



# 131-133 MINERVA STREET, GLASGOW

## ENERGY REPORT

OCTOBER 2021  
6438

## THIS VERSION

Prepared by:

Name: Craig Sutherland

Role: Mechanical Engineer

Signed: *Craig Sutherland*

Date: 13th October 2021

Reviewed by:

Name: David Ross

Role: Director

Signed: *David Ross*

Date: 13th October 2021

Authorised for issue by:

Name: Martin Reilly

Role: Director

Signed: *Martin Reilly*

Date: 13th October 2021

The signed original of this page is retained by the issuing team.

## VERSION HISTORY

Version	Date	Status and Purpose	Changes Overview
0	13/10/2021	DRAFT	



## CONTENTS

SECTION 1	Executive Summary
SECTION 2	Introduction
SECTION 3	Planning Policy Conditions
SECTION 4	Domestic Energy Assessment
SECTION 5	Conclusion

## APPENDIX A - Domestic SAP Reports





# SECTION 1

## EXECUTIVE SUMMARY

Hawthorne Boyle Ltd have been appointed to provide the Energy Statement for the proposed Minerva Street development, located in Glasgow. The analysis will include for the proposed building design, covering the whole building area. This development consists of 64 residential flats.

This report will be used as part of the planning application for the Minerva Street development and illustrate that energy efficiency and carbon reduction have been considered in accordance with the planning policy.

The aim of this report is to demonstrate compliance with the planning requirements target for a 20% abatement in regulated CO2 emissions using low or zero carbon generating technologies (LZCGT), along with compliance with Standard 6.1 of Section 6, 2015 regulations. These targets have been met for this development, with the current proposed energy strategy outlined below:

### **Energy – Section 6 and Aspect Gold Level 1**

- Fabric first approach with improved U-values and target air permeability
- Centralised whole house extract ventilation
- Low energy lighting
- Efficient heating and hot water provided from Community Combined Heat and Power (CHP) heating and boiler systems
- Solar PV proposed on the roof of the building to improve carbon credentials of the proposed development

### **Space Heating and Domestic Hot Water Demand - Aspect Silver Level 2 and 3**

- The use of standard accredited details for all flat types helps significantly improve the space heating demand, however a number of flat types do not meet the Aspect Silver 2 requirement. The proposal would be to improve through passive measure and a number of options are being considered for all flat types to meet this requirement.
- The implementation of a Communal CHP Boiler system helps achieve the requirement of average annual energy demand for water heating being from renewable sources or heat recovery devices for Aspect Silver Level 3.





# SECTION 2

# INTRODUCTION

This energy statement has been prepared for the proposed residential development, on 131 Minerva Street, located in Glasgow and has been commissioned by Hawthorne Boyle Ltd. This report is for submission as part of the planning application for the proposed 64 flats development and is intended to demonstrate that energy savings and sustainable design has been considered in accordance with planning policy. Sustainable design in the built environment is a three-stage hierarchical process. This report looks briefly at all three stages and must be continuously considered throughout the design process.

*Table 1 – Three-stage hierarchical process*

<p><b>Passive Design</b></p>	<p><b>Reduce Energy Demand</b> – The team should first seek to design out excess energy requirements by optimising certain design elements of the building. These could include; better fabric performance, reduced infiltration, solar shading, solar control devices to reduce cooling and where applicable the use of natural ventilation. This reduction in demand will result in a reduction of fuel use but may also mean smaller plant items required resulting in a greater cost saving.</p>
<p><b>Energy Efficiency</b></p>	<p><b>Reduce Energy Consumption</b> – The building services design should incorporate efficient heat and coolth generation systems, insulated distribution systems and adequately effective system controls; electrical lighting efficacy and control should also be designed for efficient usage. The remainder energy requirements will then be quantified to analyse the most appropriate renewable energy system for the project.</p>
<p><b>Low and Zero Carbon Technology</b></p>	<p><b>Provide Renewable Energy</b> – The most suitable LZC technologies are selected and appraised for their likely contribution to the project. The aim is to maximise the amount of renewable energy utilisation for the project within a cost-effective manner. A summary will outline those that should be rejected and those that should be considered further during the more detailed stages of the design process.</p>





## Location and Site Weather

The site is in Minerva Street, in Glasgow which is a densely populated urban locale. The site location is shown in figure 1.

*Figure 1 – Site Location*



The relevant weather data was used for the SAP (Standard Assessment Procedure) calculations, as per the guidance in Appendix U of the SAP 2012 manual.

From the energy assessment for the development, an estimate for the predicted energy consumption and associated carbon emissions is documented.





## SECTION 3

# PLANNING POLICY CONDITIONS

The planning requirements outlined by the planning authority (Glasgow City Council) which requires new developments to commit to reduce energy and achieve compliance with the Gold rating outlined below:

*Table 2 - Extract from Glasgow City Council LDP*

Submission Date	Domestic and Non Domestic Properties
2014	Bronze Active - The baseline level for sustainability achieved where the building meets the functional standards set out in Sections 1-6 of the Technical Handbook and includes a minimum 10% carbon dioxide emissions abatement through the use of Low and Zero-Carbon Generating Technology (LZCGT).
2016	Silver Active - Where the building complies with the Silver Active level in each of the 8 aspects in the handbook and includes a minimum 15% carbon dioxide emissions abatement through the use of LZCGT.
2018	Gold - Where the building complies with the Gold level in each of the 8 aspects in the handbook and includes a minimum 20% carbon dioxide emissions abatement through the use of LZCGT.

The planning requirements in relation to energy require that renewable technologies be included as part of the development and that the carbon savings made by the selected technology are demonstrated through modelling and calculation. This energy statement has been prepared for the planning submission, to explain the various options within the constraints of the existing site. The target is to incorporate a 20% reduction in CO2 emissions by way of introducing an integrated LZCGT.





Further to this, there are three options to achieve Gold Level of Sustainability for domestic projects with regards to the SG5 policy:

Table 3 - Gold Level Options

Alternative Gold Level Options: Domestic		
Option 1 Gold Hybrid	Option 2 Nearly Zero Emissions	Option 3 Net-Zero Carbon
Achieve Gold Aspect 1, along with Silver Active Level Aspects 2-8 inclusive	Achieve Passivhaus energy performance requirements with Gold Level Aspect 1 and Silver Aspect 1 and Silver Active Level Aspects 4-8 inclusive	Achieve Platinum Level Aspect 1 and Silver Active Level Aspects 2-8 inclusive
PLUS: All will be required to include a minimum of 20% carbon dioxide emission abatement through the use of low and zero carbon generating technologies, except certified Passivhaus developments which are exempt.		

For this proposed development, Option 1 – Gold Hybrid is being targeted, which requires the dwelling emissions rate for the development to meet the requirements of Aspect Gold level 1, and Aspect Silver for all other aspects of sustainability (2-8).





## SECTION 3

# DOMESTIC ENERGY ASSESSMENT

This energy statement has been prepared in accordance with the Scottish building regulations, with regards to section 6 and 7 of the technical handbook.

The detailing of energy and carbon savings follows the hierarchical approach. The planning requirement for a 20% abatement in regulated CO<sub>2</sub> emissions using LZCGT, along with compliance with Standard 6.1 of Section 6, 2015 regulations and further achieving Gold hybrid level for sustainability. Our proposed development consists of 64 apartments, however only 13 different flat types have been considered at this stage. The domestic energy assessments have been carried out by a qualified OCDEA (On-Construction Domestic Energy Assessor) SAP assessor using the compliant FSAP software for this assessment.

### Fabric Performance and Air Tightness

As part of the energy hierarchy, the first stage is to introduce demand reduction measures. Reducing energy demand determines a more cost-effective means of achieving carbon savings and have greater longevity. Passive design measures should be applied to the proposed development to minimise energy demand and therefore improve energy performance of the development.

Careful consideration of the building fabric insulation levels and air infiltration rates could help to further reduce the requirement for space heating.

Table 4 - Building U-Values (Domestic Apartments)

Minerva Street - U-values		
External Element	Notional Dwelling (W/m <sup>2</sup> K)	New-Build (W/m <sup>2</sup> K)
External Wall	0.17	0.18
Ground Floor	0.15	0.15
Roof	0.11	0.11
Window	1.40 (g=0.63)	1.20 (g=0.63)
Door	1.40	1.20

It should be noted that the proposed U-values are similar to the concurrent notional building specification and therefore an opportunity to improve, in consultation with the architect.

Approved thermal bridging details are currently proposed, taken from the standard accredited details (Accredited Construction Details Scotland 2015 for a steel frame building) for the residential development to meet the planning requirements.

The air permeability for this project has been targeted at 3m<sup>3</sup>/m<sup>2</sup>.h@50Pa for the apartments, this is better than the air infiltration of 7m<sup>3</sup>/m<sup>2</sup>.h@50Pa applied for the notional building.



### Energy Efficiency Measures

The proposed development incorporates energy efficiency measures sufficient to achieve compliance with the Section 6 requirement. Further design enhancements (other than described above) have been applied:

- Centralised whole house extract ventilation
- Low energy lighting
- Energy efficient heating and hot water systems with FGHRs

The heating infrastructure for the proposed development has been considered in accordance with the planning policy. It is proposed that the development would incorporate a communal CHP Boiler system to cater for the heating and hot water demand for the entire development. The proposed specification for the CHP Boiler system is outlined below:

*Table 5 - Communal Heating Network System*

<b><i>District Heating System Efficiencies</i></b>	
CHP heat efficiency	53%
CHP electrical efficiency	32%
CHP heat fraction	40%
Boiler heat efficiency	96%
Boiler heat fraction	60%

The system will distribute heating through radiators with minimal distribution losses. Programmer, room thermostat and TRV controls will be installed within each flat to optimise use of the heating system. The proposal improves the carbon reduction initiatives for the development and will help achieve compliance with the planning requirements.

A site-wide heat network has not been considered at this stage.

### Energy Demand and Associated Carbon Emissions

An assessment was undertaken to determine the estimated energy consumption and associated carbon emissions for the domestic flats and the results are detailed below. All flat types were analysed making appropriate assumptions for the current design stage.





The initial results from the SAP assessments can be summarised to show the predicted baseline emissions from the proposed development in the table below:

Table 6 - Baseline SAP results

Dwelling Ref	Flat Type	No. of Units	Flat Type Floor Area (m <sup>2</sup> )	Target Emissions Rate, TER (kgCO <sub>2</sub> /m <sup>2</sup> )	Dwelling Emissions Rate, DER (kgCO <sub>2</sub> /m <sup>2</sup> )
1	1 Bed Type A	3	47.10	24.32	20.60
2	1 Bed Type B	1	63.00	19.69	17.31
3	2 Bed Type E	6	74.70	16.20	15.31
4	2 Bed Type D	6	76.00	16.84	15.31
5	1 Bed Type C	18	51.40	16.01	14.68
6	2 Bed Type F	6	77.21	17.59	15.08
7	2 Bed Type G	6	80.54	17.63	15.94
8	3 Bed Type J	6	94.50	14.81	14.55
9	2 Bed Type H	1	75.15	14.90	14.02
10	3 Bed Type K	3	98.30	15.94	14.66
11	3 Bed Type M	2	94.72	15.77	13.91
12	2 Bed Type I	3	84.52	16.61	13.91
13	3 Bed Type L	3	114.70	14.69	12.80
<b>Total no. of flats in development</b>		<b>64</b>	<b>Average for complete block</b>	<b>16.49</b>	<b>14.95</b>

The overall figures determine that compliance with Standard 6.1 is not achieved through passive design measures alone and further contribution from LZCGT is required.

Table 7 - Initial results summary – Domestic Apartments with Passive measures

Description	Baseline emissions (TER) – regulated (kgCO <sub>2</sub> /yr)	Dwelling emissions (DER) – regulated (kgCO <sub>2</sub> /yr)	Improvement over baseline (%)
Apartments	77,569	70,309	9.36%

Aspect Gold level 1 requires an improvement over baseline of 27% for Block compliance and therefore suitable low or zero carbon generating technologies should be considered to achieve this requirement.





### Low or Zero Carbon Generating Technologies (LZCGT)

The baseline results show that renewable energy technologies will need to be considered for this development to comply with the requirements of Aspect Gold level 1. A feasibility study is undertaken to determine the most appropriate renewable energy technologies is considered for the development and is summarised in the table below:

Table 8 – LZC technologies feasibility

Technology	Appropriate	Comments
Biomass heating, cooling and electricity	NO	The site lies within a dense urban area with little opportunity to build appropriate fuel storage and also there is a lack of local fuel source.
Renewable energy from waste	NO	No capability to generate on-site electricity from waste and may present potential local air quality issues.
Solar Photovoltaics	YES	There is suitable roof space and no obvious shading from nearby buildings however will require to be further investigated as the design progresses.
Wind	NO	Building-integrated wind turbines perform poorly due to unfavourable wind microclimate and present a structural issue for the building.
Heat Pumps	NO	Unsuitable for flatted accommodation without a communal hot water system and therefore requires further investigation and cost analysis.

Due to site constraints, being in a dense urban location, there are limited technologies proposed for the development. The presence of ASHPs is likely to reduce available roof area for a PV install, and therefore for the purposes of this initial study the use of solar PV has been selected as this presents a more favourable and flexible solution for the project.

The SAP models were updated to include for 0.588 kWp of Solar PV for each flat type. This equates to approximately 1.5 panels per flat, with a total peak rating of 37.66kWp and an approximate 186 m<sup>2</sup> of roof coverage.





The proposed roof mounted PV solution is shown below:

Figure 2 – Minerva Street Development proposed PV solution





The improved SAP results incorporating the above proposed PV solution are presented below:

Table 9 - SAP Results with LZCGT Technology

Dwelling Ref	Flat Type	No. of Units	Flat Type Floor Area (m <sup>2</sup> )	Target Emissions Rate, TER (kgCO <sub>2</sub> /m <sup>2</sup> )	Dwelling Emissions Rate, DER (kgCO <sub>2</sub> /m <sup>2</sup> )
1	1 Bed Type A	3	47.10	24.32	15.00
2	1 Bed Type B	1	63.00	19.69	13.13
3	2 Bed Type E	6	74.70	16.20	11.78
4	2 Bed Type D	6	76.00	16.84	11.84
5	1 Bed Type C	18	51.40	16.01	9.55
6	2 Bed Type F	6	77.21	17.59	11.67
7	2 Bed Type G	6	80.54	17.63	12.67
8	3 Bed Type J	6	94.50	14.81	11.76
9	2 Bed Type H	1	75.15	14.90	10.52
10	3 Bed Type K	3	98.30	15.94	11.98
11	3 Bed Type M	2	94.72	15.77	11.13
12	2 Bed Type I	3	84.52	16.61	10.80
13	3 Bed Type L	3	114.70	14.69	10.50
<b>Total no. of flats in development</b>		<b>64</b>	<b>Average for complete block</b>	<b>16.49</b>	<b>11.36</b>

The development now complies with Aspect Gold level 1 of section 7 of the domestic building regulations incorporating 0.588 kWp for each flat on the development. This approximates to 93 no. solar PV panels which are to be accommodated on the roof of the building, connected to a landlord supply, and evenly distributed across all flats within the development. The improvement in CO<sub>2</sub> emissions from the proposed development now comply with the requirements of achieving a 27% improvement on baseline emissions and are summarised below:

Table 10 – Final Results Summary – Domestic Apartments

Description	Baseline emissions (TER) – regulated (kgCO <sub>2</sub> /yr)	Dwelling emissions (DER) – regulated (kgCO <sub>2</sub> /yr)	Improvement over baseline (%)
Apartments	77,569	53,441	31.10%



One of the planning conditions is to demonstrate a 20% saving in CO2 emissions through the use of renewable energy technologies for the development site-wide. A comparison between the baseline emissions and the improved results using a Solar PV solution presents a compliant saving.

*Table 11 – Comparison between baseline and improved DER*

Baseline Average DER (kgCO2/m2)	Improved Average DER (with Solar PV) (kgCO2/m2)	Percentage Savings in CO2 (%)
13.15	9.57	23.99

### Silver Aspect Level 2 and 3

The domestic development requires to achieve Gold hybrid as part of the planning conditions set by the Glasgow city council. The first level for gold compliance has already been met. There are another 7 levels that need to be addressed as part of this requirement and should at least meet Aspect Silver compliance as outlined in Section 7 of the building regulations.

The main requirements for this target can be summarised below:

1. Energy for space heating - Maximum annual demand for useful energy is 30kWh/m2 for flats.
2. Energy for water heating - At least 5% of the average annual energy demand for water heating should be from renewable sources and/or heat recovery devices.
3. Water use efficiency - Enhanced products should be provided to improve water efficiency.
4. Optimising performance - provide a 'Quick Star Guide' and a 'Resource use display'.
5. Flexibility and adaptability – Provide a dedicated space for study or home office.
6. Well-being and Security – Provide noise attenuation, enhanced natural lighting and make provision for an intruder alarm system.
7. Material use and waste – Provide a dedicated internal storage space for storing recyclable material.

This section of the report addresses how the development will meet the requirements for Aspect Silver Level 2 and 3. Aspect Gold Level 1 addresses CO2 emissions and this is met through an energy efficient design.





Aspect Silver level 2 relates to the space heating demand and is obtained from the SAP results. The below table details the results for each assessed flat.

Table 12 - Aspect Silver Level 2 results

Dwelling Ref	Flat Type	No of Units	Flat Type Floor Area (m2)	SAP Model Space heating demand (kWh/m2)
1	1 Bed Type A	3	47.10	46.34
2	1 Bed Type B	1	63.00	38.04
3	2 Bed Type E	6	74.70	32.22
4	2 Bed Type D	6	76.00	32.63
5	1 Bed Type C	18	51.40	20.44
6	2 Bed Type F	6	77.21	31.62
7	2 Bed Type G	6	80.54	37.09
8	3 Bed Type J	6	94.50	34.05
9	2 Bed Type H	1	75.15	26.30
10	3 Bed Type K	3	98.30	35.48
11	3 Bed Type M	2	94.72	31.01
12	2 Bed Type I	3	84.52	27.90
13	3 Bed Type L	3	114.70	29.96

On reflection of the above results, four of the flat types within the development are complying with the target of 30kWh/m2 for each flat. Despite the application of standard accredited details (ACDs Scotland 2015 for Steel frame buildings) to limit heat loss through thermal junctions the remainder of the properties fail to meet the requirements for space heating in order to satisfy Silver-Aspect 2. The options to achieve compliance include the likes of improving the fabric specification or consider the use of heat recovery through a MVHR ventilation system. The development will consider one of the options outlined below to achieve compliance with this requirement:

- Option 1 – Introduction of MVHR unit and improved ground floor U-value of 0.11 W/m2K
- Option 2 – Improved ground floor U-value of 0.11 W/m2K, external wall U-value of 0.15 W/m2K and glazing U-value of 0.8 W/m2K
- Option 3 - Improved ground floor U-value of 0.10 W/m2K, external wall U-value of 0.12 W/m2K, external roof U-value of 0.10 W/m2K, glazing U-value of 0.8 W/m2K and Air permeability of 3.5 m3/m2.h@50Pa







Table 13 - Improved Aspect Silver level 2 results

Dwelling Ref	Flat Type	Flat Type Floor Area (m2)	Option 1 - SAP Model Space heating demand (kWhr/m2)	Option 2 - SAP Model Space heating demand (kWhr/m2)	Option 3 - SAP Model Space heating demand (kWhr/m2)
1	1 Bed Type A	47.10	29.32	37.34	34.01
2	1 Bed Type B	63.00	22.02	29.59	27.35
3	2 Bed Type E	74.70	19.88	25.73	23.96
4	2 Bed Type D	76.00	17.57	25.31	23.82
5	1 Bed Type C	51.40	8.79	15.99	15.39
6	2 Bed Type F	77.21	16.62	24.39	22.47
7	2 Bed Type G	80.54	23.43	29.06	26.94
8	3 Bed Type J	94.50	23.00	28.12	26.37
9	2 Bed Type H	75.15	15.56	19.24	18.07
10	3 Bed Type K	98.30	24.24	29.28	27.30
11	3 Bed Type M	94.72	20.53	24.16	22.57
12	2 Bed Type I	84.52	15.12	23.18	21.32
13	3 Bed Type L	114.70	18.89	24.19	22.52

From the above table, compliance with Aspect Silver level 2 is achievable. Options 2 & 3 focus solely on fabric performance and only the 1 Bed Type A flat is not meeting the requirement for these options. For option 3, if BFRC windows are applied then this flat will be able to comply with the requirement.

Aspect Silver level 3 relates to the hot water demand as at least 5% of the average annual energy demand for water heating should be from the contribution of the renewable or heat recovered source. Since the CHP boiler utilises waste heat from the electricity generation process and contributes to 40% of the hot water demand within the communal system, compliance with this requirement is met.

The development further complies with Silver Aspect levels 2 and 3. The inclusion of Solar PV panels ensures meeting the requirements for Aspect Gold Level 1 and meeting planning guidance. The use of further passive improvement measures will ensure Aspect Level 2 is met. Finally, the use of a CHP Boiler system has meant that the building meets the requirement for Aspect Level 3.



## SECTION 4

# CONCLUSION

The assessments completed for this domestic development confirm compliance with the below planning conditions:

- Compliance with Section 6 requirements
- Compliance with Gold Hybrid (Aspect Gold level 1 and Aspect Silver level 2 and 3) in line with Section 7 of Building Regulations
- 20% CO<sub>2</sub> reduction through installation of LZCGT (Low or Zero Carbon Generating Technologies)

The proposed development meets the planning requirements by implementing a Solar PV solution as outlined in this report. It is anticipated that further detailed energy assessments will be produced at building warrant stage and will further inform the energy credentials for the building.



## APPENDIX A

# DOMESTIC SAP REPORTS



# Regulations Compliance Report

Technical Handbook 2019, Domestic, Section 6 Summary of compliance with standard 6.1 , Version: 1.0.5.49  
Printed on 12 October 2021 at 23:21:46

## Project Information:

**Assessed By:** Aman Saleem (STRO034532)

**Building Type:** Flat

## Dwelling Details:

**NEW DWELLING DESIGN STAGE**

Total Floor Area: 47.1m<sup>2</sup>

**Site Reference :** Minerva Street

**Plot Reference:** 1 Bed Type A

**Address :** 1 Bed Type A, 131 Minerva Street, Glasgow, G3 8LE

## Client Details:

**Name:** Craig Sutherland

**Address :** Hawthorne Boyle Limited, Watermark Business Park, 365 Govan Road, Glasgow, G51 2SE

**This report covers items included within the SAP calculations.**

**It is not a complete report of regulations compliance.**

## 1 TER and DER

Fuel for main heating system: Mains gas (c), Mains gas (c)

Fuel factor: 1.00 (mains gas (c), mains gas (c))

Target Carbon Dioxide Emission Rate (TER)

24.32 kg/m<sup>2</sup>

Dwelling Carbon Dioxide Emission Rate (DER)

15.00 kg/m<sup>2</sup>

OK

## 2 Fabric U-values

### Element

### Average

### Highest

External wall

0.17 (max. 0.22)

0.18 (max. 0.70)

OK

Floor

0.15 (max. 0.18)

0.15 (max. 0.70)

OK

Roof

(no roof)

Openings

1.20 (max. 1.60)

1.20 (max. 3.30)

OK

## 2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

## 3 Air permeability

Air permeability at 50 pascals

3.00 (design value)

## 4 Heating efficiency

Main Heating system:

Community heating schemes - mains gas

Secondary heating system:

None

## 5 Cylinder insulation

Hot water Storage:

No cylinder

## 6 Controls

Space heating controls

Flat rate charging, programmer and TRVs

OK

Hot water controls:

No cylinder thermostat

No cylinder

## 7 Low energy lights

Percentage of fixed lights with low-energy fittings

100.0%

Minimum

75.0%

OK

# Regulations Compliance Report

## 8 Mechanical ventilation

Continuous extract system

Specific fan power:

0.19

Maximum

0.7

OK

## 9 Summertime temperature

Overheating risk (West Scotland):

Not significant

OK

Based on:

Overshading:

Average or unknown

Windows facing: West

8.48m<sup>2</sup>

Ventilation rate:

3.00

Blinds/curtains:

None

## 10 Key features

Air permeability

3.0 m<sup>3</sup>/m<sup>2</sup>h

Community heating, heat from boilers – mains gas

Photovoltaic array

# DRAFT

# Regulations Compliance Report

Technical Handbook 2019, Domestic, Section 6 Summary of compliance with standard 6.1 , Version: 1.0.5.49  
Printed on 12 October 2021 at 23:21:46

## Project Information:

**Assessed By:** Aman Saleem (STRO034532)

**Building Type:** Flat

## Dwelling Details:

### NEW DWELLING DESIGN STAGE

Total Floor Area: 63m<sup>2</sup>

**Site Reference :** Minerva Street

**Plot Reference:** 1 Bed Type B

**Address :** 1 Bed Type B, 131 Minerva Street, Glasgow, G3 8LE

## Client Details:

**Name:** Craig Sutherland

**Address :** Hawthorne Boyle Limited, Watermark Business Park, 365 Govan Road, Glasgow, G51 2SE

**This report covers items included within the SAP calculations.**

**It is not a complete report of regulations compliance.**

## 1 TER and DER

Fuel for main heating system: Mains gas (c), Mains gas (c)

Fuel factor: 1.00 (mains gas (c), mains gas (c))

Target Carbon Dioxide Emission Rate (TER)

19.69 kg/m<sup>2</sup>

Dwelling Carbon Dioxide Emission Rate (DER)

13.13 kg/m<sup>2</sup>

OK

## 2 Fabric U-values

### Element

### Average

### Highest

External wall

0.18 (max. 0.22)

0.18 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.15 (max. 0.18)

0.15 (max. 0.70)

OK

Roof

(no roof)

Openings

1.20 (max. 1.60)

1.20 (max. 3.30)

OK

## 2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

## 3 Air permeability

Air permeability at 50 pascals

3.00 (design value)

## 4 Heating efficiency

Main Heating system:

Community heating schemes - mains gas

Secondary heating system:

None

## 5 Cylinder insulation

Hot water Storage:

No cylinder

## 6 Controls

Space heating controls

Flat rate charging, programmer and TRVs

OK

Hot water controls:

No cylinder thermostat

No cylinder

## 7 Low energy lights

Percentage of fixed lights with low-energy fittings

100.0%

Minimum

75.0%

OK

# Regulations Compliance Report

## 8 Mechanical ventilation

Continuous extract system		
Specific fan power:	0.19	
Maximum	0.7	OK

## 9 Summertime temperature

Overheating risk (West Scotland):	Not significant	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: South	9.5m <sup>2</sup>	
Windows facing: West	4.24m <sup>2</sup>	
Ventilation rate:	3.00	
Blinds/curtains:	None	

## 10 Key features

Thermal bridging	0.04 W/m <sup>2</sup> K
Air permeability	3.0 m <sup>3</sup> /m <sup>2</sup> h
Party Walls U-value	0 W/m <sup>2</sup> K
Community heating, heat from boilers – mains gas	
Photovoltaic array	

# DRAFT

# Regulations Compliance Report

Technical Handbook 2019, Domestic, Section 6 Summary of compliance with standard 6.1 , Version: 1.0.5.49  
Printed on 12 October 2021 at 23:21:45

## Project Information:

**Assessed By:** Aman Saleem (STRO034532)

**Building Type:** Flat

## Dwelling Details:

### NEW DWELLING DESIGN STAGE

Total Floor Area: 74.7m<sup>2</sup>

**Site Reference :** Minerva Street

**Plot Reference:** 2 Bed Type E

**Address :** 2 Bed Type E, 131 Minerva Street, Glasgow, G3 8LE

## Client Details:

**Name:** Craig Sutherland

**Address :** Hawthorne Boyle Limited, Watermark Business Park, 365 Govan Road, Glasgow, G51 2SE

**This report covers items included within the SAP calculations.**

**It is not a complete report of regulations compliance.**

## 1 TER and DER

Fuel for main heating system: Mains gas (c), Mains gas (c)

Fuel factor: 1.00 (mains gas (c), mains gas (c))

Target Carbon Dioxide Emission Rate (TER)

16.2 kg/m<sup>2</sup>

Dwelling Carbon Dioxide Emission Rate (DER)

11.78 kg/m<sup>2</sup>

OK

## 2 Fabric U-values

### Element

### Average

### Highest

External wall

0.18 (max. 0.22)

0.18 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.15 (max. 0.18)

0.15 (max. 0.70)

OK

Roof

(no roof)

Openings

1.20 (max. 1.60)

1.20 (max. 3.30)

OK

## 2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

## 3 Air permeability

Air permeability at 50 pascals

3.00 (design value)

## 4 Heating efficiency

Main Heating system:

Community heating schemes - mains gas

Secondary heating system:

None

## 5 Cylinder insulation

Hot water Storage:

No cylinder

## 6 Controls

Space heating controls

Flat rate charging, programmer and TRVs

OK

Hot water controls:

No cylinder thermostat

No cylinder

## 7 Low energy lights

Percentage of fixed lights with low-energy fittings

100.0%

Minimum

75.0%

OK



# Regulations Compliance Report

## 8 Mechanical ventilation

Continuous extract system

Specific fan power: 0.2

Maximum 0.7

OK

## 9 Summertime temperature

Overheating risk (West Scotland): Not significant

OK

Based on:

Overshading: Average or unknown

Windows facing: West 9.5m<sup>2</sup>

Windows facing: East 4.27m<sup>2</sup>

Ventilation rate: 3.00

Blinds/curtains: None

## 10 Key features

Air permeability 3.0 m<sup>3</sup>/m<sup>2</sup>h

Party Walls U-value 0 W/m<sup>2</sup>K

Community heating, heat from boilers – mains gas

Photovoltaic array

# DRAFT

# Regulations Compliance Report

Technical Handbook 2019, Domestic, Section 6 Summary of compliance with standard 6.1 , Version: 1.0.5.49  
Printed on 12 October 2021 at 23:21:45

## Project Information:

**Assessed By:** Aman Saleem (STRO034532)

**Building Type:** Flat

## Dwelling Details:

**NEW DWELLING DESIGN STAGE**

Total Floor Area: 76m<sup>2</sup>

**Site Reference :** Minerva Street

**Plot Reference:** 2 Bed Type D

**Address :** 2 Bed Type D, 131 Minerva Street, Glasgow, G3 8LE

## Client Details:

**Name:** Craig Sutherland

**Address :** Hawthorne Boyle Limited, Watermark Business Park, 365 Govan Road, Glasgow, G51 2SE

**This report covers items included within the SAP calculations.**

**It is not a complete report of regulations compliance.**

## 1 TER and DER

Fuel for main heating system: Mains gas (c), Mains gas (c)

Fuel factor: 1.00 (mains gas (c), mains gas (c))

Target Carbon Dioxide Emission Rate (TER)

16.84 kg/m<sup>2</sup>

Dwelling Carbon Dioxide Emission Rate (DER)

11.84 kg/m<sup>2</sup>

OK

## 2 Fabric U-values

### Element

### Average

### Highest

External wall

0.17 (max. 0.22)

0.18 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.15 (max. 0.18)

0.15 (max. 0.70)

OK

Roof

(no roof)

-

Openings

1.20 (max. 1.60)

1.20 (max. 3.30)

OK

## 2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

## 3 Air permeability

Air permeability at 50 pascals

3.00 (design value)

## 4 Heating efficiency

Main Heating system:

Community heating schemes - mains gas

Secondary heating system:

None

## 5 Cylinder insulation

Hot water Storage:

No cylinder

## 6 Controls

Space heating controls

Flat rate charging, programmer and TRVs

OK

Hot water controls:

No cylinder thermostat

No cylinder

## 7 Low energy lights

Percentage of fixed lights with low-energy fittings

100.0%

Minimum

75.0%

OK

# Regulations Compliance Report

## 8 Mechanical ventilation

Continuous extract system		
Specific fan power:	0.2	
Maximum	0.7	OK

## 9 Summertime temperature

Overheating risk (West Scotland):	Not significant	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: West	14.25m <sup>2</sup>	
Ventilation rate:	3.00	
Blinds/curtains:	None	

## 10 Key features

Thermal bridging	0.039 W/m <sup>2</sup> K
Air permeability	3.0 m <sup>3</sup> /m <sup>2</sup> h
Party Walls U-value	0 W/m <sup>2</sup> K
Community heating, heat from boilers – mains gas	
Photovoltaic array	

# DRAFT

# Regulations Compliance Report

Technical Handbook 2019, Domestic, Section 6 Summary of compliance with standard 6.1 , Version: 1.0.5.49  
Printed on 12 October 2021 at 23:21:45

## Project Information:

**Assessed By:** Aman Saleem (STRO034532)

**Building Type:** Flat

## Dwelling Details:

**NEW DWELLING DESIGN STAGE**

Total Floor Area: 51.4m<sup>2</sup>

**Site Reference :** Minerva Street

**Plot Reference:** 1 Bed Type C

**Address :** 1 Bed Type C, 131 Minerva Street, Glasgow, G3 8LE

## Client Details:

**Name:** Craig Sutherland

**Address :** Hawthorne Boyle Limited, Watermark Business Park, 365 Govan Road, Glasgow, G51 2SE

**This report covers items included within the SAP calculations.**

**It is not a complete report of regulations compliance.**

## 1 TER and DER

Fuel for main heating system: Mains gas (c), Mains gas (c)

Fuel factor: 1.00 (mains gas (c), mains gas (c))

Target Carbon Dioxide Emission Rate (TER)

16.01 kg/m<sup>2</sup>

Dwelling Carbon Dioxide Emission Rate (DER)

9.55 kg/m<sup>2</sup>

OK

## 2 Fabric U-values

### Element

### Average

### Highest

External wall

0.18 (max. 0.22)

0.18 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

(no roof)

Openings

1.20 (max. 1.60)

1.20 (max. 3.30)

OK

## 2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

## 3 Air permeability

Air permeability at 50 pascals

3.00 (design value)

## 4 Heating efficiency

Main Heating system: Community heating schemes - mains gas

Secondary heating system: None

## 5 Cylinder insulation

Hot water Storage: No cylinder

## 6 Controls

Space heating controls: Flat rate charging, programmer and TRVs

OK

Hot water controls: No cylinder thermostat

No cylinder

## 7 Low energy lights

Percentage of fixed lights with low-energy fittings

100.0%

Minimum

75.0%

OK

# Regulations Compliance Report

## 8 Mechanical ventilation

Continuous extract system

Specific fan power:

0.19

Maximum

0.7

OK

## 9 Summertime temperature

Overheating risk (West Scotland):

Not significant

OK

Based on:

Overshading:

Average or unknown

Windows facing: West

9.5m<sup>2</sup>

Ventilation rate:

3.00

Blinds/curtains:

None

## 10 Key features

Air permeability

3.0 m<sup>3</sup>/m<sup>2</sup>h

Party Walls U-value

0 W/m<sup>2</sup>K

Community heating, heat from boilers – mains gas

Photovoltaic array

# DRAFT

# Regulations Compliance Report

Technical Handbook 2019, Domestic, Section 6 Summary of compliance with standard 6.1 , Version: 1.0.5.49  
Printed on 12 October 2021 at 23:21:44

## Project Information:

**Assessed By:** Aman Saleem (STRO034532)

**Building Type:** Flat

## Dwelling Details:

### NEW DWELLING DESIGN STAGE

Total Floor Area: 77.21m<sup>2</sup>

**Site Reference :** Minerva Street

**Plot Reference:** 2 Bed Type F

**Address :** 2 Bed Type F, 131 Minerva Street, Glasgow, G3 8LE

## Client Details:

**Name:** Craig Sutherland

**Address :** Hawthorne Boyle Limited, Watermark Business Park, 365 Govan Road, Glasgow, G51 2SE

**This report covers items included within the SAP calculations.**

**It is not a complete report of regulations compliance.**

## 1 TER and DER

Fuel for main heating system: Mains gas (c), Mains gas (c)

Fuel factor: 1.00 (mains gas (c), mains gas (c))

Target Carbon Dioxide Emission Rate (TER)

17.59 kg/m<sup>2</sup>

Dwelling Carbon Dioxide Emission Rate (DER)

11.67 kg/m<sup>2</sup>

OK

## 2 Fabric U-values

### Element

### Average

### Highest

External wall

0.17 (max. 0.22)

0.18 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.15 (max. 0.18)

0.15 (max. 0.70)

OK

Roof

(no roof)

Openings

1.20 (max. 1.60)

1.20 (max. 3.30)

OK

## 2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

## 3 Air permeability

Air permeability at 50 pascals

3.00 (design value)

## 4 Heating efficiency

Main Heating system:

Community heating schemes - mains gas

Secondary heating system:

None

## 5 Cylinder insulation

Hot water Storage:

No cylinder

## 6 Controls

Space heating controls

Flat rate charging, programmer and TRVs

OK

Hot water controls:

No cylinder thermostat

No cylinder

## 7 Low energy lights

Percentage of fixed lights with low-energy fittings

100.0%

Minimum

75.0%

OK

# Regulations Compliance Report

## 8 Mechanical ventilation

Continuous extract system

Specific fan power: 0.2

Maximum 0.7

OK

## 9 Summertime temperature

Overheating risk (West Scotland):

Not significant

OK

Based on:

Overshading:

Average or unknown

Windows facing: South

8.54m<sup>2</sup>

Windows facing: South

4.07m<sup>2</sup>

Ventilation rate:

3.00

Blinds/curtains:

None

## 10 Key features

Air permeability

3.0 m<sup>3</sup>/m<sup>2</sup>h

Party Walls U-value

0 W/m<sup>2</sup>K

Community heating, heat from boilers – mains gas

Photovoltaic array

# DRAFT

# Regulations Compliance Report

Technical Handbook 2019, Domestic, Section 6 Summary of compliance with standard 6.1 , Version: 1.0.5.49  
Printed on 12 October 2021 at 23:21:44

## Project Information:

**Assessed By:** Aman Saleem (STRO034532)

**Building Type:** Flat

## Dwelling Details:

**NEW DWELLING DESIGN STAGE**

Total Floor Area: 80.54m<sup>2</sup>

**Site Reference :** Minerva Street

**Plot Reference:** 2 Bed Type G

**Address :** 2 Bed Type G, 131 Minerva Street, Glasgow, G3 8LE

## Client Details:

**Name:** Craig Sutherland

**Address :** Hawthorne Boyle Limited, Watermark Business Park, 365 Govan Road, Glasgow, G51 2SE

**This report covers items included within the SAP calculations.**

**It is not a complete report of regulations compliance.**

## 1 TER and DER

Fuel for main heating system: Mains gas (c), Mains gas (c)

Fuel factor: 1.00 (mains gas (c), mains gas (c))

Target Carbon Dioxide Emission Rate (TER)

17.63 kg/m<sup>2</sup>

Dwelling Carbon Dioxide Emission Rate (DER)

12.67 kg/m<sup>2</sup>

OK

## 2 Fabric U-values

### Element

### Average

### Highest

External wall

0.18 (max. 0.22)

0.18 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

0.15 (max. 0.18)

0.15 (max. 0.70)

OK

Roof

(no roof)

Openings

1.20 (max. 1.60)

1.20 (max. 3.30)

OK

## 2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

## 3 Air permeability

Air permeability at 50 pascals

3.00 (design value)

## 4 Heating efficiency

Main Heating system:

Community heating schemes - mains gas

Secondary heating system:

None

## 5 Cylinder insulation

Hot water Storage:

No cylinder

## 6 Controls

Space heating controls

Flat rate charging, programmer and TRVs

OK

Hot water controls:

No cylinder thermostat

No cylinder

## 7 Low energy lights

Percentage of fixed lights with low-energy fittings

100.0%

Minimum

75.0%

OK



# Regulations Compliance Report

## 8 Mechanical ventilation

Continuous extract system

Specific fan power:

0.2

Maximum

0.7

OK

## 9 Summertime temperature

Overheating risk (West Scotland):

Not significant

OK

Based on:

Overshading:

Average or unknown

Windows facing: South

3.66m<sup>2</sup>

Windows facing: South

4.75m<sup>2</sup>

Windows facing: West

3.05m<sup>2</sup>

Windows facing: North

4.27m<sup>2</sup>

Ventilation rate:

3.00

Blinds/curtains:

None

## 10 Key features

Air permeability

3.0 m<sup>3</sup>/m<sup>2</sup>h

Party Walls U-value

0 W/m<sup>2</sup>K

Community heating, heat from boilers – mains gas

Photovoltaic array

# DRAFT

# Regulations Compliance Report

Technical Handbook 2019, Domestic, Section 6 Summary of compliance with standard 6.1 , Version: 1.0.5.49  
Printed on 12 October 2021 at 23:21:44

## Project Information:

**Assessed By:** Aman Saleem (STRO034532)

**Building Type:** Flat

## Dwelling Details:

**NEW DWELLING DESIGN STAGE**

Total Floor Area: 94.5m<sup>2</sup>

**Site Reference :** Minerva Street

**Plot Reference:** 3 Bed Type J

**Address :** 3 Bed Type J, 131 Minerva Street, Glasgow, G3 8LE

## Client Details:

**Name:** Craig Sutherland

**Address :** Hawthorne Boyle Limited, Watermark Business Park, 365 Govan Road, Glasgow, G51 2SE

**This report covers items included within the SAP calculations.**

**It is not a complete report of regulations compliance.**

## 1 TER and DER

Fuel for main heating system: Mains gas (c), Mains gas (c)

Fuel factor: 1.00 (mains gas (c), mains gas (c))

Target Carbon Dioxide Emission Rate (TER) 14.81 kg/m<sup>2</sup>

Dwelling Carbon Dioxide Emission Rate (DER) 11.76 kg/m<sup>2</sup> **OK**

## 2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.22)	0.18 (max. 0.70)	<b>OK</b>
Party wall	0.00 (max. 0.20)	-	<b>OK</b>
Floor	(no floor)		
Roof	0.11 (max. 0.15)	0.11 (max. 0.35)	<b>OK</b>
Openings	1.20 (max. 1.60)	1.20 (max. 3.30)	<b>OK</b>

## 2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

## 3 Air permeability

Air permeability at 50 pascals 3.00 (design value)

## 4 Heating efficiency

Main Heating system: Community heating schemes - mains gas

Secondary heating system: None

## 5 Cylinder insulation

Hot water Storage: No cylinder

## 6 Controls

Space heating controls Flat rate charging, programmer and TRVs **OK**

Hot water controls: No cylinder thermostat

No cylinder

## 7 Low energy lights

Percentage of fixed lights with low-energy fittings 100.0%

Minimum 75.0% **OK**

# Regulations Compliance Report

## 8 Mechanical ventilation

Continuous extract system

Specific fan power: 0.2

Maximum 0.7

OK

## 9 Summertime temperature

Overheating risk (West Scotland):

Not significant

OK

Based on:

Overshading:

Average or unknown

Windows facing: East

8.14m<sup>2</sup>

Windows facing: South

8.54m<sup>2</sup>

Windows facing: West

4.75m<sup>2</sup>

Ventilation rate:

3.00

Blinds/curtains:

None

## 10 Key features

Air permeability

3.0 m<sup>3</sup>/m<sup>2</sup>h

Roofs U-value

0.11 W/m<sup>2</sup>K

Party Walls U-value

0 W/m<sup>2</sup>K

Community heating, heat from boilers – mains gas

Photovoltaic array

# DRAFT

# Regulations Compliance Report

Technical Handbook 2019, Domestic, Section 6 Summary of compliance with standard 6.1 , Version: 1.0.5.49  
Printed on 12 October 2021 at 23:21:44

## Project Information:

**Assessed By:** Aman Saleem (STRO034532)

**Building Type:** Flat

## Dwelling Details:

**NEW DWELLING DESIGN STAGE**

Total Floor Area: 75.15m<sup>2</sup>

**Site Reference :** Minerva Street

**Plot Reference:** 2 Bed Type H

**Address :** 2 Bed Type H, 131 Minerva Street, Glasgow, G3 8LE

## Client Details:

**Name:** Craig Sutherland

**Address :** Hawthorne Boyle Limited, Watermark Business Park, 365 Govan Road, Glasgow, G51 2SE

**This report covers items included within the SAP calculations.**

**It is not a complete report of regulations compliance.**

## 1 TER and DER

Fuel for main heating system: Mains gas (c), Mains gas (c)

Fuel factor: 1.00 (mains gas (c), mains gas (c))

Target Carbon Dioxide Emission Rate (TER)

14.9 kg/m<sup>2</sup>

Dwelling Carbon Dioxide Emission Rate (DER)

10.52 kg/m<sup>2</sup>

OK

## 2 Fabric U-values

### Element

### Average

### Highest

External wall

0.17 (max. 0.22)

0.18 (max. 0.70)

OK

Party wall

0.00 (max. 0.20)

-

OK

Floor

(no floor)

Roof

(no roof)

Openings

1.20 (max. 1.60)

1.20 (max. 3.30)

OK

## 2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

## 3 Air permeability

Air permeability at 50 pascals

3.00 (design value)

## 4 Heating efficiency

Main Heating system:

Community heating schemes - mains gas

Secondary heating system:

None

## 5 Cylinder insulation

Hot water Storage:

No cylinder

## 6 Controls

Space heating controls

Flat rate charging, programmer and TRVs

OK

Hot water controls:

No cylinder thermostat

No cylinder

## 7 Low energy lights

Percentage of fixed lights with low-energy fittings

100.0%

Minimum

75.0%

OK

# Regulations Compliance Report

## 8 Mechanical ventilation

Continuous extract system		
Specific fan power:	0.2	
Maximum	0.7	OK

## 9 Summertime temperature

Overheating risk (West Scotland):	Not significant	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: South	6.1m <sup>2</sup>	
Windows facing: West	8.14m <sup>2</sup>	
Windows facing: West	8.54m <sup>2</sup>	
Ventilation rate:	3.00	
Blinds/curtains:	None	

## 10 Key features

Air permeability	3.0 m <sup>3</sup> /m <sup>2</sup> h
Party Walls U-value	0 W/m <sup>2</sup> K
Community heating, heat from boilers – mains gas	
Photovoltaic array	

# DRAFT

# Regulations Compliance Report

Technical Handbook 2019, Domestic, Section 6 Summary of compliance with standard 6.1 , Version: 1.0.5.49  
Printed on 12 October 2021 at 23:21:43

## Project Information:

**Assessed By:** Aman Saleem (STRO034532)

**Building Type:** Flat

## Dwelling Details:

**NEW DWELLING DESIGN STAGE**

Total Floor Area: 98.3m<sup>2</sup>

**Site Reference :** Minerva Street

**Plot Reference:** 3 Bed Type K

**Address :** 3 Bed Type K, 131 Minerva Street, Glasgow, G3 8LE

## Client Details:

**Name:** Craig Sutherland

**Address :** Hawthorne Boyle Limited, Watermark Business Park, 365 Govan Road, Glasgow, G51 2SE

**This report covers items included within the SAP calculations.**

**It is not a complete report of regulations compliance.**

## 1 TER and DER

Fuel for main heating system: Mains gas (c), Mains gas (c)

Fuel factor: 1.00 (mains gas (c), mains gas (c))

Target Carbon Dioxide Emission Rate (TER)

15.94 kg/m<sup>2</sup>

Dwelling Carbon Dioxide Emission Rate (DER)

11.98 kg/m<sup>2</sup>

OK

## 2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.22)	0.18 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	(no floor)		
Roof	0.11 (max. 0.15)	0.11 (max. 0.35)	OK
Openings	1.20 (max. 1.60)	1.20 (max. 3.30)	OK

## 2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

## 3 Air permeability

Air permeability at 50 pascals

3.00 (design value)

## 4 Heating efficiency

Main Heating system: Community heating schemes - mains gas

Secondary heating system: None

## 5 Cylinder insulation

Hot water Storage: No cylinder

## 6 Controls

Space heating controls: Flat rate charging, programmer and TRVs

Hot water controls: No cylinder thermostat

No cylinder

OK

## 7 Low energy lights

Percentage of fixed lights with low-energy fittings

100.0%

Minimum

75.0%

OK

# Regulations Compliance Report

## 8 Mechanical ventilation

Continuous extract system

Specific fan power:

0.2

Maximum

0.7

OK

## 9 Summertime temperature

Overheating risk (West Scotland):

Not significant

OK

Based on:

Overshading:

Average or unknown

Windows facing: West

8.54m<sup>2</sup>

Windows facing: West

9.5m<sup>2</sup>

Windows facing: East

4.27m<sup>2</sup>

Ventilation rate:

3.00

Blinds/curtains:

None

## 10 Key features

Air permeability

3.0 m<sup>3</sup>/m<sup>2</sup>h

Roofs U-value

0.11 W/m<sup>2</sup>K

Party Walls U-value

0 W/m<sup>2</sup>K

Community heating, heat from boilers – mains gas

Photovoltaic array

# DRAFT

# Regulations Compliance Report

Technical Handbook 2019, Domestic, Section 6 Summary of compliance with standard 6.1 , Version: 1.0.5.49  
Printed on 12 October 2021 at 23:21:43

## Project Information:

**Assessed By:** Aman Saleem (STRO034532)

**Building Type:** Flat

## Dwelling Details:

**NEW DWELLING DESIGN STAGE**

Total Floor Area: 94.72m<sup>2</sup>

**Site Reference :** Minerva Street

**Plot Reference:** 3 Bed Type M

**Address :** 3 Bed Type M, 131 Minerva Street, Glasgow, G3 8LE

## Client Details:

**Name:** Craig Sutherland

**Address :** Hawthorne Boyle Limited, Watermark Business Park, 365 Govan Road, Glasgow, G51 2SE

**This report covers items included within the SAP calculations.**

**It is not a complete report of regulations compliance.**

## 1 TER and DER

Fuel for main heating system: Mains gas (c), Mains gas (c)

Fuel factor: 1.00 (mains gas (c), mains gas (c))

Target Carbon Dioxide Emission Rate (TER)

15.77 kg/m<sup>2</sup>

Dwelling Carbon Dioxide Emission Rate (DER)

11.13 kg/m<sup>2</sup>

OK

## 2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.22)	0.18 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	(no floor)		
Roof	0.11 (max. 0.15)	0.11 (max. 0.35)	OK
Openings	1.20 (max. 1.60)	1.20 (max. 3.30)	OK

## 2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

## 3 Air permeability

Air permeability at 50 pascals

3.00 (design value)

## 4 Heating efficiency

Main Heating system: Community heating schemes - mains gas

Secondary heating system: None

## 5 Cylinder insulation

Hot water Storage: No cylinder

## 6 Controls

Space heating controls: Flat rate charging, programmer and TRVs

Hot water controls: No cylinder thermostat

No cylinder

OK

## 7 Low energy lights

Percentage of fixed lights with low-energy fittings

100.0%

Minimum

75.0%

OK



# Regulations Compliance Report

## 8 Mechanical ventilation

Continuous extract system		
Specific fan power:	0.2	
Maximum	0.7	OK

## 9 Summertime temperature

Overheating risk (West Scotland):	Not significant	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: South	9.5m <sup>2</sup>	
Windows facing: West	9.5m <sup>2</sup>	
Windows facing: West	8.54m <sup>2</sup>	
Ventilation rate:	3.00	
Blinds/curtains:	None	

## 10 Key features

Air permeability	3.0 m <sup>3</sup> /m <sup>2</sup> h
Roofs U-value	0.11 W/m <sup>2</sup> K
Party Walls U-value	0 W/m <sup>2</sup> K
Community heating, heat from boilers – mains gas	
Photovoltaic array	

# DRAFT

# Regulations Compliance Report

Technical Handbook 2019, Domestic, Section 6 Summary of compliance with standard 6.1 , Version: 1.0.5.49  
Printed on 12 October 2021 at 23:21:43

## Project Information:

**Assessed By:** Aman Saleem (STRO034532)

**Building Type:** Flat

## Dwelling Details:

**NEW DWELLING DESIGN STAGE**

Total Floor Area: 84.52m<sup>2</sup>

**Site Reference :** Minerva Street

**Plot Reference:** 2 Bed Type I

**Address :** 2 Bed Type I, 131 Minerva Street, Glasgow, G3 8LE

## Client Details:

**Name:** Craig Sutherland

**Address :** Hawthorne Boyle Limited, Watermark Business Park, 365 Govan Road, Glasgow, G51 2SE

**This report covers items included within the SAP calculations.**

**It is not a complete report of regulations compliance.**

## 1 TER and DER

Fuel for main heating system: Mains gas (c), Mains gas (c)

Fuel factor: 1.00 (mains gas (c), mains gas (c))

Target Carbon Dioxide Emission Rate (TER) 16.61 kg/m<sup>2</sup>

Dwelling Carbon Dioxide Emission Rate (DER) 10.80 kg/m<sup>2</sup> **OK**

## 2 Fabric U-values

Element	Average	Highest	
External wall	0.17 (max. 0.22)	0.18 (max. 0.70)	<b>OK</b>
Party wall	0.00 (max. 0.20)	-	<b>OK</b>
Floor	(no floor)		
Roof	0.11 (max. 0.15)	0.11 (max. 0.35)	<b>OK</b>
Openings	1.20 (max. 1.60)	1.20 (max. 3.30)	<b>OK</b>

## 2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

## 3 Air permeability

Air permeability at 50 pascals 3.00 (design value)

## 4 Heating efficiency

Main Heating system: Community heating schemes - mains gas

Secondary heating system: None

## 5 Cylinder insulation

Hot water Storage: No cylinder

## 6 Controls

Space heating controls Flat rate charging, programmer and TRVs **OK**

Hot water controls: No cylinder thermostat

No cylinder

## 7 Low energy lights

Percentage of fixed lights with low-energy fittings 100.0%

Minimum 75.0% **OK**

# Regulations Compliance Report

## 8 Mechanical ventilation

Continuous extract system

Specific fan power: 0.2

Maximum 0.7

OK

## 9 Summertime temperature

Overheating risk (West Scotland): Not significant

OK

Based on:

Overshading: Average or unknown

Windows facing: South 8.54m<sup>2</sup>

Windows facing: South 4.75m<sup>2</sup>

Ventilation rate: 3.00

Blinds/curtains: None

## 10 Key features

Air permeability 3.0 m<sup>3</sup>/m<sup>2</sup>h

Roofs U-value 0.11 W/m<sup>2</sup>K

Party Walls U-value 0 W/m<sup>2</sup>K

Community heating, heat from boilers – mains gas

Photovoltaic array

# DRAFT

# Regulations Compliance Report

Technical Handbook 2019, Domestic, Section 6 Summary of compliance with standard 6.1 , Version: 1.0.5.49  
Printed on 12 October 2021 at 23:21:42

## Project Information:

**Assessed By:** Aman Saleem (STRO034532)

**Building Type:** Flat

## Dwelling Details:

**NEW DWELLING DESIGN STAGE**

Total Floor Area: 114.7m<sup>2</sup>

**Site Reference :** Minerva Street

**Plot Reference:** 3 Bed Type L

**Address :** 3 Bed Type L, 131 Minerva Street, Glasgow, G3 8LE

## Client Details:

**Name:** Craig Sutherland

**Address :** Hawthorne Boyle Limited, Watermark Business Park, 365 Govan Road, Glasgow, G51 2SE

**This report covers items included within the SAP calculations.**

**It is not a complete report of regulations compliance.**

## 1 TER and DER

Fuel for main heating system: Mains gas (c), Mains gas (c)

Fuel factor: 1.00 (mains gas (c), mains gas (c))

Target Carbon Dioxide Emission Rate (TER)

14.69 kg/m<sup>2</sup>

Dwelling Carbon Dioxide Emission Rate (DER)

10.50 kg/m<sup>2</sup>

OK

## 2 Fabric U-values

Element	Average	Highest	
External wall	0.18 (max. 0.22)	0.18 (max. 0.70)	OK
Party wall	0.00 (max. 0.20)	-	OK
Floor	(no floor)		
Roof	0.11 (max. 0.15)	0.11 (max. 0.35)	OK
Openings	1.20 (max. 1.60)	1.20 (max. 3.30)	OK

## 2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

## 3 Air permeability

Air permeability at 50 pascals

3.00 (design value)

## 4 Heating efficiency

Main Heating system: Community heating schemes - mains gas

Secondary heating system: None

## 5 Cylinder insulation

Hot water Storage: No cylinder

## 6 Controls

Space heating controls: Flat rate charging, programmer and TRVs

Hot water controls: No cylinder thermostat

No cylinder

OK

## 7 Low energy lights

Percentage of fixed lights with low-energy fittings

100.0%

Minimum

75.0%

OK

# Regulations Compliance Report

## 8 Mechanical ventilation

Continuous extract system		
Specific fan power:	0.2	
Maximum	0.7	OK

## 9 Summertime temperature

Overheating risk (West Scotland):	Not significant	OK
Based on:		
Overshading:	Average or unknown	
Windows facing: South	9.5m <sup>2</sup>	
Windows facing: South	8.54m <sup>2</sup>	
Windows facing: West	3.05m <sup>2</sup>	
Windows facing: North	4.27m <sup>2</sup>	
Ventilation rate:	3.00	
Blinds/curtains:	None	

## 10 Key features

Air permeability	3.0 m <sup>3</sup> /m <sup>2</sup> h
Roofs U-value	0.11 W/m <sup>2</sup> K
Party Walls U-value	0 W/m <sup>2</sup> K
Community heating, heat from boilers – mains gas	
Photovoltaic array	

# DRAFT



HAWTHORNE BOYLE LTD  
Building Services Consulting Engineers

MERCHANT HOUSE  
WATERMARK BUSINESS PARK  
365 GOVAN ROAD  
GLASGOW G51 2SE

Telephone: 0141 420 4448

[www.hawthorneboyle.co.uk](http://www.hawthorneboyle.co.uk)