

# Design SAP Calculation Report – Part L1b 2013

**Client:** AAIP Partnership

**Architects:** Archer Architects

**Site:** 55 Newton Street,  
Manchester,  
M1 1ET

**Issue:** 0.0

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## Report Details:

| Prepared by               | Project No. | Date       |
|---------------------------|-------------|------------|
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**Proposals:** Conversion of 4-storey office block into a single townhouse

## **1 Introduction**

This report has been prepared in support of the building regulations approval Part L1B 2013. As requested by AAIP Partnership, SAP 2012 assessments and Predicted Energy Performance Certificates (EPC's) have been carried out on the above development. In contrast to L1A new build property, the properties have been assessed by L1B guideline for existing buildings for the conservation of fuel and power. Below is the information on how to demonstrate compliance with L1B and the performance of the buildings compared with the standards set out by L1B.

This report demonstrates how the dwelling will meet current Building Regulation requirements for Part L1b conservation of fuel and power for energy efficiency in dwellings.

## **2 Existing and Proposed Development**

The site is located on land to 55 Newton Street and the corner of Bradley Court, Manchester.

As previously detailed, proposals are for the conversion of an existing four storey office block into a single town house.

The proposed dwelling will face in a south westerly direction. The building is adjacent a taller block of commercial and residential flats to the north west side and there are flats to the rear of the building.



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### **3 SAP 2012 and Building Regulations (2013)**

The Standard Assessment Procedure (SAP) 2012 is the UK Government methodology for assessing and calculating the energy performance of dwellings.

The SAP calculation takes into account a range of factors that contribute to energy efficiency, including:

- Materials used for the construction of the dwelling and the thermal insulation of building fabric (u-values<sup>1</sup>)
- Ventilation of the dwelling
- Efficiency and control of heating systems
- Fuel used to provide space heating
- Lighting
- Heat recovery systems
- Renewable technologies

Approved Document Part L of current Building Regulations (2013) addresses the conservation of fuel and power. Part L is divided into four separate documents:

- Part L1A Newly Constructed Dwellings
- Part L1B Existing Dwellings
- Part L2A Newly Constructed Non - Dwellings
- Part L2B Existing Non - Dwellings

Part L1b sets out the minimum energy efficiency requirements for **existing dwellings** and is based on the SAP methodology.

To comply with Part L1b, the SAP calculation should demonstrate how the dwelling will either meet or achieve a reduction in the Dwelling CO<sub>2</sub> Emission compared with a notional dwelling of the same dimensions.

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<sup>1</sup> U-values (Thermal Transmittance) - the measure of the overall rate of heat transfer by all mechanisms under standard conditions, through a particular section of a construction. Lower u-values mean better thermal insulation

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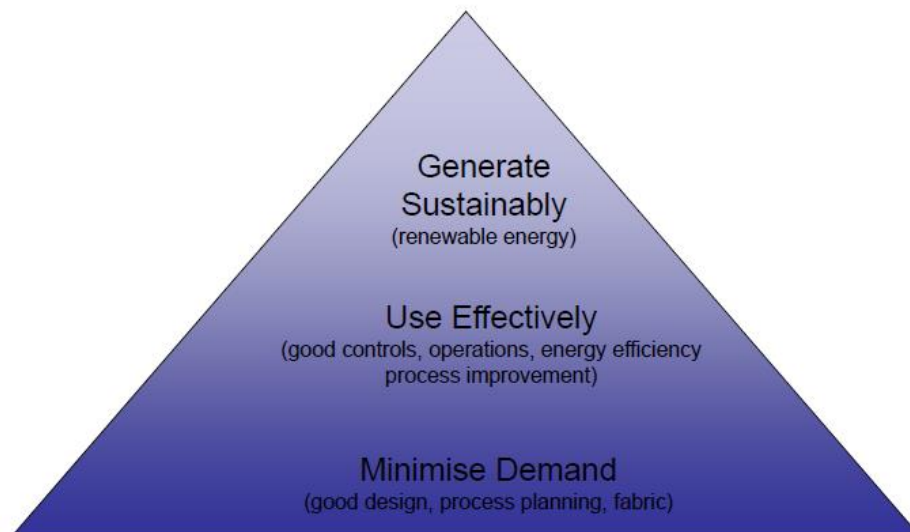
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## Proposed Strategy

- Minimise demand
- Energy Efficient controls
- Generate energy

## The Energy Hierarchy

Useful improvements can be made at all levels, but maximum benefits will be achieved if we focus first on minimising total energy requirements, then look at making better use of the energy we currently use, before thinking about how best to generate it.



## 4 SAP Calculation Scenario (Part L1B Compliance)

In order to ensure that the dwelling meets (or exceeds) the minimum standards as set out in Part L1b, the following measures are proposed:

### Fabric standards

Insulation - good levels of insulation with u-values exceeding Part L1b requirements (see Table 1)

**Table 1: Fabric Standards (u-values W/m<sup>2</sup>K) Existing**

|                         | Part L1B Limiting Parameters | Proposed Dwelling |
|-------------------------|------------------------------|-------------------|
| Ground Floor            | 0.25                         | 0.22              |
| External Walls          | 0.3                          | 0.34              |
| External wall to refuse | 0.3                          | 0.3               |
| Roof pitched and flat   | 0.18                         | 0.18              |
| Windows existing        | 1.6                          | 2.7               |
| Windows new             | 1.6                          | 1.6               |

### Thermal Bridging

Accredited Construction Details are not assessed under Part L1B, however ACD provide guidance on the continuity of insulation and therefore apply a significant improvement factor on the energy performance of a dwelling.

### Ventilation

An air test is not required under Part L1B. An air tightness design figure of 10@50Pa is proposed

Good air leakage sealing of the building will provide a reduction in energy demand

Mechanical ventilation – decentralised extractor fans

## Heating and Controls

Heating controls and hot water system are to meet the minimum set out by the guidance in the domestic heating and compliance guide, e.g. 88% for gas boilers. All pipework is to be fully insulated. The heating system is proposed to be

|            | Heating specifications                             |
|------------|----------------------------------------------------|
| Type       | System Boiler                                      |
| Model      | To be confirmed                                    |
| Fuel       | Gas                                                |
| Efficiency | 89%                                                |
| Controls   | Time / temp zone control, delayed start thermostat |

## Lighting

Minimum standard - Fixed energy efficient lighting is required that numbers no less than the greater of 75% dedicated low energy light fittings. Low energy lights to have a minimum of 45lumens per circuit watt. The design of the dwelling/s allows for natural daylight which will reduce the energy use from internal lighting. All internal lighting will be low energy. The above specification has been incorporated into the baseline SAP calculation; the results are summarised in Table 2

## Renewable Energy

Due to the limited space inside the dwelling and limited external private space, there are no suitable renewable or low carbon technologies. Furthermore, due to the roof layout and rooflights, solar PV panels would not be suitable.

## **5 Conclusion**

There are proposals for the conversion of an existing office building into a four storey town house on land to 55 Newton Street, Manchester.

The proposed dwellings will need to comply with Part L1b 2013 and the design SAP calculation has been used to demonstrate compliance, below are the dwelling CO2 emissions compared with the Notional standard based on Part L1b 2013 regulations.

**Table 2: Carbon Emissions SAP Calculation Results**

| <b>Properties</b> | <b>Actual CO2 emissions<br/>(t/p.a.)</b> | <b>Notional CO2 emissions<br/>(t/p.a.)</b> | <b>SAP Calculation<br/>Compliance</b> | <b>EPC Rating</b> |
|-------------------|------------------------------------------|--------------------------------------------|---------------------------------------|-------------------|
| <b>1</b>          | 2.34                                     | 2.71                                       | Yes                                   | 80 C              |

SAP 2012 has been used to calculate the CO2 emissions to meet Building Regulation requirements and the results are shown in the above table. In conclusion the properties have passed the SAP assessment and comply with part L1B conservation of fuel and power in existing dwellings. Furthermore, the dwellings are showing an 18.5% reduction in CO2 emissions over the Part L1b notional calculation through a fabric first approach with improved air tightness.