989 2020. The spaces that show a risk with internal blinds partially down are living room and kitchen spaces where low angle solar gains are penetrating between buildings and into the spaces. These spaces are generally overshaded by the buildings around them throughout the year, therefore the use of movable internal blinds is proposed as the most reasonable measure to reduce overheating risk for these locations without negatively impacting on daylight significantly.

The four spaces that show a residual risk even with internal blinds fully down, as per run 3 and in pink, will need to be reviewed further and this is proposed to be undertaken through a condition for the detailed Phase 1 application.

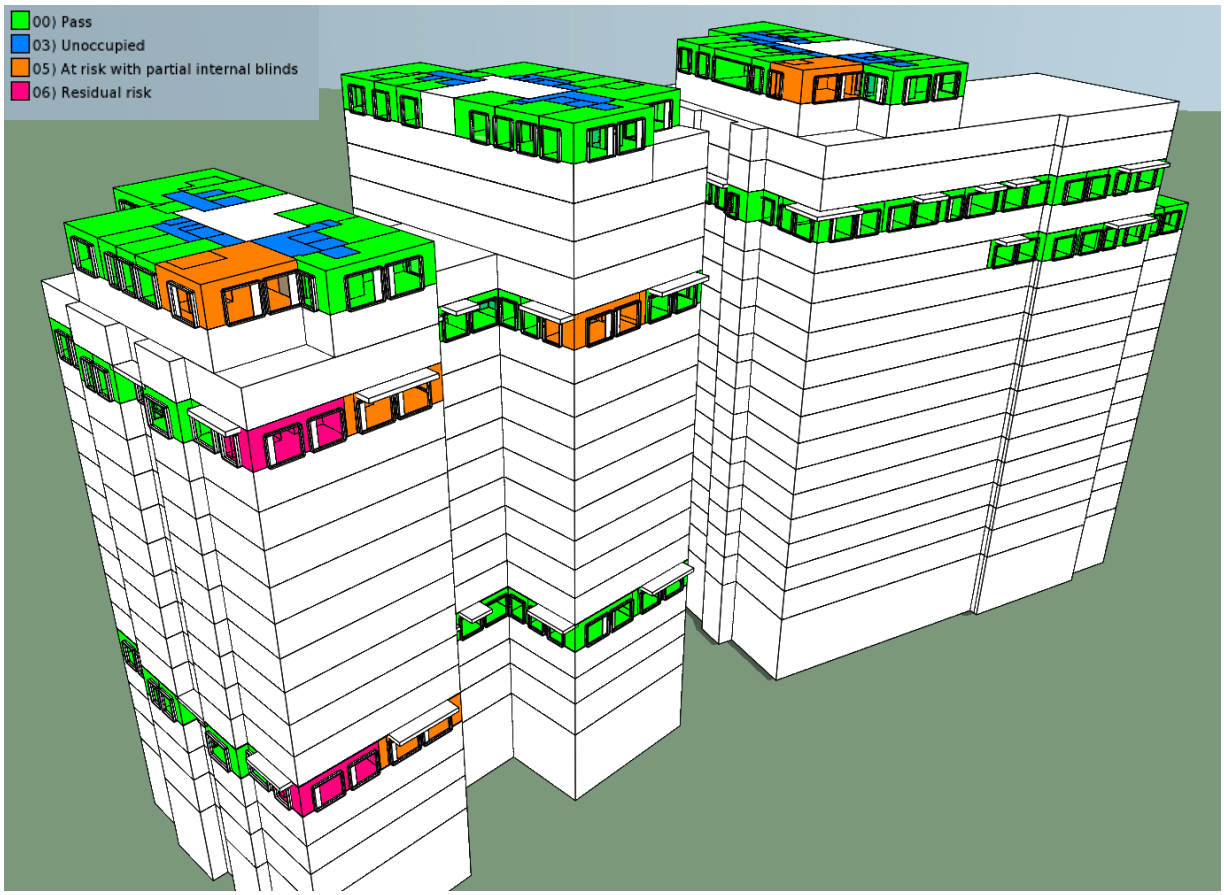


Figure 2—4 Overheating risk of units for run 2 and run 3 1989-2020

2.9.2 Window design and blind flexibility

The applicant has considered how the use of internal blinds could impact on venation rates. As a result the glazing and opening pane types have been designed to maximise flexibility for occupants to install and operate different blind types, whilst limiting the impact on ventilation. Figure 2—5 outlines a typical window typology for phase 1 of the scheme. It shows a Crittall style window split into four equal full height panes with different conditions.

The window type are built up of either a solid element which could either be glass or aluminium sandwich panel, out the outer panes. The inner two panes will have an openable top hung window. These will be positioned in the middle to avoid any reduction in air flow from the external reveals, allowing for free movement of air. Additionally the fixed pane design allows for 50% of the window to have an internal blind drawn from both sides, whilst still allowing completely free movement of air through the openable panes. Blinds will be fit by the occupant, rather than the developer, and this window design would lend itself to a side drawn blind or traditional curtain.

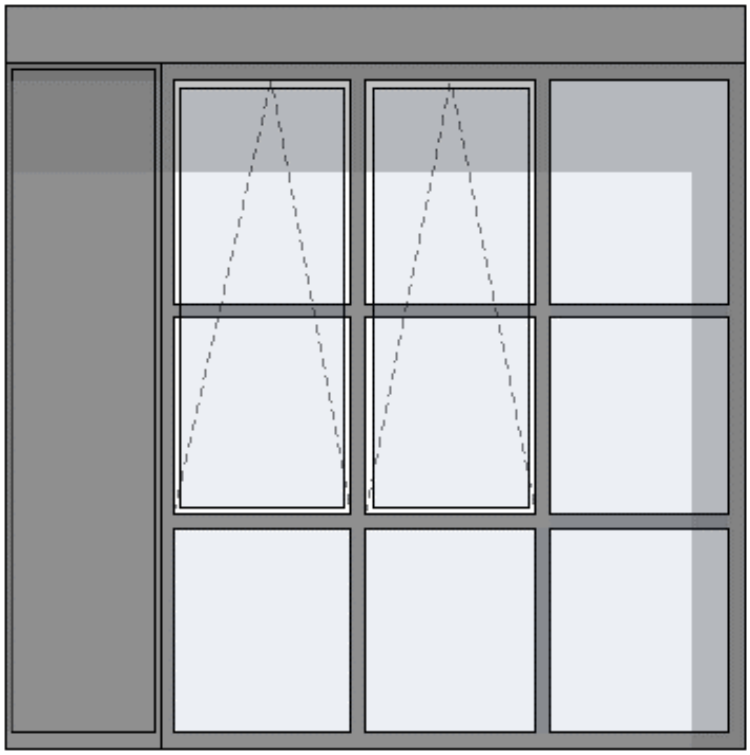


Figure 2—5 Typical window typology on the West facade

Simple Computational Fluid Dynamics modelling has been undertaken to understand the impact that different blind types, top down roller blind or a venetian blind, could have on the ventilation velocities into the room.

Figure 2—6, Figure 2—7 and Figure 2—8 below show the current window proposal with a side drawn blind, a top drawn blind and a venetian blind. All three options show limited impact on the ventilation entering the room, with high velocity flows on all three.

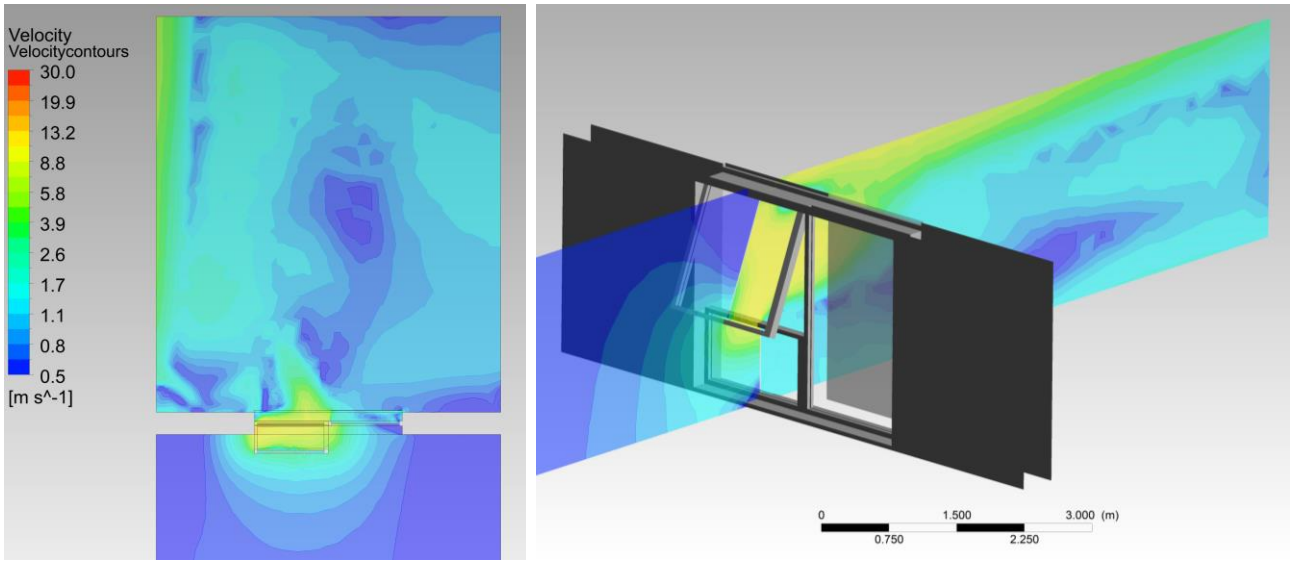


Figure 2—6 air flow velocities with a top hung window – side drawn blind

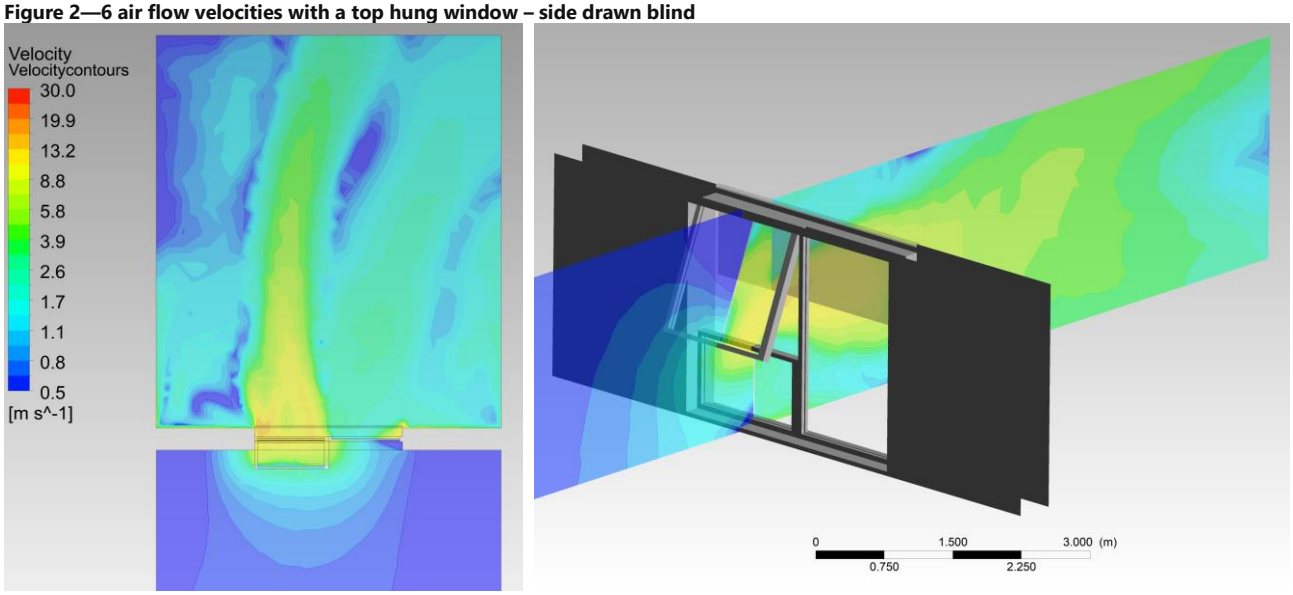


Figure 2—7 air flow velocities with a side hung window – top drawn blind

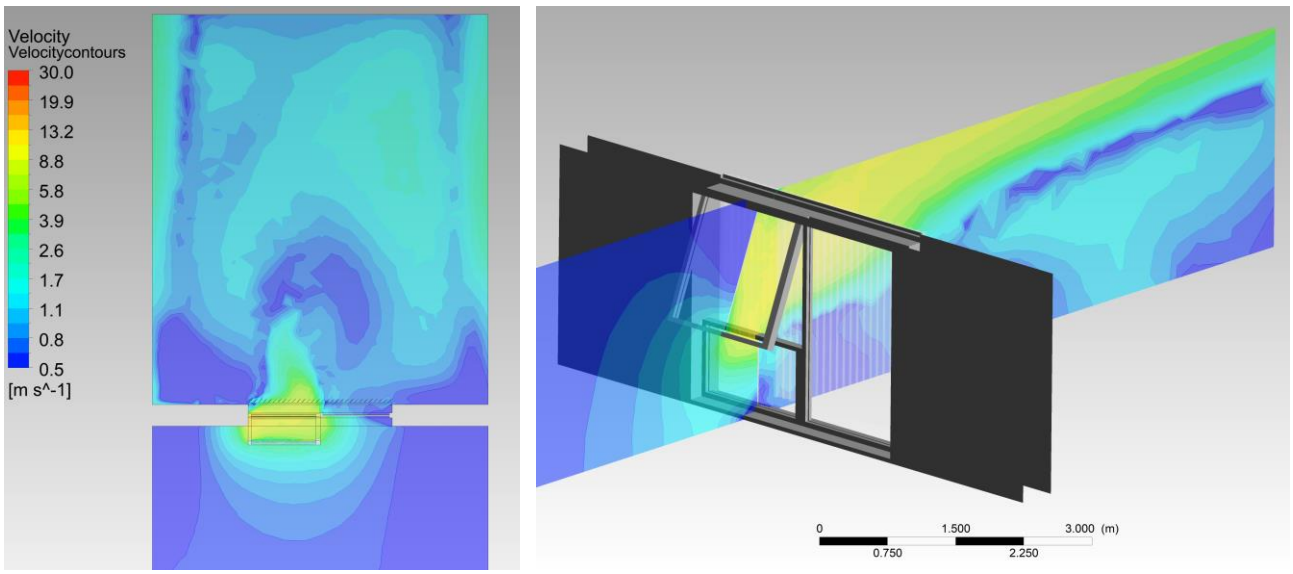


Figure 2—8 air flow velocities with a top hung window – venetian blind

Figure 2—9 and Figure 2—10 shows an alternative side hung, inward opening window, which in principle would increase the free area for ventilation. However this window type can be seen to interfere with a blind if it was down, limiting the flow entering the room, interfering with the effective opening area of the window, as shown between the differences of the air flow into the room between these two scenarios.

As a result the top hung window, or sliding door, with fixed solid adjacent pane will allow blinds to be partly closed without interfering with the effective free area of the window.

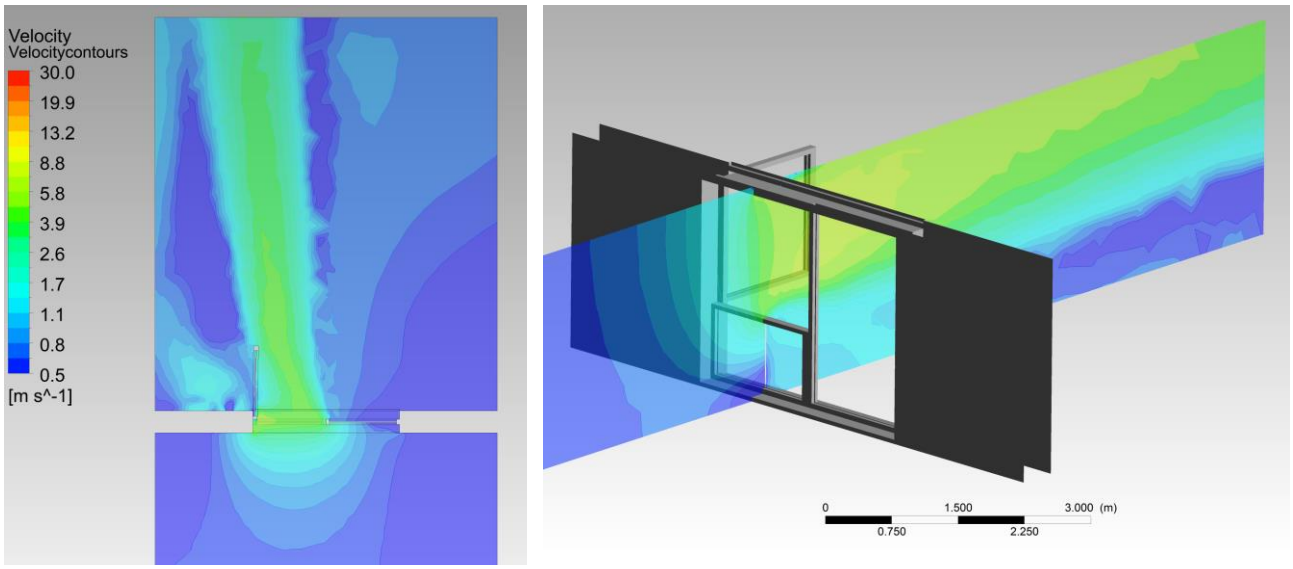


Figure 2—9 air flow velocities with a side hung window – no blind

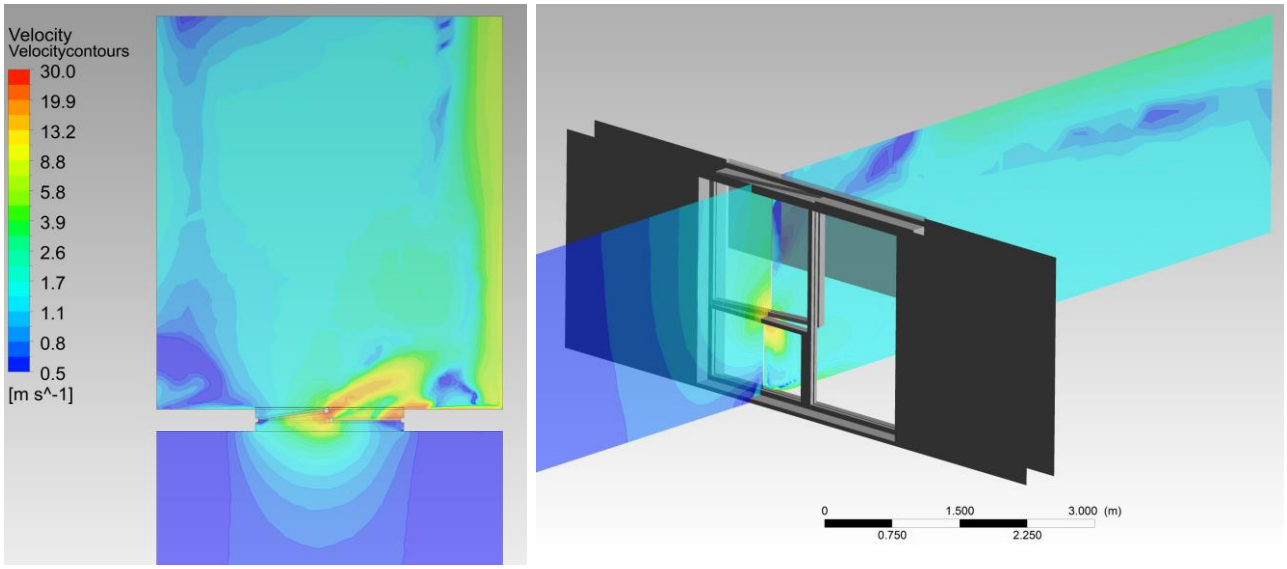


Figure 2—10 air flow velocities with a side hung window – top drawn blind

GLA Revision 01 response:

The applicant has reviewed further passive measures, which is welcomed. They have considered deepening reveal depths on all windows from 170mm to 315mm, which they propose to adopt. They have assessed the impact of adding fritting to a proportion of the glazed area, and also of using an improved solar control blind specification, but neither of these provided significant improvements and so they were ruled out. Two further options were assessed in more detail; 1) a 25% reduction in vision glazed area with the introduction of a 650mm wide aluminium sandwich panel and 2) an external louvred mesh across 50% of window area. Both options were tested against CIBSE TM59 for a representative set of upper floors, and additional modelling was undertaken on lower floor units to understand the overheating risk lower in the build. The applicant has chosen to implement the 25% reduction in glazing, which will be preferable for capital and operational cost, and will maintain the same fenestration design across the building; this is proposed to the west elevations of floors 14-19 of Block A and part of block B, and also down to the ground on another (unshaded by surrounding buildings) part of block B.

Further dynamic overheating analysis has been undertaken, which confirms that of 180 rooms, all but 29 spaces pass against DSY1 (2020s) without the use of blinds, all but 14 spaces pass if blinds are used when solar irradiance is high on the window, and all but 4 spaces pass if blinds are assumed closed. For DSY 2 and 3, >80% of rooms pass when blinds are assumed closed. The applicant proposes for the 4 spaces not passing DSY1 (2020s), to undertake further detailed review, later in the design process, to be secured through a condition. The applicant is encouraged to undertake this review at the current stage in order to demonstrate that all modelled spaces can pass against DSY1 (2020s). The applicant should confirm the margin of failure for the 4 rooms that are failing. They should also consider whether the occupants could operate these dwelling in a manner which achieves an overheating 'pass', and consider providing guidance to occupants on minimising the overheating risk (in line with the cooling hierarchy).

The applicant should confirm that blinds will be included in the base build, or these should be discounted from the analysis.

The applicant has also considered how internal blinds and ventilation will work in conjunction and suggest a limited impact.

Applicant Rev 02 response:

It is confirmed that the developer will install internal blinds through the base build for units that require it to reduce overheating risk. This constitutes approximately 65-70 dwellings across the blocks of Phase 1. This consists of the dwellings located in the west elevations of floors 14-19 of Block A and part of block B, and also down to the ground on another (unshaded by surrounding buildings) part of block B.

As requested the margin of failure for the 4 rooms is outlined in Table 2—5. This shows that the spaces are failing by less than 1% of occupied hours, which equates to between 26-31 hours per year. This is spread across June, July and August with and does not typically last longer than 2-4 hours on the hottest days.

Table 2—5 Space failure margin against Criteria 1 of CIBSE TM59

Block	Floor	Unit type	Space type	% of occupied hours operative temperature exceeds max acceptable by 1°C	% failure margin	Number of hours
A	14	1 Bed	Kitchen	3.8%	0.8%	30
A	14	1 Bed	Living Room	3.8%	0.8%	31
A	04	1 Bed	Kitchen	3.7%	0.7%	26
A	04	1 Bed	Living Room	3.8%	0.8%	29

The considerations to for an occupant to operate these dwelling in a manner which will reduce perceived overheating discomfort in these hours can be driven by internal gains and how they occupy the spaces. These are the areas that would be within control off the occupant and the most effective in line with the GLA cooling hierarchy. Suggestions for occupant operation are as follows:

- Turn of high energy electronics, TVs, Laptops or games consoles;
- Turn the MVHR onto Boost setting;
- Reduce cooking time (from the 1.5 hours in TM59);
- Turn any unnecessary lights off;
- Reduce activity level, sitting and relaxing to reduce metabolic rate;
- Sit in the breeze from the window or in the flow of a portable fan;
- Purge vent rooms (i.e. bedrooms) several hours before occupying the space to sleep; and
- Sit in external private spaces (i.e. balcony) whilst the internal spaces purges heat build-up.

It is proposed that the final results of the overheating analysis are developed and confirmed through a planning condition. It is proposed that condition includes final confirmation of overheating strategy in line with CIBSE TM59 and results, confirmation of internal blinds speciation and where they are installed as part of the base build and finally any communications to be provided to the occupants through a home user guide.

2.10 Paragraph 20 - Corridor temperatures assessment

20. The applicant should assess a sample of corridors and has proposed a strategy to ensure the CIBSE TM 59 comfort criteria can be met.

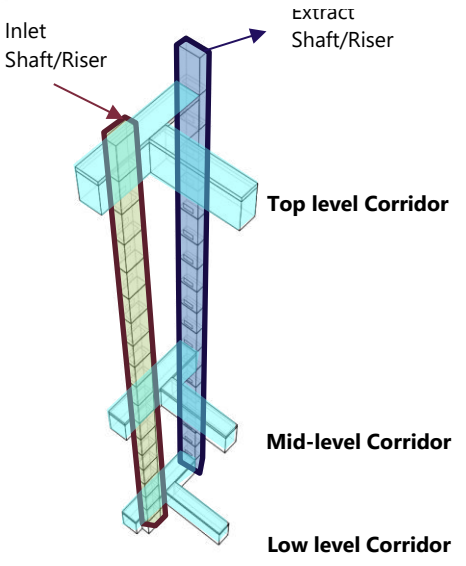
2.11 Assessment methodology

As requested the applicant has modelled a sample of corridors to ensure the ventilation strategy meetings TM59. This section reports the findings of an assessment of predicted temperatures within those sample corridor spaces. The aim of the overheating analysis is to demonstrate that the communal corridor will not experience unacceptable operative temperature based on TM59 recommendations as described below:

- The operative temperature of **28 °C** is not exceeding for more than 3% of the total annual hours

The section details the assessment methodology and overheating results based on thermal model inputs and the ventilation strategy assumed in the corridor.

As outlined in Figure 2—11 a typical corridor at the top middle and bottom of the Block B has been modelled. The fire strategy requires that the corridor will have the sprinklers and a mechanically assisted "push/pull" smoke control system. In this system a smoke shaft is provided at each end of the corridor with reversible fans. One shaft provides an inlet and the other shaft extract depending on the location of the fire, and is designed to flush smoke away from the staircase. It is proposed that this systems will provide back ground ventilation for the corridor, very typical in residential developments.



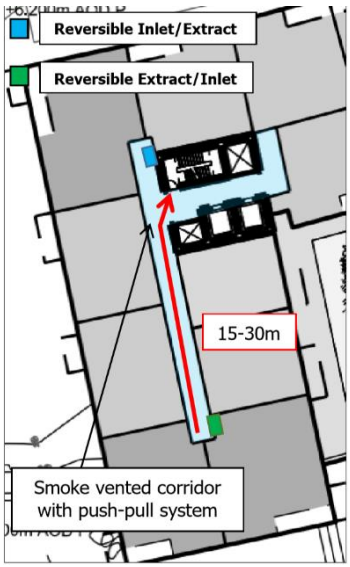


Figure 2—11 Corridors and risers as modelled in IES VE based on smoke venting strategy

An HVAC modelling was produced in IES-VE v2018 software with the input data presented below:

- Corridors were provided with balanced supply and extract mechanical ventilation at a rate of 3 air changes per hour.
- Supply air was introduced to inlet shaft/riser on roof level
- Extract air was drawn to top level through the extract shaft/riser
- Cooling was not provided to the corridor
- Heat loss transfer between district heat network pipes and ceiling void are considered constant and all year round. The DHN pipework is assumed of a flow and return of 70°C/40°C and an insulation thickness of 30mm phenolic insulation on all pipework. This provided a heat gain of 13w/m^2 to the corridor.
- Internal gains included lighting switched on between 18:00-23:00 with dimming profile and an indicative occupancy of 1 or 2 people passing through the corridors to measure the adaptive comfort in accordance with TM59 criteria
- The London Heathrow, 1989 weather file with future projection of 2020 climate on the 50th percentile has been used.

1.1 CIBSE TM59 adaptive comfort assessment

The results for communal corridors are shown in Table 2—6 and Figure 2—12 demonstrate that the recommendation of CIBSE TM59 for corridors is achieved. It is therefore concluded that although elevated temperatures are predicted to occur on hottest day (25/July), the percentage of total hours across the year will not exceed the **3%** and the conditions within the corridor would not be expected to cause thermal discomfort to people passing through it.

Table 2—6 CIBSE TM59 adaptive comfort results for corridors

Thermal comfort assessment results							
Space type	**Heating/Cooling set point**	**Ventilation provision**	**Occupied Hours**	**Hours exceeding maximum temperature**		**Peak day temperature (25/July)**	**Adptive Comfort Criteria**
	°C	**ach**	**hrs**	**Hours**	**% Hours**	**°C**	**Normal level of expectation**
				No more than 3% of occupied hours			
Lowest Level Corridor	N/A	3 ach supply/extract air from top floor risers	8760	5	0.1%	28.3	**PASS**
Mid Level Corridor	N/A	3 ach supply/extract air from top floor risers	8760	11	0.1%	27.2	**PASS**
Top Level_Corridor	N/A	3 ach supply/extract air from top floor risers	8760	42	0.5%	30.8	**PASS**

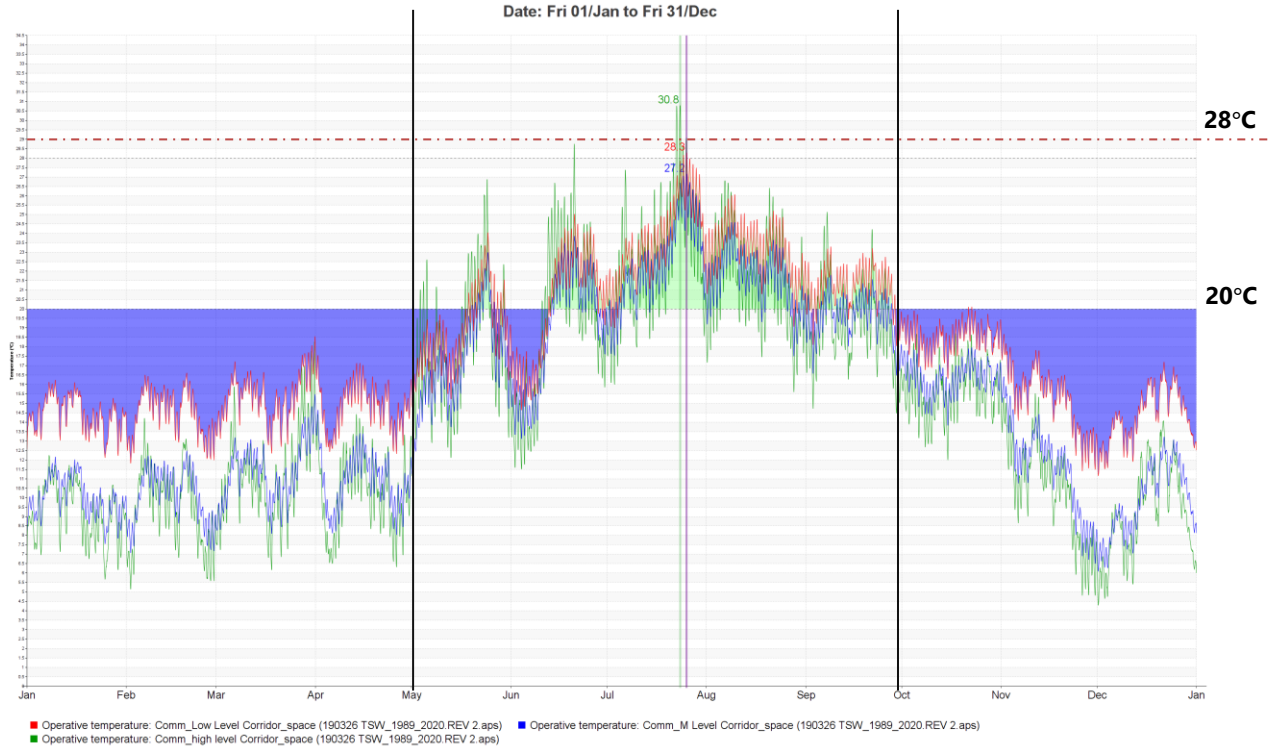


Figure 2—12 Annual Operative temperature profile

2.12 Paragraph 21 – Glass visual light transmittance

21. The g-value of 0.3 is low and the applicant should confirm the anticipated light transmission value, which will impact on daylighting performance.

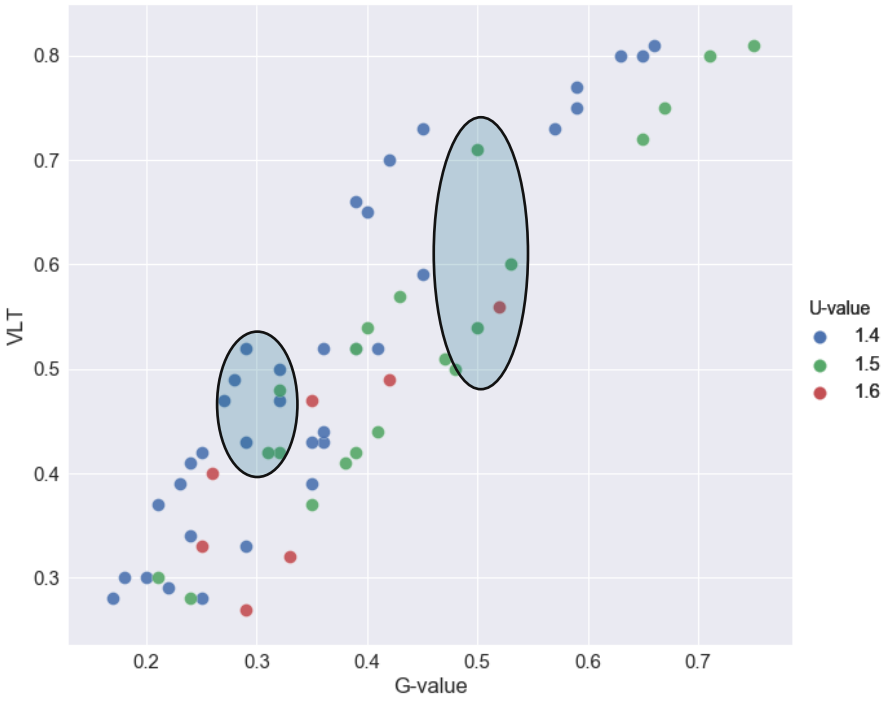


Figure 2—13 Review of glass manufactures g-value vs VLT

A G-value of 0.3 is only applied to facades that receive higher solar gains. A review of a typical glass manufacture window types has been undertaken.

Figure 2—13 outlines the VLT (Visual Light Transmittance) range of glazing types based around a G-value of 0.3 (±0.03). This shows that the VLT typically varies from 40% to 53%. Therefore the average VLT for a glazing speciation of 0.3 g-value would be 47%-50%. Variation between these numbers is based upon differing pane thickness, tints and reflective properties of the final glass specification.

The figure also shows that Where daylight is more challenging, for floors 2-13 that are overshaded by surrounding buildings, a G-value of 0.5 is specified. This would expect to have a VLT in the range of 50% to 70%.

2.13 Paragraph 23 – Peak heat capacity and site wide connections

23. The applicant has identified the Excel energy centre and district heating network within the vicinity of the development and is proposing to connect to the network for Phase 1 (the detailed application) and Phases 2 and 3 (part of the outline application). Connection to the network should continue to be prioritised. It is suggested by the applicant that the network operator (ENGIE) has confirmed that the energy centre could be expanded to meet the peak demand of the full site, although there are no plans or permission to do this currently; correspondence from ENGIE should be provided confirming this. Outline Phases 4-12 would then be served by an on-site energy centre.

The network serving Phases 1-3 should be futureproofed so that the on-site energy centre and network for Phases 4-12 can be connected to it, creating a single network.

2.13.1 Peak heat capacity and site wide connections

ENGIE have confirmed that there is sufficient space within the ExCel Energy centre to accommodate further heat raising capacity however there is been no confirmation on what this mix of technologies will be. Spatial availability was visually confirmed through a site visit undertaken by BuroHappold Engineers acting on behalf of the applicant.

It has been verbally confirmed by ENGIE the size of the existing district heating pipework will have insufficient peak capacity to serve the full build out load of the development, which would be extended to connect to the Thameside West development from the ExCel energy centre.

BuroHappold have requested written confirmation from ENGIE. The response is as follows:

"We presently have 3 x 6 MW Gas boilers and 2 CHPs (1.2MWe and 1.6MWe) installed in our Excel Energy Centre, there is also additional space in it for the installation of future plant which should be sufficient to meet the heat load for the development. Additionally, we are exploring new locations, energy centres on potential customer's site to install low carbon plant i.e. Heat pumps further CHPs and also addition of Thermal stores to decarbonise our network and also add resilience to it."

It can be confirmed that the network serving Phases 1-3 is to be futureproofed so that the on-site energy centre and network for Phases 4-12 can be connected to it, creating a single network across the site. See Figure 8-6 in the original planning application indicates a future connection between phases 1-3 network and phases 4-12 network to create a single network.

GLA Revision 01 response:

The applicant has confirmed that they have received the following response from ENGIE:

"We presently have 3 x 6 MW Gas boilers and 2 CHPs (1.2MWe and 1.6MWe) installed in our Excel Energy Centre, there is also additional space in it for the installation of future plant which should be sufficient to meet the heat load for the development. Additionally, we are exploring new locations, energy centres on potential customer's site to install low carbon plant i.e. Heat pumps further CHPs and also addition of Thermal stores to decarbonise our network and also add resilience to it."

They should provide the original correspondence to confirm this.

This item is outstanding.

Applicant Rev 02 response:

BH Response: Original correspondence included in attachment "ENGIE_TSW Queries_REDACTED"

2.14 Paragraph 24 and 25 – Carbon factors and timescales of ENGIE's network

24. The applicant has provided some correspondence from ENGIE, and suggests the CO2 emissions factor would be 0.135kgCO2/kWh including residential distribution or 0.114 for non-domestic, but further information is required from them. The correspondence provided from ENGIE must include confirmation or otherwise that the network has the capacity to serve the new development, together with supporting estimates of the CO2 emission factor, installation cost, timescales for connection.

25. In order for it to be acceptable to use the SAP 2012 carbon factors, the applicant is required to provide details from ENGIE on their future plans to decarbonise the Excel heat network.

ENGIE has provided the following information in their response to BuroHappold:

2.14.1 Network Capacity

Response from ENGIE:

"We have quite a bit of heating capacity available in our Energy centre presently and the ability to install more plant in there should we feel more plant capacity is required. Installation cost are high level only at this stage for the connection of Thames Side West development, however based on the limited due diligence we have carried out to date we feel that connection to Thames Side West is commercially viable and the connection programme for the Thames Side West development achievable. More work needs to be done to understand the connection cost in more detail and this will be progressed in future stages of the project."

2.14.2 CO2 emission factors

Response from Engie:

"ENGIE is the UK's leading district heating solutions provider and providing low carbon heat, cooling and power to our customers across the UK. As we grow our Excel District Energy scheme, we are committed to investing in solutions which deliver the carbon savings and low cost energy bills required by our customers, ensuring that our proportion of renewable / low carbon heat remains high. To achieve this we are exploring the potential installation of further low carbon plant i.e. Heatpumps, CHPs and Thermal stores etc on potential customer site and elsewhere to benefit not just them but the wider EDEC scheme."

The following carbon emissions factors were provided by ENGIE within the initial draft of their consumer services proposal.

ENGIE

Carbon Emissions

The below table captures the carbon intensity factors for the supply of heating from our Excel District Energy Centre and the assumptions behind it:

Heat Split	Full Consumer Services	Bulk Supply	Units	Notes
Proportion of heat from gas boilers	20.0%	20.0%		Operational Assumption
Proportion of heat from CHP	80.0%	80.0%		Operational Assumption
Heat losses (% of heat generated)				
Primary Heat losses % of heat generated	5.0%	5.0%		Assumption
Secondary Heat losses % of heat supplied to secondary network	15.0%	0.0%		Assumption
Total Heat losses % of heat generated	19.3%	5.0%		Total loss from generator to customer meter
Distribution loss factor	1.238	1.053		Required input to SAP = 1/(1-%heat loss)
Generator and network efficiencies				
Energy Centre Gas Boiler Efficiency	82.00%	82.00%		Real operational data
Energy Centre CHP Thermal Efficiency	37.53%	37.53%		
Energy Centre CHP Electrical Efficiency	37.03%	37.03%		Based on HHV values
Parasitic' electricity factor	0.010	0.010		
Carbon emission factors				
Mains Gas	0.216	0.216	$kgCO_2/kWh$	Part L 2013 SAP 2012 - This is to be used until SAP 2016 comes along
Grid Supplied Electricity	0.519	0.519	$kgCO_2/kWh$	Part L 2013 SAP 2012 - This is to be used until SAP 2016 comes along
Grid Displaced Electricity	-0.519	-0.519	$kgCO_2/kWh$	Part L 2013 SAP 2012 - This is to be used until SAP 2016 comes along
Total Emission Factor per Unit of Heat ($kgCO_2/kWh$)	**0.135**	**0.114**	**$kgCO_2/kWh$**	

The heat from our Excel District Energy Centre will result in almost 50% carbon savings against a gas boiler (assuming bulk supply). This will help the developer comply with the requirements for the planning process and would be expected to offset costs associated with photovoltaics and fabric efficiency etc.

Installation Cost

This cannot be provided as it is commercially sensitive and part of a negotiation between the applicant and ENGIE.

2.14.3 Timescales for connection

Based on reports provided by ENGIE, extract below, it is proposed that if connection agreed for heating Phase 1, DHN infrastructure will be in place prior to the Heat on Date of 2022 of Development Phase 1.

Heat On Date	Development Phase	Heating Phase	Units
2022	1	1	440
2023	2	1	540
2024	3	1	487
2025	4	2	343
2026	5	2	608
2027	6	2	499
2028	7	3	474
2029	8	3	298
2030	9	3	580
2031	10	4	462
2032	11	4	508
2033	12	4	396
		Total	5,635

2.14.4 Future network decarbonisation

BuroHappold have worked with ENGIE to determine the future plans to decarbonise the heat network. While it is uncertain what technologies will replace existing gas boiler and CHP capacity within the ExCel energy centre, the proposal for consumer services received from ENGIE assumes the eventual adoption of the on-site energy centre which utilises low carbon heating technologies. Negotiations are ongoing between ENGIE and the developer on these matters. An extract from the consumer services proposal is shown below outlining the strategy.

> **Connection Charges and Adoption Fee**
>
> Connection Charge is an initial payment which the developer is required to make to ENGIE (Energy Company). This contribution assists us with the extension of the network to connect to the development. This Connection Charge is set in such a way that it offers a saving against an alternative onsite energy system that the developer would otherwise need to install, this could include CHP, gas boilers etc. Connection Charge has been based on the prorated cost provided by the Buro Happold for a temporary Energy Centre for Phase 1 with a 10% discount applied to it.
>
> It has been assumed that the district heating connection to the development would be for phase 1 only and for the future phases developer will be building an energy centre onsite which the ENGIE would adopt by paying an Adoption Fee to the developer. The Adoption Fee is based on the prorated cost for the energy centre required for future phases as provided by Buro Happold. These costs are captured in the later part of the proposal.

GLA Revision 01 response:

The applicant has received the following confirmation from ENGIE on network capacity and installation cost:

"We have quite a bit of heating capacity available in our Energy centre presently and the ability to install more plant in there should we feel more plant capacity is required. Installation cost are high level only at this stage for the connection of Thames Side West development, however based on the limited due diligence we have carried out to date we feel that connection to Thames Side West is commercially viable and the connection programme for the Thames Side West development achievable. More work needs to be done to understand the connection cost in more detail and this will be progressed in future stages of the project."

The applicant has received the following confirmation from ENGIE on CO_2 emissions factor, alongside a calculation table:

"ENGIE is the UK's leading district heating solutions provider and providing low carbon heat, cooling and power to our customers across the UK. As we grow our Excel District Energy scheme, we are committed to investing in solutions which deliver the carbon savings and low cost energy bills required by our customers, ensuring that our proportion of renewable / low carbon heat remains high. To achieve this we are exploring the potential installation of further low carbon plant i.e. Heatpumps, CHPs and Thermal stores etc on potential customer site and elsewhere to benefit not just them but the wider EDEC scheme."

The applicant has provided confirmation from ENGIE that if connection is agreed for heating Phase 1, DHN infrastructure will be in place prior to the Heat on Date of 2022 of Development Phase 1.

Regarding network decarbonisation, the applicant has discussed with ENGIE the future plans to decarbonise the heat network. They suggest that it is uncertain what technologies will replace existing gas boiler and CHP capacity within the ExCel energy centre, but the proposal for consumer services received from ENGIE assumes the eventual adoption of the on-site energy centre which utilises low carbon heating technologies. They confirm that negotiations are ongoing between ENGIE and the applicant, but provide an extract from the consumer services proposal which supports this.

The applicant should provide the original correspondence from ENGIE to support all points previously raised, and should continue to pursue the connection.

Applicant Rev 02 response:

BH Response: ENGIE are yet to commit to a low carbon alternative technology for future provision of heat. While the consumer services proposal currently assumed heat pumps, an extract from the consumer services proposal is shown below which highlights the uncertainties around future RHI availability which may be required to make such technologies commercially viable:

> The above plant operational mix has been used for the financial modelling, this was provided by Buro Happold and it allows the client to be able to comply with the present and future building regs. It should also be noted that there is quite a bit of uncertainty around Renewable Heat Incentives and this could have an impact on how the heat pumps are operated.

Original correspondence included in attachment "ENGIE_TSW Queries_REDACTED"

2.15 Paragraph 26, 27, 28 & 29– Connection to the ENGIE network

26. The applicant proposes to use 'Reasonable endeavours' for connection to the ENGIE network, and to be conditioned to further investigate connection to the network prior to material start on site of development phase 1. However, this further investigation should be provided at this stage. If the connection is not possible, the applicant proposes to use gas boilers for Phases 1-3, until the on-site energy centre is delivered for occupation of development phase 4, in approximately 2024 and Phases 1-3 can be connected. A condition would be required to secure this connection.

27. However, the applicant should review the feasibility of providing an on-site low carbon solution for Phases 1-3 as an alternative to the gas boiler temporary option; this could later be incorporated into the site wide heat network serving all phases.

28. The applicant should provide a commitment to ensure that the development is designed to allow future connection to a district heating network. Drawings demonstrating how the site is to be future-proofed for a connection to a district heating network should be provided; these should include space provision for heat exchangers in the plant room, isolation valves, safe-guarded pipe route to the site boundary etc. Plant room layouts should be provided for the Phase 1 and 2/3 boiler rooms and show space for these features.

29. The applicant is proposing to install a site-wide heat network for Phase 1 (detailed) and this should be extended to outline Phases 2 and 3. However, the applicant should confirm that all apartments and non-domestic building uses will be connected to the site-wide heat network.

2.15.1 Further investigation

A connection to the ENGIE energy centre has, thus far, been deemed technically feasible by ENGIE and a commercial offer of connection has been presented with the assumption that ENGIE would eventually adopt the main site energy centre and the resulting network. However, a competitive tendering process will likely be required in order to determine the most suitable ESCo to design / build / adopt the main site wide energy centre.

Additionally discussions have since been held with Paul Creed and Alex Hobley of the GLA as well as ENGIE to facilitate a longer term low carbon heat network in the Royal Docks area as a whole. This process is on-going.

2.15.2 On-site low carbon solution for Phases 1-3

Development within phases 1-3 have progressed on the basis of securing a connection to the Excel network. Temporary boiler plant has been presented as backup option until low carbon heat from the main energy centre can be supplied. In

the event that connection to the ExCel network is no longer feasible for Phase 1 then low carbon alternatives for supply of heat will be taken from the On-site energy centre. This strategy has been proposed to limit the number of long term energy centres on the site to one, in line with GLA guidance.

2.15.3 Phase 1 futureproofing

The development has been futureproofed in order to facilitate connection to a district heating network. The drawings below indicate the space provision for plant within phase 1 plant room, including plate heat exchangers as well as a safe guarded pipe route to the site boundary. Both domestic and non-domestic buildings shall be connected to the network. Phase 2 and 3 are currently in the outline design stages so no detailed layouts are available, however an indicative layout is provide in section 8.7.3 of the original report.

Figure 2—14 Detailed plant room layout and DHN connection routing for Phase 1

GLA Revision 01 response:

The applicant has confirmed that connection to the ENGIE energy centre has been deemed technically feasible by ENGIE and a commercial offer of connection has been presented with the assumption that ENGIE would eventually adopt the main site energy centre and the resulting network. However, they propose to undertake a competitive tendering process in order to determine the most suitable ESCo to design / build / adopt the main site wide energy centre. The applicant should consider that the submission has been made on the basis of connection to the ENGIE network, and they now have a connection offer from ENGIE. This suggests that ENGIE are ready to commit to the connection at the present stage. The applicant should outline the issues that are currently stopping them from taking up the connection offer and securing the proposed energy strategy. They should also explore the option of solely agreeing to connect to the ENGIE network, rather than for the agreement to cover both the connection and also future adoption of the main site energy centre.

They also refer to discussions being held with Paul Creed and Alex Hobley of the GLA as well as ENGIE to facilitate a longer term low carbon heat network in the Royal Docks area as a whole, which is an ongoing process. This is welcomed.

Applicant Rev 02 response:

BH Response: The option of connecting to the ENGIE network is still being explored as the preferred option. Current issues with an agreement being secured include:

1) ENGIE are yet to commit to a low carbon alternative technology for future provision of heat. While the consumer services proposal currently assumed heat pumps, an extract from the consumer services proposal is shown below which highlights the uncertainties around future RHI availability which may be required to make such technologies commercially viable:

> The above plant operational mix has been used for the financial modelling, this was provided by Buro Happold and it allows the client to be able to comply with the present and future building regs. It should also be noted that there is quite a bit of uncertainty around Renewable Heat Incentives and this could have an impact on how the heat pumps are operated.

2) Commercial aspects of the consumer services proposal as still being negotiated between ENGIE and the developer
3) As noted above, there is a wider piece around a Royal Docks wide network that is currently being driven by the GLA, this shall require careful planning and strategic oversight to ensure that optimal long term solutions are in place rather than piecemeal connections.
4) There are obvious commercial advantages to a competitive tender amongst differing ESCOs to adopt an site energy centre rather than allowing ENGIE to adopt without this.

27. However, the applicant should review the feasibility of providing an on-site low carbon solution for Phases 1-3 as an alternative to the gas boiler temporary option; this could later be incorporated into the site wide heat network serving all phases.

GLA Revision 01 response:

The applicant has confirmed that the development within phases 1-3 have progressed on the basis of securing a connection to the Excel network, with temporary boiler plant as a backup option until low carbon heat from the main energy centre can be supplied. They suggest that in the event that connection to the ExCel network is no longer feasible for Phase 1 then low carbon alternatives for supply of heat will be taken from the on-site energy centre, which is a strategy that seeks to limit the number of long term energy centres on the site to one. The aim to limit the number of on-site energy centres to one is welcomed, however, there are two aspects of the proposals which are currently not secure. Firstly, the connection to the ENGIE network is not secured as per item 26, and secondly, the backup option relies on the outline phases coming forward as per the programme, which is also not secure. Therefore, at present there is the possibility that the connection to the Excel network is not made, and the outline phases do not come forward, and that Phases 1-3 are only served by gas boilers. The applicant should now consider the outline feasibility of later implementing an on-site low carbon solution for Phases 1-3, should this situation arise. The applicant should be conditioned to implement a future on-site solution for Phases 1-3 in the event that connection to the Excel network is not made and outline phases 4-12 do not come forward in a suitable timescale to be agreed.

Applicant Rev 02 response:

BH Response: This could be conditioned and form part of the energy panel reviews. We suggest that a condition is made that 5 years after occupancy of phases 1-3, if phases 4-12 are yet to come forward then a low carbon on site energy centre shall be provided for phases 1-3.

2.16 Paragraph 34 & 35 – Green emissions update

34. The applicant has proposed GSHPs for the Energy Centre supplying Phases 4-12. These should be included under the Be Green rather than Be Clean element of the energy hierarchy.

35. The applicant should revise their reported carbon figures as per item 5, and demonstrate the CO_2 emissions saving that will be achieved through this third element of the energy hierarchy.

The applicant has updated the carbon emissions for all phases and has provided these within Section 2.19 Paragraph 38, 40, 42 & 45 and Section 2.20 Paragraph 46, 48 & 50 – Non-residential energy hierarchy of this report.

2.17 Paragraph 36 – Heat pump feasibility

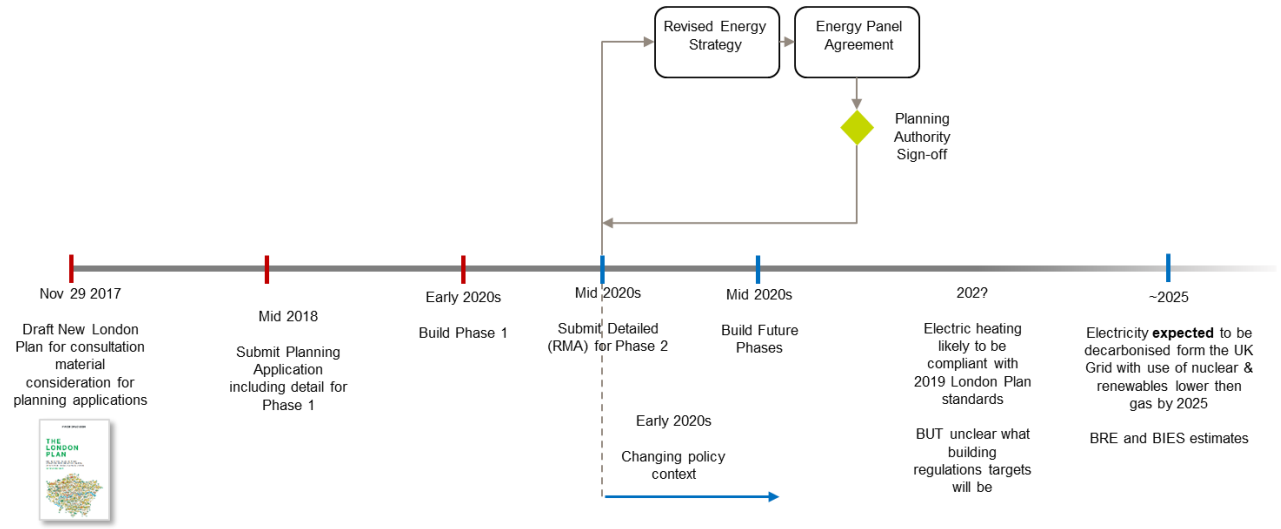
36. Centralised GSHPs are being proposed for the outline energy centre supplying Phases 4-12. It is estimated that the heat pumps will have an output capacity of 3x 1MW, a Seasonal Performance Factor of 4, and that they would serve 60% of the heat demand. Flow and return temperatures are anticipated to be 35-65°C. Heat network losses are estimated at 30%, and the carbon factor of the heat is estimated to drop from 0.235kgCO_2/kWh with SAP 2012 carbon emissions factors to 0.155 kgCO_2/kWh when using BRE's estimated 2025 carbon emissions factors. Further information on the heat pumps should be provided at time of the reserved matters application, but the applicant should endeavour to continue to investigate the detailed feasibility for the GSHPs before then.

2.17.1 GSHP Feasibility

Burohappold agree that the feasibility for GSHP's should continue to be investigated. As such an energy panel approach proposed. Quoted text from the initial planning application is shown below:

"The 'Energy Panel' consisting of the Developer, London Borough of Newham, the GLA and the heat network provider will review the energy strategy as it progresses. The panel's role would be to review the energy strategy post occupancy and consider the energy options of future phases with clarity on the grid carbon factors, allowing for the best approach to achieve the delivered heat of ≤ 0.160 kg CO_2/kWh at the point of use. The Panel will convene at each RMA."

"It is also proposed that an 'Energy Panel' is set up including the Developer, London Borough of Newham, the GLA and the heat network provider to review the energy strategy as it progresses. The panel's role would be to review the energy strategy post occupancy and consider the energy options of future phases with clarity on the grid carbon factors, allowing for the lowest carbon options to be implemented. The Panel will convene at each RMA."



Energy review panel proposal process

2.18 Paragraph 37 – Maximising and optimising solar PV across the masterplan

37. 25kWp of PV is being proposed for Phase 1, and 197kWp is proposed for the Phases 2-12 as included in the outline application. The applicant should confirm the proposed net PV areas. It appears that there might be additional space available for PV. A detailed roof layout should be provided demonstrating that the roof's potential for a PV installation has been maximised; they should outline the solar insolation and any other constraints. The applicant is required to maximise the on-site savings from renewable energy technologies, regardless of the London Plan targets having been met, and therefore the PV proposals should be reviewed.

2.18.1 Maximising Potential

As requested, we have outlined the predicted solar insolation for Phase 1, 2 and 3. Varying heights and contexts of buildings differentiates the insolation for each roof, have led to the conclusion that some areas would not be appropriate for solar energy harvesting (see Figure 2—15). We have maximised the potential where we think appropriate.

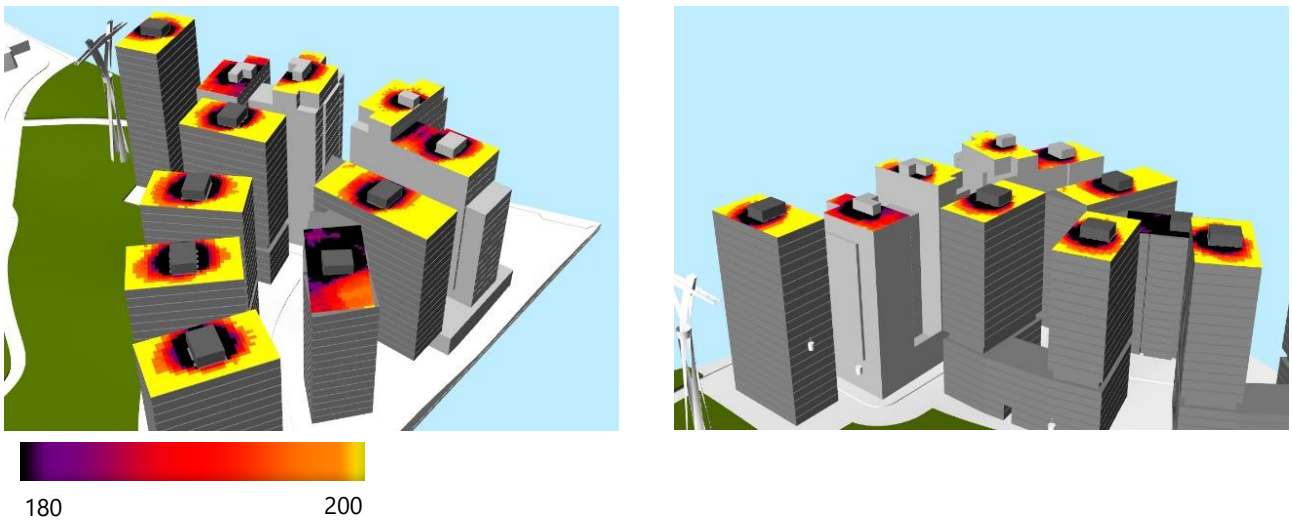


Figure 2—15 solar insolation displayed on Phase 1, 2 and 3, showing that different building heights and contexts affect the potential for solar energy harvesting

2.18.2 Resulting Solar PV areas

The suggested PV placement is generated by a computer optimisation based on angle, spacing, tilt and direction. This is done in order to ensure that all the suggested PV panels are highly performing, and to maximise the energy output for each roof throughout the day. Figure 2—16 shows that the applicant could increase the amount of PV panels across the

roofs, but also that not all panels would be working efficiently, which could potentially affect the overall performance negatively. Figure 2—17 shows the detailed roof layout as suggested by the computer optimisation.

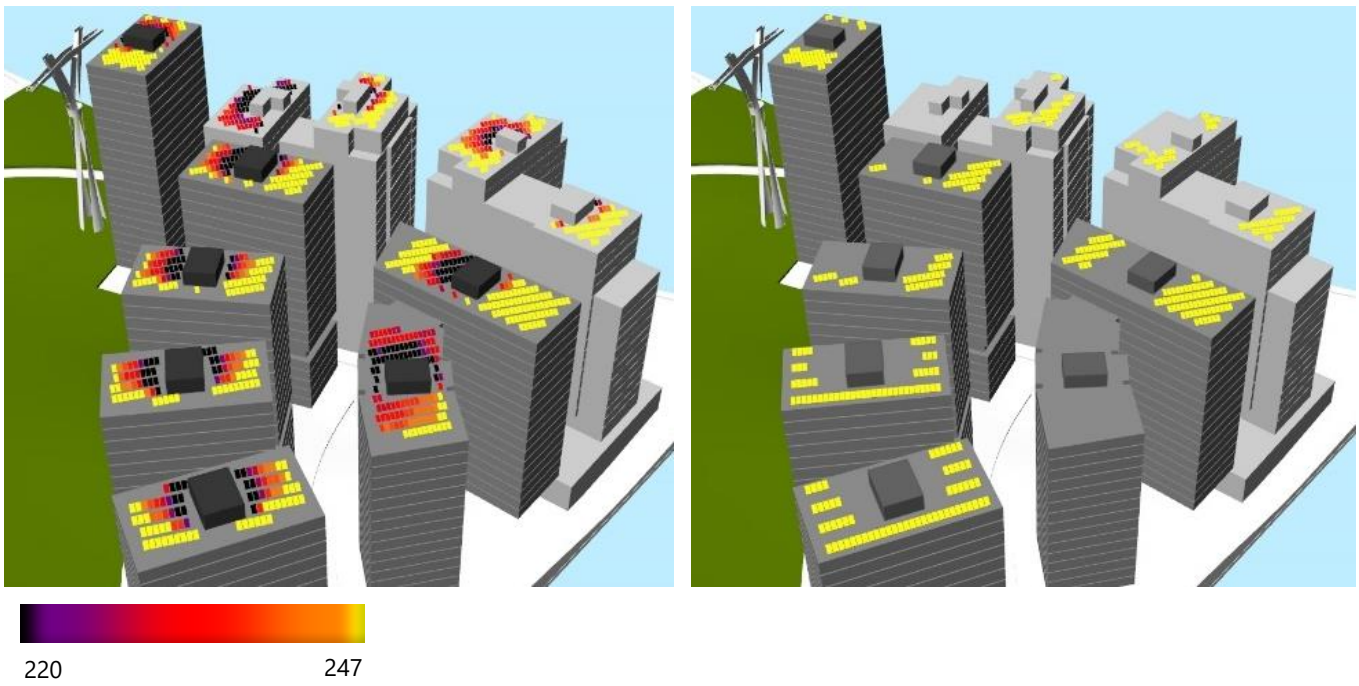


Figure 2—16 PV setup shows why certain locations have been favoured and a setup where all panels are high performing

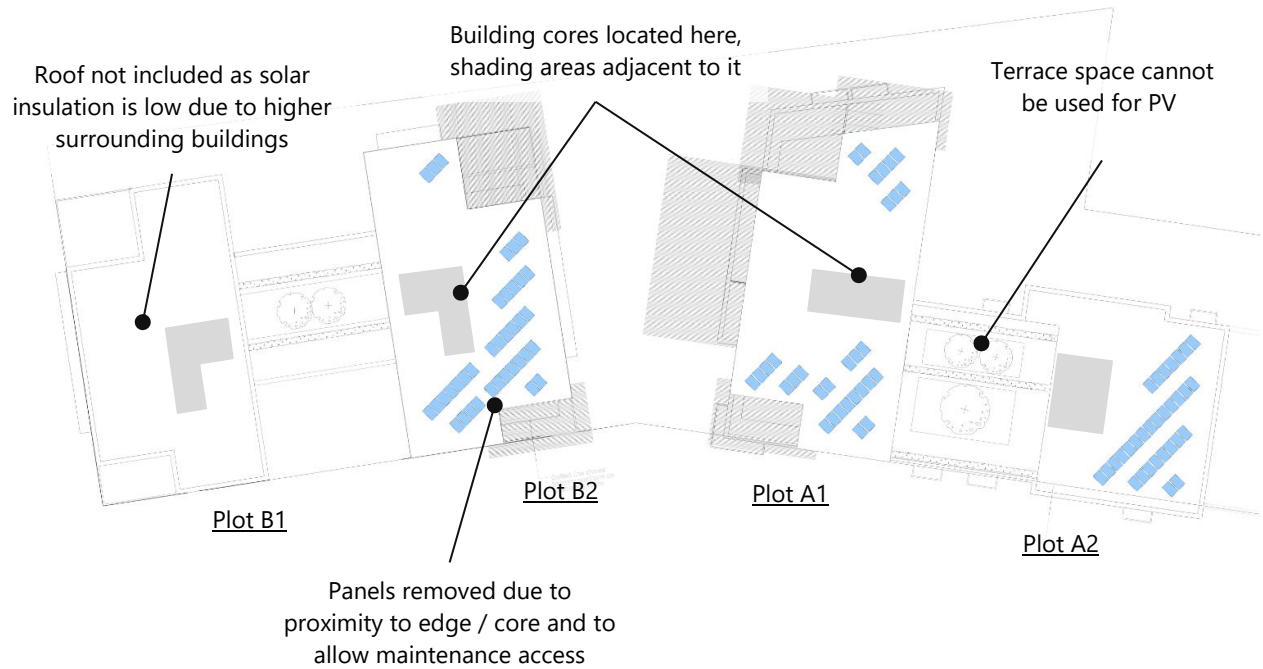


Figure 2—17 the detailed PV layout for the roofs of plots A and B as based on the optimisation

Table 2—7 Specifications for panels over plot A and B

Development Phase	kWh produced per roof (kWh/yr)	kWp per roof	No of panels	Average kWh/kWp	Total PV Area
A1	7,912	4.65	31	1,021	44.6 m^2

A2	8,009	4.65	31	1,033	44.6 m^2
B1	-	-	-	-	-
B2	9,483	5.55	37	1,025	53.3 m^2
Total	**25,404**	**14.85**	**99**		**142.5 m^2**

GLA Revision 01 response:

The applicant has outlined the predicted solar insolation for Phase 1, 2 and 3, and they suggest that varying heights and contexts of buildings differentiates the insolation for each roof and that some areas would not be appropriate for PV, but they believe have maximised the potential where they think appropriate. The applicant has sought to place PV panels in positions that are optimal, as when not all panels are working efficiently this can negatively impact the overall performance. The exercise conducted is welcomed, however the applicant should consider the potential for additional PV and the use of power optimisers that allow panels to function well even when part of an array is shaded.

Applicant Rev 02 response:

The solar PV panels on Plot B1 have been reviewed and panels have been added as requested by the GLA. Figure 2—18 and Table 2—8shows the addition of 8 kWp of panels. The final performance and design of these panels and whether or not power optimisers are required will be developed through detailed design with a Solar PV contractor.

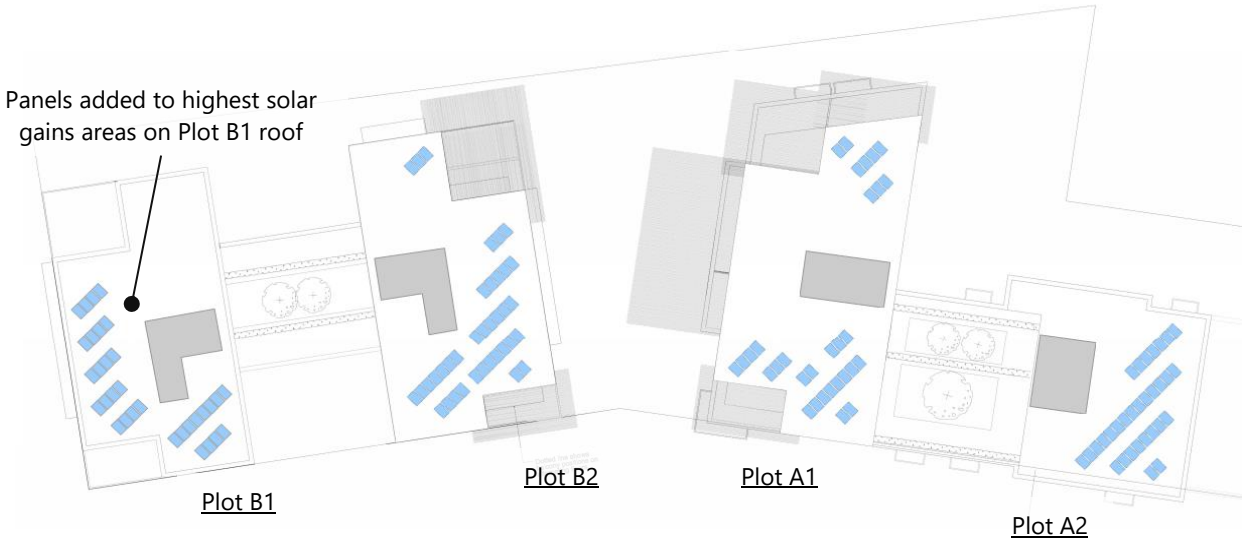


Figure 2—18 the detailed PV layout for the roofs of plots A and B as based on the optimisation

Table 2—8 Specifications for panels over plot A and B

Development Phase	kWh produced per roof (kWh/yr)	kWp per roof	No of panels	Average kWh/kWp	Total PV Area
A1	7,912	7.75	31	1,021	44.6
A2	8,009	7.75	31	1,033	44.6
B1	**6,400**	**8**	**32**	**800**	**46**
B2	9,483	9.25	37	1,025	53.3
Total	31,804	33	131	-	189

2.19 Paragraph 38, 40, 42 & 45 – Residential energy hierarchy

2.19.1 Residential carbon emission under Part L 2013

Table: Residential CO2 emission reductions from application of the energy hierarchy – Detailed Phase 1 (Part L 2013)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baselinei.e.2013BuildingRegulations	475		
`Energy Efficiency	425	49	10%
CHP	273	152	32%
Renewable energy	254	19	4%
Total		220	46%

38. The applicant should revise their reported carbon figures as per item 5, and demonstrate the on-site CO2 emissions saving that will be achieved for the domestic element.

Table: Residential CO2 emission reductions from application of the energy hierarchy – Outline Phases 2 & 3 (Part L 2013)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baselinei.e.2013BuildingRegulations	990		
Energy Efficiency	893	97	10%
CHP	613	280	28%
Renewable energy	583	30	3%
Total		407	41%

40. The applicant should revise their reported carbon figures as per item 5, and demonstrate the on-site CO2 emissions saving that will be achieved for the domestic element.

Table: Residential CO2 emission reductions from application of the energy hierarchy – Outline Phases 4-12 (Part L 2013)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baselinei.e.2013BuildingRegulations	3,245		
Energy Efficiency	2,927	319	10%
CHP	2,966	-39	-1%
Renewable energy	2,821	145	4%
Total		424	13%

42. The applicant should revise their reported carbon figures as per item 5, and demonstrate the on-site CO2 emissions saving that will be achieved for the domestic element.

45. The applicant is required to confirm either the amount of funding that will be paid into the borough's carbon offset fund or that an agreement has been reached with the borough that the applicant will undertake a carbon reduction project off-

site to meet the shortfall. In both cases evidence of correspondence with the borough confirming the approach should be provided.

2.19.2 Residential carbon emission under SAP 10

Table: Residential CO2 emission reductions from application of the energy hierarchy – Detailed Phase 1 (SAP 10)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baseline i.e.SAP 10	415		
Energy Efficiency	360	55	13%
CHP	588	-228	-55%
Renewable energy	580	9	2%
Total		-164	-40%

38. The applicant should revise their reported carbon figures as per item 5, and demonstrate the on-site CO2 emissions saving that will be achieved for the domestic element.

Table: Residential CO2 emission reductions from application of the energy hierarchy – Outline Phases 2 & 3 (SAP 10)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baseline i.e.SAP 10	864		
Energy Efficiency	757	107	12%
CHP	1,256	-499	-58%
Renewable energy	1,243	14	2%
Total		-379	-44%

40. The applicant should revise their reported carbon figures as per item 5, and demonstrate the on-site CO2 emissions saving that will be achieved for the domestic element.

Table: Residential CO2 emission reductions from application of the energy hierarchy – Outline Phases 4-12 (SAP 10)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baseline i.e.SAP 10	2,832		
Energy Efficiency	2,482	351	12%
CHP	2,444	38	1%
Renewable energy	1,845	599	21%
Total		988	35%

42. The applicant should revise their reported carbon figures as per item 5, and demonstrate the on-site CO2 emissions saving that will be achieved for the domestic element.

45. The applicant is required to confirm either the amount of funding that will be paid into the borough's carbon offset fund or that an agreement has been reached with the borough that the applicant will undertake a carbon reduction project off-site to meet the shortfall. In both cases evidence of correspondence with the borough confirming the approach should be provided.

Table 2—9 outlines the expected carbon offset payment to the London Borough of Newham.

Table 2—9 Expected zero carbon cash in lieu payment quantum for Phase 1, 2 & 3 and 4-12

Element	Typology	CO_2 offset required (1 year)	Cumulative savings for off-set payment (30 years)	Equivalent offset payment to LBN
Phase 1 (Using Part L 2013)	Residential	254	7,631	£457,873
	Non-residential	3	96	£5,756
Outline Phases 2 & 3 (Using Part L 2013)	Residential	583	17,490	£1,049,400
	Non-residential	18	540	£32,400
Outline Phases 4-12 (Using Part L at the time of RMA)	Residential	1,698	50,942	£3,056,492
	Non-residential	240	7,212	£432,695

The applicant should provide correspondence from the borough confirming agreement with these figures.

2.20 Paragraph 46, 48 & 50 – Non-residential energy hierarchy

Based on the energy assessment submitted at stage I, the tables below show the residual CO2 emissions after each stage of the energy hierarchy and the CO2 emission reductions at each stage of the energy hierarchy for the non-domestic buildings

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2.20.1 Non-residential carbon emission under Part L 2013

Table: Non-residential CO2 emission reductions from application of the energy hierarchy – Detailed Phase 1 (Part L 2013)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baselinei.e.2013BuildingRegulations	99		
Energy Efficiency	72	28	28%
CHP	68	4	4%
Renewable energy	68	0	0%
Total		32	32%

The carbon dioxide savings (based on SAP 2012) fall short of the on-site target set within Policy 5.2 of the London Plan. While it is accepted that there is little further potential for carbon dioxide reductions onsite, in liaison with the borough the developer should ensure the short fall in carbon dioxide reductions, equivalent to 32 tonnes of CO_2 per annum, is met off-site.

46. The applicant should revise their reported carbon figures as per item 5, and demonstrate the on-site CO2 emissions saving that will be achieved for the non- domestic element.

Table: Non-residential CO2 emission reductions from application of the energy hierarchy – Outline Phases 2 & 3 (Part L 2013)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baselinei.e.2013BuildingRegulations	26		
Energy Efficiency	18	7.7	29.9%
CHP	18	0.6	2.2%
Renewable energy	18	0.0	0.0%
Total		8.3	32.1%

The carbon dioxide savings (based on SAP 2012) fall short of the on-site target set within Policy 5.2 of the London Plan. While it is accepted that there is little further potential for carbon dioxide reductions onsite, in liaison with the borough the developer should ensure the short fall in carbon dioxide reductions, equivalent to 8.3 tonnes of CO_2 per annum, is met off-site.

48. The applicant should revise their reported carbon figures as per item 5, and demonstrate the on-site CO2 emissions saving that will be achieved for the non- domestic element.

Table: Non-residential CO2 emission reductions from application of the energy hierarchy – Outline Phases 4-12 (Part L 2013)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baselinei.e.2013BuildingRegulations	839		
Energy Efficiency	614	224.7	26.8%
CHP	615	-0.9	-0.1%
Renewable energy	613	1.7	0.2%
Total		225.5	26.9%

50. The applicant should revise their reported carbon figures as per item 5, and demonstrate the on-site CO2 emissions saving that will be achieved for the non- domestic element.

2.21 Non-residential carbon emission under SAP 10

Based on the energy assessment submitted at stage I, the tables below show the residual CO2 emissions after each stage of the energy hierarchy and the CO2 emission reductions at each stage of the energy hierarchy for the non-domestic buildings.

Table: Non-residential CO2 emission reductions from application of the energy hierarchy – Outline Phases 4-12 (SAP 10)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baseline i.e.SAP 10	47		
Energy Efficiency	34	13	27%
CHP	30	4	8%
Renewable energy	30	0	0%
Total		17	35%

46. The applicant should revise their reported carbon figures as per item 5, and demonstrate the on-site CO2 emissions saving that will be achieved for the non- domestic element.

Table: Non-residential CO2 emission reductions from application of the energy hierarchy – Outline Phases 4-12 (SAP 10)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baseline i.e.SAP 10	13		
Energy Efficiency	9	3.8	29.7%
CHP	10	-1.0	-8.2%
Renewable energy	10	0.0	0.0%
Total		2.7	21.5%

48. The applicant should revise their reported carbon figures as per item 5, and demonstrate the on-site CO2 emissions saving that will be achieved for the non- domestic element.

Table: Non-residential CO2 emission reductions from application of the energy hierarchy – Outline Phases 4-12 (SAP 10)

	Total residual regulated CO_2 emissions	Regulated CO_2 emissions reductions	
	(tonnes per annum)	(tonnes per annum)	(per cent)
Baseline i.e.SAP 10	410		
Energy Efficiency	303	107.1	26.1%
CHP	302	0.9	0.2%
Renewable energy	289	13.1	3.2%
Total		121.1	29.5%

The carbon dioxide savings (based on SAP 10) fall short of the on-site target set within Policy 5.2 of the London Plan. While it is accepted that there is little further potential for carbon dioxide reductions onsite, in liaison with the borough the developer should ensure the short fall in carbon dioxide reductions, equivalent to 121 tonnes of CO_2 per annum, is met off-site.

50. The applicant should revise their reported carbon figures as per item 5, and demonstrate the on-site CO2 emissions saving that will be achieved for the non- domestic element.

3 GLA responses to Rev 02 (written in June 2019)

This section address the GLA Energy Comments outlined in an email Titles" FW: 4039c Thameside West Post stage 1 energy comments"

3.1 Correspondence with ENGIE

23. The applicant has identified the Excel energy centre and district heating network within the vicinity of the development and is proposing to connect to the network for Phase 1 (the detailed application) and Phases 2 and 3 (part of the outline application). Connection to the network should continue to be prioritised. It is suggested by the applicant that the network operator (ENGIE) has confirmed that the energy centre could be expanded to meet the peak demand of the full site, although there are no plans or permission to do this currently; correspondence from ENGIE should be provided confirming this. Outline Phases 4-12 would then be served by an on-site energy centre. The network serving Phases 1-3 should be futureproofed so that the on-site energy centre and network for Phases 4-12 can be connected to it, creating a single network.

The applicant has confirmed that they have received the following response from ENGIE:

"We presently have 3 x 6 MW Gas boilers and 2 CHPs (1.2MWe and 1.6MWe) installed in our Excel Energy Centre, there is also additional space in it for the installation of future plant which should be sufficient to meet the heat load for the development. Additionally, we are exploring new locations, energy centres on potential customer's site to install low carbon plant i.e. Heat pumps further CHPs and also addition of Thermal stores to decarbonise our network and also add resilience to it."

They should provide the original correspondence to confirm this.

The applicant has suggested that this is supplied in an attachment called "ENGIE_TSW Queries_REDACTED", however this has not been received. They should submit the attachment for review.

This item is outstanding.

24. The applicant has provided some correspondence from ENGIE, and suggests the CO2 emissions factor would be 0.135kgCO2/kWh including residential distribution or 0.114 for non-domestic, but further information is required from them. The correspondence provided from ENGIE must include confirmation or otherwise that the network has the capacity to serve the new development, together with supporting estimates of the CO2 emission factor, installation cost, timescales for connection.

& 25. In order for it to be acceptable to use the SAP 2012 carbon factors, the applicant is required to provide details from ENGIE on their future plans to decarbonise the Excel heat network.

The applicant has received the following confirmation from ENGIE on network capacity and installation cost:

"We have quite a bit of heating capacity available in our Energy centre presently and the ability to install more plant in there should we feel more plant capacity is required. Installation cost are high level only at this stage for the connection of Thames Side West development, however based on the limited due diligence we have carried out to date we feel that connection to Thames Side West is commercially viable and the connection programme for the Thames Side West development achievable. More work needs to be done to understand the connection cost in more detail and this will be progressed in future stages of the project."

The applicant has received the following confirmation from ENGIE on CO_2 emissions factor, alongside a calculation table:

"ENGIE is the UK's leading district heating solutions provider and providing low carbon heat, cooling and power to our customers across the UK. As we grow our Excel District Energy scheme, we are committed to investing in solutions which deliver the carbon savings and low cost energy bills required by our customers, ensuring that our proportion of renewable / low carbon heat remains high. To achieve this we are exploring the potential installation of further low carbon plant i.e. Heatpumps, CHPs and Thermal stores etc on potential customer site and elsewhere to benefit not just them but the wider EDEC scheme."

The applicant has provided confirmation from ENGIE that if connection is agreed for heating Phase 1, DHN infrastructure will be in place prior to the Heat on Date of 2022 of Development Phase 1.

Regarding network decarbonisation, the applicant has discussed with ENGIE the future plans to decarbonise the heat network. They suggest that it is uncertain what technologies will replace existing gas boiler and CHP capacity within the ExCel energy centre, but the proposal for consumer services received from ENGIE assumes the eventual adoption of the on-site energy centre which utilises low carbon heating technologies. They confirm that negotiations are ongoing between ENGIE and the applicant, but provide an extract from the consumer services proposal which supports this.

The applicant should provide the original correspondence from ENGIE to support all points previously raised, and should continue to pursue the connection.

The applicant has confirmed that ENGIE are yet to commit to a low carbon alternative technology for future provision of heat, and that while the consumer services proposal currently assumed heat pumps, an extract from the consumer services proposal highlights the uncertainties around future RHI availability which may impact on viability. The applicant has suggested that the original correspondence is supplied in an attachment called "ENGIE_TSW Queries_REDACTED", however this has not been received. They should submit the attachment for review.

This item is outstanding.

3.1.1 Applicant Response

This is now appended to this statement in Appendix D Evidence of communication with ENGIE.

3.2 Solar PV

37. 25 kWp of PV is being proposed for Phase 1, and 197 kWp is proposed for the Phases 2-12 as included in the outline application. The applicant should confirm the proposed net PV areas. It appears that there might be additional space available for PV. A detailed roof layout should be provided demonstrating that the roof's potential for a PV installation has been maximised; they should outline the solar insolation and any other constraints. The applicant is required to maximise the on-site savings from renewable energy technologies, regardless of the London Plan targets having been met, and therefore the PV proposals should be reviewed.

The applicant has outlined the predicted solar insolation for Phase 1, 2 and 3, and they suggest that varying heights and contexts of buildings differentiates the insolation for each roof and that some areas would not be appropriate for PV, but they believe have maximised the potential where they think appropriate. The applicant has sought to place PV panels in positions that are optimal, as panels when not all panels are working efficiently this can negatively impact the overall performance. The exercise conducted is welcomed, however the applicant should consider the potential for additional PV and the use of power optimisers that allow panels to function well even when part of an array is shaded.

The applicant has reviewed the solar PV panels on Plot B1 and propose an additional 8 kWp of panels. They suggest that the final performance and design of these panels and whether or not power optimisers are required will be developed through detailed design with a Solar PV contractor. ***They should be conditioned*** *to submit a PV review document to the borough and GLA for approval prior to occupation; this should demonstrate that the potential for PV has been maximised.*

The applicant should confirm the revised Be Green CO_2 emissions for detailed Phase 1 element using SAP 2012 and SAP 10 emissions.

This item is outstanding.

3.2.1 Applicant Response

It can be confirmed that the maximised Solar PV allowance is included in the previously issued Be Green CO2 emissions for detailed Phase 1 element using SAP 2012 and SAP 10 emissions.

3.3 Offsetting agreements

44. The domestic buildings are required to meet the zero carbon target as the application was received by the Major on or after the 1st October 2016. The applicant should therefore ensure that the remaining regulated CO2 emissions are met through a contribution to the borough's offset fund, at this stage for the detailed Phase 1 application or at the time of reserved matters application for outline phases 2-12.

& 45. The applicant is required to confirm either the amount of funding that will be paid into the borough's carbon offset fund or that an agreement has been reached with the borough that the applicant will undertake a carbon reduction project off-site to meet the shortfall. In both cases evidence of correspondence with the borough confirming the approach should be provided.

The applicant has confirmed the expected carbon offset payments to LB Newham. These are:

Element	Typology	CO_2 offset required (1 year)	Cumulative savings for off-set payment (30 years)	Equivalent offset payment to LBN
Phase 1 (Using Part L 2013)	Residential	254	7,631	£457,873
	Non-residential	3	96	£5,756
Outline Phases 2 & 3 (Using Part L 2013)	Residential	583	17,490	£1,049,400
	Non-residential	18	540	£32,400
Outline Phases 4-12 (Using Part L at the time of RMA)	Residential	1,698	50,942	£3,056,492
	Non-residential	240	7,212	£432,695

The applicant should provide correspondence from the borough confirming agreement with these figures.

The applicant has not responded to this item and ***it remains outstanding.***

3.3.1 Applicant Response

Correspondents directly with the borough have not taken place regarding carbon offsetting funds. However it is confirmed that the offset payments will be included in the S106 agreements drafted by Newham.

4 Updates to the scheme since original submission (written in June 2019)

4.1 Proposed massing changes to outline scheme

Since the scheme was initially submitted for planning, design reviews have been undertaken and comments have been received on the designs. As result of these discussions between the applicant, London Borough of Newham and GLA, massing has been redistributed across the masterplan.

The updates and changes to floors has been outlined in Figure 4—1. This shows that 5, 2 and 1 floors have been taken from Blocks E and F and added to Blocks Q, U, R, S and T to the north of the site.

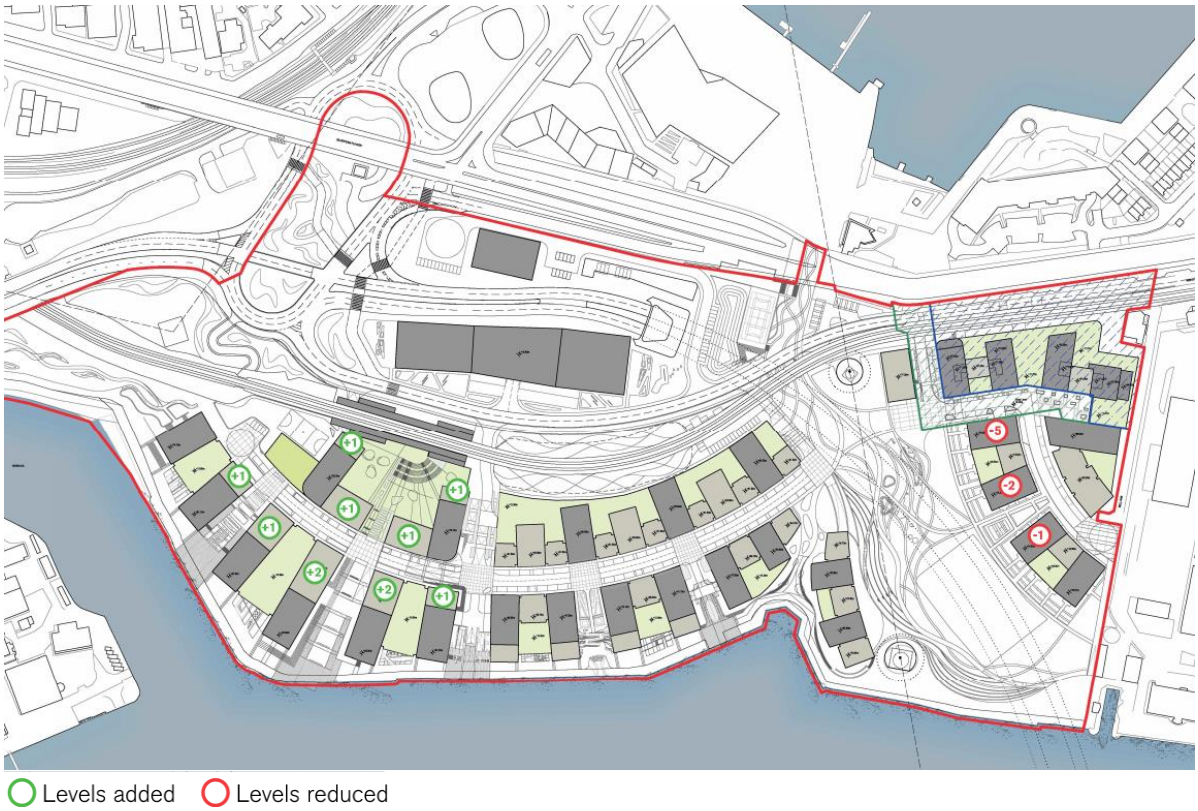


Figure 4—1 Massing redistributed to Riverside Quarter and Station Plaza

These changes have no material impact on the energy and sustainability strategy overall. However it will have a small impact to the façade treatments on the detailed Blocks A and B. The proposed changes are outlined in the following section.

4.2 Consideration of impact on Detailed Phase 1

Figure 4—2 outlines the floors heights that have reduced to the west of Blocks A and B. It also outlines the high level solar exposure impacts to these blocks. As result of the updates, Block B and Block A core 1 will require additional facades treatment as outlined previous for the top floors.

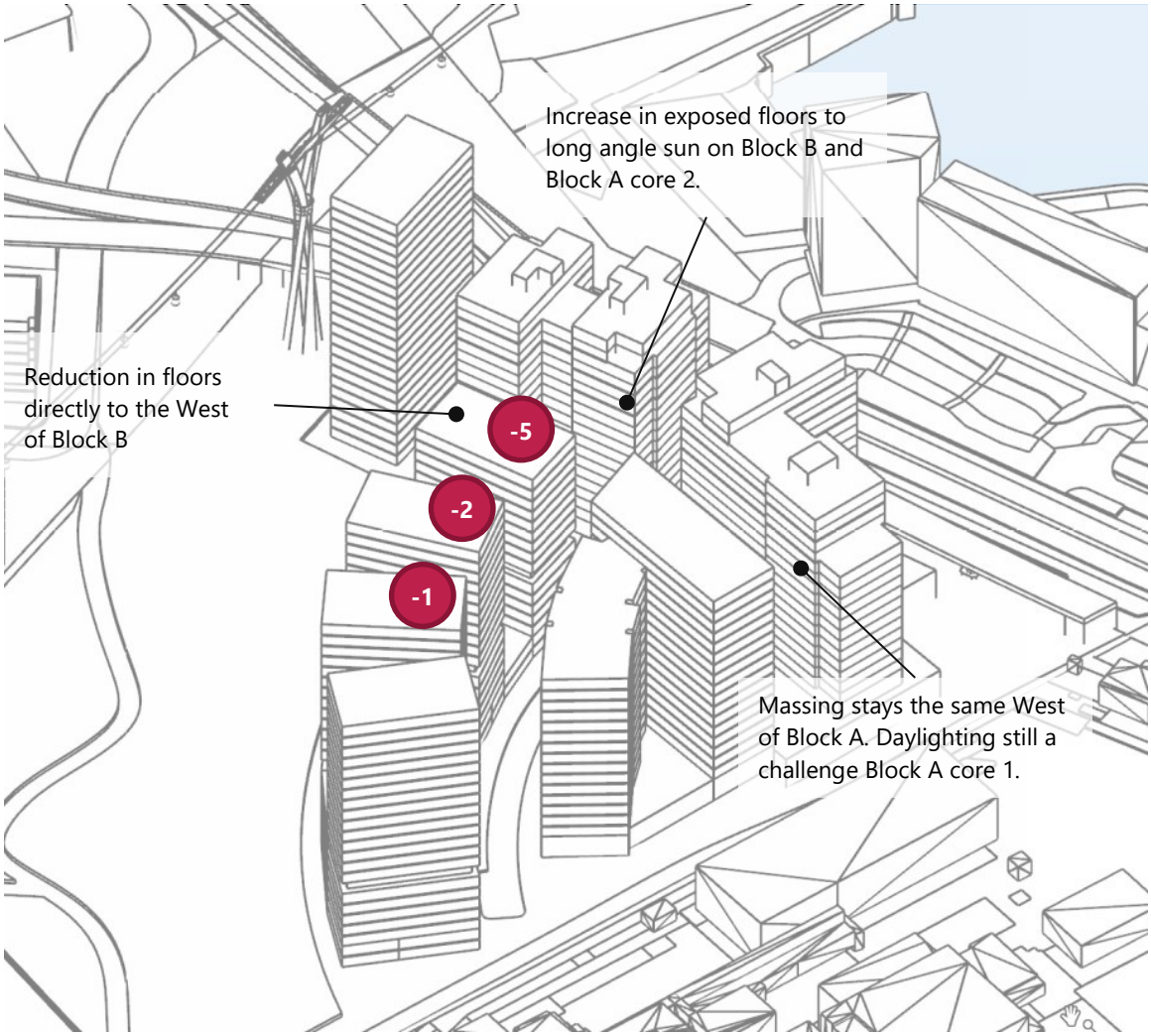
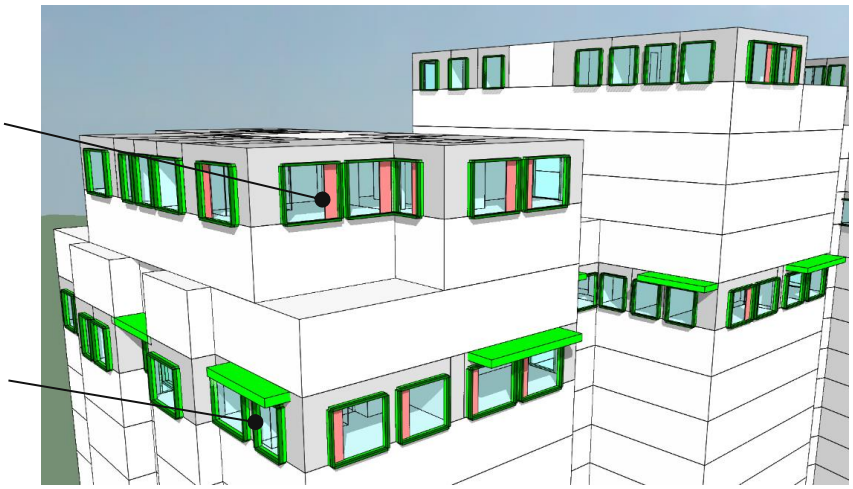


Figure 4—2 Massing updates and exposure changes to Phase 1

Figure 4—3 outlines the proposed locations for the addition of sandwich panels in the window faced design, to limit low angle solar gains from the west. The panels combined with increased reveal depths to 315mm and internal blinds have shown to effectively reduce overheating risk in the majority of units. These measures were applied to floor 19-14 and now based on the reduced massing adjacent, these measures are proposed on floors 19-9.

Modelled representatively with an external shading element to reduce solar gain without limiting key views out; whilst reducing low angle solar gains by ~25%.

External window reveal depth have been increased from 175mm to 337mm; reducing solar gain from both high and low angle sun throughout the day.



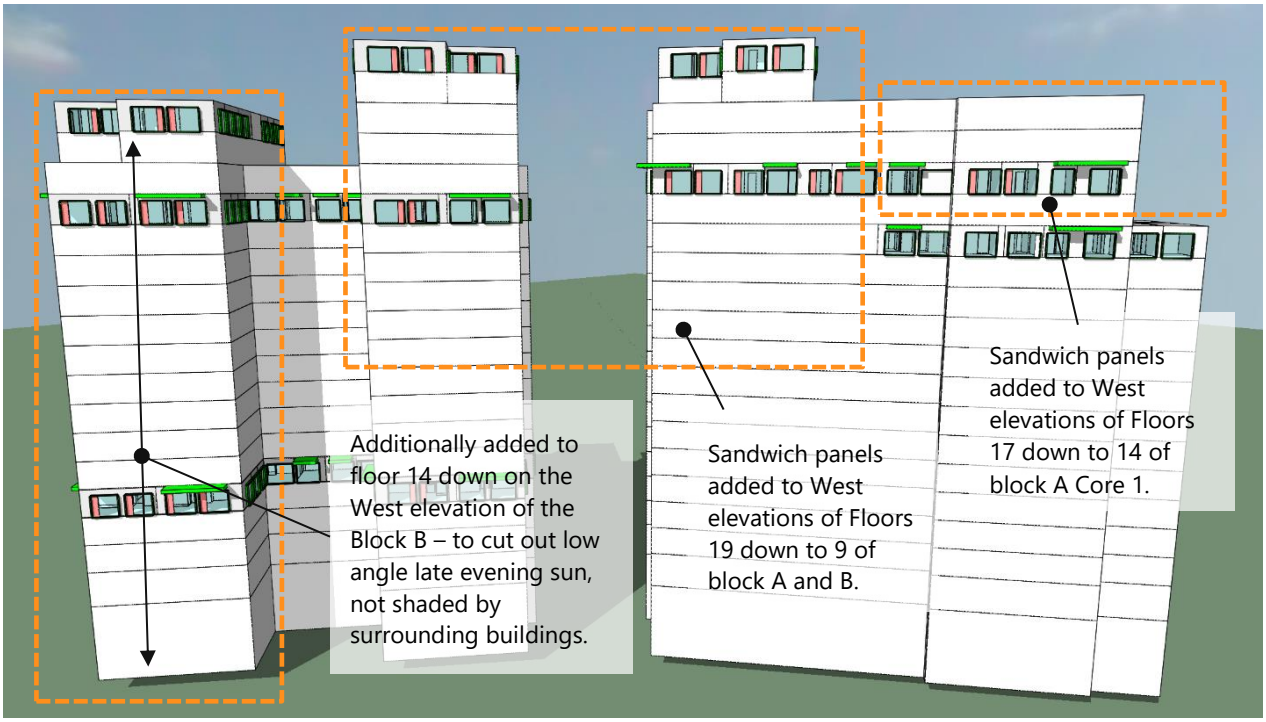


Figure 4—3 Sandwich panel addition strategy modelling IES

Contents

1 Executive summary

1.1 Overview

This Energy and Sustainability statement has been prepared on behalf of Silvertown Homes Limited and GLA Land and Property (the applicant) in support of a "hybrid planning application". Phase 1 and the river wall proposals will be submitted in full detailed application whilst all other phases will be submitted part outline (with all matters reserved).Figure 2—1 Figure 1—1 shows the location of the proposed plot in the context of the wider area.

Hybrid planning application comprising:

1. Detailed planning application for Phase 1 with works to include: The proposed demolition of existing buildings and structures, the erection of buildings, including tall buildings, comprising: 460 residential Units (Use Class C3), 3,417 sqm (GEA) of flexible employment floorspace (Use Classes B1b, B1c, B2 (restricted) and B8); 162 sqm (GEA) of flexible retail floorspace (Use Classes A1-A4); a new/altered access road from Dock Road/North Woolwich Road; new streets, open spaces, landscaping and public realm; car, motorcycle and bicycle parking spaces and servicing spaces; and other works incidental to the proposed development.

2. Outline planning application (all matters reserved) for the phased delivery of the balance of the site for the proposed demolition of existing buildings and structures; the erection of buildings, including tall buildings, comprising: a new local centre; a primary school (Use Class D1); residential and older person units (Use Class C3); flexible employment floorspace (Use Classes B1b, B1c, B2 (restricted) and B8); flexible employment floorspace (Use Classes B1c, B2 and B8); flexible retail floorspace (Use Classes A1-A4); community and leisure floorspace (Use Classes D1 and D2); the construction of a new flood defence wall and delivery of ecological habitat adjacent to the River Thames and associated infrastructure; streets, open spaces, landscaping and public realm (including new park and SINC improvements); car, motorcycle and bicycle parking spaces and servicing spaces; utilities including energy centre and electricity substations; and other works incidental to the proposed development.

"Where applicable, the detailed energy modelling outputs, SAP and BRUKL reports, can be found in Appendix A-C

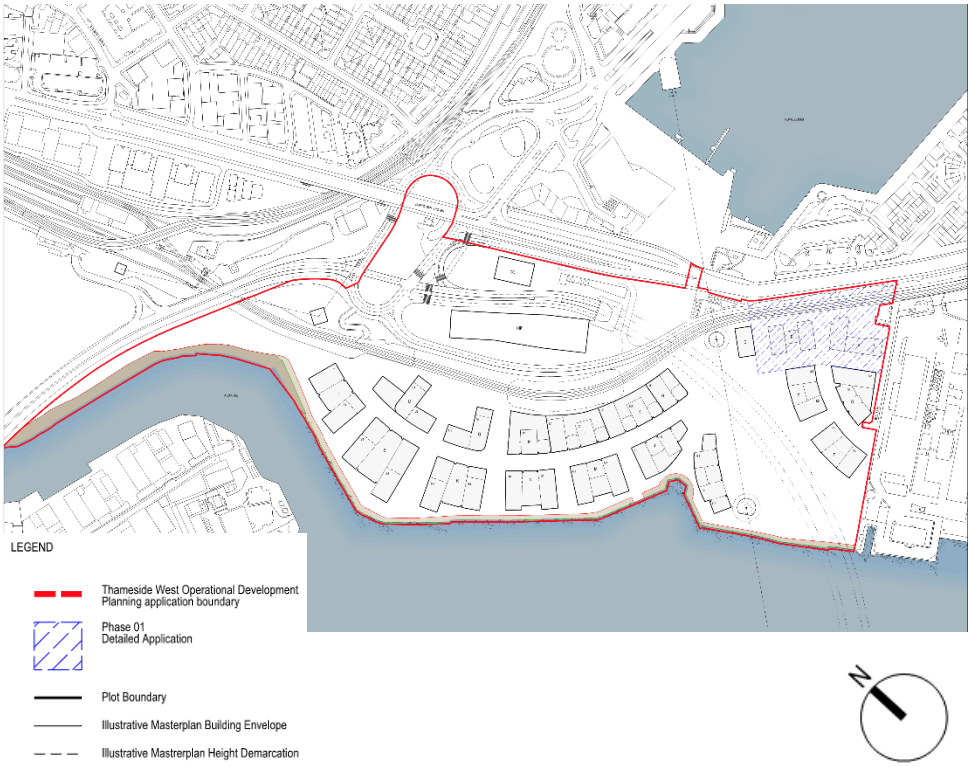


Figure 1—1 the proposed site and red line boundary and the Phase 01 Detailed Application elements

1.2 Development Phasing

Table 1-1 outlines the proposed development phasing, the number of units and the expected construction to operation dates. This phasing has been used to calculate the predicted carbon emissions of the development, by evaluating the corresponding carbon factors to use within the calculations. Table 1-1 also outlines the carbon factors of fuels used for each phase. Further detail on these factors is provided below.

Table 1-1 Development phasing by block and expected operational date

Phase	Plot/Blocks	Start on Site	Complete	Carbon factor to use
Phase 1 (460 units)	A & B	May 2020	June 2022	Part L 2013
Phase 2 (589 units)	D & E	Feb 2021	May 2023	Part L 2013
Phase 3 (481 units)	C & F	Dec 2021	April 2024	Part L 2013
Phase 4 (320 units)	G	Sept 2022	Sept 2024	2022 (SAP16 CONSP:07)
Phase 5 (336 units)	J & H	July 2023	July 2025	2022 (SAP16 CONSP:07)
Phase 6 (397 units)	M & K	June 2024	April 2026	2025 (SAP16 CONSP:07)
Phase 7 (493 units)	N & L	April 2025	July 2027	2025 (SAP16 CONSP:07)
Phase 8 (526 units)	R	Feb 2026	May 2028	2025 (SAP16 CONSP:07)
Phase 9 (480 units)	U, Q & P	Jan 2027	April 2029	2025 (SAP16 CONSP:07)
Phase 10 (542 units)	S	Jan 2028	May 2030	2025 (SAP16 CONSP:07)
Phase 11 (376 units & School)	T	April 2029	Feb 2031	2025 (SAP16 CONSP:07)
Phase 12 (Industrial)	-	Nov 2029	Nov 2030	2025 (SAP16 CONSP:07)