

The Compatibility of Building Regulations with Projects under new Low Impact Development and One Planet Development Planning Policies: Critical and Urgent Problems and the Need for a Workable Solution

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Introduction

Low Impact Development (LID) has been studied and recognised as a worthy approach to rural land use. This has resulted in the introduction of Pembrokeshire County Council's (PCC) Low Impact Development Policy and, more recently, the Welsh Assembly's One Planet Development (OPD) policy. This document is written by and partly based on the experience of the first family to build a dwelling with prior planning permission under the former of these policies.

This interim dwelling (to be our home whilst setting up our plot and building our long term dwelling) is very much following the traditional vernacular of previous LID projects. It has however, been deemed by PCC to be in multiple breaches of the building regulations. At the time of writing we have had a year of dialogue which has shown the local authority to be unable to show significant flexibility to our situation other than recommending a misguided application for relaxation of building regulations. We are currently subject to criminal prosecution in the magistrate's court. This is despite repeated acknowledgements from PCC employees that the building regulations system does not seem to be compatible with LID. At least one of the requirements placed on us directly contradicts the requirements of the planning policy to which we are bound.

It is apparent from our experience, as well as consideration of the wider matters involved, that there is at the very least a tension, if not an incompatibility, between the conventional application of the building regulations and LID. If permitted LID and OPD is to continue and remain true to its original premise, there needs to be a review of when and how building regulations should be applied to these projects. This needs to lead to a coherent and supportive practice whereby LID can be enabled whilst meeting the state's need to safeguard health safety & welfare of the public.

Personally, it is imperative for there to be intervention to decriminalise our family and others in the same situation, to avoid severe fines or prison sentences. This may require an interim building regulations solution until the solution described above can be implemented. Then our, and other LID projects, could continue working towards meeting the ambitious targets required by the planning policies.

This document presents our experience of LID, investigates key issues surrounding the application of building regulations to LID and outlines the requirements and possible mechanics of a positive solution.

Our Experience

My wife and I met at university where we had both studied ecology in scientific, philosophical and political contexts. We were well aware of the severe challenges faced by our culture and the need for radical change. We understood the constraints on policy makers operating within a consumption and growth based paradigm, inherently at odds with the need for sustainability. We knew this meant (for ourselves) that solutions need to come from the grass-roots level, i.e. from the actions and lives of ordinary people.

Around ten years ago we became aware of the significant numbers of people in our country, who were opting to live very simple and sustainable lives. People who were living within their means, both financially and ecologically. Resourceful people who were being creative with what they had to meet their modest needs. People who made wind turbines out of old car alternators; converted old washing machines to wood and bicycle power; grew potatoes in old tyres to keep them warm and save the labour of digging the ground; and who housed poultry in their greenhouse to provide heating and convenient compost. We came across people living in houses, outbuildings, caravans, yurts, benders, sheds, huts, railway carriages, cabins and roundhouses. In essence making dwellings however they could most simply and efficiently meet their needs for shelter. This was the world for which Simon Fairlie coined the term 'Low Impact Development' in his book of the same name. (Fairlie 1996)

We have committed the last decade of our lives to pursuing low impact lives, living in many different structures and scenarios, learning practical skills to make the things we need from waste and natural materials, learning to work and care for land to produce the timber and foods that we need whilst promoting biodiversity and maximum ecological benefit. Three times we have built our own home, using almost exclusively natural and salvaged materials, at a tiny fraction of the cost and ecological impact of any alternative that we could have rented, bought or even seen at the Centre for Alternative Technology.

We had watched the evolution of planning cases and policies associated with low impact development, and were delighted when Pembrokeshire introduced its low impact development planning policy. As well as bringing LID out of the shadows, it offered us an opportunity to use our recent but modest inheritance to get a piece of land and home of our own with the security of planning permission. We had no hesitation about signing up for Llammas, which looked set to be the first project to get permission under the new policy.

Getting planning permission proved to be a gruelling process with no political will within PCC to implement their new policy. However we eventually got permission at appeal and with it five years to set up the infrastructure, growing systems, animals, orchards and coppices that we would need to meet our productivity targets and prove the viability of our plans. Aware of this ambitious challenge we moved immediately onto the land in a tent, ready to start building. Two months later, with snow falling we were able to move ourselves and our two young children into our cosy new home of salvaged double and triple glazing, straw bales and round timber thinnings harvested by hand from the adjoining woodland.



We have now been living in this home, called 'the chalet' on our plans, for just over two years. During this time we have carried much of our drinking water by handcart or wheelbarrow, from the spring overflow nearby, but below, our land. We will continue to do this until our communal hydro-electric system is ready to pump drinking water up to our plot. We are currently being prosecuted by Pembrokeshire County Council for our home not complying with building regulations. Carrying water in containers is not an acceptable means of provision, likewise heating it in a pot on top of the woodstove is not an acceptable way to provide hot water. These simple methods have been the only options for most of human history and much of the world today. They are methods that can be sustained indefinitely, so long as clay or skins for pots are available, they are sustainable,

equitable, and reliable. We now find ourselves subject to criminal prosecution and having to appeal to national government for our right to do the same.

Our experience of building regulations enforcement has been of bewilderment and confusion on both sides. Enforcement has been pursued against three families in the Lammas project at Tir-y-Gafel. Initially we were advised to adopt the most conventional of solutions and that no leeway for discretion or flexibility was possible. This even included requirements that were in direct contravention of the conditions of our planning permission. Later we were advised to apply for relaxation or dispensation for all of these identified breaches, even where we thought our solutions were not breaches and were within guidelines given in the approved documents. These applications were subsequently refused since, in most cases, relaxation or dispensation was not necessary or

appropriate. We have now been asked to resubmit justifications of our buildings against all parts of the regulations, including those PCC had previously agreed that we satisfied. These justifications are required to include expert evidence, or well referenced evidence by ourselves produced to BS standards. First quotes for providing necessary assessments suggest professional fees around two times the total cost of our building. An experienced green architect and BRAC member recently commented that he thought this task would take many months longer than the six weeks we have to do it before the next court appearance.

LID has naturally included a wide spectrum of approaches to shelter, reflecting the ethics, resources and needs of the individuals involved. This spectrum has ranged from those in already established buildings, through simple roundhouses and huts to those in benders and tents to even living in hammocks under strung up tarpaulins. The introduction of planning policy for LID recognises the value of these approaches. In particular it recognises the discrepancy between conventional housing costs and the income possible from sustainable and small scale land stewardship. However there has not been consideration of how LID / One Planet Development (OPD) Policy relates to the enforcement of building regulations.

It is clear that the vast majority of existing low impact developments would not meet the regulations as they are commonly enforced. One notable exception is woodsman Ben Law who, after many years of living and working in his woodland, built a house which met the building regulations in force at the time. It is an excellent and inspirational building which combines energy efficiency with the use of local and natural materials. However it is right at one end of the spectrum, having more in common with contemporary green buildings than the benders and huts more typical of other LIDs.

We recognise that some low impact developers will have the means and inclination to construct a building which complies with building regulations. However if all projects under new LID/OPD policies are expected to include buildings reaching full building regulations compliance in the same way as we have been asked to, the vast majority of established approaches to low impact development will be prohibited. This would include carrying water to one's home in containers and heating it on a woodstove, using an outdoor composting toilet, or not connecting to a mains electricity supply. The result would be the future of legislated LID and OPD becoming something significantly different to LID as practiced to date. Individuals wishing to pursue more traditional low impact development would effectively be left, as before, without a policy framework which could accommodate them.

For this reason we believe it is crucial to establish a coherent approach to the interaction of the building regulations and LID/OPD policies.

Images of LID - The Spectrum of Approaches



Key Issues

The term Low Impact Development was coined in 1996 to describe a number of 'deep green' integrated living and land use projects. Some of these projects were the subject of numerous studies before the introduction of specific LID planning policy.(Shorten, J. et al. 2002; Baker Associates 2004) The introduction of first Pembrokeshire's Low Impact Planning policy, and later Wales' One Planet Development policy are indications that the low impact approach was deemed to have value.

It is clear from our experience that LID cannot continue in its previous form subject to the application of the building regulations as we have experienced from PCC. Modification of LID practice to satisfy the building regulation requirements as applied to us would result in future LID / OPD projects being something quite different to those of the past. This would jeopardise those identified merits that lead to the introduction of LID/OPD policy.

Some apparent key issues for the application of building regulations to LID are given below. Many of these were found to be already well documented issues of the application of building control systems to sustainable developments throughout the world.

LID as practiced to date has happened without the application of building regulations.

Of the many LID projects in the UK, with and without planning permission, few have ever had building regulation enforced, at least one even had it written into their planning conditions that they would never be expected to comply. Low impact structures generally have had more in common with tents, caravans and other unregulated forms of shelter than with the conventional contemporary housing at which the building regulations are aimed. These are the projects which have been studied and used as models in the development of LID and OPD policies.

Ben Law's Prickly Nut Cottage in Sussex is to the best of our knowledge, the only low impact dwelling to have complied with the building regulations as they were at the time it was built. It does however represent one extreme end of the spectrum that low impact development represents in terms of complexity, expense and other inputs. Whilst this could be one approach for future LID/OPD, it would severely restrict the range of approaches available along with LIDs accessibility and hence value. If this is wished to be the future of legislated LID/OPD there should be a careful and conscious decision made by the policy makers concerned as it could jeopardise the benefits of LID as identified in studies of previous, unregulated, projects.

Ben Law built his house **after** several years of living in his woodland in simpler shelters whilst establishing the other aspects of his LID project, establishing coppice rotations, other facilities and building up his business and market. He advises people wishing to pursue more traditional and simple LID to try and remain on temporary planning permissions. This is specifically to avoid the involvement of building control.

Building control officials have difficulty assessing unconventional solutions used by LIDs.

That LID and the common practice of building control are at odds has been acknowledged verbally on many occasions by PCC building controllers and by our building control surveyor in his court witness statement against us:

“The use of ‘natural locally’ sourced materials and having minimal foundations and infrastructure does not achieve compliance with ... requirements ... in the Building Regulations” (EJ Lewis 6/7/11)

This suggests that full compliance is not practicable under recently introduced planning policies for LID & OPD which specify just this kind of approach. For example whilst our building control surveyor required us to have a mains connected fire alarm, Pembrokeshire’s Low Impact planning policy requires that developments do not use mains resources. In this case it was simply not possible to satisfy both sets of requirements.

In addition to the absolute requirements of the building regulations, their enforcement is further restrictive. There is insufficient expertise or flexibility for building control staff to assess situations like ours where building methods are used. For example our convection powered ‘passive stack’ ventilation system was deemed in violation by Mr Lewis who told us electrically powered, mechanical ventilation is required. This is despite natural ventilation systems being covered in detail in the approved document F which says in its introduction:

“4.16 This [the required] ventilation strategy can be delivered by a natural ventilation system or a mechanical ventilation system or a combination of both.....”

When the above argument was put to PCC, they made the following statement:

“A clear distinction must be drawn between the schedule 1 requirements of the building regulations and the Approved Documents. Whilst some elements of the Approved Documents may be difficult to meet when considering low impact development, the building regulations application is ultimately assessed against the schedule 1 requirements and not the Approved Documents. Where the applicant considers that the proposals will not comply with the Approved Documents he should provide justification of how the works will meet the schedule 1 requirement. When considering unconventional building techniques this work may require an assessment of the issue from first principles.” (PCC, Oct 2011 paragraph 3.2.2)

PCC’s statement was enlightening for us. If assessed from first principles against schedule 1, and with favourable interpretations of ‘reasonable’, ‘appropriate’ and ‘adequate’ measures, in the context of LID, the prospect of compliance becomes a lot more reasonable. On this basis our building might reach compliance with a modest number of dispensations and much of this application and appeal would be redundant.

However, this picture of building control is very different to our experience with our building control surveyor, who was presumably looking for conventional solutions and had no room for flexibility. For examples he told us that it was not possible for him to be flexible about, amongst other things, the need for mains operated smoke detection and mechanical (electrical) extract ventilation, and if we were to have battery powered smoke detection or passive stack ventilation, we would need to make this appeal to the Welsh Assembly. This seems in contrast to schedule 1 which requires that:

“The building shall be designed and constructed so that there are appropriate provisions for the early warning of fire...”

“There shall be adequate means of ventilation provided for people in the building”
(Building Regulations 2010)

The viability of a schedule 1 assessment of LID would depend on at least three significant factors. Firstly the ability of building control officers to offer this kind of approach, for us it took nearly a year to get this statement by which time we were mid prosecution proceedings. Secondly, the flexibility of the officers involved to negotiate standards in interpreting the relative terms used in schedule 1. Thirdly the proof required, whether this is practicable by the builder or whether a professional expert and associated additional costs are required.

The building control system is aimed at the construction industry which is very different to LID.

The building control system fills a valuable role in regulating profit making developers and giving house buyers a guarantee of a buildings quality at the time of assessment. A developer will make a building, on completion it is assessed and certificated to have met the regulations, whereupon it is sold to a buyer who takes responsibility of it in that state.

The typical scenario for a low impact builder is a very different one where development and usage are concurrent with no clear point of completion. The motivator is shelter (not commerce) and she satisfies her needs of the moment with the resources available to her. As her needs evolve and resources become available, her shelter will evolve. As she sees how the shelter works for her she will feedback her observations into modifications and improvements of the shelter she understands and which is her home. This is a very different process to that for which the building control system is devised.

The permaculture design approach is followed by many LID projects and is identified as an appropriate design tool in LID planning policies. It advocates a general approach of implementation followed by use and observation to evaluate the performance of a system followed by modification or redesign, this process repeating continuously towards the point of optimisation. This approach is particularly significant in relation to developing innovative solutions and optimising systems to match the evolving needs of the users.

“A sustainable construction industry cannot be seen in isolation from supply, construction processes and manufacturing. Neither can it be divorced from the proper management and maintenance of buildings in use and continual improvement over time. Sustainable construction should be seen as a process, rather than a product delivered at handover. The need to manage the built environment as a process, rather than simply manage buildings as products will necessitate a step change in the way in which functional and performance standards are developed.” (Gaia group: report to the Scottish executive 2004)

Low Impact Developments tend to involve systems created by their users, who will naturally match them to their needs, as described above, and the resources available to them, such as salvaged building materials. This is a key issue and one of the reasons why LID has shown such extreme

sustainability advantages around areas such as resource consumption, embodied energy and associated pollutants. Full compliance with all areas of the building regulations makes no space for the consideration of difference in users' needs and brings all developments up to an 'across the board' standard. This may be appropriate for professional developers who may not know the people who will live in their buildings. However it threatens one of the major advantages of self built LID as practiced to date.

In addition, the majority of users of the building control system are professionals, experienced at dealing with it or are able to employ such people. For the low impact builder, who may be perfectly skilled, the building regulations system is hard to navigate, even just in terms of jargon and procedure. The requirement for those in LID projects just to understand and justify themselves to the building regulations system would for many constitute a significant proportion of their time, energy and financial set up budgets, as it has already become for ours. That is even before considering extra works required, time delays, requirements for the provision of alternative temporary housing and covering all of the associated costs. Given that LID planning is only being awarded with ambitious targets for land based productivity, this will jeopardise LIDs' chances of success.

Considering our example, we are just a couple, not acting in any professional role, with two young children who are trying our very hardest to set up a whole working smallholding, establish small land based businesses, set up gardens, orchards and livestock from which to derive the bulk of our subsistence, renewable energy and rainwater harvesting systems, build a house, workshop and barn to support the above whilst working to fund our project and living expenses. On top of this we are investing approaching the same amount of time as it took us to build our temporary home into understanding the details and procedure of the building act, regulations, schedules, approved documents, application and appeals procedures and consider ways in which these could be adapted to work in conjunction with the LID planning policy we are under. Simultaneous to this we are being prosecuted in the criminal court, understanding the courts procedures, applying for adjournments, legal aid, meeting with solicitor and barristers etc. This is adding a significant extra workload and potential expense to an otherwise very challenging situation especially considering that we have five years to reach the mandatory targets or risk losing our home and all the effort and investment put in to the project.

The application of building regulations and associated costs compromises the affordability of LID.

Simon Fairlie first defined Low Impact Development in his book of the same name. The original criteria have since been updated by The Land is Ours Rural Planning Group to define Low Impact Development in 15 criteria. They include the following:

"[2] The project provides affordable access to land and/or housing to people in need"
(The Land is Ours 1999)

The provision of affordable housing is a well documented issue. LID/OPD offers the opportunity for housing at significantly lower costs than those of the conventional market. It is these cost savings that make small scale and ecological land management livelihoods viable in the LID context. It is well

recognised that the income from such livelihoods is not commensurate with the cost of conventional housing options.

The cost savings of LID housing come from both planning policies allowing access to otherwise non-residential land and the use of simple low cost building methods and materials to provide the appropriately sophisticated level of shelter required to meet an individual or family's basic needs. The enforcement of building regulations challenges this in two ways. Firstly with professional fees, including the charge levied by the local authority to accept a building notice, and the fees of the various accredited individuals required to certificate an unusual building (eg. Structural and HEATAS engineers). Secondly full compliance precludes individuals building to meet their individual needs (eg. The provision of an indoor, disabled access toilet will cost 10 to 100 times that of a simple outdoor composting toilet which the owner may be completely happy and safe using).

Our home cost approximately £3000 to construct. Depending upon the flexibility of building control officers, compliance would increase this cost by an estimated 100-1000% which would use up at least all our budget for establishing our land based businesses and quite likely possibly render the project unviable.

The building regulations and approved solutions are inherently unsustainable.

We are trying hard to make our lives as sustainable as possible. Ideally this is to the point that the whole world population and future generations may be able to live in the way we are now, without reliance on speculative new technological advances. This seems to reflect the Brundtland definition of sustainability as "...development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (United Nations General Assembly 1987)

It is hard to say how any use of non-renewable materials can be considered to be truly sustainable, as any use will reduce the available material remaining and hence compromise the ability of future generations to use it. The approved documents refer throughout to materials and solutions which use non-renewable resources so must ultimately be considered as unsustainable. For example, it is simply impossible for everyone in the indefinite future to have thermostatic wax mixers on their bathtubs.

The building regulations do attempt to address the issue of operational energy usage and associated carbon associated emissions as well as water usage. This is achieved by increasing energy efficiency. This is clearly a positive move, although limited in its contribution to sustainability as increased efficiency generally leads to increased consumption so is unlikely to reduce fuel consumption and associated emissions. (Giampietro, Mayumi, 2008) This effect is the well known Jevons Paradox and associated Khazzoom-Brookes postulate.

In addition to the operational energy consumption of buildings, it is important to recognise the embodied energy inputs of building materials and processes used, end of life treatment and associated carbon emissions.

"Current legislation in construction focuses solely on the operational aspects of carbon dioxide emissions. However, as legislation drives down operational carbon dioxide, embodied carbon will

become more significant in overall emissions. In fact, it can be argued that the legislative drive to reduce operational carbon, with measures such as high thermal mass, increases the emissions associated with embodied energy, and could be ultimately counter-productive. One needs to know where the optimum balance lies.

To gain a more comprehensive picture we have to take a whole-life approach to carbon analysis, considering both the embodied and operational characteristics of materials, and to integrate the analysis with end-of-life issues, such as recyclability.” (Tse, BSRIA 2011)

Our home is predominantly built from straw bales as well as, stone, earth and timber from the site. It is a low cost, innovative low impact building with an embodied energy and associated carbon emissions estimated to be around 5-10% of the construction industry average. In the case of buildings like ours, where heating is provided from renewable sources, the carbon emissions associated with the building over its lifetime are virtually all embodied in the construction materials. These costs are currently externalised from consideration in the building regulations. To make the best decisions requires a full life cycle analysis. For example in terms of carbon emissions, even though underfloor insulation may improve the comfort and easy operation of the building, it would be a better choice to leave it out unless there is a practicable material choice which is carbon neutral, as is the extra fuel which would otherwise compensate for its lack. Such counter intuitive results are not considered in the mechanics of the building regulations although these are the aims they are trying to achieve.

‘Accomplishing sustainability is about much more than simply achieving energy efficiency, specifying “natural” materials and finishes, or delivering healthy buildings...At heart, it is about drastically reducing the amount of consumption caused, at every level, by the processes involved in the construction, use, maintenance and replacement of our built environment...’

(Ian Cooper, Eclipse Research Consultants)

A necessary space for experimentation, research and innovation.

“1.3.9 Research into sustainable building materials is ongoing and the use of recycled, low energy content, natural and locally sourced materials is seen as a priority.” (PCC, Synopsis of environmental and energy initiatives, 2011)

If our society is to move to truly sustainable ways of living we require innovation and experimentation. The scientific complexity of our contemporary situation implies a range of unpredictable and widely divergent future scenarios. (Holmgren 2009) The most robust strategy for development is therefore to pursue a diverse range of solutions suitable for different future scenarios. It is also apparent that simple solutions which have minimal reliance upon technological and other specific inputs are reliable across a range of future scenarios making them more resilient.

The international movement from prescriptive to performance based codes does significantly improve the opportunity for innovation. However the enforcement of prescriptive elements and the need to provide prior verification of performance requirements do significantly limit accessibility and diversity of innovation. Private sector R&D favours solutions which are profit making and hence tend to maximise consumption. In contrast, self-sheltering individuals will develop solutions which

provide for their functional needs whilst tending to minimise cost and hence consumption. Whilst the BRE and private sector companies are able to conduct experimentation to validate performance requirements in laboratories or sanctioned test sites, experimentation by individuals without these facilities, or the empirical assessment of experiments through actual use, is effectively outlawed.

That regulation through building codes, particularly in the case of prescriptive requirements, does limit innovation is well documented. (Baxter and Liddell 1996; Stevenson and Macrae, 1998; Morton and Little, 2002; Halliday and Pemberton 2001; etc.)

“the codes present a significant practical barrier to innovation...while in theory it is possible to get almost anything approved with enough time, money, and technical resources, in practice few projects have unlimited budgets and open-ended schedules.” (Eisenberg, Done and Ishida, 2002)

Agenda 21.

'All countries should . . . strengthen the indigenous building materials industry, based, as much as possible, on inputs of locally available natural resources . . . promote the increased use of energy efficient designs and technologies and sustainable use of natural resources . . . promote the use of labour-intensive construction methods . . . develop policies and practices to reach the informal sector and self-help builders . . . discourage the use of construction materials and products that create pollution during their life cycle.' (Agenda 21 Chapter 7)

'All countries should, as appropriate, support the shelter efforts of the urban and rural poor by adopting and/or adapting existing codes and regulations to facilitate their access to land, finance and low cost building materials.' (Agenda 21 Chapter 7)

The need to obtain building regulations consent and most of the Agenda 21 aims quoted are not mutually exclusive. However the approved documents and control based on their content naturally reflect and favour by familiarity the conventional building industry methods. In the current economic climate the industry of course dislikes *“labour-intensive construction methods”* and inherently inhomogeneous *“locally available natural resources”* preferring the use of standardised, manufactured construction products that tend to *“create pollution through their lifecycle”*.

More significantly though, the introduction of a methodology for dealing with LID and the regulations would allow the building regulations system to play an active role in working towards the realisation of **all** these Agenda21 aims as it does currently for the aim of *“promot[ing] the increased use of energy efficient designs and technologies”*. It would in itself be *“develop[ing] policies and practices to reach the informal sector and self-help builders”*

The Building Regulations disregard wider health, safety and welfare hazards which result from current building practice.

The building regulations play a valuable role in ensuring health, safety and welfare. They do so by addressing a set of identified risks such as structural collapse, fire, poor air quality etc. They do also aim to address the risk of catastrophic climate change by promoting energy efficiency of buildings in use as commented on above.

The need for sustainable development however necessitates the consideration of a much wider range of ecological and sustainability issues and their associated risks. The interaction of mitigation measures for such a wide variety of risks incorporating unknown factors makes such consideration complex and somewhat daunting. For example the provision of indoor toilets in all homes and the risk saving compared to allowing outdoor composting toilets needs to be weighed up against the extra embodied energy and pollution associated with both the convenience itself, as well as the space needed to house it and their contribution to wider risks, including catastrophic climate change, and ecosystem collapse.

The act of regulating acknowledged hazards can be shown to increase contributions to wider, externalised hazards.(Eisenberg, Done & Ishida, 2002) This points to some measure of responsibility needing to be taken by the existing regulatory system.

We are aiming to provide for our needs in as sustainable way as possible by making qualitative as well as quantitative design decisions which consider and take responsibility for as wide a range of implications and risks as possible.

In the words of Eisenberg, Persram et al, writing about the restorative Living Building scheme:

“There is an awakening to the reality that long held assumptions on which much current regulatory thinking is based are no longer valid. These assumptions include that we will continue to have adequate supplies of affordable energy, fresh water and other key resources, a stable and predictable climate, and that the natural systems on the planet are robust enough to withstand the growing level of human impact. Increasing evidence of these emerging risks obligates us to take action.

The impacts of building and development contribute substantially to these crises, arising throughout the lifecycle of built projects. They begin far from the building site and long before the building exists, and they extend far beyond the site and the life of the building. They emerge during the acquisition of resources and their transportation and processing. They come from impacts on the land and natural systems at the site, and related impacts from the infrastructure projects typically require. They involve impacts during construction and throughout the life of a building to maintain, repair, heat, cool, ventilate, illuminate, remodel, and eventually dismantle and dispose of, or recycle and reuse parts of it. Only a small fraction of those impacts are regulated.

A crucial misconception at the heart of many apparent obstacles for Living Building projects is that proponents of sustainable development have different goals or agendas than the regulators. In truth, the goals of both groups are aligned – no one wants unsafe projects. A key finding for moving towards more fruitful interactions is seeing that what is deemed “safe” in regulatory terms, depends entirely on which risks will be considered and which will not. Historically, concerns about risks like

climate change, resource depletion, ecological health, or persistent toxic chemicals have not been included in building and development codes and related regulations. Much of the current resistance to addressing these larger risks is based on the belief that current building and regulatory practices adequately safeguard the public. To people who take these larger risks seriously, there appears to be a false sense of security founded on too narrow an assessment of risk. Recognizing that Living Building projects voluntarily address a more comprehensive set of risks than currently required by regulation helps dispel a persistent perception that these projects are trying to get away with something that is 'less-than-code'." (Eisenberg, Persram et al. 2009)

We are told by environmental groups, governments, the UN etc that for the stabilisation of climate change and reasonable continuation of life on this planet we urgently need to change to radically more sustainable ways of living. It seems that the task of effecting such change is such a slow and difficult process for our public institutions that we as individuals have to take the responsibility ourselves. Our work and home are sincere attempts to do this for ourselves and to encourage change at the grassroots level. We have had overwhelming positive response to this work from around the world with ten million website visitors, tens of thousands of emails, thousands of visitors and features in hundreds of printed and online publications.

Positive Solutions

“A key area for increased integration lies between planning and building legislation and guidance...to develop strong bi-lateral referencing in the guidance documentation of each area, to ensure the greater integration required by sustainable development” (Gaia Group report to the Scottish Executive 2004)

If planning policies for LID and OPD are to be made workable and their full value is to be realised, there needs to be a coherent consideration of the application of building regulations to such projects. This is a timely opportunity, given the devolution of building regulations to the Welsh Assembly. This consideration, which could be through a working group or similar mechanism, needs to combine a thorough understanding of LID as well as the aims and practice of the building regulations. The outcome should be a robust mechanism to ensure appropriate and supportive practice for building control in relation to LID projects. It is noted that the Welsh Assembly will have limited power to change the building regulations during the next two years. However, as an interim measure, positive solutions can be achieved by changes in practice, without change to the legislation.

Full or partial deregulation of LID

It would be possible to make a class exemption for Low Impact Development as described in section 3 of the Building Act 1984. This would give LIDs like ours the most freedom to achieve their aims and significantly increase our chances of meeting the ambitious targets of LID & OPD policies. From our point of view this would be the ideal option under which we would be most likely to succeed. This would allow people to take responsibility for assessing and managing risk in their own homes. For example having a hot bath tap without a thermostatically controlled temperature limit.

A similar option in which the state is legally indemnified exists in the US through the existence of Alternative Owner Builder (AOB) codes for limited density rural dwellings.

“Various jurisdictions in the US have Alternative Owner Builder (AOB) codes, including Mendocino, Humboldt, Nevada and Butte counties in California, Cochise County, AZ, and San Juan County, WA. These allow owners to take responsibility for the design and construction of their homes. Fees are minimal. There is minimal inspection, for public safety issues, only. Sometimes there is an upper size limit. Liability stays with the owner, not the regulators. A note to this effect may be recorded on the deed, so all future owners are informed that they are responsible for the structure's safety.”
(Ludwig, A.)

Alternative practice within the existing framework

If this kind of freedom is not possible, another option would be to support LID projects through a more appropriate practice under the existing system. Such practice should ensure:

Alternative solutions are allowed – Often, LIDs will need to be assessed against the functional requirements of schedule 1, rather than the prescriptive solutions described in the approved documents. Also consideration should be made of the root concerns of the regulations, for example, as the aim of part L is to reduce operational CO₂ emissions (RIA Part L, 2006), then why not assess the actual emissions associated with the shelter's use, rather than the insulation values of discrete building elements. Ideally such a consideration would ideally include recognition of the users' lifestyle, perhaps judged by post occupancy evaluation.

Essential health and safety ensured – A reduced set of schedule 1 functional requirements could be agreed for LID. This would be similar to how a reduced set has been used at the Lammas project for agricultural barn conversions.

All types of shelter can be catered for – LID has included a wide range of approaches to shelter, from tents to Ben Law's two storey house. The system adopted should be able to cope with this diversity. The key to this would be the case by case interpretation of the functional requirements. For example a simple hut or a sophisticated family house would be subject to all the same schedule 1 considerations, but with different interpretations of what would constitute 'reasonable', 'adequate', or 'appropriate' measures.

This approach points to the use of risk assessments made of individual cases with mitigating actions identified where appropriate. By contrast, the conventional approach is more like repeated reference to a generic risk assessment for all buildings.

Approved solutions can be easily shared – An alternative set of approved documents could be built up over time in a 'wiki' style, by collating solutions approved in individual cases. The 'alternative approved documents' would serve as a best practice building manual for LID projects. As well as offering standard solutions it would be a reference point for low impact builders to justify alternative methods appropriate to their situations which would subsequently be added. It would also serve building controllers to easily assess low impact building techniques.

Professional fees should be minimised – Where possible the need to employ accredited experts should be removed. The 'alternative approved documents' could assist by sharing standard methods for practical and theoretical works. For example working sheets and tables could be given for the structural engineering of simple buildings. This is most important for low budget, simple shelters.

Fees and inspection costs manageable – If building control services were free or as a percentage of building cost it would avoid the possible situation of fees being many times the cost of the building/structure being assessed. It would help to allow small structures and short term shelters to be incorporated.

Allow specialists to emerge – Enable private sector involvement by allowing subsidies to independent inspectors. Alternatively there could be a role for advisors to help LIDs to prove compliance to local BCBs.

Experimentation is allowed – Where there are not critical health and safety risks, empirical testing and proof of unusual solutions should be allowed. Performance based code compliance could be judged by post occupancy evaluation (POE) before a building is signed off.

A variation of this is made possible in the US by the issuing of experimental permits. . Where an experimental permit is issued the owner takes responsibility for an alternative solution, not otherwise permissible under building codes. The solution is then subject to assessment of its function, to be replaced or issued a permanent approval accordingly. (Ludwig, A.)

Low impact building is allowed to be an on-going process - Allowance should be made for buildings construction and use to be concurrent subject to sensible risk assessment. Also that buildings will be safe and minimally functional first, then improve and change over time. This would include designs being modified based on observations of performance and dwellings being reconfigured for different seasons and with changing needs.

Holistic consideration of risks and environmental performance – There should be consideration of risks currently externalised by the building regulations. These include local risks such as domestic toxicity of building materials but more importantly global risks including environmental risks to the wellbeing of future generations and those remote to the building who may be affected. For example, those affected by pollution from building material production or ecological and social damage associated with extraction of primary resources.

The above is just one possible picture, from the view of experienced Low Impact Developers with sympathy and attempted understanding of the needs of those in the building control system. The exact details would need thorough consideration based on understanding between all parties to reach a mutually beneficial, workable solution that supports the aims of both building control and LID/OPD policy as well as meeting the practical needs of those operating under these policies.

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