Energy Performance Standards for Modular and Portable Buildings

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1.Introduction

This document provides supporting information and assistance in how to respond to the special considerations given to modular and portable buildings listed within the Building Regulations Approved Document L-2A (2006)*: New buildings that are not dwellings*

The special considerations relating to the design and construction of modular/portable buildings listed in Section 0 of the Approved Document are shown below. *(The considerations relating to pressure testing of single modular and portable buildings are covered in section 4 of this document).*

Modular buildings

Special considerations apply to modular and/or portable buildings in those situations where the intended life of the building is more than two years.

"Temporary buildings with a planned time of use of two years or less" are exempt from the energy efficiency requirements - see paragraph 17. The hire contract could be suitable evidence of the intended life.

Where more than 70% of the external envelope is to be created from sub-assemblies manufactured before 06 April 2006, Part L and regulation 17C apply. In such situations, reasonable provision would be to follow the guidance in Energy Performance Standards for Modular and Portable buildings. In all other cases, the guidance given in this Approved Document should be followed.

Ways of showing compliance with these requirements are described in *"Energy Performance Standards for Modular and Portable Buildings published by the Modular and Portable Building Association and available @ www.mpba.biz*

The ODPM has accepted that modular and portable buildings have unique energy efficient properties and this is recognised in the special considerations applied to them in ADL-2A. This MPBA document provides further explanation of those considerations and a step-by-step flowchart on how to demonstrate compliance when approving a modular and/or portable building.
The unique characteristic possessed by modular and portable buildings is that the embodied energy required to manufacture them is transportable. The

embodied energy of both traditional and modular and portable buildings is locked into their fabric. In traditional buildings this is largely lost when they are no longer required and demolished, even when the materials are re-cycled, however, with modular and/or portable buildings the embodied energy can be relocated along with the modules to another site.

Where a modular and/or portable building is relocated, with minimal alteration, the amount of energy used is less than three percent of the energy that would be required to manufacture an equivalent new building. Even when the modular building is refurbished and reconfigured internally, the energy used is no more than ten percent of the energy that would be required to create a new modular building.

An independent report prepared by Ove Arup[1] (*available from the MPBA website* www.mpba.biz) confirms the above data and the unique embodied energy characteristic of modular and portable buildings.

2.Definitions

The Approved Document uses the following terms and those terms have the meanings set out below:-

Sub assemblies – these are clearly identifiable elements manufactured from a number of components but not the components or raw materials themselves. They can be single or multiple volumetric modules or flat pack modules.

Modular/Portable Buildings – Prefabricated buildings, which are designed for delivery to site as sub assemblies, connected together and completed on site. These buildings can also be disassembled into their sub assemblies, when no longer required, and transported to another location and reassembled.

Single Module Building – A modular/portable building, which is factory produced as a single finished module with four external walls and requiring no site assembly work.

Ref: 1 Ove Arup Report No.117088, dated Jan 2005 "CO_2 emissions from use, scrapping and the manufacture of modular buildings

3.Further Explanation of Special Considerations

3.1 Existing modular and portable buildings to be re-sited for greater than 2 years

3.1.1. Buildings created where more than 70% of the external envelope is from existing sub-assemblies manufactured before 1st April 2002. Reasonable provision would be if the sub assemblies comply with the standards given in the 1995 edition of Approved Document L.

3.1.2. Buildings created where more than 70% of the external envelope is from existing sub-assemblies manufactured between 1st April 2002 and 6th April 2006. Reasonable provision would be if the sub assemblies comply with the standards given in the 2002 edition of Approved Document L (see also the note* below).

3.2 New or existing modular/portable buildings to be sited for less than 2 years

These are exempt from the energy efficiency requirements – see paragraph 17 and therefore do not need to conform to the requirements of Approved Document L2A. However, it is recommended by the MPBA that these such building should conform to a minimum standard equal to the requirements stated within the 2002 edition of Approved Document L2

3.3 Modular/portable buildings to be sited for more than 2 years created from sub-assemblies manufactured after 06 April 2006

The above special considerations do not apply to buildings, which are to be created wholly from new sub-assemblies manufactured after 6th April 2006, or where **more** than 30% of the external envelope is from new sub-assemblies manufactured after 6th April 2006. For compliance in these cases the guidance in the Approved Document **must** be used.

Note As a further supplement to section 1.76 of ADL (2002) the calculated annual carbon emissions from the proposed building can be obtained from the calculation tool described in section 1 and criteria 1 of Approved Document ADL-2A (2006). Reasonable provision would be if the proposed design BER (Building Emissions Rate) is less than or equal to the CO_2 emissions rate of the notional building (C-Notional) excluding any 2006 improvement factor.*

4.Demonstrating Compliance

4.1 Compliance flowchart

The flowchart shown in figure 1 is a simple step-by-step process that demonstrates reasonable provision for compliance.

4.2 Pressure testing of small modular and portable buildings

The following special consideration is given to Single Module Buildings

Section 2: Criterion 4

Factory-made modular buildings where no site assembly work is needed; in this case, it can be assumed that the standard of airtightness for its module type had been achieved, provided that third party accreditation approval had demonstrated through site based testing, that the design air permeability is routinely achieved.

Site based testing is necessary to demonstrate the building is sufficiently robust to resist flexure during lifting and transportation

Single module buildings that require no site assembly work, can avoid the need for a pressure test if a suitable type approval is achieved. This approval must be part of an overall type approval certificate e.g. BBA, BRE Certification, LANTAC or similar and show the results of a pressure test programme carried out in accordance with the ATTMA guidance document and caveat below, see *. The result, which must be equal or better than the minimum standard can then, be used in the calculation of the target and actual CO_2 emission rate.

**Each test must be carried out on a finished unit as built and sited. A total of five tests should be carried out on separate units and the type approval result should be given as the average of the five results plus 1 $m^3/m^2.hr$*

Further clarification on the interpretation of this document can be obtained from the MPBA direct @ www.mpba.biz

FLOWCHART TO SHOW COMPLIANCE WITH ADL-2A (2006) FOR MODULAR / PORTABLE BUILDINGS

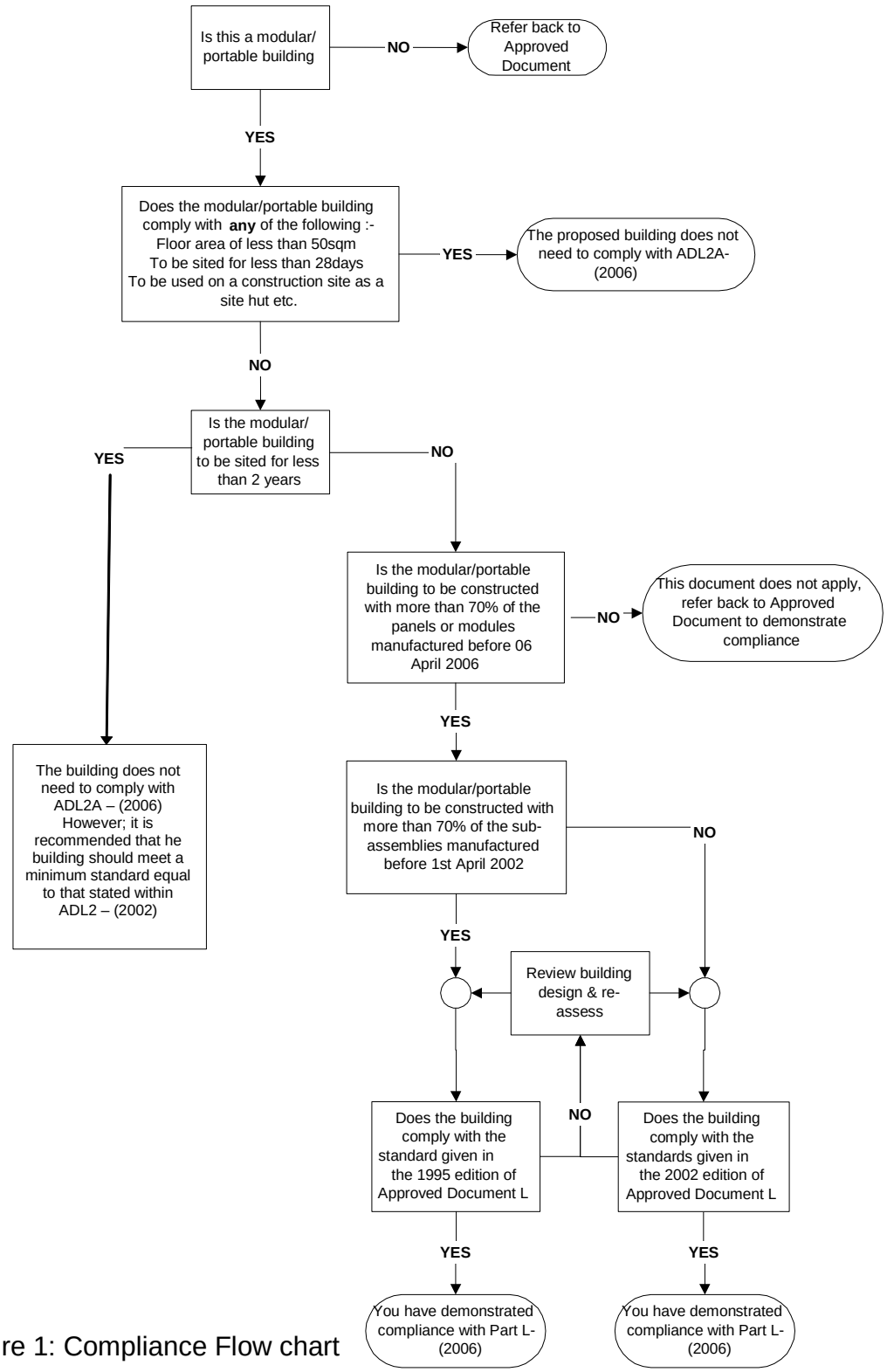

Figure 1: Compliance Flow chart