



Land at Court Meadow School,
Cuckfield, Mid Sussex

Sustainability Statement

October 2021

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1 Introduction

1.1 This Statement

- 1.1.1 This *Sustainability Statement* supports the full planning application for the proposed development on land at Court Meadow School, Cuckfield in Mid Sussex. It has been commissioned by Quantum Homes Ltd (the Applicant) to demonstrate how the development addresses sustainability, including energy and water efficiency.
- 1.1.2 The policy framework encouraging sustainable new development is comprehensive at both a national and local level. This Statement responds to existing planning policy, including the Mid Sussex District Plan 2014-2031, while also looking ahead to emerging policies, including the proposed Future Homes Standard.
- 1.1.3 In particular, the Statement demonstrates how the requirements of policy DP39 of the Mid Sussex District Plan will be met, including how the proposed site will:
- Minimise energy use through the design and layout of the scheme including through the use of natural lighting and ventilation;
 - Explore opportunities for efficient energy supply;
 - Use low carbon sources of energy;
 - Maximise the efficient use of resources, including minimising waste and maximising reuse and recycling;
 - Conserve and manage water resources;
 - Demonstrate climate resilience and adaptation.
- 1.1.4 In addition, the Statement includes summaries of other sustainability considerations and features of the site, drawing on the work of other consultants where necessary, to gain a full picture of the sustainability credentials of the proposals.
- 1.1.5 The recommendations provided are described in as much detail as is possible. Where specifics are not available, the overall approach and design standards have been laid out to ensure that the sustainable quality of construction remains high throughout the lifetime of the development.

1.2 Site Description

- 1.2.1 The application is for the demolition of the former Court Meadow School and the redevelopment of the site with 13 new two, three and four bedroom residential dwellings, new vehicular access and associated parking and landscaping.
- 1.2.2 The proposed site is on the fringes of Cuckfield village within a grouping comprising the former school, Orchard House and Horsgate House. There are open fields to the east and north of the site.
- 1.2.3 The images show the site location and site plan:



Figure 1: Site Location

Land at Court Meadow School, Cuckfield Sustainability Statement

2 Sustainability Policy Review

2.1 National Planning Policy

The National Planning Policy Framework 2021 (NPPF)

2.1.1 The NPPF Section 2 states that the purpose of the planning system is to contribute to sustainable development, and it therefore has three overarching objectives 'to be pursued in mutually supportive ways':

- An economic role, contributing to a strong, responsive, competitive economy;
- A social role, supporting vibrant and healthy communities and;
- An environmental role, protecting and enhancing our natural, built and historic environment.

2.1.2 As such, the NPPF at its heart contains a 'presumption in favour of sustainable development'. Emphasising the need to achieve well designed places, the NPPF states that "*Good design is a key aspect of sustainable development, creates better places in which to live and work and helps make development acceptable to communities*".

2.1.3 The NPPF sets out a number of principles which should underpin both plan-making and decision-taking, and of which many are particularly relevant to this document. In this context, planning should:

- Promote healthy and inclusive places that encourage social interaction, enhance healthy lifestyles, and which are safe and accessible;
- Seek to secure a high-quality of design and a good standard of amenity for occupants;
- Support the transition to a low-carbon future, avoid increased vulnerability to climate change impacts, take account of flood risk and coastal change and seek to reduce greenhouse gas emissions. Plans should include a positive strategy for dealing with more sustainable forms of energy and, in particular, renewable sources;
- Help conserve and enhance the natural environment, achieve net gains in biodiversity and reduce the impact of all forms of pollution;
- Plan and manage development to make full use of public transport, walking and cycling; and take into account the emerging changes in, and requirements of, the transport industry around electric vehicles and other ultra low emission vehicles;
- Support the expansion of high-quality communications networks which are seen as integral to economic growth and wellbeing (for example the application of full fibre connections to the building).

Acts of Parliament

- 2.1.4 The Climate Change Act 2008 is the basis for the UK's approach for tackling and responding to climate change. It originally set a binding target to reduce the UK's carbon emissions by at least 80% by 2050 compared to 1990 levels. In June 2019, this target was replaced with achieving net zero emissions by 2050.
- 2.1.5 Part L (Conservation of Fuel and Power) and Part F (Ventilation) of the Building Regulations 2013 lay out the current standards for energy efficiency and ventilation in new build developments. Schedule 1 of Part L Conservation of Fuel and Power specifies the following:

<i>Requirement</i>	<i>Limits on application</i>
Schedule 1 – Part L Conservation of fuel and power	
L1. Reasonable provision shall be made for the conservation of fuel and power in buildings by:	
(a) limiting heat gains and losses–	
(i) through thermal elements and other parts of the building fabric; and	
(ii) from pipes, ducts and vessels used for space heating, space cooling and hot water services;	
(b) providing fixed building services which–	
(i) are energy efficient;	
(ii) have effective controls; and	
(iii) are commissioned by testing and adjusting as necessary to ensure they use no more fuel and power than is reasonable in the circumstances.	

Figure 3: Extract from Approved Document Part L1A Building Regulations

- 2.1.6 Part L aims to deliver reductions in CO₂ emissions from new development and results in a CO₂ saving of approximately 33% against the previous 2006 Building Regulations standards. The 2013 update also introduced a fabric energy efficiency target, related to the heating energy performance of the buildings.
- 2.1.7 Further updates to Part L and Part F will be coming into force in 2022, and these will include a tightening of energy and carbon performance targets alongside a new range of calculation methodologies and measures included within the compliance mechanism. At the time of writing however, full details have not been announced. This report therefore applies Part L 2013 standards but makes some recommendations based on the tightening of standards expected.
- 2.1.8 These Building Regulation updates will act as achievable 'stepping stones' to the more rigorous Future Homes Standard which will come into force in 2025. The Standard, which is currently in development, is the proposed update to Part L and Part F of the Building Regulations for new dwellings and is part of the Government's strategy for achieving its 2050 target set under the updated Climate Change Act. Under the proposed new Standard, an average home will have 75 – 80% fewer carbon emissions than one built to the current Building Regulation requirements. It is expected that this will be achieved through a combination of high fabric standards (for walls, floors, roofs and glazing) and low carbon heating (such as heat pumps).

- 2.1.9 The Government's 'Green Industrial Revolution' announcement in November 2020 included an ambition to implement the Future Homes Standard 'in the shortest possible timeframe' and a target to bring forward the ban on the sale of new petrol and diesel cars to 2030.
- 2.1.10 Water efficiency targets are driven by Part G of the Building Regulations 2015 which pertain to sanitation, hot water safety and water efficiency. This is discussed in more detail in section 7 of this report.

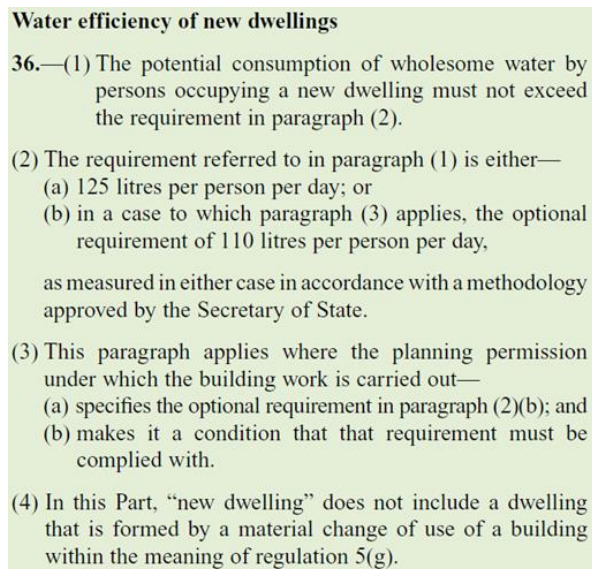


Figure 4: Extract from Approved Document G of the Building Regulations

2.2 Local Planning Policy

Mid Sussex District Plan 2014-2031 (Adopted March 2018)

- 2.2.1 The Mid Sussex District Plan sets out the Council's spatial vision, key objectives and overall principles for development in the district. It forms the main basis for assessment in planning terms and this Statement has therefore been designed to address its requirements.
- 2.2.2 'Protecting and enhancing the environment' is a priority theme within the Strategic Objectives for the District Plan, including resource efficiency, climate adaptation, protecting green infrastructure and promoting sustainable transport networks.
- 2.2.3 Policy extracts from the District Plan which are of most relevance to this document are provided within the following table:

Policy	Title	Extract
DP21	Transport	(...) decisions on development proposals will take account of whether: • The scheme is sustainably located to minimise the need for travel (...); • Appropriate opportunities to facilitate and promote the increased use of alternative means of transport to the private car, such as the provision of, and access to, safe and convenient routes for walking, cycling and public transport, including suitable facilities for secure and safe cycle parking, have been fully explored and taken up; (...) Where practical and viable, developments should be located and designed to incorporate facilities for charging plug-in and other ultra-low emission vehicles. (...)
DP23	Communication Infrastructure	(...) The Council will encourage the incorporation of digital infrastructure including fibre to premises, in major new housing, employment and retail development. (...)
DP26	Character and Design	(...) All applicants will be required to demonstrate that development: (...) • is of high quality design and layout and includes appropriate landscaping and greenspace; • positively addresses sustainability considerations in the layout and the building design; (...)
DP37	Trees, Woodland and Hedgerows	(...) Trees, woodland and hedgerows will be protected and enhanced by ensuring development: • incorporates existing important trees, woodland and hedgerows into the design of new development and its landscape scheme; and • prevents damage to root systems and takes account of expected future growth; and • where possible, incorporates retained trees, woodland and hedgerows within public open space rather than private space to safeguard their long-term management; and • has appropriate protection measures throughout the development process; and • takes opportunities to plant new trees, woodland and hedgerows within the new development to enhance on-site green infrastructure and increase resilience to the effects of climate change; and • does not sever ecological corridors created by these assets
DP38	Biodiversity	(...) Biodiversity will be protected and enhanced by ensuring development: • Contributes and takes opportunities to improve, enhance, manage and restore biodiversity and green infrastructure, so that there is a net gain in biodiversity, including through (...) incorporating biodiversity features within developments; and

Policy	Title	Extract
		• Protects existing biodiversity, so that there is no net loss of biodiversity. Appropriate measures should be taken to avoid and reduce disturbance to sensitive habitats and species. Unavoidable damage to biodiversity must be offset through ecological enhancements and mitigation measures (or compensation measures in exceptional circumstances); (...)
DP39	Sustainable Design and Construction	(...) All development proposals must seek to improve the sustainability of development and should where appropriate and feasible according to the type and size of development and location, incorporate the following measures: • Minimise energy use through the design and layout of the scheme including through the use of natural lighting and ventilation; • Explore opportunities for efficient energy supply through the use of communal heating networks where viable and feasible; • Use renewable sources of energy; • Maximise efficient use of resources, including minimising waste and maximising recycling/ re-use of materials through both construction and occupation; • Limit water use to 110 litres/person/day in accordance with Policy DP42: Water Infrastructure and the Water Environment; • Demonstrate how the risks associated with future climate change have been planned for as part of the layout of the scheme and design of its buildings to ensure its longer term resilience.
DP41	Flood Risk and Drainage	(...) Sustainable Drainage Systems (SuDS) should be implemented in all new developments of 10 dwellings or more, or equivalent non-residential or mixed development unless demonstrated to be inappropriate, to avoid any increase in flood risk and protect surface and ground water quality. (...). SuDS should be sensitively designed and located to promote improved biodiversity, an enhanced landscape and good quality spaces that improve public amenities in the area, where possible.
DP42	Water infrastructure and the Water Environment	(...) Building Regulations – Part G applies to all new residential development in the district. Development must meet the following water consumption standards: • Residential units should meet a water consumption standard of 110 litres per person per day (including external water use);

Cuckfield Neighbourhood Plan (2011-2031)

- 2.2.4 The Cuckfield Neighbourhood Plan establishes a vision for the development of the parish, covering the period to 2031. The former Court Meadow School site is allocated for residential development within the plan, which also acknowledges the importance of climate change mitigation and adaptation.

Mid Sussex Design Guide Supplementary Planning Document (Adopted November 2020)

- 2.2.5 The Mid Sussex Design Guide is intended to inform and guide the quality of design for developments across Mid Sussex district. It has been adopted as a Supplementary Planning Document and is therefore of material consideration in the determination of planning applications.
- 2.2.6 A key objective of the Design Guide is to encourage sustainable design and construction and it includes the following principle of relevance to this Statement:

Principle	Title	Extract
DG37	Deliver high quality buildings that minimise their environmental impact	(...) The Council welcomes innovative and inventive designs that respond to the sustainability agenda by minimising the use of resources and energy both through building construction and after completion. Applicants must demonstrate how this has informed their design and should consider in particular: • Orientation and design of buildings and roofs to maximise daylight / sunlight penetration and solar gain, whilst also avoiding overheating; • The use of green roofs or walls to reduce storm water run-off, increase sound-proofing and biodiversity; • The use of materials with low embodied energy (for example, renewably sourced timber and recycled materials); • The use of sustainable materials that are locally sourced wherever possible; • Incorporating high levels of insulation (in combination with air tightness and temperature control systems) including the use of materials with a high thermal mass, such as stone or brick, which store heat and release it slowly; • Incorporating renewable energy including photovoltaics, solar thermal water heating, ground and air source heat pumps; • The use of low flow technology in water fittings, rainwater harvesting systems and grey water recycling systems to reduce water consumption to 110 litres/person/day (maximum); and • Laying out development to support identified opportunities for decentralised renewable or low carbon energy systems. Further guidance is provided by District Plan policy DP39: Sustainable Design and Construction.

West Sussex County Council Guidance on Parking at New Developments (September 2020)

- 2.2.7 In accordance with policy DP21 of the District Plan this document includes details of electric vehicle charging on the proposed site, designed in accordance with the standards set out in the Guiding Principles within the West Sussex County Council (WSCC) *Guidance on Parking at New Developments (September 2020)*.

Principle	Extract																																										
B	Electric Vehicle Charging Infrastructure 4.7 'Active' charging points for electric vehicles should be provided at a minimum of 20% of all parking spaces with ducting provided at all remaining spaces where appropriate to provide 'passive' provision for these spaces to be upgraded in future. 4.8. Due to the unprecedented scale of change in vehicle manufacturing and sales, the guidance of electric vehicle car parking places should be reassessed when local plans and supplementary planning documents are reviewed to take account of any recent developments in this technology.																																										
E	Design Considerations (...) 4.14 To ensure that developments function efficiently and as intended, detailed consideration needs to be given to the following at the design stage: (...) c) Where 'active' electric vehicle charging points are provided, if these spaces are dedicated to electric vehicles only, they should be included in the 'total demand' as allocated spaces (see Principle B). d) Likely cycle ownership and storage – Although good cycle storage facilities are important, requirements should take account of dwelling size and type, and have regard to existing levels of cycle ownership. The minimum levels of cycle provision are set out in Table 1. The distinction has been made for cyclists on the basis of space requirements, availability of secure communal storage facilities, and the anticipated occupants of flats.																																										
n/a	Electric Vehicle Charging Overarching Guidance (...) 4.19. In order to respond to changing needs, it is important that developers consider the likely demand for electric charging points within new developments, and how this is likely to change over time. Developers should identify ways to cater for this demand within the design of new developments as part of the overall provision of parking facilities. This could include; for example, a mix of spaces with active charging facilities and passive provision, i.e. ducting to allow facilities to be brought into use at a later stage. 4.20. The values in Table 2 include provision of EV spaces at new residential developments. To allow for increased sales in EVs over time and an increasing proportion of the overall vehicle fleet, it is proposed that current base levels of EV car sales in West Sussex be used as an index to base levels of active provision for EVs at new developments as set out in Principle B. 4.21. The Government's 'Road to Zero Strategy' sets out an ambition for at least 50% — and as many as 70% — of new car sales to be ultra-low emission by 2030, alongside up to 40% of new vans. Taking a starting percentage of 20% active EV provision and using a linear growth between 2018 and 2030, produces a set of yearly EV provision indexes as set out in Appendix B. These values should be used as a guide to the level of 'active' EV spaces to be provided in the year of construction. 4.22. As the demand for electric vehicle charging points is expected to change rapidly over time, any standard for electric vehicle charging points is likely to become quickly out of date. Therefore, there is no specific standard for electric vehicle charging points but developers should consider the Guiding Principles when designing parking provision. This guidance will be subject to review in line with the development of technology and relevant legislation. Appendix B: Electric Vehicle Space Allocations <table><tr><th>Year</th><th>% Growth Index</th><th>% Spaces for Active EV Charging Facilities</th></tr><tr><td>2018</td><td>0</td><td>20</td></tr><tr><td>2019</td><td>4</td><td>24</td></tr><tr><td>2020</td><td>8</td><td>28</td></tr><tr><td>2021</td><td>13</td><td>33</td></tr><tr><td>2022</td><td>17</td><td>37</td></tr><tr><td>2023</td><td>21</td><td>41</td></tr><tr><td>2024</td><td>25</td><td>45</td></tr><tr><td>2025</td><td>29</td><td>49</td></tr><tr><td>2026</td><td>33</td><td>53</td></tr><tr><td>2027</td><td>38</td><td>58</td></tr><tr><td>2028</td><td>42</td><td>62</td></tr><tr><td>2029</td><td>46</td><td>66</td></tr><tr><td>2030</td><td>50</td><td>70</td></tr></table>	Year	% Growth Index	% Spaces for Active EV Charging Facilities	2018	0	20	2019	4	24	2020	8	28	2021	13	33	2022	17	37	2023	21	41	2024	25	45	2025	29	49	2026	33	53	2027	38	58	2028	42	62	2029	46	66	2030	50	70
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- 2.2.8 The WSCC Guidance also outlines the County Council's approach to encouraging and facilitating the use of sustainable modes of transport on new developments. These are outlined in further detail in the Transport Strategy accompanying this application.

Additional Planning Policy Documents and Commitments

- 2.2.9 Further guidance exists relating to transport, parking, flood risk and ecology. These are covered in more detail in the other reports accompanying this submission. This Statement does however refer to the outputs of these reports where relevant to give a rounded picture of the approach to sustainable design and construction issues.

3 Low Carbon and Renewable Energy Demand and Supply

- 3.1.1 This section describes the building performance standards expected, how the development will balance solar gain against overheating risk, the approach to minimising energy demand through energy efficient buildings and the low carbon approach to energy supply.
- 3.1.2 Detailed analysis of the property types proposed for the site has been undertaken to inform the overall 'fabric first' approach and specification, and to demonstrate compliance at this detailed planning stage.

3.2 The Energy Hierarchy

- 3.2.1 The Energy Hierarchy underpins the entire approach to building performance for this development, thus prioritising a reduction in the demand for energy as far as possible through thermally efficient, easily controlled, well designed and oriented buildings.

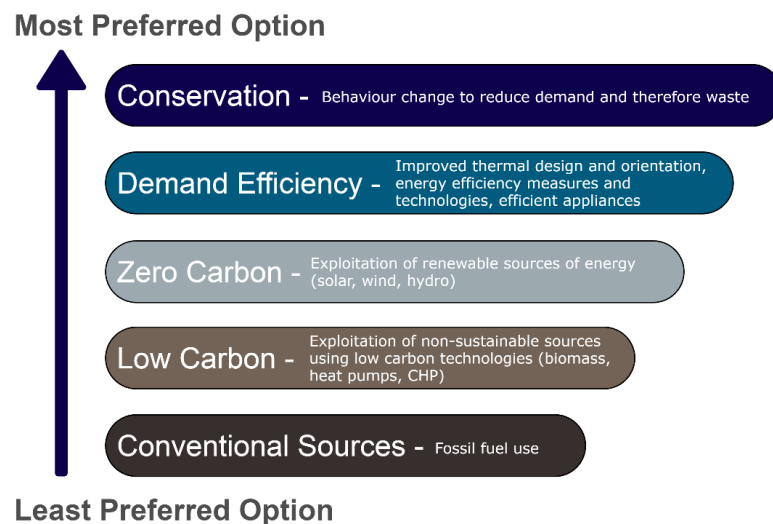


Figure 5: The Energy Hierarchy

3.3 Site Layout - Orientation, Passive Solar Design and Daylighting

- 3.3.1 The orientation of properties – along with the size and location of the properties' glazing and the extent of overshadowing – plays an important part in energy performance. Improving a building's orientation, so that the main living spaces can benefit from the heat and light of the Sun, can reduce the requirement to use fossil fuels to perform the same function. This reduces costs, energy use and associated carbon emissions.
- 3.3.2 Ideally buildings should have a southerly orientation, so they benefit from the Sun during the middle portion of the day without suffering from potential overheating later in the afternoon. This also helps to ensure that during the winter, when the Sun's path is shortened, the buildings still benefit as much as possible from winter sunlight.

- 3.3.3 The proposed layout of the site has been developed with respect to identified topological and visual constraints. Within these parameters, a proportion of the properties benefit from a southerly orientation. Furthermore, the low density of the development ensures appropriate spaces around dwellings, reducing the risk of overshadowing.



Figure 6: Site Orientation and Sun Path

- 3.3.4 In order to reduce the risk of overheating, a simple and cost-effective enhancement is to reduce the 'g-value' of the glazing. The 'g-value' is a measure of how much infrared radiation, or solar heat, is able to pass through the glass. By reducing the g-value, less heat enters the building thus reducing overheating risk.
- 3.3.5 This does mean however that the building will not benefit from so much 'free-heat' by way of solar gain. It is therefore a balance between the two. For the purposes of this site, we have assumed that overheating will be an increased risk in an energy efficient property over time, so we are therefore recommending that a g-value of 0.45 should be implemented (where typical glazing is supplied with a g-value of 0.65-0.7).

3.4 Energy Efficient Domestic Building Envelope

Thermal Elements

- 3.4.1 The buildings will need to be energy efficient structurally. To facilitate this, not only will the individual elements (wall, roof, and floor) be thermally efficient, but the construction will need to ensure that thermal bridges are minimised through the application of Accredited Construction Details, insulated lintels and by ensuring air tightness.

- 3.4.2 Part L1a of the Building Regulations (2013) has two core targets. The first relates to a maximum level of annual CO₂ emissions per m² of the building (the Target Emission Rate or TER) and the second relates to a Target Fabric Energy Efficiency level (TFEE). The TER is calculated taking account of the geometry of the building, the construction details and the mechanical and electrical specification for the property. The TFEE establishes a maximum level of energy permitted to meet the space heating demands of the property (measured in kWh/m² on an annual basis). As such it is primarily affected by the construction details (thermal envelope) of the property, including how airtight the building will be, as well as its geometry.
- 3.4.3 The proposed thermal performance of different construction details is provided in the table in section 3.4.12, and these have been used within the SAP calculations undertaken to inform the approach and demonstrate compliance with the current planning policy standards. In each case, they exceed the minimum performance standards required by the current Building Regulations.
- 3.4.4 We would note however that, depending upon planning and construction timescales, these dwellings may be subject to the new Building Regulations regime which uses SAP10 methodology and therefore a calculation against Part L (2013) may no longer be applicable. The wording of any condition imposed would therefore need to take this change into account.

Ventilation and Air Tightness

- 3.4.5 Air tightness of a building is important in reducing heat loss, and in the prevention of draughts. The target for the development will be to ensure domestic properties are built with an air permeability level of 5m³/m²@50Pa or less. This will help reduce the size of the required heating system thus reducing energy use and carbon emissions. Other benefits include the reduction in the risk of interstitial condensation, improving the building's lifespan and reducing sound transmission through the structure.
- 3.4.6 The drive for air tightness will need to be matched by correctly designed ventilation. This is vital for healthy, comfortable buildings as it removes or dilutes pollutants that can accumulate in a closed space. Excessive moisture in particular can be a significant problem.
- 3.4.7 It is the intention that this development will benefit from natural ventilation through cross ventilation and openable windows. This will enable rapid purges of air and good levels of internal air quality. There may also be the need to implement a high efficiency continuous mechanical extract system to ensure that ventilation does not become an issue, with particular focus on mechanical extract ventilation from bathrooms and kitchens.

Lighting, Fixtures and Fittings

- 3.4.8 Further energy savings will be made by maximising the efficiency of appliances, lighting, fixtures and fittings.
- 3.4.9 All electric lighting will be energy efficient, and any spot lighting (for example within kitchens and bathrooms) will be provided using dedicated LED fittings. All appliances where installed will be high efficiency, further minimising the use of both electricity and hot water. Moreover,

where these are not installed, they will be provided to incoming residents within the list of optional extras. Taps and shower fixtures and fittings that reduce hot water consumption with low and/or aerated flows will be specified; more detail in relation to potable water management is provided in section 7.

- 3.4.10 In addition to the internal lighting, all street lighting and other street furniture will use appropriate LED technologies to further minimise lifetime energy use and associated emissions.

Performance Targets

- 3.4.11 The table below provides the proposed levels of performance for the different building elements shown against the limiting values within the Building Regulations 2013. The proposed values for this site considerably outperform those baseline standards, driving down energy use and emissions within the homes. Current Building Regulations allow for flexibility in how the standards are achieved, and it may be that these evolve as the design progresses – the overall performance standards however will be achieved.

- 3.4.12 These values have been used in the detailed energy calculations shown in section 3.6. Careful consideration has also been given to the more challenging targets within the emerging Part L of the Building Regulations, whereby an average 31% reduction (calculated across the full range of different housing forms) will be expected against current standards.

Element	Building Regulations Maximum (W/m ² K)	Indicative U-value (W/m ² K)
Roof / Sloped Roof	0.20	0.10
External walls	0.30	0.20
Party walls	0.3	0.00 (filled and sealed)
Ground floor	0.25	0.16
Glazing / doors	2.00	1.1-1.4
Factor	Detail	
Thermal bridging	Y-value < 0.15	Accredited Construction Details (or replacement as per emerging Building Regulations)
Air permeability	10m ³ /m ² /hour@50Pa	5m ³ /m ² /hour@50Pa
Heating controls	Programmer, TRVs and room stats	Time and temperature zone controls

Table 1: Summary of U-Values and Specifications

3.5 Domestic Energy Supply Options

Space Heating

- 3.5.1 District heating is not considered viable for this site for a number of reasons, including the disproportionately high infrastructure costs for a low density development and the relatively low heat demand from a small number of high efficiency dwellings.
- 3.5.2 The Applicant has instead committed to installing low carbon air source heat pumps (ASHPs) for space and water heating in all properties on this development. This option aligns closely

with the nationwide approach to the low carbon energy transition and the country's climate change targets: the rapid expansion in renewable and low carbon energy supply within the grid in recent years means that even direct electric heating now emits less carbon per kWh than natural gas.

- 3.5.3 For the purposes of the calculations, we have assumed that a Mitsubishi Ecodan air source heat pump will be installed; within Part L (2013) this has an efficiency of almost 290%. The highly efficient nature of the proposed properties on this development complements the low temperature output of heat pump technology, as does the zoned approach to controlling the heating system.
- 3.5.4 By installing the heat pumps – a recognised low carbon technology - the Applicant has also addressed the application of low carbon / renewable technologies within the development. The Mid Sussex District Plan policy DP39 requires that renewable resources of energy are used where appropriate and feasible. The heat pump solution delivers against this requirement, and also futureproofs the dwellings, enabling them to benefit from Grid decarbonisation over time, effectively resulting in fewer emissions year on year.
- 3.5.5 At this stage therefore there are no plans to install additional renewable energy technologies on the dwellings.
- 3.5.6 Finally, a further option that could be explored is the installation of waste water heat recovery (WWHR) units in dwelling types that can accommodate them. WWHR enables heat to be recovered from the waste water produced in bathrooms (i.e. via baths or showers). The heat recovered is used to pre-warm water to the boiler, and thus reduce the amount of fuel needed to provide hot water for use within the property. The impact is a further reduction in energy use and emissions.

3.6 Baseline Energy Demands

- 3.6.1 In order to calculate the property energy demands, design stage SAP calculations have been completed for each of the different house types designed for the development, using the specifications described above, including the application of ASHPs. This establishes the regulated energy demands for space heating, domestic hot water and regulated electricity.
- 3.6.2 It can be seen within the table that the properties exceed current Building Regulation requirements – the difference between the Dwelling Emission Rate (DER) and Target Emission Rate (TER) - by over 43% on average.

Residential Accommodation			SAP2012 results		
Plot	Plot Type	G.I.A. (sqm)	DER	TER	% Reduction
1	Type 1C 3B5P	116.0	14.23	26.07	45.42%
2	Type 2 4B7P	142.0	13.24	25.05	47.15%
3	Type 3 3B5P	101.0	15.56	28.29	45.00%
4	Type 8 4B7P	146.0	13.48	24.67	45.36%
5	Type 7 4B7P	194.0	11.51	21.78	47.15%
6	Type 1A 3B5P	116.0	14.33	26.54	46.01%
7	Type 1A 3B5P	116.0	14.33	26.54	46.01%
8	Type 1B 3B5P	116.0	14.33	26.54	46.01%
9	Type 6 4B7P	158.0	12.21	22.83	46.52%
10	Type 5 3B5P	108.0	15.07	27.37	44.94%
11	Type 4 2B4P	83.0	17.2	29.25	41.20%
12	Type 9 GF 1B2P	54.0	23.33	33	29.30%
13	Type 9 TF 1B2P	54.0	22.36	31.95	30.02%
TOTAL		1504.0			43.08%

Table 2: Energy Demands per Property Type

4 Materials and Waste Management

4.1 The Waste Hierarchy

- 4.1.1 Waste generation, storage, treatment and disposal before, during and after construction will be managed in accordance with the Waste Hierarchy:

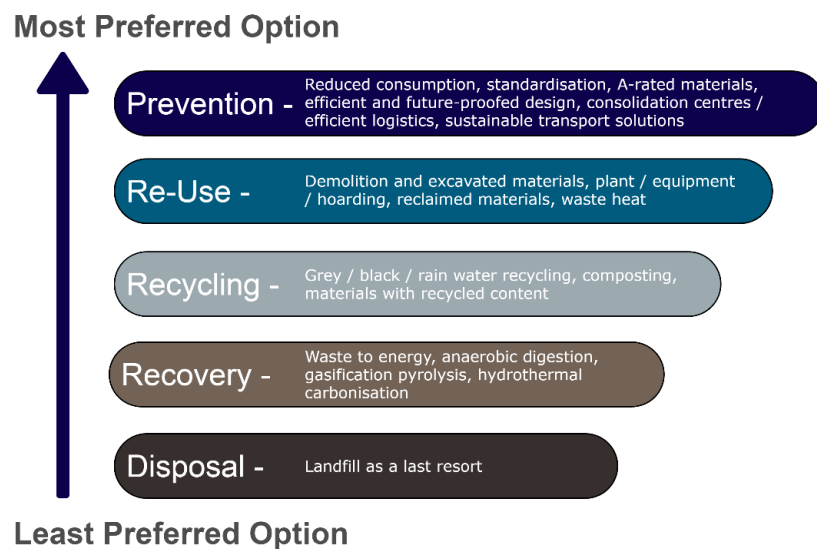


Figure 7: The Waste Hierarchy

- 4.1.2 This is in line with the Mid Sussex District Plan DP39, which requires proposals to maximise efficient use of resources, including minimising water and maximising recycling and re-use of materials through both construction and occupation.

4.2 Waste Management

Sustainable Building Materials

- 4.2.1 It is too early in the process to carry out a supply chain analysis for the construction phase, however we can establish the principles behind the sourcing of materials. Materials will be sourced using suppliers that have environmentally focused accreditations and management systems such as ISO:14001, and all timber will be 100% FSC accredited.
- 4.2.2 The approach to materials is to use local suppliers where viable – using a palette of materials that is both appropriate and in keeping with the local architectural vernacular. As such the form of construction will not require the use of unusual materials, those with significant environmental impact or those that require significant off-site processing and development before use on site.

Construction Waste

- 4.2.3 The Applicant recognises that waste needs to be sustainably managed and requires all contractors to adhere to strict management processes for waste on site. A Waste Management Plan will be developed to facilitate this and will:
- Identify waste streams, plan for their management and set targets for waste reduction;
 - Identify a lead person responsible for the Waste Management Plan delivery and provide site induction and training to all staff;
 - Identify suitable locations for the efficient separation and storage of waste prior to removal from site to encourage higher levels of recycling;
 - Identify opportunities for the on-site reuse of materials and scaffolding, hoarding and other such materials to be removed from site for use on subsequent construction projects.
- 4.2.4 In addition to the above, it will be a contractual requirement that any contractor operating on the site commits to the Considerate Constructors Scheme and aims to achieve best practice under assessment. This will help further minimise the impact on the surrounding area and neighbours to the site.
- 4.2.5 Where earth moving activity is needed, all excavated materials will be retained on site and any necessary storage will follow best practice guidelines so that none is lost to the weather and/or erosion.

Operational Waste

- 4.2.6 The Applicant will encourage property occupants to manage waste sustainably. For example, the houses will have a private rear garden with direct external access which will provide sufficient space for the discreet storage of bins and composting facilities, keeping waste storage away from the public domain.
- 4.2.7 Internally, the dwellings will be provided with integrated bins to manage different recycling streams prior to storage outside. Facilities will be easy to access and will be designed in line with the collection regime of the council.

5 Sustainable Transport

5.1 Sustainable Transport Options

- 5.1.1 District Plan policy DP21 encourages well located development that can be accessed by sustainable modes of transport, and requires that alternatives to the private car are encouraged through the provision of safe and convenient walking and cycling routes, and through the promotion of public transport.
- 5.1.2 Sarnlea Consulting Engineers have completed a comprehensive Transport Assessment which accompanies this application. The Assessment demonstrates that the site is well situated to make the most of existing pedestrian and road networks, public transport provision and local amenities in the vicinity.
- 5.1.3 Secure cycle parking will be provided on site in line with local requirements, with two spaces per unit within rear gardens.

5.2 Provision of Electric Vehicle Charging Facilities

- 5.2.1 Increasingly, energy and transport systems are becoming interlinked as the nation transitions from the use of petrol and diesel vehicles to zero emission solutions based around electric charging and cleaner, hydrogen-based fuels. The government announced in November 2020 that there will be a ban on the sale of petrol and diesel cars by 2030 and hybrid cars by 2035
- 5.2.2 Crucially, therefore, the need for charging infrastructure to support this wholesale shift to cleaner vehicle technology needs to be implemented now and this is supported by policy: the West Sussex County Council's Guidance on Parking at New Developments provides guidance on the minimum levels of electric vehicle charging points required.
- 5.2.3 With this in mind, the Applicant has committed to designing and managing the power network to install 3kW trickle charging points on 70% of properties on site.

5.3 Provision of High Speed Broadband and Home Working

- 5.3.1 The availability of high-quality broadband connections is increasingly viewed as essential in ensuring that people remain informed and connected and can access a range of services effectively. Moreover, it also facilitates greater home working which can help minimise transport issues.
- 5.3.2 It is likely that the dwellings will be provided with access to Fibre-to-the-Property to enable ultra-high-speed broadband should residents wish to connect, and this will be explored further at later stages in the planning process.

6 Climate Resilience and Adaptation

6.1 Adapting to the Future

- 6.1.1 The ability of the development to adapt to anticipated future changes in the climate is an important aspect of its longevity, and ultimate habitability. The principle of adaptation applies to both the built and external environment, and indeed how they interact.
- 6.1.2 District Plan policy 39 requires that development proposals demonstrate how the risks associated with future climate change have been planned for in the design of the buildings and the scheme's layout. This section details how the Applicant is addressing these requirements.

6.2 Reducing Overheating Risk Through Design

- 6.2.1 The risk of overheating living spaces is of concern, given our knowledge of future climate. The basis for overheating analysis is the CIBSE Guide *TM59 Design Methodology for the Assessment of Overheating Risk in Homes* (CIBSE, June 2017). For homes which are predominantly naturally ventilated, compliance is based on passing both of the following two criteria:

(a) For living rooms, kitchens and bedrooms: the number of hours during which ΔT is greater than or equal to one degree (K) during the period May to September inclusive shall not be more than 3 percent of occupied hours. (CIBSE TM52 Criterion 1: Hours of exceedance).

b) For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of annual hours. (Note: 1% of the annual hours between 22:00 and 07:00 for bedrooms is 32 hours, so 33 or more hours above 26 °C will be recorded as a fail). The third criterion sets an absolute maximum daily temperature for a room, beyond which the level of overheating is unacceptable.

(CIBSE, 2017)

[ΔT is defined as the difference between the actual operative temperature in the room at any time and the limiting maximum acceptable temperature, rounded to the nearest whole degree].

- 6.2.2 In due course, and as the specification is developed further, 'TM59 compliant' tests could be undertaken to ensure overheating continues to be minimised. In order to provide a more robust analysis, and in the context of a changing climate, the use of a 'future weather' file may also help ensure that we can be more certain of the impact in the future, and the resulting efficacy of the solutions put forward where any overheating risk exists.
- 6.2.3 Based on previous analysis for similar developments, we typically find the following solutions are sufficient to enable buildings to comply, depending on the house type and orientation:

- Recommendations on the performance of glazing as described in section 3 – for example reducing the g-value of the glass to increase the amount of sunlight reflected before entering the property;
- Changing the depths of overhangs on southern facades;
- Adjusting glazing sizes;
- Examining external options including louvres and shutters as a 'last resort'.

6.3 The Multiple Benefits of Open Space and Vegetation

- 6.3.1 Retaining trees and hedgerows, planting new trees around the site and the provision of open space will provide multiple benefits in a changing climate. From a microclimate perspective they help provide a comfortable external environment in hot periods whilst reducing heat gain in buildings, therefore decreasing the need for mechanical cooling.
- 6.3.2 Trees also contribute to the reduction of wind speeds which improve comfort levels and reduce air infiltration into buildings on windier days. Trees sequester CO₂ and improve air quality through dry deposition of gases (including NO_x, SO_x, PM10 and O₃) whilst also helping reduce levels of ambient noise.
- 6.3.3 Trees are also part of, and result in further, biodiversity gains through ecosystem improvement, whilst providing aesthetic improvement and a better quality of life – numerous studies show tree lined streets deliver higher property values and higher levels of wellbeing. The landscape can also offer a great opportunity to address issues that fall outside of the strict boundaries of the site including the use of landscape as a food source through the planting of productive fruit and nut trees, edible herbs and fruit growing vines.

6.4 Managing Water in a Changing Climate

- 6.4.1 Consideration must be given to design features that respond to other aspects of climate change, particularly storm water flows and the rapid removal of water run-off from roofs to prevent building damage and water ingress such as:
- Increased diameter guttering and downpipes – to cope with additional intensity of storm water, reducing the risk of backing up
 - Extensive SuDs management train to deal with rainfall within the development at a surface level, prior to discharge.
- 6.4.2 The integration of different SuDs features into the landscape layout will be pivotal in its future development, in order to enable the necessary storage volumes associated with a 1 in 100 year storm event, plus a 40% allowance for the impacts of climate change. The Flood Risk Assessment and Drainage Strategy which accompanies this application includes a detailed SuDs Strategy.

7 Management and Conservation of Water Resources

7.1 The Water Hierarchy

- 7.1.1 Water efficiency becomes increasingly important in a changing climate with diminishing water resources.
- 7.1.2 We consume a vast amount of potable water in non-potable situations, including flushing the toilet, washing the car and irrigating our gardens. Only a small proportion of our *potable* mains water is used for drinking, cooking and personal washing:

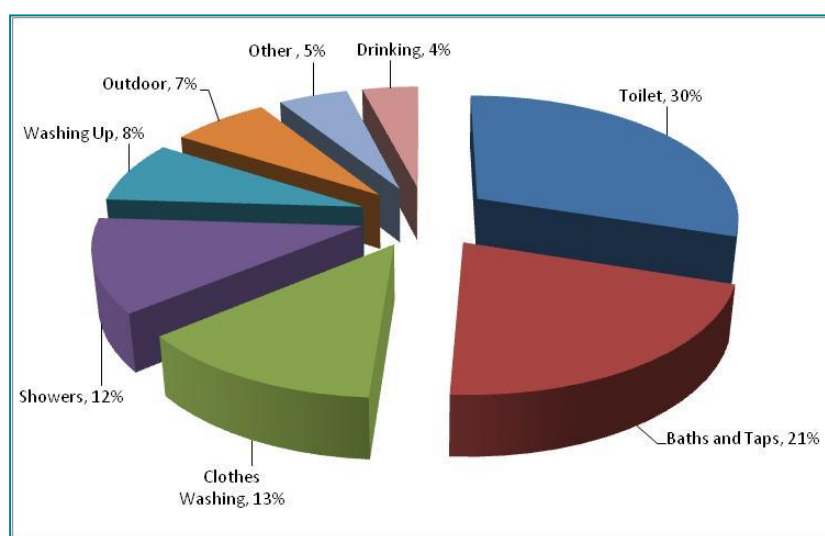
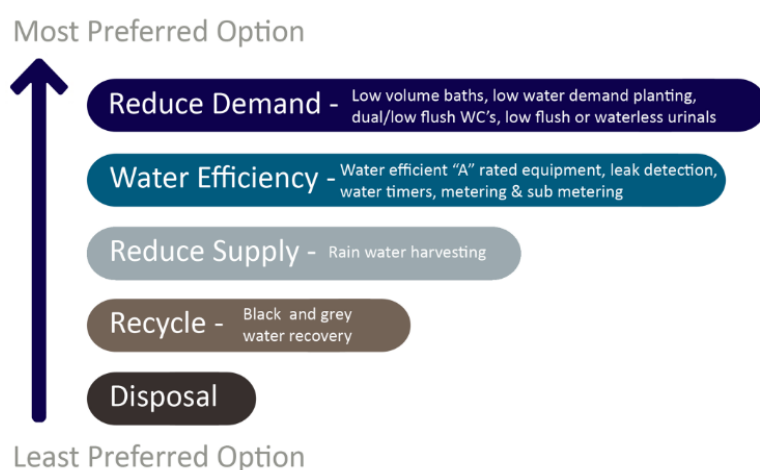


Figure 8: Domestic Water Consumption by End Use (waterwise.org.uk)

- 7.1.3 The national average for water consumption is around 143l per person per day. In order to reduce this figure, the management of water in the proposed development will follow the principles of the water hierarchy:



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Figure 9: The Water Hierarchy

7.2 Domestic Water Reduction Measures

- 7.2.1 The District Plan policies DP39 and DP42 include a specific target for all new residential developments to achieve a water efficiency equivalent of 110 litres or less per person per day. Water efficiency targets are also driven by the higher standards described within Part G of the Building Regulations (see section 2). The enhanced target in section 2b matches the council's target.
- 7.2.2 Fixtures, appliances and fittings plus rainwater recycling measures will be specified in the development which considerably reduce potable water use so that the daily potable/wholesome water use will be calculated to not exceed 110 litres per person per day. The following table is an illustrative list of water specifications which typically achieve this standard:

Measure	Water Use
Showers (l/min)	10
Aerated taps (l/min)	4
Kitchen sink taps (l/min)	3
Bath (l capacity)	140
Low / dual flush WC (l)	4/2.6
Washing machine (l/kg dry load)	7
Dishwasher (l/place setting)	1.08
Rainwater recycling	Rainwater butts

Table 3: Illustrative Water Specifications

7.3 Surface Water Management

- 7.3.1 Any new development on a previously undeveloped site will inevitably increase the amount of hard standing (roofs, roads, pavements) and therefore the amount of surface water run-off. Furthermore, rainfall levels in 20-30 years' time are expected to be very different to current levels, not necessarily in annual total volume, but with respect to the rainfall distribution throughout the year and the number of heavy downpours and storm events. It is therefore important that there is sufficient management of these rainfall volumes to reduce flood either locally or further afield.
- 7.3.2 District Plan policy DP41 details the authority's requirements for water management in new developments. These requirements are reflected in the accompanying Flood Risk Assessment (FRA) and Drainage Strategy provided by MTC Engineering on behalf of the Applicants. This provides further detail in relation to the level of flood risk and management of surface water flows on the site and should be referred to for full details in this regard.

8 The Natural Environment and Landscaping

- 8.1.1 District Plan policies DP37 and DP38 require that development protects and enhances trees, woodland and hedgerows, and that appropriate provision is made to protect and enhance biodiversity through careful and considered design.
- 8.1.2 A Tree Survey has been completed with a particular focus on the existing tree screen to Hanlye Lane and the trees and hedges on the eastern boundary. These will be largely retained. Where trees do need to be removed to facilitate the development, these will be replaced with new trees along the southern boundary. Additional planting of fruit trees within the gardens is also proposed.
- 8.1.3 The site currently comprises school buildings and hard surfaces. The provision of gardens within these proposals alongside retaining and enhancing boundary trees and verges will increase the biodiversity potential of the site.

9 Conclusion

- 9.1.1 This *Sustainability Statement* has been commissioned by Quantum Homes Ltd to detail how issues relating to sustainability are being implemented for the proposed development on land at Court Meadow School in Cuckfield, Mid Sussex.
- 9.1.2 Throughout the document we have sought to actively address national and local planning policy objectives and standards to demonstrate the Applicant's commitment to these issues.
- 9.1.3 In particular we have provided the necessary detail related to energy supply and minimising demand, water efficiency and sustainable waste management to demonstrate compliance with policy DP39 of the Mid Sussex District Plan and current Building Regulations.
- 9.1.4 A summary of the recommendations made in order to achieve relevant policy requirements is provided in Appendix A.
- 9.1.5 Further work will be necessary to ensure continued compliance throughout the later planning phases and as construction progresses. Overall, and in conclusion, the proposals for the development maximise the site's assets and layout in relation to sustainable design, creating an attractive, environmentally sound development.

10 Appendix A – Key Recommendations

Section		Policies Addressed	Key Recommendations
3	Low Carbon and Renewable Energy Demand and Supply	District Plan DP26 District Plan DP39 Design Guide DG37	- Follow the priorities of the Energy Hierarchy - Ensure building orientation is such that dwellings maximise solar gain - Control overheating risk by using glazing with g-value of 0.4-0.45 as standard - Minimise energy consumption to achieve a substantial improvement in the DER over the TER, calculated according to Building Regs 2013 - Air permeability levels should be 5m³/m²@50Pa or less - Install energy efficient lighting and appliances - Install a high efficiency air source heat pump in each dwelling - Explore the option of Waste Water Heat Recovery units in properties
4	Materials and Waste Management	District Plan DP39 Design Guide DG37	- Follow the priorities of the waste hierarchy - Source materials from suppliers with environmental accreditations, using local suppliers where possible - Ensure contractors implement strict waste management processes and commit to Considerate Constructor Scheme - Consider opportunistic on-site reuse of materials where feasible - Provide sufficient and accessible bin storage to facilitate waste management and recycling
5	Sustainable Transport and EV Charging	District Plan DP21 District Plan DP23 WSCC Guidance on Parking	- Provide individual 3kW trickle charging points to 70% of properties - Investigate providing Fibre-to-the-Property to enable ultra-high speed broadband thus enabling home working
6	Climate Resilience and Adaptation	District Plan DP39	- Control overheating risk by using glazing with g-value of 0.4-0.45 as standard - Consider adjusting depths of overhangs to provide shading on southern facades - Adjust glazing sizes where necessary - Examine the use of external options as a last resort - Include street trees, shrubbery and open spaces throughout the site.
7	Management and Conservation of Water Resources	District Plan DP39 District Plan DP41 District Plan DP42 Design Guide DG37	- Specify fixtures, appliances and fittings that reduce potable water use including aerated taps, low/dual flush WCs, low capacity baths - Provide opportunities for rainwater recycling i.e. rainwater butts - Closely follow the FRA recommendations including those for SuDs.
8	The Natural Environment and Landscaping	District Plan DP26 District Plan DP37 District Plan DP38	- Enhance planting on site with native species of trees, hedgerows and shrubs