

Regulatory and other barriers to overcome

Rupert Scott

Regulations and Codes Consultant

How do I keep you interested
with a title like that?!

Services by BM TRADA Group



Non-standard testing



Air tightness testing




Product certification

BM TRADA

CE

Publications

Sunderland Aquatic Centre
Swimming pool with glulam roof structure



Project Information

Completion date: 2008
Building type: Swimming pool
Location: Sunderland, Tyne and Wear
Client: Sunderland City Council
Architect: Red Box Architecture
Main Contractor: Anp (Newcastle upon Tyne)
Installer of timber: Balbour Beatty Construction
LVL supplier: Wehag (Austria)
Timber element: Glulam timber beams
Timber species: Spruce

Introduction

The £19.8 million Aquatic Centre, the largest in the North East, is the first phase of a development of sport and educational facilities for Sunderland. The 50 metre pool, together with its diving pool and Wellness Centre, is the only facility of its type between Leeds and Edinburgh. The building is on a site formerly occupied by a part of Sunderland's past, the Monkwearmouth Colliery, and stands next to the Sunderland football stadium. It is designed to act as a regional hub for swimming events – performance swimming, diving, synchronised swimming and water polo – as well as attracting national and regional events to Sunderland. It will also act as a community pool, providing facilities for local schools and fostering young talent. The state-of-the-art Wellness Centre will, it is hoped, increase participation in exercise and, through support and learning, encourage the community to choose a healthy lifestyle.

Building design

The building houses a 50m wide pool, 25m wide with floor and a movable purpose diving tank and a variety of diving seating for 500 spectators. The building is designed to be a hub for swimming events – performance swimming, diving, synchronised swimming and water polo – as well as attracting national and regional events to Sunderland. It will also act as a community pool, providing facilities for local schools and fostering young talent. The state-of-the-art Wellness Centre will, it is hoped, increase participation in exercise and, through support and learning, encourage the community to choose a healthy lifestyle.

The shape of the pool, curved laminated timber, over 50 metres across, provides a space for the circulation of air. This helps avoid any air-borne chemical surface and away from the pool, and support the structure.

(Continued page 4)

Case Study | Sunderland Aquatic Centre

TRADA

TIMBER IN CONTEMPORARY ARCHITECTURE

A DESIGNER'S GUIDE

**PETER ROSS
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IN ASSOCIATION WITH

RIBA Publishing

TRADA CONSTRUCTION BRIEFINGS

Lifetime Homes Standard

A Summary of the Standard & Comparison with Part M

1 Introduction

Energy efficiency has dominated the headlines in recent years, the issue of accessible and inclusive design arguably set to make a bigger impact on the design in the coming years.

The Lifetime Homes (LTH) specification, developed in 1980s by a group of housing organisations including the Housing Association and the Joseph Rowntree Foundation, has received increased attention in recent years. It is being built into the specification of the Sustainable Homes (CSH) – see separate construction briefing on this. A revision in 2008 of the LTH specification means that LTH is no longer just a means of collecting the much needed points, but a means of ensuring that the LTH specification both to the standards within CSH and also to England's housing standards is summarised below.

The Standard is based on 16 design criteria, which relate to either accessibility or enabling adaptability. The dwelling can be best suited to householders who are a member of the household experiences mobility. A common theme running through the 16 requirements is the better use of / need for space in order to increase accessibility. Space of course costs money and so good design will be even more crucial than it has been.

The implications for dwelling design are far more (but not all) of the Criteria are similar to regulation Part M requirements and thankfully specification is relatively straightforward and which cannot be said for some of the other design published recently!

Based on why the LTH standards are greater than Part M, the LTH specification is a good reference point for using the LTH specification in conjunction with UK building regulations. The LTH specification is a good reference point for using the LTH specification in conjunction with UK building regulations. The LTH specification is a good reference point for using the LTH specification in conjunction with UK building regulations.

Provision for a future stairlift is one of the requirements of LTH. Photo courtesy of Stannah Stairlifts Ltd

2008	LTH specification a mandatory requirement for those seeking CSH level 6.
2011	LTH specification a mandatory requirement for those seeking CSH level 4 and above. All new social housing to meet the LTH specification.
2013	LTH specification a mandatory requirement for those seeking CSH level 3 and above. All new private housing to meet the LTH specification.

Phasing in the LTH specification and England's new housing policy

Homes Standard Summary

Nov 2008 (Version 1)

1

Research



Setting the scene

- Enormous drivers for increased energy efficiency – new and existing buildings
- Many (but not all) believe: fabric 1st, equipment 2nd
- Enormous market:
 - 25 million homes x £40k
 - = £1 trillion
- Many hurdles – need to understand the rules of the construction game to make money.

Building Regulations: Part L: Energy



CONSTRUCTION BRIEFINGS

England & Wales Building Regulations: Part L1A Conservation of Fuel and Power: New Dwellings *A Detailed Summary of the Requirements*

Effective from April 2006 in England & Wales

1 Introduction

The 2006 edition of Approved Document L1A became effective in April 2006. It seeks to conserve the amount of energy used by buildings in their day-to-day usage. It achieves this by addressing all the key issues which affect fuel usage throughout the seasons (including cooling in hot summer periods).

2 Scope

This Construction Briefing is only intended to give an overview of the requirements for Part L1A. For details of where to obtain the full requirements please see 'Useful resources' on the back page.

There are 4 parts to Approved Document L (Conservation of fuel and power):

Part L1A **Construction of new dwellings**

Part L1B **Alteration of existing dwellings**

This Construction Briefing addresses this area only.

Part L2A **Construction of new non-dwellings**
i.e. commercial properties, factories etc

Part L2B **Alteration of non-dwellings**

Certain listed buildings and those in conservation areas are exempt from meeting the requirements of Approved Document L. Please contact your local authority to determine if this is the case.



Air tightness testing being performed by Chiltern Dynamics (sister company to TRADA Technology)

E&W Pt L1A Detailed summary of requirements

Apr 2009 (Version 2)

1



CONSTRUCTION BRIEFINGS

England & Wales Building Regulations: Part L1B Conservation of Fuel and Power: Existing Dwellings *A Summary of the Requirements*

Effective from April 2006 in England & Wales

1 Introduction

Approved Document L1B (AD L1B) seeks to improve the energy efficiency of existing dwellings as and when they are renovated, extended or altered. Because we are only adding a small percentage to our housing stock each year, improvements are necessary to existing housing if we are to make an appreciable improvement to the energy requirements of the nation's dwellings.

Part L1B takes a component approach, defining minimum standards for specific elements of a dwelling (e.g. walls, doors etc). This is in contrast to Part L1A for new dwellings, which sets an overall energy efficiency target for the building as a whole.

Part L1B is most concerned with the building elements listed to the right.

Element	These affect a building's ability to:
External walls, roofs and floors	Retain heated or cooled air
Windows and doors	Retain heated or cooled air and prevent excessive solar gain in Summer
Hot water and heating systems, mechanical ventilation and cooling systems and lighting	Use energy efficiently in heating, cooling and lighting a house



TRADA Technology consultant assessing the moisture conditions of timber members for barn conversion

E&W Pt L1B Summary of requirements

Apr 2009 (Version 2)

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Functional goals of Part L

CONSERVATION OF FUEL AND POWER IN NEW DWELLINGS

L1A

The Requirement

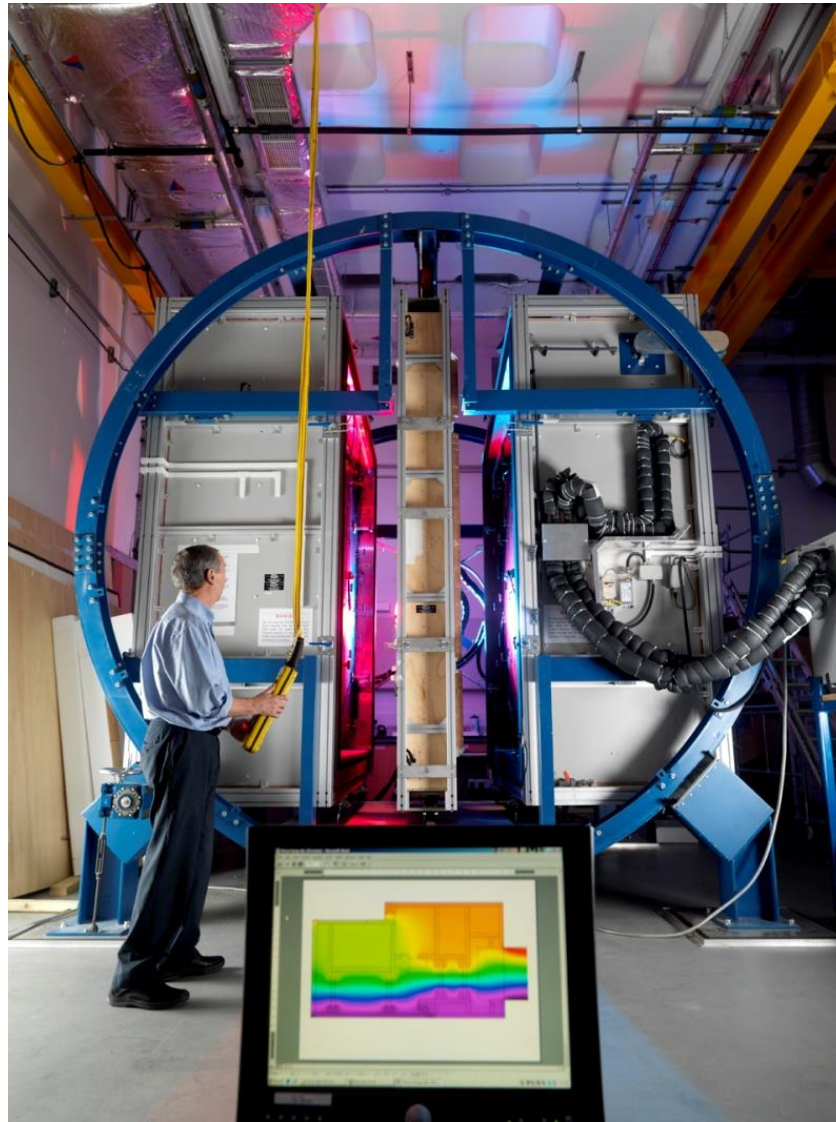
This Approved Document, which takes effect on 6 April 2006, deals with the energy efficiency requirements in the Building Regulations 2000 (as amended by SI 2001/3335 and SI 2006/652). The energy efficiency requirements are conveyed in Part L of Schedule 1 to the Regulations and regulations 4A, 17C and 17D as described below.

<i>Requirement</i>	<i>Limits on application</i>
Part L Conservation of fuel and power	
L1. Reasonable provision shall be made for the conservation of fuel and power in buildings by:	
a. limiting heat gains and losses:	
i. through thermal elements and other parts of the building fabric; and	
ii. from pipes, ducts and vessels used for space heating, space cooling and hot water services;	
b. providing and commissioning energy efficient fixed building services with effective controls; and	
c. providing to the owner sufficient information about the building, the fixed building services and their maintenance requirements so that the building can be operated in such a manner as to use no more fuel and power than is reasonable in the circumstances.	

Functional goals of Part L

- For new build - Whole building –which seems sensible
- Performance measured in CO₂, not kWh
- No clear target for individual elements – all are ‘traded’ against one another
- For dwellings, SAP software is used to set the target as well as determine if the target is met. It is not a linear relationship between energy or CO₂ and building dimensions.
- SAP only really looks at U-values and g-values for building elements.

VIPs perform well in the guarded hot box



Other factors affecting energy performance

- Air tightness (often provided by other materials, eg plastering)
- Air movement over insulation (reflected in proposed approach to Party Walls)
- Non-repeating linear thermal bridges (may be minimal with VIPs)
- Steady state measurements used, not dynamic
- Reality can often be out by a factor of 2.
- Consequence of the above – not a fair playing field

Functional testing

- Comparative testing undertaken because no absolute goals given.
- Comparative not liked by those being compared!



Existing buildings: Renovation

Element	(a) Threshold U-value	(b) Improved U-value 2006 edition	(b) Improved U-value 2010 edition
Wall – cavity insulation	0.7	0.55	0.55
Wall – external or internal insulation	0.7	0.35	0.3
Floor	0.7	0.25	0.25
Pitched roof – insulation at ceiling level	0.35	0.16	0.16
Pitched roof – insulation at rafter level	0.35	0.2	0.16
Flat roof or roof with integral insulation	0.35	0.25	0.16

See ADL1B: Table 5 and para 3.1


Existing buildings: Extensions

Element	2010 U-value required	2006 U-value required for extension	2006 U-value required for replacement
Wall	0.28	0.3	0.35
Pitched roof – insulation at ceiling level	0.16	0.16	0.16
Pitched roof – insulation at rafter level	0.16	0.2	0.2
Flat roof or roof with integral insulation	0.16	0.2	0.25
Floors	0.22	0.22	0.25
Swimming pool basins (new item)	0.25	N/A	N/A

See ADL1B: Table 4

Projections: 2010, 2013, 2016

- Zero carbon definition
 - Min 70% reduction on 2006 plus a 'tax'
- Addressing the reality gap
- Suspect there will be 3 different technical solutions for the 3 time periods
- For briefings see:
www.trada.co.uk – Regulations and Codes

**CONSTRUCTION BRIEFINGS**

CLG Part L and F Consultations, Summer 2009
A Summary of the Significant Proposed Changes

Consultation closes: 17 Sept 2009
To be published: Spring 2010
To take effect from: October 2010

1 General

1.1 Structure of documentation

The consultation consists of three volumes and the consultation versions of SAP and SBEM. All are accessible via the CLG consultation page although you can easily miss the links to the downloadable SAP and SBEM programs. They are in the top right corner of the page as "SAP and SBEM software including helpline". The other link "DECC SAP consultation" is for the technical consultation on how SAP2009 is proposed to work. The link is: <http://www.communities.gov.uk/publications/planningandbuilding/partl2010consultation>

The three volumes are:

Volume 1: Overall proposals

- Summary (who wrote this, dates, how to respond etc)
- Introduction
- Proposals for improving compliance
- Proposals for Accredited Construction Details
- Training and dissemination strategy
- Future thinking paper (looking at 2013 and zero carbon)
- Annex A – the legal aspects of consultations
- Annex B – the Impact Assessment
- Annex C – the response form with 113 questions


Volume 1 provides an overview of the proposals and the rationale supporting them. To establish the exact details it is necessary to read the proposed text given in Vol 2.

Volume 2: Proposed technical guidance for Part L

- Proposed AD L1A for new dwellings
- Proposed AD L1B for work in existing dwellings
- Proposed AD L2A for new buildings other than dwellings
- Proposed AD L2B for work in existing buildings other than dwellings

Volume 3: Proposed technical guidance for Part F

- Proposed AD F
- Proposed Domestic Ventilation Installation and Commissioning Compliance Guide



Air tightness testing by TRADA's sister organisation, Chiltern Dynamics

- Proposed changes to National Calculation Methodology
- Proposed Domestic Buildings Services Compliance Guide
- Proposed Non-Domestic Buildings Services Compliance Guide

CLG Part L and F Consultations, Summer 2009

Aug 2009 (Version 2)

1

What the Building Regulations don't address

- Longevity
- Assessment of the ease of repair and replacement
- Ease of extending
- Real performance (in the case of energy)
- Full assessment of condensation

Construction Products Directive (CPD)

- You have to meet the requirements of this.
- CE Marking is the intended method of communicating compliance – but is voluntary in UK
- Aim is to show fit for purpose
- Trading standards police this (but not well resourced)



6 Essential Requirements

- Fire
- Mechanical resistance
- Safety in use
- Protection against noise
- Energy economy
- Health, hygiene and environment
- (Durability)

Product assessed against:

- EN standard
- European Technical Approval (very long process)
- National certification mark

Mortgage lenders

- Risk business
- 60+ lifespan
- Concerned about LT effects on value of asset
- Traditional construction techniques – history provides the evidence
- Move to MMC cautiously embraced
- Employ few technical people

Loss Prevention Standard



Standard for Innovative Systems, Elements and Components for Residential Buildings

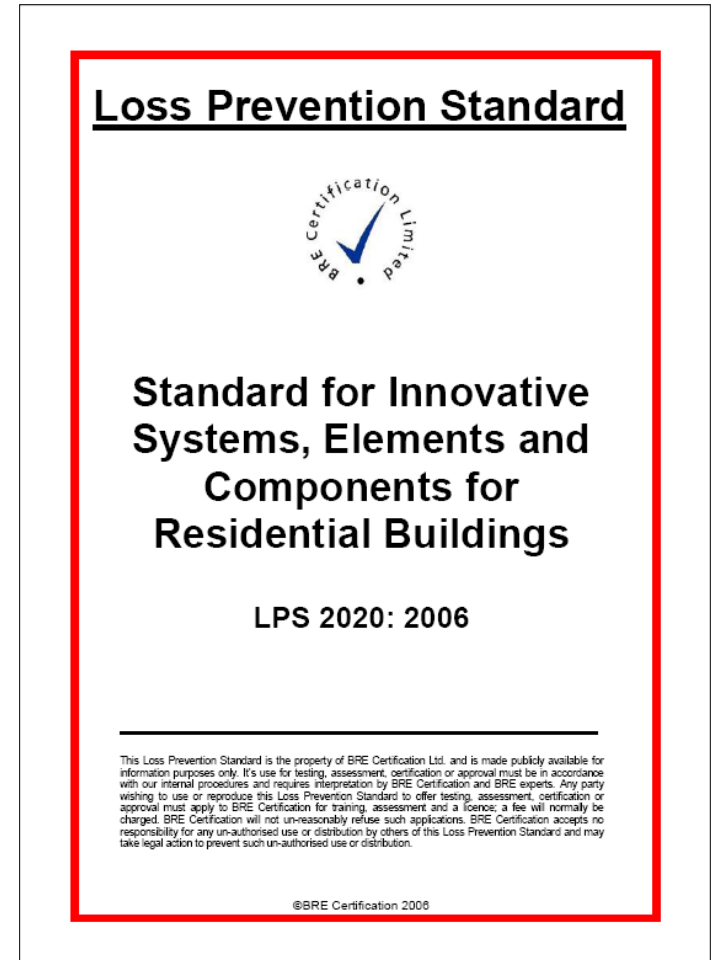
LPS 2020: 2006

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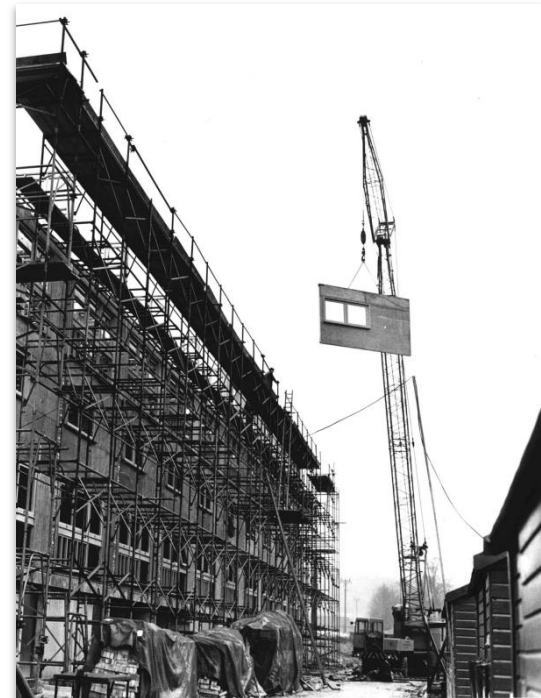
LPS2020 assessment areas

- Mechanical resistance
- Fire
- Hygiene, health, environment
- Safety in use
- Sound
- Energy economy
- Durability
- Buildability
- Practicality of repair and adaptability



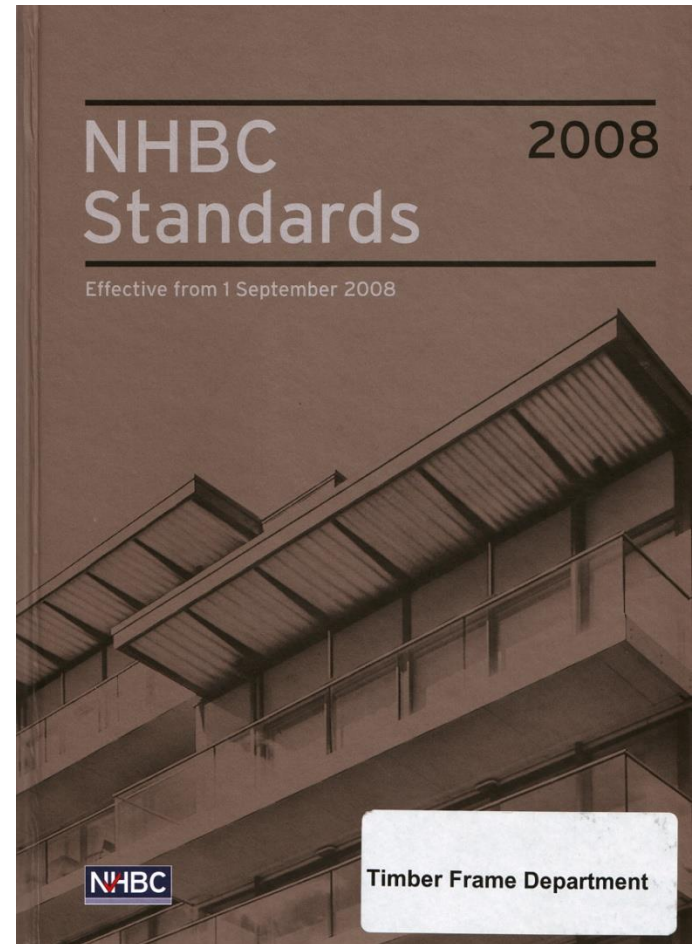
Q-Mark and assessment of elements

- Take up of LPS2020 not that great
- UK market generally doesn't sell a complete system
- Move from individual element / material to large composite elements
- Certification saves a lot of time spent trying to convince people



Warranty Providers

- NHBC, Zurich, Premier
- Insurance policy for builders against defects
- Years 3-10
- Quite a prescriptive approach – defined in a thick book!



NHBC Rules

R3 Materials requirement

All materials, products and building systems shall be suitable for their intended purpose

The structure of the home shall, unless specifically agreed otherwise in writing with NHBC, have a life of at least 60 years. Individual components and assemblies, not integral to the structure, may have a lesser durability and need planned maintenance, repair or replacement during that period.

Proper account shall be taken of the use and location of materials, products and building systems in relation to:

- durability of both the structure and individual components and assemblies
- geographical location
- position on the site
- position within the structure.

Materials, products and building systems will normally be acceptable if they comply with the following:

(a) **MATERIALS AND PRODUCTS USED FOR CRITICAL FUNCTIONS**

Functions critical to performance are: structure, fire resistance, weatherproofing, durability, thermal and sound insulation, services including heating appliances and flues.

Any of the following are acceptable:

- (i) performance in accordance with standards set by NHBC, or
- (ii) where no NHBC standard is set, compliance with the relevant British Standard or equivalent European Technical Specification approved by a Committee for Standardisation, provided they are used in accordance with the relevant Code of Practice, or
- (iii) compliance with standards not lower than those defined in a relevant British Standard specification or equivalent,

provided their use is accepted by NHBC, or

- (iv) satisfactory assessment by an appropriate independent technical approvals authority accepted by NHBC, including: British Board of Agrément (BBA), Building Research Establishment (BRE), or a body authorised under Annex 4 to the Construction Products Directive, or
- (v) use of materials and products in accordance with well established satisfactory custom and practice, provided that such custom and practice is acceptable to NHBC, or
- (vi) acceptance, in writing, by NHBC that the quality and use is satisfactory.

MATERIALS AND PRODUCTS USED

Warranty provider key issues

- Practicality of working on site
- Longevity
- Replacement in event of failure
- Fixings

Conclusions

- The construction industry is a lot more complicated than most other sectors in terms of:
 - Understanding what is required
 - Assessing the potential, partly driven by regulations and govt policies
- The potential is enormous
- There are routes to show compliance with all key 'stakeholders'
- Recommend talking with a certification body early on.