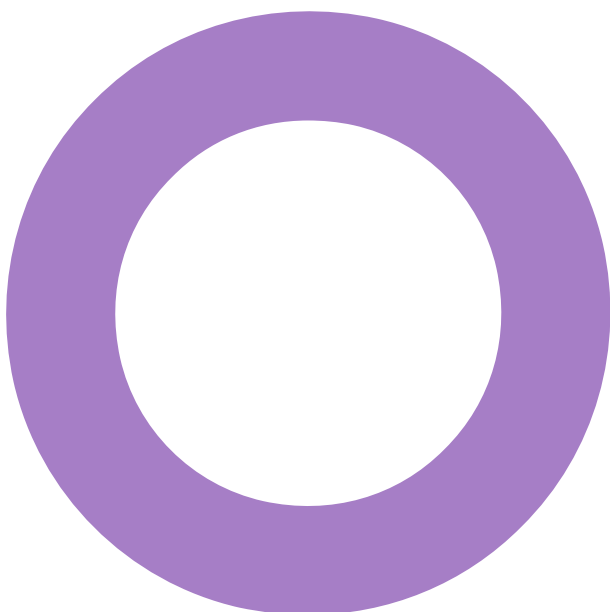


**Manor Road.
Richmond.**
**Avanton Richmond
Development Ltd.**

ENERGY STRATEGY
RESPONSE TO ADDITIONAL GLA COMMENTS

REVISION 01 – 26 JUNE 2019



Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
01	26/06/2019	Issued for information	L. Wille	Design team	L. Wille

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Project number: 23/23145

Document reference: REP-2323145-5A-LFW-20190626-Response to updated GLA comments-Rev 01

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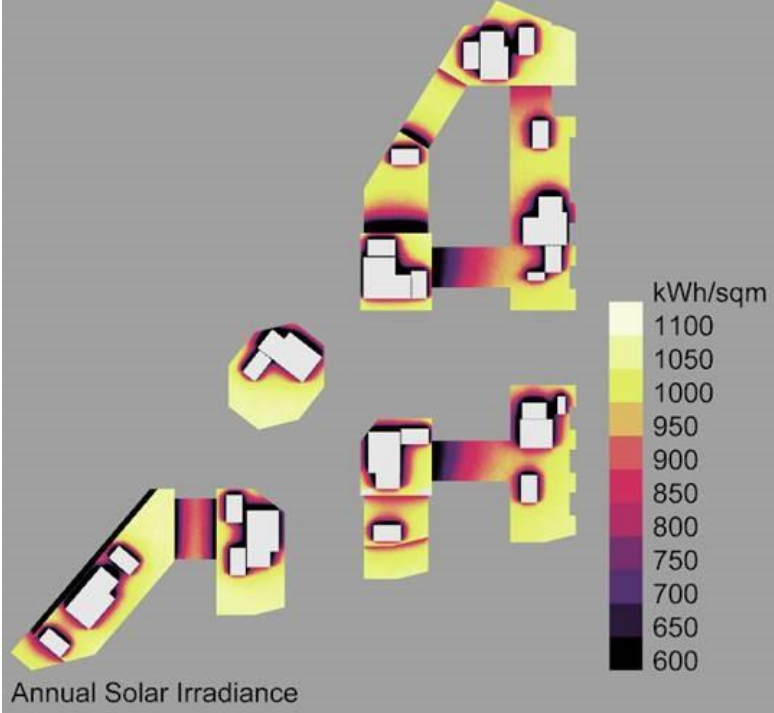
Executive summary

This document provides a response to the second round of comments provided by the Greater London Authorities (GLA) on 17/06/2019 to the Energy Strategy prepared by Hoare Lea in support of the planning application for Manor Road, Richmond (case number 4795).

Item #	Query	Team response
6	They should be conditioned to investigate further possible improvements to the thermal bridging prior to the commencement of work on site, with the aim of achieving the Be Lean 10% reduction on Part L 2013 from energy efficiency measures alone.	The developer confirms they will commit to investigate this further.
16	GLA policy requires the assessment of overheating using the DSY 2 & 3 weather files; the applicant should submit the results.	The assessment was carried out in line with the TM59 methodology, section 2.2-11 of which states that the assessment should be carried out using the DSY1 2020, high emissions, 50% scenario weather file. In line with the same methodology, as the development is not situated in the central London heat island, and as it is not expected that there will be a concentration of vulnerable occupants, it is considered that the weather file used is already a good assessment of overheating risk without the need to test further weather files.
19	The applicant should clarify their statement that the DSY 1 assumed external temperature "effectively precludes the use of mechanical ventilation as a design solution to mitigate overheating risk, since whatever the amount of mechanical supply air, and / or passive design measures, internal temperatures will exceed the 3% threshold due to unavoidable heat gains".	<p>External ambient temperatures in the London DSY1 exceed 26oC by 2.7% of annual hours, leaving very little margin (0.3%) to the maximum allowed 3% of annual hours exceedance. This is the weather file alone, prior to adding any internal heat gains. Once internal heat gains are added (cooking, lighting, people etc) the rooms will therefore be expected to exceed the threshold.</p> <p>Mechanical ventilation without cooling would be circulating hot air through the apartment, but would not be able to dissipate the high temperatures arising from a combination of the weather file, and the unavoidable internal gains.</p>
21	The applicant has confirmed they have contacted the Borough of Richmond Upon Thames, but are yet to receive a response. They should submit the response when it is received.	<p>Comments have been received from the council. Summary provided below, and full comments attached in Appendix A. The comments support the applicant's approach.</p> <p><i>"After review of the available evidence CIS has concluded that there are no upcoming schemes in the vicinity of the proposed development. However, the nature of the surrounding plots makes it reasonably likely that currently unforeseen DHN's will be developed in the area within the building lifetime, therefore in line with the Greater London Authority guidance on preparing energy assessments basic futureproofing should be provided, including providing space in plantrooms for heat exchangers and leaving a likely path for connecting pipes as clear as possible. "</i></p>

Item #	Query	Team response
23	<p>(...) providing a site-wide network is a strategic policy to encourage future connection to district heating, with future connection expected to provide wider benefits over the lifetime of the development. In our experience, other applicants proposing similar schemes are able to provide a site-wide network whilst minimising operational costs. The applicant should consider the benefit of increased demand diversity, when providing a site-wide network, which may allow plant sizes to reduce.</p>	<p>While we appreciate the benefits a potential future district energy network could pose, it remains the applicant's stance that the specific site constraints at Manor Road, and the fact there are no planned future networks in the vicinity of the site makes this theoretical future connection highly unlikely.</p> <p>Further, due to the ongoing decarbonisation of the grid, it is expected that the proposed ASHP strategy will continue to become ever more efficient in terms of carbon emission reductions as time passes, and therefore we find it unlikely that any potential future district energy network would provide carbon savings compared to the proposed strategy, especially when taking distribution losses into account.</p> <p>The strategy that has been put forward to enable potential future connection is deemed by the applicant to be a reasonable compromise (a space allowance for a future potential heat exchanger at the ground floor of each block, so that a connection can be made in future, should a low carbon network become available, albeit this would require some ground work to extend the district connection from the site boundary to each block).</p> <p>Circulating hot water in pipework around the site would lead to an increase in carbon emissions for the site due to heat losses in the pipework. We would be very interested to see what calculations other applicants have put forward to confirm their schemes are able to minimise operational cost whilst accounting for estimated 'real' distribution losses (i.e. not the SAP default 5% losses).</p> <p>Our calculations suggest that 25% distribution loss is expected in the building-by-building scenario, while a 50% distribution loss would be expected in the site-wide scenario. That is assuming standing losses for 22 hours out of every day (arguably could be even higher if losses are assumed 24h/day). Losses were estimated using industry standards for W/m heat loss, with a reduction to account for the reduced distribution temperature of the system.</p> <p>Options for allocating central plant was reviewed during design, however this made limited impact on the diversity when utilising DS439 methodology. The difference equated to approximately 11% reduction in overall ASHP capacity, which does not result in a significant overall space saving, and when coupled with other plant siting considerations (acoustics, architectural massing, views) the decentralised approach was deemed most appropriate. There is also very limited efficiency benefit from centralising ASHP and providing fewer, larger units. On the contrary, a greater number of smaller units will allow the site management to match the load more accurately to the demand.</p>

Item #	Query	Team response			
		Strategy	Carbon Emissions (based on SAP 10)	Carbon Offset Payment	Resident Fuel Cost Difference
		Air Source Heat Pumps building by building	35% reduction	£450,000 (residential areas) + £10,800 (potential, retail areas)	Baseline: 2.2 p/kWh (incl. RHI) 4.8 p/kWh (excl. RHI)
		Air Source Heat Pumps with site-wide connection	23% reduction (i.e. 12% less CO ₂ emission reductions compared to the building-by-building design)	+ additional £83,000 (estimated an additional ~46 tonnes CO ₂ /year would be emitted by the development)	+0.40 p/kWh (incl. RHI) +1.2 p/kWh (excl. RHI)
28b	The applicant should confirm the SEER assumed for cooling, and whether the SCOP accounts for the proposed cooling.	An SEER of 6.5 has been assumed for cooling. The SCOP did not assume simultaneous heating and cooling, so potential to recover waste heat was not used in modelling, however this will be investigated during developed design.			
28c	The applicant has provided a datasheet confirming their assumptions, including the runtime and external temperature as per item b. (...) They should confirm the proposed size of the heat pumps.	Approximately 2.8MW of ASHP heating is provided across the site in module sizes varying from 90-250kW.			
28e	A commitment to monitor the performance of the heat pump system post-construction to ensure it is achieving the expected performance approved during planning.	The client has confirmed they will commit to monitoring the performance of the heat pump system post-construction and compare against the expected performance estimated during planning. Suitable commissioning will be carried out of the system to ensure optimised performance.			
29	Solar PV and roof space availability: the applicant should provide further detail and provide solar insolation levels.	A solar irradiance study of the roofs has been completed – see image below. Due to some updates in the allocation of plant space, it would be prudent to move two of the arrays, however the over-all estimated allocation is unchanged (140m ² of PV panel area). See updated mark-up attached. Grey areas in the attached are allocated for			

Item #	Query	Team response
		<p>mechanical plant space or overshadowed areas, red areas are areas that are deemed too small for a PV array (less than 15 panels would fit).</p> <p>Further PV allocation is not deemed suitable for the following reasons:</p> <ul style="list-style-type: none"> - All remaining unshaded locations would only allow for small arrays (<15 panels each). - Such small arrays would have a negligible impact on the carbon emission reductions for the development - Small PV arrays are less efficient due to inverter losses (each array would need a separate inverter) - The development is already expected to achieve in excess of 35% carbon emission reductions based on the current design. 
32	<p>The applicant has confirmed that they have currently omitted the CO₂ emissions reduction associated with PV. Once all other comments are resolved, they should provide updated CO₂ emissions reductions for all stages of the energy hierarchy, including the CO₂ emissions from PV.</p>	<p>To clarify: We have not omitted the carbon emission reductions from our calculations, however they are not included in the SAP calculations for the apartments at the current point in time, but were added to the calculations separately. Updated CO₂ emission reductions at each stage of the energy hierarchy are set out in the Appendix E. This includes the additional PV array identified by the team in the previous response (i.e. total array now 140 m² PV panel area).</p>

Item #	Query	Team response
34	<p>The applicant has confirmed that the carbon offset payment is expected to be fixed as part of the S106 negotiations. The borough has confirmed that they are happy with the approach but will have to check the figures once the energy assessment is finalised. If the outstanding comments result in further changes to the CO₂ emissions and carbon offset payment, the applicant should provide correspondence from the borough confirming the figure has been agreed.</p>	<p>The team will continue to review any amendments to the value of the carbon offset payment once the energy assessment has been finalised. The final figure will be agreed with relevant parties.</p>

Appendix A – Correspondence with LBRuT regarding local district heating networks

District Heating Network Review.

Site Name:	84 Manor Road TW9 1YB
Planning reference number:	2018/5833
Consultant:	Owen Bevan Thomas
Comments provided on:	17/06/19

Details:

For the proposed development at the applicant has carried out an investigation and found that there are no existing or planned district heat networks within the vicinity of the proposed development. They have been asked to contact the borough to see if they were aware of any upcoming schemes, the council have then forwarded this search to Climate Integrated Solutions (CIS).

Summary:

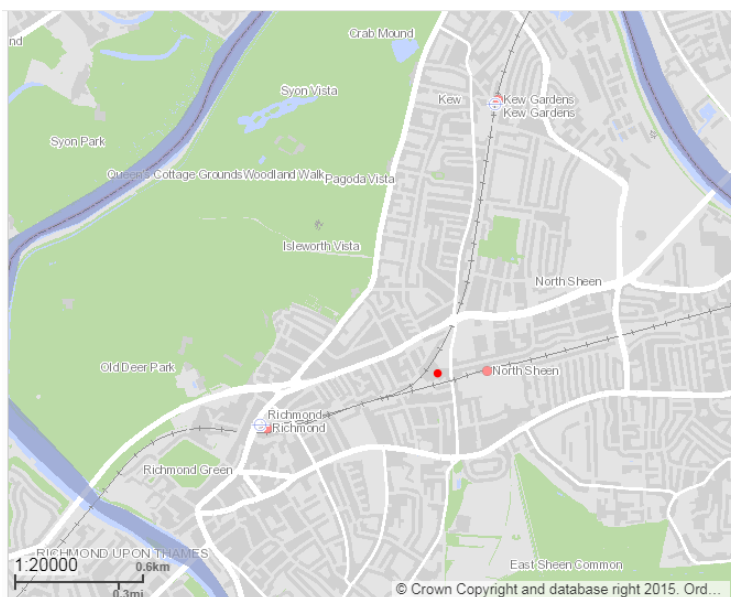
After review of the available evidence CIS has concluded that there are no upcoming schemes in the vicinity of the proposed development.

However the nature of the surrounding plots makes it reasonably likely that currently unforeseen DHN's will be developed in the area within the building lifetime, therefore in line with *the Greater London Authority guidance on preparing energy assessments* basic futureproofing should be provided, including providing space in plantrooms for heat exchangers and leaving a likely path for connecting pipes as clear as possible.

Evidence Review:

Heatmap:

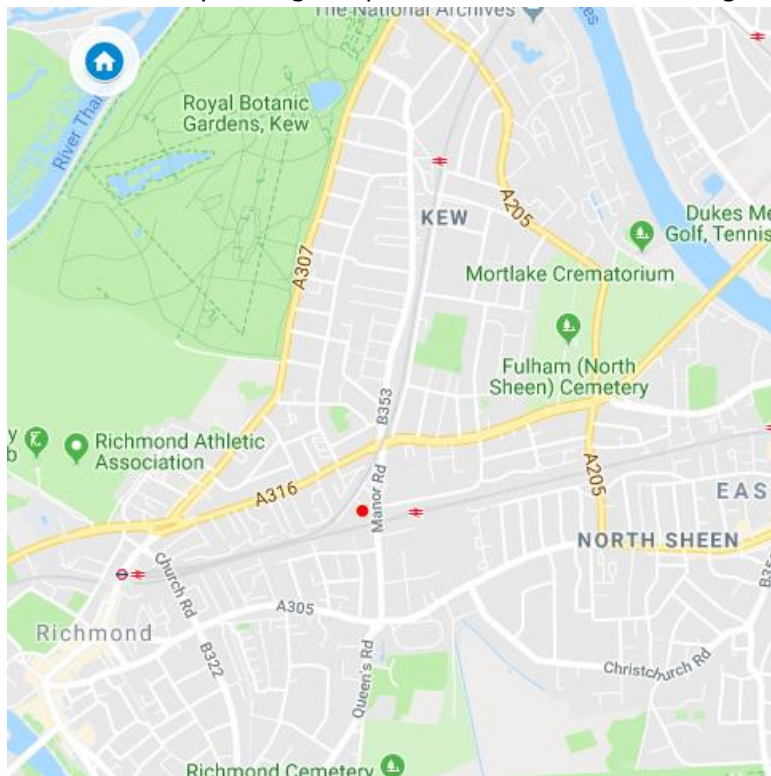
The image below taken from the London.gov.uk London Heat Map which, whilst not 100% reliable, includes most current and proposed District Heat Networks shows nothing within a practical distance of the site marked in red.



District Heating Network Review.

ADE:

The Association for Decentred Energy also maintain a nationwide map which includes some London projects not present on the Heat Map. The closest DHN to the site marked in red on this map is over a kilometre away making it impractical even without crossing The Thames and Kew Gardens.



Planning searches.

Searches have been conducted for any applications to the Richmond Counsel or Mayor of London and none relating to District Heating in the area have been found.

Word of mouth search.

CIS has also reached out to various of its numerous contacts within the planning and heating industries. In each case we have been told that they do not know of any networks being discussed near the site.

Conclusion





After conducting all reasonable checks and diligently searching CIS is able to concur with the applicant that there appear to be no current or upcoming District Heat Networks in the vicinity of the site.

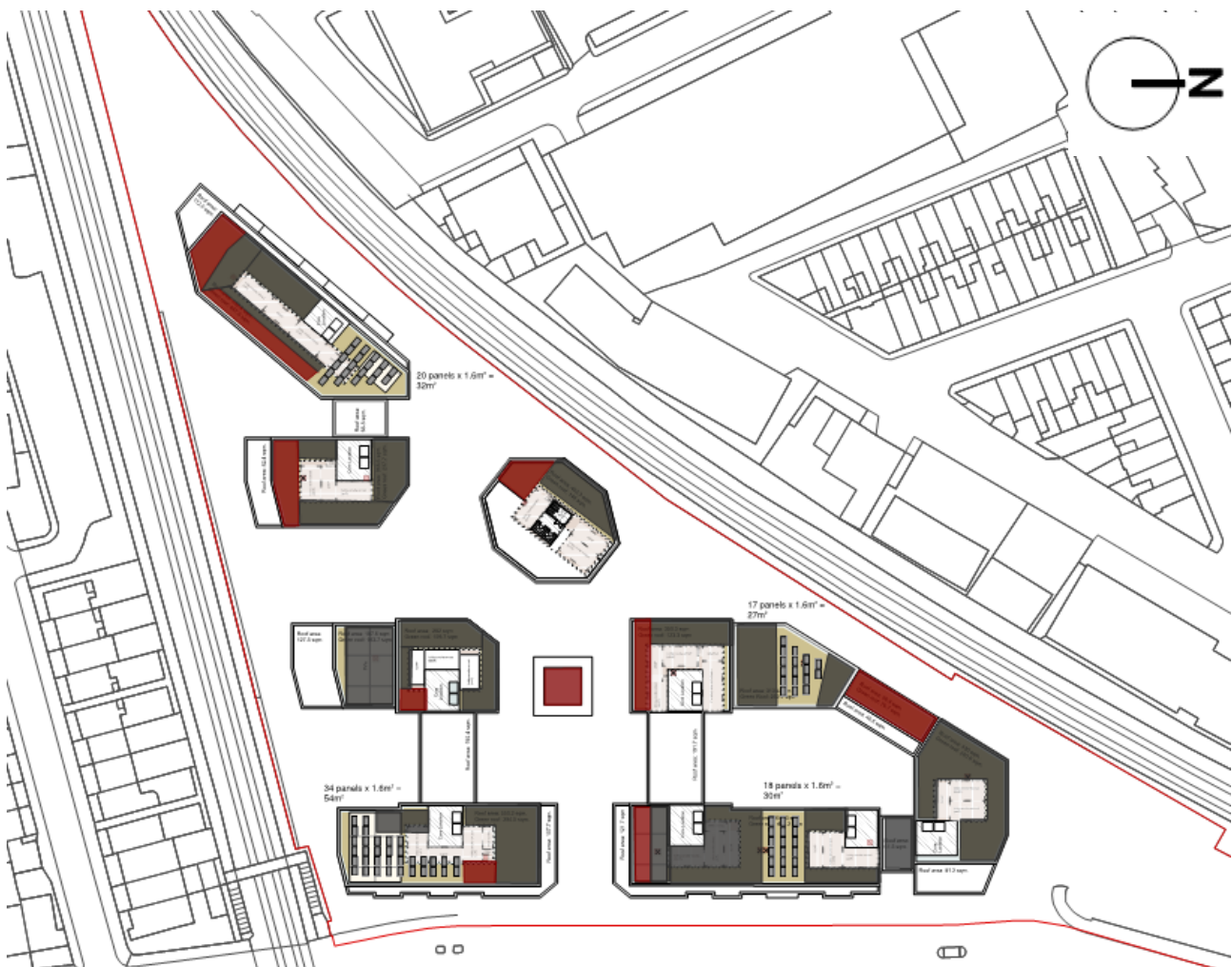
It should be noted however that the vicinity include a wide range of uses including large and small domestic blocks, large retail, transport and recreation, it should not therefor be assumed that there will not be a DHN within practical reach during the lifetime of the building so GLA Energy Planning guidance of basic futureproofing for this applies.

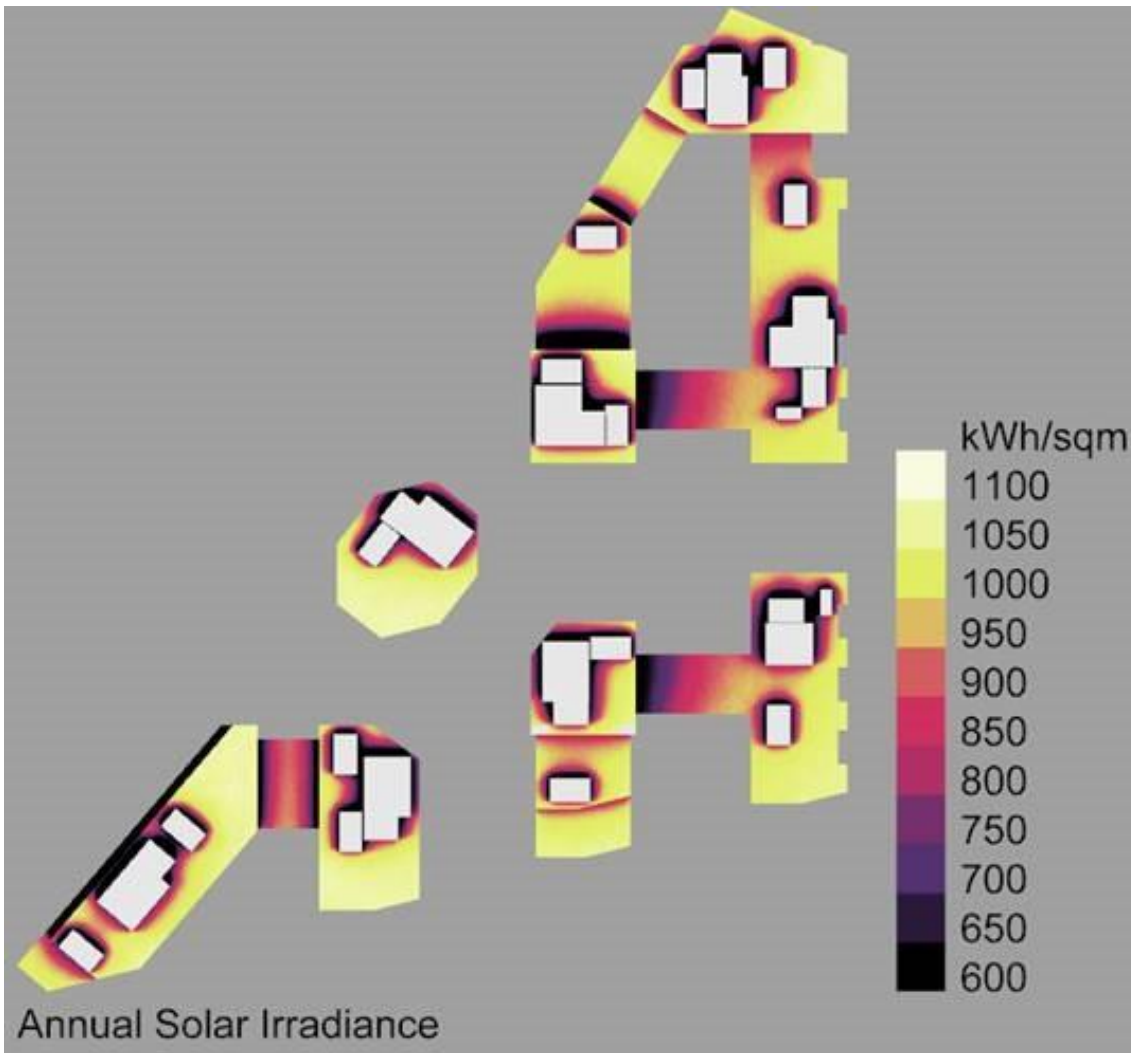
Appendix B – PV array sizing

The roof layout has been detailed further since the planning application, and plant allocations have changed slightly. This has allowed for a further PV array on the affordable block to the SW of the site. Please see an updated roof layout below. We have now marked this up further to annotate areas that are likely to be overshaded, and areas that are estimated to be too small for individual PV arrays. In total, an additional ~20m² of PV panel area (13 panels) has been allocated, resulting in an expected further 0.6 tonnes carbon emission reductions for the site.

Legend:

-  Roof amenity space
-  Plant space
-  Roof areas expected to be overshaded for significant periods, or to be allocated for plant space (see also roof solar irradiance study overleaf)
-  Roof area deemed too small to fit a PV array





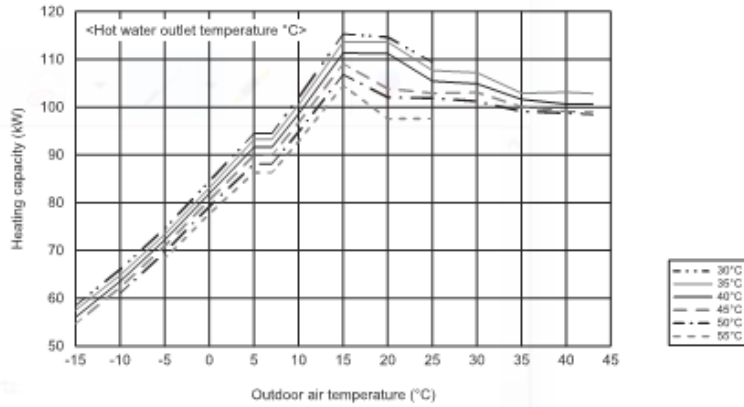
Appendix C – ASHP selection - technical datasheet (Mitsubishi)

2. Product Data

[Cold/hot water outlet/inlet temperature difference 5°C]

EAHV-P300Y(A)(H)

■ Heating Capacity



the following parts:

ers

air project

the following parts:

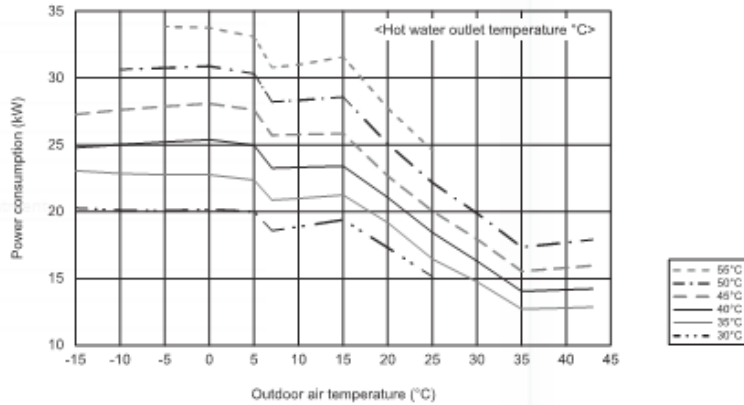
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air project



Appendix D – Correspondence between applicant team and planning officer regarding carbon offset payment approach

From: [Garside, James](#)
To: [Doull, Rebecca \(Avison Young - UK\)](#)
Cc: [Crick, Rachel \(Avison Young - UK\)](#); [Clarke, Freddie \(Avison Young - UK\)](#)
Subject: RE: Homebase Manor Road - carbon offset fund
Date: 07 May 2019 10:02:40

External Sender

External Sender

Hi Rebecca,

Yes we're happy with a contribution.

We will have to check the figures once the energy report is finalised (presuming the GLA are seeking further info etc).

Thanks,
James

From: Doull, Rebecca (Avison Young - UK) <Rebecca.Doull@avisonyoung.com>
Sent: 03 May 2019 17:06
To: Garside, James <James.Garside@richmondandwandsworth.gov.uk>
Cc: Crick, Rachel (Avison Young - UK) <Rachel.Crick@avisonyoung.com>; Clarke, Freddie (Avison Young - UK) <Freddie.Clarke@avisonyoung.com>
Subject: Homebase Manor Road - carbon offset fund

Hi James,

One of the GLA's comments requires us 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.

As set out in our Energy Strategy, we are proposing a contribution to the borough's carbon offset fund. The current estimate is £451,800 based on anticipated carbon emissions.

Are you able to confirm that this approach is acceptable please? Does the borough have a fund that we can pay into?

Kind regards,
Becky

Rebecca Doull
Principal Planner
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Appendix E - CO₂ reductions at each stage of the energy hierarchy

New Build Dwellings	Regulated Carbon Dioxide Emission Savings (tonnes CO ₂ /yr)	
	Regulated	Unregulated
Baseline: Part L 2013 Building Regulations with SAP 10 carbon factors	386.4	198
After energy demand reduction (Be Lean)	359.6	198
After heat network / CHP (Be Clean)	359.6	198
After renewable energy (Be Green)	250	198
	Regulated domestic carbon dioxide savings	
	(tonnes CO ₂ /yr)	(%)
Savings from energy demand reduction	26.8	7%
Savings from heat network / CHP	0	0%
Savings from renewable energy	109.6	28%
Cumulative on site savings	136.4	35.2%
Annual savings from offset payment	250.0	-
Dwellings offset Payment Rate (£/tCO ₂)	£1,800	
Total Offset Payment	£450,000	

New Build Retail	Regulated Carbon Dioxide Emission Savings (tonnes CO ₂ /yr)	
	Regulated	Unregulated
Baseline: Part L 2013 Building Regulations with SAP 10 carbon factors	10.5	6
After energy demand reduction (Be Lean)	8.5	6
After heat network / CHP (Be Clean)	8.5	6
After renewable energy (Be Green)	6.0	6
	Regulated non-domestic carbon dioxide savings	
	(tonnes CO ₂ /yr)	(%)
Savings from energy demand reduction	2.0	19.2%
Savings from heat network / CHP	0	0%
Savings from renewable energy	2.5	23.7%
Cumulative on site savings	4.5	42.9%
Total target savings	3.7	35%
Shortfall	N/A	-
Dwellings offset Payment Rate (£/tCO ₂)	£1,800	
Total Offset Payment assuming 35% target requirement (current GLA requirement)	£0	
Total offset payment assuming to Zero Carbon (future GLA requirement)	£10,800	



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