
Planning Issues

Shaftesbury


Energy Statement



August 2023



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1.0 Introduction

1.1 Purpose of the Report

Instructions were received from Planning Issues to produce an Energy Statement for the proposed development on the land adjacent to Christy's Lane, Shaftesbury. This report has been produced to support the planning application to be submitted for the proposed development, which is situated within the boundaries of North Dorset District Council.

This statement provides a response to the relevant North Dorset District Council documents and policies:

- North Dorset Local Plan Part 1
 - Policy 3.

1.2 Site and Building Description

The development will be located on the land adjacent to Christy's Lane, Shaftesbury SP7 8QN. The application seeks approval for the construction of a retirement living complex consisting of 41 apartment dwellings (a mix of 1- & 2-bed), as well as associated parking spaces, landscaping and communal areas. The communal areas comprise circulation spaces, a Guest Suite, a communal lounge and staff facilities. A proposed site layout has been included in Appendix 1.

1.3 Methodology

The proposed specifications, representative house type drawings and site plan were reviewed to gain a good understanding of the development; following this, sample SAP & SBEM calculations for all proposed house types have been completed to determine the As Designed performance of the development. The application will be considered under the new Part L1A 2022 regulations. Therefore, the new Elmhurst SAP 10 & SBEM software have been used to conduct the above calculations.

An assessment has been completed to review the potential connection of the proposed development to an existing district heat network. Up to date map data has been provided by the Association of Decentralised Energy, to enable the suitability and distance in relation to the location of the proposed development from a district heating network be reviewed.

In relation to the Part G water requirements, a proposed sanitaryware specification has been assessed against the 125 litre/person/day limit outlined in the building regulations requirements.

2.0 Planning Policy

2.1 North Dorset Local Plan Part 1

The North Dorset Local Plan Part 1 outlines the requirements for new developments regarding sustainability, with Policy 3 having been identified as relevant.

2.2 Policy 3: Climate Change

Development proposals within the District should seek to reduce greenhouse gas emissions including through appropriately sited renewable and low carbon energy developments.

Where the proposal involves the re-use or extension of existing buildings, developments should seek to improve the buildings energy performance unless it can be demonstrated that it is not practical or viable to do so.

Where the proposal includes new buildings they should:

- a) be located in line with the Core Spatial Strategy in Policy 2 and where possible in areas served by a good range of everyday facilities and facilitate cycling, walking and the use of public transport; and*
- b) be designed to make best use of solar radiation and passive cooling through the incorporation of passive solar design principles; and*
- c) incorporate measures to meet the current national targets for energy performance by incorporating measures into the building fabric itself or through the inclusion of renewable or low carbon energy measures. Where this is not practical or viable, near-site or off-site measures may be considered.*

Development should seek to minimise the impacts of climate change overall through:

- d) incorporation of measures to reduce water consumption; and*
- e) avoidance of areas at risk of flooding from all sources and the incorporation of measures to reduce flood risk overall; and*
- f) incorporation of measures to reduce the impact of excessive heat on the urban environment through the incorporation of green infrastructure and passive shading and ventilation.*

Neighbourhood plans will be required to consider local community actions that will help to mitigate and adapt to climate change.

3.0 Policy Response

North Dorset Local Plan Part 1

- Policy 3: Climate Change

3.1 Sustainable Transport

Where the proposal includes new buildings they should:

- a) be located in line with the Core Spatial Strategy in Policy 2 and where possible in areas served by a good range of everyday facilities and facilitate cycling, walking and the use of public transport; and***

We understand that Policy 2: Core Spatial Strategy will be addressed under a different submission. The proposed development is located in a central location surrounded by many amenities including a Tesco ATM & Superstore, eateries, a post office and Christian place of worship.

As per Part S of the Building Regulations, Planning Issues are also proposing to install sufficient Electric Vehicle (EV) charging points, to service all resident parking spaces at the scheme. While this is not directly connected to the energy performance of the building, it does demonstrate their commitment to emphasising low carbon technologies throughout the site, as this will provide the easily accessible facility for the end user to operate an electric vehicle rather than a petrol fuelled vehicle.

There is a bus stop within 150m of the development through which several services connect to nearby local towns.

3.2 Solar Radiation & Passive Cooling

- b) be designed to make best use of solar radiation and passive cooling through the incorporation of passive solar design principles; and***

Passive solar design and providing a benign site microclimate both enhances the energy and environmental performance of a building. The development at the land off Christy's Lane Shaftesbury will have good access to solar radiation and daylight.

Many of the apartments benefit from a South-East /South-West orientation which will allow them to gain maximum benefit from the sun. It will not be significantly shaded by surrounding buildings and there is sufficient space between the buildings so that overshadowing will not be an issue and there will be significant potential for solar gain.

The use of high thermal mass and good insulation levels in this proposed scheme provides an effective medium for managing solar gains, both having the ability to both hold heat and cool. The external walls will be constructed using high density blocks, and with a 150mm cavity fully filled with insulation, while the cold pitched roof will benefit from 400mm mineral wool insulation.

These materials have high levels of thermal mass meaning they can absorb excess heat throughout the day, keeping the surrounding area cooler, and then slowly release and re-radiate the stored heat as the temperature drops. This prevents rooms from becoming uncomfortably hot in summer and stores warmth in winter. Passive cooling design measures have been incorporated, with use of overhanging eaves, inset elements and balconies to help limit gains at the height of summer.

The proposed development will have associated green amenity space for residents and is maintaining several trees already on site to serve as green infrastructure. This green infrastructure has the potential to reduce the risk of heat island effect, acting as a heat soak for the scheme.

Given the timescales of the proposed scheme, it will be assessed against the new Part O Overheating Building Regulations. The apartments will be assessed using the Dynamic Thermal Modelling method, which follows the CIBSE TM59 methodology. It is currently expected that compliance will be achieved through a combination of passive measures and mechanical ventilation, and the client is currently in the process of developing a rigorous strategy to ensure Part O Compliance. Where further measures are required to ensure Part O Compliance, these will be installed in full by the client.

3.3 Energy Performance

- c) *incorporate measures to meet the current national targets for energy performance by incorporating measures into the building fabric itself or through the inclusion of renewable or low carbon energy measures. Where this is not practical or viable, near-site or off-site measures may be considered.***

3.3.1 Energy Efficiency

In efforts to reduce the overall carbon emissions associated with the development and to maximise the energy efficiency, the developer has a robust 'fabric first' approach to the build specification, which allows it to achieve compliance with all metrics under the recently adopted and revised Approved Document Part L 2022.

This will be achieved in this project through building fabric improvements with an uplift on the minimum requirements of Approved Document Part L1A 2022, and also specification of efficient mechanical and electrical services, including a number of 'add-on' measures to improve efficiency and performance.

Fabric Energy Efficiency is a measure of the efficiency of the building fabric, the key areas being building fabric U-values, thermal bridging, air permeability, thermal mass and features which affect lighting and solar gains. A higher fabric energy efficiency means that the building will require less energy to heat and cool thus reducing the energy demand of the property and the CO₂ released.

Table 1 over the page demonstrates how the specification of the development at the land off Christy's Lane compares to the limiting values and minimum efficiencies allowed within Part L 2022.

Table 1: Comparison with Building Regulations Part L 2022		
Building Element	Limiting Part L 2022 Specification	Proposed Specification Part L
External Walls U-Value	0.26	0.17
Roof U-Value	0.16	0.11
Ground Floor U-Value	0.18	0.12
Window U-Value	1.60	0.80
Party Wall U-Value	0.20	0.00
Heating Efficiency	100%	100%
Pressure Test	8.00	5.00
Lighting Lumens	75 lm/w	80 lm/w

The development is proposed to adopt a 'fabric first' approach to the specification and as detailed above, the proposed U-Values are a significant uplift on the minimum requirements under Part L.

The build-up of external wall for the apartment is a fully filled 150mm cavity that achieves a u-value of 0.17W/m²K with the addition of insulated plasterboard. With regards to the thermal envelope as a whole, well insulated cavity walls, roof, floors and openings provide a comfortable environment within the development and reduce the buildings' reliance on the main heating system. The high thermal mass, achieved through the use of dense blocks to the inner face of the external wall, will be key to temperature regulation. The air permeability target is 5.00 m³/(h.m²), again providing a significant improvement over the Notional Building target.

Triple Glazed windows are currently proposed for the scheme, which is a significant improvement over the requirements of ADL1. The improved U-Value will provide significant benefit to the overall performance of the scheme, minimising heat loss through this construction element.

Intelligent construction methods are also utilised in the specification of this development. The use of bespoke calculated thermal bridge details and a relatively simple building form ensures that thermal performance is enhanced by minimising heat and energy losses through thermal bridges and air gaps.

3.3.2 Fabric Energy Efficiency

Table 2 below demonstrates the development's approximate average building fabric energy efficiency based on the representative domestic building types modelled.

Table 2: Fabric Energy Efficiency Breakdown	
Domestic	Average (kWh /m²/yr)
Target Fabric Energy Efficiency (TFEE)	24.45
Dwelling Fabric Energy Efficiency (DFEE)	22.68
Percentage Reduction (%)	7.24

As a result of the sample SAP outputs for the development, Table 2 shows the average Target Fabric Energy Efficiency (TFEE) of the development to be 24.45 kWh/m²/yr. The average Predicted Dwelling Fabric Energy Efficiency (DFEE) is demonstrated to be an improvement against this amount, currently modelled to achieve 22.68 kWh/m²/yr.

Overall, this is an improvement in fabric energy efficiency, equating approximately 7.24% reduction against the notional amount. This highlights the design specification performance of the development being an uplift to Building Regulations requirements.

3.3.3 Carbon Emissions Breakdown

In addition to the robust fabric specification as detailed above, the client is also proposing an efficient M&E strategy.

Space Heating is serviced through direct electric panel heaters which provide efficiencies of up to 100%. The use of an electric heating solution strategy also brings the client in line with what appears to be the Government's preferred direction of travel for domestic heating going forward and given the continuing decarbonisation of the grid, electricity can be seen as an increasingly low carbon solution. The client's strategy for Water Heating is still under review, but a highly efficient electric based strategy will be employed.

A Mechanical Ventilation System (MEV) will be installed to all apartments. MEV is a whole house ventilation methodology which consists of a system of extract fans and background ventilators in bathrooms and kitchens. These are set to run constantly at low speeds to draw moisture-laden air out of the home. As such, they provide the same benefits as intermittent fans in wet rooms, but do so with a higher degree of efficiency, minimising the need for electricity use for ventilation.

Solar Photovoltaic panels will be provided to the suitable roof areas of the scheme. It is currently proposed that an array with a total predicted output of 37,060.36 kWh/yr will be applied to the scheme.

The installation of PV panels on the roof helps to reduce the CO₂ emissions from the development, as electricity generated from solar panels is considered to be an on-site zero carbon renewable energy and doesn't release any harmful carbon dioxide or other pollutants.

An EVCP control unit is used to monitor electricity use within the building and assists with distribution of the solar photovoltaic (PV) output around the building and to elements such as Electric Vehicle (EV) charging points. Each apartment also benefits from its own individual smart meter.

To understand the overall approximate performance of the development, sample SAP and representative SBEM calculations have been undertaken. The initial calculations have been undertaken on a sample of the proposed dwellings at the development. Software outputs of the calculations completed can be made available on request.

Table 3 over the page demonstrates the development's total approximate breakdown of carbon emissions based on the representative domestic building types modelled.

Table 3: Carbon Emission Breakdown	
Domestic	Predicted Carbon Emissions (kgCO₂ /yr)
Target Emissions	25,029.67
Dwelling Emissions	11,868.76
Non-Domestic	Predicted Carbon Emissions (kgCO₂ /yr)
Target Emissions	4061.91
Building Emissions	4035.04
Total Reduction	13,187.78
Percentage Reduction (%)	45.33%

As a result of the sample SAP and representative SBEM output for the development, Table 3 shows the Target CO₂ emissions (TER) of the development to be 29,091.58 kg/CO₂/yr. The Predicted Carbon Emissions (BER) are demonstrated to be a substantial improvement against this amount, currently modelled to achieve 15,908.80 kg/CO₂/yr.

Overall, this is a 13,187.78 kg/CO₂/yr reduction in carbon emissions, approximately 60.73% reduction against the notional amount. This highlights the design specification performance of the development being a significant improvement above Building Regulations requirements.

The below table 4 details the overall expected regulated energy demand for the scheme, and therefore allows us to ascertain the proportion of regulated energy that will be derived from low / zero carbon technologies, in the form of solar photovoltaic panels.

Table 4: Predicted Regulated Energy Demand	
Domestic	Predicted Regulated Energy Demand (kwh/yr)
Space Heating	37,410.33
Water Heating	56,547.12
Ventilation	1257.14
Lighting	6760.58
Non-Domestic	Predicted Regulated Energy Demand (kwh/yr)
Space Heating	29,024.41
Water Heating	1504.41
Auxiliary	102.09
Lighting	7398.48
Total Predicted Regulated Energy Demand	140,004.55
Predicted PV Contribution	37,060.36
Percentage PV Contribution (%)	26.47%

As demonstrated by the table, the proposed PV to be applied to the scheme will provide a contribution to the overall energy demand of 26.47%, a significant contribution to be derived from a renewable technology.

3.4 Water Efficiency

Development should seek to minimise the impacts of climate change overall through:

d) incorporation of measures to reduce water consumption; and

In order for the development to meet the requirement that planned water usage does not exceed the Building Regulations Target of 125 Litres/person/day. The development at Shaftesbury, will incorporate efficient, water saving sanitaryware to meet this goal. Where this is not possible, flow restrictors will be installed to limit water use of sanitaryware items.

Representative specifications are shown below in Tables 5 and 6. Based on these specifications, the 1 bed flats at the site will achieve a predicted mains internal water consumption of 98.20 litres/person/day and the 2 and 3 bed flats will achieve a predicted mains internal water consumption of 104.70 litres/person/day.

Whilst the final flow rates of individual sanitaryware items may change as detailed design progresses, performance sufficient to comply with this condition will be maintained. A full breakdown of calculations is available in Appendix 2.

Table 5: Proposed Sanitaryware Specification Flow Rates (1 Bed Flats)	
Component	Water Usage
WC's	4.5 Litres (Full Flush Volume), 3 Litres (Part Flush Volume)
Showers	8 Litres/Minute
Wash-hand basin taps	4 Litres/Minute
Kitchen taps	5 Litres/Minute
Bath	N/A
Washing Machine	8.17 Litres/kg (Default Figures)
Dishwasher	1.25 Litres/Place Setting (Default Figures)

Table 6: Proposed Sanitaryware Specification Flow Rates (2 Bed Flats)	
Component	Water Usage
WC's	4.5 Litres (Full Flush Volume), 3 Litres (Part Flush Volume)
Showers	8 Litres/Minute
Wash-hand basin taps	4 Litres/Minute
Kitchen taps	5 Litres/Minute
Bath	155 Litres Capacity
Washing Machine	8.17 Litres/kg (Default Figures)
Dishwasher	1.25 Litres/Place Setting (Default Figures)

Both specifications provide expected flow rates below the Part G Building Regulation requirements of a maximum 125 Litres/person/day, and indeed both improve on the more onerous 'Optional' target within Part G of 110 Litres/person/day

3.5 Flood Risk

- e) avoidance of areas at risk of flooding from all sources and the incorporation of measures to reduce flood risk overall; and***

We understand that this issue is not applicable to this submission and will be addressed in a separate document.

3.6 Passive Shading & Ventilation

- f) incorporation of measures to reduce the impact of excessive heat on the urban environment through the incorporation of green infrastructure and passive shading and ventilation.***

This issue has been addressed in Section 3.2.

4.0 Conclusion

This statement has reviewed the proposed development at the land off Christy's Lane, Shaftesbury, a retirement living complex consisting of 41 apartment dwellings, as well as associated parking space, landscaping, and communal areas. The communal areas comprise circulation spaces, a Guest Suite, a communal lounge and staff facilities.

- North Dorset Local Plan Part 1
 - Policy 3.

The statement has highlighted that the scheme currently proposes to utilise a robust, well insulated thermal envelope to minimise heat loss, as well as efficient heating and lighting systems, which will drive energy efficiency in the building. Solar Photovoltaic panels will be provided to the suitable roof areas of the scheme. It is currently proposed that an array with a total predicted output of 37,060.36 kWh/yr will be applied to the scheme. This is in line with the Policy 3 objective of promoting development which minimises energy consumption, and in turn carbon emissions and greenhouse gas emissions.

The sample calculations completed on the proposed development confirm that the specification meets the required performance in relation to carbon emissions. The Target CO₂ emissions of the development are predicted to be 29,091.58 kg/CO₂/yr. The Predicted Carbon Emissions are demonstrated to be a substantial improvement against this amount, currently modelled to achieve 15,908.80 kg/CO₂/yr.

Overall, this is a 13,187.78 kg/CO₂/yr reduction in carbon emissions, approximately 60.73% reduction against the notional amount. This highlights the design specification performance of the development being a significant improvement above Part L Building Regulations requirements

Two proposed sanitaryware specifications have been detailed, both of which provide a significant improvement over the Building Regulations requirement of 125 Litres/per person/per day. The clients commitments and strategies with regards to solar gain and overheating mitigation have also been detailed.

Whilst the proposed water sanitaryware flow rates and construction specification system are the preferred specification at this present time. Nonetheless, it will be ensured that where any changes are made, the policy requirements listed will be maintained.

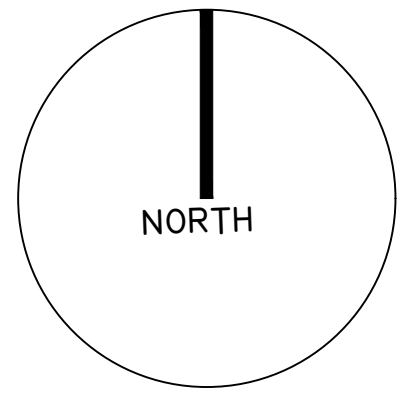


Appendix 1

Proposed Site Plan

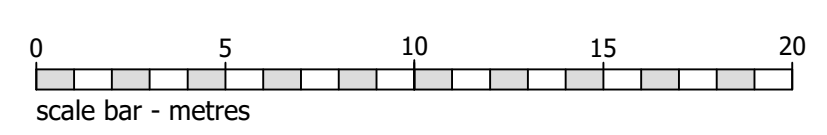
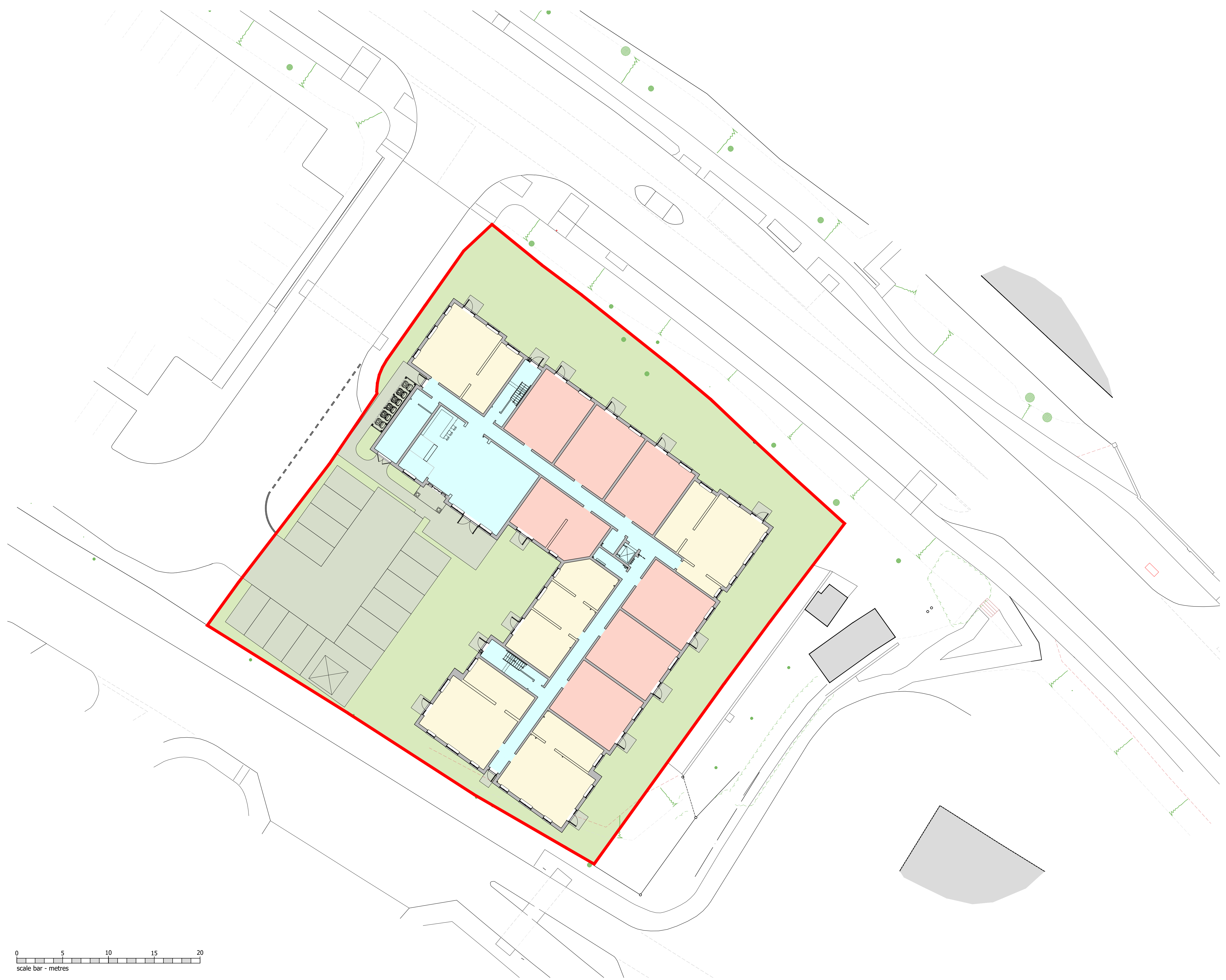
REVISIONS

Rev.	Date	By



1 BED APARTMENTS = 27
 2 BED APARTMENTS = 14
 TOTAL = 41

- 1 BED APARTMENTS
- 2 BED APARTMENTS
- COMMUNAL AREAS



©CHURCHILL RETIREMENT LIVING

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Client
Churchill Retirement Living

Project Title
 Retirement Living Apartments
 Christys Lane
 Shaftesbury

Drawing Title
 PROPOSED SITE PLAN

Scale	1:200 @ A1	Date	AUG 23
Drawn	MJS	Checked	RJ
Drawing No.	10127SB-PA01	Rev.	



Appendix 2

Part G Water Calculations



Job no:	R3605
Date:	15.08.2023
Assessor name:	Ben Matthews
Registration no:	
Development name:	Shaftesbury

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PRINTING: before printing please make sure that in "Page Setup" you have selected the page to be as "Landscape" and that the Scale has been set up to 70% (maximum)

WATER EFFICIENCY CALCULATOR FOR NEW DWELLINGS - (BASIC CALCULATOR)																							
House Type:		Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		Type 9		Type 10			
Description:		1 BED		2 BED																			
Installation Type	Unit of measure	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day	Capacity/flow rate	Litres/person/day		
Is a dual or single flush WC specified?		Dual		Dual		Select option:		Select option:		Select option:		Select option:		Select option:		Click to Select		Click to Select		Click to Select			
WC	Full flush volume	4.5	6.57	4.5	6.57		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		
	Part flush volume	3	8.88	3	8.88		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		
Taps (excluding kitchen and external taps)		Flow rate (litres / minute)		4		7.90		4		7.90				0.00				0.00				0.00	
Are both a Bath & Shower Present?		Shower only		Bath & Shower		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:			
Bath	Capacity to overflow	0	0.00	155	17.05		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		
Shower	Flow rate (litres / minute)	8	44.80	8	34.96		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		
Kitchen sink taps	Flow rate (litres / minute)	5	12.56	5	12.56		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		
Has a washing machine been specified?		No		No		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:			
Washing Machine	Litres / kg		17.16		17.16		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		
Has a dishwasher been specified?		No		No		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:			
Dishwasher	Litres / place setting		4.50		4.50		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		
Has a waste disposal unit been specified?		Select option:		0.00		Select option:		0.00		Select option:		0.00		Select option:		0.00		Select option:		0.00			
Water Softener	Litres / person / day		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		
Calculated Use		102.4		109.6		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0			
Normalisation factor		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91			
Code for Sustainable Homes		Total Consumption		93.2		99.7		0.0		0.0		0.0		0.0		0.0		0.0		0.0			
		Mandatory level		Level 3/4		Level 3/4		-		-		-		-		-		-		-			
Building Regulations 17.K		External use		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0			
		Total Consumption		98.2		104.7		0.0		0.0		0.0		0.0		0.0		0.0		0.0			
		17.K Compliance?		Yes		Yes		-		-		-		-		-		-		-			