

# ASSESSING THE IMPACT OF AMENDED BUILDING REGULATIONS ON THE OPERATIONS OF UK CONSTRUCTION COMPANIES

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The UK government continues to make regular amendments to building regulations. This is in order to keep these regulations relevant to today's prevailing construction environment. More recently, UK building regulations have been amended to facilitate the introduction of the sustainability concepts in UK building design and delivery. This paper examines the impact that these amendments on the operations of UK Construction companies. To conduct the study, five major building practitioners were interviewed. We found from this preliminary study that changes to building regulations do have a considerable impact on the operations of UK Construction companies. It is however important to highlight that a full assessment of the impact of these changes in building regulations is still not fully assessed due to the limitations with the sample size.

Keywords: building regulation, energy policy.

## INTRODUCTION

The revised Part L of the Building Regulations focuses on the energy efficiencies of buildings. The need for the revised regulations is supported by current statistics which indicates that the UK construction industry produces almost half of the UK's total CO<sub>2</sub> emissions (DLE, 2001; DTI, 2006). With recent regulatory developments in Europe, the government has responded by initiating amendments in 2006 to the Part L of Building Regulations (Warren, 2003; Baiche *et al.*, 2007). The primary objective of these amendments is to help address the concerns relating to high energy efficiencies of new and existing building (Campbell, 2007) which needs to be managed in order to reduce national carbon dioxide emissions (English Heritage, 2002). The regulation also applies to the renovation and alteration of existing buildings.

At present, compliance with Part L is via a National Calculation Method which calculates carbon emissions (Heywood, 2006). Baiche *et al.* (2007), however points to further revisions to Part L planned for 2010 which will probably include a reduction of allowable carbon dioxide emissions. The amended regulations mean that building construction post 2006, must now take into greater account the conservation of fuel and power. This new regulations also requires that 'carbon footprints' of new buildings be monitored, although in marked difference from the 2002 regulations, the performance of the whole building, rather than the individual elements of the building envelope needs to be taken into consideration (Heywood, 2006).

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## **STUDY OBJECTIVES**

Two main research objectives were set. The first objective was to identify what new approaches construction companies are adopting in order to adhere to the amended building regulations. The second objective of the study involved assessing the regulatory impact against various parameters, including the three primary criteria for assessing project success (Time, Cost and Quality). These two objectives are seen as important especially with possible increases in energy demands and carbon emissions. These rises are anticipated as cooling requirements rise with increases in global warming and climate change (Houghton, 1996; Chappells and Shove, 2005).

## **NEW PART L BUILDING REGULATIONS**

In April 2006, the most recent amendments to Part L of the Building Regulations came into force. Within these amendments are various sections, which deal with definitions, procedures and required standards expected in terms of the technical performance of buildings. This amendment covers various area such as defining what types of work are subject (such as NHS buildings) and others that are exempt (such as the Metropolitan Police) from control under the amended regulations. The new amendments do not specify the energy-saving devices or materials to be used, although it sets target level of carbon emission. It also allows designers to have the flexibility to innovate and to choose the most cost-effective and practical solutions (BRE, 2006).

## **PREVIOUS WORK**

Numerous studies have been carried out by various scholars examining the impact of amendments to building regulations. Such scholars have included Bell and Lowe (2000), who identified shortcomings of the methods used to demonstrate building regulatory compliance, Warren (2003) who carried out studies on the advantages of establishing sensible and consistent national building policies and programmes and Chappells and Shove (2005) who examined the need for a regulatory framework that recognises increased challenges associated with increasing energy demands and carbon emissions. Other scholars have included Campbell (2007), who examined strategies for building certification. More specifically, in recognition of the importance of new building designs, we have seen studies examining the impact of amendments to building regulations; we have seen due to recognition that the design effectiveness of the building envelope is critical, an increase in studies exploring the significant impact of these regulations on building design. Such studies include that of Heywood (2006), Imrie (2007) and Ward (2008). Previous studies have also conducted by the Office of The Deputy Prime Minister (ODPM). In these studies the ODPM (2002; 2006a; 2006b; 2006c; 2006d and 2006e), attempted to examine the impact of the amended regulations on the operations of UK construction companies (ODPM, 2002; 2006a; 2006b; 2006c; 2006d and 2006e). This so called 'small firm impact test' involved a sample of companies involved in the different delivery phases of construction projects. The study was however not deemed adequate for three main reasons. In the first instance response rates for the surveys that it conducted were too low for credible conclusions to be drawn. Secondly, the respondents who did take part in the data gathering exercise were not sufficiently clear as to what the full implications of the regulations were on their business operations. The third limitation of the study was that the findings of this research were published in March 2006 (a month before the amended regulations came into force). This gave industry very little time to assess its implications.

The findings from the ODPM research have acted as a good source of information for the development of this current paper. The use of this existing knowledge is therefore intended to act as a platform for drawing comparisons with our research.

## RESEARCH METHODOLOGY

In order to support our study, we chose to conduct semi-structured interviews. This approach was regarded as the most suitable as it enabled flexibility in terms of the order in which the research themes were to be examined. This approach also enables the interviewees speak more widely on the issues that are raised by the researcher (Denscombe, 2003). Five respondents, all of whom worked in the same professions sampled in the earlier ODPM survey, were interviewed. The sample size was regarded as appropriate to satisfy requirements of informational redundancy and saturation of our preliminary study.

The questions that were asked during the interviews were split into six categories. A number of the questions asked have been modified from the small firm's impact test.

*Table 1.0: Interview Question Categorisation*

<b>Questions</b>	<b>Question Objectives</b>
Introduce the interviewee to the subject.	Overall view of the respondent's perception of the amended building regulations.
Identify business specific concerns.	Main concerns of respondent's organisation. Impact the new regulations have had on the respondent's construction approach employed. Cost and benefits of the new amended regulations on respondent's organisation.
How have the regulations affected various construction-related professions?	Impact moving from a whole-building compliance standard (as against a simple elemental approach) affected the respondents working practices. Manner of compliance of respondent's organisation to these new regulations. Changes to the respondent's business operation model.
Opportunities or threats on respondent's organisation (especially on partnership).	Any specific business opportunities created as a result of new regulations. If new business opportunities have been created has respondent's organisation been able to exploit these. Have SME or larger organisations been better placed to react to the new regulations? Any impact on the design process. Possible impact on suppliers.
Impact of new regulations on key criteria for project success.	Any impact of the new regulations on cost of construction production. Any impact of the new regulations on quality of construction production. Any impact of the new regulations on time to deliver of construction production.
How to achieve compliance.	Impact of loss of the Elemental Method? Impact of Robust Detail? Impact on use of Model Designs? Impact on use of Compliance Checklists? Impact on use of Controlled Elements?

Table 1.0, above, shows the different categories along with a description as to why each different category was selected and the specific questions asked under each section.

## **DISCUSSIONS**

Analysis of the data gathered from the interviews provided a total of nine major variables. These variables are discussed in the next section of the paper.

### **Overall perception of the new regulations**

When discussing the overall perception of the new regulations, the majority of the interviewees agreed that the government's decision to amend Part L was a positive step. It was also seen as a positive approach of supporting the government's commitment to the problem of climate change. However concerns were raised related to how prepared the industry was to adopt these changes. Specifically, two of the respondents (B and C) suggested that insufficient technology was a major limiting factor as relates to the capability of construction companies to comply with the new regulations.

### **Impact on working practices**

All of the respondents suggested that their companies have been directly affected in some way or another by the new regulations. Particularly, efficiency standards and questions on how the design, selection and use of energy efficient technologies impacts on the industry appeared to be the main areas of concern (respondent A, B and C).

### **Cost**

On discussions around the costs, the majority of respondents identified concerns with cost (both financial and non-financial) to their respective businesses. The consensus amongst the interviewees was that financial costs have arisen from the need to recruit and train staff. By concentrating only on associated cost with recruitment and training, it appeared that the interviewees demonstrated a limited understanding of the cost implications of the new regulations. Earlier cost models developed by DLE (2001), for example appears to show that on average compliance with the new Part L2 could add up to 4.4% to building cost. For occupiers, this will no doubt translate into higher rents (GVA Grimley, 2005). Neither of these points or concerns highlighted earlier within the DLE or GVA Grimley study was raised by any of the respondents.

### **Complying with regulations**

We identified from the analysis that there were various approaches in which the different delivery partners sought to comply with the changes to Part L. These approaches included the education of staff and the proactive inclusion of professional organisations such as DEFRA, BESCA and BRE in the overall delivery process. For example Respondent B's company have signed up to BESCA to help record projects.

### **Benefits**

Major benefits to the industry were identified by the respondents. This relates to work and professional opportunities that the regulations had provided within certain construction fields (identified by B, C and E). For example, we now see the need for Building Services Engineers and Building Designers to get involved in projects at an earlier stage of the project than would have previously been expected due to the increased demand for more specialist and technical knowledge to support the construction process.

Another key benefit that arises from the new regulations is its ability to stimulate innovation in building construction. Studies by Gann et al (1999), for example suggest that shifts from building regulations which are prescriptive to those that are performance based will create more opportunities for innovation in the industry. Unfortunately, majority of the respondents (A, D and E), were of the opinion that larger organisations were perhaps better placed to take advantage of such opportunities. This is primary because of the increased financial cost associated with the new regulations [earlier discussed in previous section]. Other areas also raised include the challenges of implementing a self-certification scheme which was seen as only going to benefit larger organisations. Overall, the results of the were in line with earlier work by DLE (2001), which points out that it will take time for designers to gain a better understanding of the new regulations and hence be in a position to identify and implement optimum design solutions for buildings.

### **Working Relationships**

The impact of these amendments on working relationships was also addressed. Respondent C identified that building services engineers are now seen as a much more influential and important part of the construction team stating, ‘we are now involved in the construction process about 3-4 months earlier than before the changes to part L were made’.

### **Quality Standards**

Majority of the respondents appeared to suggest that much more action was required if the regulations were to make a difference. Respondents C and D both point out that the UK is still a long way behind other EU countries. It is noted that Part L will continue to alter the TER to produce carbon neutral buildings (in operation) by 2016). We see for example Respondent E suggesting that before more action is taken it is important to recruit ‘more highly qualified people with the appropriate knowledge’ to help enforce the current standards.

### **Project Durations**

There were been conflicting responses with regards to whether the new regulations had led to longer project durations. Generally, we see the respondents pointing out that project time durations had not been significantly been affected. Both respondents A and D on the other hand felt that they had. For example, they suggested that delays have been caused on Part L related projects due to the need for extra work activities to be programmed and carried out. This opinion is shared by DLE (2001), who suggest that not only will the new regulations slow building design and compliance processes while the industry gains a more detailed understanding of the regulations, but also that with the new regulations incorporating commissioning criteria, the construction industry may need to allocate more time to its commissioning phase. This will undoubtedly have an impact on overall construction durations and cost. It is however important to point out that while respondents A and D highlighted impact of the new regulations on project durations, respondents B, C and E were of the opinion that the changes have not extended project durations as the extra work could still be implemented within the same time periods. For example, Respondent C suggested that although a little more work and extra costs have been incurred, ‘it still only takes approximately two weeks to generate a building model which complies with part L.

### **The use of compliance standards**

There was consensus amongst all of the respondents that the loss of the elemental method had made it more difficult for each of the different companies to validate conformance standards. Respondent C did however identify an unlikely advantage in that it was now more difficult for contractors to use cheaper and often lower quality materials in the construction process.

There were a range of feelings with regards to the use of robust details as a means of assisting compliance. Overall, it was felt that robust details did not necessarily offer a route to demonstrate compliance for Part L. This was because robustness in terms of compliance could only be achieved by formal calculations by an approved professional. It was then up to the designated institution or body to certify the build as compliant. With regards to the use of model designs as a tool to help companies achieve the required building standards, majority of the respondents agreed that the application of this technique was very limited. Four of the five respondents (B, C, D, and E) suggested that the idea was good in principle but pointed to a criticism regarding the accuracy of models. The general opinion was that buildings were unique so a model would not accurately represent new buildings compliance.

The use of more compliance checklists, as a tool to help enforce the new requirements of Part L attracted a mixed response from the interviewees. Respondent D suggested that the use of more checks had led to increased delays on the projects that his firm was involved in. However the other respondents were more positive. They suggested that the use of checklists served as a 'good aide memoir' or 'prompt' to ensure that the necessary evidence was made available and could be monitored.

### **CONCLUSIONS**

Results from the analysis of the interviewee's responses confirm the perceived challenges faced by UK Construction companies having to operate within existing or perceived challenges that have arisen as a result of the amendments to Part L of the Building Regulations. Overall, the consensus amongst the interviewees has been that the amendments to Part L have brought about significant changes to the procedures and techniques that are employed in the construction process.

Our view at present is that the amendments to Part L, although resulting in challenges for industry, will have a positive impact. Meeting the challenges brought about by the introducing of the amendments to Part L also highlights the positive impact of more close working collaboration and partnerships with organisations such as DEFRA, BESCA and BRE. There are also increased opportunities to engage industry in training and accreditation services. Our study has not gone as far as identifying clear 'solutions' to the debate. This is because we have not yet conducted an extensive impact assessment of the scope of the challenge brought about by the amendments. The intention of this paper has been to highlight the need for more research to be carried out in this area (especially as building regulations are constantly amended).

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