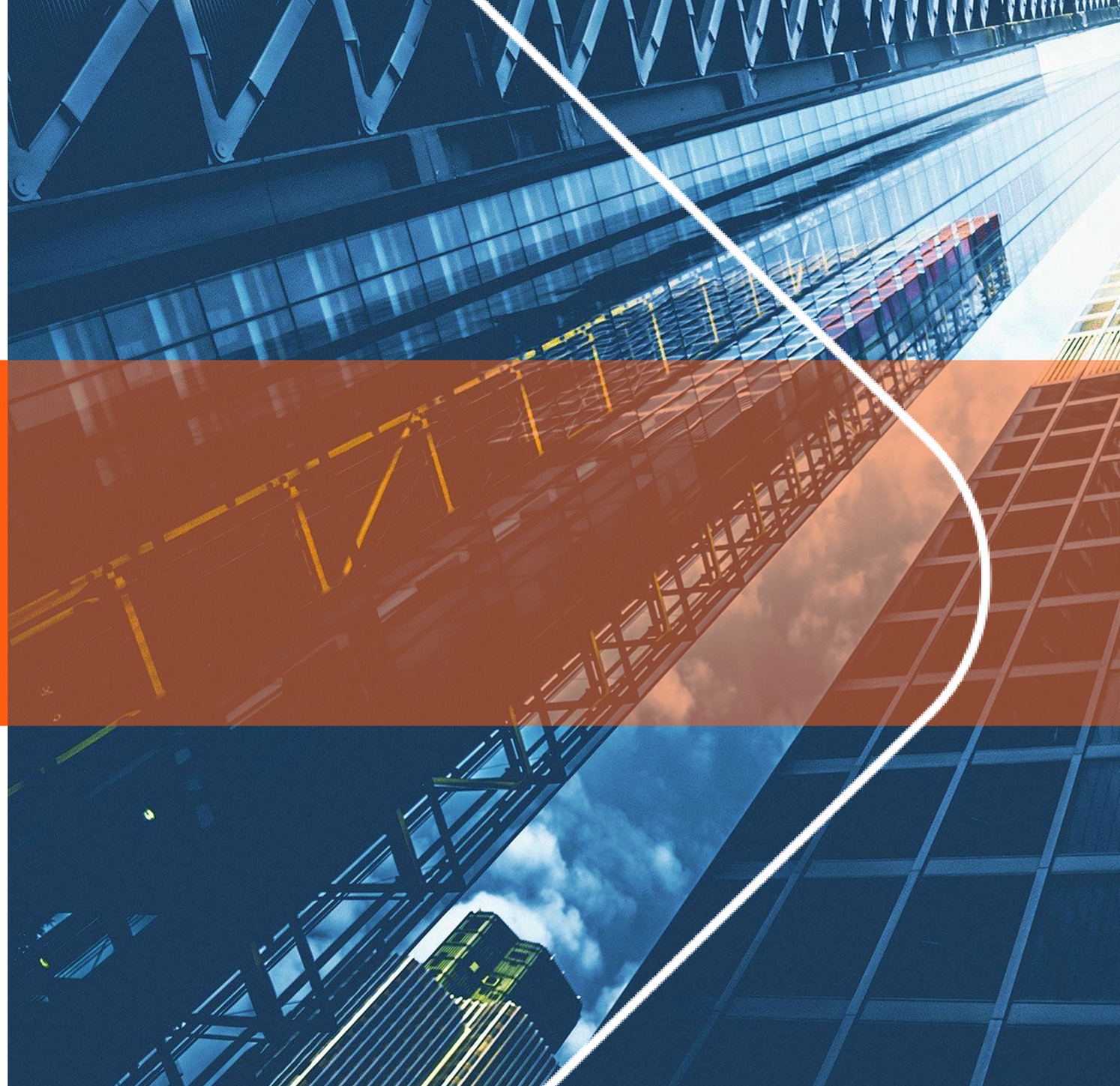
LONDON BUILDING CONTROL

CORPORATE APPROVED INSPECTORS

Approved Documents L Volumes 1 & 2

Conservation of Fuel & Power



London Building Control
13 Woodstock Street, Mayfair, London, W1C 2AG

Tel: 0207 099 3636
info@londonbuildingcontrol.co.uk
www.londonbuildingcontrol.co.uk

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Agenda:

- The Headlines
- New Build Dwellings & SAP 10
- Extensions to Dwellings including consequential improvements
- Commercial Buildings – brief overview

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

The Headlines

In the shift towards a Future Buildings Standard, the Government has introduced a range of changes to the Building Regulations, including a 30 per cent cut in carbon for all new homes and a 27 per cent cut for other buildings, including offices and shops.

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

The Headlines

The existing 4 ADs will be reduced to two:

Approved Document L, Conservation of fuel and power, Volume 1: Dwellings

Ref: ISBN 978-1-914124-78-5
PDF, 4.83 MB, 104 pages

Approved Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings

Ref: ISBN 978-1-914124-79-2
PDF, 1.3 MB, 114 pages

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON BUILDING CONTROL

CORPORATE APPROVED INSPECTORS

The Headlines

Transitional Provisions

Coming into force date: **Wednesday 15 June 2022.**

The new regulations and requirements will apply to applications registered on or after this date.

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Transitional Provisions

Where an application is registered by a Building Control Body before the 15 June 2022 and work commences before the 15 June 2023, the current regulations and requirements will apply.

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Transitional Provisions

For multiple plot sites work must commence on each individual plot.

This is intended to ensure dwellings are built to current standards, removing the current ‘time-lag’.

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

The 2021 standards will be subject to a more significant uplift in 2025 to meet the Government's 'Future Homes Standard' in the drive for Net Zero Carbon Homes.

https://www.gov.uk/government/consultations/the-future-homes-standard-changes-to-part-l-and-part-f-of-the-building-regulations-for-new-dwellings

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

The Headlines

The new Approved Documents contain both new Regulations, from The Building Regulations 2010 (as amended) and Functional Requirements from Schedule 1, together with supporting guidance to indicate how those Requirements can be met.

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Minimum energy performance requirements for new buildings

25. Minimum energy performance requirements shall be approved by the Secretary of State, calculated and expressed in accordance with the methodology approved pursuant to regulation 24, for—

(a) new buildings (which shall include new dwellings), in the form of target CO_2 emission rates;

(b) new dwellings, in the form of target fabric efficiency rates; and

(c) new buildings in the form of target primary energy rates.

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

Requirement

Requirement *Limits on application*

Schedule 1 – 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 fixed building services which—

(i) are energy efficient to a reasonable standard;

(ii) have effective controls; and

(iii) are commissioned by testing and adjusting as necessary to ensure they use no more fuel and power than is reasonable in the circumstances.

LONDON BUILDING CONTROL

CORPORATE APPROVED INSPECTORS

New Dwellings Compliance Matrix

Regulation 27

CO_2 Emission Rate Calculation

Regulation 27(a)

Fabric energy efficiency rate calculation

Regulation 27(c)

Target primary energy rate calculations for new building.

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

New Dwellings Compliance Matrix

Part L amendments introduce a new principal performance metric measuring energy efficiency. ‘Primary energy’ will be used in combination with CO_2 metrics to assess compliance with Part L. Primary energy calculations take into account factors such as the efficiency of the building’s heating system; power station efficiency for electricity; and energy used to produce fuel and deliver it to the building.

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

New Dwellings

SAP 10

SAP 10.3, in conjunction with the 2019 edition of **BRE 443**, will be adopted for Building Regulations purposes in England from June 2022.

SAP 10 has updated the National Grid Carbon Factors so that the Electricity Carbon Intensity is almost the same as Natural Gas. It is essential that the SAP assessor is an integral member of the design team.

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

LONDON BUILDING CONTROL

CORPORATE APPROVED INSPECTORS

Local Planning Authority (LPA)

In addition to the requirements within Part L Volume 1, the LPA will still have the option to raise the threshold requirement for individual schemes.

Any additional provisions, which the LPA may choose to impose, are not a matter to be considered by the Building Control Body as is the case for Optional Requirements under Parts G2 or M4.

Within London, the 2021 London Plan requires higher standards than those within the current Part L.

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Managing the Performance Gap

To further ensure the as built matches the design, dwellings will be subject to 100% Air Leakage testing, as opposed to the current regime of sample testing.

Photographic evidence for basic elements for each plot, will be required from the contractor to enable the SAP assessor to determine compliance.

1. Insulation type and thickness
2. Main and secondary heating system including controls
3. Ventilation system
4. Evidence of LZC technologies
5. Construction details

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

New Dwellings

Although gas boilers will still be permitted under the new requirements, heating systems will be required to be future proofed for heat pumps, with wet heating systems designed for flow temperatures of 55^{0}C.

In addition, with targets based on PVs, it is likely that some degree of PV will be required in the design.

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

Table 1.1 Summary of notional dwelling specification for new dwelling[1]

Element or system	Reference value for target setting
Opening areas (windows, roof windows, rooflights and doors)	Same as for actual dwelling not exceeding a total area of openings of 25% of total floor area[2]
External walls including semi-exposed walls	U = 0.18 W/(m²·K)
Party walls	U = 0
Floors	U = 0.13 W/(m²·K)
Roofs	U = 0.11 W/(m²·K)
Opaque door (less than 30% glazed area)	U = 1.0 W/(m²·K)
Semi-glazed door (30–60% glazed area)	U = 1.0 W/(m²·K)
Windows and glazed doors with greater than 60% glazed area	U = 1.2 W/(m²·K) Frame factor = 0.7
Roof windows	U = 1.2 W/(m²·K), when in vertical position (for correction due to angle, see specification in SAP 10 Appendix R)
Rooflights	U = 1.7 W/(m²·K), when in horizontal position (for correction due to angle, see specification in SAP 10 Appendix R)

Ventilation system	Natural ventilation with intermittent extract fans
Air permeability	5 $m^3/(h \cdot m^2)$ at 50 Pa
Main heating fuel (space and water)	Mains gas
Heating system	Boiler and radiators Central heating pump 2013 or later, in heated space Design flow temperature = 55 °C
Boiler	Efficiency, SEDBUK 2009 = 89.5%
Heating system controls	Boiler interlock, ErP Class V Either: – single storey dwelling in which the living area is greater than 70% of the total floor area: programmer and room thermostat – any other dwelling: time and temperature zone control, thermostatic radiator valves
Hot water system	Heated by boiler (regular or combi as above) Separate time control for space and water heating

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Hot water system	Heated by boiler (regular or combi as above) Separate time control for space and water heating
Wastewater heat recovery (WWHR)	All showers connected to WWHR, including showers over baths Instantaneous WWHR with 36% recovery efficiency utilisation of 0.98
Hot water cylinder	If cylinder, declared loss factor = 0.85 × (0.2 + 0.051 $V^{2/3}$) kWh/day where V is the volume of the cylinder in litres
Lighting	Fixed lighting capacity (lm) = 185 × total floor area Efficacy of all fixed lighting = 80 lm/W
Air conditioning	None
Photovoltaic (PV) system	For houses: kWp = 40% of ground floor area, including unheated spaces / 6.5 For flats: kWp = 40% of dwelling floor area / (6.5 × number of storeys in block) System facing south-east or south-west

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

Appendix B: Reporting evidence of compliance

BREL report

B1 The Buildings Regulations England Part L (BREL) report and photographic evidence should be provided to the building control body and to the building owner to show that building work complies with energy efficiency requirements.

B2 SAP 10 will produce the BREL report for the building as a standard output option.

B3 Two versions of the BREL report should be produced, using the approved software.

a. The first, the design stage BREL report, before works begin, to include all of the following.
   i. The target primary energy rate and dwelling primary energy rate.
   ii. The target emission rate and dwelling emission rate.
   iii. The target fabric energy efficiency rate and dwelling fabric energy efficiency rate.
   iv. A supporting list of specifications.

b. The second, the as-built BREL report, to include all of the following.
   i. The target primary energy rate and as-built dwelling primary energy rate.
   ii. The target emission rate and as-built dwelling emission rate.
   iii. The target fabric energy efficiency rate and as-built dwelling fabric energy efficiency rate.
   iv. A supporting list of specifications and any changes to the list of specifications that was provided at design stage.

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

The building control body can then use these reports to help check that what was designed has been built. The software includes a facility to compare the design stage and as-built data input files and automatically produce a schedule of changes.

B4 The as-built BREL report should be signed by the person carrying out the SAP assessment to confirm that the as-built calculations are accurate and that the supporting documentary evidence and photographs have been reviewed (see paragraphs B6 and B7).

B5 The as-built BREL report should be signed by the developer to confirm that the dwelling has been constructed or completed according to the specifications in the report.

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

LONDON BUILDING CONTROL

CORPORATE APPROVED INSPECTORS

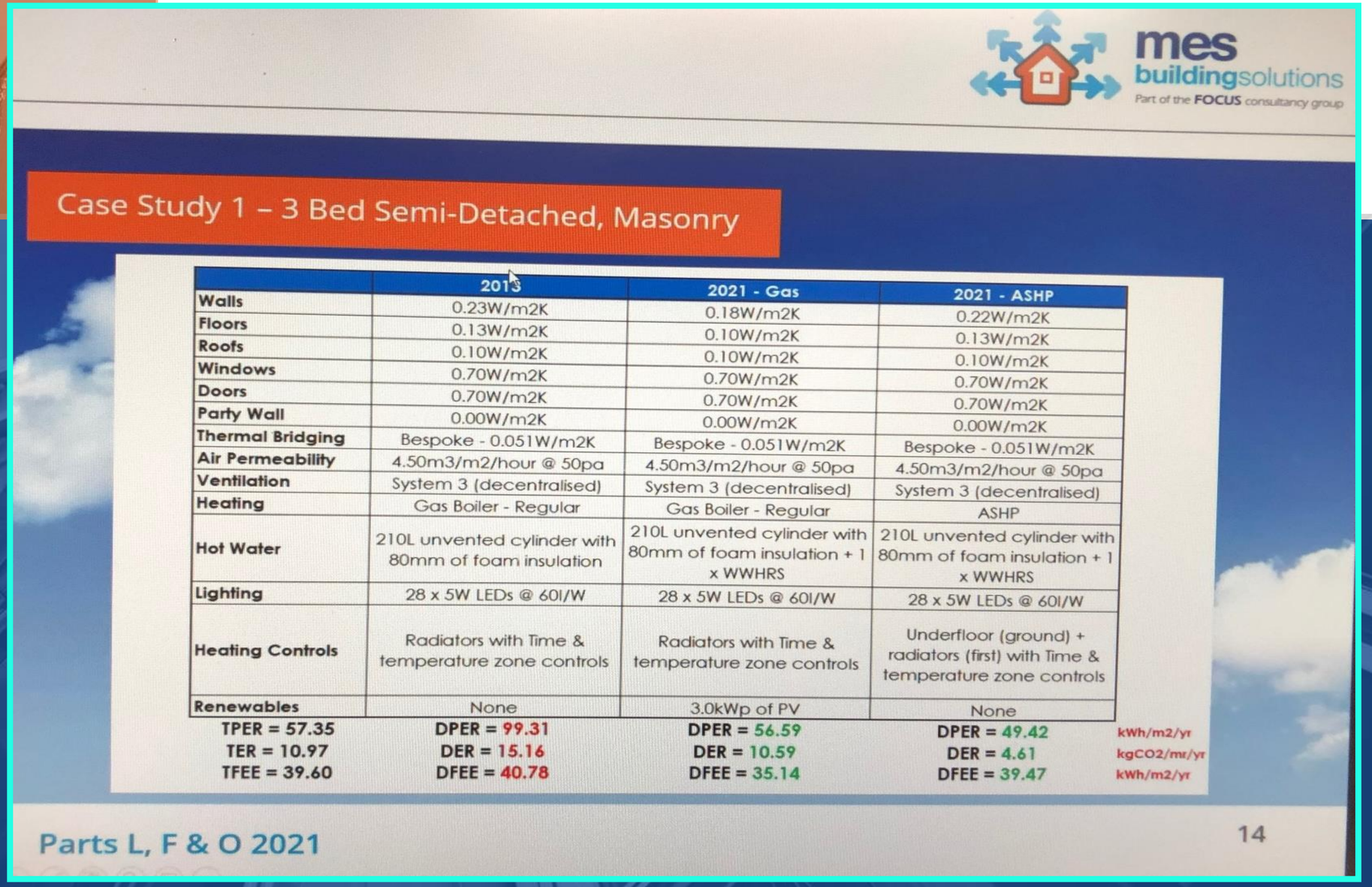
Photographic evidence

B6 Photographs should be taken for each dwelling on a development as a record during the construction of a property. The photographs should be made available to the energy assessor and the building control body. Anyone may take the photographs.

B7 Photographs should be taken of typical details as listed below and should be unique to each property. One photograph per detail should be recorded. Additional images, such as a close-up detail, should be provided only when necessary (see below). Photographs should be taken at appropriate construction stages for each detail when completed, but prior to closing-up works.

1. Foundations/substructure and ground floor, to show thermal continuity and quality of insulation in the following places.
   a. At ground floor perimeter edge insulation.
   b. At external door threshold.
   c. Below damp-proof course on external walls.
2. External walls: for each main wall type, to show thermal continuity and quality of insulation for the following.
   a. Ground floor to wall junction.
   b. Structural penetrating elements.

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk



	2013	2021 - Gas	2021 - ASHP
Walls	0.23W/m2K	0.18W/m2K	0.22W/m2K
Floors	0.13W/m2K	0.10W/m2K	0.13W/m2K
Roofs	0.10W/m2K	0.10W/m2K	0.10W/m2K
Windows	0.70W/m2K	0.70W/m2K	0.70W/m2K
Doors	0.70W/m2K	0.70W/m2K	0.70W/m2K
Party Wall	0.00W/m2K	0.00W/m2K	0.00W/m2K
Thermal Bridging	Bespoke - 0.051W/m2K	Bespoke - 0.051W/m2K	Bespoke - 0.051W/m2K
Air Permeability	4.50m3/m2/hour @ 50pa	4.50m3/m2/hour @ 50pa	4.50m3/m2/hour @ 50pa
Ventilation	System 3 (decentralised)	System 3 (decentralised)	System 3 (decentralised)
Heating	Gas Boiler - Regular	Gas Boiler - Regular	ASHP
Hot Water	210L unvented cylinder with 80mm of foam insulation	210L unvented cylinder with 80mm of foam insulation + 1 x WWHRS	210L unvented cylinder with 80mm of foam insulation + 1 x WWHRS
Lighting	28 x 5W LEDs @ 60l/W	28 x 5W LEDs @ 60l/W	28 x 5W LEDs @ 60l/W
Heating Controls	Radiators with Time & temperature zone controls	Radiators with Time & temperature zone controls	Underfloor (ground) + radiators (first) with Time & temperature zone controls
Renewables	None	3.0kWp of PV	None
TPER = 57.35	DPER = 99.31	DPER = 56.59	DPER = 49.42 kWh/m2/yr
TER = 10.97	DER = 15.16	DER = 10.59	DER = 4.61 kgCO2/m2/yr
TFEE = 39.60	DFEE = 40.78	DFEE = 35.14	DFEE = 39.47 kWh/m2/yr

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Extensions to Dwellings

The New Standards and examples of insulation solutions to:

External Walls
Ground Floor Slabs
Flat Roofs
Pitched Roofs

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Minimum standards for new and replacement thermal elements

	Current standards U-values ($W/m^2.K$)	2021 standards U-values ($W/m^2.K$)
Pitched roof - insulation at ceiling level	0.16	0.15
Pitched roof - insultation at rafter level	0.18	0.15
Flat roof or roof with integral insulation	0.18	0.15
Wall	0.28	0.18
Floors	0.22	0.16
Window, roof window	1.6 or Window Energy Rating Band C	1.4 or Window Energy Rating Band B
Rooflight	1.6 or Window Energy Rating Band C	2.2
Doors with >60% of internal face glazed	1.8 or Doorset Energy Rating Band E	1.4 or Doorset Energy Rating Band C
Other doors	1.8 or Doorset Energy Rating Band E	1.4 or Doorset Energy Rating Band B

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Minimum standards for the renovation of thermal elements in existing homes:

Element	Current standards U-values ($W/m^2.K$)		2021 standards U-values ($W/m^2.K$)	
	Threshold	Improved	Threshold	Improved
Pitched roof - insulation between rafters	0.35	0.18	0.35	0.16
Flat roof or roof with integral insluation	0.35	0.18	0.35	0.16

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Table 4.3 Limiting U-values for existing elements in existing dwellings

Element	U-value[1] W/(m²·K)	
	(a) Threshold	(b) Improved
Roof[2][3][4]	0.35	0.16
Wall – cavity insulation[2][5]	0.70	0.55
Wall – internal or external insulation[2][6]	0.70	0.30
Floor[7][8]	0.70	0.25

2013

External Walls Cavity Insulation	No change
External Walls Int/Ext Insulation	No change
Ground Floor Slabs	No change
Roofs	**All @ 0.16**

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

LONDON BUILDING CONTROL

CORPORATE APPROVED INSPECTORS

Uplifted the improved U-value for:

- Pitched roof – insulation between rafters
- Flat roof or roof with integral insulation

NO uplift to the threshold values or the improved U-values for:

- Pitched roofs – ceiling level insulation
- Cavity walls
- Solid walls
- Floors

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Extensions to Dwellings

Examples of insulation solutions are indicative only. The Building Control Body, whilst happy to advise on solutions are not responsible for the design or compliance

Technical solutions indicated from Insulation manufacturers are for illustrative purposes only and there are a number of alternative available.

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Extensions to Dwellings

Examples of insulation solutions to:

Pitched Roof
Flat Roof
External Wall
Ground Floor Slab

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Extensions to Dwellings

Examples of insulation solutions to:

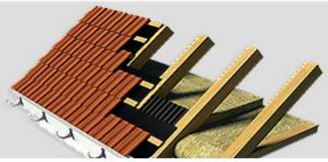
Pitched Roofs
Insulation at ceiling level

Max U value 0.15

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS



← Application area
Roof

← Type of Roof
Pitched Roof

← Location Of The Insulation Layer
Pitched Roof Horizontal

← Insulation Type
Roll Insulation

← Joist Depth
100 mm

← Back

Pitched Roof Loft Insulation - Roll Insulation

Change U-value
[mm]

0.16

0.10

U-value
0.15
[W/m²K]

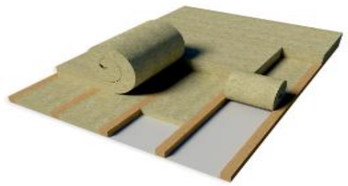
Change thickness
[mm]

450

270

Insulation thickness
300 mm

Construction build-up



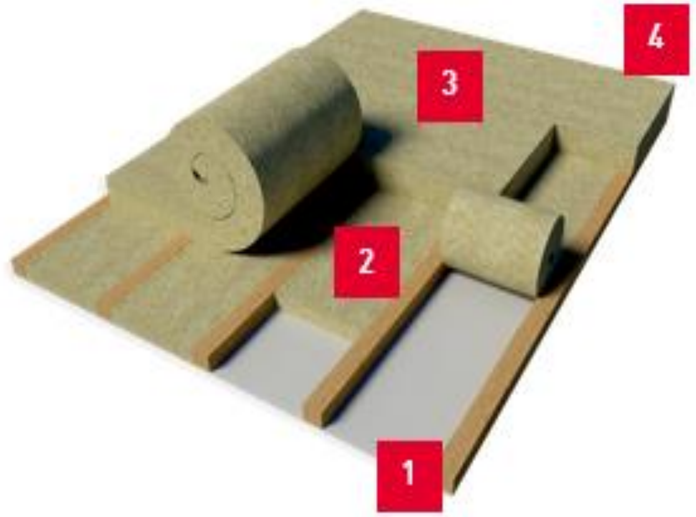
Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Construction build-up:

1. Gypsum plasterboard (12.5 mm)
2. Roll (100 mm)
3. Roll (100 mm + 100 mm)
4. Sheeted or tiled roof with felt/boards under tiles (500 mm)



Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Extensions to Dwellings

Examples of insulation solutions to:

Pitched Roofs
Insulation at rafter level

Max U value 0.15

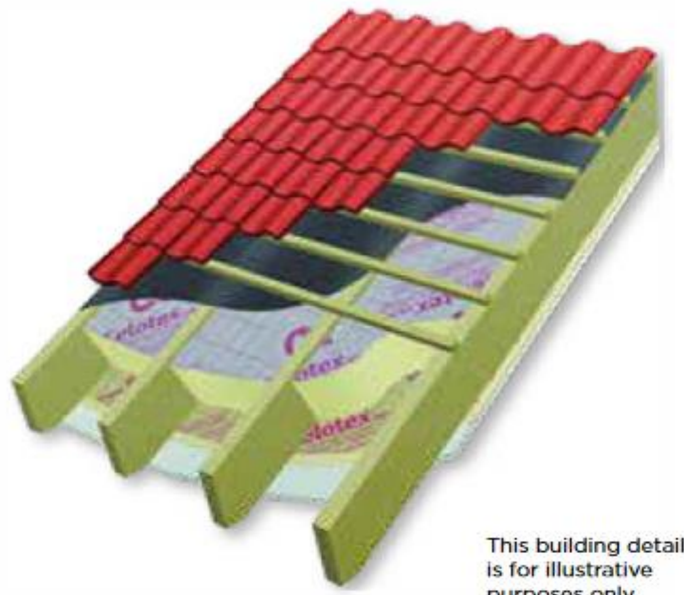
Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Celotex GA4000 or Celotex XR4000, with Celotex PL4000 high thermal performance plasterboard thermal laminate can be considered in pitched roof between and under rafter applications to minimise insulation thickness and give the following benefits:

- Provides both the below rafter insulation and plasterboard in one product, helping reduce installation time
- Can be considered for use with shallow rafters
- Can help provide long term energy savings for buildings
- Minimised additional loading to the structure
- Can be considered for loft conversions/ room in the roof applications
- Upgrade existing ceilings



This building detail is for illustrative purposes only. It does not constitute advice and should not be

Indicative U-value (W/m².K) calculation: un-ventilated between and under rafters

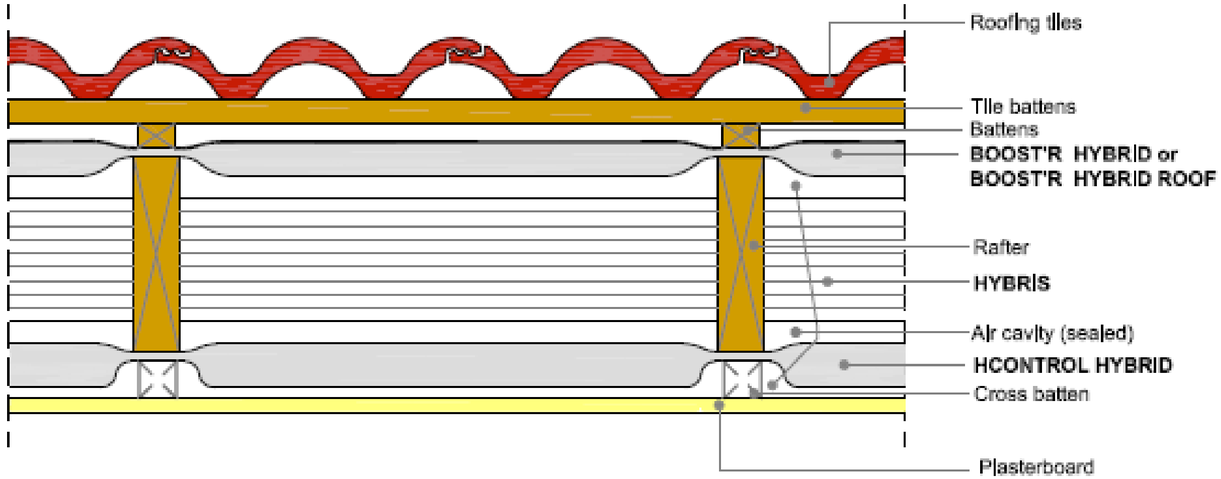
Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

Construction		100mm deep rafters Thickness (mm)	125mm deep rafters Thickness (mm)	150mm deep rafters Thickness (mm)	175mm deep rafters Thickness (mm)
Outside surface resistance		-	-	-	-
Tiling including batten space		-	-	-	-
Breather membrane		-	-	-	-
Low E cavity between rafters (11.7% brg)		20	25	30	25
Celotex between rafters @ 400 ctrs (11.7% brg)		GA4080	GA4100	XR4120	XR4150
Variable layer (for below rafters)		See below	See below	See below	See below
Board joints taped for VCL		-	-	-	-
Plaster skim		-	-	-	-
Inside surface resistance		-	-	-	-
Variable layer	Thickness (mm)	U-value (W/m^2K)	U-value (W/m^2K)	U-value (W/m^2K)	U-value (W/m^2K)
Celotex PL4000	65 + 12.5†	0.16	0.14	0.13	0.12
Celotex PL4000	60 + 12.5†	0.16	0.15	0.13	0.12
Celotex PL4000	50 + 12.5†	0.18	0.16	0.14	0.13
Celotex PL4000	40 + 12.5†	0.19	0.17	0.15	0.14
Celotex PL4000	25 + 12.5†	-	0.20	0.17	0.15

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Actis solutions for pitched roof applications to achieve 0.15



Warm Pitched Roof
with BOOST'R HYBRID or BOOST'R HYBRID ROOF
HYBRIS Insulation and HCONTROL HYBRID

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Extensions to Dwellings

Examples of insulation solutions to:

Flat Roof
Warm Deck

Max U value 0.15

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Floors | Walls | Pitched Roof | Flat Roof

Warm flat roofing

Single ply

Fully adhered

Timber deck with plasterboard ceiling

- 140mm 145mm 150mm +

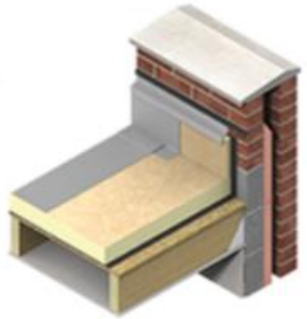
U-value

0.15

W/m²·K

0.10

Click here to view construction build-up



Kingspan Thermaroof TR27

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Extensions to Dwellings

Examples of insulation solutions to:

Flat Roof
Cold Deck

Max U value 0.15

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

Celotex GA4000 or Celotex XR4000 with Celotex PL4000 high thermal performance insulation can be considered in flat roof between and under joist applications to minimise insulation thickness and give the following benefits:

- Celotex PL4000 provides both the below joist insulation and plasterboard in one product helping reduce installation time
- Celotex PL4000 offers the installer maximum flexibility and installation speed due to the tapered edge plasterboard
- An effective solution to upgrade older buildings
- Can help provide long term energy savings for buildings
- Ventilated cold roof construction

This building detail is for illustrative purposes only. It does not constitute advice and should not be relied upon.

- Can be considered for renovation/ conversion solutions
- Helps to minimise any loss of internal headroom

Indicative U-value (W/m².K) calculation: cold flat roof – between and under joists

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

Construction		100mm deep joists Thickness (mm)	125mm deep joists Thickness (mm)	150mm deep joists Thickness (mm)	175mm deep joists Thickness (mm)
Outside surface resistance		-	-	-	-
Weatherproofing system		n/a	n/a	n/a	n/a
Plywood		18	18	18	18
Ventilated cavity		50	50	50	55
Celotex between joists @ 400 ctrs (11.7% brg)		GA4050	GA4075	GA4100	XR4120
Variable layer (for below joists)		See below	See below	See below	See below
Board joints taped for VCL		-	-	-	-
Plaster skim		-	-	-	-
Inside surface resistance		-	-	-	-
Variable layer	**Thickness (mm)**	**U-value (W/m^2K)**	**U-value (W/m^2K)**	**U-value (W/m^2K)**	**U-value (W/m^2K)**
Celotex PL4000	65 + 12.5†	0.20	0.17	0.15	0.14
Celotex PL4000	60 + 12.5†	-	0.18	0.16	0.14
Celotex PL4000	50 + 12.5†	-	0.20	0.17	0.15
Celotex PL4000	40 + 12.5†	-	-	0.19	0.17
Celotex PL4000	25 + 12.5†	-	-	-	0.19

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Extensions to Dwellings

Examples of insulation solutions to:

External Cavity Wall
Partial Fill

Max U value 0.18

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Celotex CW4000 high thermal performance insulation can be considered in partial fill cavity wall applications to minimise insulation thickness and give the following benefits:

- Easy to install using retaining clips on wall ties
- Can provide long term energy savings for buildings
- Low emissivity foil facers give improved thermal insulation performance within sealed cavity air spaces
- Boards sized to fit standard wall tie spacing for ease of installation

This building detail is for illustrative purposes only. It does not constitute advice and should not be relied upon.

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Indicative U-value (W/m².K) calculation: partial fill cavity wall with Celotex CW4000

Construction	103mm brick / Cavity / Celotex CW4000 / 100mm block (below) / plasterboard on dabs			
	Blocktype (lambda)			
Product thickness (mm)	Dense (1.13 W/m.K)	Medium dense (0.59 W/m.K)	Lightweight concrete (0.25 W/m.K)	Aircrete (0.15 W/m.K)
CW4040	0.33	0.32	0.30	0.28
CW4050	0.28	0.28	0.26	0.25
CW4060	0.25	0.25	0.24	0.23
CW4075	0.22	0.21	0.20	0.20
CW4085	0.20	0.19	0.19	0.18
CW4100	0.17	0.17	0.17	0.16

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Extensions to Dwellings

Examples of insulation solutions to:

External Cavity Wall
Full Fill

Max U value 0.18

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Masonry Cavity Wall - Full Fill Insulation - Brick Outer

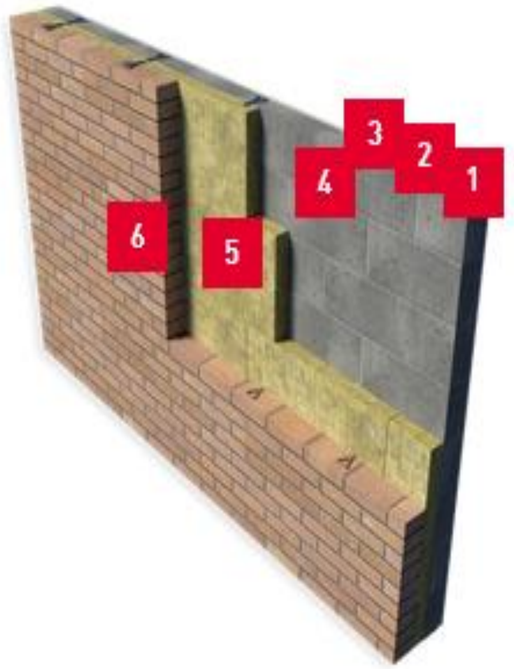
Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Construction build-up:

1. Gypsum plastering (1300) (3 mm)
2. Standard Wallboard Plasterboard (12.5 mm)
3. Plaster dabs - Gypsum (1200) (15 mm)
4. Aircrete Standard & Mortar inner leaf (100 mm)
5. ROCKWOOL Cavity (170 mm)
6. Brick outer leaf & Mortar outer leaf (102 mm)



Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Extensions to Dwellings

Examples of insulation solutions to:

Ground Bearing Slab
P/A 0.7

Max U value 0.16

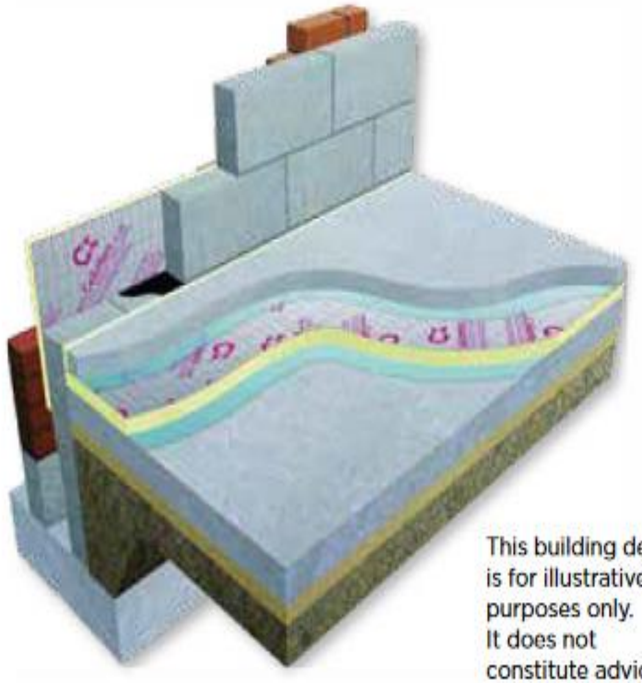
Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Celotex GA4000 and Celotex XR4000 high thermal performance insulation can be considered in concrete slab floor applications to minimise insulation thickness and give the following benefits:

- Excellent thermal performance to minimise depth of floor build-up.
- Can provide long term energy savings for buildings
- Square edges to help deliver insulation continuity
- Easy to cut boards to fit in most spaces
- Easy to install to quickly insulate large areas



This building detail is for illustrative purposes only. It does not constitute advice and should not be relied upon.

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Indicative U-value (W/m².K) calculation: ground floor – concrete slab

	Perimeter / area ratio									
Celotex product	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
XR4200	0.07	0.08	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.10
XR4165	0.07	0.09	0.10	0.11	0.11	0.11	0.11	0.11	0.12	0.12
XR4150	0.08	0.10	0.11	0.11	0.12	0.12	0.12	0.12	0.13	0.13
XR4140	0.08	0.10	0.11	0.12	0.12	0.13	0.13	0.13	0.13	0.13
XR4130	0.08	0.11	0.12	0.13	0.13	0.14	0.14	0.14	0.14	0.14
XR4120	0.09	0.11	0.13	0.13	0.14	0.14	0.15	0.15	0.15	0.15
XR4110	0.09	0.12	0.13	0.14	0.15	0.15	0.16	0.16	0.16	0.16
GA4100	0.10	0.13	0.14	0.15	0.16	0.17	0.17	0.17	0.18	0.18
GA4090	0.10	0.14	0.15	0.16	0.17	0.18	0.18	0.19	0.19	0.19
GA4080	0.11	0.14	0.16	0.18	0.19	0.20	0.20	0.21	0.21	0.21
GA4075	0.11	0.15	0.17	0.19	0.20	0.20	0.21	0.22	0.22	0.22
GA4070	0.11	0.16	0.18	0.19	0.21	0.21	0.22	0.23	0.23	0.24

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Part L Volume 1 Consequential Improvements

12.1 For an existing dwelling with a total useful floor area of over 1000m^2, additional work may be required to improve the overall energy efficiency of the dwelling if proposed work consists of or includes any of the following.

a. An extension.

b. Providing any fixed building service in the dwelling for the first time.

c. Increasing the capacity of any fixed building service (which does not include doing so on account of renewable technology).

Consequential improvements should be carried out to ensure that the dwelling complies with Part L of the Building Regulations, to the extent that they are technically, functionally and economically feasible.

12.2 Technical guidance on consequential improvements is given in Approved Document L, Volume 2: Buildings other than dwellings.

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Part L Volume 1
Consequential Improvements

Total useful floor area The total area of all enclosed spaces, measured to the internal face of the external walls. When calculating total useful floor area, both of the following should be taken into account.

- The area of sloping surfaces such as staircases, galleries, raked auditoria and tiered terraces should be taken as their area on plan.
- Areas that are not enclosed, such as open floors, covered ways and balconies, should be excluded.

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Part L Volume 2 Consequential Improvements

12.3 When an existing building with a total useful floor area of over 1000m² is being extended or the habitable area is being increased, consequential improvements should be installed. The measures listed in Appendix D, Table D1, may be considered technically, functionally and economically feasible in normal circumstances.

12.4 For an extension or increase in habitable area, the value of the principal works is used to determine the minimum value of the consequential improvement works. The value of the consequential improvement works should not be less than 10% of the value of the principal works.

12.5 As part of the initial notice or deposit of plans, a chartered quantity surveyor or other suitably qualified person should produce a signed report that establishes the value of the principal works and the value of the consequential improvements using prices current at the date when the building control body is informed of the proposals.

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Part L Volume 2 Consequential Improvements

Measures usually to be installed whenever consequential improvements are required

D3 Energy efficiency improvements to the building are required whenever consequential improvements apply. All technically, functionally and economically feasible measures should be implemented, with the requirement for consequential improvements being met based on the value of the principal works in some circumstances. This is outlined in Section 12.

D4 The energy efficiency improvements in Table D1 can be considered technically, functionally and economically feasible in normal circumstances. As such, these measures should usually be installed when consequential improvements are required. These should be installed at least to the extent outlined in Table D1, based on the value of the principal works, as outlined in Section 12.

Tel: 0207 099 636 info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Part L Volume 2 Consequential Improvements

Table D1 Energy efficiency measures which should usually be installed whenever consequential improvements are required

These measures are considered technically, functionally and economically feasible in normal circumstances.

These measures should be installed at least to the extent outlined to meet the reasonable provision criterion, based on the value of the principal works, as outlined in Section 12.

Item	Improvement measure
1	Upgrading heating systems that are more than 15 years old by providing new plant or improved controls.
2	Upgrading cooling systems that are more than 15 years old by providing new plant or improved controls.
3	Upgrading air-handling systems that are more than 15 years old by providing new plant or improved controls.
4	Upgrading general lighting systems that have an average lamp efficacy of less than 60 light source lumens per circuit-watt and that serve areas greater than 100m^2 by providing new luminaires and/or controls following the guidance in Section 6.
5	Installing energy metering following the guidance given in CIBSE's TM39.
6	Upgrading thermal elements that have U-values higher than those in Table 4.2, column (a), following the guidance in paragraphs 4.7 and 4.8.

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Part L Volume 2 Consequential Improvements

7	Replacing existing windows, roof windows or rooflights (but excluding display windows) or doors (but excluding high-usage entrance doors) that have a U-value higher than the following. a. For windows, roof windows and doors – 3.30W/(m²·K) b. For rooflights – 3.80W/(m²·K), calculated by following paragraph 4.4.
8	If existing on-site low and zero carbon energy-generating systems provide less than 10% of on-site energy demand: increasing the capacity of on-site systems, provided the increase will achieve a simple payback of 7 years or less.
9	Measures specified in the recommendations report that accompanies a valid energy performance certificate which will achieve a simple payback of 15 years or less.

NOTE:

Items 1 to 7 usually meet the economic feasibility criterion of a simple payback of 15 years. A shorter simple payback period of 7 years is given for item 8 because such measures are likely to be more capital intensive or more risky than the others.

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Part L Volume 2
Buildings other than Dwellings

The current compliance matrix through SBEM will remain, being:

Target Emission Rate **TER**, and the
Target Primary Energy Rate **TPER**, together with a 2021 targeted **27%** reduction in $C0_2$ emissions.

Tel: 0207 099 636 info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Part L Volume 2
Buildings other than Dwellings

2.4 The building control body must be notified, before the work starts, of all of the following.

a. The target primary energy rate and the building primary energy rate (calculated using design values).

b. The target emission rate and the building emission rate (calculated using design values).

c. A list of specifications used in the calculations.

Items (a) to (c) above may be reported using the design stage Building Regulations UK Part L compliance report (BRUKL report) which is produced as a standardised output from the approved software. For further details of the design stage BRUKL report, see Appendix C.

Tel: 0207 099 636 info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Part L Volume 2
Buildings other than Dwellings

2.5 The building control body must be notified, once the work is complete, of all of the following.

a. The as-built target primary energy rate and as-built building primary energy rate.

b. The as-built target emission rate and the as-built building emission rate.

c. A list of specifications used in the as-built calculations, and whether the specifications have changed from those used in the design stage calculations.

Building control bodies are authorised to accept notification of (a) to (c) above as reported in the as-built BRUKL report, which is produced as a standardised output from the approved software. For further details of the as-built BRUKL report, see Appendix C.

Tel: 0207 099 636 info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Part L Vol 2 2021 guidance

Table 4.1 Limiting U-values for new or replacement elements in new and existing buildings and air permeability in new buildings

Element type	Maximum U-value[1] W/(m²·K) or air permeability
Roof (flat roof)[2]	0.18
Roof (pitched roof)[2]	0.16
Wall[2][3]	0.26
Floor[4][5]	0.18
Swimming pool basin[6]	0.25
Windows in buildings similar to dwellings[7][8]	1.6 or Window Energy Rating[9] Band B
All other windows,[8][10][11] roof windows, curtain walling	1.6
Rooflights[12][13]	2.2
Pedestrian doors (including glazed doors)[14]	1.6
Vehicle access and similar large doors	1.3
High-usage entrance doors	3.0
Roof ventilators (including smoke vents)	3.0
Air permeability (for new buildings)	8.0m³/(h·m²) @ 50Pa

Tel: 0207 099 636 info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Part L Vol 2 2021 guidance

To achieve the Governments target of 27% reduction in CO2 emissions a number of enhancements have been included.

Fabric First approach is to be adopted, which already applies to projects in London. Following minimum standards is unlikely to demonstrate compliance and fabric improvements will be required.

Air tightness limit is to be reduced to 8m3 @ 50Pa.

Tel: 0207 099 636 info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Part L Vol 2 2021 guidance

Low carbon heating technologies are being emphasised

Heat pumps for the vast majority of heating applications are to be adopted.
District Heating networks are being encouraged where practical.
Direct electric heating is dissuaded in all but a few very low demand cases.
Hot water: Low heat demand – heat pumps encouraged.
High heat demand – gas still allowed to enable the industry to develop suitable alternatives.

Tel: 0207 099 636 info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Part L Vol 2 2021 guidance

Fabric First is seen to be the way forward with renewable technologies being secondary to good low carbon design and their impact on the BRUKL will be greatly reduced. There has been an uplift in minimum efficiency standards of fixed building services.

Lighting is to be significantly improved from 65lm/W to 95lm/W.

PV will be applied in the notional building UNLESS heat pumps meet 100% of the actual building's space heating demand – this is intended to reduce the use of PV's as a means of overcoming poor fabric performance.

Tel: 0207 099 636 info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Part L Vol 2
2021 Guidance

As indicated in the Volume 1 guidance slides, the early involvement of the Energy Assessor in the design team to assess compliance with the Regulations and Functional Requirements is considered essential.

Tel: 0207 099 636 info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

LONDON BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Other Upcoming changes to Building Regulations

Part Q Security: Dwellings – Soon to consult on proposals to increase security in existing homes.

The Government will be extending requirements for **smoke and carbon monoxide alarms**. Smoke alarms will be required in social rented homes. Carbon monoxide alarms will be mandatory in rooms with a fixed combustion appliance used for heating in private and social rented homes.

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Thank you for listening.

Please send any questions to:

alan@londonbuildingcontrol.co.uk

Tel: 0207 099 3636 * info@londonbuildingcontrol.co.uk * www.londonbuildingcontrol.co.uk

ISO9001 Certified

LONDON
BUILDING CONTROL
CORPORATE APPROVED INSPECTORS

Head Office:

London Building Control,
13 Woodstock Street, Mayfair,
London, W1C 2AG

Tel: 0207 099 3636
www.londonbuildingcontrol.co.uk
info@londonbuildingcontrol.co.uk

Offices also in:

Chichester: 01243 882990
Manchester: 0161 660 0806
Welwyn Garden City: 01707 248611
Exeter: 01392 240770