Technical Note 105

England 2021 Building Regulation Overview – Energy performance

Introduction

1 This Technical Note introduces the reader to the thermal performance criteria for building envelopes as set out in the 2021 England Building Regulation guidance and Approved Documents F, L and O (ADF, ADL and ADO).

2 This note is intended to give some context as to how the building envelope influences the different compliance criteria as well as some key points to consider for limiting heat gains and losses.

3 The note is primarily focused on aspects relating to Requirement L1 Conservation of fuel and power, item (a) *limiting heat gains and losses*, sub-item (i) *through thermal elements and other parts of the building fabric*.

4 It should be noted that in addition to the guidance and requirements discussed below, there is also a requirement to consider high-efficiency alternative systems. This should include considering high performance building envelopes.

Primary energy and emission rates

5 In order to demonstrate compliance with the energy requirements outlined within Approved Document L (ADL), the design and later as-built building must achieve or better the target primary energy rate and the CO_2 emission rate. The primary energy rate is based purely on the building's operational energy use. Improving overall efficiencies and performance is necessary to improve the primary energy rate. The CO_2 emission rate is associated with the operational energy use but is based on the resulting CO_2 emission associated with producing that energy. As such, improving the building's overall performance as well as utilising renewable energy sources such as on-site photovoltaic panels will improve this rate.

6 These two rates are based on the building's space heating, space cooling, ventilation, and lighting requirements. Improved building fabric performance in these areas can offset building services requirements and reduce operational energy use and emissions. The primary energy and CO_2 emission rates are outlined within ADL and the '*Standard Assessment Procedure* (SAP)' for dwellings or '*National Calculation Methodology (NCM) modelling guide (for buildings other than dwellings in England)'* for buildings other than dwellings.

7 The following will typically improve these rates:

- Improving thermal performance, e.g., lower U-values and reduced thermal bridging;
- Improving airtightness of the building fabric, e.g., lower air-permeability;
- Reducing heat gains (to reduce cooling loads), e.g., reducing solar heat gains with shading and/or selective glazing;
- Improving natural lighting, e.g., daylighting windows, rooflights and similar.