From 1st October 2010 there have been a number of revisions to the Building Regulations that cover the Conservation of Fuel and Power in buildings. This is the second in a series of guides to try and explain how these changes will impact on you.

**REPAIRS, ALTERATION, REPLACEMENT AND RENOVATIONS TO ELEMENTS OF A BUILDING EXTERNAL SHELL.**

Replacement windows have been covered for a number of years and have controls placed on what can or cannot be done on their replacement.

Some re-roofing works i.e. replacement of the roof tiles have similarly been controlled, where the weight of the roof materials used in the re-covering are either lighter (to prevent wind uplift) or are heavier (which could potentially cause a structural failure of the supporting structure).

The regulations now cover repairs, alterations, replacement and renovation of what are called the buildings ‘Thermal Elements’. This applies equally to both domestic and commercial buildings.

Reference should be made to guide 3 – which provides guidance on the extension of ‘Self Certification Schemes’ for members of certain professional trade bodies. Membership allows works to be undertaken without having to submit a Building Regulation application.

“**THERMAL ELEMENT**” – Are defined as a wall, floor or roof, excluding windows and doors / roof lights and roof windows (separate controlled fittings rules apply to these), which separates part of a building that is thermally conditioned part of the building (‘the conditioned space’) from either:

1. The external environment (including the ground); or

2. In the case of floors and walls, another part of the building, which is:
   a. unconditioned (i.e. unheated space or cooled ) e.g. floor over an unheated garage.
   b. A building such as a conservatory, carport or porch.
   c. conditioned to a different temperature e.g. wall between a low level heated stock area and the main shop-floor, etc*

Also for commercial types of buildings only included is when the other part of the building is used for a purpose that is not similar or identical to the purpose for which the conditioned space is used (this requirement does not apply to dwellings).

All elements between the surface bounding the conditioned space and the external environment or other part of the building are considered to be ‘Thermal elements’.

Note - this definition encompasses the walls and the floor of a swimming a swimming pool basin where this is part of an existing dwelling.
Renovation of a Thermal Element.

Renovation of a thermal element through:
The provision of a new layer means either of the following:

a. Cladding or rendering the external surface of the thermal element; or
b. Dry-lining the internal surface of a thermal element.

Replacement of a Thermal Element.
The replacement of an existing layer means either of the following activities:

a. Stripping down the element to expose the basic structural components (brick / blockwork, timber / metal frame, joists, rafters, etc) and then rebuilding to achieve all the necessary performance requirements.

b. Replacing the water proof membrane on a flat roof. From 15th July 2011 the application of a new layer of felt or the application of a liquid sealant over 25% of the roof area over the existing roof covering does not constitute renovation of a thermal element.

Note – this does not effect roof works where pitched / flat roof coverings are removed and replaced which are considered replacement thermal elements requiring regulation approval and thermal upgrading.

If a new layer in the thermal element is provided or replacement of an existing layer, but excludes decorative finishes this is defined as ‘Renovation’. The only part of a thermal element that you can replace / provide without requiring approval are decorative finishes.

Note – replacement / renovated curtain walling is considered to be treated the same as replacement windows as it is defined as a controlled fitting.

Examples of controllable works requiring the submission of a Building Regulation application:

- Renewal of pitched or flat roof coverings – e.g. re-tiling, re-slating of pitched roofs or re-felting of flat roofs.
- Renewal or replacement of ceilings under a roof space or flat roof (with or without the renewal of the supporting structure).
- Renewal of cladding to external walls or dormer cheeks.
- Renewal of a finish or cladding to an external wall area or elevation (render or other cladding or applying a finish or cladding for the first time).
- Renewal of internal wall finishes to an external wall (excluding decoration) or where you are applying a finish for the first time e.g. re-plastering or dry lining walls.
- Renovation or replacement of a solid or suspended floor, involving the replacement of screed or a timber floor deck.

Don’t forget that the provision of new roofs and re-building of walls either completely or replacing an outer skin of the wall will also be controllable works.

What energy standards do thermal elements have to satisfy?
Thermal elements subject to a renovation the performance of the whole element should be improved to achieve minimum U value set out in column (b) of table 3 - Domestic (Table 5 –Non domestic) below, provided the area is greater than 50% of the surface of the individual element or 25% of the total building envelope.
### Domestic Table

**Table 3 Upgrading retained thermal elements**

<table>
<thead>
<tr>
<th>Element</th>
<th>(a) Threshold U-value W/m²·K</th>
<th>(b) Improved U-value W/m²·K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall – cavity insulation</td>
<td>0.70</td>
<td>0.55</td>
</tr>
<tr>
<td>Wall – external or internal insulation</td>
<td>0.70</td>
<td>0.30</td>
</tr>
<tr>
<td>Floor</td>
<td>0.70</td>
<td>0.25</td>
</tr>
<tr>
<td>Pitched roof – insulation at ceiling level</td>
<td>0.35</td>
<td>0.16</td>
</tr>
<tr>
<td>Pitched roof – insulation between rafters</td>
<td>0.35</td>
<td>0.18</td>
</tr>
<tr>
<td>Flat roof or roof with integral insulation</td>
<td>0.35</td>
<td>0.18</td>
</tr>
</tbody>
</table>

1. ‘Roof’ includes the roof parts of dormer windows and ‘wall’ includes the wall parts (cheeks) of dormer windows.
2. This applies only in the case of a wall suitable for the installation of cavity insulation. Where this is not the case, it should be treated as ‘wall – external or internal insulation’.
3. A lesser provision may be appropriate where meeting such a standard would result in a reduction of more than 5% in the internal floor area of the room bounded by the wall.
4. The U-value of the floor of an extension can be calculated using the exposed perimeter and floor area of the whole enlarged building.
5. A lesser provision may be appropriate where meeting such a standard would create significant problems in relation to adjoining floor levels.
6. A lesser provision may be appropriate where meeting such a standard would create limitations on head room. In such cases, the depth of the insulation plus any required air gap should be at least to the depth of the rafters, and the thermal performance of the chosen insulant should be such as to achieve the best practicable U-value.
7. A lesser provision may be appropriate if there are particular problems associated with the load-bearing capacity of the frame or the upstand height.

### Non-Domestic Table

**Table 5 Upgrading retained thermal elements**

<table>
<thead>
<tr>
<th>Element</th>
<th>U-value W/m²·K</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(a) Threshold</td>
</tr>
<tr>
<td>Wall – cavity insulation</td>
<td>0.70</td>
</tr>
<tr>
<td>Wall – external or internal insulation</td>
<td>0.70</td>
</tr>
<tr>
<td>Floors</td>
<td>0.70</td>
</tr>
<tr>
<td>Pitched roof – insulation at ceiling level</td>
<td>0.35</td>
</tr>
<tr>
<td>Pitched roof – insulation at rafter level</td>
<td>0.35</td>
</tr>
<tr>
<td>Flat roof or roof with integral insulation</td>
<td>0.35</td>
</tr>
</tbody>
</table>

Notes:
1. ‘Roof’ includes the roof parts of dormer windows, and ‘wall’ includes the wall parts (cheeks) of dormer windows.
2. This applies only in the case of a cavity wall capable of accepting insulation. Where this is not the case it should be treated as for ‘wall – external or internal insulation’.
3. A lesser provision may be appropriate where meeting such a standard would result in a reduction of more than 5% in the internal floor area of the room bounded by the wall.
4. The U-value of the floor of an extension can be calculated using the exposed perimeter and floor area of the whole enlarged building.
5. A lesser provision may be appropriate where meeting such a standard would create significant problems in relation to adjoining floor levels.
6. A lesser provision may be appropriate where meeting such a standard would create limitations on head room. In such cases, the depth of the insulation plus any required air gap should be at least to the depth of the rafters, and the thermal performance of the chosen insulant should be such as to achieve the best practicable U-value.
7. A lesser provision may be appropriate if there are particular problems associated with the load-bearing capacity of the frame or the upstand height.
How do you assess area proportions?

Area of element is taken as that of the individual element, not all of the elements of that type in the building.

To understand this assess the element from the side which the renovation work is taking place e.g. removing a plaster of a wall, the element area is the area of the external wall in the room. If removing external render form the wall it is the area of external elevation in which the wall sits.

Example 2 - all the roofing on the flat roof of an extension is being stripped down, the area of the element is the roof area of the extension, not the total roof area of the dwelling.

Example 3 - Rear wall of a single storey extension is to be re-rendered, it should be upgraded even if it was less than 50% of the total building elevation when viewed from the rear. If the plaster is being removed from a bedroom wall, the relevant area is the area of the external wall in the room, not the area of the external elevation which contains that wall section, this is because the marginal cost of dry-lining with insulated plasterboard rather than plain plasterboard is small.

Replacement of ‘Thermal Elements’.

Replacement of ‘Thermal Elements’: Any existing element that is replaced or rebuilt should achieve the U values for new build

### STANDARDS FOR NEW THERMAL ELEMENTS W/m²k

<table>
<thead>
<tr>
<th>Element</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall</td>
<td>0.28 W/m².K</td>
</tr>
<tr>
<td>Pitched roof – insulation at ceiling level</td>
<td>0.16 W/m².K</td>
</tr>
<tr>
<td>Pitched roof – insulation at rafter level</td>
<td>0.18 W/m².K</td>
</tr>
<tr>
<td>Flat roof or roof with integral insulation</td>
<td>0.18 W/m².K</td>
</tr>
<tr>
<td>Floors (3)</td>
<td>0.22 W/m².K</td>
</tr>
<tr>
<td>Swimming Pool Basin</td>
<td>0.25 W/m².K</td>
</tr>
</tbody>
</table>

**NOTES**

1. Roof includes dormers and wall refers to wall parts (cheeks) of dormer windows.
2. Area-weighted values.
3. A lesser provision may be appropriate where meeting a standard would result in a reduction of more than 5% in the internal floor area of the room bounded by the wall.

A less provision may be appropriate where meeting such a standard would create significant problems in relation to adjoining floor levels (the ‘U’ value of an extension floor can be calculated using exposed perimeter and floor area of the whole enlarged dwelling.)
Requirements Relating to Thermal Elements:

- Works to such thermal elements will require the submission of a Building Regulation application.

- Where you intend to renovate or the replace a thermal element - you are required to carryout cost effective insulation improvements. The new building regulations provide guidance on what are considered cost effective insulation upgrades and the requirements for new replacements (Refer to further guides in this series).

- You must also carryout a condensation risk assessment of the effects of carrying out the improvement works and take suitable precautions to prevent condensation damage.

Material Change of Use / Retained Thermal Elements and Renovation of Thermal Elements.

Where you change the use of the premises or part of the premise to any of the uses below, you must submit a building regulation application and comply with the requirements of Part L – Conservation of Fuel and Power.

(a) the building is used as a dwelling, where previously it was not;
(b) the building contains a flat, where previously it did not;
(c) the building is used as an hotel or a boarding house, where previously it was not;
(d) the building is used as an institution, where previously it was not;
(e) the building is used as a public building, where previously it was not;
(f) the building is not a exempt building described in Classes I to VI in Schedule 2, where previously it was;
(g) the building, which contains at least one dwelling, contains a greater or lesser number of dwellings than it did previously.
(h) the building contains a room for residential purposes, where previously it did not;
(i) the building, which contains at least one room for residential purposes, contains a greater or lesser number of such rooms than it did previously.
((j) the building is used as a shop, where previously it was not.

Retained thermal elements.

1. Where an existing thermal element is part of building subject to a ‘Material Change of Use’ or
2. Where an existing thermal element is to become part of the thermal envelope where previously it was not e.g. as part of a loft or garage conversion where the space is now heated.

The thermal elements whose U-values are worse than the threshold value in Table 3 column (a) - Domestic (Table 5 –Non domestic) must be upgraded to achieve the u values given Table 3 / Table 5 column (b) provided it is technically, functionally or economically feasible,
A reasonable test of economic feasibility is to achieve a simple payback of 15 years or less. Where the standard is not technically functionally or economically feasible, then the thermal element should be upgraded to the best standards that is technically and functionally feasible and can achieve a simple payback of no greater than 15 years. Generally this lesser standard should not be worse than 0.7w/m2.k

Examples of where lesser provision than column ‘b’ might apply are where the thickness of the additional insulation might reduce usable floor area of any room by more than 5% or create difficulties with adjoining floor levels, or where the weight of the additional insulation might not be supported by the existing structural frame.

Controlled Fittings and Material Alterations.

Any existing window or roof light or door separating heated or cooled areas from outside or unheated space having a ‘U’-value less than 3.3 W/m2.K must be replaced as previously discussed for ‘Controlled Fittings’. NOTE: Glazing restrictions apply as for extensions i.e. max 25% of the buildings floor area.

Feasibility.

When undertaking works to existing buildings there are often practical constraints or technical problems that need to be taken into account, such as an unreasonable reduction in internal floor area where internal insulation is applied; the approved document suggests that the application of internal insulation is unfeasible if the associated reduction in floor area exceeds 5%. Technical problems will be assessed with respect to the impact on other aspects of the regulations. Such things as the need to avoid compromising ventilation when replacing windows and differences in floor levels, the effects of the new construction’s loading on the existing will all be important.

All these questions of feasibility will be taken into account on a case-by-case basis. Economic feasibility is determined by a simple 15-year payback calculation, i.e. the amount of time taken to recover the initial investment through energy savings. So technically the level of upgrade could be limited to that which could be paid back over a fifteen-year period, however the examples quoted in the approved document are believed to meet this requirement.

If this is the case the element should be upgraded to the best standard that is technically and functionally feasible and which can achieve a simple payback in 15 years.

Payback Calculations.

The regulations allow for you to employ a suitably qualified person to provide a simple payback calculation for the cost of the thermal elements upgrading works or to prove the upgrading is not technically feasible. If the works do not achieve a simple payback of 15 years or less through energy cost savings or it is not technically possible - then the element should be upgraded to the best standard that is technically and functionally feasible and that would achieve a simple payback of 15 years or less.

This evidence should be submitted at the time of making your application for approval by Building Control.
EXEMPT BUILDINGS.
For a number of years certain building types and some domestic extensions were exempt Building Regulation control (see Schedule 2 extract below). As a result of Part P and these regulations it is now possible that the some of the buildings listed will not be exempt control. Refer to Guide 6 for full information on exemptions from Part L and the building uses / types exempted in addition to the Schedule 2 items below.

You must make a Building Regulation application and comply with the ‘energy efficiency requirements’ for the erection of previously exempt new buildings or extensions or undertaking work to the buildings listed in Schedule 2 below - if the following situations are present:

CONTROLLABLE WORKS IF:
1. Building or extension or works to same falls within ‘Schedule 2’; and
2. The building extension has a roof and walls enclosing it and it will use energy to condition the indoor climate i.e. cooling or heating; Note: for buildings who’s processes generates heat e.g. steel mill, are not using energy to condition the indoor climate if the heat comes from only the process;

SCHEDULE 2 - EXEMPT BUILDINGS AND WORKS.

CLASS I - Buildings controlled under other legislation
1. Any building the construction of which is subject to the Explosives Acts 1875 and 1923.
2. Any building (other than a building containing a dwelling or a building used for office or canteen accommodation) erected on a site in respect of which a licence under the Nuclear Installations Act 1965 is for the time being in force.
3. A building included in the schedule of monuments maintained under section 1 of the Ancient Monuments and Archaeological Areas Act 1979.

CLASS II - Buildings not frequented by people
A detached building -
(a) into which people do not normally go; or
(b) into which people go only intermittently and then only for the purpose of inspecting or maintaining fixed plant or machinery, unless any point of such a building is less than one and a half times its height from
(i) any point of a building into which people can or do normally go; or
(ii) the nearest point of the boundary of the curtilage of that building, whichever is the nearer.

CLASS III - Greenhouses and agricultural buildings
1. Subject to paragraph 3, a greenhouse.
2. A building used, subject to paragraph 3, for agriculture, or a building principally for the keeping of animals, provided in each case that -
(a) no part of the building is used as a dwelling;
(b) no point of the building is less than one and a half times its height from any point of a building which contains sleeping accommodation; and
(c) the building is provided with a fire exit which is not more than 30 metres from any point in the building.
3. The descriptions of buildings in paragraphs 1 and 2 do not include a greenhouse or a building used for agriculture if the principal purpose for which they are used is retailing, packing or exhibiting.
4. In paragraph 2, "agriculture" includes horticulture, fruit growing, the growing of plants for seed and fish farming.
CLASS IV - Temporary buildings
A building which is not intended to remain where it is erected for more than 28 days.

CLASS V - Ancillary buildings
1. A building on a site, being a building, which is intended to be used only in connection with the disposal of buildings or building plots on that site.

2. A building on the site of construction or civil engineering works, which is intended to be used only during the course of those works and contains no sleeping accommodation.

3. A building, other than a building containing a dwelling or used as an office or showroom, erected for use on the site of and in connection with a mine or quarry.

CLASS VI - Small detached buildings
1. A detached single storey building, having a floor area which does not exceed 30m², which contains no sleeping accommodation and is a building -
   (a) no point of which is less than one metre from the boundary of its curtilage; or
   (b) which is constructed substantially of non-combustible material.

2. A detached building designed and intended to shelter people from the effects of nuclear, chemical or conventional weapons, and not used for any other purpose, if -
   (a) its floor area does not exceed 30m²; and
   (b) the excavation for the building is no closer to any exposed part of another building or structure than a distance equal to the depth of the excavation plus one metre.

3. A detached building, having a floor area which does not exceed 15m², which contains no sleeping accommodation.

CLASS VII - Extensions
The extension of a building by the addition at ground level of -
   (a) a conservatory, porch, covered yard or covered way; or
   (b) a carport open on at least two sides;

where the floor area of that extension does not exceed 30m², provided that in the case of a conservatory or porch which is wholly or partly glazed, the glazing satisfies the requirements of Part N of Schedule 1.

Exempt Conservatories and Porches.
Conservatory is defined as having N.L.T three quarters of its roof area and N.L.T one half of its external wall area made of translucent material.

There have been some changes to the exemption rules for these types of extension, they still remain exempt if:
- They are constructed at ground level and the internal floor area does not exceed 30m2
- Safety Glazing complies with Approved Document N
- Where there are existing doors and windows between the conservatory and dwelling that these are retained or, if removed are replaced by walls, windows and doors that meet the energy efficiency requirements; and

This is the big change - Where the heating system is not extended into the conservatory or porch. So if you heat the conservatory or porch the exemption ceases to apply and a building regulation application will be required.
Where conservatories are not exempt as a result of the above the following will have to be undertaken:

**IMPORTANT NOTE** - Removing and not replacing any or all of the thermal separation between the heated part of the building and existing exempt extension, or extending the buildings heating system into the exempt extension means the exemption ceases. This constitutes a change to the buildings energy use and reasonable provisions would have to be taken as to the building energy efficiency as if it was a conventional extension and make you must make a Building Regulation application.

**MAKING AN APPLICATION FOR PREVIOUSLY EXEMPT BUILDINGS:**

Full details must be submitted of the energy efficiency provisions to be carried out. Charges will be based on cost of the thermal improvement works, unless the work being undertaken constitutes a ‘Material Alteration’ in its own right and requires the submission of an application anyway – then the charges will be based on the full cost of the works proposed (Refer to our charges guidance sheets).

**CHANGING A BUILDING’S ENERGY STATUS.**

Where by virtue of undertaking certain works to either a commercial or domestic building you change the buildings or part of the buildings energy status, the regulations regarding energy efficiency improvements applies. Examples – domestic garage conversion / providing heating say to an unheated warehouse etc. You will be required to submit a Building Regulation application for the works (see below) and comply with the provision of Building Regulation Part L.

"Change to a building's energy status" - means any change which results in a building becoming a building to which the energy efficiency requirements of these Regulations apply, where previously it was not;"

"Building" - means the building as a whole or parts of it that have been designed or altered to be used separately.

**CONSEQUENTIAL IMPROVEMENTS TO ENERGY PERFORMANCE.**

Regulation 28 requires the application of the new energy efficiency requirements of Part L to an existing building with a total useful floor area over 1,000m² where the proposed building work consists of or includes —

(a) an extension;

(b) the initial provision of any fixed building services (other than renewable energy sources); or

(c) an increase to the installed capacity of any fixed building services (other than a renewable energy generator).

However nothing in this requirement needs to be carried to the existing building, if it the work to be carried out if it is not technically, functionally and economically feasible (see ‘Payback Calculations’ below).
"fixed building services" - means any part of, or any controls associated with —  
(a) fixed internal or external lighting systems, but does not include emergency escape lighting or specialist process lighting; or  
(b) fixed systems for heating, hot water service, air conditioning or mechanical ventilation;"  

MATERIAL ALTERATION OF SERVICES.  

The provision, alteration or extension of a controlled services or fittings in or in connection with a building; is considered to be a ‘Material Alteration’ of a building or controlled services or fittings - a Building Regulation application must be submitted for such work.  

There has been little change to the provisions under this requirement, but because ‘Material Alteration’ to controlled services or fittings are covered under the Part L and the provisions have been extended some changes have occurred.  

“Controlled services or fittings are controlled service or fitting" - means a service or fitting in relation to which Part G, H, J and L.  

Examples of such are alterations of or provisions of: “new above and below ground drainage provisions; installation of new sanitary appliances and sinks; heating appliances and systems, fixed internal or external lighting systems; but not emergency escape lighting or specialist process lighting; fixed systems for heating, hot water service, air conditioning or mechanical ventilation;”  

Refer to Guide 3 for exemptions of some minor works to Controlled services or fittings.  

An alteration is material for the purposes of these Regulations if the work, or any part of it, would at any stage result -  
(a) in a building or controlled service or fitting not complying with a relevant requirement where previously it did; or  
(b) in a building or controlled service or fitting which before the work commenced did not comply with a relevant requirement, being more unsatisfactory in relation to such a requirement.  

In paragraph (2) "relevant requirement" means any of the following applicable requirements of Schedule 1, namely –  

Part A (structure)  
paragraph B1 (means of warning and escape)  
paragraph B3 (internal fire spread - structure)  
paragraph B4 (external fire spread)  
paragraph B5 (access and facilities for the fire service)  
Part M (access to and use of buildings).
MAKING A BUILDING REGULATION APPLICATION.

Refer to guidance notes on making a full plan or building notice application.

Works to thermal elements only – charges will apply to this work (Refer to our charges guidance sheets).

Building Control will only be concerned with the Conservation of Fuel and Power elements of the work – unless it constitutes a ‘Material Alteration or Building Work in its own right.

Works to thermal elements as part of a larger Building Regulation application e.g. extensions / alterations etc – you will pay the charges for the main application work elements and you must then add the appropriate additional charges - (Refer to our charges guidance sheets).

Building Control will only be concerned with the Conservation of Fuel and Power elements of the thermal element work – unless it constitutes a ‘Material Alteration or Building Work in their own right.

Your applications must include a full specification of all works to be undertaken to thermal elements, the works to be carried out to upgrade them in compliance with the regulations (including thermal performance of chosen materials) and the precautions to be taken to prevent condensation in the upgraded works.

Emergency Repairs.

In certain situations it may be necessary to carry out emergency repairs to controlled fixed building services e.g. emergency repairs to heating and hot water systems and to thermal elements, works that would be controlled by the new regulations and notification may not be possible at the time of the repair.

If this is the case you must at the earliest opportunity after commencement submit a Building Notice to Building Control to resolve the situation – repairs must comply with requirements of Regulation L1.

Other Regulations Interfaces.

Remember the requirements of related regulations C, F and J - e.g. condensation control / ventilation provisions and gas / solid fuel appliance and combustion air.