THE QUIRKS OF INTIMATE SPACE

**ARCHITECTONIC ART PRACTICE TRANSLATED THROUGH DIGITAL
TECHNOLOGY IN GLASS**

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THE QUIRKS OF INTIMATE SPACE: ARCHITECTONIC ART PRACTICE TRANSLATED THROUGH DIGITAL TECHNOLOGY IN GLASS

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Abstract

This research explores aspects of architectural phenomenology as evidenced in the 'quirk', described here as a peculiarity or idiosyncrasy of a building's personality. Using digital technology, this study frames and contextualises a body of sculpture, performance and installation in glass that interprets personal ideas of home through social, cultural and emotional connections. The research is focused on exposing the quirk to anthropomorphise the site, expressing its familiar and intimate nature.

Previous research in creative glass has used digital design and manufacturing technology in studies that contribute primarily to the practical advancement of CAD/CAM processes. This new research applies such techniques, but is instead focused on their capacity to record, translate and realise ideas in relation to the quirk of the architecture. This approach translates quirks through data capture to visualise aspects of architectural phenomenology, which is defined in this context as the embodied, personal and sensory experience of space.

A methodology which adapts architectural practice has been applied to provide a creative, flexible framework of site selection, discovery of the quirk and its translation, realisation and analysis. The four bodies of work described in this PhD include a monumental architectonic sculpture, a series of 'window' panels created using photographic imagery, a kinetic subterranean installation and a time-based performance of the experience of sleeping on glass. The contribution to knowledge can be claimed through a model of practice that utilises phenomenology through the translation of the architectural quirk to create a unique and diverse body of artwork; and the development of original working methods for waterjet cutting and kiln-forming to produce architectonic sculpture and imagery in glass. This PhD offers an example of the application of architectural phenomenology for those wishing to use architecture as inspiration for artwork.

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Author declaration

According to the regulations, I declare that during my registration I was not

registered for any other degree. I have not used material in this thesis for any

other academic award.

Acknowledgements

Chapter 1 - Introduction

In his book *The Poetics of Space* (1969), Gaston Bachelard explains that we base all of our experiences of architecture on memories of the childhood home. It is from this point that we seek comparison, and in most cases the home is the one piece of architecture to which we become the most emotionally attached. Bondi et al. (2009) describe the depth behind the emotions we feel in regard to place. The difficulty with interpretation of these spaces is that 'emotions also have a culture, history, seasonality, psychology, biology, economy and so on' (p.1). Even the most basic of actions, such as eating and sleeping, take place in very different ways according to cultural traditions and environmental conditions (Norberg-Schulz, 1980, p.8). It is for this reason that it is often difficult for us to describe to another person why we identify with certain sites, without that person having prior knowledge of our background. The phenomenology of architecture, and more broadly of space and environment, therefore is a sum of all of its constituent parts. It is the totality not only of physical things such as colour, material, texture etc.; but also our identity and orientation with place.

My interest in the emotional properties of architecture, which could otherwise be described as architectural phenomenology, began during my undergraduate studies at the Architectural Association School of Architecture (AA), where I explored the emotional effect of space on the user. However, it wasn't until I attended a lecture by Mark Cousins, The AA's History & Theory Studies Director, that I considered that everyone's perception of 'pleasant' or 'unpleasant' architecture could be different depending on their cultural, emotional and social background. 'Who would live in a Barrett home?' he asked the class incredulously. To Cousins, living in a Barrett home was clearly a step down from wherever he currently lived. To me, whose family home was and still

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is a poorly built 1960's ex-council house with a leaking roof, it was an unattainable dream home. It was at this point that I began to consider how architectural phenomenology moulds how we interpret the environment that surrounds us. Kirke (2006, p.7) considers how we project ourselves and are reflected by architecture, which is 'an interwoven part of, as well as man's commentary on, his actual life'.

I have lived in a total of 11 homes over my 27 years, 8 of them before the age of 17. The homes ranged from rented accommodation to owned property, from spare rooms in family houses to a flat above my parents' pub. I feel that each of these sites play a role in how I perceive and experience architecture today.

My move from architecture to glass was prompted by a desire to know an architectural material in more depth. National Glass Centre was on my doorstep, so I naturally began using my home, the north east of England, as my main artistic subject. Over the MA course in Glass and Ceramics at the University of Sunderland, my subject became more intimate, moving from the landscapes of the North East to specific locations that had influenced my life. The resulting forms became less a way of mapping locations and more a realisation of my emotional connections to the sites. This research serves as a continuation of this train of thought, concentrating on finding a language through glass to translate these phenomenological emotional experiences of home, whether home is the place you lay your head (*Bed Project*), the place where you spend most of your time (*Emotional Leak*), the place that fully encompasses your cultural background (*Tyne Tunnel*) or the architecture in which you grew up (*Window*).This research seeks to reinterpret these locations as a confrontation of our most intimate and emotional architecture.

1.1 Definition of Key Terms

1.1.1 Architectural Phenomenology

Architectural phenomenology, which can be considered an embodied experience of architectural space, is a subject explored by architectural theorists. Beyond looking at architecture's formal and visual qualities and toward an engagement and being within built spaces, the focus is on the culmination of a sensory experience which can include experiential and sensual aspects such as light, sound, temperature and so on. Norberg-Schulz described architectural phenomenology as the *Genius Loci* – the spirit of place:

> *'A concrete term for environment is 'place'. It is common usage to say that acts and occurrences 'take place'. In fact it is meaningless to imagine any happening without reference to a locality. Place is evidently an integral part of existence. What then, do we mean with the word 'place'? Obviously we mean something more than an abstract location. We mean a totality made up of concrete things having a material substance, shape, texture and colour. Together those things determine an 'environment character', which is the essence of place. In general a place is given as such a character or 'atmosphere'. A place is therefore a qualitative, 'total' phenomenon, which we cannot reduce to any of its properties, such as spatial relationships, without losing its concrete nature out of sight'* (Norberg-Schulz, 1980, p.6-8)

Social, cultural and historical contexts give significance to a site, as well as the emotion of the inhabitant, as the experience of place has as much to do with being in the space, as with the space itself: 'Understanding nature is in turn a highly personal matter and something conditioned by emotionally based anticipatory structures related to a particular history and culture' (Bondi, et al., 2007, p.97). Architectural phenomenology comprises the personal, sensory engagement with architectural space.

1.1.2 Architectural Quirk

Although the word quirk is generally used to describe idiosyncratic human behaviour, in this research it has been applied to describe a unique quality or

'personality' trait of a building, not in relation to its design, but to phenomenological aspects of the architectural experience that can be defined as unexpected. A quirk is an endearing quality and is often best known by those who occupy the building the most. It is for this reason that a quirk is most recognisable in our intimate spaces.

1.2 Research Aims

- To identify ways in which glass can be used in artworks to express aspects of architectural phenomenology

- To explore the use of digital technology as a tool for the production of architectonic glass sculpture, installation and performance

1.3 Research Objectives

- Describe the context for research by identifying key concepts and contemporary art practice related to architectural phenomenology and the use of technology and glass in art

- Develop a methodology informed by architectural practice for the conceptualisation and execution of architectonic artworks

- Create a body of artworks that explores the translation of architectural quirks through the use of data capture and the material and sensory properties of glass

- Utilise digital techniques for the translation and realisation of architectonic glass sculpture

- Reflect on the practice through written thesis

1.4 Methodology

This section will discuss existing methodological models used for art and design research, analysing PhD precedents within the field of art, glass and

architecture. Following this, my adapted architectural methodology for glass-specific art practice will be defined, with reference to particular methods used in the written contextualisation and the practical production of artwork.

1.4.1 Precedents and Models

The subject of practical methodologies has been extensively discussed within the art and design research community. I hope to extend this discussion by considering methodologies defined by recent writers and researchers. Cited by both Wightman (2012) and Sutherland (2013), amongst others, Frayling (1993) addresses practice-based research by dividing it into three main categories: research *into* art and design, research *through* art and design, and research *for* art and design. Both Wightman and Sutherland define their research as *through* art and design, which involves material research, developmental work or action research, which involves solving a problem in a specific real-world context (Gray and Malins, 2004, p.74). In contrast, this study can be seen as research *for* art and design, as although material process and developmental work exists in the form of the body of artwork, it is not the intention of the thesis to explain this process 'step-by-step' (Frayling, 1993, p.5). Rather as 'the thinking is…*embodied in the artefact,* the goal is not primarily communicable knowledge in the sense of verbal communication, but in the sense of visual or iconic or imagistic communication' (Frayling, 1993, p.5), therefore the knowledge gained through theoretical research is exemplified in the body of artwork.

A number of precedents exist on research into glass and digital design and manufacturing technology. Both Cutler (2006) and Troli (2012) have conducted research into the use of waterjet for creative glass practice. Doolan's (2013) research explores the use of CNC milling for glass. Each of these studies

explores the technical or quantitative aspects of new technology and glass, researching *through* art and design. They use approaches such as 'informed play' (Cutler, 2006, p.77) to draw knowledge from acquiring technical skill during the course of the research (2006, p.220). In these three studies the authors adopt a step-by-step method to explain their particular process of digital design and manufacture. However little research exists which applies these models of practice for the sole purpose of the production of artwork, as is suggested in each of their individual studies. So although new digital design and manufacturing techniques are discovered through the practical production process of the individual artworks, this is not the primary aim of this research. Instead the focus is on the *embodiment* (to borrow Frayling's word) of the theoretical and practical research in the realised artwork. Technology has been used as an intermediary tool for the production of sculpture in glass, rather than as the research subject itself.

Elements of this study could be described by a number of pre-existing art and design research methodologies. These include, amongst others:

- *The reflective practitioner* (Schon, 1984), used by Sutherland (2013) and Collier (2011), in which 'the creative output develops as a response to a theoretical context' (Sutherland, 2013, p.93)

- *Naturalistic enquiry* (Lincoln and Guba, 1985) used by Cutler (2006) and Troli (2012) to describe research in real situations and involves 'intuitive *tacit knowledge*' (Gray and Malins, 2004, p.72)

- *The phenomenological approach,* expanding on Frayling's (1993, p.5) theory of 'embodiment within the artefact', is used by Forrest (2012, p.70-74). This approach argues that 'embodiment is not primarily

textual…rather, it is consumed by a world filled with smells, textures, sights, sounds and tastes, all of which spark cultural memories' (Stoller, 1997, p.85).

- *The interdisciplinary approach,* described by Gray and Malins (2004, p. 21). This study could be seen to cover both artistic, philosophical, technological and architectural paradigms

- *Inquiry by design* (Zeisel and Eberhard, 1984), a more architectural and design based methodology.

The merging of several research methodologies in this study could also be summarised by the use of one, the *bricoleur*. Dr Mike Collier goes into great detail about this approach in his thesis (2011, p. 23 – 28), stating that the bricoleur offers '…a subtle balance between intuitive and empirical approaches to research. It is flexible enough to allow a collage of overlapping timeframes to develop…allowing ideas to overlap and interconnect.'

The *bricoleur* adopts a multi-method approach (Brewer and Hunter, 1989), working between and within competing and overlapping perspectives and paradigms (Denzin and Lincoln, 1994, p.2-3) to create a methodology which is derived from, and responds to, practice and context (Gray and Malins, 2004, p.74).

1.4.2 Methodological Approach

In the following section I will further expand on, and apply, these emerging methodologies in the context of my research. Previous architectural training and current artistic practice requires the merging of disciplines to better define individual methods of working.

Having completed a RIBA Part I in architecture prior to working with glass, my artistic practice is influenced by my architectural education, which provides me with a particular viewpoint on the use of glass for architecture. The training is a strong influence; although I work in an artistic field my practice can still be considered as distinctly architectural. In the previous section I briefly introduced a number of existing methodologies used within the fields of art and design. This included inquiry by design, an approach defined by Zeisel and Eberhard (2006). This is described by Gray and Malins as relevant to practitioners and researchers in the fields of architecture, planning and the social sciences, focused specifically on the design process in relation to the built environment (2004, p.75). The methodology follows a framework of:

Imaging → Presenting → Testing → Reimaging...

Figure 1 Inquiry by design process (Zeisel, 2006, p.10-14)

The process forms a structure in which the designer begins with a question, presents an argument, tests and evaluates the argument, and through feedback develops and revises the argument (Gray and Malins, 2004, p.76). This methodology structure is familiar to those in a design-based discipline, and in architecture school the classes were organised within a similar framework:

Charge → DisCharge → Relaxation → ReCharge...

Figure 2 Example of Architectural Association project model

Charge can be understood as the collection of information, discharge as its dissemination, relaxation a form of analysis, and recharge the collection of

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further information in reference to the knowledge gained during relaxation. What

is distinctive about the process of the design practitioner, as opposed to the

artist, is the identification of a problem and the subsequent quest to find a

solution, which is why these design frameworks are considered to be similar to

the process of research by Gray and Malins (2004, p.76) and Press and Cooper

(2003, p.102). In fact the latter goes on to identify another, more basic, design

process which can also be applied to research:

Formulation → Evolution → Transfer → Reaction...

Figure 3 Press and Cooper design process (2003, p.107)

Press and Cooper explain the relationship of the design process to applied
research:

> *Each step involves research or a process of searching for knowledge,*
> *which will inform all those stages of the creation process. Indeed for*
> *designers engaged in practice, design research is primarily about the*
> *process of searching in the three following areas. Searching for*
> *understanding…ideas… solutions.* (2003, p.102)

I discussed in the previous section that the research methodology could be

considered as a *bricolage* of methods, meaning that it can be 'messy' and 'open

to change' (Gray and Malins, 2004, p.74). This artistic approach is at odds with

the structured framework of design methodologies, in that the above processes

are more step-by-step, as seen in Frayling's research *through* art and design

(1993), rather than the pick-and-mix of processes and methods as seen in the

bricoleur approach. Although overall my methodology is not purely borrowed

from architecture, it can be said that my pre-research framework follows the

style of a typical architecture student or practitioner:

Site/Brief → Discovery → Translation → Realisation → Analysis...

Figure 4 A structured research methodology

This process is derived from the point of view of the architectural practitioner, and not the 'messy' artist. Smith and Fernie put together a crude list of contrasting views of the two practices in *Two Minds: Artists and Architects in Collaboration* (2006, p.14):

- *Artists are more interested in following an idea through to a conclusion than completing a project*
- *Architects are able to jump between different scales and forms of representation, while artists focus on a particular aspect of a design, drawing on the intimate quality of space and materials*
- *Architects are interested in creating form while artists are interested in creating an experience*
- *Architects work with large groups of people and are constantly collaborating in a way that artists rarely do*
- *Architects are often able to hide behind the work of their practice unlike artists who stand as sole representative of their art*
- *Artists and architects work at a very different pace; buildings take years to complete and have life spans of at least 30 years while art works generally take far less time to make and have a much shorter 'display' life span (three months being the average exhibition period)*

An important distinction that has been made between architectural (or design) practice and artistic practice is the architect's need for transparency in process to facilitate client understanding. The architect is required to make intentions clear at *each step*, in comparison the artist can work in a studio in relative isolation throughout the creative process. A concise and structured methodology must therefore be utilised within architectural practice, allowing the client to follow and understand the process of design. It must also be stated at this point that the site is generally chosen for the architect, whereas in this study I am able to choose my own. So while I may unconsciously follow the guidelines

of an architectural practitioner, I have found that I do not follow a transparent

process as indicated in Figure 6. Each project in this research begins with the

question, 'What is the quirk of this site?' There is a solution in the form of the

realised artwork, yet the steps taken in-between are not made entirely explicit.

My methodology can be seen to adapt the step-by-step process of the architect

by combining it with the pick-and-mix approach of the artistic practitioner.
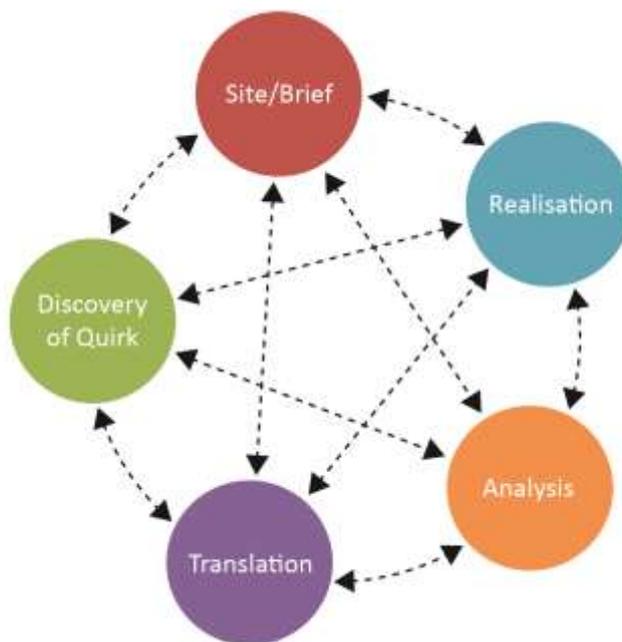
Figure 5 A messy research methodology

What makes the steps between the site and the realisation of the artwork so

difficult to clarify is that 'the goal [of the research] is not primarily to

communicate knowledge in a verbal sense, but in the sense of visual or iconic

or imagistic communication'. Again, the knowledge is *embodied in the artefact*

(Frayling, 1993, p.5). This, accompanied by an artist's inclination to shy away

from written explanation for fear of 'losing the essence of the creative spark'

(Collier, 2011, p.21), forms a void of understanding within the research

methodology. In this research the difficulty lies in finding a way to clearly define

the process leading to and following the *discovery of the quirk*. The quirk is

described in this study as an idiosyncratic 'personality' trait of the architecture, which is inherently difficult to verbalise because of its unique relationship to the individual's previous phenomenological experience. Ballantyne states:

> *The precise ways in which we respond to buildings are variable according to our prior experiences of buildings. Depending on our acculturation, we might be impressed or dismayed by different things…We respond to these aspects of buildings, which are not intrinsic in the buildings themselves, as well as to the abstract set of shapes that we see* (2002, pp.53)

 In short, artwork inspired by personal experience is problematic because of the difficulty in verbalising the decision making process without having to go into the minutiae of one's personal history. Robert Irwin identifies six key progressions of the experience of phenomenology (Weschler, p.182), which I have paraphrased as follows:

Perception	Conception	Form	Formful	Formal	Formalised
• An individual's originary, direct interface with the phenomenological experience. Not yet defined as colours, sounds etc.	• The individual can isolate zones of focus. i.e. 'that splash' or 'that tree', yet these zones remain unnamed.	• Zones of focus are named. 'that tree' becomes that tree. Communication can be established with names.	• Names begin to form rational patterns. Day and night, hot and cold, etc.	• These patterns begin to become standardised, for socially efficient usage. Clock time, calendars, temperatures etc.	• Standardised measures begin to dictate our behaviour, a behaviour that has now become estranged from direct perceptual experience.

Figure 6: Robert Irwin's Process of Compounded Abstraction

This process states that at any given moment, for any given individual, all six 'phenomenological phases' are operating simultaneously (ibid, p.183). From this we can deduce that the phenomenological experience is difficult to verbalise not only because of its complexity, but because each stage of the artistic decision making process may be operating *at the same time.* So by applying Irwin's theory to this research methodology, it is possible that the artist is at once discovering the quirk, experiencing the site, realising and translating an artwork,

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whilst also analysing an idea. With this in mind, the sections in chapter 3 and 4 follow a written structure that reflects the constant flow between methodological phases. They do not prescribe to any one particular order, but instead overlap, intersect and diverge to realise each individual artwork.

1.5 Methods

Because of the constant flux between methodological phases, the methods follow a structure in that no one rule determines the direction and production of each of the artworks. Using the methodological phases as a point of departure, I will explain the individual methods employed for each heading. It should be kept in mind that each of these methods, similar to the methodological phases, are not processed in any particular order.

1.5.1 Site

In this research, architectural phenomenology is defined as the embodied personal, sensory experience of architectural space. The theory of *embodied cognition* states that the nature of the human mind is largely determined by the form of the human body (Maehara, 2013, p.94). The human body is seen as an inseparable component in the experience of architectural space. It is our *subject of perception* (Merleau-Ponty, 2004, p.8), in that we move through and experience space with our entire selves. Juhani Pallasmaa has written extensively about our embodiment of architecture, and his statement succinctly describes the relationship of the body and architecture:

> *I confront the city with my body; my legs measure the length of the arcade and the width of the square; my gaze unconsciously projects my body onto the façade of the cathedral, where it roams over the mouldings and contours, sensing the size of recesses and projections; my body weight meets the mass of the cathedral door, and my hand grasps the door pull as I enter the dark void behind. I experience myself in the city, and the city exists through my embodied experience. The city and my*

> *body supplement and define each other. I dwell in the city and the city*
> *dwells in me.*
> *(2005, p.40)*

Pallasmaa acknowledges that we connect to architecture through the movement and action of our bodies, but we are also connected through our senses, in which 'qualities of matter, space and scale are measured equally by the eye, ear, nose, skin, tongue, skeleton and muscle' (Holl, Pallasmaa and Perez-Gomez, 2006, p.30). An important part of the embodiment of architecture also involves multi-sensory experience, in that it would be impossible to fully *inhabit* architecture without the participation of the senses. However, our senses do not exist as a disembodied part of our being; they act as 'a locus of reference, memory, imagination and integration' (Pallasmaa, 2005, p.11). In architecture we may perhaps hear, see, touch, smell or even taste something which can spark our memory or imagination.

The connection of our memory and imagination to architecture are themes which frequently emerge in architectural phenomenology, and are important influences in the direction of this research in relation to architecture. Bachelard refers to the importance of memory and imagination in terms of our most intimate architecture. He believed that architecture which had been 'seized upon by the imagination' could not remain as 'indifferent space subject to the measurements and estimates of the surveyor' (Bachelard 1969, p.xxxvi). In fact, Holl, Pallasmaa and Perez-Gomez believed that we are in constant dialogue with the environment to the point at which it is impossible to detach our 'image of Self from its spatial and situation existence' (2006, p.35). Bachelard goes on to reiterate 'the house images move in both directions: They are in us as much as we are in them' (1969, p.xxxvii). When we enter architecture we do not

experience it from the perspective of an isolated and disconnected body, coldly

measuring space with our senses, our experience is moulded by everything that

went before it, perhaps most importantly the architecture of our childhood home:

> *The house we were born in has engraved within us the hierarchy of the various functions of inhabiting. We are the diagram of the functions of inhabiting a particular house, and all the other houses are but variations on a fundamental theme. The word habit is too worn a word to express the passionate liaison of our bodies, which do not forget, with an unforgettable house* (Bachelard, 1969, p.91)

Bachelard viewed the home as 'a privileged entity for a phenomenological study

of the intimate values of inside space' (1969, p.3). However, he goes on to say

that any truly *inhabited* space can, in fact, be called home (ibid, p.5). De Botton

also makes this point, stating that home can be anywhere to which we are

intimate, 'an airport or a library, a garden or a motorway diner' (2006, p.107).

For this reason it is the architecture of the home, and the intimate architecture

which can otherwise be defined as home, which has been chosen as the site of

inspiration for this study.

1.5.2 Discovery of the architectural quirk

The previous section discusses how architecture can influence the way we

experience space through not only our body, but also our senses. Architecture

speaks to us, and we speak to it. With intimate architecture, such as the home,

this conversation holds even greater significance. John Ruskin proposed that

we expect intimate architecture to shelter us and 'speak to us of whatever we

find important and need to be reminded of' (De Botton, 2005, p.62). In this study

the architectural sites are all part of my daily life, and for this reason I have

established a relationship with them that goes beyond pure inhabitation, but

instead has evolved into a conversation.

The sites have been anthropomorphised through my interpretation of their phenomenological characteristics as part of a complex 'personality', a word usually only applied to human behaviour. This humanisation of the home is not unusual; in fact, Bachelard argues that all architecture that promotes and defends intimacy immediately transposes to the human plane (1969, p.48). This theory is also echoed in life and literature. For example, Heathcote highlights the cliché that on being burgled, owners are known to refer to this invasion of their home as equivalent to rape (2012, p.186). In literature, architecture is anthropomorphised to convey an atmosphere or as a reflection of its occupier. In Edgar Allen Poe's 1839 work *The Fall of the House of Usher*, the house is a representation of the narrator's mentally disturbed friend, Roderick Usher. In Henri Bosco's *Malicroix* (1949), the building acquires 'the physical and moral energy of a human body' when faced with a hurricane (Bachelard, 1969, p.46). So the relationship between a building and the occupier could be compared to that of a human one, in that when we become intimate we essentially project a human personality and characteristics onto this inanimate construction.

Intimacy produces the ability to understand the intricacies and idiosyncrasies of one's personality. The depth of a relationship allows us to see past superficial features and into what might be considered the 'real' or essential personality. I compare the depth of our relationship to architecture with that of an intimate human relationship. When we are first acquainted with a person, we come to understand their personality through spending time with them. We understand them superficially in that we could describe them as funny or intelligent, in the same way that we could describe architecture as contemporary or welcoming, yet we could not really claim to *know* them. However, it is when we know someone intimately that we begin to recognise the intricacies of personality, the

traits that distinguish him or her from everyone else we know, the quirks which make them distinctly who they are. We stop thinking of buildings as just bricks and mortar. Instead we begin to notice the things that are less obvious; the location of the creaking floorboard, a fear of spiders, the sounds the pipes make, what makes them laugh. These quirks are indicative of one's essence. Robert Irwin is also inspired by the experience of these spatial idiosyncrasies; he defines his practice as focusing on 'attention to the incidental, the peripheral, everything that [is] beside the point' (Weschler, 2008, p.151). To carry out his installations, Irwin spends hours, days or weeks in a space to gauge its 'specific experiential qualities' (ibid, p.242), becoming intimate with the space in order to understand it more deeply. He does not always succeed in his appraisal of the site, and will refuse a commission if he is unable to frame a specific experience:

> *All art is experience, yet all experience is not art. The artist chooses from experienced that which he defines out as art, possibly because it has not yet been experienced enough, or because it needs to be experienced more.* (Weschler, 2008, p.131)

So Irwin believes that it is the aspects of space that are overlooked that artists should be emphasising for the viewer, that the 'inconsistencies are as meaningful as consistencies' (ibid, p.139), that a quirk is perhaps the most interesting thing about the experience of architecture.

This research focuses on the 'personality' of architecture as the inspiration for a body of artwork, in which 'personality' can be described as the culmination of the architecture's phenomenology. Specifically, I have chosen one aspect of the architecture's 'personality', the quirk, to direct the research. Although the word quirk is generally used to describe idiosyncratic human behaviour, in this research it has been applied to describe a unique quality or 'personality' trait of

a building, not in relation to its design, but with unintended phenomenological aspects of the architectural experience.

1.5.3 Translation, Realisation and Analysis

This section defines the methods applied in the final methodological phases; translation, realisation and analysis. Although all five phases have been described as operating simultaneously, these last three have been combined to emphasise the interchangeability of their specific methods.

As the methodology for art practice borrows from architecture, many of the digital techniques used in this study are important working approaches in architectural design. One of the main differences in the methods of architectural practice is the way in which ideas are realised. While an artist may create, dismantle and reconfigure an artwork many times, an architectural design, once built, is often final. The architect requires a digital testing ground as a means of discovery and for the production of successful forms. Bertol states that 'architectural design in a virtual reality environment provides for the expression of ideas and the exploration of alternatives in a way which is both comprehensive and revolutionary' (1997, p.xv). Digital drawing, modelling, rendering and manufacturing techniques can be used to build, demolish and rebuild entire architectural plans with minimal real-world repercussions. With digital tools, one can instantly scale part or all of a design instantly, which is impossible through manual design. It is also possible to achieve 'an unlimited number of perspectives…defined by the user' (ibid., p.48) from one single 3D drawing. Forms which would otherwise be impossible to create are designed through digital modelling techniques (Iwamoto, 2009, p.4). This approach is used by Frank Gehry (ibid, p.6), Zaha Hadid, (Noever, 2003, p.9) and Foster

and Partners (Leach, Turnbull and Williams, 2004, pp.47-49 + 84) to create complex building designs.

This research uses digital design for architectural practice to translate and realise architectonic artworks in glass, as concepts for large scale or intricate forms can be manipulated quickly and without the need for physical construction. The use of architectural techniques affects the resulting forms, which bear the marks of their method of design and manufacture. My grounding in architectural making approaches is evident in the development of my visual style, even if not intentional. This approach links the artworks to the spaces that inspired them and also produces a body of work that could be considered human in scale, enhancing how the viewer might relate to the artwork and the space. By relating the body to the space, the artworks reflect one of the fundamental functions of architectural design (Le Corbusier, 2000).

In this study the architectural quirk inspires the creation of artwork. To visualise this quirk a combination of methods are utilised which feed and stimulate each other. Translation in this research can be understood as the conversion of one language to another, transforming the embodied experience of architecture (a personal language), into realised artwork (a public one). Because of the relative ambiguity of personal experience, the translation of the architectural quirk may not always be apparent. Practically, the translation of architectural phenomenology into a physical 'thing' is contingent on the quirk.

One of the most important methods of translation is data capture. Its application is not purely restricted to number processing, but rather extends to an idea of how to record an experience. Specific data capture methods include; stop motion photography, light readings, static photography, video recording, sound

recording, dictation, numerical sequencing and numerical code processing. Some of these methods have also been applied either as a form of realisation, or as the physical outcome of the artwork. Methods of translation also include the use of virtual tools, such as 3D modelling in Rhinoceros 4, technical drawing in AutoCAD, model rendering in V-Ray, video editing in Premiere Pro, photo editing in Photoshop, and waterjet nesting and machining in iGems. In particular, the use of 3D modelling and technical drawing allows for the virtual manipulation of artistic forms and ideas before being made physical. They also aid in the visualisation of the artwork within the space through the digital modelling of the architectural interior in which the artwork is to be installed.

Approaches to realisation can be considered less ambiguous in that they represent the physical construction, or making, of the artwork. These include sculptural object making and the creation and recording of performances and installations. In this research a number of waterjet techniques were used to create precise, contoured glass that exploits the ability of the material to take a specific shape and also exploit colour density. Specific glass manipulation methods include waterjet cutting glass contours, horizontal and vertical stacking, kiln-forming and glass finishing.

This study also invests in the creation of experiences and their recording as part of their realisation, in which a physical product is not the major emphasis. Instead performance, site specific installation and their documentation and analysis become the realised artworks. This particular subject is the area in which methods of translation and realisation become interchangeable, in that realisation becomes the process of preparing the artwork, i.e. setting up an installation, and the translation is the documented artwork for the viewer. Thus

the method of data capture of the architectural quirk could become the medium through which the artwork is most effectively disseminated.

Individual projects expand through reflection and re-examining; because of this they do not have a specific beginning or an end. Rather they are suggestive of working through an idea, and not necessarily a distinct project or object. For example one project may be revisited repeatedly over the course of the research and manipulated or expanded upon, and some parts of the realised artwork may be edited or removed as theoretical and practical understanding increases. This results in a pick-and-mix of both methodology and methods not only within each project, but also across multiple projects. Working on projects simultaneously is not unique. For example Olafur Eliasson employs over 30 people to test and develop several projects at the same time (Zuqiang 2014, p.119), and large architectural offices operate in much the same way, with different teams specialising in specific areas of each design project. This generates an approach to working which makes the body of artwork distinctive, in that each artwork informs all the others, and vice versa.

In this research analysis is an important method not only because it is used to evaluate the qualities, successes and weaknesses of a project, but also because of its capacity to generate new ideas for artworks. Analysis does not necessarily happen only at the end of a project. Instead it is adopted as a mode of self-critique and discovery throughout, which leads to developing possibilities in the artwork. This process of constant analysis is a form of reflection on what has been made so far, why it has been made as well as how it has been made. The level of critical analysis is also constantly evolving, as theoretical, philosophical and artistic texts supplement the progression of the artworks.

In summation, translation can be considered as the working through of an idea; realisation the physical manifestation of this idea, and analysis as the developing creative thought process. The initial analysis, and following chapter, exists in the form of a contextual review, which places this research within a practical context of artists, designers, glass makers, architects and fellow researchers.

Chapter 2 - Contextual Review

This chapter sets the context for this research, which explores architectural quirks through architectonic sculpture, installation and performance. Key terms are identified and described. Through a review of philosophy, artworks and exhibitions, and research projects, this study is positioned within current contemporary research and artistic practice.

The previous chapter describes a methodology that combines aspects of artistic and architectural practice. Methods include the experience of a site to uncover architectural quirks, and the translation and realisation of the quirk. As both the methodology and the individual methods can be seen to incorporate a number of fields and techniques, major themes were identified to create a framework for contextual analysis. The key words are as follows:

- Architectural phenomenology
- Architectonic
- Data capture
- Glass
- Digital design and manufacturing technology

This review examines the works of contemporary artists, glass artists, architects, designers, philosophers, writers and researchers, to provide an overview of practice in overlapping areas of interest. The following table positions this research in a context of artists, craftsmen, designers, researchers and architects. It establishes a way of visualising my research in the existing context of each keyword.

		Phenomenology	Architectonic	Data Capture	Glass	Digital Technology
Related artists, craftsmen, designers and architects	James Carpenter *Practice*	X	X		X	
	Josiah McElheny *An End to Modernity*		X	X	X	
	Olafur Eliasson *Practice*	X	X		X	X
	California Light movement *Practice*	X	X		X	
	Tomas Saraceno *14 Billion*		X	X		X
	Geoffrey Mann *Cross-Fire*	X		X	X	X
	Tavs Jorgensen *One Liner*			X	X	X
	Invisible: Art of the Unseen *Exhibition*	X	X			
	Ryan Gander *I Need Some Meaning…*	X	X	X		
	Markus Kayser *Solar Sinter*				X	X
Related Research	Mike Collier	X				
	Margereth Troli				X	X
	Shelley Doolan			X	X	X
	Jeffrey Sarmiento		X		X	
	Vanessa Cutler				X	X
	Karlyn Sutherland	X	X		X	
	Eve Forrest	X				
Pre-PhD Practice	Tumbler Series			X	X	X
	Lens Series	X		X	X	X
	Chandelier_1	X	X	X	X	X
	HSOTG	X		X	X	X
	La Dorure…	X		X	X	X
PhD Practice	Emotional Leak	X	X	X	X	X
	Window Series	X	X	X	X	X
	Tyne Tunnel	X	X	X	X	X
	Bed Project	X	X	X	X	X

The following text will expand upon the six key terms with reference to the above table, while providing a definition of the terms in the scope of this research specifically.

2.1 Phenomenology

Phenomenology is a difficult subject to characterise because of its claim as a 'radical' form of philosophy, 'a practice rather than a system' (Moran, 2000,p.4). Hammond, Howard and Keat introduce phenomenology as the description of objects 'just as one experiences them, and [the extraction of] philosophy from the process' or, more literally, 'the study or description of phenomena' (1991, p.1). Moran expands upon this theory 'Phenomenology… [describes] phenomena, in the broadest sense as whatever appears in the manner in which it appears…as it manifests itself to consciousness, to the experiencer' (2000, p.4). Phenomenology can therefore be considered as a perceptual experience of objects or space. Perception is related to the senses; sight, sound, taste, feel and smell. Hammond et al. argues that experience expands beyond purely the sensory, into 'believing, remembering, wishing, deciding…imagining…feeling apprehensive, excited or angry…judging and evaluating…bodily actions…lifting or pulling…and many others' (1991, p.2). The engagement is therefore a personal one, involving the body as a 'locus of reference, memory, imagination and integration' (Pallasmaa, 2005, p.11). As phenomenology is an extensive subject, covering many areas of philosophical study, this research will focus on architectural phenomenology, described by Norberg-Schulz as the 'Genius Loci' meaning 'the spirit of place' (1980).

This research will focus on framing and contextualising my practice through the interpretation and manifestation of architectural phenomenology and how this is

moulded by my emotional, social and cultural background. It does not focus on phenomenology as a philosophy, but instead uses it as a point of departure for the realisation and analysis of artwork. As explained by Schuld, 'Phenomenal art is no more an illustration of phenomenological philosophy than is phenomenological philosophy some sort of written analogue of or key to the work of art' (2011, p.109).

2.1.1 Architectural Phenomenology

Key philosophers, architects, psychologists and academics have contemplated architectural phenomenology. Bachelard's seminal work *The Poetics of Space* (1969) offers an observation of our connection to intimate space, specifically in relation to the home. He believed that architectural experience is shaped by the spaces we have previously inhabited, starting with the earliest shelter. Consequently each space is experienced through the lens of those that came before it:

> *The house is not experienced from day to day only; on the thread of a narrative…the various dwelling-places in our lives co-penetrate and retain treasures of former days. And after we are in the new house…memories of other places we have lived come back to us.* (ibid, p.5)

As architectural phenomenology is tied to our memories and previous experiences of space, our encounters with architecture will be influenced by these memories. One's experience is based on an individual's cultural and social context, accounting for disparate opinions of architectural experience. In addition, De Botton believes that our homes play a part in reminding us who we are, 'providing not only physical but also psychological sanctuary' (2006, p.10). This theory goes beyond just the home, and it is argued that all architecture

'directs our consciousness back to the world and to our own sense of self and being' (Pallasmaa 2005, p.12).

In contrast to Bachelard, Merleau-Ponty focused on the body as the locus of phenomenology, stating that one's experience of space is not that of a 'disembodied subject' (2004, p.42). He argued that an object or space 'symbolises or recalls a particular way of behaving' (ibid, p.48), a sentiment echoed by architectural theorist Andrew Ballantyne and psychologist Albert Mehrabian. However Ballantyne and Mehrabian believe this behaviour is also influenced by one's acculturation (Ballantyne 2002, p.25), and that our opinion is also dependent on our emotions. Mehrabian's concept of approach and avoidance explains how the same environment affects different people in different ways. Some of the reasons for this are due to differences in:

> *The physiological makeup of individuals; in attitudes toward, and past experiences with, various places; in familiarity and sophistication in dealing with places; and in the ways people cognitively process the information they receive in their surroundings. This is how a very posh restaurant may intimidate some people, be relaxing to others, or even cause boorishness in a few.* (1976, p.4)

However it is also true that architecture can play no part at all in the manipulation of our emotions. De Botton argues that if we enter a space in a bad mood, it is an unrealistic expectation to think that the mood will be changed by even the most congenial of buildings (2006, p.17). So our phenomenological experience is not only dependant on our culture, social status and emotions, but also on one's mood.

Finnish architect Pallasmaa states that architecture is experienced in its 'fully embodied material and spiritual presence' (2005, p.44), which can be explained through our intuitive knowledge of objects and material's. For example,

Merleau-Ponty discusses the lemon, its taste, shape, smell, look and feel, and how each of these individual sensory characteristics combine, yet also represent a lemon's 'different manifestations' (2004, p.45). In short, the lemon's sensory aspects can be experienced without its physical presence, alongside its associated memories. Bernard Berenson defines this as the materials 'tactile values', suggesting we imagine a genuine physical encounter through 'ideated sensations' (Montague, 1986, p.308). Pallasmaa states:

> *Vision reveals what the touch already knows. We could think of the sense of touch as the unconscious vision. Our eyes stroke distant surfaces, contours and edges, and the unconscious tactile sensation determines the agreeableness or unpleasantness of the experience. The distant and the near are experienced with the same intensity, and they merge into once coherent experience.* (2005, p.42)

This can be said of all of the materials and objects which culminate in the construction of our world. Pallasmaa discusses the sensory properties of glass at length in both *The Eyes of the Skin* (Pallasmaa, 2005) and *Questions of Perception* (Holl, Pallasmaa and Perez-Gomez, 2006). He believes the material does not bear the markings of its age, unlike natural materials such as stone and wood (2005,p.31). Despite this, Pallasmaa considers the material to have mysterious and exciting phenomenal properties, becoming 'radiant' when it is bent, cast, sandblasted, and so on (Holl, Pallasmaa and Perez-Gomez, 2006, p.92).

2.1.2 Phenomenology as methodology

Phenomenology is embraced by practice-based researchers in the arts as it supports aspects of being and experience. Collier (2011) uses it as a framework to reflect on his painting practice inspired by walks through landscape. He proposes that phenomenology 'links the theories and practice of abstraction, language and colour' and that 'the practical, ethical and embodied expression of

this philosophy can be represented through walking, expressed as a physical activity and mediated through art' (Collier 2011, p.9). A phenomenological approach to research expands on Frayling's theory of 'embodiment within the artefact' (1993, p.5). Used by Forrest (2012, p.70-74), this approach argues that 'embodiment is not primarily textual…rather, it is consumed by a world filled with smells, textures, sights, sounds and tastes, all of which spark cultural memories' (Stoller, 1997, p.85).

2.1.3 Phenomenology in art and architectural practice

In architecture, the deliberate manipulation of space is used to direct the phenomenological experience of those inhabiting a building. For example, in Daniel Libeskind's Jewish Museum the internal spaces were such that 'the body and the building [are] upset by unstable axes, walls and skins torn, ripped and dangerously slashed, rooms empty of content and with uncertain or no exits or entrances' (Vidler, 1999). This was done to 'integrate physically and spiritually the meaning of the Holocaust into the consciousness of the city of Berlin' (Bianchini, 2014). In contrast, architect James Carpenter aims to purvey a positive phenomenal experience through the use of light and its perception. In *Periscope Window* (1995-1997), Carpenter uses glass to modify the relationship between subject and object through visual and light effects which are produced through the glass's own materiality (Marpillero, 2006, p.21).

Architectural phenomenology is embodied in the work of many contemporary artists. Olafur Eliasson imagines his installations in a space that 'unfolds' according to social, cultural, psychological, behavioural and conscious decisions and actions (Eliasson, 2004).

Figure 7 Olafur Eliasson, *Mental,* **1993, Mirror and Audio**
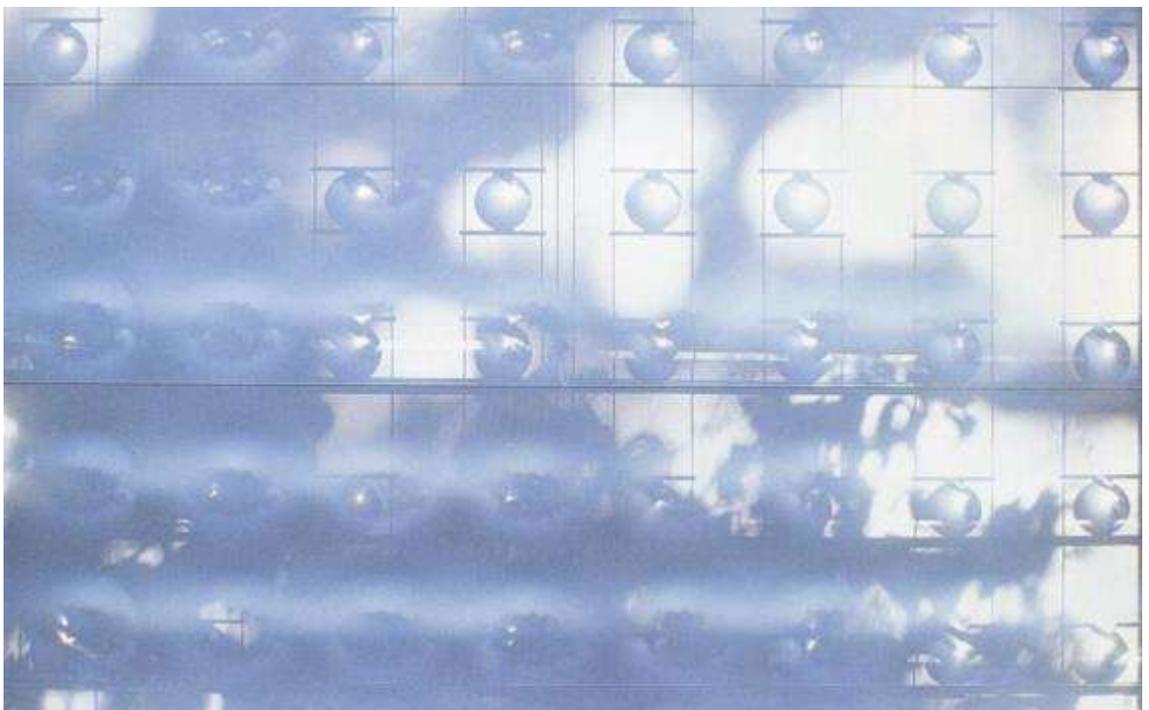
Figure 8 James Carpenter, *Periscope Window,* **1995-1997, Architectural Window**

He focuses on the visual and sensual, collaborating with architects, scientists, artists, engineers and craftsmen by experimenting with spotlights, projections, mirrors, colour filters, mono-frequency light, smoke effects and optical lenses, as well as reflected daylight. Eliasson fully integrates the viewer with the work by occupying entire architectural spaces often with only one intervention. For example in *Mental* (1993) a mirror covers a wall from floor to ceiling, effectively doubling the room.

Another example of subtle, almost unnoticeable, artistic interventions in space can be seen in the 2012 Hayward Gallery show *INVISIBLE: Art about the Unseen (1957-2012)*, which presented the work of 26 artists including Yves Klein, Yoko Ono and Claes Oldenberg. Gallery Director Ralph Rugoff explained the overall aim of the exhibition was to force the viewer to experience the art:

> *In presenting paintings, sculptures and photographs that cannot be seen, artists have asked us to think differently about what engaging with a work of art entails. Clearly, it is not just about looking at something. Art is about paying attention, and invisible art asks us to pay attention in a different way. It invites us to forego 'the complacency of seeing'…and to instead observe the ways in which our perception… shape our relationship to art'* (2012, pp. 25-27)

Creating an experience therefore must be centred on the isolation of a singular idea, to manufacture a point of phenomenological focus for the viewer.

This personal perspective will be realised in a body of artwork inspired by the architectural quirk, defined as an idiosyncratic 'personality' trait of the architecture's phenomenology. This thesis includes a detailed account of the site's cultural, social, emotional and personal importance, allowing the reader the opportunity to experience the sites from the perspective of the artist.

2.2 Architectonic

Architectonic describes an object or idea relating to architecture. It could describe an object that has been made to fit in an architectural space, an idea that echoes or emphasises the language of architecture or an intervention that draws attention to a particular architectural quirk. Such projects can provide the viewer with a unique connection to the architecture, drawing one to aesthetic or phenomenological features that may have been otherwise overlooked. Rugoff discusses this aspect of architectonic art in relation to the exhibition *Psycho Buildings,* in which artists utilised architecture to connect with, and implicate, the viewer, 'engaging us in ways that are at once visceral and conceptual, and that they call attention to what must be experienced rather than merely seen' (2008, p.19). The show included Do-Ho Suh, Rachel Whiteread, Mike Nelson and Tomas Saraceno, artists all well known for artworks relating to architectural space.

Initially Tomas Saraceno trained in architecture, but now mostly works artistically with modernist architectural ideas. His work explores the floating utopia, drawing inspiration from Buckminster Fuller and the conceptual architectural group Archigram and their *Walking City*. For his 2011 project *14 Billion*, Saraceno worked with arachnologists, astrophysicists, engineers and architects for two years to create a 'human-sized' representation of a spider's web (Arrhenius and Granström, 2011, p.8). The installation is architectonic and encompasses aspects of data capture and digital technology, stretching across the room with precisely arranged strings touching every surface and filling the space in between. The viewer is invited to explore the resulting construction, ducking under and stepping over the work to thoroughly immerse oneself in the experience, connecting with the spider's architecture.

Figure 9 Tomas Saraceno, *14 Billion,* **2011, Mixed media installation**

Figure 10 Olafur Eliasson, *Riverbed,* **2014, Mixed media installation**

Olafur Eliasson created a similarly large-scale architectonic intervention in a museum setting for *Riverbed* (2014). The site specific installation was motivated by the museum's natural setting, inspiring Eliasson to bring nature into the gallery in the form of his native Iceland.

> *Riverbed…made specifically for the museum, is based on the unique connection between nature, architecture and art…Eliasson's work transforms the place…a rocky riverbed taking up the museum's entire south Wing. A surface of rocks covers the floors as the bed for a stream of water winding through the galleries* (Laurberg, 2014, p.12)

The installation transforms the space and integrates the architecture, emphasising the body's movement through the south Wing by way of an unexpected hike through nature.

In contrast, artists such as Vito Acconci and Ryan Gander utilise space to emphasise both their artwork and the architecture through almost invisible interventions. In *Seedbed* (1972), Acconci 'employed alterations to the physical nature of the environment to effect changes in perceptions' (Linker, 1994, p.44). More specifically, Acconci built a low wooden ramp which merged seamlessly with the existing gallery floor, under which he masturbated while viewers walked above him, listening to his 'onanistic fantasies' (ibid), transmitted into the gallery via speakers. In comparison, Ryan Gander's work *I Need Some Meaning I Can Memorize (The Invisible Pull)* (2012) does not physically change the nature of the architecture in which the artwork is installed, but instead manipulates the experience of the space for the viewer through seemingly invisible forces. Installed on the empty ground floor of the Fridericianum as part of dOCUMENTA (13), Gander 'rigged air conditioning [which] whipped up a gentle breeze that the artist intended should guide visitors through the galleries' (Watts, 2012, p.267). These two artworks do not visibly manipulate the

architectural space in which they are installed; the viewer in both cases is left with what could be considered an empty gallery. The experience of space is manipulated through the artist's subtle architectonic interventions.

A pioneer in architectonic installation and sculpture is Robert Irwin. Irwin originally was part of the California Light and Space Movement of the 1970s, which also included the artists Larry Bell, Bruce Nauman and James Turrell. Irwin was fascinated by the implications of space and its artistic possibilities:

> '*Once sculpture left the elevated space atop the pedestal in the nineteenth century, artists naturally started looking around at the broader frame of arts containment… [The Light and Space Movement] approached architecture as a found object, creating a series of rooms that incorporated architecture and architectural structures directly into their art*' (Auping, 2011, p.109)

Moving away from the restrictions of the canvas, Irwin began to explore the 'incidental, peripheral and transitory properties of architectural space' in his work (Weschler, 2008, p.114). In contrast, site-specific work 'is linked to the incursive of 'surrounding' space, 'literal' space or 'real' space into the viewer's experience of the artwork' (Kaye,2000, p.25), Irwin adopted a site-generated approach: 'Instead of my overlaying my ideas onto that space, that space overlaid itself on me' (Weschler, 2008, p.154). In essence Irwin began to let architectural space speak to him and inform the direction of his practice. This can be seen clearly in his 1977 installation in the Whitney Museum, New York, *Scrim Veil – Black Rectangle – Natural Light.* A understated intervention in the existing architectural space, Irwin recalls of the exhibition, 'People would step out of the elevator, say, 'Hmm, empty room,' and hop back in before the doors shut' (Kennedy, 2013, p.C1). Specifically made for the museum's fourth floor, the installation dealt with the subtleties of the existing architecture through the use of a white polyester scrim, a black aluminium beam and a black line painted

on the wall, and nothing more. The installation was considered such a seminal work that Donna De Salvo, the museum's chief curator, reinstalled the artwork in its original site before the Whitney moved sites. *Artforum* described the 2013 reimagining as follows: 'Though pitched at epic scale, Irwin's intervention achieves an exquisite sort of understatement, its existence a plea for us to pause, linger, and actively look' (Fiske, 2013).

In this study specifically, the concept of the architectonic is applied in a number of ways. Most importantly, the realised body of artwork is inspired by the architectural quirk, an idiosyncratic aspect of the architecture's 'personality' or essence. This can be compared to Robert Irwin's definition of site-generated artwork, in which the 'architecture dictates the possibilities of [artistic] response' (Weschler, 2008, p.197). Furthermore, each of the projects is related to the scale of the architecture, either in reference to the precise space from which the artwork was inspired and consequently installed, or as a 1:1 scale replica or manipulation of an original architectural feature. Finally, the work can be seen as architectonic in its desire to highlight a specific architectural quirk through the realisation of an artwork that emphasises, exaggerates or preserves this particular feature.

2.3 Data capture

Data Capture is the process of gathering scientific, numerical or digital information, primarily from an automatic device, control system or sensor. Used in contemporary art, data can range from the microscopic, such as the recording of blood cells, to the planetary, in which landscapes are scanned to generate a digital model of the earth's surface. Dan Holdsworth works with the latter in his *Transmission* series, appropriating digitally rendered topographical

data into photographic wall works through collaboration with the geomorphologist (Holdsworth, 2012). Glass artist Norwood Viviano translates data from LiDar scans to create 3D glass casts of scaled cityscapes (Harty, 2013, p.12). At a smaller scale, Saraceno's *14 Billion* precisely translates a black widow spider's web into a 16.66:1 scaled architectonic installation. By following a precise set of coordinates created through 3D scanning an original web, 11,987 black strings and 6593 individually tied junction knots were precisely mapped in the architectural space (Arrhenius and Granström, 2011, p.153).

Geoffrey Mann reimagines everyday 'crafted' objects through digital technology and manufacture. He uses data capture techniques such as 3D scanning, stop-motion photography and sound recording, the latter of which is used to manipulate a tradition table setting in *Crossfire* (2010). Data capture for *Crossfire* begins as an animated video of a table setting upon which sound waves traverse, deforming the objects as the argument escalates. The objects are physically realised by extracting 3D models from animation stills at and reproducing them through digital manufacture. Rooted in the field of craft, Josiah McElheny began as a glassblower before moving on to a career as a contemporary artist. *An End to Modernity*, his re-imagining of the 1960's classic Lobmeyr chandelier in the Metropolitan Opera House in New York, utilized data capture to portray the theory of the Big Bang from which it was originally abstracted. However, 'the idea is not that science would be legible to the viewer' but that the use of so much data would create 'a new kind of hybrid object' (Rothkopf, 2005, p.62). The above artworks are examples of data capture used in contemporary art, craft and design. In this research, data
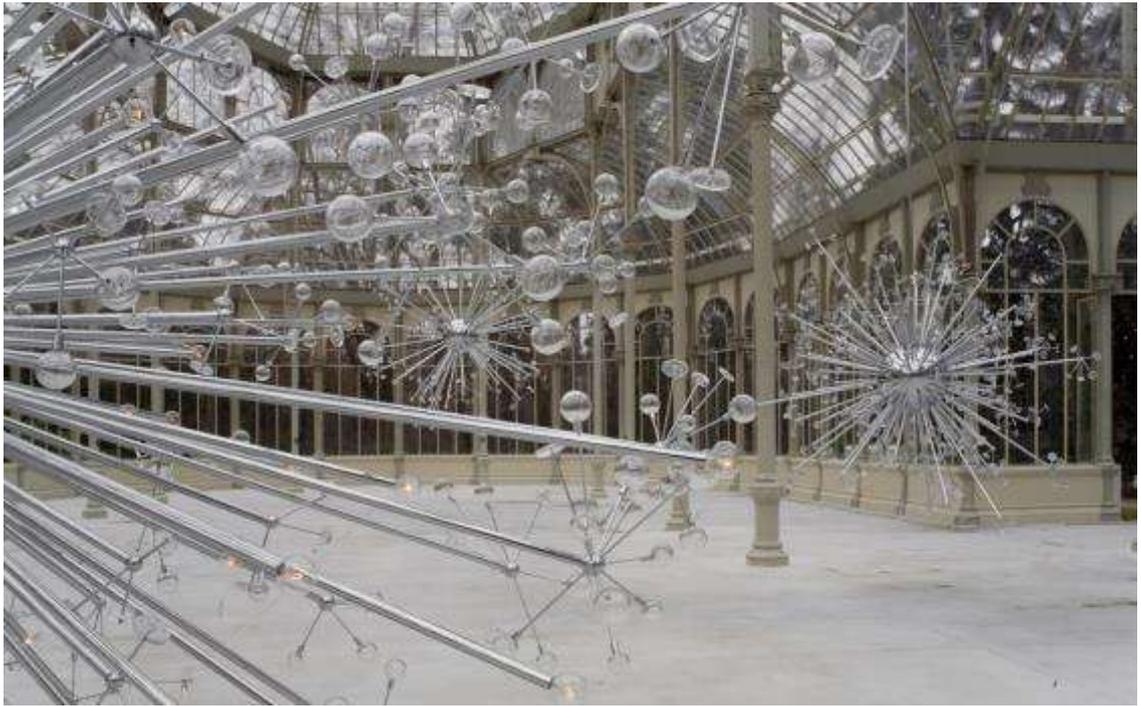
Figure 11 Josiah McElheny, *An End to Modernity,* **2005, Blown and pressed glass and chrome plated aluminium**

Figure 12 Ryan Gander, *Self Portrait X,* **2012, Toughened glass, paint**

takes on a broader definition, particularly in the installation and performance

artworks. To explain further, the quirk of the architecture is the subject from

which the data is captured. The quirk is also related to personal experience and

may be transient or invisible, representative of an emotional connection, or a

relationship rather than a physical thing. It can be argued that data capture does

not necessarily mean the collection of only quantitative information, but also

qualitative. Collecting information, in whatever form, is carrying out data

capture.

An example of this more poetic or abstract form of data capture can be seen in

George Perec's *An Attempt at Exhausting a Place in Paris* (2010). In it the

author observes a Parisian square for three days, noting the daily happenings in

his field of vision. Perec wonders 'what happens, when nothing happens other

than the weather, people, cars, and clouds?' (2010, p.3). What happens could

be understood as not much: mostly the passing of buses, friends and pigeons.

But what is interesting about this obsessive surveillance, this observational data

capture, is the occasional revelation of Perec's personality. For example, Perec

slips into a reverie while watching parking cars:

> *What difference is there between a driver who parks on the first go and*
> *another…who only manages to do so after several minutes of laborious*
> *efforts? This provokes attention, irony, the participation of an audience:*
> *to see not just the rips, but the fabric (but how to see the fabric if it is only*
> *the rips that make it visible: no one ever sees buses pass by unless*
> *they're waiting for one, or unless the Paris City Transport Authority pays*
> *them a salary to count them…) (Perec, 2010, pp.33-34)*

Here we glean not an isolated view of the square, but a view of the square

through the eyes of the writer. We begin to realise that this is not just a cold

recording of 'stuff', but a phenomenological reading of a site. Perec's work is 'an

artefact of the street, ushering the reader into a spontaneous phenomenology of

words, conventional symbols, numbers, fleeting slogans, trajectories, colors, and, as he more technically describes them, means of locomotion, means of carrying, means of traction, degrees of determination or motivation, and body positions' (Morse, 2010).

Ryan Gander's *Self Portrait X* (2012) is another example of a non-traditional form of data capture. Every day through the month of September 2011 Gander painted a self-portrait. Instead of displaying the paintings themselves, Gander instead exhibited the thirty glass plates that he used as painting palettes. From this the viewer can determine what and how much of each colour was used, abstracted data left over from the process of painting. Gander says it is 'nice to have missing bits as it allows the viewer to imagine their own painting… If I hand it to you on a silver platter you won't like it. You can choose to engage or not. By leaving blanks there is room for you' (Wright, 2012, p. 24)

This study will make use of data capture to gather information from and about architecture. It will use the architectural quirk as a point of departure to create either a literal or abstract manifestation of a building's phenomenological essence.

2.4 Digital Technology

In the majority of artworks I have made using glass, captured data is processed and used to create images, shapes and forms on a computer, and output as physical objects through code-driven machinery. It is relatively easy to access digital design and manufacturing technology with fabrication workshops widely available locally and online. With over 30 different materials available for printing, including glass, companies such as Shapeways allow consumers to remotely design and then order their 3D printed product to be delivered

worldwide. Workshops such as Fab Labs and Tech Shops offer consumer access and training in 3D modelling and rendering, animation, CNC machining, waterjet cutting and laser cutting.

At the University of Sunderland Glass and Ceramics Department, research projects have made use of a facility with 3D modelling and rendering, vinyl cutting, small scale 3D printing, ceramic decal printing, laser and waterjet cutting. Cutler (2006) pioneered the use of waterjet machining in the glass art context. Previously little knowledge existed on the use of waterjet for creative glass, and what did exist was focused primarily in only the practical issues of cutting the material. Cutler (2012) has since made the first survey of the use of technology for glass art applications. Troli (2011) decorates Cutler's findings through an example of how waterjet cutting may be used to produce Scandinavian-inspired flat-pack home ware. At Swansea Metropolitan University, Doolan (2012) merges waterjet cutting and CNC machining techniques to produce complex forms. Doolan draws upon her background as a glass-maker, using mathematical modelling techniques to generate forms which are cast in glass. Doolan's research explores CNC milling as a means of direct transfer of digital information from computer to cast glass object. Research from the Autonomatic group at University College Falmouth is focused on digital craft. In his *One Liner* series, Tavs Jorgensen uses digital technology to record physical movement as data, manipulating it to manufacture a variety of forming tools for glass. The results are unique glass objects that are a hybrid of craft, design, and digital technologies (Cutler, 2012, p.21).

Technology in the glass community is 'more ubiquitous than ever (Harty, 2013, p.12), highlighted by the Glass Art Society's recent introduction of a *Technology*

Advancing Glass grant, and a 2015 annual conference with the theme of *Interface: Glass, Art, and Technology*[1]. New forms of digital manufacture in glass are being developed by the *Mediated Matter group at* the Massachusetts Institute of Technology (MIT)[2]. A member of the group, Markus Kayser, has pushed the boundaries of 3D printing glass in his *Solar Sinter* (2011). The project has received numerous awards for innovation in product design and glass, including the European Glass Context New Talent Award. By appropriating the desert's most abundant resources, Kayser built a solar-powered 3D printer driven by a Fresnel lens instead of a laser, 'to trace lines in a bed of sand, raising the temperature above 1,400° C in order to melt the silica sand particles, creating glass'(Warnier et al., 2014, pp.188-189).

Exhibitions such as *The Power of Making* at the Victoria and Albert Museum celebrate new technology as well as traditional making (Charney, 2011). The AHRC funded research group 'Past, Present and Future Craft Practice' explored new directions, practices and perspectives in contemporary crafts, which helped to define a context and a new relevance for craft in the 21st century (Valentine + Follett, 2011). Finally, the *All Makers Now?* Conference, organised by Autonomatic in 2014, explored craft values in 21st century production[3]. The conference proposed and critiqued 'a new vision for craft where makers…harness the powers of digital technologies to create, co-create, collaborate, make and sell' (Bunnel and Marshall, 2014, p.4). Jayne Wallace discussed the possibilities of digital technology 'enabling people who often feel voiceless…to articulate profound personal meanings' (Wallace, 2014, p.17).

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[1] Erin Dickson won one of three inaugural TAG grants in 2014 and also lectured at the 2015 technology themed Glass Art Society conference
[2] Michael Stern, Shreya Dave, Markus Kayser and John Klein, a research team from MIT also won one of three TAG grants in 2014
[3] Erin Dickson and Jeffrey Sarmiento presented the paper *Emotional Leak: Collaboration in glass and monumental 3D printing* as part of the conference

Figure 13 Markus Kayser, *Solar Sinter,* 2011, Video, glass and machine

Figure 14 Geoffrey Mann, *Crossfire,* 2010, Video, ceramic, stainless steel and glass

Artists working with digital technology in glass include Jeffrey Sarmiento and Geoffrey Mann. What is distinctive about both artists is their use of technology as a *tool* for the production of artwork, and not as a representation of the technology as seen with some other artist's projects, such as Michael Eden. Kim Harty expands:

> *Although 3-D technology is becoming a mainstream art tool, one of the challenges artists face with the newfound accessibility of 3-D fabrication facilities is utilizing them to create artwork that is meaningful, not simply novel.* (2013, p.12)

Both Sarmiento and Mann use digital technology to form the glass for their artwork. The former manufactures 'large-scale cut and assembled glass sculptures', a process similar to completing a jigsaw, using 'waterjet cutting [and kilnforming]… to create low relief surfaces, fused together using precisely controlled kiln firing' (Sarmiento, 2012). The architectural façades in his *Baltic States* series are 'canny send-ups of late modernist architecture' (Yood, 2013, p.47), illustrating how a new society in the Baltic States is struggling to emerge from in the hulking remnants of its recent history (Sarmiento, 2011a, pp.75-98). Mann uses digital modelling techniques and CNC machining to realise the path of a bird taking flight in *Flight take-off* (2012) from his *Long Exposure Series*, which is then cast in glass. The artist states, 'I want people to forget about the process. First and foremost, you should be in wonderment at the object itself; how it was made comes second' (Mann, 2013, p.36). Although both Sarmiento and Mann's work bears the marks of its process of manufacture, the individual concept of the objects allows them to stand apart from it.

My interest in the use of digital technology stems from my involvement in the production of commercial and artistic waterjet design and manufacturing

projects at National Glass Centre. Projects realised include digital drawings and waterjet machining for Sarmiento's 2012 and 2013 exhibitions, as well as for *Permit Yourself…,* Cerith Wyn Evans' 2011 work for the 54th Venice Biennale, a mirror panel with a 68-word poem cut through its surface.

Figure 15 Cerith Wyn Evans, *Permit Yourself...,* 2011, Mirrored glass

Previous research in creative glass has used digital design and manufacturing technology in studies that contribute primarily to the practical advancement of CAD/CAM processes. This new research applies such techniques, but is instead focused on their capacity to record, translate and realise ideas in relation to architectural quirks.

2.5 Glass

As an art medium, glass is a fascinating material to work with because of the multiplicity of meanings its properties can express. As Codognato states, 'More than a physical material, it is a membrane, loaded with mystery and magic; fragile and resistant, rich in oxymoron' (2013, p.13). Glass is also a contemporary artistic medium, which until recently has been dominated by the Studio Glass tradition.

In his lecture '*W(h)ither Glass? The Next 50 Years*' (2014), James Yood compared four artistic mediums, printmaking, photography, ceramics and glass, and their relative progression over the last years in the world of contemporary art. While printmaking had been almost completely colonised by fine artists, losing importance as an independent medium because of its use in editions, photography flourished, achieving 'full assimilation into high art' (p.31). He believed that the traditional craft materials of ceramics and glass have been compartmentalized by their relative 'legacy of functionality' leaving the materials as 'largely a separate discipline…with only occasional spill over in the high art world…a wonderful cocoon of self-selected separateness' (ibid, p.32). This opinion was echoed by Adriano Berengo in an infamous interview with Yood in 2011. When asked why few Studio Glass artists were included in Berengo's Venice Biennale satellite *Glasstress*, Berengo responded:

> *I admire much of that work, but if the Studio Glass movement made a mistake, it was to make a world apart, to engage in an insularity that created, if I may, a kind of material masturbation, more interested in how things are made than about what is made.* (Quoted in Yood, 2011, p.41).

Berengo developed *Glasstress*, to 'expand the possibilities of the material' and to 'bring it to creative minds outside of those trained only in glass' (ibid).

Glasstress was one of two exhibitions at the Venice biennale in 2013 that exhibited sculpted works in glass from artists who were in no way connected to the Studio Glass Movement. The other, *Fragile?,* held at Fondazione Cini, included artists such as Ai Wei Wei, Gilbert and George, Gerhard Richter and Rachel Whiteread. One of the most important works in glass by a fine artist was *Air de Paris* by Marcel Duchamp (1919). His best-known work *Fountain* (1917), an overturned urinal signed R.Mutt, is an exemplar of artistic nominalism; the object is art because Duchamp named it as such (Petry, 2011, p.8). Equally irreverent, *Air de Paris* presents a pharmacist's bottle filled with Parisian air, an empty glass vessel made important by an idea.

> *Due to its transparency, glass was considered by [Duchamp] as the best material for an interaction with the background and for a double…interpretation of the work of art. Duchamp used the physical concept of transparency to attribute the glass a multitude of meanings.* (Giubilei, 2014)

For Duchamp, It was the idea behind the use of the material, and not its physical manipulation, that was most important. The idea was reiterated in what the artist considered his most important work, *Large Glass* (1923), which when damaged during transport, was not restored as the work 'does not reside in its physical substance' (Codognato, 2013, p.65).

Figure 16 Marcel Duchamp, *Air de Paris,* **1919-1939, Glass**

2.5.1 Glass and materiality

The phenomenology of material is a key component of this study. With distinctive properties including transparency, fragility, reflection, refraction, colour depth and distortion, glass can be applied in a range of contexts from the everyday to the extraordinary. Glass can be found in our homes, from drinking vessels to windows that allow light to enter the interior. As the transparent skin of skyscrapers in architecture, monumental glass walls reflect the city surrounding it, or on a small scale form a touchscreen interface for a smartphone. When working with glass one considers its myriad of material properties, some of which are shared with other media, and in the broader field of sculptural practice these properties have been used to express certain conceptual ideas.

Roni Horn works in photography, drawing, painting and sculpture, to realise various projects. Although process is a key part of her methodology, Horn believes the embodied experience is central to the success of the artworks:

> *I have this idea that each work should be unto itself. You walk in, you engage the experience, you leave: that's it…If you say that the viewer's experience is a big part of the realization of the work, then you have to tune in on that…possibility* (Cooke, De Duve and Horn 2000, p.20-22)

Horn's glass works, although embracing elements of process to realise her ambitious plans, defy the 'material masturbation' of Studio Glass. Cast into cylindrical and rectangular solid forms, the glass is used primarily for mass, transparency and light. *Pink Tons* (2008) best expresses the distinction between the crafted and the art object in glass. An impressive feat of craftsmanship, the 1.2m cube shows visible cracking, and might be seen as a failure to the craftsman who made it. Despite this, the flaws are seen as an intrinsic part of the work:

Figure 17 Roni Horn, *Pink Ton,* 2008, Solid cast glass

Figure 18 Javier Perez, *Carroña,* 2012, Murano glass and stuffed crows

> *…an accidental but infinitesimal flaw in the surface that creates an effect of massive turbulence in certain lights and absolutely none in others. Depending on the angle of view, glass has a surface of either razor sharpness or infinite depth* (Fer, 2010, p.35).

In Javier Perez's *Carroña (*2011), Spanish for carrion, a large red archetypal chandelier has been dropped to the floor and smashed, surrounded by feasting stuffed crows. Made by Murano glassblowers for *Glasstress,* the creation and destruction of classic Italian craftsmanship is an 'alteration of tradition' because of its performative nature. The chandelier has been transformed into a dying beast, 'the pieces of red glass [causing] the sensation of looking at the remains of a large animal, dead in a pool of blood' (Giubilei, 2014).

Other artists who have worked with damaged glass include Maya Lin's *Groundswell* (1993), Tara Donovan's *Untitled* (2001), Pipilotti Rist's video *Ever is Over All* (1997), Barry Le Va's *Set I A placed B placed…* (1968) and Monica Bonvicini in *VSG* (2004). This use of imperfect glass expresses a move away from the traditions of Studio Glass and instead a focus on the material's distinctive properties.

Another of the key characteristics of glass is its reflective qualities, which among other materials is used as a tool for the distortion, manipulation or the 'bringing-in' of ourselves and our physical surroundings. Ryan Gander's *more really shiny things that don't mean anything* (2011), reflects its surrounding through a myriad of 'shiny stainless steel components of various sizes and shapes' (Gander, 2014, p.507). The work has been installed in the city of London and in the sculpture garden of the Ordrupgaard Museum in Denmark; two contexts with two very different audiences. Gander believes the work 'does not have stationary meaning, it changes according to context and who views

it… there's hundreds of thousands of millions of endpoints of stories. But the starting point is stationary and singular and that's a catalyst for these stories to be told' (Ordrupgaardmuseum, 2014). Eliasson utilises mirrored glass, often with kaleidoscopic effects, to integrate the viewer with their surroundings. These include *Your Invisible House* (2005), *Mental* (1993), *Seeing Yourself Sensing* (2001) and *Mikroskop* (2010). Daniel Birnbaum, Director of the Museum of Modern Art in Stockholm, says Eliasson's work 'introduces a surprising split-screen effect where the actual and the reflected surroundings coexist, simultaneously but differently' (Brendel, 2010). Finally, Anish Kapoor's *Cloud Gate* (2004), a public sculpture based in Chicago's Millennium Park, is 'one of the largest, most popular, and, at $23 million, most expensive public sculptures in the world' (Kent, 2008). More commonly known as 'The Bean', it has become a tourist magnet since its opening in 2005 as viewers capture their image in its mirrored surface alongside the distorted cityscape. What each of these artists achieves in their use of reflective material is the willing participation of the audience with the artwork. Like magpies, we are often drawn toward reflective surfaces and their distorting properties., where we are reflected in our environments, placing us in a sculpture park, a gallery or in the centre of a metropolitan city.

2.5.4 Placing my practice in the contemporary glass field

Artist and researcher Jerome Harrington attempted to visualise the state of contemporary practice in glass. *Glass in the Expanded Field* (2011) placed 100 examples of international glass artists' work, made since 2000, in a diagram inspired by Rosalind Krauss' *Sculpture in the Expanded Field* (1979). It revealed 'the breadth of work that the field encompasses' (Harrington, 2011, p.8). In fact, over 10% of the mapped works are defined as 'outliers', works that

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sit outside the mean and represent an estrangement to the original values of Studio Glass.

Harrington found that the field of glass art and terms such as 'glass artist' are denying 'the opportunity to embrace and understand new developments… diminishing newness and mitigating difference' (ibid, p.10). He continues:

> *[…] the best of these works move beyond a simply oppositional stance and transcend the field's systems of exhibition, commission, or criticism, whereby the context of glass as an area of activity falls away, and the works stand in their own right, as works of art* (ibid, p.11)

He states that the outliers belong as much to other art practices, such as performance or conceptual art, as they do to Studio Glass. He also echoes Krauss' findings that although it is relatively easy to place a single artist's work in the scope of the diagram, often artists find themselves 'occupying, successively, different places within the expanded field' (Krauss,1985, p.288).

Harrington was asked to place each of the four bodies of work from this research into the original diagram. He was provided with an image or video of each individual work and a brief supporting description. This placement served to contextualise the work amongst the artists already included, thus gaining a perspective of where they sit in the field of glass (Figure 19).

The works did not sit together but rather occupied a number of areas. *Emotional Leak* (2011) is situated furthest away from the Studio Glass tradition, alongside works such as Tiina Sarapu's *The Light and Silence of Sound* (2009), an installation involving the light and shadow created with a cluster of mirrored glass. Closer to studio glass, *Window* (2012) occupies 'prioritised concept' at the right side of the diagram.
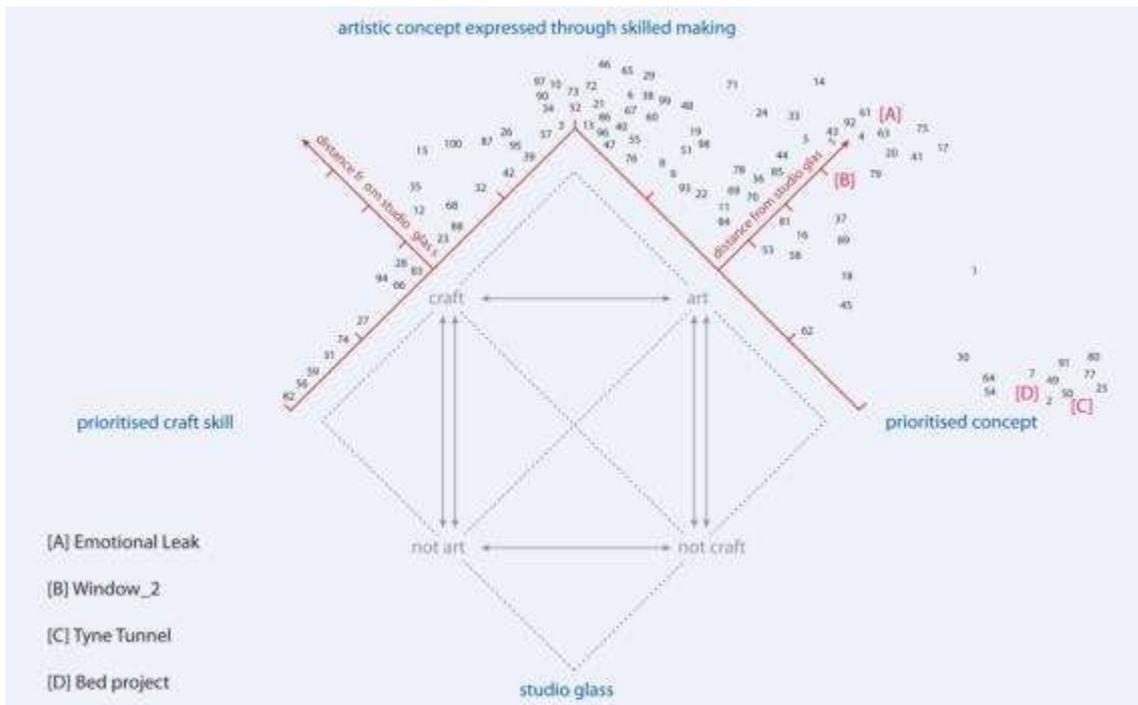
Figure 19 Jerome Harrington, *Glass in the Expanded Field,* 2011 (See Appendix 5)

Figure 20 Tiina Sarapu, *The Light and Silence of Sound,* 2009, Mirror and music stand

Tyne Tunnel (2012) and *Bed Project* (2013-) sit comfortably in the 'outliers' (Harrington, 2011, p.8), with Marc Barreda's *Sea Glass* (2011), McElheny's *Conceptual Drawings for a Chandelier, 1965* (2005) and Harrington's *The Glass Archive* (2005). This indicates a shift in the practice during the period of research, from the making of sculptural glass objects to more ephemeral and sensory works based on the phenomenology of material.

Glass in this research is applied both as a crafted material and also as a ready-made material. In both cases glass has been used mainly for its physical and phenomenological properties to emphasise aspects of reflection, refraction, colour depth, transparency and fragility, amongst others, and how it is made is secondary to the artistic concept.

2.6 Summary

In this review I have investigated the key elements that define my practice and this study. The identification of architectural quirks can be discussed as an interpretation of architectural phenomenology. In the context of my work this relates to intimate spaces expanding on the concept of the home. The architectonic artworks use buildings and other built sites as a point of departure. An expanded definition of data capture describes ways in which a site is translated. Digital technology drives the translation and realisation of the works. Finally, glass is discussed as both a material with phenomenological qualities as well as a material within and outside of a field of art practice. The following three chapters analyse bodies of artwork that address how glass can be used to visualise architectural phenomenology.

Chapter 3 - Interpretations of home: Architectural quirks visualised through waterjet cut glass sculpture

The artworks in this chapter express the phenomenology of two of our most frequented architectural sites: the home and the workplace. Inspired by a leaking roof, *Emotional Leak* and *Window* both relied on digital modelling for the translation of a quirk and the precision of waterjet cut glass for their realisation. The resulting sculptures are very different in terms of form, content, scale, mass and colour density. This chapter will explore how an adapted architectural methodology was used to interpret architectural quirks, and how the application of digital modelling and manufacturing techniques produce a broad range of outcomes for large and medium scale glass sculpture. In the interpretation of the work, ideas about colour, materiality and metaphor are discussed.

3.1 *Emotional Leak*

Erin Dickson and Jeffrey Sarmiento
Waterjet cut float glass, metal, rubber
Height varies x 136 x 136 cm
2011-13

Emotional Leak is a large sculpture, inspired by a quirk in the architecture of National Glass Centre, Sunderland, where I study and work. It was originally commissioned for the *Kith and Kin* exhibition in Sunderland in 2011, modified and reinstalled in London in 2013 and Venice in 2014. Constructed from individual glass plates stacked from floor to ceiling, the precise contours of the leak were waterjet cut using high pressure water. The collaboration provides a perspective on the shared phenomenological experience of space. This section exposes the context, content, and outcomes of the sculpture, reflecting on its potential interpretations.

Figure 21 Erin Dickson and Jeffrey Sarmiento, *Emotional Leak,* **2011-2014, Glass and steel**

Figure 22 Erin Dickson and Jeffrey Sarmiento, *Emotional Leak (Detail),* **2011-2014, Glass and steel**

Figure 23 Erin Dickson and Jeffrey Sarmiento, *Emotional Leak (Detail),* **2011-2014, Glass and steel**

3.1.1 Intimacy from insignificant details

> *There is also the courage of the writer who braves the kind of censorship that forbids 'insignificant' confidences. But what a joy reading is, when we recognize the importance of these insignificant things, when we can add our own personal daydreams to the 'insignificant' recollections of the author! Then insignificance becomes the sign of extreme sensitivity to the intimate meanings that establish spiritual understand between writer and reader. (Bachelard 1969, p.71)*

This text is a personal phenomenological reading of National Glass Centre based on my previous experiences of what could be called academic or university architecture. Although it may initially seem inconsequential to the reader, such details can be important in moulding our experience of place. They can lead us to intimacy (or lack thereof) with the site. I hope that by describing these details and why they became an important part of my experience, the reader might also relate to the significance of the insignificant things that connect us to architecture.

Prior to joining the University of Sunderland at National Glass Centre (NGC), my only experience of an academic institution were three years at Architectural Association School of Architecture in London (the AA). In Chapter 1, I briefly introduced my conflicting impressions of both buildings. Despite the similar functions of the two sites, I quickly formed a strong connection to the NGC whereas I intentionally avoided the architecture of the AA. The AA campus was not built for academic purpose, similar to NGC. The way in which the students were housed in these two buildings was radically different[4], and could explain how one place could promote intimacy, while the other a feeling of foreboding.

At the AA, each project cohort of about 12 students was assigned a classroom for a year. The room was also assigned to a second cohort, so a total of 28

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[4] The AA buildings, like most of the sites in this study, has since undergone a major refurbishment.

people share one room that was less than 16m^2. The room was a student's hub of interaction with fellow classmates and their two tutors. The room quickly filled with models and drawings, leaving no working area. If this 'home' space for the year is uninhabitable, it affects one's relationship to the entire institution. There was nowhere to work or to socialise with classmates; nowhere to sit for lunch or for a private conversation with your tutor. Most importantly, no architectural space existed with which to make an intimate connection. The AA made me feel alone and isolated; I could not form an intimate bond with the building or those inhabiting it, so the architecture was unable to 'speak' to me.

In contrast, I was designated my own space to work at National Glass Centre. This seemingly insignificant difference encouraged me to form a physical and metaphorical anchoring point. I was able to spend as much time as possible in one specific workspace. Beyond my desk, I could easily socialise with other staff and students, and these friendships encouraged me to spend even more time in the building. I began to form an intimate relationship with the architecture and came to see it as a home away from home. I also began to recognise and appreciate architectural quirks within a cultural venue and university housed in a former factory.

De Botton (2006, p.25) believes that in order to appreciate the subtleties of architectural experience we might first 'need to be a little sad'. This theory would explain why NGC became an intimate site following the isolation felt at the AA. The phenomenology of the architecture of the AA campus is an inextricable influence in my relationship with the NGC. As Bachelard explains, 'an entire past comes to dwell in a new house' (1969, p.5). Something as insignificant as a desk can be the catalyst of an emotional and sensory experience of

architecture. The insignificant details that tie us to one place and not to another are unconscious points of phenomenological reference left over from architecture that we have experienced in the past.

Albert Mehrabian uses the terms approach and avoidance as ways to consider our connection with architecture. He states that 'a particular environment can cause an emotional reaction, and that these reactions can cause a person to approach or avoid an environment to a greater or lesser degree' (1976, p.9). Mehrabian explains that these reactions to an environment are open to manipulation: we are able to make ourselves 'happier, more comfortable, freer, and more productive' by changing the space which we are occupying (ibid., p.VIII), and we are also able to attempt to manipulate the emotional reaction of others, with varying degrees of success (ibid., p.7). An example of this may be a dentist's waiting room. A welcoming environment may instigate an approach reaction by those unscathed by the thoughts of the dentist's chair. However, the same pleasant surroundings will not promote comfort in a patient who is already anxious .

The effect of a site on our emotions can be accidental, even as we strive to create an environment of comfort and approach, and not of avoidance. The architecture of the AA offered little free or flexible space, so students were squeezed in where possible. As an unintended consequence, students like me tended to avoid the building even though the AA campus is generally considered as one of the best-preserved examples of Georgian architecture in London. In contrast, according to Birch (2013) the NGC building 'isn't particularly welcoming', and yet I found it more intimate. Our phenomenological connection is not determined by how 'good' the architecture is, but rather by the

quality and depth of the experience. Ballantyne (2002, p.115) describes this distinction:

> *We like to see great buildings around the world as the clearest expressions of one lofty ideal or another…But there are also pleasures closer to home, which may be no less intense, involving feeling of rapport with a place, which may involve a surprising range of contradictory emotions involved in any long term relationship.*

Here architecture is anthropomorphised to emphasise our relationship to it. One could argue that I became intimate with the architecture of NGC because it acted as a contrast to my previous negative experience in the 'beautiful' architecture of the AA campus. Inhabitation has nothing to do with the 'charms of external beauty' (Bachelard, 1969, p.107). In fact, the architecture of National Glass Centre was anything but beautiful; it was too cold in winter and too hot in summer, so vast that one can spend hours looking for tools or people. It was constantly dusty and, most importantly, leaky.

3.1.2 Converging and diverging mutual phenomenological experience

My intimate relationship with NGC stretched beyond the architecture, and I began to form important relationships with its residents. Perhaps the most important of those relationships was with Jeffrey Sarmiento, whom I began working for as an assistant in 2010, and consequently became my mentor and friend. When I was asked to create a sculpture for the 2011 *Kith and Kin* exhibition in the main gallery at NGC, it was Jeffrey with whom I wished to collaborate.

Figure 24 National Glass Centre, Detail of glass roof from inside
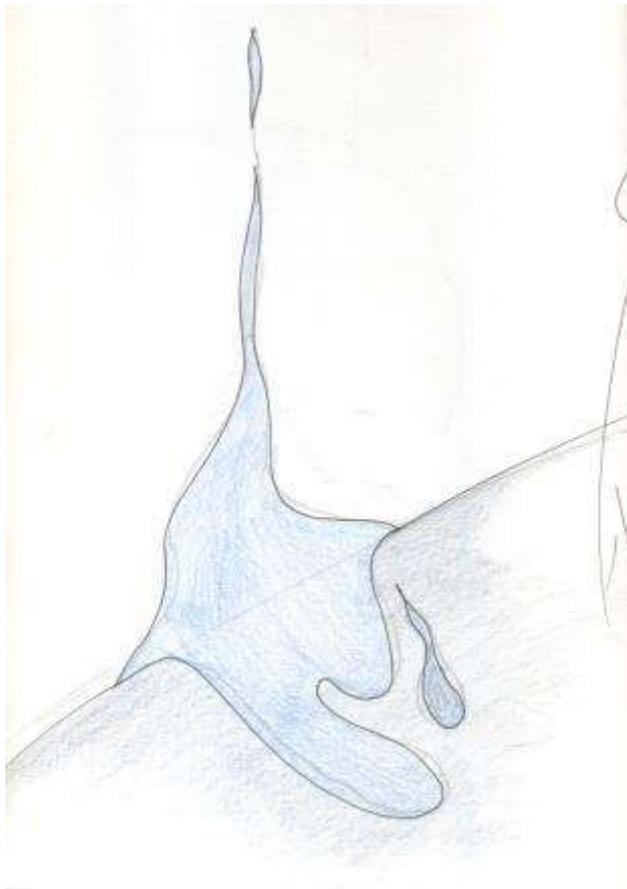
Figure 25 Initial sketch for *Emotional Leak*

Designed by Gollifer Langston Architects, National Glass Centre was built in 1998 in Sunderland, on the former site of J.L. Thompson and Sons shipyard on the banks of the River Wear. The building was originally built to house a glassblowing factory, Sunderland Glassworks Ltd, independent workshops for smaller scale designer production, galleries, a café and restaurant. Sunderland Glassworks Ltd. used the factory for only a short period, until the University of Sunderland (UoS) relocated its Glass and Ceramics department in 2000, where it continues to operate today. The building is constructed from concrete, steel and glass. Its main feature is a large glass roof, on which one can walk and look down into the building's restaurant, galleries and work spaces. The building is split into two sections: NGC, which is open to the public and occupies upper levels and the windowed façade facing the River Wear, and the University of Sunderland Glass and Ceramics Studio, which occupies the subterranean spaces.

At the time Sarmiento and I collaborated on this project, we had been based in NGC for 5 and 2 years respectively. Having spent a large amount of time both working and studying there, we developed a relationship with its atmosphere and 'personality'. This attachment to a workplace is not unusual, given that on average a third of one's day is spent in a place of work. Sarmiento started in 2006 as a Research Council's UK Academic Fellow, completing his PhD at NGC in 2011. He offered his opinion of the architecture:

> *[The building is] rubbish really, at least from the perspective of a glassmaker. Too much ventilation left over from the glass factory means it is hot and cold, drafty and dusty. I don't think of the exterior too much— I enter from the side where you wouldn't have any idea what it looks like…The lack of drains makes the floor impossible to wash, concrete terrible for knees and the location of the stained glass studio (up a flight of stairs) is ridiculous. In short, it's the best worst place I've ever worked in (Sarmiento, 2011b).*

My opinion was much the same. Although I had knowledge of NGC as a visitor, my relationship to the architecture of NGC began in September 2009 when I joined the MA Glass programme. The University's occupation of the factory building was at once both natural and forced. A national centre for glass seemed the ideal place to learn and work with the material, but the building was not designed for education. The university program was retrofitted into the factory program's envelope. Temporary platforms constructed to house student desks became wobbly permanent mezzanines, and computer rooms lacked appropriate ventilation. Despite these obvious flaws, Sarmiento and I enjoyed working there, uncovering its distinctive 'personality', and found the building had begun to reveal its quirks.

In this research, as stated in Chapter 1, a quirk is defined as a peculiarity or idiosyncrasy of a building's 'personality'. Architectural phenomenology is the embodied personal, sensory experience of space; an individual experience influenced by our unique social and cultural backgrounds. Yet an aspect of this project's realisation is that it was inspired by architectural phenomenology, but was in fact made in collaboration. Considering the superficial elements of Sarmiento's and my social and cultural background, it would be easy to assume that each of our experiences of NGC would be very different. Sarmiento grew up in metropolitan Chicago, USA, in the 1970s, as a middle class, first generation Filipino-American in a family of 6 (Sarmiento 2011a, p.15). In comparison, I was an only child in a single parent, low-income family, born in the 1980's in the suburban beach town of south Shields, north east England. Our ages, cultures, upbringing and social statuses were different; however our experiences converged in the realisation of this project.

Merleau-Ponty discusses the subject of the other as a tool which can be utilized as an extension of the phenomenological self. He states that one is able to experience more of the world through social interaction, allowing our perspective to 'slip into' one another's (Priest, 1998, p.104). He continues, '… my body is always perspectival – I never have an all-encompassing hold on the world; there is therefore room for other incarnate subjectivities, and their points of view compliment my own' (ibid., p.103)

Rather than creating confusion, the combination of phenomenological experience provides a more all-encompassing and enriching experience of the world. Ballantyne argues that phenomenological experience is filtered through acquired culture 'picked up from the culture that surrounds us…and the circles in which we move' (2002, p.111) and is not only inherited. At the time of working together, Sarmiento and I shared a work ethic influenced by our similar academic backgrounds[5], and an interest in the artistic interpretation of architecture in glass[6]. Most importantly we both worked and studied at NGC and shared a familiarity with its unique architecture. Because of this we can be seen to have *acquired* similar cultural perspectives. Also, the differences in our *inherited* cultures contributed to the overall sensory perspective of the site. Instead of only one phenomenological observation informing the translation of the quirk, two overlapping perspectives can be seen as providing a wider or 'more comprehensive' (Priest, 1998, p.104) view of the architectural space.

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[5] Sarmiento studied for his MFA at Rhode Island School of Design, while I received my RIBA Part I from the Architectural Association School of Architecture, both of which are renowned institutions in their respective fields. They also promote a culture of hard work and competition, creating an intense working environment.

[6] Sarmiento completed a body of work inspired by the facades of brutalist architecture in the Baltic states as part of his PhD research (2011a, p.75-98)

3.1.3 Poetic reading of water

The architecture we inhabit from day to day possesses imperfections that familiarity allows us to overlook. We interpret these flaws as an inextricable part of the architecture, just as we do with our loved ones and their personality quirks. We circumvent them, stepping over creaking floorboards or slamming closed stiff doors, without noticing the absurdity of our behaviour. De Botton (2006, p.13) believes this indifference to architectural decay is a coping mechanism formed to protect our emotions:

> *It is to prevent the possibility of permanent anguish that we can be led to shut our eyes to most of what is around us, for we are never far from damp stains and cracked ceilings, shattered cities and rusting dockyards. We can't remain sensitive indefinitely to environments which we don't have the means to alter for the good – and end up as conscious as we can afford to be… professions of detachment stem not so much from an insensitivity to beauty as from a desire to deflect the sadness we would face if we left ourselves open to all of beauty's many absences.*

However there is a point at which the architectural quirk demands our attention by causing such a level of inconvenience that it can no longer go unnoticed. This was the case for *Emotional Leak*, in that the discovery of the quirk was serendipitous as it made itself known through inconvenience, rather than a slow unearthing by the artists.

One of the key features of NGC is the glass roof. At the time of my inhabitation, the roof was expensive to maintain, and was often left unrepaired for long stretches of time. This allowed rain, a staple of the northern English climate, to enter both public and academic areas of the building. Stopping the leak by fixing the glass roof quickly became an in-joke within the community. When *Emotional Leak* was completed in 2011 and discussed during a seminar at the NGC the Director, James Bustard, proudly declared the leak in the roof that inspired

Emotional Leak to be fixed. A week later a new leak had formed. The flow of rainwater into the interior of NGC was not part of the architect's plan but an inevitable consequence of failed engineering, and the water took advantage of this weakness, trespassing into the building where it could. This infiltration of water came to represent the essence, or quirk, of the architecture of the NGC.

Water is distinctive in the impression it has made with a number of key philosophers and poets. Pallasmaa considers water a 'phenomenal lens, with power of reflection, spatial reversal, refraction, and the transformation of rays of light' (Holl, Pallasmaa and Peres-Gomes, 2006, p.80). Merleau-Ponty discussed the essence of water, emphasising that the importance of the element lies 'less in [its] observable properties than it what [it] says to us' (2004, p.49). The French essayist and 'poet of things' Francis Ponge wrote several poems on the 'voice' of both rain and water. Following is an extract from his poem *Water*:

> *[…] persistent in its one vice, gravity…twisting, piercing, eroding, filtering…water collapses all the time, constantly sacrifices all form…flattens itself on the ground, like a corpse…Water eludes me…slips between my fingers…water escapes me yet marks me, and there is not a thing I can do about it.* (1972, p.50-51)

Here Ponge has attempted to anthropomorphise water, describing its properties and distinct behaviour in minute detail in order to give this inanimate element a voice and, as a consequence, a 'personality'. Miller observed of Ponge's poem *Plants*, 'we feel in reading [Ponge] almost as though it were the plant which spoke to express miraculously, without human intervention, its personality' (1947, p.214-220). Water also has unique sensory properties, especially when it comes to the framing of space through sound:

> *Anyone who has become entranced by the sound of water drops in the darkness of a ruin can attest to the extraordinary capacity of the ear to carve a volume into the void of darkness. The space traced by the ear*

becomes a cavity sculpted in the interior of the mind. (Holl, Pallasmaa and Perez-Gomez, 2006, p.30)

Similarly, the volume of the architecture of NGC was carved and delineated by the leaking roof. One was able to ascertain an abstract distance from glass ceiling to concrete floor from a single drip of water, which drew a visual and audible line through the space. The leak enticed the gaze to move overhead into space which normally did not elicit attention, highlighting parts of the architecture which were usually forgotten. The water also influenced how fellow staff and students occupied the space. They navigated around buckets placed under each of the leaks, and moved objects out of the way when new leaks developed. Most importantly, though, the leak was never seen as an inconvenience, instead the various inhabitants of NGC embraced this idiosyncrasy as just another intrinsic part of the architecture, as necessary as the roof. This quirk increasingly touched me personally, and I could no longer ignore it when a leak developed over my artwork in the gallery and the work was subsequently destroyed. This point of personal revelation signified the final decision to choose water, or more specifically the leak, as the quirk for this artistic collaboration.

3.1.4 Collaboration and process

A sequence of processes enabled us to capture and visualise a leak inside NGC. Having identified the quirk of NGC, Sarmiento and I wished to visualise in sculptural form the motion and movement of the leak, the artwork serving as a metaphor for our intimate connection to architecture. We envisaged what might happen if an 'emotional leak' were to burst in the existing architecture, revealing a bubbling surge of glass emanating from its ceilings and rising from floors. According to Ponge, water 'constantly refuses to assume any form' (1942,

p.50); in the case of the leak the water was also in constant motion, falling endlessly from the glass roof. To capture this and translate the quirk into a physical artwork posed a challenge. If the falling water were to be literally captured, the growing body of water would assume the shape it had been contained within, losing its kinetic and formless properties. Therefore a process of recording this aspect of a leak's accumulation and dynamic form needed to be developed. Sarmiento and I also had to choose an approach of realisation, which would in turn inform the method of data capture. Stop motion photography was used to record the accumulative nature of leaking water through the growth of a puddle over a period of time. This formed a layered set of animated images depicting the 'collapsing' (Ponge, 1942, p.50) and growing mass of water, capturing the essence of the leak.

Prior to collaboration, Sarmiento and I had worked extensively with waterjet cutting for glass. Sarmiento had worked in glass for 15 years, mastering a wide range of studio glass techniques. At the time, Sarmiento's personal body of work uses printing, precise cutting and kiln-forming processes to create two-dimensional architectural imagery from coloured, opaque and transparent glass. In my practice, I focused on the construction of 3D objects from 2D planes of cut glass; a precursor to *Emotional Leak* can be seen the form and technique behind *The Gilt Sticks to Our Fingers (See p.215).* Having worked with glass for only two years prior to this research, my relative lack of knowledge produced mixed results, and the sculptures were often fragile and difficult to transport. As Sarmiento's studio assistant, I applied digital drafting skills to his existing jigsaw processes, achieving complex and intricate designs, as well as improving my glass manufacturing skills. For this collaboration in particular, my creative role can be seen in the conceptual theme of the artwork as well as its method of

design, manufacture and construction. Sarmiento's role was in the successful application of these methods and as material expert. Our combined role included the decision of the final form and its colour.

The narrative on the following pages illustrates the digital and physical making process behind *Emotional Leak.*

3.1.5 Process narrative

1. The leaking roof of National Glass Centre inspired Emotional Leak. Although the leak was seen as a flaw of the building, staff and students embraced the flaw with good humour, jokingly floating ducks in buckets full of water and accepting the leaks as part of the architectures fabric, or personality.

2. In order to capture a leak within the NGC, a mock-drip was installed within the building. This setup allowed for an accurate recording to be made of the accumulation of liquid through stop motion photography, as it was possible to control the amount of liquid falling over a period of time.

3. Approximately 360 photographs were taken over the course of an hour, one taken every 10 seconds, in order to create a detailed recording of the growth of the resulting puddle.
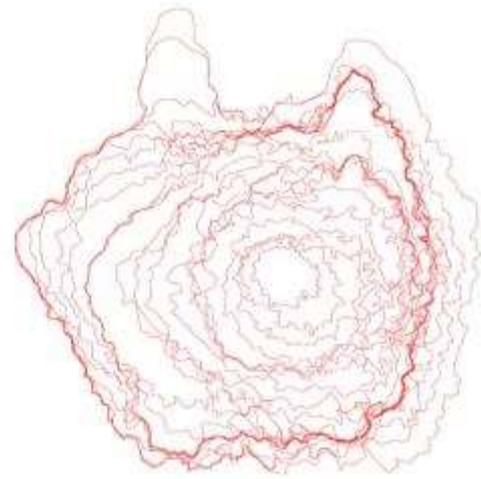
4. A cross section of 20 photos were chosen out of the 300 to be digitally traced using illustrator and AutoCAD. These drawings were then imported into Rhinoceros 4 for 3D manipulation.

5. The gallery space is measured manually and then 3D modelled in Rhino 4. This enables the artist to be able to design the artwork to fit precisely within the space of the gallery.
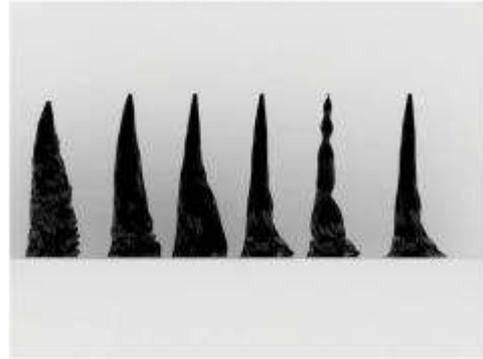
6. The traced contours imported from Illustrator are placed at equal distances within the space from floor to ceiling. They are then lofted to create a solid form. This form can be manipulated in several ways until the desired shape is achieved.

7. The final form is chosen, and tweaked to suit the artist. It can then be installed and rendered within the virtual gallery space. This allows the artist to visualise what the final object may look like before manufaturing has begun.
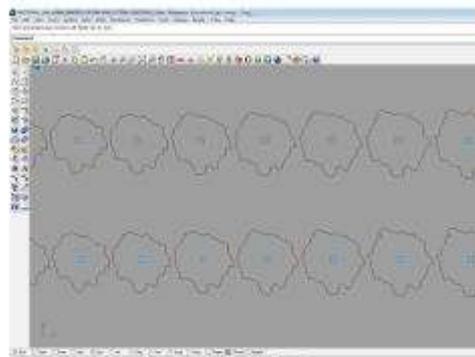
8. The final digital sculpture is sliced at regular intervals to create layered contours suitable for cutting on the waterjet. The layers are then seperated and flattened onto the same plane and each section is numbered, then exported for waterjet cutting.
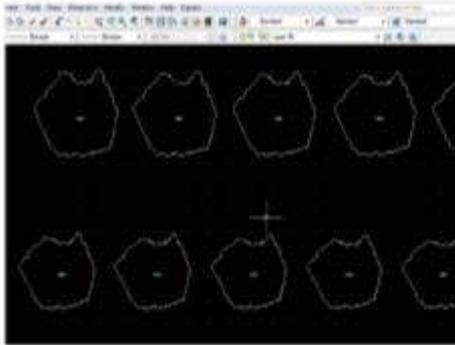
9. The contours are imported into Lantek/iGems, the software used for waterjet cutting. The drawing files are then checked for any abnormalities and nested within the confines of the glass sheet. This is then converted into a set of CNC instructions and loaded onto the waterjet console for cutting.

10. The waterjet etches a layer number and then cuts each part out of the glass sheet. Once the machine has cut all the parts it is possible to remove them safely from the waterjet bed.

11. The finishing process involves cleaning each surface of glass to remove any sand residue remove any watermarks. The edges are then treated with wax to darken the sandblasted effect left from cutting.

12. A steel base with a central sectioned spindle is manufactured for the glass to be stacked around. The base is cut to the exact shape of the first glass layer and has a thick rubber layer below and above it to provide stability on uneven flooring.

13. The layers of glass are carefully stacked around the central steel pole in reverse numerical order. The spindel is extended in sections until the full 3-4 meters is achieved.

14. The finishing process involves a final cleaning and waxing of any untouched surfaces.

3.1.6 Applying an absence of colour

The use of colour in art is an expansive topic. Although colour is not one of the primary subjects in this study, its possibilities for interpretation and meaning make it relevant for discussion in reference to *Emotional Leak.*

Colour can contain multiple meanings depending on what an artist is trying to portray. Prior to commencing this research, my art work was made primarily from industrial float glass, an uncoloured, transparent material. The reason for this was that in choosing a colour, I felt one is also choosing to represent any number of both known and unknown meanings. These meanings are even more complex given that colours can be interpreted in different ways according to their cultural context. Pallasmaa states:

> *Situation, climate, and culture may determine use and subsequent experience of colour. Further, we can imagine people having particular colour concepts based on the qualities of light and air in their site and situation.* (Holl, Pallasmaa and Perez-Gomez, 2006, p.61)

Our interpretation of colour is intimately linked to our cultural, social and time-based heritage, and not only do we inherit these associations, but we also respond to colours in individual ways (Zelanski + Fisher, 1989, p33). This individual interpretation of colour can be seen as an extension of the phenomenological philosophy of architecture, in that 'colour in architecture has to meet many different demands, concerning human experience as well as economic and practical issues' (Anter, 2008, p.1). Colour is sometimes even used deliberately to influence our behaviour and mood, making us move more quickly or slowly, feel more relaxed, eat more, increase productivity and even spend more (Haller, 2014). In comparison, a transparent, colourless material such as glass can be seen as having almost a complete lack of connotations

due to its inherently undefinable nature. One looks *through* glass. Therefore the decision to move from clear float glass, a material which because of its lack of colour has no intrinsic association, to a coloured glass, with its many associations, was a difficult one.

My fears of the implications of colour most likely stemmed from my architectural background. I learned that architects such as Le Corbusier and Loos viewed ornament, clutter and colour as a sign of primitive degeneracy (Batchelor, 2000, p.45). This chromophobia in architecture is not unusual and can be seen today, as innovation is achieved through form and creative use of material over colour (Anter, 2008, p.3). This train of thought is sometimes echoed in other creative media. The monochromatic photographer Walker Evans thought colour photography was a 'vulgar' medium: '…colour photographers confuse colour with noise,' they '[blow] you down with screeching hues alone…a bebop of electric blues, furious reds and poison greens' (Eauclaire, 1981, P9). In fact, Goethe writes:

> *…it is also worthy of remark, that savage nations, uneducated people, and children have a great predilection for vivid colours; that animals are excited to rage by certain colours; that people of refinement avoid vivid colours in their dress and the objects that are about them, and seem inclined to banish them altogether from their presence.* (1970, p55)

From these statements we can construe that the use of colour can be linked to 'snobbishness' within the art and design world, and certain colours have even been described as 'working class' (Collings, 1998, p158).

The coloured glass chosen for *Emotional Leak* was a grey tinted float glass. The grey tint, when viewed from the edge across its width, appears to be opaque black. The colour black has many cultural, social, historical and religious connotations, according to Pastoureau's *Black: The History of Colour*

(2008). In the context of this research, one of the most important details is that the colour black wasn't actually considered a colour for almost three centuries (ibid, p.11). Black was considered a non-colour alongside white, where white is the combination of all colours in the form of light, and black signifies a lack of light, void, or darkness (ibid, p.11). Therefore the colour black can be seen as the closest substitute to the absence of colour found in transparent glass, with the added property of having an accumulating colour density. In my own view black signifies an absence of light, or a void in space, an ideal visual metaphor for a sculptural object that represents a passing moment in phenomenological experience.

3.1.7 Analysis

Emotional Leak uses water as its method of manufacture and as a source for form. Its meanings and implications hint toward a wider range of interpretations. It is the product of collaboration between artists whose individual experiences as an architect and a glassmaker are brought together in a response to site, space and place. This dialogue looks more deeply into architectural phenomenology, and the implications of a combined phenomenological experience. *Emotional Leak* is an attempt to create a language from what cannot easily be described, in which water becomes a metaphor for the inevitable flow of emotion, a physical representation of the building's quirks and a frozen moment in time in the relationship between the inhabitant and the architecture.

The sculpture retains an organic quality that in some respects defies the machining that makes the work. No other method could produce this type of sculpture, making *Emotional Leak* an innovative sculpture. As a technical and

creative collaboration based on a shared experience, the artwork expresses our

love/hate relationship with its architecture, and that many can relate to when

discussing their jobs. The creation of a glass leak came out of adversity. Having

had my work destroyed by the leaking roof both mocked the absurdity of the

situation and turns it on its head, making a positive outcome of an upsetting

experience. If we were to anthropomorphise the 'personality' of the architecture,

Sarmiento and I would describe the building as 'the brother we never wanted'; it

isn't easy to get along with, but we love it anyway.

3.2 Window Series *Fused waterjet cut float glass panels*

Varying sizes

2013-2015

…

Window_1 and Window_2 (Home #13): 16 Bramham Ct. (2004 – present)

Window_3 (Home #14): 74a Gladstone St. (2013 - 2015)

Window_4 (Home #15): 12-13 South Lodge (2015)

…

Window Series are waterjet cut glass panels that depict mundane suburban vista's using similar design and manufacturing technology as Emotional Leak. Shifting to the architectural context of home brings with it new associations, experiences and ultimately imagery. An analysis of the context, process and interpretation of the project shows how architectural phenomenology can inspire new glass forms visualised through digital technology and fabricated using waterjet cut and kiln formed glass.
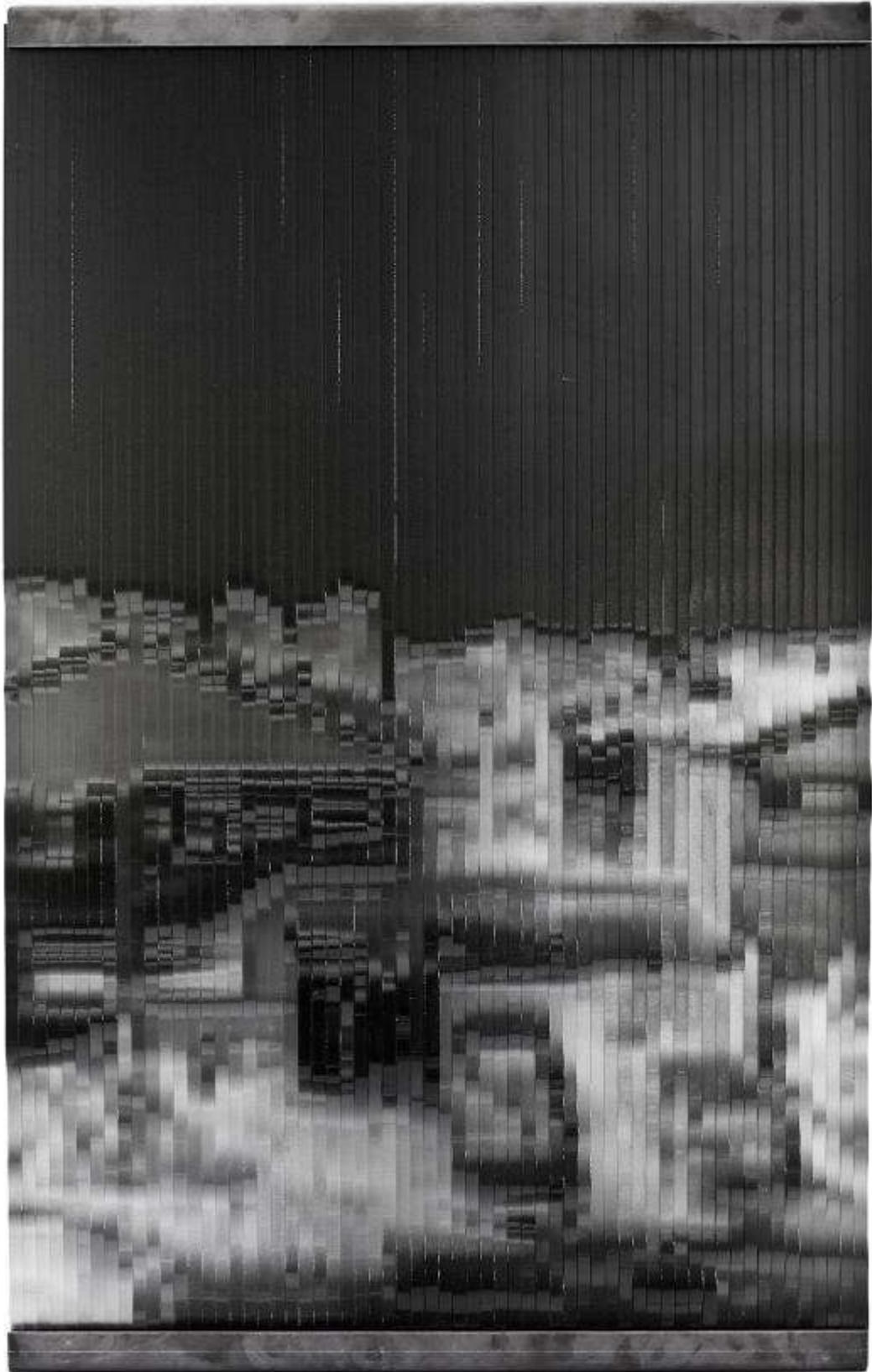
Figure 26 Erin Dickson, *Window_1,* 2012, Grey tint float glass
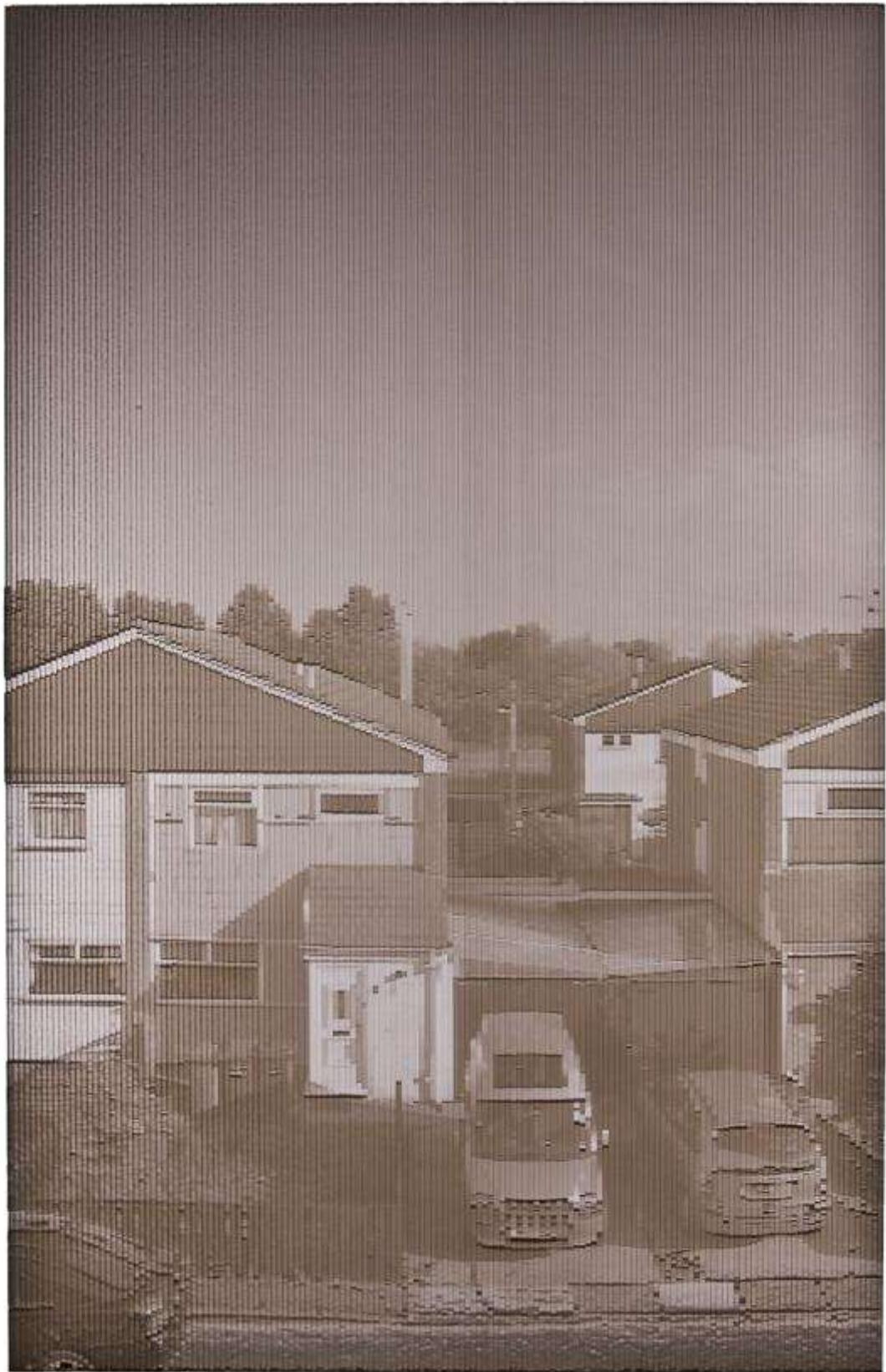
Figure 27 Erin Dickson, *Window_2*, **2013, Bronze tint float glass**

Figure 28 Erin Dickson, *Window_3*, 2014, Silver grey Bullseye glass
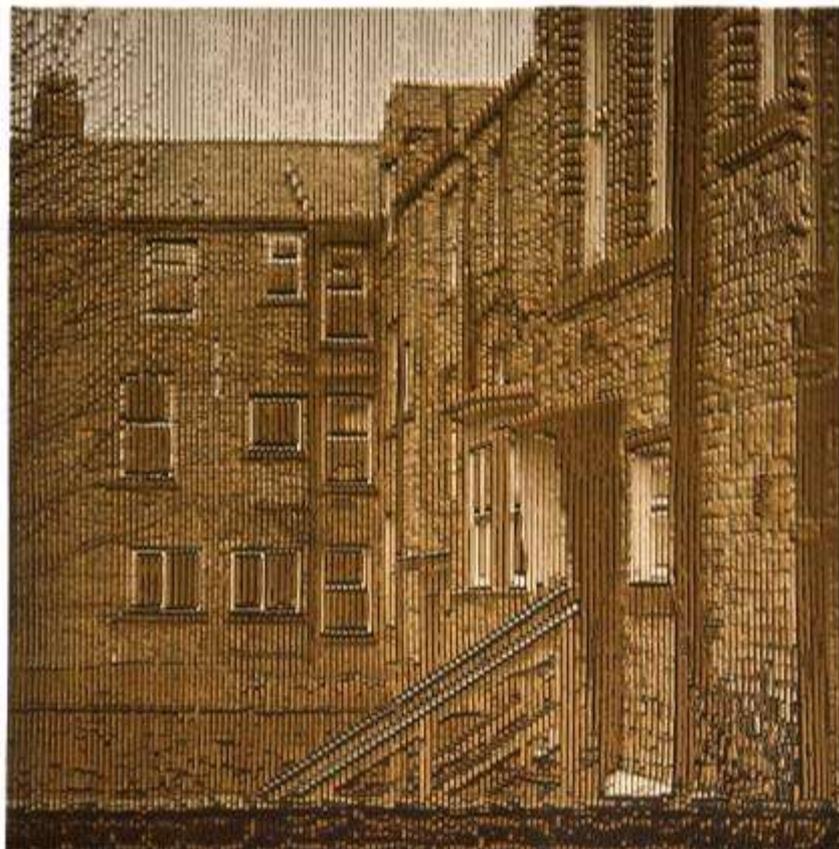
Figure 29 Erin Dickson, Window_4, 2015, Bullseye glass

3.2.1 Social immobility and the window as a means of escape

In autumn 2012, exactly a year after *Emotional Leak* was completed, a leak sprung in my home. It began near my bedroom window, and then spread through the rest of the house, destroying a large proportion of the interior. Unlike that of NGC, the inhabitants did not embrace this leak. It affected my daily life; it woke me at night to remind me to put out buckets, it ran through electrical sockets and ceiling lights, it soaked carpets and caused the ceiling to collapse. As it took over more of my intimate space, I was incapable of stopping it, losing my comfort and escape. I changed my habits to fit around the leak. I would occupy rooms that weren't affected, only going upstairs when absolutely necessary.

My home is situated in Harton Moor, a 1960's Council estate in east South Shields. Once known as one of the most anti-social estates in the borough, its inhabitants were labelled as 'charvers', a northern version of 'chav', a young working class person who dresses in casual sports clothing (BBC, 2005). Over the years the estate has undergone several regeneration programs, including the demolition of a block of flats that attracted anti-social behaviour, but the estate continues to struggle. At the time of writing, local newspapers covering the estate included the headlines 'Police team back in heart of community' (Ward, 2012*), '*Man charged over South Shields siege' (Clifford, 2013) and 'Raids round off estate's week of action' (Clifford, 2011). This social and economic condition of a council estate is not an unusual one, and estates throughout Britain have undergone regeneration, with mixed results. The Pembury estate in Hackney was recently refurbished at a cost of £12m but it is still seen as 'visibly, a large estate, ringed by an invisible force-field that asks outsiders why they might want to enter, and insiders why they might want to

leave' (Hanley, 2011). Hanley goes on to suggest that 'living on a council estate still suggests social immobility, which can leave its occupants feeling trapped by their own worthlessness to society' (2012). De Botton also states that architecture 'invites us to be specific sorts of people' (2006, p.72). His opinion is echoed by Ballantyne (2002, p.25): 'The architectural setting has a part to play in putting in a place a sense of how it would be appropriate to behave, and in indicating status and aspirations of its inhabitants'. The Harton Moor estate is no exception, it still retains the stigma of its past, seen as a no man's land to the rest of the population of south Shields, and as such those who occupy it continue to act as if no one cares.

The architecture of the home could be described as our most intimate space. While all architecture is essentially providing shelter (Lamster, 2012), it is the home which provides intimacy in a way which no other architecture can. Philosophers frequently return to the home when discussing the importance of our intimate relationships to architecture. Heathcote states that homes are 'made of memories' (2012, p.18). De Botton expands upon this theory, arguing that the home is as important to us psychologically as it is physically, in that it acts as a compensation for our vulnerability and reminds us of who we really are (p.10). De Botton goes on:

> *If one room can alter how we feel, if our happiness can hang on the colour of the walls or the shape of a door…What will we experience in a house with prison-like windows, stained carpet tiles and plastic curtains?* (2006, p.13)

This is an important question to ask, especially in the context of this research. In my home, aspects of comfort and shelter have been removed because of the decay of the roof. This, combined with the existing stigma of the estate, could promote a sense of sadness and worthlessness. Yet Heathcote argues that the

home is a vessel for the images of our memories (2012, p.18). From this we can deduce that the home could still be a container of happiness despite its decaying physical state. 'Even when we no longer have a garret…there remains the fact that we once loved a garret' (Bachelard, 1969, p.10) Therefore we cope with the sadness through embracing the homes of our past, averting our gaze to live within our memories and imagination. For me, this was achieved through the act of daydreaming through windows. This sentiment is echoed by Codognato, who discusses French poet Paul Eluard's image of resting the head on a window pane in a moment of 'existential and sentimental angst…something all of us have done in a moment of despair, like a pressure towards the external reality that depressed and disappointed us' (2013, p.13).

The architectural plan of Harton Moor estate has been reproduced several times throughout the north east and across England. Houses were built to a standard design in three styles; flat, semi-detached and terraced townhouse. My bedroom sat on the second floor of a townhouse, overlooking the two storey family homes at the edge of the estate. Every aspect of this view, and the estate as a whole, could be described as ordinary. Inside a home which was physically unstable, the reliability of my window vista offered solace. It was in fact ordinariness that provided comfort:

> *We rarely wish to be surprised by novelty as we round street corners…The architects who benefit us most may be those generous enough to lay aside their claims to genius in order to devote themselves to assembling graceful but predominantly unoriginal boxes. Architecture should have the confidence and the kindness to be a little boring.* (De Botton, 2006, p.183)

Alain De Botton has also written about the reverie of windows in an article for *The Book of Life*, an online book which 'aims to be the curation of the best and

most helpful ideas in the area of emotional life' (Anon, 2014). The article

highlights how often staring through a window can be seen as a form of time

wasting, yet it is this time wasting which offers one a chance to 'discover the

contents of our own minds' (De Botton, 2014, p.3). Further:

> *Window daydreaming is a strategic rebellion against the excessive demands of immediate (but ultimately insignificant) pressures – in favour of the diffuse, but very serious, search for the wisdom of the unexplored deep self (ibid, p.4)*

The mundane can inspire comfort and belonging, and perhaps there is also

beauty to be found in the commonplace. Therefore the most extraordinary thing

about the view through my window is that it is so ordinary. Ballantyne discusses

the importance of the everyday in relation to the cultures in which we live:

> *We tend to feel that there is no need to give an account of ordinary things, because their ordinariness means they are not worth our attention…we pay attention to the Parthenon and the Sydney opera house but the homes of ordinary Greeks and ordinary Australians do not feature in the architectural history books, even though we would certainly learn a good deal more about how life is lived in these places if we were to study the dwellings.* (2002, pp.87)

The everyday, intimate buildings of our lives represent the culture in which we

live more succinctly than British castles, palaces and skyscrapers can. The view

through my window was accurately representative of my life; it defines my

culture, social status and the place and time in which I live. For this reason I

believed that the quirk of my home was the context in which it sat; the view

through the window. *Window Series* can be understood as a personal,

emotional biography recorded through exterior views. It is this view I sought to

capture in the making of this artwork. Working in series extends the biographical

nature of the window, as in subsequent iterations I have sought to capture the

view from all the places I have lived (Figure 28 and 29).

3.2.2 Capturing a view in glass

Window Series uses many of the same digital and physical processes as *Emotional Leak*. The *Windows* were inspired by the varying density of colour achieved in the glass construction of *Emotional Leak* and both projects use aspects of photography in the translation of the quirk. Despite the similarities, the two artworks differ in both concept and scale. This is caused not only by the two individual quirks, but also the specific data capture techniques that were applied in each case. In comparison to the layered images used as a source of form for *Emotional Leak,* data capture in *Window_1* and *Window_2* takes the form of digital photography of the view through a window of the Harton Moor council estate. This image captures the entire view from the desired window, which is digitally manipulated to produce a 3D low relief image, in which colour density in glass recreates the tonal qualities of a photograph.
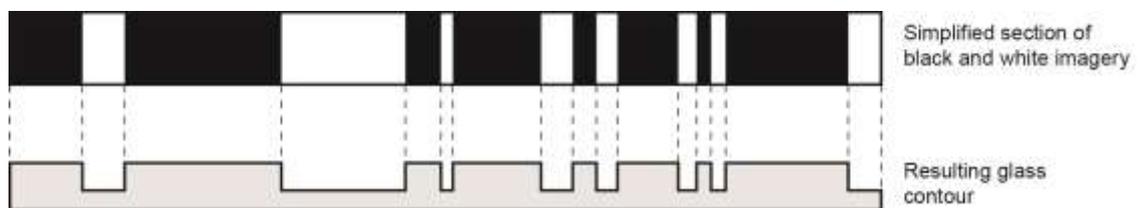
Figure 30 Diagram of image section in relation to final glass contour

The most important process in the reproduction of photographic imagery in glass is light level sampling. This process uses software to analyse an image and from it creates a corresponding three-dimensional surface based on light readings. More specifically, the user assigns a sample rate to an image, which determines the number of times the level of light will be tested across its surface. For example, if one were to assign a 10x10 sample rate over a 10cm² image, a light sample would be taken every 1cm² of the photograph. These light levels determine the 3D surface, in that the darkest areas are the lowest, or

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deepest, areas of the surface, and the brightest are the peaks. When each of these samples are combined, it forms an undulating, three-dimensional surface.

It is the introduction of glass to this particular light sampling method which gives this process a very specific visual effect. In the realising of *Emotional Leak*, and through previous experimentation during my MA degree, I discovered that the colour density of glass varies according to the thickness of the material. At the peak of *Emotional Leak,* the glass was 1cm in width, allowing light to pass through the material, causing it to be a light grey hue. At the base of the sculpture, which was 130cm wide, no light passed through at all, making the glass appear to be opaque black. The varied thickness of glass in low-relief topography can be used to produce a wide range of continuous tone, and transparency and light transmission can be controlled to produce an artwork that is both image and object. This process of light sampling, combined with the varying colour density of glass as discovered through *Emotional Leak*, led me to propose an original working method involving the reproduction of imagery in glass through the material's colour density.

Waterjet cutting was again employed in *Window Series,* three dimensional objects from two dimensional float glass sheets. The method applied in this case mirrors many of those used for *Emotional Leak,* with several key modifications. As with *Emotional Leak,* the sculpture is built from individually cut glass contours, stacked to create the form. However, instead of being stacked over a central steel spindle, cut glass contours for *Window Series* were arranged vertically and on edge, and fused. This results in undulating, fused glass surfaces or panels, which because of the removal of the need for the steel structure, offer unobstructed views of the translated imagery. This process

could be considered as an alternative to CNC milling, a process by which material is removed from a block via an automated machine to create a three dimensional surface. Instead, here I have the sliced the surface into rows (similar to chopping a carrot lengthwise), each individual slice is then waterjet cut from a flat sheet of glass, and then effectively 'stitched' back together via the process of kiln-forming to produce the final object. In this technique, the thickness of the glass being cut determines the resolution of the image. *Window_1* and *Window_2* depict the same image, but *Window_2* is far more legible and detailed because of its use of thinner glass. This process of modelling, contouring and reconstruction is particularly important, as an effective way of detailed CNC milling for glass has yet to be established.

This project combines data capture, computer modelling, digital fabrication, and an abstraction of 3D printing techniques to offer a unique and innovative method for producing imagery in glass sculpture. It merges the printed image with manufacturing technologies, moving from the flatness of pictorial space to the interiors of transparent glass, and through the use of craft skills objects containing meaning and beauty are created.
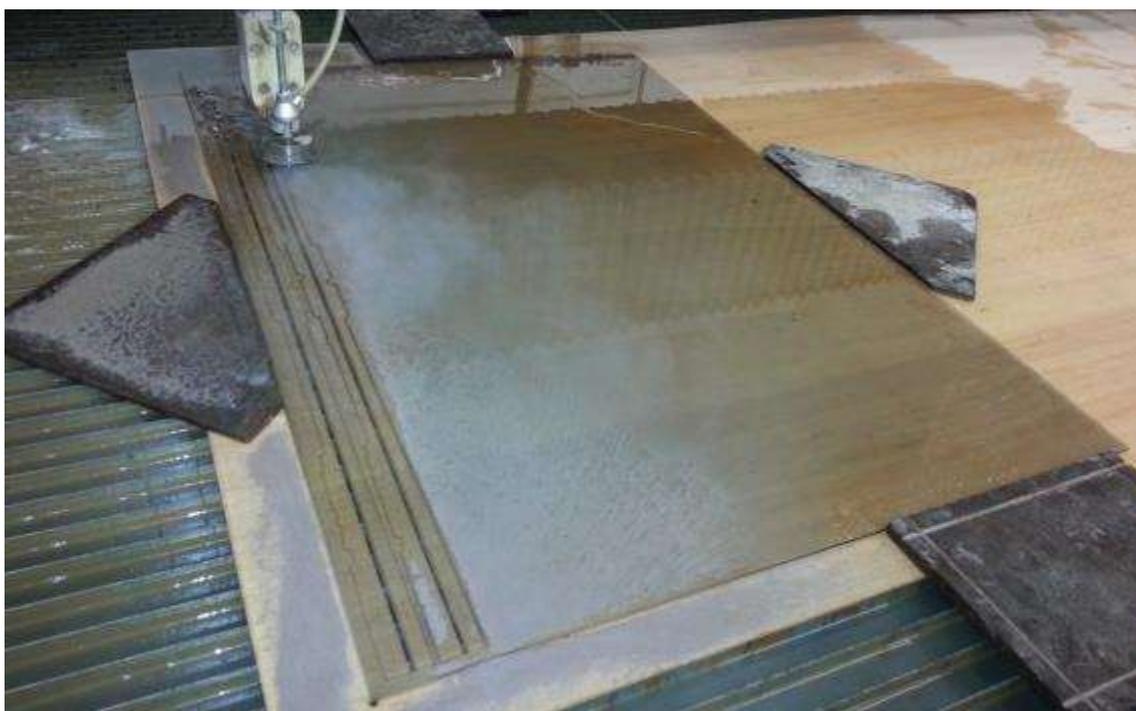
Figure 31 Waterjet cutting contours from float glass sheet

**Figure 32 Float glass contours laid out for cleaning before construction**

Figure 33 The individual contours are rotated 90 degrees and stacked on edge to form a full panel

Figure 34 Detail of *Window* contours prior to kiln-forming

3.2.3 A brief history of windows in art

> *A window provides two of life's essentials: light and air.* (Masters, 2011, p.6)

The window is an important object in history as well as a subject in art, giving this artwork a rich context. Having windows in the home is not seen as a luxury but as a human right. Any building will be designed with windows as much a priority as a wall. It provides us with not only light and air, but with a connection to the outside world in which we live. Losing the right to a window can be seen as a form of punishment; in prisons this can be used to disassociate offenders from time and place. In the past the window has also been a source of consternation in politics. In 1696, a Window Tax was introduced in England and Wales (and later in France and Scotland) by King William III, whereby tenants paid a fee based on the number of windows in their home (*Oates and Schwab, 2014, p.11*). The more windows, the higher the tax, which is why many houses of the time can still be seen with bricked up windows, ready to be re-glazed at a later date. The tax was apocryphally the origin of the term 'daylight robbery'. I believe that we must look through a window at least once every day; whether it is to check the weather before we head out the door, or without realising it at some point in our day. Sometimes we linger at the window, watching the world go by or some drama unfold from the safety and comfort of indoors. Or we may catch a glimpse through a window, while rushing about our daily business, of something we have been longing for through our favourite shop window. Windows are an important and essential part of our everyday lives.

The representation of windows in art is often used for symbolic and representational purposes. Where a window frames a vista over a romantic and prosperous city, the window gives a glimpse of a particular lifestyle. This idea

can be seen in David Hockney's *Mr and Mrs Clark and Percy* (1970-71) in

which designers Celia Birtwell and Ossie Clark, stylish and affluent figures in

the 1960's and 70's, are depicted with a balcony window overlooking central

London (Masters, 2011, p.24). Windows have also signified freedom and

possibility, as seen in Martinus Rorbye's *View from the Artist's Window* (1825)

and in contrast captivity and restriction, as in Caspar David Friedrich's *Window*

with a View of a Park (1837). *The Red Cape* (1869) by Claude Monet uses the

window to signify desire and emotion, while Chiharu Shiota uses real windows

in his sculpture *House of Windows* (2005) to act as metaphors for the dreams

and aspirations for those who once gazed through them (Masters, 2011, p.150).

Glass artist April Surgent's work captures the multiple reflections of glass *in*

carved cameo glass, creating a '…poetic portrait of place, of a moment in

time…' (Traver, 2014). However, it is in Rene Magritte's *The Human Condition*

(1933) that the window, depicted as a painting on an easel, represents the

experience, or phenomenology, of itself:

> *Magritte himself described how, in The Human Condition, each section of*
> *the canvas on the easel represents 'exactly that portion of the landscape'*
> *it conceals, so as to confound the normal distinction between exterior*
> *and interior suggested by the window. According to the artist, 'This*
> *simultaneous existence in two different spaces is like living*
> *simultaneously in the past and the present, as in the cases of Déjà vu'; it*
> *also emphasises the fact that although 'we see it [the world] as being*
> *outside ourselves, … it is only a mental representation of it that we*
> *experience inside ourselves. (Masters, 2011, P136)*
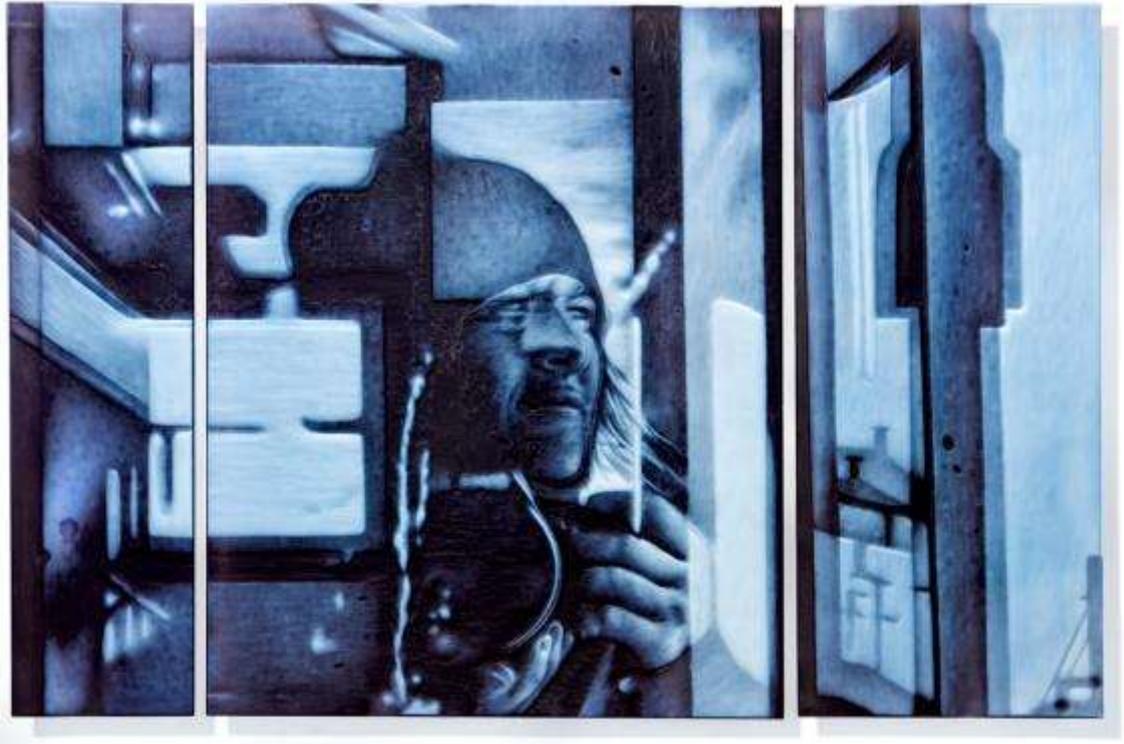
Figure 35 April Surgent, *Self Portrait at High Latitude,* **2014, Glass**
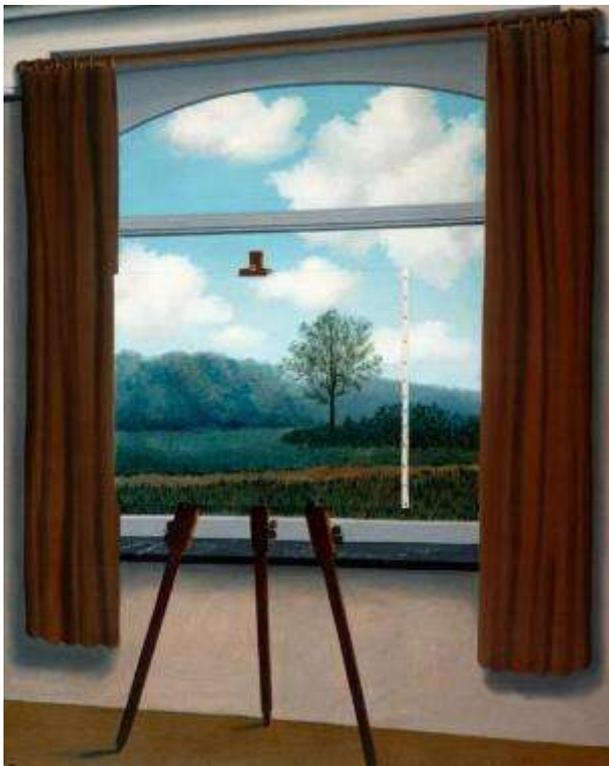
Figure 36 René Magritte, *The Human Condition,* **1933, Oil on canvas**

3.2.4 Analysis

Window Series echoes many of the symbolic and metaphorical meanings found in the aforementioned artworks and the above diagram. The artworks are recreations of a view from a window in my home, and I have an emotional attachment to that particular view. This is reinforced by the fact that the windows are presented as objects without context. The *Window's* function as autonomous wall-based sculptural glass objects; inspired by, rather than tied to, their context. This approach works in contrast to an architectural glass approach that in most cases relies on the fixed position of an architectural glass window. Another comparison can be drawn in The *Window's* duplication of an already existing view within the glass, whereas an architectural glass window generally serves to partially or entirely block the existing view.

In comparison to Surgent's body of work, *Window Series* also recreates a frozen moment in time through glass. Our practices are similar, in that we begin with a photograph of a certain place and time from which to work, which I then manipulate digitally, whereas Surgent adopts a more traditional glass working method, cameo engraving. Surgent's 'views' often illustrate a protagonist in a transitory space, adding to the feeling of the image being of a specific, animated moment that could not be recreated. In *Window Series,* any human presence is deliberately avoided. All of the windows are views of residential settings, the photographs taken during a weekday at a time that most people are at work. The street layout in the view of *Window_3* is also such that even if someone were present he or she would not be seen. The lack of a human presence in the original photograph, and consequently the artwork, may create a sense of isolation. The viewer is not observing a scene unfolding, or a specific moment, but a completely static uninhabited landscape.

Window Series challenges the more traditional use of the window in paintings as a sign of wealth, status and taste. To begin with, *Window_1, _2, _3 and _4* are of moderate residential window size, sitting at under 1 meter in any one dimension. These are not the windows of an exquisite villa or a coastal apartment in France. The view through the *Window's* is neither flamboyant nor prosperous. It is, in fact, the exact opposite. It is not *a view*, it is just the view that happened to come with my home. The view is taken directly from the original photograph, it has not been stylised or manipulated. My social and cultural background influences my interpretation of architectural phenomenology, so an essential part of the inspiration for *Window Series* is social status. It is not necessary for the viewer to interpret it this way. It is more

important that their experience of the work is informed by their phenomenological, and consequently social, background.

Window Series examines my personal obsession with what it means to have a home. A recorded biography through exterior views, the work aims to document my relationship to the buildings in which I have lived by isolating the views from their architectural frames and re-presenting them without context. Similar to framing pictures of loved ones, this process enables me to appreciate the worth of each individual view, and how often beauty, comfort and love can be found in the commonplace. The *Window Series* was a way of diarising my life through personal context. The two physical windows chosen to be translated in glass are the two most recent, and for those reasons are the two to which I am still the most emotionally attached. It is hoped that the viewer will be able to gaze at and through the windows, at the mundane views to which they themselves have no connection, but will recognise because of their ordinariness.

3.3 Summary

In this chapter glass has been used as a sculptural material for the production of spatial artworks inspired by architectural phenomenology. The main focus is the use of digital design and manufacturing technology for the translation and realisation of the architectural quirk, in particular the utilization of the waterjet cutter. This section discusses the advanced technology applied within each project, and the innovative processes which have developed throughout the research. It also touches upon the importance of context and time in relation to the realised object.

3.3.1 Innovative digital glass fabrication

In *Emotional Leak* and *Window Series*, the waterjet machine has been repurposed as a large-scale 3D printer, in that it is programmed to cut contoured layers of 3D objects to construct sculptural artwork. This is particularly pertinent when one considers the aesthetic qualities of the installation and form of *Emotional Leak*, which is reminiscent of a large-scale architectural model. This technique of contouring, or slicing, these large scale sculptures means that they can be designed to be cut in two dimensions and assembled in a three dimensional form. This method of production creates a high level of detail and opportunities to make work at a large scale. *Emotional Leak* is also one of the largest glass sculptures to have been made using a waterjet cutter.

In both artworks in this chapter, digital technology has been used in three ways; to record invisible phenomena and experience, to analyse and model the site, and to machine glass using digital fabrication. This application of technology allowed for a high level of artistic control at each point of the creative process, in that modelling provided a means of visualising and manipulating the artwork before physical manufacture took place. Both of these projects are realised in a 1:1 or a 'realistic' scale which provides the work with a visual quality that enhances how the viewer relates to the artwork and the space.

Both *Emotional Leak* and *Window Series* use photography as their method of data capture, specifically stop-motion and urban landscape photography respectively. In both artworks this photography is manipulated digitally to convert the 2D images into 3D virtual images and eventually, through the process of manufacture, realised sculptures. However the method in which this

technology is applied for each project is completely different. In *Emotional Leak,* the collection of stop-motion photographs of the growing puddle are compiled and traced in digital drawing software, then lofted in digital modelling software to create a sculptural abstraction of the original leak. In *Window Series,* the single photograph is digitally analysed in the same software to create a 3D surface informed by the dark and light points of the imagery. This surface is then translated back into an object though the waterjet cut contoured sections which are reassembled to produce an interpretation of the original imagery through glass colour density. The method of production used in *Window Series* is a unique way of recreating imagery in glass. *Emotional Leak* was a catalyst for this approach, as through the stacking of its individual layers it was revealed that the transparent grey glass became completely opaque after a certain thickness was achieved because light was no longer able to penetrate it.

In particular, the *Windows* can be considered an innovative and original use of the processes of digital design and manufacture for glass. The project combines the possibilities of data capture, computer modelling, digital fabrication, and 3D printing to offer a unique new method for producing relatively high resolution imagery in glass sculpture. This original process was awarded one of three inaugural *Technology Advancing Glass* bursaries from the Glass Art Society in America in 2014 to enable further experimentation of its application.

3.3.2 Relationships of context, time and object

In this chapter, in comparison to the one following, the realisation of the quirk lies in the production of a series of physical objects. These objects translate and materialise the architecture's unique phenomenological essence, which by its nature is an ever changing and evolving phenomenon. The resulting artworks

act as static representations of a kinetic and ephemeral moment that cannot be revisited.

Emotional Leak and *Window Series* physically record a quirk, as well as my intimate relationship to the architecture at the time of conception. However three years have now passed since these pieces were created, and it is fair to assume that during that time the buildings and I have undergone significant changes. In terms of *Emotional Leak,* the building been physically altered, and the roof repaired, so the leaks were now a thing of the past. My intimate relationship to the architecture had also changed and developed. Even in the realisation of the artwork, our perception of the work is shifted through the phenomenology of making. The quirk becomes *ours* in its translation and realisation. It would seem that architectural quirks, as an inspiration for sculpture, are not only based on the individual that experiences them, but on the particular time at which they are experienced. One cannot be inspired by the quirk twice in the same way; by the time one is uncovered, visualised and resolved, our surroundings have already noticeably changed. It stands to reason that if I were to make a sculpture inspired by National Glass Centre or my home today, it would look nothing like *Emotional Leak* or the *Windows.*

The sites chosen for inspiration in this chapter are two of my most frequented buildings, and therefore the contexts of *Emotional Leak* and *Window Series* are important in the creation of the artworks. It is true that where the artwork is subsequently disseminated also plays an important part in how the sculptures are experienced. Invariably the space in which the sculpture is installed cannot be disconnected from the artwork, just as the viewer's phenomenological preconceptions cannot be cast aside while seeing the work. When viewing the

artwork within a particular space, one is interpreting the space *and* the artwork.

Therefore the architectural space in which the work is exhibited plays a part in

the embodied experience of the viewer. In terms of the two bodies of work

discussed in this chapter, this changing context of display has resulted in a

variety of interpretations. Tina Oldknow, curator of modern glass at The Corning

Museum of Glass, described *Emotional Leak* as 'a black stalagmite…it looks

soft, eroded, and earthlike, yet it is also otherworldly' (2013, p.69). In

comparison, the same sculpture was described as an abstraction of

'contemporary gothic architecture' by Glasstress' creative director Adriano

Berengo (2014). These two viewpoints show an example of the wide range of

interpretations an artwork can embody depending on context, in this case the

former on a digital display and a publication, the latter in a disused Italian glass

factory.

3.3.3 Conclusion

The sites used in this chapter are the two buildings in which I choose to split my

time, the workplace and the home. The two projects both begin from a similar

source of inspiration yet produce divergent results. Whereas the leaking roof at

NGC was seen as an endearing part of the architecture's 'personality', the leak

in my roof negated the comfort of home. Applying the methodology as a

response to site provides a framework for art practice; however a number of

outcomes can arise from its application. The projects realised in this chapter

deal with aspects of time in relation to phenomenology, in that both of the

artworks represent certain frozen moments of the architectural quirk (a solid

leak and a static view). In the next chapter I will further explore this aspect of

time, and attempt to answer the question of how a phenomenological process

over time can be recorded through spatial artwork. Though glass was utilised in

this chapter for its unique material properties, such as transparency, reflectivity and fusibility, it was used primarily as a vehicle in the translation of the architectural phenomenology, or quirk, to the viewer. In the following chapter I will address this disconnection, and create artworks which not only embody the phenomenology of the space in the form of the quirk, but also take into account the inherent phenomenological associations with the material glass. The site moves onto an extremely public space, but one which is often overlooked because of its subterranean location and its use as a route of human circulation. It is a study of historical social and cultural context and regional identity, which deals with obsolescence, boundaries and 'invisible' spaces.

Chapter 4 - Tyne Tunnel: Time based work inspired by architectural quirks

Installation/Video/Photography
Dimensions variable
2012
(Video available at erindickson.co.uk)

Tyne Tunnel is a kinetic, site-specific artwork installed on 30 July 2012 in the Tyne Pedestrian and Cyclist tunnel in north east England. In a clear shift from crafting glass into sculptural objects (Chapter 3), this installation uses mirrored glass in its manufactured form for a temporary, time-based work. This is achieved through manipulating the intrinsic properties of mirrored glass, including reflection, reverberation, surface, and fragility.

Data capture plays an important role in the translation of numerical data into sensory experience. The installation consisted of five mounted mirrors, which vibrated in a sequence informed by numerical data taken from the architecture. This project confronts the architecture with a physical blockade, a vibrating mirror, and noise, embodying issues of culture, social and personal boundaries. Furthermore, this chapter discusses obsolescence and significance of an architectural space. *Tyne Tunnel* aims to expose sensory and historical aspects of the subterranean passage, encouraging the awareness of the architecture's unique properties.

Figure 38 Erin Dickson, *Tyne Tunnel,* 2012, Mixed media kinetic installation

Figure 39 Erin Dickson, *Tyne Tunnel (Filming process),* 2012, Mixed media kinetic installation

4.2 Frozen transient spaces

… 'Architecture' did not seem to be anything to do with these buildings when they were built…The stones have not moved. It is the culture that has shifted. … every building has its cultural aspect, and if we choose to notice it then we are looking at the building as architecture (Ballantyne, 2002, p.31)

The Tyne Pedestrian and Cyclist Tunnel (TPCT), opened in 1951, runs under the river Tyne between Jarrow and Howdon in the north east of England. The tunnel was primarily constructed for shipyard workers, a career so synonymous with the north east that the Tyne & Wear Archives and Museums Shipyards collection was added to the UNESCO Memory of the World Register, a list of documentary heritage that holds cultural significance specific to the UK (UNESCO, 2014). The TPCT was used by up to 20,000 people per day at its height, and was the first of its kind in the UK in offering a passage specifically for cyclists. It boasted the longest subterranean passages in the UK, and, until recently, the longest working wooden escalators in the world (Tyne and Wear Integrated Transport Authority, 2009). Because of the decline in industry, particularly shipbuilding but also the chemical and lead works, and a growth in car ownership, the TPCT's usage has dropped significantly, and at its lowest point less than 250 people used it per day. At the time of realising the artwork, the tunnel remained in excellent preserved condition; 'For nearly 50 years the Tyne Tunnels have had a special place in the affections of local people and visitors alike. They are fine examples of municipal architecture and civil engineering with virtually all of the original fabric and machinery still intact' (Howarth, 2000).

With very few changes made to its interior since construction, the building has managed to retain its original architectural features and, perhaps more

importantly, its original atmosphere. In 2000, the TPCT became a Grade II listed building for its economic and social significance on the community. The building now not only attracts commuters, but those interested in the building's architecture. Similarly, several London underground stations are now listed because of their architectural and historical significance in the development of London Transport's iconic graphic identity (English Heritage, 2011). In 2013, the TPCT was closed for regeneration. It is hoped that after refurbishment the tunnel will become more popular as local government focuses its support on green travel and commuting. This relatively obscure subterranean tunnel, which has dropped out of favour as a passage, is instead a culturally and socially significant piece of architecture.

Although my ancestors used the tunnel as a means of visiting family members as well as for work, my trips to the TPCT were never for commuting. As a child I would cycle or walk through only to experience the sensory qualities of the site, making a noise to create echoes and hiding from friends in the dip of the midpoint of the tunnel. I would never exit at the other side, not only because of the stern warning from my mother, but also because it was the tunnel I had come to see. In the concrete rotunda at the Jarrow entrance, a small exhibition of the building and opening of the TPCT contained various newspaper clippings announcing the progress of the tunnel, as well as photographs taken of builders and the tunnel in use. One photograph stood out, in which families, commuters and the plain curious, are captured riding down the wooden escalators, a modern marvel at the time, with a mixture of trepidation and excitement in their faces:

Figure 40 Archival imagery of Tyne Pedestrian and Cyclist Tunnel

Figure 41 Archival imagery of Tyne Pedestrian and Cyclist Tunnel

> *'Within the first ten weeks of the TPCT opening, there were 81 accidents on the escalators, the majority caused by clothes getting caught…The general public using the tunnels had not had any experience of using escalators prior to its opening, which contributed to the accidents…The daily usage of the escalators [dropped] from 14,000 in 1951 to 7,500 in 1952, which remained fairly constant until 1967'* (Tyne and Wear Integrated Transport Authority, 2009)

Very little has changed over the 64 years of the tunnel's existence, and a month before my installation, the Waygood-Otis wooden escalators still moved, albeit very slowly. For me, the experience of travelling on those escalators and through the tunnel felt like stepping back in time, much as Pallasmaa describes how 'architecture connects us with the dead; through buildings we are able to imagine the bustle of the medieval street, and picture a solemn procession approaching the cathedral' (2005, p.52). As I walked through the almost empty tunnel, I could imagine the crowds of its heyday, and how hundreds of men and women would crowd down its dark passages to get to the other side of the river. The tunnel seemed as if it had been frozen at a point in time, a subterranean otherworld. This experience of subterranean architecture is not unusual. Ballantyne's encounter with the Parisian subway system left a similar impression:

> *'The artistic vision seems to be that the Metro is a sensuous dreamworld, and it certainly has an air of being set apart from normal life as we know it above pavement level. A journey on the Metro is framed as a descent to the underworld, from which we return like Orpheus. That does not stop it being a practical transport system, but the practicality is not what the architecture expresses.'* (2002, pp.97)

The TPCT, no longer a busy commuter highway for the shipyards, had developed a 'personality' beyond its original planned usage. My intention was to

assess this atmosphere, and discover its quirks, to accurately portray the experience of the architecture and its attached heritage.

4.3 Phenomenology and cultural significance of the tunnel

Three distinctive elements emerged from my direct experiences with the architecture of the TPCT: social and historical context, contemporary use of the tunnel and the sensory experience.

The TPCT is Grade II-listed because of its role in the shipbuilding industry, which is synonymous with North East culture. This part of my heritage not only moulded the architecture of the region but also the people, as the boom and subsequent bust of both the shipbuilding and mining industry was part of 'the greatest de-industrialisation of any major nation' (Chakrabortty, 2011). Although my family was not directly involved with the shipyards, the decline of the North East's most important industry is part of the community's consciousness:

> *'When a ship was launched at [Newcastle firm] Swan Hunter all the kids at the local school went to see the thing our fathers had put together and when we looked down from the cross-wired fence, tried to find Uncle Mick, Uncle Jim or your dad, this notion of an integrated, productive community was quite astonishing.' (Kennedy, 2010)*

The TPCT plays an important role in this sense of community, as an architectural monument to regional pride for this lost industry, showing how influential we *were* as a society. Architecture becomes meaningful to one person, or a group of people, simply by having existed nearby all their lives. The TCPT is a protected remnant from obsolete industry, still used as a connection to the other side of the river Tyne. It is an obsolete piece of architecture that symbolises the death of industry. Yet because of its disuse, I was able to experience the space in a way that wasn't possible 50 years ago.

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Since the closure of most shipyards in late 1980s, the TCPT has seen a change in both its visitor type and number. The opening of the Tyne Motor Vehicle Tunnel in 1967 and its expansion in 2011 signifies a growth in car ownership in the north east, meaning less people are choosing to cross the Tyne by foot or bicycle (Tyne and Wear Integrated Transport Authority, 2009). Although its main usage is still as a thoroughfare, many visitors now go to the TPCT to see and experience the site's unique interior. The distinction between visitors and commuters is the way they circulate through this subterranean tunnel. Instead of entering at one side and leaving the other as a way of going through the passage, they enter the tunnel, deciding at the midway point whether to continue to the other side and return, or whether they have seen enough already. This might be considered an odd behaviour in an architectural structure that was built as a passage, and not a place to stop. At the midpoint of the tunnel, a thick tiled line marks the original border between the two counties either side of the river Tyne. Two tiled signs bear the names 'County of Durham' and 'County of Northumberland'. After the Local Government Act 1972, both sides of the Tyne became the metropolitan county Tyne and Wear (The National Archives, 2014). The geographical distinction in the TPCT no longer exists except in the tunnel, emphasising the experience of a bygone era.

Figure 42 An elevation of the TPCT, taken from a brochure commemorating the opening of the Vehicular Tunnel, 1967

Finally, the incidental light and sound effects produced in the tunnel give a unique experience. One would expect a tunnel to be a fairly quiet space, as it is separated and insulated from the general urban noises of the area above. However, the architecture produces unique sounds that are part of the vital workings of the tunnel. The sounds include the mechanism of the wooden escalators, the 1950s air conditioning systems and various pumps and electrical systems that are hidden behind a small door at the centre of the tunnel. In architecture above ground, it is rare that one would notice noise from the inner workings of the building. We become accustomed to the sounds they produce, and the background noise of the active world around us tends to drown the subtler noises out. The architecture of the TCPT not only makes unique sounds; it also has unique acoustic properties. The oval shape of the tunnel reflects sound along its length, and noises made at one end of the tunnel are amplified and bounced so they can still be heard at the opposite end. This effect emphasises even the most subtle of the noises that the tunnel produces, including the hum and throb of the overhead strip-lighting, produced by the original cold cathode tubes (Tyne and Wear Integrated Transport Authority, 2009). After being captivated by their unique noise, my eyes were drawn to the unique light movements the cathode tubes were making. The light rippled and swirled in its casing, casting not a solid light on the walls but instead causing the walls to move in and out of darkness in waves. The light and the sound together made me think that the tunnel was breathing above me, and I began to think of the TPCT as a subterranean creature, no longer just a piece of cold architecture, but a living part of my cultural landscape.

This sensory experience, the social and historical context, and the tunnel's changing use, are all part of the phenomenology of the TCPT. The quirk that

ties these three aspects together is the tunnel's obsolescence. The sounds are only obvious as the tunnel is not as busy as it once was, and only exist because until 2012 the tunnel did not attract enough visitors to warrant any kind of update. The way visitors walk through the architecture has also changed; a growing number only visit to 'see' the tunnel, have no reason to exit on the opposite side, and also stop within the space, an unusual action for a transitory space. Finally the cultural and social influence of the tunnel has developed and changed over time. What was once just a building to help the shipyard workers cross the river Tyne is now a frozen architectural memorial to this obsolete occupation.

4.4 Culture by numbers

The document *Conservation Plan 290909 (*Ibid) catalogued the history and upcoming green development plan for the site. This document included figures relating to people who had helped develop the TPCT as well as those who passed through it since its opening. The document listed telephone numbers of the original contractors, dates of installations, postcodes of the planning offices, order numbers for products from the 1940s and 50s as well as average commuter numbers. This patchwork of digits was vital for the existence of the architecture, providing a point of connection to this historic building, and inspired and informed the Ty*ne Tunnel* artwork. Compared to the other three projects in this study that are derived from visual information, the data used in this project is numerical. One challenge was to translate the figures into a sensory installation artwork.

As well as translating the numerical data, I also wished to emphasise the 'breathing' of the tunnel's interior, incorporating both sound and light into the artwork. To achieve this, I used mirrored glass to create matching reflections of

both ends of the long corridor. To emphasise the sound of the strip lights, I created a device to vibrate the mirrors that would create a ripple effect emphasising the lighting and producing a noise emulating the throbbing sound. With the help of the University of Sunderland's Centre for Internet Technologies, I tested a variety of electronic vibration motors and attachments with mirrored glass. I found that by attaching a 12V vibration motor to the back of the glass with duct tape, the resultant vibration was enough to create both a ripple effect in the reflection in the glass as well as a loud humming sound.

The vibration of the mirrors is determined by data from the tunnel, helping to mould the kinetics of the artwork. To create the 'throbbing' effect, it was also necessary to have the motors vibrate intermittently. A sequence derived from the *Conservation Plan* was extracted from the figures from *Conservation Plan 290909*, creating a list of numbers between 0 and 9. The numbers were split into sets of five (one for each mirror), and each individual number determines the duration of that mirror's vibration. So the first number in the list would be assigned to mirror #1, the second to mirror #2 and so on.

For example, the sequence number '10169' is split as follows:

Mirror #	1	2	3	4	5
Seconds spent vibrating out of 9	1	0	1	6	9

Finally, the old county borders were used as the site of the artwork, removing the transitory purpose of the tunnel and forcing those who used it to stop and assess the architecture and see it not just as a means of travel. The five mirrors on individual stands formed a barrier. The blockade did not cover the entire view of the opposite half of the tunnel; instead the eye was allowed to wander

between and beyond the kinetic installation, so that the architecture was not removed, but intensified and distorted.

Tyne Tunnel was installed in the cyclist side of the TPCT, blocking access to the tunnel for three hours. The artwork consisted of five steel stands that held mirrors at head height. The electronic equipment that controlled the vibration motors was left exposed behind the installation, and the numerical sequence ran for 10'15" but was looped to provide no obvious end or beginning. As the artwork magnified the conditions of the site prior to regeneration, it is unlikely that this artwork will be installed again. The audience of *Tyne Tunnel* totalled around 11 people. No physical artefacts remain from *Tyne Tunnel;* however the work has since been widely disseminated and published through the video documentation and interview as well as photography.

4.4 Analysis

This analysis considers the sensory aspects, the historical and cultural aspects, and the phenomenology of obsolescent spaces, and how the artwork utilises glass.

4.4.1 Sensory aspects of noise

Tyne Tunnel combined a number of sensory aspects in the realisation of the artwork to emphasise more subtle architectural quirks of the TPCT. The most obvious of these is the interpretation of the strip lighting's 'throb', translated through the use of vibration motors. As discussed previously in this research, each of the artworks present some form of emotional, social or physical confrontation. *Tyne Tunnel* is perhaps the most successful confrontation in that as soon as one entered the TPCT via the Jarrow or Howdon entrance, the sound from the installation could already be heard, despite it being 137m away,

permeating the architecture. What separated the throb from the ambient noise of the tunnel was a data sequence controlling the vibration motors. As the five motors buzzed for variable durations, the combined sound and volume of the vibration was not consistent throughout the course of the entire sequence. The resultant noise ascends and descends, and abruptly halts, only to start again with a slow crescendo or a sudden cacophony.

The type of sound *Tyne Tunnel* made is very important. The sound produced was not pleasant or musical, and is best described as noise. Whereas the strip lighting produced a low, almost unnoticeable hum overhead throughout the length of the architecture, *Tyne Tunnel* howls in comparison. While some may find the experience unpleasant, others may find the noise intriguing. There is no doubt that the noise produced by *Tyne Tunnel* was loud, and as one approaches the depths of the tunnel, it only continued to increase in volume. Another definition of noise is as 'a disturbance interfering with the operation of a usually mechanical device or system' (Merriam-Webster, 2014). Audio noise is a common experience with analogue radio; the crackling interferes with the enjoyment of a radio station in a car, especially if the signal is suddenly lost when going out of range. *Tyne Tunnel* creates a similar disruption to the enjoyment of the architecture. Not only does it emphasise the existing sounds of the TPCT, in the process it also blocks them out. The audience was unable to focus on the subtler sound of the TPCT, even during the quieter moments, as our ears rang from the amplified buzzing of the motors. *Tyne Tunnel* removes all subtlety; it interferes with our experience of the architecture and deafens us to its charms.

Noise can also refer to 'irrelevant or meaningless data or output occurring along with desired information' (Merriam-Webster, 2014). This is an important definition in consideration of the methodology of this study as *Tyne Tunnel* uses numerical data to create a sequence of sound. The TPCT conservation document can be useful, in that can inform a reader about the history and regeneration of the architectural site. For *Tyne Tunnel* this information was reduced until only the numerical data remained. This data could be considered a meaningless list of numbers without context, yet it contains dates and numbers critical for the creation and maintenance of the TPCT. This numerical data sequence informed the vibration of the motors, which in turn created a visual and audio noise. As it cannot be interpreted by the viewer, we can say that the data has become meaningless. The noise also obscures the information it aimed to highlight. The data translated in *Tyne Tunnel* can be seen as both useful and irrelevant, as it informs the artwork yet in its realisation the data is unreadable by the viewer.

The audio noise of *Tyne Tunnel* directs the viewer to its source; the visual aspects of the installation are not revealed until the walker almost reaches the midpoint of the tunnel. The visual noise of *Tyne Tunnel* is realised in the shaking mirrors that distort the reflected image of the tunnel, which, depending on the viewer's location, is also reflected in their distorted image. This experience dislocates the viewer from their surroundings while also directing them to consider the architecture in a different light. Other visual sensory effects of *Tyne Tunnel* include the caustic reflections across the architecture's interior caused by the thin, rippling, mirrored glass. As the sound from *Tyne Tunnel* evokes the gentle throb of the strip lighting, so too does the installation

emphasise the rippling light of the surroundings through the alternating vibrations of the motors.

The sensory experience of *Tyne Tunnel* is intended to be both disturbing and intriguing. The sound of vibration motors and rattling mirrors is unavoidable, in that upon entering the tunnel the viewer is confronted by noise and the decision of whether to move toward or away from it. If the viewer chooses to move towards it, the noise only grows louder and more layered as the sound reverberates through the 274m length of the TPCT. However, if the viewer is determined, their reward is to experience both the amplified sound *and* visual effects of the tunnel at once in the form of the realised installation, and so a new experience of the significant architecture of the TPCT.

4.4.2 Obsolescence before regeneration

At the time of choosing the TPCT as a site for the inspiration of artwork, the architecture was at its lowest state of repair and usage. The last of four wooden escalators had broken down a week before the installation, leaving just a small lift at either entrance as a means of reaching the tunnel. The descent down the escalators into the tunnel at an extremely slow 15 meters per minute (half normal speed in order to extend its working life) was originally part of the planned journey to the installation. Without the escalators, the space lacked part of the architecture's unique voice; it was noted that they created 'a constant squeaking noise which is most disconcerting' (Tyne and Wear Integrated Transport Authority, 2009). The interior of the TPCT was allowed to deteriorate in anticipation of the upcoming regeneration in 2012. In my opinion the TPCT is still a beautifully preserved example of 1950s architecture, but this accumulation of problems was a hint that the site has been ignored or even forgotten. Just as

the shipbuilding industry had become obsolete, so too was the architecture which facilitated it. In 2000, the site was given a Grade II English Heritage listing, prompting an influx of funding for preservation and regeneration, and possibly a renaissance of its cultural and social significance in the North East. The regeneration program began nearly 12 years after the Grade II listing, and only a matter of weeks after *Tyne Tunnel* was installed. The video documentation of this artwork may be the last made before the architectural makeover. This architectural quirk at a point of obsolescence was key to the realisation of *Tyne Tunnel.* Furthermore, it was only made possible because of a nearly complete lack of traffic. In contrast, at a London Tube station, there would be no time in which a glass blockade would not cause a significant interruption. The unique sounds and visual effects made by the tunnel are only noticeable *because* of obsolescence. It is only possible to hear the 'heartbeat' of the tunnel because of the relative emptiness of the site. The unique amplifying properties of the TPCT mask the quiet hum of the surroundings when commuter footsteps or pedalling drowns out the subtle noise. Obsolescence was not only an inspiration for the realisation of *Tyne Tunnel,* but disuse of the space allowed the artwork to be installed within the actual space from which it was inspired.

4.4.3 Border, Reflection and Barrier

In this artwork, a barricade of steel and mirror sat on the former border between Counties Durham and Northumberland. Border signage is often used as a landmark and tourist attraction, such as the signpost at John O'Groats, marking the northernmost point of Great Britain. A company that privately owned the popular spot charged tourists by the photograph. In 2013, as part of the area's regeneration, a free version of the signpost was reproduced only a few metres away. Sign posting is a way for us to proclaim that we are here. But whereas

signposts enable us to orient ourselves in reality, borders stretch across broad areas of land and are only clearly seen on maps, represented by a solid or dashed coloured line; often we cannot see the literal border though we acknowledge that it is there. For example, between Baarle-Nassau in Holland, and the Belgian municipality of Baarle-Hertog, the borders are complicated as 'there are Dutch enclaves within the Belgian enclaves that are within the Netherlands' (Benfield, 2012). The towns have developed interesting ways to visualise the borders (See Figure 43).

In *Tyne Tunnel*, a visual borderline cut the architecture of the TPCT in half; the corridor is almost symmetrical when cut at the centre point, a fact that is reiterated in the conservation document. The glass in *Tyne Tunnel*, which sits on top of this literal borderline, reflects an image of an architecture that is already a physical mirror image. The mirrored glass creates a disconcerting visual effect, in that what is reflected is the exact reproduction of the architecture hidden behind the glass.

I was physically subverting the basic use of the tunnel. In fact, the first rule on the list of the TPCT's bylaws states:

> *'No persons shall use the cyclist and pedestrian tunnels except for the purpose of travelling as a pedestrian or a pedal cyclist from the entrance to the said tunnels on one side of the River Tyne to the entrance to the said tunnels on the other side of that river' (*Tyne and Wear Integrated Transport Authority, 2009*)*

Violators were in 1967 charged five pounds, which was then equal to three days wages, and today is the equivalent to approximately £70. Thus any person who visited *Tyne Tunnel* was also willingly breaking a historic bylaw of the TPCT.

Figure 43 New signposts at John O'Groats, Scotland

Figure 44 Border between Baarle-Nassau in Holland, and Baarle-Hertog in Belgium

In the creation of a mirrored barrier in the TPCT, I had also changed the way pedestrians could use the space. Those wishing to go from one side of the river Tyne to the other faced an obstruction midway through their passage. Those who wished to visit the architecture were no longer given the choice of experiencing the entire length of the tunnel; instead the mirrored barrier almost questioned why they would need to continue to the end, when what was beyond was the same as what was reflected in the glass.

4.5 Summary

The artwork in this section *e*xplores the phenomenology of architecture through the study of an obsolete transitory space. *Tyne Tunnel* literally and figuratively reflects the unique 'personality' of the TPCT, incorporating aspects of its social and cultural history, as well as its more recent disuse and deterioration. The artwork utilises numerical data from a document created for the preservation and regeneration of the site, and this literal data was translated through electronic hardware to embody the essence of the tunnel via movement and sound. The material glass is utilised for its reflective qualities, as a disorienting barrier in an already reflected architectural space, as well as for its unique sensory effects when in vibration. The project also plays with ideas of subversion through the creation of a barrier in an architectural space where one is, by law, not supposed to stop.

In Chapter 3, glass was used as a material for the production of artwork, and shaped into the chosen forms through waterjet machining. In *Tyne Tunnel*, glass has been utilised for its unique material properties of reflection, distortion and fragility. Glass is integrated into the architecture in a performative way. It is also temporal as the performance could not be recreated retrospectively. The

embodied sensory qualities of the material are at the centre of this ephemeral work, and for this reason digital technology is appropriated only in order to emphasise these qualities, and not as a method of forming the glass. The expertise of other specialists was also incorporated to compliment my skill set, and to expand the visual and sensory qualities of the artwork. Although it was not my original intention to use glass directly from the factory, this denial of material manipulation in *Tyne Tunnel* emphasised the fact that the artwork was not going to result in a finely crafted artefact. In fact there were no artefacts. Instead the work is documented through digital recording methods, such as photography and videography, for its subsequent dissemination. It is because of this professional documentation that the artworks have garnered critical review without the need for them to be re-staged. For example, the *Tyne Tunnel* video was included in the European Glass Context Exhibition 2012, and in *New Glass Review 34* the static photography was thought to 'capture [the] interactive installation perfectly' (Maes, 2012, p.65).

Whereas the artwork in the previous chapter consisted of glass sculptures that could be defined as crafted objects, the artwork in this chapter is more closely aligned with contemporary art practice. This can be seen by the precedents used as a means of comparison, such as Ryan Gander, Vito Acconci, Tracey Emin and Gillian Wearing, all well-known contemporary artists. Although my work is medium-specific, the way in which the work is analysed exposes concept over craft process. The architectural quirk expands on the historical and cultural context as well as the physical qualities, exposing these by creating a sensory glass installation. Translation is not confined to static object-making, with time, performance and experience becoming crucial elements in the work.

Tyne Tunnel challenged both artist and viewer to consider the phenomenology of the space as an evolving part of the architecture.

The artwork deals with intimate architectural spaces in a confrontational manner, by forcing myself or the viewer to change their routine to accommodate the physical imposition of glass. The artwork also encourages the reversal of roles of the architectural space, and what is public becomes private. Subversion is utilised as a key concept behind the realisation of the work, in that it forces the viewer to move in a particular way through a space. This means they are technically breaking the law and inflicting a level of discomfort in the viewer, indeed forcing the viewer to take notice of the architectural space. This work represents a move away from a literal translation of phenomena into glass, attempting to consider the interplay of the phenomenology of the material as well as the site.

Chapter 5 Bed Project: Exposing architectural quirks through the phenomenology of glass

Bed
Installation/performance
Cast iron bed and glass
2013-4

Read Me Lips
Video and sound
Dubbed interview video
2015

Bed Project is inspired by the phenomenology of the bedroom, which could be considered the most intimate of architectural spaces. This chapter considers what it means to expose personal space, and how this can in turn reveal part of our intimate selves. For this reason the quirk combines aspects of architectural and personal exposure, and highlights the unique and inseparable bond between intimate architecture and the self. *Bed Project* reflects upon the consequences of the exposure of intimate experience, which includes themes such as secrecy, confession, vulnerability, censorship, and the testing of one's personal boundaries.

This chapter also proposes an alternative concept for data capture, and it considers how the translation and realisation of projects inform each other to generate new artworks. Whilst the outcomes of the project do not necessarily involve glass, a focus on the phenomenology of the material is crucial to the execution of the project. The outcome consists of two artworks. *Bed* is a time based work in which I slept on a glass bed for five nights in the winter of 2013. *Read Me Lips* is a modified documentary video based on interviews with a psychologist, which took place each morning after sleeping on the bed. The process of *Bed Project* was recorded through photography, sound and video.

**Figure 45 Erin Dickson,** *Bed,* **2013-2015, Performance and photography**

Figure 46 Erin Dickson, *Bed,* **2013-2015, Performance and photography**

Figure 47 Erin Dickson, *Read Me Lips,* 2013-2015, Video

A a a a a a a a a a a a a a in is a continuance of the original to the old well the full for allowing the was a leading to avoid a period of time where the knowledge of justice because freezing all on their underclass that it was just a year are you likely results is only one change implementation awful slow untruthful follow our that right up the first time that the bloodlust they got the battle of Melbourne North and woman allowing their hair and torture because I thought were pretty using just have a negative and are not then it looks horrible and the trailers felt by going like a soft white quilt book and the launched a I was shocked and how horrible thought I would realise that the "out of a small with her that she couldn't handle any motion through movement and a conclusion is which is contingent on your own and you reach is an intention and introduction to do you smoke is almost on the Internet and you are in this and now little know your goal laughing at 130 500 and an even even before the play when you try to run out-without having to a meeting now that's all had a few hours on the Scripture belonging in order to custody and in a snazzy roughly 21 day for the weakening of the bedroom nevermind you know so much I finish it because I think have to only about one night a essential, and for the delay quite experienced in and install a third treasure you is when you is warned note motion in the whole genome is only in a mood and you should note motion on an important notion you are you and I think he could see my fingers and I think it is that the threat that they are currently running it wasn't all the because of the material here is all that is unbearable because the car is running its not like when it's your bed in the section on small business and body up but he's not there the glass doors and just like a shock to the site and that's what Ang contrast have in mind the report launched in a note to the emotional so-called functional I thought I could make comparable whenever a letter, the Russell which will be fully bound by affinity and you want to finish is to convince interesting and the importance of all simply using an infringement which Bush intrusion sponge and much more when caution to mental instrument stores and when questions and normal births are better

Figure 48 Erin Dickson, *Read Me Lips,* 2013-2015, Extract from dictated script interpreted from video audio

5.1 Welcome to my room

While the bedroom may be a place of sanctuary, it is also a place of experience. While other spaces in the house may express something about who we are, the bedroom is the place where we engage in some of our more formative experiences, the landscape of affecting and profound personal revelations (Busch, 1999, p.119)

The architectural context of *Bed Project* is an intimate place to which most people can relate. My bedroom is occupied mostly by one person, me. Occasionally family, friends and lovers visit the space, but relatively briefly. The other architectural sites in this study might be assumed to be more public, frequented by more people, and on the surface more familiar. However, this is not strictly true, as it would be fair to presume that most people understand some form of bed or bedroom. In comparison, museums, pedestrian tunnels and council estates exist throughout the world, but none of these locations are more familiar than the bedroom.

Bedrooms come in many different forms. They can physically be anything from a mat on the floor to palatial spaces designed specifically around the bed and the activities that go alongside, on or in it. Bedrooms, and the beds themselves, change form and function according to culture, location and social status. What is remarkable about the modern bedroom is that a room which only requires a single piece of furniture has come to accommodate and signify much more (Busch, 1999, p.116). In my bedroom, I take comfort in the personal items with which I surround myself, such as books, mementos and photographs. Miller describes how our material relationships and the routines that accompany them give 'order, meaning and moral adjudication' to our lives, which, once familiar, can provide us with comfort (2008, p.296). So a photograph could be a talking point, or a book on the bedside table may provide the comfort in a routine of

reading before sleep. But these material objects do not just provide us with comfort; they also express a part of the person that we are:

> *…Every object in that room is equally a form by which they have chosen to express themselves…Some things may be gifts or objects from the past, but they have decided to live with them…These things are not a random collection. They have been gradually accumulated as an expression of that person or household (ibid, p.2).*

The contents of our bedrooms can give an indication of who we are, even if we do not realise it. Objects may reveal our age, gender, social status, cultural upbringing, geographical location, and even our sexuality. Perhaps the bedroom holds the most revealing collection of objects, given its intimate and private nature.

The personal nature of the bedroom has been a subject for artists of all media. Tracy Emin's *My Bed* (1998) consists of the artist's bed surrounded by detritus including 'knickers soaked with menstrual blood, innumerable cigarette ends, desiccated apple-cores, the remains of a take-away meal…a bewildering variety of pre- and post-coital sexual…paraphernalia' (Brown, 2006, p.100). Emin shares not only her most personal and intimate space with the audience, but also a confessional tableau of the 'fallen woman' (ibid. p.102). Other artists have taken interest in the interpretation of other people's bedrooms through their personal objects. James Mollison's documentary project *Where Children Sleep* drew from his experience of the bedroom and 'how significant it was during [his] childhood, and how it reflected what [he] had and who [he] was' (Mollison, 2010). The project involved photographing a diverse cross section of children from around the world through portraiture and pictures of their bedrooms. The project 'addressed some of the complex situations and social issues affecting children' and provides a stark contrast between cultural

differences as well as the social situations of children throughout the world (ibid). Similarly, the Society for Community Organisation used photographs of people's bedrooms in their 2013 campaign to highlight the squalid living conditions of Hong Kong's poor population (De la Torre, 2013), and *The Guardian* newspaper recently asked young people to photograph their bedrooms and describe 'what it says about them' (Parkinson & Mokoena, 2014). Finally, Sophie Calle conducted an artistic project, *The Hotel* (1981). Working as a chambermaid, Calle analysed the personal possessions of guests in hotel bedrooms through photography and written record. In *Room 28,* she notes:

> *'Wednesday 18, 9am. The two beds have been slept in. There is some progress on the crossword grid started yesterday. The pyjama bottom is still in the same place. I lift the suitcases: three of them seem to be full. I open them. In the first one I find a toilet kit, in the second a set of identical Brooks Brothers shirts with blue and white stripes. In the third one, a book* Artists in Crime *by Marsh, a Minox camera, a denture (lower jaw), a 7" x 9 1/2" photograph of a sailing boat on the sea…I hear some noise, hastily close the suitcase and make the bed'* (Calle 2007, pp.146-7).

What is made clear in this project is that a hotel might be seen as a 'home away from home', where we make ourselves comfortable by spreading our belongings and body about the room. This artwork seems intrusive of the mystery occupants' personal space, which is ironic given how public a hotel room actually is. From these five artworks we see how much can be learned about a person from objects in a bedroom, and how this can be intriguing to the artist and viewer. Our bedrooms are a site of 'birth, sleeping, dreaming and sex. They are also [a place] for less positive experiences such as depressive isolation, illness, collapse, confinement and death' (Brown, 2006, p.97).

Figure 49 James Mollison, *Where children sleep,* 2010, Photography


Figure 50 Sophie Calle, *The Hotel (Room 28),* Photographic and textual documentation

This study anthropomorphises architecture by using words that typically portray human behaviour, such as describing a room as intimate. The bedroom provides a place to sleep, an essential human need according to Maslow's hierarchy. As previously discussed, the bedroom and its contents reveal a part of who we are, which might be described as characterizing one's deepest nature. Over time we build a long-standing, close relationship to that particular area of the home. The proof of the intimacy of the bedroom can be seen in how we invite others to join us in it: 'Come to my room'. The fact that this reference to a room is non-specific, and yet we still understand this to mean the bedroom, reiterates the fact that we project ourselves onto this most personal room of the home. It is the only room that we can define as our own.

5.2 Site: The most intimate but familiar space

As part of my intimate architecture, the sites chosen for this study have moulded the way I perceive all other architecture, much like the childhood home described by Bachelard (1969, p.7). An intimate relationship was formed to each of the sites before I considered their quirks for the artwork. But the viewers, who have their own impression of the spaces informed by personal history, may experience and interpret the artworks differently. As Ballantyne states:

> *[My home] carries a special feeling for me that it does not carry for people who don't live in it. I understand that and don't expect them to feel the same way I do about my home, though I might expect them to feel about their home the way I do about mine. (2002, p.21)*

To explore this idea, with each new project I chose a more intimate site, until I ended at the most intimate of all, my bedroom.

Artwork	Architecture location	Approximate number of visitors or occupants
Tyne Tunnel	Tyne Cyclist And Pedestrian Tunnel, Jarrow	250,000 per year[7],
Emotional Leak	National Glass Centre, Sunderland	170,000 visitors + 100 students per year
Window	Harton Moor Estate, south Shields	134 home occupiers[8]
Bed	My bedroom, Bramham Court, south Shields	1

In *Bed Project*, I chose an architectural location that only a known few people had experienced, but with which many people can identify. Therefore the bedroom is a space that is both universally understood but incredibly personal to its occupier.

In the other three projects in this research the quirk was inspired by my personal experience of the architecture. For *Emotional Leak*, the discovery of the quirk was serendipitous; the leaking roof destroyed one of my sculptures while I was contemplating ideas for the next piece. In the *Window* project, another roof leak led me to question how comfort can be found in the commonplace, in this case via a mundane view from the window of my home. In *Tyne Tunnel,* the quirk was discovered through a study of a transient and obsolete architectural space, both in visits to the site and by searching historical records. However, in *Bed Project* the quirk is as much of a personal revelation as an architectural one. Ultimately the bedroom was an architectural site through which I would not only uncover the quirk of the building, but in the process also reveal my phenomenological connection to it.

In this research I translate personal experience through the production of artwork; yet this personal aspect is often missing in the interpretation of the object or installation by the viewer. This is because a workplace, estate or pedestrian tunnel is in fact not very personal due to its public location. By

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[7] http://www.tynepedestrianandcyclisttunnels.co.uk/faqs/

[8] http://www.streetcheck.co.uk/Postcode/NE340HP

choosing the bedroom as a site that is not only defined as my most intimate and private architecture, but also a place specifically 'intended for physical intimacy' (Busch, 1999, p.119), I was also offering myself up for investigation. The space reinterpreted as was my personal relationship and experience with it. Ballantyne (2002, p.17) states that 'The home is charged with meaning, because it is the basis of what we know, and is closely involved with the most personal aspects of our lives.' Yet this meaning is forever changing and evolving. Just as it does with intimate human relationships, architecture is interpreted through the minutiae of human emotion and experience. Whereas one day we may see our bedroom as a place of sanctuary and retreat (Busch, 1999, p.118), the next it could make us feel vulnerable and isolated.

> *Buildings are able to solve no more than a fraction of our dissatisfactions or prevent evil from unfolding under their watch. Architecture, even at its most accomplished, will only ever constitute a small and imperfect…protest against the state of things. (De Botton, 2006, p.25)*

We can deduce that the experiential interpretation of an intimate space can change on a daily, if not hourly, basis depending on our state of mind. For this reason it must be remembered that the quirk is time-contingent, and represents the specific moment when the project was first imagined.

5.3 Quirk: What goes on behind closed doors

My bedroom is where I take sanctuary and store my most important personal possessions. The bed is its most important furnishing, and, as with most bedrooms, it is the centre of most activities in the room. This particular object initially represented growing up; it was my first full-sized bed, and I did not have to share it with anyone else. Unlike my friends' newer flat-pack beds, it had a cast iron frame covered in layers of thick paint, chipped and scratched to reveal

maroon underneath. The frame was missing its original baseboard, replaced by a thick sheet of chipboard. The casters and some of their fittings were missing, so the bed sat jauntily on the floor, cutting through the carpet and denting the floorboards. The most important feature of this bed was the mattress. In fact there were two mattresses, each a different size and stacked on the base. The larger mattress hung over one side of the chipboard and both were second-hand and worn. For my 12-year-old self they were the epitome of luxury, and I imagined myself in *The Princess and the Pea.* As I got older, the fairy-tale magic wore off, and I began to see the old bed differently. The bed became symbolic of lost innocence and disappearing childhood. The place where I had once fallen asleep was no longer the place where I woke.

This project is inspired by a context in which the narrative of one's life is played out from birth, youthful innocence, through to the complications of adulthood and relationships, and finally death. In its conception, *Bed Project* is a physical manifestation of the emotions dealing with Catholic guilt through the confiscation of my only place of respite and comfort, the bedroom. In Catholic tradition, the act of confession is meant to provide healing and absolution through the painful and humiliating act of penance, a lesser penalty than eternal punishment. What is interesting is the relationship of privacy to confession. In order to receive freedom from guilt, one must be willing to admit his or her sins in a private booth in a public place. But it is also true that even outside of religion, a confession, whether to a friend or a trusted individual, can evoke personal relief upon sharing. As Sigmund Freud realised:

> *'We repress the memory of our guilty acts…and such vibrant secrets, buried deep within the psyche, tend to fester over time and to lead to conflictual spasms within the individual that only the psychoanalytic conversation can relieve.' (Grayson, Carolin, Cardinal ,2006, p.43)*

This psychoanalytic conversation has often been achieved by artists through a self-made public confessional. Vito Acconci conducted a series of performances in 1973 which made explicit use of his autobiographical material in order to free himself from 'indecision, guilt, accusation, and recrimination' (Linker, 1994, p.56), the most important of these being *Home Movies, Line-up, Reception room* and *Scenes from this side of the camp*. In particular, *Line-up* dealt with Acconci's coming to terms with a lengthy past relationship with one woman while involved with another (Linker, 1994, p.58) and in *Scenes from this side of the camp* (1973) Acconci 'subjected himself to a fusillade of imagery projected like artillery fire from a gun.' (Linker, 1994 p.58), where even the language used to describe the performance expresses the violence of the process. Tracy Emin's *Everyone I Have Ever Slept With 1963–1995* (1995) explores the revelation of autobiographical material, in this case intimate acts. However, it is Tehching Hsieh who could be considered the master of the torturous process:

> *From 30 September 1978 Tehching Hsieh was confined to a cell for one year. From 11 April 1980 at 7pm, [he] punched a time clock in his studio every hour on the hour for one year. From 26 September 1981 at 2pm, Hsieh stayed outdoors without shelter for one year. From 4 July 1983 at 6pm, [he] tied himself at the waist to Linda Mantano without physical contact for a year. From 1 July 1985, Hsieh did not 'do art, talk art, see art', or go to galleries or museums for a year. From 31 December 1986, Hsieh made art but did not show it publicly for 13 years. (Grayson, Carolin, Cardinal ,2006, p.72)*
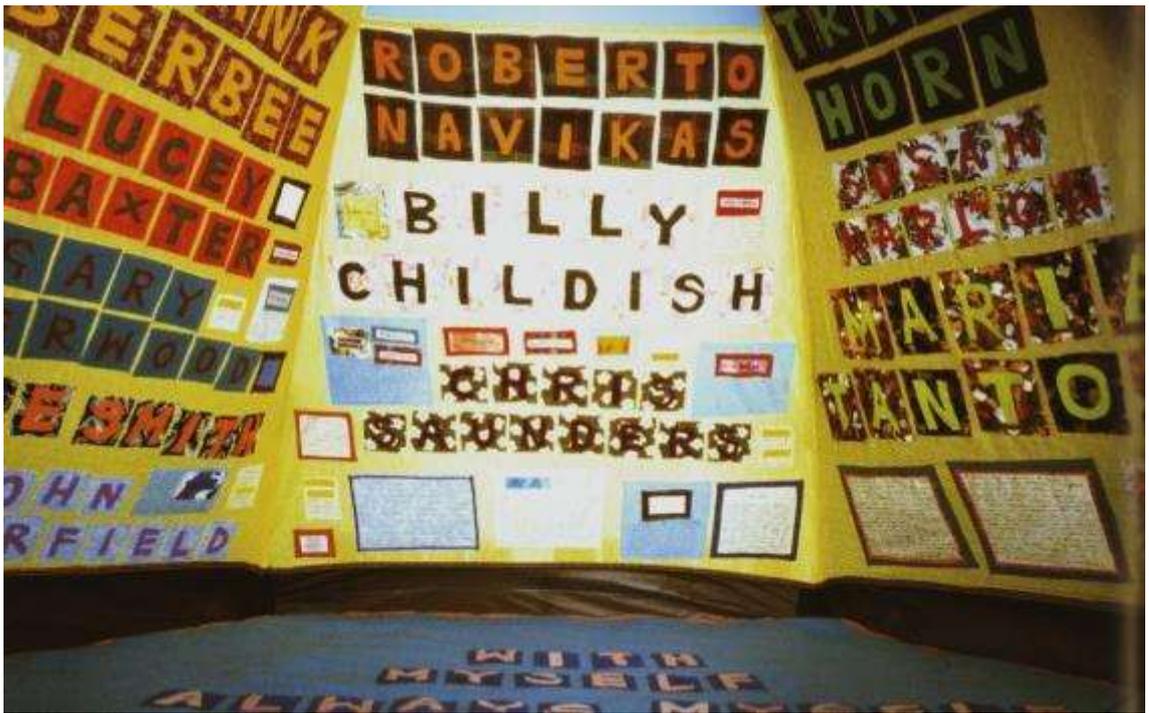
Figure 51 Tracey Emin, *Everyone I Have Ever Slept With 1963–1995*, 1995, Appliquéd tent, mattress, light

Figure 52 Tehching Hsieh, *One Year Performance,* 1978-1979, Performance

Hsieh's work was exhibited in *Secret Service: Art, Compulsion and Concealment* (2006), which focused on artists whose work 'in one way or another, takes on some of the qualities of 'the secret' where the usual exchanges or readings have been replaced with something more difficult and awkward; where the viewer's gaze is refused or made contingent and access is not given.' (ibid, p.13). In Hsieh's work the experience is not recordable, in that there is no way for him to translate it for the viewer. Therefore the audience can only use its imagination to interpret how this process may feel.

This element of secrecy seems paradoxical to the main ideals of art. Yet an important part of the creative act is in its concealment; 'Ars est celare artem', true art is to conceal art. Just as 'alchemical treatises are crammed with arcane symbols and coded allusions that… pass from adept to initiate while looking like gibberish to the profane' (ibid, p.43), so too may an artist's work be filled with hidden significance. In *Bed Project*, the act of using the bedroom as inspiration for artwork requires personal revelation due to the intimate nature of the site. As a consequence of this reciprocal relationship, the quirk is the inevitable exposure of both the space as well as myself. However, the unadulterated disclosure of personal information is neither self-serving nor in line with the themes of art and concealment. For this reason methods of translation and realisation both encourage the exposure of intimacy, as well as maintaining an element of secrecy.

5.4 Translation/Realisation, Realisation/Translation

In this section I will discuss the two artworks *Bed* and *Read Me Lips* separately to distinguish between their individual data capture methods, and to demonstrate how they feed into one another to form a cohesive body of work that describes the phenomenology of the bedroom.

5.4.1 *Bed*

Inspired by personal confession and penance, I identified the architectural quirk as the juxtaposition of the exposure and secrecy of the bedroom with religious confession. The bedroom is a private space; yet I was proposing to reveal its intimacy it in the artwork. Combining each of these aspects led me to consider what provides comfort in my bedroom specifically, and how this could be manipulated as an act of penance. The bed, particularly the mattress, is an important, intimate object in my bedroom. A mattress is designed to provide comfort to its user. However, the intrinsic properties of glass clash with the notion of comfort. Even if we imagined that we substituted our mattresses with glass, we can still envision the discomfort it would cause. I decided the comfort of my bed would be removed by replacing the mattress with a sheet of glass. I would also disassociate myself with the space, blocking my personal relationship to the architecture.

The performance of *Bed* included the removal of all the objects in the room: the carpet, curtains and furniture, excluding the bedframe, a lamp, and a rosary. The bedframe was removed of its sheets and mattress, replaced by a large sheet of industrial float glass, on which I was to sleep. Because of my knowledge of the properties of glass, it was clear that sleeping on a float glass sheet would be difficult and most likely cause sleep deficiency. Although a

rosary has obvious links to religion and Christian guilt, its attachment to the process of *Bed* holds additional meaning. This particular rosary has always been hung on the bedframe, and as a consequence I associate it with sleep. This religious paraphernalia provides comfort through familiarity. Despite the fact that I am a lapsed Roman Catholic, the rosary serves as a reminder of religion and my own moral positioning. Catholic doctrine continues to dictate my conduct and judge others, as well as how I view myself as a 'good' or 'bad' human being. Whilst the project is loaded with personal content and religious associations, *Bed* is based on a single premise: a recording of myself, within my intimate space, sleeping (or most likely not) on a glass-topped bedframe.

Figure 53 Erin Dickson, *Bed,* **2013, Performance**

5.4.2 *Read Me Lips*

Sleeping on glass for five nights would predictably cause lack of sleep, but side effects would evolve during the performance, including 'confusion and heightened emotions' (Lockley and Foster, 2012, p.90). I felt that it would be revealing to have a professional assess my changing emotional state. The data capture included 30-minute meetings with a psychologist each morning after sleep. This process reflected the idea of confession, in that the interviewer could lead the conversation prompted by my mood and emotional state. I was also encouraged to discuss my feelings associated with the bedroom. These sessions were recorded through video; however the translation of the video data serendipitously inspired an additional artwork to accompany *Bed.*

The title of this work alludes to my use of the English language. The most common form of misunderstanding I encounter is caused by my Geordie accent, which is local to north east England. The accent is a source of frustration when trying to communicate with others in and outside of the United Kingdom. This is most obvious when I try to use automated phone systems that require the user to speak commands. I am not alone with this problem. Hanani, Russell and Carey (2011) found that speech recognition technology used by call centres fails to understand regional accents, particularly from Scotland, the Midlands and the North.

I thought naively that computer dictation software would be a straightforward way to transcribe notes from my sessions. Dragon Naturally Speaking Home 12.0 is pre-programmed for Received Pronunciation (RP), which is also known as 'The Queen's English', 'BBC English' and 'Oxford English'. RP is described as typically British, as it is 'regionally non-specific, in that is it does not contain

any clues about a speaker's geographic background. But it does reveal a great deal about their social and/or educational background' (British Library, 2014). When I played the recorded session, the application transcribed an RP word closest to what I said. The result was a series of five garbled scripts, which were then dubbed in RP over the original interview videos. This produced the triple effect of filtering the data collected during the performance, maintaining the secrecy of my 'confession', as well as embodying a sense of confusion caused by disturbed sleep.

5.5 Analysis

The intimate space of the bedroom and the acts of confession and penance are brought together in the realisation of *Bed Project.* The artwork visualises the phenomenal experience of sleeping on glass. An act of penance is performed through the removal of comfort in the bedroom, interrogating the relationship between myself and my most intimate space. The confessional aspect is achieved through recorded interviews with a psychologist in *Read Me Lips*, in which I expose my feelings of Christian guilt after each night of penance. Verbal information is distorted through transcription, mistranslation and dubbing, which also acts as an auditory trigger of the confusion caused by lack of sleep. This analysis considers personal experience, the phenomenology of glass, exposure and secrecy, confession and penance, and the interweaving of data capture, translation and realisation in artwork.

5.5.1 Personal Experience

Before the performance of Bed, I had no prior knowledge of how I would be affected both physically and mentally. Although I had experienced sleepless nights before, I had never attempted it deliberately. I assumed that my sleep time would be reduced dramatically, yet this was not the case. I often fell asleep at some point during the night. However this sleep was very agitated, as I would wake every few minutes when my

skin touched the cold glass. When I thought of sleeping on a glass bed, I knew it would be uncomfortable. I thought it would be hard and my body would ache, but that wasn't the worst part. I got used to the hardness; it's the cold that got to me. I'd get myself comfortable and finally fall asleep, and the glass underneath me would warm up with my body. But if I moved even slightly, the cold glass against my skin would shock me awake, and I'd have to start the whole process again, frightened to move and increasingly anxious as the night wore on.

This experience was more frustrating than I had anticipated. Being woken up every few minutes was more upsetting than not sleeping at all. Disturbed sleep affected my mental focus in capturing data. I found it very difficult to concentrate, and this grew worse as the performance progressed. As I became obsessed with achieving some level of sleep, I started to forget or dismiss the idea of recording the process.

Because of its site and personal content, *Bed Project* is both the most intimate and emotionally charged artwork in this study. The bedroom was chosen as a way to question how intensely one can translate the phenomenological experience of space, before reaching one's boundaries of physical and emotional exposure. The intimate subject of the work, my nudity and suggested confession, pushed me to the limits of discomfort. It consequently became difficult for me to assess the progress of the performance objectively while it was being carried out. This project also challenges the boundaries of comfort through its dissemination.

5.5.2 Phenomenology of Glass

Bed capitalises on a viewer's material, cultural and social knowledge of glass through wordplay, imagery and cultural cues. Though not able to touch and experience the glass directly, the viewer seeing (or reading about) *Bed* might form an experiential image in their mind through visual cues such as the material's sharp edges, polished finish, and transparency. Pallasmaa describes this viewer experience; 'Vision reveals what the touch already knows. We could think of the sense of touch as the unconscious vision. Our eyes stroke distant surfaces, contours and edges, and the unconscious tactile sensation

determines the agreeableness or unpleasantness of the experience' (2005, p.42).

This view was also shared by art historian Bernard Berenson, specifically in relation to art. He suggested that when experiencing an artistic work, we imagine a genuine physical encounter through 'ideated sensations'. The most important of these he called 'tactile values' (Montague, 1986, p.308). Even without the artwork, the phrase 'glass bed' can create a catalyst to piece together material knowledge of how a glass bed may feel. Bachelard described this effect as 'suspended reading' (1969, p.14) in which 'the values of intimacy are so absorbing that the reader has ceased to read your room: he sees his own again.'

Other artists who have explored the intimacy of sleep include Andy Warhol in *Sleep* (1963) and Sam Taylor Johnson in *David* (2004). A work that explores the material properties of glass and sleep can be found in Cornelia Parker's and Tilda Swinton's collaboration *The Maybe* (1995-2013)*,* in which actress Swinton lies sleeping in a glass case in a gallery '…as if she were just another exhibit in a museum' (Blazwick, 2013, p.85). The closest visual comparison to *Bed* photography may be drawn from Jenny Saville and Glen Luchfords photographic series *Closed Contact* (1995-1996), in which the artist Saville is photographed lying atop a plexiglass sheet deliberately distorting her body to create a grotesque form of self-portraiture.

The bed is often associated with warmth, comfort and sleep. Pallasma states, **'**There is a strong identity between naked skin and the sensation of home…the experience of home is essentially an experience of intimate warmth' (Holl, Pallasmaa and Perez-Gomez, 2006 p.33). Like the bed, glass is a material we

experience every day; it is a hard, cold and fragile material that can cause physical harm when it is sharp. The experiential connotations can be juxtaposed to produce a confusing set of opposites: hardness and comfort, warmth and cold, sleep and discomfort, softness and sharpness. From the 'glass bed' the viewer can begin to pull from memory a feeling of glass against the skin, replacing the softness of a mattress. *Bed* can provoke a phenomenological response, despite the viewer never having experienced it.

Glass is not the only material that could inspire this kind of connection with the viewer. Other hard and cold materials, such as metal or stone, could equally do so. However, glass has one property that others do not: transparency. Transparency lends itself to the removal of privacy, especially in architectural applications. A glass wall may bring the outside in, but it also exposes the interior to the world. 'Take the use of enormous plate windows… they deprive our buildings of intimacy…we have lost our sense of intimate life, and we have become forced to live public lives, essentially away from home' *(Barragan and Ugarte, 1962, p.242).*

The revelation of intimate space is intensified when the mattress is replaced by a 'window'. My body is not only exposed from above; the view normally hidden against the surface of the mattress is also revealed. People sometimes hide objects in and under pillows and mattresses, yet personal objects, save the rosary, have been stripped from the room during the performance. For me, the experience of sleeping on glass was confusing and disconcerting because I could see through the bed. This application of glass intensifies the quirk through the further exposure of myself in my intimate space.

5.5.3 Secrecy and confession, intimacy and exposure

In other projects in this study, personal content is separated from the outcome. In contrast, the translation of data and realisation of this artwork further interrogates aspects of public versus private and revelation versus secrecy.

Bed Project				
Site/Brief	Discovery of Quirk	Translation	Realisation	Analysis
My Bedroom	Intimacy and its exposure and censorship	Photographic, video and sound recordings of myself sleeping on a glass bed	Projected and static videos of myself with dubbed sound and text.	Personal context revealing subject matter and experience of performance.

Figure 54 Application of methodology in *Bed Project*

There is intrigue in secrecy, but also power (Grayson, Carolin and Cardinal, 2006, p.43). An example of the artist exercising this power is in Janine Antoni's *Swoon* (1997). The artist presented only a partial view of two ballet dancers, obscuring the top half of the screen with red velvet curtains. This presentation of a partial view 'heightens the air of expectancy, provoking us to wonder what is beneath the curtain, even when we have no reason to believe it will contradict what we have already experienced' (Cameron, Cappellazzo and Bechtler, 2000, p.37). Ryan Gander uses this power playfully in *Kodak Courage* (2012), in which he subverts the purpose of a display case by turning opaque as the viewer approaches, censoring its contents (*The Culture Show*, 2014).

In *Bed Project* the artist is in control of censoring and revealing information. *Read Me Lips* is based on video camera recordings of daily interviews with a counsellor. Such sessions are usually held in private, but in this artwork they have been recorded and disseminated to the public. The video is focused on the interviewee's face, and bodily gestures and facial expressions indicate that

it is a one sided conversation. The dialogue produced in the interview videos

has been translated with dictation software. Explicit details of the interview do

not transfer save a few words, so the viewer cannot tell what is being

discussed. The fact that there is something being censored piques the viewer's

interest in what exactly required redaction. The same is true when profanities

are censored with a bleep on television**.** The dialogue has been removed and

replaced with nonsense, so the intimate information can no longer be

understood. This filtering of information could be seen as the removal of the

most revealing outcomes of the process. Yet, it resulted in keeping the work

from being overly burdened with information, which would run the risk of the

viewer becoming distracted from the artistic intent of the project and its visual

and sensory effects.

> *There will always be more things in a closed, than in an open, box. To verify images kills them, and It is always more enriching to imagine than to experience.* (Bachelard, 1969, p.88)

These artworks still reveal a great deal of personal information; however the

aim of the installation is not to form a sort of 'tell all', but rather to convey the

phenomenology of the bedroom, the experience of sleeping on a glass bed and

the intrigue of a concealed confession.

5.5.4 Data Capture as artwork

In this research, information is made meaningful through the realisation of

artwork. How data is captured and used in *Bed* and *Read Me Lips* is a further

development from those used in the other projects. In *Emotional Leak, Window*

Series and *Tyne Tunnel,* data capture is used to record the quirk, which informs

the production of the artwork. In *Bed* and *Read Me Lips,* the data capture is

informed by the artwork, and also is the artwork. Data capture is used to record

the process of my experiencing glass in *Bed.* The emotional outcome of this experience is also recorded in *Read Me Lips,* in which the audio is manipulated through data capture software. It is the experience of glass, which is recorded through data capture, and not the glass, that becomes the subject of the artwork. In the process of manipulating the audio, and the display of both audio and video in an artistic setting, the work has been given meaning, and can thus be seen as data.

Because of its emotional and experiential properties, the data for these two projects was particularly time-dependent. If the information was not gathered during the performance process, it would be very difficult to restage. This is especially true for the interviews, as the experience of sleeping on a glass bed on a particular night could only happen once. One might mentally and physically 'prepare' for the activity if staged again.

5.6 Summary

This chapter explores architectural phenomenology through the study of my most intimate space, the bedroom. My bedroom can be considered as a place with which only I have had a specific and personal connection. However, such a room is also a site for activities essential to life, and as such most people have a notion of how a bedroom may be experienced.

The quirk of *Bed Project* lies in the symbiotic relationship between the architecture and its inhabitant and the subsequent exposure of this intimacy through the creation of artwork. *Bed* embodies this relationship of private space to the inhabitant through the process of performance, and tests my limits of physical exposure, discomfort and vulnerability through the removal of all personal effects. The personal nature of the work is not only an exposure of the

body, but also of the acquired culture of religion and its relationship to morality and acts of intimacy associated with the bed.

Phenomenology of both architecture and material are crucial to the conception and execution of this work. Glass is utilised for its hardness, transparency, coldness and fragility. When it is conflated with the bed and sleep, the suggestion of this experience triggers a response from the viewer. In both artworks my own body, personality and self are an inextricable part of the process. Personal exposure in an intimate space is achieved through the documentation of a sleeping body against clear glass. It is also achieved through the transcription of a counselling session designed to record the emotional effects of this act. The detailed information is then censored due to an inadvertent expression of culture and class: a regional accent. *Read Me Lips* alludes to the exposure of intimate secrets yet deliberately conceals a documented confession.

Bed Project has led to a wide range of outcomes. The raw footage in this documentation can be found in the artwork *Read Me Lips*, in which both the video and the translated audio are presented. The polished photographic outcome of *Bed* was produced retrospectively to visualise the overriding experience of the performance; the compressed body and contact between skin and glass. These photographs point towards further artworks connected to the performance including normal and infra-red video recordings. Already explored future applications, including 3D manufacturing processes, can be found in Section 6.4.2.

The project experiments with heightened human experience and tests limits of exposure and censorship. It is also a model for an alternative conception of data

capture, and the intertwining methods of translation, realisation and analysis to execute and expand a project into multiple artworks. *Bed Project* has become an open-ended investigation into the intimacy of the bedroom and the various ways in which it can be interpreted and expressed.

Chapter 6 – Conclusion

This concluding chapter reflects on the study, identifies its contribution to knowledge, and suggests opportunities for further research. The written thesis and the corresponding body of artwork are considered together in terms of research objectives and aims. The contribution to knowledge can be claimed as a model of practice that utilises phenomenology through the translation of the architectural quirk to create a unique and diverse body of artwork; and through the development of original working methods for waterjet cutting and kiln-forming to produce architectonic sculpture and imagery in glass. The creative and technical contributions to knowledge and their dissemination indicate how the work sits in the context of glass art today. Finally, further research includes projects not included in the main body of research, as well as future opportunities to extend this study.

6.1 Conclusion in relation to research objectives

By locating the context and methodology of the research, analysing the role of phenomenology and the architectural quirk, and identifying the use of digital technology in data capture and fabrication, this study has accomplished the following objectives (Section 1.4):

- Creating a body of artwork that explores the translation of architectural quirks through the use of data capture and the material and sensory properties of glass
- Describing the context for research by identifying key concepts and contemporary art practice related to architectural phenomenology and the use of technology and glass in art
- Developing a methodology informed by architectural practice for the conceptualisation and execution of architectonic artworks
- Utilising digital techniques for the translation and realisation of architectonic glass sculpture
- Reflecting on the practice through written thesis

6.1.1 Locating the research: context and methodology

This thesis provides a description of architectural phenomenology in relation to my personal history, combining theory and practice of architecture, contemporary art and glass, and providing a rationale for undertaking this study (Chapter 1). A contextual review identified the main themes of this research; architectural phenomenology, architectonic, glass, digital technology and data capture (Chapter 2). The review identifies relevant contemporary artists, researchers, philosophers and writers within the five themes, the potential for merging of subjects, and established key areas for research. This allowed me to contextualise my practice in the field of contemporary art practice and glass.

My experience as an architecture student is a major influence on my artistic practice. The ways in which I process space and conceptualise and develop work differ from traditional making-based philosophies of many glass art practitioners. In Section 1.4, I articulated my approach to creative practice. Combining architectural practice with established artistic approaches, I was able to use digital tools typically associated with architecture to design and fabricate artwork. These techniques, as well as an architectural approach for the development of ideas, were used in the production of a body of artwork distinct from the forms and expressions often associated with artworks in glass. This is evidenced by Harrington's placement of artworks made in this research on his 2011 diagram of the expanded field of Studio Glass (Section 2.5.4). It was concluded that craft skill was not the priority of the artwork, and because of this the work sits outside of the 'mean' of artistic glass practice. Although the work may not sit in the context of Studio Glass as such, its focus on the phenomenology of material makes this body of work relevant to glass practice.

In Chapter 1.4, this study discusses existing methodological models used for art and design research, analysing precedents in the field of art, glass and architecture. Architectural practice was used as a point of reference throughout the methodological framework, which describes my conception, execution and reflection of an artwork. Previous architectural training and current artistic practice required the merging of disciplines to better define specific methods of working. Therefore the methodology can be seen to adapt the step-by-step process of the architect by combining it with the pick-and-mix approach of the bricoleur artistic practitioner (Section 1.4.2).

An approach was developed in which five intertwining phases comprise a creative project: identification of the site, discovery of the architectural quirk, translation, realisation and analysis. The architectural site was chosen according to my intimate relationship to it; this connection informed the discovery of the architectural quirk, an idiosyncrasy of the building's 'personality'. Translation combines methods of data 'captured' from the architecture, and includes digital drawing and modelling. The artwork is realised at a scale relative to the original site, even when not re-installed in situ. This parameter linked the artworks to the spaces that inspired them and also gave a visual quality that is relatable to a human scale, enhancing how the viewer might relate to the artwork and the space. By relating the body to the artwork, this approach embodies one of the fundamental functions of architectural space. Through the application of the methodology a unique body of artwork has been realised which is informed and inspired by architecture. The artworks harness the phenomenological qualities of a space to provoke new ways of experiencing architecture.

6.1.2 Architectural quirks and phenomenology

Writing this thesis helped to identify the core subject matter, consider the context of the artwork, and clarified the role of glass in each creative project. It has brought what would appear to be a disparate set of subjects (creative glass practice, architecture, and digital design and manufacture) into clearer focus, illuminating my approach to creative practice. Developing the concept of the architectural quirk synthesised a methodology that is adapted from both architectural practice and established practice-based research.

This research may be unique in that it merges aspects of architectural phenomenology with digital technology in the production of architectonic artworks in glass. The sites used in this research have played an important role in the everyday architecture of my life. Despite the specificity of the sites I chose, they are part of a wider cosmology of architecture with which most people can identify. *Emotional Leak, Window Series*, *Tyne Tunnel* and *Bed Project* were inspired by the architecture of the workplace, the council estate, a commuter tunnel and the bedroom. The use of commonplace subject matter helps to create a connection between artwork and viewer.

Both the phenomenology of the sites and the material were combined in projects that referenced features in, and disrupt the experience of, architecture. Glass has been used as both the object formed through manufacture as well as the medium through which the architectural quirk is translated. The artworks in Chapter 3 also employed glass for its specific material properties. Digital manufacturing processes were used in order to cut glass into specific forms. *Emotional Leak* (2011) uses black tinted glass as the closest substitute to the absence of colour found in transparent glass, with the added property of having

an accumulating colour density, and to signify an absence of light, or a void in space (Section 3.1.6). This use of colour depth went on to inspire and inform the unique application of glass in *Window Series* (2012), which isolates a view found when looking through a window, within the window itself. In Chapters 4 and 5, glass is not fabricated, but is explored for its phenomenological properties. These two projects relied on the embodied properties of glass for the translation of the quirk to the viewer.

This thesis demonstrates an engagement with architectural space that does not rely solely on visual qualities, but also incorporates aspects of architectural phenomenology through the identification of the quirk. It articulates an approach to working with glass as an architectural feature, a phenomenological material and material for digital manufacturing.

6.1.3 Data capture and digital technology for glass

This research uses data capture and the appropriation of existing data to gather information within architecture. Identifying the architectural quirk is the point of departure in creating an artwork, manifest through the translation of a literal or abstract data which captures the building's 'personality'. This research argues that data capture does not only mean the collection of quantitative information, typically numerical data, but also qualitative information related to the sensory experience (Section 2.3). In this study, data capture came to encompass more than just the physical characteristics collected from the architecture. Social, cultural, emotional, and historical narratives also played a role in the shaping of the artworks. Data capture techniques used in this study included stop-motion photography, static photography, image light reading, video, sound recording, and numerical abstraction.

This research explored the use of digital design and manufacturing techniques for the translation and realisation of sculpture in glass. This was achieved through the use of digital software such as AutoCAD for technical drawing, Rhinoceros for 3D modelling and V-Ray for realistic model rendering. Waterjet cutting was the main process of manufacture.

Digital technology was used in three ways: to record invisible phenomena and experience through data capture, to analyse and model the site, and to machine glass using digital fabrication. The application of digital tools provided a means to model, visualise and plan the artwork for physical manufacture. This methodology for making artwork is based on an architectural approach, in that a digital model precedes any physical construction (Section 1.5.3). It has also been used as a means of discovering form that could not be made using traditional glass techniques. This development of digital techniques is not the artistic intention of this study. However, a useful by-product of working with digital technology and glass is the development of new processes and techniques that expose and visualise artistic ideas.

In Chapter 3, waterjet processes were used as an abstraction of 3D printing concepts. The machine was programmed to cut contoured layers of three-dimensional objects to construct the sculptural artworks *Emotional Leak* and *Window Series*. This technique of 'slicing' digital models facilitates their manufacture in two dimensions and assembly in three dimensions, which can provide intricate detail and possibilities to make artwork at a large scale. *Window Series* (2012) combines the possibilities of data capture, computer modelling and digital waterjet fabrication to offer a unique new method for producing imagery in glass sculpture. By combining architectural modelling

techniques with the colour depth of tinted glass, an innovative process has been developed which can be seen as a contribution to knowledge (Section 6.3.2).

Finally, this study extends the use of digital technology beyond manufacture and into a means of disseminating and generating other forms of creative practice, such as text-based artworks and kinetic installation. In Chapters 4 and 5, technology was used not as a way of forming glass, but as a means of producing and documenting ephemeral artworks. This is a focus that has been neglected in previous studies utilising digital technologies in glass art in which manufacture is the focus of the study.

6.2 Conclusion in relation to research aims

This research explored architectural quirks through the development and production of artworks in glass. Inspired by architectural phenomenology, digital technology has been applied in the translation and realisation of three projects linked to a specific site. This section considers how the following aims were achieved. The concept of the architectural quirk has been used to:

> • Identify ways in which glass can be used in artworks to express aspects of architectural phenomenology
>
> • Explore the use of digital technology as a tool for the production of architectonic glass sculpture, installation and performance

6.2.1 Glass and architectural phenomenology

Study of existing philosophies summarising architectural phenomenology provided a foundation from which to begin working. The study of the phenomenology of space is closely associated with our most intimate architectures, such as the home. This is found in writings on the subject. This study focused on the idiosyncratic 'personalities' of my intimate architecture. The quirk is central to the creation of the artwork because it emphasises

seemingly insignificant details of our intimate architecture. By identifying the quirk, one prioritises overlooked characteristics of the architecture's 'personality'. This expresses an intimate connection with that particular space.

These quirks were translated through the conceptualisation of architectonic data, and realised as sculpture, installation and performance in glass. As idiosyncrasies make something or someone unique, each of the quirks inspired a unique artwork in response. The projects were not led by a preconceived technical process, but instead by the application of glass and technology that best suited the concept. It is in this working approach that the conception of a monumental stacked glass sculpture such as *Emotional Leak* might relate to the development of a temporary intervention with kinetic mirrors in *Tyne Tunnel.*

A variety of approaches was used in the translation of architectural quirks. Literal translation can be seen in *Emotional Leak* and *Window Series* (Chapter 3), in which stop-motion and static photography recorded visual phenomena from the sites. In *Tunnel* (Chapter 4), the quirk of the architecture relates to its current disuse and obsolescence. In its heyday, it would have been illegal to stop and consider the architecture. The act of stopping is now encouraged as the Tyne Pedestrian and Cyclist Tunnel is used more often as a location of historical importance rather than a means of commute. This work is particularly poignant in regards to our experience of space in relation to time, as the tunnel was closed for regeneration a few months after the installation of the artwork. *Bed Project* (Chapter 5) reveals the quirk in my language as manipulated by the transcription software in *Read Me Lips*.

The inclusion of a biographical context within the written thesis helps to explain the intricacies of my intimate relationship to the architecture. The divulgence of

intimate details may be interpreted as significant or irrelevant. However, they explain *why* these places became a significant part of my life's architectural landscape. The artworks also mark a particular time in my life, as well as in the life of the buildings. They encapsulate a location-based biography of my relationships with architecture between autumn 2011 and winter 2015. The artworks reveal the architectural quirk, but in the process also expose my working life, class, cultural upbringing and emotional mind-set. The work can thus be considered as a form of self-portraiture through the exploration of my intimate architecture. The sites used in this research can be seen as overlooked, either due to their disuse, or because they are so ingrained in everyday life that we forget their importance. Developing and exhibiting the artwork focused on this obsolescence, drawing first the artist's and subsequently the viewer's attention to the unique 'personality' of each of the buildings. However, I was not the only one taking note of the relative obsolescence of each site; the locations have since been regenerated in some capacity after the creation of the artwork[9]. This development adds to the ephemerality and uniqueness of each of the artworks.

6.2.2 The role of digital technology in architectonic glass sculpture

The application of digital technology was not preconceived for each project, but instead developed to interpret the individual quirk as an artwork in glass. This approach could have been limited by the scope of my digital skills. My openness allowed the incorporation of other people's abilities and collaboration with glass, engineering and psychology experts. A willingness to diversify

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[9] It must be noted that none of these sites were chosen *because* of their imminent state of change.

resulted in broader possibilities for the translation and realisation of each project.

Manufacturing through digital technology is a beginning, and not an end point in this study. The development of creative concepts expands into the wider areas of making meaning in contemporary art. Though I approached a form of mastery of manufacture in glass (Chapter 3), technical skill was not a primary objective or tool in the execution of the installation works (Chapter 4 and 5). Digital technology consequently became a more abstracted method in the translation of data and the recording of architectural experience.

Digital technology is applied as a tool for recording aspects of the architecture's 'personality', as well as for manipulating captured data into a visual and sensory form. In some projects the glass is literally formed through digital manufacturing, and in others the experience is formulated using digital recording methods. In *Tunnel*, the kinetic quality of the vibrating mirrors was an important aspect of the installation. Video documentation records the experience of the artwork, capturing the movement, sound and the viewer's journey through the unique architecture.

In this research, the process of forming an artwork mirrors that of the architectural practitioner. The methodology borrows from both architectural and artistic practice, and many of the digital techniques used in this study are working approaches and standard practice in architectural design. For the architect, experimentation is accomplished, virtually, through digital drawing and modelling. Larger and more ambitious projects can be achieved in glass through this approach. Concepts for objects and installations are easily scalable; this also means they can be made to relate to a physical space. Each

of the artworks can be considered architectonic because of their relative scale, location, or reference to architecture. *Emotional Leak* and *Tunnel* are constructed and installed at an architectural scale; the *Window's* are one-to-one scale re-imaginings of an architectural element; and *Bed Project* is performed in the space of a bedroom.

The sculpture, installation and performances in this study show that multiple approaches to the use of digital technology can be taken not only to manufacture but also record and conceptualise architectonic artworks.

6.3 Contribution to knowledge

It can be claimed that the study is a contribution to knowledge through the offer of a model of creative practice in glass. This is guided by architectural phenomenology in which the architectural quirk inspires a process of translation, realisation and analysis to develop and create a unique and diverse body of artwork. It is also claimed that this study offers original working methods for waterjet cutting and kiln-forming to produce architectonic sculpture and imagery in glass. This section will then evaluate the contribution to knowledge through the dissemination of the research and the impact on its field through a subsequent change in context.

6.3.1 Architectural phenomenology inspiring a model of creative practice

This research uses architectural phenomenology as an inspiration for architectonic artwork in glass. Instead of purely focusing on the visual aspects of architecture, the methodology encourages an exploration of the experience of architecture and its unique phenomenological 'personality', named in this research as the 'quirk' (Section 1.5.2). The methodology, combining aspects of architectural and artistic practice, also provides a new way of working with

digital technology for glass. Compared to previous PhD studies, digital technology is not the primary subject of research. Rather, it is used in the translation phase as a means of realising the architectural quirk (Section 1.4.1). The application of this methodology is not restricted to the architecturally scaled artwork as seen in this particular body of work, nor is it restricted to a single material, as will be evidenced in developing future projects (Section 6.4).

In this study, I compared my connection with architecture to that of human beings; the relationships developed over time, and consequently became an intimate part of my life. This association is important when considering the quirk, a word typically used to describe human behaviour. The architectural quirk describes the idiosyncratic 'personality' of a building, which is uncovered through an observation of its overlooked qualities. As described in the contextual review (Section 2.1), this approach draws on the ideas of philosophers and theorists who have moulded the dialogue of phenomenology in art and architecture today.

The sites examined in this study have not been placed in a context of architectural design precedents, but instead are contextualised through personal biography. This is achieved by considering the sites in an emotional, social and cultural context. The individuality and subjectivity of experience of sites is reflective of architectural phenomenology. Yet whilst the site is specific, the subject matter is universal. Exploring architectural quirks inspired the conception and creation of a unique and original body of work, which is at once intimate as well as relatable. As a model of practice, this study suggests how others might approach artistic practice in glass as well as other creative genres.

6.3.2 Waterjet cut architectonic sculpture and imagery in glass

This study yielded two novel approaches to the use of waterjet cutting for creative glass practice. Details of these techniques can be found in Chapter 3.

The use of waterjet cutting can be seen to mirror an abstracted process of 3D printing, a manual version of additive manufacture, programmed to cut contoured layers of three-dimensional objects to construct sculptural artwork. The process of contouring digital models facilitates the manufacture of artwork in two dimensions that can then be assembled in three dimensions. Whereas many studio glass processes do not lend themselves to the production of architecturally scaled artworks, this process offers the potential of manufacturing large-scale glass objects from multiple components. This is best evidenced in *Emotional Leak* (Section 3.1.5).

A new method of working with waterjet cutting for the creation of photographic imagery in glass has been established. This was achieved through design and manufacturing techniques that transform 2D imagery into 3D embossed surfaces through the process of light sampling (Section 3.2.2). This 3D surface can then be digitally sliced at intervals equivalent to the thickness the desired material, nested on a single plane, and cut from glass using a waterjet. The contoured layers can then be reassembled horizontally to create a physical reconstruction of the embossed digital surface. When combined with the cumulative colour density of tinted glass, the variable thickness of the contours creates a reproduction the original imagery. Seen in the production of *Window Series* (Section 3.2), this process combines data capture, computer modelling and digital fabrication to offer potential applications for architectural glass at a

variety of scales[10]. It also has potential for expansion into other glass making methods (Section 6.4.2).

6.3.3 Evaluating contribution through change in context

My contribution to knowledge can be evidenced by ways in which this study has advanced the study of waterjet cutting for creative glass practice, and has been disseminated in the field of practice through exhibition, presentation and publication.

Cutler (2006, p.206) considers the 'development of handling and removal of large-scale work' as an area for future research. This study improves upon methods for large-scale waterjet sculpture through the process of contouring, thereby developing the means to assemble and transport the artwork, as evidenced through the making and exhibition of *Emotional Leak* (Section 3.1). This study also suggests an alternative method of milling glass by combining waterjet cutting and kilnforming, contributing to the exploration of milling glass with a waterjet cutter considered in both Cutler (2006) and Doolan (2014) (Section 1.4.1).

The new artworks realised in this study have been made available to the public through exhibition in galleries and selection for juried exhibitions and publications (Appendix 4). A number of the *Window* artworks have been acquired for permanent public and private collection. *Emotional Leak* is on semi-permanent loan to Berengo Centre for Contemporary Art and Glass on Murano, Venice. It is also scheduled for inclusion in the 2015 iteration of *Glasstress*, *Gotika*, a satellite exhibition of the Venice biennale that attracts around 260,000 visitors. In 2012 my work was chosen by a panel of jurors to

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[10] The formative development for *Window* can, in fact be traced to a proposal for an architectural glass commission for St Nicolas' Cathedral, Newcastle in 2011.

represent the UK as one of two emerging artists at the *European Glass Context* exhibition and conference on Bornholm, Denmark. The exhibition was presented separately over two locations, representing 'New Talent' and 'European Glass Art', which represented the best of emerging and established artists in glass from around Europe.

Conference paper presentations and publications exposed the practical and conceptual approaches behind the artworks to a wider audience in a variety of specialist contexts (Appendix 1). In 2015, I will present at BECon and the Glass Art Society Annual Conference, both of which are important events in the glass art community (Appendix 4). These lectures will discuss the philosophical and practical concepts of *Window* and *Architectural Quirks: Translating and Realising Ideas in Glass through Digital Design and Manufacture* respectively. In 2014, Jeffrey Sarmiento and I presented a paper titled *Emotional Leak: Collaboration in Glass and Monumental 3D Printing* at *All Makers Now?, at* a conference discussing craft values in 21st century production (Appendix 1.1).

Finally, in 2014 I was awarded one of three inaugural Technology Advancing Glass (TAG) grants from the Glass Art Society, USA, to further fund my research of *Window Series* (Appendix 4.8). The TAG program follows the worldwide educational trend that combines science, technology, engineering and maths (STEM) with the arts (STEAM) to accelerate the development of new, expressive forms. The grant, donated by Dr Wayne Strattman and Ted and Melissa Lagreid, awarded $2,500 to fund research on new materials, techniques, making methods, and applications of technology in glass art.

The dissemination of this study within and outside of the field of glass provides evidence that this research contributes to a wider context both technically and

conceptually. It can be claimed that this research has made an impact on the context of practice.

6.4 Areas for further research

Alongside the large-scale spatial artworks included in the main body of this research, a number of other, smaller projects took place that dealt with similar practical and/or conceptual themes. These projects now exist in various stages of completion, ranging from initial ideas to realised sculptural works, yet they all have the potential to be interesting areas of further study relating to both glass and conceptual art practice. This study concludes with the discussion and analysis of these projects, as well as focusing on areas for further research. In autumn 2013 I attended a two-month emerging artist's residency at Pilchuck Glass School located in Stanwood, Washington, USA. During the residency a number of projects emerged which pointed to new directions for future research. The following is a short description of each project, and how these works could be expanded further.

6.4.1 Wall

Red clay brick, Mortar, Glass bottle shards
Installation/Photography
450x400x40mm
2013

Built at 1:5 scale and with the same materials as a real brick wall, *Wall* was built as a reaction to the lack of brick buildings in Washington State, and my own longing for the familiar during my two month residency at Pilchuck Glass School. As my research had previously explored the architectural quirks of spaces to which I was already familiar, the residency provided me with the opportunity to explore space with which I was not accustomed. The residency provided what I thought was the ideal location for the expansion of this area of

research, and during the two months that I was there I attempted to form a new relationship with the site. However, because of the extreme contrast between the sites with which I was intimate and *at home*, and that of Pilchuck, I found it increasingly difficult and thus frustrating to create any sort of connection at all. The site was completely foreign to me, it was located on a north Western tree farm and for the duration of my stay there I occupied only wooden 'hut' architectures. My difficulty was not only in connecting with the geographical location, but also with the materials with which I was surrounded. This lack of a connection compounded with my longing for home inspired me to install my architectural culture into that of northwest USA. The original intention was to build a 1:1 stereotypical British back wall, complete with graffiti, 'No Ball Games' sign and anti-theft glass shards. However the project was deemed too large by the Pilchuck artistic director Tina Aufiero, so she asked me if there was any way I could 'scale down [my] ideas'. So I did, literally. Installed on the grounds of a tree farm located north of Seattle, USA, *Wall* is a physical representation of the intersection of my own north east English culture, and that of north western America. For me *Wall* is a little part of home, visually comforting and reassuring.

Wall required no digital technology at all. It can be seen as a continuation of the work in Chapter 4 of this research, in that it utilises and expands upon the inherent properties of glass, in this case the cultural connotations of the glass used as an anti-theft device typically seen on British back lane walls, which has its own complicated history. It also expands upon the idea of what home can mean, in that a visual connection was created in order to stifle my home-sickness, be it via a somewhat ridiculous cultural totem. This cultural totem is not what one would expect as a form of home comfort; a rather imposing, aggressive brick wall. Yet somehow the recognisable imagery, alongside the

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miniaturised scale, lends to *Wall's* charming and relatable qualities. *Wall* continues the research focus on architectonic artwork that is based on architectural modelling as sculpture as well as site-specific installation in overlooked spaces.

Figure 55 Erin Dickson, *Wall,* **2013, Mixed media installation**

Figure 56 Erin Dickson, *Wall,* **2013, Mixed media installation**

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6.4.2 Expanding on *Window:* 3D printing and CNC testing

The original aim of the Pilchuck residency was to develop the digital techniques required to realise *Window Series*. The creation of a window through waterjet machining is both a time-consuming and costly method of manufacture. Each individual contour of glass must be individually cut, cleaned and reassembled into the wall panel, and up to 50% of the sheet glass becomes wastage. By utilising kiln casting methods with digitally manufactured mould positives, I believed this process could be simplified to expand the methods of application, raise image resolution, and reduce waste. I created small, castable tests using 3D printed mould negatives to see if a clearer image could be achieved using alternative digital methods. Whilst this project has only produced tests, the experiments made in *Self Portrait* provide a more practical expansion of the *Window Series* research. More importantly, the photography used as source material (my face squashed against a window) informed the photographic realisation for *Bed Project*, in this case expanded to a full body portrait.

2013_3D Printing/Bullseye colour casting tests

Figure 58 3D printed mould negative for glass casting

2013_CNC machining/Bullseye casting test

Figure 57 CNC milled mould negative for glass casting

6.4.3 What were the skies like when you were young?

Alongside other methods of manufacture, I have also experimented with the use of more ambiguous and less formal imagery as source material. *What were the skies like when you were young?* (2014) uses photographic images of clouds as the source for form. The result is an abstracted reproduction of the original photograph; the translated imagery resolves itself when at a distance but is distorted when viewed up close. This experimentation has proven that the relative scale of the glass thickness in relation to the scale of the overall artwork is crucial in the resolution of the translated imagery.

6.5 Epilogue

When this research began, it was intended to be a study of technical methods of capturing light readings to produce 3D sculpture in glass. This was accomplished in the *Window* series of artworks. But what I realised in the making of this research is that coming to grips with what inspired me would become the most important accomplishment, and one that would serve me beyond completion of this study. Developing an understanding of phenomenology, though I have only begun to comprehend it, has been influential in how I view my work and my world. My education as an architect was far more influential on my artistic endeavours than I thought, and I appreciate the foundation it gave me. The skills and unique viewpoints help to set my work apart from other artists working in glass today. Without a conscious effort to do so, the artworks all took on aspects of the architectonic, whether through scale or site, or their visual qualities. Digital tools have brought me a long way toward making visually exciting artwork, but in the process of this study I have also discovered new potentials for making work that do not involve technology as such. These artworks have been the most revelatory, as I found that one can develop deeper conceptual understanding of phenomenological experience when not separated by the computer screen. Finally, I have also realised that more important than the mastering of glass as a material was mastering my understanding of what makes glass such an interesting material for an artist to work with. This I was able to articulate as the phenomenology of material. Through this thesis I hope that I have been able to share some ideas and techniques with artists looking to extend their practice both in process and concept.

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Appendix 1 Academic paper publication

1.1 Emotional leak: Approaches to 3D printing in glass

This paper was presented at the 'All Makers Now?' Conference in July 2014, held at Falmouth University. The conference explored craft values in 21st century production. To be published in 2015.

EMOTIONAL LEAK: COLLABORATION IN GLASS AND MONUMENTAL 3D PRINTING

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Abstract
This paper considers the impact of an alternative approach to 3D printing with glass. It describes how collaborative practice has merged concepts of digital and craft skills with manufacturing technologies. Emotional Leak, a large-scale waterjet cut glass sculpture, is inspired by architectural phenomenology of National Glass Centre in Sunderland. Collaboration in this artwork involved the combination of the individual researchers' methodologies and skills. The paper concludes by considering the impact of the research, the outcomes of future artworks, and the innovative use of digital technology for creative glass practice.

Key Words
Waterjet, 3D printing, architectural phenomenology

Introduction
This paper will consider the impact of an alternative approach to 3D printing with glass. It describes how collaborative practice has merged concepts of digital and craft skills with manufacturing technologies. In this paper, two practitioners combine their knowledge in glass, print, architecture and digital fabrication. Dickson and Sarmiento share a common interest in the potential for extracting new meanings from historical objects, the phenomenology of architectural spaces and social contexts. The artists contribute to each other's individual practice by finding new conceptual and physical solutions to site and material.

The paper introduces architectural phenomenology as a driving concept behind the creation of artwork. It then considers aspects of collaboration and the individual researchers' methodologies and skills. A description of the fabrication includes the combination of digital and traditional craft skills. The paper concludes by considering the impact of the research, the outcomes of future artworks, and the innovative use of digital technology for creative glass practice.

Architectural Phenomenology

Emotional Leak is a monumental sculpture, inspired by a quirk in the architecture of National Glass Centre, Sunderland, where Dickson and Sarmiento both study and work. Constructed from individual glass plates stacked from floor to ceiling, the precise contours of the work were made using a waterjet cutter. This collaboration provides a perspective on the shared phenomenological experience of space.

Architectural phenomenology can be considered the embodied experience of built space. It entails an engagement with a site beyond observing a building's formal qualities, and instead explores being within built spaces. The focus is on the culmination of a sensory experience which can include aspects such as light, sound, temperature and so on. Norberg-Schulz described architectural phenomenology as the *genius loci* – the spirit of place: '*In general a place is given… a character or 'atmosphere'. A place is therefore a qualitative, 'total' phenomenon, which we cannot reduce to any of its properties, such as spatial relationships, without losing its concrete nature out of sight*' (Norberg-Schulz, 1980, p.6-8)

Social, cultural and historical context gives significance to a site, as do the emotions of the inhabitant: '*Understanding nature is in turn a highly personal matter and something conditioned by emotionally based anticipatory structures related to a particular history and culture*' (Bondi, et al., 2007, p.97). The experience of place has as much to do with being in the space, as with the space itself. Architectural phenomenology comprises the personal, sensory engagement with architectural space.

National Glass Centre was built in 1998 in Sunderland on the banks of the River Wear. Having spent a several years working and studying there, the two artists developed a relationship with the building's atmosphere and personality. Its main feature is a glass roof, on which one can walk and look down into the restaurant, galleries and workspaces. The roof is expensive to maintain, which has allowed rain, a staple of the northern English climate, to enter the building. This infiltration of water came to represent the phenomenology of the architecture and consequently inspired the artwork. Stopping the leak quickly became an in-joke within the community. When *Emotional Leak* was discussed in a symposium at NGC, executive director James Bustard proudly declared the leak to be fixed. A week later a new drip had formed.

Collaboration
Dickson and Sarmiento shared a mutual experience of the quirk in the architecture of their workplace. Their collaboration involves the bringing together of methodologies and skills. Sarmiento's research explores cultural identity through the graphic image in glass. His methodology, inspired by ethnography, involves the identification of subject, an exploration of multiplicity of ethnic, social and historical contexts in a specific site, and the fabrication of work through craft-based methods (Sarmiento, 2011, p.55). Many of these artworks can come to be seen as object biographies, to borrow a term from Kopytoff (1986, p. 68), considering how they come to embody a cultural context and an experience. In contrast, Dickson adapts architectural practices for art making, using the phenomenology of a site as a source for inspiration. Her methodology applies data capture, visualisation, realisation and analysis to

create sculpture, performance and sensory installations. Dickson's connection to intimate spaces is inspired by Bachelard's contemplation of the home as a point for reference for all experiences of architecture (Bachelard, 1969, p.7). Both Dickson and Sarmiento share a focus on architecture and its potential for a myriad of readings. Whereas Sarmiento's work explored the lived experience of Brutalist Soviet-era housing in the Baltic States, Dickson's subject matter considers aspects of local, North East English architecture as an extension of intimate space, or the home. Anthropomorphising her intimate architecture, Dickson is interested in the idiosyncrasies of a building or site which she refers to as 'quirks'.

The overlap in subject matter can also be found in their shared skill sets. Sarmiento and Dickson both worked extensively with waterjet cutting for creative glass practice prior to the *Emotional Leak* collaboration. Sarmiento had worked with glass for 15 years, mastering a wide range of Studio Glass techniques. His artwork uses printing, precise cutting and kiln forming processes to create two-dimensional architectural imagery from glass. Dickson, moving into glass practice from architecture in 2009, focused on the construction of 3D objects from 2D planes of cut, clear float glass, designed using digital drawing and modelling tools. Dickson applied her digital drafting skills to Sarmiento's existing waterjet processes, achieving increasingly more complex and intricate designs, as well as improving her own glass handling and manufacturing skills.

Architectural phenomenology is mostly considered to be an individual experience of space, influenced by our unique social and cultural backgrounds. Yet an aspect of this project's realisation is that it was made in collaboration. Considering the superficial elements of the artists' social and cultural background, it would be easy to assume their personal experiences of NGC would be very different. Their ages, cultures, upbringing and social statuses were different; however their experiences converged in the realisation of this project. Merleau-Ponty discusses the subject of the other as a tool that can be utilized as an extension of the phenomenological self. He states that one is able to experience more of the world through social interaction, allowing our perspective to 'slip into' one another's (quoted in Priest, 1998, p.104). He continues, *'… my body is always perspectival – I never have an all-encompassing hold on the world; there is therefore room for other incarnate subjectivities, and their points of view compliment my own'* (ibid., p.103).

Rather than creating confusion, the combination of phenomenological experience provides a more all-encompassing and enriching experience of the world. Ballantyne (2002, p.111) argues that phenomenological experience is filtered through acquired culture 'picked up from the culture that surrounds us… and the circles in which we move'. Dickson and Sarmiento could be seen to have acquired similar cultural perspectives through their mutual occupation of NGC, sharing a familiarity with its unique architecture. Also, the differences in the artists' *inherited* cultures contributed to the overall sensory perspective of the site. Instead of only one phenomenological observation informing the translation of the quirk, two overlapping perspectives can be seen as providing a wider or 'more comprehensive' view of the architectural space (Priest, 1998, p.104)

In this research, a phenomenological and biographical approach to reading architecture was combined with adapted 3D printing in glass to visualise an architectural quirk.

Fabrication
Emotional Leak utilises a waterjet cutter as a 3D printer in a sculptural response to the quirk in an architectural site. In this work, Dickson's expertise in architecture, digital modelling and machining is combined with Sarmiento's skills in glassmaking, particularly in construction for glass sculpture. Working with technology expanded their ability to pack objects with information and even provide new viewer experiences beyond what is initially visible.
The artists looked toward idiosyncrasies that the architect did not envisage in his design, a notoriously leaky glass roof. To visually express the atmosphere of this space, we envisaged what might happen if an 'emotional leak' were to burst in existing architecture, revealing a bubbling surge of glass emanating from its ceiling.

As the methodology for art practice borrows from architecture, many of the digital techniques used in this study are important working approaches in architectural design. While an artist may create, dismantle and reconfigure an artwork multiple times, an architectural design once built is often final. The architect requires a digital testing ground as a means of discovery and for the production of successful forms. Digital drawing, modelling, rendering and manufacturing techniques are used to build, demolish and rebuild entire architectural plans with minimal real-world repercussions. With digital tools, one can instantly scale part or all of a design instantly, which is impossible through manual design. Forms that would otherwise be impossible to create are designed through digital modelling techniques (Iwamoto, 2009, p.4). Digital modelling allowed the artists to work creatively prior to committing to making. Ideas were discussed and models were sketched and visualised so ideas and understanding were quickly formed.

The work is based on a time-lapse photographic recording of a literal leak from under the glass ceiling of National Glass Centre. The data capture consisted of about 300 photographs taken over an hour, one every 10 seconds, recording of the growth of a drip into a puddle. The photographs were traced into contours and the resulting drawing was used to create a 3D model, lofted to create an undulating surface. The final digital model was built to scale within the virtual gallery space.

The digital model is then 'sliced' at 10mm intervals, the thickness of the glass used in its construction, to create drawings that can then be transferred into AutoCAD and the machining software for the waterjet cutter. A waterjet machine uses a high-pressure stream of water and abrasive garnet to cut hard materials such as steel, stone and glass, following a computer designed drawing. In particular, with it one can create shapes in glass that are otherwise difficult or impossible. Furthermore, it was possible to modify the work for a range of exhibition spaces to span from floor to ceiling by revisiting the digital model and programming and machining new components.

Utilising craft skills, the artwork was constructed considering how the machined parts could be assembled into a viable sculpture. Based on the concept that

glass is strong in compression, the artists developed a system of stacking the components and registering them over a spindle by cutting a matching square hole through the centre of each glass piece. The 406 individual sections of *Emotional Leak* range from a diameter of 10 to 1300mm. The artwork weighs over 1000kg, and in its final configuration stands at over 4 metres tall.

Impact

Emotional Leak was exhibited in three locations, premiering at National Glass Centre in *Kith and Kin: New Glass and Ceramics*. It was then displayed in Saatchi Gallery at *COLLECT: the international fair for objects* in 2013. At the time of writing it is on display in Italy at Berengo Centre for Contemporary Art and Glass, home of *Glasstress*, a satellite event of the Venice Biennale.

In this research, digital technology has been applied in three ways: to record invisible phenomena and experience, to analyse and model the site, and to machine glass using digital fabrication. This application, a method borrowed from architectural practice, provided artistic control at each point of the creative process, with modelling as a means to visualise and manipulate the artwork before physical manufacture.

The waterjet machine has been repurposed as a large-scale 3D printer for glass, programmed to cut contoured layers of objects to construct sculptural artwork. This is particularly visible in the aesthetic qualities and installation of *Emotional Leak*, which is reminiscent of an architectural model. This technique of contouring, or slicing, sculptures allows a design in glass to be cut in two dimensions and assembled in three. Its flat-pack design allows such a large sculpture to be easily transported and assembled. This precision method of production offers opportunities to make custom work at a high resolution and a large scale. *Emotional Leak* is one of the largest glass sculptures to have been made using a waterjet cutter. New aesthetic qualities have emerged through the use of digital tools. Its qualities include the marks of manufacture, the resolution of the print evident in the ridges between the stacked layers of glass. This sculpture could be realised in glass only through digital design and manufacturing methods.

As an artwork, the leak is a physical realisation of the experience of architectural phenomenology as shared by two individuals. It is the product of collaboration between artists whose individual experiences as an architect and a glassmaker are brought together in a response to site, space and place. The sculpture is a physical representation of the building's quirks, a frozen moment in the relationship between the inhabitant and the architecture.

The artwork deepens the relationship between the digital and physical, pushing the physical boundaries of studio glass and digital technologies and providing new viewer experiences. Whereas objects made through 3D printing are often restricted in scale due to cost, access, material and methods of manufacture such as the scale of the machinery, this project reinterprets the process through craft and manual handling to replace additive manufacture. Despite the use of digital manufacture, craft skills play a critical role in the realisation of the artwork. A machine normally used for serial production has been applied to a single artistic sculptural project.

Future Work
After the completion of *Emotional Leak*, individual directions for Dickson and Sarmiento's practices continue to develop expert use of the waterjet cutter, with the addition of aspects of the printed image. Interpretations of architecture continue to be a subject matter behind the work.

Additional complexity and the continued use of the waterjet machine as a craft process is evidenced in Sarmiento's pictorially oriented artworks. He recreates modernist buildings, using the waterjet cutter to create low relief surfaces and textures. *Centre* (2012) is a two-metre tall wall-based artwork, inspired by a controversial London high-rise. The glass portrait of its façade consists of over 4000 multi-coloured non-repeating components in a single glass artwork. The innovative process behind the work is the use of waterjet cutting on kiln-formed glass to create low relief surfaces, fused together using precisely controlled kiln firing.

Using similar design and manufacturing technology as *Emotional Leak*, Dickson has established a new method of working with waterjet cutting for the creation of imagery in glass. This was achieved through the utilization of digital design and manufacturing methods to form an embossed glass surface, which when combined with the accumulating colour density of glass can contain almost photographic reproductions of the original imagery. *Window* (2012) combines the possibilities of data capture, computer modelling, digital fabrication, and 3D printing to offer a unique new method for producing imagery in glass sculpture. It merges the printed image with manufacturing technologies, moving from the flatness of pictorial space to the interiors of transparent glass, and beyond into concepts of printed sculptures and innovative ways of making images with glass. This unique and new method of producing imagery in glass has potential applications for architectural glass and at larger sizes because of the scalable digital design process.

The collaboration between two artists, and consequently their individual architectural and craft methods, bridges the gap of what Sennett refers to as the 'disconnect between simulation and reality', and the tactile, embodied understanding of material (Sennett 2009 p.42). *Emotional Leak* can be considered to have an impact as an artwork and as an example of practice combining digital and craft skills.

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Authors' Biography

Erin Dickson is an artist, technician and researcher at National Glass Centre, Sunderland, UK. Her practice combines architecture, 3d modelling and digital manufacture to create glass sculptures and installations that consider the emotional qualities of urban and domestic spaces. She was an emerging artist in residence at Pilchuck Glass School, exhibited at National Glass Centre, COLLECT at Saatchi Gallery, the Cheongju Craft Biennale in Korea, Glasstress on Murano, Italy, and represented the UK in the European Glass Context in Denmark.

Jeffrey Sarmiento is known for his artwork exploring cultural identity and the graphic image in glass. Educated at Rhode Island School of Design, he has worked internationally, having won a Fulbright scholarship to Denmark, and a Research Councils UK Academic Fellowship at the University of Sunderland, where he is Reader in Glass. He won the International Glass Prize 2012 at Glazenhuis, Belgium and recently held a major solo exhibition at National Glass Centre, UK that toured to Bullseye Gallery, USA. His work is the permanent collections of Speed Art Museum, USA, Museum of Liverpool, and Glasmuseum Ebeltoft, Denmark*.*

1.2 Contempory Glass Society Article

This article was written for the March 2015 issue of 'Glass Network', a quarterly CGS publication.

TITLE: TO BE CONFIRMED

Our home is the most important architecture of our lives. It protects us from birth and informs us of our culture, social status, perhaps even the type of person we are meant to be. It instils a sense of belonging, an anchor we can return to. More than just bricks and mortar, the home extends beyond the place in which we lay our heads each night. Philosopher Alain de Botton believes that the home can be 'an airport or a library, a garden or a motorway diner' . As the saying goes, the home is where the heart is.

In 2009, I returned to my own home in the North East after three long years of architecture school in London. I had come home to 'find myself'; however, what I found first was glass at National Glass Centre. Drawn to the sites of my youth, I began to use them as starting points for the creation of artwork. The views of back lanes in Newcastle were transformed through digital modelling and waterjet cutting into contoured, undulating glass sculptures. I was trying to express my relationship to the site, how it represented home, perhaps more than the house in which I lived.

The embodied experience of built spaces can be called architectural phenomenology, an idea explored by prominent philosophers such as Gaston Bachelard and Maurice Merleau-Ponty. To truly connect to architecture, we must look beyond aesthetics and instead focus on sensory experience. In my artwork, the sites I use are not particularly beautiful, yet they represent a part of home and therefore have their own intangible charms. Such a site might include the Tyne Pedestrian and Cyclist Tunnel, where in 2012 I created Tunnel, a kinetic installation that translated numerical data taken from the site into a sequence that vibrated a barrier of mirrors. A monument to the lost industries of the shipyards and ironworks, the tunnel had dwindled from its peak of 20,000 commuters per day to 250. Retaining the style of the period, the tunnel had been allowed to deteriorate prior to regeneration. Industrial smells, the echoing sound reverberating through its length, flickering strip lighting and the hum of the internal workings made me long for a time that I had never experienced. The site filled me with a sense of belonging, and my artwork magnified all the subtle qualities that already existed but were no longer noticed.

I'm not sure if I ever found myself, but in 4 years I have explored all aspects of home from my Bed (2015), a performance in which I slept on a glass bed for five nights, to my workplace (Emotional Leak, a 2011 monumental sculpture in collaboration with Jeffrey Sarmiento). The Window series (2012 – present) documents the view from the bedroom of every house I have lived in. Glass offers the unique possibility of distorting, magnifying, reflecting and transforming space, exposing our invisible connections to home.

Appendix 2 Dissemination of Research

The following is a list of artworks exhibited and talks delivered based on this study

2.1 Outputs related to *Emotional Leak*

1) Berengo Centre for Contemporary Art and Glass
   Semi-permanent loan
   February 2014 – ongoing
   Murano, Italy

2) Collect: The International Art Fair for Contemporary Objects
   Group exhibition
   May 2013
   Saatchi Gallery, London

3) New Glass Review 34
   Juried publication
   2013
   Corning Museum of Glass, New York

4) Kith and Kin
   Group exhibition
   Winter 2011-2012
   National Glass Centre, Sunderland

2.2 Outputs related to *Window (1,2 and 3)*

1) Print and Glass
   Group exhibition
   Window_3
   2015
   Bullseye Resource Centre, Emeryville, CA, USA

2) New Glass Review 36
   Window_3
   Juried publication
   2015
   Corning Museum of Glass, NY, USA

3) Neuerwerbungen 2014
   Group exhibition
   Window_1 and Window_2
   2014
   Ernsting Stiftung Glass Museum

4) Acquired for permanent collection
   Window_1 and *Window_2*

2014
Ernsting Stiftung Glass Museum, Germany

1) Commissioned for permanent collection
   Window_3
   2014
   Bullseye Projects, Portland, OR, USA

2) UK Glass
   Group exhibition
   Window_1 and *Window_2*
   2014
   Glazenhuis, Lommel, Belgium

5) Technology Advancing Glass (TAG) grant
   2014
   Glass Art Society (GAS), USA

6) Jutta Cuny Franz Memorial Award
   Selected entries and publication
   Window_1
   2013
   Neues Glas/New Glass, Winter 2013, 4/13, p.79

7) European Glass Context
   New talent (Selected UK representative)
   Window_1
   Group exhibition
   2012
   Gronbechs Gaard, Bornholm, Denmark

2.3 Outputs related to *Tyne Tunnel*

1) European Glass Context
   New talent
   Group exhibition
   2012
   Gronbechs Gaard, Bornholm, Denmark

2) New Glass Review 34
   Juried publication
   2013
   Corning Museum of Glass, New York

Appendix 3 Portfolio of works

3.1 Artworks produced from 2009 - 2011

3.1.1 Tumbler_1, 2009

3.1.2 Tumbler_2, 2009

3.1.3 Lens_1, 2009

3.1.4 Chandelier, 2010
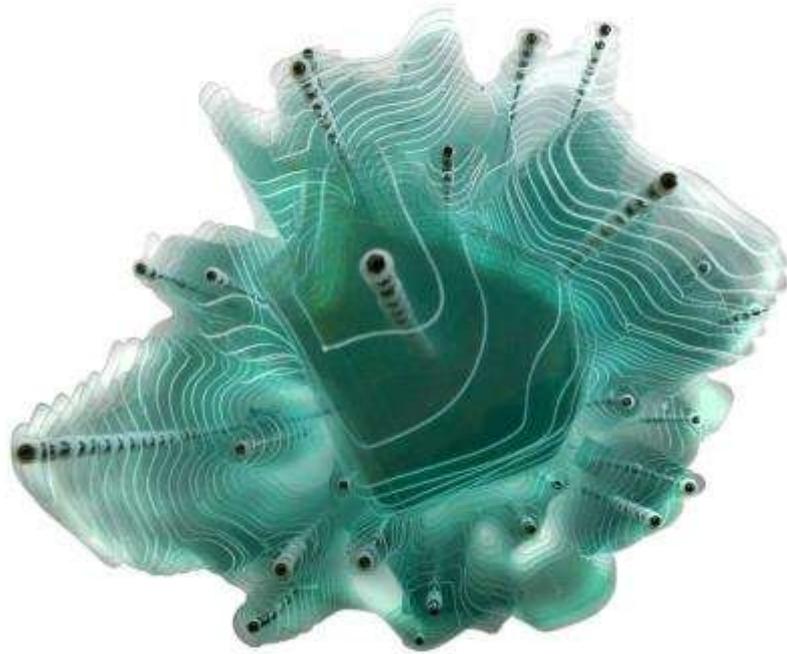
3.1.5 Lens_3, 2011

3.1.6 Heaven Starts on the Ground, 2010
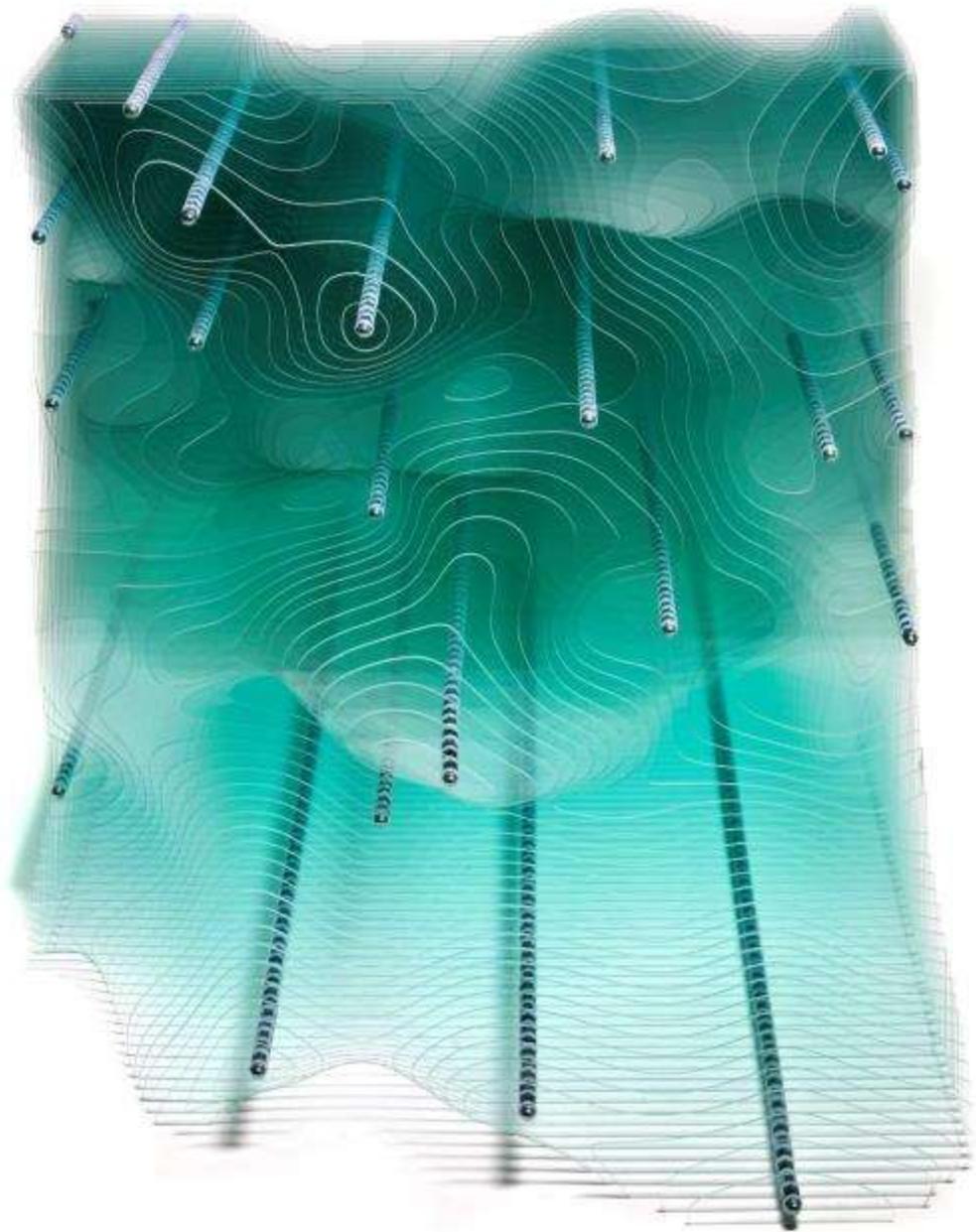
3.1.7 La Dorure un Reste aux Mains (The Gilt Sticks to our Fingers), 2011

3.2 Artworks produced from 2011-2015

3.2.1 Emotional Leak, 2011-2014

3.2.2 Window_1 (Detail), 2012
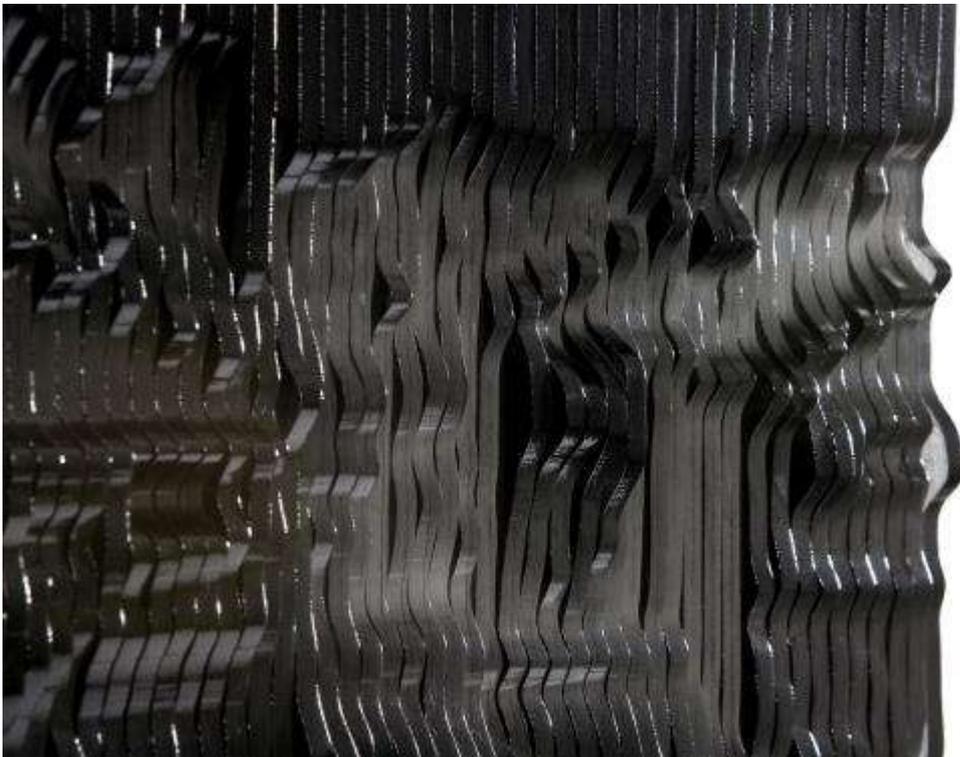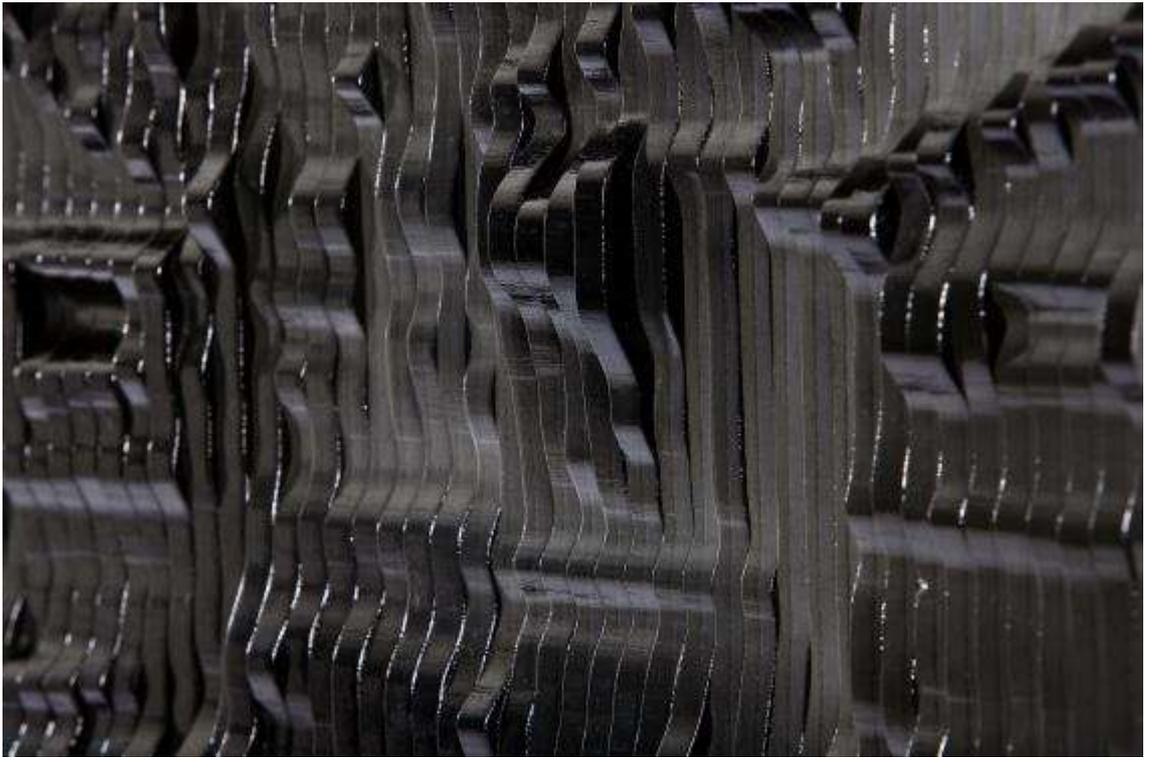
3.2.3 Window_2, 2013
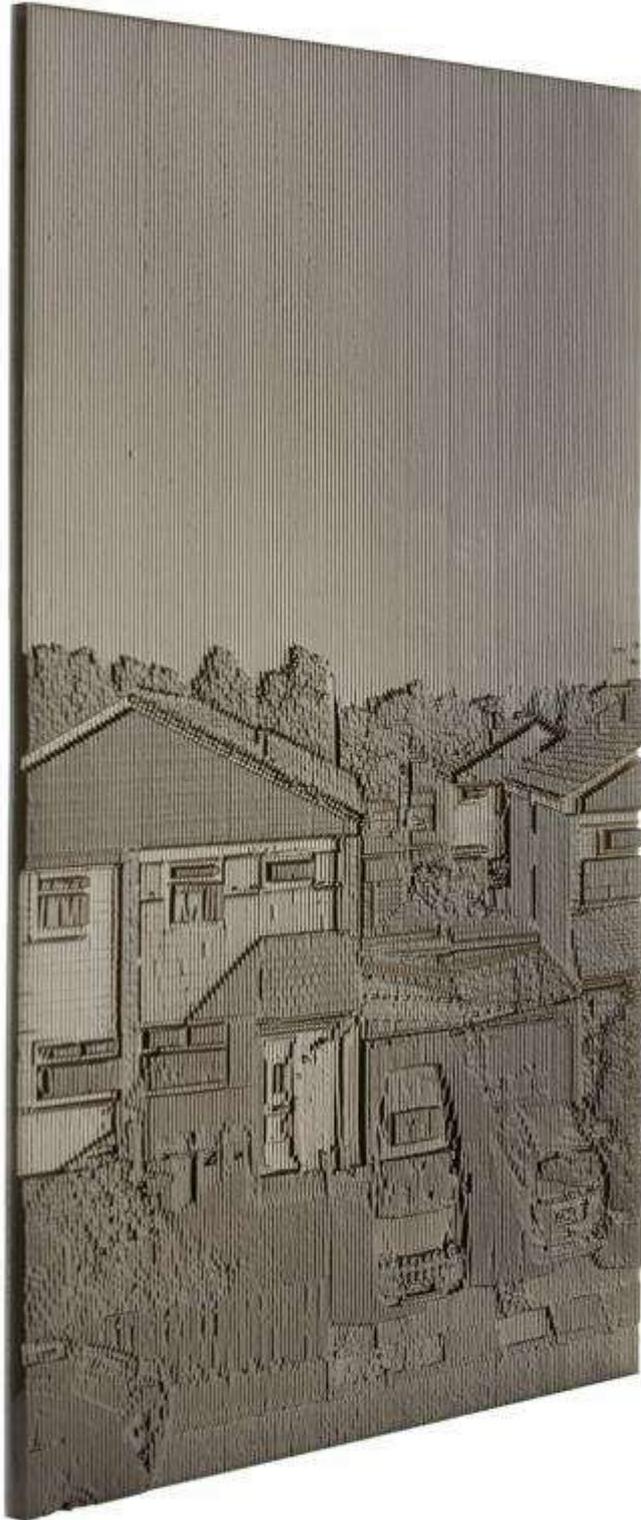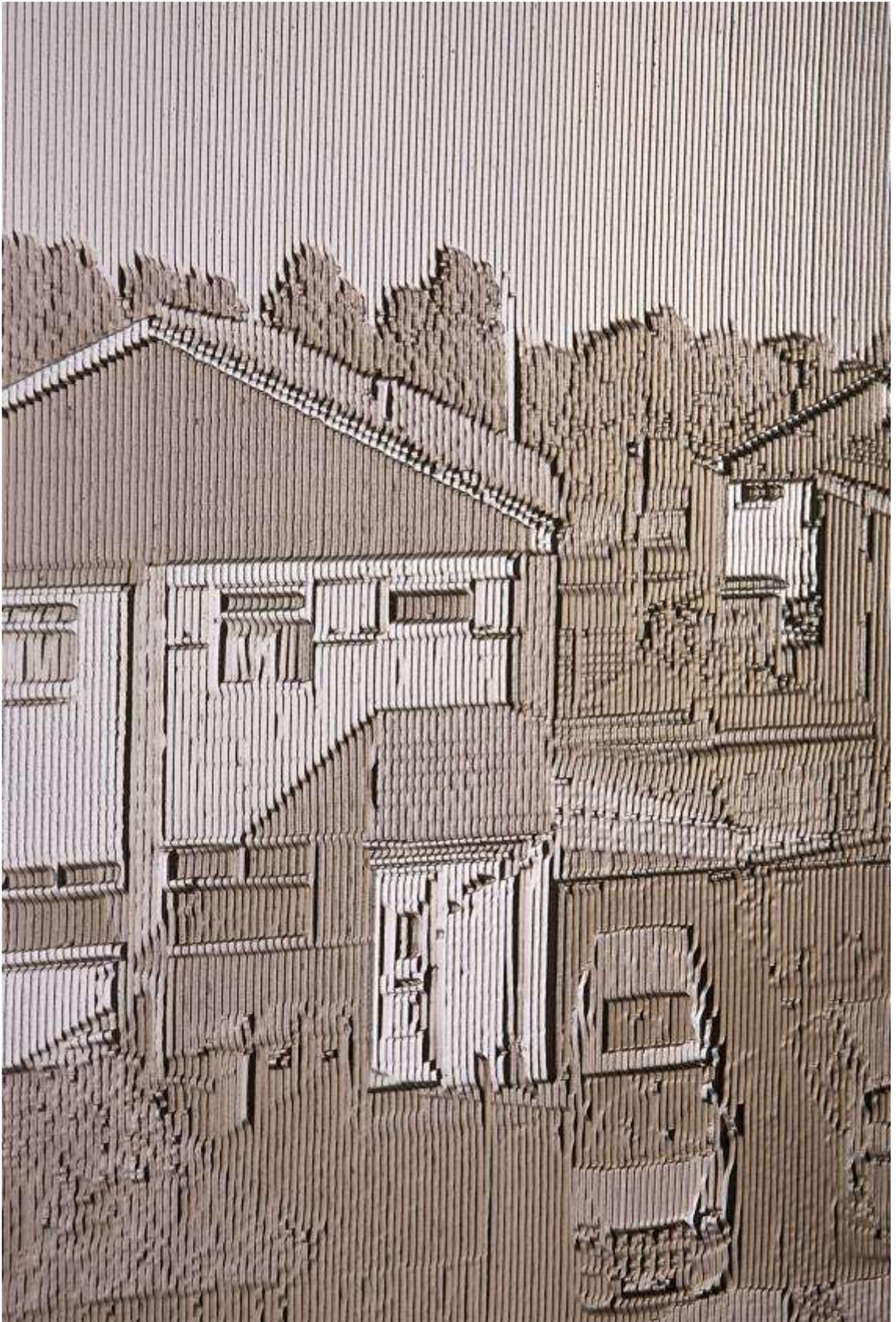
3.2.4 Window_3, 2014
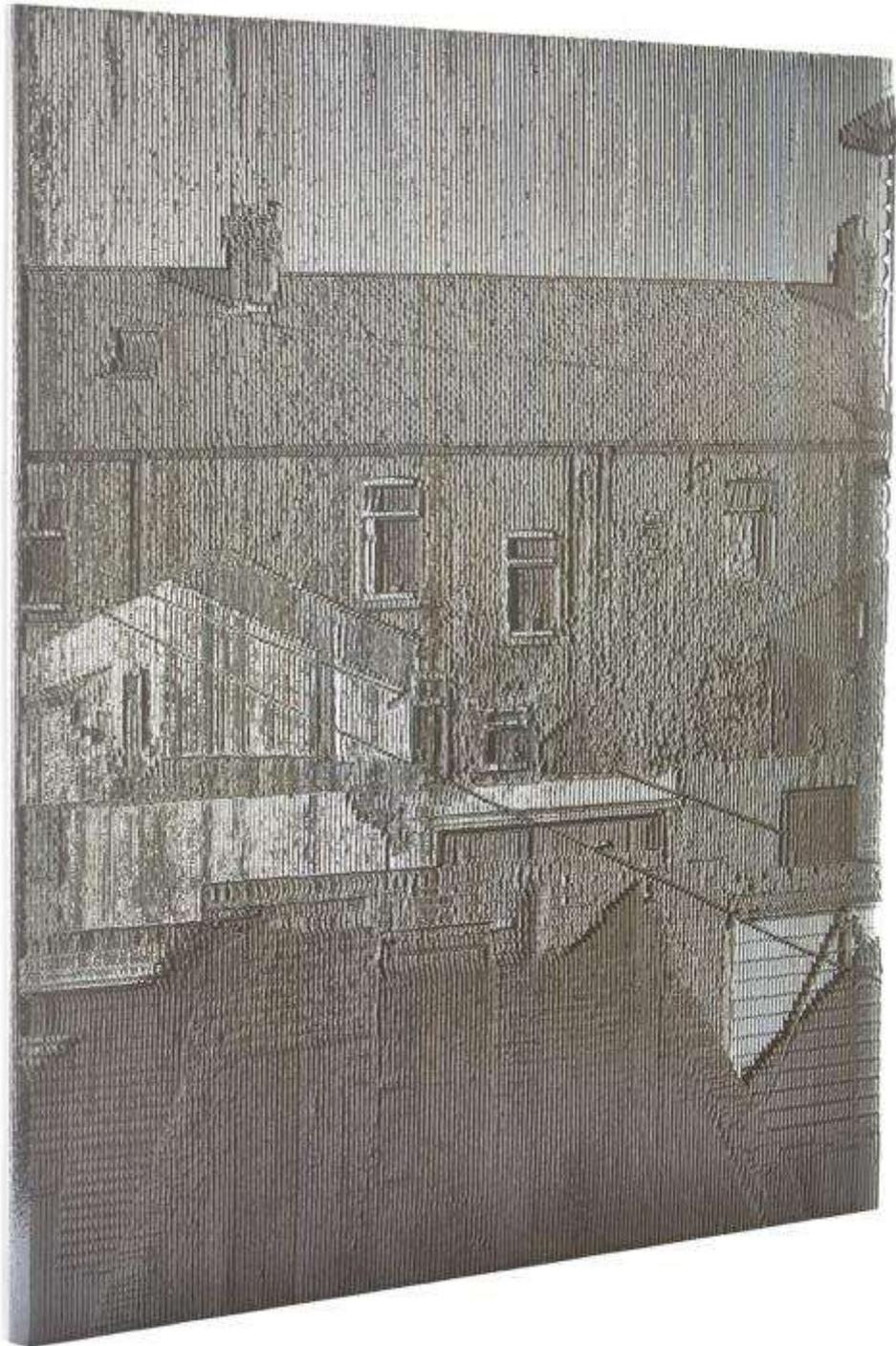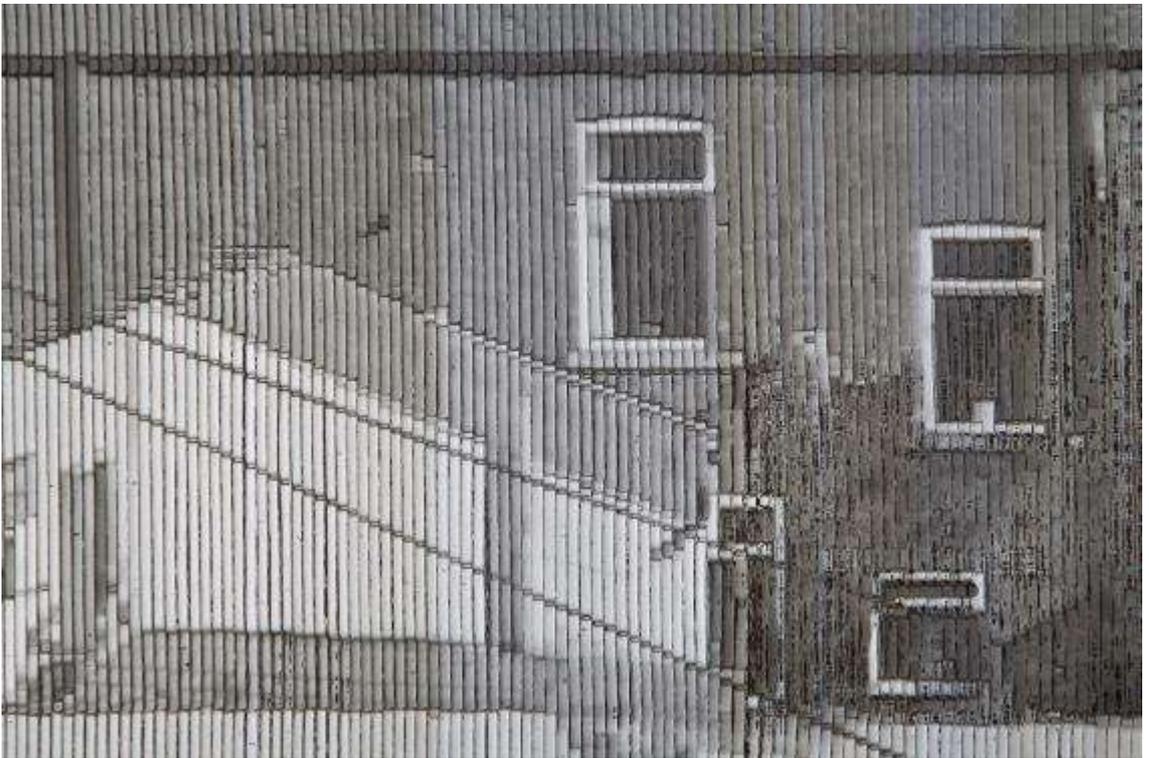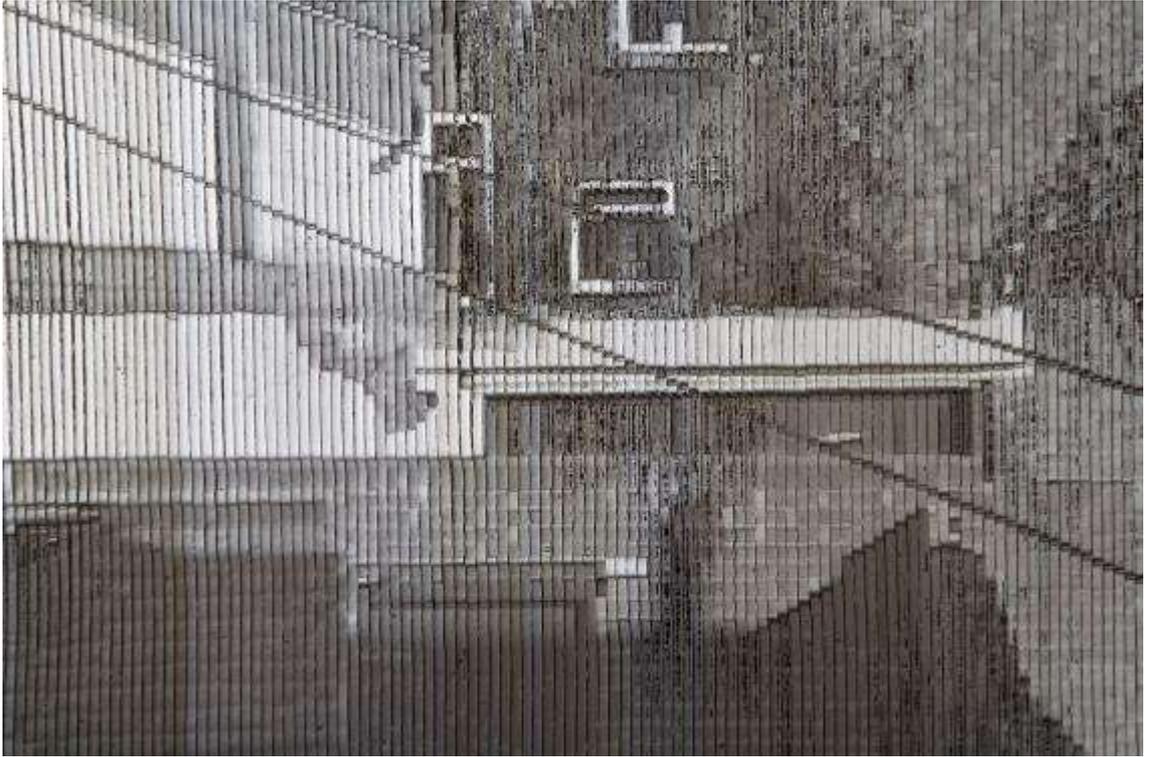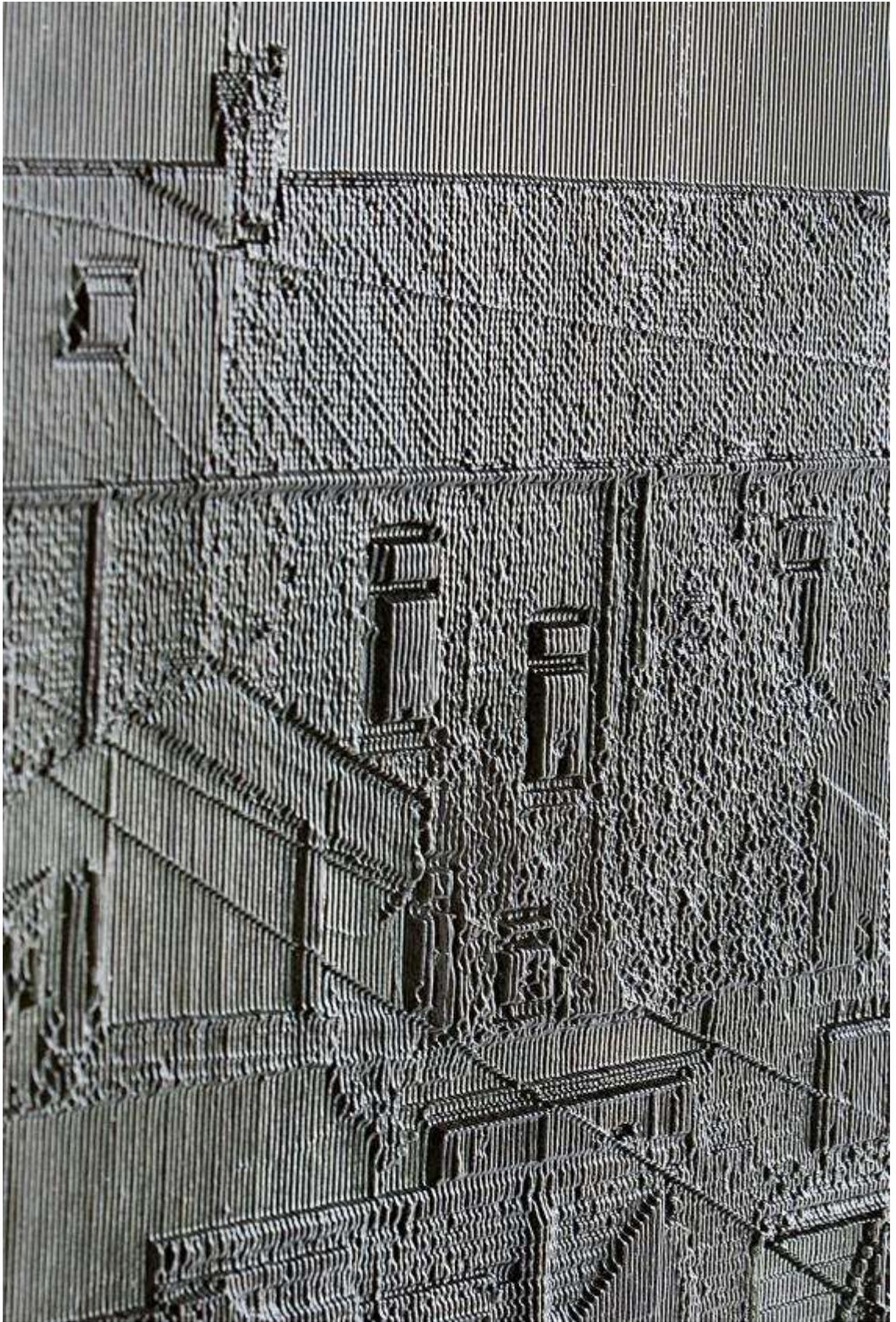
Appendix 4 Press and print material

4.1 Press Release for Neuerwerbungen group exhibition

4.2 New Glass Review 34

28. Erin Dickson
United Kingdom
Tyne Tunnel
Site-specific installation
consisting of mirrors set to
vibrate in sequence, causing
a distortion of the viewer's
reflection
Dimensions vary
Photo: David Williams
HMA, JM, TO, JAP

**29. Laura Donefer
and Jeff Mack**
Canada and United States
Classico Moderno Group
Blown and hot-sculpted glass
Largest: H. 76 cm, W. 41 cm,
D. 28 cm
Photo: Leslie Patron
JM, TO, JAP

18
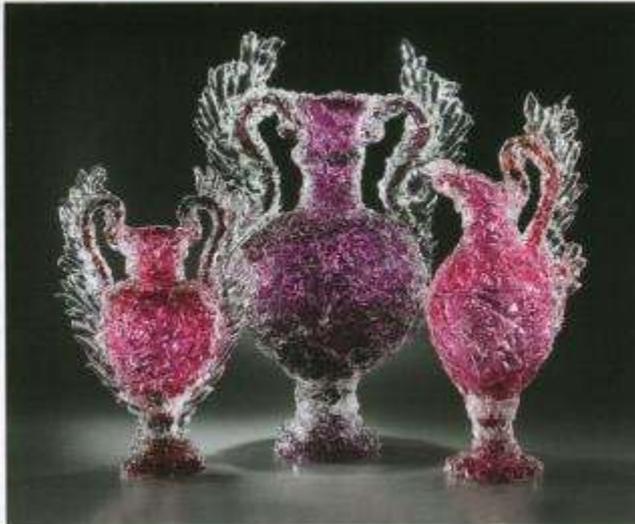
77. Jeffrey Sarmiento
and Erin Dickson
United States
and United Kingdom
Emotional Leak
Waterjet-cut float
glass; steel, rubber
H. 300 cm, W. 130 cm,
D. 130 cm
Photo: David Williams
HMA, TO, JAP

45

4.3 Neues Glass/Jutta Cuny 2013 Selected Entries

Window_1, 2012, Float glass, waterjet cut, fused,
100 x 60 x 3 cm, Foto: David Williams

ERIN ELIZABETH DICKSON

**Born 1987 in Great Britain
Lives and works in South Shields, UK**

Education: 2009 RIBA Part I, Architectural Association School of Architecture, London, UK; 2010 MA, University of Sunderland, UK.

Work experience: Since 2010 waterjet technician, University of Sunderland, UK.

Group exhibitions: 2010–2012 in England and 2011 at the Korean Craft Biennale.

www.erindickson.co.uk

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4.4 Collect: The International Art Fair for Contemporary Objects Catalogue

National Glass Centre

National Glass Centre's vision is to be a centre of national excellence supporting the research, teaching, production, exhibition and enjoyment of contemporary glass – a centre valued by the local community in Sunderland, whose reputation stretches across the North East region as well as nationally and internationally.

80 Exhibitors

4.6 European Glass Context 2012

Erin Dickson

UNITED KINGDOM / NEW TALENT

Born
1987 South Shields, United Kingdom

Contact
erin.dickson@sunderland.ac.uk

Education
2011- University of Sunderland, UK
       Ph.D. "Glass sculpture inspired by
       architecture translated through digital
       technology"

2011   University of Sunderland, UK
       MA Glass (Distinction)

2009   School of Architecture, UK
       RIBA Part I, Architectural Association

Dickson's work is a mixture of her passion for architecture and glass. Drawing inspiration from architectural phenomenology and digital technology she creates large scale sculptures which aim to inform the viewer of a particular time, place, space or emotion.

P112

230
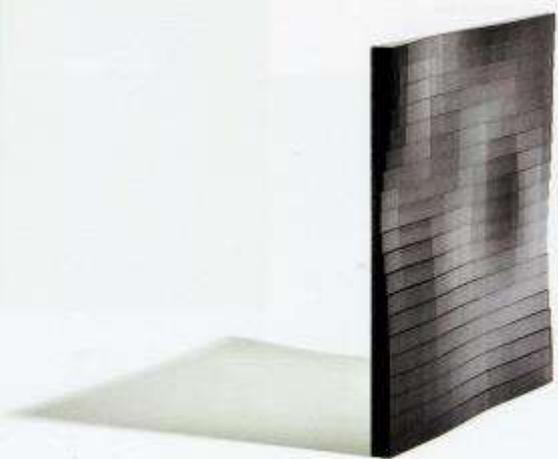
<
WINDOW_1
Waterjet cut glass, fused
60 x 100 x 3 cm
Photo: David Williams

A landscape created through light, "Window_1" is a
digital manipulation of a mundane, everyday vista
made beautiful.

By taking samples of light and colour across an
existing image or location, in this case a view
through a window, Dickson is able to create an
undulating surface representative of the original.
The resulting density of glass is what recreates
the image, an abstraction of the original location
drawn with light.

"Window_1" is a glass panel made from waterjet
cut slices which have been fused together on their
side to form an undulating surface. The changing
thickness of the glass manipulates the light flowing
through the piece, creating its own image.

TYNE TUNNEL
5 mirrors, video
250 x 250 x 30 cm
Photo: Erin Dickson

Made as part of an installation for the Tyne pedes-
trian and cyclist tunnel, this work is from Dickson
current PhD research "Glass sculpture inspired by
architecture translated through digital technology".
Inspired by "La Poétique de l'Espace" by G.
Bachelard, Dickson works with the living experience
of architecture. "Tyne Tunnel" aims to emphasise the
unease of passing through a remote underground
tunnel, capturing a moment in time and space for
its viewers.

"Tyne Tunnel" is an installation consisting of a wall
of mirrors which are set to vibrate in sequence,
causing a distortion of the viewer's reflection.

4.7 Vanessa Cutler, New Technologies in Glass (2012)

ABOVE Margareth Troli, *Bar (Rochjococo Lamp*, 2010. Fused, water-jet-cut glass, 53 x 35 cm (21 x 13¾ in.). Held at Broadfield House Glass Museum. Photo: Simon Bruntnell.

ABOVE RIGHT Setting the cut glass; this is an example of how the water-jet can cut the variety of materials needed for formers and the glass to produce work like *Raised Crossing*. The kiln set-up shows developmental work for a similar work called *Three Layers*. Photo: Vanessa Cutler.

CENTRE Vanessa Cutler, *Raised Crossing*, 2006. This sort of outcome can be produced using the kiln set-up shown top right, 20 x 20 x 4 cm (8 x 8 x 1½ in.). Held in a private collection. Photo: David Williams.

RIGHT Erin Dickson, *Tumbler*, 2009. Erin's *Tumblers* are manufactured using water-jet machining. By cutting the glass into sections, she is able to create 2D layers of glass which can be reassembled into the tumblers, 15 x 7 x 7 cm (6 x 2¾ x 2¾ in.). Photo: David Williams.

4.8 UrbanGlass coverage of *Technology Advancing Glass* grant 2014

Thursday October 2, 2014 | by Claudio Martino (/glass/author/45)

Tweet 0   Like 0

Glass Art Society announces the winners of inaugural Technology Advancing Glass grant

FILED UNDER: ANNOUNCEMENTS (/GLASS/CATEGORY/ANNOUNCEMENTS), AWARD (/GLASS/CATEGORY/AWARD)
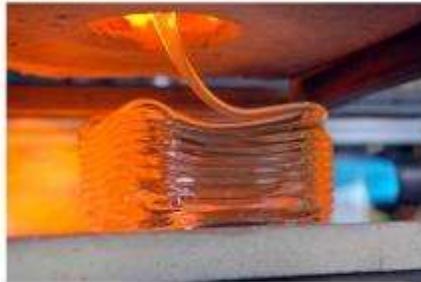
Prototyping a hot-glass, 3D-printing method at Massachusetts Institute of Technology, from proposal by Michael Stern, Shreya Dave, Markus Kayser and John Klein.

(https://s3.amazonaws.com/urban-glass/blog-new/3d3d.jpg)

The Glass Art Society (GAS) (http://www.glassart.org/) has announced the winners of its first-ever Technology Advancing Glass (TAG). The winner, Anna Mlasowsky (http://www.annamlasowsky.com/), will receive an award of $5,000, while the two runner-ups each receive a stipend of $2,500. All three are to use the money to conduct and fund research on new materials, techniques, methods, and applications of technology in the creation of glass art. The funding for TAG was made possible through the donations of long-time glass collectors Ted and Melissa Lagreid as well as those of former GAS board member and glass artist Wayne Strattman (http://strattman.com/).

This year's top recipient Mlasowsky plans to use the award money to finance a project that hopes to update the classic glass-making technique of pate de verre. She has proposed a new sculpting method that works by utilizing a combination of digital prototyping, 3D modeling, and printing techniques in order to create molds that wouldn't be possible otherwise.

Runner-up Erin Dickson (http://erindickson.co.uk/) plans on using her award to create a new method for producing imagery in glass sculpture through the use of data capture, computer modeling, digital fabrication, and 3D printing. This process translates digital photography onto a glass object by using modeling software such as AutoCAS and Rhino to reproduce it as a three-dimensional surface on the computer. The artwork is then crafted through water-jet machining, CNC machining, 3D printing, and kiln casting.

The team of Michael Stern, Shreya Dave, Marcus Kayser (http://www.markuskayser.com/), and John Klein are also recipients of the second-tier of the TAG grant, with an award of $2,500 for their four-person team. Their proposal aims to continue their research on the first automated hot-glass 3D printer, an effort that they originally launched at the Massachusetts Institute of Technology. In creating such a device, the team plans on inviting the strong 3D printing community and introducing them into the world of glass-making.

TAG grant recipients have three years to give a presentation on their completed projects after funding. In addition to the presentation, GAS will also publish the results in their annual GAS Journal. TAG will be a regular edition to the already existing GAS conferences. Applications for the 2015 grant will open in March 2015.

4.9 Press release for BECon 2015

Bullseye is taking its biennial conference on the road!

When: Wednesday, June 3, 2015
Where: Bullseye Resource Center Bay Area
4514 Hollis Street, Emeryville, CA 94608

Earlybird registration: November 25, 2014 to March 1, 2015
Regular registration: March 2 to May 17, 2015

Register Now

Get fired up for this year's GAS Conference in San Jose with this one-day whirlwind kiln-glass event at Bullseye's Bay Area Resource Center!

- Fast-paced PechaKucha presentations by artists and experts at the forefront of kilnformed glass
- Technical displays by a variety of vendors
- An exhibition featuring artists at the leading edge of print-and-glass
- Demonstrations and other kiln-glass oriented activities
- Box lunch, coffee and beverages
- Evening festivities in true BECon style including BBQ, beer and wine

Tracks (topics)

- Business of Glass
- Design/Architecture
- Kid-Formed Glass
- Print-and-Glass Technology

Speakers include

- Erin Dickson
- Michael Endo
- Louise Krampien
- Anna Mlasowsky
- Tessa Pappas
- Orfeo Quagliata
- Jeffrey Sarmiento
- Stacy Lynn Smith
- Nicole Leaper
- Dardi Troen
- Kathryn Wightman

(List subject to change.)

What is PechaKucha?
PechaKucha is a concise presentation format: Each speaker shows 20 images for 20 seconds each. The images advance automatically and the speaker talks along to the images. Each track will repeat once to give attendee a chance to see every presentation. We've added a 20-minute Q&A with the speakers at the end of each track.

Find out more at PechaKucha.org.

4.10 Glass Art Society Annual Conference 2015 Pre-Conference Brochure

4.11 The Glass Art Society Journal, Chicago Illinois, 2014

Ethan Stern,
Green Coastline
Photo: Russell Johnson
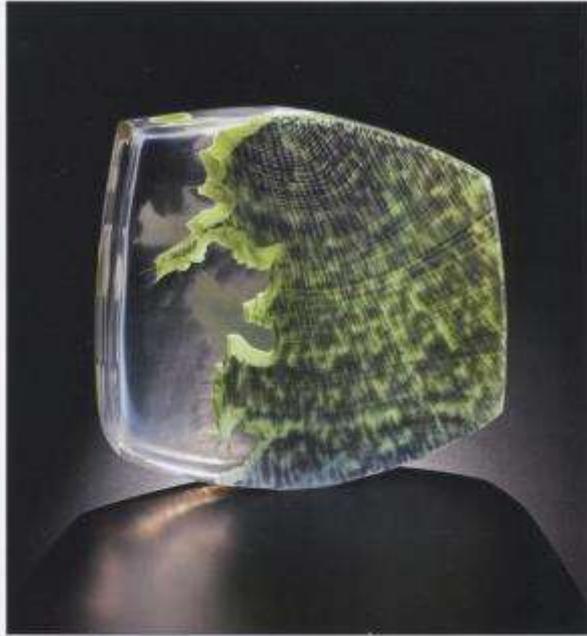
Erin Dickson,
Tyne Tunnel

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Appendix 5 Jerome Harrington: Glass in the Expanded Field (2011)

Key to diagrams

#	Artist	Title (date)
1	Marc Barreda	Sea Glass (2011)
2	Alexandra Ben-Abba	Glass Haircut (2010)
3	Annette Blair	127628 Cups of Tea (2009)
4	Sarah Blood	Object specific (2009)
5	Sander Boeijink	Untitled (2006)
6	Christina Bothwell	While You Are Sleeping (2007)
7	Richard Box	Snake Pole (2006)
8	Heike Brachlow	Waiting No.6 (2009)
9	Xandra Bremers	I am You (2011)
10	Lee Brogan	Bombora (2009)
11	Annie Cattrell	Capacity (2000 - 2007)
12	Dale Chihuly	Persian Chandelier (2007)
13	Simsa Cho	Uranium 8 (2006)
14	Nick Crowe	The Beheaded (2006)
15	Vanessa Cutler	Suburbia (2009)
16	Marie de Bruyn	The big white shape (2010)
17	Melissa Dyne	Glass: A site Specific Installation (2008)
18	Deirdre Feeney	I thought I saw you there again (2009)
19	Lisa Gheradi	Down to the Bone (2003)
20	Anna Gray	Untitled (2011)
21	Katherine Gray	Acqua Alta (2009)
22	El Ultimo Grito	Apartments (2009)
23	Mieke Groot	Untitled (2002)
24	Arena Lena Grau	Untitled (2007)
25	Jerome Harrington	The Glass Archive (2005)
26	Joseph Harrington	Ice Bar (2006)
27	Jamie Harris	Cut Out (2007)
28	Denise Hommes	Inheritance 2 (2009)
29	Laura Heyworth	Vacuumscapad (2003)
30	Emma Hogarth	3,600 Seconds (2009)
31	Deborah Horrell	Hover (2009)
32	Martin Hlubucek	Dekadence (2009)
33	Esther Jiskoot	Suntrap No.6 (2004)
34	Ditte Johansson	Paused 3 (2009)
35	Menno Jonker	Head Over Heels (2002)
36	Dafna Kaffeman	Persian Cyclamen (2006)
37	Helena Hagebrand	When my love swears that she is made of truth, I do believe her though I know she lies (2008)
38	Mike Kelly	Kandor 4 (2007)
39	Yasuko Rita	Ancient Relics 2 (2009)
40	Pavel Kopriva	Local Problem (2001)
41	Carol Lee Mei Kuen	Sending Love (2007)
42	Karen LaMonte	Dress Impression with Train (2007)
43	Marianne Lammersen	Untitled (2007)
44	Mia Lerssi	Cinderella is a slut (2008)
45	Beth Lipman	Bancketje (2003)
46	Silvia Levenson	Life is Beautiful (2006)
47	Alena Matejkova	The sea between us (2009)
48	Katrin Maurer	The Spectacle (2006)
49	Josiah McElheny	Conceptual Drawings for a Chandelier, 1965 (2005)
50	Kimberly McKinnis	The Shape of an Emotion-II (2010)
51	Richard Meitner	Descending a stair case (2009)
52	Ian Mowbray	It Went Deathly Quiet Hours Ago (2009)
53	Catherine Newell	Palimpsest: Rough Draft (2009)
54	Anna Norberg	17 minutes (2007)
55	Geir Nustad	Who am I? (2010)
56	Sean O'Neill	Messipi (2009)
57	Andy Paiko	Spinning Wheel (2009)
58	Dylan Palmer	Sealed Air (2009)
59	Inge Panneels	Nest (2005)
60	Jens Pfeifer	Guns (2003)
61	Mary A. Phillips	Reflecting Place 4 (2009)
62	Angus M Powers	Blind Glass Blowing (2008)
63	Charlotte Potter	Spinning my wheels (2008)
64	Jocelyne Prince	Spin Event Performance (2008)
65	Caroline Prisse	Difiant (Elephant) Trophy (2011)
66	Janusz Pozniak	Sanctuary (2008)
67	Ana Quiroz	Papa-ya-rio (2008)
68	Marie Retpen	Still Life Melt Down – Silver and China (2009)
69	Tobias Rehberger	Outsideron (2002)
70	Louise Rice	Safe as Houses 1 (2003)
71	Jenny Ritzenhof	Untitled (2011)
72	Michael Rogers	Flight Remembered (2008)
73	Layne Rowe	Picking Daisies 2 (2010)
74	Richard Royal	Optical Lens Series (2009)
75	Tina Sarapu	The Light and Silence in Sound (2009)
76	Jeffery Sarmiento	Encyclopedia 1-8 (2007)
77	Rui Sasaki	Walking on Glass (2010)
78	Ryoko Sato	Loving Myself (2007)
79	Katrijn Schatteman	For my sailor (2007)
80	Franz Schonbeck	My Stress is Gone Now (2008)
81	Anjali Srinivasan	Particulate Devil (2008)
82	Ethan Stern	Red Chew (2004)
83	Alex Stisser	Sleep Walkers (2009)
84	Tavares Strachan	Components for Absolute Symbiosis (2006)
85	Martina Strusny	One day (2005)
86	Elizabeth Swinburne	Golden Embrace (2002)
87	C. Matthew Szosz	Inflatable No.3 (2008)
88	Lino Tagliapietra	Mandara (2006)
89	Chris Taylor	Real (2002)
90	Hiromi Takizawa	Gathering (2009)
91	Barbara Amalie Skovmand Thomsen	We are between You and Me. Glass (2006)
92	Ellen Urselmann	Forgotten (2003)
93	Ellen Vaertun	Untitled (2011)
94	Sylvie Vandenhoucke	Field (2006)
95	Vincent Van Ginneke	Small Body Shapes (2000)
96	Lieve Van Stappen	Beggar (2009)
97	Kate Williams	Dounreay Nuclear Power Station (2006)
98	Gareth Noel Williams	Untitled (2000)
99	Emma Wolffenden	Elephant Boy (2009)
100	Jeff Zimmer	Interventions in Landscape (2008)

See Figure 19 for *Glass in the Expanded* Field diagram