Energy Statement

Energy and Carbon Reduction

Moorthorpe Way, Owlthorpe

Reference Number: 007780

Issue 1

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Company Profile

FES Group was established in 2006, as a Building Surveying firm specialising in sustainable design and construction. Since then, the company has expanded and developed a nationwide footprint becoming one of the leading sustainability and Part L compliance consultancies in the UK marketplace along with adding testing services to our extensive suite of works. With offices in London and York we are a one stop dependable partner providing surveying and technical services for construction projects. Our key services include:

- Energy Strategy Studies
- Compliance Assessments
- BREEAM Assessments
- Code for Sustainable Homes Assessments
- Building Surveys
- Design Services
- Testing Services

We work with a range of clients including national and regional house builders, construction contractors, architects, M&E consultants, town planners and commercial developers. Our work varies from large scale well known projects to smaller individual projects adapting to each projects needs and requirements.

Introduction

This report has been prepared by the FES Group on behalf of Avant Homes Central to accompany the planning application for the proposed development known as Moorthorpe Way, Owlthorpe.

The development proposals will see the construction of 74 new dwellings, consisting of a mix of detached, semi-detached, and terraced dwellings.

This report reviews the proposed energy and carbon reduction strategy advanced by Avant Homes Central within the context of local and national planning policy. The report in particular considers and evaluates the measures incorporated into the design of the development to reduce the predicted CO_2 consumption of the site equal to a 20% improvement over 2013 building regulations under SAP2012, at least 10% to be offset through the use of renewable energy.

The following documents were considered when formulating the report:

- **National Planning Policy Framework 2012 –** The NPPF strengthens the emphasis on sustainable development and encourages Local Authorities to adopt standards consistent with the Government's zero carbon building policy and other nationally described standards.

- **Building Regulations Part L1A 2013 –** Approved Document L1A 2013 Conservation of Fuel and Power in new dwellings sets minimum energy efficiency and fabric efficiency standards for all new domestic buildings.

- **Planning Policy CS65 Sheffield City Council –**

All significant developments will be required, unless this can be shown not to be feasible and viable, to:

a. *provide a minimum of 10% of their predicted energy needs from decentralised and renewable or low carbon energy; and*

b. *Generate further renewable or low carbon energy or incorporate design measures sufficient to reduce the development's overall predicted carbon dioxide emissions by 20%. This would include the decentralised and renewable or low carbon energy required to satisfy (a).*

The renewable or low carbon energy technologies must be operational before any new or converted buildings are occupied.

If it can be demonstrated that the required reduction in carbon emissions cannot be met through decentralised renewable or low carbon energy and/or design and specification measures, a contribution towards an off-site carbon reduction scheme may be acceptable.

Sustainable Design

The building fabric, the building services and the management of a building broadly determine the energy use of a building. In understanding this, design teams can take measures to advance sustainable design from the earliest stages of a development. However sustainability is not limited to issues concerning energy consumption. Material selection, the protection of local environments, addressing flood risk and the health and wellbeing of future occupants are all issues requiring consideration. Addressing all these issues in an integrated and intelligent manner will result in truly sustainable developments.

Material Selection

Significant amounts of energy and natural resources are consumed in the production, transportation and disposal of building materials. Two issues are of significant importance in the procurement of materials: the environmental impact of materials and the sourcing of materials. Avant Homes Central is dedicated to taking pro-active measures to addressing these issues.

Table 1- Green Guide Rating of Specification

	BRE Green Guide Rating
External Wall	A+
Ground Floor	B
Intermediate Floor	C
Roof	A+
Internal Walls	A
Windows	A

The developer will choose materials which have a lesser environmental impact. This will be implemented during the procurement process. Suppliers will be obliged to produce Environmental Management System certificates covering the sourcing and production of materials. Timber or timber composite products will be sourced from responsible sources. Suppliers will be obliged to provide full Chain of Custody Certificates right through the supply chain; from the initial timber yard, manufacturing process, transformation and distribution. Secure certificates must be produced by valid accrediting bodies – FSC, PEFC, CSA, SFI & MTCC.

Flood Risk

Planning Policy Statement 25 and the Flood and Water Management Act 2010, directs developers to avoid, reduce and delay the discharge of rainfall to public sewers and watercourses through the use of Sustainable Urban Drainage Systems (SUDS) with the aim of protecting watercourses and reducing the risk of localised flooding and pollution.

This obligation is taken seriously:

- Where possible, impermeable surfaces are kept to a minimum, thus allowing for maximum infiltration (e.g. permeable paving)
- Sustainable Drainage Systems will be incorporated where feasible and will be designed in line with the guidance published in the *CIRIA SUDS Manual (2007)*

Pollution during Construction

The contractor will be required, under the terms of their contract, to minimise dust, fumes, discharges and any other form of pollution on site, in line with best practice policies:

- The Control of Dust and Emissions from Construction & Demolition: Best Practice Guidance.

The sustainable management and monitoring of waste generated during the construction of a development is a major concern to local and national planners. Due to the size and anticipated construction costs the developer will not be required by regulations to implement a Site Waste Management Plan. Furthermore the site will be too small to allow the successful segregation of waste on site in line with Best Practice policies. However the contractor will be obliged to adopt many of the principles of the waste hierarchy:

- Accurate specifications of materials and volumes.
- Recycling and re-use of waste on site.
- Arrange take back schemes with suppliers.
- Instruct a licensed waste contractor to segregate site waste for recycling.

Health and Wellbeing

In achieving ever stricter levels of energy efficiency, it is important that designers do not lose sight of the fact that they are building homes that people can live in and not just occupy. This is an integral part of sustainability, and a hugely important consideration if the population (and the market place) is to tolerate the sustainability agenda.

While it is quite difficult to measure or even quantify health and wellbeing, the following measures are a sample of the efforts made by Avant Homes Central to address this issue:

- The proposed properties will have sufficient living/dining space. While this is obviously a marketing consideration, it does fall within this category.
- The principal living rooms have sufficient glazing to allow natural light to penetrate into the rooms. Numerous studies have shown this to be beneficial to the general

health and happiness of occupants. Daylighting calculations can be undertaken to demonstrate that living rooms, dining rooms, kitchen and home offices receive adequate daylighting.

- The property will benefit from a garden or private space for recreation. This will take the form of secure rear gardens to each property.
- The property has dedicated internal recycling facilities and accessible external storage in line with the local council waste and recycling collection scheme.

Water Efficiency

The average person consumes some 150 litres per day; this represents an annual increase of 1% since the 1930s. Despite the United Kingdom's wet and temperate climate, climate change will most probably result in an increase in the occurrence of drought orders and hosepipe bans. With this in mind, it is not difficult to appreciate that within the next few decades the UK (particularly the South East) will face regular water shortages. In response to this water efficiency has gained equal billing, alongside energy efficiency. The following are the principle policy drivers.

- The new Approved Document G (2015) restricts new build dwellings to a maximum consumption of 125 litres per person per day. The Water Efficiency Calculator of New Dwellings also includes an allowance for external water use.
- Part L 2013 and SAP 2012 will take account of Part G and water consumption in the calculation of the forecasted energy demand of a dwelling.

The below table details the recommended sanitary ware fittings to be adopted by Avant Homes Central to meet with the requirement to achieve 125 Litres per person per day as required by Building Regulations Part G 2010.

Table 2 – Water Consumption

Installation Type	Unit of Measurement	Capacity/Flow Rate	Use Factor	Fixed Use	Litres Per Person Per Day
WC (Dual Flush)	Full Flush (litres)	4	1.46	0.00	5.84
	Part Flush (litres)	2.6	2.96	0.00	7.70
Taps (excluding kitchen tap)	Flow rate (litres/minute)	6	1.58	1.58	11.06
Baths (where shower present)	Capacity to overflow (litres)	140	0.11	0.00	15.40
Showers (where bath present)	Flow rate (litres/minute)	9	4.37	0.00	39.33
Kitchen sink tap	Flow rate (litres/minute)	6	0.44	10.36	13.00
Washing Machine	Litres/kg dry load	8.17	2.1	0.00	17.16
Dishwasher	Litres/place setting	1.25	3.60	0.00	4.50
	TOTAL				113.99

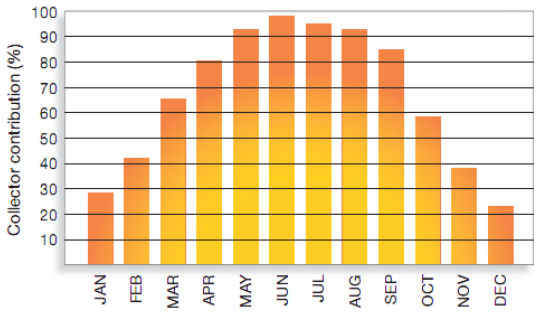
Total Internal Water Consumption	113.99
Normalisation Factor	0.91
Water Consumption with Normalisation Factor	103.73
External Use	5.00
Part G Water Consumption	108.73

Renewable Technologies

There are a number of recognised renewable technologies which have the potential to reduce the energy consumption of a dwelling. However given the nature of the development, we judge that only three technologies are worthy of consideration;

- Solar thermal panels.
- Photovoltaic panels.
- Air source heat pumps.

Solar Thermal



Solar thermal panels use radiant solar energy to heat water for domestic consumption. The system works successfully across the UK as they can work in diffuse weather conditions. In comparison to other technologies it is considered a reliable and proven technology. The system works most efficiently when the panel or evacuated tube is mounted on a 10-60° pitch facing due south, though other combinations do work successfully. During late spring to early autumn months, the system can be expected to meet some 70-90% of a dwellings domestic hot water needs.

Most systems in the UK are two panel systems, typically 4 sq m in size and accompanied with a 180-250 litre cylinder with a dedicated solar storage capacity of 65-110 litres. The typical installation costs for solar thermal vary, especially when large volumes are considered. However a rough estimate is £3500 per plot. Occupants can expect annual savings in the region of £50-85 per year, which is relatively modest. Solar thermal panels do not qualify for feed in tariffs, however it is expected that solar thermal systems will benefit from the Renewable Heat Incentive. A 20-25 year payback can be expected, dependent on usage and dwelling type.

Taking into consideration the proposed house, the site layout and orientation a two panel systems is most likely.

Photovoltaic

Photovoltaic panels convert sunlight into electricity for use within a dwelling. PV panels use cells to convert light into electricity. A PV cell usually consists of 1 or 2 layers of a semi-conducting material such as silicon. The greater the intensity of sunlight, the more electricity is generated. PV systems can come in different forms. The most aesthetically pleasing are PV tiles which resemble roof tiles. However the most popular are modules which can either sit on the roof or be integrated into it. The technology is most efficient when oriented due south. However panels orientated south of east or west are suitable. Generally panels orientated away from due south require a greater surface area to generate a set amount of energy.

It is recommended that a PV array installed on a select number of plots across a development is the most cost effective solution to a site wide CO_2 reduction. As a result we recommend this technology for consideration.

Air Source Heat Pumps

Air source heat pumps extract heat from the outside air. The heat is absorbed into a fluid, which is pumped through a heat exchanger. Low grade heat is then extracted by the refrigeration system and after passing through the compressor is concentrated into a higher temperature. This energy is then used to heat water for space and hot water use within the dwelling. While heat pumps use national grid electricity, and so are not a renewable resource, they utilise a heat source which is naturally renewed in our environment and so are considered a low carbon technology.

Heat pumps have stated CoPs in the region of 2-4, though test results outside of the laboratory have produced mixed results. Typically the heat pump is located on an external wall. It is generally accepted that 1kW in heat pump size will provide enough heating for 20m^2 of floor space

While the use of heat pumps reduces the energy consumption of a dwelling (when gas is considered the baseline), the carbon benefit is minimal as electricity has a much higher carbon factor than gas. In addition to this there has been varying anecdotal evidence across

the country which suggests differing models are achieving mixed levels of performance. As such we would not recommend this technology as the preferred route to compliance.

Energy Strategy

The Context

The proposed works fall under the scope of Approved Document L1A 2013. The Approved Document sets minimum fabric energy efficiency standards and a maximum CO_2 emission rate for residential buildings. To place the proposed energy strategy into its correct regulatory context it is worthwhile summarising the minimum standards included in the Approved Document.

Table 3 – Minimum Fabric Efficiency Standards

Element	Part L1A 2013 Minimum Standard
External Walls	0.30W/m^2K
Roof	0.20W/m^2K
Floor	0.25W/m^2K
Glazing & Doors	2.00W/m^2K
Air Test	10m^3/h.m^2 at 50Pa

Proposed Strategy

The National Planning Policy Framework requires that all development proposals are in line with the Government's zero carbon buildings programme.

The figures and calculations detailed in this report have been taken from SAP 2012 (2013 building regulations).

In response to this guidance, and recent shifts within the industry, Avant Homes Central proposes the adoption of a fabric first energy strategy which addresses the core policy goals of sustainable construction:-

- Reduced CO_2 emissions to combat the causes of **climate change**.
- Reduced energy consumption to address legitimate concerns of **energy security**.

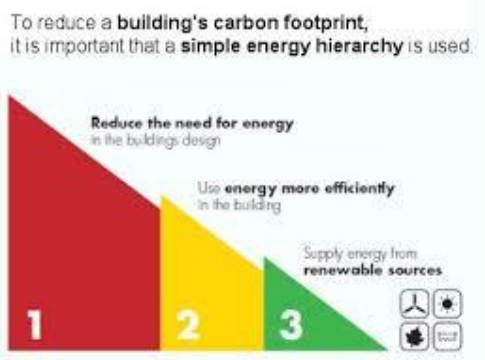
By reducing the energy requirement of the building, the sustainable credentials of each development are enhanced and are not validated by simply bolting on expensive renewable equipment. By focusing on fabric performance and the provision of efficient heating systems each dwelling is intrinsically "green".

Before the potential of various technologies can be assessed, it is first necessary to calculate the base line energy consumption of the development and hence the target reduction. The proposed dwellings were modelled in SAP2012 to determine the energy consumption and corresponding CO_2 emissions of the development. Standard Assessment Procedure, or SAP, is the Government's approved methodology for the calculation of energy consumption and CO_2 emissions for new build dwellings.

In line with best practice the proposed energy strategy for Moorthorpe Way, Owlthorpe will adhere to the principles of the Energy Hierarchy;

- **Be Lean** – reduce the need for energy.
- **Be Clean** – supply and use energy in the most efficient manner.
- **Be Green** – supply energy from renewable sources.

The Energy Hierarchy



Adhering to the principles of the Energy Hierarchy has a number of benefits. The principle benefits are;

- By reducing the energy requirement of each dwelling the renewable requirement shrinks in proportion. This has obvious cost benefits.
- The sustainable credentials of each development are enhanced and are not validated by simply bolting on expensive renewable equipment. By focusing on the fabric performance and the provision of efficient heating systems each dwelling is intrinsically “green”.

Establishing a Baseline

To adequately ascertain the potential of Avant Homes Central's preferred strategy, a baseline energy consumption associated with the development must be calculated. As such the development was modelled in SAP 2012 to determine the current CO_2 emission and associated energy requirement prior to the incorporation of improved fabric efficiencies and renewable technologies. The table below summarises the results calculated.

Table 4 – Baseline Energy Consumption & CO_2 Emission Rate

House Type	No	Baseline Emission Rate (kg/year)	Baseline Energy Requirement (kWh/year)
House Type - Chesham - DET	**4**	11,518.85	49,904.32
House Type - Denbury - DET	**2**	4,115.33	17,592.73
House Type - Easton - DET	**6**	9,779.60	41,690.61
House Type - Finsbury - DET	**2**	4,214.42	18,051.48
House Type - Haddington - DET	**1**	1,701.96	7,245.73
House Type - Haddington - SEMI	**6**	9,588.58	40,590.94
House Type - Helmsdale - END	**2**	2,690.75	11,335.36
House Type - Helmsdale - MID	**2**	2,487.60	10,373.82
House Type - Kinnerton - DET	**3**	5,237.39	22,344.75
House Type - Lathbury - DET	**7**	15,059.88	64,460.31
House Type - Napsbury - DET	**8**	20,265.89	87,405.93
House Type - Nithsdale - END	**4**	6,238.44	26,352.38
House Type - Nithsdale - MID	**2**	2,898.10	12,139.19
House Type - Paignton - MID	**2**	3,442.36	14,451.03
House Type - Paignton - SEMI	**2**	3,765.86	15,963.73
House Type - Ramsbury - DET	**3**	6,952.67	29,827.67
House Type - Seaton - SEMI/END	**4**	7,608.73	32,318.70
House Type - Sudbury - DET	**9**	23,053.06	99,548.33
House Type - Weydale - SEMI/END	**4**	6,846.76	28,948.17
House Type - Weydale - MID	**1**	1,602.62	6,724.42
TOTAL	**74**	**149,068.86**	**637,269.61**

The table above confirms the proposed shared ownership plots at Moorthorpe Way, Owlthorpe has an energy requirement of **637,269.61 kWh/year** and an associated CO_2 emission rate of **149,068.86 kg/year**.

Fabric and Building Services Specification

Avant Homes Central propose a series of fabric and building service enhancements that exceeds the minimum requirements of Part L1A 2013. By placing a significant emphasis on the performance of the fabric of each property, reductions in energy and carbon will be achieved. The following table details the anticipated fabric efficiency and building services standards to be incorporated into the design. These measures constitute the **lean** efforts.

Table 5 – Enhanced Specification Summary & Comparison

Element	Part L1A 2013	Enhanced Specification
Wall	0.30W/m^2K	0.24 W/m^2K
Roof	0.20W/m^2K	0.11 W/m^2K
Floor	0.25W/m^2K	0.14-0.17 W/m^2K
Glazing & Doors	2.00W/m^2K	1.30 W/m^2K
Air Test	10m^3/h.m^2 at 50Pa	5.00m^3/h.m^2 at 50Pa

The U values above show that the minimum requirements of Part L1A have been exceeded.

In addition to the summary above the following additional measures will be incorporated into the design, constituting the **clean** measures to reduce energy consumption;

- Avant Homes Central have adopted a set of Airecrete Product Association thermal bridging details which is being implemented on the site. These reduce thermal bridging throughout junctions and penetrations through the building fabric, typically producing a dwelling Y-value of between 0.03 and 0.06, these equal approximately a 60% improvement over the Governments ACD details.

- Efficient independent heating systems will be provided with a programmer, room thermostats and thermostatic radiator values. These will allow the eventual occupants to exercise control over their heating system and thus reduce energy consumption.

- Energy efficient lamps will be installed in each light fitting.

- Water consumption is now included in the calculation of a property's energy consumption. Thus each property will adhere to the requirements of Approved Document G– maximum internal water consumption of 125 litres per person per day.

It is clear that the proposed strategy places a great importance on the efficiency of a buildings thermal envelope and internal building services. This emphasis is to be

encouraged. It recognises that it is inherently more sustainable to invest resources in reducing a property's long term energy consumption in contrast to short term generation benefits.

Reduced Emission Rate & Energy Requirement

To determine the benefits of the proposed specification, the development was again modelled in SAP 2012. The table below summarises the results calculated.

Table 6 – Reduced Emission Rate & Energy Requirement

House Type	No	Reduced Emission Rate (kg/year)	Reduced Energy Requirement (kWh/year)
House Type - Chesham - DET	**4**	11,473.03	49,070.58
House Type - Denbury - DET	**2**	3,912.13	16,436.87
House Type - Easton - DET	**6**	9,426.83	39,612.35
House Type - Finsbury - DET	**2**	3,956.26	16,651.64
House Type - Haddington - DET	**1**	1,612.06	6,749.75
House Type - Haddington - SEMI	**6**	9,206.29	38,331.55
House Type - Helmsdale - END	**2**	2,610.60	10,824.36
House Type - Helmsdale - MID	**2**	2,443.38	10,032.88
House Type - Kinnerton - DET	**3**	4,972.34	20,874.17
House Type - Lathbury - DET	**7**	14,241.31	59,857.67
House Type - Napsbury - DET	**8**	19,598.75	83,389.72
House Type - Nithsdale - END	**4**	5,953.66	24,746.89
House Type - Nithsdale - MID	**2**	2,799.26	11,534.00
House Type - Paignton - MID	**2**	3,276.05	13,476.62
House Type - Paignton - SEMI	**2**	3,622.34	15,097.53
House Type - Ramsbury - DET	**3**	6,605.66	27,832.56
House Type - Seaton - SEMI/END	**4**	7,249.08	30,244.49
House Type - Sudbury - DET	**9**	22,297.22	94,858.83
House Type - Weydale - SEMI/END	**4**	6,500.88	27,004.52
House Type - Weydale - MID	**1**	1,538.75	6,342.28
TOTAL	**74**	**143,295.89**	**602,969.25**

The calculations summarised in the table above confirm a reduced energy requirement of **602,969.25 kWh/year** and an associated emission rate of **143,295.89 kgCO_2/year**. These are respectively **5.38%** and **3.87%** reductions over the baseline calculated previously.

In order to comply with the planning requirements, it is necessary for this development to show measures have been taken to ensure high energy efficiency and best practice with regards to energy consumption.

Proposed Solution

To satisfy the requirements of achieving a 20% carbon reduction, Avant Homes Central proposes the incorporation of PV panels to a portion of the development. The technology can be justified on the following grounds:-

- PV is a proven and reliable LZC technology.
- There is sufficient roof space to accommodate the technology.

The Planning Condition requires the incorporation of sufficient solar panels to generate a minimum of 20% on-site emissions. In order to comply with this Avant Homes Central must offset a total of **29,813.77 kg/year**.

A total CO_2 reduction after fabric first improvements have been applied reduces CO_2 on the site by **5,772.97 Kg/year.** This figure is 3.87% of the site wide emissions.

Avant Homes Central will be required to supply a suitably sized PV array across the site capable of generating at least **24,040.08 kg/year.** This figure is 16.13% of the site wide emissions calculated post fabric improvement.

The above figure can also be converted into kWh/year as follows.

- 24,040.08 / 0.519 =46,320.00 kWh/year.

Evaluation

The FES Group was instructed by Avant Homes Central to review the performance of the proposed Energy Strategy for the development at Moorthorpe Way, Owlthorpe. The energy strategy was detailed previously but can be best summarised as follows;

- Avant Homes Central proposes an energy strategy, which addresses the two policy concerns of sustainable design and construction: climate change and energy security.

- Avant Homes Central has proposed a fabric first strategy, which aims to achieve long term reductions in CO_2 emissions and climate change.

- The proposed fabric and building services specification will permanently reduce emissions by **3.87%** and the proposed energy demand by **5.38%** This is a significant betterment and demonstrates that the proposed development will have a reduced reliance on national resources (gas and electricity)

- In order to address the planning requirements, renewable technologies have been proposed capable of offsetting 16.13% emissions of the shared ownership plots. This will be achieved through the installation of a suitably sized solar P.V. array capable of generating **24,040.08 kg/year** or **46,320.00 kWh/year.**

After detailed analysis we can conclude that the preferred energy strategy adheres to the principles and aspirations of sustainable design and construction as advanced by national and local government and the house building industry. We therefore recommend the adoption of the preferred energy strategy by Avant Homes Central.

Appendix A

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Chesham - Det	**Issued on Date**	05/12/2019
Assessment Reference	As Designed As / Opp	**Prop Type Ref**	007780-SAP-Chesham-D_DS
Property	Plot , Moorthorpe Way , Owlthorpe		

SAP Rating	84 B	**DER**	17.53	**TER**	17.60
Environmental	83 B	**% DER<TER**	0.39		
CO_2 Emissions (t/year)	2.68	**DFEE**	59.87	**TFEE**	67.57
General Requirements Compliance	Pass	**% DFEE<TFEE**	11.39		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	2
3.0 Date Built	2018
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	46.43 m	71.78 m²	2.87 m
1st Storey:	39.41 m	91.84 m²	2.36 m

7.0 Living Area	45.90	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	137.31	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	189.77	155.92
Solid Garage Wall	Solid Wall	Solid wall : plasterboard on dabs, insulation, any outside structure	0.32	9.00	34.20	32.34

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	109.12
First Floor	Plasterboard on timber frame	9.00	260.02
Ground Floor Block	Dense block, plasterboard on dabs	75.00	5.85

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	93.40	93.40
Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.14	9.00	17.89	17.89

10.2 Internal Ceilings

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	52.33

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.16	75.00	71.78
Exposed Floor Above Garage	Exposed Floor - Timber	Timber exposed floor, insulation between joists	0.15	20.00	39.50

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	52.33

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30
Garage Door	Manufacturer	Door to Corridor							1.50

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall	East							2.86	
Front Window	Window	[1] External Wall	East	None	0.00					9.09	
LH Window	Window	[1] External Wall	South	None	0.00					1.41	
Rear Window	Window	[1] External Wall	West	None	0.00					6.72	
Rear Patio Door	Window	[1] External Wall	West	None	0.00					12.36	
Front Garage Door	Door to Corridor	[2] Solid Garage Wall	East							1.86	
RH Window	Window	[1] External Wall	North	None	0.00					1.41	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	
17.0 Thermal Bridging	Calculate Bridges	

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	0.89	0.500	No
Independently assessed	E2 Other lintels (including other steel lintels)	21.08	0.050	No
Independently assessed	E3 Sill	14.07	0.034	No
Independently assessed	E4 Jamb	35.95	0.040	No
Table K1 - Approved	E4 Jamb	4.20	0.050	No
Independently assessed	E5 Ground floor (normal)	34.52	0.060	No
Table K1 - Approved	E5 Ground floor (normal)	11.91	0.160	No
Table K1 - Default	E20 Exposed floor (normal)	13.44	0.320	No
Table K1 - Default	E21 Exposed floor (inverted)	11.91	0.320	No
Independently assessed	E6 Intermediate floor within a dwelling	25.97	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	18.19	0.123	No
Table K1 - Default	E24 Eaves (insulation at ceiling level - inverted)	7.11	0.240	No
Independently assessed	E12 Gable (insulation at ceiling level)	21.78	0.063	No
Table K1 - Default	E14 Flat roof	12.10	0.080	No
Independently assessed	E16 Corner (normal)	27.30	0.058	No
Table K1 - Approved	E16 Corner (normal)	5.74	0.090	No
Independently assessed	E17 Corner (inverted – internal area greater than external area)	11.93	-0.069	No
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	2.87	-0.090	No

Y-value	0.052	W/m²K

18.0 Pressure Testing — Yes

Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.16	Through Wall Fan Other Wet Room	2
0.18	In Room Fan Other Wet Room	3

20.0 Fans, Open Fireplaces, Flues

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	17	
Total number of L.E.L. fittings	17	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	No	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18580	
Fuel Type	Mains gas	
Main Heating	BGB	
SAP Code	102	
In Winter	90.1	
In Summer	79.4	
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Flue Type	Balanced	
Fan Assisted Flue	Yes	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Radiators	
Flow Temperature	Normal (> 45°C)	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

SAP Code	901	
29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder Stat	Yes	
Cylinder In Heated Space	Yes	
Independent Time Control	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	170.00	L
Loss	1.20	kWh/day
Pipes insulation	Fully insulated primary pipework	
31.0 Thermal Store	None	

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£42	B 85	
	Typical Cost	**Typical savings per year**	**Ratings after improvement SAP rating**	**Environmental Impact**
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	B 91	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Denbury - Det	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As	**Prop Type Ref**	007780-SAP-Denbury-D_DS
Property	Plot , Moorthorpe Way , Owlthorpe		

SAP Rating	84 B	**DER**	16.75	**TER**	17.62
Environmental	85 B	**% DER<TER**	4.93		
CO_2 Emissions (t/year)	1.78	**DFEE**	53.15	**TFEE**	59.00
General Requirements Compliance	Pass	**% DFEE<TFEE**	9.92		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	2
3.0 Date Built	2018
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	32.22 m	58.39 m²	2.38 m
1st Storey:	32.22 m	58.39 m²	2.70 m

7.0 Living Area	20.15	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	186.16	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	163.82	136.12

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	72.12
First Floor	Plasterboard on timber frame	9.00	186.46
Ground Floor Block	Dense block, plasterboard on dabs	75.00	56.52

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	58.39	58.39

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	58.39

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.16	75.00	58.39

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	58.39

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall	East							3.80	
Front Window	Window	[1] External Wall	East	None	0.00					9.18	
Rear Window	Window	[1] External Wall	West	None	0.00					5.11	
Rear Patio Door	Window	[1] External Wall	West	None	0.00					8.89	
RH Window	Window	[1] External Wall	North	None	0.00					0.72	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	

17.0 Thermal Bridging	Calculate Bridges	

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	17.46	0.050	No
Independently assessed	E3 Sill	11.58	0.034	No
Independently assessed	E4 Jamb	38.10	0.040	No
Independently assessed	E5 Ground floor (normal)	32.22	0.060	No
Independently assessed	E6 Intermediate floor within a dwelling	32.22	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	17.05	0.123	No
Independently assessed	E12 Gable (insulation at ceiling level)	15.16	0.063	No
Independently assessed	E16 Corner (normal)	30.51	0.058	No
Independently assessed	E17 Corner (inverted – internal area greater than external area)	10.17	-0.069	No

Y-value	0.032	W/m²K

18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.16	Through Wall Fan Other Wet Room	2
0.18	In Room Fan Other Wet Room	2

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	

22.0 Lighting

Internal

Total number of light fittings	15	
Total number of L.E.L. fittings	15	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No	

23.0 Electricity Tariff	Standard	

24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18493	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Flue Type	Balanced	
Fan Assisted Flue	Yes	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Flow Temperature	Normal (> 45°C)
Combi boiler type	Standard Combi
Combi keep hot type	None
25.0 Main Heating 2	None
Community Heating	None
28.0 Water Heating	HWP From main heating 1
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£30	B 85	
	Typical Cost	**Typical savings per year**	**Ratings after improvement SAP rating**	**Environmental Impact**
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	A 94	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Easton - Det	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As	**Prop Type Ref**	007780-SAP-Easton-D-DS
Property	Plot , Moorthorpe Way , Owlthorpe		

SAP Rating	83 B	**DER**	19.24	**TER**	19.96
Environmental	85 B	**% DER<TER**	3.61		
CO_2 Emissions (t/year)	1.43	**DFEE**	56.73	**TFEE**	60.88
General Requirements Compliance	Pass	**% DFEE<TFEE**	6.82		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	2
3.0 Date Built	2018
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	27.41 m	40.83 m²	2.38 m
1st Storey:	27.41 m	40.83 m²	2.70 m

7.0 Living Area	33.80	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	196.21	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	137.85	114.20
Dormer Wall	Timber Frame	Timber framed wall (one layer of plasterboard)	0.30	9.00	0.15	0.15

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	70.92
First Floor	Plasterboard on timber frame	9.00	120.96
Ground Floor Block	Dense block, plasterboard on dabs	75.00	30.05
First Floor Block	Dense block, plasterboard on dabs	75.00	3.78

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	39.31	39.31
Warm Roof	External Slope Roof	Plasterboard, insulated slope	0.16	9.00	2.15	2.15

10.2 Internal Ceilings

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
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Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	40.83

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.16	75.00	40.83

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	40.83

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half-Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall	East							2.86	
Front Window	Window	[1] External Wall	East	None	0.00					6.95	
RH Window	Window	[1] External Wall	North	None	0.00					4.89	
LH Patio Door	Window	[1] External Wall	South	None	0.00					7.11	
LH Window	Window	[1] External Wall	South	None	0.00					1.84	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	
17.0 Thermal Bridging	Calculate Bridges	

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	13.59	0.050	No
Table K1 - Default	E2 Other lintels (including other steel lintels)	1.36	1.000	No
Independently assessed	E3 Sill	10.43	0.034	No
Independently assessed	E4 Jamb	28.92	0.040	No
Table K1 - Default	E4 Jamb	0.78	0.100	No
Independently assessed	E5 Ground floor (normal)	27.41	0.060	No
Independently assessed	E6 Intermediate floor within a dwelling	27.41	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	12.67	0.123	No
Table K1 - Default	E10 Eaves (insulation at ceiling level)	0.78	0.120	No
Independently assessed	E11 Eaves (insulation at rafter level)	1.68	0.037	No
Independently assessed	E12 Gable (insulation at ceiling level)	11.70	0.063	No
Independently assessed	E13 Gable (insulation at rafter level)	0.96	0.080	No
Independently assessed	E16 Corner (normal)	29.83	0.058	No
Independently assessed	E17 Corner (inverted – internal area greater than external area)	9.49	-0.069	No
Table K1 - Default	R6 Flat ceiling	3.04	0.060	No
Table K1 - Default	R7 Flat ceiling (inverted)	1.36	0.040	No

Y-value	0.041	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa

Property Tested ?		
As Built AP_{50}		$m^3/(h.m^2)$ @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.16	Through Wall Fan Other Wet Room	1
0.18	In Room Fan Other Wet Room	1

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	

22.0 Lighting

Internal

Total number of light fittings	10	
Total number of L.E.L. fittings	10	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No	

23.0 Electricity Tariff	Standard	

24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18204	
Fuel Type	Mains gas	
Main Heating	BGW	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

SAP Code	104
In Winter	89.9
In Summer	86.7
Controls	CBI Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2110
Flue Type	Balanced
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Flow Temperature	Normal (> 45°C)
Combi boiler type	Standard Combi
Combi keep hot type	None
25.0 Main Heating 2	None
Community Heating	None
28.0 Water Heating	HWP From main heating 1
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£29	B 84	
	Typical Cost	**Typical savings per year**	**Ratings after improvement SAP rating**	**Environmental Impact**
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	A 94	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Finsbury - Det	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As	**Prop Type Ref**	007780-SAP-Finsbury-D_DS
Property	Plot , Moorthorpe Way , Owlthorpe		

SAP Rating	84 B	**DER**	17.47	**TER**	18.61
Environmental	85 B	**% DER<TER**	6.10		
CO_2 Emissions (t/year)	1.81	**DFEE**	55.48	**TFEE**	62.48
General Requirements Compliance	Pass	**% DFEE<TFEE**	11.22		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	2
3.0 Date Built	2018
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	33.79 m	55.80 m²	2.72 m
1st Storey:	32.22 m	57.43 m²	2.36 m

7.0 Living Area	29.58	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	154.66	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	167.14	141.82

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	107.66
First Floor	Plasterboard on timber frame	9.00	144.62

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	57.43	57.43
Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.14	9.00	1.56	1.56

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	54.24

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.16	75.00	55.80
Exposed Floor Above Porch	Exposed Floor - Timber	Timber exposed floor, insulation between joists	0.15	20.00	3.19

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	54.24

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall	East							2.86	
Front Window	Window	[1] External Wall	East	None	0.00					6.95	
LH Window	Window	[1] External Wall	South	None	0.00					0.69	
Rear Window	Window	[1] External Wall	West	None	0.00					3.67	
Rear Patio Door	Window	[1] External Wall	West	None	0.00					7.11	
RH Window	Window	[1] External Wall	North	None	0.00					2.12	
RH Door	Half Glazed Door	[1] External Wall	North							1.92	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	
17.0 Thermal Bridging	Calculate Bridges	

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	15.66	0.050	No
Independently assessed	E3 Sill	10.23	0.034	No
Independently assessed	E4 Jamb	30.60	0.040	No
Independently assessed	E5 Ground floor (normal)	33.79	0.060	No
Table K1 - Default	E20 Exposed floor (normal)	3.71	0.320	No
Table K1 - Default	E21 Exposed floor (inverted)	3.71	0.320	No
Independently assessed	E6 Intermediate floor within a dwelling	28.51	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	9.63	0.123	No
Table K1 - Default	E24 Eaves (insulation at ceiling level - inverted)	1.98	0.240	No
Independently assessed	E12 Gable (insulation at ceiling level)	22.59	0.063	No
Table K1 - Default	E14 Flat roof	0.56	0.080	No
Independently assessed	E16 Corner (normal)	26.92	0.058	No
Independently assessed	E17 Corner (inverted – internal area greater than external area)	9.29	-0.069	No

Y-value	0.038	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.16	Through Wall Fan Other Wet Room	2
0.18	In Room Fan Other Wet Room	2

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	

22.0 Lighting

Internal

Total number of light fittings	14	
Total number of L.E.L. fittings	14	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No	

23.0 Electricity Tariff	Standard	

24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18493	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Controls	CBI Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2110
Flue Type	Balanced
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Flow Temperature	Normal (> 45°C)
Combi boiler type	Standard Combi
Combi keep hot type	None
25.0 Main Heating 2	None
Community Heating	None
28.0 Water Heating	HWP From main heating 1
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£30	B 85	
	Typical Cost	**Typical savings per year**	**Ratings after improvement SAP rating**	**Environmental Impact**
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	A 93	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Haddington - Det	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As	**Prop Type Ref**	007780-SAP-Haddington-D_DS
Property	Plot , Moorthorpe Way , Owlthorpe		

SAP Rating	83 B	**DER**	18.47	**TER**	19.50
Environmental	85 B	**% DER<TER**	5.27		
CO_2 Emissions (t/year)	1.47	**DFEE**	53.88	**TFEE**	59.87
General Requirements Compliance	Pass	**% DFEE<TFEE**	10.00		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	2
3.0 Date Built	2018
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	27.18 m	43.64 m²	2.38 m
1st Storey:	27.18 m	43.64 m²	2.70 m

7.0 Living Area	33.68	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	163.15	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	138.23	119.68

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
				45.00	

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	65.59
First Floor	Plasterboard on timber frame	9.00	136.84

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	43.64	43.64

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	43.64

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.15	75.00	43.64

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	43.64

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall	East							2.86	
Front Window	Window	[1] External Wall	East	None	0.00					3.99	
LH Window	Window	[1] External Wall	South	None	0.00					0.92	
Rear Window	Window	[1] External Wall	West	None	0.00					3.67	
Rear Patio Door	Window	[1] External Wall	West	None	0.00					7.11	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	

17.0 Thermal Bridging	Calculate Bridges	

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	11.34	0.050	No
Independently assessed	E3 Sill	6.82	0.034	No
Independently assessed	E4 Jamb	25.80	0.040	No
Independently assessed	E5 Ground floor (normal)	27.18	0.060	No
Independently assessed	E6 Intermediate floor within a dwelling	27.18	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	10.40	0.123	No
Independently assessed	E12 Gable (insulation at ceiling level)	16.78	0.063	No
Independently assessed	E16 Corner (normal)	20.34	0.058	No

Y-value	0.031	W/m²K

18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes

Night Ventilation	No
Air change rate	8.00
Mechanical Ventilation	
Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.16	Through Wall Fan Other Wet Room	2
0.18	In Room Fan Other Wet Room	2

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	12	
Total number of L.E.L. fittings	12	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	No	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18204	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Flue Type	Balanced
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Flow Temperature	Normal (> 45°C)
Combi boiler type	Standard Combi
Combi keep hot type	None
25.0 Main Heating 2	None
Community Heating	None
28.0 Water Heating	HWP From main heating 1
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£30	B 84	
	Typical Cost	**Typical savings per year**	**Ratings after improvement SAP rating**	**Environmental Impact**
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	A 94	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Haddington - Sem	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As	**Prop Type Ref**	007780-SAP-Haddington-S_DS
Property	Plot , Moorthorpe Way , Owlthorpe		

SAP Rating	84 B	**DER**	17.58	**TER**	18.31
Environmental	86 B	**% DER<TER**	3.98		
CO_2 Emissions (t/year)	1.38	**DFEE**	49.81	**TFEE**	53.77
General Requirements Compliance	Pass	**% DFEE<TFEE**	7.36		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Semi-Detached
2.0 Number of Storeys	2
3.0 Date Built	2018
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	18.79 m	43.64 m²	2.38 m
1st Storey:	18.79 m	43.64 m²	2.70 m

7.0 Living Area	33.68	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	187.59	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	95.56	77.01

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall	Filled Cavity with Edge Sealing	Single plasterboard on dabs both sides, lightweight aggregate blocks, cavity or cavity fill	0.00	110.00	42.67

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	65.59
First Floor	Plasterboard on timber frame	9.00	136.84

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	43.64	43.64

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	43.64

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.15	75.00	43.64

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	43.64

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall	East							2.86	
Front Window	Window	[1] External Wall	East	None	0.00					3.99	
LH Window	Window	[1] External Wall	South	None	0.00					0.92	
Rear Window	Window	[1] External Wall	West	None	0.00					3.67	
Rear Patio Door	Window	[1] External Wall	West	None	0.00					7.11	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	
17.0 Thermal Bridging	Calculate Bridges	

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	11.34	0.050	No
Independently assessed	E3 Sill	6.82	0.034	No
Independently assessed	E4 Jamb	25.80	0.040	No
Independently assessed	E5 Ground floor (normal)	18.79	0.060	No
Independently assessed	E6 Intermediate floor within a dwelling	18.79	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	10.40	0.123	No
Independently assessed	E12 Gable (insulation at ceiling level)	8.39	0.063	No
Independently assessed	E16 Corner (normal)	10.17	0.058	No
Table K1 - Default	E18 Party wall between dwellings	10.17	0.120	No
Table K1 - Default	P1 Party wall - Ground floor	8.39	0.160	No
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	8.39	0.000	No
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	8.39	0.240	No

Y-value	0.054	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.16	Through Wall Fan Other Wet Room	2
0.18	In Room Fan Other Wet Room	2

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	

22.0 Lighting

Internal

Total number of light fittings	12	
Total number of L.E.L. fittings	12	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No	

23.0 Electricity Tariff	Standard	

24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18204	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Controls	CBI Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2110
Flue Type	Balanced
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Flow Temperature	Normal (> 45°C)
Combi boiler type	Standard Combi
Combi keep hot type	None
25.0 Main Heating 2	None
Community Heating	None
28.0 Water Heating	HWP From main heating 1
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£30	B 85	
	Typical Cost	**Typical savings per year**	**Ratings after improvement SAP rating**	**Environmental Impact**
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	A 95	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Helmsdale - End	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As	**Prop Type Ref**	007780-SAP-Helmsdale-E_DS
Property	Plot , Moorthorpe Way , Owlthorpe		

SAP Rating	83 B	**DER**	18.89	**TER**	19.47
Environmental	86 B	**% DER<TER**	2.99		
CO_2 Emissions (t/year)	1.17	**DFEE**	50.14	**TFEE**	53.30
General Requirements Compliance	Pass	**% DFEE<TFEE**	5.93		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, End-Terrace
2.0 Number of Storeys	2
3.0 Date Built	2018
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	16.66 m	34.55 m²	2.38 m
1st Storey:	16.66 m	34.55 m²	2.70 m

7.0 Living Area	28.25	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	201.73	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	84.69	72.30

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall	Filled Cavity with Edge Sealing	Single plasterboard on dabs both sides, lightweight aggregate blocks, cavity or cavity fill	0.00	110.00	39.81

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	41.79
First Floor	Plasterboard on timber frame	9.00	77.81

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	34.55	34.55

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	34.55

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.15	75.00	34.55

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	34.55

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall	East							2.07	
Front Window	Window	[1] External Wall	East	None	0.00					3.16	
LH Window	Window	[1] External Wall	South	None	0.00					0.92	
Rear Window	Window	[1] External Wall	West	None	0.00					2.44	
Rear Patio Door	Window	[1] External Wall	West	None	0.00					3.80	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	
17.0 Thermal Bridging	Calculate Bridges	

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	7.79	0.050	No
Independently assessed	E3 Sill	4.99	0.034	No
Independently assessed	E4 Jamb	18.60	0.040	No
Independently assessed	E5 Ground floor (normal)	16.66	0.060	No
Independently assessed	E6 Intermediate floor within a dwelling	16.66	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	8.83	0.123	No
Independently assessed	E12 Gable (insulation at ceiling level)	7.83	0.063	No
Independently assessed	E16 Corner (normal)	10.17	0.058	No
Table K1 - Default	E18 Party wall between dwellings	10.17	0.120	No
Table K1 - Default	P1 Party wall - Ground floor	7.83	0.160	No
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	7.83	0.000	No
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	7.83	0.240	No

Y-value	0.057	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.18	In Room Fan Other Wet Room	2

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No

22.0 Lighting

Internal

Total number of light fittings	11	
Total number of L.E.L. fittings	11	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No

23.0 Electricity Tariff	Standard

24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18204	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	
Controls	CBI Time and temperature zone control	
PCDF Controls	0	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Delayed Start Stat	Yes
Sap Code	2110
Flue Type	Balanced
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Flow Temperature	Normal (> 45°C)
Combi boiler type	Standard Combi
Combi keep hot type	None
25.0 Main Heating 2	None
Community Heating	None
28.0 Water Heating	HWP From main heating 1
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£28	B 84	
	Typical Cost	**Typical savings per year**	**Ratings after improvement SAP rating**	**Environmental Impact**
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	A 96	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Helmsdale - Mid	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As/Opp	**Prop Type Ref**	007780-SAP-Helmsdale-M_DS
Property	Plot , Moorthorpe Way, Owlthorpe		

SAP Rating	84 B	**DER**	17.68	**TER**	18.00
Environmental	87 B	**% DER<TER**	1.76		
CO_2 Emissions (t/year)	1.08	**DFEE**	44.28	**TFEE**	45.35
General Requirements Compliance	Pass	**% DFEE<TFEE**	2.35		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Mid-Terrace
2.0 Number of Storeys	2
3.0 Date Built	2018
4.0 Sheltered Sides	3
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	8.83 m	34.55 m²	2.38 m
1st Storey:	8.83 m	34.55 m²	2.70 m

7.0 Living Area	28.25	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	231.33	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	44.88	33.41

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall	Filled Cavity with Edge Sealing	Single plasterboard on dabs both sides, lightweight aggregate blocks, cavity or cavity fill	0.00	110.00	79.62

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	41.79
First Floor	Plasterboard on timber frame	9.00	77.81

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	34.55	34.55

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	34.55

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.14	75.00	34.55

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	34.55

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall	East							2.07	
Front Window	Window	[1] External Wall	East	None	0.00					3.16	
Rear Window	Window	[1] External Wall	West	None	0.00					2.44	
Rear Patio Door	Window	[1] External Wall	West	None	0.00					3.80	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	

17.0 Thermal Bridging	Calculate Bridges	

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	7.10	0.050	No
Independently assessed	E3 Sill	4.30	0.034	No
Independently assessed	E4 Jamb	15.90	0.040	No
Independently assessed	E5 Ground floor (normal)	8.83	0.060	No
Independently assessed	E6 Intermediate floor within a dwelling	8.83	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	8.83	0.123	No
Table K1 - Default	E18 Party wall between dwellings	20.34	0.120	No
Table K1 - Default	P1 Party wall - Ground floor	15.66	0.160	No
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	15.66	0.000	No
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	15.66	0.240	No

Y-value	0.101	W/m²K

18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.18	In Room Fan Other Wet Room	2

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	

22.0 Lighting

Internal

Total number of light fittings	11	
Total number of L.E.L. fittings	11	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No	

23.0 Electricity Tariff	Standard	

24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18204	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Flue Type	Balanced
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Flow Temperature	Normal (> 45°C)
Combi boiler type	Standard Combi
Combi keep hot type	None
25.0 Main Heating 2	None
Community Heating	None
28.0 Water Heating	HWP From main heating 1
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£28	B 85	
	Typical Cost	**Typical savings per year**	**Ratings after improvement SAP rating**	**Environmental Impact**
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	A 97	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Kinnerton - Det	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As	**Prop Type Ref**	007780-SAP-Kinnerton-D_DS
Property	Plot, Moorthorpe Way , Owlthorpe		

SAP Rating	83 B	**DER**	18.76	**TER**	19.76
Environmental	85 B	**% DER<TER**	5.06		
CO_2 Emissions (t/year)	1.51	**DFEE**	55.50	**TFEE**	61.70
General Requirements Compliance	Pass	**% DFEE<TFEE**	10.04		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	2
3.0 Date Built	2018
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	27.72 m	43.53 m²	2.72 m
1st Storey:	27.72 m	44.82 m²	2.36 m

7.0 Living Area	35.08	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	163.35	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	140.94	121.37

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	75.72
First Floor	Plasterboard on timber frame	9.00	133.95

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	44.82	44.82

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	43.53

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.16	75.00	43.53
Exposed Floor Above Porch	Exposed Floor - Timber	Timber exposed floor, insulation between joists	0.15	20.00	1.29

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	43.64

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall	East							2.86	
Front Window	Window	[1] External Wall	East	None	0.00					5.01	
LH Window	Window	[1] External Wall	South	None	0.00					0.92	
Rear Window	Window	[1] External Wall	West	None	0.00					3.67	
Rear Patio Door	Window	[1] External Wall	West	None	0.00					7.11	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	

17.0 Thermal Bridging: Calculate Bridges

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	11.79	0.050	No
Independently assessed	E3 Sill	7.27	0.034	No
Independently assessed	E4 Jamb	27.00	0.040	No
Independently assessed	E5 Ground floor (normal)	27.72	0.060	No
Table K1 - Default	E20 Exposed floor (normal)	2.59	0.320	No
Table K1 - Default	E21 Exposed floor (inverted)	2.59	0.320	No
Independently assessed	E6 Intermediate floor within a dwelling	25.13	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	8.95	0.123	No
Independently assessed	E12 Gable (insulation at ceiling level)	18.76	0.063	No
Independently assessed	E16 Corner (normal)	25.42	0.058	No
Independently assessed	E17 Corner (inverted – internal area greater than external area)	5.09	-0.069	No

Y-value: 0.037 W/m²K

18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	$m^3/(h.m^2)$ @ 50 Pa
Property Tested ?		
As Built AP_{50}		$m^3/(h.m^2)$ @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather: Windows fully open

Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.16	Through Wall Fan Other Wet Room	2
0.18	In Room Fan Other Wet Room	2

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	

22.0 Lighting

Internal

Total number of light fittings	11	
Total number of L.E.L. fittings	11	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No	

23.0 Electricity Tariff	Standard	

24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18204	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Sap Code	2110
Flue Type	Balanced
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Flow Temperature	Normal (> 45°C)
Combi boiler type	Standard Combi
Combi keep hot type	None
25.0 Main Heating 2	None
Community Heating	None
28.0 Water Heating	HWP From main heating 1
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£30	B 84	
	Typical Cost	**Typical savings per year**	**Ratings after improvement SAP rating**	**Environmental Impact**
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	A 94	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Lathbury - Det	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As/Opp	**Prop Type Ref**	007780-SAP-Lathbury-D_DS
Property	Plot , Moorthorpe Way , Owlthorpe		

SAP Rating	85 B	**DER**	16.18	**TER**	17.11
Environmental	85 B	**% DER<TER**	5.44		
CO_2 Emissions (t/year)	1.85	**DFEE**	51.84	**TFEE**	58.23
General Requirements Compliance	Pass	**% DFEE<TFEE**	10.97		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	2
3.0 Date Built	2018
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	31.77 m	62.87 m²	2.38 m
1st Storey:	31.77 m	62.87 m²	2.70 m

7.0 Living Area	32.53	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	173.08	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	161.54	130.27

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	91.63
First Floor	Plasterboard on timber frame	9.00	192.78
Ground Floor Block	Dense block, plasterboard on dabs	75.00	51.23

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	62.87	62.87

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	62.87

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.16	75.00	62.87

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	62.87

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall	East							3.80	
Front Window	Window	[1] External Wall	East	None	0.00					11.41	
Rear Window	Window	[1] External Wall	West	None	0.00					7.51	
Rear Patio Door	Window	[1] External Wall	West	None	0.00					7.11	
RH Window	Window	[1] External Wall	North	None	0.00					0.72	
LH Window	Window	[1] External Wall	South	None	0.00					0.72	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	

17.0 Thermal Bridging — Calculate Bridges

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	21.05	0.050	No
Independently assessed	E3 Sill	16.08	0.034	No
Independently assessed	E4 Jamb	35.70	0.040	No
Independently assessed	E5 Ground floor (normal)	31.77	0.060	No
Independently assessed	E6 Intermediate floor within a dwelling	31.77	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	16.78	0.123	No
Independently assessed	E12 Gable (insulation at ceiling level)	14.98	0.063	No
Independently assessed	E16 Corner (normal)	20.34	0.058	No

Y-value: 0.032 W/m²K

18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.16	Through Wall Fan Other Wet Room	2
0.18	In Room Fan Other Wet Room	2

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	16	
Total number of L.E.L. fittings	16	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	No	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18493	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Flue Type	Balanced	
Fan Assisted Flue	Yes	
Is MHS Pumped	Pump in heated space	

Heat Emitter	Radiators
Flow Temperature	Normal (> 45°C)
Combi boiler type	Standard Combi
Combi keep hot type	None
25.0 Main Heating 2	None
Community Heating	None
28.0 Water Heating	HWP From main heating 1
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£31	B 86	
	Typical Cost	**Typical savings per year**	**Ratings after improvement SAP rating**	**Environmental Impact**
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	A 93	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Napsbury - Det	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As	**Prop Type Ref**	007780-SAP-Napsbury-D_DS
Property	Plot , Moorthorpe Way , Owlthorpe		

SAP Rating	83 B	**DER**	17.92	**TER**	18.53
Environmental	83 B	**% DER<TER**	3.30		
CO_2 Emissions (t/year)	2.25	**DFEE**	60.46	**TFEE**	66.91
General Requirements Compliance	Pass	**% DFEE<TFEE**	9.65		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	3
3.0 Date Built	2018
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	33.34 m	43.99 m²	2.72 m
1st Storey:	33.35 m	58.91 m²	2.36 m
2nd Storey:	26.59 m	33.81 m²	2.12 m

7.0 Living Area	29.00	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	168.22	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall (GF)	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	64.20	52.47
External Wall (1F+)	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	126.81	112.84
Garage Wall	Solid Wall	Solid wall : plasterboard on dabs, insulation, any outside structure	0.33	9.00	26.56	24.59
Stud Wall	Timber Frame	Timber framed wall (one layer of plasterboard)	0.12	9.00	29.15	29.15

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	77.19
First Floor	Plasterboard on timber frame	9.00	115.12
Second Floor	Plasterboard on timber frame	9.00	120.97
Ground Floor Block	Dense block, plasterboard on dabs	75.00	8.92
First Floor Block	Dense block, plasterboard on dabs	75.00	28.74

10.0 External Roofs

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	43.46	43.46
Warm Roof	External Slope Roof	Plasterboard, insulated slope	0.16	9.00	23.40	23.40
Stud Roof	External Slope Roof	Plasterboard, insulated slope	0.12	9.00	4.54	4.54

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	38.35
First Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	33.81

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.16	75.00	43.99
Floor Above Garage	Exposed Floor - Timber	Timber exposed floor, insulation between joists	0.15	20.00	20.56

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	38.35
Second Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	33.81

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30
Garage Door	Manufacturer	Solid Door							1.50

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall (GF)	East							2.86	
Front Window	Window	[1] External Wall (GF)	East	None	0.00					0.92	
LH Window	Window	[2] External Wall (1F+)	South	None	0.00					0.72	
Rear Window	Window	[2] External Wall (1F+)	West	None	0.00					5.91	
Rear Patio Door	Window	[1] External Wall (GF)	West	None	0.00					6.10	
Front Window	Window	[2] External Wall (1F+)	East	None	0.00					7.34	
Rear Window	Window	[1] External Wall (GF)	West	None	0.00					1.85	
Front Garage Door	Solid Door	[3] Garage Wall	East							1.97	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	
17.0 Thermal Bridging	Calculate Bridges	

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	0.94	0.500	No
Independently assessed	E2 Other lintels (including other steel lintels)	10.66	0.050	No
Independently assessed	E2 Other lintels (including other steel lintels)	6.80	0.048	No
Independently assessed	E3 Sill	10.66	0.034	No
Independently assessed	E3 Sill	2.73	0.034	No
Independently assessed	E4 Jamb	20.40	0.040	No
Independently assessed	E4 Jamb	16.80	0.040	No
Table K1 - Approved	E4 Jamb	4.20	0.050	No
Independently assessed	E5 Ground floor (normal)	23.59	0.067	No
Table K1 - Approved	E5 Ground floor (normal)	9.76	0.160	No
Table K1 - Default	E20 Exposed floor (normal)	9.47	0.320	No
Table K1 - Default	E21 Exposed floor (inverted)	9.47	0.320	No
Independently assessed	E6 Intermediate floor within a dwelling	39.04	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	6.75	0.123	No
Independently assessed	E10 Eaves (insulation at ceiling level)	3.37	0.125	No
Table K1 - Default	E24 Eaves (insulation at ceiling level - inverted)	11.14	0.240	No
Independently assessed	E11 Eaves (insulation at rafter level)	18.13	0.037	No
Independently assessed	E12 Gable (insulation at ceiling level)	9.90	0.063	No
Independently assessed	E12 Gable (insulation at ceiling level)	1.67	0.073	No
Independently assessed	E13 Gable (insulation at rafter level)	6.58	0.080	No
Independently assessed	E16 Corner (normal)	20.33	0.058	No
Independently assessed	E16 Corner (normal)	10.89	0.063	No
Table K1 - Approved	E16 Corner (normal)	2.72	0.090	No
Independently assessed	E17 Corner (inverted – internal area greater than external area)	4.73	-0.069	No
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	2.72	-0.090	No
Table K1 - Default	R6 Flat ceiling	18.13	0.060	No

Y-value	0.055	W/m²K

18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1

0.16	Through Wall Fan Other Wet Room	3
0.18	In Room Fan Other Wet Room	2

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	17	
Total number of L.E.L. fittings	17	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	No	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18493	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Flue Type	Balanced	
Fan Assisted Flue	Yes	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Radiators	
Flow Temperature	Normal (> 45°C)	
Combi boiler type	Standard Combi	
Combi keep hot type	None	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	

Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901

29.0 Hot Water Cylinder None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	B 91	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Nithsdale - End	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As	**Prop Type Ref**	007780-SAP-Nithsdale-E_DS
Property	Plot , Moorthorpe Way , Owlthorpe		

SAP Rating	84 B	**DER**	17.77	**TER**	18.62
Environmental	86 B	**% DER<TER**	4.55		
CO_2 Emissions (t/year)	1.33	**DFEE**	49.38	**TFEE**	53.50
General Requirements Compliance	Pass	**% DFEE<TFEE**	7.70		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, End-Terrace
2.0 Number of Storeys	2
3.0 Date Built	2018
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	18.45 m	41.88 m²	2.38 m
1st Storey:	18.45 m	41.88 m²	2.70 m

7.0 Living Area	38.86	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	185.91	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	93.84	78.68

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall	Filled Cavity with Edge Sealing	Single plasterboard on dabs both sides, lightweight aggregate blocks, cavity or cavity fill	0.00	110.00	40.95

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	48.69
First Floor	Plasterboard on timber frame	9.00	98.12

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	41.88	41.88

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	41.88

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.15	75.00	41.88

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	41.88

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall	East							2.07	
Front Window	Window	[1] External Wall	East	None	0.00					4.70	
LH Window	Window	[1] External Wall	South	None	0.00					0.92	
Rear Window	Window	[1] External Wall	West	None	0.00					3.67	
Rear Patio Door	Window	[1] External Wall	West	None	0.00					3.80	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	
17.0 Thermal Bridging	Calculate Bridges	

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	10.29	0.050	No
Independently assessed	E3 Sill	7.50	0.034	No
Independently assessed	E4 Jamb	25.50	0.040	No
Independently assessed	E5 Ground floor (normal)	18.45	0.060	No
Independently assessed	E6 Intermediate floor within a dwelling	18.45	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	10.40	0.123	No
Independently assessed	E12 Gable (insulation at ceiling level)	8.05	0.063	No
Independently assessed	E16 Corner (normal)	10.17	0.058	No
Table K1 - Default	E18 Party wall between dwellings	10.17	0.120	No
Table K1 - Default	P1 Party wall - Ground floor	8.05	0.160	No
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	8.05	0.000	No
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	8.05	0.240	No

Y-value	0.055	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.18	In Room Fan Other Wet Room	1
0.16	Through Wall Fan Other Wet Room	1

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System — No

22.0 Lighting

Internal

Total number of light fittings	11	
Total number of L.E.L. fittings	11	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No

23.0 Electricity Tariff — Standard

24.0 Main Heating 1 — Database

Percentage of Heat	100	%
Database Ref. No.	18204	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	

Controls	CBI Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2110
Flue Type	Balanced
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Flow Temperature	Normal (> 45°C)
Combi boiler type	Standard Combi
Combi keep hot type	None
25.0 Main Heating 2	None
Community Heating	None
28.0 Water Heating	HWP From main heating 1
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£29	B 85	
	Typical Cost	**Typical savings per year**	**Ratings after improvement SAP rating**	**Environmental Impact**
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	A 95	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Nithsdale - Mid	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As/Opp	**Prop Type Ref**	007780-SAP-Nithsdale-M_DS
Property	Plot , Moorthorpe Way, Owlthorpe		

SAP Rating	84 B	**DER**	16.71	**TER**	17.30
Environmental	87 B	**% DER<TER**	3.41		
CO_2 Emissions (t/year)	1.24	**DFEE**	44.20	**TFEE**	46.50
General Requirements Compliance	Pass	**% DFEE<TFEE**	4.94		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Mid-Terrace
2.0 Number of Storeys	2
3.0 Date Built	2018
4.0 Sheltered Sides	3
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	10.40 m	41.88 m²	2.38 m
1st Storey:	10.40 m	41.88 m²	2.70 m

7.0 Living Area	38.86	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	211.02	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	52.88	38.64

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall	Filled Cavity with Edge Sealing	Single plasterboard on dabs both sides, lightweight aggregate blocks, cavity or cavity fill	0.00	110.00	81.91

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	48.69
First Floor	Plasterboard on timber frame	9.00	98.12

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	41.88	41.88

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	41.88

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.14	75.00	41.88

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	41.88

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall	East							2.07	
Front Window	Window	[1] External Wall	East	None	0.00					4.70	
Rear Window	Window	[1] External Wall	West	None	0.00					3.67	
Rear Patio Door	Window	[1] External Wall	West	None	0.00					3.80	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	

17.0 Thermal Bridging	Calculate Bridges	

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	9.60	0.050	No
Independently assessed	E3 Sill	6.81	0.034	No
Independently assessed	E4 Jamb	22.80	0.040	No
Independently assessed	E5 Ground floor (normal)	10.40	0.060	No
Independently assessed	E6 Intermediate floor within a dwelling	10.40	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	10.40	0.123	No
Table K1 - Default	E18 Party wall between dwellings	20.34	0.120	No
Table K1 - Default	P1 Party wall - Ground floor	16.11	0.160	No
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	16.11	0.000	No
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	16.11	0.240	No

Y-value	0.091	W/m²K

18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.18	In Room Fan Other Wet Room	1
0.16	Through Wall Fan Other Wet Room	1

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	

22.0 Lighting

Internal

Total number of light fittings	11	
Total number of L.E.L. fittings	11	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No	

23.0 Electricity Tariff	Standard	

24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18204	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	
Controls	CBI Time and temperature zone control	
PCDF Controls	0	

Delayed Start Stat	Yes
Sap Code	2110
Flue Type	Balanced
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Flow Temperature	Normal (> 45°C)
Combi boiler type	Standard Combi
Combi keep hot type	None
25.0 Main Heating 2	None
Community Heating	None
28.0 Water Heating	HWP From main heating 1
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£29	B 86	
	Typical Cost	**Typical savings per year**	**Ratings after improvement SAP rating**	**Environmental Impact**
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	A 96	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Paignton - Mid	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As/Opp	**Prop Type Ref**	007780-SAP-Paignton-M_DS
Property	Plot , Moorthorpe Way , Owlthorpe		

SAP Rating	86 B	**DER**	14.38	**TER**	15.11
Environmental	88 B	**% DER<TER**	4.86		
CO_2 Emissions (t/year)	1.47	**DFEE**	41.32	**TFEE**	44.23
General Requirements Compliance	Pass	**% DFEE<TFEE**	6.59		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Mid-Terrace
2.0 Number of Storeys	3
3.0 Date Built	2018
4.0 Sheltered Sides	3
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	9.05 m	37.97 m²	2.38 m
1st Storey:	9.05 m	37.97 m²	2.70 m
2nd Storey:	9.05 m	37.97 m²	2.70 m

7.0 Living Area	22.99	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	152.25	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall (GF)	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	21.58	11.70
External Wall (1F+)	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	48.87	37.86

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall	Filled Cavity with Edge Sealing	Plasterboard on dabs mounted on cement render on both sides, AAC blocks, cavity	0.00	45.00	130.66

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	94.68
First Floor	Plasterboard on timber frame	9.00	99.58
Second Floor	Plasterboard on timber frame	9.00	90.83

10.0 External Roofs

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	37.97	37.97

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	37.97
First Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	37.97

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.14	75.00	37.97

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	37.97
Second Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	37.97

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall (GF)	East							2.86	
Front Window	Window	[1] External Wall (GF)	East	None	0.00					0.92	
Rear Window	Window	[2] External Wall (1F+)	West	None	0.00					6.12	
Rear Patio Door	Window	[1] External Wall (GF)	West	None	0.00					6.10	
Front Window	Window	[2] External Wall (1F+)	East	None	0.00					4.89	

14.0 Conservatory None

15.0 Draught Proofing 100 %

16.0 Draught Lobby No

17.0 Thermal Bridging Calculate Bridges

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	9.52	0.050	No
Independently assessed	E2 Other lintels (including other steel lintels)	4.75	0.048	No
Independently assessed	E3 Sill	8.83	0.034	No
Independently assessed	E4 Jamb	13.50	0.040	No
Independently assessed	E4 Jamb	11.40	0.040	No
Independently assessed	E5 Ground floor (normal)	9.05	0.067	No
Independently assessed	E6 Intermediate floor within a dwelling	18.10	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	9.05	0.123	No
Table K1 - Default	E18 Party wall between dwellings	31.14	0.120	No
Table K1 - Default	P1 Party wall - Ground floor	16.78	0.160	No
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	33.57	0.000	No
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	16.78	0.240	No

Y-value 0.097 W/m²K

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	$m^3/(h.m^2)$ @ 50 Pa
Property Tested ?		
As Built AP_{50}		$m^3/(h.m^2)$ @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.16	Through Wall Fan Other Wet Room	3
0.18	In Room Fan Other Wet Room	1

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	

22.0 Lighting

Internal

Total number of light fittings	16	
Total number of L.E.L. fittings	16	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No	

23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18493	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Fuel Type	Mains gas
Main Heating	BGW
SAP Code	104
In Winter	89.9
In Summer	86.7
Controls	CBI Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2110
Flue Type	Balanced
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Flow Temperature	Normal (> 45°C)
Combi boiler type	Standard Combi
Combi keep hot type	None
25.0 Main Heating 2	None
Community Heating	None
28.0 Water Heating	HWP From main heating 1
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£30	B 87	
	Typical Cost	**Typical savings per year**	**Ratings after improvement SAP rating**	**Environmental Impact**
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	A 95	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Paignton - Semi	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As	**Prop Type Ref**	007780-SAP-Paignton-S_DS
Property	Plot , Moorthorpe Way , Owlthorpe		

SAP Rating	85 B	**DER**	15.90	**TER**	16.53
Environmental	86 B	**% DER<TER**	3.81		
CO_2 Emissions (t/year)	1.63	**DFEE**	48.23	**TFEE**	51.86
General Requirements Compliance	Pass	**% DFEE<TFEE**	7.00		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Semi-Detached
2.0 Number of Storeys	3
3.0 Date Built	2018
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	17.44 m	37.97 m²	2.38 m
1st Storey:	17.44 m	37.97 m²	2.70 m
2nd Storey:	17.44 m	37.97 m²	2.70 m

7.0 Living Area	22.99	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	197.38	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall (GF)	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	41.60	31.72
External Wall (1F+)	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	94.19	81.74

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall	Filled Cavity with Edge Sealing	Single plasterboard on dabs both sides, lightweight aggregate blocks, cavity or cavity fill	0.00	110.00	65.33

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	94.68
First Floor	Plasterboard on timber frame	9.00	99.58
Second Floor	Plasterboard on timber frame	9.00	90.83

10.0 External Roofs

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	37.97	37.97

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	37.97
First Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	37.97

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.15	75.00	37.97

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	37.97
Second Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	37.97

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall (GF)	East							2.86	
Front Window	Window	[1] External Wall (GF)	East	None	0.00					0.92	
LH Window	Window	[2] External Wall (1F+)	South	None	0.00					1.44	
Rear Window	Window	[2] External Wall (1F+)	West	None	0.00					6.12	
Rear Patio Door	Window	[1] External Wall (GF)	West	None	0.00					6.10	
Front Window	Window	[2] External Wall (1F+)	East	None	0.00					4.89	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	
17.0 Thermal Bridging	Calculate Bridges	

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	9.52	0.050	No
Independently assessed	E2 Other lintels (including other steel lintels)	4.75	0.048	No
Independently assessed	E3 Sill	9.52	0.034	No
Independently assessed	E3 Sill	0.69	0.034	No
Independently assessed	E4 Jamb	17.70	0.040	No
Independently assessed	E4 Jamb	11.40	0.040	No
Independently assessed	E5 Ground floor (normal)	17.44	0.067	No
Independently assessed	E6 Intermediate floor within a dwelling	34.88	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	9.05	0.123	No
Independently assessed	E12 Gable (insulation at ceiling level)	8.39	0.063	No
Independently assessed	E16 Corner (normal)	10.80	0.058	No
Independently assessed	E16 Corner (normal)	4.77	0.063	No
Table K1 - Default	E18 Party wall between dwellings	15.57	0.120	No
Table K1 - Default	P1 Party wall - Ground floor	8.39	0.160	No
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	16.78	0.000	No
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	8.39	0.240	No

Y-value	0.053	W/m²K

18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.16	Through Wall Fan Other Wet Room	3
0.18	In Room Fan Other Wet Room	1

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0

Number of intermittent fans		0
Number of passive vents		0
Number of flueless gas fires		0
21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	16	
Total number of L.E.L. fittings	16	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	No	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18493	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Flue Type	Balanced	
Fan Assisted Flue	Yes	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Radiators	
Flow Temperature	Normal (> 45°C)	
Combi boiler type	Standard Combi	
Combi keep hot type	None	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£30	B 86	
	Typical Cost	**Typical savings per year**	**Ratings after improvement SAP rating**	**Environmental Impact**
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	A 94	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Ramsbury - Det	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As	**Prop Type Ref**	007780-SAP-Ramsbury-D_DS
Property	Plot, Moorthorpe Way , Owlthorpe		

SAP Rating	85 B	**DER**	15.80	**TER**	16.63
Environmental	85 B	**% DER<TER**	4.99		
CO_2 Emissions (t/year)	2.02	**DFEE**	52.11	**TFEE**	58.50
General Requirements Compliance	Pass	**% DFEE<TFEE**	10.92		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	2
3.0 Date Built	2018
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	42.34 m	74.50 m²	2.38 m
1st Storey:	36.49 m	64.86 m²	2.70 m

7.0 Living Area	22.35	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	166.16	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	199.06	165.65

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	88.39
First Floor	Plasterboard on timber frame	9.00	189.76
Ground Floor Block	Dense block, plasterboard on dabs	75.00	28.14

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	72.94	72.94
Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.14	9.00	1.56	1.56

10.2 Internal Ceilings

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	65.15

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.16	75.00	74.50

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	65.15

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall	East							2.86	
Front Window	Window	[1] External Wall	East	None	0.00					11.84	
LH Window	Window	[1] External Wall	South	None	0.00					3.85	
Rear Window	Window	[1] External Wall	West	None	0.00					7.65	
LH Patio Door	Window	[1] External Wall	South	None	0.00					5.09	
RH Window	Window	[1] External Wall	North	None	0.00					2.12	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	
17.0 Thermal Bridging	Calculate Bridges	

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	22.91	0.050	No
Independently assessed	E3 Sill	19.29	0.034	No
Independently assessed	E4 Jamb	42.00	0.040	No
Independently assessed	E5 Ground floor (normal)	42.34	0.060	No
Independently assessed	E6 Intermediate floor within a dwelling	32.87	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	29.83	0.123	No
Table K1 - Default	E24 Eaves (insulation at ceiling level - inverted)	5.76	0.240	No
Independently assessed	E12 Gable (insulation at ceiling level)	14.71	0.063	No
Table K1 - Default	E14 Flat roof	0.56	0.080	No
Independently assessed	E16 Corner (normal)	32.01	0.058	No
Independently assessed	E17 Corner (inverted – internal area greater than external area)	14.37	-0.069	No

Y-value	0.037	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.16	Through Wall Fan Other Wet Room	2
0.18	In Room Fan Other Wet Room	2

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	

22.0 Lighting

Internal

Total number of light fittings	16	
Total number of L.E.L. fittings	16	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No	

23.0 Electricity Tariff	Standard	

24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18493	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	
Controls	CBI Time and temperature zone control	

PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2110
Flue Type	Balanced
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Flow Temperature	Normal (> 45°C)
Combi boiler type	Standard Combi
Combi keep hot type	None
25.0 Main Heating 2	None
Community Heating	None
28.0 Water Heating	HWP From main heating 1
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	A 92	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Seaton - Semi	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As	**Prop Type Ref**	007780-SAP-Seaton-S_DS
Property	Plot, Moorthorpe Way , Owlthorpe		

SAP Rating	85 B	**DER**	15.52	**TER**	16.29
Environmental	86 B	**% DER<TER**	4.71		
CO_2 Emissions (t/year)	1.65	**DFEE**	48.45	**TFEE**	52.30
General Requirements Compliance	Pass	**% DFEE<TFEE**	7.35		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Semi-Detached
2.0 Number of Storeys	3
3.0 Date Built	2018
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	20.59 m	40.83 m²	2.38 m
1st Storey:	17.44 m	37.97 m²	2.70 m
2nd Storey:	17.44 m	37.97 m²	2.70 m

7.0 Living Area	13.60	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	191.68	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall (GF)	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	48.22	32.66
External Wall (1F+)	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	94.19	75.62

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall	Filled Cavity with Edge Sealing	Single plasterboard on dabs both sides, lightweight aggregate blocks, cavity or cavity fill	0.00	110.00	65.33

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	91.68
First Floor	Plasterboard on timber frame	9.00	98.66
Second Floor	Plasterboard on timber frame	9.00	91.48

10.0 External Roofs

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	39.27	39.27
Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.14	9.00	1.56	1.56

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	37.97
First Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	37.97

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.16	75.00	40.83

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	37.97
Second Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	37.97

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall (GF)	East							2.86	
Front Window	Window	[1] External Wall (GF)	East	None	0.00					3.24	
LH Window	Window	[2] External Wall (1F+)	South	None	0.00					6.12	
Rear Window	Window	[1] External Wall (GF)	West	None	0.00					0.69	
LH Patio Door	Window	[1] External Wall (GF)	South	None	0.00					6.10	
Front Window	Window	[2] External Wall (1F+)	East	None	0.00					8.78	
RH Window	Window	[1] External Wall (GF)	North	None	0.00					2.67	
RH Window	Window	[2] External Wall (1F+)	North	None	0.00					3.67	

14.0 Conservatory None

15.0 Draught Proofing 100 %

16.0 Draught Lobby No

17.0 Thermal Bridging Calculate Bridges

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	14.06	0.053	No
Independently assessed	E2 Other lintels (including other steel lintels)	9.08	0.048	No
Independently assessed	E3 Sill	14.06	0.034	No
Independently assessed	E3 Sill	5.01	0.034	No
Independently assessed	E4 Jamb	28.50	0.040	No
Independently assessed	E4 Jamb	16.20	0.040	No
Independently assessed	E5 Ground floor (normal)	20.59	0.067	No
Independently assessed	E6 Intermediate floor within a dwelling	34.88	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	8.39	0.123	No
Independently assessed	E10 Eaves (insulation at ceiling level)	2.43	0.125	No
Table K1 - Default	E24 Eaves (insulation at ceiling level - inverted)	3.62	0.240	No
Independently assessed	E12 Gable (insulation at ceiling level)	9.05	0.063	No
Independently assessed	E12 Gable (insulation at ceiling level)	0.79	0.073	No
Independently assessed	E16 Corner (normal)	10.80	0.058	No
Independently assessed	E16 Corner (normal)	10.47	0.063	No
Independently assessed	E17 Corner (inverted – internal area greater than external area)	8.40	-0.068	No
Table K1 - Default	E18 Party wall between dwellings	15.57	0.120	No
Table K1 - Default	P1 Party wall - Ground floor	8.39	0.160	No
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	16.78	0.000	No
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	8.39	0.240	No

Y-value	0.061	W/m²K

18.0 Pressure Testing — Yes

Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.16	Through Wall Fan Other Wet Room	3
0.18	In Room Fan Other Wet Room	1

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	14	
Total number of L.E.L. fittings	14	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	No	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18493	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Flue Type	Balanced	
Fan Assisted Flue	Yes	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Radiators	
Flow Temperature	Normal (> 45°C)	
Combi boiler type	Standard Combi	
Combi keep hot type	None	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery	No	

Storage System	
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£30	B 86	
	Typical Cost	**Typical savings per year**	**Ratings after improvement SAP rating**	**Environmental Impact**
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	A 94	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Sudbury - Det	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As	**Prop Type Ref**	007780-SAP-Sudbury-D_DS
Property	Plot , Moorthorpe Way , Owlthorpe		

SAP Rating	84 B	**DER**	17.70	**TER**	18.30
Environmental	83 B	**% DER<TER**	3.30		
CO_2 Emissions (t/year)	2.29	**DFEE**	59.45	**TFEE**	66.19
General Requirements Compliance	Pass	**% DFEE<TFEE**	10.19		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Detached
2.0 Number of Storeys	2
3.0 Date Built	2018
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	41.67 m	69.52 m²	2.72 m
1st Storey:	34.69 m	70.45 m²	2.36 m

7.0 Living Area	44.00	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	148.33	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	169.19	140.39
Solid Garage Wall	Solid Wall	Solid wall : plasterboard on dabs, insulation, any outside structure	0.32	9.00	24.92	22.95

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	107.28
First Floor	Plasterboard on timber frame	9.00	182.29
Ground Floor Block	Dense block, plasterboard on dabs	75.00	17.08

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	70.45	70.45
Flat Roof	External Flat Roof	Plasterboard, insulated flat roof	0.14	9.00	17.89	17.89

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	51.63

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.16	75.00	69.52
Exposed Floor Above Garage	Exposed Floor - Timber	Timber exposed floor, insulation between joists	0.15	20.00	18.82

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	51.63

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Half Glazed Door	Manufacturer	Half Glazed Door	Double Low-E Soft 0.05			0.63		0.70	1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30
Garage Door	Manufacturer	Door to Corridor							1.50

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Half Glazed Door	[1] External Wall	East							2.86	
Front Window	Window	[1] External Wall	East	None	0.00					7.65	
LH Window	Window	[1] External Wall	South	None	0.00					0.72	
Rear Window	Window	[1] External Wall	West	None	0.00					3.67	
Rear Patio Door	Window	[1] External Wall	West	None	0.00					12.46	
Front Garage Door	Door to Corridor	[2] Solid Garage Wall	East							1.97	
RH Window	Window	[1] External Wall	North	None	0.00					1.44	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	
17.0 Thermal Bridging	Calculate Bridges	

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Table K1 - Approved	E1 Steel lintel with perforated steel base plate	0.94	0.500	No
Independently assessed	E2 Other lintels (including other steel lintels)	17.45	0.050	No
Independently assessed	E3 Sill	10.44	0.034	No
Independently assessed	E4 Jamb	35.40	0.040	No
Table K1 - Approved	E4 Jamb	4.20	0.050	No
Independently assessed	E5 Ground floor (normal)	32.52	0.060	No
Table K1 - Approved	E5 Ground floor (normal)	9.15	0.160	No
Table K1 - Default	E20 Exposed floor (normal)	9.15	0.320	No
Table K1 - Default	E21 Exposed floor (inverted)	9.15	0.320	No
Independently assessed	E6 Intermediate floor within a dwelling	25.54	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	18.36	0.123	No
Table K1 - Default	E24 Eaves (insulation at ceiling level - inverted)	5.13	0.240	No
Independently assessed	E12 Gable (insulation at ceiling level)	19.48	0.063	No
Table K1 - Default	E14 Flat roof	12.11	0.080	No
Independently assessed	E16 Corner (normal)	25.24	0.058	No
Table K1 - Approved	E16 Corner (normal)	5.44	0.090	No
Independently assessed	E17 Corner (inverted – internal area greater than external area)	7.62	-0.069	No
Table K1 - Approved	E17 Corner (inverted – internal area greater than external area)	2.72	-0.090	No

Y-value	0.052	W/m²K

18.0 Pressure Testing — Yes

Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.16	Through Wall Fan Other Wet Room	2
0.18	In Room Fan Other Wet Room	2

20.0 Fans, Open Fireplaces, Flues

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	14	
Total number of L.E.L. fittings	14	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	No	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18204	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	
Controls	CBI Time and temperature zone control	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2110	
Flue Type	Balanced	
Fan Assisted Flue	Yes	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Radiators	
Flow Temperature	Normal (> 45°C)	
Combi boiler type	Standard Combi	
Combi keep hot type	None	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HWP From main heating 1	
Water Heating	Main Heating 1	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901

29.0 Hot Water Cylinder None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	B 91	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	007780 - HT - Weydale - Mid	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As/Opp	**Prop Type Ref**	007780-SAP-Weydale-M_DS
Property	Plot , Moorthorpe Way , Owlthorpe		

SAP Rating	85 B	**DER**	15.66	**TER**	16.31
Environmental	87 B	**% DER<TER**	4.00		
CO_2 Emissions (t/year)	1.36	**DFEE**	43.07	**TFEE**	45.80
General Requirements Compliance	Pass	**% DFEE<TFEE**	5.96		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Mid-Terrace
2.0 Number of Storeys	2
3.0 Date Built	2019
4.0 Sheltered Sides	3
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	12.20 m	49.13 m²	2.38 m
1st Storey:	12.20 m	49.13 m²	2.64 m

7.0 Living Area	42.80	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	193.6	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	61.26	44.22

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall	Filled Cavity with Edge Sealing	Single plasterboard on dabs both sides, lightweight aggregate blocks, cavity or cavity fill	0.00	110.00	80.88

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	47.65
First Floor	Plasterboard on timber frame	9.00	127.62

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	49.13	49.13

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	49.13

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.14	75.00	49.13

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	49.13

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacturer	Solid Door							1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Solid Door	[1] External Wall	East							2.18	
Front Windows	Window	[1] External Wall	East	None	0.00					7.14	
Rear Windows	Window	[1] External Wall	West	None	0.00					3.81	
Rear Patio Door	Window	[1] External Wall	West	None	0.00					3.91	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	

17.0 Thermal Bridging	Calculate Bridges	

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	11.58	0.050	No
Independently assessed	E3 Sill	8.68	0.034	No
Independently assessed	E4 Jamb	23.40	0.040	No
Independently assessed	E5 Ground floor (normal)	12.20	0.060	No
Independently assessed	E6 Intermediate floor within a dwelling	12.20	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	12.20	0.123	No
Table K1 - Default	E18 Party wall between dwellings	20.08	0.120	No
Table K1 - Default	P1 Party wall - Ground floor	16.11	0.160	No
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	16.11	0.000	No
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	16.11	0.240	No

Y-value	0.081	W/m²K

18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	Yes
Night Ventilation	No
Air change rate	8.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Mechanical extract ventilation - decentralised
MV Reference Number	500230
Duct Type	Flexible

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.16	Through Wall Fan Kitchen	1
0.16	Through Wall Fan Other Wet Room	1
0.18	In Room Fan Other Wet Room	1

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	

22.0 Lighting

Internal

Total number of light fittings	11	
Total number of L.E.L. fittings	11	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No	

23.0 Electricity Tariff	Standard	

24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18493	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	
Controls	CBI Time and temperature zone control	
PCDF Controls	0	

Delayed Start Stat	Yes
Sap Code	2110
Flue Type	Balanced
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Flow Temperature	Normal (> 45°C)
Combi boiler type	Standard Combi
Combi keep hot type	None
25.0 Main Heating 2	None
Community Heating	None
28.0 Water Heating	HWP From main heating 1
Water Heating	Main Heating 1
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
Solar water heating	£4,000 - £6,000	£30	B 86	
	Typical Cost	**Typical savings per year**	**Ratings after improvement SAP rating**	**Environmental Impact**
Solar photovoltaic panels, 2.5 kWp	£3,500 - £5,500	£303	A 95	

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
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Property Reference	007780 - HT - Weydale - Semi	**Issued on Date**	05/12/2019
Assessment Reference	As Designed - As	**Prop Type Ref**	007780-SAP-Weydale-S_DS
Property	Plot , Moorthorpe Way , Owlthorpe		

SAP Rating	84 B	**DER**	16.54	**TER**	17.42
Environmental	86 B	**% DER<TER**	5.06		
CO_2 Emissions (t/year)	1.46	**DFEE**	47.41	**TFEE**	51.70
General Requirements Compliance	Pass	**% DFEE<TFEE**	8.29		

Assessor Details	Mr. George Leadley, George Leadley, Tel: 01904 656271, george.leadley@thefesgroup.com	**Assessor ID**	P719-0001
Client	Avant Homes Central		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Suburban
1.0 Property Type	House, Semi-Detached
2.0 Number of Storeys	2
3.0 Date Built	2019
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	20.25 m	49.13 m²	2.38 m
1st Storey:	20.25 m	49.13 m²	2.64 m

7.0 Living Area	42.80	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	172.42	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.24	60.00	101.70	83.67

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall	Filled Cavity with Edge Sealing	Single plasterboard on dabs both sides, lightweight aggregate blocks, cavity or cavity fill	0.00	110.00	40.44

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard on timber frame	9.00	47.65
First Floor	Plasterboard on timber frame	9.00	127.62

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
Cold Roof	External Plane Roof	Plasterboard, insulated at ceiling level	0.11	9.00	49.13	49.13

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Plasterboard ceiling, carpeted chipboard floor	9.00	49.13

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Ground Floor	Ground Floor - Solid	Suspended concrete floor, carpeted	0.15	75.00	49.13

11.2 Internal Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
First Floor	Plasterboard ceiling, carpeted chipboard floor	18.00	49.13

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Solid Door	Manufacturer	Solid Door							1.50
Patio Door	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.50
Window	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.30

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front Door	Solid Door	[1] External Wall	East							2.18	
Front Windows	Window	[1] External Wall	East	None	0.00					7.14	
Rear Windows	Window	[1] External Wall	West	None	0.00					3.81	
Rear Patio Door	Window	[1] External Wall	West	None	0.00					3.91	
LH Window	Window	[1] External Wall	South	None	0.00					0.99	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	
17.0 Thermal Bridging	Calculate Bridges	

17.1 List of Bridges

Source Type	Bridge Type	Length	Psi	Imported
Independently assessed	E2 Other lintels (including other steel lintels)	12.32	0.050	No
Independently assessed	E3 Sill	9.42	0.034	No
Independently assessed	E4 Jamb	26.10	0.040	No
Independently assessed	E5 Ground floor (normal)	20.25	0.060	No
Independently assessed	E6 Intermediate floor within a dwelling	20.25	0.000	No
Independently assessed	E10 Eaves (insulation at ceiling level)	12.20	0.123	No
Independently assessed	E12 Gable (insulation at ceiling level)	8.05	0.063	No
Independently assessed	E16 Corner (normal)	10.04	0.058	No
Table K1 - Default	E18 Party wall between dwellings	10.04	0.120	No
Table K1 - Default	P1 Party wall - Ground floor	8.05	0.160	No
Table K1 - Default	P2 Party wall - Intermediate floor within a dwelling	8.05	0.000	No
Table K1 - Default	P4 Party wall - Roof (insulation at ceiling level)	8.05	0.240	No

Y-value	0.051	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	5.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

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Design SAP
elmhurst energy

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20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	

22.0 Lighting

Internal

Total number of light fittings	11	
Total number of L.E.L. fittings	11	
Percentage of L.E.L. fittings	100.00	%

External

External lights fitted	No	

23.0 Electricity Tariff	Standard	

24.0 Main Heating 1	Database	
Percentage of Heat	100	%
Database Ref. No.	18493	
Fuel Type	Mains gas	
Main Heating	BGW	
SAP Code	104	
In Winter	89.9	
In Summer	86.7	

Controls	CBI Time and temperature zone control
PCDF Controls	0
Delayed Start Stat	Yes
Sap Code	2110
Flue Type	Balanced
Fan Assisted Flue	Yes
Is MHS Pumped	Pump in heated space
Heat Emitter	Radiators
Flow Temperature	Normal (> 45°C)
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28.0 Water Heating	HWP From main heating 1
Water Heating	Main Heating 1
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Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	Yes
SAP Code	901
29.0 Hot Water Cylinder	None

Recommendations

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	Typical Cost	Typical savings per year	Ratings after improvement SAP rating	Environmental Impact
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