



**LAYSTALL STREET,
MANCHESTER**

**ENERGY STRATEGY
AND
ENVIRONMENTAL
STANDARDS
STATEMENT**

Client: McCauls

Project No: 7/6822

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DOCUMENT ORIGIN

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-	08/09/2020	First Issue	G Hirst	S Howe	S Howe
P2	13/10/2020	Updated report further to amendment of window specification. SAPs updated	G Hirst	S Howe	S Howe
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1. Executive Summary

The following document outlines the planning environmental strategy required for the proposed refurbishment of the grade II listed Showroom for office uses and the construction of a new build residential element at:

Laystall Street, Manchester, M1 2JZ

Site description

The site is in Manchester city centre between Urban Exchange and Presbar Dicastings building.

The site currently consists of a number of existing period buildings which are of the grade II listed former headquarters of John Armitage.

The adjacencies to the proposed development site are as follows:

North: Laystall Street
East: Brock Street
South: Ducie St
West: Pigeon Street

Development description

The project comprises:

It intended to construct a nine-storey residential apartment block to replace existing redundant buildings and current public parking and to refurbish the listed building in the northern area of the site for office use.

The project proposals have been reviewed and it is considered that the scheme can be constructed utilising sustainable design methods to ensure that the Manchester City Council aspirations for good quality building stock are met.

- Table A outlines building fabric criteria which can be utilised to achieve compliance.
- Table B outlines system performance criteria which can be utilised to achieve compliance.
- Appendix A provides the rationale for the allocation of on-site Low and Zero Carbon technologies and renewables.

During the detail design period the proposals will be examined in further detail and will be the subject of more refined SAP and thermal model analysis. This detailed analysis will be based on the actual details intended for construction to confirm and / or modify the information below. The results can then be used to define the final EPC rating for the scheme.

2. Terms of Reference

This Energy Strategy and Environmental Standards Statement seeks to demonstrate that the design intent for the scheme as well as the commitment to aligning with Manchester City Council's aspirations and wishes to deliver sustainable developments. The environmental and energy strategy for the scheme has been developed using the following regulations and planning policies:

2.1 Building Regulations

The Building Regulations Approved Document Part L (Conservation of Fuel and Power) 2013 outline the requirements for reductions in carbon emissions required for new developments.

The domestic / residential elements of the scheme have been initially reviewed against the requirements of Building Regulations Part L1A utilising SAP assessment software.

The landlord and commercial elements of the scheme have been initially assessed against the requirements of Building Regulations Part L2A utilising the SBEM assessment software / IES dynamic thermal modelling software.

2.2 Manchester City Council Core Strategy

The Manchester City Council, Manchester Core Strategy 2012 to 2027 document and planning policies have been utilised for assessment as follows. The following policies are extracted from the Manchester Core Strategy Document:

2.2.1 Policy EN 4 - Reducing CO2 Emissions by Enabling Low and Zero Carbon Development

The Council will seek to reduce fuel poverty and decouple growth in the economy, growth in CO2 emissions, and rising fossil fuel prices, through the following actions:

- All development must follow the principle of the Energy Hierarchy, being designed:
 - to reduce the need for energy through design features that provide passive heating, natural lighting, and cooling
 - to reduce the need for energy through energy efficient features such as improved insulation and glazing
 - to meet residual energy requirements using low or zero carbon energy generating technologies
- Wherever possible new development and retrofit projects, including energy generation plant, must be located, and designed in a manner that allows advantage to be taken of opportunities for low and zero carbon energy supplies.
- Where possible new development and retrofit projects will be used as a mechanism to help improve energy efficiency and provide low and zero carbon energy supplies to existing buildings.
- Where appropriate new development and retrofit projects will be required to connect to and/or make contributions to low or zero carbon energy schemes and/or to incorporate provision to enable future connection to any existing / potential decentralised energy schemes.

- The use of building materials with low embodied carbon in new development and refurbishment schemes.

2.2.2 Policy EN 6 - Target Framework for CO₂ reductions from low or zero carbon energy supplies

Applications for residential development of 10 or more units and all other development over 1,000 sq m will be expected as a minimum to meet the target shown in Tables 12.1 or 12.2 unless this can be shown not to be viable. This should be demonstrated through an energy statement, submitted as part of the Design and Access Statement. Such a statement will be expected to set out the projected regulated energy demand and associated CO₂ emissions for all phases of the development.

Developments smaller than the above threshold but involving the erection of a building or substantial improvement to an existing building will also be expected to meet the minimum target, where viable, but will not be expected to submit an energy statement.

The target framework relates to three broad development locations and their potential for low and zero carbon, decentralised energy. The areas are defined as follows:

- Target 1 Network development areas: Locations where the proximity of new and existing buildings, the mix of uses and density of development provide the right conditions to support district heating (and cooling).
- Target 2 Electricity intense areas: Locations where the predominant building type has an all-electric fit-out such as retail units and leisure complexes.
- Target 3 Micro-generation areas: Locations where lower densities and a fragmented mix of uses tend to mean that only building scale solutions are practical.

Domestic CO₂ emissions reduction targets (Table 12.1)

Target	% Minimum requirement
Target 1: Network development area	CHP/district heating anchor or connection or where not feasible a 15% increase on Part L 2010
Target 2: Electricity intense buildings	+15% increase on Part L 2010
Target 3: Micro generation area	+15% increase on Part L 2010

Non-domestic CO₂ emissions reduction targets (Table 12.2)

Target	% Minimum requirement
Target 1: Network development area	CHP/district heating anchor or connection or where not feasible, a 15% increase on Part L 2010
Target 2: Electricity intense buildings (Applies to commercial uses with a high proportion of emissions from electricity use (>45 kg CO ₂ /m ²))	+10% increase on Part L 2010

Target 3: Micro generation area	+15% increase on Part L 2010
------------------------------------	------------------------------

Where the CO2 emissions reduction required under any future revision to Part L of the building regulations becomes greater than the '% Minimum requirement', the reduction required under building regulations would apply.

Where the Council identifies an 'allowable solution', for example within an energy proposals plan, that would produce higher carbon reductions at no extra cost than that of achieving the '% Minimum requirement' (or required under building regulations if greater) the higher percentage reduction will be required. The cost comparison is based on the cost of incorporating the 'allowable solution' at design stage.

The energy statement will be required to be submitted at the outset of any proposed development (outline application or before). Developers will be permitted to use green infrastructure elements such as green roofs, green walls, street trees and waterways to contribute to compliance with CO2 mitigation, subject to the energy statement incorporating evidence such as modelling to demonstrate compliance.

Guidance on what the energy statement should contain and how to decide which target applies to a development proposal is given in Appendix A of the policy.

2.3 Policy DM 1 - Development Management

All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document:-

- Appropriate siting, layout, scale, form, massing, materials and detail.
- Impact on the surrounding areas in terms of the design, scale and appearance of the proposed development. Development should have regard to the character of the surrounding area.
- Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise.
- Accessibility: buildings and neighbourhoods fully accessible to disabled people, access to new development by sustainable transport modes.
- Community safety and crime prevention.
- Design for health.
- Adequacy of internal accommodation and external amenity space.
- Refuse storage and collection.
- Vehicular access and car parking.
- Effects relating to biodiversity, landscape, archaeological or built heritage.
- Green Infrastructure including open space, both public and private.

- The use of alternatives to peat-based products in landscaping/gardens within development schemes.
- Flood risk and drainage.
- Existing or proposed hazardous installations.
- Subject to scheme viability, developers will be required to demonstrate that new development incorporates sustainable construction techniques as follows (In terms of energy targets this policy should be read alongside policy EN6 and the higher target will apply):-
 - a) For new residential development (note that the requirement to meet Code for Sustainable homes targets has been removed from planning policy)
 - b) For new commercial developments to demonstrate best practice which will include the application of the BREEAM (Building Research Establishment Environmental Assessment Method) standards. By 2019 provisions like the Code for Sustainable Homes will also apply to all new non-domestic buildings.

Guide to Development in Manchester 2007 SPD

The Core Strategy requires that all new residential developments should accord with the design guidance set out in the Supplementary Planning Documents (SPD). The Guide to Development in Manchester SPD was adopted on 11th April 2007 and supports and enhances the ongoing shaping of the City by providing a set of reasoned principles which will guide developers, designers, and residents.

Greater Manchester Spatial Framework Revised Draft 2019

Greater Manchester Spatial Framework Revised Draft 2020 supports the council's strategies which include underpinning the ambition to become a carbon neutral city 2038.

Objective 7 of the document ensures Greater Manchester is a more resilient and carbon neutral city region which will:

- Promote carbon neutrality of new development by 2028
- Promote sustainable patterns of development that minimise the need to travel and contribute to cleaner air
- Locate and design development to reduce car dependency
- Facilitate provision of infrastructure for cleaner vehicles
- Improve energy efficiency and the generation of renewable and low carbon energy.

Policy GM-S2 is a policy that supports objective 7 and has the aim of delivering a carbon neutral Greater Manchester no later than 2038. Part of this policy is to take a positive approach to renewable and low carbon energy schemes. Keeping fossil fuels in the ground. It also provides an energy hierarchy as follows:

- i. Minimise energy demand.

- ii. Maximise energy efficiency.
- iii. Utilise renewable energy.
- iv. Utilise low carbon energy; and
- v. Utilise other energy sources.

Manchester City Councils Climate Emergency Declaration 10th July 2019

The declaration looks to deliver the zero-carbon target by 2038 and determine if an earlier target can be possible. To become carbon neutral as soon as possible.

Manchester City Council Climate Change Framework

Manchester Climate Change Framework for 2020-2025, builds on the Draft Manchester Zero Carbon Framework 2020-38, which was published in February 2019 and Manchester City Council's declaration of a climate emergency in July 2019. This gives a target for the 2020-25 period to reduce direct CO₂ emissions by at least 50% to stay within carbon budget targets. This is to support Objective 1 of the document which includes staying within our 15 million tonne carbon budgets for 2018-2100.

The Framework recognises that the UK gas supply will take a long time for decarbonisation with biogas and / or hydrogen and that to stop using gas will promote decarbonisation because of the opportunity available for reducing carbon emissions associated with grid electricity. Therefore, moving buildings to electric heating, air source heat pumps and zero carbon district heating provide a more immediate carbon reduction benefit.

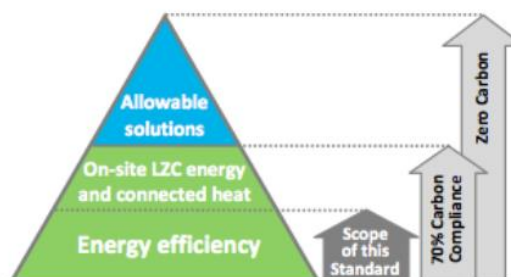
The Framework wants to ensure new developments in the city do not eat into our limited carbon budgets and add to the already significant retrofit challenge. This means that we need them to be built and operated to zero carbon standards as soon as possible.

3. Confirmation of Scope and Route to Compliance

3.1 Energy Hierarchy

This development follows the principles to make the fullest contribution to minimising carbon dioxide emissions in accordance with the following energy hierarchy:

- **Be lean:** use less energy
- **Be clean:** supply energy efficiently
- **Be green:** use renewable energy



3.2 New Residential Building

The intention is to adopt an enhanced building fabric based on values which are better than the minimum required for compliance with Building Regulations AD Part L 2013 as outlined in Table A below. This will minimise the building energy demand and contribute towards Building Regulations compliance.

Description	Part L 2013 minimum	Minimum requirement for this building	Performance Relative to Part L Requirement
External Wall U-Value	0.35 W/m ² .K area-weighted average	0.17 W/m ² .K	Improvement
Ground Floor U-Value	0.25 W/m ² .K area-weighted average	0.14 W/m ² .K	Improvement
Roof U-Value	0.25 W/m ² .K area-weighted average	0.14 W/m ² .K	Improvement
Window / Door glazing U-Value	2.2 W/m ² .K area-weighted average	1.4 W/m ² .K (Double Glazing with some solar protection –glass G-value 0.49 – Example Planitherm One T)	Improvement
Building Air Permeability	10 m ³ /(h.m ²) @ 50 Pa	3.0 m ³ /(h.m ²) @ 50 Pa	Improvement
Thermal Bridging	Accredited Construction Details - YES		-

Table A – Proposed fabric performance

Furthermore, efficient systems will be adopted as outlined in Table B below to minimise the building energy consumption and contribute further towards a passive and sustainable building which is compliant with Building Regulations.

Description	System
Ventilation	High Performing MVHR (Building Regulations Part F - System 4) – Example Sentinel Kinetic Advance S
Main Heating	Electric
Emitters	Panel Heaters
Controls	Time, Temperature and Zone Control – Lot 20
Hot Water	High Performing Hot water Electric Cylinders - Example Tempest Indirect Plus (2Bed 150L, 1 Bed 125L)
Secondary Heating	None
Renewable Energy	Approx. 174 m ² of PV (Approx. 32.1 kWp) (full feasibility and requirement for building regulations and planning condition compliance to be reviewed during detail design)
Lighting	100% Low Energy Lighting

Table B – Proposed efficient building services system inputs

The above parameters (outlined in Table A and Table B) offer a Building Regulations / SAP compliant solution for the proposed new build element of the development which also meets the current Core Strategy target of 15.5 over Part L 2010 (Equivalent to 9.6% over Part L 2013 for domestic buildings and 6.6% over part L 2013 for non-domestic buildings). With the actual currently being 15.5%, 9.8% and 6.7 % respectively.

The double-glazing proposal has incorporated some solar protection to assist in summertime temperature mitigation, this is required as the acoustic report requires that windows are not to be used for controlling summer overheating. This glass will reduce the solar gain by almost 1/3 when compared to standard clear double glazing, but the trade-off will be additional PV due to reduced light penetration into the apartment.

This solution also supports the use of MVHR style ventilation as it requires a maximum ventilation rate to 1.9 ac/hr. Further reductions are being progressed utilising improvement in solar protection particularly the on exposed facades.

The corridors are currently proposed as being electrically heated, this is both capital and carbon efficient solution as electricity is an increasingly more sustainable form of power as a result of the decarbonisation of the grid. The corridors therefore would be assessed under Part L2A (SBEM). We have included 81m² of PV to be used in the SBEM calculation to achieve the necessary 6.6% improvement for planning.

It is estimated that the 174m² of PV panel area will require approximately 300m² of flat roof area to allow for access and prevent self-shading of panels. To enable the flexibility to incorporate further solar protection it is suggested that **350m² of roof area is allocated for PV panels for the planning stage.** This is recommended so that additional PV can be used to offset a lower G-value on more exposed facades. If there is inadequate / limited space for this increase, then alternatively the PV efficiency can be increased from the current proposed 300 W per panel (1.635m² / panel – 18.3% efficient) by an alternate panel selection.

During the design stage, the proposals will be subject to more refined modelling based on the final building form, construction details and building services systems to optimise the design. It is proposed to fully review the inclusion of photovoltaic panels at this stage to best suit the scheme.

3.3 Refurbished Office Building

The existing building to the east of the site has significant conservation requirements which limits the amount of fabric enhancement. The roof will be upgraded to include insulation, but external wall and the exposed ground floor will remain with its original thermal performance. There may be some betterment to windows, but this will be limited within the constraints of their refurbishment.

All new building services systems will improve upon the minimum efficiencies contained within the Non-Domestic Compliance Guide. This will include new electrical radiators (direct) and mechanical ventilation with heat recovery to the ground floor only.

3.3.1 Listed Office Building Elements and Sustainability

In this section we will address BREEAM, Code for Sustainable Homes, HQM, and energy strategy. BREEAM was considered, but due to the office element being a small % of the overall development and being listed, it would not be readily applicable, as so many of the scoring criteria cannot be implemented

i.e., full energy strategy, windows, daylight etc. However, we would assess this construction element of the project to be “very good” when reflected against the scoring criteria that could be applied.

3.4 Water Management

The disposal of surface water has been considered in the following order of priority.

1. Infiltration into the subsoil via soakaways or permeable paving.
2. Discharge to a water course or the sea.
3. Discharge to a surface water sewer.
4. Discharge to a combined sewer.

Due to the previously developed nature of the site, the development is considered as brownfield. Existing brownfield run-off rates from the site have been calculated as follows:

1 in 1-year storm event	=	11.4l/s
1 in 30-year storm event	=	27.9l/s
1 in 100-year storm event	=	35.9l/s

It is proposed to restrict surface water discharge from site, for all storm events up to and including the 1 in 100 year plus 40% climate change event, to a rate no greater than 5.0l/s, to mitigate the risk of blockages. This represents a reduction of 56% for the existing worst case 1 in 1-year storm event, 82% for the existing worst case 1 in 30-year event and 86% for the existing worst case 1 in 100-year storm event.

The full document defining the above is contained in Clancy Consulting’s Report:

“Proposed Drainage Design Strategy”

Laystall Street
Manchester
M1 2JP

1/20445-DS-001 - Rev B

Dated: 05 October 2020

3.5 Waste Management

An extract from the OMI Architects Waste Management Statement is below, this document is extracted from their Design and Access Statement:

Laystall Street

Design and Access Statement

Dated: November 2020

3.6 Building Life Statement

As the existing structure has been partially retained on site the scheme is able to maximise the site building material efficiency and to, reduce transporting building waste and spoil off site. This has been done to also maximise and promote the site character and balance it against the new build element of the site adjacent.

The new scheme elements (old and new) occupy most of the site that was previously fully developed. The scheme proposes several planters within the courtyards on Brock Street, which will provide a small increase in landscaping/biodiversity.

The building design has where practical considered the potential benefit to mitigate solar gain through building orientation and façade design where this can be achieved without compromising good urban design or creating issues associated with overheating.

Where new materials are used, they shall be selected so their waste impact is considered. Also, where possible be of low embedded energy, we will work with the Main Contractor to support this where practical. Also, we will further consider the sustainability measures of this project further as we progress through the more detailed design stages.

5.3 WASTE MANAGEMENT STRATEGY

- 5.3.1 A copy of the completed Manchester City Council Waste Management pro-forma is included in Appendix A of this report and the waste management strategy plan (drawing reference L0110) accompanies the planning application. This drawing sets out the following:
- 5.3.2 At each end of the residential block a vertical refuse chute is provided which discharges into a refuse store within the lower ground floor. At the base of the chute, a tri-separator allows residents to select the type of waste before depositing it down the chute, the waste is then automatically directed to the correct waste/recycling container in the refuse room. Residents will not need to travel greater than 30m from their apartment to the refuse chute.
- 5.3.3 On collection days, building operators will bring out the full waste containers, via the access ramp for collection on Brock Street. An area for marshalling of full waste containers is included within the courtyard the head of the ramp.
- 5.3.4 Commercial waste is held within a compound area in the open space between the rear of the listed showroom and the new residential block, screened from view by a brick wall. Similarly, on collection days the building operator will wheel the waste containers out to Brock Street via the courtyard gate. bins, the refuse collection vehicles will manoeuvre down Brock St via the one-way system and stop for a kerbside collection. The collection crew will not need to travel more than 10m to collect the bins. A transport plan and servicing swept path analysis has been undertaken in support of this application.
- 5.3.6 In accordance with Manchester City Council's 'Waste Storage and Collection Guidance in New Developments' the proposed residential component of the development would require the following no. of refuse bins, based on 1 collection per week;

In accordance with Manchester City Council's 'Waste Storage and Collection Guidance in New Developments' the proposed commercial component of the development would require the following no. of refuse bins, based on 1 collection per week;

IMAGE 51

Waste Management strategy diagram

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3.7 Sustainability and Embedded Carbon Statement

A Whole Life Carbon Analysis will be undertaken to establish the carbon emissions and a more detailed Analysis will be carried as part of detailed design development and prior to commencement. The proposals aim to go beyond the requirements of the current Core Strategy to contribute towards the City's 2038 Net Zero Carbon target.

The proposals for this site also utilise the re-use of the Listed Building, as well as providing the new build apartments, in the construction / refurbishment, they will also enlist several material initiatives across their operations to reduce their impact on the environment, including, water-consumption, sourcing low materials, energy monitoring and efficiency, limiting use of plastic, second -life consumables, environmental clean-ups, protection of wildlife and habitats etc.

We fully support the economic, social, and environmental imperative to improve the energy efficiency of domestic and commercial building and that larger buildings should attain high standards of sustainability because of their high profile and impact.

This Environmental Standards Statement (ESS) and Energy Statement (ES) has assessed the physical, social, economic, and other environmental effects of the proposal and how it relates to sustainability objectives.

This ESS sets out measures that could be incorporated across the lifecycle of the development to ensure high levels of performance and long-term viability and ensure compliance with planning policy. The development will be designed and specified in accordance with the principles of the energy hierarchy in line with the adopted Core Strategy Policy EN 4. The requirements for CO2 reductions set out within the Core Strategy would be met through minimising energy demand and meeting any demand efficiently through adopting the lean, clean and green energy hierarchy. The sites highly sustainable location should reduce its impact on the environment.

The ESS and ES indicates that the new build element would achieve a 9.6 % reduction over the Part L 2013 baseline improving upon the core Strategy through enhanced fabric plus efficient servicing and renewable energy generation.

The new build energy strategy incorporates an enhanced 'fabric led' material specification, an element of renewable energy generation plus high-quality design and construction standards to improve the energy efficiency of the building. The apartments use direct electric radiators which can follow the decarbonisation of the grid and support the 2025 Future Homes and Future Building requirement that all homes constructed post 2025 shall not require any retrofitting to achieve Zero Carbon, this also follows MCC's Climate Emergency declaration to be Zero Carbon by 2038.

The energy strategy for the listed building would include a significant improvement over the original baseline specification allied with efficient mechanical and electric servicing including the use direct electric radiators which can follow the decarbonisation of the grid and support the 2025 Future Homes and Future Building requirement that all homes constructed post 2025 shall not require any retrofitting to achieve Zero Carbon, this also follows MCC's Climate Emergency declaration to be Zero Carbon by 2038.

The new building would be thermally tight, with low energy systems such as LED lighting and high efficiency heat recovery. This represents a 30 % saving over current RIBA Benchmarks and the proposed scheme but will be verified during detailed modelling at the next design stage.

The design incorporates features that reduce energy demand and carbon emissions:

The lighting in common areas would include active sensors, time, temperature and zone controls on the space heating, high efficiency DHW generation and a large PV array.

Water efficiency measures such as dual flush toilets, flow restrictors on taps and reduced volume baths (where provided) and extensive use of low volume showers would limit potable water demand. This would reduce water heating energy loads and also cut the process energy required to supply clean drinking water.

A materials review will be carried out pre commencement regarding embodied carbon aimed at reducing the environmental and social impact of the material to compare the life cycle impact of different façade options and undertaking material efficiency appraisal to explore opportunities to design out waste through the life of building. Materials would be selected which have a low environmental impact throughout their life cycle through conducting a life cycle assessment and integrating its outcomes in the design decision-making process. An IMPACT compliant Life Cycle Analysis (LCA) tool would be utilised, and an assessment carried out to measure the environmental impact of the building. The design team will use this tool to measure reductions in the lifecycle impact of materials used in construction would be achieved through the following:

- Selection of materials which have a low environmental impact throughout their life cycle for the main building elements.
- Responsible Sourcing of Materials – All timber used on the project would be responsibly sourced in accordance with the UK Government's Timber Procurement Policy (FSC sourced timber, for example); Materials will be selected which have a low environmental impact throughout their life cycle; Suppliers and manufacturers who operate Environmental Management Systems would be prioritised; Consideration will be given to local sourcing of construction materials where feasible; The use of thermal insulation which has a low embodied environmental impact relative to its thermal properties would be specified throughout the development to reduce the construction phase impact of this scheme upon climate change.
- Material Efficiency – At the Preparation, Brief and Concept Design RIBA stages; targets would be set, opportunities identified, and methods put in place to optimise the use of materials. This is to avoid unnecessary materials use arising from over specification without compromising structural stability, durability or the service life of the building.

A Construction Resource Management Plan would be produced to limit on and off-site environmental impacts of construction. The waste management strategy would also include the following: Pre-demolition/Pre-refurbishment audit of all existing buildings, structures or hard surfaces to promote resource efficiency via the effective management and reduction of construction waste; Procedures to reduce construction waste related to on-site construction and off-site manufacture/ fabrication; Diverting non-hazardous construction (on-site and dedicated off-site manufacture/ fabrication), demolition and excavation waste from landfill.

A building specific adaptation strategy would be undertaken to encourage consideration of Design for Disassembly and Adaptability and implementation of measures to accommodate future changes to the use of the building and its systems over its lifespan. This strategy would ensure that there is unnecessary materials use, cost and disruption arising from the need adaptation owing to changing functional demands and maximise the reclamation and reuse of materials at final demolition as part of a circular economy

4. Conclusion

The information obtained from the current design activity demonstrates that a building complying with Building Regulations AD Part L 2013 and the Manchester City Council current planning policy documents can be constructed by utilising the fabric performance values outlined in Table A and the system performance parameters outlined in Table B above.

We have also not been requested on this project to follow the HQM / Code for Sustainable Homes Standards on the residential element of this project.

Due to the constraints presented by this building being listed, we considered BREEAM, but have not specifically carried out a formal assessment, would assess this construction element of the project to be “very good” when reflected against the scoring criteria that could be applied.

The site water management is arranged as follows:

Due to the previously developed nature of the site, the development is considered as brownfield. Existing brownfield run-off rates from the site have been calculated as follows:

1 in 1-year storm event	=	11.4l/s
1 in 30-year storm event	=	27.9l/s
1 in 100-year storm event	=	35.9l/s

It is proposed to restrict surface water discharge from site, for all storm events up to and including the 1 in 100 year plus 40% climate change event, to a rate no greater than 5.0l/s, to mitigate the risk of blockages. This represents a reduction of 56% for the existing worst case 1 in 1-year storm event, 82% for the existing worst case 1 in 30-year event and 86% for the existing worst case 1 in 100-year storm event.

Surface site water management collected via hard soakaways / roofs and attenuated via a underground tank, release into the wider adopted network.

A separate foul system drainage system is provided that will be discharged into a combined sewer.

The Waste Management strategy is in accordance with the City Councils – “Waste Storage and Collection Guidance in New Developments”.

The Building has where practical, that where new materials are used, they shall be selected so their waste impact is considered and be where possible be of low embedded energy, we will work with the Main Contractor to support this where practical. This is further demonstrated by the retention and use of repurposing of the existing building on the site in lieu of demolition.

5. APPENDIX A: Regulation 25A Assessment



**LAYSTALL STREET
MANCHESTER**

**REGULATION 25A
CONSIDERATION
OF HIGH
EFFICIENCY
ALTERNATIVE
SYSTEMS**

Client: McCauls

Project No: 7/6822

Date: 07/09/20

Revision: 0

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1 Introduction

1.1 Purpose of Study

This report considers the technical, environmental and economic feasibility of using high-efficient alternative systems in the construction.

The Building Regulations are technology neutral and do not require that high-efficiency alternative systems or other low and zero carbon systems are installed. However, where a technology is feasible but not included in the design, then consideration of making the building easily adaptable by facilitating the integration of any feasible technology will be included if appropriate.

This assessment has been carried out at RIBA Stage 2 (Concept Design).

1.2 Description of Project

The project comprises:

It intended to construct a nine-storey residential apartment block to replace existing redundant buildings and current public parking and to refurbish the listed building in the northern area of the site for office use.

We have considered the most suited technology for implementation within the scheme as outlined within this report.

The proposed solution will be in line with the City Council's planning policy documents.

A BREEAM compliance rating has not been requested as part of the environmental assessment of this scheme by Manchester City Council guidelines. However, we shall follow good environmental engineering practice and will consider BREEAM recommendations wherever practical and feasible during our decision making processes for the proposed development.

1.3 Limitation

This report considers high efficient systems at a high level and considers its feasibility on physical limitations of the site and known issues associated with each technology. It is recognised that the development of any energy strategy is an iterative process that takes into account development needs, end users requirements, site restrictions and changes to legislation and incentive programmes. Any considered system will need further detailed analysis prior to specification and installation.

2 High Efficient Alternative Systems

2.1 Energy from Renewable Sources

2.1.1 Wind – Micro scale

Technology Description

Wind turbines harness energy from wind and convert it into electricity. Wind passing over the blades causes them to rotate and the blade rotor axle passes through an electricity generator. The electrical output is passed through a control system and then an inverter which is connected to the buildings mains electrical system. The inverter ensures that the alternating current electricity produced by the turbine is synchronous and in phase with the mains electrical supply.



Not Technically Feasible - Urban Location with disrupted wind patterns which would not be appropriate for this development

2.1.2 Wind – Large and Medium scale

Technology Description

Medium (30m – 80m overall height to blade tip) and large turbine (80m+) can be used for a large building or groups of buildings. A 'private wire' system can deliver electricity to each building with any surplus being exported to the grid. Other factors to consider include risk of collision with low flying aircraft and interference with radar as well as visual impacts, shadow flicker and noise.



Not Technically Feasible - Urban Location with disrupted wind patterns which would not be appropriate for this development

2.1.3 Solar Photovoltaic Panels

Technology Description

Photovoltaic (PV) systems convert energy from the sun into electricity through semiconductor cells. When sunlight reaches the semiconductor material, direct current is generated. In most systems, this is then converted into alternating current by means of an inverter, which is fed into the dwelling's mains electrical system.



Feasible - It is currently proposed to include PV's within the design

2.1.4 Solar Thermal

Technology Description

Solar thermal systems harness energy from the sun to heat water. Various systems are available, but generally a solar thermal collector, installed at roof level, absorbs the sun's energy and transfers it into a liquid (normally a water/antifreeze solution). This liquid is circulated through a heat exchange coil where its heat is transferred. Generally solar thermal systems are used to heat domestic hot water or swimming pool water.

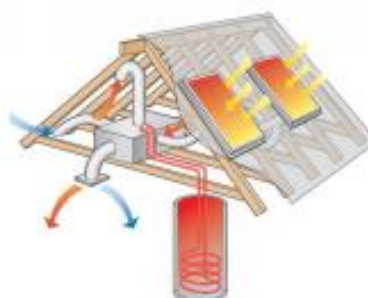


Not Practical - Individual systems would be required for individual dwellings It would need pipework penetrations and pumps for each system, making it undesirable

2.1.5 Solar Air Heating

Technology Description

Solar air heating systems collect solar energy to heat air. The air can be used to pre-heat ventilation air, heat air inside a building or to heat water. A basic system comprises a solar collector and a hot air distribution system. Solar air systems can also incorporate thermal storage using either the thermal mass of the building or dedicated thermal stores, such as a rock store. The solar collectors can be purpose-built panels or a glazed cavity over an existing façade.



Not technically Feasible - No centralised mechanical ventilation to take advantage of solar air system

2.1.6 Aero-Thermal / Air Source Heat Pump

Technology Description

Air source heat pumps extract heat from the outside air or warm exhaust air. The heat can then be used for heating and domestic hot water. The heat pump efficiency is related to the difference between the source temperature and supply temperature, therefore in winter, when heat is most needed the efficiency and output reduces. Noise from the external unit also has to be considered.



Not Economically Feasible - Increasing emitter size to suit lower temperatures required by a heat pump is prohibitive due to cost and space issues

2.1.7 Ground Source Heat pumps

Technology Description

Ground source heat pumps extract heat from the ground by either horizontal coils or vertical bore holes. The heat can then be used for heating and domestic hot water. A ground source heat pump system absorbs heat from the ground and releases it at a higher temperature for use within a building. The ground has a more stable temperature than ambient air which often results in higher overall efficiencies than an air source heat pump.



Not technically Feasible - No adequate external ground which can be used for ground source

2.1.8 Hydrothermal / Surface Water Source Heat Pumps

Technology Description

Surface water (rivers, lakes, sea canal) can be used in an open-loop or via submerged heat exchanger to extract heat to be used for heating and domestic hot water. The choice of system will depend on environmental consideration, quality of the water and risk of bio-fouling of the pipework and heat exchanger (for open source systems)



Not Technically Feasible - No suitable surface water bodies which can be used for heat extraction

2.1.9 Hydropower

Technology Description

The energy from flowing water is used to generate electricity using a turbine. Depending on the water flow and head of the water course, different types of turbines are used. An abstraction licence is required for all turbines, as the part of the water course between extraction and insertion can be affected by the reduced flow (this is known as the depleted or deprived reach). This can impact on ecology, amenity and navigation needs.



Not Technically Feasible - No suitable water course within the boundaries of the development.

2.1.10 Biomass

Technology Description

Biomass is any plant-derived organic material that renews itself over a short period. Biomass energy systems are based on either the direct or indirect combustion of fuels derived from those plant sources. The amount of carbon released from burning the biomass is equal to the carbon absorbed when growing. The only carbon associated with biomass is related to processing and transportation.



Not Practical - Local Pollution associated with burning biomass is not desirable for City Centre site.

2.1.11 Biogas

Technology Description

Biogas can be obtained from the breakdown of various organic materials, by natural digestion. The gas generated can be used for burning or may be used in internal combustion engines as part of CHP systems. Farm, food and market waste products are particularly good as source materials. Generally, plant is of an industrial nature and is more ideal co-located with light industrial or agricultural buildings.



Not Technically Feasible - Inappropriate location for industrial type plant

2.2 Cogeneration (Also Known as Combined Heat and Power [CHP])

Technology Description

Combined heat and power is the generation of thermal and electrical energy in a single process where both energy streams can be utilised within buildings. Although the production of electricity by CHP is less efficient than that achieved from national power stations, the use of the heat that would otherwise be rejected leads to net saving in primary energy.



Not Technically Feasible - currently no centralised thermal distribution network proposed which would provide a load for waste heat.

2.3 District or Block Heating

2.3.1 Onsite District Heating or Block Heating

A community heating scheme provides heat from a central source to more than one building or dwelling via a network of heating mains. Heat can be supplied from conventional boilers or from renewable energy sources or waste heat from power generation (Combined Heat and Power). Community heating is most appropriate where heating demand is required over a small area. This is known as the heat usage density and is measured in kWh/m² per annum.



Not Technically Feasible - Inadequate space for an energy centre/plant room

2.3.2 Offsite District Heating

Large scale or city centre district heating schemes have greater efficiency where there is a greater energy density and diversity of load served. Where buildings are in the locality of such systems consideration should be given to using the thermal energy provided.



Not Technically Feasible - No offsite district heating system available

6. APPENDIX B: Sample SAP Calculations

BASIC COMPLIANCE REPORT Calculation Type: New Build (As Designed)						 Design SAP elmhurst energy	
Property Reference	000852				Issued on Date	22/09/2020	
Assessment Reference	001_28_V2		Prop Type Ref	Apt 28			
Property	Apt 28, Laystall Street, MANCHESTER						
SAP Rating	83 B	DER	23.09	TER	23.85		
Environmental	85 B	% DER<TER	3.17				
CO₂ Emissions (t/year)	1.16	DFEE	32.61	TFEE	37.11		
General Requirements Compliance	Pass	% DFEE<TFEE	12.15				
Assessor Details	Mr Ian Owen, Clancy Consulting, Tel: 0161-613-6000, ian.owen@clancy.co.uk				Assessor ID	C580-0001	
Client	Clancy Consulting, Clancy						
SUMMARY FOR INPUT DATA FOR New Build (As Designed)							
Criterion 1 – Achieving the TER and TFEE rate							
<u>1a TER and DER</u>							
Fuel for main heating	Electricity						
Fuel factor	1.55 (electricity)						
Target Carbon Dioxide Emission Rate (TER)	23.85						kgCO ₂ /m ²
Dwelling Carbon Dioxide Emission Rate (DER)	23.09						kgCO ₂ /m ² Pass
	-0.76 (-3.2%)						kgCO ₂ /m ²
<u>1b TFEE and DFEE</u>							
Target Fabric Energy Efficiency (TFEE)	37.11						kWh/m ² /yr
Dwelling Fabric Energy Efficiency (DFEE)	32.61						kWh/m ² /yr
	-4.5 (-12.1%)						kWh/m ² /yr Pass
Criterion 2 – Limits on design flexibility							
Limiting Fabric Standards							
<u>2 Fabric U-values</u>							
Element	Average	Highest					
External wall	0.17 (max. 0.30)	0.17 (max. 0.70)				Pass	
Party wall	0.00 (max. 0.20)	-				Pass	
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)				Pass	
<u>2a Thermal bridging</u>							
Thermal bridging calculated from linear thermal transmittances for each junction							
<u>3 Air permeability</u>							
Air permeability at 50 pascals	3.00 (design value)						
Maximum	10.0						Pass
Limiting System Efficiencies							
<u>4 Heating efficiency</u>							
Main heating system	Room heaters - Electric Water or Oil filled radiators						
Secondary heating system	None						
<u>5 Cylinder insulation</u>							

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)


Design SAP
elmhurst energy

Hot water storage	Measured cylinder loss: 0.91 kWh/day Permitted by DBSCG 1.89	Pass
Primary pipework insulated	No primary pipework	

6 Controls

Space heating controls	Programmer and room thermostat	Pass
Hot water controls	Cylinderstat	Pass

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass

8 Mechanical ventilation

Continuous supply and extract system			
Specific fan power	0.46		
Maximum	1.5		Pass
MVHR efficiency	92	%	
Minimum	70	%	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (West Pennines (England))	Medium	Pass
Based on:		
Overshading	Average	
Windows facing North East	11.34 m ² , No overhang	
Air change rate	1.40 ach	
Blinds/curtains	None	

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m ² K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)		
Maximum	10.0		Pass

10 Key features

Party wall U-value	0.00	W/m ² K	
Air permeability	3.0	m ³ /m ² h	

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)



Property Reference	000853	Issued on Date	22/09/2020
Assessment Reference	001_26_V2	Prop Type Ref	Apt 26
Property	Apt 26, Laystall Street, MANCHESTER		
SAP Rating	85 B	DER	20.23
Environmental	87 B	TER	22.03
CO ₂ Emissions (t/year)	1.05	% DER<TER	8.17
General Requirements Compliance	Pass	DFEE	26.79
		TFEE	30.45
		% DFEE<TFEE	12.02
Assessor Details	Mr Ian Owen, Clancy Consulting, Tel: 0161-613-6000, ian.owen@clancy.co.uk		Assessor ID
			C580-0001
Client	Clancy Consulting, Clancy		

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	22.03	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	20.23	kgCO ₂ /m ²	Pass
	-1.80 (-8.2%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	30.45	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	26.79	kWh/m ² /yr	
	-3.6 (-11.8%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.17 (max. 0.30)	0.17 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	Pass

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)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Room heaters - Electric Water or Oil filled radiators	
Secondary heating system	None	

5 Cylinder insulation

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)

Hot water storage Measured cylinder loss: 0.91 kWh/day Pass

Permitted by DBSCG 1.89

Primary pipework insulated No primary pipework

6 Controls

Space heating controls Programmer and room thermostat Pass

Hot water controls Cylinderstat Pass

7 Low energy lights

Percentage of fixed lights with low-energy fittings 100 %

Minimum 75 % Pass

8 Mechanical ventilation

Continuous supply and extract system

Specific fan power 0.46

Maximum 1.5 Pass

MVHR efficiency 92 %

Minimum 70 % Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (West Pennines (England)) Medium Pass

Based on:

Overshading Average

Windows facing North East 9.45 m², No overhang

Air change rate 1.40 ach

Blinds/curtains None

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type U-value

Filled Cavity with Edge Sealing 0.00 W/m²K Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals 3.00 (design value)

Maximum 10.0 Pass

10 Key features

Party wall U-value 0.00 W/m²K

Air permeability 3.0 m³/m²h

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)

Property Reference	000854	Issued on Date	22/09/2020
Assessment Reference	001_86_V2	Prop Type Ref	Apt 86
Property	Apt 86, Laystall Street, MANCHESTER		
SAP Rating	81 B	DER	27.12
Environmental	82 B	% DER<TER	-5.98
CO ₂ Emissions (t/year)	1.35	DFEE	40.67
General Requirements Compliance	Fail	% DFEE<TFEE	3.92
Assessor Details	Mr Ian Owen, Clancy Consulting, Tel: 0161-613-6000, ian.owen@clancy.co.uk		Assessor ID
Client	Clancy Consulting, Clancy		C580-0001

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity	
Fuel factor	1.55 (electricity)	
Target Carbon Dioxide Emission Rate (TER)	25.59	kgCO ₂ /m ²
Dwelling Carbon Dioxide Emission Rate (DER)	27.12	kgCO ₂ /m ²
Excess emissions	1.53 (6.0%)	kgCO ₂ /m ²

Fail

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	42.33	kWh/m ² /yr
Dwelling Fabric Energy Efficiency (DFEE)	40.67	kWh/m ² /yr
	-1.6 (-3.8%)	kWh/m ² /yr

Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.17 (max. 0.30)	0.17 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Roof	0.14 (max. 0.20)	0.14 (max. 0.35)	Pass
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	Pass

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)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Room heaters - Electric Water or Oil filled radiators	
Secondary heating system	None	

5 Cylinder insulation

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)

Hot water storage Measured cylinder loss: 0.91 kWh/day **Pass**

Permitted by DBSCG 1.89

Primary pipework insulated No primary pipework

6 Controls

Space heating controls Programmer and room thermostat **Pass**

Hot water controls Cylinderstat **Pass**

7 Low energy lights

Percentage of fixed lights with low-energy fittings 100 %

Minimum 75 % **Pass**

8 Mechanical ventilation

Continuous supply and extract system

Specific fan power 0.46

Maximum 1.5 **Pass**

MVHR efficiency 92 %

Minimum 70 % **Pass**

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (West Pennines (England)) Medium **Pass**

Based on:

Overshading Average

Windows facing North East 9.45 m², No overhang

Air change rate 1.20 ach

Blinds/curtains None

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type U-value

Filled Cavity with Edge Sealing 0.00 W/m²K **Pass**

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals 3.00 (design value)

Maximum 10.0 **Pass**

10 Key features

Party wall U-value 0.00 W/m²K

Air permeability 3.0 m³/m²h

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)



Property Reference	000855			Issued on Date	22/09/2020
Assessment Reference	001_88_V2	Prop Type Ref	Apt 88		
Property	Apt 88, Laystall Street, MANCHESTER				
SAP Rating	79 C	DER	29.39	TER	27.15
Environmental	81 B	% DER<TER	-8.24		
CO ₂ Emissions (t/year)	1.48	DFEE	44.88	TFEE	48.08
General Requirements Compliance	Fail	% DFEE<TFEE	6.66		
Assessor Details	Mr Ian Owen, Clancy Consulting, Tel: 0161-613-6000, ian.owen@clancy.co.uk			Assessor ID	C580-0001
Client	Clancy Consulting, Clancy				

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	27.15	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	29.39	kgCO ₂ /m ²	
Excess emissions	2.24 (8.3%)	kgCO ₂ /m ²	Fail

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	48.08	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	44.88	kWh/m ² /yr	
	-3.2 (-6.7%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.17 (max. 0.30)	0.17 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Roof	0.14 (max. 0.20)	0.14 (max. 0.35)	Pass
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	Pass

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)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Room heaters - Electric Water or Oil filled radiators	
Secondary heating system	None	

5 Cylinder insulation

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)



Hot water storage	Measured cylinder loss: 0.91 kWh/day Permitted by DBSCG 1.89	Pass
Primary pipework insulated	No primary pipework	

6 Controls

Space heating controls	Programmer and room thermostat	Pass
Hot water controls	Cylinderstat	Pass

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass

8 Mechanical ventilation

Continuous supply and extract system			
Specific fan power	0.46		
Maximum	1.5		Pass
MVHR efficiency	92	%	
Minimum	70	%	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (West Pennines (England))	Medium	Pass
Based on:		
Overshading	Average	
Windows facing North East	9.45 m ² , No overhang	
Air change rate	1.20 ach	
Blinds/curtains	None	

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m ² K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)		
Maximum	10.0		Pass

10 Key features

Party wall U-value	0.00	W/m ² K	
Air permeability	3.0	m ³ /m ² h	

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)

Property Reference	000856	Issued on Date	22/09/2020
Assessment Reference	001_20_V2	Prop Type Ref	Apt 20
Property	Apt 20, Laystall Street, MANCHESTER		
SAP Rating	84 B	DER	22.90
Environmental	86 B	TER	23.37
CO ₂ Emissions (t/year)	1.03	% DER<TER	2.02
General Requirements Compliance	Pass	DFEE	30.25
		TFEE	32.37
		% DFEE<TFEE	6.54
Assessor Details	Mr Ian Owen, Clancy Consulting, Tel: 0161-613-6000, ian.owen@clancy.co.uk		Assessor ID
			C580-0001
Client	Clancy Consulting, Clancy		

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	23.37	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	22.90	kgCO ₂ /m ²	Pass
	-0.47 (-2.0%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	32.37	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	30.25	kWh/m ² /yr	
	-2.1 (-6.5%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.17 (max. 0.30)	0.17 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	Pass

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)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Room heaters - Electric Water or Oil filled radiators	
Secondary heating system	None	

5 Cylinder insulation

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)

Hot water storage	Measured cylinder loss: 0.86 kWh/day Permitted by DBSCG 1.70	Pass
Primary pipework insulated	No primary pipework	

6 Controls

Space heating controls	Programmer and room thermostat	Pass
Hot water controls	Cylinderstat	Pass

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass

8 Mechanical ventilation

Continuous supply and extract system			
Specific fan power	0.39		
Maximum	1.5		Pass
MVHR efficiency	93	%	
Minimum	70	%	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (West Pennines (England))	Medium	Pass
Based on:		
Overshading	Average	
Windows facing South East	9.45 m ² , No overhang	
Windows facing South West	3.78 m ² , No overhang	
Air change rate	1.90 ach	
Blinds/curtains	None	

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m ² K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)		
Maximum	10.0		Pass

10 Key features

Party wall U-value	0.00	W/m ² K
Air permeability	3.0	m ³ /m ² h

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)

Property Reference	000857				Issued on Date	22/09/2020
Assessment Reference	001_80_V2			Prop Type Ref	Apt 80	
Property	Apt 80, Laystall Street, MANCHESTER					
SAP Rating	80 C	DER	28.66	TER	26.39	
Environmental	82 B	% DER<TER	-8.61			
CO ₂ Emissions (t/year)	1.27	DFEE	42.14	TFEE	42.50	
General Requirements Compliance	Fail	% DFEE<TFEE	0.85			
Assessor Details	Mr Ian Owen, Clancy Consulting, Tel: 0161-613-6000, ian.owen@clancy.co.uk				Assessor ID	C580-0001
Client	Clancy Consulting, Clancy					

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	26.39	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	28.66	kgCO ₂ /m ²	
Excess emissions	2.27 (8.6%)	kgCO ₂ /m ²	Fail

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	42.50	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	42.14	kWh/m ² /yr	
	-0.4 (-0.9%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.17 (max. 0.30)	0.17 (max. 0.70)	Pass
Party wall	0.00 (max. 0.20)	-	Pass
Roof	0.14 (max. 0.20)	0.14 (max. 0.35)	Pass
Openings	1.40 (max. 2.00)	1.40 (max. 3.30)	Pass

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)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Room heaters - Electric Water or Oil filled radiators	
Secondary heating system	None	

5 Cylinder insulation

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)

Hot water storage	Measured cylinder loss: 0.86 kWh/day Permitted by DBSCG 1.70	Pass
Primary pipework insulated	No primary pipework	

6 Controls

Space heating controls	Programmer and room thermostat	Pass
Hot water controls	Cylinderstat	Pass

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100	%	
Minimum	75	%	Pass

8 Mechanical ventilation

Continuous supply and extract system			
Specific fan power	0.39		
Maximum	1.5		Pass
MVHR efficiency	93	%	
Minimum	70	%	Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (West Pennines (England))	Medium	Pass
Based on:		
Overshading	Average	
Windows facing South East	9.45 m ² , No overhang	
Windows facing South West	3.78 m ² , No overhang	
Air change rate	1.60 ach	
Blinds/curtains	None	

Criterion 4 – Building performance consistent with DER and DFEE rate

Party Walls

Type	U-value		
Filled Cavity with Edge Sealing	0.00	W/m ² K	Pass

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)		
Maximum	10.0		Pass

10 Key features

Party wall U-value	0.00	W/m ² K
Air permeability	3.0	m ³ /m ² h