A Shifting Façade: An Exploration of the Zone Between Actual and Illusionary Form

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Signed Statement of Originality

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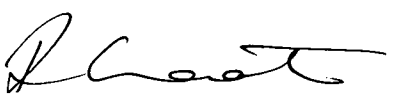

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Abstract

A Shifting Façade: An Exploration of the Zone Between Actual and Illusionary Form.

The starting point for this project was in the reflections upon modernist glass façades. Throughout this research the reference to reflections developed into a broader critical interrogation and investigation into the possibilities of glass within other architectural spaces.

The aim has been to develop both a visual and working methodology which could speak from within, and about, particular architectural spaces; with the intention to disrupt the formalised architectural grid by distorting our perception of architecture as being contained. By taking what is intrinsic to external glass architecture - a visual combination of stable and fragile forms - into utilitarian architectural spaces, I sought to create non-static readings of otherwise static spaces. The ultimate aim being to create multiple reflections that could suggest a constructed space that seemed sturdy, but with the illusion of being able to shift or collapse at any moment.

Throughout this project I have explored the possibilities of combining float glass and stainless steel through the process of kiln-forming. I experimented with installation strategies to attach these materials directly to the architectural elements they reference, so the work seems to come from its architectural source before breaking away and disrupting it. The resulting works falls into three categories: architectural installations, objects and large-scale public art. The installations in the final submission exhibition are arranged as a collection of ideas and possibilities for utilitarian architectural spaces, which could be applied on a larger-scale. The two public art commissions see the accumulation of the studio research within actual architectural spaces, and the objects are experiments into industrial processes and prototypes.

The contextual research focused mainly on the glass façade and the critique and interpretation of it. This project finds a solid grounding in both the questioning of,

and admiration for, modernist glass architecture, particularity Mies van der Rohe; looking at his glass skyscraper and Barcelona Pavilion as case studies. Leading on from this I explored the new sensibility of post modernist and contemporary glass architecture along with the Deconstructivist architects of the 1980's who collapsed and questioned architectural structure. A sculptural influence on the project has been Dan Graham and his critique of glass within architecture through his 'pavilion' series, along with artists Mary Schaffer and Christopher Wilmarth who explore the potential use of glass in an innovative and sculptural way. The installation of glass within architectural space has been researched through Australian artists Janet Laurence, Wendy Mills and Maureen Cahill.

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Chapter 1. Introduction

The idea of a shifting façade hints at movement, something not static; being opposed to the traditional perception of architecture as being strong and stable. This project has its starting point in reflections upon modernist glass façades. Throughout this research the reference to reflections developed and expanded into a broader critical interrogation and investigation into the possibilities of glass within other architectural spaces. The methodologies developed, through research in the studio, intended to disrupt the formalised architectural grid by distorting our perception of architecture as being contained.

The project explored the possibilities of glass and stainless steel – the modernist materials of the glass façade – to create installations within architectural spaces and large-scale architectural public art which the viewer must move through, past or around; the aim being to create multiple reflections that could suggest a constructed space that seemed sturdy but could shift or collapse at any moment.

Previous Honours project and subsequent skills development

This project leads on from my Honours year (2003) and skill development in 2004 where I learnt the craft of kiln-forming glass. In my Honours year I investigated architecture and memory. The project titled *Seeing Nothing: A Visual Investigation into the Paradox of Perception* referenced modernist glass architecture, questioning the glass façade and my perception of it. Architecture had been a dominant part of my memory because my father was an architect and contract builder and I had spent my childhood growing up on building sites. What informed that project was a sense of frustration from not being able to see any structure behind the glass wall, as reflections inhibited my ability to see through.

In 2003 I set out to create works which conveyed this sense of frustration, never revealing what was behind. This was the first time I had used glass (although during my undergraduate studies I had used clear perspex), and the reasons were twofold. Firstly, as a screen and a reference to modernist glass architecture. Secondly, as a metaphorical expression of memory where I was attracted to glass

because of its duality; it can appear strong and dependable, but it can also fracture and break. The aim of that project was to have this solid and fragile material somewhere in-between, being in a state of flux.

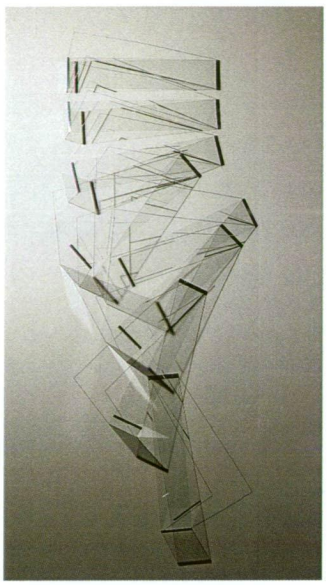

Figure 1. *wavering*

The final works (Fig. 1) were constructions made from two sheets of 3mm glass and aluminium to form a right angle. They were attached to the wall at one edge, leaving the other edge raw but sitting flush with the wall. They were arranged in a configuration that started out strong and upright, then fell away. Shadow lines from the constructions were traced with reflective tape from different angles to create illusionary three-dimensional 'box' forms.

These works succeeded in creating an illusion of depth and structure behind, leaving the viewer feeling frustrated. The glass constructions had opened themselves up, been transparent, but what lay behind was just a white wall. The traced shadow lines added to this ambiguity; posing as possible structure behind but in reality they were just an illusion.

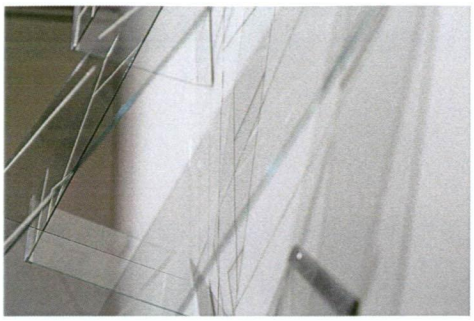

Figure 2. *wavering* (detail)

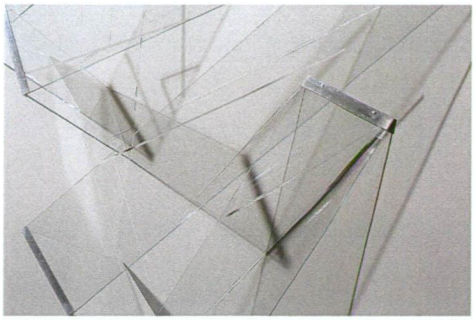

Figure 3. *wavering* (detail)

After completing Honours I wanted to explore the possibilities of glass further, and I felt limited by my technical skills. I realised I needed to learn how to curve glass, to start to mimic the reflections I had been so fascinated with so I could express my ideas in a more fluid way. I decided to dedicate 2004 to learning new skills. I received the Contemporary Art Services Tasmania (CAST) Craft Mentorship (funded by the Australia Council), which enabled me to work with Hobart ceramicist and glass artist Dianne Martin in her home studio on a twelve-week program. I learnt a range of techniques from ceramic mould-making through to glass fusing and slumping. It was a huge learning curve. When I started I didn't even know how to turn on a kiln, but by the time I finished I had a good grounding in glass kiln-forming techniques to expand upon. I subsequently received an Arts Tasmania grant to train in advanced kiln techniques with Hobart glass artist Martin Warren, which followed on from my basic skill training earlier that year. At the end of this year I produced *resemble*, for Arts Tasmania's 'Young Designers Month'.[1]

resemble (Figs 4 & 5) was my first large-scale glass installation (2m high), made from thirteen curved glass sections with slots for the aluminium attachments formed into the glass. It was arranged in a cascading formation where the slipping glass forms 'fell' down the wall to retake their position at the bottom. This work was my interpretation of shifting reflections upon glass facades; the movement of their form from a one-dimensional plane into three-dimensional space became the starting point for this MFA project.

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[1] ' Young Designers Month' was exhibited at the IXL Atrium in Hobart, Design Centre Launceston and Artworks in Stanley *(resemble* subsequently won the People Choice Award)

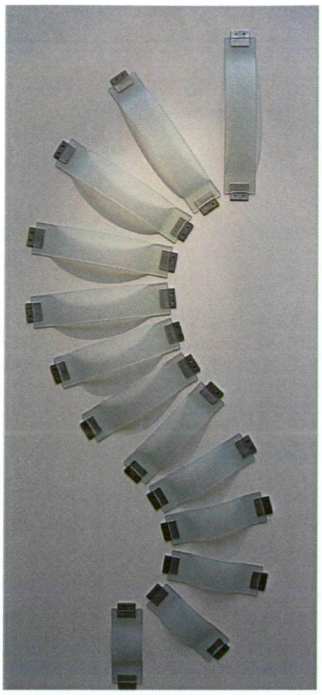

Figure 4. *resemble*

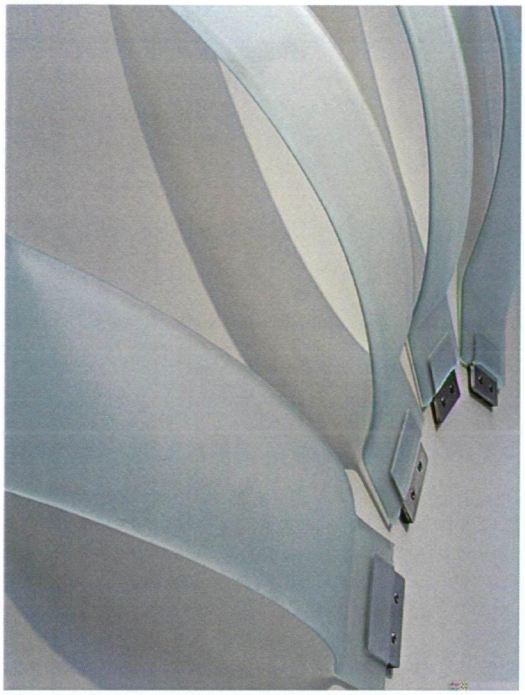

Figure 5. *resemble* (detail)

That year I also successfully tendered for my first public art commission, in collaboration with a graphic designer and furniture designer. This work was an integrated desk, screen and hanging installation (Figs 6 & 7) at the Nubeena Multi-Purpose Centre. This project made me more interested in the possibilities of designing for a particular architectural site and to an architectural scale. Here perspex was used for the hanging installation. However, I realised that as my skills in glass developed, there were possibilities for future commissions like this being made with glass.

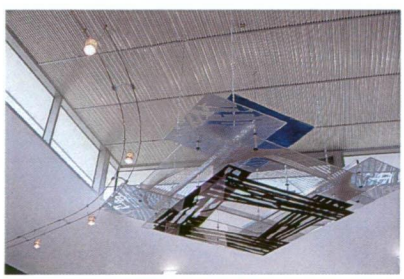

Figure 6. Nubeena

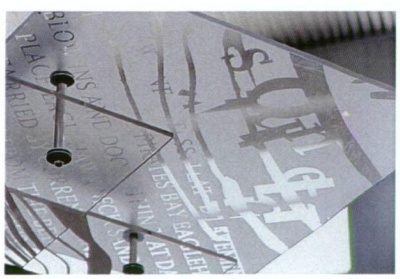

Figure 7. Nubeena (detail)

The MFA Project

Aims of the project

The aim of this project has been to develop both a visual and working methodology which could speak within, and about, particular architectural spaces; to take the materials of the glass façade - glass and steel - and combine them with light to create a non-static reading of an otherwise static space.

I want to take what is intrinsic to external glass architecture; a visual combination of stable and fragile forms, into utilitarian architectural spaces and question form from there. By disrupting the integrity of that space and distorting the grid to make what is logical about architecture illogical, I hope to create new and surprising readings of familiar spaces and open up a discussion into future possibilities.

Through this visual language I aim to formalise a co-dependent relationship between architecturally stable and fragile forms by constructing multiple reflections which would speak of a constructed space, seemingly sturdy, but with the illusion of being able to shift or collapse at any moment. I want the viewer to experience these spaces, like they do architecture as a whole. Throughout this project I have explored these possibilities within different architectural scales and spaces. The resulting works fall into three categories: architectural installations, objects and large-scale public art.

The architectural installations are made in response to particular architectural sites and elements. The final works in the submission exhibition show the majority of this research and are arranged as a collection of ideas and possibilities for utilitarian architectural spaces. *passing through* (Fig. 8) is a door-framed work, which the viewer must pass through. *mind your step* (Fig. 9) is a ceiling based large-scale work which enables the viewer to walk under a 'collapsing' grided ceiling of glass and steel. *corner study #3* is the third in a series of corner investigations which depict a fluid reading of an otherwise static space. *flourish* is

a large wall work which incorporates light, wrapping around the walls of the exit that the viewer must also pass through.

Figure 8. *passing through*
Linden Gallery

Figure 9. *mind your step*
Inflight Gallery

The objects are smaller in scale and are experiments into developing new working methodologies and industrial processes, which can later be applied on a larger scale. *turnings* (Fig.10), *light objects #1 and #2*

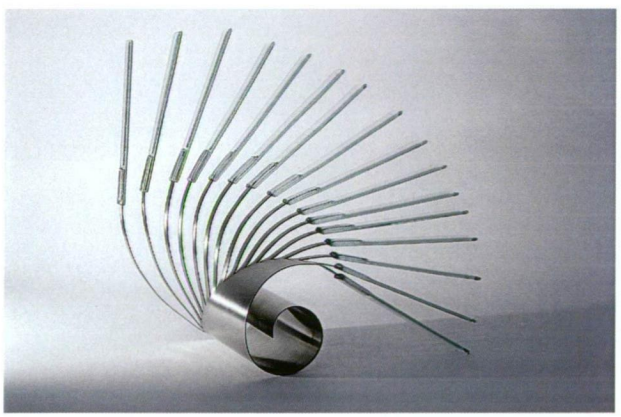

Figure 10. *turnings*

The two large-scale public art commissions at Rosetta High School (Fig. 11) and the Launceston Police Station (to be shown in design prototypes and concept drawings, Fig. 12) are made in response to particular architectural spaces and affords me the opportunity to work to an architectural scale, to respond to a unique space, and to create work within a permanent architectural setting.

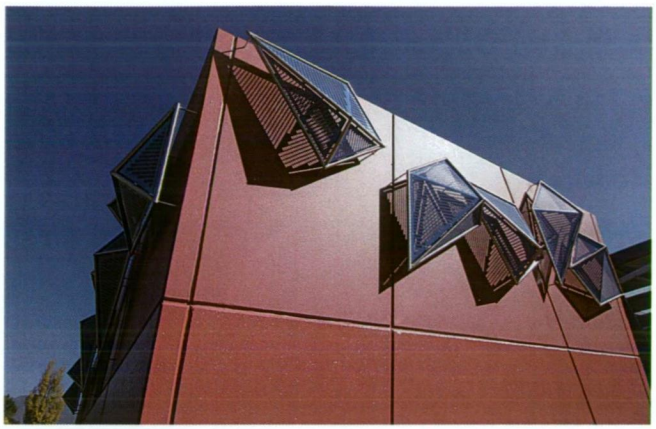

Figure 11. *elements* Rosetta High School

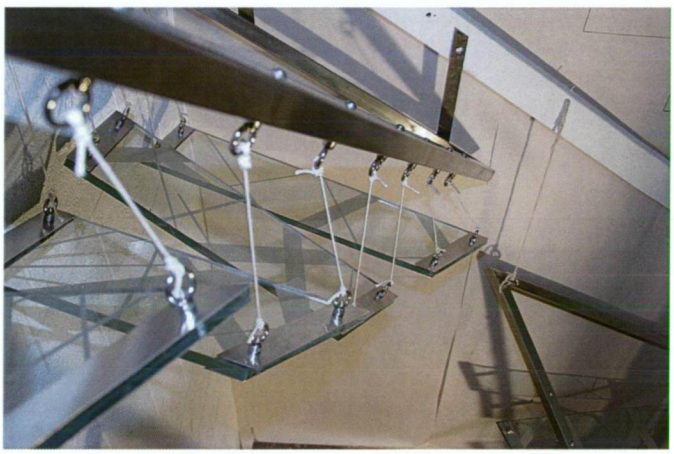

Figure 12. Studio model for Launceston Police Station

Parameters of the project and materials explored

This project references the every day architectural spaces that I experience and pass through. The spaces I have explored are spaces often over-looked; with utilitarian doors, walls, corners and corridors. I have attempted to engage with these particular architectural spaces in order to change them, by using materials which are sourced from the glass façade; to create a non-static reading of an otherwise static space. By installing the works within architectural spaces I want the viewer to experience these spaces, to navigate through, past or around the work, like we navigate through architecture as a whole. This function of movement by the viewer has been of growing importance throughout the project and is fully orchestrated in the final submission installations.

The contextual research focused mainly on the glass façade and the critique and interpretation of it. This project finds a solid grounding in both the questioning of, and admiration for, modernist glass architecture, particularly Mies van der Rohe; looking at his glass skyscraper and Barcelona Pavilion as case studies. Leading on from this I explored the new sensibility of post modernist and contemporary glass architecture along with the Deconstructivist architects of the 1980s who collapsed and questioned architectural structure. A sculptural influence on the project has been Dan Graham and his critique of glass within architecture through his 'pavilion' series, along with artists Mary Schaffer and Christopher Wilmarth who explore the potential use of glass in an innovative and sculptural way. The installation of glass within architectural space has been researched through Australian artists Janet Laurence, Wendy Mills and Maureen Cahill.

The materials used and the way I install them in a space are fundamental to this project. Glass and stainless steel reference the modernist glass façade I draw my inspiration from. Float glass, as a medium, not only directly references the windows and reflections, but its intrinsic qualities encompass the ideas of stability and fragility, tangible and intangible. Through the processes of cutting and kiln-forming I am able to manipulate the form of the glass to create multiple sections, which speak of fractured reflections.

Stainless steel (earlier in the project aluminium) represents the structural grid of the glass façade. Cut into linear lengths and used as the support structure for the glass sections this material opens up possibilities to attach to, then break away from, architectural structure. The successful union of glass and stainless steel has driven this project as I have attempted to translate the ideas of fragility and stability into the union of these two materials.

The strength and stability of each material is questioned, and tested, to aid in the visual 'collapse' of the grid. The kiln-formed glass, initially created by fusing two sheets of 3mm glass, and later by the use of fused single 3mm sheets highlights the fragility of the thin glass. The slot formed into the glass during the firing process enables me to take a one-dimensional surface and manipulate it. As the metal enters the glass the façade becomes penetrable. The metal structure within

is seen and the glass façade viewed as an impenetrable surface that has been disturbed and ruptured by this foreign material. The skin of the building now holds the structure that supports it, rather than hiding it.

The use of thin 1.2mm stainless steel - which I determined through experimentation to be the thinnest profile I could use to hold and balance the glass in space - creates a fine line between strength and possible collapse of the grid. I aimed to have these two materials, when combined, to appear weightless and airborne; as if they were floating in a breeze. This experimentation is dealt with at length in Chapter Three and Appendix #1.

The installation strategy of attaching directly to architectural spaces is fundamental to this project. This direct attachment enables me to initiate a dialogue between my reading of the space and the actual space. Much of the studio research has gone into finding suitable solutions into minimal attachment strategies, so the steel appears to be part of, or emerging out of, the architectural form, before it distorts and breaks away. *mind your step* at Inflight in June 2006 demonstrates this as the steel was attached behind the walls, out of view; the steel appearing to come from behind. The hidden attachment strategy was not always suitable, so an attachment mechanism made from MDF and painted white (like the wall) was attached directly to the site. The steel would emerge from behind the MDF block with their attachment screws hidden from view. The screws holding the block in place were then hidden by puttying up the holes and painting them white as well. *passing through* (Fig. 13) at Linden Gallery and later works show this attachment strategy.

Figure 13. MDF attachment at Linden Gallery

Throughout the project the placement and availability of light has been of increasing importance: light is seen as an activator for the glass and steel. When the installations are lit the resulting shadows become part of the whole work, their intangible forms hovering behind the glass and steel adding to the non-static and shifting reading of the space. Light also aids in the realisation that these are not two-dimensional works, as sourced from a flat façade, but are three-dimensional and floating in space. The realisation of the potential of, and need for, light is detailed in chapter three, and is fully realised in the final work *flourish.*

The two large-scale public art commissions use slightly different materials from the studio based installation work. The Rosetta High School sculptural wall uses stainless steel frames and perforated aluminium. The aluminium is substituted for glass, yet speaks of transparency and flux, creating shadows on the concrete walls behind. The reason for this was that the architect throughout the major redevelopment of the site used perforated aluminium and I was aiming for a consistency of materials. The installation at the Launceston Police Station uses stainless steel frames and laminated glass, as laminated glass is the safest option for a 13m high glass installation within the stairwell space. Both of these works draw from the conceptual foundations of my studio work, attempting to shift space and create a dialogue between my installed forms and the actual site.

Central Argument

A world seen for an instant on a windowpane is a world that exists nowhere in reality, the boundaries between inside and outside have disappeared. A windowpane is a place where elements both tangible and intangible come together to create unique spaces and facilitate different readings of architecture. When I view the world through reflection I find that solid objects liquefy, shift and become groundless; forms become fragile and the perceived strength and stability of the architectural grid - as a contained unit - is disturbed.

As the glass façade hovers between reality and illusion its skin is not just a one-dimensional surface but also a substance that has its own space and volume,

where fragility and transience take a form. A skin which can be manipulated to create different views and possibilities.

> Questions regarding skin are profound, not superficial. Where are its boundaries? What is its status? Skin is the space of flux, of oscillating conditions.[1]

These glass surfaces act as filters, allowing some information to pass from one side to the other, and altering our perception of them in the process. It is the skin that I am questioning; the irrationality of glass as a building material and how, when take inside, it can alter the perception of architecture.

Like windows, architecture as a whole sets up this dialogue between inside and outside, this passage through space. It is my intention to extend this passage into 'nothing' spaces, to create installations that expand and broaden this tension and play. I want to take what I see in reflections upon glass facades – a dialogue between tangible and intangible forms – into utilitarian architectural spaces; to distort the perception of the architectural grid as being contained, to make the logical illogical and to open up new possibilities and readings for that space.

Architectural movements and architects have, over the course of the twentieth century, changed the perception of architecture. Modernist architect Mies van der Rohe began to subtly make the logical structure of architecture illogical through the use of reflective materials which dissolved space. His 1929 Barcelona Pavilion blurred the distinction between inside and outside, creating a solid yet transparent skin which allowed glimpses in. Once inside the use of reflective materials further dissolved the interior, creating new and illusionary spaces.

The Deconstruictivist architects in the late 1980s went further. Their intention was to 'corrupt' and 'disrupt' the structure of architecture to definitely make the logical appear illogical. Using what is intrinsic to architecture to question architecture, the visual appearance of Deconstructivist designs often presented a feeling of unpredictability and controlled chaos. By drawing on my non-static

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[1] Imperiale, A. "Digital Skins: The Architecture of Surface" in Lupton, E. *Skin: Surface, Substance and Design,* Princeton Architectural Press; New York, 2002, pp 55.

readings of the glass façade I wish to distort the strong grided structure which surrounds us to comment on how we pass through, view and use the space around us.

This project is a part of the broader discourse investigating our perception of modernism and architectural spaces, drawing on and adding to a long history of works by both architects and artists. New York critic Sarah Lookofsky notes that:

> In contemporary art practices that employ the forms of modern design, there is a broad affirmation of the fact that modernism did go wrong, yet there is everywhere the complacent confirmation of; yet here it is! Rather than evoking a game-over-end-all stance, many contemporary artworks rather seem to investigate the implications of a profoundly ideologically dysfunctional system that is still stylistically in place.[1]

This project is characterised by the use and experimentation of glass and stainless steel within an architectural installational practice. My research and exploration into the potential of thin and fragile kiln-formed glass sections, combined with stainless steel, has enabled me to create highly individual and unique works. My consideration of architectural space, when transcribed into my visual language also allows me the opportunity to create large-scale public art commissions which subtly disrupt the grid.

The works created within this project (with the exception of the public art commissions) are prototypes and ideas for future large-scale architectural applications. Vladimir Taltin's *Monument to the Third International 1920* was the accumulation of his relief experiments which demonstrated both the rational and irrational sides of construction. Likewise these works are inquiries into possibilities for architectural spaces. *corner study #1,2* and *3* are good examples of an investigation into one static space which could be translated to a larger architectural scale, such as a voluminous public space.

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[1] Lookofsky, S 'Glass plane, White wall, Steel grid' in *NY Arts Magazine* online at www.nyartsmagazine.com. Accessed 12\8\06.

My research into the possibilities of glass within this project has been experimental. I have explored glass as a sculptural/installational medium. I am not a glass artist, but an artist that uses glass. This distinction is important as I do not consider myself part of the well established international and national discourse of studio glass - glass as objects - but an artist who uses glass as a modernist material to question architectural space and perception.

Chapter 2. Context

Modernism, Mies and architectural objects

This project finds a solid grounding in both the questioning of, and admiration for, modernist glass architecture and the buildings of the influential architect Ludwig Mies van der Rohe. His concept of a skin and bone architecture, which required the use of open and transparent materials, revolutionised our modern cityscapes. The steel frames, sparse interiors, white walls and glass skin facades replaced the compacting and solid effect of brick and sandstone. By the middle of the 1960s there were buildings everywhere in the world with almost only straight lines and right angles, with façades made from only glass and steel.

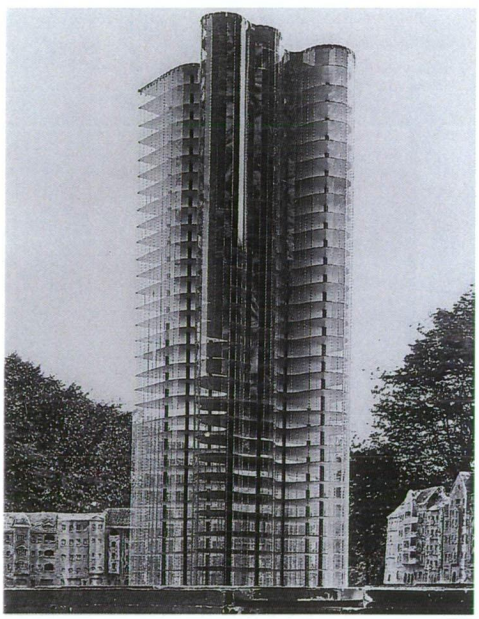

Figure 14. Mies van de Rohe *Model of the Glass Skyscraper Project*

The structural supports for Mies' buildings where built inwards so the surrounding glass walls appeared to float, with the whole building creating a sense of immateriality and weightlessness. In 1922 he stated that: 'Only skyscrapers under construction reveal the bold constructive thoughts, and then the impression of the high-reaching steel skeletons is overpowering.' The 'novel constructive principle of these buildings comes clearly into view if one employs glass for the

no longer load bearing walls.'[1] In the same year Mies built *Model of the Glass Skyscraper Project* for a competition in Berlin (Fig. 14). The proposed thirty-floor high-rise had a curved glass façade which exemplified his ideas. Here, the skin of the glass skyscraper was continuous and uninterrupted giving it the impression of something almost immaterial. Where the glass takes on a telling visual definition of flux; of dissolving and reappearing, as the supporting structure is only revealed spasmodically depending on the time of day and the play of reflective light. Mies was dissolving space, dissolving materials and blurring the distinction between inside and outside. He began to making the logical 'illogical'.

The Barcelona Pavilion

Mies designed the *Barcelona Pavilion* in 1929 as the German National Pavilion for the Barcelona International Exhibition (Figs 15, 16, 17, 18 & 19). This rectangle seemed the essence of simplicity and became a key point of reference for Mies' career and a symbol for twentieth-century architecture.

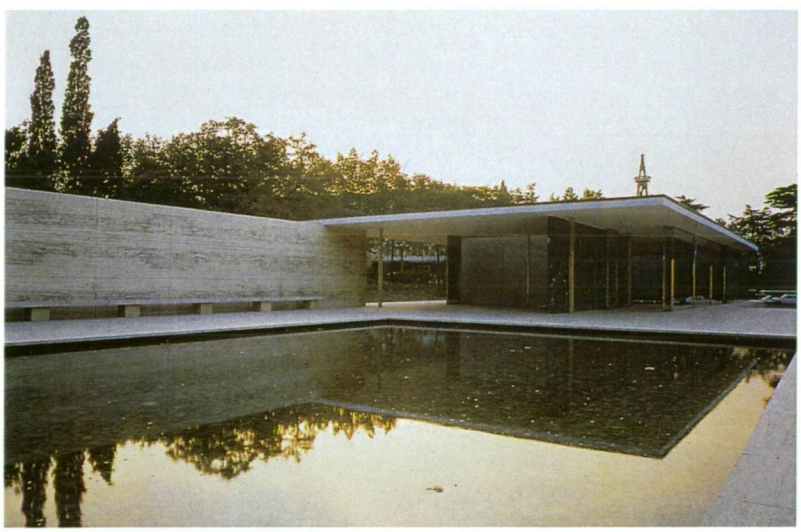

Figure 15. *Barcelona Pavilion* view over pool (reconstructed pavilion)

The pavilion was bounded by glass walls with interior partitions made from onyx, polished green marble and green glass; the spaces in between these surfaces flowed with no definite rooms. On the outside two reflecting pools softened the

[1] Mies van der Rohe, "Skyscrapers" in Neumeyer, F. *The Artless World,* The MIT Press, Cambridge; Massachusetts and London; England, 1991, p 240.

geometry. With the resulting play of reflections and light a dialogue between opened and closed, transparency and opacity, offered the viewer an experience of material and space.

> Mies demonstrated brilliantly the extent to which the observer had become an element of the spatial construction of the building itself. From one position, the viewer looking into the patio gains the impression of being in an enclosed space, sheltered by walls from all sides. In moving one step forward the side wall opens and reveals itself to be only a slab, thereby generating an ambiguous space; depending on the point of view this space can be closed as well as open.[1]

The pavilion seemed both there and not there as the whole architectural space dissolved into a sea of reflection and refraction. The geometry and sense of structure became over-ridden by the immaterial reflections, creating an illogical structure that was solid, yet not.

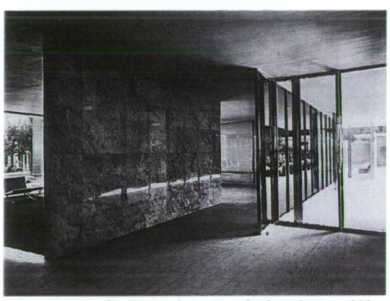

Figure 16. Interior (original pavilion)

Figure 17. Interior (reconstructed pavilion)

Figure 18. Entrance (original pavilion)

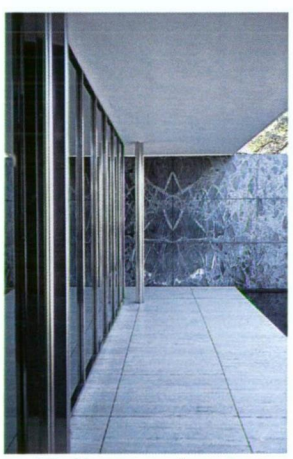

Figure 19. Entrance (reconstructed pavilion)

[1] Neumeyer, F, "A world in itself: Architecture and Technology" in Mertins, D (ed) *The Presence of Mies*, The MIT Press, Cambridge; Massachusetts and London; England, 1994, p 71.

The collapse of Modernist ideals

Modernity has been haunted by the 'myth' of transparency and Mies van der Rohe's celebration of glass. The Barcelona Pavilion offered an architecture which could no longer be viewed on structural terms alone. The possibilities to attach other meanings to the unembellished glass were endless with both critics and artists questioning the modernist ideal.

Writers Colin Rowe and Robert Slutzky questioned Modernism's simplistic definition of 'transparency' in their essay 'Transparency: Literal and Phenomenal'. They believed that the 'literal' physical qualities of the transparent material and our perception of transparency in relation to spatial order were quite different. They wrote: 'the transparent ceases to be that which is perfectly clear and becomes, instead, that which is clearly ambiguous.'[1] Their ideas of transparency rest on the principle that the viewer has visual access to the architectural object.

Artists have also drawn attention to the glass wall. In the modernist ideal it mediated between the inside and outside, with the intention that it disappear, and thereby become an object of focus in its own right. Dan Graham, a conceptual artist and writer working since 1960, has repeatedly lifted the glass planes from modernist structures to reveal the irrationality of glass. Graham states that glass alienates the 'subject' from the 'object' and that the 'reflexiveness of glass allows it to be a sign signifying, at the same time, the nature of the opposition between the two spaces and their common mediation.'[2] Graham uses glass and two-way mirror in his Pavilion Sculpture Series to question the psychological effects these materials have on the viewer. These solid glass structures are visually in flux; that is, the solidness of the structure is contradicted by distorted ephemeral reflections, and transparency is contradicted by opacity.

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[1] Rowe, C. Slutzky, R. "Transparency: Literal and Phenomenal" in Rowe, C. *The Mathematics of the Ideal Villa and Other Essays,* The MIT Press, Cambridge; Massachusetts and London; England, 1976, p161

[2] Graham, D and Alberro, A. (ed) *Two-Way Mirror Power: Selected Writings by Dan Graham on his Art,* The MIT Press, Cambridge; Massachusetts and London; England, 1999, p 56.

Figure. 20 Dan Graham *Two-way Mirror inside Cube and Video Salon.*

Graham's piece, *Two-way Mirror Cylinder inside Cube and Video Salon,* (1991) is a sculptural installation for the rooftop of the Dia Centre for the Arts in New York (Fig. 20). Here he utilises the architectural vocabulary of the modernist glass façade to evoke a re-evaluation at the urban environment. This walk-in sculptural installation is comprised of an external glass structure with an internal glass cylinder. These simple geometric forms are made from two-way glass, steel and wood. Viewers enter the structure via a door, and are confronted by a distorted view (depending whether they are inside or out of the cylinder) of themselves, others and the surrounding city. The experience intensifies the self-reflective and kinetic nature of the urban landscape. Upon viewing the artwork one becomes part of the piece, a player whose reflection and movement becomes part of the work. The paradoxical effects of surface reflections and depth, transparency and opacity return the artwork to the roots of its conception; everyday urban life and activity. The work engages the viewer as they are confronted by their own selfhood in relation to glass and their surroundings. As architecture, the work is clearly related to Mies van der Rohe's Barcelona Pavilion where the viewer experienced reflection and opacity but here the interior is also all glass, creating an all round transient effect.

New sensibilities and post-modernist glass architecture

> We touch with our eyes and are touched in turn through our gaze. If seeing is believing, then touching induces feelings about what we touch. Disgust or delight are triggered in an instance. As we allow our gaze to linger or our hand to pause on a surface, that surface can spring to life.[1]

In recent years a new sensibility towards glass architecture, and glass used within architectural spaces has emerged. 'Light Construction', an exhibition of contemporary architecture at the Museum of Modern Art in 1995 showcased thirty three projects from ten countries, all expressing a new sensibility which sees a shift from architectural form to surface. Many of these projects utilise a layering, or veiling, of the façade to create a visual tension, indicating a departure from the past attitudes, and addressing the complex relationship between the architectural object and the observer. Curator Terence Riley states that within this exhibition:

> Priority is given to the visual encounter with a structure, a choice that is not meant to imply a hierarchy of importance but to recognize that the appearance of architecture provides not only the initial but frequently the most defining contribution towards its eventual comprehension.[2]

Architects Jacques Herzog's and Pierre de Meuron's The *Goetz Collection,* in Munich (1992), demonstrates this new sensibility and critique of modernism (Fig. 21). Upon first glance the building appears to be reminiscent of Mies van der Rohe's buildings; structural and functional, but upon investigation the building is ambiguous. The façade suggests three floors, but there are only two and the steel support structure is enclosed within the two surfaces of a double glass façade. The structure appears ghost like between the frosted glass surfaces, bound up by the glass rather than in full view, yet it remains visible. Here the architects have compressed the illusion of depth within their façades as the exterior skin is built up as layers or wraps, invoking what might lay behind the surface.

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[1] Forster, K.W. 'Surface Tension in Modern Architecture' .Public Lecture Transcripts 2005-06 www.haecceityinc.com/public_lecture Accessed 18\5\2006.

[2] Riley, T. *Light Construction,* The Museum of Modern Art; New York, 1995, p 9.

Figure 21. Herzog and de Meuron
The Goetz Collection

Bernard Tschumi's *Glass Video Gallery* was commissioned by the city of Groningen as a public pavilion for watching videos (Fig. 22). Situated in the centre of a traffic roundabout this tilted gallery was intended to be in full view. Not unlike modernist glass structures, the façade is a glass curtain wall. Here the entire toughened glass enclosure is held together with metal clips, thus erasing any significant difference between structure and skin; minimising the difference between inside and outside. Glass plates also divide the interior of the space which is also only being held together by the metal clips. The resulting interior space is a multiple layer of reflection and refraction, thus denying the interior any structural grid formation, denying it the modernist internal structural grid.

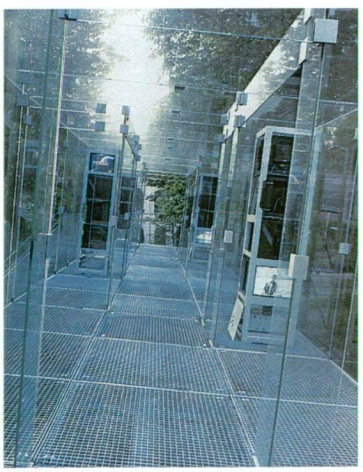
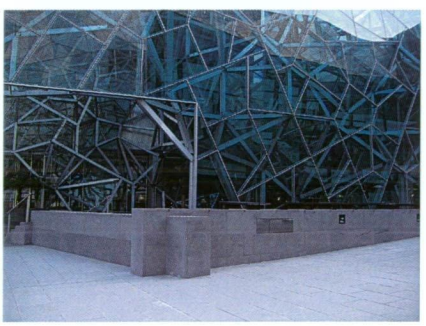


Figure 22. Bernard Tschumi
Glass Video Gallery

Closer to home Melbourne's Federation Square[1] also expresses a new sensibility towards architectural surface and the observer (Figs 23 & 24). The design is based on the grid structure of Melbourne's primary and secondary street plan, taking into account the laneways and side streets which break the grid, and better demonstrates the pedestrians use of city space. 'As the designers see it, people's experience and perception of the city are influenced more by the laneways and arcades woven into the city fabric than by any dominant grid.'[2] The basic façade modules are comprised of triangular tiles made from sandstone, zinc and glass, linked together in groups of five to create a symmetrical pattern which also appears fractured and chaotic. The glass section on the Flinders Street end is of particular interest to me as this structured system creates a collapsible grided glass space, structurally intact yet in flux. When standing under this glass you can feel the sense of movement the designers where trying to convey. Sections of the grided exterior are also carried into the building, creating surprising ruptures and shifts within.



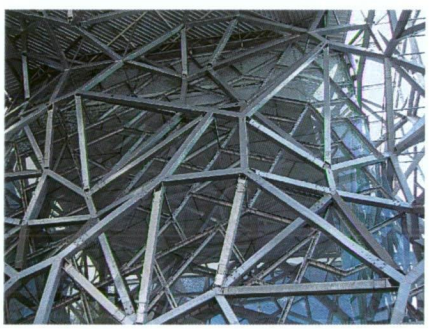


Figure 23 & 24. *Federation Square*, Flinders Street, Melbourne.

Deconstructive architecture and Gehry, Constructivism and collapsing the grid

This project also draws inspiration from the 'Deconstructivist' architects and their collapsible, shifting façades and internal spaces. Deconstructivism in architecture is a development of postmodern architecture that began in the late 1980s. This style is characterised by ideas of fragmentation, non-linear design process, and an

[1] Federation Square was opened in 2002 and was designed by Lab Architecture Studio in association with Bates Smart.
[2] Ferguson, A. 'On the Surface of Things', *Frame Magazine* no. 31, 2003, p 94.

interest in the manipulation of a structure's surface or skin to distort and dislocate the structural form. The visual appearance of Deconstructivist design often presents a feeling of unpredictability and controlled chaos.

The 1988 'Deconstructivist Architecture' exhibition at the Museum of Modern Art, curated by Philip Johnson and Mark Wigley, showed a cross section of several key architects, each presenting this shift from, and critique of, modernism. Deconstructivist architecture replaced the well known mantra 'form follows function' by buildings where flexibility was the focus. These architects sought to challenge architectural values like unity and harmony, and offered a different view: that flaws were intrinsic to structure. These buildings exploited the unseen potential of modernism, breaking away from a formalized grid structure to create works where the logical becomes illogical.

Mark Wigley writes in the catalogue essay 'architecture has always been valued as an institution for its provision of stability and order... the projects in this exhibition mark a different sensibility, one in which the dream of pure form has been disturbed. Form has become contaminated. The dream has become a kind of nightmare.'[1] Wigley goes on to say that the projects displayed do not destroy or dismantle structure, but they locate the "inherent dilemmas within buildings". This is what informs this project; to locate a space within architecture and to disturb and shift it, to use what is intrinsic to architecture to question it and open up new possibilities for its interpretation.

The key architects shown in this exhibition were Frank Gehry, Daniel Libeskind, Rem Koolhass, Peter Eisenman, Zaha Hadid, Coop Himmelblau and Bernard Tschumi. All these architects have continued to produce substantial works which question the form and perception of architecture.

Frank Gehry's work in the exhibition is *Gehry House*, Santa Monica, California 1978-88 and is shown in model form (Figs 25 & 26). This design is a renovation

[1] Johnson, P and Wigley, M. *Deconstructivist Architecture,* The Museum of Modern Art; New York, 1988, p 10.

of an existing suburban home where the original house was surrounded by several conflicting structures which gave the building a very different face. These extensions were sourced from, and emerged out of, the inside of the existing house, as if they were always there, lying dormant. At one point a tilted cube (made up from the original framework from the house) bursts through a void, becoming stuck.

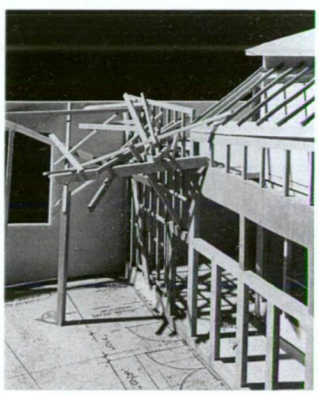


Figure 25 & 26. Frank Gehry, models of *Gehry House*

More framework bursts through the exterior skin to rest on other escaped framework to create a collapsed grid with no structure to place linear walls on. The result is an extended play between forms, their relationship and opposed positioning.

In 1990 Gehry designed *The Vitra Design Museum* which again shows the form of the internal coming outwards to distort and shift the façade of the building (Figs 27, 28 & 29). This building was designed to house a collection of international furniture objects, accommodating galleries as well as public spaces. Here Gehry's design takes the white cube of modernist art galleries and distorts it. He uses what is intrinsic to the display of art – white walls – to deconstruct the form of the gallery. Inside the museum Gehry takes ordinary elements - ramps, stairs, corners – and pulls them apart and re-assembles then to challenge notions of what the inside should look like. These deconstructive projects of Gehry's have produced architecture which slips from the familiar into the unfamiliar; where the form distorts itself to create a new reading of that form, and ultimately a new reading of the architectural object as a whole.

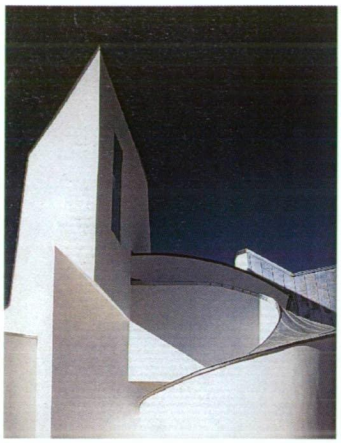



Figure 27 & 28 Frank Gehry *The Vitra Design Museum* (external)

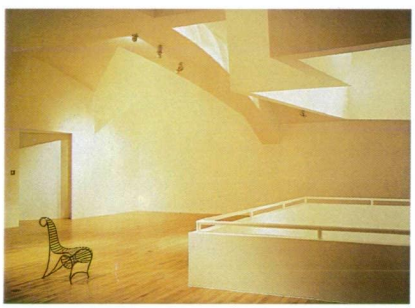


Figure 29. Frank Gehry *The Vitra Design Museum* (internal)

Constructivism and the articulation of space

The modernist sculptural engagement with architecture has a long lineage going back to the early Avant-garde and Russian Constructivism. The constructivists created unbalanced and unhierarchial compositions that started to address architectural space. Naum Gabo used industrial materials like plastic and glass to construct works that could interact with the space around them (Figs 30 & 31). The sense of space he created within his constructions was a result of opening up the form to create weightlessness. Gabo's glass and plastic works express 'with new purity his ambition to create an immaterial sculpture that appears to shape and articulate space itself.'[1] These works make you aware of a sense of fine balance, as they hover between materiality and intangibility.

[1] M.Hammer &C.Lodder "Naum Gabo and the Constructivist idea of sculpture" in p 44, in Naum Gabo: The Constructive Process. 1976

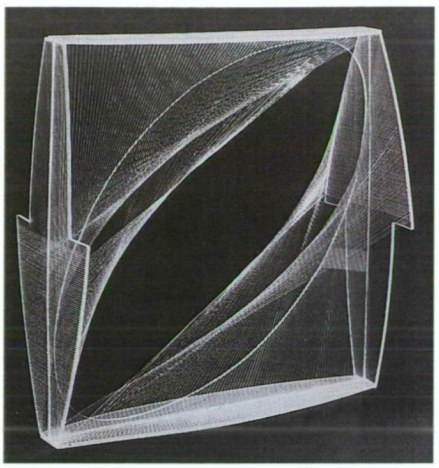


Figure 30. Naum Gabo *Linear Construction In space No. 1, Variation*

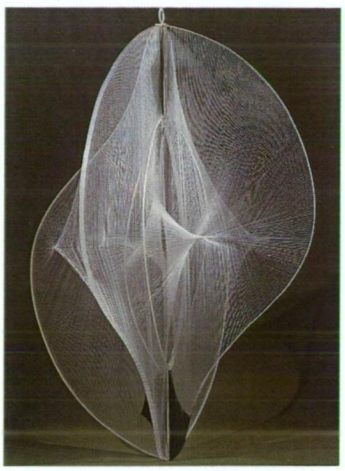


Figure 31. Naum Gabo *Linear Construction in Space No. 2*

> As we look at his works, where a sheet of glass cuts the air, where the edge of a transparent curve appears to dissolve into the surrounding space and yet remain defined, where thread seems to be sewn into the air, perhaps we sense the chaotic forces that his fragile constructions hold at bay.[1]

Vladimir Taltin's *Monument to the Third International 1920* (a model for a tower that was never built) reflects the Constructivist's ideals when applied to architecture (Fig. 32). The huge monument was intended to be positioned in Moscow. It was to be constructed from glass and iron, with a revolving central glass cylinder. Despite never being built this structure was the accumulation of Taltin's relief experiments which demonstrated both the rational and irrational sides of construction. Based on a spiral design the geometric forms became trapped and twisted within the frame. The tower took on a lean, balancing between strength and collapse, the grided beams collapsing in and articulating a space and structure in flux.

[1] C.Collier, 'Introduction' in Gabo, N. *The Constructive Idea,* South Bank Centre; London, 1987, p 8.

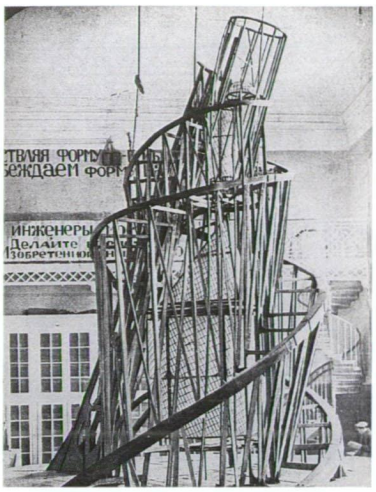


Figure 32. Vladimir Taltin
Monument to the Third International
(model)

The grid

The Deconstructivist architects and the Constructivists departed radically from the traditional use of the grid within architecture. Grids, in the classical tradition, where used for tectonic composition and the articulation of space within that composition. Modernist architecture did not sway from this tradition; in fact if anything they became more rigid, where the structural grid became an integral part of the structure (as seen in the work of Mies van der Rohe).

Rossalind Krauss' seminal essay 'Grids' first published in *October* 1979 says that 'grids are the emblems of modernity', and that there are two ways in which the grid does this: one is spatial, the other temporal:

> In the spatial sense, the grid states the absolute autonomy of the realm of art. Flattened, geometricized, ordered, it is anti-natural, anti-mimetic, anti-real. It is what art looks like when it turns its back on nature. In the flatness that results from its coordinates, the grid is the means of crowding out the dimensions of the real and replacing them with the lateral spread of a single surface. In the over-all regularity of its organization, it is the result not of imitation, but of aesthetic decree. Insofar as its order is that of pure relationship, the grid is a way of abrogating the claims of natural objects to have an order particular to themselves; the relationships in the aesthetic field are shown by the grid to be sui generis and, with respect to natural objects, to be both prior and final. The grid declares the space of art to be at once autonomous and autotelic. In the temporal dimension, the grid is

> an emblem of modernity by just being that: the form that is ubiquitous in the art of our century.[1]

This questioning of the grid as being autonomous informs this project. It has been a notion I have used throughout the research to question the articulation of space.

Glass as artistic medium to explore

Although architecture, and the use of glass within architecture, has been a major contextual element in this project, glass and artists using glass as a means for artistic expression, have also been explored. As stated in Chapter One I am not a glass artist, but an artist who uses glass. Because of this, the artists I have researched are ones who are experimental and innovative in their approach to the medium of glass, with a particular emphasis on the sculptural and installational possibilities for glass.

From the beginning of this project I have been interested in the work of Mary Shaffer. Her innovative approach to kiln-forming plate glass and metal has resulted in works, which capture the balance between fragility and stability which I aspire to. Her early experiments resulted in objects of thick molten glass caught flowing through wire mesh and chains (Fig. 33), others are taken from the hot kiln just before iron hooks were about to break the heavy glass's downwards slump.

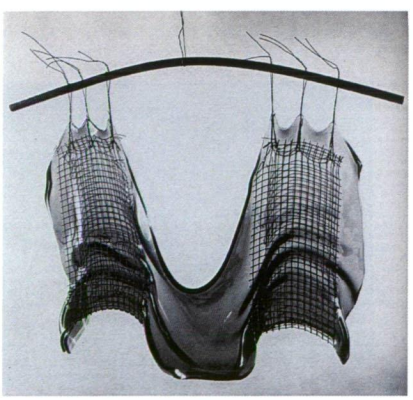


Figure 33. Mary Shaffer *Untitled.*

[1] R.Krauss *Grids: Format and Image in Twentieth Century Art,* The Pace Gallery; New York, 1980, p 1-2.

Shaffer's later work is a delicate dialogue of opposing strengths. *Centre Cube*, 1992, (slumped and cast glass, cast bronze) is made from two figures, one a drooping sheet of glass, the other a mimicked sheet of bronze (Fig. 34). Both hold up the corresponding material in the form of a cube. Here gravity defies comprehension as the viewer is left wondering how the glass stays upright, and the perception of the innate qualities of both strength and stability of each material is brought into question.

Figure 34. Mary Shaffer *Centre Cube*

Christopher Wilmarth, an American sculptor working in the 60s and 70s, also experimented with plate glass and steel. He was best known for his geometric structures which were often attached to the wall, thus creating a relationship with the space, giving the work a backdrop with which to converse with (Fig. 35). His fascination with glass as a medium to explore led him to exploit the intrinsic qualities of opacity and transparency, to create works which are full of tension.

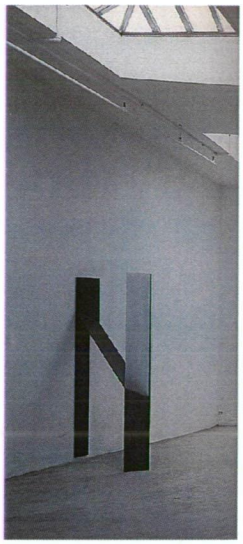


Figure 35. Christopher Wilmarth *Gnomon's Parade*

Of particular interest is the way he would weave steel in, through, and around the etched glass plates, linking the two materials together: (Figs 36, 37 & 38)

> The dialogue in which the two materials engage – steel with its ruggedness and permanence, glass with its transparency and vulnerability – transforms their individual voices into a single, unique metaphorical language.[1]

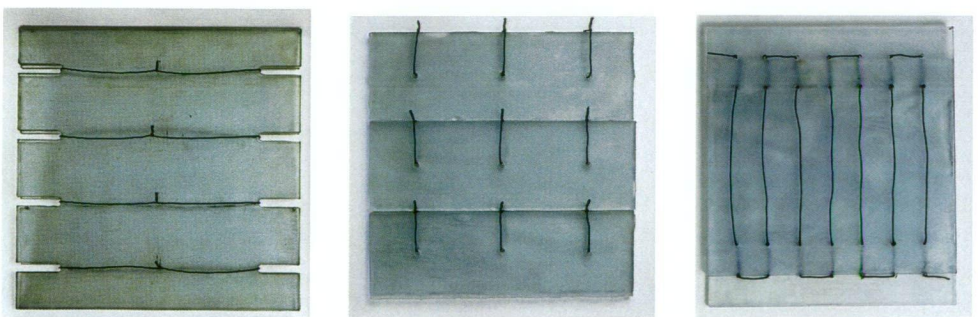


Figure 36, 37 & 38. Christopher Wilmarth *Crosscut Drawing, Tied Drawing* and *Untitled Drawing.*

Light

Light as an integrated medium within the project was only fully realised in the final installation works. After installing numerous works within gallery spaces and being 'let down' by the available lighting system, I decided that I had to make

[1] Poirier, M " Christopher Wilmarth: The Medium is Light" *ARTNews (U.S.A),* vol. 84, no. 10, 1985, pp 68-75.

light an integral part of the work. In both the public art commissions I had incorporated lights into the design. This led me to Moholy-Nagy and his light projection works.

Lazlo Moholy-Nagy, the influential early twentieth century artist, explored the creative potential of light and shadow as an image-making tool. Moholy-Nagy's famous *Lightplay Black White Grey* was a short film of the light and movement produced by *Light-Space Modulator* and completed in 1930 (Fig. 39). The *Light-Space Modulator* was a six-foot high construction of moving glass, aluminium and chrome plated surfaces, driven by an electric motor. Spotlights were cast upon its turning components, which resulted in dramatic shadows passing over the walls and ceilings. The effect is one whereby the real and the illusory combine, with both being dependent on each other for meaning. Krisztina Passuth wrote how 'it exists in two forms simultaneously: in reality as a metal-and-glass structure, virtually as its own shadow. It is when they operate together that the two have meaning: the projector and what is projected forms a whole.'[1]

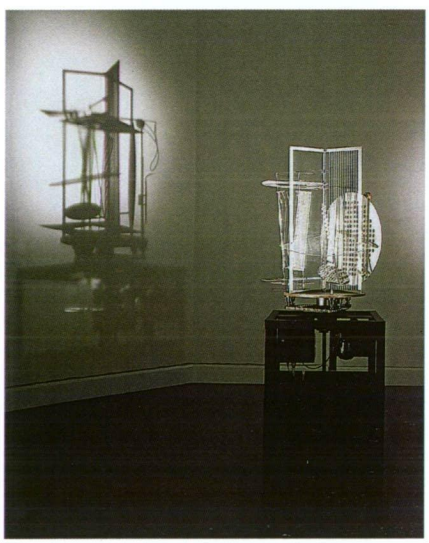


Figure 39. Lazlo Moholy-Nagy
Light-Space Modulator

[1] Passuth, K. *Moholy-Nagy,* Thames and Hudson; London, 1985, p 53.

Installing artworks within architectural and public spaces

The term 'installation art' is often used to define (or try to) a certain artistic practice. Within my own practice I install works in the space from which they were derived. Geczy and Genocchio note 'installation art is an activity that activates a space. It is less a style than an attitude, tendency and aesthetic strategy insofar as we now read every art object as inseparable from the location in which it is placed.'[1] Australian artist Janet Laurence is often regarded as an architect's artist[2] having worked with many leading architectural firms to create site-specific installations that reflect the cultural context of their location. Well known installations include the *Tomb of the Unknown Soldier* (1993)[3] made in collaboration with architect Peter Tonkin; and *Edge of the Trees* (1994)[4] with Fiona Foley

Laurence has influenced this project through her subtle incorporation of glass within site-specific architectural and public spaces. For the past two decades Laurence has explored the slippage between one state and the other, her works sitting within the parallel world of architecture and the environment. Although her conceptual concerns differ from mine, I am inspired by her use of glass to create the tensions between stability and fragility.

Less Stable Elements (1996) was a site-specific installation at the University of Newcastle Gallery (Fig. 40). The gallery is a glass pavilion within wooded bush land. Here Laurence covered the gallery floor with forest debris, as if the ground outside had made its way into this space. Timber and aluminum rods lent against the wall like a collapsing or slipping structure unable to keep the forest litter at bay. Ambiguous reflections created by the shifting natural light turned the space into a place of reflection, confusing the boundary between inside and out, nature and architecture; neither one dominating but both seeming fragile.

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[1] Geczy, A and Genocchio, B. (eds) *What is Installation?: An Anthology of Writings on Australian Installlation Art,* Power Publications; Sydney, 2001, p 1.
[2] Geissler, M. "Principles of Uncertainly" *Craft Arts International* no. 65, 2005, pp 49-53.
[3] National War Memorial, Canberra, ACT with Tonkin Zulaikha Architects.
[4] Forecourt, Museum of Sydney, NSW.

Figure 40. Janet Laurence *Less Stable Elements*

Wendy Mills is an Australian artist who has been producing large-scale public art works for twenty years. She has extended her practice from the limitations of an individual artist by utilizing the expertise of fabricators, lighting designers and architects. Mills' works are usually site-specific and conceptually driven by the significance of their location. Helmrick notes Mills is 'altering the viewers' experience of space and affecting their response to a site are fundamental to her practice, and public commissions allow her to do this for a large number of people'[1]. Mills has long been interested in the ephemeral. Many of her earlier site-specific installations were made from clear and reflective materials, installed in an architectural space for a short amount of time. More recently she has been interested in the ephemeral also being permanent, and for these works her materials include glass, stainless steel and water.

Mills' best known public art work is *On This Auspicious Occasion*, informally known as the *Water Tables*. She was commissioned to create the work as part of the redevelopment of Brisbane's Queen Street Mall in 1998 (Figs 41 & 42). This work is situated at the George Street end of the Mall where water table cloths stream down over rows of kiln-formed glass table tops. Nine polished stainless steel seats sit upright at the table inviting people to come and join the feast. The work is based on the colonial past of the site and is accompanied with words from songs about the Brisbane River which are relief moulded (kiln-formed) into the tops of the tables.

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[1] Helmrick, M. "Wendy Mills' Water Table – serving river songs to the public", *Artlink*, vol. 20, 2000, no. 4 pp 62-64

Figure 41. *Wendy Mills* On This Auspicious Occasion

In order to realise this project Mills worked with steel fabricators, a lighting designer, water designer and the glass was made by a glass production company. The glass alone was troublesome and after many trials at kiln-forming the 25mm thickness of the glass, which was needed for safety and visual impact (kiln-forming that thickness of glass is always difficult due to the cooling stresses which tend to crack glass at that thickness) the desired result was achieved. The glass, water, light and steel components were trialed on many occasions to ensure they all worked together.

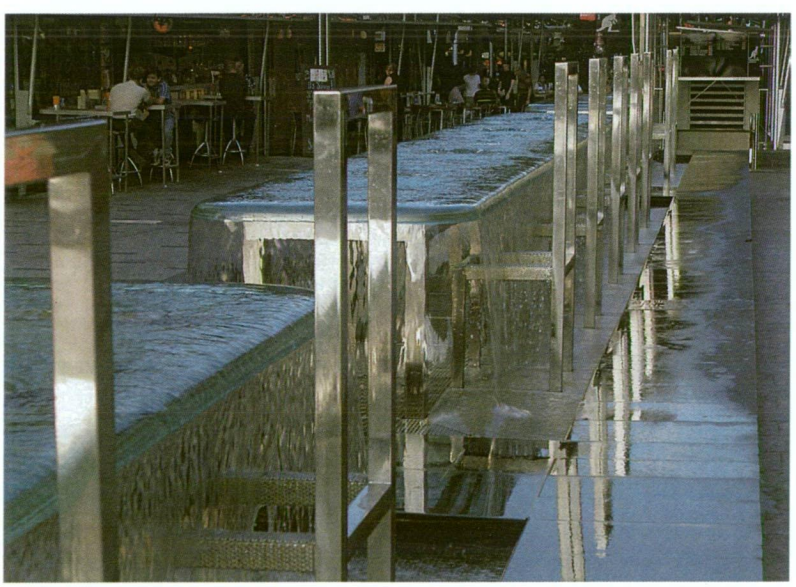

Figure 42. Wendy Mills *On This Auspicious Occasion*

This work was challenging for Mills as it went over time and budget, due to the technical problems involved with getting the glass fabricated and the water running efficiently, all within the constraints of working to a large redevelopment time schedule. This work was decommissioned in May 2005 due to ongoing maintenance and technical problems,[1] however it still stands as an impressive and successful installation of glass, light and stainless steel within a public space where the use of industrial technologies helped in its creation.

Maureen Cahill is one of Australia's most innovative glass artists and her practice spans from gallery based sculptural work through to large-scaled public art commissions. For the public art works Cahill also utilizes the services of fabricators and industry professionals to help her produce glass works which are suitable for public spaces. Her best known public work is *Willy Willy* 1988, commissioned for the New Parliament House in Canberra (Figs 43 & 44). Cahill states 'I worked with models and then transferred the idea to a prototype where the glass lamination autoclave process was collaboratively developed using the resources of the glass industry, in order to comply with Australian architectural safety standards for permanent public works'[2]

Willy Willy, the result of this industry collaboration, is a stunning installation. The seventeen slumped and laminated glass components, each being one metre square, are suspended from the ceiling by stainless steel rigging. They float downwards in a display space spaning twelve by eight by eight metres, the glass being attached delicately to the rigging at three small attachment points. The sense of weightlessness and floating Cahill has created through this installation almost negates the heavy industrial process the glass went through to be manufactured safely, making it a successful installation where the work is safe and the artist still carries across her conceptual themes of ambiguity and spatial relationships.

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[1] Morrell, T. "An Inauspicious Occasion" *Artlink* vol. 25, no. 3, 2005, pp 42-45
[2] Gavan, J. "Maureen Cahill" *Craft Arts International* no. 41, 1997-98, p 28.

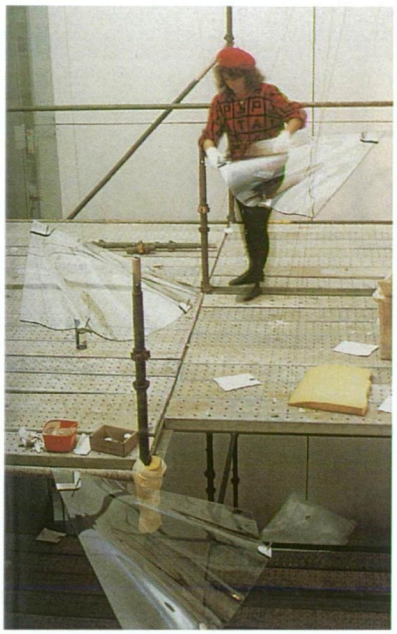


Figure 43 & 44. Maureen Cahill *Willy Willy*

In summary, the contextual research into the modernist glass façade and the critique and interpretation of it has given this project a grounding in architectural form and perception of architectural form. This foundation has been taken into the studio where the practical studio research into kiln-forming and installing the works within architectural spaces has been influenced by artists experimenting with the medium of glass. Particular interest has been taken in artists like Wendy Mills and Maureen Cahill who, through trial and error, have managed to successfully install large-scaled experimental glass installations within public spaces.

Chapter 3. How the project was pursued

This chapter is written as a narrative, following the chronological development of the project and detailing the processes explored and the decisions made in the studio. Specific works and techniques are discussed under sub-headings, with the final works discussed at the end.

I began by constructing models out of paper and plastic, then moved to constructing three-dimensional models from glass sections I had formed the previous year (Figs 45 & 46). At this early stage of the investigation I had a timely meeting with Suzie Attiwill, a Melbourne based curator and writer on craft and design, who pointed out to me that I had spent my time talking to her about architectural space and perception but the models I had made, and were proposing to construct, were becoming more like sculptural objects - objects that where to be placed on a wall rather than sculptural installations which interacted with the architectural space in which they were placed.

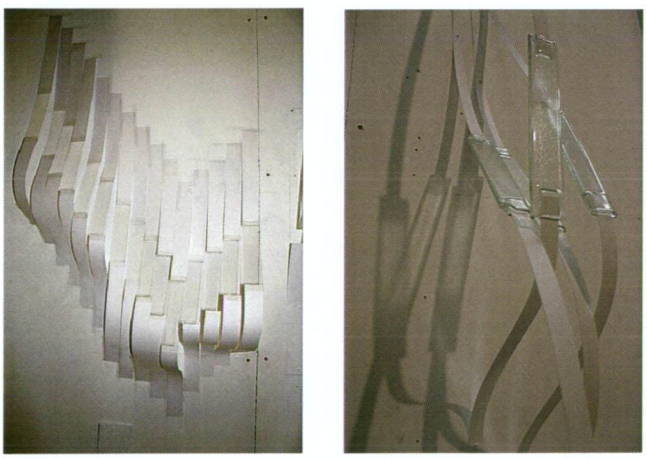


Figure 45 & 46 paper and glass studio models

The idea of installations that set up a dialogue with architectural space was not new to me. I had been working with that dialogue between glass and wall during my Honours year, but through my mentorship training into kiln-formed glass I had been more process and technique driven rather than conceptually driven. During that time I had also been influenced by glass artists, and the beauty and craftsmanship of their formed works. I was now realising through my research

into 'glass artists' who worked sculpturally that most were creating objects for objects sake! This was an important juncture, realising that I was not a 'glass artist' but an artist that 'uses' kiln-formed glass. The direction I wanted to take was clear. I decided not be too precious about the kiln-forming process and experimentation was to become my focus.

on the outer

on the outer was made for the small exhibition space in the foyer at Salamanca Arts Centre in May 2005, three months into my candidature (Fig. 47). It's a window display case measuring 1870mm x 1060mm x 720mm. The gallery has metal security bars running vertically down the exterior of the window facing the street. The space then opens through to the public access area behind, allowing the display case to be viewed from either side.

I designed a glass screen which would fit inside the contained space, referencing the security bars which surrounded it; making the work seemingly open and transparent like the gallery itself, yet also impenetrable. The glass sections, based on the decorative, but distorted nature of reflections falling across glass façades, were formed with a slot in the middle where the aluminium support bars ran through.

Figure 47. *On the outer*

As soon as I had installed the work in the space I knew I had failed. I could not 'see' the work because of all the other visual 'barring' effects happening around,

and behind it. This 'barring' effect was what I had wanted to emphasise and play on, but my screen just became lost, overpowered. If I could not 'see' the work, if my minimal aesthetic had become too minimal, I realised that the viewing public were going to have trouble as well.

This raised questions. Was the work too pared down? Was glass and aluminium, the mediums I was proposing to concentrate on, going to be strong enough to carry my ideas? Was it the sculptural, three dimensional aspect of it (a genre I was moving into) which needed more processing? Importantly I had lost the wall which now I realised was such a critical part of the past work; the place where the intangibility of the cast shadows had played a vital role in the formation and reading of the work as a whole. Now the work had no backdrop behind it, it had to compete with its surroundings.

The positive aspect was the quality of the kiln formed glass, and the successful use of threading the metal through the glass, so it became incorporated into the piece, as well as the attachment method.

In the studio I decided to go back a step, back to the wall, to start my sculptural investigation from there. I was starting to think of ways to 'lift' the wall away from the wall, and once it was in three-dimensional space how it could then be manipulated and shifted. I began to work vertically and horizontally, letting gravity take control and creating rhythms with the glass and aluminium. I let the weight of the glass dictate its rhythm (Figs 48, 49 & 50).

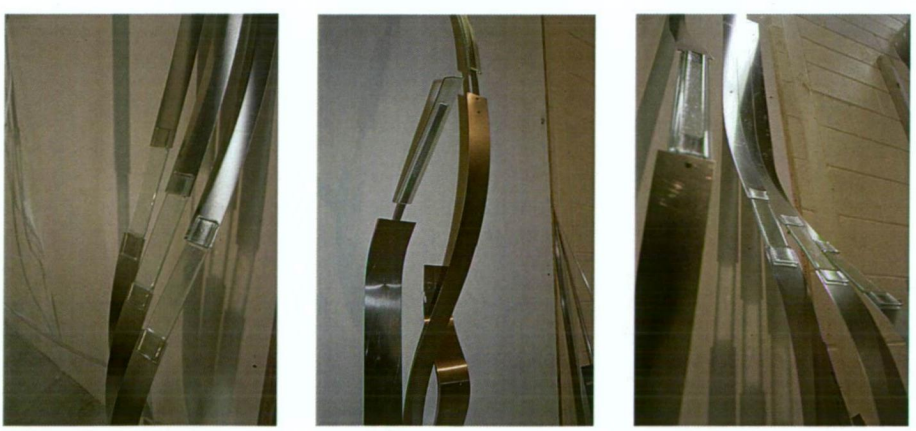


Figure 48, 49 & 50. Studio Models

I was kiln-forming glass sections with a variety of slots in them for varying widths of aluminium, then weaving the two materials together (Fig. 51). I experimented with painting the aluminium white like the wall so it took on the appearance of the wall. This lead to applying electrical, reflective and mirror tape to the aluminium, which seemed lighter and more fluid, giving the aluminium strips a light ribbon effect. The reflective nature of the tape seemed to undermine the strength of the material because it changed with movement and available light.

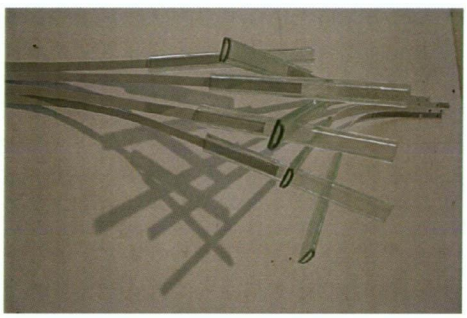


Figure 51. Studio Model

These experiments lead to *corner study #1*, for a group show at Inflight Gallery in October 2005. This work, made eight months after the start of the project, represented the starting point for my engagement with architectural space, becoming a point for reference for future works.

corner study #1

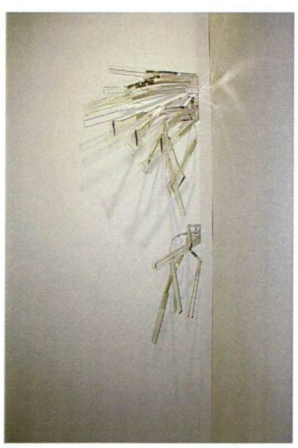


Figure 52. *corner study # 1*

corner study #1 was designed for, and installed within the corner, the 27 sections of glass emerged from a crack in the wall on aluminium strips with mirror film on both sides (Figs 52, 53 & 54). To create this emerging effect the aluminium was

attached behind a triangular piece of timber, 3 metres tall, which was bolted into the actual corner of the gallery and painted white to match the wall. The aluminium was twisted, pulled and weaved into position, levering the glass out and offering support for other strips. The mirror film not only reflected the other strips, making it confusing for the eye to focus on shadow or mirrored aluminium, it also reflected light back onto the wall, in effect occupying the space of the corner. As pleased as I was with this work, it raised issues of architectural scale or presence; again it became a bit lost in the gallery because of the high ceilings.

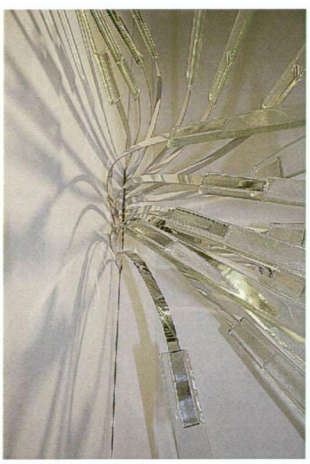



Figure 53 & 54 *corner study # 1* detail

Kiln-forming techniques

The bringing together of glass and metal is of paramount importance to this project because the combination of these materials created the main dialogue between stability and fragility. At this stage of the project I was starting to refine my kiln-forming techniques. The processes and skills I had learnt through my mentorship training were now being applied in an innovative way to produce glass sections which had slots formed into them during the firing process for the metal attachment. Full descriptions of the kiln-forming techniques are given in Appendix one.

I wanted the kiln-formed glass to appear like sections of a reflection; repetitious and fractured, like the glass façades I was referencing. I wanted to explore glass's inherent qualities of fragility and strength to set up the dialogue between stability

and fragility. The glass was cut and formed, often in the same shape, or shifted versions of a similar shape, to mimic the repetitious nature of reflections.

In November 2005 I received some funding from the Graduate Research Support Scheme to attend a 5 day kiln- forming workshop at the ANU glass studios in Canberra. As I had learnt my craft through a mentorship with artists who themselves were self-taught, I felt that I should spend some time in a 'real' glass studio to see how trained glass artists kiln-formed. The workshop was great and it was reassuring to realise that I actually did know a lot about kiln-forming glass and came back with a greater belief in my own abilities and a desire to push my experimentation further.

In October I presented a progress report to the postgraduate group, showing the experiments I had been doing and *corner study #1*. The feed back was encouraging. The main issue which arose was that of scale. How was I to successfully scale the work up to have an architectural presence? It was noted that I don't work in big forms but smaller pieces which seemed fragile and likely to shatter. I liked this association so an option was to scale up in mass. That is, to keep the elements roughly the same size, maybe a bit bigger, but have many more of them.

It was also noted that the glass and metal were working well together and that I was almost making them 'airborne'. This notion of the weightlessness pleased me. Other issues about the use of aluminium arose, and it was suggested that I experiment with other materials like stainless steel. I realised I was not married to the use of aluminium. It was an appropriate material to be using at this stage because it is easy to manipulate, but I was aware that the mirror tape, which I was applying to the aluminium, might not be a long-term answer. As I did not (ultimately) want to be limited to interior space, a more permanent metal like stainless steel would be good to experiment with.

It was noted that I was interested in the movement of the body around the glass. Asked " what about the tension you create with the glass and the viewer, what about the precariousness? " I said I wanted people to feel that precariousness, to

stand under the glass and feel the sense of movement and tension. This notion of physical interaction has been carried through all my installation works.

***elements* at Rosetta High School**

Around this time I had successfully tendered for an Art in Public Building Scheme Commission at Rosetta High School in Hobart. I was interested in the project because it called for an artist to work collaboratively with the architect Patrick Yeung to design a 20 metre sculptural wall which would wrapped around the façade of the new kiosk building he was designing.

To start my design process I was looking at Yeung's plans for this building and thinking about the surrounding architecture of the school. I became interested in the lean of the proposed building and the strong angular lines on the cast concrete panels - architectural objects that were different from the already established more traditional school buildings. I therefore started to base my designs on Yeung's plans for the kiosk itself.

The architect liked these initial ideas and we started our design process. The first part of the process had to happen quickly because the plans were to go up for tender in three weeks, and as I wanted the walls to be part of the final overall construction, rather than placing the work on there after the fact, we had to finalise sections of the design quickly so the architect could alter the designs he had already drafted on the pre-cast concrete panels.

Yeung's initial designs included not only the angular lines I was interested in, but also a lot of curving lines and textured sections carved into the concrete. We came to a compromise; that the 85 and 110-degree angular lines would stay, and the rest would go. I then started to work through some ideas, heading back to the architect's office regularly with new drawings and models I had made out of cardboard. We would discuss the structural possibility and feasibility of constructing some of these ideas, and what materials could be used. During this phase of the project being able to discuss the structural issues regarding these

materials, building requirements and other issues (which I don't usually have to deal with in my studio practice) was invaluable.

We settled on a three-dimensional sculptural element, which takes on the form of the building, and incorporates the 85 – 110 degree lines. We also settled on using perforated aluminium, a suitable translucent material, which would create the shifting shadows I wanted, as well as being structurally sound. Perforated aluminium was also incorporated in other parts of the building so there was a consistency of materials as well.

I constructed scaled cardboard models and detailed drawings for the sections and they were made in Melbourne and then attached to the stainless steel tubed frames by fabricators in Hobart (Figs 55, 56, & 57). I chose the colours from a palette, which had been pre selected by the school and the architect. The plum walls came from an existing sports complex Yeung had built a few years earlier, which is adjacent to this site, and the blue is the school colour.

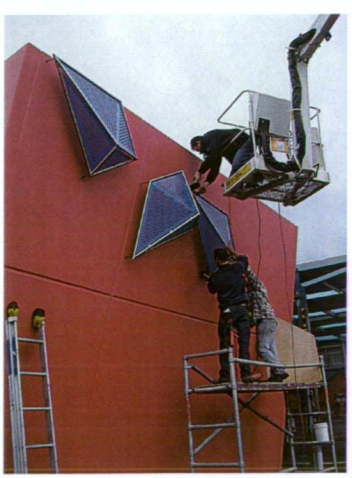


Figure 55, 56 & 57. Fabricators installing *elements* at Rosetta High School

The 14 sections are arranged in a pattern which links haphazardly around the walls; shifting these models of the angled façade around like they were shifting reflections. During the day the elements cast strong shadows onto the walls, which shift with the sun (Figs 58 & 59). At night the ground lights incorporated into the landscaping light it (Fig. 60). This project was completed in February 2006.

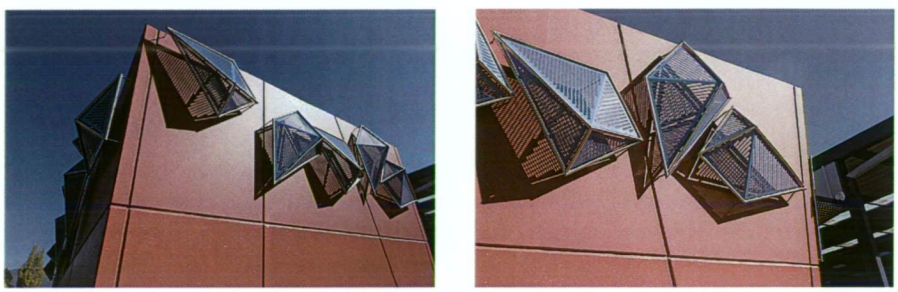


Figure 58 & 59 *elements* at Rosetta High School

Figure 60. *elements* at night

Back in the studio I wanted to follow through with the possibilities that commenced with *corner study#1*. I decided to construct a three metre tall wall work, which tackled scale and used stainless steel as the attachment metal. I also was interested in creating more movement by slumping the glass into different shapes. Slumping is a kiln-forming process that bends the glass into shapes through the use of moulds. It is best to slump glass that has already been fused, because slumping occurs at a lower temperature than fusing. I made some curved ceramic moulds, by laying rolled clay into corrugated iron, a texture was left on

the ceramic surface, which would be picked up by the hot glass. These moulds where bisque fired before being used for slumping.

I began constructing the three metre work in December 2005. This involved cutting and polishing the stainless steel strips, and putting the glass through two firings – a fuse and a slump.

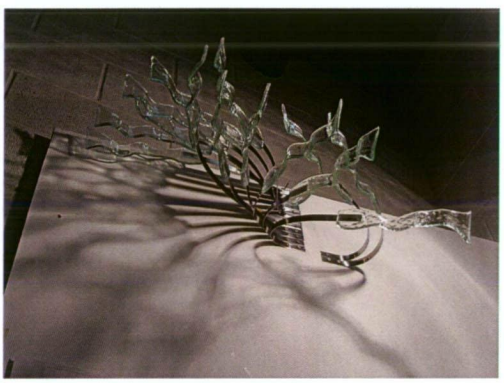


Figure 61. Start of three metre wall work in studio

I had been progressing well with the work and got 80cm (Fig. 61) completed when Suzie Attwill came back to see me about being in the craft and design show 'Making Relations' at CAST Gallery in April 2006. She had seen *corner study #1* at Inflight gallery and wanted to include that, plus some new work. I did not want to include the original corner study, as I saw it as a model, and had since moved onto stainless steel which was working much better. I agreed to construct another corner work out of the new curved sections and stainless steel. This work was to tour so I started thinking about another attachment section that was not like the Inflight one, (where a 3 metre piece of angled timber was used). This attachment would be difficult to tour, plus no guarantee that the wall heights were to be the same at each gallery. I wanted this work to have a relationship with the corner so I started thinking about the corner itself as an architectural object, and about constructing a reverse corner in the corner, which would double as the attachment.

Again the question of architectural scale was arising, but the exhibition could not provide a large amount of space. I still wanted the work to be intimate, so I considered creating a smaller corner study which came up from the ground. This would bring the architectural object back into the work, which doubled as a

platform to get the stainless and glass further into 'space' and create more of an architectural presence. I persevered with this for a while but was not happy with the outcome (Fig. 62).

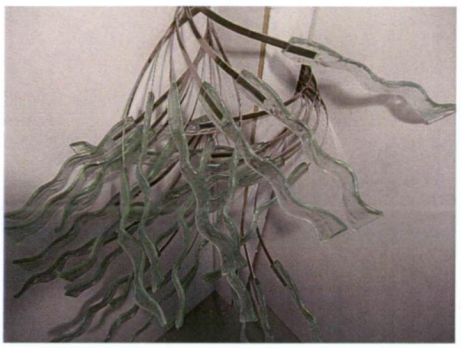


Figure 62. Experiments for *corner study #2*

At this time I was working across different projects and deadlines where looming; three openings in a six week period! The works were starting to mingle and ideas flowed from one to another.

turnings

I designed *turnings* for the 2006 Design Island exhibition, a showcase of 11 emerging Tasmanian Craft and Design practitioners.[1] For this work I utilised the skills of the steel fabricators that had made the frames for Rosetta High to cut and roll the stainless steel. These objects were designed as small-scaled (460mm x 400mm x 250mm) maquettes for future, larger architectural applications, and the possible use of industrial sheet metal fabricators to do that (Figs 63 & 64).

In this work the collapsing grid creates the form of the work. Here the grid slowly unfolded itself from a tight curl, where the glass is dependent upon the stainless steel to stay balanced and composed, and visa versa. They were designed to emphasise a co-dependent relationship between stable and fragile form through a delicate counterbalance between standing up and falling over. I see these works as reflections materialised into being; as if they have somehow appeared in our world; fleeting, they may fold and disappear.

[1] This exhibition was shown at Mawson's Pavilion in Hobart and the Design Centre in Launceston in May 2006.

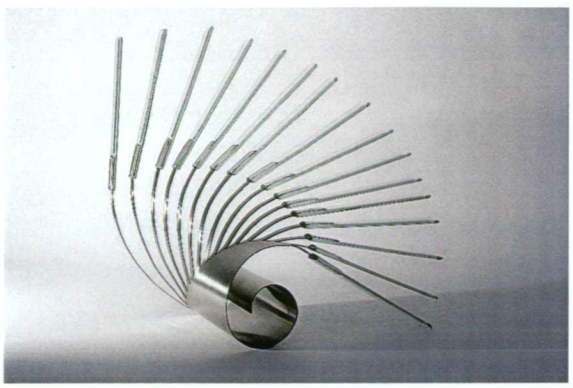
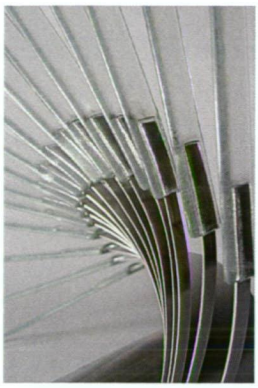



Figure 63 & 64. *turnings*

I was pleased with the stainless steel curl, and the way the metal became the support structure for the work. The use of metal in this way in *turnings* led me to rethink the support structure for the corner piece I was struggling with. I decided to use more stainless steel in this work to try to resolve it.

corner study #2

The version of *corner study #2* which went into the exhibition[1] had stainless steel curving wings attached to the outside of the framework, which the glass and steel pushed its way through (Figs 65 & 66). These wings also hid the mechanism which attached the stainless steel to the wall. In this instance, the 50 lengths of steel were riveted to right-angled aluminium, which was in turn bolted to the walls. The wings screwed onto the right-angled aluminium, hiding the rivets.


Figure 65 & 66. *corner study #2*

[1] 'Making Relations' at CAST Gallery April 2006 and Devonport Regional Gallery June 2006.

The viewer was invited to take a close, intimate, look at the collapsing grid within this contained space before it losses its form and comes free. The twisted stainless steel arms, which were tightly bound and contained within the barrel, push their way through a thin gap in the wave-like stainless steel walls. The glass takes on the waveform of the walls as they free themselves from the containment of the corner. The uncoiling tension within the barrel was highlighted by reflections of the polished stainless steel arms inside on the walls of the container.

This work was never resolved. It set up a relationship with the corner, but not in the architectural sense I was wanting. This may have been because there was nothing in the work that referenced the corner itself. There was just this knotted tangle of curved glass trying to escape it; also the gallery lighting at both sites was not adequate to fully light the interior of the barrel to highlight the reflections within. At the back of my mind I was thinking that if I was to re-show this work I would install LED lighting into the barrel, so the light emitted from within, creating very strong reflections within the polished wings of the stainless steel.

Working with stainless steel in the studio

I had, by now, moved away from the aluminium and was trying to develop skills in stainless steel. The shift from aluminium to stainless was twofold. Firstly, it was a much stronger material to hold the weight of the glass. Secondly, the highly polished, reflective and permanent finish was a lot more durable than the mirror tape. It also referenced the grid and modernist glass and steel architecture; creating a visual tension between the strength of its materiality and the fragility of the glass.

The 1.2mm thick sheets were only polished on one side so I would manually polish the other. This physically exhausting and dirty task involved the use of four grades of 'steelo's', which would be worked, in order, over the surface until the desired finish was achieved. The steel would then be polished with automotive steel polish. This process could have been done with polishing discs on grinders but I felt I received a better, smoother, finish doing it by hand. I would polish the sheets in large format before cutting them up in a giant steel guillotine to the

desired width. Two holes would be drilled into one end for secure attachment to the support structure of the wall or MDF.

Back in the studio something settled, I felt I was really getting to the crux of what I was trying to do. There where three streams to my project; object design, for experimenting with new industrial process and possibilities for larger scaled works; sculptural installation and public art. I was seeing how one fed the other. I was looking at architectural spaces and responding to them; working out how to disrupt that space; no matter what scale. In my notebooks I was recording my response to an architectural space and using that response to create the work.

mind your step

mind your step (3500mm high other dimensions variable) was made for a solo exhibition in June 2006 at Inflight Gallery, an artist run initiative in Hobart (Figs 67, 68 & 69). This was a small gallery space with high 3.5 metre walls, the ceiling was about another 3 metres above the walls with insulation bound to it with grided wire- showing the constructive nature of the building. This site was a good venue to collapse the grid on a large scale. The 50 glass sections were formed into a grid structure, like that on the ceiling, and the stainless steel weaved its way through the glass to create a sagging and collapsing ceiling. I installed a strong light on a beam above the work which floodlit the entire end of the gallery.

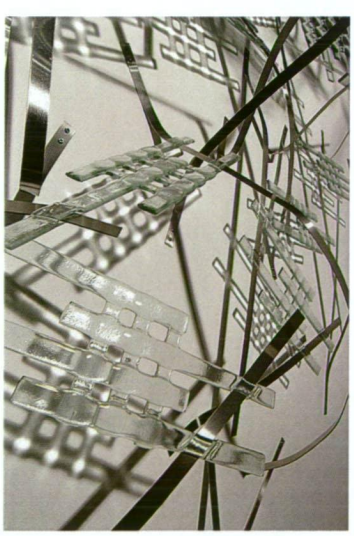


Figure 67 & 68. *mind your step* Inflight Gallery

The ceiling cascaded down the wall, creating a slow motion, weightless effect, where light and shadow played an important role in highlighting the fall. My intention was for the viewer to walk up to the work and stand under the tangled mesh of glass and steel. To feel this sense of fragility and weightlessness, and hopefully a sense of collapse. This work will be reconstructed in the final exhibition slightly differently.

Figure 69. *mind your step* Inflight Gallery

passing through

passing through is a work made for gallery 5 at Linden, St Kilda Centre for Contemporary Art, in November 2006. Earlier in the year I had been to Melbourne to view the site and my response was that this small space was really a passage, with the two ornate doorframes dominating the space. This gallery was somewhere to pass through. I based the design of the glass sections on the right-angled doorframes, spinning the right-angled sections out on stainless steel from a central pivot point (Figs 70 & 71).

This central pivot point was the MDF attachment mechanism, which was attached to the edge of the door. The stainless steel was neatly screwed on the back of this panel, emerging from a small crack at the edge. The whole panel was securely attached to the walls, and then putty filled and painted white, taking on an architectural appearance of structure that, although visible, was not foreign to the

site. They fanned 180 degrees, lowering all the time, to rest back on the walls. The viewer had to walk in under the glass, and back out under the glass, in order to pass through the space.

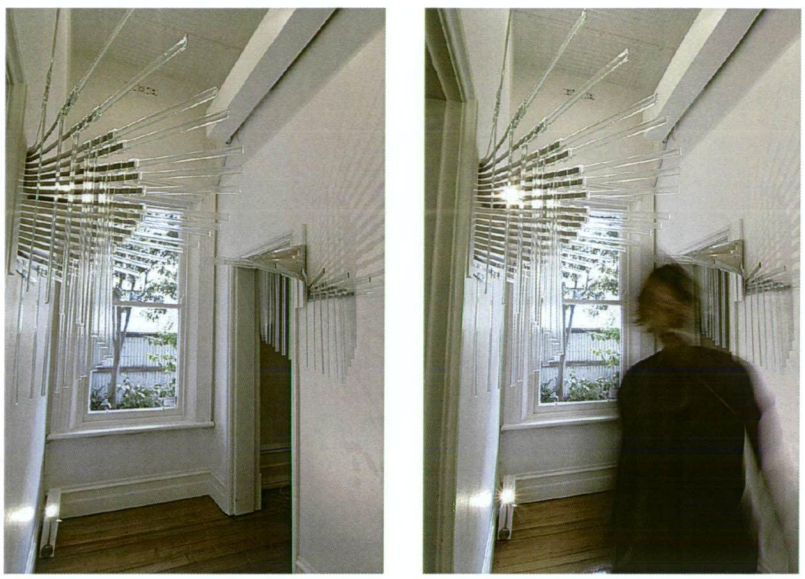


Figure 70 & 71. *passing though* Linden Gallery.

When I installed this work I was happy with it but felt compromised by the lighting. This small gallery did not have spotlights in it to use and the two rooms on either side of me where 'blacked out' for video works (I did not realise this until I arrived to install). I installed my own lights but the dark rooms on either side limited the position and strength of the lights. This installation proved (again) that I could not depend on a gallery space to provide appropriate lighting for the works; I was now determined to incorporate lighting into future works that needed it. However, *passing through* will be shown as set out at Linden, with appropriate gallery lighting, in the final exhibition.

This work also sees a change in the kiln-forming process. I wanted to accentuate the fragility of the glass more, so I started doing single layer glass firings (Fig. 72). There was still the second layer of glass applied above the ceramic fibre so the slot could be formed. But the rest of the glass was very thin and fragile once taken out of the kiln. This single layered firing proved to be successful and has been carried through the later works.

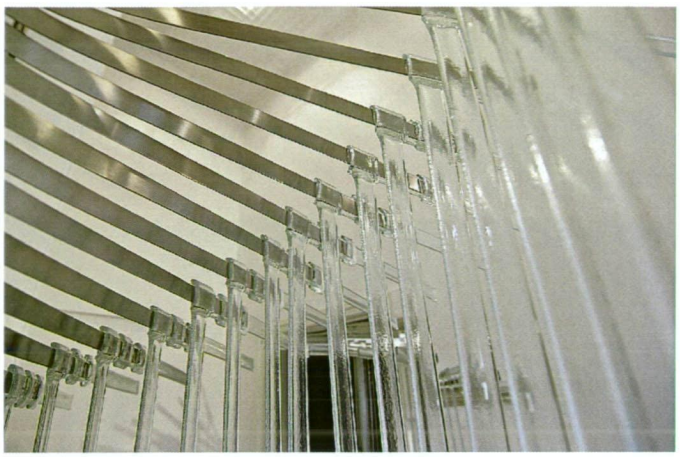


Figure 72. *passing through* Linden Gallery

Launceston Police Station

In August 2006 I successfully tendered for a public art commission at the Launceston Police Station. Even though this work will not be completed in the timeframe of this project a detailed description of the design and processes to be used will be discussed. This commission sees the large-scale architectural application of my studio concepts and research into industrial process over the past two years.

The tender, with a budget of $36,000, called for a sculptural lighting installation in two stairwells. The main stairwell is 13.8 metres high, dropping down through four landings (Figs 73 & 74) The second stairwell is adjacent to a large window 6 metres high facing the main road. This work is to be visible through the window from Cimitiere Street especially at night when the lighting element will stand out.

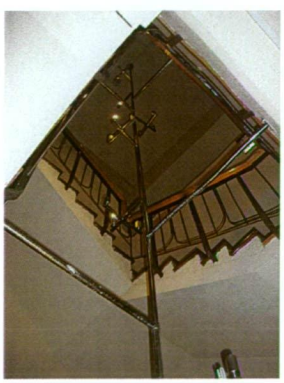


Figure 73 & 74. Central void space in main stairwell. Frames and lights will replace existing lighting system.

I proposed to create a lighting installation out of glass and steel. As with the Rosetta High commission and my studio work, this work was to be designed in response to the site and to create a non-static reading of this utilitarian space. The largest stairwell has a central void space between the stairs of 1.4m wide x 1.7m deep, which the curving ornate balustrade and stairs wrap around. The design is based on the actual stairwell to appear like abstracted stairs which also mimic the movement of people going either up or down. These abstracted stairs appear strong and attached to the stairwell before fracturing away and collapsing into the void. The design committee approved the final designs in December 2006 for installation in May 2007.

The main stairwell, which drops down through the four landings, will have triangular stainless steel frames (1750mm x 1500mm x 850mm) bolted into four corners of the central void space (Fig. 75 – diagram of how the frames will sit in the centre of the void). Suspended below each frame on architectural rigging are 5 sheets of 12 mm glass, varying in length as they follow the lines of the triangular frame. Following the angles of the stairwell the steel frames start to shift and fall, further emphasised as the glass suspended below the steel frames shift again at conflicting angles; creating a sense of movement and collapse (Figs 76, 77, 78 & 79). Track lighting at all four landings will spot light the suspended frames and glass, throwing shadows from the glass and steel onto the walls surrounding the stairs.

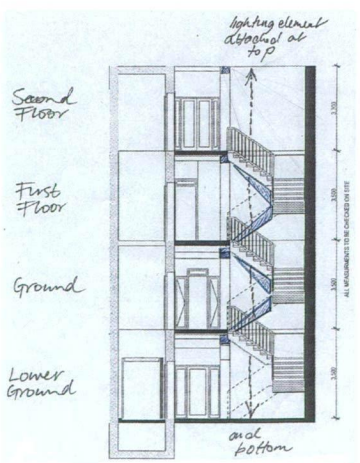


Figure 75. Diagram of frames in stairwell

Before design approval stage a lot of issues had to be resolved. In order to design this work, a scaled model of the angles within the stairwell had to be built. Because the triangular steel frames were going to be attached on two different planes, the measurements for the angles had to be exact otherwise the frames would not fit (this model can be seen in my studio). I employed the services of a steel fabricator to help me determine the angles of the frames as well as fabricate them. With the frames resolved I went to see DMSglass, a large architectural firm in Melbourne. This firm had the technologies to laminate an image within the glass. This process not only made the glass safe through the laminating process, it also could provide the sandblasted linear design I was wanting. Upon seeing my designs the engineers advised me that the glass also had to be toughened because I was going to suspend it.

The suspension of glass within a public space was completely new to me, and I was quickly learning the legal requirements involved with such a venture. My design needed the glass and frames to appear like they where unstable and likely to collapse; but as a result all the industry people I spoke with shuddered, and advised me to have everything certified!

Figure 76 & 77 Studio model for stairwell installation Launceston Police Station.

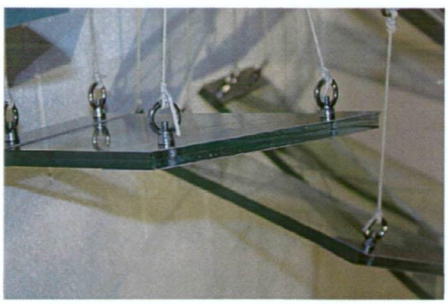



Figure 78 & 79. Studio model for stairwell installation, Launceston police station.

The artwork in the Cimitiere Street second stairwell site uses the same materials, so there is a strong connection between the two works. This design is based on the two flights of stairs which go under the wall on which this work will be mounted. Similar cut rectangular sections of glass are to be vertically attached to the wall with the rigging bracing them back securely, appearing like steps which are shifting from side to side. These glass sections will be arranged in a 1 metre wide by 2.5 metre high section. A light will be installed at the base of the wall to under-light the vertical glass steps, giving a strong visual effect at night time from outside the building (as requested by the clients).

Light Objects

The decision to incorporate light into the studio artworks came about from frustration at existing gallery sites not being able to provide suitable lighting for the glass. I had already been incorporating light into the large-scale public art works and I needed to take the next step in the studio. In preparation for my final architectural installation *flourish*, I decided to create some smaller scaled light objects. These prototypes are explorations into possible architectural placement of lights, along with construction techniques and the discrete wiring of the electrics within the attachment mechanism.

I used stainless steel sections from *corner study #2* and kiln-formed very thin curved sections of glass. The end of the stainless steel that was to enter the glass was cut at an angle, so the steel appeared to cut through the glass. Thin-tubed aluminium rods were sourced from a model shop (stainless steel is not made this small in diameter) and twisted into position by filling the tube with sand before

twisting around a pole to achieve the desired result. One amp lights were then pushed into the tube and slotted into the MDF support structure, the wiring hidden behind.

The design of these lights allows them to be placed in varied architectural positions. The stainless steel arms curve to wrap around a corner, enabling the glass and lights to 'creep' around the corner of a wall, or cascade over, across or down a plinth. The one amp lights are not intended to 'light' the work on their own, but to highlight the glass, bring the work to life and aid in the non-static reading of the architectural space (Figs 80 & 81).

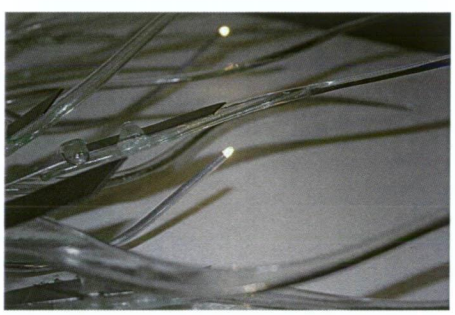



Figure 80 & 81. *light object #1.*

Works in the submission exhibition

The works in the final submission are set up in three sections. The major section is the four architectural installations which are arranged as a collection of ideas and possibilities for utilitarian architectural spaces which the viewer passes through one to the next. These installations are ideas which could be applied on an even larger architectural scale. Leading on from this space in the gallery is the back up section where a number of *turnings* are arranged in different configurations, along with *light objects #1* and *#2.* Image projections of *passing through* at Linden Gallery and *mind your step* at INFLIGHT gallery are also shown to demonstrate how they were installed in the architectural spaces for which they were originally designed for.

The Public Art Commission *elements* at Rosetta High School is shown through image projection; both the finished work and the installation process. The scaled

prototype and detailed drawings for the main stair well at Launceston Police Station can be viewed in my studio.

The Architectural Installations

The aim of this project has been to create methodologies which could speak from within, and about, particular architectural spaces: with the intention to disrupt the formalised architectural grid by distorting our perception of architecture as being contained. In order to show this within a gallery context a series of utilitarian spaces like entrances, corridors and corners have been set up using the partitions of the gallery.

The display of the final installations is intended to take the viewer on a journey through which they will navigate around, and pass through the works. With each one collapsing or shifting its particular space, these four installations intend to make what is logical about architecture illogical, and to give the viewer new and surprising readings of familiar spaces where the static has become non-static.

The viewer enters the space under *passing through* which is the door framed work designed for gallery 5 at Linden. Here this work is installed similar to the Linden site but in a slightly more elongated passage space. The viewer leaves under this work into a corridor where *mind your step* from Inflight Gallery is installed. The grided sections have been reconfigured to drop down from behind the high partitioned walls, making for a more confined work than when shown at Inflight. Once leaving the grided glass and steel the viewer walks down a corridor to be confronted with *corner study #3* which must be navigated past to enter the final section which contains *flourish*.

corner study #3 is the third in a series of utilitarian corner investigations, which aimed to set up a dialogue between the corner and my fluid reading of it. Made with interweaving glass and stainless sections this work takes its reference from the 90-degree angle of a corner. The steel swings out from the wall to span 90 degrees, linking up with its other half to create a dynamic swirl effect within the corner space. Here one grided section is interwoven with another to create new

grid systems when they unite. The white MDF attachments are cut at angles to mimic the way the steel has left them and discretely attached on alternate sides of the corner. The work reaches out to fill the narrow space, forcing the viewer to come very close to it in order to get past it and into the room that contains *flourish*.

flourish is the final installation and is the large-scaled result of my light experiments. Reaching the three metre height of the gallery partitions *flourish* wraps around from behind the walls to frame the exit door from the installation display section; once again forcing the viewer to come up close and move through it in order to exit. The stainless steel twists and curves, hugging the edge of the partitions as it makes its way around and into the space; as if it was growing from behind. One amp lights within twisted aluminium rods interweave with the glass and steel to highlight the glass. The steel and electrical attachments are attached to MDF sections bolted behind the partitions.

Chapter 4: Conclusion

The major outcome of this project was that I shifted my focus from a critique of the glass façade, to a questioning of interior architectural space. Notions of instability, fracture and intangibility that I observed in fragile reflections were transferred into the architecture that we surround ourselves with; to question and open up dialogues between what is strength and what is fragile.

The works shown in the submission exhibition are the result of two years experimentation into the possibilities for kiln-formed float glass and stainless steel installations and how to install them within architectural spaces. As a result of this, these works were arranged as a collection of ideas and possibilities which could be applied to a larger scale. *mind your step*, *passing through* and *corner study #3* take their form from the architectural space they are sourced from, and are placed back into; using that form to set up dialogues between stability and fragility, light and shadow. Each one fracturing to shift, collapse or distort the space around them and forcing the viewer to navigate through this new space. *flourish,* the final architectural installation, is the result of the light experiments which were born out of frustration at existing available gallery lighting. This work has also opened up a new lighting direction that I will continue to explore in the future.

Through this project I have developed and 'mastered' my own visual language with these materials. In order to do this the strength and stability of each material has been questioned, and tested over the two years. A lot of time has been spent cutting and kiln-forming the glass into sections which are both extremely fragile yet sturdy enough to create the work with. Hundreds of sections, initially created by fusing two sheets of 3mm glass and later by the more successful use of single sheets of 3mm glass, were formed so that the final balance between the glass holding and collapsing at the end of the steel could be achieved.

flourish demonstrates this developed and refined processes of cutting and kiln-forming glass and the union with the stainless steel. These extremely fragile glass sections appear like fleeting reflections; long, thin and wisp-like they seem to

float in the air, only held down by the steel. The point of union between the glass and steel has been narrowed down to two thin top bars of glass where the steel enters and holds. This point of union between the two materials is fragile yet sturdy. The steel cut to a point, it appears to penetrate the glass as it slides through it.

Much of the studio research has also gone into finding suitable solutions into minimal attachment strategies so the steel appears to be part of, or emerging out of, the architectural form before it distorts and breaks away. The MDF attachment mechanism seen in passing *through, corner study#3* and *flourish* means the works can be installed in any utilitarian space without being too obvious or too out of place.

The time I took to experiment with, and develop, a language between kiln-formed glass and stainless steel has allowed my visual language to evolve into a multi-faceted practice where gallery based installation work, object design and large scaled public art projects are being pursued.

The research and experimentation into the possibilities for glass to be installed in architectural space has given me the confidence to tender for large scaled architectural public art commissions. My considered approach to a particular architectural site when designing has allowed me new opportunities to create unique works on a large-scale. The Launceston Police Station glass installation (when complete) will be one of the largest glass architectural installations in Tasmania. Here my research into application of the possibilities of industrial processes, to create a visual language of fragility and stability can be tested. These opportunities to work on large-scaled public art commissions will hopefully continue into the future, where the opportunity to talk about architectural space, within architecture, and on an architectural scale is exciting.

Appendix 1: Kiln-forming float glass

Below is a detailed description of the kiln-forming techniques followed during this project.

Cutting and preparing the glass for firing

Having decided on the size of the glass section I wanted I would cut, with an oil glasscutter sheets of 3mm float glass. The sheet that would be on the top had to be cut 2mm wider on each edge so that the glass would 'roll' over the bottom sheet during firing and create a clean rounded edge. The cut glass would then be soaked in hot soapy water for a few hours, or preferably over night, before being thoroughly washed and polished. If there are any traces of oil or grime on the glass before it goes in the kiln, these marks will fire into the glass, leaving the glass looking dirty.

Float glass must be 'tin tested' before it is fired because during the original forming process the glass it is rolled out on a molten bed of tin. This tin leaves a residue and if the side that has the tin residue on it is fired exposed to the heat it will cause devitrification; a whitening of the glass. Therefore, all float glass I use is tested with a special UV light, which shows up the tin side.

To form the slot where the metal would go I used a ceramic fibre material, which holds its form at high temperatures. I would use two layers of 1mm fibre and a final layer of fire paper, both cut to the size of slot I wanted. This top layer of paper would stop the molten glass from forming 'crows feet' (which glass can do at high temperatures) leaving a well-rounded, smooth finish (Figs 82 & 83).


Figure 82 & 83. kiln experiments

Stacking the kiln and firing the glass

With the glass prepared and ready for firing I would stack the kiln. I was using a ceramic kiln, which is slightly different from a glass kiln because it does not have any heating elements in the roof. This particular kiln also only had elements on three sides, so to over come the problem of not having adequate elements I would fire the glass over an extended period so the kiln had time to equalise the heat.

I would stack the kiln on a large lifting machine (Figs 84 & 85). This allowed me to set up the glass sections with the felt in between - a very delicate operation - outside the kiln and then carefully place the shelves inside. I would stack three shelves at a time. The kiln shelves were prepared with kiln wash and I would also lay down a sheet of the fire paper to stop the 'crows feet' effect.

Figure 84 & 85. stacking the kiln

The process of cutting and preparing the glass and stacking the kiln is a long one, and would often be a whole days work. Because I was firing small glass section

on three 550mm x 55omm shelves I was able to stack up to 45 sections per firing (15 per shelf). That meant I would cut 90 sections of glass and the cleaning and polishing alone would take hours.

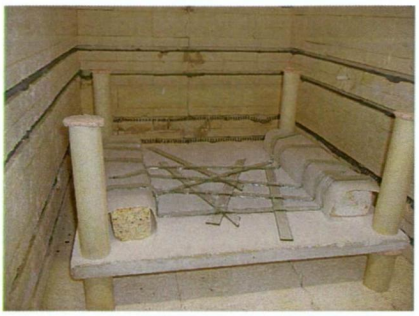
The firing schedule I used was:

0 to 200 degrees in 1 Hour
200 to 500 degrees in 2 hours
500 to 810 degrees in 4 hours
810 to 835 degrees in 30 minutes
Total 7.5 hours

Once the glass reached top temperature of 835 degrees it had the be 'crash cooled'. This meant that the kiln door had to be opened so a lot of hot air escaped, freezing the molten glass into place and stopping any further movement. The temperature would then be lowered towards the annealing temperature before the door was closed and the annealing cycle reprogrammed into the kilns computer.

Annealing glass is a way to control the cooling of glass so it does not cool too quickly and leave the internal glass warmer than the exterior, which can lead to cracking. Even though I was forming relatively thin sections of glass (6mm) I would over anneal because I had the extra element of ceramic fibre within the glass, which could, if not controlled, cool at a slower rate than the glass. The annealing schedule I used was:

Hold at 557 degrees for 1 hour
557 down to 510 degrees over 4 hours
510 down to 480 degrees over 3 hours
480 down to 250 degrees over 5 hours



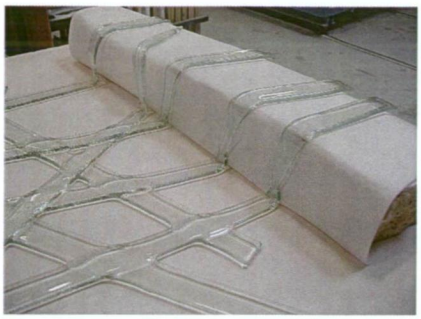


Figure 86 & 87. slumped glass ready to come out of the kiln

Then the kiln would then cool naturally to room temperature (Figs 86 & 87). This process of firing up to top temperature than back down through the annealing cycle to room temperature, would take 48 hours. The ceramic fibre forming the slot for the stainless steel would then be dug out from the glass under water, leaving the glass ready to work with.

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List of Figures

Chapter 1

1. *wavering*
2003
Glass, aluminium and reflector tape
330cm x 110cm x 45cm

2. *wavering* (detail)
2003
Glass, aluminium and reflector tape
330cm x 110cm x 45cm

3. *wavering* (detail)
2003
Glass, aluminium and reflector tape
330cm x 110cm x 45cm

4. resemble
2005
Kiln-formed glass and aluminium
200cm x 100cm x 10cm

5. resemble (detail)
2005
Kiln-formed glass and aluminium
200cm x 100cm x 10cm

6. *Hanging Installation*
2004
Nubeena Multi-Purpose Centre
Collaborative work with James Newitt and Finn Seccombe
Dimensions Variable

7. *Hanging Installation* (detail)
2004
Nubeena Multi-Purpose Centre
Collaborative work with James Newitt and Finn Seccombe
Dimensions Variable

8. passing through
Installation at Linden Gallery November 2006
Kiln-formed glass, stainless steel and MDF
Height 2 metres other dimensions variable

9. mind your step
Installation at Inflight Gallery June 2006
Kiln-formed glass and stainless steel
Height 3.5metres other dimensions variable

10. turnings
2006
Kiln-formed glass and stainless steel
400mm x 500mm x 250mm

11. elements
2006
Arts for Public Building scheme (APBS)
Rosetta High School, Tasmania
Perforated aluminium, stainless steel and ground lighting
20 metre sculptural wall

12. Studio model for Launceston Police Station main stairwell.
2006
10mm laminated glass, stainless steel and sign writers vynal.
Dimensions variable

13. *passing through* (detail of MDF attachment)
Installation at Linden Gallery November 2006
Kiln-formed glass, stainless steel and MDF
Height 2 metres other dimensions variable

Chapter 2

14. Ludwig Mies van der Rohe
Model for the Glass Skyscraper Project
1922
Unbuilt (no intended site known)
No dimensions available

15. Ludwig Mies van der Rohe
Barcelona Pavilion (image of reconstructed pavilion)
1986
Barcelona, Spain.

16 & 18. Ludwig Mies van der Rohe
Barcelona Pavilion (original pavilion)
1929
Interior and Entrance

17 & 19. Ludwig Mies van der Rohe
Barcelona Pavilion (reconstructed pavilion)
1986
Interior and Entrance

20. Dan Graham
Two-way Mirror Cylinder inside Cube and Video Salon
1991
Transparent glass, steel, wood, rubber
244 x 1098 x 1098 cm
Rooftop Park for Dia Centre for the Arts
Collection, Dia Centre for the Arts, New York.

21. Jacques Herzog and Pierre de Meuron
Goetz Collection
Designed 1989-90
Completed 1992
Munich, Germany.

22. Bernard Tschumi
Glass Video Gallery
1990
Groningen, The Netherlands.
Structural glass and steel clips.
3.6 x 2.6 x 21.6 m

23 & 24. Lab Architecture Studio and Bates Smart
Federation Square (Flinders Street)
Completed 2002
Melbourne, Australia.

25 & 26. Frank Gehry
Gehry House (model)
1978 - 88
Santa Monica, California, U.S.A.
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27, 28, & 29. Frank Gehry
The Vitra Design Museum
1990
Weil am Rhein, Germany.

30. Vladimir Taltin
Monument to the Third International (model)
1919 - 20.
Photograph Alfred J Barr Archive, Museum of Modern Art, New York.
Dimensions unavaliable

31. Naum Gabo
Linear Construction in Space No. 1, Variation
Conceived 1942-43, this version executed 1956-57
Perspex with nylon monofilament
453 x 453 x 179 mm

32. Naum Gabo
Linear Construction in Space No.2
Conceived 1949, this version executed 1972-73
Perspex with nylon monofilament
920 mm high.

33. Mary Shaffer
Untitled
1978
Glass, wire, screen, metal rod
625 x 675 x 150 mm

34. Mary Shaffer
Centre Cube
1992
Slumped and cast glass, cast bronze
950 x 725 x 425 mm

35. Christopher Wilmarth
Gnomon's Parade
1980
Plate glass, plate steel
Dimensions unavailable

36. Christopher Wilmarth
Crosscut Drawing
1972
Etched glass, steel cable

37. Christopher Wilmarth
Tied Drawing
1972
Etched glass, steel cable

38. Christopher Wilmarth
Untitled Drawing
1972
Etched glass, steel cable

39. Lazlo Moholy-Nagy
Light-Space Modulator
1921 – 30
Mobile construction with steel, plastic and wood
150 mm high with base

40. Janet Laurence
Less Stable Elements
1996
Glass, wood, aluminium, oxides, leaf mulch, seeds and oil
700 x 2500 cm
Site-specific installation , Newcastle University Art Gallery

41 & 42. Wendy Mills
On This Auspicious Occasion
1999
Slumped glass, stainless steel with mirror-polish surface, water
2040 x 310 x 173 cm.
Queen Street Mall, Brisbane, Queensland.

43 & 44. Maureen Cahill
Willy Willy
1988
Slumped, laminated glass components and stainless steel
Display space 12 x 8 x 8 metres, each unit 1 metre squared
House of Representatives, New Parliament House, Canberra.

Chapter 3

45 & 46. Studio models
February – May 2005
Kiln formed glass, paper, aluminium
Dimensions variable

47. *on the outer*
2005
Kiln-formed glass and aluminium
2 m x 1 m

48, 49, 50 & 51. Studio Models
May – September 2005
Kiln-formed glass and aluminium
Dimension variable

52, 53 & 54. *corner study #1*
2005
Kiln-formed glass, aluminium and mirror tape
2.2m tall, other dimensions variable.

55, 56 & 57. *elements* being installed by fabricators
2006
Perforated aluminium, stainless steel and ground lighting
Sculptural wall 20 metre in length. Each unit approx 1 metre square.
Rosetta High School, Hobart.

58, 59 & 60. *elements*
2006
Perforated aluminium, stainless steel and ground lighting
Sculptural wall 20 metre in length. Each unit approx 1 metre square.
Rosetta High School, Hobart.

61. three metre wall work in studio
December 2006
Kiln-formed glass, stainless steel
62. experiments for *corner study #2*
December 2006
Kiln-formed glass, stainless steel and MDF
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63 & 64. *turnings*
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Kiln-formed glass and stainless steel
400mm x 500mm x 250mm

65 & 66. *corner study#2*
2006
Kiln-formed glass and stainless steel
Height 2metres other dimensions variable

67, 68 & 69. *mind your step*
Installation at Inflight Gallery June 2006
Kiln-formed glass and stainless steel
Height 3.5metres other dimensions variable

70, 71 & 72. *passing through*
Installation at Linden Gallery November 2006
Kiln-formed glass, stainless steel and MDF
Height 2 metres other dimensions variable

73 & 74. Images of central void space in main stairwell
Launceston Police Station

75. Diagram of frames in stairwell

76, 77, 78 & 79. Studio model for Launceston Police Station main stairwell.
2006
10mm laminated glass, stainless steel and sign writers vinyl.

80 & 81. light object #1
2007
Kiln-formed glass, stainless steel, MDF, one amp lights and aluminium rods.
600 x 600 x 200 mm

Appendix #1

82 & 83. kiln experiments

84 & 85. kiln stacking

86 & 87. slumped glass ready to come out of the kiln.

List of works in the exhibition

The Architectural Installations:

1. passing through
2006
Kiln-formed glass, stainless steel and MDF
2.2 metres high, other dimensions variable

2. mind your step
2006
Kiln-formed glass and stainless steel
3 metres high, other dimensions variable

3. corner study #3
2007
Kiln-formed glass, stainless steel and MDF
2.8 metres high, other dimensions variable

4. flourish
2007
Kiln-formed glass, stainless steel, MDF, one amp lights and aluminium rod.
3 metres high, other dimensions variable

Back-up work:

5. DVD projection of:
elements at Rosetta High School
passing through installed at Linden Gallery, Melbourne.
mind your step installed at Inflight Gallery, Hobart.

6. light object #1
2007
Kiln-formed glass, stainless steel, MDF, one amp lights and aluminium rod.
600 x 600 x 200mm

7. light object #2
2007
Kiln-formed glass, stainless steel, MDF, one amp lights and aluminium rod
1000 x 600 x 200mm

8. turnings
2006
Kiln-formed glass and stainless steel
400mm x 500mm x 250mm

CURRICULUM VITAE

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Education

2002	Bachelor of Fine Art University of Tasmania, School of Art, Hobart.
2003	Bachelor of Fine Art with Honours (First Class). University of Tasmania, School of Art, Hobart.
2005 (current)	Master of Fine Art (Research) University of Tasmania, School of Art, Hobart.

Solo Exhibitions

2002	'Delineate', Foyer Gallery, Salamanca Place, Hobart.
2003	'Installation 1', Foyer Space, State Library of Tasmania, Hobart.
2005	'On the Outer', Avago Installation Space, Salamanca Arts Centre, Hobart.
2006	'Mind your step', INFLIGHT Gallery, Hobart.
2006	'Passing Though', Linden Gallery, St Kilda, Melbourne.

Selected Group Exhibitions

2002	'The Quite', Entrepot Gallery, University of Tasmania, Hobart.
2002	'Home Stretch', Fine Arts Gallery, University of Tasmania, Hobart.
2003	'Urban Suite', Side Space Gallery, Hobart.
2003	'View with Some Room', INFLIGHT Gallery, Hobart.
2003	'Scape', CAST Gallery, Hobart. Curated by Celia Lendis.
2004	'Art with Purpose', Arts @ Work, Hobart.
2004	'InStalls', Long Gallery, Hobart. Curated by Mish Meijers and Tricky Walsh.
2005	'Young Designers Month' Arts Tasmania. Hobart, Launceston and Stanley
2005	'And then some…', INFLIGHT Gallery, Hobart.
2006	'Making Relations', CAST Gallery, Hobart and Devonport Regional Art Gallery. Curated by Suzie Attiwill.
2006	'Beneath the Surface' Design Island, Arts Tasmania. Hobart and Design Centre Launceston

Public Art Commissions

2004	Tasman Multi-Purpose Centre, Nubeena, Tasmania. Art for Public Buildings Scheme (APBS)
2006	Rosetta High School, Tasmania. (APBS)
2006	Launceston Police Station, Tasmania. (APBS)

Awards

2004	CAST Emerging Craft Mentorship Program. (Funded through the Australia Council)
2004	Arts Tasmania Grant (Mentorship)
200	Australian Postgraduate Award (APA)
2005	Peoples Choice Award – Young Designers Month
2006	NAVA Visual and Craft Artist Grant

Committees

2003\04	CAST Board Traineeship
2005\06	INFLIGHT Art Board member

Bibliography

2002 Joerg Andersch, 'Inside Arts', The Mercury, pg 40, October 26th 2002.

2002 Dorothy Maniero, 'The Quiet', Togatus, vol 73 no 4, pg 36-37.

2003 Jane Rankin-Reid, 'Perspective', The Sunday Tasmanian, pg 31 November 16.

2003 Celia Lendis, 'Scape' exhibition catalogue.

2004 Briony Downes, 'Scape' exhibition review. Artlink, vol 24 no 1, pg93-94.

2004 Diana Klaosen, 'Installs' exhibition review. Artlink, vol 24 no 4, pg 89.

2005 Noel Frankham (editor) 'Claiming Ground: Twenty-Five Years of Art For Public Buildings Scheme', 2005, pg100-101.

2006 Sarah Macklin, 'Tasmanian Talent', Belle magazine, pg 163, June\July issue

2006 Peter Hughes, 'Making Relations' exhibition review. www.craftculture.org/Review/phughes1.htm

2006 Stephen Crafti, 'Design Mania' Urbis Magazine, pg 164 issue 33.