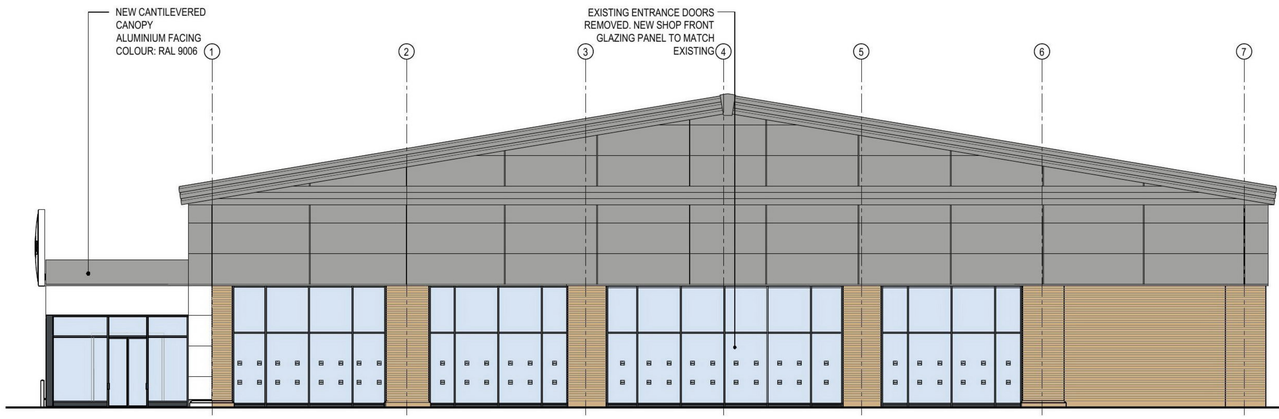
NOTES:

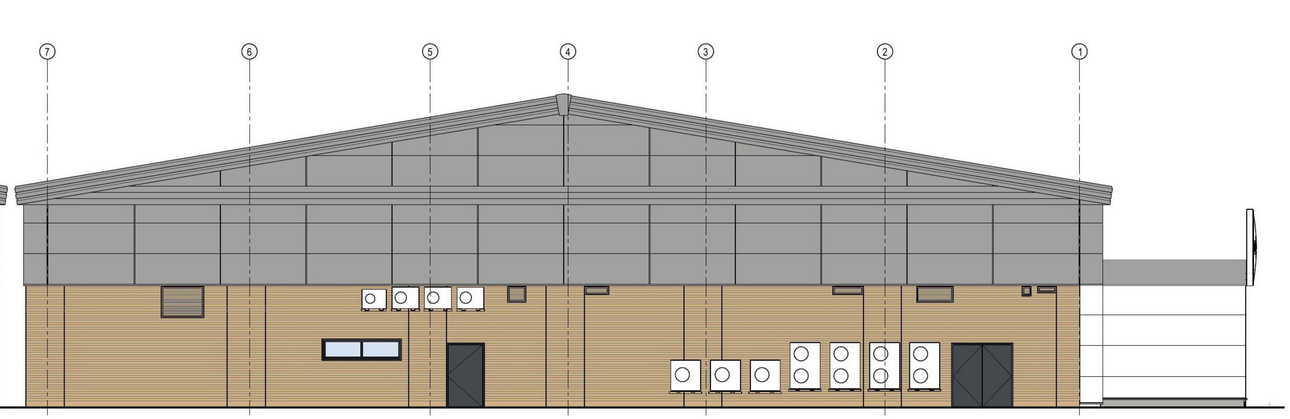
- TO BE READ IN CONJUNCTION WITH LIDL FINNIESTON SCOPE OF WORKS DOCUMENT AND LIDL BBS SPEC 2020.2 - **IF IN DOUBT ASK**
- NEW CLADDING TO BE ARCELOR MITTAL FI PANELS AS PER CURRENT LIDL SPEC

1. Do not scale this drawing - if in doubt ask.
2. All sizes to be checked on site prior to construction.
3. This drawing is the copyright of the author.

NOTE:
ALL MEASUREMENTS & SERVICES LOCATIONS SUBJECT TO CHANGE FOLLOWING SITE SURVEYS



NORTH ELEVATION | 1:100



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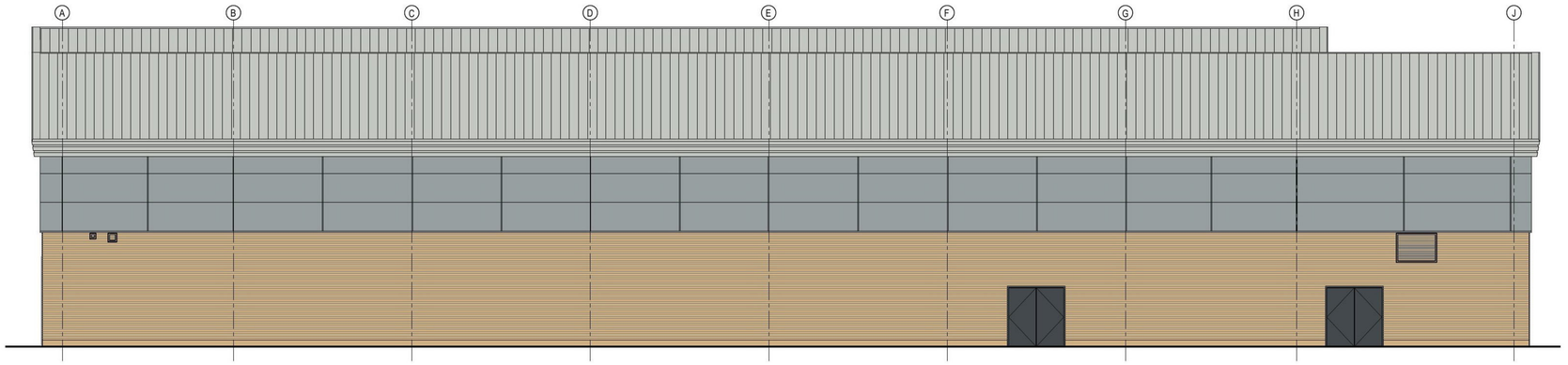
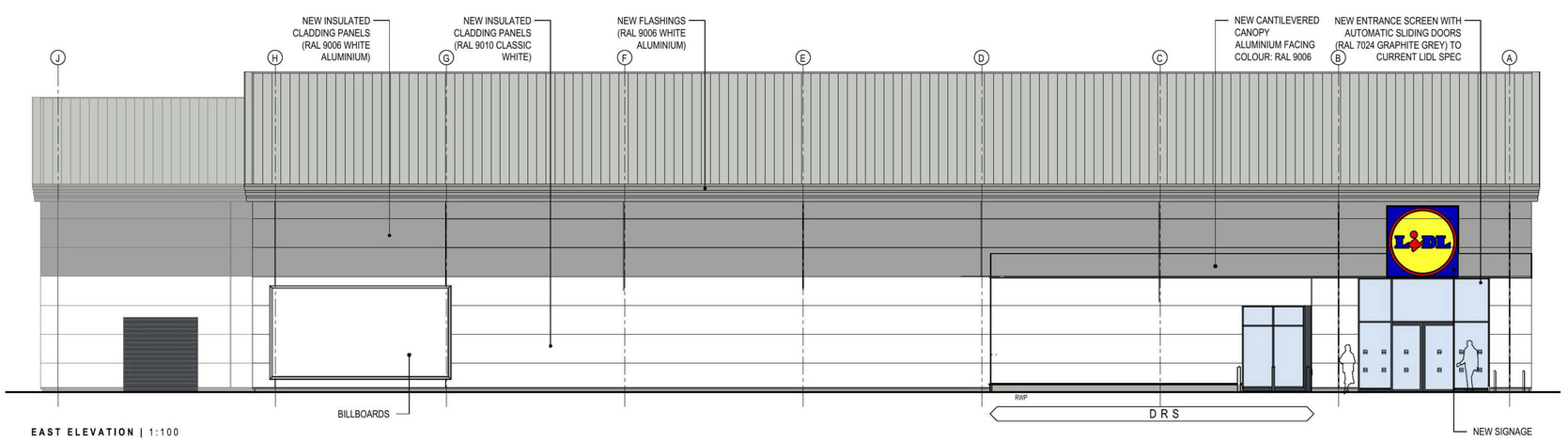


WEST ELEVATION | 1:100



EAST ELEVATION | 1:100

P5	08.02.21	DRS Repositioned	SBM
P4	12.01.21	Note added. Windows removed.	SBM
P3	18.11.20	White render removed.	SBM
P2	19.10.20	DRS added.	SBM
P1	13.05.19	FIRST ISSUE	SBM

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client
Lidl GmbH Ltd

project
Food Store Fit Out
Unit 2, 30 Finnieston Street, GLASGOW

drawing
Proposed Elevations
Transition Works

original size
A1

scale
1:100 A1 | 1:200 A3

drawn
SBM

date
06.05.19

checked

status
PRELIMINARY

passed

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APPENDIX 3
Sustainability Statement

30 Finnieston Street

Sustainability Statement

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JOB TITLE: STATEMENT OF ENERGY
JOB NUMBER: 6804
DOCUMENT TITLE: STATEMENT OF ENERGY
VERSION: 01
FILE NAME: 6804 FINNIESTON STREET SUSTAINABILITY STATEMENT 2021.05.12 REV01

PREPARED BY: BERNIE CARR
SIGNED: [redacted]
DATED: 12/05/21

CHECKED BY: FELIPPE CASTRO
SIGNED: [redacted]
DATED: 12/05/21

APPROVED BY: BERNIE CARR
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DATED: 12/05/21

NO:	DATE	APPROVED

CONTENTS

The energy strategy for 30 Finnieston Street applies air source heat pumps that achieve the carbon requirements of Gold Hybrid of Policy CDP 5.

EXECUTIVE SUMMARY

This Statement of Energy (SoE) provides a response to Policy CDP 5 Resource Management of the Glasgow City Development Plan (adopted 29th March 2017) for the proposed 30 Finnieston Street residential development.

The energy efficiency and low carbon design measures outlined in this report demonstrate that the 30 Finnieston Street proposals comply with Gold Hybrid (Option 1) requirements of Policy CDP 5, and achieve the following specific sustainability measures:

- 35.7% improvement on building regulation CO_2 emission targets.
- Installation of a Low Zero Carbon Generating Technology (LZCGT) providing a 21.8% CO_2 emission abatement.
- Compliance against Silver Active aspects 2-8 of Section 7 (Sustainability) of the building regulations.

A vital aspect of the proposal application of local Air Source Heat Pump (ASHP) plant and back up electric boilers within each apartment. This solution complies with the objectives of Policy CDP5, the Glasgow City Energy and Carbon Masterplan, and the Scottish Government Heat Policy Statement, all of which encourage all electric buildings. The ASHP system is also an eligible LZCGT under Policy CDP 5 which provides a 21.8% abatement of the buildings CO2 emissions.

In addition to ASHPs, passive and low carbon design resonate throughout the development that have influenced site massing, building design and apartment layout. This has significantly reduced the energy consumption and carbon emissions from the development, while maintaining healthy and enjoyable living environments that will enhance the wellness of its occupants and visitors.

A completed copy of the SoE form is provided in Appendix A of this report.

1.0 INTRODUCTION

This report has been prepared to address the aims and objectives of Policy CDP 5 Resource Management of the Glasgow Development Plan (adopted 29th March 2017) for the proposed 30 Finnieston Street residential development.

30 Finnieston Street is a residential and mixed-use development located between Glasgow's West End and City Centre. The development comprises of residential blocks with cycle parking and commercial spaces located on the ground floor.

By adopting a sustainable approach in design, construction and operation, coupled with the incorporation of Policy CDP 5, the development will provide attractive, vibrant and low energy homes for the foreseeable future.

In response to Policy CDP 5, Atelier Ten have completed passive design analysis and energy modelling to define the energy strategy for the development and achieve best practice carbon emission reductions. Regarding the wider sustainability issues, responses to the 8 sustainability aspects of Section 7 have also been outlined in this report.

This SoE has applied the guidance provided in the SG5 Resource Management document, as well as Scottish Technical Standards (Section 6 Energy and Section 7 Sustainability) and the Government Standard Assessment Procedure for the Energy Rating of Dwellings (SAP 2012).

2.0 POLICY CDP 5 GOLD HYBRID

The Glasgow City Development Plan was adopted on the 29th March 2017. The development plan outlines the Councils land use strategy and provides a basis for assessing planning applications under a series of development policies. In terms of developing a sustainable and resilient energy strategy for the city, Policy CDP 5 (Resource Management) sets out the council's recommendations as outlined in Figure 1 below.

Table 1: Required levels of sustainability for proposed domestic and non-domestic properties

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.

Figure 1: Planning Policy CDP 5 Requirements

Planning applications submitted under the Glasgow Development Plan are required to provide a Statement of Energy (SoE) demonstrating compliance against one of the Gold Hybrid options summarised in Table 1. The Finnieston Street development is targeting compliance against Option 1 as this is the most economic and technically feasible solution.

Table 1: Domestic Gold Hybrid Options

Option 1 (Gold Hybrid)	Option 2 (Nearly Zero Emissions)	Option 3 (Net Zero Carbon)
Achieve Section 7 Gold Aspect 1, along with Silver Active Level Aspects 2-8 inclusive	Achieve Passivhaus energy requirements with Gold Level Aspect 1 and Silver Active Level Aspects 4-8 inclusive	Achieve Platinum Level Aspect 1 (i.e. net zero carbon homes) and Silver Active Level aspects 2-8 inclusive
PLUS: All will be required to include a minimum 20% CO_2 emission abatement using LZCGT		
PLUS: connect to an existing nearby (and compliant low carbon) district heating network OR install its own low carbon heat network (subject to development heat demand & density)		

Further information relating to the requirements of Gold Hybrid Option 1 are provided below.

SECTION 7 SUSTAINABILITY ASPECTS

To comply with Section 7 Gold Aspect 1, a 27% improvement on building regulation CO_2 emission targets is required. This level of carbon reduction is amongst the most stringent in the UK, which requires significant fabric thermal enhancements (U-values and air permeability), highly efficient systems (e.g. lighting) and the application LZCGT.

The wider issues of sustainability are also addressed in the Silver Aspects 2-8 through acoustic performance, water efficiency, daylighting and providing flexibility for home working (i.e. home office space).

LOW AND ZERO CARBON TECHNOLOGIES

Policy CDP 5 requires developments to incorporate eligible Low and Zero Carbon Generating Technologies (LZCGT) as part of the compliance method against Section 6 of the Scottish technical standards. The policy sets a LZCGT target of 20% to be provided by the following eligible technologies:

- Biomass
- Fuel Cells
- Micro-Hydro
- Micro-Wind
- Solar Thermal
- Photovoltaics
- Ground Source Heat Pumps
- Water Source Heat Pumps
- Air Source Heat Pumps
- Combined Heat and Power
- Heat Exchange and Recovery Systems
- Geothermal

Justification for the chosen technology must be provided in the form of a feasibility study, including consideration of the design and visual impact of the selected solution.

DISTRICT HEATING

Policy CDP 5 supports the application of district heating networks based on low carbon and renewable sources, including waste heat and CHP. The Policy outlines the zones of the city that the council believe have the greatest potential for district heating and is where the planners are looking to implement the policy in the first instance. This drive towards low carbon heat networks aligns with the recent Scottish Government public consultations (Scottish Energy Strategy and the Climate Change Plan) which aim for 94% of non-domestic buildings to be supplied via low carbon heat networks. Similarly, the district heating aspect of Policy CDP 5 agrees with the low carbon heat objectives of the Glasgow City Energy and Carbon Masterplan, and the Scottish Government Heat Policy Statement.

To comply with this requirement, new applications must submit to the planning authority, a district heating (DH)/ heat network (HN) evaluation that is specific to the development. This requires the applicant to investigate any existing or proposed DH/ HN that the development could utilise using the Scottish Heat Map, and the Energy and Carbon Masterplan as a resource. Where there are no DH/ HN local to the development, an appraisal investigating the opportunity for the development to install its own DH/ HN is required, including an analysis of anticipated site heat, cooling and electricity loads.

To assist in the development of SoE reports, the council have published Supplementary Guidance document 5 (SG5), which has been applied in the energy calculations outlined in this report.

3.0 DISTRICT HEATING APPRAISAL

This section of the SoE presents the results from district heating analysis for the 30 Finnieston Street residential development in accordance with Policy CDP 5 and SG5.

HEAT MAP AND EXISTING/ PROPOSED HEAT NETWORKS

The Scottish Government Heat Map website was not available at the time of preparing this Statement of Energy. However, we can confirm that to Atelier Ten's knowledge there is no district heating scheme available to connect to.

SITE HEAT DEMAND

Atelier Ten have completed detailed work to identify the key energy demands for the 30 Finnieston Street development as presented in Figure 2. Since the development is mainly residential apartments, the main energy loads are space heating and domestic hot water.

With this significant demand for heat, and the block arrangement of the development, the building could be suited to a communal heating system. The preferred option is however to apply local air source heat pumps within each apartment as this is a more technically feasible solution that still achieves the requirements of Policy CDP5 and the Scottish Government framework for all-electric buildings given there is no heat network in the vicinity of the development.

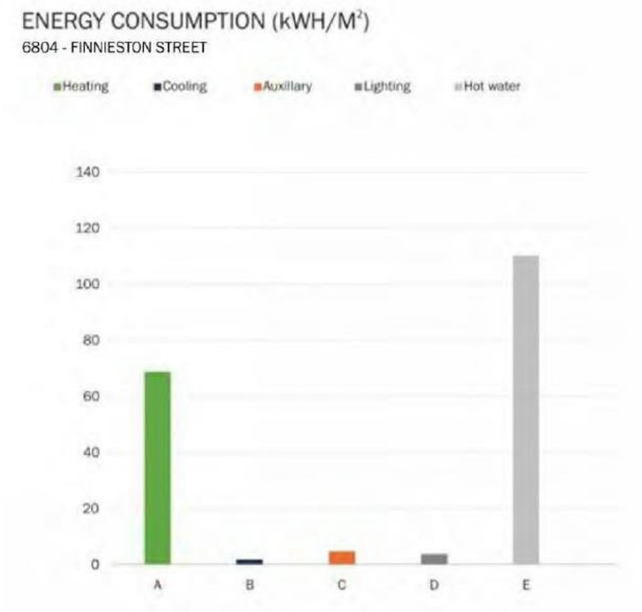

Figure 2: 30 Finnieston Street Estimated Energy Demands

ASHP TECHNOLOGY APPLICATION AT FINNIESTON STREET

Air Source Heat Pumps are proposed for each dwelling within 30 Finnieston Street. The heat pumps planned for use are internally integrated heat pumps, mounted on top of the hot water cylinder located in each apartment. The hot water cylinder and heat pump are provided as one packaged unit (outlined in Figure 3 below). This approach means that all space heating and hot water equipment is located within the apartment. Only a power supply is needed to enable the system. This solution takes advantage of waste heat from bathrooms and kitchens to maximise the efficiency of the system.

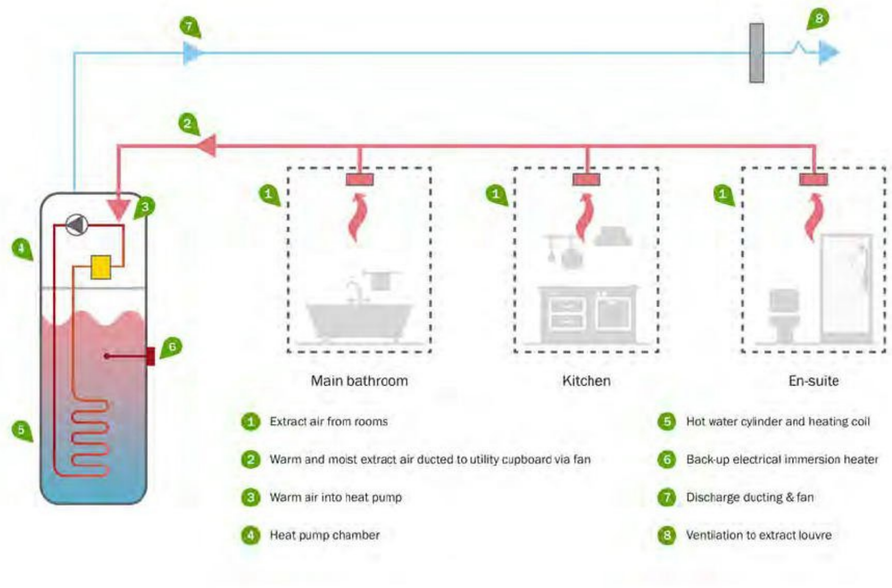

Figure 3: Process of the ASHP and hot water cylinder

Since ASHP are an eligible technology under Section 7 and Policy CDP 5, this is the proposed solution to delivering the Gold Hybrid certification, and the 20% reduction in CO_2 emissions (from LZCGT) of Policy CDP 5. SAP calculations have been undertaken to verify that this strategy can achieve compliance as outlined Section 5 of this report.

4.0 LOW CARBON AND RENEWABLE APPRAISAL

This section of the SoE presents the results from a low carbon and renewable technology feasibility study for 30 Finnieston Street development to identify technologies that are appropriate for the project. Fuel cells been excluded from the assessment due to the infancy of this technology which would result in a significant technical, commercial and economic risk to the project.

Prior to the installation of electrical generating technologies, the local Distribution Network Operator (DNO) must be contacted to establish existing power flow arrangement of their electrical network and its suitability to accept parallel connectivity from local embedded generators (e.g. photovoltaics, wind turbines, CHP).

Table 2 below presents the results for all other eligible technologies listed under Supplementary Guidance SG5.

Table 2: Low Carbon and Renewable Technology Feasibility Study

	Photovoltaic Panels	Building mounted solar photovoltaic panels to generate renewable electricity	• Installation of technology subject to local DNO approval for embedded generators. • Electrical energy generated will be provided to the landlord supply. Connection to each apartment is not cost effective. • The EPC ratings for the apartments will not take benefit of the PV as the electrical generation goes to the landlord. • PV array larger than the available roof space is required to achieve policy CDP 5 compliance with a gas boiler heating solution. • Potential solution however there are technical, environmental and economic issues to consider. • Technology not recommended at this stage.	
	Solar Thermal Heating	Building mounted solar collectors to generate domestic hot water for use in each building	• The outputs from solar thermal systems installed in Scotland tend to be low. Capital cost of the system result in a poor pay pack. • Additional plant space will be required within each apartment to install the hydraulic arrangements of the solar thermal system. • Solar thermal collector larger than the available roof space is required to achieve policy CDP 5 compliance with a gas boiler heating solution. • Roof terraces will be lost to allow for the installation of solar thermal collectors. • The system qualifies for payment under the Renewable Heat Incentive however payback is poor. • Technology not recommended due to the above.	
	Wind Turbines	Free standing mast mounted micro wind turbine to generate renewable electricity	• Installation of technology subject to Scottish Power approval for embedded generators. • High capital cost, and ongoing maintenance costs associated with technology. • Requires significant amount of space to allow maintenance access which is unlikely to available at 30 Finnieston Street. • Can be contentious planning issues, particularly due to aesthetics., noise and environmental/ wild life impacts. • Technology not recommended due to the above.	
	Biomass	Use of wood biomass or biofuel to generate hot water for space heating and DHW.	• Boilers require tall flues several meters tall to comply with the Clean Air Act and can result in air quality issues. • System requires a significant amount of plant space for thermal stores, fuel stores and auxiliary plant. • System has high capital and maintenance costs. Back up gas boiler plant likely to be required in addition to biomass plant. • Potential technology however there are significant cost and technical implications to consider. • Technology not recommended due to clean air act requirements not accepted for city centre locations.	
	CHP	Combined generation of heat and power from a single fuel source	• Gas CHP does not comply under Policy CDP 5 or Section 7 as an eligible LZCGT. • Biomass/ biofuel CHP does comply as an eligible LZCGT, however this technology is in its infancy. • Installation of technology subject to Scottish Power approval for embedded generators. • Technology not recommended due to the above.	

	Ground Source Heat Pumps	Use of the thermodynamic refrigeration cycle to generate hot water from a ground heat sink	• Technology requires large area of utility free clear ground for the installation of ground loops which is not available at 30 Finnieston Street. • Capital cost of technology tends to be high due to ground works required. • Performance dependent upon ground conditions. • Technology not recommended due to the above.	
	Air Sourced Heat Pump	Use of the thermodynamic refrigeration cycle to generate hot water using air as a heat sink	• Technology does not require large areas of ground. • Packaged units allow for a more cost-effective option compared to GSHP. • Performance dependent upon ambient air temperatures (higher temperatures preferred). • Acoustic attenuation possibly required to address noise from ASHP units.	
	Geothermal	Use of the thermodynamic refrigeration cycle to generate hot water using deep geothermal boreholes	• Technology has a high capital costs due to borehole drilling costs. • Technology requires large area of utility free ground for the installation of boreholes which are not available at 30 Finnieston Street. • Technology not recommended due to the above.	

 Technology recommended  Potential solution (further investigation required)  Technology not recommended

5.0 ENERGY EFFICIENT DESIGN MEASURES

Atelier Ten have completed passive design analysis for the 30 Finnieston Street development that has maximised the energy and environmental performance of the scheme.

ENERGY PERFORMANCE & CO_2 EMISSIONS

The 30 Finnieston Street development will exceed the carbon emission criteria of Section 6 (Energy) of the Scottish Technical standards by 27%. Calculations demonstrate that each apartment will achieve an Energy Performance Certificate (EPC) rating of at least a B, for both energy efficiency and environmental impact. An energy hierarchy process has been applied to achieve these standards by implementing the following principles in sequence:

- Be Lean: minimise energy consumptions through passive design measures and fabric thermal performance. This has involved enhancing the building fabric thermal performance to minimise the reliance on the heating systems in each apartment. In addition, glazing fenestration and specification has been refined to enhance daylight access to each apartment whilst minimising solar glare.

- Be Clean: Providing heating through low carbon and energy efficient technologies. Each apartment at 30 Finnieston Street will be have an ASHP and back up electric boilers which achieves the requirements of Policy CDP5 and the Scottish Government framework for all-electric buildings. Energy efficient lighting will also be deployed in each apartment to minimise electrical energy consumptions.

- Be Green: Deployment of Low Zero Carbon Generating Technologies (LZCGT). The final solution is still to be realised however it is likely to be air sourced heat pumps within each apartment.

Table 3 outlines the energy performance features proposed for the 30 Finnieston Street development. These include the proposed U-values, air permeability, system efficiencies and low carbon technologies. These parameters have been applied in the SAP calculations as outlined in Section 6 of this report.

Non-residential/ commercial units have been excluded from the energy assessments as these are likely to be shell and core/ speculative units with no fixed building services on completion of the development. These units will be subject to a staged building warrant application where the fit out will be subject to complying with Section 6 of the Scottish Technical Standards.

Table 3: Energy Performances Applied in 30 Finnieston Street SAP Calculations

Element or System	ASHP & Electric Boilers
Wall U-value	0.17 W/m²·K
Floor U-value	0.15 W/m²·K
Roof U-value	0.11 W/m²·K
Window Overall U-value (Including Frame)	1.4 W/m²·K
Thermal Bridging	Non Accredited Construction Details (Thermal Bridge Parameter of 20 W/K applied to each apartment)
Heating System Efficiency	Mechanical Extract ASHP (80% contribution) with electric top up boiler (20% contribution) serving central heating.
Heating System Controls	Programmer & thermostat & TRVs
Hot Water System	Mechanical Extract ASHP (80% contribution) with electric top up boiler (20% contribution)
Secondary Space Heating	None
Communal Corridor Heating	Yes
Renewable Technologies	ASHP
Window daylight/ solar values	Daylight transmittance of 70%, solar g-value of 0.45
Fabric air permeability	5 m³/h·m² @ 50Pa
Party Wall U-value	0.00 W/m²·K (Separating party cavity wall with no heat loss)
Low Energy Lighting	100% of all fittings LED
Ventilation systems	Single sided natural ventilation with fully openable windows. Intermittent extract fans (bathrooms & kitchens)

6.0 SAP CALCULATIONS

This Section of the report presents the results from SAP calculations of 30 Finnieston Street to demonstrate compliance against Section 6 of the Scottish Technical Standards (i.e Scottish building regulation) and compliance with Policy CDP 5 of the Glasgow City Development Plan.

Carbon emissions are calculated using government approved calculation methods. For dwellings this is the SAP 2012 methodology.

SAP CALCULATIONS

SAP 2012 is the methodology applied to assess the energy performance of dwellings in the UK. Atelier Ten have completed SAP calculations for the 30 Finnieston Street apartments, to identify the fabric and energy performances required to comply with Section 6 of the Scottish Technical Standards. This involves calculating the Dwelling Emission Rate (DER) and Target Emission Rate (TER), where compliance is achieved provided the DER is less than or equal to the TER (The DER and TER values are the kgCO2/m² emissions for the actual dwelling and a building regulation compliant dwelling respectively).

The SAP calculations have been completed using the JPA Designer SAP software which has been approved by the Scottish Government for the energy assessment of buildings against Section 6. The geometry of the building was created using IES VE 2019 with the wall, floor, roof and window areas imported into JPA Designer.

For blocks of apartments it is acceptable to aggregate the DER and TER of each apartment to provide a block overall compliance check. This is to account for ground and top floor apartments being more challenging to achieve compliance, compared to mid floor apartments. This strategy has been applied to 30 Finnieston Street.

A copy of SAP calculations for Block 3 are provided in Appendix B of this report which have been applied to assess and demonstrate compliance against Section 6 of the Scottish Technical Standards and Policy CDP 5 of the Glasgow City Development Plan.

SECTION 6 ENERGY

Each apartment will be subject to complying with Section 6 (Energy) of the Scottish Technical Handbooks. Section 6 requires all new buildings to achieve minimum performances in respect to CO2 emissions from heating, cooling, ventilation and lighting energy consumptions. In addition, Section 6 sets minimum energy performance standards and assessment of summertime overheating risk. SAP calculations provide assessment against these three issues and confirms whether compliance is achieved.

The results from the SAP calculations for a typical block at 30 Finnieston Street (Block 3) confirms that the development complies with all three aspects of Section 6 as summarised in Table 4 below.

Table 4: Section 6 Compliance Results for 30 Finnieston Street

Section 6 Compliance Requirement	Modelling Results (Electric boilers & ASHP)	Compliance Achieved
CO2 emission (DER ≤ TER)	Block TER = 24.03 Block DER = 15.45	✓
Minimum U-values & equipment efficiencies	Fabric and equipment performances beyond regulation minimums	✓
Overheating	Openable windows in accordance with Section 3 applied	✓

POLICY CDP 5 COMPLIANCE

Planning Policy CDP 5 requires compliance significantly beyond Section 6 standards. For compliance new developments must achieve a 27% improvement on Section 6 compliance plus include a LZCGT that provides a 20% abetment of CO_2 emissions. The results from the SAP calculations are applied to demonstrate compliance against these criteria.

Table 5 below presents the results from the SAP calculations that confirms compliance against both planning requirements.

Table 5: Policy CDP 5 CO_2 Emission Reduction Calculation

Step	Calculation	SAP Result	Compliance Achieved
1	The Target Emissions Rate (TER), which is an output from the SAP/SBEM calculation.	24.03	-
2	The Compliant Dwelling or Building Emissions Rate (DER/BER), which is the predicted CO2 emissions for the actual proposal, which includes the low and zero carbon generating technology (LZCGT).	15.45	-
3	Re-calculation of the DER/BER without the low and zero carbon generating technologies*.	19.76	-
4	The percentage reduction in carbon due to renewables: [(1-(Step 2 ÷ Step 3)) x100]	21.8%	✓
5	The percentage improvement over Section 6	35.7%	✓

* Heat provided via gas boilers only

Blocks 1, 2 & 4 will also achieve the same carbon reduction performances as these buildings will use the same energy strategy as Block 3 which has been assessed in this report.

7.0 SECTION 7 DESIGN RESPONSE

Sustainability features high on the agenda for the 30 Finnieston Street development as the developer not only recognises the opportunities that major development creates with respect to the economy and environment, but also the positive influence it can have on the day to day lives of people.

It is for this reason that high standards of sustainable design are targeted for the development, with Section 7 Silver Active sustainability certification targeted for each dwelling. To achieve this level of certification, the development will address all 8 sustainability aspects of Section 7. This includes implementing measures that address the following sustainability headings:

- Energy performance & carbon emissions
- Health & wellbeing
- Water efficiency
- Adaptable & flexible design
- Acoustic performance
- Waste storage
- Security

Table 6 outlines a summary of the 8 sustainability aspects of Section 7 and the design response to achieving compliance against each requirement for Policy CDP 5 compliance.

Table 6: 30 Finnieston Street Response to Section 7 Sustainability Aspects

Aspect	Summary of Requirements for Silver Active	Design Response	Section 7 Rating Achieved
1. Carbon Dioxide Emissions	Development to exceed current Section 6 carbon emission targets by 27%.	SAP calculations demonstrate that the 30 Finnieston Street development achieves a 35.7% enhancement over Section 6 targets, equating to Gold.	★
2. Energy for Space Heating	Thermal performance of building fabric to not exceed 30 kWh/m²	Early Stage SAP calculations demonstrate that the fabric thermal performances outlined in Table 3 of this report achieve 25-30 kWh/m².	★
3. Energy for Water Heating	Waste water heat recovery or renewable heating technologies (e.g. solar thermal) to provide at least: 5% of dwellings energy demand for water heating.	SAP calculations confirm that the ASHP system provides at least 5% of the dwellings hot water demand. WWHRS and solar thermal systems are not suited for flatted residential developments.	★
4. Water Use Efficiency	Sanitary appliances to achieve the following: WC ≤ 4.5 litres, WHB ≤ 6 litre/ min, showers ≤ 8 litres/ min and rain water collection butt for irrigation.	Water efficiencies will be incorporated within the architect's sanitary specifications at detailed design stages.	★
5. Optimising Performance	Building User Guide to be provided plus smart electricity meter technology	Smart metering will be incorporated in the building services design for each apartment.	★
6. Flexibility & Adaptability	Provide a home office space with daylight access, power & data points.	The apartments have been designed on an open plan living space that provides opportunity for home office space. Natural daylight is provided to all open plan spaces with power and data points incorporated in the apartment layouts.	★
7. Wellbeing & Security	Achieve minimum standards of acoustic performance and glazing area. Power outlet for intruder alarm system.	An Acoustician has been appointed to recommend on acoustic measures required. Power requirements for a security alarm will be incorporated in the building services designs.	★
8. Material & Waste	Internal recyclable waste storage of at least 120 litres per dwelling.	Recyclable waste storage will be incorporated in the architect kitchen designs and specifications.	★

★ Gold Rating ★ Silver Active Rating

8.0 CONCLUSIONS

This Statement of Energy (SoE) provides a response to Policy CDP 5 Resource Management of the Glasgow City Development Plan (adopted 29th March 2017) for the proposed 30 Finnieston Street residential development.

The energy efficiency and low carbon design measures outlined in this report demonstrate that the 30 Finnieston Street proposals comply with Gold Hybrid (Option 1) requirements of Policy CDP 5, and achieve the following specific sustainability measures:

- 35.7% improvement on building regulation CO_2 emission targets.
- Installation of a Low Zero Carbon Generating Technology (LZCGT) providing a 21.8% CO_2 emission abatement.
- Compliance against Silver Active aspects 2-8 of Section 7 (Sustainability) of the building regulations.

A vital aspect of the proposal application of local Air Source Heat Pump (ASHP) plant and back up electric boilers within each apartment. This solution complies with the objectives of Policy CDP5, the Glasgow City Energy and Carbon Masterplan, and the Scottish Government Heat Policy Statement, all of which encourage all electric buildings. The ASHP system is also an eligible LZCGT under Policy CDP 5 which provides a 21.8% abatement of the buildings CO2 emissions.

In addition to ASHPs, passive and low carbon design resonate throughout the development that have influenced site massing, building design and apartment layout. This has significantly reduced the energy consumption and carbon emissions from the development, while maintaining healthy and enjoyable living environments that will enhance the wellness of its occupants and visitors.

The 30 Finnieston Street development also addresses the wider sustainability issues with responses to each of the 7 aspects for Silver Active compliance detailed within this report.

It can therefore be concluded that the 30 Finnieston Street development complies with the Gold Hybrid (Option 1) requirements of Policy CDP 5.

9.0 APPENDIX A

This Appendix presents the completed Statement of Energy Application Form

ANNEX A: STATEMENT ON ENERGY

This Statement on Energy analyses the energy and CO2 savings that can be achieved by utilising energy efficient design, practice and technologies from the outset of a proposed development. This form should be completed by a registered SAP assessor (for domestic) or Low carbon energy assessor (for non-domestic). This form is for planning applications **submitted after 1 September 2018**.

A. Sustainability level to be achieved

Option 1 Gold Hybrid (●) Option 2 Nearly Zero Emissions ( ) Option 3 Net-Zero Carbon ( )

B. Planning Application Number and Summary of Development

The development proposals are for a residential apartment block located on Finnieston Street, Glasgow. The proposals are for a block of residential apartments and commercial spaces on the ground floor.

C. Energy Efficient Design Measures

Please explain the key energy efficient design features, including materials.

An energy hierarchy process has been applied in the buildings design as described in Section 5 of the Atelier Ten Statement of Energy report Rev 00. This includes the application of fabric thermal performance significantly beyond Section 6 regulation requirements, low energy systems and the application of air sourced heat pumps within each dwelling.

D. Energy Efficiency Measures

Please explain the measures utilised (e.g. BMS, smart meters, controls, specification, etc.)

The buildings heating strategy applies ASHP with top-up electric boilers. A description of the system is provided in Section 3 of the the Atelier Ten Statement of Energy report Rev 00. Smart meters will also be incorporated as will thermostatic controls and programmers.

E. Decentralised Heat

Is there an existing or proposed decentralised heat network in this area?	YES ☐	NO ☑
If yes, will the development link to the decentralised heat network?	YES ☐	NO ☑

If the development will not link in to an existing or proposed decentralised heat network please explain why below:

No heat network near development

If there is no proposed or existing decentralised heat network available, will the development install its own decentralised heat network?	YES ☐	NO ☑

If yes, please describe the proposed network below:

N/A

If no, please explain why not below:

With the significant demand for heat, the building could be suited to a communal heating system. The preferred option is however to apply local air source heat pumps within each apartment as this is a more technically feasible solution that still achieves the requirements of Policy CDP5 and the Scottish Government framework for all-electric buildings.

What is the main heating source? Air sourced heat pump

F. Low and Zero Carbon Generating Technologies (LZCGT): Proposed Technologies

Please tick chosen LZCGT:

Photovoltaics	☐	Solar thermal	☐	Geothermal	☐
Micro-wind	☐	Air source heat pump	☑	Biomass	☐
Micro-hydro	☐	Ground source heat pump	☐	CHP	☐
Fuel cells	☐	Water source heat pump	☐	Heat Exchange & Recovery Systems	☐
Other (please name)					

Please explain why this is the most appropriate LZCGT for the development including reference to: design considerations (see SG1: Placemaking); size of the scheme; expected output in energy consumption (kWh per year); carbon emissions savings when compared with non-renewable energy source (tonnes of CO2 per year); and its location in relation to other buildings on-site and any sensitive receptors on or off-site.

The buildings primary energy demands are space and domestic hot water heating and as such it is these loads that offer the greatest opportunity in reducing the developments carbon emissions (Refer to Section 3 of Atelier Ten SoE report Rev 00 for load analysis results). Since ASHP are an eligible technology under Section 7 and Policy CDP 5, this is the proposed solution to delivering the Gold Hybrid certification, and the 20% reduction in CO2 emissions (from LZCGT) of Policy CDP 5.

G. Estimated Energy Consumption of the Development

Using the Standard Assessment Procedure Energy Rating (SAP) for dwellings and the Simplified Building Energy Model (SBEM) for all other developments, please supply the following:

1	The **Target Emissions Rate (TER)**, which is an output from the SAP/SBEM calculation.	24.03
2	The **Compliant Dwelling or Building Emissions Rate (DER/BER)**, which is the predicted CO2 emissions for the actual proposal, which includes the low and zero carbon generating technology (LZCGT).	15.45
3	**Re-calculation of the DER/BER without the low and zero carbon generating technologies.**	19.76
4	**The percentage reduction in carbon due to renewables:** [(1-(Step 2 ÷ Step 3)) x100]	21.8%

Note:
When calculating the energy contribution and CO2 emissions saved from the LZC installation the following rules should be applied:

1. The net yield of the LZC installation(s) must be used (i.e. subtract any CO2 related to the energy used by the LZC technology itself such as pumps, inverters, controllers, etc).
2. The percentage CO2 savings should be calculated using the following assumptions:
   a. It should be assumed that renewable heat energy is displacing natural gas.
   b. Renewable electrical energy is displacing grid electricity at the national CO2 conversion rate.

H. Estimated Annual Energy Consumption of the Development

Gas consumption (kWh per year)	405,800
Electricity consumption (kWh per year)	949,000
Others fuels (annual units, depending on the source fuel)	None

I. SAP/LCEA Assessors Details

Name of SAP/LCEA assessor	Bernie Carr
Name of SAP/LCEA assessor company	Atelier Ten
Name of SAP/LCEA assessor protocol body and registration details	CIBSE Certification (LCEA 159609)

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10.0 APPENDIX B

This Appendix presents the combined SAP calculations for apartment Block 3 of the 30 Finnieston Street development with the proposed ASHP and electric boiler heating strategy, and the LZCGT comparison scenario of gas boilers only.

ASHP AND ELECTRIC BOILER:

Project Information
Reference
Date

Dwelling	TER	DER	TFA (m²)
Block 5 L01 F19 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	24.90	16.75	55.19
Block 5 L01 F20 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	22.06	14.38	77.49
Block 5 L01 F21 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	21.79	14.11	77.85
Block 5 L02 F17 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	24.88	16.74	55.19
Block 5 L02 F18 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	21.87	14.36	77.49
Block 5 L02 F19 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	21.79	14.11	77.85
Block 5 L03 F17 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	24.88	16.74	55.19
Block 5 L03 F18 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	21.87	14.36	77.49
Block 5 L03 F19 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	21.79	14.11	77.85
Block 5 L04 F17 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	25.21	17.12	55.19
Block 5 L04 F18 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	22.29	14.25	77.49
Block 5 L04 F19 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	22.13	14.17	77.85
Block 5 L05 F17 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	26.06	18.48	49.69
Block 5 L05 F18 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	23.19	15.60	67.38
Block 5 L05 F19 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	23.10	15.34	69.92
Block 5 L06 F17 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	26.42	17.94	49.69

Project Information
Reference
Date

Dwelling	TER	DER	TFA (m²)
Block 5 L06 F18 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	23.66	15.12	67.38
Block 5 L06 F19 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	24.46	15.68	63.36
Block 5 L07 F7 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	26.04	16.65	53.57
Block 5 L07 F8 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	27.62	16.61	56.42
Block 5 L08 F7 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	25.93	14.65	80.65
Block 5 L08 F8 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	29.70	16.75	61.38
Block 6 L06 F20 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	26.62	16.00	66.74

Total floor area	**1528.30**
Average TER	**24.03**
Average DER	**15.45**
Compliance	**Pass**
Average TFEE	**43.74**
Average DFEE	**43.54**
Compliance	**Pass**

GAS BOILERS ONLY:

Project Information
Reference
Date

Dwelling	TER	DER	TFA (m²)
Block 5 L01 F19 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	14.92	26.99	55.19
Block 5 L01 F20 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	13.00	23.18	77.49
Block 5 L01 F21 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	12.82	22.77	77.85
Block 5 L02 F17 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	14.90	26.98	55.19
Block 5 L02 F18 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	12.87	23.09	77.49
Block 5 L02 F19 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	12.82	22.77	77.85
Block 5 L03 F17 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	14.90	26.98	55.19
Block 5 L03 F18 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	12.87	23.09	77.49
Block 5 L03 F19 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	12.82	22.77	77.85
Block 5 L04 F17 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	9.48	18.51	55.19
Block 5 L04 F18 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	7.45	13.71	77.49
Block 5 L04 F19 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	7.35	13.53	77.85
Block 5 L05 F17 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	10.16	20.09	49.69
Block 5 L05 F18 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	8.20	14.96	67.38
Block 5 L05 F19 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	8.00	14.55	69.92
Block 5 L06 F17 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	10.22	20.23	49.69

Project Information
Reference
Date

Dwelling	TER	DER	TFA (m²)
Block 5 L06 F18 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	8.33	15.33	67.38
Block 5 L06 F19 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	8.72	16.02	63.36
Block 5 L07 F7 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	9.79	19.04	53.57
Block 5 L07 F8 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	10.23	19.69	56.42
Block 5 L08 F7 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	9.32	15.83	80.65
Block 5 L08 F8 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	12.05	20.76	61.38
Block 6 L06 F20 in 6804 Finnieston Street Model Model 210426.jpa SAP 9.92 Dwelling	9.78	17.08	66.74

Total floor area	**1528.30**
Average TER	**10.88**
Average DER	**19.76**
Compliance	**Fail**
Average TFEE	**24.32**
Average DFEE	**26.16**
Compliance	**Fail**