Building Simply

An investigation into the potential
for Building Simply in the UK

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SUMMARY OF THESIS: POSTGRADUATE RESEARCH DEGREES

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Summary of Thesis:

This Thesis explores the theme of Building Simply; architecture of simple, elemental forms, constructed in a logical, legible and resourceful way from raw local materials. These buildings have a sense of timelessness and authenticity, and express an empathy with the landscape in which they sit.

The thesis aims to demonstrate that it is possible, and even beneficial to Build Simply in the context of the contemporary UK construction industry.

'Building Simply' means to design and construct in a direct but refined and artful way, producing buildings of simple form and visual calm often constructed with the appropriate use of a predominant local material. An ethical and economical approach to sensible resource use and a critical approach to site are adopted. Buildings are designed with quiet appropriateness in mind, rather than the louder formal manifestation of iconic architecture. Building Simply is not concerned with purely visual simplicity; it is concerned with *minimisation* to give tectonic clarity and not *minimalism* as an aesthetic style. With priority given to construction, relationship to context and considered composition of forms and spaces rather than surface aesthetics, this architecture is timeless rather than fashionable.

Principles for Building Simply are abstracted from a study of vernacular architecture.

Having set out a framework which defines Building Simply, the thesis argues its benefits. Case studies of three European buildings are used as examples to show how Building Simply is possible:

- Cultural Centre, Riudaura, Spain; by RCR Arquitectes
- Wine Store, Vauvert, France; by Gilles Perraudin
- Gallery for Contemporary Art, Marktoberdorf, Germany; by Bearth and Deplazes

A further 'working case study' of a UK project then acts a discussion of the real issues involved in Building Simply in the UK.

Contents

1. Introduction

This Thesis explores the theme of Building Simply; architecture of simple, elemental forms, constructed in a logical, legible and resourceful way from raw local materials. These buildings have a sense of timelessness and authenticity, and express an empathy with the landscape in which they sit.

1.1 Aims

The thesis aims to demonstrate that it is possible, and even beneficial to Build Simply in the context of the contemporary UK construction industry.

Having set out a framework which defines Building Simply, the thesis argues the benefits of Building Simply. Case studies of three European buildings are used as examples to show how Building Simply is possible. A further 'working case study' of a UK project then acts a discussion of the real issues involved in Building Simply in the UK.

1.2 Definitions

Dictionary definitions of 'simple' include honest, straightforward, unaffectedly, frugal, humbly, readily understood, without complication, and without unnecessary elaboration or superfluous ornament. For the purposes of this thesis 'Building Simply' means to design and construct in a direct but refined and artful way, producing buildings of simple form and visual calm often constructed with the appropriate use of a predominant local material. An ethical and economical approach to sensible resource use and a critical approach to site are adopted. Buildings are designed with quiet appropriateness in mind, rather than the louder formal manifestation of iconic architecture. Building Simply is not concerned with purely visual simplicity; it is concerned with *minimisation* to give tectonic clarity and not *minimalism* as an aesthetic style. With priority given to construction, relationship to context and considered composition of forms and spaces rather than surface aesthetics, this architecture is timeless rather than fashionable.

1.3 Overview

It is demonstrated that this way of thinking about building contradicts contemporary architectural tendencies. Today's global culture has resulted in aesthetic diversity and places value on information, speed, profit and image; whereas study of traditional and vernacular architecture reveals simple ways of building that closely relate buildings to their sites, giving meaning to the landscapes they inhabit and providing people with a sense of home. However, these older buildings do not meet the high standards of performance and comfort expected by today's users, although lessons may be learnt from their direct and resourceful approach to construction. Lessons are abstracted from vernacular architecture and inform a descriptive framework for Building Simply.

A framework for Building Simply examines various aspects of the design and construction process, setting out what it means to build simply at each stage in the creation of a building, including the response to site, form and composition, visual qualities, materials, construction methods and approaches to sustainability.

The advantages of Building Simply are then discussed in light of the more detailed definition provided by the framework.

Potential problems with Building Simply in the context of the contemporary UK construction industry are outlined, providing discussion on issues of cost, design difficulties, environmental performance standards, public perceptions and supply chain availability which must be overcome if Building Simply is not to be compromised.

Three building case studies, each analysing European examples of Building Simply within the framework, show to what extent it is possible to achieve Building Simply in practice:

- Cultural Centre, Riudaura, Spain; by RCR Arquitectes
- Wine Store, Vauvert, France; by Gilles Perraudin

- Gallery for Contemporary Art, Marktoberdorf, Germany; by Bearth and Deplazes

Following the example case studies, a 'working case study' of Burry Port Methodist Church Community Hall, Carmarthenshire, UK by the Design Research Unit Wales provides a discussion of the real issues involved in attempting to Build Simply in the UK.

The four case studies allow conclusions to be drawn about the feasibility and appropriateness of Building Simply in the UK.

1.4 Literature Review

This section of the thesis appraises key existing literature relating to the theme of Building Simply in order to give an overview of current knowledge in this area. There are two publications which are referred to in this thesis which focus on 'simple' architecture in general. These are reviewed below. The content and presentation of material, as well as the limitations are evaluated in each case. The relevance of each publication to the thesis is also considered.

In Detail: Building Simply

The main text on the subject is a book edited by Christian Schittich called *Building Simply*. The publication forms part of the Birkhäuser *In Detail* series which examine construction details relating to different themes or building types. The book contains several introductory essays including 'Building Simply' by Christian Schittich which introduces the subject; and 'Simply Good' by Florian Musso which is more detailed and explores different themes such as Values, Asceticism, Less, Understanding, Economical, Ordinary, Solid and Material.

The essays are followed by 25 example projects which are arranged according to construction material – Timber, Brickwork and Stone, Clay, Steel, and Concrete. Schittich explains that 'The examples in this book are principally concerned with small and predominantly economical construction… What they all have in common is their stance, their concentration on the essentials and their renunciation of any unnecessary miscellany'.[1] Together, the collection of projects helps the authors to define Building Simply through examples, as Musso explains:

> This book shows a spectrum of selected buildings, which illuminate the subject of simplicity from various possible stand points. The definition of the term is achieved using examples, whose similarities clarify the meaning of the term.[2]

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[1] Christain Schittich, 'Building Simply', in *Building Simply*, ed. by Christian Schittich (Switzerland: Birkhäuser, 2005) p.9

[2] Florian Musso, 'Simply Good', in *Building Simply*, ed. by Christian Schittich (Switzerland: Birkhäuser, 2005), pp. 11-25 (p. 11)

The examples are found mainly in Europe and Japan, with none from the UK. Each project includes a short written description of the building, the philosophy behind it and the construction used. Several photographs and plan and section drawings accompany a 1:20 construction detail which reveals the simplicity (or complexity) of the construction. It is interesting that the photographs demonstrate aesthetic simplicity, the plans and sections compositional or formal simplicity, and the 1:20 details constructional simplicity. This reveals that some projects are simpler in form than construction and others vice versa. The photographs are also helpful in communicating the material qualities of each building.

The introductory essays are useful to this thesis in establishing the framework for Building Simply and reference is made to them in chapter 4 The visual presentation of the project examples as discussed above is helpful in developing a methodology for the case studies at the end of the thesis, to analyse different aspects and scales of simplicity. However, this book, which was published in Germany does not make reference to any UK examples and certainly comes from a European standpoint.

Minimum

Another publication whose subject is simplicity in architecture is *Minimum* by architect John Pawson. He says that:

> This book is an attempt to crystallise some thoughts about the notion of simplicity as it can be applied to architecture and art. And beyond that, to discuss simplicity as a way of life, to look at simplicity as a means for ordering and defining the everyday rituals and necessities of existence. It is an attempt to examine the idea of the 'minimum', which can be seen as the purist of simplicity, as a way of thinking; exploring the possibilities that it offers for working creatively.[3]

The book is introduced with an essay by Pawson which explains his interpretation of simplicity and the choice of images that follow. He

[3] John Pawson, *Minimum* (London: Phaidon, 1996) p. 7

explains that 'The emphasis here is visual', and this is evident from the fact that the rest of the book is a collection of images which evoke, describe and capture simplicity or minimum.[4]

Each of the images; which are arranged under headings which include Mass, Light, Structure, Ritual, Order and Essence; has no more than a short caption to explain what it is. The images do not include only architecture but other structures, paintings, sculptures, household items and landscapes.

Because *Minimum* focuses on the aesthetic qualities of simplicity it is less useful in showing *how* we can build simply; unlike *Building Simply*, there are no drawings which explain construction details or plan composition. Nonetheless, the images are inspiring and evocative examples of simplicity.

These two publications focus specifically on simplicity in architecture in general. Other literature which is relevant to particular themes or aspects of the thesis is introduced in the relevant chapters.

Books and journal articles have been used to gather information and images of the case study projects. These sources provide a commentary on the architects' work do not necessarily look at the buildings from the angle of Building Simply, but by analysing the information in light of the framework for Building Simply set out in Chapter 4 it is possible to draw conclusions about the methods and feasibility of Building Simply.

[4] Ibid. p. 7

1.5 Methodology

The methods used in researching and drawing conclusions about whether it is possible and beneficial to Build Simply in the context of the contemporary UK construction industry can be divided into four categories: Analysis of literature, learning from the vernacular, building case studies, and a working case study.

Analysis of Literature

Existing literature informs the thesis in a number of ways. Firstly it helps to set the context for the investigation by demonstrating how Building Simply sits within the current construction industry and by identifying the challenges and benefits this brings. The literature is used to obtain the opinions of architectural critics and historians, which supports the argument for Building Simply. Analysis of published material informs the detailed definition for Building Simply which is set out in the framework in Chapter 4, and provides the criteria against which the case studies are assessed. Journals and books also provide data and information for the building case studies as described below.

Learning from the Vernacular

Chapter 3 looks to vernacular architecture to draw lessons about Building Simply. It is not appropriate to directly copy aspects of traditional building because they will not meet the demands of contemporary architecture. Therefore, the vernacular architecture is looked at as a 'model system' in order to abstract various principles; a method encouraged by Ammos Rapoport in 'Vernacular Design as a Model System'.[5] The principles of simplicity learned in this way inform the Building Simply framework.

[5] Amos Rapoport, 'Vernacular Design as a Model System', in *Vernacular Architecture in the Twenty-First Century: Theory, Education and Practice*, ed. by Lindsay Asquith and Marcel Vellinga (UK: Taylor & Francis, 2006), pp. 179-198

Building Case Studies

Case studies of three European buildings demonstrate the extent to which it is possible to achieve Building Simply, whilst highlighting the benefits of doing so. Data, drawings, photographs and commentaries on the buildings and their architects are collected from published material. These are then analysed against the framework for Building Simply in order to establish how 'Simple' the buildings really are in all aspects of design and construction.

Working Case Study

The sources used in the building case studies described above only present the finished buildings and do not describe the processes by which they were delivered. This means we do not know what difficulties the architects faced in achieving Building Simply. To identify the challenges for Building Simply in the UK, a 'live' project is followed through the design, procurement and construction stages, providing a discussion on each of the themes of the framework. Burry Port Methodist Church Community Hall, designed by the Design Research Unit Wales is a £126,000 project which attempted to employ some ideas of Building Simply in its design and construction. Together with the building case studies, this enables conclusions to be drawn about the feasibility and potential for Building Simply in the UK. The author was the project architect for this building, therefore an in depth knowledge of the processes involved in the design, procurement and construction can be used.

2. Setting the Context for Building Simply: Counter Cultural

2.1 Introduction

This chapter examines the culture and environment in which architecture takes place today, particularly in the Western World, which seems to have led to a preference for the iconic. Building Simply contradicts contemporary architectural tendencies towards the iconic, and a comparison is made in this chapter.

Today's global culture has resulted in aesthetic diversity and places value on information, speed, profit and image. Buildings can be mass-produced and a sense of place is often neglected or even rejected. As Charles Jenks explains in *Iconic Building: The Power of Enigma*,

> A spectre is haunting the global village – the spectre of the iconic building. In the last ten years a new type of architecture has emerged. Driven by social forces, the demand for instant fame and economic growth, the expressive landmark has challenged the previous tradition of the architectural monument.[6]

The commercially driven industry demands a fashionable, marketable image and fast! This situation is exacerbated by the immediacy with which the glossy, computer generated image can be produced. Frequently, clients have expectations of iconic buildings, and the response to this usually means an aversion to the right angle, an enthusiasm for pointy roofs of one kind or another, a random mixture of materials, an infatuation for lightness and transparency and little consideration for the surrounding context. A generation of architects who have more interest in surface appearance than knowledge of tectonic reality is emerging.

Advances in construction technologies have allowed architecture to take on complex and expressive forms. Buildings tend to be constructed of layers of highly-processed, globally-sourced materials; each layer contributing in its own way to the building's performance, but only the

[6] Charles Jenks, *Iconic Building: The Power of Enigma* (London: Frances Lincoln Ltd, 2005) p. 7

outer skin legible. In parallel to advances in construction technology, we have seen the traditional skills of builders diminishing; the knowledge to work effectively with local materials is being lost.

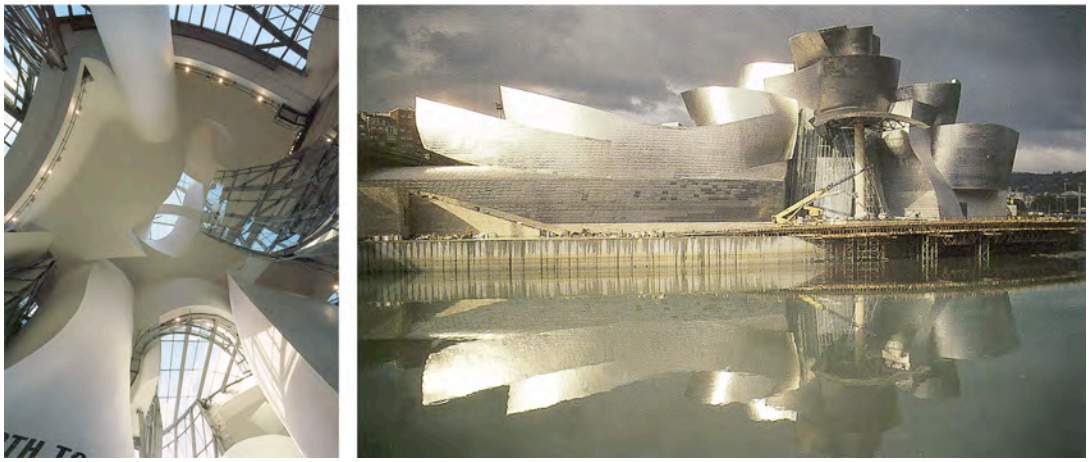

Figure 2.1 Gehry's Guggebheim Museum in Bilbao epitomises the iconic building culture

2.2 Placeless-ness

Rather than responding sensitively to the surrounding landscape or urban context and traditions, the tendency today is for mass production and global distribution; and design is usually commercially driven by national or global markets. Volume house builders put up standard house types across the country, perhaps giving them something of a pastiche vernacular costume; a slate roof in Wales for example. In 'Fake or Real?', an essay on Welsh architecture, David Lea explains that this phenomenon is due to local quarries closing, saying that 'In reaction, the British building industry has developed a "vernacular" costume to hide modern construction; its colours and textures can easily be adjusted to give a regional flavour'.[7]

With it becoming easier to communicate electronically more and more architects can work on projects around the globe without having to travel. Materials are easily distributed and it is often cheaper to import

[7] David Lea, 'Fake or Real?', in *Planet* 138 (December 1999/January 2000), 77-83 (p. 80)

slate from China and timber from New Zealand, for example, than to purchase home grown and processed materials.

All these factors led to placeless-ness. Buildings lack a sense of belonging as local traditions fade. The feeling that "this could be anywhere in the world" is a common experience.

Figure 2.2 Three buildings by Norman Foster in England, Dubai and Scotland could be anywhere in the world

2.3 Maximise!

In contrast to the refined and reduced simply built, the iconic is loud, and flamboyant. Clients demand an iconic building that will stand out from the crowd – a crowd that are all trying to stand out! This attitude encourages use of a mixed palette of processed materials to create gymnastic forms that respond to the latest fashions. In fact, by Building Simply in this dynamic context a quiet, minimal building can stand out itself as Christian Schittich describes:

> Minimalist trends regularly are often linked to ethical questions or at least to a particular mentality. However, they sometimes arise (as do many sculptural forms) purely from the wish to attract attention or at least to stand out from the loud, heterogeneous environment.[8]

[8] Christain Schittich, 'Building Simply', in *Building Simply*, ed. by Christian Schittich (Switzerland: Birkhäuser, 2005) p.9

2.4 Breaking the Rules

In order to achieve the iconic, the rules of construction are often broken and the boundaries of engineering are pushed to the limits. Rather than construct a simple form that obeys, or even expresses the laws of gravity and uses materials in a way that articulates their natural qualities, construction detailing and engineering which require complex computer calculations are employed.

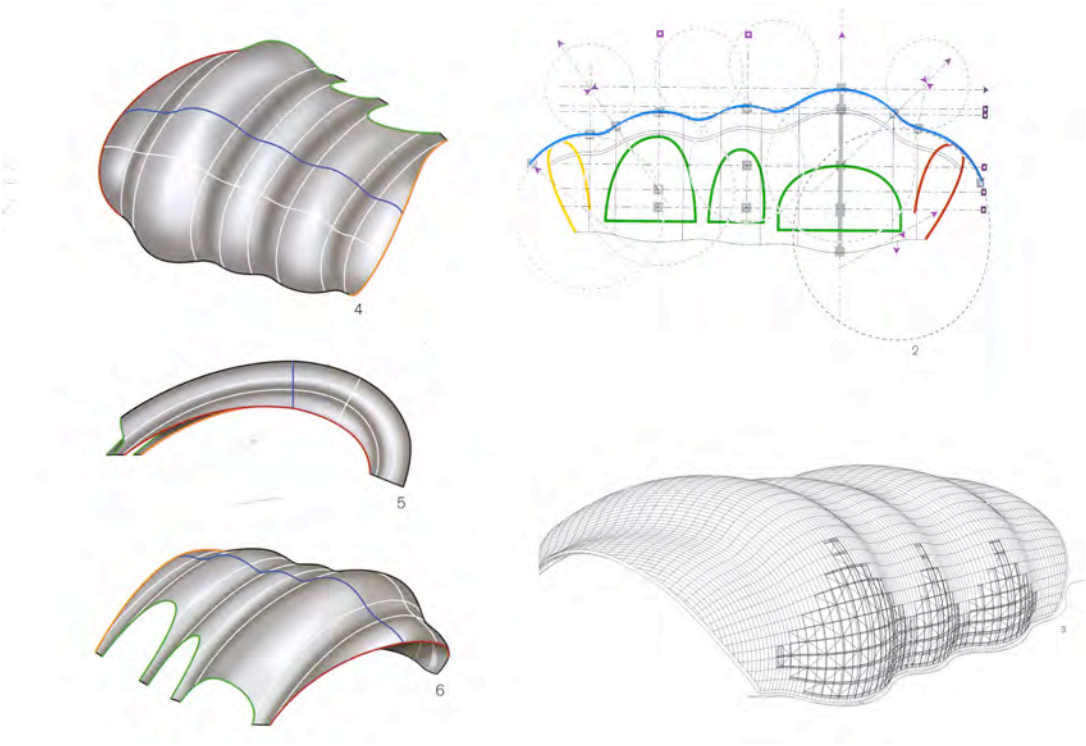

Figure 2.3 Complex parametric CAD studies required to create the curved sculptural form of The Sage Gateshead.

2.5 On the Surface

The typical contemporary building cannot be easily read. Construction is usually multi-layered so that only the outside and inside layers are visible and the structure is hidden. The thin claddings and internal finishes follow the latest fashions, to be replaced when they become dated and worn. In this sense, iconic buildings are superficial, as priority is given to surface image over tectonic clarity. The heaviness, mass, presence and timelessness of the traditional is exchanged for the light, transparent and fast.

Figure 2.4 Herzog and de Meuron's Ricola building gives importance to the surface image through its graphic facade

2.6 Aversion to the Right Angle

In many projects the rational right angle is rejected for 'organic' curved or dynamic pointy forms which are seen as iconic and clever, as Christian Schittich explains in the introductory essay to *Building Simply*:

> Today, in a time of pluralistic diversity, these tendencies [to build simply] are confronted with other, sometimes contradictory movements, stances and approaches, which exist together in parallel. The exuberant sculptures of a Frank Gehry or a Zaha Hadid, or the numerous blobs inspired by biology, stand in contrast to the retrospective consideration of the simple form.[9]

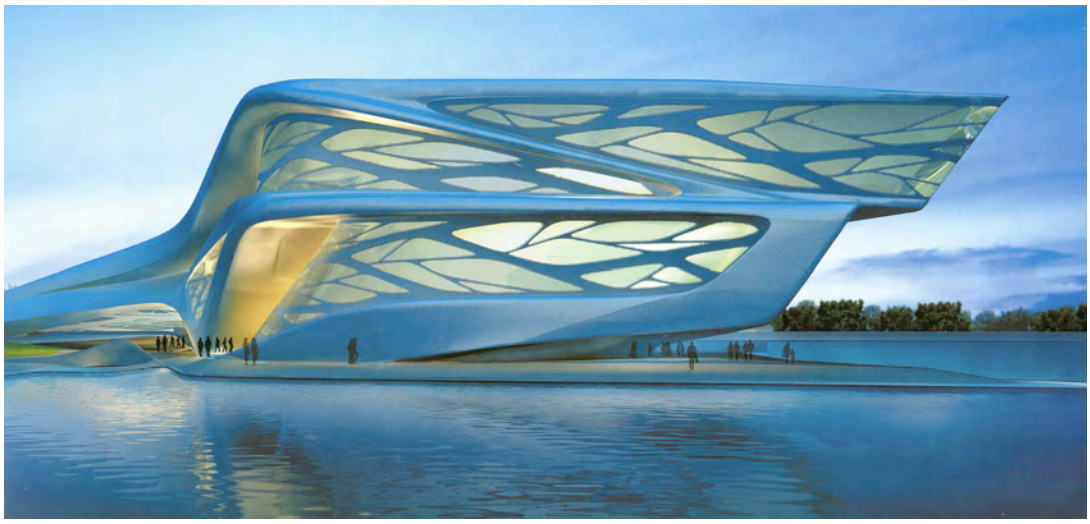

Figure 2.5 Zaha Hadid's Performing Arts Centre for Abu Dhabi includes no right angles

2.7 Over-Cooked Materials

Typically, construction materials are mass-produced and globally distributed. (Although a trend for the locally produced is emerging in response to sustainability demands.) As opposed to the 'raw' materials used to build simply, materials are highly-processed composites which require specialisation. Whereas a building could traditionally be constructed with few trades and local knowledge, modern construction requires the specialised skills of many trades:

> In a society with divisions of labour, this simplicity is lost. Specialisation allows more efficient production processes.

[9] Ibid p.9

> Products are measurably more efficient and are available to broad groups of the population. The production of items by hand to meet immediate needs is succeeded by machine production ahead of demand. The place of production is relocated from the family to the factory.[10] …Specialisation means that it is no longer possible to understand all processes.[11]

2.8 Complex Details – Layered Construction

In order to meet the performance standards required of buildings today, construction has become multi-layered with each layer performing a different task such as waterproofing, insulating, providing structure or decoration. Regulatory requirements, such as the Building Regulations, demand minimum standards to ensure occupant comfort and environmental performance. This, combined with the emphasis on surface image, has led to complex detailing and layered construction becoming the norm and therefore the 'safest' way to build:

> Sticking to the standards simplifies life an offers protection against liability claims. Increased demands on the performance of building components lead to standardised construction. Standards define the expected and safe… The desire to send a simple message often stands in opposition to standardised construction.[12]

2.9 Eco-Bling

With demands for sustainable building performance and carbon reduction ever increasing, an additive approach to 'green' design has developed. Rather than employing passive design principles at the early stages of design, many buildings are adorned with 'eco-bling' as an afterthought when carbon emissions do not meet the expected standards because energy guzzling climate control and electric lighting systems have to be installed. Costly wind turbines, photovoltaic panels and the like have to be added to buildings to compensate. In 'Eco-

[10] Florian Musso, 'Simply Good', in *Building Simply*, ed. by Christian Schittich (Switzerland: Birkhäuser, 2005), pp. 11-25 (p. 11)
[11] Ibid. p. 11
[12] Ibid. p. 18

Minimalism Revisited', an essay which promotes passive deign above complex technology, Nick Grant explains how these technological, add-on solutions are the easy option:

> PV and wind turbines are visible and get people thinking! And that is the problem. They are the magic pill that is claimed to cure another social ill without us having to face the deep complexities of the real problems. The simple approach is harder work.[13]

2.10 Summary

This chapter has highlighted the differences between typical contemporary iconic architecture and aspirations for Building Simply. The comparison helps to identify potential problems for Building Simply in the UK which are discussed in Chapter 6. These contrast become clearer when the contemporary iconic is compared with the simplicity of vernacular architecture which is considered in the following chapter.

[13] Nick Grant, 'Eco-Minimalism Revisited', in *Green Building Magazine* (Winter 2008), 32-35 (p.34-35)

3. Learning from the Vernacular

3.1 Introduction

The *Oxford English Dictionary* definition of 'vernacular' in relation to the arts is;

> Native or peculiar to a particular country or locality. *spec.* in ***vernacular architecture***, architecture concerned with ordinary domestic and functional buildings rather than the essentially monumental.

In contrast to the contemporary architectural culture described in the previous chapter, the study of traditional and vernacular architecture reveals simple ways of building that closely relate architecture to site. They are constructed in a direct and straightforward way from materials that can be found nearby. Materials are used in their natural state and construction is expressed and readable. Rational geometries and the consideration given to orientation and form demonstrate a resourceful manner of building. Although built in this way by necessity, this architecture gives meaning to the landscape it inhabits, expressing its origins and providing people with a sense of home.

However, these older buildings do not meet the high standards of performance and comfort expected by today's users. Building Regulations, concerns for occupant health and the impact of energy use on the environment make it inappropriate to directly copy these traditional building techniques, but lessons may be learnt from their direct and resourceful approach to construction.

3.2 The Vernacular and Building Simply

Vernacular buildings embody many of the principles of Building Simply, so it is useful to look to traditional ways of building for inspiration and to discover some benefits of Building Simply. Vernacular architecture was naturally simple by necessity rather than wilfully simple as the result of a desire to send a particular message through design.

3.3 Why study the past?

Whilst studies of the traditional are insightful, building traditions cannot be copied directly today as construction would not meet the demands of modern-day Building Regulations or expected occupancy comfort. However, despite this problem, there are still useful lessons to be learned from vernacular buildings if the principles they embody are studied abstractly. This is an idea encouraged by Amos Rapoport in his paper, 'Vernacular Design as a Model System', where he argues that 'this is best done by looking at vernacular design as a *model system*'.[14] This, he states, 'requires moving away from the 'natural' history' stage to more problem-oriented, conceptual ways of addressing the topic'.[15] Rapoport goes on to describe his method of learning from the vernacular which is translated from the scientific field of environmental behaviour studies:

> Once it is realised that vernacular design cannot be ignored, still the most common attitude, one can still deny that it can provide any useful lessons. Accepting that something can be learned, the most common approach is to copy certain formal qualities (shapes, massing, details, etc.), often based on a romanticized version of the vernacular. In general this approach has not, does not and is increasingly unlikely to work. The only valid approach is to derive more or less general lessons and principles by analysing vernacular environments using EBS [Environmental Behaviour Studies] concepts, models and the like, and applying

[14] Amos Rapoport, 'Vernacular Design as a Model System', in *Vernacular Architecture in the Twenty-First Century: Theory, Education and Practice*, ed. by Lindsay Asquith and Marcel Vellinga (UK: Taylor & Francis, 2006), pp. 179-198 (p. 180)
[15] Ibid. p. 183

these lessons to design. The differences between these two can be diagrammed as illustrated.[16]

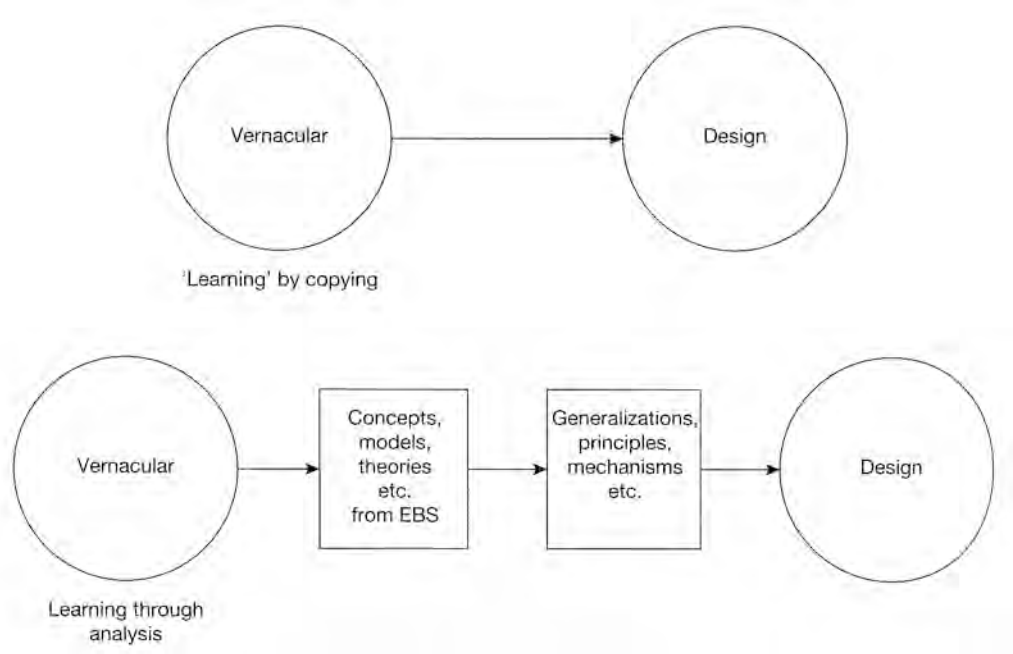

Figure 3.1 Rapoport's diagram for learning from the vernacular

Using this method, he believes we can learn lessons about, 'response to climate and energy use, sustainability, the variability of standards and notions of environmental quality, the nature and attributes of distinctive ambience, preferences for various product characteristics and many other topics'.[17]

Rapoport's abstracted Model System approach to the vernacular avoids the stylistic copying of the traditional. The dangers of this are identified by David Lea in 'Fake or Real', a paper about traditional and contemporary Welsh Architecture. He says that;

> The idea that there is a local, or even national style which offers some continuity with the past, after the social conditions and old ways of building have been swept away, leads directly to the transformation of our settlements into a continuum of fakery where the boundary lines between authentic construction at St

[16] Ibid. p. 182
[17] Ibid. p. 183

> Fagans, the theatricality of Portmeirion, and the emptiness of Disneyland are hard to distinguish.[18]

He suggests that, in response to the closing of local quarries and other barriers to traditional ways of building, that the construction industry has 'developed a "vernacular" costume to hide modern construction; its colours and textures can easily be adjusted to give a regional flavour'.[19] Lea also believes that;

> The mummification of this process in our planning laws, and in the minds and design guides of those who operate them, is culturally repressive. The pressure to put form before content forces designers to devise ways of circumventing the planning authorities, rather than confronting the conditions of existence as they really are and creating an appropriate, living architectural expression for our age.[20]

This concern is echoed by Florian Musso in 'Simply Good', who says that;

> Stone quarries are being closed, timber is cheaper from abroad. So it is usually senseless to take on the forms of historically developed building types without questioning their rationale. A poorly understood copy of old buildings, without clarification as to the living styles and construction forms of the present, destroys the spirit of this architecture.[21]

He goes on to suggest that, 'a well understood interpretation of the values and of the method that forms the foundation of these architectural styles allows for a procedure that is related to the context and has direct reference to the cultural basis'.[22]

The aim of the 'model system' method of studying the vernacular is not to try to recreate the past or the primitive, but to discover the underlying principles on which the vernacular was built and to learn from them.

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[18] Lea, p. 80
[19] Ibid. p. 80
[20] Ibid. pp. 80-81
[21] Musso, p. 16
[22] Ibid. p. 16

The book, *Elementare Architektur: Architectonics*, by Raimund Abraham, presents such a study through a series of evocative photographs and an accompanying essay. Photography by Josef Dapra captures the elemental qualities of primitive timber and stone constructions found in the mountains of Austria, Germany, Italy, France and Switzerland which 'show a common architectural language deriving from common conditions of simplest means and building techniques. They are elementary in that they manifest the basic form of building'.[23]

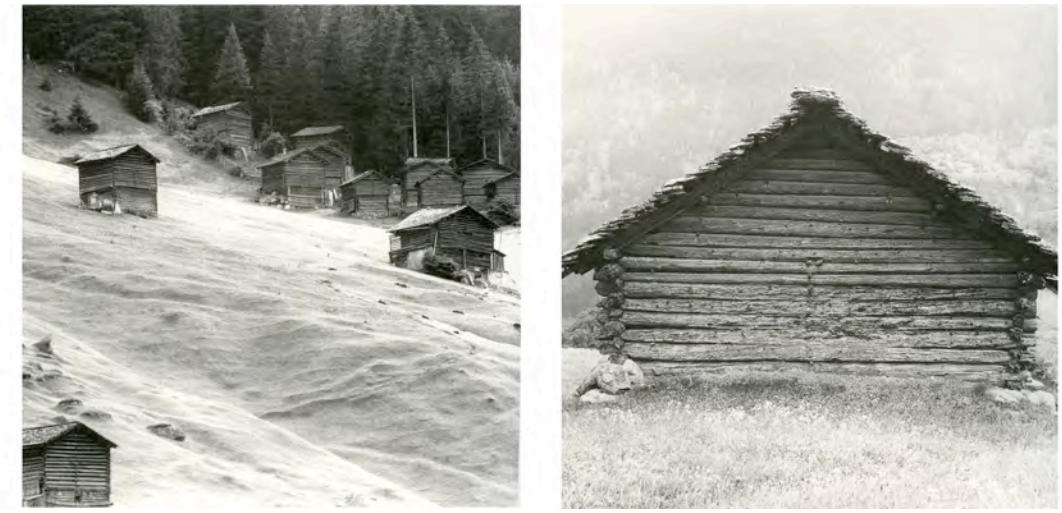

Figure 3.2 Two of Josef Dapra's photographs of traditional alpine buildings

Abraham describes the purpose of the book:

> It is one and the same ordering principle which is intrinsic both to contemporary buildings and to the primitive timber and stone constructions of early times. The attempt to examine the roots of anonymous building on the basis of examples of primitive timber and stone structures does not derive from a yearning for the primitive. The aim of this book is to free the natural results of primitive building from the isolation of tradition and to view them purely as examples of construction… These examples are intended to show how, within the limits of geographical dependence, simple ideas on building were clearly and convincingly realised.[24]

[23] Raimund Abraham, *Elementare Architektur: Architectonics* (Salzburg: Pustet, 2001) p. XXXI
[24] Ibid. p. II

Abraham's study of the simple buildings in the mountains demonstrates how an analytical study of the vernacular can teach us about the basic principles of Building Simply which are fundamental to both primitive and contemporary architecture.

3.4 What can be learnt from the vernacular?

The lessons that can be derived from the vernacular can be organised into a number of themes which cover issues such as landscape, order, legibility, composition, materials, details and sustainability. Some of these lessons are picked up by Schittich, Lea and Abraham in their writing.

3.5 Using the landscape

Before the development of motorised transportation, it was harder for people to travel and transport goods from place to place. This meant that, in the majority of cases, buildings were constructed from local materials using local labour. This was especially true of 'ordinary', non-monumental buildings whose inhabitants could not have afforded to build any other way.

Through vernacular building, people developed a deep knowledge of the landscape in which they lived, worked and built; and this was reflected in the architecture. A good understanding of the properties of local materials and knowledge of the climate and topography led to efficient, economical buildings which were in close relationship with the landscape in which they stood. As Abraham describes;

> The sensitivity for materials and structure is repeated in the building and the way in which it is placed. Built into the dynamic of landscape forms, the buildings seem to have grown together with the land from whose raw materials they were built. As geometric forms they illustrate a simple interrelationship between their parts, the scale of their functions is natural and obvious, they relate to a clearly defined axes and show subtle differences in their detailing.[25]

[25] Ibid. p. V-VI

This localised way of building developed traditions which closely related to the resources available in a particular landscape. The building traditions of each area, repeated over time, produced local character and established a strong sense of place which is so often lost in contemporary development.

3.6 Minimised and ordered

Out of necessity and for reasons of economy, vernacular buildings tended to be minimised to the bare essentials. They are functionally efficient; providing for basic human needs of shelter and comfort using basic elements such as floor, walls, roof and hearth. Forms and spatial relationships are dictated by lifestyle and the needs of the occupants rather than the wilful composition of a designer. This is evident in appearance too, as vernacular buildings are not usually highly decorative or fanciful in form. As Lea states, 'they are uncluttered by formal concepts: there was a Way to build, and most buildings were done that way… Absence of concepts produced simplicity of form'.[26]

Geometry is dictated by the materials available for construction and the topography of the landscape. To build in the most efficient way, materials have to be put together according to their inherent properties which include the size and shape of the materials and components. This gives an order to the architecture which is not based on conceptual ideas, but logic and rationale. Construction methods are kept simple and minimal because skills are not technologically advanced.

On a larger scale, where there are many buildings together, type is minimised as forms are repeated across the site. Each individual building deviates little from the rational arrangement and construction which results from the local climate, materials, skills and knowledge.

[26] Lea, p. 78-79

Figure 3.3 The similarity of form between these shepherd huts in Spain creates simplicity through repetition

3.7 Legible

Vernacular buildings are usually very easy to interpret. The basic elements of the building can be easily read as wall, roof and floor and the building's function is often evident from its form and arrangement.

The construction methods and materials are also legible. Because construction is not usually layered, all the materials are visible and the ways in which they are joined is apparent. Materials are not highly processed, making them easy to distinguish. As Abraham describes, 'primitive tools and ignorance of joints using foreign materials allowed systems of construction to develop which, due to the way in which they are reduced to the elementary, are most convincing. The building elements are put together in the simplest form appropriate to the material'.[27]

[27] Abraham, p. V

3.8 Materials and Construction

The aesthetic values of vernacular architecture come from the materials that are used and the way they are constructed. This is why it does not make sense to copy the aesthetic 'style' of the traditional; because it was never intended to be a style, but resulted as a natural outcome of the construction. Lea describes how tradition is formed in this way:

> The basic elements of traditional buildings, the walls, roof and openings, together with the materials from which they were made, changed little over the centuries. In fact these elements *are* the tradition… But the roots of tradition do not lie in form or style, they lie in construction.[28]

While it may not be appropriate to directly copy the aesthetic material palette of the traditional and apply it to modern construction, there are aspects in the use of materials that go below the surface and can influence our thinking about Building Simply today.

We have already seen that materials are usually sourced locally, giving buildings a sense of belonging to a particular place and requiring minimal transportation. Traditionally, materials tended to be used in their most natural, raw state where possible. In comparison to the highly processed materials found in much contemporary construction, such as plastics and synthetic insulations, raw materials are more easily read and have to be used in a way which exploits their natural qualities. With modern construction it is possible to 'hang' a thin veneer of stone cladding over the surface of a tall building to give the appearance (from a distance) of mass and solidity. However, in vernacular construction the laws of nature and material properties are obeyed. Heavy stone construction obeys the law of gravity as the weight of the material is expressed in the massiveness of the load bearing construction.

[28] Lea, p. 79

Figure 3.4 A solid stone Welsh house expresses its mass and gravity

The photographs in *Elementare Architektur: Architectonics* capture the visual result of such construction, while Abraham explains the order that underlies the buildings which applies to modern construction too:

> From the earliest times architecture has complied with that order of logical forms which is contained in the nature of each material. That is to say each material can only be used within the limits imposed by its organic and technical possibilities. This is the basis for the demand for a precise knowledge of materials and their organic laws as a precondition for every creative process. The natural feeling for material and structure which can be seen in the reduced constructions of primitive buildings is necessary for all built architecture, whether it is constructed using hand-craft or by employing perfected industrial methods of fabrication.[29]

[29] Abraham, p. IV

Figure 3.5 An example of construction from Abraham's collection

So the ways in which materials are assembled and joined respects the inherent properties of the different materials. Buildings are constructed in the simplest way with few materials and uncomplicated joints. This way of building is very direct and straight forward.

> These are primitive buildings which make no claims to any significance but they are "really built". You can examine every detail and you will not find a single element which does not obey the law of the whole.[30]

3.9 Sustainability

Although sustainability is a relatively new term in relation to architecture and the widespread concern for global warming and diminishing energy resources has only developed in the last few decades, vernacular architecture embodies many of the principles which are sought after by sustainability conscious designers and developers today. The builders of the vernacular were not necessarily concerned with the global impact of their buildings, but they did have to consider how comfortable and practical conditions could be achieved with the limited local resources

[30] Ibid. p. III

available to them. Where gas, electricity and water could not be piped in, basic resources became precious, to be used as economically and efficiently as possible.

Passive Design

High-tech solutions for heating, cooling and lighting buildings were not available in the past, so buildings were constructed to make use of natural resources such as sunlight, daylight, wind and the thermal mass of materials. These are the principles which we now refer to as passive design. As discussed above, vernacular buildings are constructed with a good, developed understanding of the local landscape and climate. People used this knowledge to site and orientate their buildings in a way which benefited from the sun to heat in winter, shelter from cold prevailing winds and daylight workspaces during the day.

In terms of form, vernacular buildings are usually compact in shape to reduce the surface area of the walls and minimise heat loss in colder climates. The arrangement of spaces within each building follows similar principles. For example, a kitchen or larder might be on the north side of a dwelling so that food is kept cool and lasts longer. The entrance might be turned away from prevailing winter winds to reduce cold draughts inside. Traditional dwellings were usually heated by a single fireplace which was also used for cooking. This meant that the hearth became the focus of the home and living spaces were orientated around it to benefit from the heat generated. In buildings where stone or brick was available, thermal mass around the hearth soaked up heat from the fire during the day and released it during the night. These basic rules of siting, orientation and form are often ignored in contemporary developments but have the potential to improve modern building performance in an economical way.

Local

The necessary use of local materials for vernacular construction has already been demonstrated. This is another issue which has seen increased attention in recent years. The sustainability conscious are

keen to promote the use of local products and skills to reduce the energy costs involved in transportation and to support local economies.

David Lea believes that the drive for sustainability will be an opportunity to encourage a return to the localised, low-tech architecture demonstrated in traditional buildings; and that this could help to re-establish a sense of place and cultural identity in Welsh communities:

> Agenda 21 frameworks arising from the Rio Summit offer the opportunity to bring these resources into a creative relationship. A worldwide movement now exists for local populations to re-establish their economic roots in their own regions. Even if the old national and local ways of building no longer exist, this is a positive context in which Welsh communities can create buildings which are relevant to our time from the materials of the Welsh landscape.[31]

3.10 Summary

This chapter shows that many lessons that relate to Building Simply today can learned from vernacular architecture. Although it may not be appropriate to copy directly from traditional building, there are many useful ideas that can be abstracted from them and applied to contemporary architecture. These include using the local landscape and resources responsibly, constructing in a rational and direct manner and employing passive design methods to reduce energy demand – resulting in clear, simple, unaffected architecture.

The themes described in this chapter inform the framework for Building Simply set out in Chapter 4.

[31] Lea, p. 81

4. A Framework for Building Simply

4.1 Introduction

The purpose of this chapter is to provide a detailed operational definition of Building Simply, incorporating the lessons derived from vernacular architecture and those found in literature.

The chapter is arranged under a number of themes which describe the different aspects of Building Simply. The themes follow the design and construction process from the analysis of the site, through design, to detailing and sustainability. In a sense, the framework is a non-prescriptive guide for how to build simply; it establishes a set of criteria for Building Simply, but there are many ways in which it can be achieved.

The framework can also be used to analyse existing architecture. The building case studies are critically appraised against the themes set out in this chapter.

4.2 Respond to the Landscape

The process of Building Simply should begin with a thorough analysis of the site and context. The landscape in which a building sits has the potential to offer energy, materials and a sense of place and belonging. It may also hold construction traditions which have developed over hundreds of years in response to the topography and available resources. Responding appropriately to this cultural heritage can help to simplify the building as well as making it fit in with the surroundings. Creating a sense of place and relationship to context entails an understanding and response to the site and landscape, especially in terms of geometry, scale and materials.

A relationship between building and landscape is visible where locally extracted or grown materials are used. The relationship may also extend to form and geometry where buildings respond to patterns and scale of the surroundings, whether these are rural or urban. This simplifies the building as variety and diversity are not added to the place. The building seems to belong to the landscape, as if they had grown together. Schittich explains how using the resources provided by the surrounding landscape also brings environmental benefits:

> Building Simply in the sense of traditional construction methods means, above all, making do with the locally available materials; that is to fall back on whatever building materials the landscape has to offer, in order to save on transport costs and transport energy. It also means, however, that the load-bearing structure and the construction should be designed such that the available resources can be used as economically as possible and, if possible, that the energy equilibrium is also in order.[32]

Analysis of the site is also important from a sustainability point of view. If the topography and climate have been understood, the designer can employ passive design strategies to reduce the building's energy demand and carbon emissions. A carefully sited, oriented and composed building will make uses of the natural resources from the sun, wind, earth and sky. The demand for mechanical heating, cooling and electric

[32] Schittich, p. 9

lighting is then reduced, meaning that complex high-tech building services are not required. Reducing complexity leads to simplicity.

4.3 Minimise

Minimising is about making things as simple as possible by reducing complexity. The definition of the word minimise is 'To reduce (esp. something unwanted or unpleasant) to the smallest possible amount, extent, or degree.' In terms of architecture, this means getting rid of inessentials so that only the basic elements of the building remain. The essence of the building is condensed and strengthened in this way. A minimum cannot be made simpler.

This idea forms part of Spanish architect, Alberto Campo Baeza's manifesto for architecture of 'essentiality' which achieves 'more with less':

> I propose an ESSENTIAL Architecture of IDEA, LIGHT and SPACE. Of a built IDEA, materialized in the ESSENTIAL SPACES animated by the LIGHT. An Architecture which has the IDEA as an origin, the LIGHT as a basic material, and in the ESSENTIAL SPACE the will to get MORE WITH LESS. An IDEA being called to be built, an ESSENTIAL SPACE with the capacity to translate efficiently these ideas, and the LIGHT which puts man into relation with those SPACES.[33]

'Minimise' is not necessarily the same as Minimalism. Minimalism in the arts usually refers to the visual appearance of architecture, but what appears minimal and simple to the eye on the surface, may in fact be complex underneath.

For Building Simply, architecture may have a minimal appearance, without decoration; but it is also minimised in its form, composition and construction. The number of materials, components and joints used in constructing the building is also minimised. In order to reduce complexity, the essential elements of the building may be doing more than one thing.

For larger buildings, which have a natural tendency to be more complex than smaller buildings, it may be necessary to reduce complexity through repetition. A generic form or type can be repeated to accommodate a complex project brief. In this way the number of

[33] Alberto Campo Baeza, 'Essentiality: More with Less', in *Architecture and Urbanism* 264 (September 1992), 12-13 (p. 12)

different forms and buildings types is minimised. The same can be said for repetitive use of building products and components in construction which come together to form a simple whole. This effect is described by Florian Musso in the essay 'Simply Good':

> On a large scale, the routes to simplicity change. Series products are brought together in uniform images to form components. The brick structure of a wall does not direct the attention towards the individual element, it becomes a texture.[34]
>
> If the repeated element is of high quality and attuned to character and proportions of the building, this can have a positive influence on the overall quality. The complexity of the sum of the individual problems is then reduced accordingly.[35]

In the same essay, Musso also describes an architectural "subsistence minimum" which developed in response to the inadequate living standards of the lower classes following the First World War. The aim was to provide 'a minimum standard, affording human dignity and the necessities of life, even where the economic capability is insufficient'.[36] To achieve this, he says, 'Architects are concerned here with the simplicity and direct functionality… satisfying elementary needs without regard for exercises in style'.[37]

[34] Musso, p. 17
[35] Ibid. p. 17
[36] Ibid. p. 14
[37] Ibid. p. 14

4.4 Obey the rules

Rules and systems to bring order and simplify complexity. Just as the rules in a game of football prevent the match turning into chaos and the laws of a country are enforced to keep order, rules can be applied to architecture to bring order and simplicity to building.

Some rules are created and imposed by the designer, whereas others already exist in the world. The latter are sometimes referred to as the laws of nature.

When aiming to build simply, an architect may create and impose a set of rules or systems to inform design decisions from the concept stages through to the construction. These rules give control and logic to a design, and can be used to organise complex functions, determine the building form or direct construction methods. Rules can be used to inform design decisions relating to the building's plan, form, elevations, detailing and materials.

A well defined concept can act as an ordering system. In 'Simply Good', Musso describes how a concept can bring clarity and order:

> Clear concepts bring order to a complex problem. The concept is a caricature of the interaction of the systems within the design… Concepts link formal and structural simplicity to architecture. In a concept, systems are organised, with a high quality detailing, to provide quality of space and comprehensibility.[38]

One example of a conceptual, designer imposed system is the grid. A grid can be used as a spatial organiser at various scales, to order the structural system and to compose elevations. The grid brings control to the dimensions of forms and components, as well as aligning them. In this way it helps to simplify the building.

Other ordering principles may relate to the structural system and technologies used. In sizing the structural elements, an engineer will use rules or formulae to calculate the dimensions required. Each structural system has its own set of rules which must be obeyed if the

[38] Ibid. p. 19

structure is to perform. For Building Simply, the structural rules are followed in the most simple and straightforward way, without breaking or bending them in the attempt to create fanciful shapes or gymnastic forms. This following of the laws of a particular technology or system is one of the aspects that Raimund Abraham draws out of his study of traditional Alpine timber buildings:

> The elementary function of architecture is to realize building concepts with the simplest of means. The dependence of these means on the development of technology determines the laws which govern any particular way of building.[39]

The rules attached to a structural system also influence the form and spatial organisation. To achieve simplicity, the layout of the building should work in harmony with the rules of the structural system as opposed to fighting against them, bringing further order to the design as Abraham goes on to explain:

> Structure is more than a summation of constructional solutions, it is far more a necessary and fundamental system of ordering both for architecture and for man himself.[40]

Musso highlights this as a distinguishing feature between the simple building and the 'heroic vision of modernity'

> In contrast to the "heroic" vision of modernity, "simplicity" presents itself… as a reconciling link between locally rooted tradition, bound to the rules of civil engineering, and an internationally operating, abstract modernity.[41]

Structures and constructions are themselves governed by the laws of nature and physical law. For example, gravity acts on the mass of a building, pulling it towards the ground. Different constructions respond differently to these natural forces due to the inherent properties of the materials they use. Building Simply expresses the inherent properties of the materials it uses by obeying these laws. For example, where stone is used, its mass and heaviness is expressed through thick, solid, load-

[39] Abraham, p. I
[40] Ibid. p. III
[41] Musso, pp. 14-15

bearing construction. Large cantilevers and thin, surface fixed claddings are avoided as these try to work against the laws of gravity. The treatment of openings can be used to further reveal the mass and express the heavy nature of the material.

In the essay, 'Of Mass and Apparent Heaviness', Martin Tschanz describes mass as 'a fundamental property of material which expresses itself in the mutual attraction of bodies and in their inertias'.[42] He advocates the expression of massiveness, suggesting that,

> We understand massiveness to express the (relative) homogeneity of the material of a body. It lends it interesting properties. Without immediately having to think of a "ruin", it lets objects age with dignity, and gives them a claim to durability and longevity. In addition it permits simple, direct design.[43]

[42] Martin Tschanz, 'Of Mass and Apparent Heaviness' in *Constructing Architecture*, ed. by Andrea Deplazes (Switzerland: Birkhäuser, 2005), pp. 255-257 (p. 255)
[43] Ibid. p. 256

4.5 Clear and Legible

One definition of the word simply is, 'in simple language, with simplicity of speech, with no attempt at style; also, so as to be readily understood, plainly, clearly'.

Building Simply employs simple architectural language. It is easy to understand because the complexity is minimised. In 'Simply Good', Musso describes this contrast between simple and complex;

> Simple can be contrasted with the word complicated. In place of complicated, which has negative connotations, simplicity could also be seen as the opposite of complex. Complex things can be described simply in order to understand them better. The norm can be complicated. The simplicity of normality relates to the pair of opposites: simple and difficult. It is the simplicity of least resistance.[44]

This simplicity can be easily read in the form of the building or the elements that it is composed of. The observer can read these by looking at the building and can understand what the building is. Musso explains this in terms of semiotics;

> Consciously simple building also certainly represents a need for semiotic clarification. Semiotics is the philosophy of the meaning of terms…
> In this context, simple can also mean that a roof is a "roof", a wall is a "wall" and a house is a "house".[45]

This lucidity is achieved through the minimising and expression of the elements that form the building. For example, a roof looks like a roof because it is functional and rational. It is there to provide shelter from the rain and wind and is designed to do so efficiently, rather than taking on a wilful, quirky form. Building Simply is straightforward and unpretentious.

Building Simply also seeks legibility in the use of materials and construction methods. David Lea believes that authenticity in this

[44] Musso, p. 12
[45] Ibid. p. 17

respect 'affirms the power of the real over the unreal. Materials are what they appear to be. Construction explains itself lucidly'.[46]

Because the materials used in Building Simply are not highly processed and are used in a way that it true to their natural qualities, they are easily identified. Hidden materials in the construction are avoided as this is confusing and not a truthful expression. Multi-layered construction hides materials, such as insulations, vapour barriers and fixings from view; whereas minimising the material palette and moving toward solid construction makes the building easier to read. Tectonic expression is encouraged.

[46] Lea, p. 82

4.6 Composition

Building Simply employs a simple architectural language and building geometry. In contrast to the exuberant sculptural forms of iconic architecture, the geometry of Building Simply is refined, calm, quiet and dignified. It is ordered and orthogonal, lending it an absence of movement rather than dynamic form.

This ordering and orthogonality is a result of rational and efficient construction and functionality, not wilful form making as Musso explains:

> If the expression of the logical construction cannot be taken into consideration in the appearance, there is a danger that functional and technically suboptimal solutions will be applied, for the sake of the form.[47]

The rationalised geometry may also be the result of the rules or systems described in the previous chapter. Where regular dimensions are used, the geometry will establish a rhythm or pattern which is naturally regular.

The geometric composition is similar at a smaller, detail scale and at the wider scale of the building as a whole or even a larger development, where overall scale and form become important. The simple forms of traditional buildings in the landscape, such as this mountain hut in Spain, epitomise this idea.

Figure 4.1 A Spanish mountain hut creates a simple form in the landscape

[47] Musso, p. 15

Elements

A simple way to think about the composition of architecture is to consider it as made up of a number of basic elements, put together to create buildings. This way of thinking is described by Simon Unwin in one of the chapters of *Analysing Architecture*. *Analysing Architecture* provides a 'thematic framework' for understanding and analysing architecture. In the first chapter, Unwin defines architecture as *identification of place*, and the following chapters present conceptual strategies for organising space in architecture.

In the second chapter of the book, Unwin describes 'the "materials" that are available to us in doing architecture'. He explains that they are not physical building materials, but 'conceptual elements of architecture' which contribute to the making of places. He calls these the 'Basic Elements of Architecture'.[48] These Basic Elements, he says, include *defined area of ground; raised area, or platform; lowered area, or pit; marker; focus; barrier (this could be a wall); roof, or canopy; supporting posts, or columns; path* and *opening.*

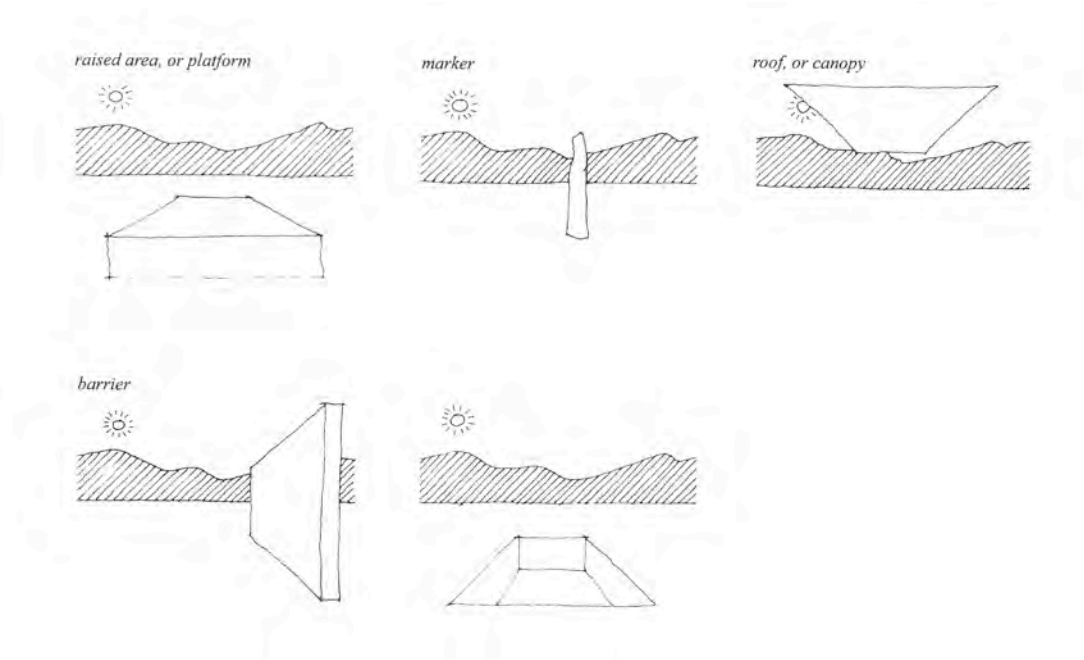

Figure 4.2 Unwin's basic elements for architecture

[48] Simon Unwin, *Analysing Architecture* (London: Routledge, 1997), p. 19.

He also says that, 'Basic elements such as these can be combined to create rudimentary architectural forms', such as a cell or an aedicule.[49]

Figure 4.3 The basic elements can be combined

As explained in Chapter 4.5, buildings that employ a simple architectural language and building geometry, where the basic elements are clearly distinguishable, are easy to read and can be understood simply. Building Simply should be composed of basic elements which relate both to function and material construction.

In *Architectonic Space*, Dom Hans van der Laan 'deals with the fundamentals of architecture…the natural art of building'.[50] He considers 'the most elementary themes in all architecture: our experience of the spatial and material universe, and our reaction to it by building within it an inside space of our own.'[51] Van der Laan goes back to first principles, to think about the creation of architecture in the most simple and elementary sense; defining space for ourselves within the vast 'space of nature' that exists in contrast to the mass of the earth. In some ways his thinking parallels that of Unwin's, as he considers the simple elements and processes that are used to define architectural space:

> The elements of a house can be derived only from nature: the primary datum of the wall separated space is the unlimited mass of the earth with the limitless space above it; so the limited mass

[49] Ibid. p.21
[50] Van der Laan, Dom Hans, *Architectonic Space: Fifteen Lessons on the Disposition of the Human Habitat* (Leiden: EJ Brill, 1983) p. V
[51] Ibid. p. V

> of the walls must also be drawn from the earth in order to withdraw a limited piece of space from the space of nature.[52]

Van der Laan sees these man-made elements, such as walls, which we use to mark out places as a dichotomy of mass and space, or solid and void:

> If we want to make a subdivision in the space above the earth's surface, we can do so only by means of solid elements extracted from the earth itself and by their nature opposed to open space.[53]

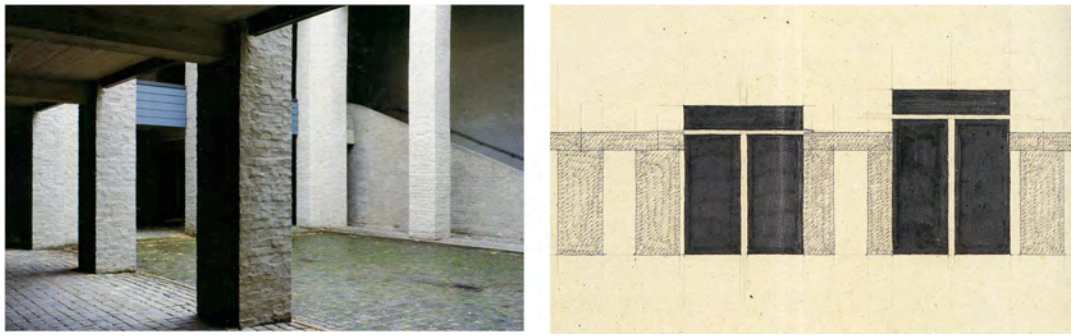

Figure 4.4 Van der Laan's extension for St. Benedict's Abbey at Vaals, and a sketch for a hypothetical construction of monoliths

Architecture as a composition of mass and space is another way to think of Building Simply.

Mass and Space

Mass and space (or solid and void) provide a simple elemental description of architectural composition, construction and experience. Building materials (mass) are arranged and joined to create rooms and buildings which we experience (space). In Building Simply the relationship between mass and space is clearly defined.

Van der Laan explains that, '…the space-dyad inside-outside is supplemented by the form-dyad, which we will call *solid-void*…. Space

[52] Ibid. p. 2
[53] Ibid. p. 7

gets its form from and hence its visibility from its involvement with the form of the wall.'[54]

One of the most simple and primitive example of mass defined space is a cave. The space of the cave exists as a void in the mass of the earth or rock. The cave might be naturally occurring, or it might be a space carved out of the earth. 'Carving' mass creates space, but space can also be created by building mass into elements. This 'mass' may be extracted from the earth:

> Where a piece of stone is removed from the earth there arises automatically a spatial from that corresponds like a matrix to the solid form of the stone.[55]

Primitive examples of mass-space compositions demonstrate some of the simplest buildings. In *Designing the Earth: The Human Impulse to Shape Nature*, David Bourdon explores the human desire to reshape the surface of the earth throughout history. He explains how humans have used the earth to create simple forms of shelter:

> Natural caves and rockshelters provided many of our earliest ancestors with convenient and secure shelter – and probably prompted their first glimmering concept of architectural space… Eventually, in many parts of the world, groups of people settles down in riverside communities, where they gathered at the water's edge. The ground surface of the Earth is a wonderfully varied terrain that lends itself to numerous structural uses. Residents in the Near East typically built their dwellings with mud-brick. Prehistoric people in China, Korea and Japan often lived in semi-subterranean pit houses, which they roofed over with animal skins or plant materials. Reclusive individuals in Asia Minor carved domiciles out of volcanic rock. Viking immigrants to Iceland and Prairie homesteaders in 19th-century Kansas made buildings blocks of turf from the ground. Earth, being readily available, has served as a building material for pueblos in New Mexico, clay houses in Mali, and adobe dwellings in Yemen. Many of these structures arouse the imaginations of today's householders, who long for a more natural and harmonious relationship to their surrounding terrain.[56]

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[54] Ibid p. 15
[55] Ibid. p. 7
[56] David Bourdon, *Designing the Earth: The Human Impulse to Shape Nature* (New York: Harry N. Abrams Inc, 1995) p. 13

The distinction between mass and space is most apparent when a building has a monolithic aesthetic, expressing the solidity and heaviness of the mass.

In the essay, 'Of Mass and Apparent Heaviness', Martin Tschanz says that massiveness 'permits simple direct design', sighting the Alpine buildings of Switzerland built entirely of stone as an example.[57] He goes on to describe the chapel building at Oberrealta, designed by Christian Kerez, which illustrates both monolithic construction and elemental composition; a good example of Building Simply:

> His design concentrates fully on the essentials: a protective envelope in a trusted form, a door with a threshold and a window form a structure which is both a man-made symbol of a house absolute and hence also a symbol of shelter and protection. This embodiment of familiarity and extreme abstraction, the simple, well-proportioned form and the solid materiality give this building a sacred dignity which does justice to the function and the location. This concentration would be inconceivable without a material "from one mould", which enables such a construction without details.[58]

Figure 4.5 A 'monolithic' concrete chapel by Christian Kerez

[57] Tschanz, p. 256
[58] Ibid. p. 256

Whilst it may be possible to build simply with lightweight materials, massive construction, by its nature, lends architecture a timeless, monolithic, elemental character.

4.7 Materials

The choice, use and expression of materials are important in Building Simply. To build simply requires a good understanding of the properties and limits of different materials.

Form and Material Limits

As mentioned previously, the properties and limits of different materials impact the form and construction. In Building Simply, material properties are expressed truthfully and the rules imposed on construction by the natural limits of materials are followed. Musso uses the buildings of Mies van der Rohe to illustrate how their forms are derived from the structural properties of the materials they use.

> In his German building projects and designs, Mies van der Rohe makes direct links between the materials used and the architectural form. The office building made of reinforced concrete, high-rise buildings made of steel and glass and the brick built houses are all formally derived from the structural possibilities. The demonstrative display of exquisite natural stone surfaces shows the effect of materials as a constituent part of the architectural composition.[59]

When discussing timber as a building material, Musso claims that 'Wooden components tend to be limited by fire protection requirements, weather and acoustics. If these limits are exceeded, the construction then becomes complicated.' However he points out that 'simplicity is possible where the material is used in accordance with its characteristics and limitations'.[60]

Expression of Material Properties

By working within the limits of materials, their inherent properties and characteristics will be expressed. This simple, natural expression replaces the need for elaborate, superfluous decoration, which would add complexity to a building, and therefore results in simplicity. In Building Simply, where possible, materials are not hidden behind layers

[59] Musso, p. 15
[60] Ibid. p. 23

of other materials where they cannot be expressed. This idea is discussed further in the next chapter which focuses on construction.

In a paper called 'Material Presence and the Mystery of the Object', Pamela Self discusses the importance of material expression for our experience of and connection with the world around us. To do so, she draws on examples of architecture and art that use simple, raw materials with evocative qualities. She uses La Congiunta in Leventina by Peter Märkli to demonstrate how the use of simple materials which express the construction process can benefit the experience of the visitor.

Figure 4.6 Markli's sculpture gallery in Leventina demonstrates expressive material qualities

> This is the place where the phenomenological presence of matter plays an important role. Märkli avoids the use of composite materials. As Hans Frei has said, they 'have far too many characteristics for each to be given a visible form'. Instead the architect focuses here on a single material which has direct experiential impact because the processes of making can be

> expressed: Construction methods are basic almost archaic, revealing the inherent roughness of cast concrete.[61]

Self also refers to the work of artist Carl André, whose minimal floor sculptures, she says, are a welcome contrast to 'the highly simulated surfaces of today's commercialized world, where appearance and reality are divorced'.[62]

> Experiences of materiality can be conveyed with a minimum of manipulation. In Carl André's floor pieces the only process carried out by the artist is the placement of basic units of building material. He encourages an intimacy with matter by laying his pieces on the floor – the surface with which we have a continual physical contact – for his is a tactile art, in which materials are not only a means, but also the subject and the content of the work. André's power in triggering a sense of closeness to matter highlights the rarity of such directness in our everyday experience of the world. The sophistication and complexity of modern materials renders such moments of connection all the more poignant.[63]

Self goes on to promote this direct approach to material use in architecture, saying that,

> The potentially magical, evocative qualities of materials differentiate them from authoritarian forms of architectural communication such as symbolism or representation… I believe that this possibility should be encouraged. In a time when ephemeral surfaces rather than physical matter dominate our perceptual experiences, direct contact with real materials can be a way of re-establishing our relationship with the world.[64]

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[61] Pamela Self, 'Material Presence and the Mystery of the Object', in *arq* 4, no. 3 (2000), 190-192 (p. 190)
[62] Ibid. p. 190
[63] Ibid. p. 190
[64] Ibid. p. 192

Reduce

As discussed in the chapter 'Minimise', simplicity is achieved by reducing complexity. In terms of materials, this means reducing quantity of type and complexity. Using fewer materials will simplify the appearance of a building and reduce the number of types of connections required in constructing it. Of course, the building will need to meet the functional and performance needs required of it, and this may well require the use of more than one material. However, if the properties of each material are exploited effectively, the number of layers can be reduced. This can be achieved if a material component is performing more than one task, as Musso highlights as he considers concrete construction:

> The simplification of the appearance, by making use of the load-bearing function of an element that is required anyway, was the consequence in the case of frameless load-bearing panels. By adding light aggregates, the concrete wall can have a monolithic structure. Some of the costs incurred due to formwork and building physics problems in a layered wall construction are avoided.[65]

Reducing the complexity of individual materials themselves also leads to simplicity. This means using raw materials instead of highly-processed or composite materials.

Raw Materials

Building Simply makes use of raw materials. These have not been over-processed and closely resemble the natural state of the material as it is extracted from the earth or grown. They are often found locally, enhancing the connection between building and site. Musso refers to Brutalism (which comes from the French word 'brut' meaning 'raw') to show how the use of raw materials, which bear the marks of their construction and are not 'finished', can add to simplicity.

> In Brutalism… handcrafted raw… materials were often put on show. The construction phase becomes part of the design repertoire. Materials come to the fore, which would previously have been considered unfinished or poor: raw bricks or concrete, unpainted wood, or steel. Not industrially perfect, but

[65] Musso, p. 22

handcrafted and solid, with the visible traces of human labour. Not smooth but raw and rough. The visibility and comprehensibility of how the structure caries the loading, how it functions and how it was constructed is important here.[66]

The Slate Fence

The traditionally constructed slate fence found in parts of rural Wales illustrates well the use of materials in Building Simply.

Figure 4.7 A welsh slate and wire fence

Using only two materials – slate and wire – the fence efficiently performs its function of dividing fields and enclosing livestock. The slate is mined locally and the only process it required is to break it roughly into appropriate size pieces. It is not highly finished, but left rough at the edges and irregular in sizes, making it a 'raw' material.

In the construction of the fence the material properties are clearly expressed. The solidity of the slate provides the structure and the barrier between one side and the other. Slate naturally breaks into flat

[66] Ibid. p. 15

pieces due to its stratification, and this property is exploited to create the flat, linear form of the fence. The wire is naturally malleable, and so is twisted to hold and join the slates together.

Because there are only two materials used, only one type of connection is required to construct the fence.

The finished fence is simple, functional and beautiful yet humble.

4.8 Construction

Visual and formal simplicity in architecture do not necessarily mean simple construction. Architect, John Pawson recognises that, 'Simplicity in architecture can sometimes only be achieved by the most complex of means'.[67] The same thoughts about stylistically simple architecture are shared by Christian Schittich, who says that,

> The formal simplicity resulting from aesthetic endeavours is rarely also really simple in a technical or economic sense, however. The perfectly reduced form can often be attained with greater effort. This effort can manifest itself in more extensive design work, but also in an enormous amount of work on hidden details, as is often found beneath the smooth outer surface of a multi-layered wall construction.[68]

Often, buildings that appear simple contain the most complex details behind the surface. Building Simply, however, is not concerned with purely visual simplicity; it is concerned with minimisation to give tectonic clarity and not minimalism as an aesthetic style. It looks beyond the surface to ensure that the construction details are also in the spirit of Building Simply.

To truly comply with Building Simply, construction should be minimised to reduce the number of materials and junctions, and to reduce the processes involved. This will aid the expression of materials properties and the legibility of construction.

Minimise Processes

In Building Simply the number of processes required to construct the building is also minimised. The construction processes involved are likely to reduce if the number of materials is reduced; and in turn, the skills required will also decrease. In this sense, the simplest way to create a habitable space is to make a cave. Only one process and skill is required – carving, and only one material is used – the rock which is carved. Of course, it is not really feasible to construct most building in

[67] John Pawson, *Minimum* (London: Phaidon, 1996) p. 18
[68] Schittich, p. 9

this way, but this is the most extreme example. The next step might be to extract stone from the ground and stack it to enclose a space. This involves two processes and one material; if mortar is used to hold the stone together, another material and process are added. In this case, the materials may also have to be transported from the quarry to the building site. And so, further levels of complexity are added as more processes are required in the construction.

Layers vs. Mono-material

One of the dictionary definitions of *simple* is 'consisting or composed of one substance, ingredient, or element'.

The ultimate expression of Building Simply would be a building built from one material; mono-material construction has a minimal number of types of connections, and no materials are hidden in the construction.

Historically, masonry walls were solid, thick and monolithic; the depth of the wall alone provided weather-proofing, insulation, thermal mass, security, and structural support. Aesthetically, the exposed stone and deep window reveals expressed these masonry qualities. Expected standards of thermal performance and occupant comfort have changed greatly since these times, especially with the growing concerns for energy use reduction, and this method of construction is no longer accepted, as Katja Dambacher, Christoph Elener and David Leuthold explain in 'The Skill of Masonry Construction':

> The insulation standards for the building envelope that have been demanded since the late 1970s have made traditional, solid, facing masonry practically impossible, and so this form has almost disappeared... Building performance requirements simply put an end to the façade as we knew it and divided our monolithic masonry into layers.[69]

[69] Katja Dambacher, Christoph Elener and David Leuthold, 'The Skill of Masonry Construction', in *Constructing Architecture*, ed. by Andrea Deplazes (Switzerland: Birkhäuser, 2005), pp. 43-48 (p. 46)

The standard contemporary cavity-wall method with its numerous layers of insulation, membranes, block-work and plaster board goes against the principles of Building Simply. Layers of materials performing their various functions are hidden beneath the surface skin of brickwork. The need to highly insulate buildings has resulted in an invisible building material. In an essay called 'The "Invisible" Building Material', Eva Geering and Andrea Deplazes discuss the properties and dilemmas of the use of insulation. They ask,

> What does an insulated wall look like? Could or should its form correspond to that of a monolithic wall? One obvious solution to the dilemma is to build the outer protective layer in the form of a self-supporting leaf of masonry or concrete. That enables our multi-layer wall to appear like a solid wall, almost as if there had never been an oil crisis.[70]

When a wall construction is broken down into layers, further issues arise which must be addressed, and these lead to further complexities. As Musso explains,

> The cladding in such constructions is often subject to high thermal stresses. This results in the need for expansion joints, ventilation and drainage openings, fragile wall anchors and horizontal support brackets. The ageing of the insulation embedded in the middle of the wall cannot be subsequently checked.[71]

The reasons discussed above explain why the monolithic, mono-material wall has become almost extinct in modern construction. However, there are a few contemporary examples, found mainly in Europe, of mono-material construction which does perform to the required thermal standards. Two examples are given below:

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[70] Eva Geering and Andrea Deplazes, 'The "Invisible" Building Material', in *Constructing Architecture*, ed. by Andrea Deplazes (Switzerland: Birkhäuser, 2005), pp. 139-142 (p. 139)
[71] Musso, p. 22

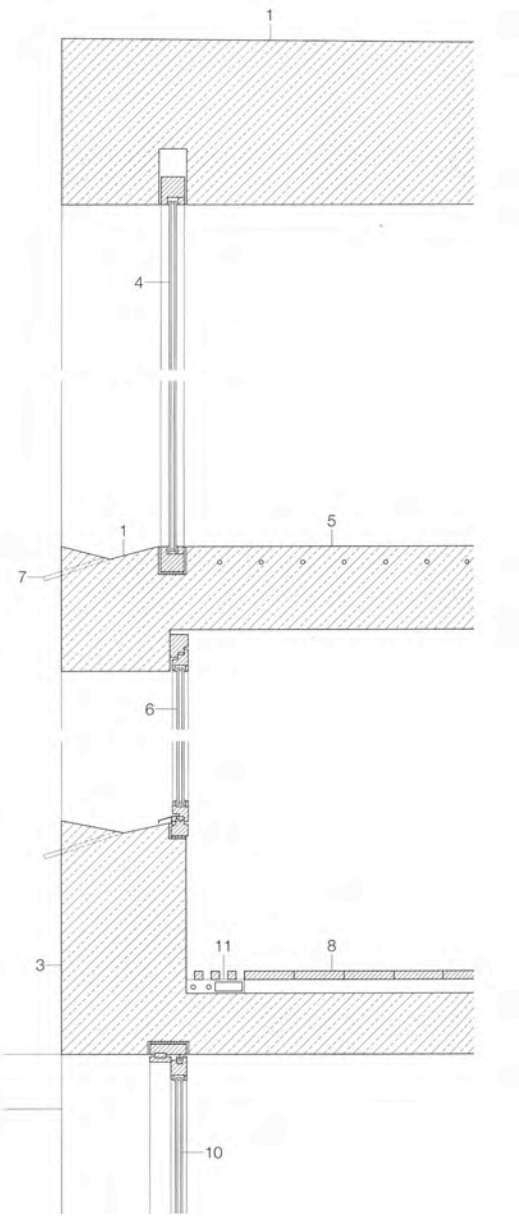

Figure 4.8 House in Chur by Patrick Gartmann

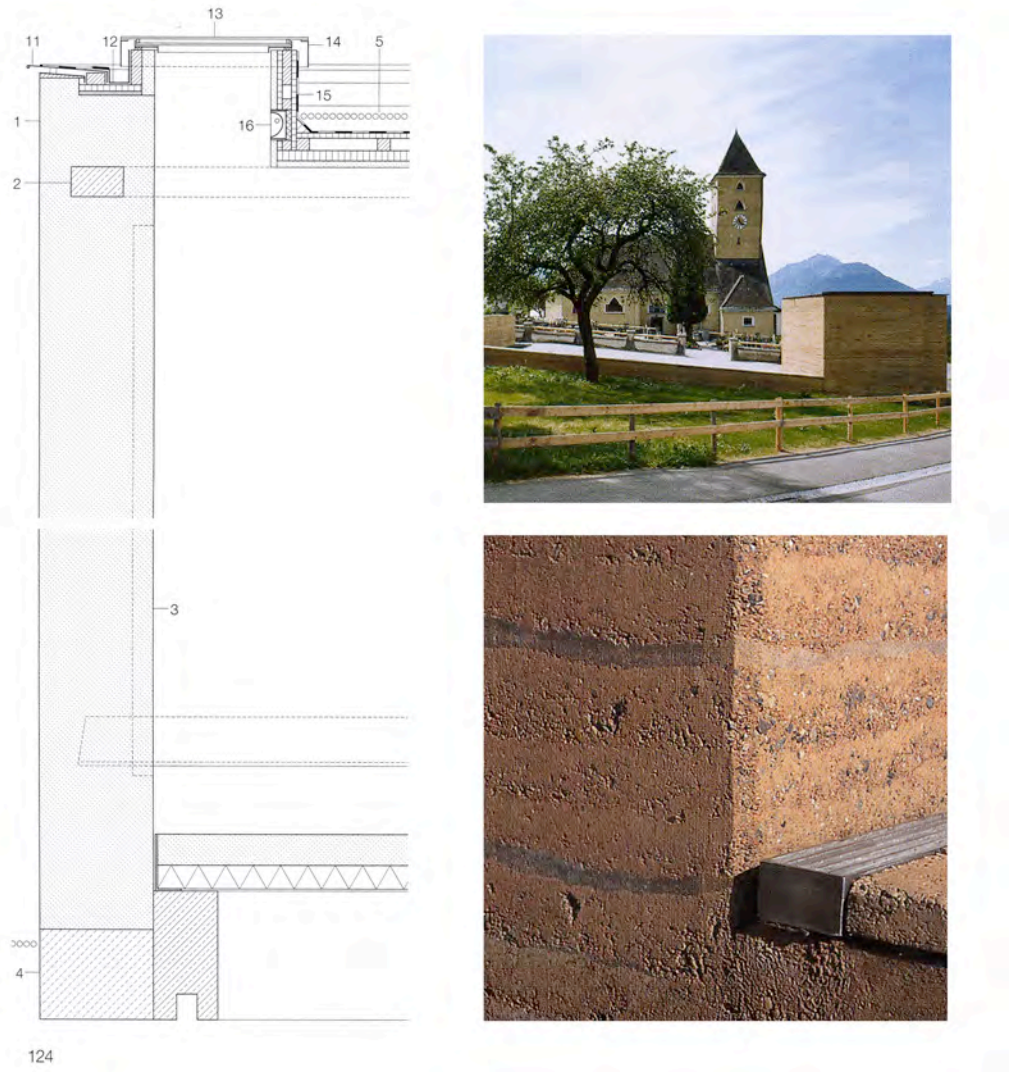

Figure 4.9 Cemetery Extension in Batschuns by Marte.Marte Architekten

These examples demonstrate tectonic reality and material expression. Concrete and brick do not pretend to be light or thin by floating weightlessly over a facade. Instead, they are heavy, thick and solid. The material performs more than one role, therefore minimising complexity.

The contrast between the performance of mono-material construction compared with that of layered construction is considered by Colin Porteous in *New Eco-Architecture: Alternatives from the Modern Movement*.

Porteous explains that *New Eco-Architecture* 'seeks to address neglected aspects of the Modern Movement as a prelude to supporting a diversity of architectural insight and experimentation aimed at twenty-first century environmental needs and priorities. The attitudes and influences of renowned figures are re-examined in relation to current issues of sustainability'.[72] Throughout the book he considers the links between architectural science and design since 1927, with the aim of 'supporting a diversity of architectural insight and experimentation aimed at twenty-first century environmental needs and priorities. The attitudes and influences of renowned figures are re-examined in relation to current issues of sustainability'.[73]

In his writing, Porteous recognises that as early as 1927 'two constructional cultures, one essentially mono-material and the other multi-material' existed. He states that the 'latter may have become increasingly dominant, but, in today's more ecologically conscious architectural scene, the former is starting to reassert itself. One example is that of rammed earth walls. Nevertheless, relatively slim multi-layered, multi-material construction will always have a strong place'.[74] Porteous references the work of Frank Lloyd Wright who 'explicitly extolled mono-materialism as part of his long-standing advocacy of "organic" and "simplicity"'.[75] In an essay for the *Architectural Record* in 1928 called 'Mono-Material Building' Wright wrote:

> The more simple the materials used, the more the building tends towards a mono-material building, the more nearly will 'perfect style' reward an organic plan and ease of execution economize results. Not only the more logical will the whole become, but all will emerge with the countenance of simplicity.[76]

[72] Colin Porteous, *The New Eco-Architecture: Alternatives from the Modern Movement* (London: Spon Press, 2002) back cover
[73] Porteous, back cover
[74] Ibid. p. 5
[75] Ibid p. 7
[76] Ibid p. 7

Porteous compares Frank Lloyd Wright's mono-material approach with that of architects such as Le Corbusier, who hid complex layers of construction behind smooth white-painted rendered surfaces:

> For example, in terms of heat gain and loss, Wright has been criticised here with respect to his mono-material stance… However, mono-material constructions do have other thermal advantages compared with multi-material ones. If there is only one material, there is only one set of thermal properties – density, specific heat capacity, thermal conductivity, and vapour permeability. Consequently, there is no risk of interstitial condensation, and if the material is hygroscopic, as with timber, there is also no likelihood of surface condensation. The material simply self-adjusts with respect to moisture content and this sponge effect, as well as inhibiting surface condensation, will also tend to lower relative humidity within occupied rooms.[77]

Here, it is possible to see that mono-material construction can have environmental benefits over insulated layered construction because it is more stable in response to temperature changes and has the potential to store heat in its thermal mass. The following chapter explores the use of such passive means to achieving simple, sustainable architecture.

[77] Ibid. p. 25

4.9 Sustainability: An Economy of Means

Layered construction is not the only building complexity to have come out of this energy conscious society. Technologies for producing or conserving energy and generating heat and coolth are becoming more and more popular in an attempt the reduce carbon emissions and consumption of non-renewable energy sources whilst meeting the demanding living standards of consumers. Wind turbines, solar panels, ventilation systems with heat recovery, ground source heat pumps and the like can be added to buildings to make them more 'sustainable'.

Sustainability, both environmental and economic, requires building with an economy of means and a concern for the consumption of energy and resources. However, the additive approach to environmental sustainability as described above adds to both complexity and capital costs, and is not in the ethos of Building Simply which aims to minimise and reduce.

Building Simply requires a strong environmental strategy that maximises the use of passive methods such as natural ventilation, daylighting and thermal efficiency. This concern for meeting the demands of the brief while limiting the expenditure of funds, resources, energy and land necessitates building with an economy of means: a value of Building Simply is that it limits waste and excess.

In 'Simply Good', Musso agrees with this philosophy. Seeing that 'ecology is a special form of economy', he suggests that,

> By reduction of needs and consumption, the disruption potential of buildings with regard to equilibrium in the environment can be reduced. The law of economy should lead to a specific (passive) architecture that uses resources sparingly. Technical systems are simplified or omitted.[78]

The 'economy principal', he says, 'is concerned with achieving as much as possible on a given budget, or meeting a target using a minimum of

[78] Musso, pp. 16-17

resources, limiting the expenditure of funds, energy and land'.[79] This means,

> ...making do with the locally available materials; that is, to fall back on whatever building materials the landscape has to offer, in order to save on transport costs and transport energy. It also means, however, that the load-bearing structure and the construction should be designed such that the available resources can be used as economically as possible and, if possible, that the energy equilibrium is also in order.[80]

The use of passive design strategies to reduce energy consumption is, in principle, supported and encouraged by the UK Government in its drive to reach zero carbon buildings. In a consultation paper, *Definition of Zero Carbon Homes and Non-Domestic Buildings*, the Government recommends a hierarchical approach to meeting the zero carbon standard.[81] Illustrated in the diagram in figure 4.10, the preferred hierarchy prioritises energy efficiency parameters over the use of on-site carbon mitigation solutions and off-site low and zero carbon energy solutions. It believes that this is a cost-effective, long-term way to reduce carbon emissions compared with expensive technologies.

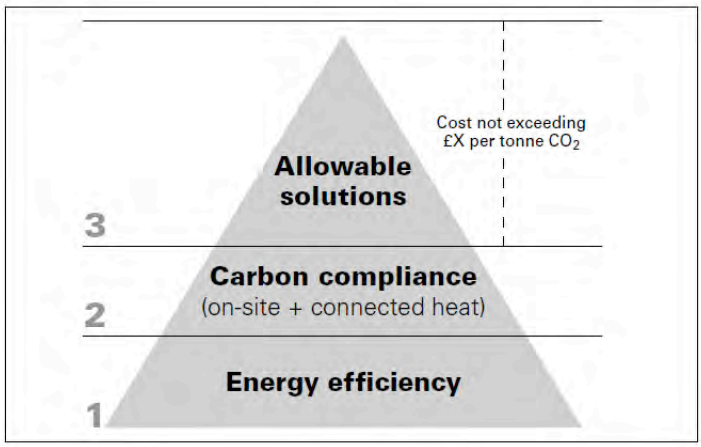

Figure 4.10 The government's preferred hierarchy for zero carbon buildings

[79] Musso, p. 16
[80] Schittich, p. 9
[81] HM Government, *Definition of Zero Carbon Homes and Non-Domestic Buildings: Consultation* (UK: Communities and Local Government Publications, 2008) pp. 28-29

A paper by Nick Grant, 'Eco-Minimalism Revisited', published in Green Building Magazine, advocates a particular approach to environmental sustainability which reflects the ideals of Building Simply.

> Eco-minimalism is an approach – not a style, or set of new clichés. Sadly the eco-minimal approach of stripping back to the essentials and debunking green icons is often seen as boring… However, to the eco-minimalist seeking honest expression of ecological function, the clichés stand out as just that.[82]

Grant promotes the use of passive design strategies to eliminate or reduce the need for complex technologies, saying that 'complication tends to be the enemy of good performance'.[83] In the paper, he sets out five principles for Eco-minimalism:

1. Question
2. Reduce: A smaller house uses fewer resources and will need less stuff to fill it. The reduction applies to quantity and complexity.
3. Order: Building examples include arranging services to minimise hot water pip runs and subsequent energy and water wastage, or ordering to maximise useful living area, perceived space or solar gain.
4. Model
5. Monitor[84]

Principles 2 and 3 in particular, reflect the principles set out here for Building Simply, demonstrating how this way of thinking can apply to all areas of building design, construction, services and use. Grant says that 'we are learning that in order to achieve very low energy use, a simple compact building form is a necessity. A simple box is the obvious solution'.[85]

In Building Simply, a designer should consider eco-simplicity at all stages of design, incorporating passive principles into the siting, formal

[82] Nick Grant, 'Eco-Minimalism Revisited', in *Green Building Magazine* (Winter 2008), 32-35 (p. 32)
[83] Ibid. p. 32
[84] Ibid. pp. 32-32
[85] Ibid. p. 32

composition, construction and material selection. In this way, the complexity added through the use of high-tech solutions can be minimised. As Grant puts it, 'there is something graceful – even elegant – in striving for eco-minimal simplicity'.[86]

[86] Ibid. p. 35

4.10 Summary

This chapter has set out a framework for Building Simply which, informed by literature and a study of vernacular architecture, further defines the subject. In the case study chapters, buildings are analysed within this framework. It provides a non-prescriptive set of criteria and discussion points against which to test the case study projects.

Respond to the Landscape:

Use local materials

Building responds to topography and climate

Minimise:

Reduce the design to the essentials

Obey the Rules:

Use systems to simplify and order

Obey laws of nature

Clear and Legible:

Use simple architectural language (Not stylistic)

Composition:

Use basic elements

Use simple geometric form, construction and materials

Compose mass and space

Materials:

Express material properties

Use raw materials

Construction:

Minimise the processes

Use mono-material over layered construction

Sustainability:

Use 'eco-simplicity' rather than high-tech

5. Why Build Simply?

Building Simply may not be commonplace, and may contradict popular construction tendencies, but there are many arguments supporting it. Some of these have been highlighted in the framework or will be illustrated by the case studies, and others are discussed in this chapter.

5.1 Historic Precedent

Building Simply is not a new idea. In some senses, it looks right back to the prehistoric and it reflects many of the ideals found in vernacular buildings as discussed in Chapter 3. As well as traditional examples, architectural history demonstrates a variety of movements which also embodied the ideas of Building Simply such as Shaker architecture, Japanese Wabi,[87] Cistercian architecture, Minimalism and Brutalism. These examples do not comply with all of the themes of the framework for Building Simply set out in this thesis, but they demonstrate that 'simplicity' is a recurring theme in architecture. The motives behind such movements are different in many cases; some are political, some religious, some ethical, some financial, and some a reaction against something complex or ostentatious. The Building Simply described in this thesis is in some ways a reaction against the commercially driven attitude towards architecture which results in complex iconic buildings. In 'Simply Good', Florian Musso explains this:

> So, the search for simplicity turns out to be an ever recurring new beginning. Reflecting on the essentials is a reaction to specialisation in an industrially influenced society.[88]

Whatever the motives, history demonstrates a recurring desire for the simple.

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[87] '*Wabi* now connotes rustic simplicity, freshness or quietness, and can be applied to both natural and human-made objects, or understated elegance.' http://en.wikipedia.org/wiki/Wabi-sabi [Accessed September 2010]
[88] Musso, p. 25

5.2 Slow

In the West, we live in a society where, generally, we want everything now! We have world of information at our fingertips, thanks to the internet; making it easy to access data and material things almost instantly. However, fashions change and we can dispose of our possessions just as quickly; in a throw-away society, the world around us in constantly changing. Building Simply, though, is 'slow'; the antithesis of this fast-paced, high-tech world. It resists thoughtless economic development.

Building Simply has a sense of timelessness and permanence which gives a feeling of security and stability in an unstable world. It is durable and ages gracefully, so that it will not be rejected when the fashion changes.

5.3 Belonging

Because of the permanence of Building Simply, it also gives a sense of belonging; the building is rooted in its place. All too often architecture is built which has no connection to its place; it could be anywhere because its materials have come from around the world and it does not relate to it surroundings in terms of form or composition. Building Simply uses local materials and responds to topography, giving meaning to the landscape in which it sits comfortably. It makes sense of its surroundings.

5.4 Essence

By reducing architecture to its essentials, it becomes easier to understand, explain and relate to. This is to the benefit of both the user and the architect, as Musso explains,

> The satisfaction of understanding something. To have found an "ultimate" solution. To have no need to constantly and painfully redefine oneself and one's world view. To believe in something. To know what is right. To have a direct connection to food and materials without industrial alienation. To belong to a community with a fixed structure. To put things to use rather than use things

> up.[89] The architect's need to clearly explain stands vis-à-vis the interested observer's need to understand. Reduction to the essentials not only decreases the level of complexity of the structure, but strengthens the role of the architect in the diverging construction process.[90]

Reduced to their fundamentals, simple buildings are authentic and truthful, rather than superficial or meaningless. Colin Porteous says that Frank Lloyd Wright talked 'about simplicity as "something with graceful sense of beauty in its utility from which discord and all that is meaningless has been eliminated'".[91]

5.5 Sustainable

Although Building Simply is not concerned with using technology or gadgets to improve its environmental credentials, it does promote the use of passive design principles to improve its energy use and resulting carbon emissions. This has a number of benefits:

Firstly, passive design solutions are not as complex as technological ones, so they are more reliable and likely to last longer before they need replacing or fixing. They may also be cheaper to incorporate if considered as part of the whole design of the building. For example, a house will need windows anyway, but if they are deigned to exploit solar gains, improve daylight levels and reduce heat loss, they also have the potential to reduce running costs and energy demand during the life of the building.

Where raw, local materials and skills are used, less energy will be used in production and transportation. Massive materials also add thermal mass to a building which can further improve its thermal performance by evening out temperature fluctuations and reducing heating and cooling demands.

To a certain extent, these principles fit with UK Government aspirations for reaching zero carbon buildings. Government promotes a

[89] Musso, p. 11
[90] Ibid. p. 25
[91] Porteous, pp. 97-98

hierarchical approach which gives priority to reducing energy demand through passive design and the building envelope over technological solutions which produce renewable energy.

5.6 Economy of means

Based on the principle of an economy of means, Building Simply is sensible, rational and ethical. It aims to use a minimum of resources and technology to provide humble yet elegant building solutions. This is an ethical approach, which opposes greediness and encourages a socially and economically sustainable approach to architecture.

5.7 Summary

The views set out in this chapter show the benefits of and develop the argument for Building Simply both in the UK and other contexts. Despite these benefits, there are still challenges to overcome in order to successfully Build Simply.

6. The Problem of Building Simply

6.1 Introduction

Theoretically there are many advantages to be gained by Building Simply. However, in the reality of the contemporary construction industry in the UK there are many challenges to be faced in this pursuit. In terms of the design process, the architect must design and detail a building that is not only meets the criteria for Building Simply, but simultaneously satisfies the building regulations and the space requirements of the brief. The prejudices and expectations of clients, developers and planner have to be overcome and appropriate materials and labourers sourced. Furthermore, in an industry where complexity is the norm, it does not necessarily follow that simplification leads to a reduction in costs.

6.2 Perception

Building Simply is against the norm in today's culture. It does not follow the latest fashions in architecture and is therefore not always the expected response to the brief to design a building. The idea of a quiet, humble, unassuming building is foreign in the attention-seeking, celebrity culture where the iconic dominates. To attract the funding and support to Build Simply means persuading clients and collaborators to go beyond the alluring image of the iconic in order to understand the context in which it occurs.

Public perceptions are also challenged by Building Simply, which can be seen as plain and uninteresting. Planners may prefer to adopt a more prescriptive, style guided approach, and architects are left to battle against a naïve prejudice about what constitutes local character and distinction and appropriate form.

6.3 Design Process

The route to designing a simple building is not necessarily simple in itself. Reducing the complexity in a design requires time and effort, an

iterative review of designs and striving to make each element of the building work harder to achieve more with less.

In addition to following the framework for Building Simply, architects must design to meet the usual functional and spatial requirements of the client's brief. This brief may be changed during the course of the project or the ability to accommodate flexibility may be requested. The challenge of achieving these ambitions simultaneously must be faced. Conventions in space planning may be too restrictive when there is a desire to build simply.

6.4 Scale and Function

Building a simple *small* building is likely to be easier than a large one. A smaller building, by nature, will probably have a simple functional brief and less demanding technical requirements than a large one. As Florian Musso explains in 'Simply Good';

> The whole can be developed without the problems of repetition such as beginning and ending, and can be an entity in itself. Construction using a simple material is easier. It is also easier to take risks. Simpler technical requirements are made of small buildings in comparison to large ones.[92]

When the scale of the building is increased, the architect has added levels of complexity to deal with. The brief may include a variety of uses each with their own spatial and environmental needs. A simple, single form may not accommodate these spaces so the architect may have to consider repetition of forms. The materials appropriate to the larger scale may also be different. Musso says that;

> On a large scale, the routes to simplicity change. Series products are brought together in uniform images to form components. The brick structure of a wall does not direct the attention towards the individual element, it becomes a texture… Various hierarchical levels of readability are created.[93]

[92] Musso. P. 17
[93] Ibid. p. 17

6.5 Supply Chain

The materials desired for Building Simply are not always readily available through the current UK supply chain. For example, many quarries have closed making it difficult to source local stone. Global markets have meant that it is usually cheaper to import materials from abroad than to use those grown or extracted in the UK. As well as finding it difficult to source materials, the skills required to build simply may also be limited. Traditionally, local tradesmen would have become skilled in building with local materials, and this way of building would have dominated in that particular area. Knowledge and skills would have been handed down through the generations. Conventional contemporary building requires the diverse skills of various trades, but there is little regional difference cross the country. Local building traditions are disappearing fast. Any deviation from standard methods, materials and details is often met with confusion or confrontation from builders.

6.6 Meeting the Standards

Building regulations, concerns for occupant health and the impact of energy use on the environment make it more challenging to Build Simply.

To deal with these demands, construction has become multi-layered and multi-material. Synthetic materials such as plastics and insulations are produced to tackle some of these issues. All these conventions move away from the ideals of Building Simply. Standard details have been developed to meet the requirements of the Building Regulations and any move away from these is seen as an added risk to the project.

6.7 Sustainability

The 'tick box' approach to sustainable design has become a feature of most contemporary building projects. Sustainability codes often mean that points have to be accumulated by making additions to the design, therefore adding to its complexity. It could also be argued that a solid,

permanent, massive construction is not sustainable because it uses a greater quantity of resources.

6.8 Cost

Although aims of Building Simply include minimising construction and using resources efficiently, it is not necessarily cheap. When demand for a product is high, costs tend to come down. Building Simply is unconventional and therefore the materials and skills required will come at a greater expense. Unconventional or innovative methods bring with them added risks which will also increase the cost of a project.

6.9 Summary

This chapter identifies some of the difficulties that may be faced in the pursuit of Building Simply in the context of the UK construction industry. The case studies which follow, in particular the working case study of Burry Port Methodist Church Hall, serve to further illustrate these challenges.

7. Introduction to the Case Studies

The next three chapters are case studies of three contemporary buildings in Europe which are examples of Building Simply. Each of the three buildings is tested within the framework for Building Simply which was set out in Chapter 4.

7.1 Aims

The aim of the case studies is to demonstrate whether the challenges of Building Simply in the context of today's construction industry can be overcome. The case studies highlight some of the issues faced; but they also give examples of successful solutions and resultant benefits which provide evidence to support the argument for Building Simply.

7.2 Methodology

For the building case studies, published material provides photographs, drawings, and written commentaries of the projects and the work of their architects so that the buildings can be critically appraised in order to draw conclusions about how well they fit the framework for Building Simply. A construction section through an external wall is used in each case to study the relative simplicity or complexity of the construction. Each project is discussed under each of the framework headings, allowing comparisons to be made as to their relative simplicity. The limitations of each case study in answering the question posed by the thesis are discussed in a summary at the end of each building study

The working case study is also tested against the framework. The architects' drawings and photographs are used alongside a commentary of the processes that were involved in the design, procurement and delivery of the building. This gives a better understanding of the procedural problems met in the attempt to build simply.

7.3 Selection of the Building Case Studies

The research uncovered no examples of architecture in the UK which truly followed the framework for Building Simply. Therefore the three case study projects are selected from European examples. The European context most closely matches that of the UK, and for that reason is usefully in addressing the aims of this thesis.

A number of potential building case studies were considered. Each project was reviewed in terms of building type, location, predominant building material, whether the setting is urban or rural, and whether it meets the criteria under each theme of the framework.

The selected case study projects were chosen to give a balanced picture of Building Simply in Europe and the challenges it brings. Each one has a different predominant material and a different site situation. They also cover a variety of building types to allow a wider discussion of the topic.

The chosen case studies are:

- Cultural Centre, Riudaura, Spain; by RCR Arquitectes Aranda Pigem Vilalta

- Wine Store, Vauvert, France; by Gilles Perraudin

- Gallery for Contemporary Art, Marktoberdorf, Germany; by Bearth & Deplazes

The RCR project uses metal construction in a village context. It is simple in composition and appearance, but the construction drawings reveal a level of complexity. It provides little discussion about sustainability issues.

Perraudin's wine store is a predominantly stone construction in a rural setting. It is simple in both appearance and construction, but does not

have to meet the challenging environmental demands of other building types.

The gallery by Bearth & Deplazes is also simple in form and construction, but additionally provides an appropriate environment for the exhibition of art.

The variety between the three case study buildings allows a broad discussion of the issues relating to Building Simply.

8. Building Case Study: RCR Aranda Pigem Vilalta Arquitectes, Cultural Centre, Riudaura, Spain

Figure 8.1

8.1 Introduction

The first case study examines a project by RCR Aranda Pigem Vilalta Arquitectes (RCR), three architects who work in northern Spain. The building is a Cultural Activities Centre in a small village near Olot called Riudaura, which provides a place for different cultural, sports, leisure and community activities. Having a population of fewer than 500, formerly, the only public buildings in the village were the church and town hall. With a floor area of 740m^2 the facility includes a multi purpose space, bar, exhibitions and outside space. The horizontal plan defines space for a public plaza in front. The construction is predominantly metal over a stone-covered concrete floor.

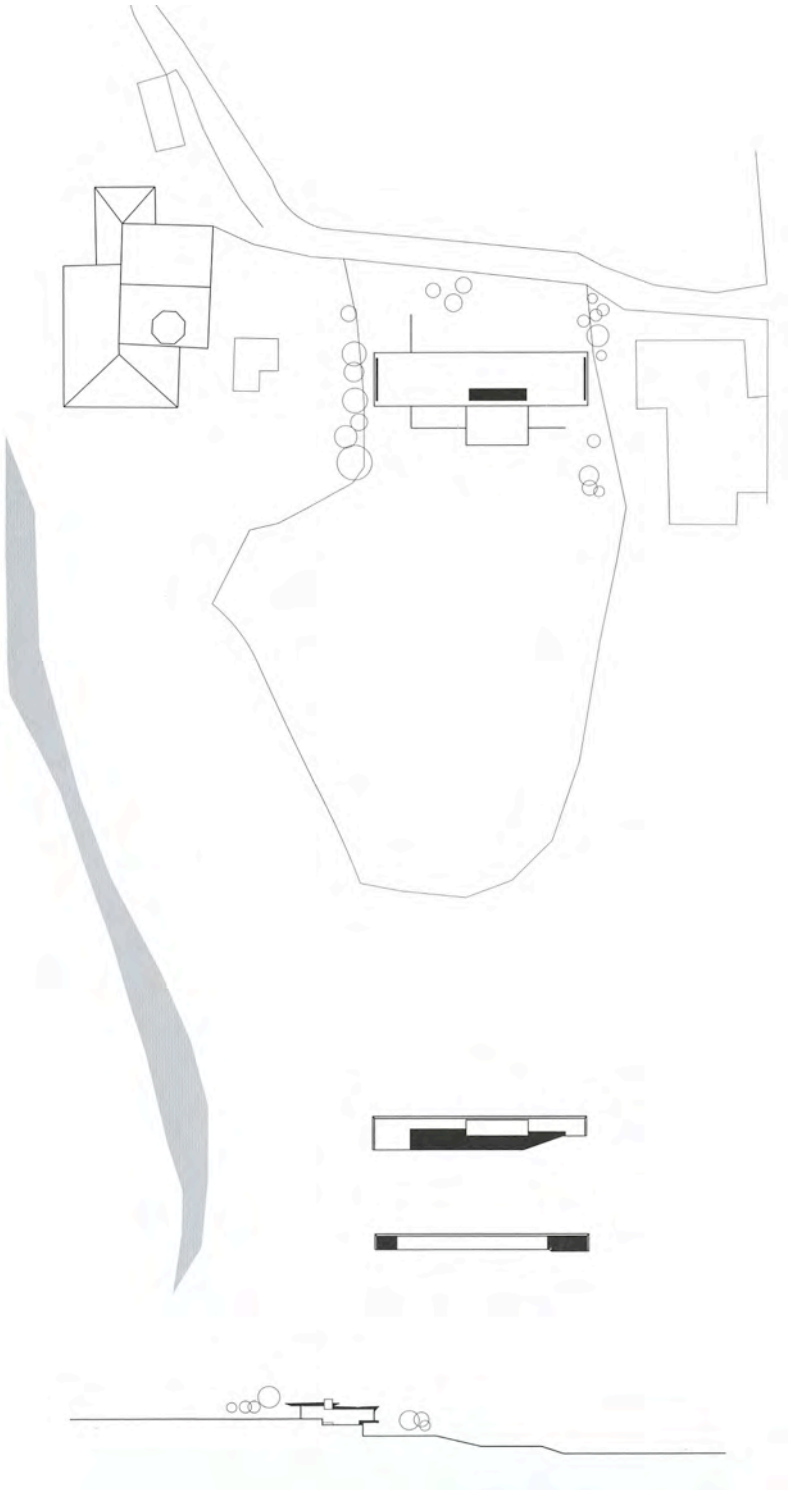

Figure 8.2 Site plans and section

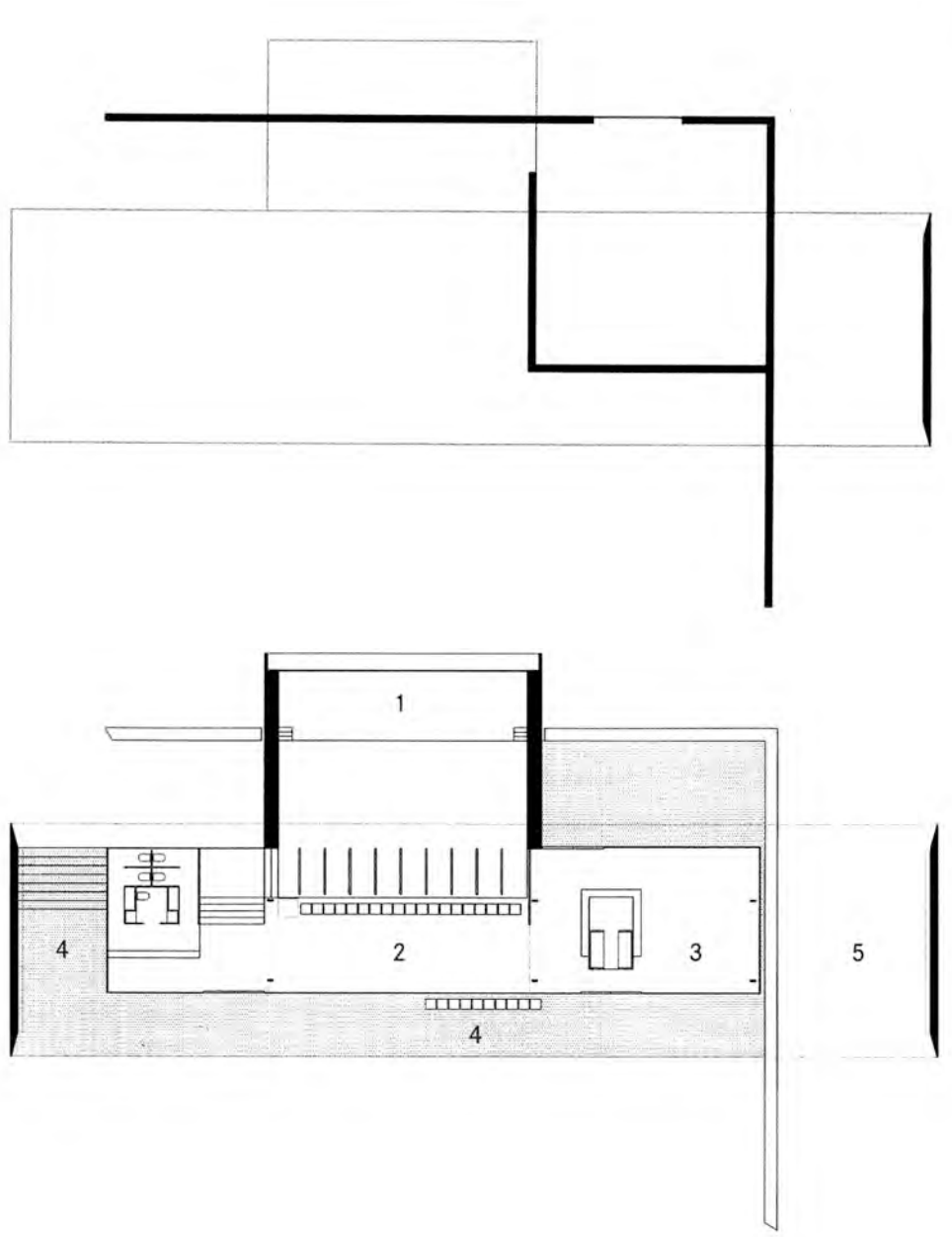

Figure 8.3 Lower ground and ground floor plans

1 Multipurpose space

2 Exhibitions

3 Bar

4 Outside gallery

5 Portico

In *Between Abstraction and Nature*, an essay about the work of RCR, William Curtis describes their buildings as 'bold in form, refined in proportion and elegant in detail. They establish a clear presence in the landscape and evoke a feeling of repose. Their clean lines and sensual materials seduce the observer and reinforce the underlying sense of order'.[94]

Luis Fernández-Galiano also writes about the practice in an introductory essay to a monograph of their work. He says that,

> In no more than two decades they have built in their area a crop of works with a unique language that combines the romantic desire to blend with nature and to seek the sublime through extreme relinquishment, with the rational determination of geometric rigour, abstract composition and constructive refinement, with details that bring together violently tactile materials. It is an architecture at the same time essential and eloquent, reductive as corresponds to what popular language calls minimalism, and at once expansive in its horizontal dialogue with the landscape, that is framed or perforated with resolve.[95]

The writings of both these critics as well as photographs of their buildings suggest that RCR's work fits closely with the framework for Building Simply. Therefore, this cultural centre has been selected as the first case study to be analysed with the framework.

8.2 Response to the Landscape

A recurring theme picked up by critics of RCR's work is the way in which they strongly relate their buildings to the distinctive landscapes which they occupy. This is the case for this cultural centre in Riudaura, whose 'challenge was creating an environment able to house different activities in a unique social context and landscape'.[96] The form and scale of the building respond well to the context, as its horizontal emphasis

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[94] William Curtis, 'Between Abstraction and Nature: The Architecture of RCR Aranda Pigem Vilalta Arquitectes', in *RCR ARanda Pigem Vilalta Arquitectes* (Barcelona: Editorial Gustavo Gili, 2004), 10-41 (p. 11)
[95] Luis Fernández-Galiano, 'RCR, Romanticism Confronts Rigor', in *AV Monographs* 137 (2009), 3-6 (p. 3)
[96] Ibid. p. 32

communicates with the verticality of the church tower. It works with the natural slope of the topography to divide the site, creating clearly defined outside spaces such as the public plaza in front of the building.

Although the metal materials used are not traditional, they seem to be at home against the backdrop of this rugged landscape.

Overall, this architecture responds well to the landscape; as a review of the project in *Techniques et Architecture* exclaims:

> What a joy to find in the depths of Switzerland, France, or Spain, one of those extraordinary places where a building seems to have landed from nowhere and instantly embraced both time and place![97]

Figure 8.4 The horizontal form talks to the vertical church tower

8.3 Minimise

Plans of the building show that it has been reduced and abstracted to the essentials. A portal over-sails the building, defining the spaces below including the outdoor portico and gallery; whereas the multipurpose space is marked by a projecting rectangular volume. Changes in level or built-in seating cleverly provide other distinctions between spaces without the need for dividing walls.

The abstract painting sketches and models that accompany RCR's projects demonstrate that each of their building is based on a simple

[97] Marie Christine Loriers, 'Village Art: Cultural Activities Centre, Riudaura', in *Techniques et Architecture* 452 (February/March 2001), 32-36 (p. 33)

concept or formal principle. Curtis says that 'Aranda Pigem Vilalta compress their meanings in abstract forms. They use minimal gestures to maximum effect. They seek simplicity, but as the result of a complex route'.[98] So, here is an example of a well considered design that is reduced to the essentials.

Figure 8.5 The building follow a clear conceptual idea

[98] Curtis, p. 35

8.4 The Rules

The design for the cultural centre is clearly ordered by a controlling rationale. The dimensions of the building correspond to a uniform geometric grid which relates to the steel structure. The drawings show that this grid controls the proportions of cladding panels, openings and room sizes.

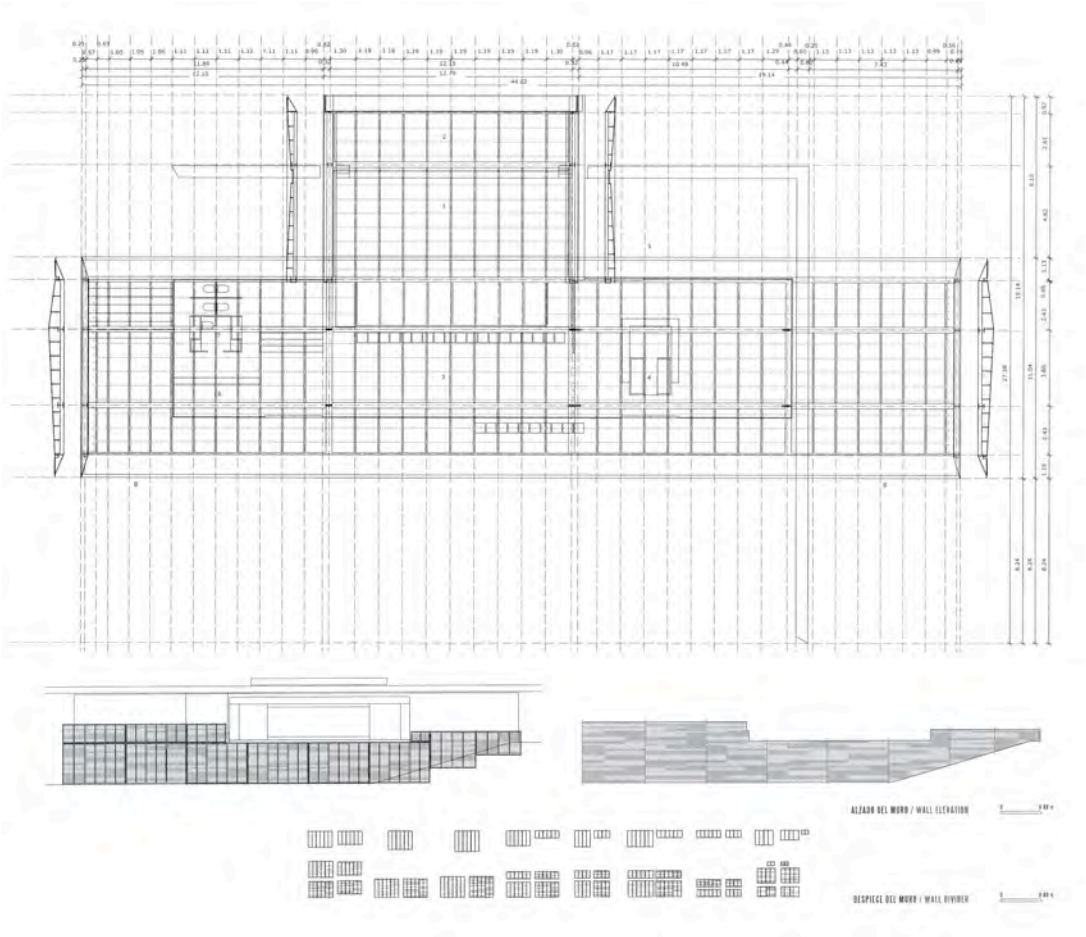

Figure 8.6 The structural grid and correspondingly dimensioned cladding panels

A cross-section through the building shows a clear distinction between the light-weight, spanning nature of the steel structure over the heavy, ground bearing concrete floor. In this sense the building obey the rules of each construction type. The cantilevered projecting volume at the front of the building appears to break the rules of gravity. It does, however, reinforce the lightness of the steel construction in comparison to the mass of the ground.

Juan Antonio Cortes believes that RCR's structured and ordered approach to composition is what gives their buildings an empathy with the natural world. In *The Attributes of Nature*, he writes:

> They have been keenly aware that the use of architecture to approach nature requires a clear formal structure which gives the buildings balance and consistency and permits the establishment of a relationship of affinity with the natural world at a deeper level than a merely coincidental formal appearance. In their search for the formal structure that gives their work balanced composition, they have relied on basic organisational procedures such as symmetry.[99]

[99] Juan Antonio Cortes, 'The Attributes of Nature', in *El Croquis* 138 (2007), 6-24 (p. 19)

8.5 Clear and Legible

With its few elements and simple architectural language, the cultural centre is easy to read. The building can be read as a series of planes which define the various spaces both indoors and out. The distinction between the heavy ground plane and the light metal structure is also clearly visible as the visitor walks up the 'carved' steps or ramp under the over sailing canopy of the roof.

The architecture of this building is not stylised or decorative. Although the architects strived to relate to nature and the surrounding architecture, they do so in an abstracted way; they 'do not imitate earlier architecture or copy natural phenomena directly: they rather translate their impressions and ideas into the medium and materials of architecture through a resonant abstraction'.[100]

Figure 8.7 The simple architectural language makes the building legible

[100] Curtis, p. 31

8.6 Composition

As already discussed, the cultural centre is composed of the basic elements of sculpted ground, planar walls and roof canopy. These are arranged in an ordered geometric fashion as Curtis explains:

> Seen in photographs, the buildings of Aranda Pigem Vilalta may suggest an affiliation with so-called "minimalism". But their work goes deeper than any uniform of neo-modernist clichés. The primary materials of their architecture are space, light and landscape, which they translate into geometrically refined architectural ideas.[101]

Apart from the distinction between ground and structure, there is no clear mass-space dichotomy in this building. The planes of the metal walls do not define spaces in the way that solid, massive structure does; instead spaces flow into each other and to the outside spaces too. The nature of metal construction does not permit this aspect of Building Simply.

[101] Ibid. p. 11

8.7 Materials

The main materials used in the building are the steel frame, glass and metal sheets: the roof is covered in zinc sheet, and the walls are varnished oxidised metal. Laminated sheet glass is used in the openings. The floor is 20mm thick pumiced limestone over concrete.

It has already been mentioned that the material properties are expressed in the light and heavy construction. Metal lends itself to a skeletal structure with panels and sheets for cladding. Photographs reveal how the textural qualities of the materials add to the building's character and presence.

The effect of the materials is more powerful because of their 'natural' finish. Instead of being painted, which would hide its material properties, the metal cladding is oxidised and varnished giving it a 'raw' appearance. Whether it is locally quarried or not, the natural stone floor relates the building to the surrounding architecture and landscape.

The choice of materials is clearly important for RCR. In *RCR Aranda Pigem Vililta Arquitectes*, which presents their various works, each project description is accompanied by a materials square. The square gives a visual indicator of the proportions of different materials used in the project.

Figure 8.8 The 'materials square'

8.8 Construction

Because the building is predominantly metal, it does not readily permit solid construction. The construction section for this project discloses a level of complexity which is hidden behind the metal sheet cladding. For example, the roof has a suspended metal ceiling which hides the skeletal structure above it. A wall detail also reveals how sheet metal cladding is anchored back to a concrete wall. The clean lines and simple finishes of the interior, in reality hide the complexity of the skeletal structure behind. In contrast to the following case studies the construction of this cultural centre is not simple.

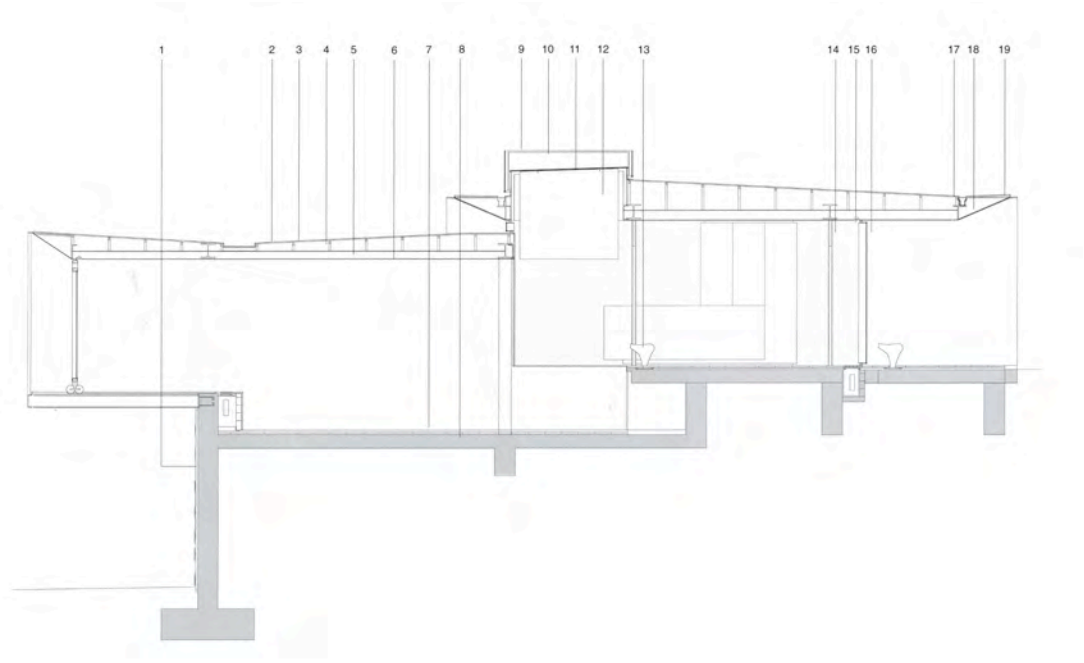

Figure 8.9 The cross-section reveals a complex structure

1. Metal sheeting
2. Zinc sheet roof
3. Damp proof board
4. Metals supports
5. Steel structure
6. Suspended metal ceiling
7. Cabra stone floor
8. Floor slab
9. Skylight
10. Galvanised steel tube
11 Laminated clear glass
12. Laminated opaque glass screens
13. Artificial stone bench
14. Metal pilar
15. Steel window frames
16. Laminated opaque glass
17. Galvanised steel gutter
18. Varnished oxidised sheet
19. Varnished oxidised plate

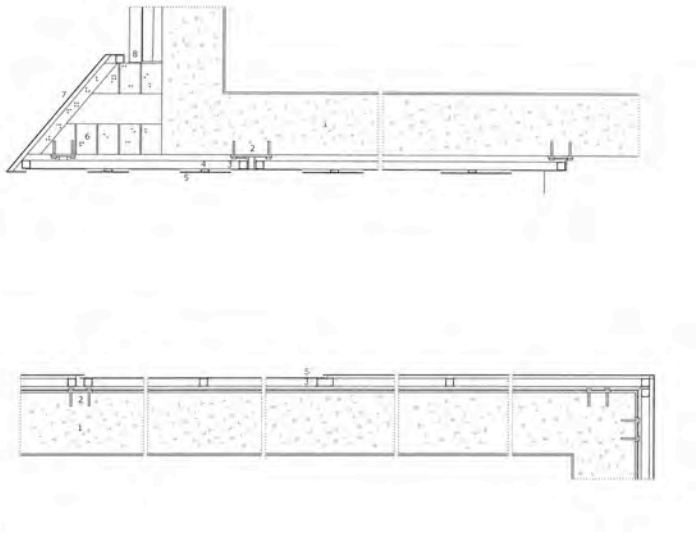

Figure 8.10 A wall detail shows complex hidden joints.

8.9 Sustainability

There is little information about sustainability to be found in literature relating to this building, so it is difficult to draw conclusions about how simple it is in this sense. The drawings show that the roof canopy projects well beyond the walls on the south side of the building, which would be a passive design strategy to prevent overheating in the summer; and there is no evidence of any complex technological energy systems in any of the photos.

It is also problematic to discuss the environmental performance of this building in relation to Building Simply in the UK. The Spanish climate is much milder than the UK, so buildings do not have such demanding thermal performance requirements. Reaching the required level of insulation is one of the biggest challenges for Building Simply in a cooler climate, but is not such an issue in Spain.

Figure 8.11 The overhanging roof could be to prevent over-heating in summer

Conclusions and Limitations

Analysis of RCR Arquitectes' cultural centre in Riudaura demonstrates that is responds well to the landscape, is legible and simple in composition, and uses a relatively simple palette of materials. However, the construction is not simple in the way that the complexity of the skeletal structure is hidden behind the planar sheet cladding. Discussions on the simplicity of the environmental strategies of this building in relation to UK practice are limited due to its location and lack of information.

Therefore, this case study alone does not answer the questions posed by the aims of the thesis. It does demonstrate that it is possible to design buildings which are visually and formally simple, and that these can be beneficial addressing the needs of a challenging site. A carefully considered and refined building can act as an anchor, helping to redefine the meaning of the landscape in which it sits.

Figure 10.12 An interior view

9. Building Case Study: Gilles Perraudin, Wine Store, Vauvert, France

Figure 9.1

9.1 Introduction

French architect, Gilles Perraudin designed this wine store in Vauvert, which is situated in the wine district near Nîmes in the south of France, in 1998. The single storey building has an area of 900m^2, and comprises a reception, office and open courtyard, as well a storage space for wine.

Having a keen interest in exploring the material and constructional properties of stone, Perruadin initiated this project to test the material and a system of using it in large raw blocks for building. The walls of the winery at Vauvert are built largely from these stone blocks which measure 1.05 by 2.6 metres by 52 centimetres thick.

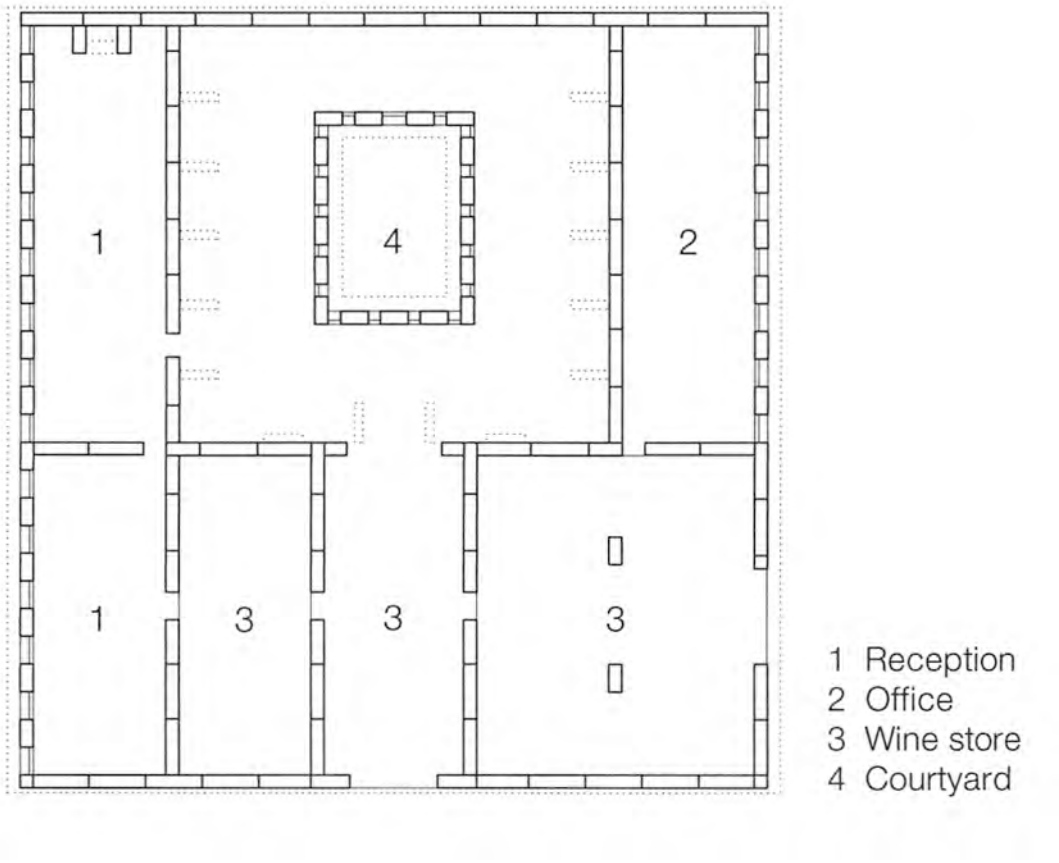

Figure 9.2 Plan

9.2 Response to the Landscape

The winery is predominantly made of blocks of stone from local quarries, linking it to the rural landscape in which it sits. In 'Confounding Lightness', Brian Carter explains how the use of stone is appropriate to the context, yet unconventional by today's architectural standards:

> Although building in stone seems quite appropriate in the context of the historic cities of southern France, many new buildings there – as in other parts of the world – are constructed using materials that are synthetic, mass-produced and globally distributed. In this context, Gilles Perraudin's use of load-bearing stone is clearly radical and at the boundaries of contemporary architectural practice.[102]

[102] Brian Carter, 'Confounding Lightness', in *Architectural Design* 73, No. 1 (January/February 2003), 68-69 (p. 69)

As well as being an outcome of the construction system employed, the low-lying, rectangular form of the building reflects the geometric-patterned, rolling landscape of the vineyards which surround it.
Through materials and form, the wine cellar responds well to the landscape.

9.3 Minimise

The simple construction of the winery is reduced to the essentials. There are few elements which provide the necessary spaces and environment required by the brief. This is achieved by making the massive stone walls perform a variety of functions; they divide and enclose space, as well as providing structure, surface finish and thermal control. In an article about Perraudin's work with stone, Jean-Francois Pousse explains that, 'Stone permits a construction of the essential, plays a liberating role; in itself is both structure and cladding, introduces a natural, protective element, forms a strong liaison with the site'.[103]

[103] Jean-Francois Pousse, 'Raw Blocks', in *Techniques + Architecture* 442 (April 1999), pp. 64-71 (p. 71)

9.4 The Rules

The stone structure obeys the rules of a modular system which controls all the dimensions; 'each of these blocks is 1.05 metres by 2.6 metres by 52 centimetres thick and weighs 2.5 ton'. This brings order and simplicity to the building; 'by planning openings that conform to the module of the cut block it is a system that obviates the need for additional lintels'.[104] The geometric arrangement of spaces is also derived from this ordering principal, which in-turn fits with the timber roof structure.

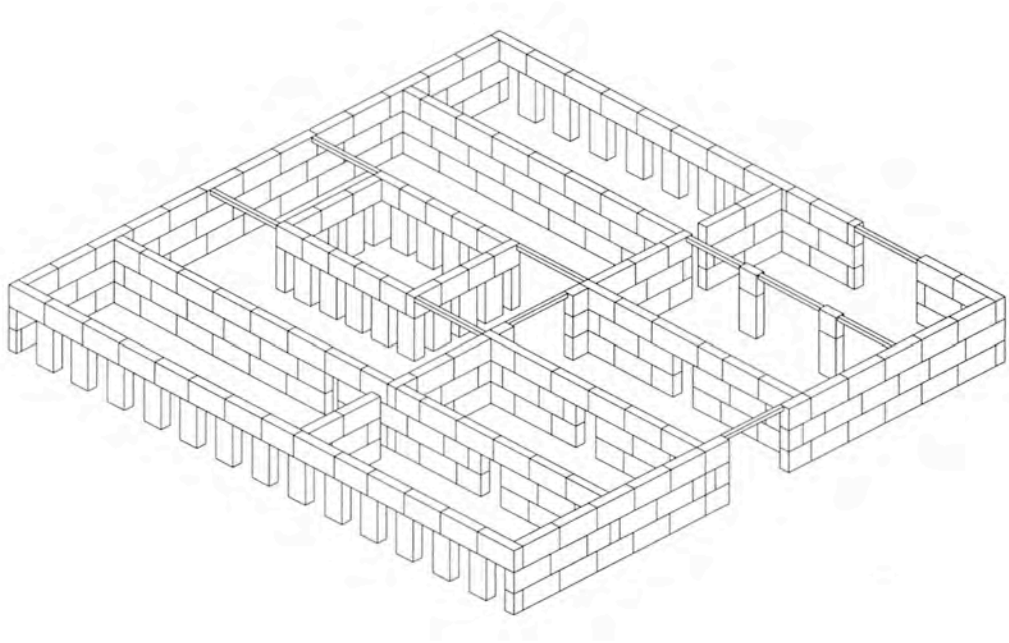

Figure 9.3 The methodical and ordered arrangement of stone blocks

The rules imposed by the natural properties of the heavy stone are also obeyed. The gravity, solidity and massiveness are demonstrated in the load-bearing construction which sits firmly on the ground. The lighter timber roof sits over heavy stone walls.

[104] Carter, p. 68

9.5 Clear and Legible

The visible materials and simple architectural language used make the building very easy to read and understand. Because there are no layers in the construction, it is clear how it is built. There are not even any hidden lintels, but the stone can clearly be seen to be spanning the openings. The monolithic, almost primitive looking structure makes clear the heaviness of the stone blocks. Where openings require glazing or a door, these are set at the inside edge of the reveal so that the thickness of stone is expressed with the full depth of the reveal exposed.

Figure 9.4 The construction is clearly legible

9.6 Composition

The winery is composed of basic elements: stone walls, flat timber roof, and openings which occur almost naturally between the modular blocks of stone. These elements are arranged to provide wine stores, office, reception and a courtyard. In both the compact plan and simple elevation, the composition is strictly geometric and orthogonal, conforming to the modular dimensions of the construction system. There is a clear division between the mass of the walls and the space it defines.

9.7 Materials

Perraudin's knowledge and understanding of stone and its properties as a building material are the key to this building's successful performance. 'Since 1998, Perraudin has been working in the south of France and exploring the potential of one particular material. Stone, he argues, is one of the most ecologically sensitive materials available. With no energy required in its transformation, it performs well structurally, thermally and acoustically, requires virtually no maintenance and almost invariably ages gracefully.'[105] It is clear that Perraudin,

> seeks a relationship between material, structural capability, space and nature. Knowledge of the material induces a spatial logic, a matter/form relationship, an integration of the climatic parameters. The choice of stone also responds to the objectives of rationality, economy, and life-cycle.[106]

With his in-depth knowledge of the material, Perruadin has been able to exploit the qualities of natural stone, using it to its full potential. This has led to a simplified building because few materials were required to achieve the desired results. Perraudin's 'selection of materials is usually confined to naturally found, predominantly renewable resources, such as timber, earth and locally available stone, which are justifiable by their longevity and ability to be recycled'[107]. In this case, the stone used is certainly a 'raw' material. Once it was cut from the quarry in blocks of the required dimensions it required no transformation to be used in the construction of the winery.

Figure 9.5 Perraudin demonstrates an good understanding of materials

[105] Ibid. p. 68
[106] Pousse, p. 71
[107] *Building Simply*, ed. by Christian Schittich (Switzerland: Birkhäuser, 2005), p. 114

9.8 Construction

A typical section through a wall and junctions with the roof and floor reveals the nature of the construction detailing. It is clear to see that the walls are not layered in any way; stone provides the structure, weatherproofing, physical barrier, and surface finish.

The planted roof construction is a little more complex, requiring several materials to perform its function. Perhaps, here, the visual and formal simplicity of the flat roof has compromised the simplicity of construction. On the other hand, it would not be sensible to also make the roof of stone, which is heavy and lends itself to load-bearing construction, not spanning long distances horizontally from wall to wall. In this sense, to work with the natural properties of materials, timber is a wise choice for the roof structure; and although there are a number of layers on top of the timber, these also help with the passive thermal performance of the winery.

Junctions between different components are kept simple too; no complex fixings or hidden details are required – with this building what you see is what you get.

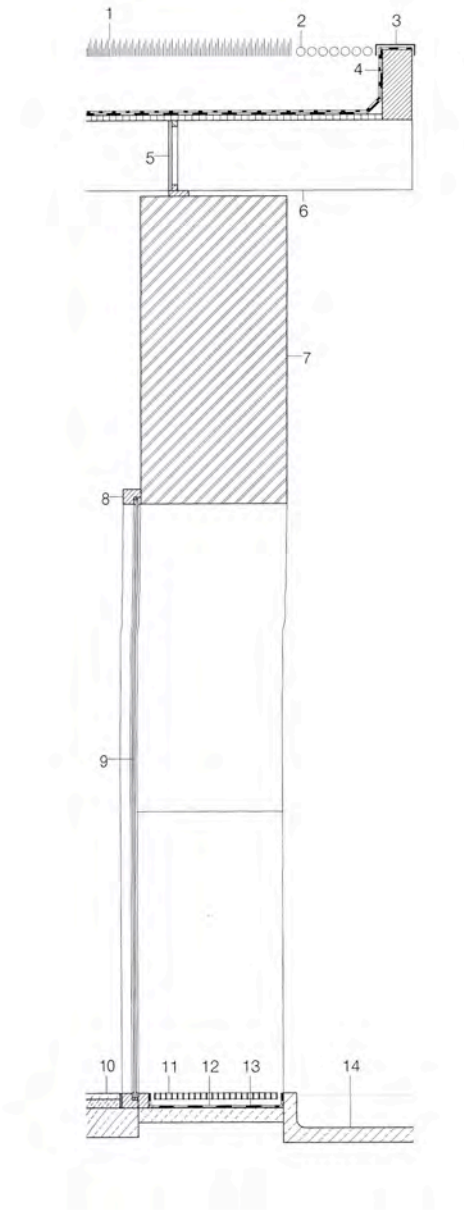

Figure 9.6 Construction section

1. Roof: Substrate, bituminous membrane, plywood
2. Gravel bed
3. Aluminium sheet cover
4. Timber edge beam
5. Polycarbonate hollow cellular slab
6. Timber beams
7. Limestone block
8. Timber frame
9. Laminated safety glass
10. Floor: Reconstituted stone paving, screed, reinforced floor slab
11. Metal grating
12. Bituminous coating
13. Base layer
14. Concrete water trough

As discussed above, few processes were required in order to use the stone in the building. 'Perraudin's construction is extremely simple. Once extracted from the quarry by direct sawing, the stone is delivered to site by truck where it can be immediately craned from the truck bed and placed into position in a standard bonded wall construction. The site operation is quick, dry and without waste.'[108] The efficiency of this process is possible because 'Perraudin is not only preoccupied with the use of this singular material but also with developing ways of applying the latest construction technology to natural stone instead of reverting to romanticised notions of handicraft'.[109] Although stone is a traditional building material, the way it is used in this building is not copied from the past. The architect has worked hard to simplify the process for use in today's construction industry.

Figure 9.7 Placing the blocks

The volume of stone used in this construction may be seen as excessive and expensive. However, additional costs were 'compensated by the uncomplicated structure and short construction period of this austere and almost archaic building. The entire building process was completed in only one month'.[110]

[108] Carter, p. 68
[109] Ibid. p. 69
[110] *Building Simply*, ed. by Christian Schittich (Switzerland: Birkhäuser, 2005), p. 114

9.9 Sustainability

The durability and lifetime running of this building have certainly been well considered. The thick stone walls should last for centuries without need for much maintenance.

One of the most simply dealt with aspects of the winery is the environmental control. The building is 'subject to the uncompromising climate of the Mediterranean. To offset extreme differences of temperature, which would be problematic for the storage of wine, the structure was designed with substantial thermal mass'.[111] The stone absorbs heat during the day and releases it at night when the air is cooler. This obviates the need for any complex, technical climate control system. Three other aspects of the design also assist with passive cooling. Water troughs about the perimeter of the building aid cooling through evaporation, and the planted roof does the same by soaking up rain water. The roof also provides additional thermal mass. A courtyard in the centre of the plan echoes a traditional technique for cooling and ventilating buildings in a hot climate. In these ways the energy demands and running costs of the building are substantially reduce in comparison to a mechanically controlled one.

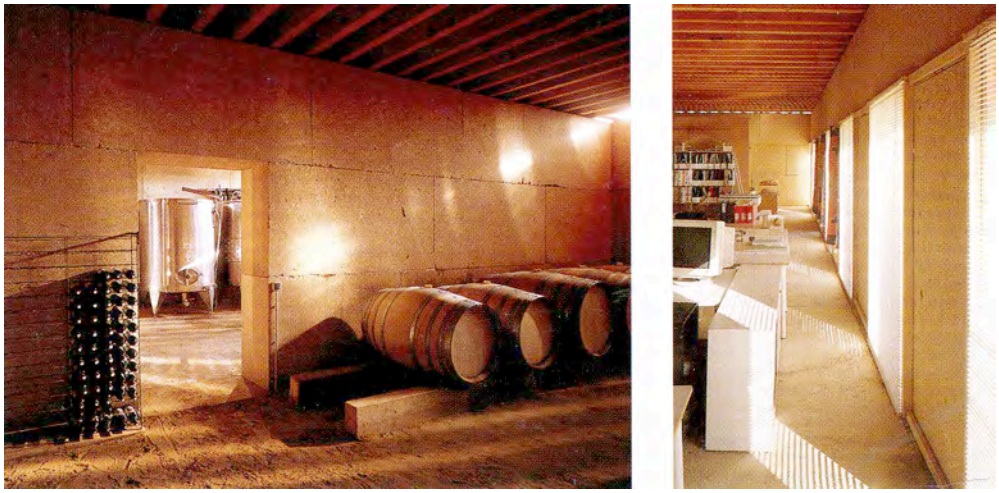

Figure 9.8 The stone construction provides ideal conditions for storing wine

[111] Ibid. p. 114

9.10 Conclusions and Limitations

From the analysis of the building within the framework for Building Simply, it can be seem that this case study meets almost all of the criteria. The winery is simple in concept, form, appearance, construction and environmental performance. Unlike the previous case study, the construction drawings reveal truly simple detailing, in which layers and complex fixings are not hidden.

However, there are a number of limitations with this project in demonstrating the possibilities for Building Simply in the UK. Firstly, the location of the winery is rural and agricultural. This means that there was not the same challenge of addressing neighbouring buildings or street frontages as in an urban situation. It also means that the plan size and form were not constrained and could easily fit the modular dimensions imposed by the size of the stone blocks. Also, as Pousse questions, there may be a debate as to whether the natural stone Perraudin has specified would fit so well into the context of a modern urban environment:

> Stone permits a construction of the essential, plays a liberating role; in itself is both structure and cladding, introduces a natural, protective element, forms a strong liaison with the site. This is also where the problem lies. Is stone out of place in an urban universe cut-off from nature?[112]

Secondly, the Mediterranean climate may be hot, but it does not experience harsh winters like northern Europe.

Thirdly, the building type does not impose the same environmental challenges as, say, a dwelling or education facility. Although the storage of wine presents it own difficult requirements in terms of thermal performance, they are not the same as those typically required of buildings. In this case, the massive stone construction works in harmony with the warm climate, resulting in ideal, cool conditions for storing wine; whereas a house in northern Europe would be concerned with keeping out the cold and keeping the heat in.

[112] Pousse, p. 17

The next case study investigates a building which aims to meet such challenges whilst remaining simple in construction and environmental management.

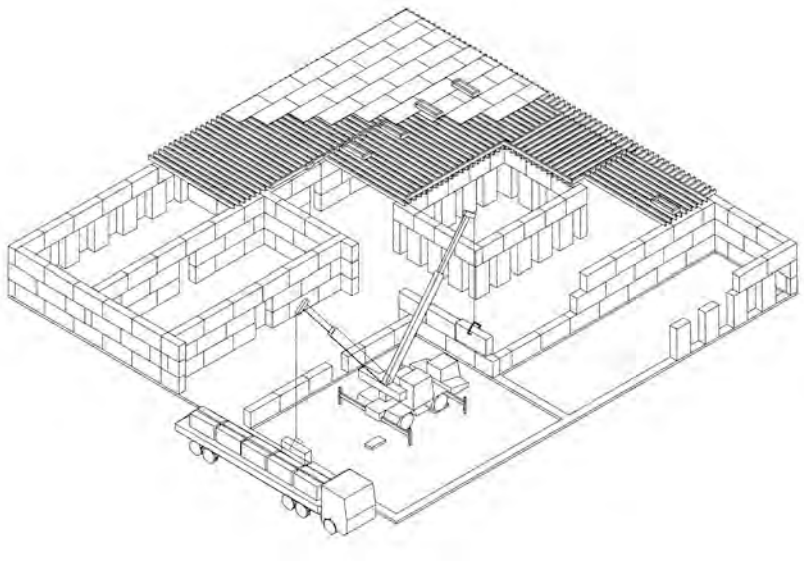

Figure 9.9 Construction process diagram

10. Building Case Study: Bearth & Deplazes, Gallery for Contemporary Art, Marktoberdorf, Germany

Figure 10.1

10.1 Introduction

In this third case study, an art gallery in Marktoberdorf, in the Allgäu region of Germany, designed by Bearth and Deplazes is analysed against the criteria for Building Simply. The gallery, which houses the Dr Geiger Foundation collection as well as other special exhibitions, is located between the town hall and some private villas. The galleries designed by Bearth and deplazes are adjacent to the existing foundation building which also occupies the plot. The building has three storeys, including a basement level, which are formed by two offset brick cubes. The construction is predominantly solid brick walls with steel and timber intermediate floors.

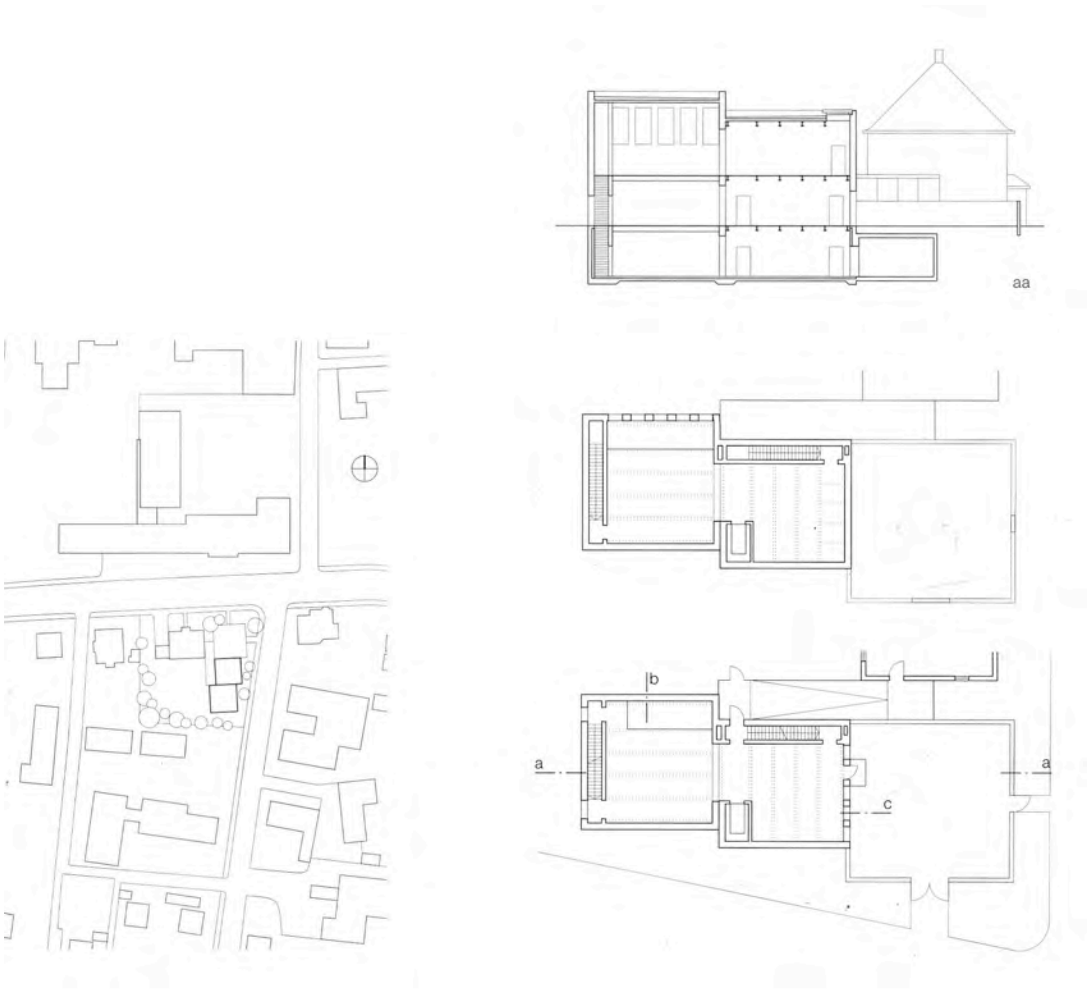

Figure 10.2 Plans and section

10.2 Response to the Landscape

The urban setting for this gallery provides a challenge for Building Simply – to respond to the context of the surrounding buildings whilst remaining simple in form, expression and construction. The building meets this challenge by reflecting the scale and pattern of the nearby detached buildings in its simple cube-like forms:

> This detached building nicely integrates into the environment of individual buildings so typical of Marktoberdorf. [...]The composition with the existing Foundation building maintains the internal logic while achieving optimum utilisation within the plot.[113]

The materials used also relate to the historical background of the location. 'The Bavarian hard-fired facing bricks used for the gallery resemble the materials employed in this region in the Middle Ages,'[114]

Figure 10.3 The brick volumes relate to the surroundings in form and scale

[113] Katerina Stehrenberger, 'Gallery for Contemporary Art, Marktoberdorf ,Bearth + Deplazes', in *Constructing Architecture*, ed. by Andrea Deplazes (Switzerland: Birkhäuser, 2005), pp. 313-321 (p. 313)
[114] Ibid. p. 320

10.3 Minimise

The architects have worked hard to minimise the building to essentially two brick cubes. To do this, the stairs and services have been carefully integrated, and other interruptions the simple forms, such as openings have been kept to a minimum.

10.4 The Rules

The rules to be followed by this building were imposed by the method of solid load-bearing brick construction. As Katja Dambacher et al explain in 'The Skill of Masonry Construction', 'the brick module as a generator implies an obligatory logic and leads to a governing dimensional relationship between the parts'.[115] For brick construction to work effectively, the overall dimensions of walls and openings should be a multiple of the brick and mortar dimension. The bond specified also influences the rules for construction, and determines the wall thickness where solid brick construction is used. In the conclusion to their essay Dambacher et al quote Mies van der Rohe speaking about the discipline the brick gives to construction:

> In conclusion we would gladly echo here the confession Mies van der Rohe once made: "We can also learn from brick. How sensible is this small handy shape, so useful for every purpose! What logic in its bonding, pattern and texture! What richness in the simplest wall surface! But what discipline this material imposes!"[116]

The gallery appears to obey these rules of bond and dimension, with opening widths corresponding to brick dimensions. The use of hidden steel lintels over the openings, which cheat at the rules of load-bearing masonry construction, is eliminated. Instead, 'structural masonry cambered arch door and window lintels, which effectively distribute the

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[115] Katja Dambacher, Christoph Elener and David Leuthold, 'The Skill of Masonry Construction', in *Constructing Architecture*, ed. by Andrea Deplazes (Switzerland: Birkhäuser, 2005), pp. 43-48 (p. 48)

[116] Ibid. p. 48. Excerpt from his inaugural speech as Director of the Faculty of Architecture at the IIT Chicago

wall loads of the masonry above, were built insitu with the smallest possible rise'.[117]

Where brick is exposed, the rules which are inherent in a system of masonry construction, in turn influence the appearance as Dambacher et al explain:

> The structure of facing masonry reveals a system of lucid and rational rules based on a stable foundation of knowledge and experience. The image of a brick in a wall is the image of its production and its direct link with the precise rhythm of brick and joints.[118]

10.5 Clear and Legible

As described above, exposed solid brickwork demonstrates its construction method visually in the pattern of bricks and mortar on display. However, where layered construction, such as insulated cavity brick and block wall is used, the facade lies to the viewer about the construction. The typical cavity wall hides the truth behind an outer skin of brick, whilst pretending to be solid.

Because the gallery is built from solid brick, the construction can be made legible and the facade tells the truth. The structure and construction of this building is almost celebrated in the way it is made clear. The 540mm thick walls are made visible to the outside world by placing the windows at the inner edge of the reveal. Openings are used sparingly to 'reinforce the monolithic character of this art workshop. The economical positioning of windows and the sometimes narrow, low-height openings gives the effect of broad, mostly uninterrupted wall surfaces for the presentation of exhibits'.[119] The load-bearing nature of the brick construction is visually reinforced by the low-rise cambered arch lintels used for the external openings. Inside, where larger width openings are required, steel lintels have been used; but the underside is exposed so that they can be seen clearly. The surface of the brick work

[117] Stehrenberger, p. 318
[118] Dambacher et al. p. 48
[119] Stehrenberger, p. 318

is also left exposed on the inside so as not to take away from the homogeneity of the structure.

The architects have also taken steps to ensure that the building clearly reads as two cube forms. The two cubes are different heights and offset to distinguish them from each other. Inside, the structure in the second cube runs perpendicular to the first so that, 'The seam between the two parts is rendered visible by way of the change in direction of the span of the beams and the double thickness of the wall'.[120] The basement floor is finished in brick, so that it is read as the bottom face of the cube, and the brick stairs appear to have been 'carved' out of the thick brick walls. Intermediate floors, which create layers within the cubes, are not of brick so that they are read as separate elements.

Figure 10.4 Construction is clearly legible

[120] Ibid. p. 315

10.6 Composition

As discussed above, the gallery is composed of two simple cubes whose orthogonal geometry suits the brick construction.

There are few basic elements which make up the building; walls, roof, stairs and intermediate floors. Like Perraudin's winery, the mass of the solid walls clearly defines the space within the cubes.

10.7 Materials

The properties of the individual materials used in the gallery are exploited and expressed. Brick, the predominant material is used for its load-bearing structural properties, its attractive finish, and to provide weather proofing, insulation and thermal mass; 'their stability and inertia with respect to climatic influences underscores the aesthetic qualities of these bricks'.[121] The steel and timber in the intermediate floors and roof are used for their tensile strength and spanning properties.

Although it may be debatable as to whether brick and steel are 'raw' materials, because they require natural materials to be transformed in their making, they are used here in a simple way. All the materials used in the building are not highly processed or treated. Brickwork is not painted, the steel beams are not boxed in (although they have presumably been painted with fire-retardant paint) and the timber floors are simply oiled with white pigment. In *Constructing Architecture*, Katerina Stehrenburger describes this simple use of materials, but also explains how this has meant compromises in terms of sound transmission:

> The arrangement is very "proper" and thrifty: solid, 80mm thick, finely glazed spruce laid on white-painted steel beams without any further floor finishes. This results in sound transmissions that propagate vertically throughout the building. However, this has been accepted in order to retain the minimalist concept of the architecture.[122]

[121] Ibid. p. 320
[122] Ibid. p. 319

10.8 Construction

Because the number of materials in the building is few, few processes were required in it construction. Whilst the construction process was not as simple as that used for the winery in Vauvert, one skill and process was predominant in the construction of the gallery – brick-laying.

> Basically, the building is reduced to the interplay between a self-supporting envelope and the floors it surrounds, which are supported on steel beams. The monolithic basement and the roof functioning in a similar way to the intermediate floors provide a logical construction to the brickwork envelope.[123]

Although brick is commonly used for cavity construction, the skills and knowledge required for solid brick construction is presumably fading as builders are required to be multi-skilled in order to carry out the variety of trades required by typical modern construction. '[This] clay masonry building owes its existence to expertise imported from the Czech Republic (knowledge of old masonry bonds and sound knowledge about the building of facing brickwork)'.[124] This situation highlights one of the major challenges for Building Simply; that many of the skills traditionally used for mono-material construction are being lost.

[123] Ibid. p. 315
[124] Ibid. p. 320

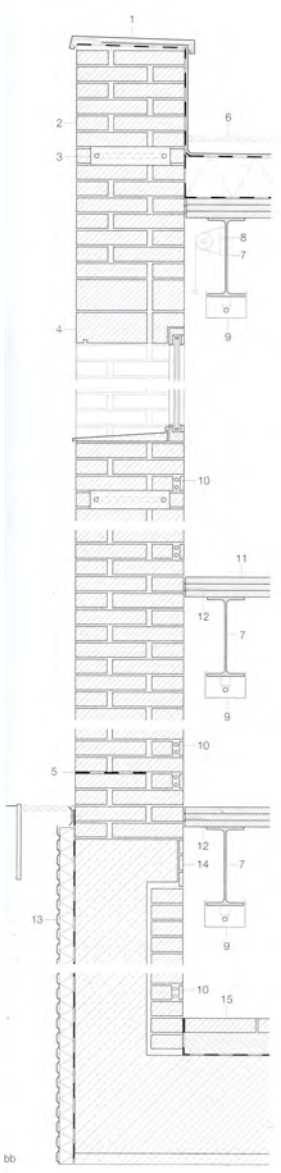

Figure 10.5 Construction Section

1. Sheet copper covering
2. Engineering brickwork
3. Reinforced concrete ring beam
4. Brick lintel
5. Damp proof course
6. Roof: Gravel, plastic membrane, polystyrene insulation, vapour barrier, laminated wood board
7. Steel I-beam
8. Fabric sun blind
9. Fluorescent tube
10. Heating pipes enclosed in mortar
11. oiled laminated softwood boarding
12. Compressed rubber sealing strip
13. Wall: Knopped membrane, polystyrene insulation, bituminous coat, reinforced concrete wall
14. Engineering brick facing slips
15. Floor: Engineering bricks, mortar bed, PVC separating layer, concrete strip foundations, concrete binding layer

The construction section shows the mono-material brick walls which rely on their thickness to provide insulation and weather-proofing. They also provide thermal mass which helps control the internal environment as discussed below. The solid brick construction is not only simple because it is not layered, as a result there are other benefits which add to its visual and constructional simplicity:

> Besides the climatic advantages of an inert wall construction, this thick uniform shell offers an advantage, i.e. no expansion joints are necessary. Such continuous vertical joints in a solid brick wall are normally required to prevent uncontrolled cracking (caused by disparate loadings, settlement or thermal movement of individual components)… The lack of interruptions in the wall considerably helps the sculpted effect.[125]

Apart from the brick walls, other materials and therefore joints and details are used for the roof and basement. The basement walls require layered construction to provide waterproofing, thermal insulation and retaining structure. Here, the simple construction is compromised and the layers are hidden behind a skin of brick which provides the internal finish.

The roof also requires layers, but is relatively straightforward as it repeats the construction used or the intermediate floors, with the addition of insulation and a waterproof layer.

10.9 Sustainability

Designing an art gallery which performs without the use of complex mechanical services poses a huge challenge because a stable temperature and relative humidity are needed:

> Until now, the interior climate necessary in such buildings containing highly sensitive works of art had been regulated mainly by way of extremely cost-intensive technology.[126]

However, this gallery avoids the use of such technology by utilizing the properties of the solid brick construction combined with a simple space

[125] Ibid. p. 320
[126] Ibid. p. 321

heating system. The heating system takes inspiration from the principle of the Roman hypocaust system which heats the building mass, which in turn radiates heat into the space. In the gallery, heat is distributed by two circuits of water-filled copper pipes which have been built into the brick walls just above each floor level.

> The internal surface of the masonry radiates the heat evenly and ensures a comfortable interior climate. This combination of single-leaf wall construction and wall plinth heating has proved to be simple but effective.[127]

Because the system works efficiently, by distributing the heat through the mass rather than using convection air heating, a lower water temperature is needed and therefore less energy is used. It also provides a controllable and relatively stable interior environment for the artwork.

> Owing to the inertia of the solid masonry, the controllable heat radiation is sufficient to guarantee a controlled interior temperature. A lower water temperature and hence less expensive heating is the outcome of the more even heat distribution of this heating by radiation.[128]

With most layered construction methods, internal surfaces are impervious to water vapour, leading to wide variations in relative humidity which have to be controlled by mechanical means where this is not acceptable. 'Another prime advantage of the choice of clay masonry for an art gallery is that the humidity of the internal air – so crucial for preserving the exhibits – always remains constant'.[129]

The environmental performance of this gallery provides a strong argument for the use of solid construction with high thermal mass; but it also shows that architects must consider the design of the building as whole in order to achieve such simple and effective solutions. The success of this system is the integration of the low-tech heating with the concept of solid brick construction. The mass of the brick is made to

[127] Ibid. p. 321
[128] Ibid. p. 321
[129] Ibid. p. 320

work harder so that fewer building and services components are required. The result also minimises visual clutter in the form of radiators, air conditioning units, duct and vents.

10.10 Conclusions and Limitations

The Gallery for Contemporary Art in Marktoberdorf fits all parts of the framework for Building Simply to some extent.

Through it form, scale and materials it manages to relate to its urban context. It is very simple in its composition and appearance, reduced to the essential elements. Because of the simple architectural language it uses and the expression of construction, the building can be easily understood.

The materials and construction are perhaps not quite as simple as those of the previous case study, yet compared to conventional construction methods they can be classified as simple. Brick does require clay to be fired in its manufacture, whereas the stone blocks used in the winery could be taken straight from the quarry; but in this context brick is a more appropriate choice than stone for other reasons, such as response to the site and availability of local materials. It seems that in all situations compromises must be made in striving to build simply.

One of the most successful and simple solutions in this building is the environmental control using the mass of the bricks to provide for such as specialised environment as an art gallery. The design also manages to meet this challenge in a cool European climate.

On the whole, this case study provides strong evidence to support the idea the Building Simply is achievable, effective and a viable solution for contemporary architecture.

11. Working Case Study: Design Research Unit Wales, Burry Port Methodist Church Community Hall, Wales

Figure 11.1

11.1 Introduction

The three building case studies above demonstrate various principles of Building Simply, proving that it is possible to Build Simply in Europe; but there are limitations in the support they give to the argument for doing so in the UK today. The gallery in Marktoberorf is evidence that simple construction can be used effectively in a Northern European climate for an environmentally sensitive building. However, legislation, planning policy, procurement and funding routes, and design traditions and ambitions in the UK do not necessarily mirror those in Germany. Furthermore, a modern art gallery is a 'special' type of building which may have had a wealthy funder, and is a good opportunity to make a strong design statement.

For these reasons, this working case study follows a UK project with ambitions to build simply through the design, procurement and construction stages to identify the real challenges and opportunities that were faced in Building Simply. Like the three building case studies, the

working case study is tested against the framework. Alongside analysis of drawings, photographs and construction details, a commentary of the issues met in relation to each of the themes of the framework is given.

Burry Port Methodist Church Community Hall was selected for the working case study because the architects set out with aspirations to Build Simply. The author of this thesis was the project architect, so a detailed discussion on the processes and challenges met during the project can be given.

Design Research Unit Wales

Design Research Unit Wales (DRU-w) is a practice combining award-winning design, research and teaching; a collaboration of young architects and designers working within Wales' challenging and inspiring cultural, political and economic climate. DRU-w aims to make architecture of simple forms, well crafted, with a strong sense of materiality and inspired by the environment in which they work. DRU-w is part of the Welsh School of Architecture at Cardiff University and was set up in 2001 with the aim of combining architectural design and practice with research. There are currently five architects employed, of which the author is one. DRU-w has particular interests in sustainability, tectonics, material innovation, environmental and functional performance, and economy. As well as design projects, DRU-w also carries out more orthodox research, publishing the outcomes in journals and at international conferences.

Project Description: Burry Port Methodist Church Community Hall, Carmarthenshire, Wales

Burry Port Methodist Church was constructed in 1866 in the heart of an industrial community. This small brick chapel was once a thriving church used by Cornish tin miners who had come to work the local foundries. The current congregation required a new community hall to replace the dilapidated Sunday School room to the rear of the church. The brief included a small hall, kitchen and WC which would bring the premises in line with DDA requirements and support the church's role in

developing a sustainable community in Burry Port. The facility is now used throughout the week by numerous community and church groups.

The new hall mediates between the chapel and adjacent row of terrace houses. Built of yellow brick to match that of the chapel, the new building sits quietly in its site without competing with the chapel for attention.

The Hall was constructed between October 2008 and April 2009, with a construction value of £126,000. A traditional procurement route was followed using the JCT Minor Works Building Contract 2005.

A set of planning stage drawings can be found in Appendix A.

11.2 Respond to the Landscape

Burry Port provides an urban context of a post-industrial town which built up around the former local mining community and is formed mainly of small terrace houses which are typical of such Welsh communities.

The site for the new community hall meant that it had to mediate between the church building and the adjacent row of terrace houses without outshining the church itself. Plans and elevations show that the design responds to the surroundings in terms of form and scale. In elevation, the height of the hall matches the eaves of the terrace and the dimensions of the window openings reflect the proportions of those of the chapel without copying the stylised pointed heads. In plan, the width of the hall continues the rhythm of the terrace plots and dividing walls align with the plan form of the church.

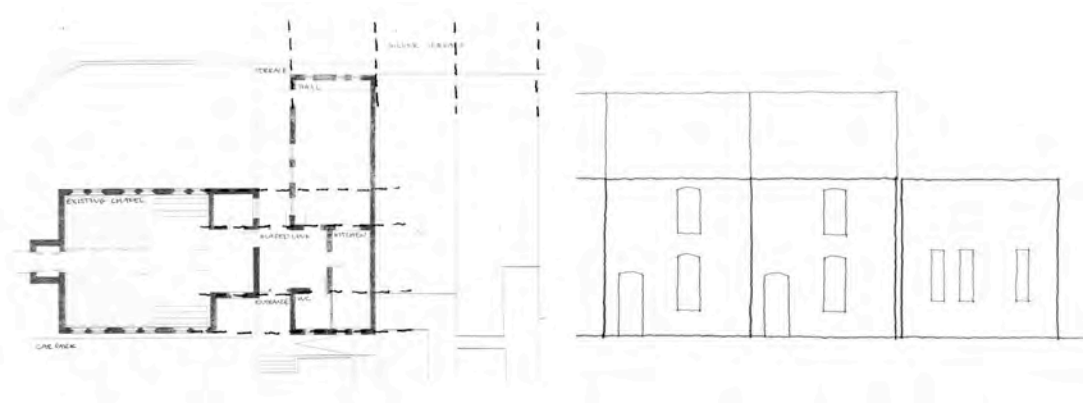

Figure 11.2 Scale and form respond to the dimensions of church and terrace

The unusual yellow brick of the original church is also used for the hall, giving it a sense of belonging.

Overall, the hall responds well to urban landscape in which it sits without directly copying the surrounding traditional architecture.

11.3 Minimise

This particular project lent itself to being 'minimised'. The spatial brief itself was not complex, requiring only a small hall, kitchen and toilet. The design keeps to these essential spaces with the inclusion of a foyer space which links the building to the existing church. Despite the simple brief, careful spatial planning was required at the outline design stage to makes the different size spaces fit and work together in a neat and compact plan. However, once this arrangement had been achieved it meant that few elements were required to complete the building; essentially four external walls, plinth, roof and three internal walls.

The client was happy to see a compact and spatially efficient plan at the design stages because this indicated that it would also be cost efficient.

11.4 Obey the Rules

Two dimensional sets of rules were imposed on the design; one is a large scale grid derived from the form of the adjacent buildings; the other is smaller scale and determined by the dimensions of the bricks used in construction. Both controlling grids are applied in plan and elevation.

The large scale grid means that the form of the hall aligns with the terrace houses and the back of the church in plan. In elevation, the grid determines the height of the façade.

To avoid cutting bricks as far as possible, the dimensions of the outer skin of brick work and the openings with in it conform to the dimensions of a brick and mortar joint.

However, the two grids do not exactly coincide, so the lager scale grid had to be adjusted to fit the brick dimensions. This is hardly notable to the viewer though.

In some ways the rules of load-bearing brick construction have been broken as hidden steel lintels are used to support bricks at the opening heads. It would have been preferential to have used a visible, spanning and load-bearing lintel such as the concrete ones used in this school by

O'Donnell and Tuomey; or to have created a low-rise arch from the bricks themselves and in the Marktoberdorf gallery. Steel lintels were chosen in the end, mainly for reasons of cost, but also because this is what the contractors were used to and any variation from the standard adds risk to a project. Concrete lintels also incurred potential problems with thermal bridging.

Figure 11.3 Window head details: Ranelagh School by O'Donnell & Tuomey, as built, the original church

11.5 Legible and Clear

The hall uses a simple architectural language of walls roof and openings. A brick ramp and steps clearly mark the entrance. Lightweight construction joins the new building to the old church so as to clearly separate the two visually. The building is clear in this way.

In terms of legibility of construction though, the building is not so easily read. It was not feasible to use solid brick construction in this case, as discussed in the section on construction below. Instead, facing brick is used internally and externally with an insulated cavity between. The internally exposed brick may give the impression that the walls are solid brick, whereas they are really layered and conceal insulation and wall ties. However, it is an interesting point that brick cavity wall construction is so common in the UK that is probably how most people would expect it to be constructed. It is unclear here, then, whether the construction is readable or not.

The hidden steel lintels mentioned above also lie to the viewer. The design specified that the brick bond should continue over the window heads, making it clearer that it was supported by steel. However, the brick layer added a soldier course above the opening because this is what he was used to doing - the soldier course is often specified to 'add interest' to volume-built houses and the like. This gives the impression that the window heads may be supported by low-rise brick arches.

11.6 Composition

As previously discussed, the hall is composed of few simple elements which give a compact and orthogonal form. The orthogonality makes efficient use of space, reflects the surrounding architecture and makes for simplified construction; each brick module is rectangular and therefore lends itself to orthogonal construction. A flat roof further simplifies the visual and formal simplicity of the building.

The flat roof proved to be a challenge when the design reached the planning application stage. The architects were informed that 'the planning committee do not like flat roofs'! It was apparent that the committee thought of flat roofs as boring or ugly and preferred a pitched roof to give more character. Any attempt at a pitched roof in this case would have added complexity to the design and would have made it sit awkwardly with either the terrace houses or the church. It would also have increased the height of the building. The case for the simple flat roof was argued by the architects with the aid of a model which clearly demonstrated how the overall form of the proposed building related well to its surroundings.

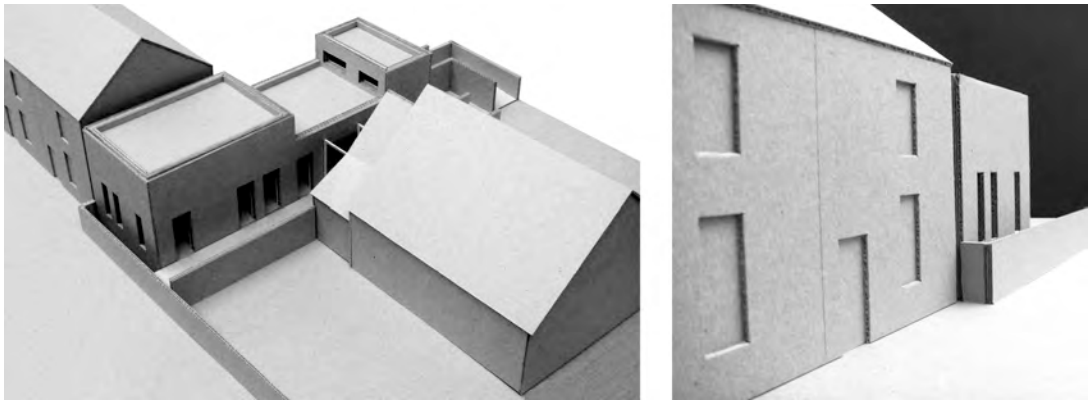

Figure 11.4 Model showing simple building form

In this instance, the perceptions of the public and planning authorities were a barrier to Building Simply.

11.7 Materials

The predominant material used is brick which is a relatively natural material, although not as raw as stone, for example, because it has to be shaped and fired. Yellow brick was chosen for this project to match the existing chapel, although the actual brick used was not manufactured locally.

Because the building form is composed of few elements, few materials were required, in turn making construction simpler.

The exposed brickwork expresses its load-bearing properties to a certain degree both externally and internally, but this is limited by the hidden lintels. The exposed internal facing brick does allow greater expression than a plastered or dry-lined wall though.

The roof is covered and waterproofed with a single-ply membrane. This material would not be considered as 'raw', but is a compromise that allows the simple flat roof form. The roof materials are not expressed, but hidden behind a parapet wall. Lead flashing which was used where the roof level steps and where the new building joins the existing church has subsequently been stolen. The value of this 'raw' material means

that it has been replaced with a plastic composite alternative. This was an unforeseen problem with using 'raw' materials.

Figure 11.5 Brick is exposed on the interior

The window frame materials provided a challenging discussion point between the architects and the client. The architects specified hardwood timber frames because they are natural and environmentally sustainable. The clients however, wanted uPVC frames because they saw them as cheaper and more sustainable from a maintenance point of view. When the contractors' tender prices came back, they were over budget so the scheme had to be value engineered. The choice of window frames was considered at this point, and eventually the clients were convinced that painted softwood frames would be a more appropriate alternative to plastic. Cost, maintenance and client perception were obstacles to Building Simply in this situation.

11.8 Construction

Mono-material vs. layered construction

Solid brick walls were considered for the community hall to make the construction truthful and simple. It soon became clear though, that there would be many difficulties delivering a successful building in this way.

To begin with, 540mm thick walls like the gallery by Bearth and deplazes were considered; but when the walls were drawn this thick the spatial planning became more difficult. It became evident that the wall-volume to space ratio for such a small building was not desirable. That is, there was a lot of brick mass to enclose not very much space. (For a larger building like the gallery case study, this becomes less of an issue.) Moreover, due to the narrow width of the site it became difficult to achieve the room areas required by the brief. For example, a suitable width kitchen and disabled access toilet could not be accommodated within the width available.

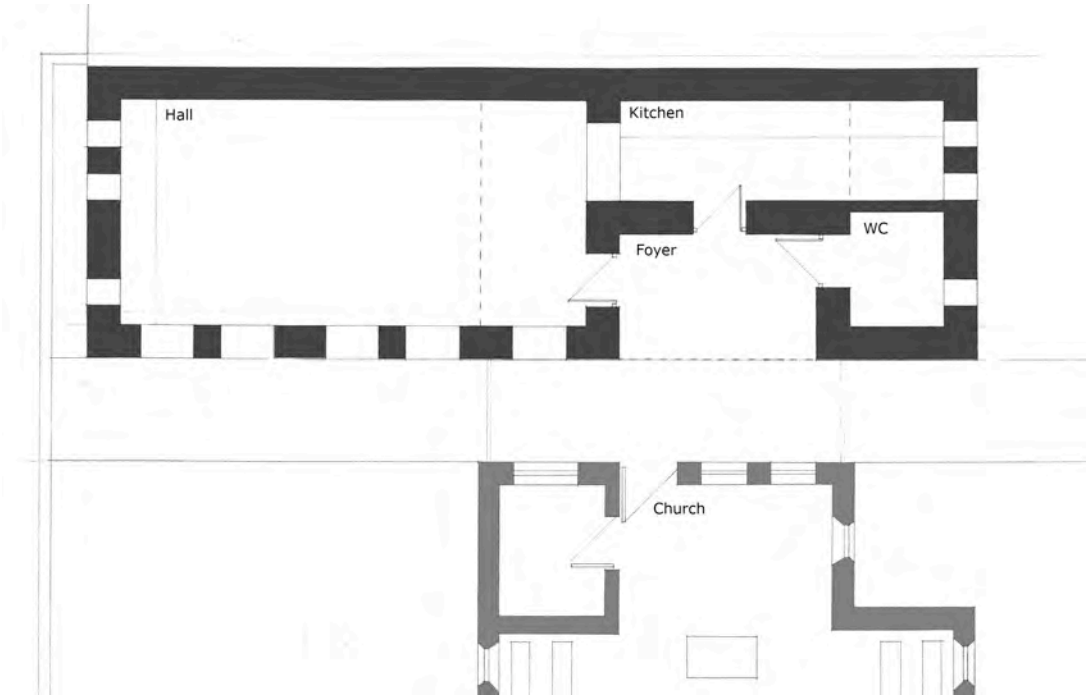

Figure 11.6 Plan drawn with 540mm thick walls

The next issue would have been achieving approval from Building Control. In order to satisfy Part L of the Building Regulations, it has to be proved that the required u-values can be achieved by the construction.

Building control would also be concerned about other aspects of the construction such as structure and weather tightness. Where construction methods deviate from approved details or standard methods in becomes harder to prove satisfactory performance. This means added risk for the project, architect and engineer.

By the time this project was tendered for by contractors, it had become clear that it was not feasible to use solid brick construction. Therefore, the real costs of building the hall in this way are unknown. However, it can be assumed that solid brick construction would have been more expensive because it is a non-standard construction method. Throughout the process of value engineering that took place with the contractors, it was clear that any deviation from what the contractors were used to incurred extra costs. This may be because it would take them longer to build or increase the risk of their workmanship not being to the standard required. Also a greater volume of brick would have been required, although the costs of cavity wall insulated could have been omitted.

For these reasons it was not feasible or beneficial to build the hall using mono-material construction.

Figure 11.7 Construction of brick cavity walls

In a similar way, the roof construction was not as 'simple' as the architects hoped it would be. The original designs used steel beams exposed internally, but these were too expensive so a conventional timber structure and plasterboard ceiling were used.

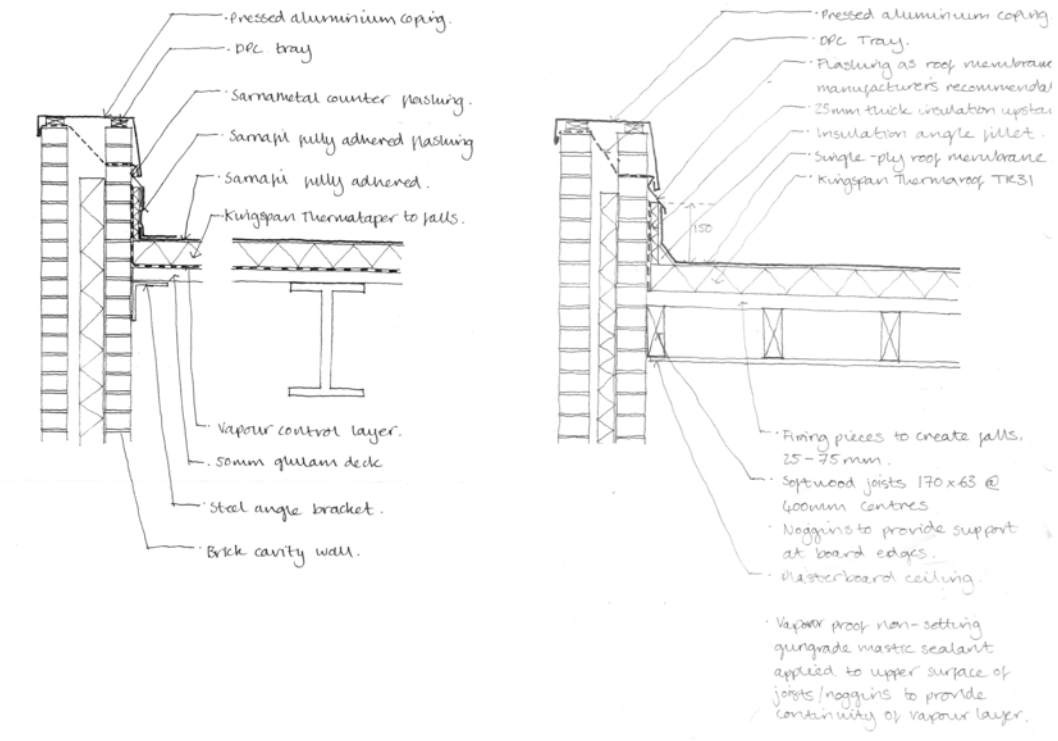

Figure 11.8 Proposed roof construction with visible structure. As built concealed timber roof structure

Although the construction itself is not very simple, it could all be undertaken by a general contractor and no specialists were required. All the processes were easily understood and carried out by the contractors. The predominant skill required was brick-laying, and constructing insulated cavity was a familiar process to the bricklayer. In this sense it could be argued that the construction was simple because it was 'simple' for the contractor to build. However, this contradicts the argument for Building Simply which says that new skills need to be gained or lost skills recovered in order to construct truly simple buildings.

11.9 Sustainability

The community hall was designed to use passive ventilation and to maximise daylighting. For this reason the roof was stepped in section to allow high-level window opening into the hall space and kitchen. Unfortunately due to cost-cutting and the subsequent change in roof structure, these windows had to be omitted. However, the hall space can still be naturally ventilated through side windows; and daylighting, though sufficient, is not as good as it would have been.

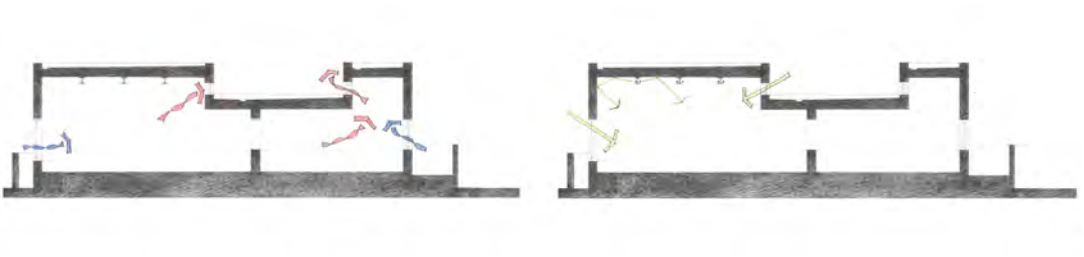

Figure 11.9 Passive design strategy diagrams

Because the building is small and efficiently compact, it was built with an economy of means, requiring less material consumption that a larger more extravagant design.

Underfloor heating was chosen to suit the sporadic use of the building throughout the week, and this works well with the thermal mass provided by the exposed inner leaf of brick to provide a stable and constant temperature. No high-tech renewable energy systems were used.

11.10 Summary

The working case study has shown that, whilst Building Simply has been achieved in a few cases in Europe, there are many difficulties in doing so in the UK. Although not all projects would face the same challenges as the community hall in Burry Port, many of the issues are common to all building projects, such as planning procedure, budget, public perception, Building Regulations and skills availability.

This case study demonstrates that it is not so difficult to design a building that is simple in form and visual terms (although this may require more time and effort by the architect); but the real challenge is deliver a building that is also simple in construction and use of materials.

Figure 11.10

12. Conclusions

12.1 Summary

This thesis aimed to demonstrate that it is possible, and even beneficial to Build Simply in the context of the UK construction industry.

It can be seen that this way of building is contrary to typical contemporary iconic architecture, which tends to be fashionable, fast, loud, and built from globally available synthetic materials.

In contrast to iconic architecture, a study of vernacular architecture reveals many principles that apply to Building Simply. Whilst it is not practical to copy directly from traditional architecture, the ideas uncovered can be abstracted and applied to contemporary building. The abstracted themes set out in Chapter 3 informed the framework definition for Building

The framework provides a more detailed definition of what it means to Build Simply by considering the various aspects of the design and construction process under the following headings:

- Respond to the Landscape
- Minimise
- Obey the Rules
- Clear and Legible
- Composition
- Materials
- Construction
- Sustainability

As well as defining Building Simply, the framework provides criteria against which case studies can be analysed as to their relative simplicity or complexity.

There are many benefits which support the argument for Building Simply. It is 'slow' and relates to its surroundings giving a sense of

timelessness and belonging. Building Simply is truthful and easy to understand because it has been reduced to essentials. It promotes passive design which can reduce carbon emissions without the need for complicated technologies; and it adopts a rational and ethical approach to construction, using resources sensibly. The result is a humble yet elegant and refined architectural solution.

Despite the advantages, there are many obstacles to Building Simply in the context of the UK construction industry, including perceptions, supply chain, Building Regulation standards, sustainability issues, costs and design issues. These challenges are illustrated in the case studies.

The three building case studies demonstrate, to varying degrees, that Building Simply is possible and beneficial.

The RCR Arquitectes case study revealed a building that although elemental in appearance and simple in composition, was relatively complex in terms of construction. The simplicity here was only skin deep.

Gilles Perruadin's wine store demonstrates a truly simple building; simple in construction and materials as well as aesthetically. Although this project performs well in terms of providing the right conditions for the storage of wine, it is not helpful as an example of Building Simply meeting the demands of a typical building in cooler European climate such as Britain.

The Gallery for Contemporary Art in Germany by Bearth and Deplazes is relatively simple in form, appearance, construction and environmental performance. It is also a good example of a building type which has demanding requirements for environmental control in a Northern European climate. This study proves that, in theory, Building Simply is possible in a UK context, as well as revealing some benefits of building with solid construction.

The working case study of Burry Port Methodist Church community hall served to highlight and illustrate the real challenges faced in an attempt to Build Simply in the UK. Problems relating to the form, composition and appearance of the design (such as planning and public perceptions) were overcome. However, when it came to construction, there were too many challenges in the way of building in solid brick construction. These barriers included environmental performance and other Building Control issues, cost, construction skills and added risks for the design team.
Whilst no two construction projects are the same and each comes with its own opportunities and challenges, this working case study suggests that the hardest part of Building Simply to achieve in the UK is the construction.

Concluding Remarks and Speculations

In response to the aim of this thesis, (which set out to show that it is possible and beneficial to Build Simply in the UK) the conclusion would be that it *is* possible and potentially beneficial to Build Simply in the UK. The gallery by Bearth and Deplazes demonstrates this because it meets the demands of a complex brief using simple form, construction and heating system. It also proves that there are benefits to Building Simply through the way it exploits the thermal properties of the massive solid brick construction to give a low-energy, thermally stable solution to the environmental though requirements of an art gallery.

In theory there is no reason why such a strategy could not be used for building in the UK. Although the Gallery in Marktoberdorf is one of only a few mono-material constructions in Europe, there are a small handful of others which use solid brick or concrete construction whilst meeting the performance standards expected of buildings such as museums and houses.

Although Building Simply is possible and beneficial in theory, it is not easy to achieve and many aspirations have to be compromised due to other demands, as the Burry Port Methodist Church Community Hall project shows. This is especially true when it comes to construction; as

layered construction has become so much the norm that it makes any attempt at mono-material construction more difficult.

The extent to which Building Simply can be achieved perhaps depends on a number of other factors relating to the project. These might include having a suitable building type and brief, a client who aspires to have a simple building, a budget that can stretch to the extra costs incurred due to non-standard construction, and a design team willing to take on the added risks of using innovative materials or methods.

Ironically, it appears any endeavour to produce a 'simple' building seems to add complexity to the processes involved. This is because Building Simply is not familiar, ad if it started to become more popular this hurdle would be reduced.

Reaching current energy performance standards is perhaps the biggest challenge for Building Simply, and these are constantly becoming more demanding as the Government tries to hit its targets for carbon emissions reduction. Even during the time taken to research this thesis, energy performance demands have moved up the agenda and pose a tougher challenge for Building Simply both now and in the future.

The most relevant result of this concern for energy performance is that lower u-values are being required in order to satisfy Part L of the Building Regulations. For example, the new 2010 Building Regulations Part L looks for a 25% improvement in carbon emissions over 2006 Part L. The table below shows the improvements in limiting U-values required.

Element	2006	2010
Roof	0.25	0.20
External wall	0.35	0.30
Party Wall	N/A	0.20
Floor	0.25	0.25
Windows	2.20	2.00

Figure 12.1 Table showing limiting u-values for Building Regulations[130]

In 2013 a further revision to Part L is expected to demand a 44% improvement in carbon emissions over 2006 in England, and a 55% improvement in Wales where the Building Regulations are due to be devolved in 2011. The changes will make it harder for mono-material construction to meet the requirements.

The Government's drive toward zero-carbon building is also likely to increasingly require buildings to incorporate renewable energy technologies to compensate for the energy used by lighting and appliances. However, passive design strategies which reduce energy demand are still a priority over technology.

For these reasons, architect's who aspire to Build Simply are likely to have to look to material innovations in order to deliver simple constructions which meet performance requirements. Hemp lime construction, for instance, can be used for casting solid insulating walls and is made using natural 'raw' materials. It also has the benefit of carbon sequestration – carbon dioxide is absorbed by the hemp plant as it grows and becomes stored within the walls. Although hemp lime products are not used widely in mainstream construction, use of hemp lime is becoming more popular as it is seen as a sustainable alternative to other construction methods.

[130] '10 Key Changes in Building Regulations Part L1A 2010' www.nesltd.co.uk/sites/default/files/documents/news/10-key-changes-part-l.pdf [Accessed September 2010]

Finally, although the advantages of Building Simply can be demonstrated and the research shows that it is possible, it is becoming increasingly more challenging to achieve. However, if architects can find design and construction solutions which meet the demanding building performance levels required, we stand to benefit from architecture whose simple, quiet forms give a sense of timelessness, stability and belonging in a fast-changing commercial world; and which is constructed in an efficient and rational way using raw, local materials which giving the buildings an empathy with the landscape in which they sit.

'Making the simple complicated is commonplace; making the complicated simple, awesomely simple, that's creativity.' Charles Mingus

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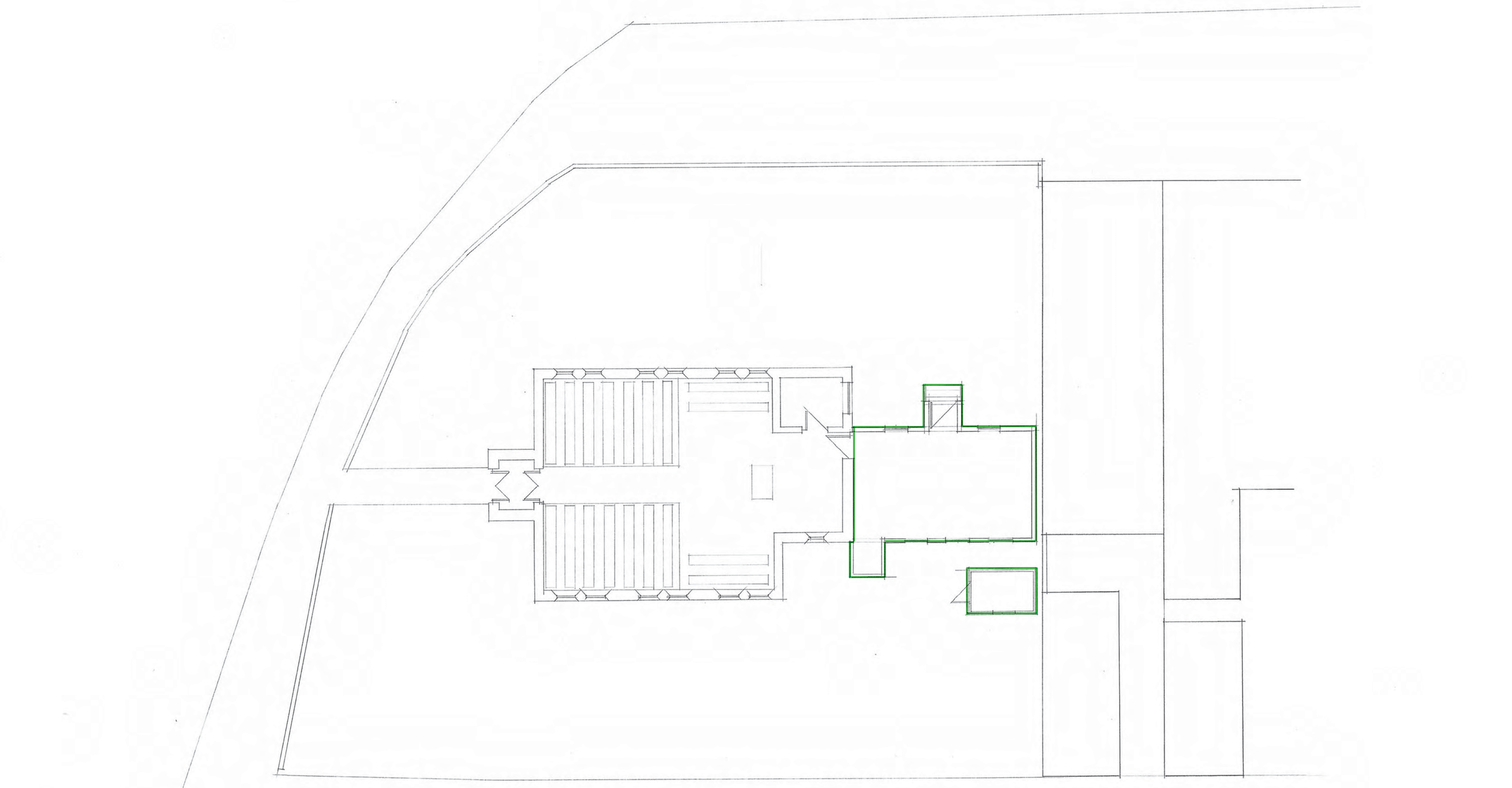
11.1 – 11.10 Design Research Unit Wales

Appendix A:

Burry Port Methodist Church Planning Stage Drawings



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REVISION: -
DATE: 14.01.08

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CLIENT: BURRYPORT METHODIST CHURCH
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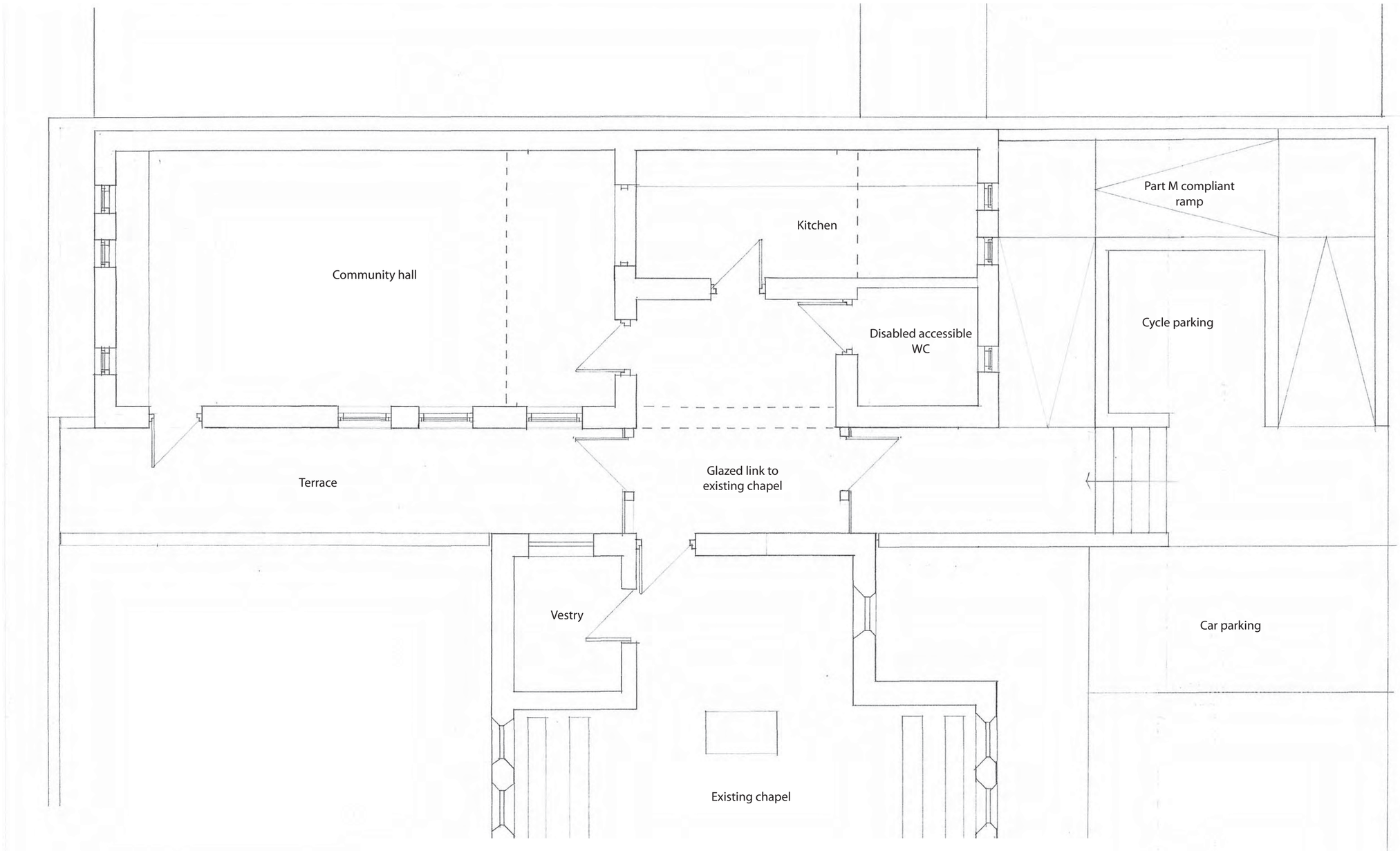

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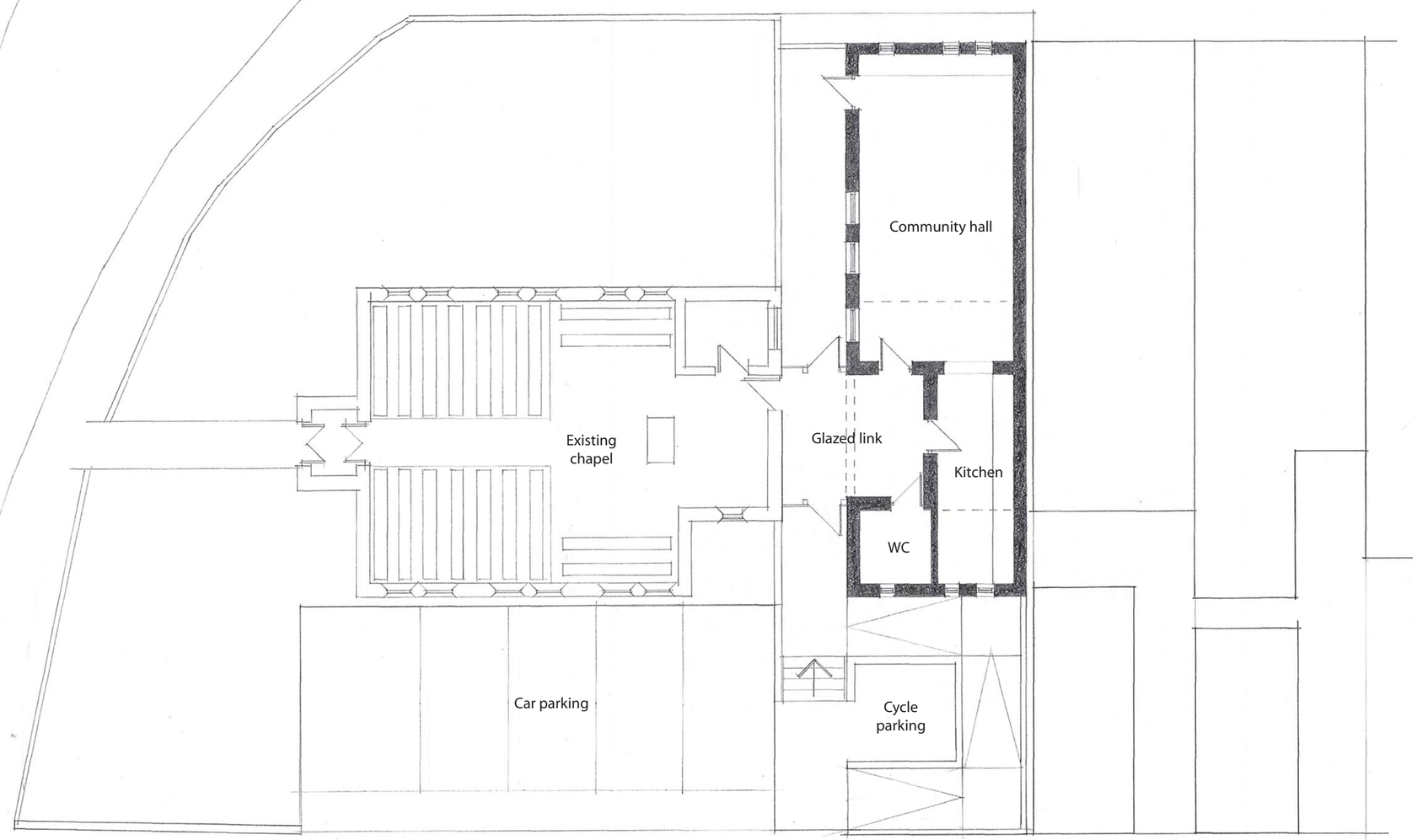

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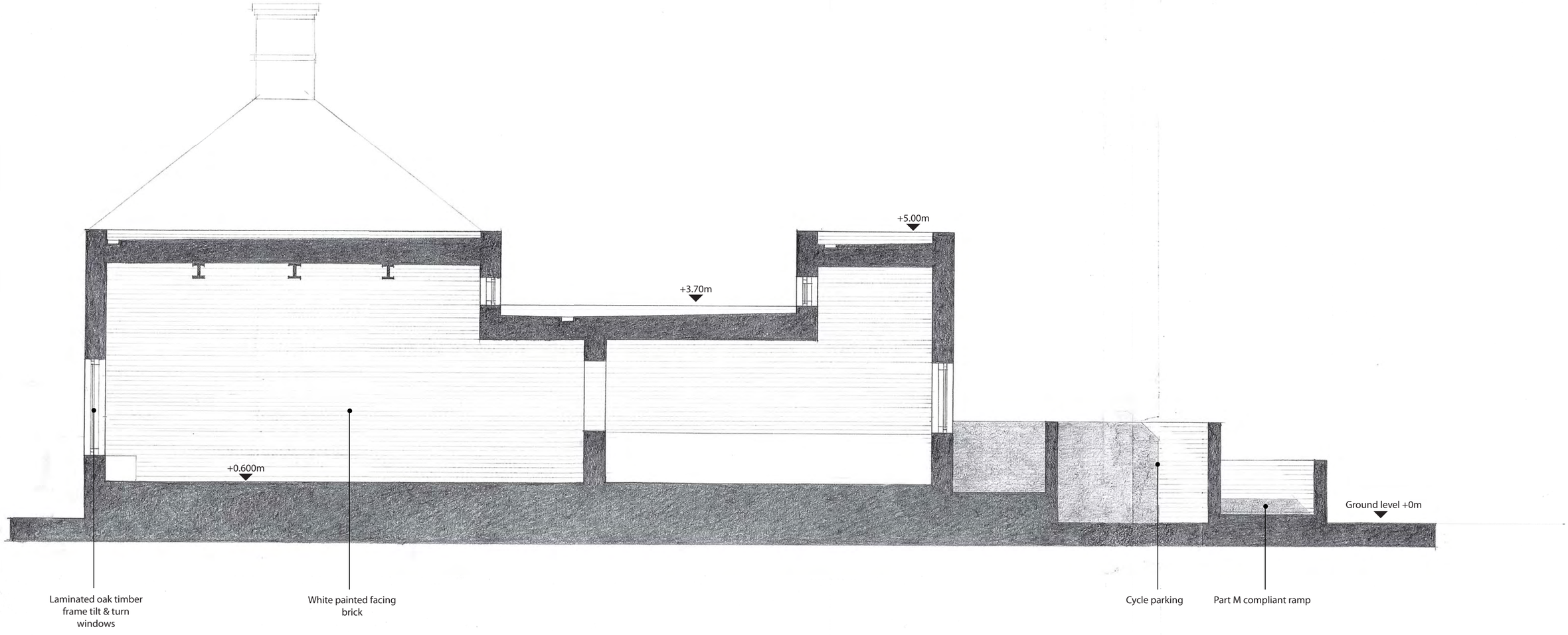

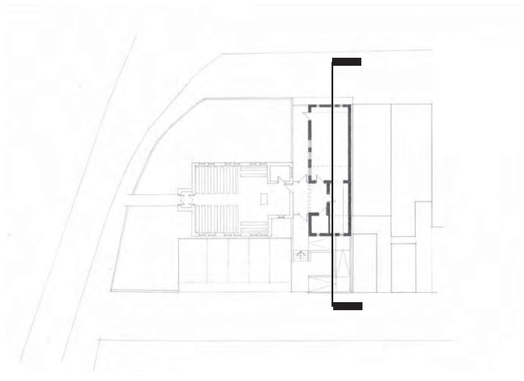

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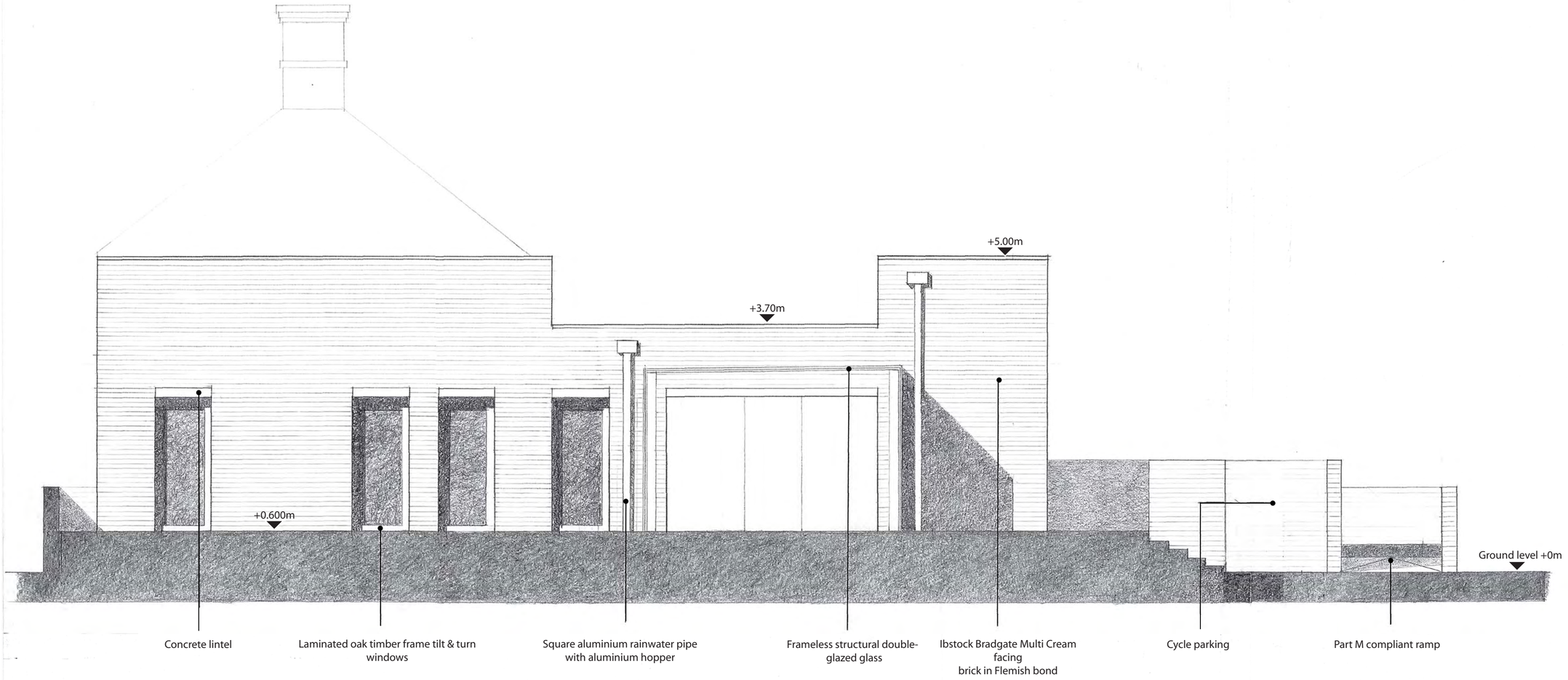

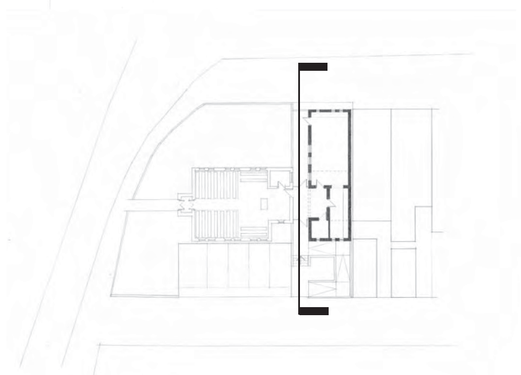

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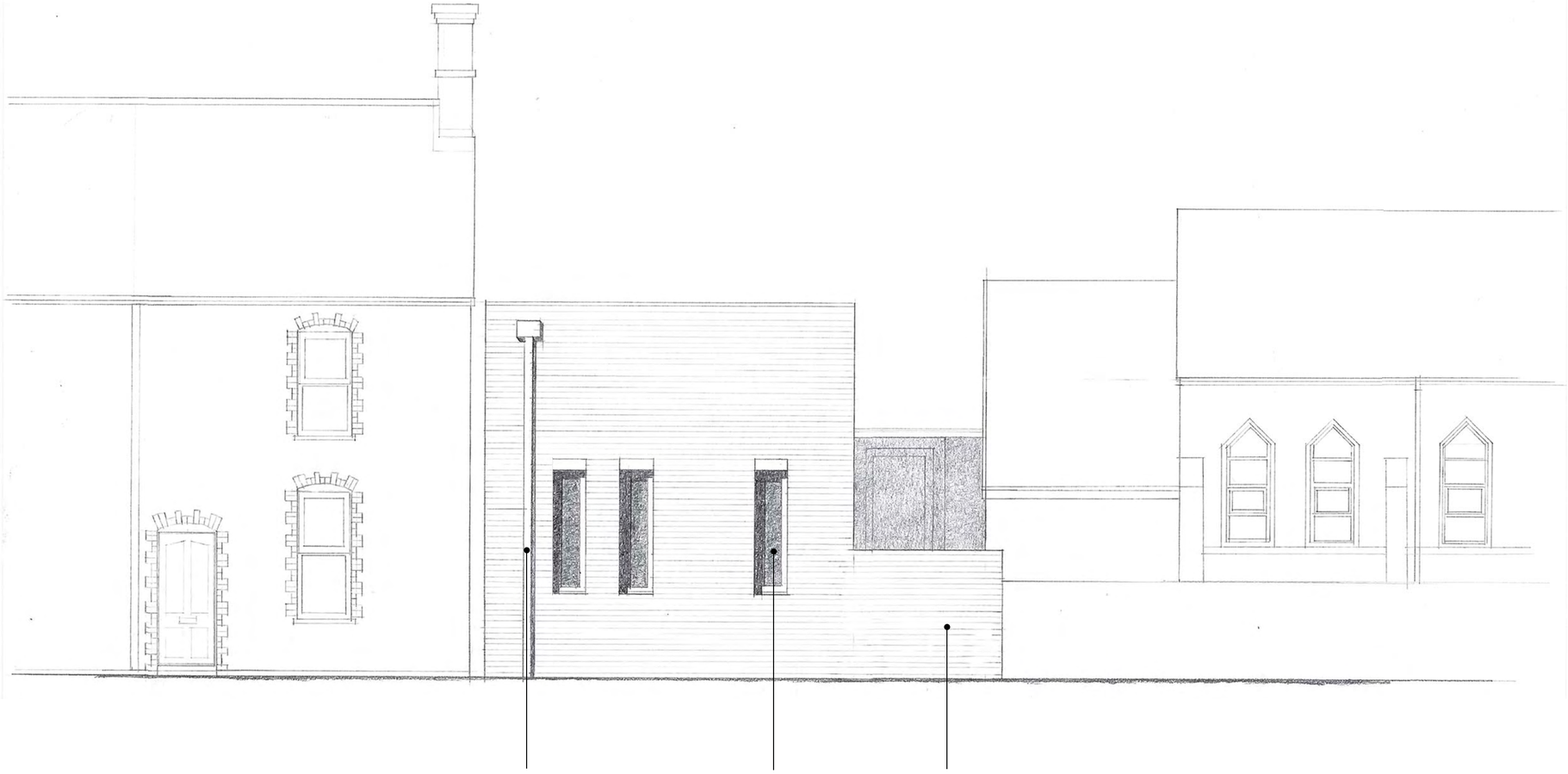

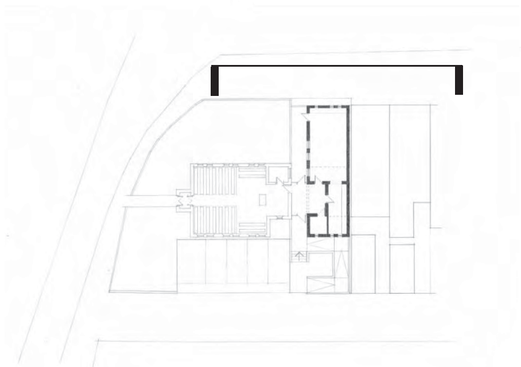

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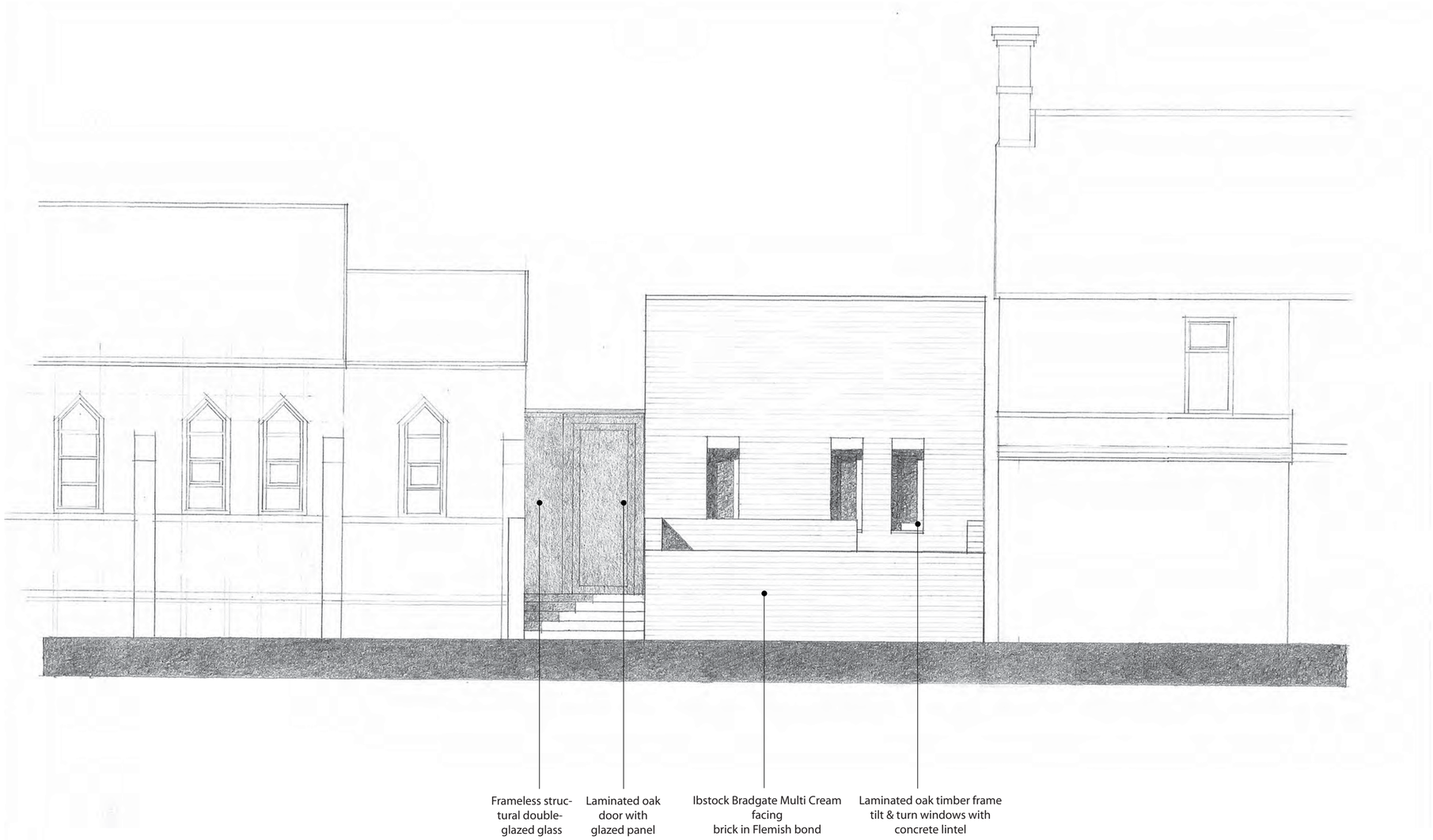

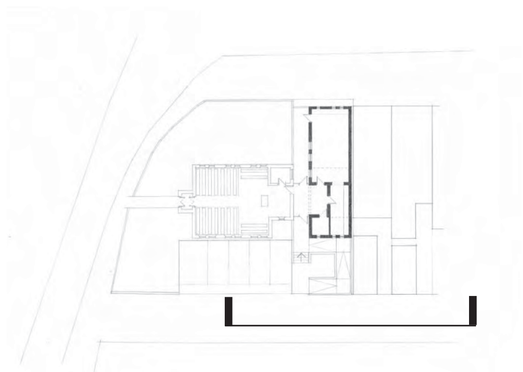

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