

PERCEPTIONS OF SUSTAINABILITY IN DOMESTIC HOUSING: HOW DO THOSE WHO MUST DELIVER IT UNDERSTAND IT?

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A response to the needs of the sustainability 'agenda' has been the development of different assessment methods that are intended to direct and inspire designers towards sustainable practices. Each of these assessment methods are underpinned by a particular understanding or interpretation of the best way to meet a perceived set of sustainability needs. This situation raises questions surrounding how notions of sustainability and sustainable development are assimilated and interpreted by Industry Professionals. These questions revolve around how a designer perceives sustainability and how this influences their personal design approach. However, one issue that persists is the lack of a shared sense or understanding of what sustainability is and why it is important to our industry and society. In order to explore the breadth of perception within the domestic housing sector, a series of 24 semi-structured interviews with architects and structural engineers have been thematically analysed. Early outcomes suggest that while there is a thread of working towards sustainability, three aspects need further exploration. First is a confirmation that the level of understanding around sustainability practices and procedures among designers is diverse. Second is a potential lack of engagement with the standards they are being asked to adhere to. Thirdly, is that designers consider the impact of cost when pursuing sustainability in their design - particularly to enhanced levels, to be extensive and often prohibitively so. The outcomes of this study will be beneficial in three ways - they can contribute to the understanding of sustainability practices within the domestic housing sector; knowledge dissemination via guidance and design guides could help limit the variability of approaches of design teams; and, finally, the understanding developed will allow a more informed approach to policy development.

Keywords: housing, sustainability, standards, architectural practice

INTRODUCTION AND CONTEXT

Sustainability, or at least the *notion* of 'sustainability' or 'sustainable development', is now seemingly at the very heart of the Construction Industry, while sustainability credentials have become the near-ubiquitous means of marketing any given building product. With a widely acknowledged housing shortage in the UK, too, the residential element of the construction industry faces a considerable task to meet this demand while also meeting increasingly stringent sustainability requirements that must be met through the Building Standards.

Sustainability - as a concept - has become increasingly prominent in recent years and is now fairly ubiquitous across all sectors - not just the construction industry. This

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originally emerged from environmental concerns and goes hand in hand with discoveries and advances in scientific knowledge concerning the interactions or impact that humans have on planet Earth. In the 1960s this could be characterised by a greater understanding of pesticide use and the associated unintended consequences; in the 1970s and 80s with (fossil) fuel shortages, ozone depleting chemicals and the emergence of continent-wide famine. Since the 1990s it has largely been driven by a greater understanding of climate change and how extensive the human contribution to this might be (Edwards 2014)

As applied to the construction industry, it is *environmental* sustainability that is often implied when referring to sustainability. In practice, this is essentially a variety of factors that reduce CO₂ emissions - widely accepted as the primary driver for climate change. With residential buildings still accounting for around 14% of carbon emissions in the UK (Department for Business, Energy and Industrial Strategy 2018) and around three quarters of this from the heating of space and light, mostly from natural gas (The Scottish Government 2018) before including electricity generation, which itself accounts for around 25% of UK emissions, this is hardly surprising.

While not necessarily synonymous with each other, 'sustainability' and 'sustainable development' are sometimes used interchangeable and often erroneously so. Indeed, Sustainable Development, is a term that is actually much broader in its scope and is one that is ingrained in the relevant primary legislation across the UK, including the Climate Change (Scotland) Act (2009) and Climate Change Act (2003) which drive the implementation of the associated aspects of the Building Regulations. Rather than employing the term 'development' in the way it would typically be understood for the construction industry i.e. 'housing development' or the 'development' of land, 'development' in this context is instead concerned with a society-wide notion of sustainability and includes a variety of interrelated factors that are '...crucial for the well-being of individuals and societies.' (United Nations 2016). For the United Nations this has traditionally been defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' and is the definition that has been widely employed since the Brundtland Report in 1987 (United Nations 1987). This is now embodied in 17 distinct goals laid out by the UN that cover a range of goals that seek to 'harmonize three core elements: economic growth, social inclusion and environmental protection' (United Nations 2016).

For the construction industry, the rise of the sustainability agenda has led to a multiplicity of 'Tools' and 'Assessment Methods' to promote more sustainable building practices. Most notable in the UK are: BREEAM, used exclusively for non-domestic developments, CEEQUAL, The Code for Sustainable Homes (now retired and being rebranded as the Home Quality Mark following recent changes to Government Policy) and EcoHomes (now also retired and latterly only applicable in Scotland). Since the early 2010s there have been efforts to increase the requirements of the Building Regulations (termed the Building Standards in Scotland); beyond their original Health and Safety orientation to include increased mandatory levels for conservation of energy and materials or design factors covering aspects such as glazing and insulation, amongst other 'sustainability' requirements.

However, in spite of substantial advances in knowledge in these areas and continuing efforts to implement measures at the supra-national level to tackle sustainability issues, sustainability is far from being achieved and many questions remain. Not least

of these is the need for greater understanding of how designers perceive the problems they are being asked to help solve and how they see their own particular role in that, as it is the designer who must (de facto) meet the various sustainability requirements that are now laid down in Standards and Regulations.

Questions arise around how designers view the issue of sustainability - both a concept and as a deliverable - and how much a designer's perceptions of sustainability influences their approach to meeting or surpassing the requirements of the Building Standards. Questions also revolve around how far these perceptions influence their personal design approach; the ongoing impact this has on their sustainability literacy (Higham and Thomson 2015; Stribbe 2009) and to what extent these impact their final design. Together, these may begin to reveal how effective the current 'system' is in attempting to deliver its stated aims and desired outcomes.

Looking at the views of designers is not to diminish the role that other professionals play in the construction process. It is, however, the designer that is responsible for a design that complies with minimum standards and the designer, more than any other person, that is likely to be involved from the concept stages through to the construction phase. In so far as 'sustainability' is concerned, then, the designer resides in a fairly unique position with unique knowledge.

Aims and Objectives

The aim of this paper is to capture and begin to understand the perceptions of sustainability that exist amongst construction industry designers in order to develop insights into the relationship between sustainability policy and practice. Specifically, the research presented will attempt to understand how perceptions of sustainability differ and how designers perceive their role in delivering sustainability.

RESEARCH DESIGN

The overall approach for this investigation to bring about an understanding of the 'themes of the lived daily world from the subjects' own perspective' (Brinkmann and Kvale 2015:27). This understanding has been obtained via the views of individuals currently working in the construction industry, (see data section below). This took the form of semi-structured interviews - that is - interviews that are intended to in essence, the interviews seek to 'research other persons' worlds' (Fellows and Liu 2008:156) and enable the researcher to find meaning from the information they glean from the interviewees.

Data

Specifically, at the time of writing, twenty-three individuals have been interviewed so far for this research. Each person was interviewed on their own and, while the intention was for the interview to last around 45 minutes, the length of each interview did vary in time substantially - from around 30 minutes to in excess of 1 hour and 30 minutes. In each interview the order, phrasing and framing of each 'prompting' or starter question was as similar as possible and practicable.

The recruiting of interviewees was via a variety of sources including existing contacts known to the researcher, and, in many cases the contact networks and recommendations of the participants themselves. All potential participants were emailed to ascertain their willingness to contribute and this was followed up with a further explanatory email to provide broad details about the project and what to expect for the format of the interview.

The majority of interviewees - 19 - were chartered architects. One interviewee was a very experienced Architectural Technologist, two were approaching chartership and one was a chartered structural engineer. Professionally, the breakdown of experience is: two 'early career' (less than five years experience); 13 'early mid-career' (five to 20 years experience); seven 'late mid-career' (more than 20 years experience) and one 'late-career' (within five years of retirement).

This research has been carried out in Scotland and has only gathered information from practitioners currently working in Scotland with experience of residential projects. This has partly been done to reduce a factor of complexity in the findings, since Scotland operates under different Building Standards compared to the rest of the UK. While the Scottish Standards are arguably more ambitious than the current Building Regulations applied elsewhere in the UK, the findings are thought to be equally important across the Industry - not least because several interviewees had worked under both systems and were asked to draw upon the entirety of their knowledge and experiences in their responses. Similarly, every interviewee had experience in both the Commercial and Domestic sector and, while asked to reflect primarily upon the domestic projects, they were free to draw upon the breadth of their professional experience.

Thematic Analysis

Analysis of the data obtained from these interviews is through a thematic analysis of the interview data using NVivo. Thematic analysis is described by Braun and Clarke (2006) as "a method for identifying, analysing and reporting patterns (themes) within data". In part, this is achieved by 'coding' the transcripts of the interviews. Coding is a means of gathering and collating the different pieces of related information that exist across sources and the use of NVivo allows them to be analysed more accurately and systematically to identify themes and develop theory. In the data presented here, for example, one of the themes that has been identified across interviewees is that of cost - but no questions in any of the interviews specifically asked about project costs, or indeed, the costs associated with implementing sustainability. Yet, almost every person interviewed offered cost as one of the major obstacles to sustainability in their professional experience.

Further to this, and to go beyond an objective, descriptive mode of analysis and "attempt to theorize the significance of the patterns and their broader meanings and implications" Braun and Clarke (2006) and begin "to identify or examine the underlying ideas, assumptions, and conceptualizations" (ibid), it is necessary to adopt aspects of 'latent' thematic analysis and thus adopt a subjective, interpretative approach to the data in order to develop themes.

As far as possible, these interviews are intended to operate much like an everyday conversation, but this 'conversation' is, of course, led and developed by the researcher to gravitate towards the areas of specific interest to the research by choosing which areas to pursue and respond to in reaction to what is said to them (Barbour 2008). The researcher must continually be at pains to not unduly influence the responses of the interviewee in developing the conversation, as this could inadvertently lead to the development of the 'Hawthorne' or 'observer' effect whereby the respondent, in different ways, may alter or conform their answers under this influence (for an example of how this can be mitigated see Oswald *et al.*, 2014). This was felt to be particularly relevant when discussing the matter of sustainability, as it was felt that

there might be an inclination on the part of the participant to provide what they thought to be model' or 'good' answers.

This paper presents early findings in this process and the complete analysis is being developed as part of a larger PhD project.

FINDINGS

This paper draws on early-stage analysis of the interview data and a number of themes are already apparent.

1. The level of understanding around sustainability practices and procedures among designers is diverse.

In the interviews, participants were asked a range of questions intended to draw out their own definitions of sustainability, how and when issues of sustainability are introduced to a project and also questions designed to capture the practitioners understanding of sustainability and sustainable development more broadly - beyond the individual project and even beyond the realms of the Construction Industry.

The noted diversity manifested itself in a number of ways, although there was a clear and general propensity to gravitate towards a discussion of materials and energy rather than broader issues. This is exemplified by one participant expressing their understanding of sustainability as the "...use of material or certain levels of, energy to be achieved."

Of course, this is quite understandable since a considerable portion of minimum compliance is reliant on the reduction of CO2 emissions. However, it does raise questions about whether some designers are operating with a somewhat blinkered approach to their work. This may be wilful and deliberate on the part of the designer, but it may also be an indicator of shortcomings either in education or ongoing development of designers.

Even when asking directly about broader themes such as 'society', 'the economy' and 'the environment' comments were largely directed down to the individual building or development level - with a particular tendency to equate 'economic' elements of sustainability with the cost implications of their particular building(s).

Some architects are very clear in their own mind what sustainability means to them and in some respects, this is not in line with what they are required to implement by the Building Standards. A number of interviewees mentioned the concept of 'fabric first' - particularly with reference to their distrust or dislike of the expectancy to use technological or mechanical solutions in their buildings [by the Standards].

I'm resistant to the idea of sustainability being something that you just plug on bits of kit to make it work... form, function, materiality as being a kind of holistic part of the design process - that's what I would think of as being sustainability... in a wider sense as well as, you know, culturally sustainability what it means to be living in rural Scotland today and how people can kind of make that a sustainable lifestyle.

For others, however, there is a marked lack of clarity around what they understand sustainability to mean or what it is to be defined as. This should not be taken out of context - 'sustainability' is undeniably an inherently intangible term to define. More generally, however, was the sense that a broader awareness of the wider issues of sustainability was not present for some - aside from the fairly narrow range of factors that the Building Standards ascribe as 'sustainability'. This line of discussion led one participant to express their understanding of the societal element of sustainability as:

How it affects peoples as well - in their lives and stuff like that.

This, too, could potentially indicate a shortfall in training and/or education of some architects as well as potential deficiencies in how CPD is delivered, since, as a number of participants pointed out, sustainability CPD can often be little more than a marketing exercise for a product that claims to be more sustainable than another.

...the trouble is most CPD that the industry provides aims essentially marketing under a different guise, so in general everyone, whatever their product is, is what's going to save the world

The role of the client should not be forgotten in this with regard to sustainability practices either. The architect can attempt to lead a client in a particular direction, but it is ultimately the design brief that that architect must fulfil. Some participants did, however, stress that they may not be willing to continue working with a client who was asking them to compromise on aspects that they would see as being essential to their own approach - particularly with respect to their sustainability credentials as they would see them.

2. There is a notable lack of engagement with the relevant building standards and particularly the enhanced levels of achievement.

Several questions were posed to the participants relating to the Scottish Building Standards. Of particular interest for this research was Section 7: Sustainability although clearly Section 6: Energy is relevant here too.

Since minimum compliance with Section 7 ('Bronze' Level) is fulfilled by meeting the requirements of Sections 1-6, for some participants there has scarcely been a reason to familiarise themselves with the enhanced levels of achievement (Silver, Gold and Platinum) because there have been so few occasions where their clients have been willing to consider the extra (financial) burdens of doing so. Some participants noted their general ambivalence to some of the requirements due to their perceived unsuitability or seemingly contradictory nature with telling comments such as:

I'm not sure if it's necessarily attempting to measure the right things anyway.

and

...I've never really quite understood what it's meant to be doing because it seems to be a section that's there that you can comply with if you feel like

It should be noted, however, that there was a general appreciation from a number of participants of the "backstop" benefits that may be gained with the Standards generally:

We quite often find ourselves in a situation where with clients who don't have any sustainability agenda, that the building regulations provide a really, really useful backstop where we're able to say you just have to do this...

For others, there was somewhat different attitude expressed about some elements of the Standards:

I'll be honest with you - in practice I think section Seven is a waste of time.... I don't know of anybody that actually has adopted the gold standard. I've never seen it in any marketing literature for any housing development

This does not, however, provide a complete picture. Several participants suggested other reasons for their admitted reticence to engage with the Building Standards and it is certainly does not seem to be because designers are taking no notice of them, One

participant expressed their frustration in terms of how they had to go about complying with some aspects and the negative effect they feel it has on their design process:

You spend all your time trying to comply with them rather than try to do it well

Another reason is that some designers broadly consider their design process as embodying superior sustainability aspirations to those that are required by the Standards and thus - in their estimation at least - exceed the minimum requirements in a different way. In addition to this, a number of participants were clear in their opinion that seeking such achievement would provide very little added value for them or their client, who so often just wanted to meet the minimum compliance levels. One participant, reflecting on this noted, to his amusement:

I think I did exceed the minimum standard one time on sustainability but it was purely by accident!

Further to this, several participants indicated a frustration with the Building Standards and the approach they find themselves taking to material use which is, to them, seemingly contradictory:

Are we using less plasterboard in a house than we did 15 years ago? The answer is probably not because, what has happened is that because of issues with noise and what not, we're now using more plasterboard in houses... So, if sustainability was to drive down the use of materials... We should be using less, but are we?

3. Designers consider the impact of cost when pursuing sustainability in their design - particularly to enhanced levels, to be extensive and often prohibitively so

Whilst it will seem somewhat obvious or even hardly worth noting that cost is a prohibitive feature for the Construction Industry, it is nonetheless significant, and of particular interest, when considering the pursuit of increased and enhanced levels of sustainability and this has emerged in this research in a number of ways so far.

One thing this may indicate is that the embedding of sustainability aspirations still has some way to go. As such, it has become something of a 'movable feast' inasmuch that it can be all too easily dislodged and essentially 'parked' for the sake of a project continuing rather than a project being altered in some other way.

As one participant reflected:

Sadly it's also true that having set out with a high aspiration for a project - when that translates to pounds, shillings and pence, people's agendas often change and they're then able, or somehow able, to find the ways around things that were previously sacrosanct as it were.

While another reflected that when the 'wish list' is longer or larger than the budget:

...it is about making distinct decisions.

Of course, much could be written about the economic and regulatory frameworks that exist to create this situation and, while this will not be possible here, it is clear that changes to these frameworks or a change to how sustainability is incentivised may yield increasing benefits for the pursuit of sustainability.

A further nuanced aspect of the impact of cost may simply be that for some, and particularly the clients that control the project brief, sustainability is not much more than something to 'be seen' to be doing, with one participant noting that:

we quite often find that we have clients who maybe talk about that ambition early on as part of their brief and when the cost plan comes in they want to revert to the cheaper materials that maybe don't have the same sustainable credentials

And for another:

I very often find that a big factor, that overrides all sorts of other things is cost. You start off with “oh yeah, yeah, we’d love to do this” and then “oh wait, that costs more than doing the bare minimum... ah right, no - forget about that then

For another participant when the issue of cost came up, there was a further example of this need to ‘be seen’ aspiring to sustainability but this also highlighted the dangerous extent this type of approach can lead to. This is when the mistaken belief persists that sustainability is being pursued - even when it has systematically have been abandoned as a project has progressed:

...particularly sometimes clients start off with the, the ambition that they’re going to do something really good, you know, might talk about getting BREEAM certification and whatever. And as it goes on, that gets watered down and watered down [due to cost constraints] until you get something that they’re still claiming is wonderfully sustainable that actually “well, yeah, we used a bit of timber on it.

As this research progresses, further features relating to the impact of cost will emerge but, ultimately, as one participant revealed when reflecting on sustainability aspirations specifically, is the need to compromise on something - and currently it is these sustainability aspirations that have to give way:

The punchline for everybody, though, or punchline for 90% of the people, is that they cannot really afford to indulge their dream or aspiration and it always comes back to money, does it not? So, when it comes back to money, people’s philosophies ideas, aspirations always get compromised

CONCLUSIONS

The results obtained from this research thus far reveal several interesting features and offer insights as to how specific sections of the construction industry are currently operating to meet the demands of the sustainability ‘agenda’ in the UK and many more are expected to unfold as this research progresses.

This is shown in three areas that have been expanded up on in this paper. Firstly, is that there is significant diversity of knowledge, understanding of sustainability principles amongst designers. Second is that the Building Standards, having been re-imagined in recent years to further the delivering of a more sustainable built environment, do not yet seem to be engaging a substantial number of designers - and particularly not to seek the higher levels of achievement included in the standards. Thirdly, is the significant impact that cost has on a designer’s ability to pursue higher levels of sustainable design and construction, and how this impact affects either their client’s sustainability aspirations or their own.

There are a number of ways that the findings from this research may be further developed to provide vital contributions to both sustainability discourse and its practical application in the Construction Industry.

In relatively simple terms, practicing designers, can gain an insight into how their fellow professionals perceive of themselves and their work and therefore be in a position to understand and appreciate each other better. Additionally, insights from this research can also feed directly into CPD delivery for designers - to make it more applicable and more robustly ‘educational’ rather than the marketing opportunity that has been experienced by many.

For the education and training of designers there is an opportunity to input directly and constructively into these processes. A small number of ‘early career’ designers

were interviewed in this project and there was a clear lack of both knowledge and familiarity with sustainability issue that cannot simply be attributed to their limited amount of practical work experience. Indeed, it might be expected that practitioners who have only relatively recently completed their formal training might be much better informed on these issues. That was not seen in this research and indicates both a clear need for, and opportunity to contribute to the educational frameworks that direct the education of future designers.

This research can also offer much to the development of Policy, Legislation and Regulation for sustainability and the built environment. In discussing designers' thoughts and perceptions around the applicable Building Standards, much was learned about how they interacted with the regulatory aspects of their work. Greater understanding of these issues can assist in developing increasingly realistic, robust and achievable regulation - and in ways that might empower and incentivise designers to begin addressing the current, seemingly inescapable, compromise between cost and aspirational levels of sustainability in their design.

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