



Sustainability Statement

Greenhill, Liverpool

*from Energist UK
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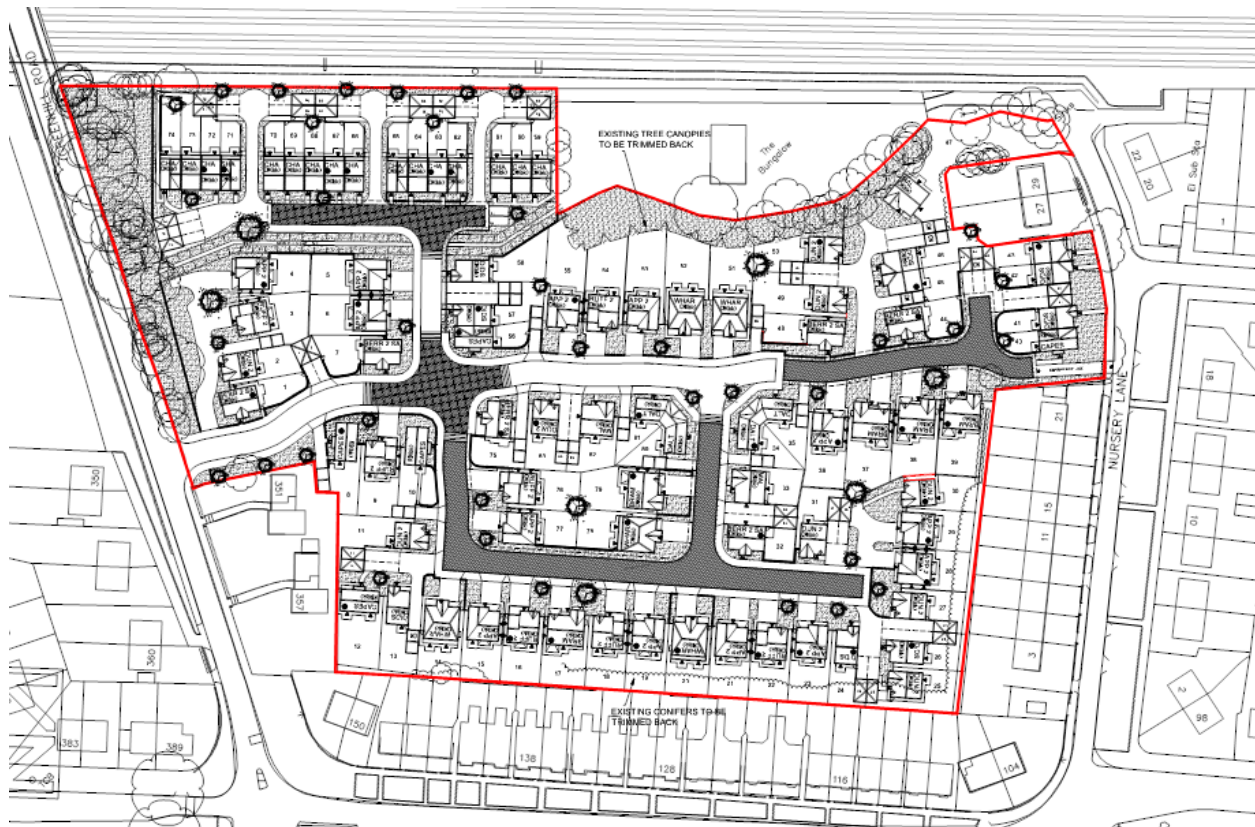
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Introduction

This Sustainability Statement will explore and evaluate the sustainability measures that will be implemented on this development, with a view to reducing site carbon emissions along with the impact the development will have on the immediate and wider environment.

The site consists of 83 dwellings, a mixture of detached, semi-detached and terraced mews houses, to be constructed to a standard over and above that of Part L1A 2010 and Ene 1 of the Code for Sustainable Homes.



The following categories of sustainability will be addressed, in addition to the commitment of Morris Homes towards Sustainable Design:

- Carbon Emissions
- Heating Demand
- External Lighting
- Internal Water Consumption
- Materials
- Construction Site Waste Management
- Responsible sourcing of site timber
- Minimising water pollution
- Minimising dust pollution

A Commitment to Sustainable Design and Construction:

Morris Homes pride themselves on combining exceptional build quality, high specification, good design with energy efficient homes. Their commitment to building sustainable homes and developments is reflected in their design and achievements:

Morris Homes has been voted 'Green Housebuilder of the Year' in the Green Construction Awards and have secured a 'What House?' award for Best Energy Efficient Development.

Morris Homes were the first house builder in the UK to comply with SAP 80+, the government's accreditation scheme for energy efficiency, ensuring all their developments meet this standard.

Over 90% of their developments are 'brownfield sites', transforming derelict land into well designed, energy efficient developments whilst adding value to local areas and improving outlook.

Morris Homes invest heavily in high quality landscaping and working with the local eco-systems, whilst protecting natural habitats and features. These features help to create a sense of place and community. As a result Morris Homes are a regular winner of the Daily Mail Green Leaf Awards.

These commitments result in the development of highly sustainable communities and this can be seen by the following sustainability initiatives that will be implemented on this site.

Sustainability Measures

Carbon Emissions

The development is to be assessed under Part L1A 2010. Inherently, this is a 25% improvement over the carbon emission targets of Part L1A 2006, and therefore the dwellings are to be designed and built to a stringent sustainability standard. It is also worth noting that the current Energy 1 requirement under the Code for Sustainable Home is compliance with Part L 2010. Therefore these dwellings will meet the minimum Energy 1 requirement of the Code for Sustainable Homes.

It is proposed that this target be met through the use of highly insulating building fabric, efficient heating systems and low energy lighting. The specification is as follows:

Element	Part L1A Requirement	Proposed Specification
Ground floor U value	0.25	0.15
External wall U value	0.3	0.27
Roof U Value	0.2	0.12
Window U Value	2	1.2
Door U value	2	1.1
Air permeability	10 m ³ /m ² /hour	6 m ³ /m ² /hour
Space heating	88% efficient boiler	89% efficient boiler
Heating Controls	Programmer, Room Thermostat and TRVs	Time and Temperature Zone Control
Low Energy Lighting	75% of all light bulbs Low E	100% of all light bulbs Low E

It is evident that the proposed specification is in excess of the requirements of Part L1A 2010 and the requirements of Energy 1 of the Code for Sustainable Homes.

In order to accurately quantify the Carbon Emissions of the development, SAP calculations have been completed using SAP 2009 methodology, and based on the proposed specification above, are as follows:

Housetype	Target Emission rate (kg CO ₂ /m ² /year)	Dwelling Emission Rate (kg CO ₂ /m ² /year)
Moreton	17.81	17.71
Willington	17.27	17.14
Staunton	17.95	17.83
Malham	18.4	18.29
Appleton	20.42	20.18
Wharfdale	18.59	18.56
Dunham	20.39	20.15
Dalton	19.22	18.42
Houghton	17.92	16.39
Rufford	20.87	19.89
Ely	21.62	21.52
Bramhall	18.76	18.68
Berrington	19.28	17.87
Capesthorpe	20.16	19.96
Budworth	19.33	18.38
Edgeware	21.83	20.52
R3	16.96	16.43

These calculations confirm that the average reduction over the TER for these units is 3.76%, showing a further improvement over both Level 3 of the CSH and Part L1A 2010.

Full SAP worksheets can be found in Appendix 2 of this report.

Heating Demand

Under the Code for Sustainable Homes heating demand is assessed under Ene 2: Fabric Energy Efficiency. This calculation assesses the influence of fabric U values, ventilation, orientation and solar gain, on the heating demand of a dwelling. The lower the figure the more energy efficient the building will be.

By assessing a selection of dwellings, the Fabric Energy Efficiency can be calculated:

Housetype	FEE	Ene 2 Credits
Houghton	50.89	5.4
Berrington	55.08	4
Rufford	57.98	3.4
Dalton	51.92	5
Edgeware	54.96	4

The Code for Sustainable Homes would award credits for a Fabric Energy Efficiency figure of 58 or below. The calculations confirm that the dwelling are designed to a high standard and will have a low heating demand compared to dwelling built to the limiting U values of Part L 2010.

External Lighting:

All external lighting to the dwelling will low energy, and controlled suitably with PIR, Time switches, Manual override or daylight sensors. This is in line with the requirements of Ene 6 of the Code for Sustainable Homes.

Internal Water Consumption

Each dwelling will comply with the requirements of Part G: Water Efficiency. This ensures the daily internal water consumption of the properties will be less than 120 litres of mains water per person per day. It is proposed that this be achieved using flow restrictors, dual flush toilets, and lower capacity baths. Where provided, energy efficient white goods will also be used. This would meet the mandatory requirements of CSH Levels 1 and 2. A calculation confirming this water consumption can be found in Appendix 1.

Materials

All materials used by Morris Homes are sourced sustainably, are Green Guide Compliant and have a low ozone depletion and global warming potential. Due to substantial developments in insulation performance, issues regarding sustainability and manufacturers' awareness of these issues, Morris Homes are able to ensure that they build using materials from sustainable sources with very low environmental impact. The following are key build elements and materials used:-

- 1.** Insulation used within room-in-roof and floor slabs is Kingspan TF70 and Kingspan TP10, both have zero rated Ozone Depleting Potential (ODP).
- 2.** Party wall acoustic batt RD35 is zero ODP and made up of 80% recycled waste.
- 3.** All lagging required for services is done using Rockwool Mineral Wool Batts, which has zero rated ODP and zero Global Warming Potential.
- 4.** Timbers for all build elements such as floor, roof, stud-walls are from Forest Stewardship Council certified suppliers.
- 5.** Checks are made to ensure that all non-certified timber used is not on the list of timbers specified within the Convention on International Trade in Endangered Species of Wild Fauna and Flora document.
- 6.** Kingspan, Rockwool and Isover are all manufacturers that are committed to ensuring their manufacturing processes have the least amount of impact possible on the environment and they are all committed to developing technologies and methods to improve their processes further. For example Rockwool is manufactured using a state-of-the-art production process that does not use, and has never used, harmful gases such as CFCs, HCFCs, HFCs, in fact any 'blowing agents' that have Ozone Depleting Potential or Global Warming Potential.

The above is in accordance with both the requirements of Mat 2 and Mat 2, along with Pol 1 of the Code for Sustainable Homes.

Construction Site Waste Management

Morris homes adopt a strict site waste management scheme. At present materials are segregated as follows: -

1. 2 No 40 cubic yard skips on a 'roll on roll off' system. These are used solely for crushable inert materials. These skips are recovered by our nominated waste contractor who segregates all materials off site and work to a minimum 90% recycling efficiency.
2. Inert materials such as brick/block/hardcore are crushed and re-used whenever possible on site. An example would be for road or driveway construction.
3. Plasterboard is dealt with as a separate item. Mini skips are provided to each plot and at the end of each day are emptied to 2 No 40 cubic yard skips, which are provided by the waste contractor. They all have a recycling agreement in place with Gypsum.
4. Timber pallets are either collected for re-use from site or are collected for recycling.
5. Hazardous waste is stored in a separate lockable container with 205 litre drums. This includes glues, paints, silicone tubes etc.

Site waste management details are provided to all principle and subcontractors at tender stage for reference. The site manager and team enforce this on site with regular 'toolbox talks' and regular skip inspections. The site waste management system is updated on a regular basis to reflect changing build conditions and clear notification and waste locations are designated and indicated on site plans located within the site office.

The Full SWMP for this site contains full details for reducing site waste, however the above policies will ensure that waste is minimised from site and landfill and that this part of the construction process is truly sustainable. This would meet the requirements of Was 2 of the Code for Sustainable Homes.

Responsible sourcing of site timber

During the construction process timber is a common material, used for hoardings, signage, framework and storage.

If timber is not sourced from a sustainable source, it can have a severe negative impact on the environment, leading to degradation of forests and natural habitats, which can in turn cause loss of species.

As a result, Morris Homes will ensure that all timber used on site is second – hand (recycled) or responsibly sourced.

In order to be defined as responsibly sourced, the supplier must be able to produce a chain of custody certificate. Examples of COC certificates can include:

FSC - Forest Stewardship Council

PEFC - Programme for the Endorsement of Forest Certification

MTCC - Malaysian Timber Certification Council

By sourcing timber from suppliers who hold a chain of custody certificate you can be sure that the timber has been responsibly managed and farmed, and that the environment has not suffered.

Morris Homes will ensure that all site timber is responsibly sourced and will present COC certificates where required.

Monitoring of site energy consumption

With so much focus on the sustainability of a dwelling once it is occupied it is easy to forget the energy that can be consumed during the construction of the dwelling itself.

In order to reduce site energy consumption Morris Homes will undertake to complete the following:

- Take monthly measurements of energy consumption, which will be recorded and displayed on site
- Display on site appropriate target levels, set in accordance with UK construction Industry KPIs.
- Compare actual records to targets to identify areas where energy consumption could be reduced.
- This information is to be disseminated amongst site operatives to increase awareness of site energy consumption.

By implementing the above measures the tools become available for Morris Homes to actively manage site energy consumption, in addition to increasing awareness and encourage energy saving measures.

This would meet the requirements of Man 3 of the Code for Sustainable Homes.

Minimising water pollution

A construction site can create many potential pollutants (silt, oil, chemicals) which can find there way into watercourses if left unchecked. Morris Homes will therefore undertake to implement best practice policies designed to remove the risk of water pollution. The following will be in place to ensure water pollution is minimised:

- All cleaning activities (such as wheel washing) will be done with biodegradable detergents and will discharge into the foul sewer (if possible) or if not, a closed loop vehicle wash system will be used. These activities will also be completed on hard standing to allow easy management of excess water.
- Any chemical storage will be done in areas, where a potential leak could not find it's way into a water course.
- Any silty water, created as a consequence of demolition, will be pumped into the foul sewer.
- Roads will be regularly brushed and scraped to remove dust and mud, which would form silt when it rains.

By implementing the above procedures Morris Homes will greatly reduce the risk of water pollution from this development.

This would meet the requirements of Man 3 of the Code for Sustainable Homes.

Minimising air or dust pollution

Dust pollution can cause a concern for both the local environment and construction workers. In order to minimise the potential for air pollution, Morris Homes will introduce the following procedures, which are considered best practice within the construction industry

- Any demolition works will be screened to prevent dust movement.
- Hard standing areas will be watered down to prevent dust
- All skips will be covered with secure dust sheets
- Wet disk cutting will be used where appropriate
- Stockpiles of earth will be watered down to prevent drying out and dust forming.
- Burning of materials on site will not be permitted
- Wheel wash facilities will be used and roads regularly swept.
- Regular air monitoring will take place to ensure an acceptable level of air quality (monthly)

This would meet the requirements of Man 3 of the Code for Sustainable Homes.

Providing Information and Advice to Purchasers

It is obviously important to provide more sustainable developments but of equal importance is ensuring that the occupants fully understand the property they are living in and can't make the most of its environmental features. Morris Homes aim to provide as much information as possible within their home information packs to ensure purchasers are aware of possible cost savings which can only improve the environment.

Home Information Packs include the following information:

1. Gas boiler details, confirming specification and that by following the manufacturer's guidelines for heating controls, programmers and room thermostat settings they could reduce emissions and reduce their energy bills by a third. We recommend that in the in warmer months by merely reducing the temperature by one degree, they could provide an additional 10% saving.
2. General advice regarding switching off of appliances and their eco label, and what this means to them.
3. General guidance on reducing water consumption and also advise them that using the 'eco' setting on their dishwashers is more economical and uses less water than washing by hand.

Although these are simple suggestions, they can go a long way to reducing a homeowners operational costs and helping the environment. The information provided in the Home User Guide is in excess of the requirements of the Building Regulations and is in accordance with the requirements of Man 1 of the Code for Sustainable Homes.

Ecology

The existing development site consists mainly of grassland. To ensure that the existing biodiversity is enhanced, Morris Homes will be implementing a diverse landscaping scheme, the will increase the number of native plant species to the area, providing a habitat insects, birds and other wildlife.

Local Transport

The site is located centrally, taking advantage of local public transport routes. In addition the site contains a network of cycle and footpaths. The combined impact of all of these factors will reduce the carbon footprint of those living in the development as they will have many alternatives to car travel, helping the local environmental and easing traffic on the local roads

Conclusion

This report has set out the measures that Morris Homes will introduce to ensure that not only the development itself is sustainable, but also that the construction of this development, will also be sustainable. Elements of the design meet and exceed requirements set out in the Code for Sustainable Homes. The impact on local residents and the environment has been greatly reduced as a consequence of these measures, which are not statutory. All these policies are measurable and specific and can be evidenced at any time in the construction process.

Appendix 1: Water Calculations



Part G Calculation (2010 Secti

Water efficiency calculation for at Morris Homes
Specification, , , .

Table 1: The water calculator for new dwellings

Installation Type	Unit of measure	Capacity / Flow rate	Use factor	Fixed use (l/p/d)	Litres/ person/day
WC (Dual Flush) - Full Flush	Flush volume (Litres)	6.00	1.46	0.00	8.76
WC (Dual Flush) - Part Flush	Flush volume (Litres)	3.00	2.96	0.00	8.88
Taps (Excluding Kitchen and Utility)	Flow rate (Litres/Minute)	5.00	1.58	1.58	9.48
Baths	Capacity to Overflow (Litres)	200	0.11	0.00	22.00
Showers	Flow rate (Litres/Minute)	9.00	4.37	0.00	39.33
Taps (Kitchen and Utility)	Flow rate (Litres/Minute)	6.00	0.44	10.36	13.00
Washing Machines	Litres/ KG of Dry Load	8.17	2.10	0.00	17.16
Dishwashers	Litres/ Place Setting	1.25	3.60	0.00	4.50
Waste Disposal	Litres/Use	0.00	3.08	0.00	0.00
Water Softener	Litres/Person/Day	0.00	1.00	0.00	0.00
Total Calculated Use				123.11	

Contribution from Greywater (Litres/Person/Day)	0.0
Contribution from Rainwater (Litres/Person/Day)	0.0
Normalisation Factor	0.91
External Water Use (Part G assumption)	5.00
Total Water Consumption	117.03

Target Methodology	Part G 2010 Regulations	125.0
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Target	>	Expected	=	Result
125.0		117.0		Pass

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Part G Calculation (2010 Section 6)

Morris Homes Specification, 1, 2, 3

Table 2: Consumption calculator for multiple fittings for new dwellings

Table 2.1: Taps (Excluding Kitchen and Utility)			
Tap Fitting Type	Flow Rate	Quantity	Total per Fitting
Basin Taps	5.0	3	15.0
	0.0	0	0.0
	0.0	0	0.0
	0.0	0	0.0
Totals		3	15.0
Average flow rate (Litres/Minute)			5.0
Maximum flow rate (Litres/Minute)			5.0
Proportionate flow rate (Litres/Minute)			3.5

Table 2.2: Baths			
Bath Fitting Type	Capacity	Quantity	Total per Fitting
Bath	200.0	1	200.0
	0.0	0	0.0
	0.0	0	0.0
	0.0	0	0.0
Totals		1	200.0
Average capacity (Litres)			200.0
Maximum capacity (Litres)			200.0
Proportionate capacity (Litres)			140.0

Table 2.3: Taps (Kitchen and Utility)			
Tap Fitting Type	Flow Rate	Quantity	Total per Fitting
Taps	6.0	1	6.0
	0.0	0	0.0
	0.0	0	0.0
	0.0	0	0.0
Totals		1	6.0
Average flow rate (Litres/Minute)			6.0
Maximum flow rate (Litres/Minute)			6.0
Proportionate flow rate (Litres/Minute)			4.2

Table 2.4: Dishwashers			
Dishwasher Type	Litres/Place Setting	Quantity	Total per Fitting
Default Dishwasher	1.3	1	1.3
	0.0	0	0.0
	0.0	0	0.0
Totals		1	1.3
Average litres per place setting			1.3
Highest litres per place setting			1.3
Proportionate litres per place setting			0.9

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Part G Calculation (2010 Section 6)

Morris Homes Specification, , , ,

Table 2: Consumption calculator for multiple fittings for new dwellings

Table 2.5: Washing Machines

Washing Machine Type	Litres per KG	Quantity	Total per Fitting
Default Washing Machine	8.2	1	8.2
	0.0	0	0.0
	0.0	0	0.0
Totals		1	8.2
Average flow rate (Litres/Minute)			8.2
Maximum flow rate (Litres/Minute)			8.2
Proportionate flow rate (Litres/Minute)			5.7

Table 2.6: Showers

Shower Fitting Type	Flow Rate	Quantity	Total per Fitting
Shower	9.0	1	9.0
	0.0	0	0.0
	0.0	0	0.0
	0.0	0	0.0
Totals		1	9.0
Average flow rate (Litres/Minute)			9.0
Maximum flow rate (Litres/Minute)			9.0
Proportionate flow rate (Litres/Minute)			6.3

Table 2.7: WCs

WC Type	Effective Flush Vol	Quantity	Total per Fitting
WC	4.0	1	4.0
	0.0	0	0.0
	0.0	0	0.0
	0.0	0	0.0
Totals		1	4.0
Average effective flushing volume			4.0

Table 3: Water softener consumption calculation for new dwellings

No water softener has been included in the design of this dwelling	
Total capacity used per regeneration (%)	
Water consumed per regeneration (litres)	
Average number of regeneration cycles per day	
Number of occupants served by the system	
Water consumed beyond 4% (litres/day)	0.0
Water consumed beyond 4% (litres/person/day)	0.0

Tables 4 & 5: No greywater or rainwater systems are proposed for this dwelling

Appendix 2: SAP Worksheets