ESALA, MA Architecture, Final Design Studio March 2013

Civic Fabrication

Making [Sense] of Place

Exercise #1

: Fabrication #1

: Architectonic Experiments

THE UNIVERSITY of EDINBURGH
Edinburgh College of Art

ESALA
Edinburgh School of Architecture & Landscape Architecture

ESALA, MA Architecture, Final Design Studio March 2013

Civic Fabrication

Alex MacLaren, Fiona McLachlan

We posit that an architectural concept (readable on a civic scale) can arise out of engagement and intelligent experiment with the way the building is made: FABRICATION in the sense of praxis/making: creative exploration applied in built form. Each student chooses a source for their work, and inspiration for investigating a particular tectonic theme. These themes go on to inform proposals for architecture at the macro- and micro- scale: design informed by materials and construction techniques. We investigate **rhythm, shadow, repetition, frame, fold, balance** and **enclosure**. We begin the semester with these personal, scale-less investigations and seek a tectonic thesis for development as architectural proposition later in the semester.

Students have been encouraged to work intuitively with material, construction and photography in the first weeks of the course and to develop these experiments to bring a formal or material language to the site.

Each student identified a sculpture, painting, photograph or other work of art from a suggested list provided by the tutors, to act as the starting point for a series of quick, iterative, model / drawn /photographic investigations on a theme suggested by the piece.

What follows is a portfolio of abstract architectonic investigations that suggest possibilities for further study as built proposals.

Students: Fraser Aitchison, Carl Baker, David Black, Lauren Boal, Greg Chatfield, Michael Chisholm, Shona Common, Michael Dargo, Slavka Gancheva, Gillian Glachan, Rob Hebblethwaite, Zoë Herbert, Aideen Herron, Farihin Jaafar, Lewis Kelly, Scott Lawson, Rohana MacKenzie, Paula Madden, Jamie Marshall, Zena Moore, Heather Munro, Jessica Orr, Justine Ramage, Anna Raymond, Grant Richardson, Elise Schneider, Anoushka Sivaraman, James Stone, Neil Waring.

Tutors: Alex MacLaren, Fiona McLachlan

This exercise formed the first of four parts:

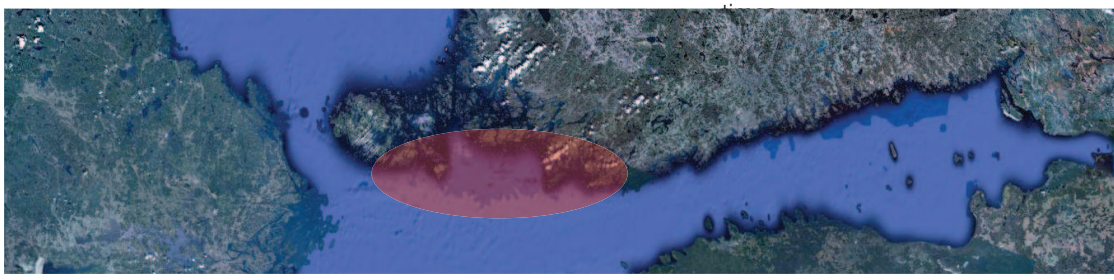
Fabrication #1:	Make and Create	Architectonic Investigation
Fabrication #2:	Stories and Fables	Proposing Urban Futures
Fabrication #3:	Construction and Assembly	Civic Building
Fabrication #4:	(Pre) Fabricated	Detail Studies

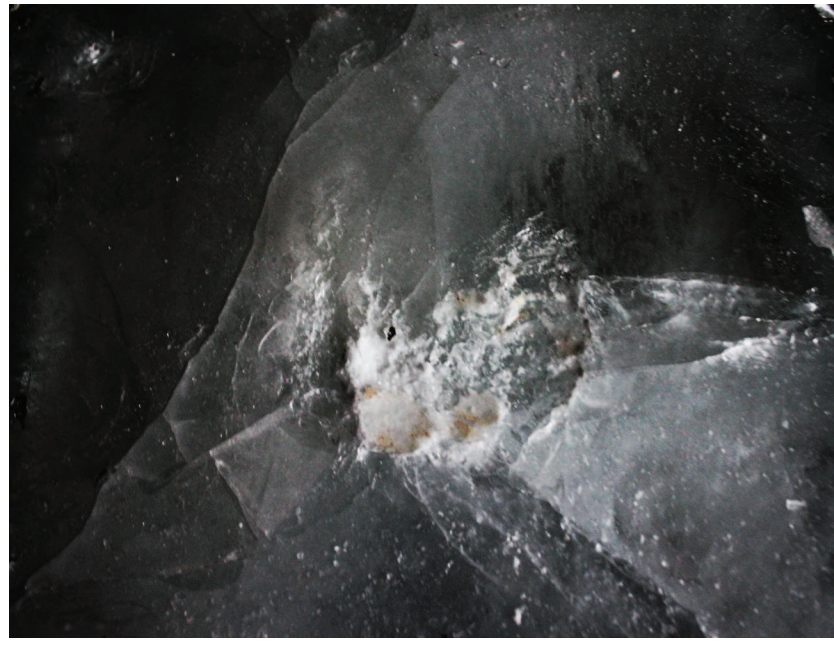
page **ARCHITECTONIC INVESTIGATIONS**

Laminations, Connections, Memory, Autopoiesis

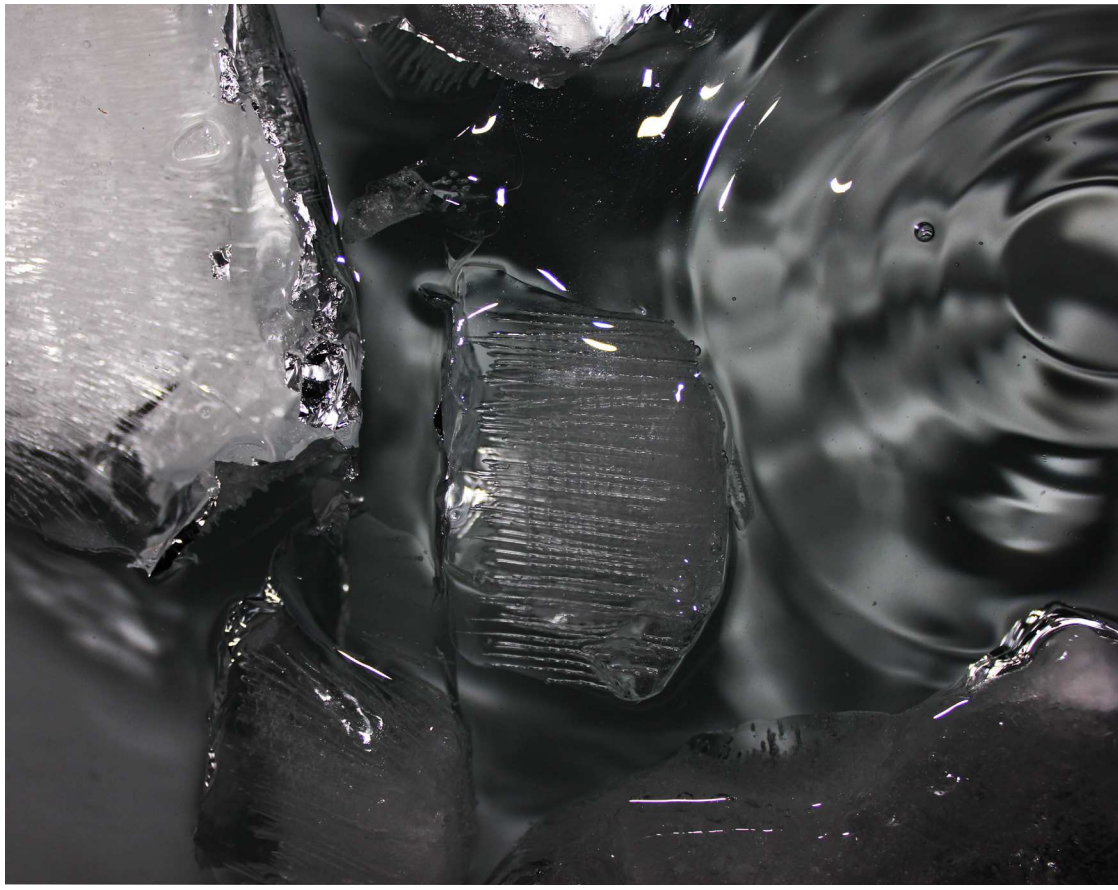
Fraser Aitchison

At the altitude the Turku Archipelago sits on the globe the water should be frozen all year round. Warm water brought by the gulfstream causes the ice to break up and float away during the warmer months of the year. When the temperature drops the floating ice fragments reform and freeze together over the winter months until the process repeats itself in summer. To interpret this I decided to re-create this process by freezing large blocks of ice, let them float in the bath and break up, then gather the fragments and refreeze them, repeating the process several

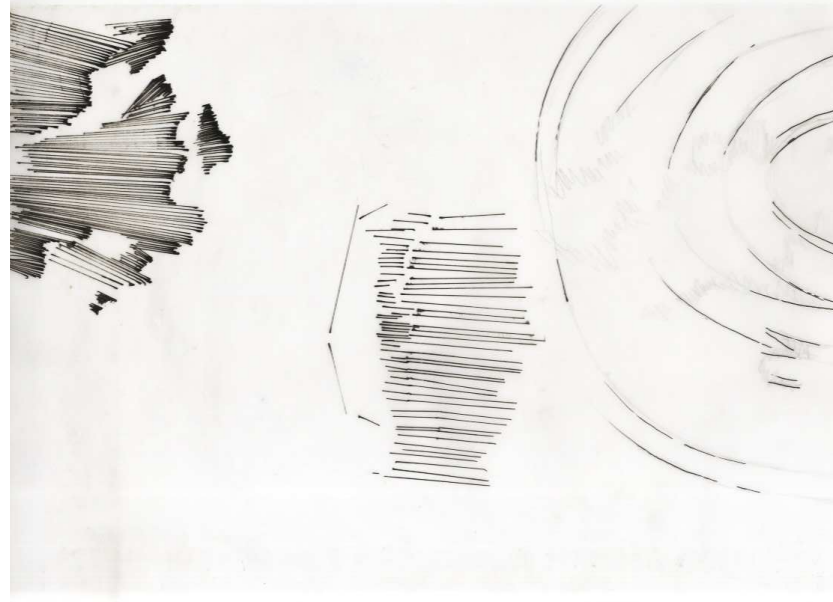




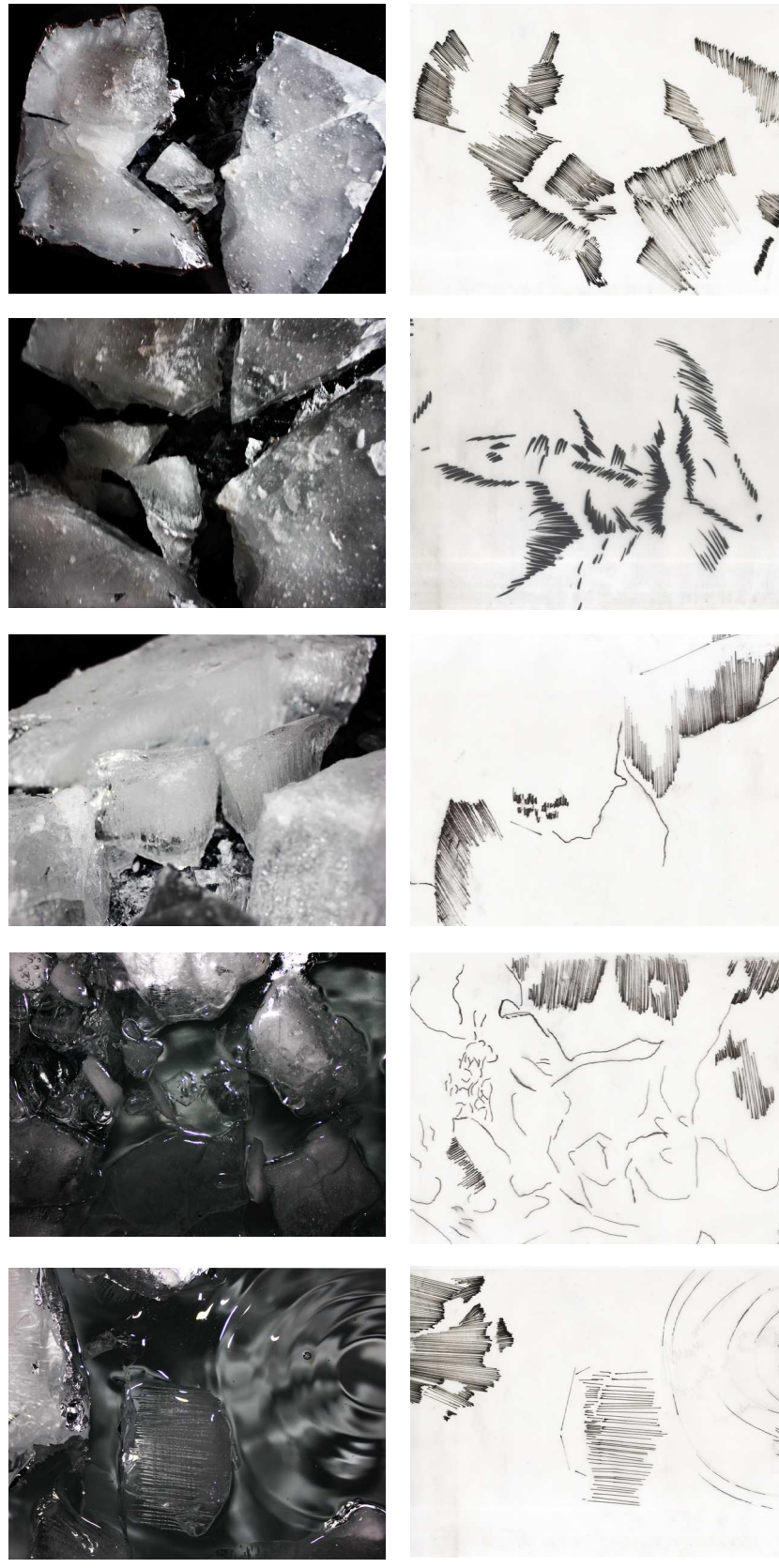
Top: Yann Arthus Bertrand
Middle: Position on globe
Bottom: Initial ice breaking



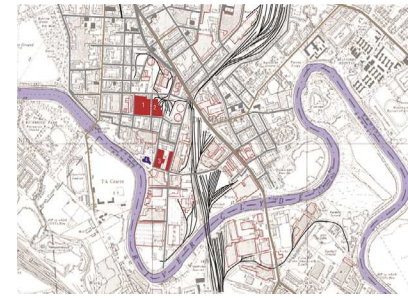
When the ice breaks up and is then refrozen, it does not freeze as one solid block. Lines and cavities begin to appear within the block. The more the ice is broken up and refrozen the more dense and varied the markings appear. Tectonic themes begin to appear from this process. The idea of memory in that even though the ice is refrozen some markings and form still remain from previous fragments. Autopoiesis or self-creation from the ice being allowed to take whatever from happens naturally when it floats and melts on the water. By use of photography and sketching, I documented the process of the ice melting changing and then re-freezing.



Top: photograph of ice
Bottom: Sketch of ice



Photographs and sketches of ice formations

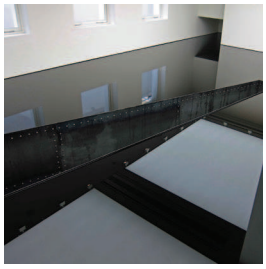


In relation to our site study of Dalmarnock, the various master plans created for the area all suggest areas of different uses: some commercial, some business and others residential. The site also possesses a lot of historical context from the various developments that have happened in the past. My interpretation is that like the study of Yann Arthus Bertrand the site is like large fragments of broken ice shards that are floating apart with its various areas of different uses and overlay of historical context. My design and master plan will focus on pulling these fragments back together.

top left: site use diagram
top right: historic map
bottom: make & create over site

Perception, Reflection and Absorption

Carl Benjamin Baker



20:50 Installed in different galleries.

20:50

The artwork is an installation which occupies the entire volume in which it sits. The gallery space is tanked in steel to waist height, this void is then flooded to the brim with recycled engine oil. From a single entrance a tapering walkway juts into the space, leading the viewer until they are surrounded by oil on all sides, placing them at the mid-point of a preternaturally still pool. The impenetrable, symmetrical visual plane distorts the viewers perceptions of depth, materiality and space.

My first exploration focused on our perception of depth and space, this involved using Photoshop to manipulate an image of a generic, familiar corridor. I imagined the volume had been filled with oil as in the original art work, but experimented with the depth of the reflective liquid. As the level of the reflective plane is raised we presume the volume of liquid has increased, visually communicated as the reflection becomes short, mirroring the volume above it.

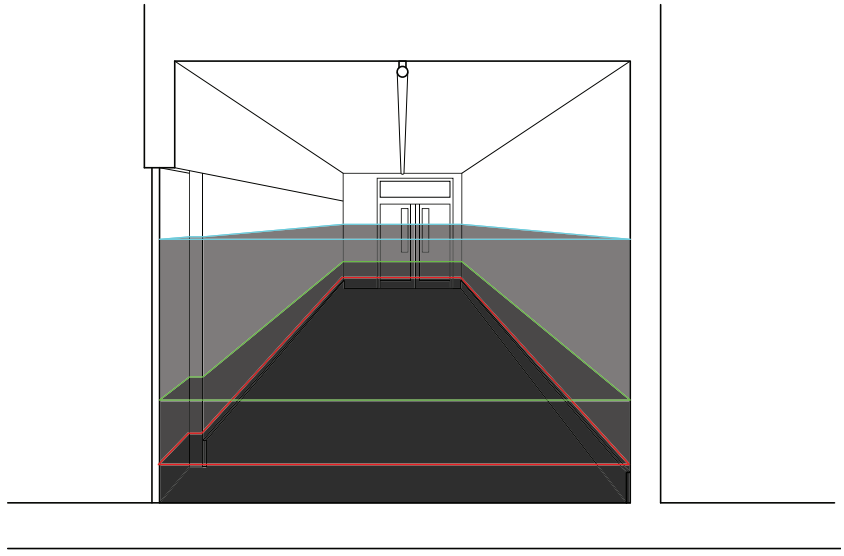


Diagram of Photoshop study.

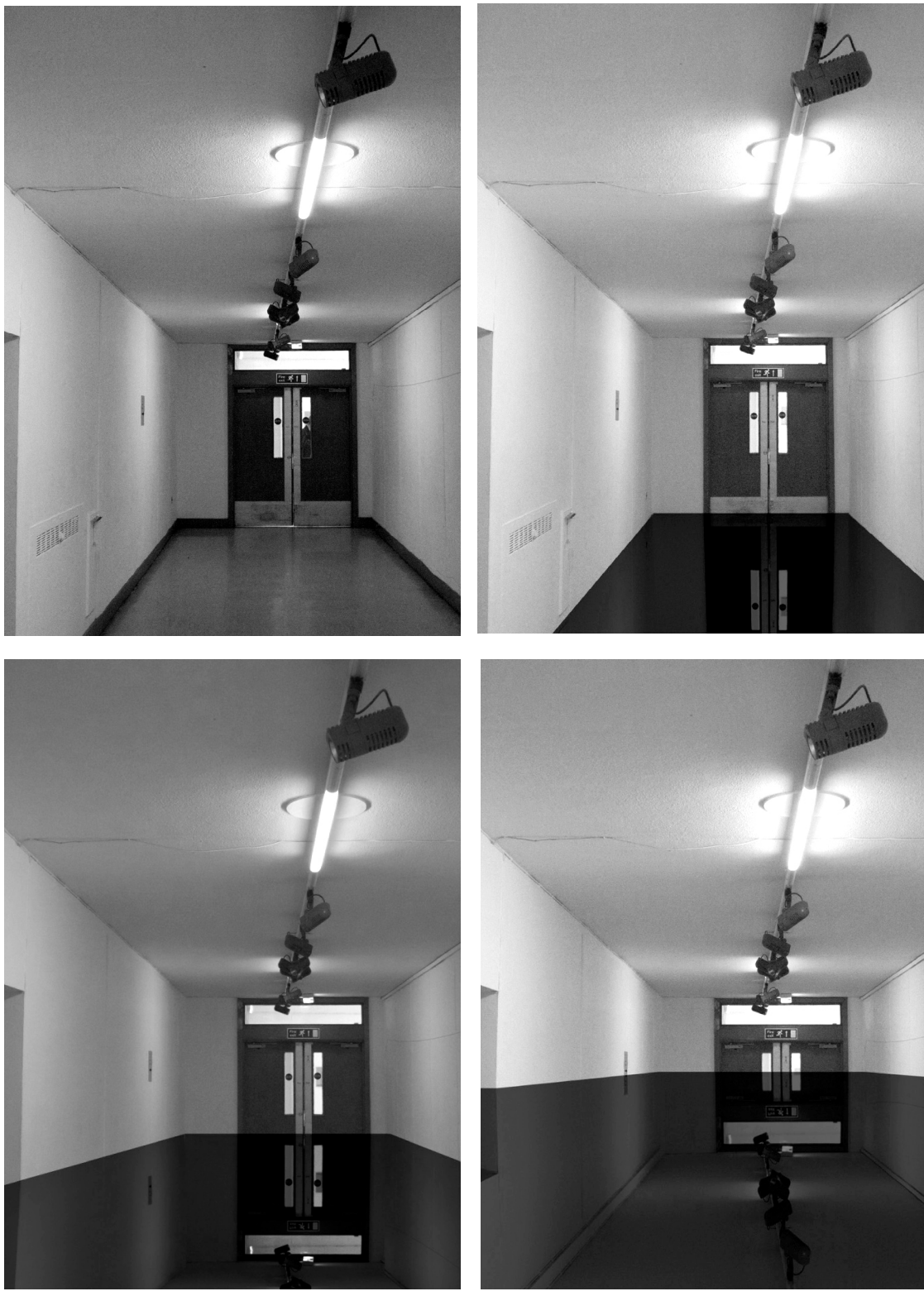
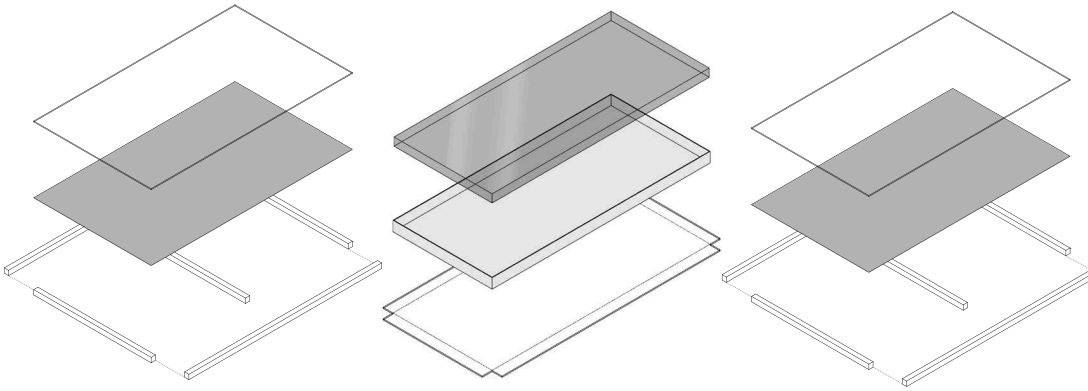


Image study on perception
of depth.



Tectonic Elements of reflective tools

The second stage involved a physical exploration of materiality and reflection. To begin with I filtered and recycled vegetable oil and coloured this with black oil based paint. To contain the black viscose liquid I constructed a shallow tray from sheet metal. Along side this I also constructed two further 'black mirrors' - clear sheet acrylic which has the underside blacked out - These two explorations contrast from the original art work both on scale and permeability, but explore the reflectivity. As these change with location, this micro scale project can interrogate it's surroundings.

Density through Perspective

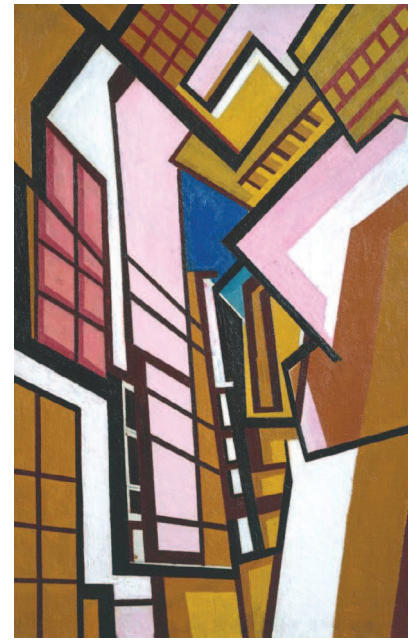
David Black

Wyndham Lewis (1882-1957), co-founder of Vorticist movement, (*above*). Workshop (c.1914-15) oil on canvas, (*right*)

As a co-founder, Wyndham Lewis is a prominent figure in the Vorticist movement. This style revolved around introducing a new, more importantly British alternative to the Cubist and Futurist art movements commonly associated with Europe.

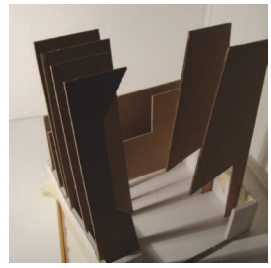
The followers of this Vorticist period, utilised a necessary language of abstraction to illustrate their ideas of an industrial dynamism which was commonly associated with the vortex of the modern city.

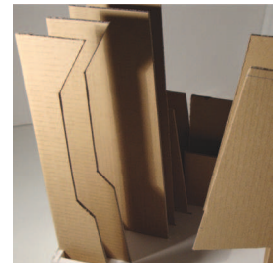
Using a vibrant and individual style which mixed the sharp diagonal machine age forms with strong geometric imagery and the illusion of a perspective being created through their work.



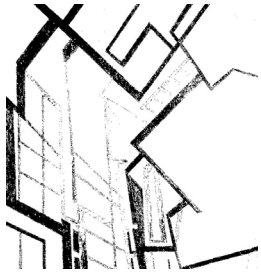
Initial thoughts on this painting which made me take and interest in this particular painting were not only the dominant thick lines which form the sharp diagonals, but also the immediate sense of depth which makes Workshop look like a layered view through a modern city.

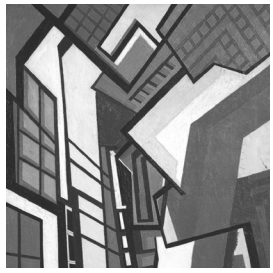
First studies into perspective through the model below investigated how the image of perspective envisaged through the original painting could be tweaked by altering the angle the layers are viewed from.





Layered model, interpretation of Workshop in three dimensions

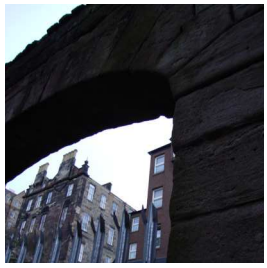




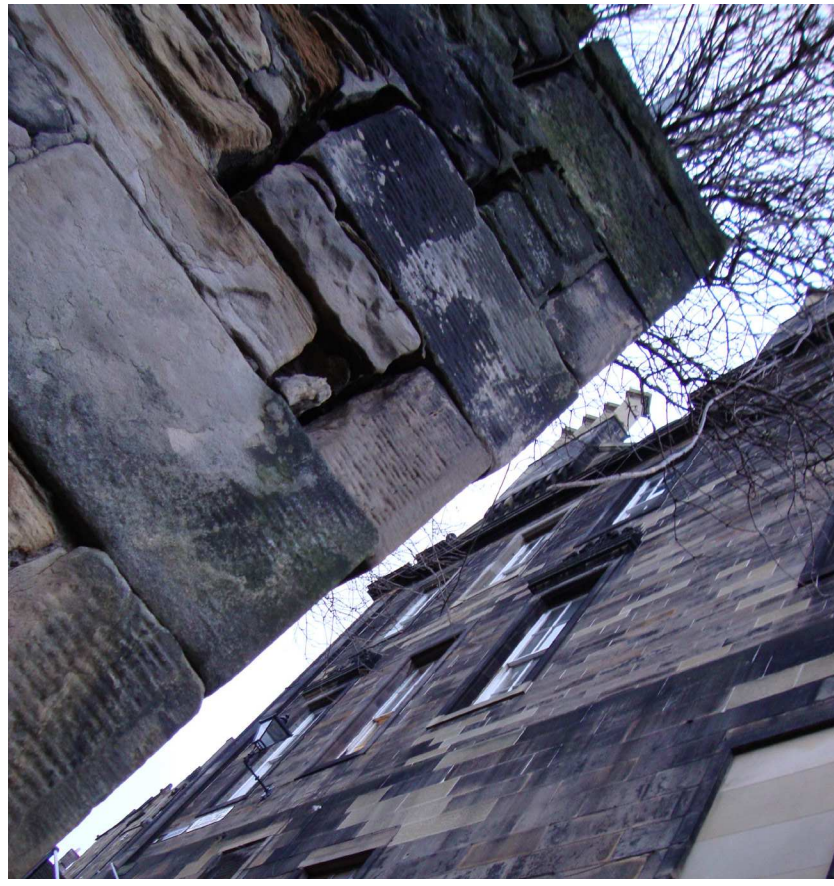
To test the extent to which the sense of depth in Workshop is effective. By adapting the image by removing the harsh vibrant colours, distorting geometries and altering threshold values the image changes dramatically.

Each study has its own value with the idea of a solid versus void tectonic being clear from the most successful image above.

Series of studies altering original Workshop painting to change its effect on viewing

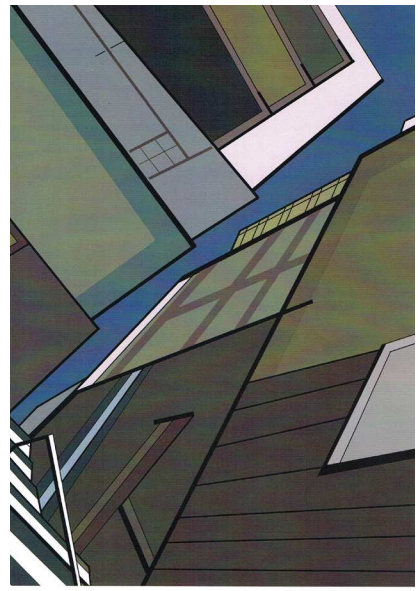


The next stage of this project needed the use of photography to recreate Lewis' work. The Old town of Edinburgh suited my needs with its dense Medieval street planning. This series of photographs attempted to capture the layers of buildings found in any dense urban area to interpret the sense of depth viewed from a close object with many geometric layers behind conveyed by Workshop. In my opinion the image below was most successful in achieving the criteria I set out to achieve. It has a small crevice shape focal point slithering down the centre of the image with multiple layers of buildings at a varied set of distances away similar to that illustrated in the original Workshop painting.



Photographic study recreating Workshop concepts based in Edinburgh

Final images adapting earlier Photographic studies to reflect qualities found in original Workshop image.



These final images are the culmination of all the work in the make/create project which are the most influential in taking forward into the design process. The image left creates a new take on the workshop image with the similar properties of strong geometric shapes, except with the colours taken from the original photograph of old town Edinburgh. Above is the image which I will use to be most influential in my design project, it portrays the ideas of solid/ void which I intend to use in planning of section/ elevation/plan. While maintaining the vital perspective view and intimacy of the dense buildings nearby.

Intensity and Release

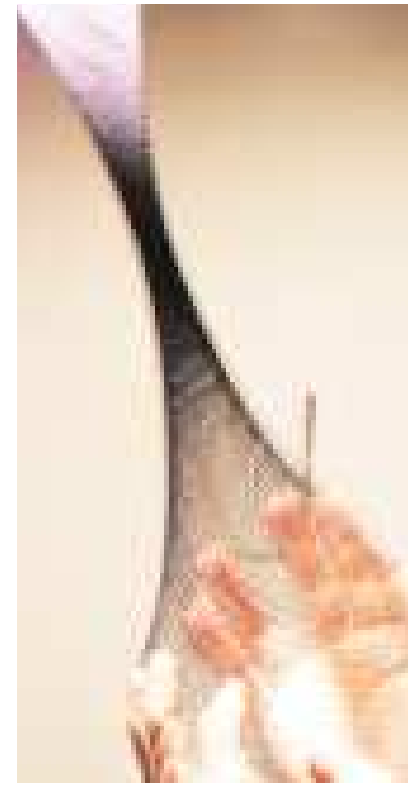
Lauren Boal

I chose to study a structural sculpture by Anish Kapoor, called Temenos. This structure is approximately 110m long and 50m high. The structure cost £2.7 million to make and is constructed by steel. It consists of a pole, a circular ring and an oval ring, all held together by steel wire.

I was interested in the way I could manipulate this shape and see what would happen when the structure could be changed. There is a clear sense of limitations, tension points, pressure and pathways. I wanted to explore these themes.

Initially, I began by trying to re-create the structure but in a less precise way, using a flexible material. I did so by using tights which allows me to play around with tension and see what happens when the structure is stretched in different directions.

Top: Temenos, Anish Kapoor
Bottom: Model



The previous model I made was helpful in the sense I could see where most tension was in the structure. However, I wanted more flexibility so the next step for me was try and stretch the model but with less restriction and having more control over the form.

I did so by using my hands and stretching the tights at different strengths and pulling this to create the shown effect.

The photographic model shows where the intensity takes place and where the points of release occur.

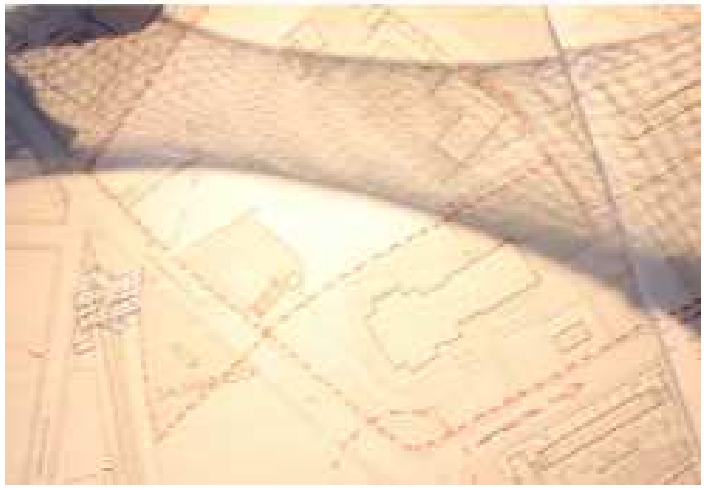
This then made me look at the model more aesthetically and this made me more interested in the shadows the models create.

Images of model stretched at different points

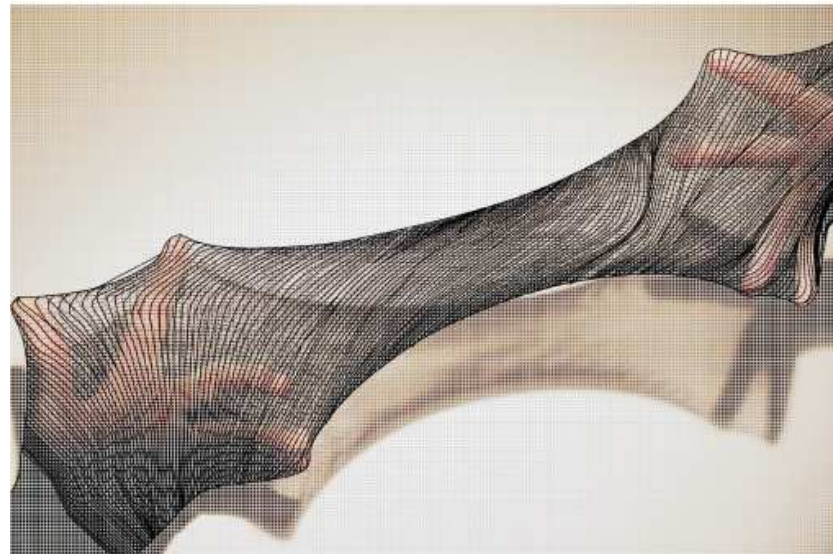
After looking at shadows briefly in the previous exercise, I then decided to experiment with overlapping the model several times and capturing the effects it created.

I found the overlapping spaces interesting as they represented places of intensity.

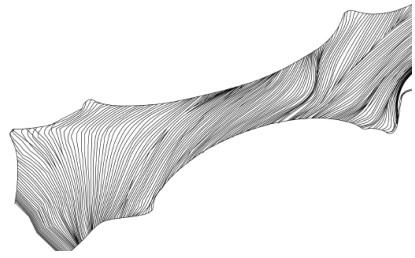
It also made me look at different routes the model made.



The next step for me was to use the model and combine it which our given site for our project. I began by overlapping the shadows it created.



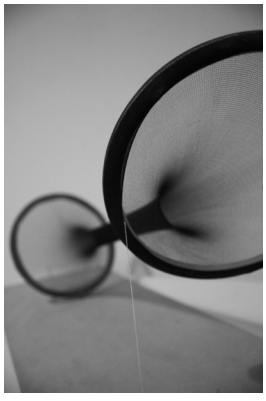
Top: overlay of my model and site
Right: AutoCAD drawing of one of the images.



I then look one of the images which I believed showed a lot of intensity and release. I decided to use AutoCAD to draw over the lines in the image. This drawing shows where the spaces of intensity occur.

Manipulation of the form

Gregory Chatfield



Temenos is represented using tight material stretched over rings to create the form.

Interpretation of Temenos

Temenos is a Greek word meaning sacred space surrounding a temple or alter. The artist wanted the sculpture to be “a symbol of regeneration of the healing of a region and regeneration of a transforming society.”

This is an appropriate influence as Anish Kapoor designed the 2012 Olympic viewing tower, as the site is so closely located to the Commonwealth games.

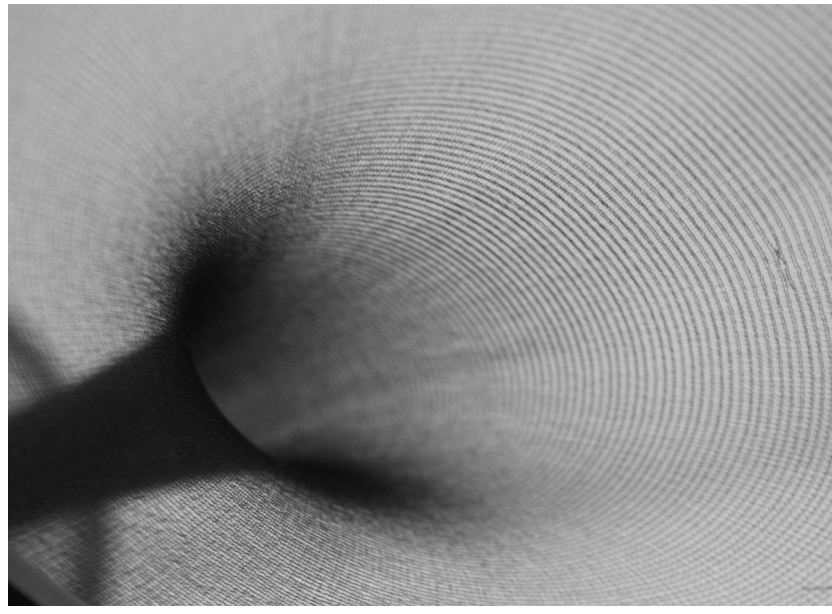
Temenos is a Hyperboliod shape that celebrates perfection through engineering. The material is a manipulation of a grid achieved through the high tensioning of the wires reminiscent to the tension in Dalmarnock.

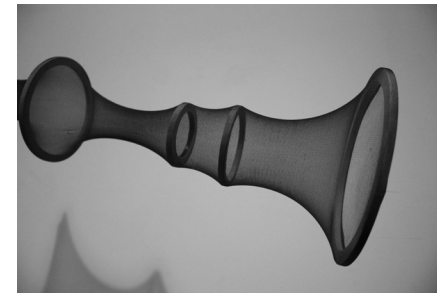
It draws comparisons to the Angel of the North as a symbol of regeneration but aesthetically to a large butterfly net or Chinese finger trap

The piece has a fabric nature; ‘fragile materiality’ acting as if unaffected by gravity.

The open ends bottle neck out, used as a metaphor to entice people into the local area through the community centre.

It could be conceived that this piece acts as the bridge between the 2014 Commonwealth Games and the local area of Dalmarnock.





Manipulation of the form

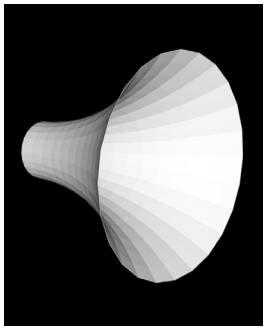
Through modelling the piece using the tight material this expressed a sense of anti gravity and tension through the pulling between the sections

In the previous model there was a status quo between the sections being most interesting looking at the end pieces. It was particularly fascinating seeing how at certain angles different amount of light was allowed through the material due to material being stretched more at different parts.

This status quo was addressed by adding rings to this shape (top) to see how the form changed. By tilting the rings (bottom left) and placing them in different locations, closer and further apart this affected the paraboloids.

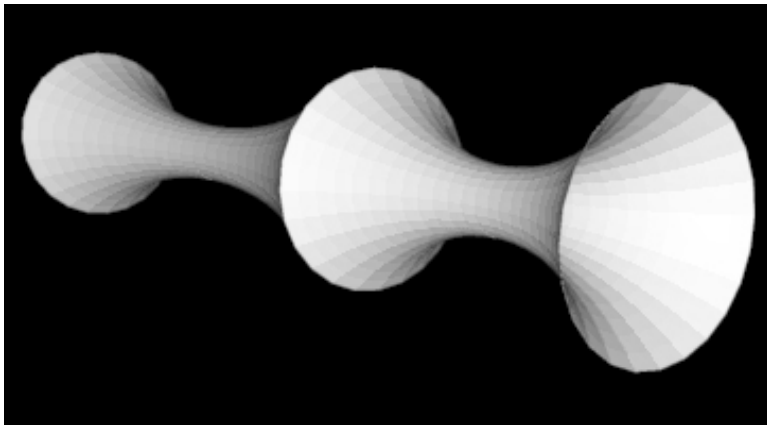
So far the material had just been manipulated along one axis so I addressed what would happen to the material on a different axis, pulling the middle ring perpendicular direction.

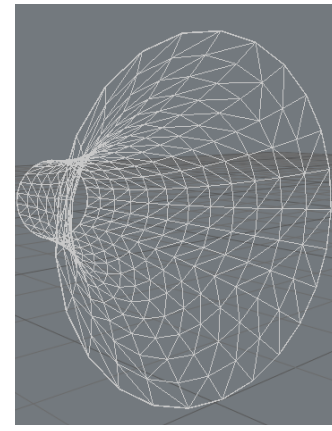
This was continued by adding another hyperboloid (bottom right) to investigate how they meet and the shape created.



Parametric Modelling

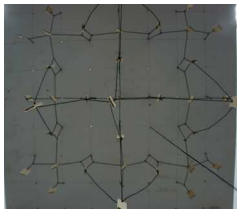
The basic shape was modelled on the computer, to understand the basic net form. This demonstrates how the form consists of a series of straight lines (bottom right) linking back to the Temenos piece and the manipulation of the grid format.

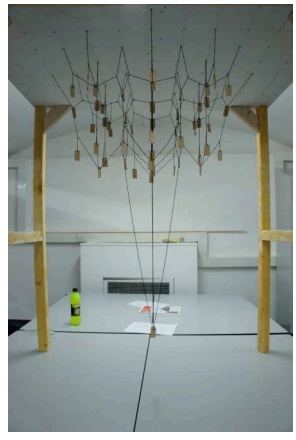


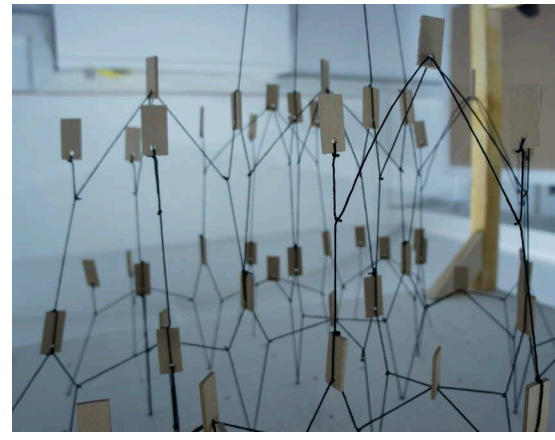


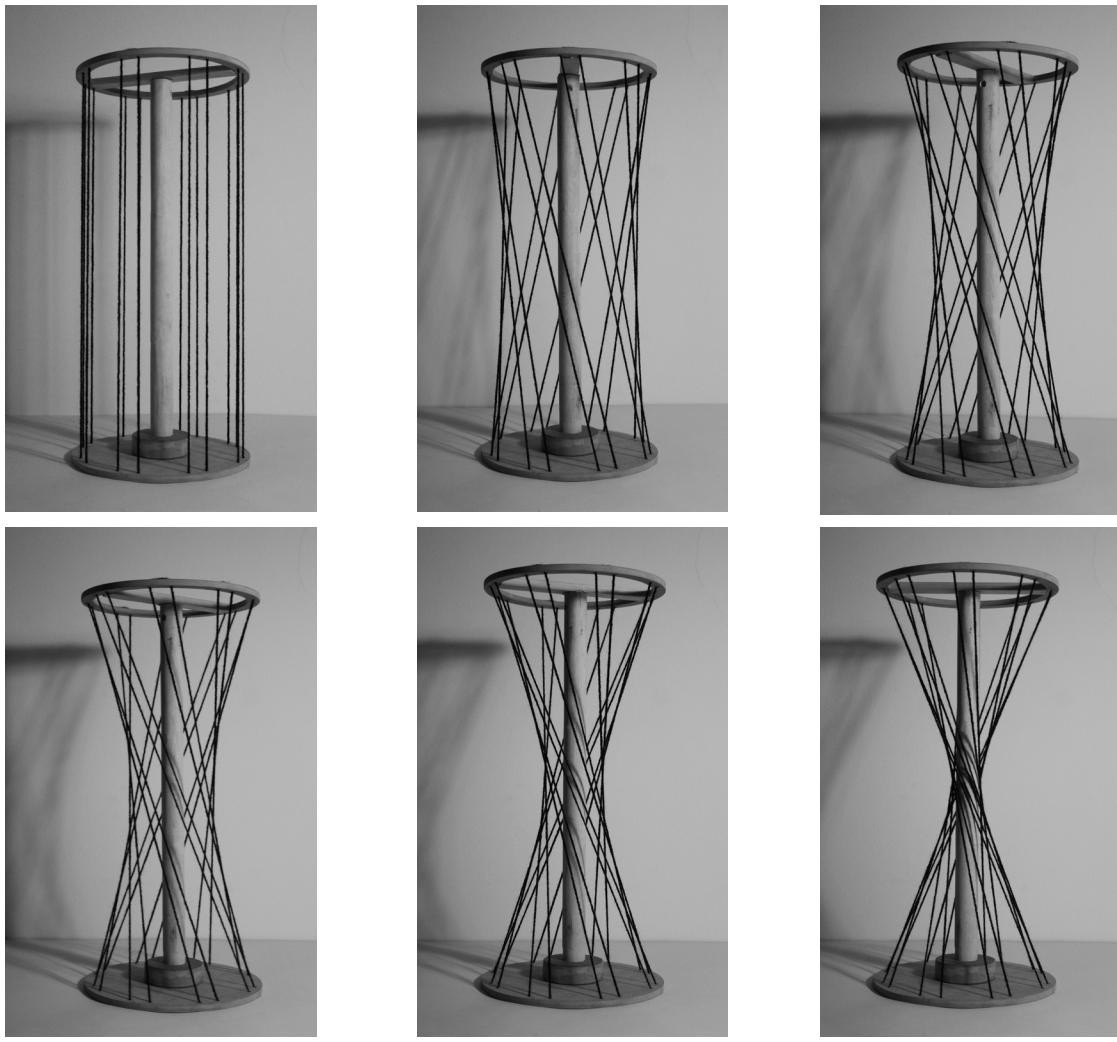
Gravity & Antoni Gaudi

The Temenos piece gives the illusion of floating being almost unaffected by gravity; an anti-gravity. I addressed the antithesis of this by studying Gaudi's work. His work is similar in the use of parabolic forms however is gravity based. To appreciate his works one of his models was recreated. Gaudi built a model (left) with lead shots and string to understand the nature of parabolic arches once turned upside down (right). Both Temenos and Gaudi's model derive from a grid.









Creating curves from straight lines

I was intrigued in understanding the nature of parabolic forms and how they are created through manipulating a grid. I therefore created this model showing by progressively rotating a series of straight lines along an axis it creates a paraboloid.

Carsten Peter, Cracked Mud, 1999

Network Hierarchy and the Division of Space

Michael Chisholm

My original inspiration piece was a 1999 photograph by self styled 'photographer, filmmaker, biologist and adventurer' Carsten Peter entitled 'Cracked Mud'.

Carsten Peters usually deals with large scale environmental wonders. However in this case he attempts an intimate examination of the environmental process of mud cracks, which form naturally when streams or lakes dry up during droughts, as strain develops and the top layer of soil tries to shrink, while the material below stays the same size.

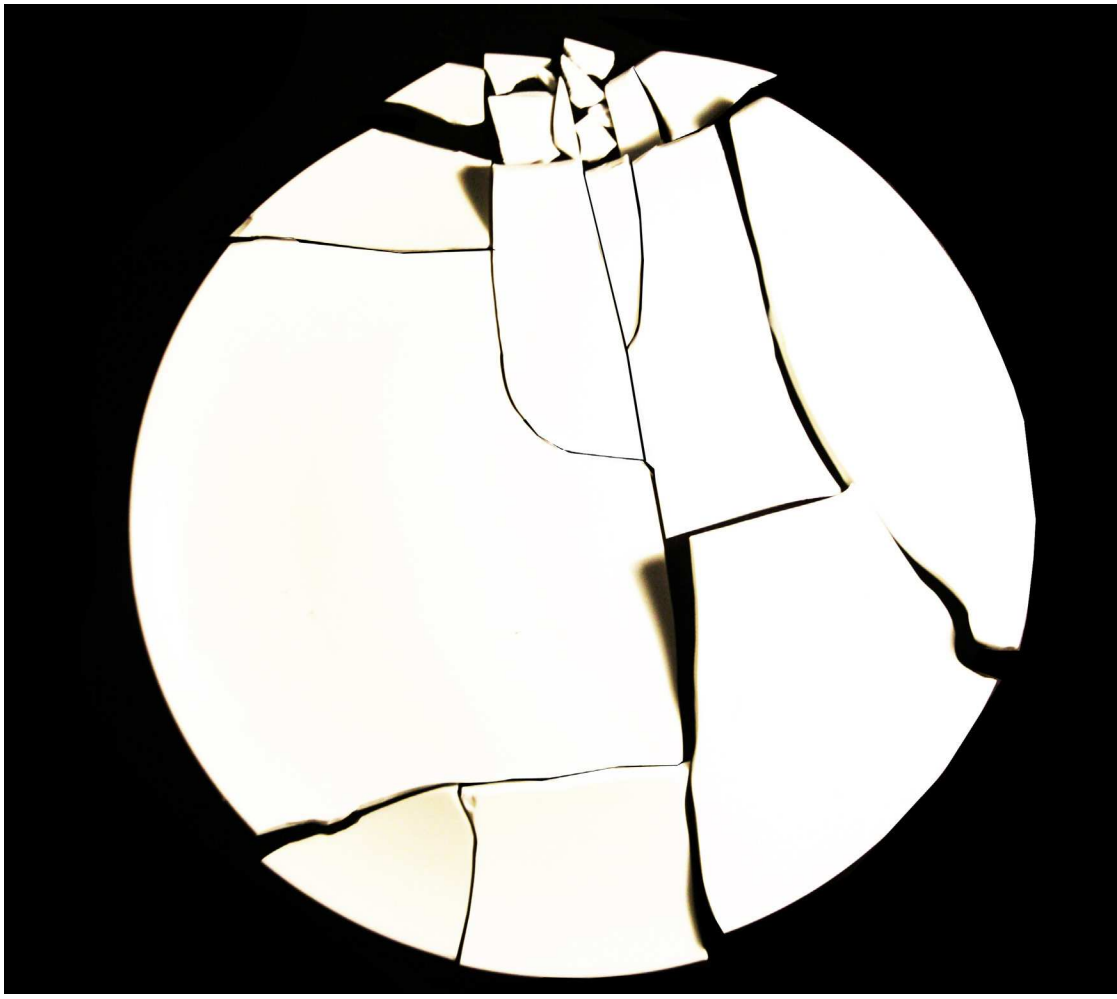
Various aspects of the photograph interested me which I decided to go and explore further through a selection of tectonic studies.

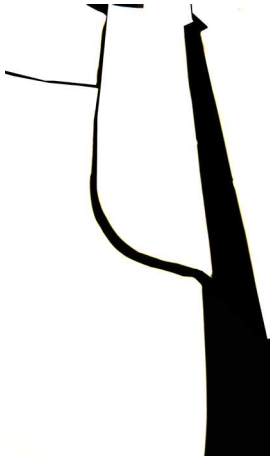
In my initial studies, I tried to mimic the photograph in a slightly abstracted form, creating natural looking grooves and networks within a piece of oasis. This study evoked many of the themes I was originally interested in; depth, light, dark, dominance and network hierarchy.

I then went on to create wooden 'blocks' which I could arrange and rearrange in various combinations. The study allowed the exploration of the relationship between primary and secondary networks, as well as a look at how solid forms may embody a flexible characteristic which provides the opportunity to suggest a relationship between forms which are not necessarily physically attached.

Above Left: Series of Initial Studies

Above Right: Original





Above: Image of Cracked Plate study, and Image of more Intimate Photograph exploring the relationship between cracks.

A tectonic study I conducted, which I found particularly interesting is a project involving a standard dinner plate. After my initial studies, I had the wish to explore crack formation within materials in a less contrived way. After leaving the plate in the oven for a prolonged period of time, the intense heat allowed for natural cracking to occur.

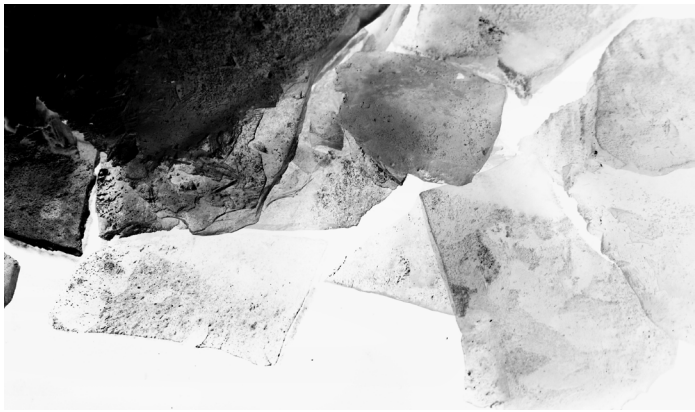
I felt the outcome of the study allowed a fascinating exploration into the hierarchy of crack networks shooting through the plate which was once whole.

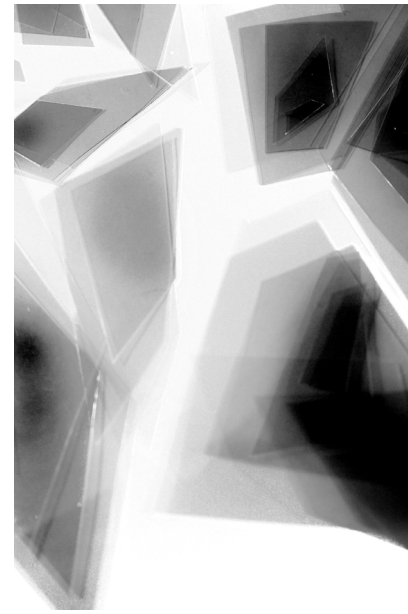
There is a clear indication in the difference between primary and secondary networks splitting up the solid form of the ceramic material.

These dividing networks also suggest a hierarchy in solid spatial elements within the piece. The cracks are more occurring in some areas than others, evoking the idea that some parts of the plate are stronger and more dominating than others.

To further explore the tectonic themes I originally set out, I began to experiment with ice which had formed naturally outdoors. After applying pressure to the ice allowing it to crack, I looked at photographing the piece in various ways to emphasise the hierarchy of ice planes which are formed. The negative image in particular emphasises the dominance some forms have over others when the division occurs.

I then began to relate this to my project of the cracked plate by creating an image somewhat similar to that of the negative ice photograph while incorporating dimensions dictated by the cracks within the plate. Through using numerous layers of acetate to suggest which forms deriding from the project has a more dominating presence.

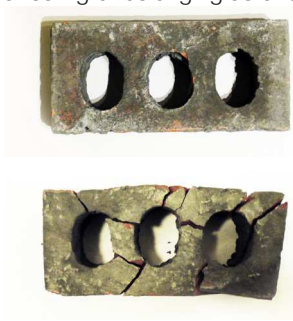




Above: Acetate Project

Left: Images of Cracked Ice exploring Division Hierarchy

Due to the large abundance of brick structures within the Dalmarnock area I felt it was relevant to use the single brick within my tectonic investigations. Through once again cracking the material chosen, I then explored the relationship between the elements which cracked off from each other. What I found particularly interesting, was how that even though the brick is no longer one solid entity, the materiality and division of the cracks suggest a feeling of belonging as one.



Above: Cracks formed within a Single Red Brick

Top: Graphic Highlighting the Hierarchy of Networks which divide Dalmarnock.

Bottom: Abstract Plan of Dalmarnock

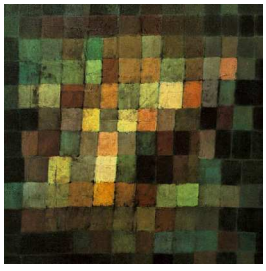
I decided to explore these tectonic themes on a much grander scale, relating the concepts of network hierarchy and spatial arrangement to the masterplan of Dalmarnock.

Studying all networks, from the primary traffic routes through Dalmarnock, to routes present in more residential areas, I developed a graphic which mimicked the style of my earlier tectonic study of the cracked plate. I have created larger routes or 'cracks' to signify the networks which experience more traffic and act as the main paths through the area. The graphic also explores how areas are divided by these networks, emphasising spatial and programmatic splits within the area.

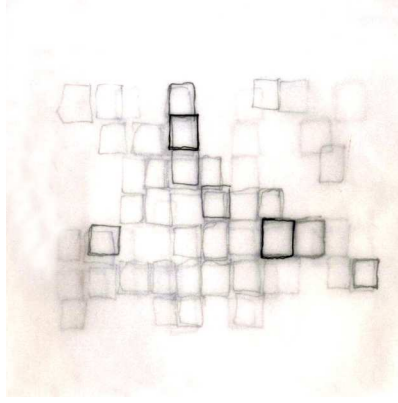
Paul Klee: Ancient Sounds, 1925

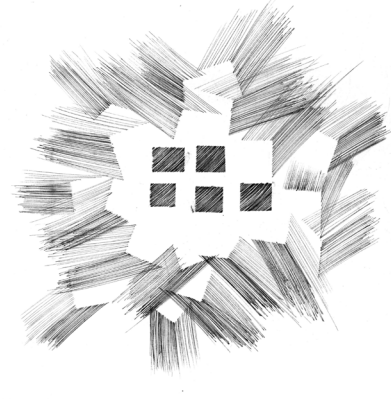
Frequency, Repetition, Intensity and Depth

Shona Common



Paul Klee's painting of acrylic colour blocks on black denoting "Ancient Sounds" has been interpreted through a series of investigations as the mapping of frequencies of sound. It is assumed that the darker colours represent the duller, deeper and more muted ancient sounds, while the brighter colours note the higher, newer sounds.

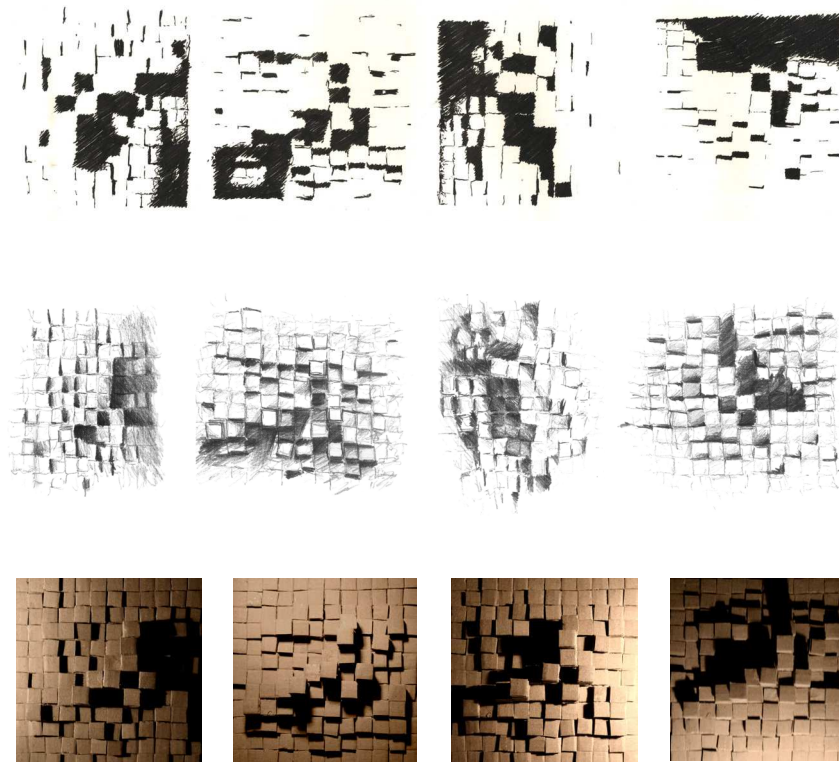




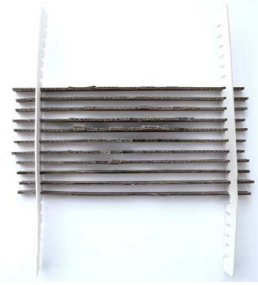
Identifying moments of intensity; abstracted static, low frequency and dynamic, high frequency sounds

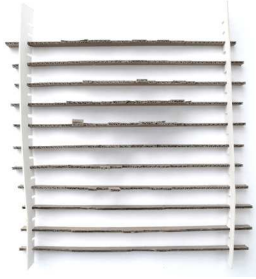
Nodes of Intensity: Volumetric Study

The initial studies considered the nodes of intensity of colour and movement in the painting. The irregularities within the 'grid' translate an additive nature, with no sense of defined perimeter edge. The brighter colours are also drawn more static and definable, while the deeper tones are harder to place or identify. The investigations below considered the painting in a volumetric study: the yellows and oranges appear closer to the eye, while the greens and greys seem more distant and so the heights of the volumes are judged accordingly. The model contemplates the pull towards the higher volumes or nodes of intensity, and the connection between these different nodes. Shadow studies progressing from this gave thought to the irregularity of the grid, the spaces which exist between the high volumes, and the sense of balance across the topography.



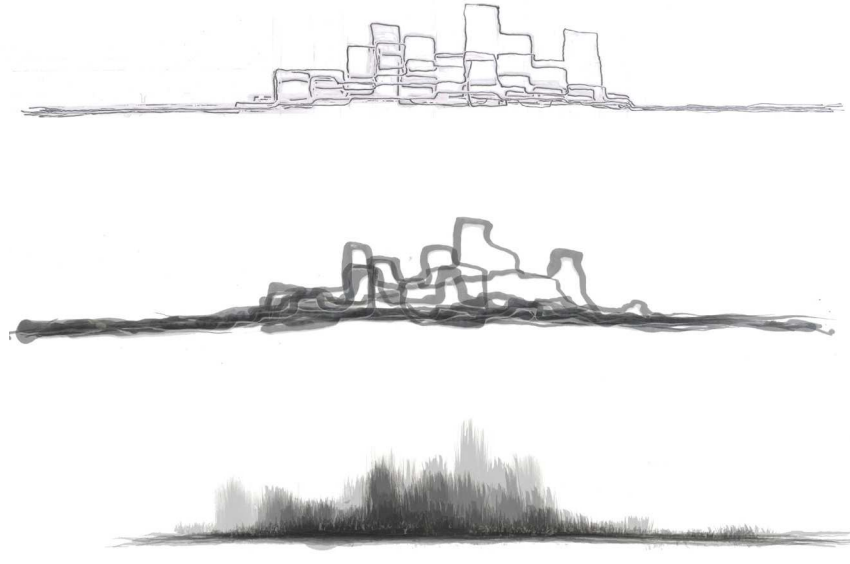
High contrast, sketch and photographic shadow studies of volumetric model



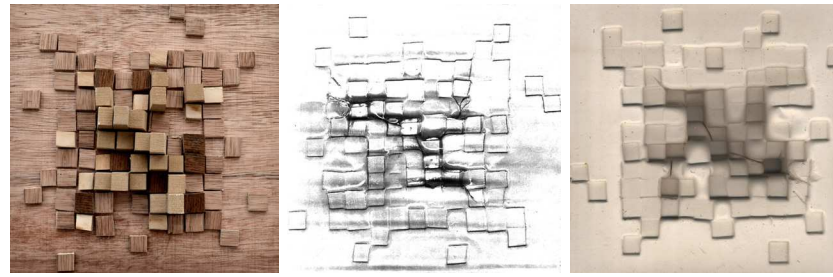


From the initial volumetric model followed sectional studies, considering the impact of depth to the intensities of the low and high profiles. The overlaid sections below indicated the higher intensity of the lower profile in which irregularity in height still exists. There is however still a pull towards the singular higher volumes. The last of these studies, where a link of ink was drawn at 'ground' and pushed to the required distance, produces results similar to a frequency graph, which give the sections a dynamic quality.

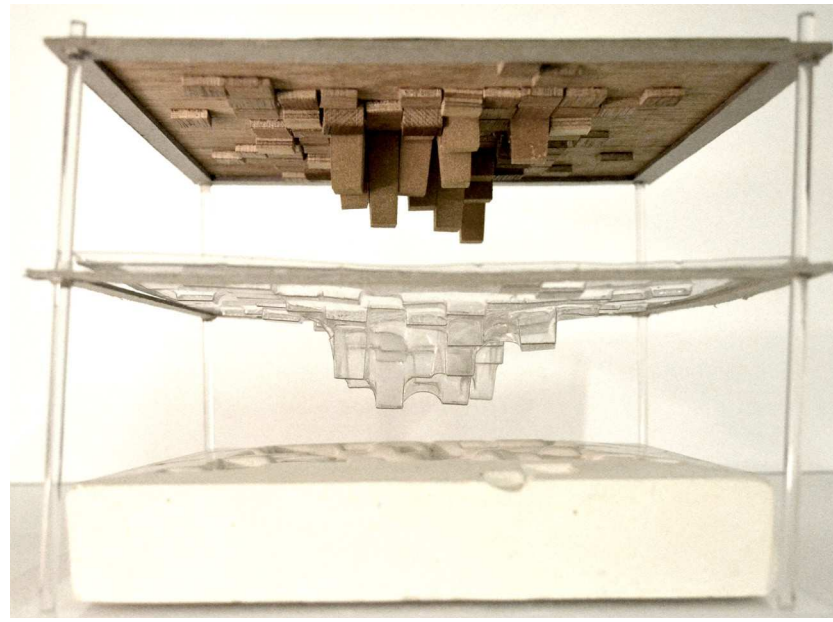
Recurring moments with the variable of depth



Overlaid sections: moments of intensity



Second volume study, vacuum form mould, cast inverse model



Charged space: suspended layers

Concluding the study of Klee's painting was a second volumetric study to consider the spaces in between, through casting an inverse. For this a second volume study was required from wood which also represented the dispersion of elements and the lack of the defined of edge. This study had three parts: the original model, the vacuum formed mould and the cast inverse. With each iteration there was a degree of distortion, with webs between the high volumes of the vacuum form and the softening of the edges of the cast, which define a more organic flow towards the nodes of intensity. The highest points of the original model were also defined only by void in the inverse study, which was suggestive of a pull towards the cores within.

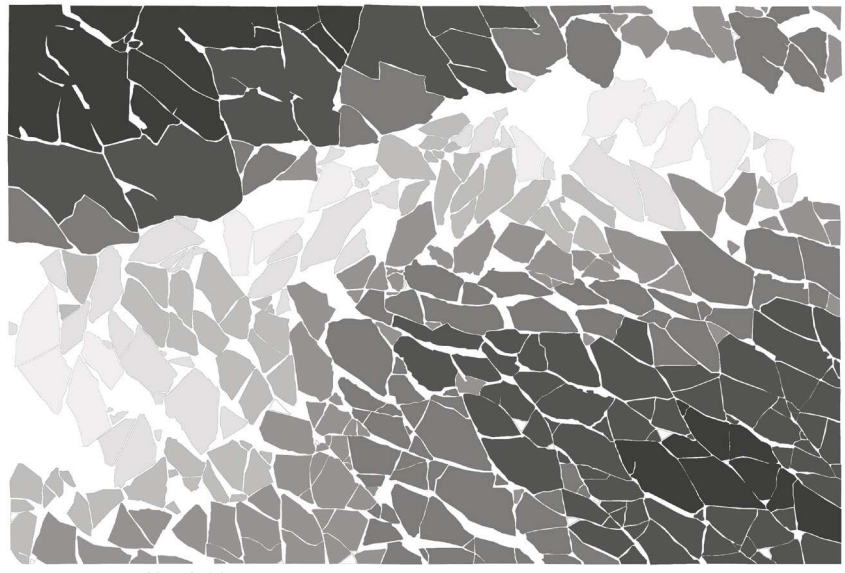
Entropy across scale

Michael Dargo

Yann Bertrand's photograph captures the delicate formation of sea ice in the Turku Archipelago of southern Finland. The image is deceptive in appearing to depict a static landscape of spatial permanence within this ice formation. However, in reality, this environment is subject to significant temporal change - with underlying currents propelling and rotating these individual fragments to constantly reshape this dynamic composition. Within this particular area that Bertrand has captured, an basic understanding of hydrology suggests that there will not be a uniform pattern of movement across the field. Instead, levels of motion will be in direct relation to fragment position and density of ice within that area.

The first step in this exploration was to map this density in an attempt to visualize the pressure, and subsequent potential for movement, within this landscape (Image below). It was through this image that areas of motion could be identified, creating a foundation for initial study.

This exploration also featured a second parallel study. After highlighting the disorder and, to an extend, randomness within this temporal movement, a contrast could be witnessed between this and an ordered hierarchy in scale. Common geometric forms could be identified at both micro and macro level within the ice field - forming a second basis of exploration.

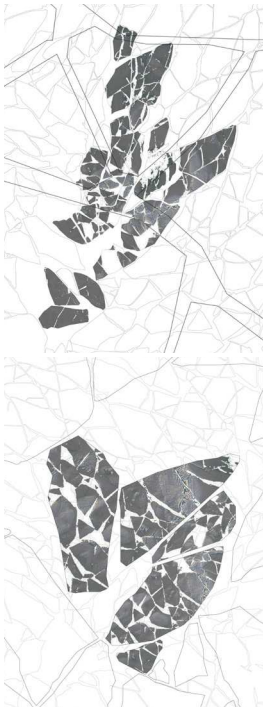


Pressure map of ice field

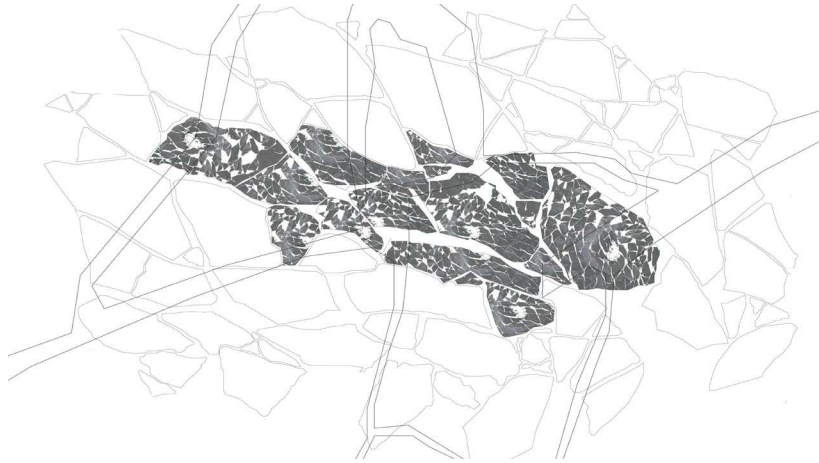
Individual fragment path

Combined ice fragment motion

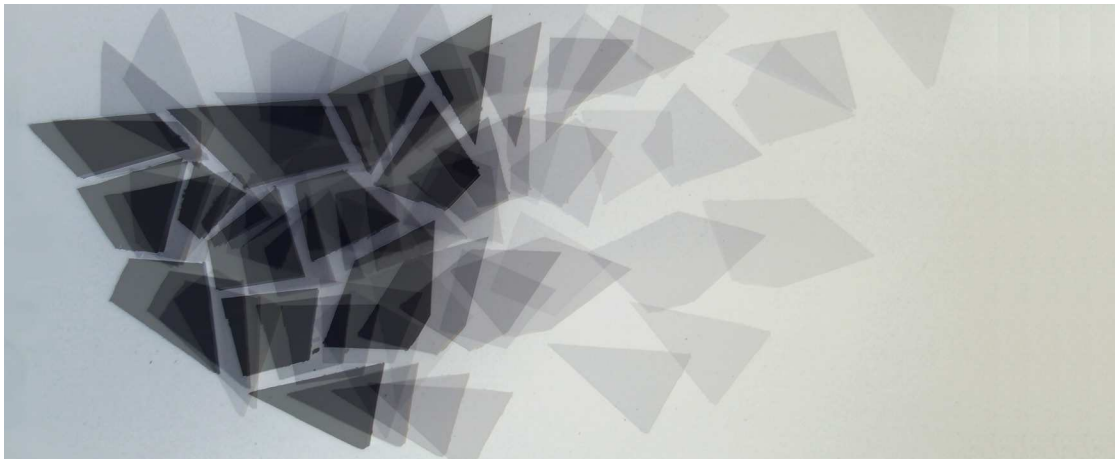
The first study into motion attempted to map the spatial migration of individual fragments across the composition. In this scenario, fragments were assumed to travel and rotate in accordance with the dominant current in the archipelago. These images explore and convey this motion through repetition of form across the predicted path of travel, rotating and decreasing in size to demonstrate the shrinking of these fragments over time. Such an exploration presented a landscape of apparent disorder, with entopic temporal shifts creating a significant contrast to the permanence of Bertrand's original photograph. However, it became apparent that forms across different scales may experience varying degrees of entropic motion, with some more static than others

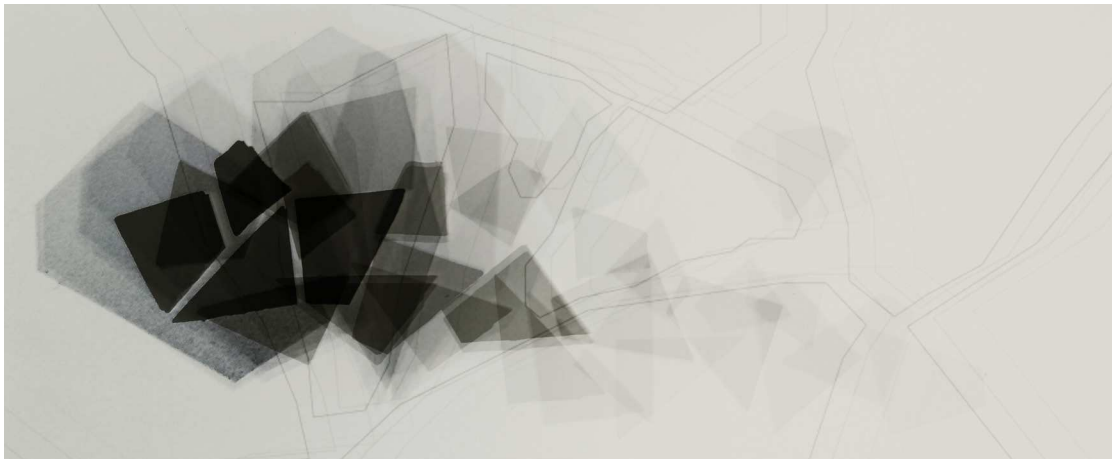


The second parallel studied explored the apparent hierarchy of scale within the ice field. Within the image, common geometric forms could be identified across several scales. This created a sense of order within the composition, with any entropic motion between the fragments existing within a strict framework. This macro/micro division also classifies the different degrees of movement within the field, with macro scale forms remaining consistent and micro fragments moving greatly over time.



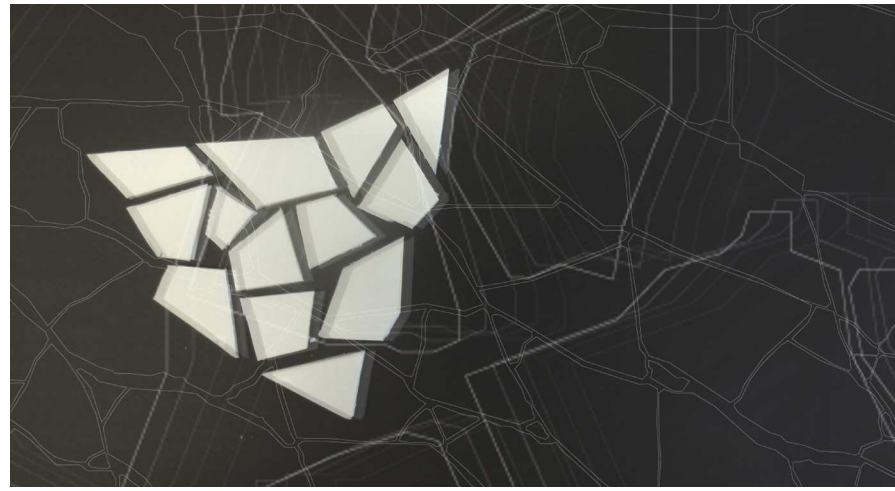
Exploring layering of scale



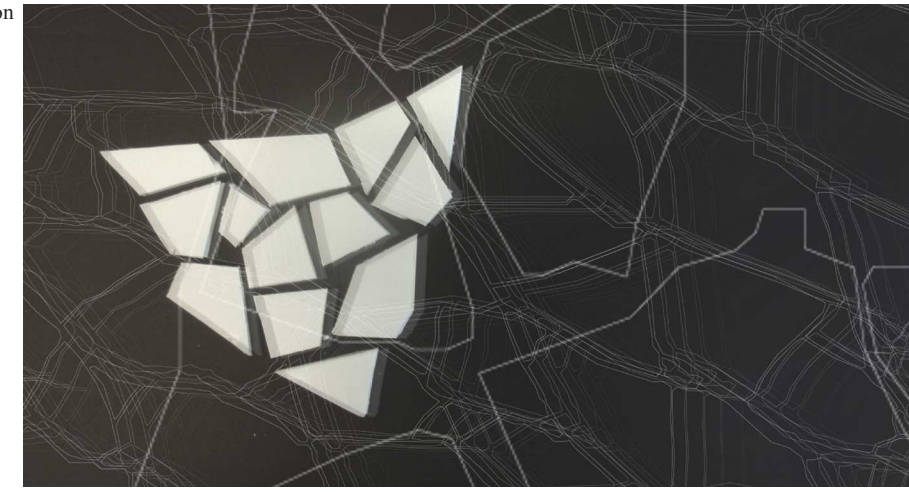


Layering spatial motion within a single scale

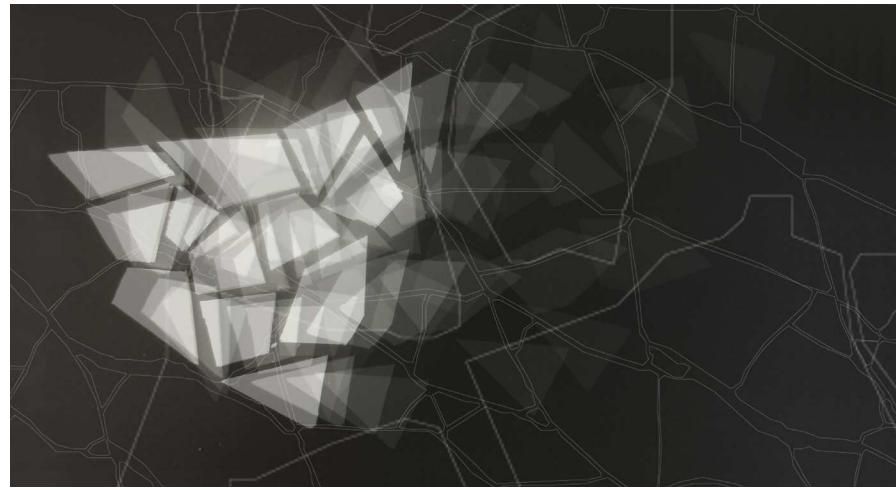
Macro motion



Medium motion



Micro motion



The final study sought to create a selection of images that conveyed both hierarchy of order within scale and entropic movement within the fragments. Each image, produced by superimposing photographs, displays spatial motion and migration within a single scale - with the others remaining as a static composition. This study explored the potential for temporal change, in this case spatial, to occur within an ordered framework.

Andy Goldsworthy, Ice Arch, 1982

Fragment, Weld, Thick/Thin Space

Slavka Gancheva

1

2

The Ice Arch is a quintessential work of environmental artist and sculptor Andy Goldsworthy (1). Unlike his more common slate arches, this sculpture brings forward a set of different themes, including transiency, fragmentation, and ephemerality.

The process of creating the arch and its subsequent gradual disintegration are perhaps even more intriguing than the art piece itself. (2) It takes several attempts to put together the sculpture and the fragile pieces of ice often break and have to be replaced. The positioning of the fragments requires ingenuity and a good understanding of load transfer. The varying thickness of the elements allows for a gradual shift in angle that creates the parabola of the arch.

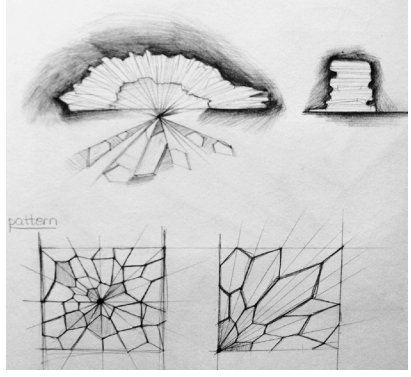
The choice of ice as a material grants the sculpture an ethereal quality through the play of light. The arch appears to glow and there are varying degrees of light intensity depending on how translucent or opaque the ice is.

The pieces are 'welded' together as a thin film of ice on each fragment melts and then refreezes when the elements are put together.

The initial investigation of this project looked at the structural qualities of the arch and attempted to recreate it using plastic pieces with varying degrees of opacity that are welded together, not unlike the manner in which the ice is.

The issue of how the size, shape, and thickness of each fragment is determined came up during this process.

Therefore, to lend logic to the piece a square grid was used as a frame and shattered at different points of impact to determine the final geometry of the elements (3,4).



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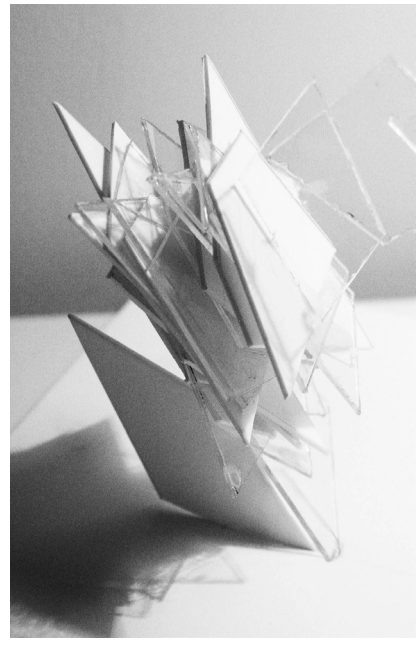
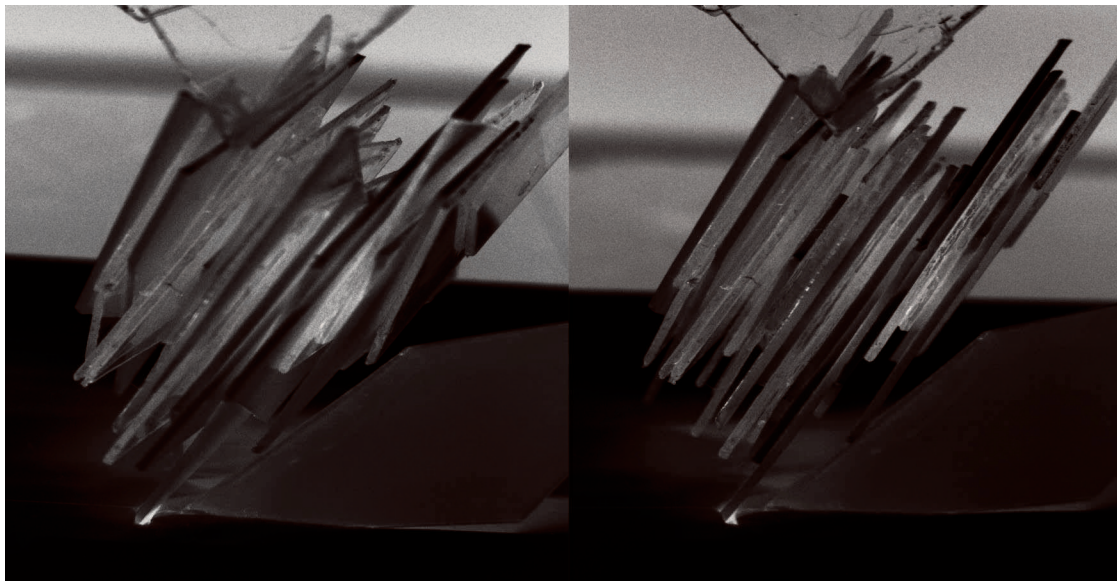


4

1. Andy Goldsworthy's Ice Arch
2. Construction process
3. Sketch studies and grid formation
4. Maquette model attempting to recreate the base support of the arch



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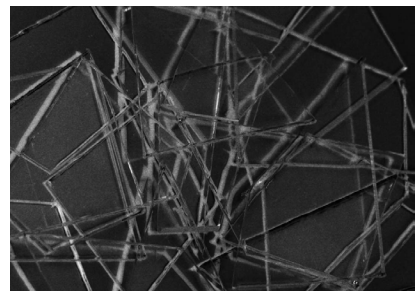

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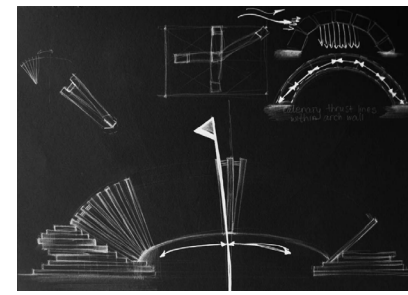


7

Photographic studies of the first model revealed an interesting tectonic formation - a result of the systematic layering of components (5). The images also manage to capture the varying quantity of light that manages to filter through the plastic creating a composition of thick/thin, dark/light elements.

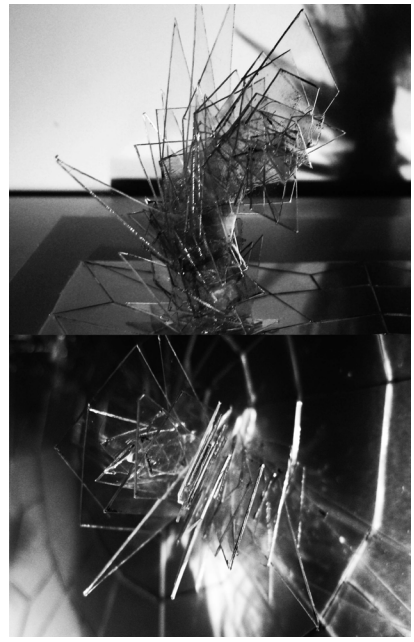
While the initial maquette gave some insight into the process of assembling the arch, it did not manage to recreate the proper angle of the parabola. Subsequently, the actual geometry and load transfer for an arch was studied in depth before attempting to recreate the sculpture again.

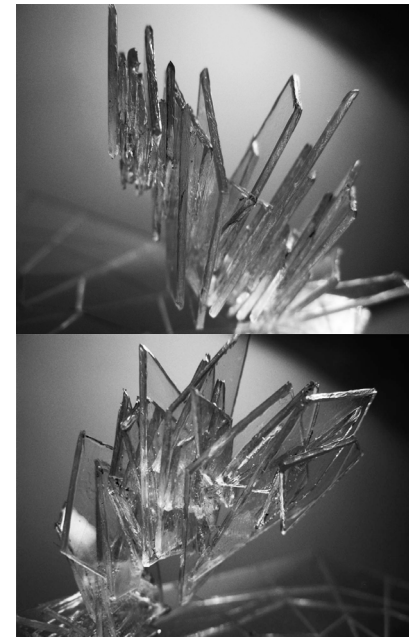
For the second set of models, a new limiting condition was established. The fractured square grid continued to define the shape and number of the fragments but this time only one grid per arch was allowed. The models became an exercise in finding a way to bridge the gap between the opposite ends of the grid using the finite number of elements available from shattering it (see next page).

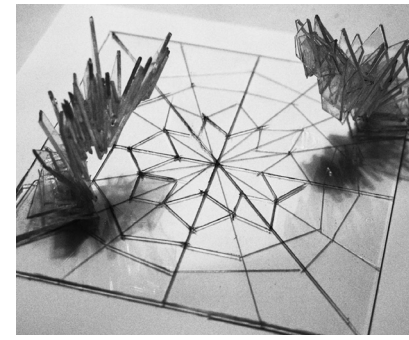
5. Photographic study: layering, thick/thin space
6. Fragments before assembly
7. Structural studies

Bridging the Gap

Two model iterations were completed using the same grid with a point of impact at the centre. The plastic used for both of them was translucent but with different thickness. This variation lent particular qualities to the final models, especially in terms of light reflection. The thicker plastic resulted in edges that captured light while with the thinner material the reflections bounced off the planes. When put together the two models create an interesting dialogue about thick/thin space. They also raise the issues of continuity and load distribution between the fragments. Each piece is relevant and supports the subsequent one, a concept appropriate to a subsequent study of civic architecture.

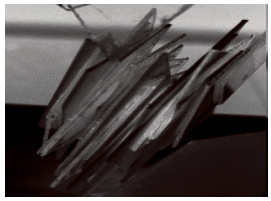


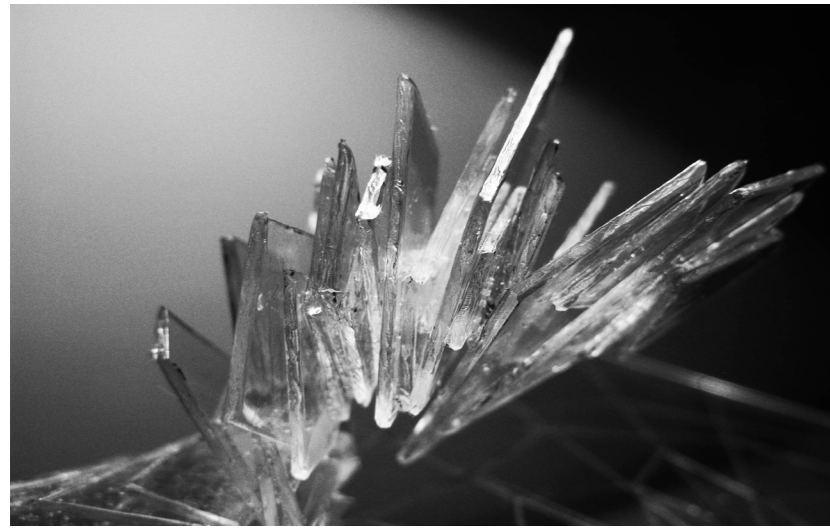




Model 1 - thin plastic

Model 2 - thick plastic





Model 2

Model 1

Below: Transferring the acquired architectural tectonic onto the site masterplan: a civic analysis of the Dalmarnock area of Glasgow

Richard Long, South Bank Circle, 1991

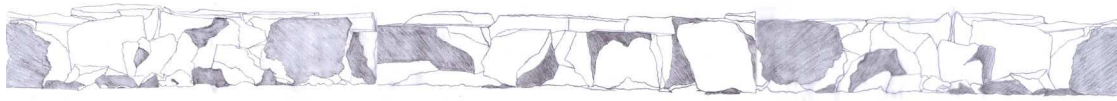
Reconfiguration: The Space Between

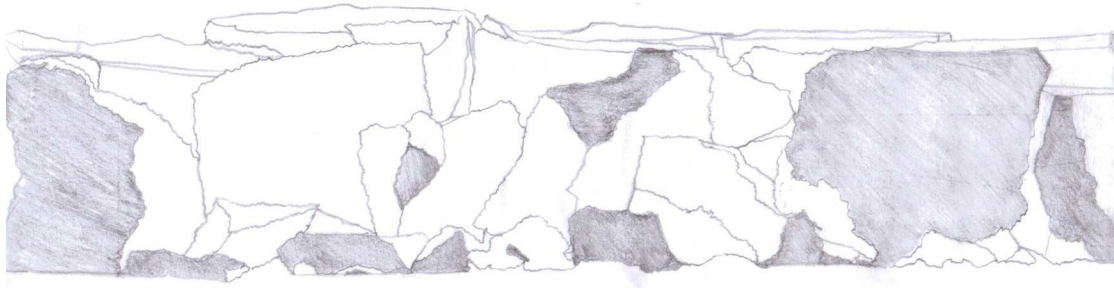
Gillian Glachan

South Bank Circle was created specifically for Long's 1991 retrospective at the Hayward Gallery at the South Bank Centre in London. The piece is a circle which is created from 168 pieces of Cornwall slate which can be re configured in a variety of ways, however it must follow a couple of simple rules. The pieces may be assembled in a wide variety of configurations within the defining form of the circle. Long has specified that every 'stone' should touch the stones adjoining it, so that they all become '"locked" together, and stable. The longest stones (and also the thinnest and smallest ones) should be placed within the work and not around the edge whilst containing an equal density of stone. Key to this piece is the relationship between natural and man made geometry.

The initial investigation into the South Bank Circle consisted of reversing the process from which it was constructed. A series of circles were cast in stone, plaster of paris and clay and then smashed into a number of different pieces. The materials were chosen due to their natural qualities and similarities to slate. Each material dispersed differently, producing an array of segments in accordance to their properties.

Images of initial circle and segments. From left: stone, plaster of paris and clay.



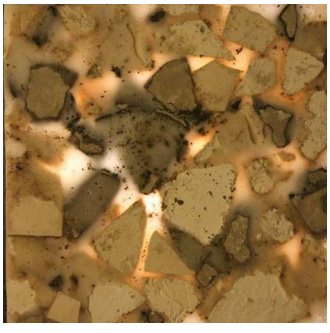


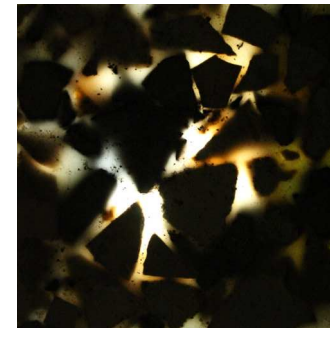
In keeping with the process in which Richard Long's sculpture can be redefined, the pieces were then collective reassembled into forms contrasting their initial geometry. In this case the circle became lines and squares. They followed the same rules as South Bank Circle and every piece touched the next with the larger pieces towards the middle and the smaller, thinner to the edges.

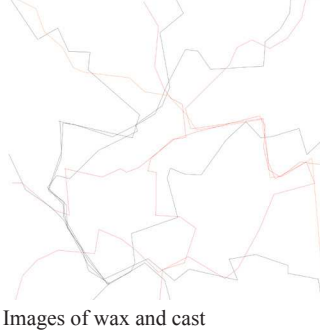
Sections were then taken through the reconfigured sculpture in order to study the relationship between the pieces and the solid and voids within.

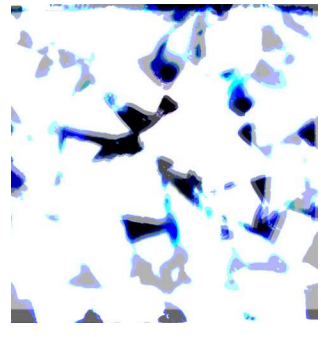
Images of reconfigured segments and sections

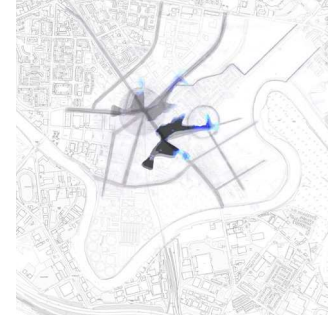
A further analysis of the reconfigured piece sparked further enquiry into the space between and where some pieces appear totally rigid they may infact contain a number of voids and cracks. Wax was then poured over the segments and light filtered through to highlight the areas of void. Through using different light sources with varying intensities, two main aspects could be identified. Although the segments themselves are solid, sharp geometries the space between is much the contrary with an extremely fluid nature. The space between the pieces comprises of ribbons and bursts which have influenced the architectural design process interpreting the ribbons into circulation and the burst into a series of social spaces.











Images of wax and cast model identifying patterns and rhythms.

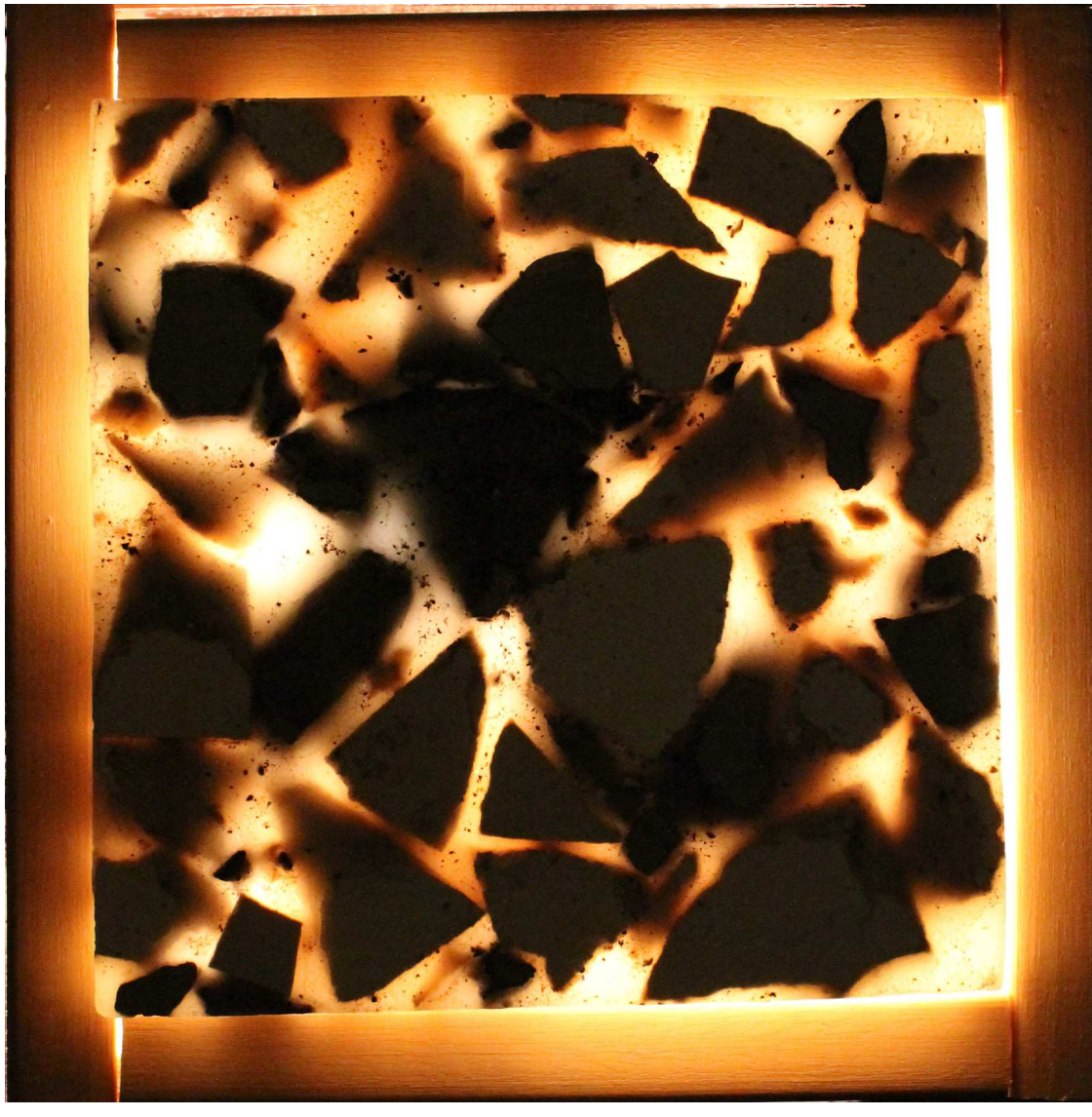


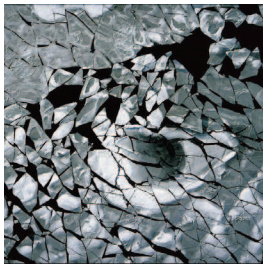
Image of model highlighting the space between.

Through researching the work of Richard Long and reversing the process, an exploration into the space between and provocative qualities of the void has been carried out. Cognitive voids have influenced many architectural designs and will continue to merit exploration in time to come.

Yann Arthus Bertrand, Formation of Sea Ice in the Turku Archipelago, Finland (60 27'N, 22 00'E) 2003

Fold, Drift, landscape

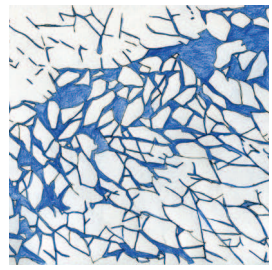
Robert Hebblethwaite

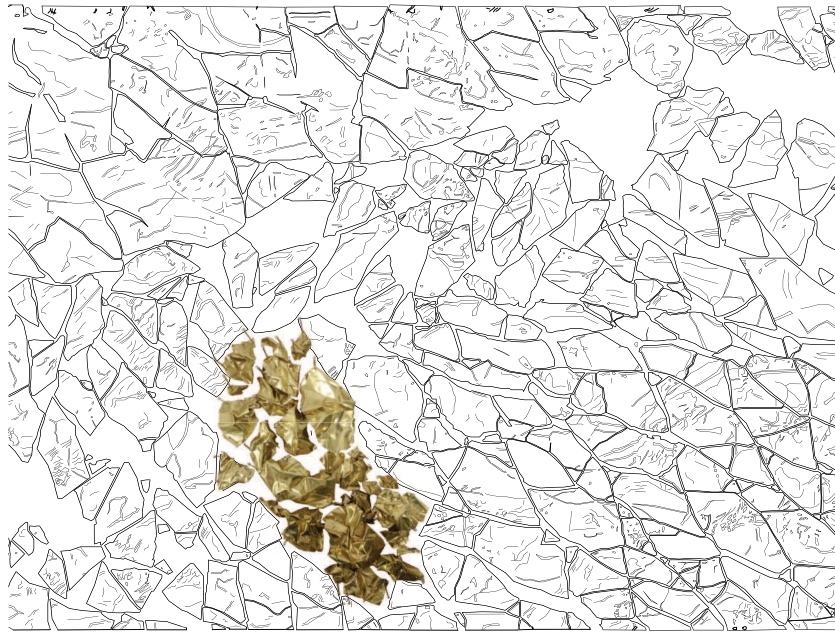


Textured Landscape:

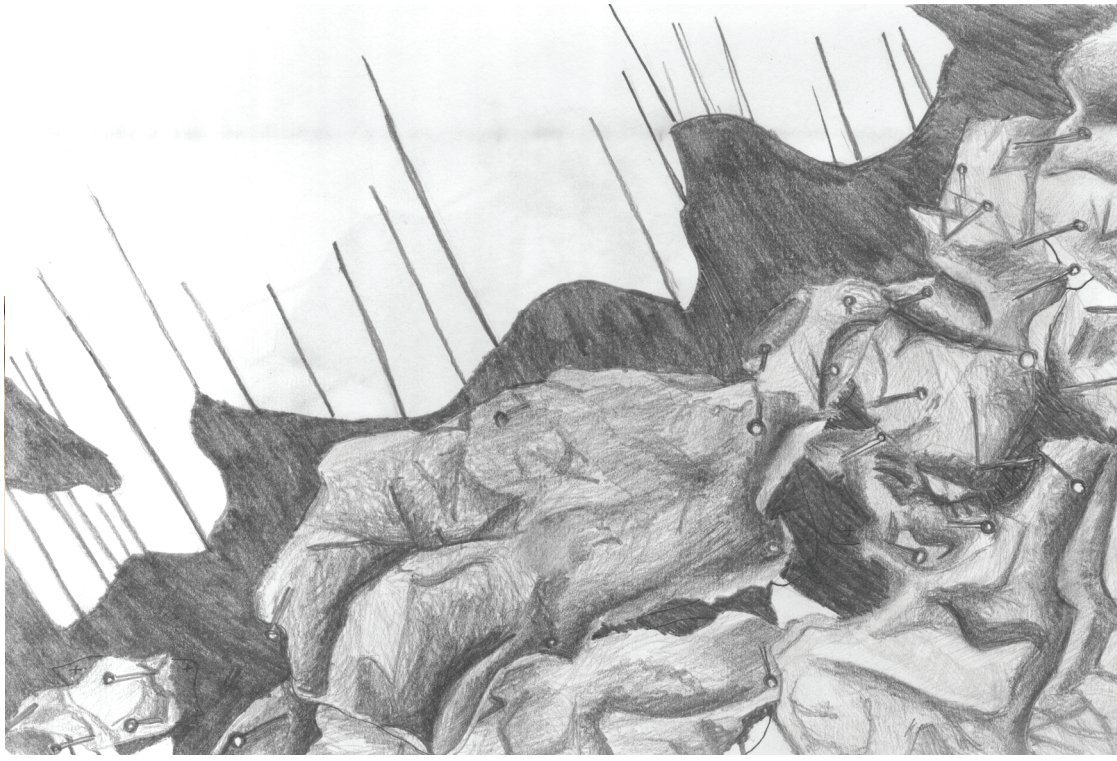
The aerial photograph captures a breaking ice floe in space and time. My first step was to imagine a 3D landscape. The ice flow was reduced to solid/void and lines, nodes, and surfaces. These were transferred to maquettes, by folding and pinning paper and brass. The studies are rich in texture, contrasting with vector line drawings abstracting the ice fragments to creases. The models were photographed to suggest a accreted landscape.

Each fragment is a beautiful object on its own, but only makes sense as part of a greater whole. Diagrams analysed a sample of the image to predict movement in the greater ice sheet.





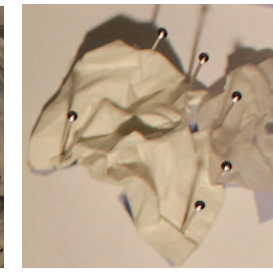
Representing a 3d landscape: Vector drawings and pinned maquette



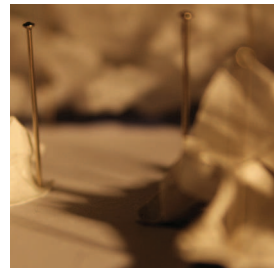
Mid-current

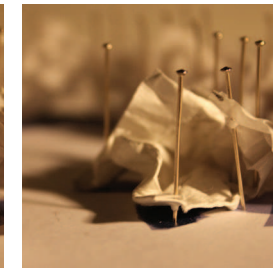
Cove

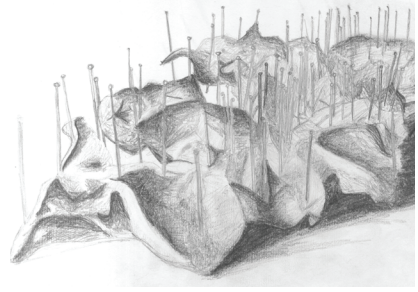
Coastal-Edge



Island/peninsular



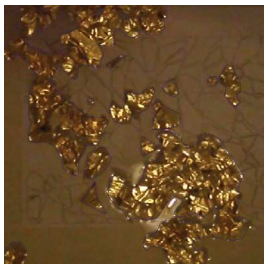




Edge conditions: Plan, elevation, pencil studies

Edge Condition:

Shadow studies and close-up photography reduced the flow to typical conditions: mid-current, cove, coastal-edge, flow-edge and island/peninsular; which all result from drift. Pin shadows imply directional movement within the pencil drawing.

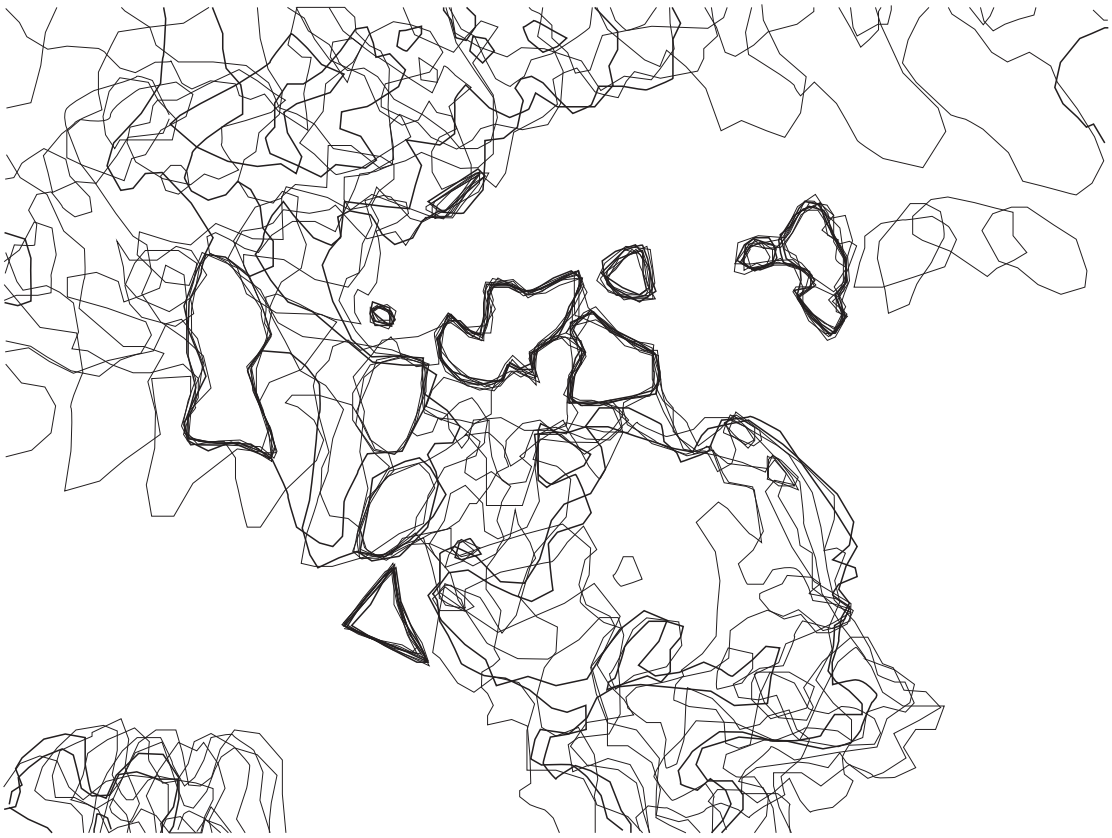


Moving Study:

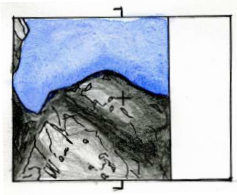
Brass fragments were floated on water. Stills from a video captured movement under both natural (calm water) and driven (wave) conditions. The fragments floated until pockets on their surface filled up with water. Vector stills were made for both natural and driven sections of the film, and layered. Heavy outlines indicate static (sunken) objects.

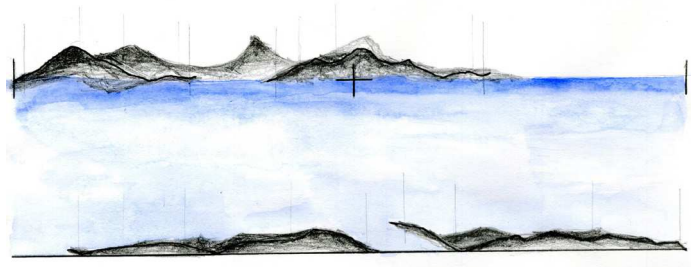
A point on an individual ice berg was tracked, and a moving section drawn. This revealed the berg's changing relationship to the ice around it, and where it passed over sunken fragments.

Themes of landscape, current and drift have informed master planning.

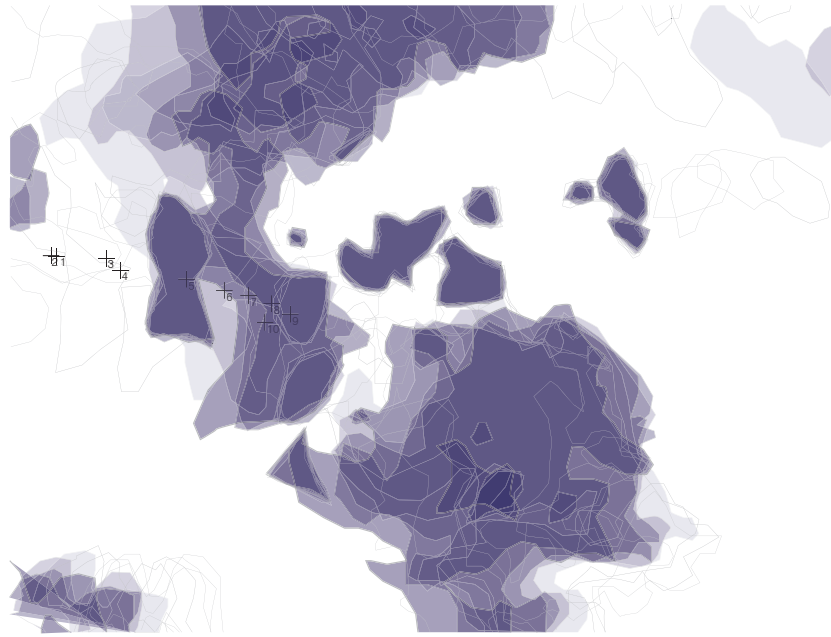


Natural conditions line drawing (10 seconds)

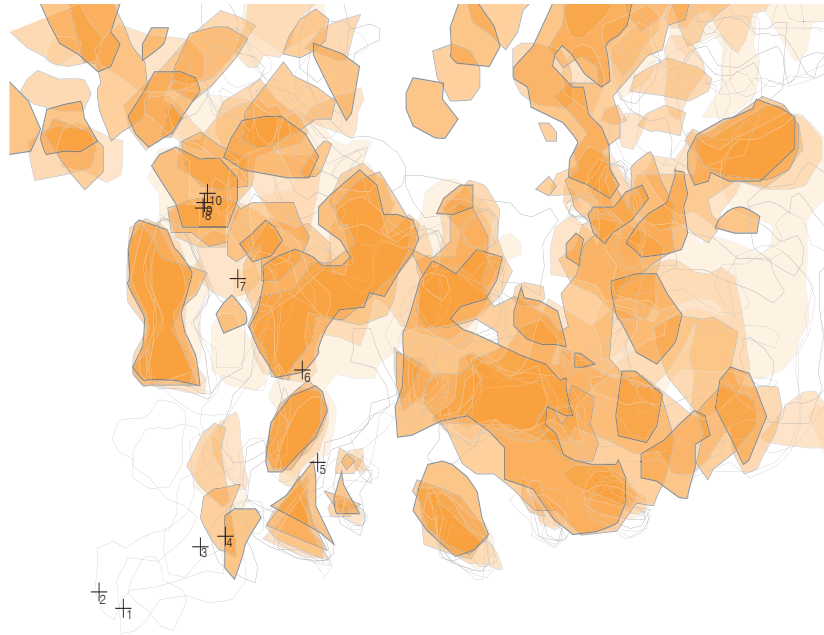




Section through one frame, showing relationship with sunken fragments

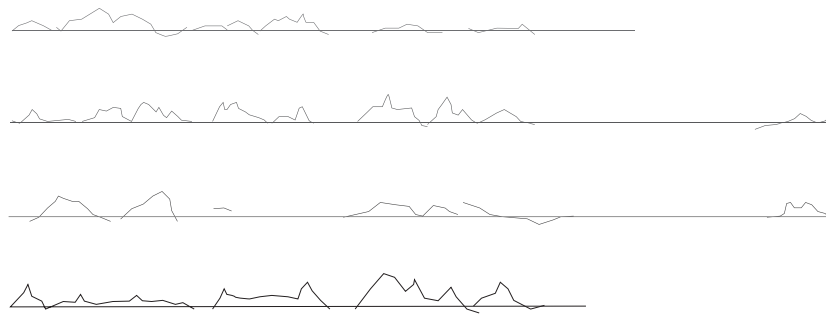


Natural conditions (10 secs)



Driven conditions (10 secs)

Cast impression of landscape



Moving line section (4 secs)

Gustav Klimt, The Park, c.1910

Glimpse, Proportion, Texture, Weathering

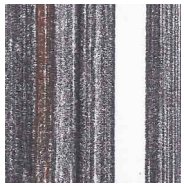
Zoë Herbert

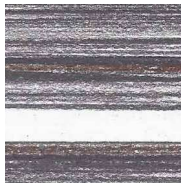
Depth, Form & Glimpse

In the Park, Gustav Klimt has piled high dabs upon splashes of paint, which rise and stretch to fill almsot the entire canvas. The canopy of trees engulf the painting, revealing a small slither of intriguing open space in the bottom left corner. This small glimpse of what could inhabit the space beyond the trees is evokative and intriguing. The lack of revealed space proves successful at capturing the onlooker and enticing them to explore beyond and through the trees. The highly textured, yet repetitous, canopy of leaves that overwhelmes the painting places great emphasis on the small sections of tree trunks potruding underneath their weight.

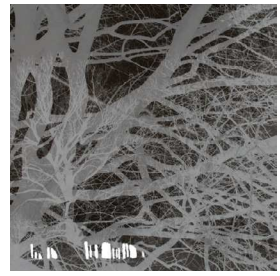
The depth of the scene presented to us can be ascertained by the diminishing thickness of the tree trunks in the background. As the leaves reveal limited information as to the scene being viewed there is greater scope for the imagination to decide what lies beyond.

I began to wonder how this scene might look during the autumn or winter months, when the leaves had fallen. The trees would begin to reveal their form, their skeletons twisting and layering onto one another. I made a model out of accetate, layering up the skeletons of the trees, in order to reveal their shape and extent. The controlled sense of glimpse is broken down through this study, as many more glimpses through the branches of the trees are revealed. They retain the same level of revealed space but in a more natural and uncontrollable way, still witholding us from the scene beyond.





left: pencil study of proportion and glimpse
right: photographs taken from accetate model, highlighting depth and texture



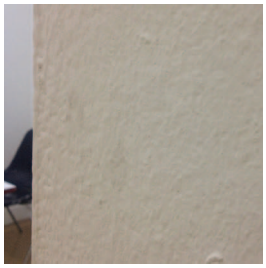
top: accetate model images
middle: depth & form study
bottom left: my own interpretation of the painting using images from Edinburgh
bottom right: depth and glimpse study using pencil

Proportion & Control

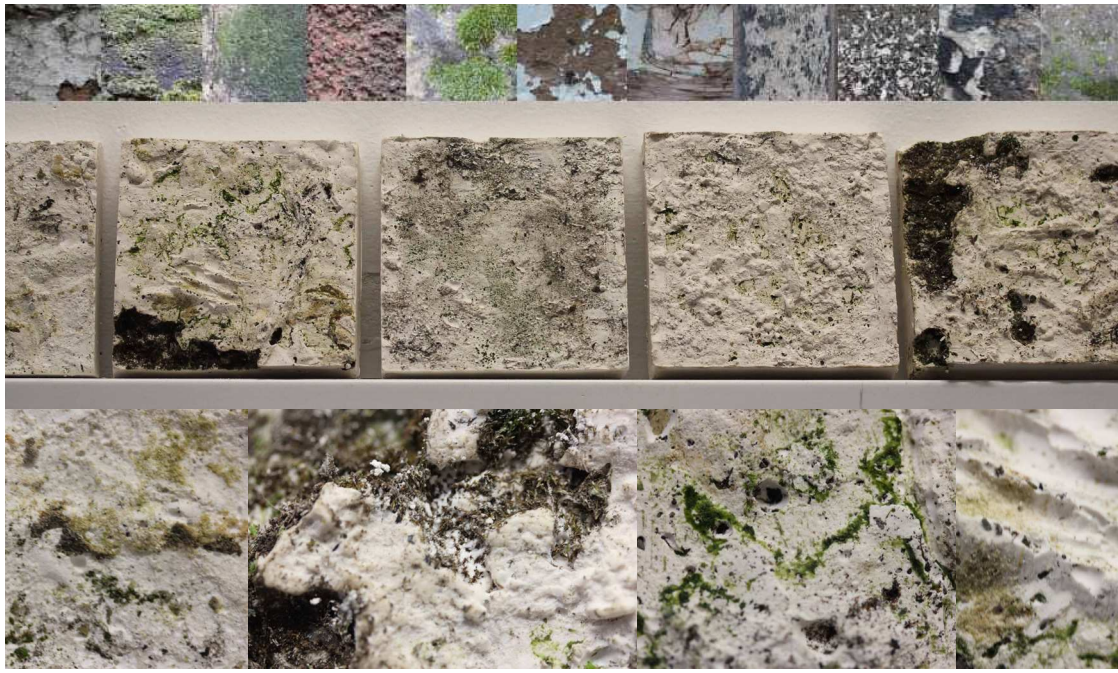
As a brief study to explore the proportion of the painting I fabricated a similar scene using images of a park in Edinburgh. By transferring some of the rules of the original piece onto another scene we can begin to control the amount of informaton a viewer recieves. By the inclusion of a bin in the place of the hedge for example, the viewer begins to gain a greater sense of scene (urban). This introduces the idea of control, not only in how much you allow a viewer to see (quantity), but exactly what you allow (object).

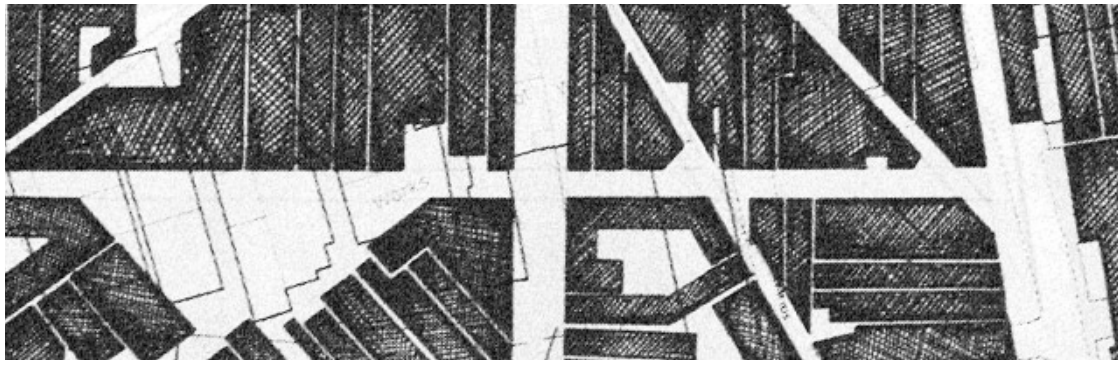
Proportion & Glimpse

The notion of glimpse became a fascinating element of the painting and I wanted to engineer something similar through photography. By witholding a large amount of a space I aimed to evoke the same sense of intrigue and exploration. Depth becomes a particularly important aspect as in reality the eye cannot focus upon two extreme levels of perspective clearly at the same time. To recreate both the textured foreground and a clear glimpse of space beyond, one level would appear blurred. To retain clarity at both levels I therefore had to take multiple images of the same scene. The proportion of glimpse to foreground was retained in order to withold the same amount of information.



left: photographic glimpse study around Edinburgh
right: glimpse study introducing elements of proportion and texture





top: texture and weathering photographic study
2nd row: plaster models of textured/weathered surfaces
3rd row: cast memories of natural weathering textures
bottom: the notion of glimpse being incorporated at a larger scale, in a proposed masterplan for Dalmarnock, Glasgow

Texture & Weathering

Through the fabricated glimpse study it became apparent that the most common highly textures surfaces, which would reflect the dense canvas of leaves, were those that had been heavily weathered over time. These surfaces produced a great sense of depth, texture and often colour. I began to take imprints of these textured, time-beaten surfaces in order to capture the weathering, therefore freezing the effects of time. The casts retained not only the memory of time but also colouful, natural residue from the surface. A lasting memory.

Alexander Calder: Performing Seal, 1950

Balance, Rhythm and Repetition

Aideen Herron

The Performing Seal by Alexander Calder creates the clear impression of a seal playing with a ball.

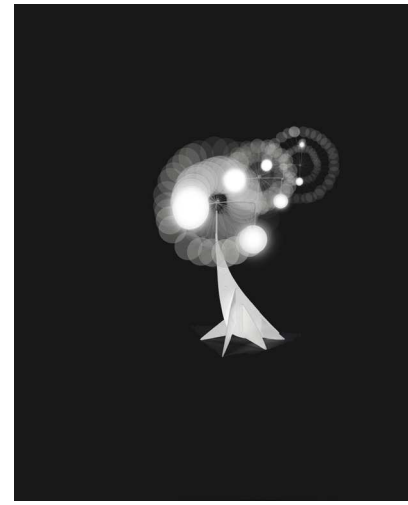
I began by asking myself what is it about this sculpture that creates this effect? Three things came to mind: its colour ,its shape and its repetition.

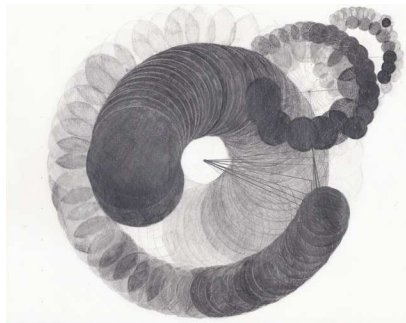
The black colour makes you focus on the shape, which in turn is the essence of the seal; its smooth, flowing shape.

The diminishing size of the ball creates a steady rhythm, reminding one of a ball repeatedly thrown in the air, as poet Edward Hirst stated,
'Rhythm creates a pattern of yearning and expectation of recurrence and difference'.

The sculpture then is a snapshot of this movement, and so I decided to investigate into this idea of balance, rhythm and difference.

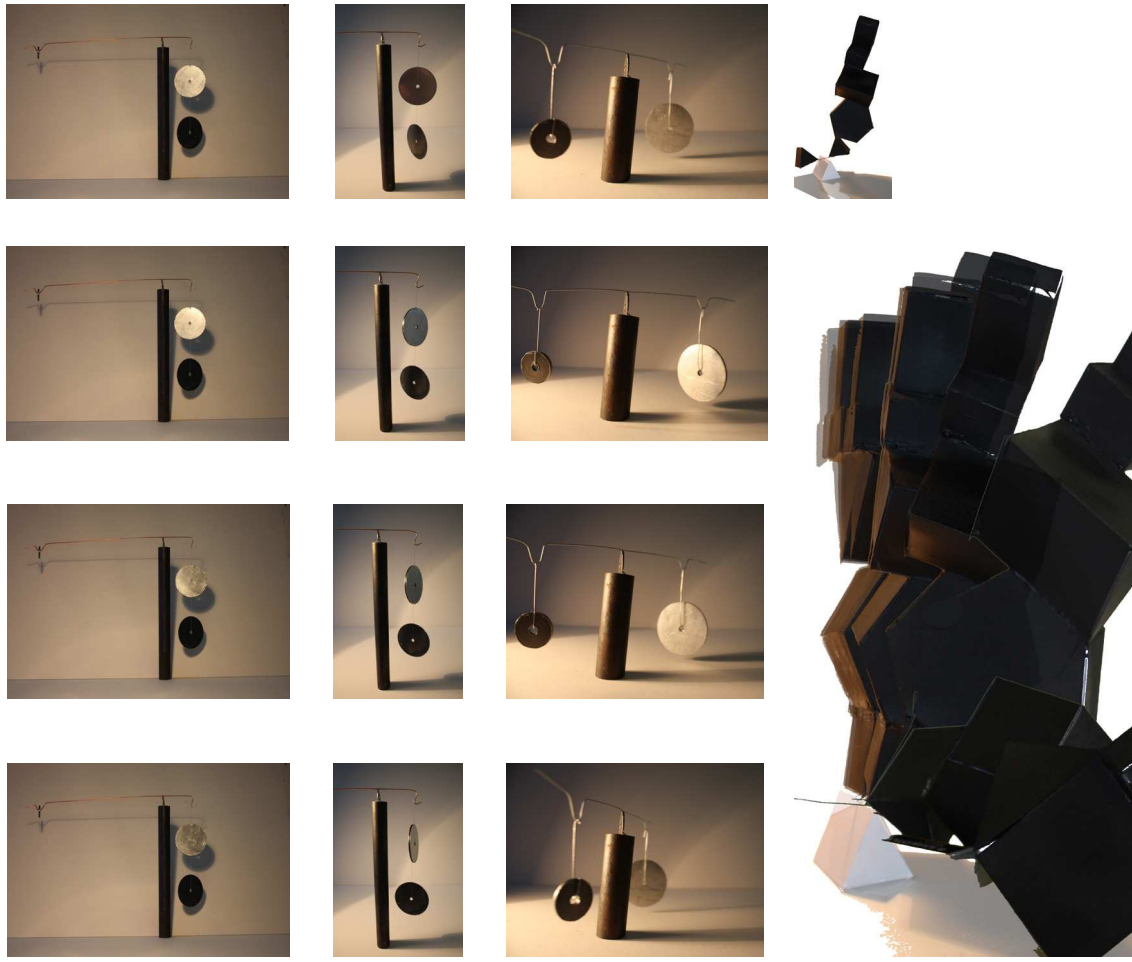
I made some explorations of this by re-creating the rotation of the ball . By inverting the colour, the rotation became even more clear.





Top: Alexander Calder
Opposite: Images exploring rotation and colour

Bottom: Sketch of rotation



Top right: Various pivots examining balance

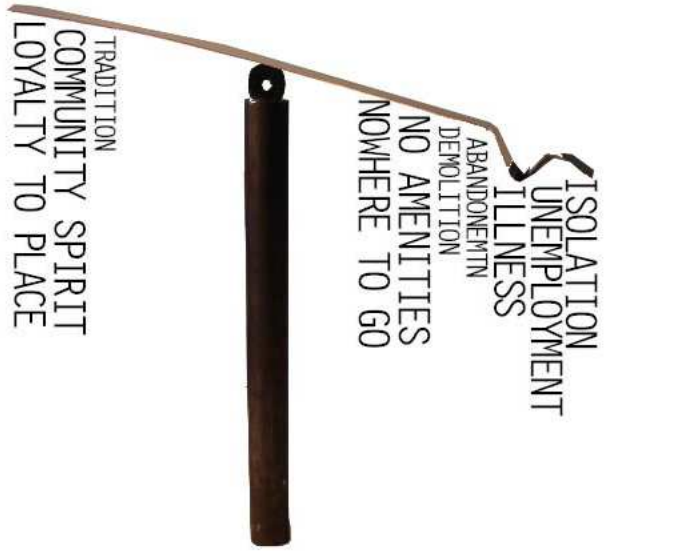
Top left: The primary shapes movement unbalancing

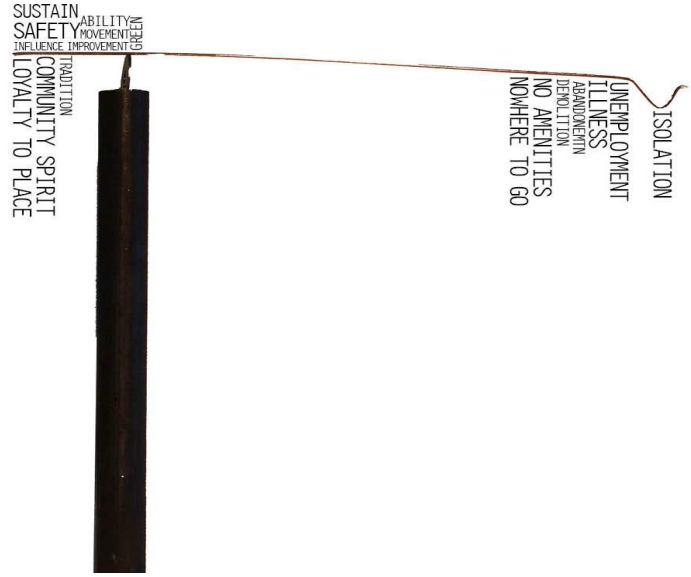
I next investigated equilibrium and balance though creating some of my own pivots. I began with creating a model that examined unbalance and primary shapes.

I wanted to especially investigate how to balance two weights that look like they should not balance. I did this through investigating through weight and distance from pivot with various materials and sizes of circles.

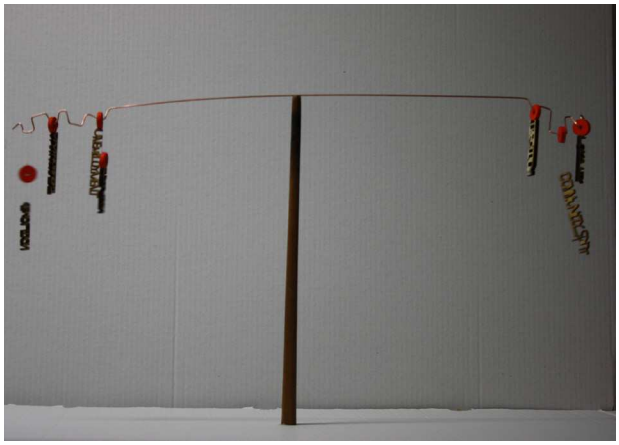
Balance of Dalmarnock

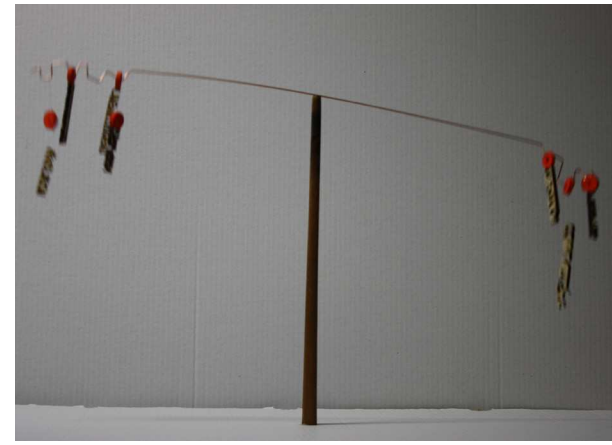
I then began to look at the idea of balance in the context of the community of Dalmarnock. I examined the stories of the online community of Dalmarnock who gathered on the internet to talk about their memories of the area and their wishes for the future. The most common words I then combined in a taxonomy, showing how there were not just sadness towards Dalmarnock, but hope, but unfortunately the bad outweighed the good. The concept is that the balance in Dalmarnock could be restored with the intervention and good will of the council and community.

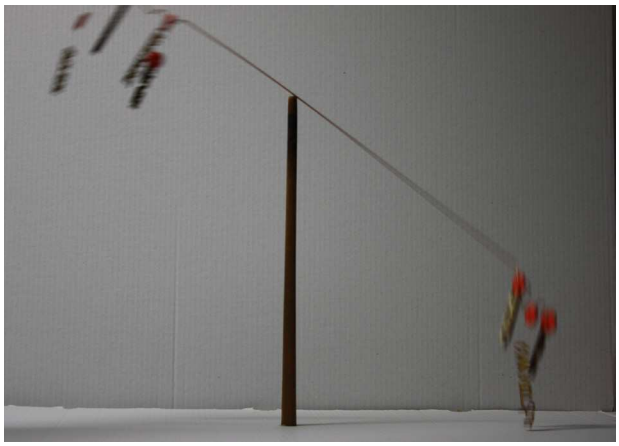


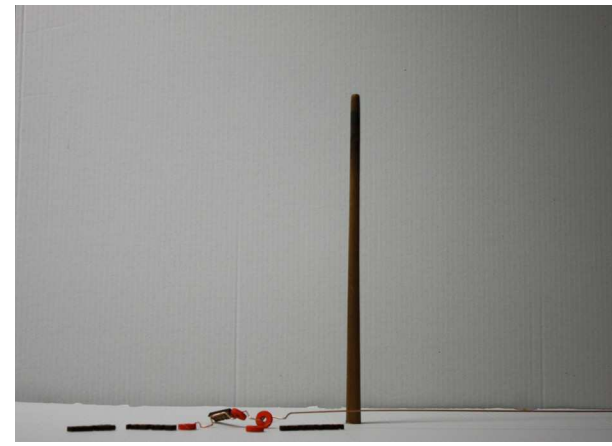


Top image: Unbalanced Dalmarnock
Bottom Image: Balanced Dalmarnock

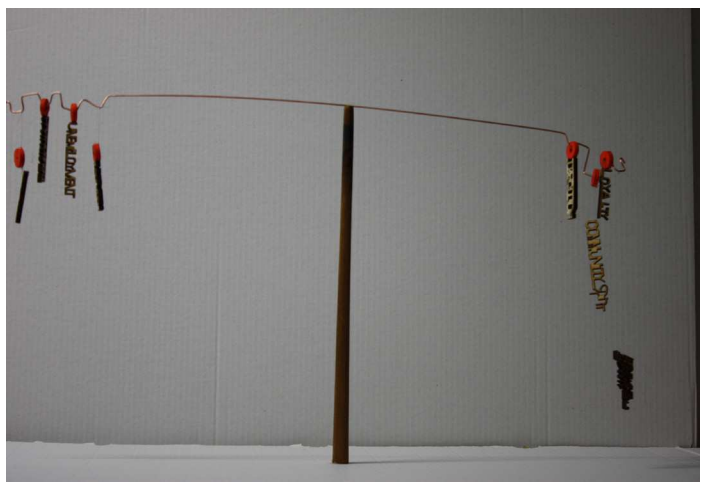




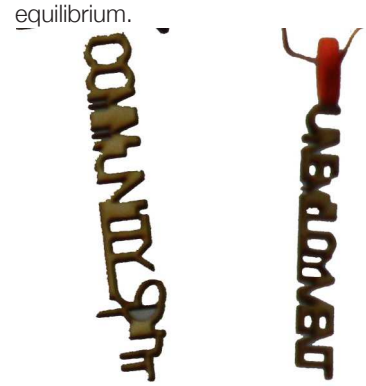




Above: Unbalanced Dalmarnock
Below: Balanced Dalmarnock
Below Right: Examples of the words



The final Make/Create work accumulated into this physical realisation of the previous images . I photographed the model as it became unbalanced and feel, and then in equilibrium.



Yann Arthus Bertrand, Cotton Fabrics Drying, 2009

Regularity and Irregularity

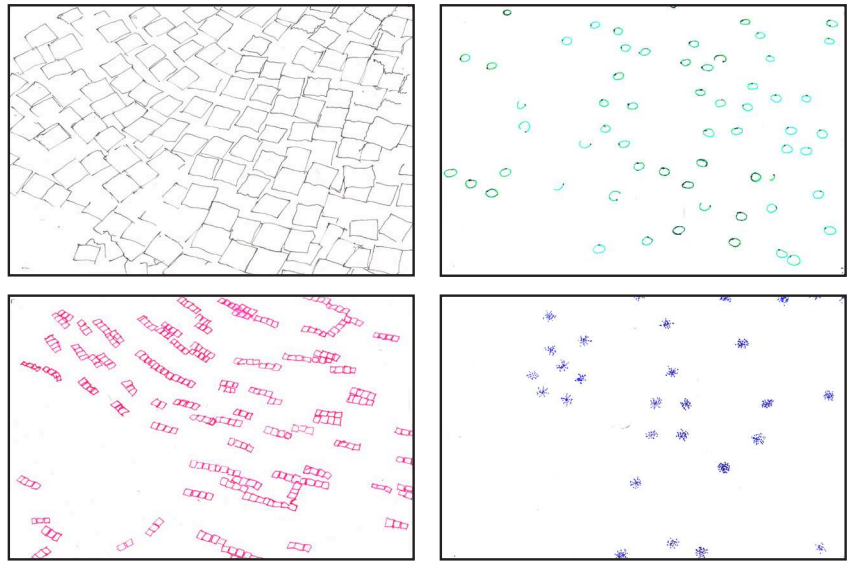
Farihin Jaafar

An Organised Mess

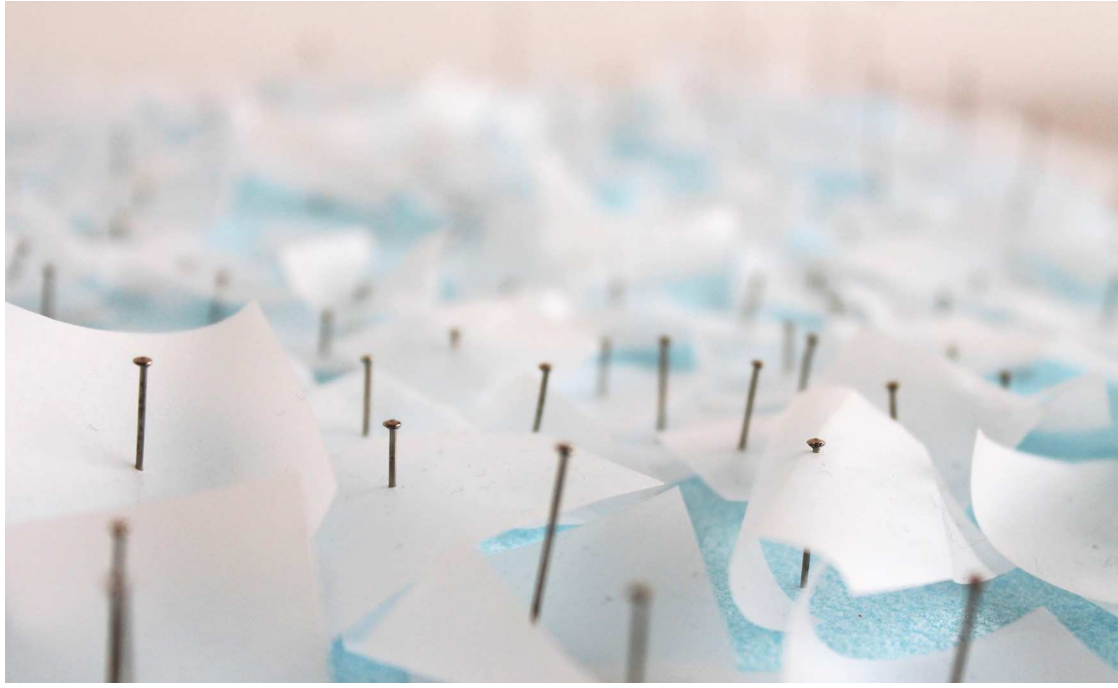
Bertrand is well known for his aerial photography, and this picture is one of his famous photographs that were taken in Jaipur, India. The vibrant colour with mix matching patterns make for a very interesting composition in this photo. One can almost imagine the radial arrangement done by the ladies who are laying it over. But true to the fact no one really knows. Are the arrangements deliberate, or are they random? My take on this photo is seeing it as an organised mess. Organisation in terms of arranging the fabrics; a mess in the mix-match of colour and pattern.

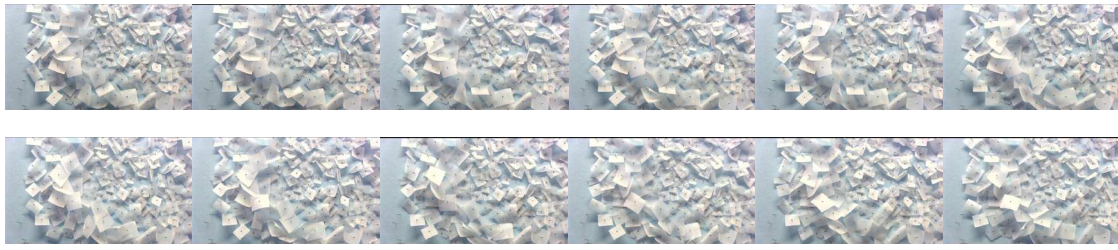
Upon further inspection into the photograph, it is not just the large fabric, different colours, and patterns that make the photograph but also the smaller fabric, and the overlap between the fabrics; the creases and the shadows made by the ladies at work. It is a far richer and busier photo and it is distracting to the eye.

This leads up to my initial study of de-layering the photo with, in my opinion, what stands out the most; the larger fabric, the smaller fabric, the circular pattern and the radial flower-like pattern. By tracing over Bertrand's photo I produced the following drawings below.



Top: Yann Arthus Bertrand, Cotton Fabrics Drying
Right: De-layering drawings





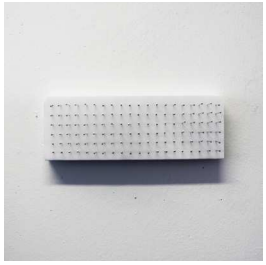
Top: Model Photo
Middle: Video screenshot series of model
Above: Recording movement

Light and Movement

Following the previous study of de-layering the photograph. I did this model by cutting random triangular pieces of tracing paper and pinning it down onto a foam board with pin needles.

The arrangement mimics the radial arrangement on the photograph however the papers are arranged according to sizes as shown in the photographs above. The pins that hold them down vary according to height in attempt to re-imagine the topography of the land where the fabrics are laid out. This study first explores the overlapping nature of the fabrics with each other and its lightness as shown in the photograph.

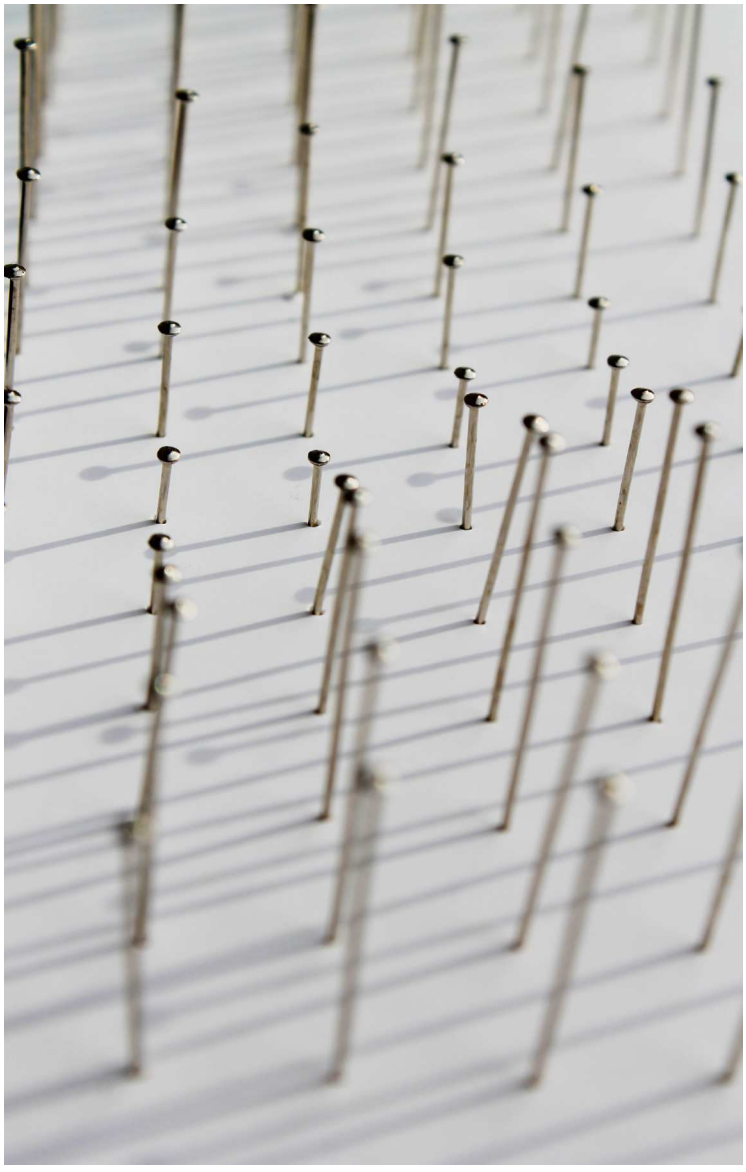
To replicate the lightness I took a video of the model being blown by air from a hair dryer. The constant movement of the tracing paper makes for a very interesting video that record random movements and sometimes spinning of the tracing paper as it is held down by the pins. The photo series above are the screenshots of a 2-minute video made for this study.

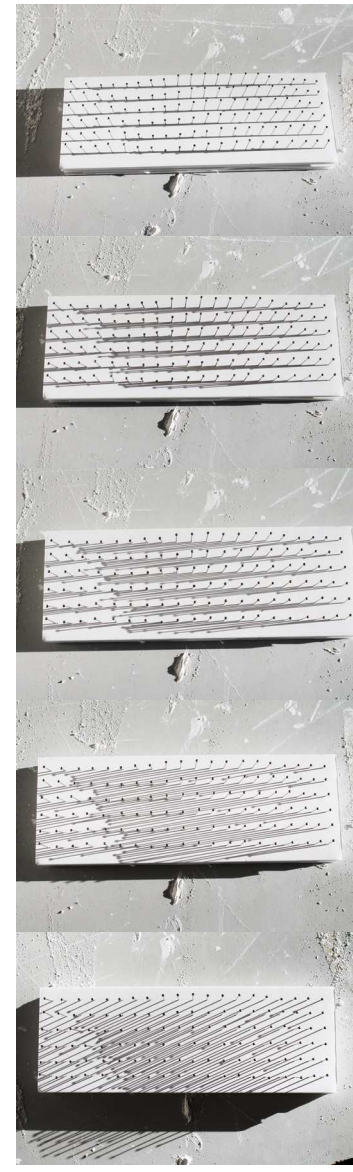


Shadow and Pattern

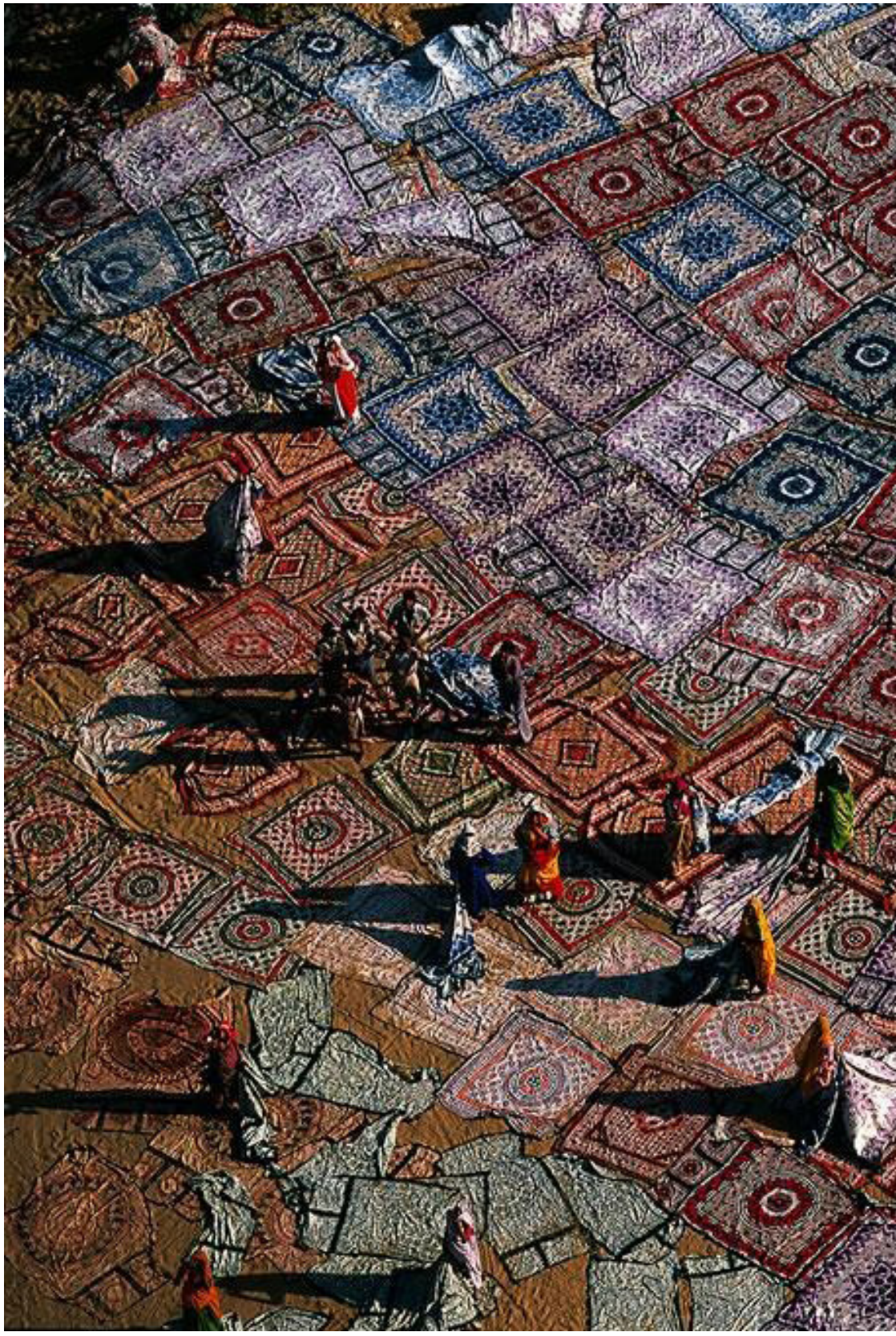
For this study, I have used the same pin needles and arranged them individually 1cm apart with varying heights as a follow up from the previous study with the lightness and movement.

With this model, I placed it against the sunlight to produce patterns, and the varying heights shows an interesting shadow pattern cast onto the surface of the model. Consequently, by slightly changing the angles of the model, it dramatically changes the patterns made by the shadows as shown in the photo series below. This captures the very essence of pattern and regularity of the Bertrand's photo.





Top: Pin model
Above: Photo series showing shadow patterns



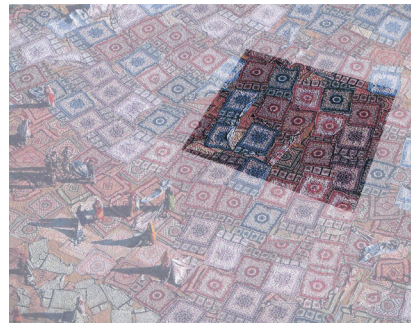
Yann Arthus Bertrand, Cotton Fabrics Drying in the Sun, Jaipur, Rajasthan. 2009

Geometry+Distortion, Layering, Translucency

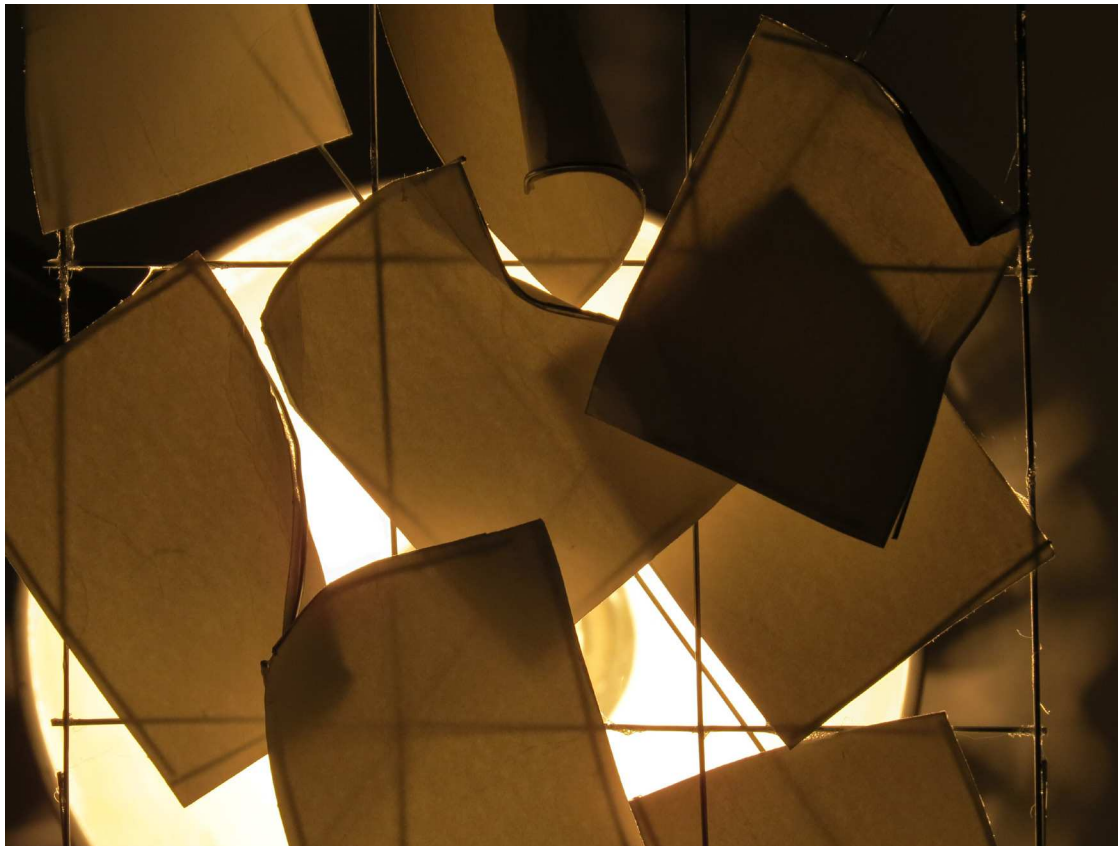
Lewis Kelly

I chose this piece as it stood out to me as one of the most beautiful of the collection. I enjoyed the rhythmic repetition of the carpet, the colour and pattern, and the exoticism that the photograph captures. Looking for some tectonic expression within the piece, I decided to analyse a small section of the photograph, as highlighted below. Looking closer it becomes clear that the rhythmic, geometric grid apparent from afar is in fact nonexistent; the true nature of the carpets is much more complex. The repetitive elements - which, laid side by side promised a structured geometry - are in fact layered above one another, overlapping and distorting the apparent grid. Many of the elements are abstracted into the 3rd dimension, their shapes becoming quite ambiguous as the 2D geometry is folded. This complexity - the distortion of geometry and the layering of elements, were of interest to me as tectonic concepts.

Cotton Fabrics Drying in the Sun, Yann Arthus Bertrand.

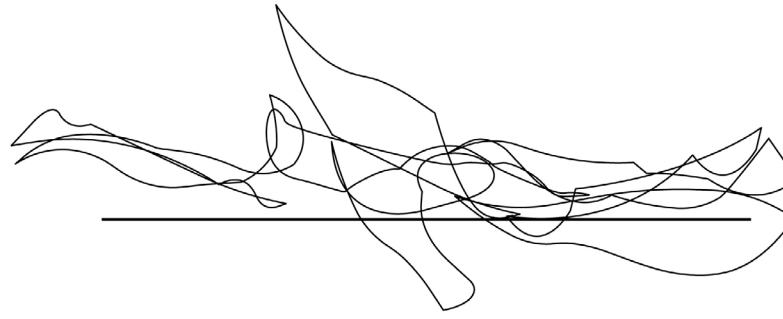


The section of the photograph analysed, accompanied by watercolour sketch.



A close up of the model created from the photograph section.

I decided to model this section of the photograph, keeping to the shapes and relationships of the carpets as accurately as possible while emphasising the idea of distorting the geometry of a grid. Built of a wire frame and curving paper planes, the model explored the possibilities of spaces created between overlapping planes, and the possibility of an undulating landscape created through the distortion of a 2D surface into 3D. Intending to emphasise the sense of a geometric grid distorted through these planes, I explored the use of light to cast a silhouetted shadow of the frame onto the curved surfaces. The changing angles of the light subtly changed the translucency of the planes, and so while visible and geometric to begin with, the frame began to disappear as it curved and distorted over the surfaces.

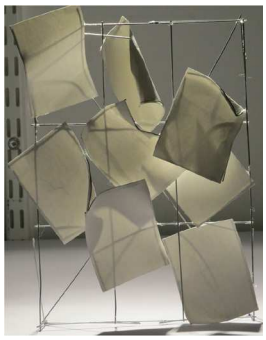


A section of the model; the planes create an exciting undulating landscape.

An example below shows the distortion of the frame over the planes when the light is shining at an angle of 30 degrees. The distortion of the geometry here is already quite pronounced. Mapping this projection of the frame over four different angles at 25 degree increments - 5, 30, 55, 80 - I built up a survey of the distorted frame against the strict geometric grid.

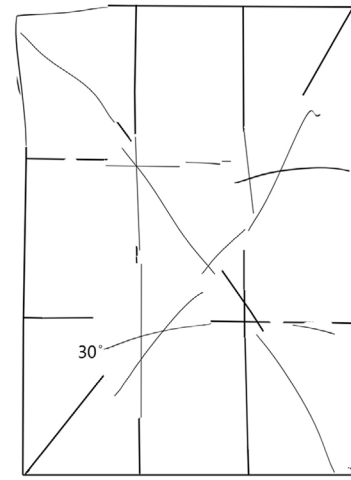
5 degrees

30 degrees

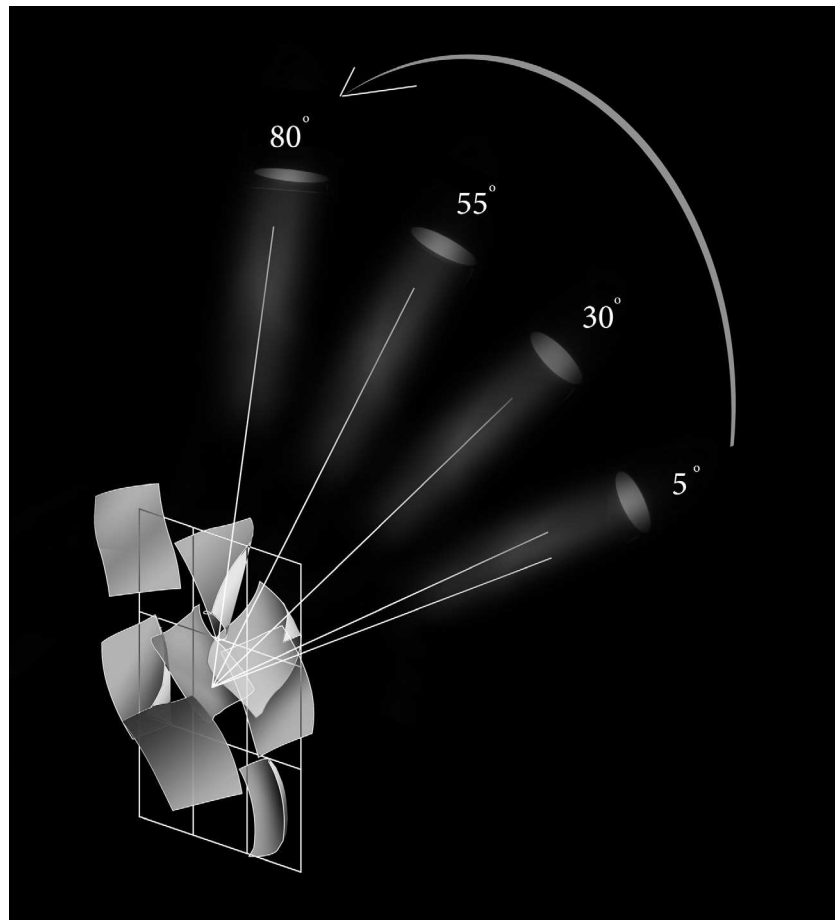


55 degrees

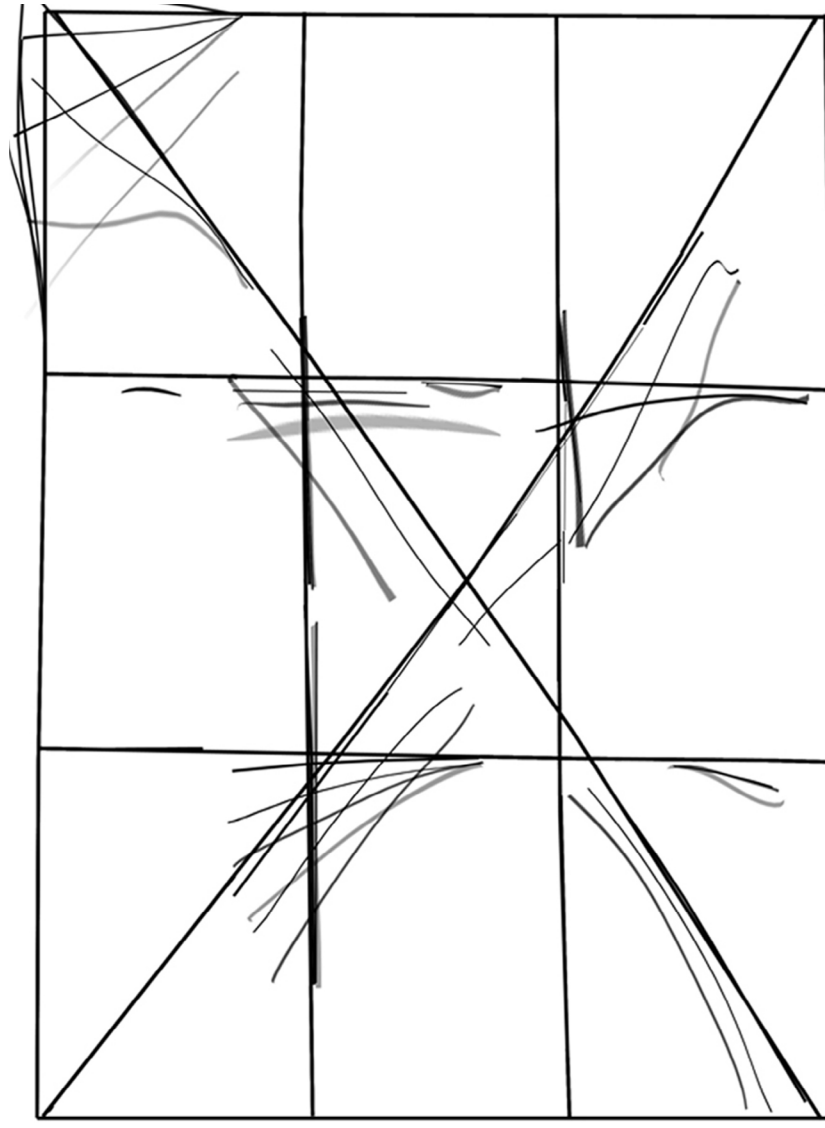
80 degrees



Model and its accompanying distortion diagram at 30 degree light angle.



Computer-drawn diagram of the light study.



The final distortion diagram.

This final diagram maps the distortion of the frame cast by the light study at 5, 30, 55 and 80 degrees against the geometric grid. It captures the relationship between the structure and the planes beginning to explore the concept of the distortion of geometry, the breaking of boundaries and rules imposed by a rectilinear grid. This, coupled with overlapping, layering of elements from the model, and the changing translucencies of the planes, are interesting to me as possible concepts for an exciting architectonic expression.

Carsten Peter, Mud Cracks, 1999

Tension/Compression, Flow and Movement

Scott Lawson

Natural Process

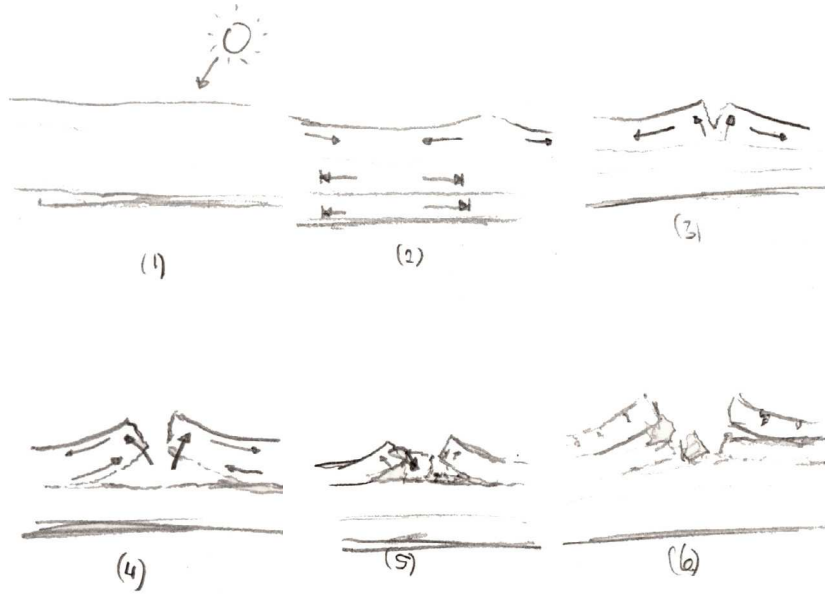
Carsten Peters 'Mud Cracks' Image captures the beautiful and random geometric patterns produced when an area of soil has been rapidly fried by the sun. No two segments produced in the mud ever match, but due to their formation they have a geometric correlation with all their immediate neighbours. Endless, sometimes long, cracks produced between each panel result in harsh contrasts and shadows forming a diverse, interesting and pleasing array of lines from an otherwise dull and lifeless plane. In response to the image, research was carried out into the formation of these beautiful arrays, ultimately leading to the discovery that the process of formation behind every segment in the Composition is very iterative and simple.

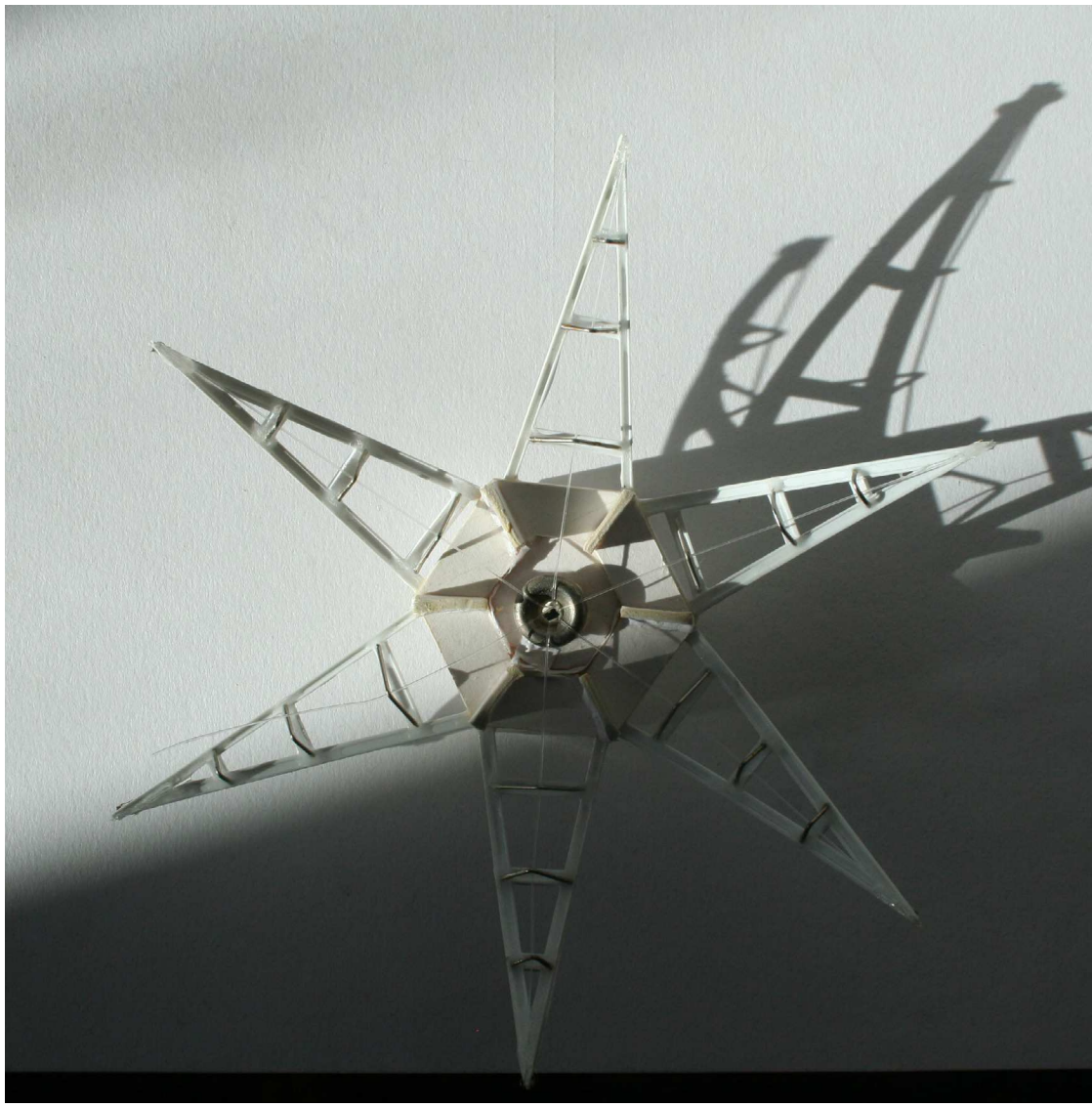
The process is driven by the primary force of tension formed Water rapidly evaporates out of the upper layers of soil due to the prolonged heating by the sun, pulling the individual particles together (tension). This evaporation occurs at a far quicker rate than the corresponding lower layers, resulting in both compressive and shear forces in these layers. The combination of all these forces result in multiple dispersed bending moments throughout the soil mass. Eventually these bending effects break a once complete surface into multiple segmented panels of soil whose sides correspond to each one another as they pull away from each other. Variances in the size of cracks are the result of replication of this process on multiple scales.

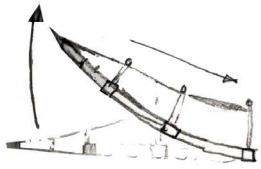
(Top) Mud Crack by Carsten Peter

(Right) Mud Crack Formation:

(1) Flat Soil Mass Dried by Sun.
(2) Differential Forces Produced due to faster evaporation of moisture in top layers.
(3) Cracks Form due to increased stress between layers.
(4) Evaporation increases, bending moments lift upper layer.
(5) Edges begin to fail due to lack of moisture.
(6) Wide, varied cracks between panels occur.







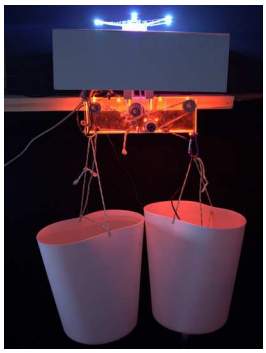
(Top): Single Panel Construction
(Above): Movement Structure Sketch

Imitating Nature

My take on making something from the original image was to try and copy the process closely in a mechanical fashion. It had to be driven by the force of water in some form and show the process in an easy to understand and enjoyable manner.

This process started with production of a single panel. A hexagonal based form was chosen due to its ability to produce a somewhat circular shape, a flat surface if arrayed and a manageable geometry. Six identical arms are connected to each side of the base, forming the bulk of the panel. Clear fishing line tendons are added to these arms so that when they are pulled (in tension) towards a central point, they cause compression in the less flexible plastic layers underneath and so force the arm structures to bend, rising towards the centre of the panel.

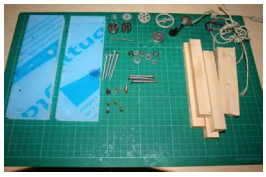
The limited flexibility induced in the plastic material and its section results in a spring action, meaning as tension is reduced in the clear tendons, they move back to their original position.

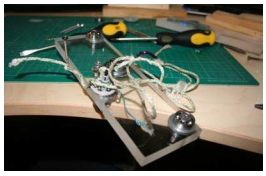


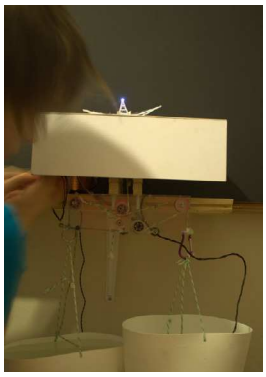
Water Driver

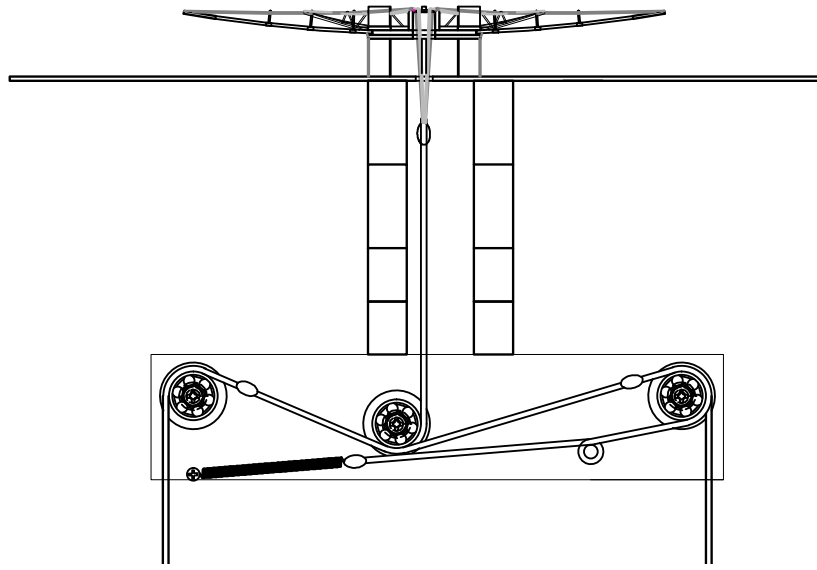
The next major problem was to find a solution to make water drive this mechanism. It took 3 iterations and a few accidents, but a pulley mechanism with ball bearings amongst other components was fabricated to turn the weight of water in a tub representing the top layer soil water content to produce sufficient force to offset the weight of a counterweight tank (the water content in the bottom layer) and pull the panel structure tendons.

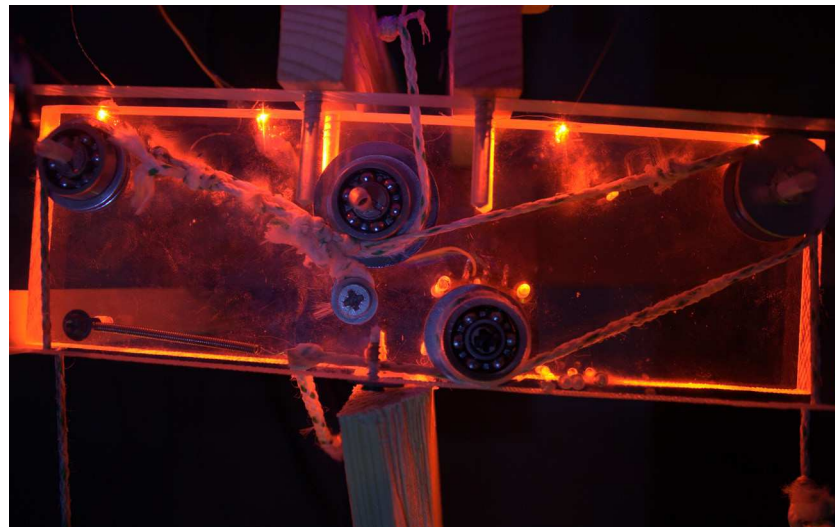
The final revision requires some 20l of water - producing 284N of force to achieve this (offsetting 15l or 211N from the counterweight tub).





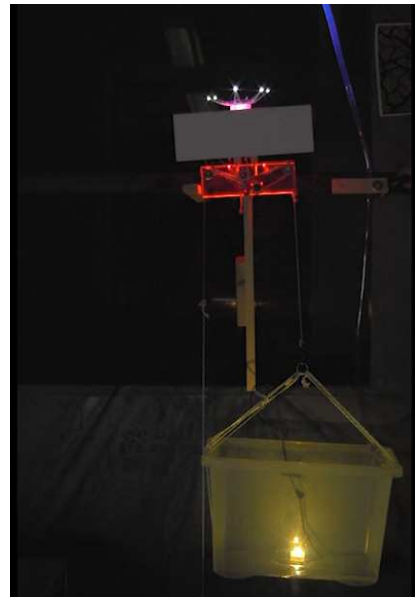






(Upper Top) Overall Design
(Middle Top) Components Laid out for construction
(Lower Top/Above) Construction Photos
(Upper Middle) CAD Drawing showing the primary components. The lower line attached to the spring is for later included electronics.
(Right) Final Design - transparency shows off the mechanics as they move.

(Top) Temperature Light Conditions
(Above) Electronics under board
(Right) Full Model Setup. Upper layer tub shown is empty so panel is 'formed' due to lack of counter force to remove the tension from the panel tendons.



Automation

As a final extension to my project it was decided to automate the whole process of filling and emptying tubs along with added lights for increased readability. Lighting reacts to different conditions, with a blue/red shift below the panel indicating core temperature and smaller lights fading depending on water content in the upper layer. This allows the machine/sculpture to work independently whilst looking attractive and readable at night.

Light, Planes and Folding

Rohana Mackenzie

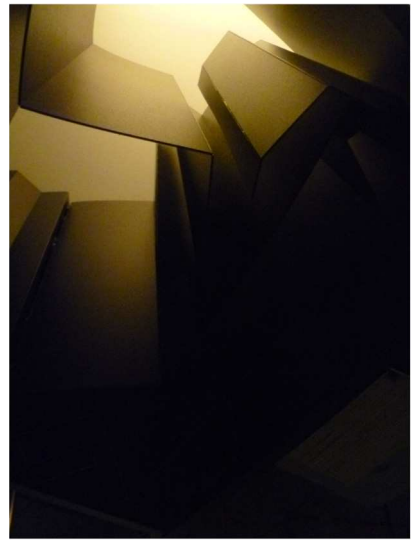
Wyndham Lewis was the self-proclaimed leader of the Vorticism movement; this style was concerned with creating a British alternative to the European Cubist and Futurist art movements.

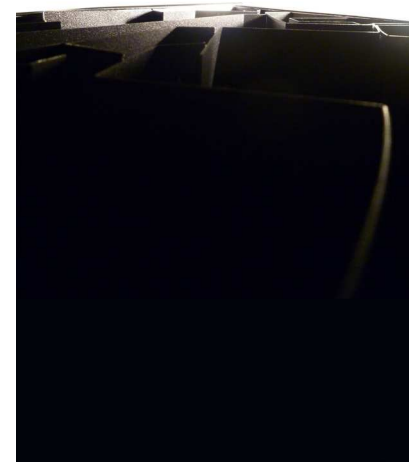
The artists of this movement harnessed the language of abstraction to convey the industrial dynamism they associated with the vortex of the modern city. They worked in a vibrant and distinctive style that combined machine-age forms with energetic geometric imagery and three-dimensional illusionism.

My first step when looking at this painting was to investigate the solid enclosing lines that maintain a sense of control over the contrasting colours and harsh angles. I saw these line as strong contours that could within a model give a sculptural solidity.

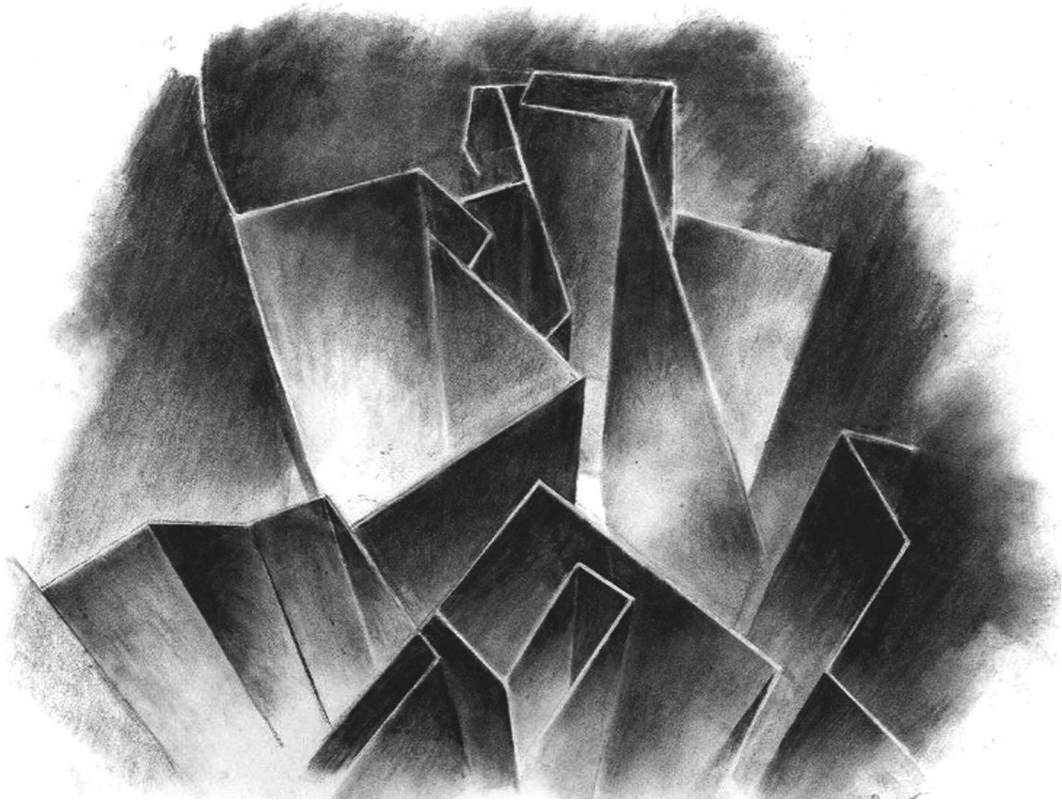
Within my model the lines fold and interact forming supporting planes. I intentionally used a material that would both reflect and absorb light dependant on conditions. I experimented with various lights and materials to see how light fell on the planes and how a sense of depth could be created.

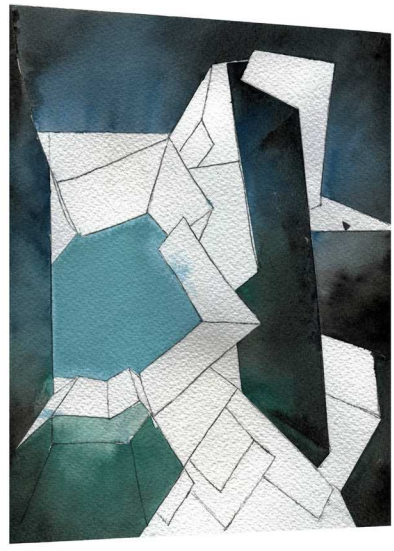
With the bottom right image I was playing with perspective and how when seen from a different angle the lines could be seen as pathways.





top: Wyndham Lewis, oil on canvas
right: model photographs





With the top image I worked with charcoal to gain a more in depth understanding of how the light was affecting the different surfaces. I saw this study as a pattern that could extend as far as you wanted it to.

The watercolour painting to the left shows how colour affects the original model. The depth and intensity of the contrasting colours is revealed within the segments that I have picked out.

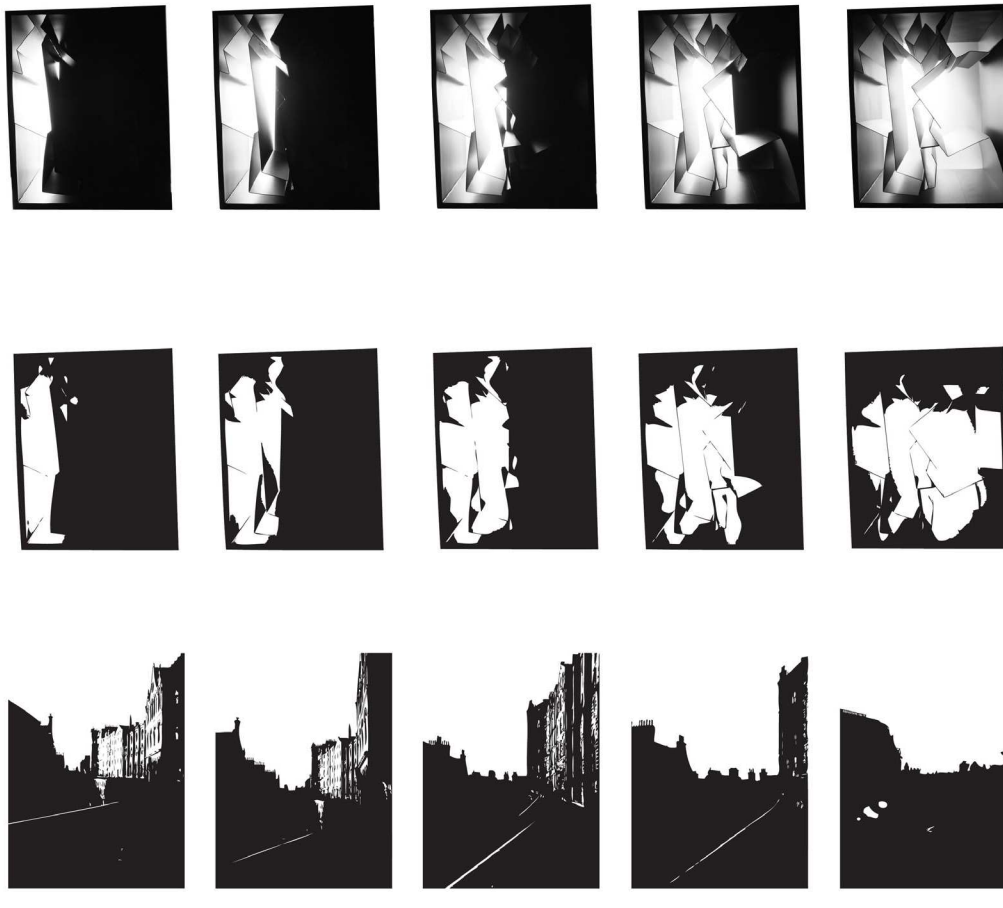
top: charcoal drawing
right: watercolour painting

Below you see a photographic study, more light was gradually introduced behind the model which both highlighted areas and reflected off the surfaces.

I found the light hitting off planes particularly interesting, so I went out in Edinburgh to find examples of light hitting off buildings.

The bottom row of images shows my journey down a curving street, in the first image you can see the highlights on the faces of the buildings but by the last image all is in shade and dark.

I also appreciated the control of light from above in an Edinburgh close, it reminded me of the tunnels within my model (image to the left).



top: Edinburgh close
above: light study

above right: layered images
above left: generative lines
and shapes

When I layered the series of images from my light study on top of one another I began to pick out interesting forms and pathways.
Top left shows the lines that are obvious as being left out, memories of the contours within the model.
In the middle drawing I have picked out blocks that allow thin paths and openings of varying size between them.
In the bottom diagram I have taken my own routes through the layered image, routes that create tension and dynamic spaces.

Andy Goldsworthy, Ice Arch 1982

Laminating, Light and Erosion

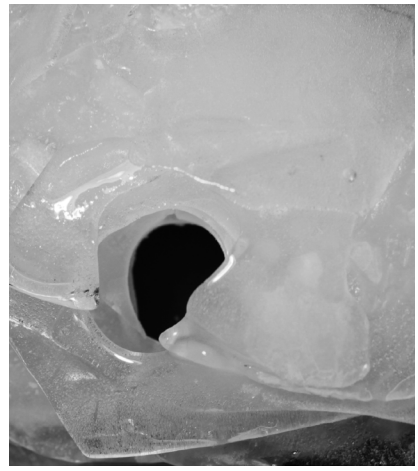
Paula Madden

Laminating

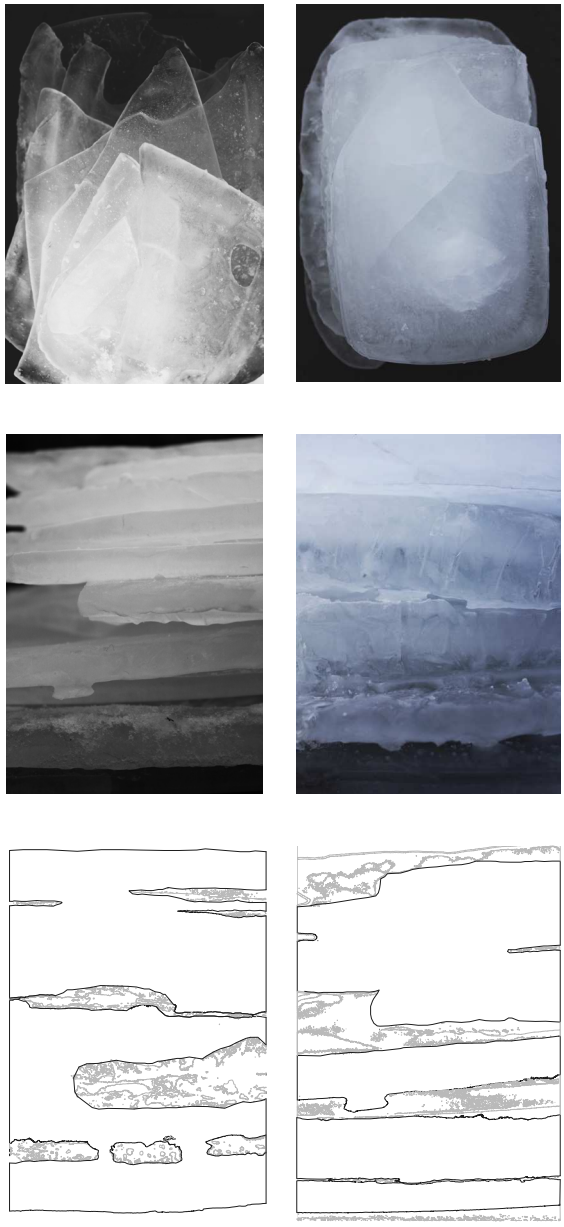
The first stage of my investigation was to explore the construction of how the Ice Arch was created by producing my own ice sculpture. This featured a tectonic of laminating; each fragment of ice would be layered on top of another, melt and freeze again. This process allowed a series of ice fragments to become a solid, a series of laminations.

Light

In addition to the ice's tectonics; I wanted to capture the natural beauty of the material through photography, as captured within the original piece. The main quality of the ice is its ability to reflect and capture light: this became the aim of my photography studies. I explored photographing the sculpture as an overall object and more zoomed into details of the layers.



(Top right): process of laminating
(Right) Ice reflecting the light



The next stage in my make and create process was to explore the weight and build up of the ice laminations. I created two more ice sculptures, one with thicker laminations than the other, to explore the difference on the light and sections through the layers.

Having created these laminations I wanted to further reveal the tectonic and nature of the layers. In order to do this I decided to carry out an experiment for eroding these layers in order to reveal the laminations in more detail.

In order to achieve this erosion I tried three different ways of eroding through the ice with heat. 1. A heated metal bolt. 2. The heat from a burning candle. 3. A heated piece of coal.

(Above) Images of sculpture in plan, elevation and a drawn section.

Experiment

0 Mins

2 Mins

4 Mins

6 Mins

8 Mins

9 mins (Bolt)

0 Mins

2 Mins

4 Mins

6 Mins

8 Mins

9 mins (Bolt)

10 Mins

12 mins (Candle)

0 Mins

2 Mins

4 Mins

6 Mins

8 Mins

9 mins (Bolt)

10 Mins

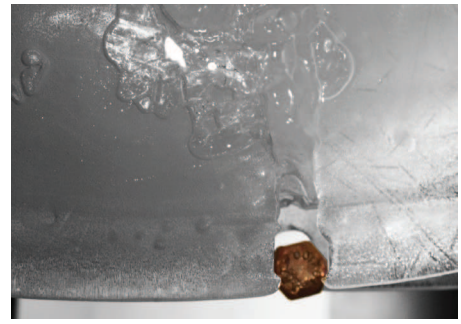
12 mins (Candle)

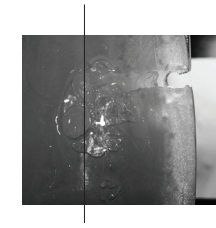
14 Mins

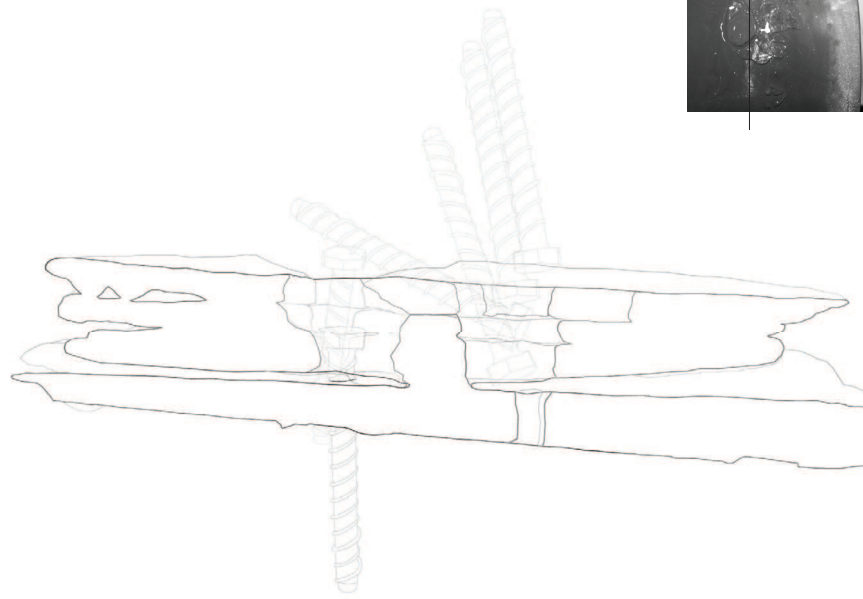
17 mins (Coal)

Video stills from experiement mapped against each time period for erosion.

1. A heated metal bolt

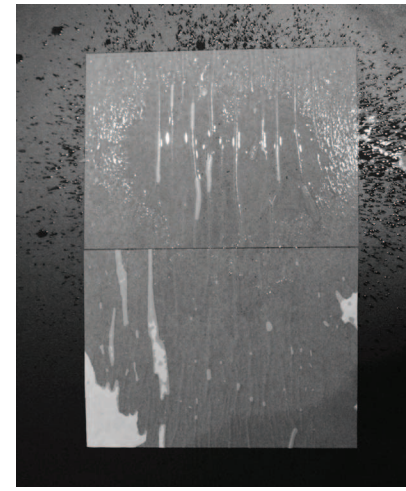


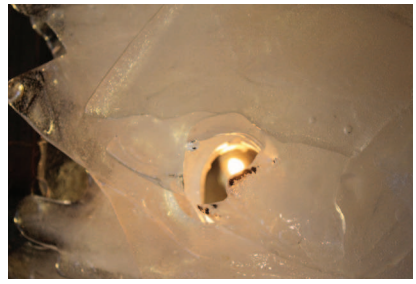


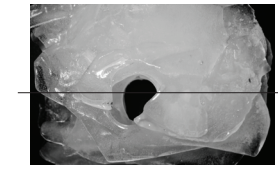


(Top Left) Bolt moving through ice. (Top Right) Drawing produced from experiment. (Right) Section showing bolts movement.

2. Burning candle

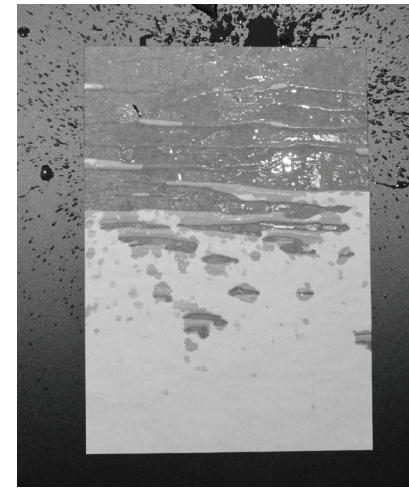


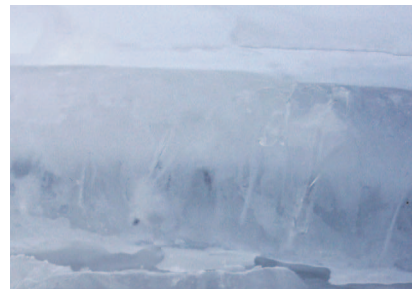


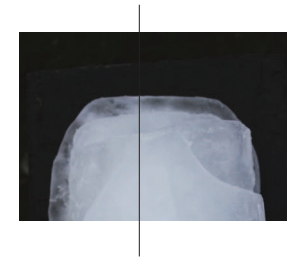


(Top Left) Candle burning through ice. (Top Right) Drawing produced from experiment. (Right) Section through ice.

3. Heated piece of coal







(Top Left) Coal's passage through ice. (Top Right) Drawing produced from experiment. (Right) Section through ice.

Black Ice

Jamie Marshall

Andy Goldsworthy (above), Ice Arch (1995) (right).

Goldsworthy studied fine art at Bradford College of Art (1974–1975) and at Preston Polytechnic (1975–1978) (now the University of Central Lancashire) in Preston, Lancashire, receiving his Bachelor of Arts (B.A.) degree from the latter.

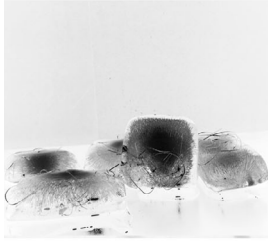
Photography plays a crucial role in his art due to its often ephemeral and transient state. According to Goldsworthy, “Each work grows, stays, decays – integral parts of a cycle which the photograph shows at its heights, marking the moment when the work is most alive. There is an intensity about a work at its peak that I hope is expressed in the image. Process and decay are implicit.”

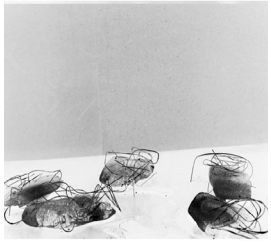
The materials used in Andy Goldsworthy’s art often include brightly coloured flowers, icicles, leaves, mud, pinecones, snow, stone, twigs, and thorns. He has been quoted as saying, “I think it’s incredibly brave to be working with flowers and leaves and petals. But I have to: I can’t edit the materials I work with. My remit is to work with nature as a whole.”

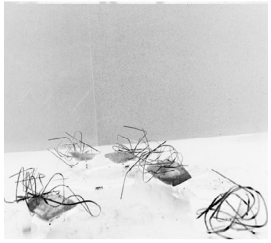
Goldsworthy is generally considered the founder of modern rock balancing. For his ephemeral works, Goldsworthy often uses only his bare hands, teeth, and found tools to prepare and arrange the materials; however, for his permanent sculptures like “Roof”, “Stone River” and “Three Cairns”, “Moonlit Path” (Petworth, West Sussex, 2002) and “Chalk Stones” in the South Downs, near West Dean, West Sussex he has also employed the use of machine tools. To create “Roof”, Goldsworthy worked with his assistant and five British dry-stone wallers, who were used to make sure the structure could withstand time and nature.

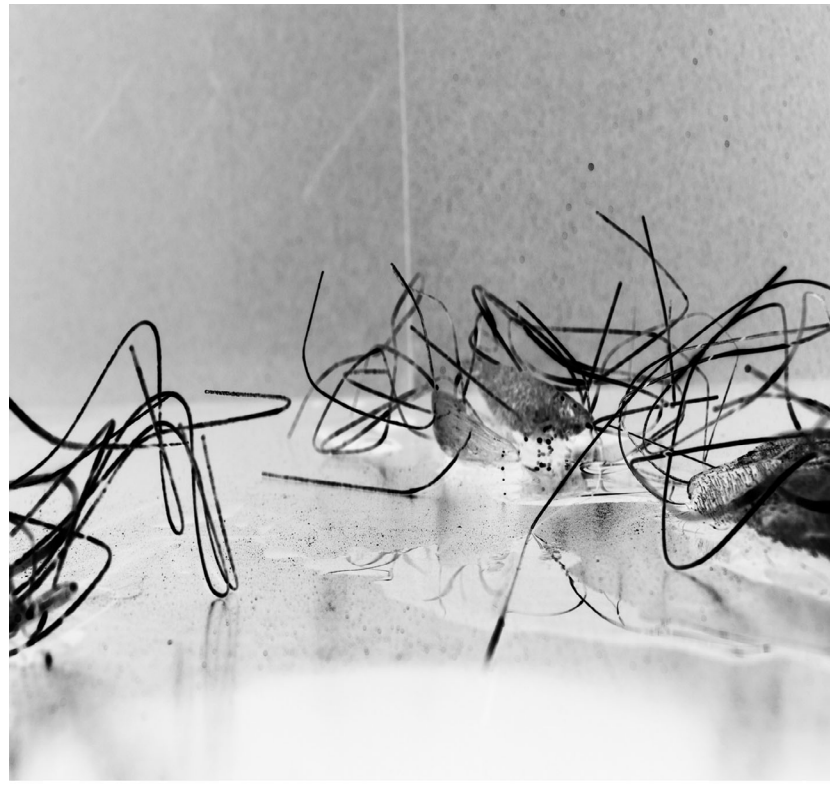
My Initial response to the Ice Arch was that it was a temporary sculputure and that eventually the form of the slabs of ice would change as it melted. The idea of erosion informed my first investigation into this project, where I created my own ice sculpture and used photography to document the change in form of the sculpture.

The images preseted below provide a summary of the ersosion of the ice over a period of several hours.





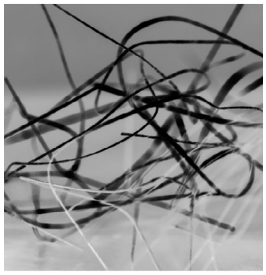




Series of images from the second iteration of my investigation

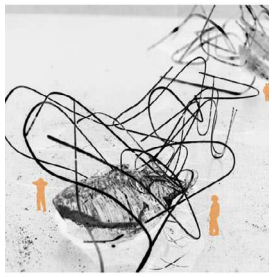
To further investigate the idea of erosion in ice sculptures I conducted an almost experimental investigation, again using an ice sculpture that I created, (this time with a rigid form-work). Also I used wire to measure the erosion of the ice, in that as the ice metled, more of the wire was able to be seen. At the end of the investigation, the steel wire and the remaining ice created some beautiful forms which i decided to further investigate.

In this stage of the project I used a high quality camera with a close up lense to investigate further the forms left behind as the ice melts away and the wire is left behind. In these images it becomes apparent that these forms could be translated directly into a strcutral frame or even a complete landscape which could be inhabited by humans when applied at diferent scale.



Photographic Study
investigating shape and form
of wire and ice

In order to conclude the make and create exercise I began to investigate how these “strctures” could be adapted to different scales to create vastly different environments. There could almost be a limitless number of variations of scale in which the environments could range from as tiny as microscopic, to sculptural installation right up to a massive range of transparant hills.



Series of Images investigating the applied scale of ice and wire models

Andy Warhol, Marilyn Diptych, 1962

Repetition, Erasure and Reprint

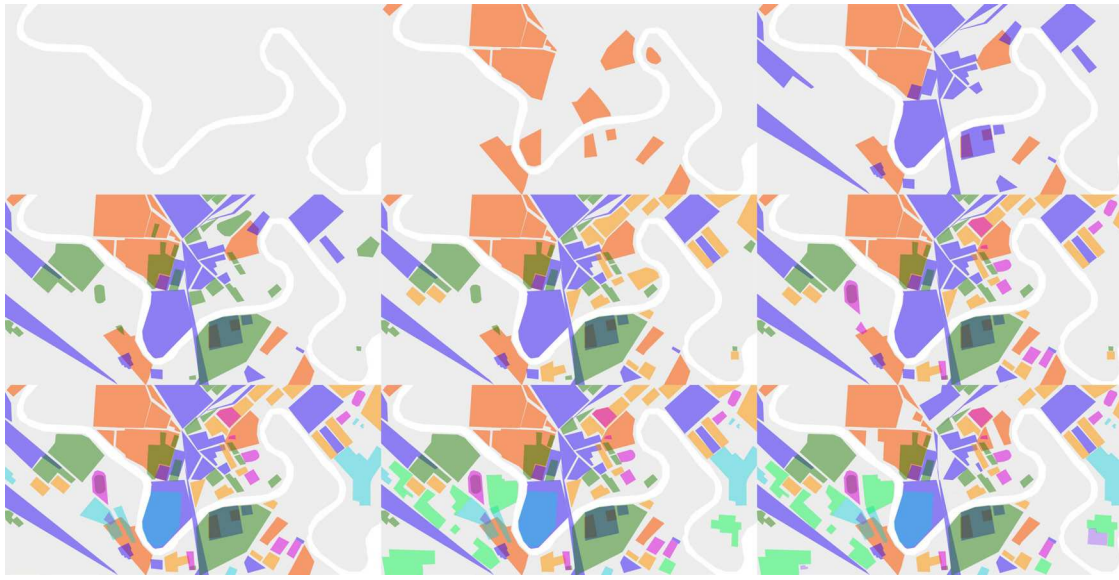
Zena Moore

The Marilyn Diptych is a repeated portrait of Marilyn Monroe, and reflects her life and death through the contrasting colour and black and white halves of the print. The iconic face of Marilyn is repeated over and over again, but with each repetition there is a slight shift in the way the paint has laid, slightly changing the face, but Marilyn is always recognisable.

I looked to the site of Dalmarnock to find an object as a vehicle for my investigation. I found maps of the area from the nineteenth century to the present day and looked at how the fabric changes. What is permanent and what is different?

top: print of layers of change in Dalmarnock

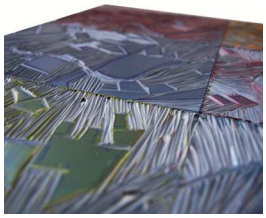
right: Marilyn Diptych



The constant feature that remains in the area is the River Clyde. The Clyde could provide an identity for Dalmarnock, as an iconic image like Marilyn Monroe. The river is a recognisable feature that stays static whilst buildings shift around it.

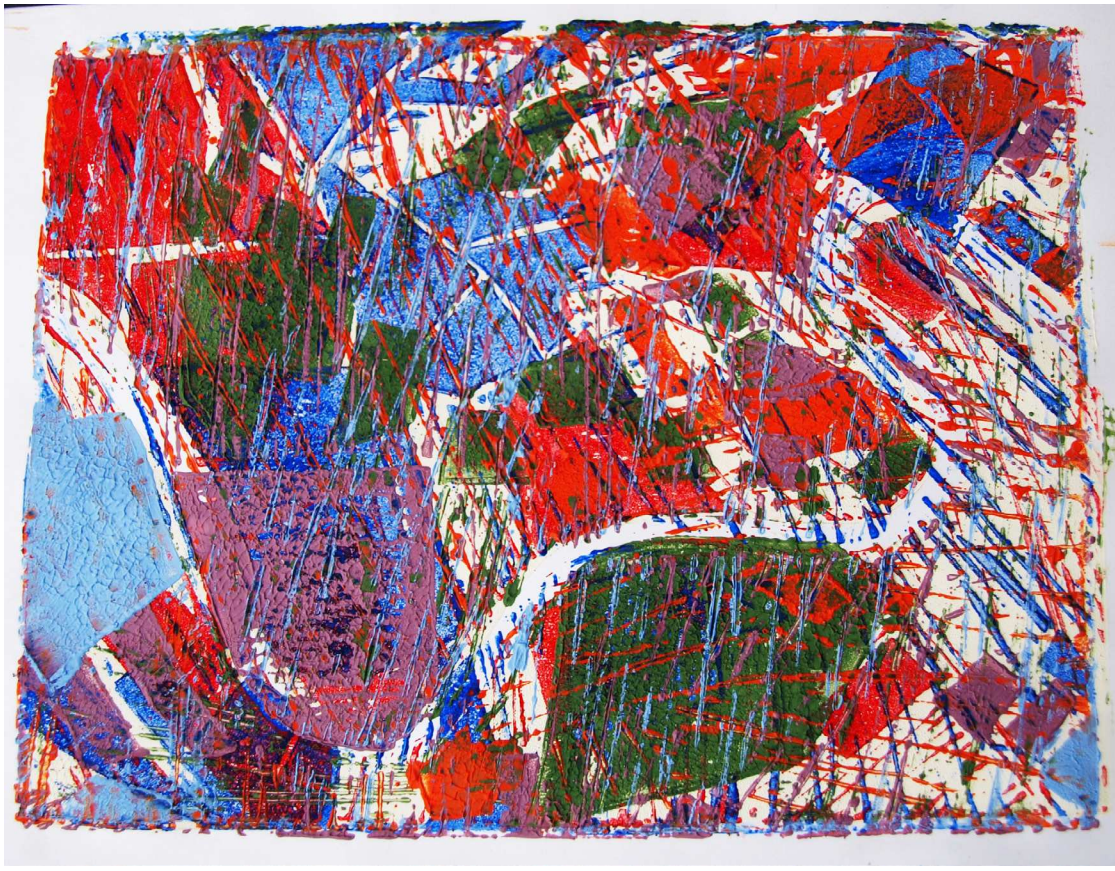
The digital version of the print shows the layers of change individually for the years looked at: 1860, 1890, 1910, 1930, 1950, 1960, 1980, 1990, 2012. This shows buildings coming and going, as part of the areas erasure and reinvention process.

top: digital version of printed layers of Dalmarnock's history



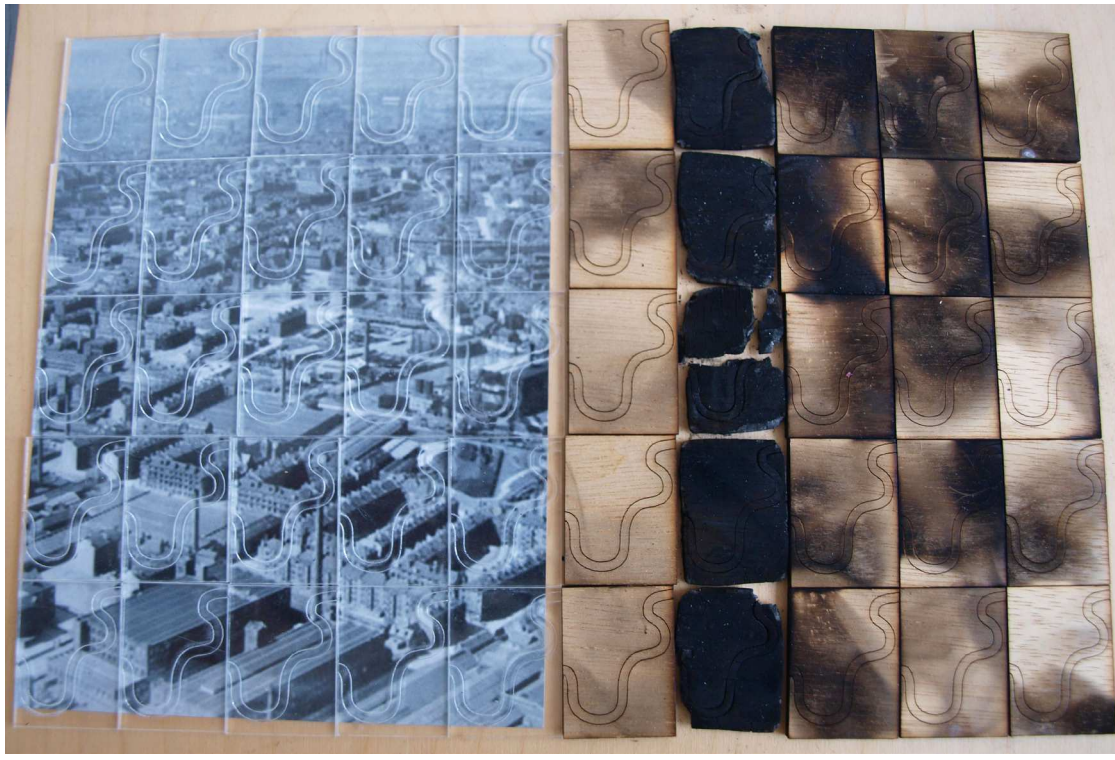
I used lino printing to print the layers of change, where each colour is a different year of Dalmarnock: 1860, 1890, 1910, 1930, 1950, 1960, 1980, 1990, 2012.

Each print is an addition to Dalmarnock, building up a layered representation of the area's changing history through the repetitive process of printing.



top: negative of lino print

bottom: final print of layers of change in Dalmarnock

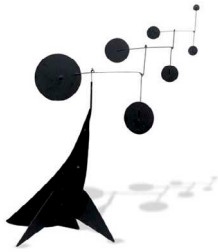


above and below:
Dalmarnock Diptych model

Another element of Warhol's print I have investigated is the disintegration of the image of Marilyn. I created a model representing Dalmarnock in the way the Diptych shows Marilyn. The River Clyde is the iconic image, and is repeated on the blocks. The transparent pieces are the 'life' of Dalmarnock, during its industrial heyday, and the wooden pieces are the 'death' that Dalmarnock has been experiencing since the decline of industry there. The ghostly image of the icon remains.

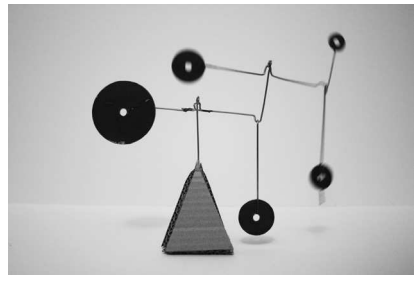
Balance, equilibrium and movement.

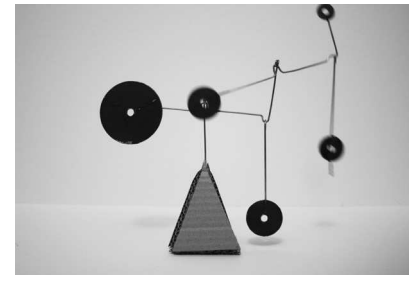
Heather Munro

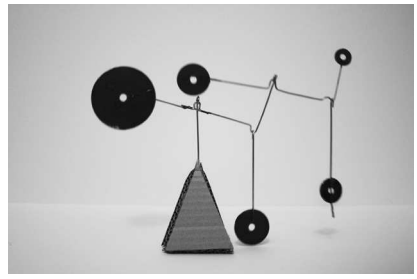


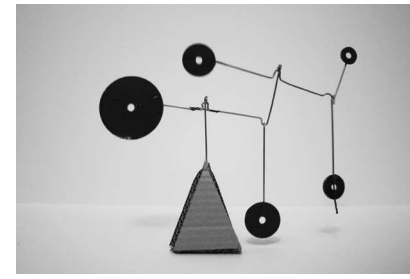
Weight Distribution.

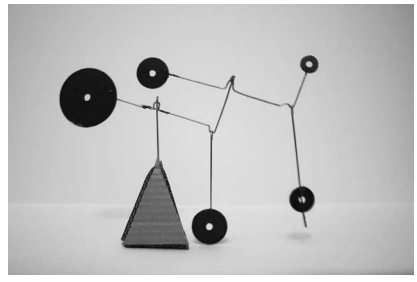
Alexander Calder created fantastic sculptures including perfectly balanced and proportional mobiles, such as the 'Performing Seal'. To begin to explore the movement and weight distribution present in this piece, a model was constructed using similar materials to the original piece. For the model to perfectly balance, the correct dimensions had to be mathematically calculated and then tried and tested at 1:1. The length of the steel rods and size of the metal discs were important considerations when trying to achieve a state of equilibrium.

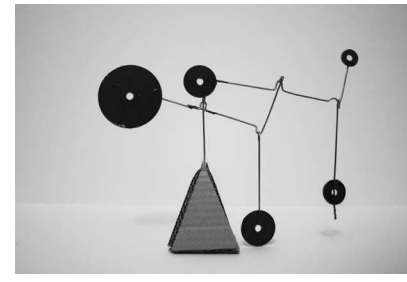


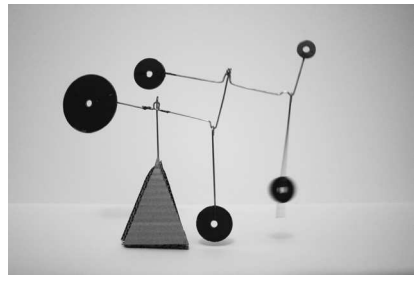


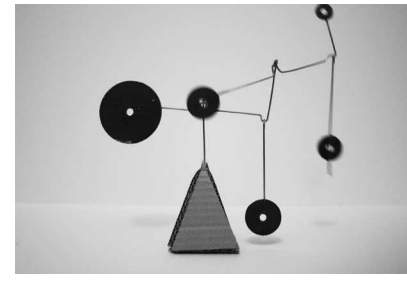




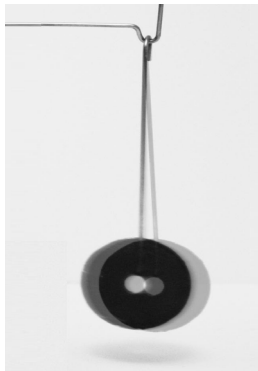


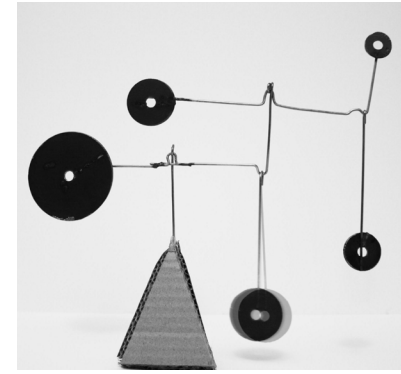


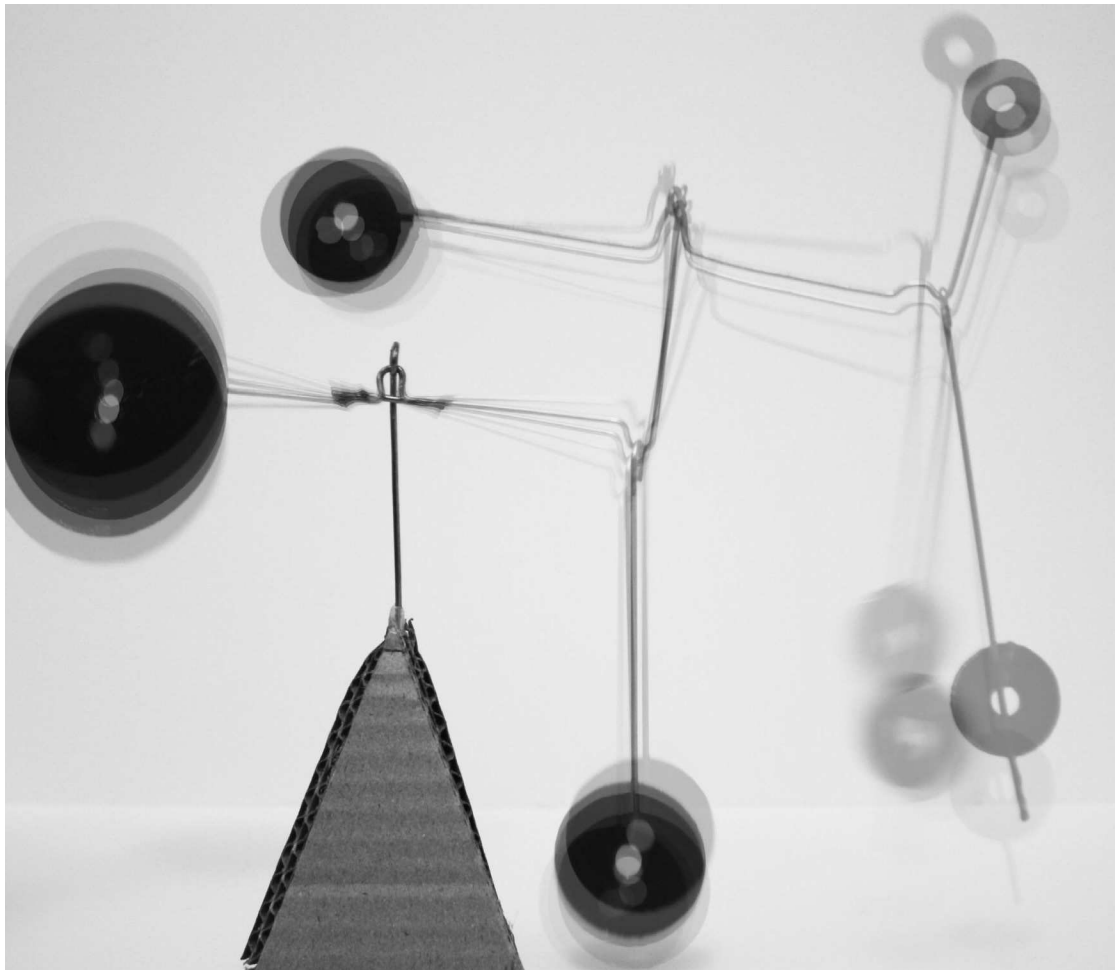




Top: Alexander Calder, Performing Seal
Right: Construction of model, workshop images.



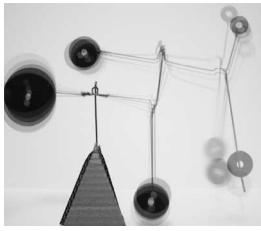




Movement.

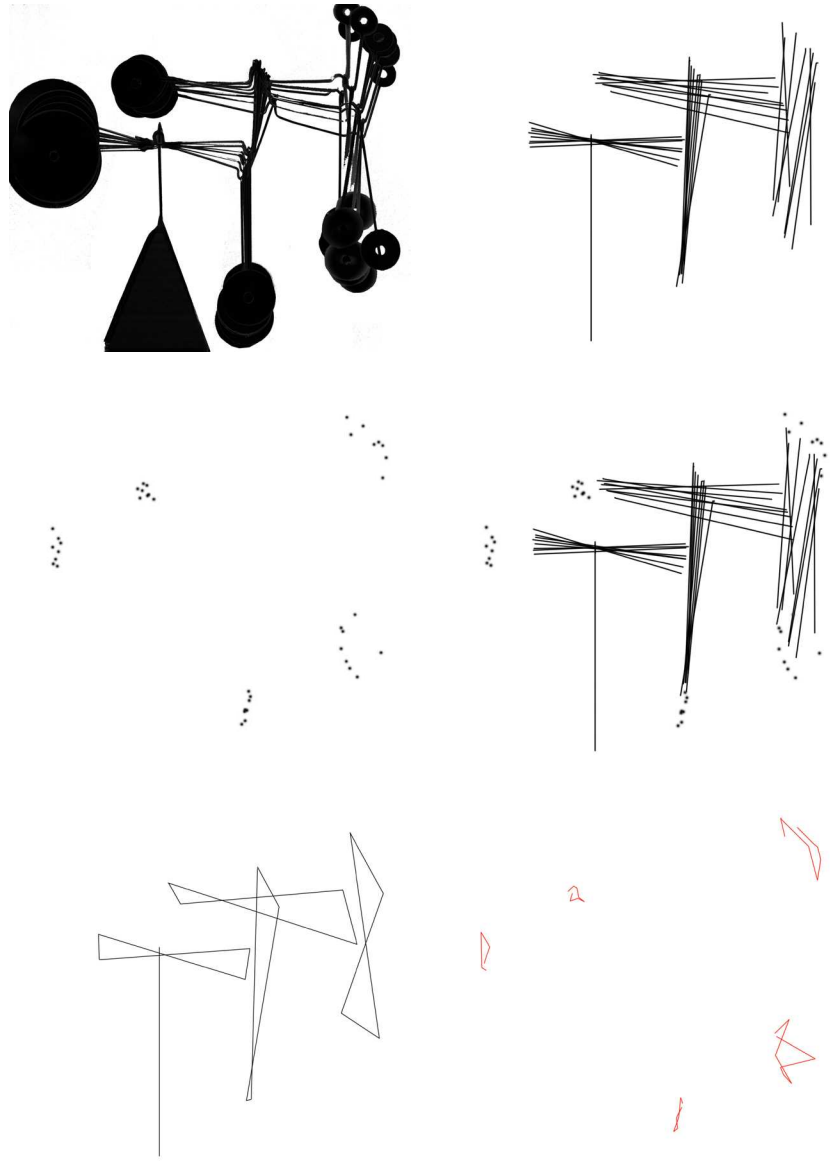
When a weight was placed on the steel support system, or when the whole piece was touched, the 'nodes' moved in order to counter- balance the added weight to achieve equilibrium again. A series of photographs were taken showing the range of movement, which were then overlaid to show the extremes to which the nodes where able to move, before returning to their optimum position. It is also clear to see which parts of the model barely move at all, compared to areas of more radical movement.

Above: Images of model overlaid in Photoshop to show movement of nodes

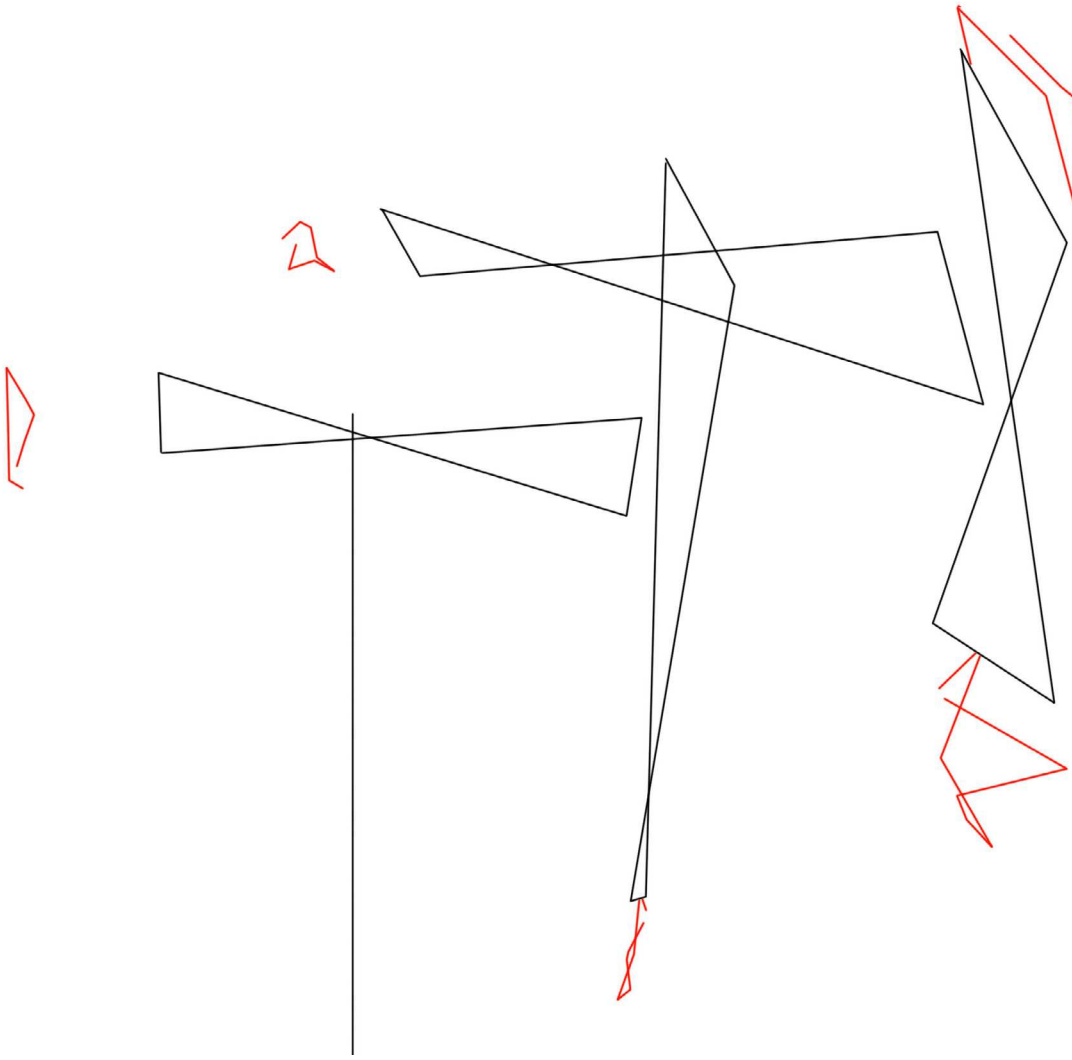


Mapping Movement.

Taking one of these overlaid images, the centre points of the nodes were mapped to show the movement of the nodes and connectors as a series of diagrams. Firstly, the original images were simplified to remove the background colour. Next, the connectors were mapped as a series of lines, and the centres of the nodes were dotted for each image overlaid. These lines and dots were then converted to wedges and lines, showing only the extremes of movement. The larger squiggly lines show more frantic movement, whereas the smaller lines show the more steady nodes.

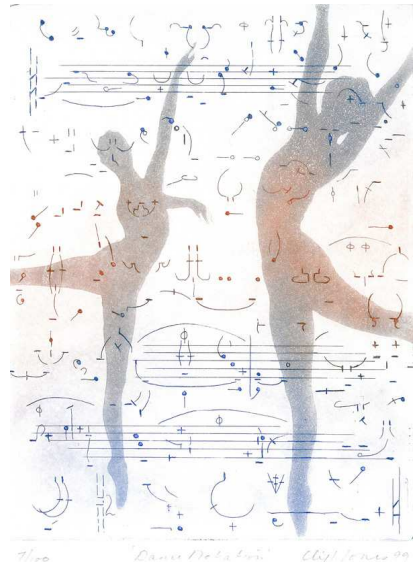


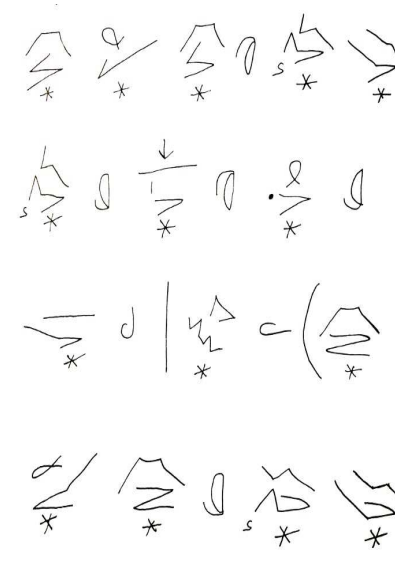
Above: Series of diagrams mapping movement of nodes and connectors.



Dance Notation.

The final diagram representing movement within the model was comparable to the notation used by dancers to represent different movements. This notion develops the sense of the nodes 'dancing' around as they jump from side to side to counter-balance the movement applied to another area of the model.





Top image: Final diagram mapping movement.
Above: Images showing examples of dance notation.

Dynamic Suprematism, Kazemire Malevich, 1916

Dynamic Equilibrium

Jessica Orr

Intensity, Rhythm. Colour, Proportion

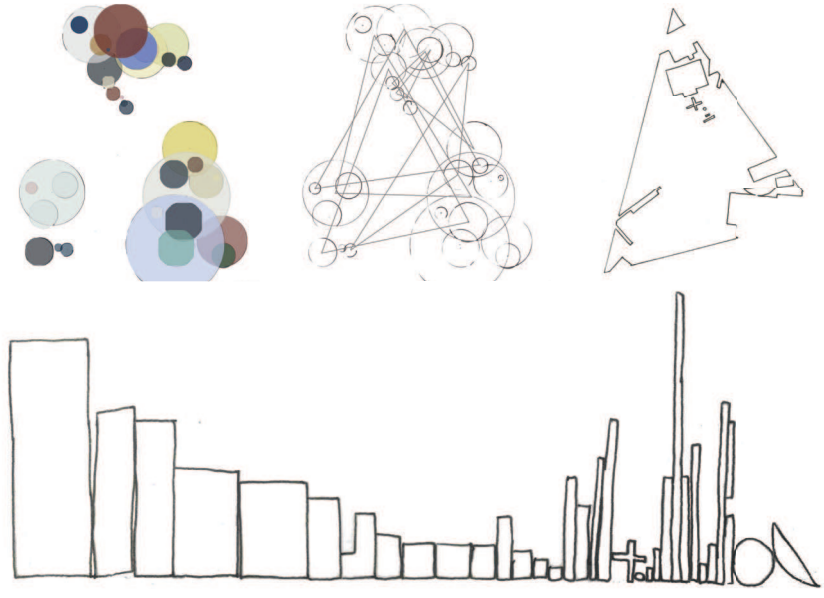
At first glance, Malevich's oil on canvas composition seems unplanned, with an array of apparently unreasoned colours and shapes. Despite this, there is somehow still a visual balance and beauty amongst its randomness. The initial tension between the shapes becomes lost and a sense of unity appears.

The investigation took two different aspects of the painting, one of colour and proportion between the nine different pigments, and one looking into the intensity and rhythm of the different shapes.

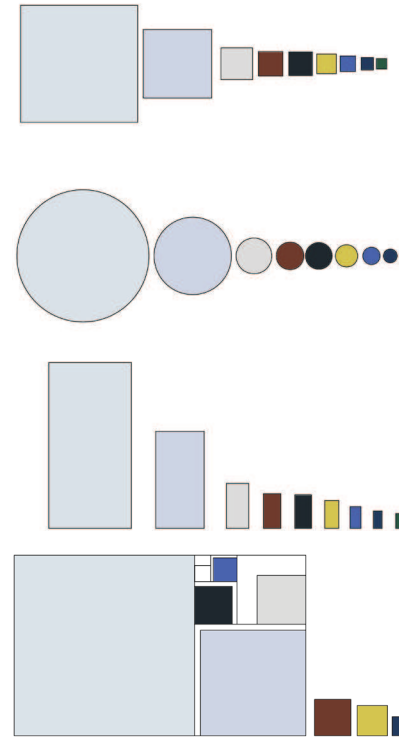
The first step for both plans was to abstract the artwork in to simple forms, highlighting the proportion of each shape to one another and the relationship between the objects devoid of shape and colour. From there two separate paths were created.

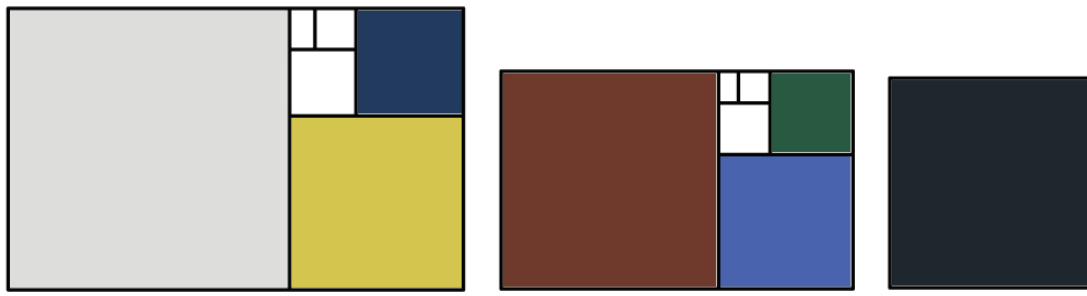
Colour was clearly an important aspect for Malevich and the balance of each is interesting to look at. Taking a completely analytical approach, the areas of each colour were measured and percentages of the painting as a whole calculated. These values then translated into proportioned units to show the exact use of colour outside the context of the painting.

With inspiration from Classical architectural proportion in the Golden Section, these colour percentages where then tested against the methods employed in the Golden Section. Initial use of the background colour as the starting stone yielded little information but taking other colours at the starting point revealed surprising results.



Colour devoid of form. Object relationships. Solid + Void. Proportion of shapes.





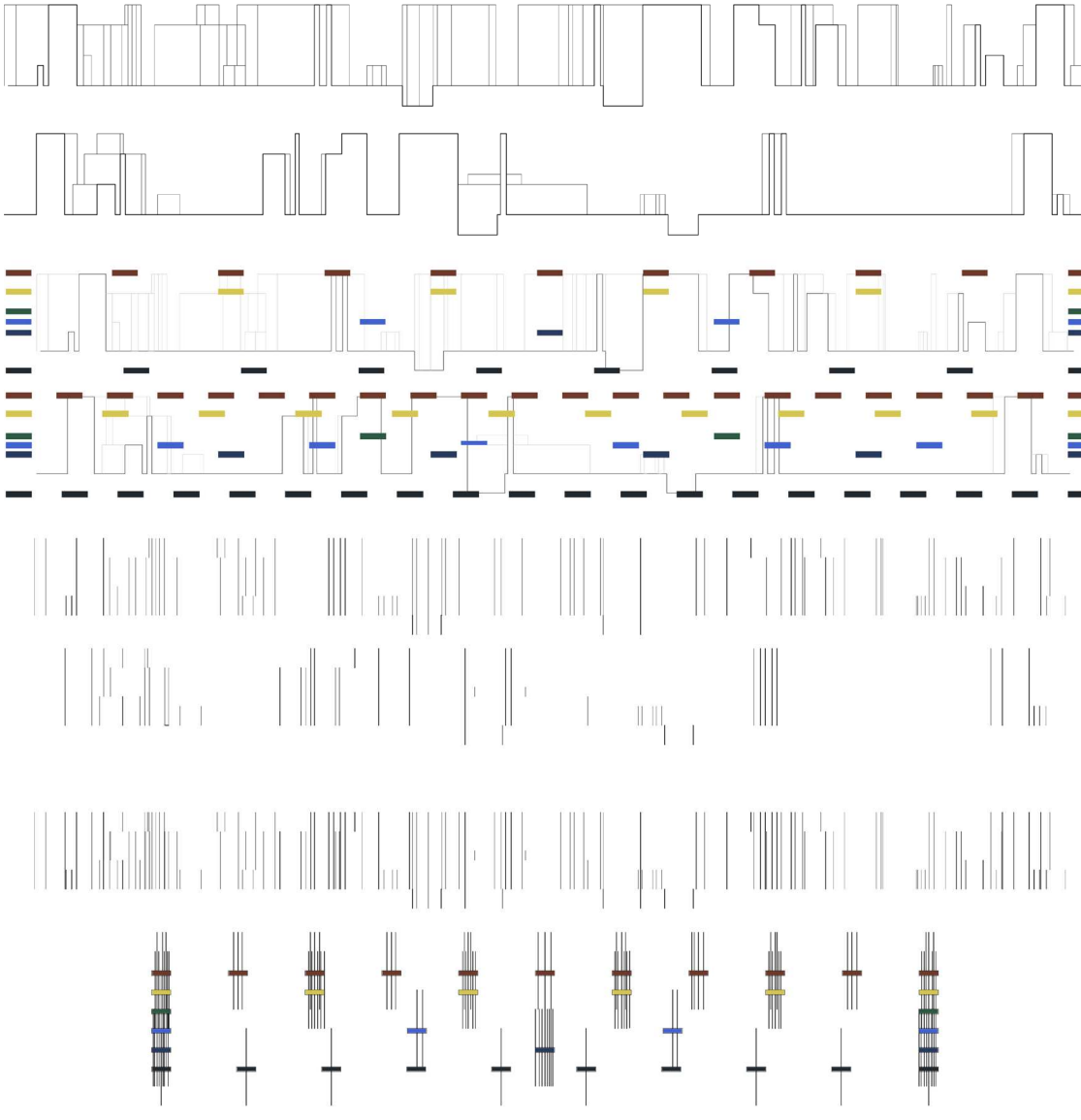
Golden Section of colour proportion.
With the base colour Red, the Cobalt Blue and Green proportioned percentages fitted almost perfectly into its Golden Section, with Ultra Marine, Yellow and the tinted white of the background triangle working similarly; the black standing alone as the only 'colour' not to be part of the visible spectrum.
A small study was also carried out to see if the most prominent colour was also that with the highest percentage. By spinning the image at various speeds, the dominance of the Yellow rectangle becomes very apparent throughout. The black is also still clearly apparent.
This study of colour and proportion was then taken on to work in parallel with the investigation into rhythm and intensity.

Shapes of colour proportion. Golden Section of colour proportion. Spinning colours.

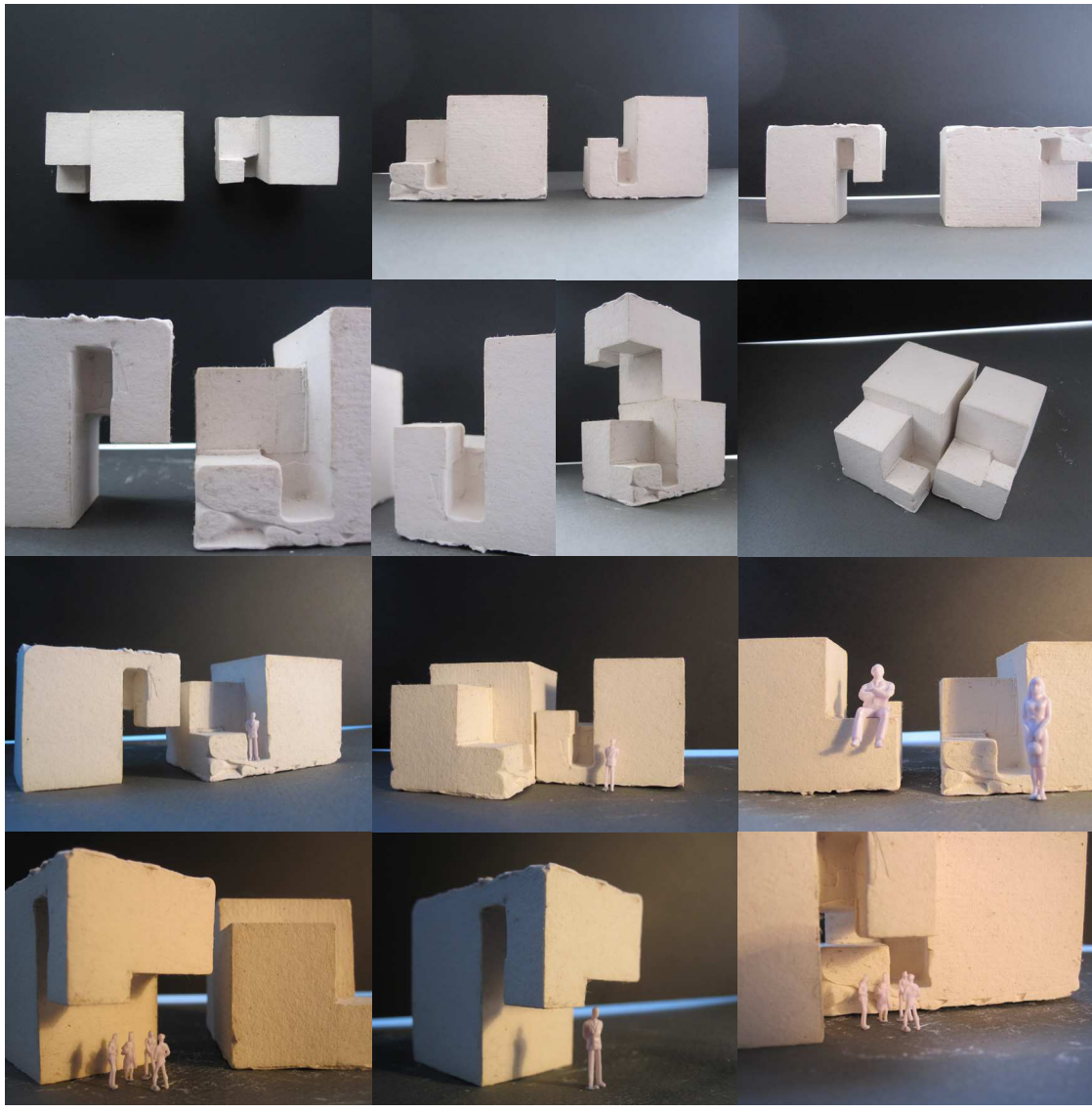
Taking Sections

The section-like appearance of the ordered shapes prompted a sectional approach to be taken. The outlines of the triangle became section lines and sections looking inwards and outwards were taken. Each shape took on a 3D form based on heights derived from the relative frequencies of light, red being the highest, ultra marine the lowest and black having a negative value.

The corresponding colour proportions where then correlated with each height to give a clearer interpretation of the pervious sections. Finally the sections were abstracted into lines of equal length and matched to lines of coloured proportion.



Development of sections into lines of rhythm, intensity and colour.



Cast model.
First scaleless, then at differing scales.

Golden Section as form.

The final stage of this make and create investigation looked into combining both pathways. This took the form of two cast models based on the golden section of colour proportion and the heights of colour frequency. Through photography these models were explored as architectural tectonics, first without scale and then through differing scales.

Gustav Klimt, The Park, 1910

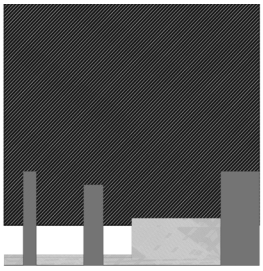
Proportion, Density, Layering

Justine Ramage

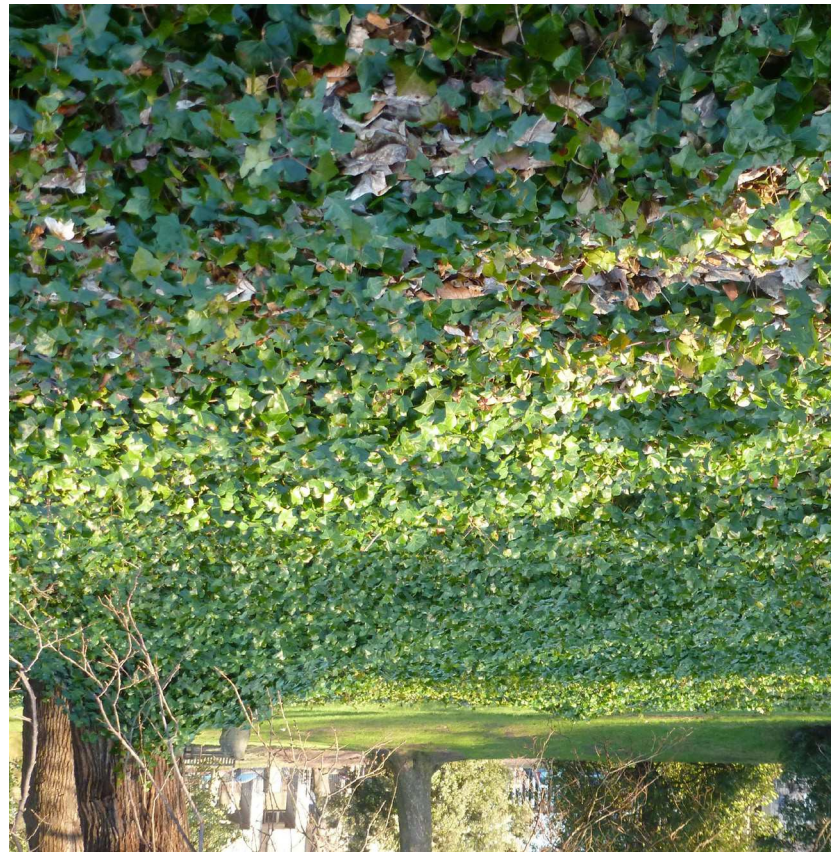
The Park, 1910
Starting point for responses

Klimt's Park is founded on simple, effective rules – contrasting the overwhelming presence of the leaves above with the rhythm of tree trunks and glimpses through them below. The squared nature of the image adds to the sense of deliberate composition and framing.

Creating an analytical diagram became a visual aid for recreating the painting through photography. The most successful of this set used ivy on the ground to mimic the dense foliage and is viewed upside down to capture the correct balance of proportion.



Proportional Diagram &
Photographic Study



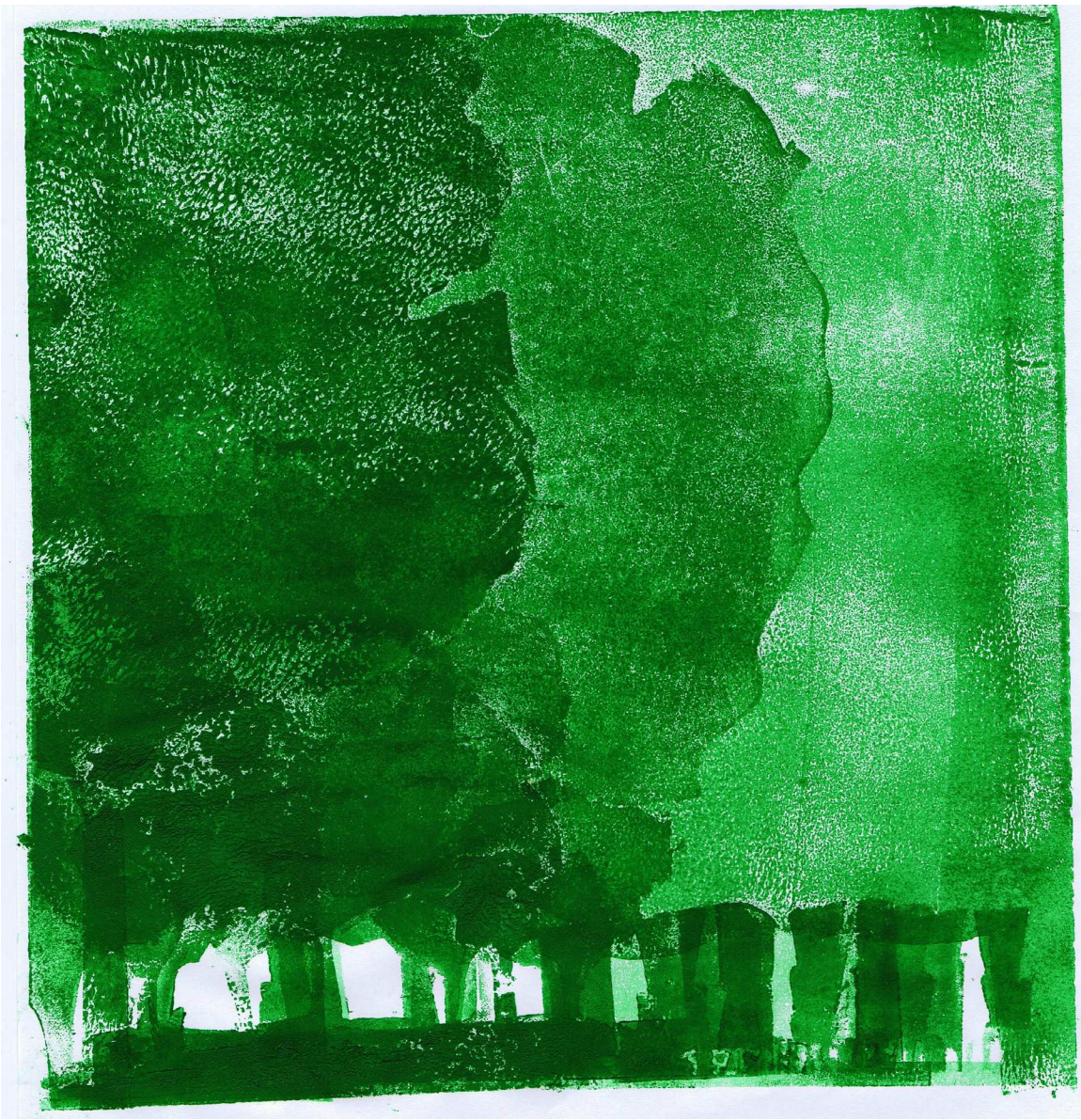
Continuous Line Study &
Gradient Map of Density

I was also interested in how that density was constructed and what separate pieces contribute to the apparent solidity of the leaves. The continuous line study intuitively marked out, from only the visible trunks, the extent and position of each tree. This personal impression of size and depth created an almost inverse diagram of the scene.

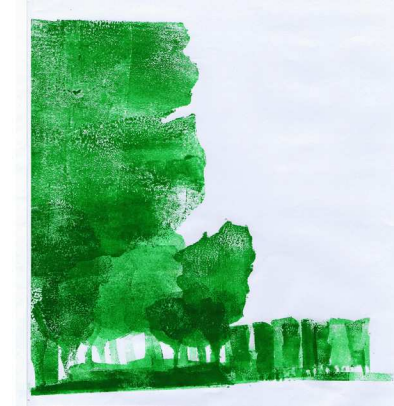
Taking this further, each tree was outlined in one shade – where the boundaries overlapped this formed a 'gradient map' which became darker when several elements were inhabiting the same space at different perceived depths

Printmaking Process,
Dying between iterations

The next fabrication involved printmaking with polystyrene tiles to re-introduce the textural quality from the original. The prints were deconstructed from the line study - each perceived depth/ section was added in a separate print to create a journey through the park and show the incremental changes which enable the building up of density.



Print no. 12/ 12,
Layered up to create density



From left,
Prints no. 2, 11, 10,
Below, Print no. 8

Photography Study &
Hierarchy of Line

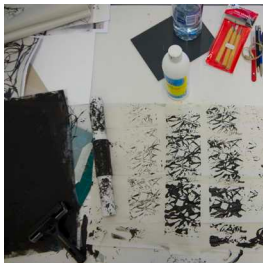
A second photography study investigated the structural framework of the park; how the branches support, overlap and interweave to facilitate such density of foliage.

This was followed by a diagram concerned with hierarchy – breaking down the images into primary, secondary and tertiary to examine the balance of elements and the different levels of solid and void space.

Brice Marden, Cold Mountain Series Zen Study 1, 1991

Repetitive Rhythm. Complete Variation.

Anna Raymond



above: different printing techniques.
right: the original piece.

Beautiful Chaos.

What originally drew me to Brice Marden's Cold Mountain was that at first glance the painting appears to be repetitive but upon closer inspection it becomes clear that no two sections of the painting are the same. What gives the painting coherency, uniting varying density, line weights and shapes, is its underlying rhythm.

I believed that a painting that flows as this one does could not be contrived but instead must rely on some element of chance (I later learned that Cold Mountain is in fact planned in great detail). I began to investigate ways of creating a rhythmic painting while creating the opportunity for chance to play a role. I liked feeling that the eventual outcome of the piece was beyond my control.

I began with simple printing techniques - card and lino blocks - and different mixes of media. I experimented with printing ink, Quink, acrylic paint, watercolours but every time the results were too consistent. There was rhythm, but no flow and nothing I didn't expect.

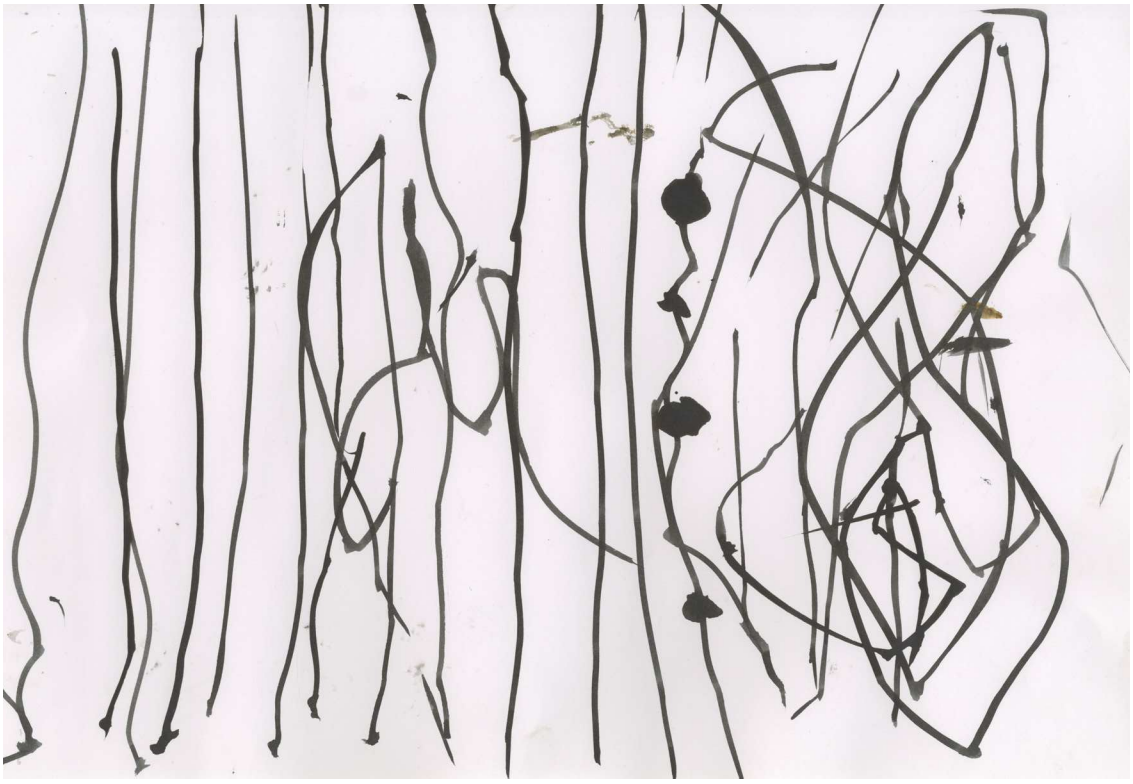
To try and make an image which flowed, I created a continuous printing tool by carving into a rolling pin. The results were beautiful but still too uniform. I then wrapped a piece of string around the rolling pin. I kept it very, very loose, allowing it to shift beneath the weight of the moving of the rolling pin. This time there was flow and I had introduced an element of chance. The result was stunning, and totally unexpected.

above: detail from final piece.
below: printing on site.

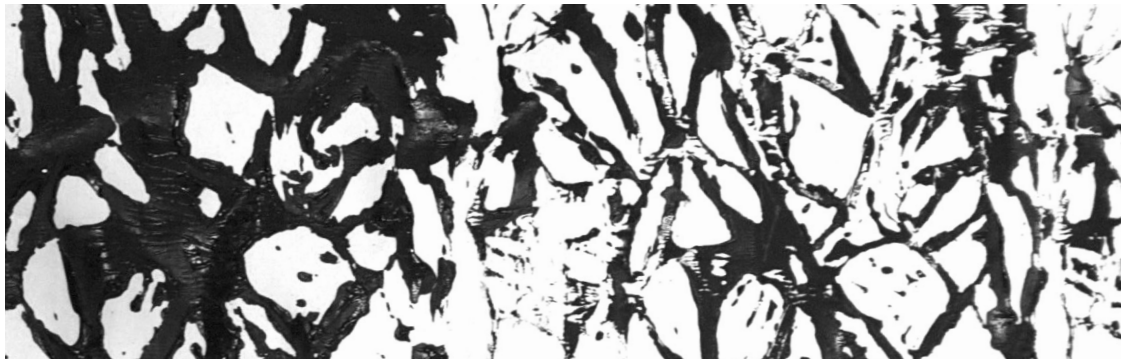
Postscript.

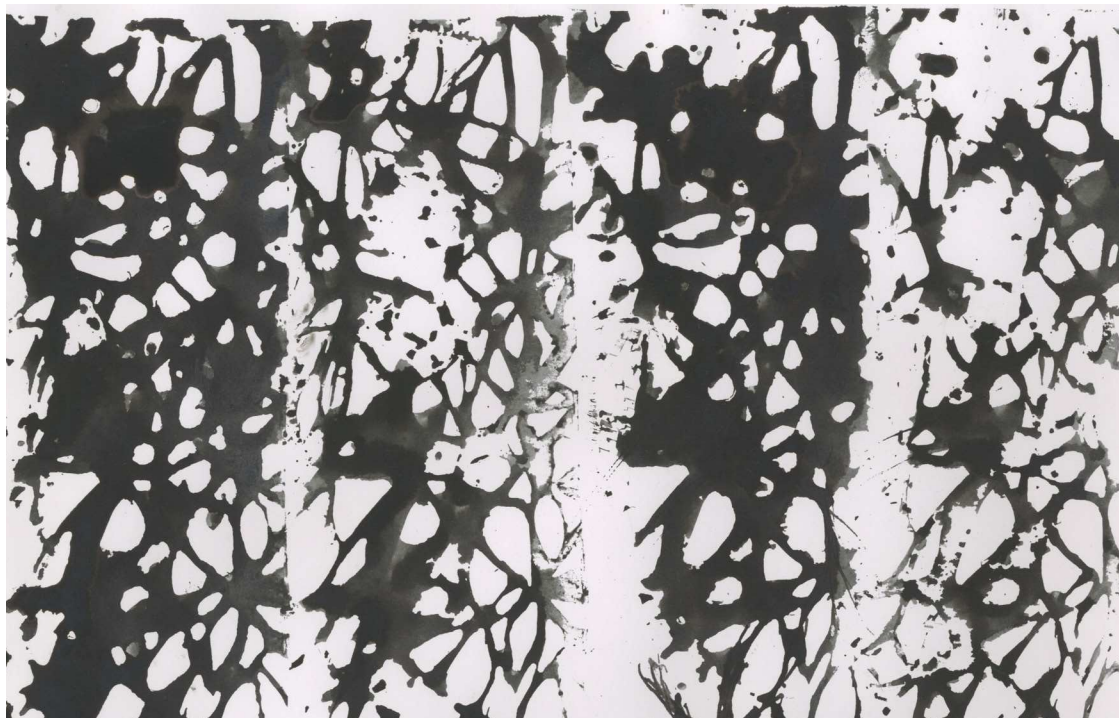
For the final piece, I decided I wanted to make a large scale version of my string prints, closer to the size of Marden's original painting. In order to have the space in which to print at such a scale I ended up working on a building site. This time the printing tool was a length of drainpipe and four metres of rope.

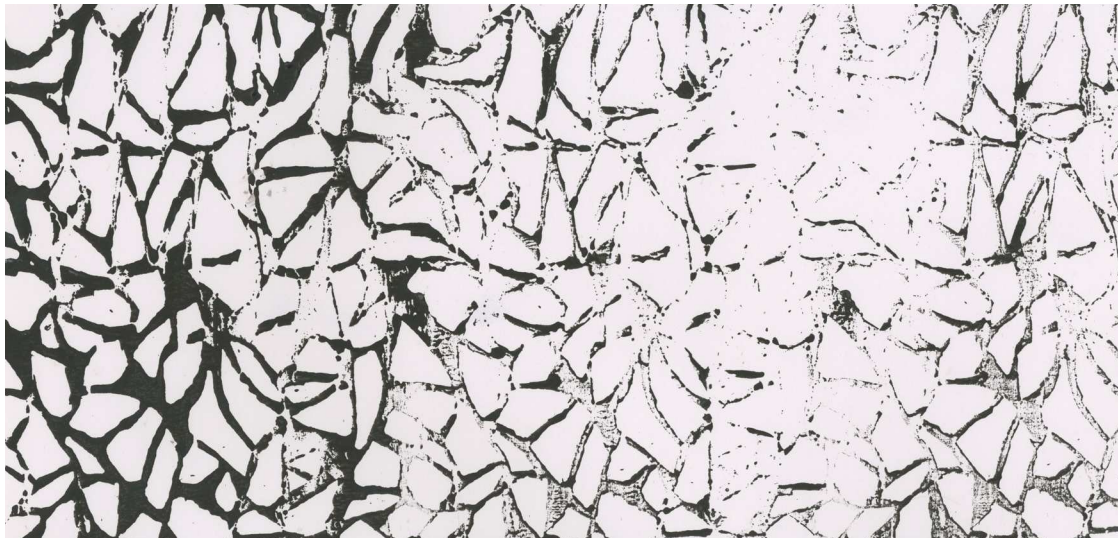
The results were surprisingly delicate and completely different from my previous prints.



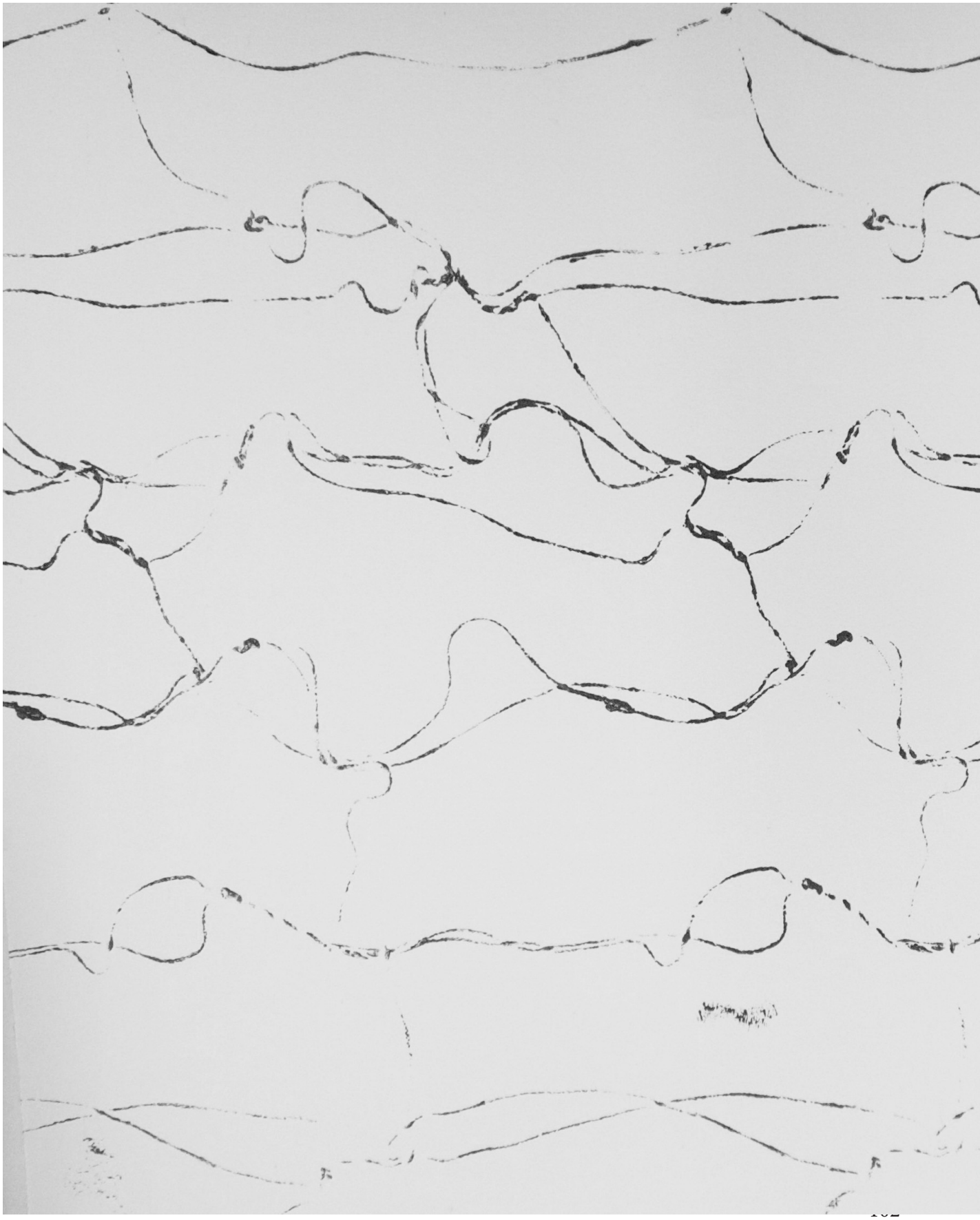
t - b: Quink& brush; ink,
rolling pin & string; drainpipe,
rope & matt emulsion.

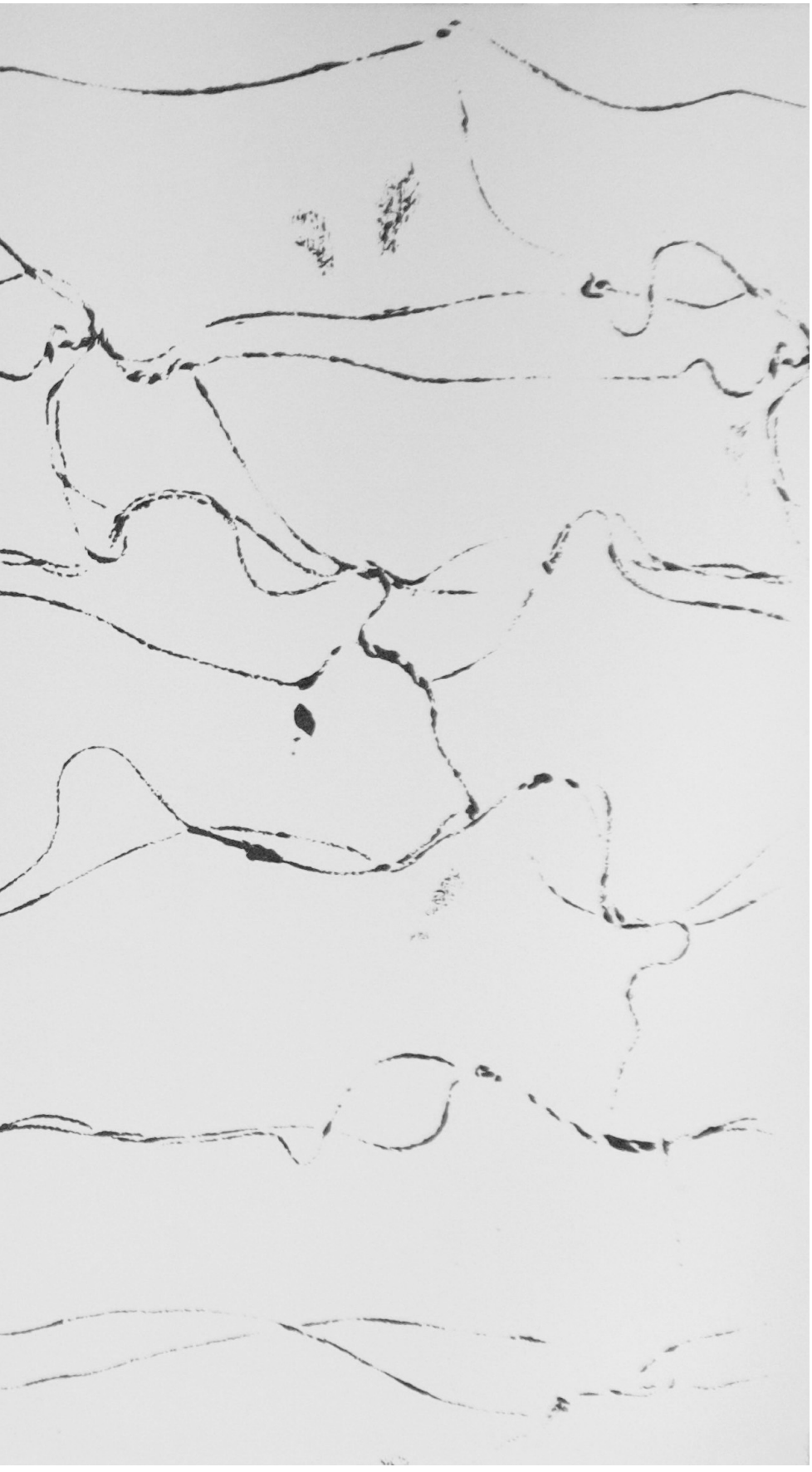






t - b: lino with printing ink;
lino with Quink; rolling pin
with printing ink.





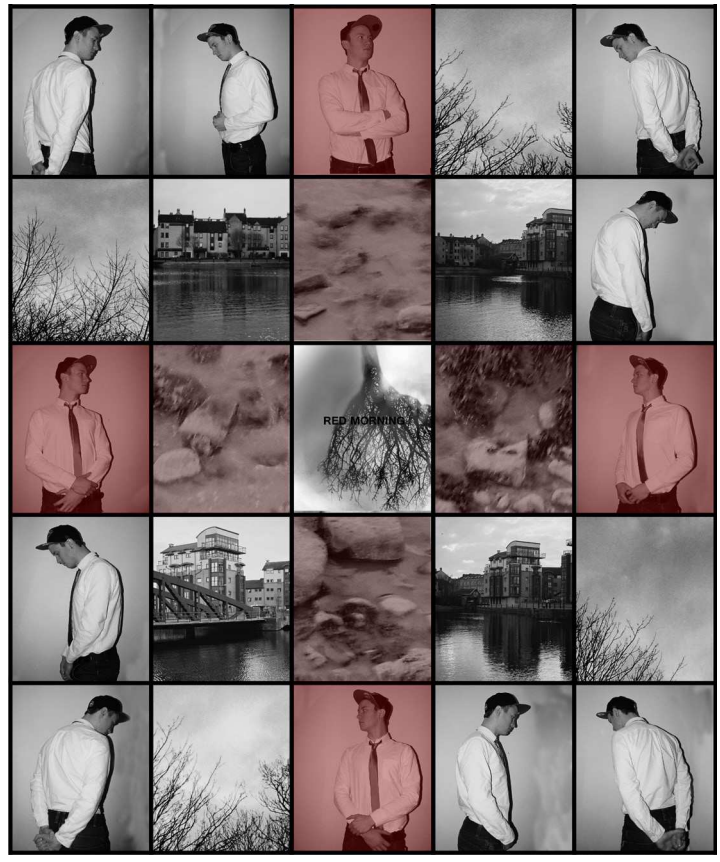
the final piece.

Gilbert & George, Red Morning Trouble (1977)

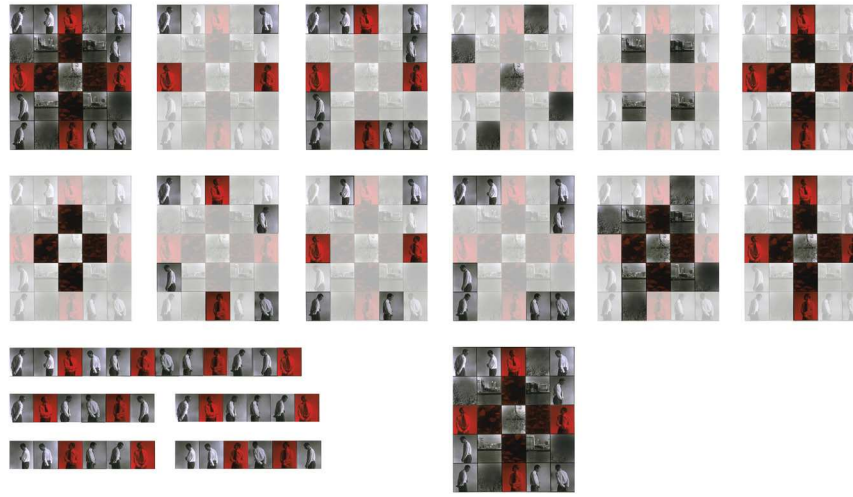
Proportion, Grid within Extent

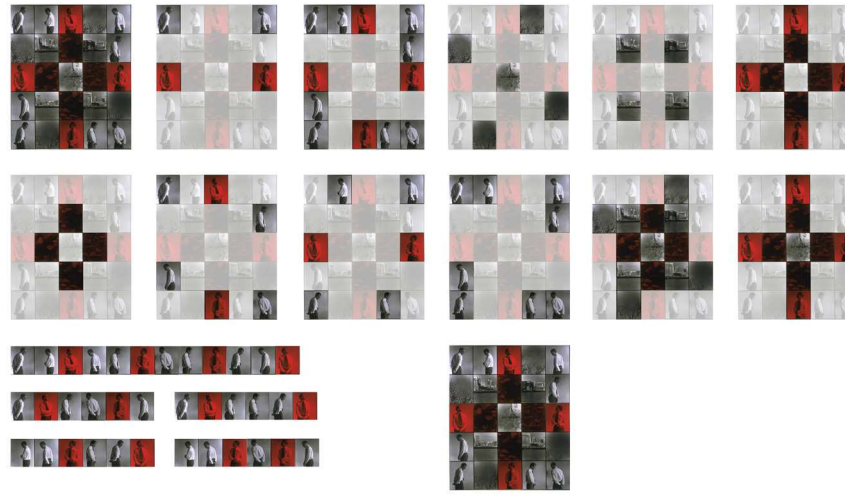
Grant Richardson

Gilbert and George created the moving 'Red Morning Trouble' in 1977, as part of a series of photographs tiled together to give an insight into their lives within East London. This is the home of the artists and the series showcases the vulnerable side to the human mind, often exploring thoughts of hatred, anger and depression throughout this series, photographing their surroundings and arranging them on a fixed grid. To understand the thought process taken by Gilbert & George, A reconstruction using Grant Richardson as the subject, within his own home surroundings. The main challenge creating images that shared the same proportions as the original art piece. There is a powerful notion of the artist within his own surroundings and the integration of self portraiture with landscape helps put oneself into perspective with his home environment.



Top: Gilbert & George, Red Morning trouble
Right: Recreation with Grant Richardson as subject





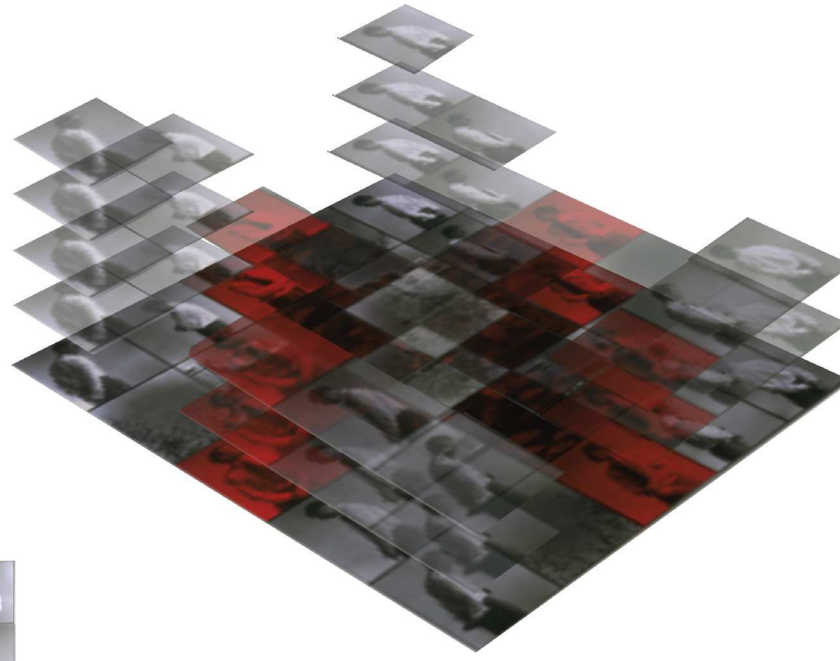
Top: Examination of the patterns within the composition

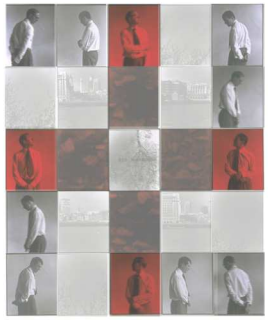
Underlying Pattern

Although the composition may seem simple at first, a set of 5x6 photographs, there are many patterns and relationships that can be seen within. The two artists themselves feature within this series in the form of portraiture. The placement of the portraits is based from the central point, seeing the portraits wrap around the exterior layer almost completely, following clock-like rotation. There are subtle relationships to be seen also, for example the subjects can be seen to be looking at each other across the piece, with the sets of Gilbert & George always looking in the opposite direction from each other when side-by-side. We also see the most prominent pattern, the red cross, which may act as a plea for help within the rough day-to-day life living in the east end of London at these times.

By overlaying the Red Morning Trouble art piece onto a map of Glasgow city centre, it was possible to see how the rigid, predefined grid can interact on a large scale. As the grid is such a great tool for the design of master-planning, it offers a fluid transition to the scale usable in Dalmarnock. There are subtle relationships to be seen also, for example the subjects can be seen to be looking at each other across the piece, with the sets of Gilbert & George always looking in the opposite direction from each other when side-by-side.

Red Morning Trouble applied to Glasgow centre at a large scale, regular grid matches street pattern





Above: layering the importance of patter for each tile
Top: 3D view of this effect

The grid is transferred to the Dalmarnock site where the extents of each will be the same, and the black between tiles represents access and roads. By layering the frequent tiles, we can see a form which is of higher density at the corners, and transferring this to a block we would have a sheltered and safe central area, and tiles representing nature and freedom used as outdoor spaces.

Carsten Peter, Cracked Mud 1999

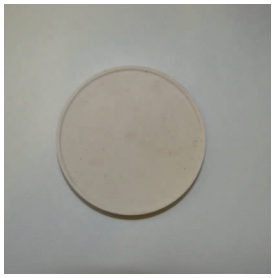
Networks, Paths, Intensity and Release

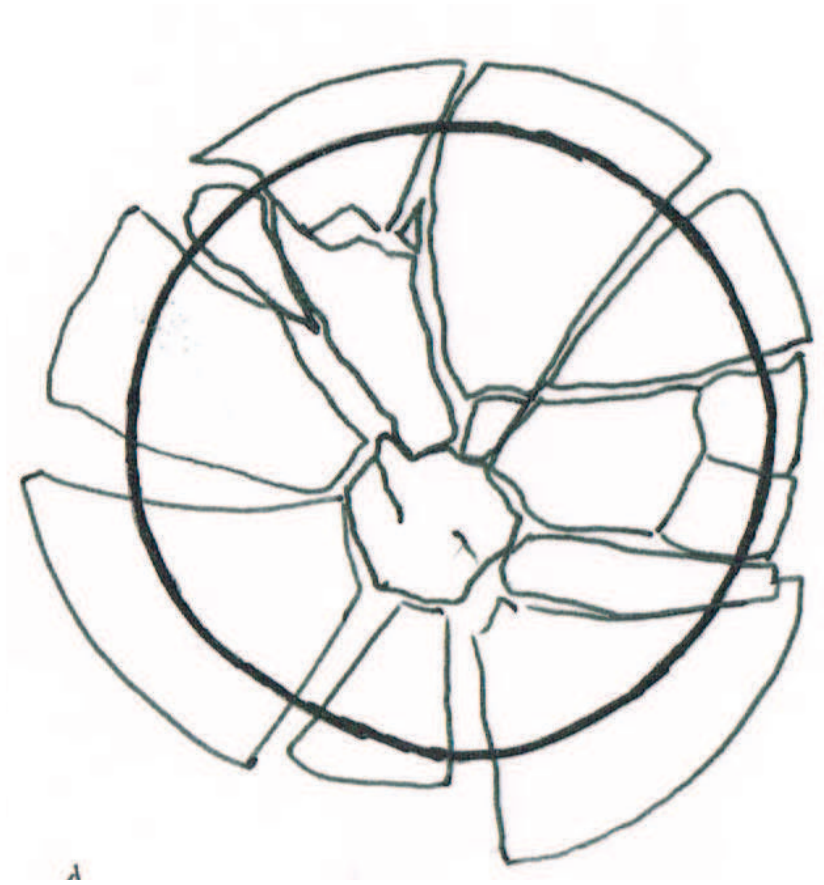
Elise Schneider

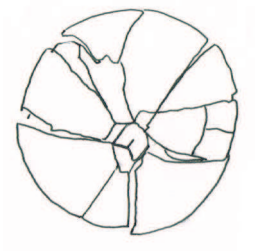
Original Image of Cracked Mud

Cracks

The image of cracked mud by Carsten Peter represents a small snapshot of a huge expanse of desert. The image is of a natural organic occurrence that creates an unexpected beauty. My initial reaction to the piece was the idea that the cracks continue on over a huge area of ground until they run out. Architecturally the image explores ideas of depth and hierarchy through the different depths of cracks, each one effecting the next. There becomes a strong sense of solid and void, the ground being the solid and the cracks between being the void. The solid and void creates interesting networks that promotes thoughts of routes and intersections. Finally my interpretation of this image is that it is scaleless, with no indication of size we can interpret this at an urban of microscopic scale.



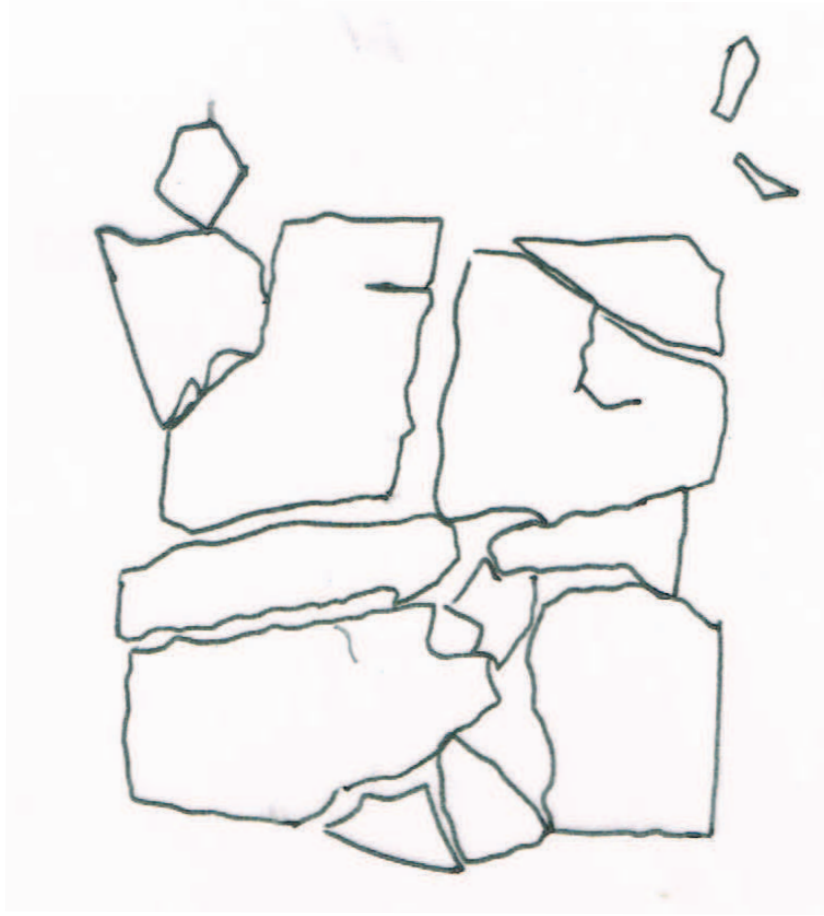


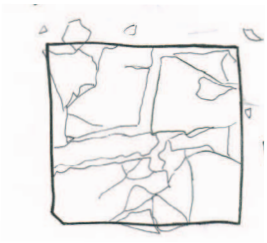


A circular block cast in plaster dropped from a height to create organic cracks

Cracks in Plaster

An investigation of cracks are created under the confines of a frame, in this instance a perfect circle of the cast block.

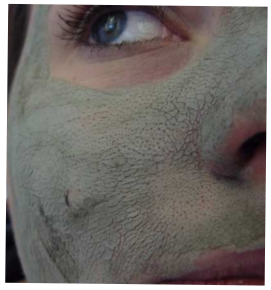


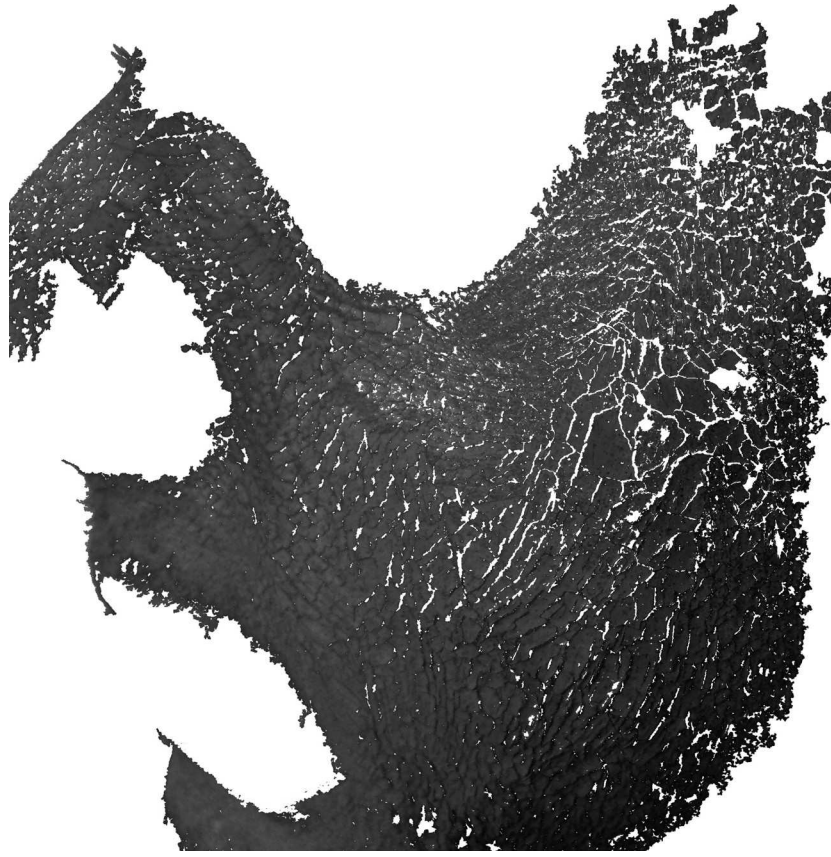


A square block cast in plaster dropped from a height to create organic cracks

Cracks in Plaster

An investigation of cracks are created under the confines of a frame, in this instance a perfect square of the cast block.

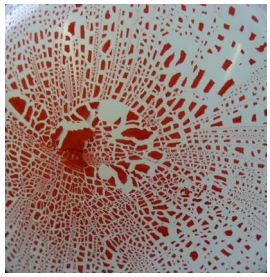


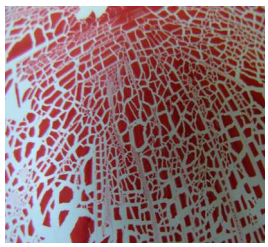


Investigation of facial cracks

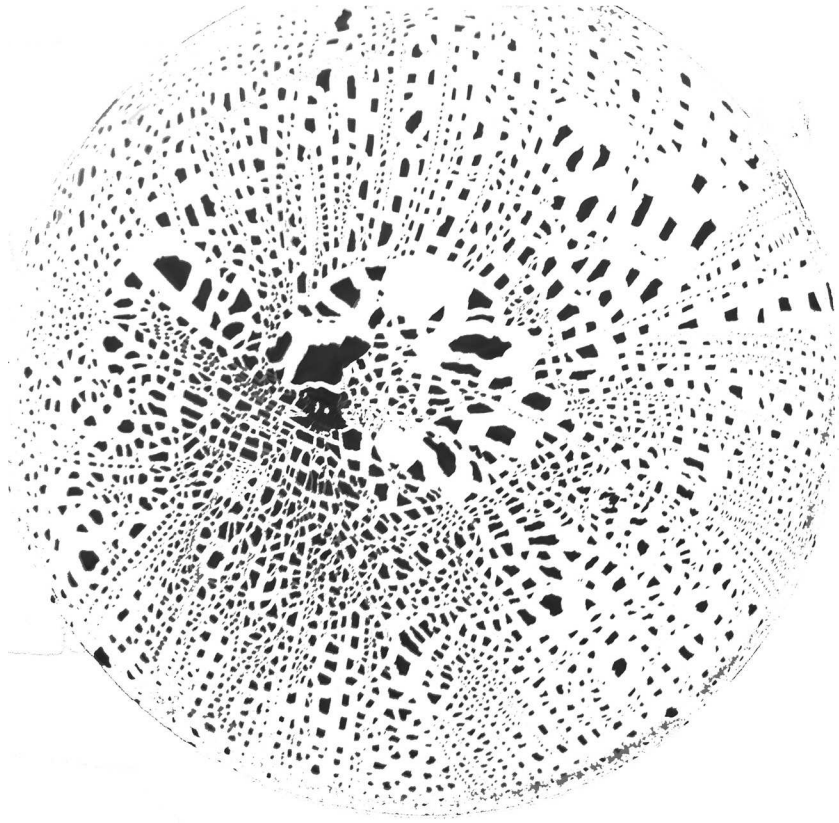
Mud Cracks on Face

Mud pack applied to face and left to dry until cracks appear along stress lines. This creates areas on intensity around muscles and expression. Networks emerge between the areas of intensity.



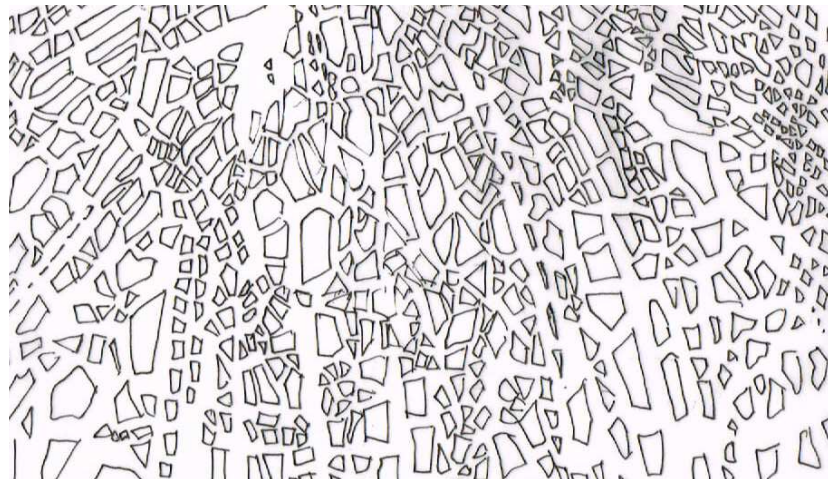


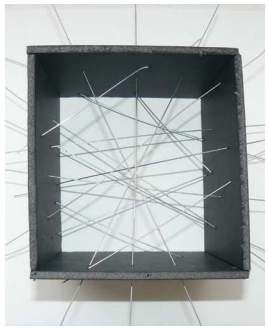
Balloon Images

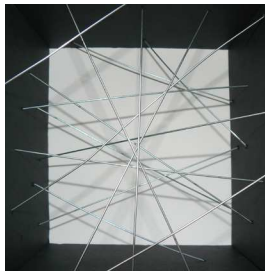


Balloon Cracks

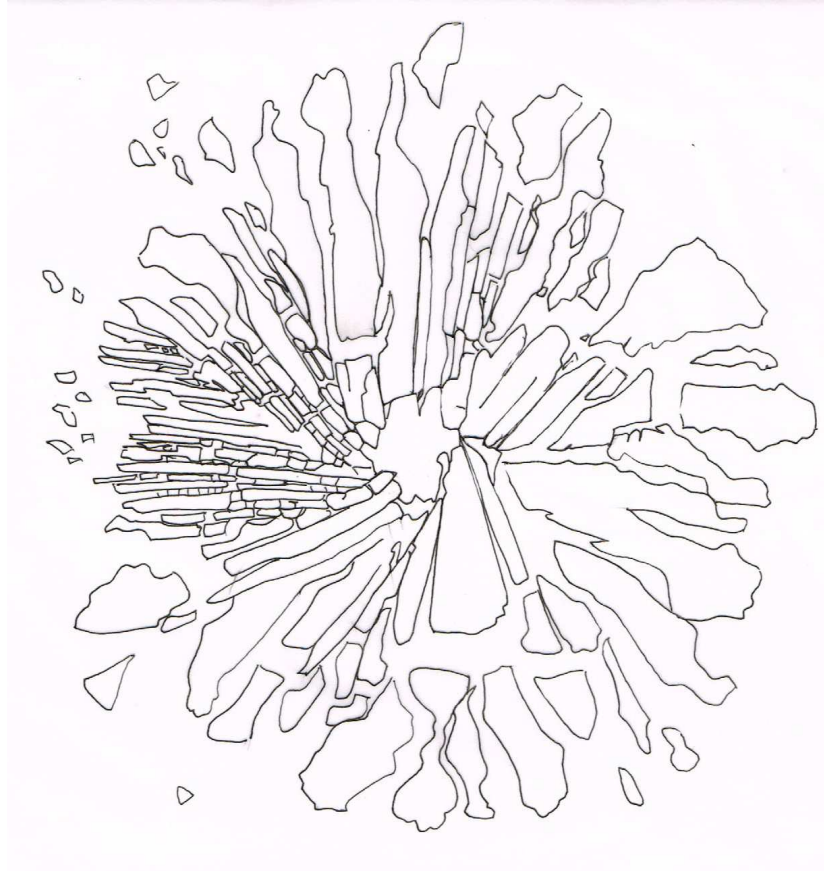
Paint applied to balloon and blown up with air once dry to place stress on the coating so that cracks and networks appear.







Investigation Images



Limiting the Expanse

Comparing the effect of limiting cracks by using a frame or allowing them to naturally come to a halt.

Richard Long, South Bank Circle 1991

Solid, Void, Boundaries and Edges

Anoushka Sivaraman

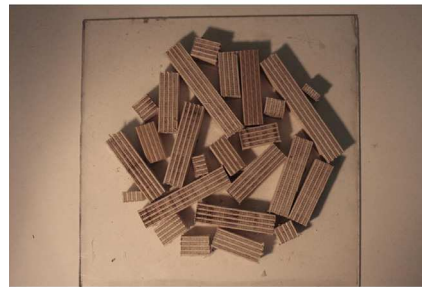
The South Bank Circle is two metres in diameter and composed of 168 pieces of slate assembled together on the floor. The pieces can be put together in a variety of different ways as long as they followed a series of simple rules.

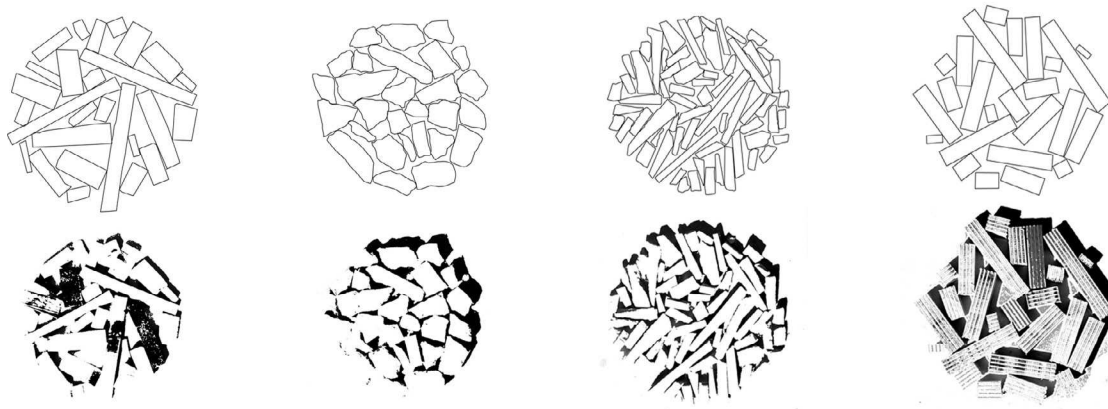
Each configuration had to exist within the defining form of a circle where every 'stone' should touch the stones adjoining it so that they all become 'locked' together and stable. The longest, thinnest and smallest stones should be placed within the work and not around the edge. There should be an equal density of stone throughout, and over all the work should look balanced and circular.

The piece intends to illustrate a common theme in Long's work by bringing together the unevenly shaped pieces of slate in the geometric structure of the circle. It demonstrates the relationship between man and nature where Long's human characteristics meet the natural forces and patterns of the world.

Long's work is intrinsically based on walks made outdoors in nature, often in remote locations. The documentation if these walks takes on different forms and visibly manifests itself in the making artwork rather than its end product.

The first step to investigating the South Bank circle was to recreate a version of it using a variety of materials, shapes and configurations and see which one resembled the shape of a circle the most.





Exploring the Void

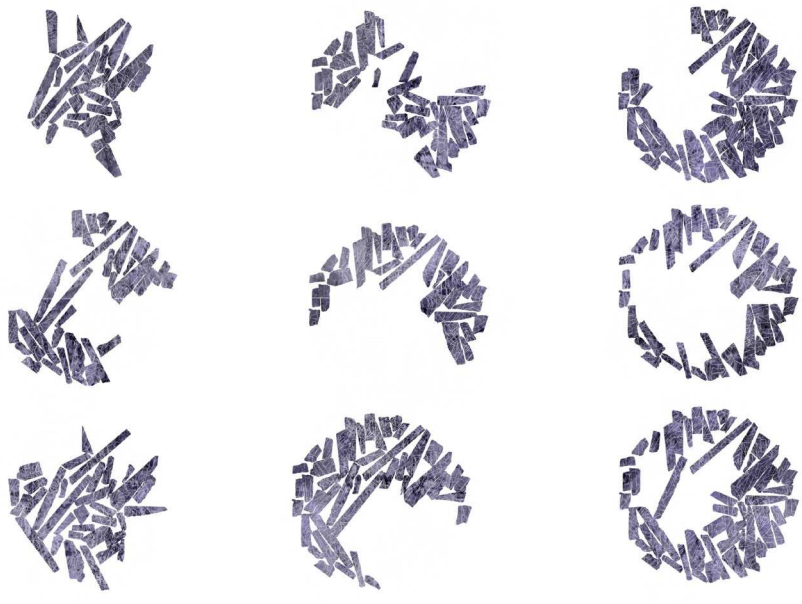
High contrast images of models live an idea of light, shadow, solid and void. Each piece has a unique negative and it worth exploring the edges of the 'spaces in between.'

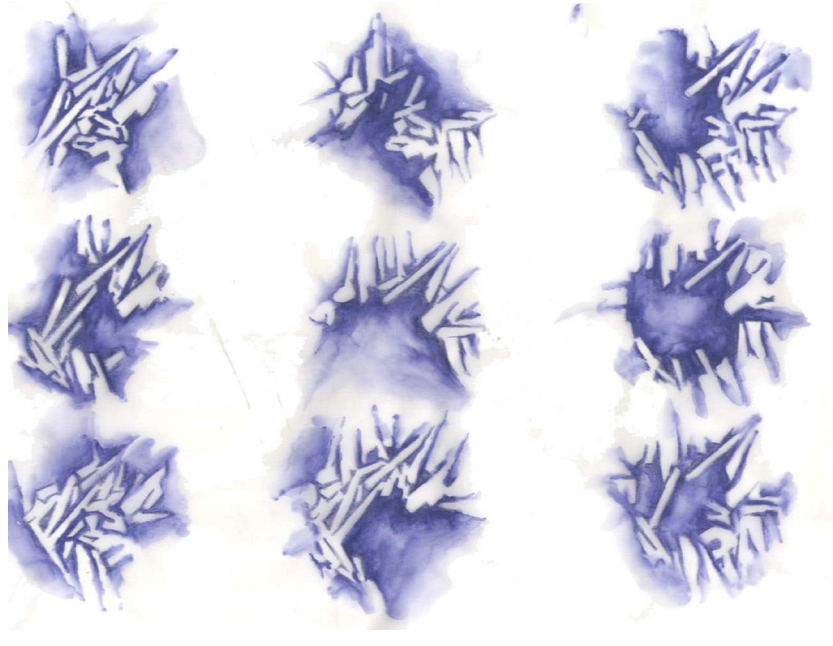
With a change in scale, the spaces in between the pieces can be inhabited, or used as walls, defining a boundary.

The edges of the pieces can start to define a space in section and each piece provides unique spatial qualities of its own.

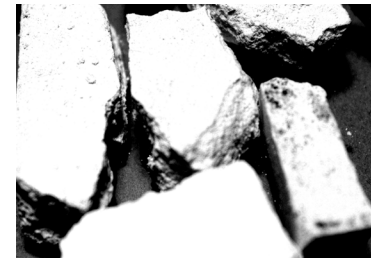
The Space Between

A study is carried out to determine the spaces in between pieces in plan. Various configurations of the existing model results in a variety of ways the space in between can be explored. What appears to have a definite boundary as a solid shape loses its clarity as the space in between the pieces is more free flowing, without a distinct boundary. Missing pieces either creating openings within the circle or expose parts of the circle to its surroundings.





Boundaries between solid and void



Highlighting the Void

Close up images were produced and the spaces in between the pieces were cut out, leaving only the solid. The images were layered on top of each other and a light was shone through the pieces. The intensity of the light determines the void and in effect 'highlights it.'

Yann Arthus Bertrand. Cotton fabrics drying in the afternoon sun in Jaipur, Rajasthan, India, 2009

Hierarchy, Voids and Distortion

James Stone

Yann Arthus Bertrand is journalist, reporter and environmentalist and is especially famous as a French photographer, particularly in the field aerial photography. This is not only because of his work, but for also being the founder of the world's first press agency and images banks which specializes in it. His photographs are renowned for being visually beautiful and interesting as it is a perspective we rarely get the opportunity to view the world in; conveying the passion he has as an environmentalist, often depicting man's relationship with nature. Sometimes the photographs also emphasize the journalist and reporter facets of his personality bringing public attention to civic problems within foreign cultures.

The photograph of his I chose to work with is of Rajasthan, a major textile production centre known for dying and printing cotton and silk. The Indian women working here handcraft intricate products that are sought after by tourists for their craftsmanship and beauty, however, the likelihood is that many of the women working in textile production are living in poverty. Poverty is a serious issue in India which affects twenty-five percent of the population, especially women. Generally Indian tradition has preference to boys because they represent the future of a family's name and its business, even in the poorest families. The abortion of female fetuses is still an occurrence in the country and the rarely accidental sari fires still occur in all social classes. These days the government has noticed that some Indian states now have worrying statistics of less than eight hundred women to every one thousand men and that action has to be taken. The photograph subtly highlights this civic problem and injustice by showing the level of work that these women put into textile production by framing the large amount of carpets they produced.

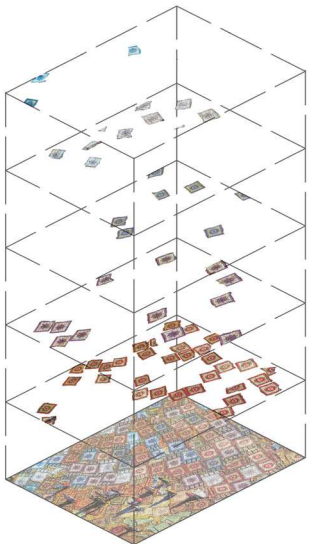
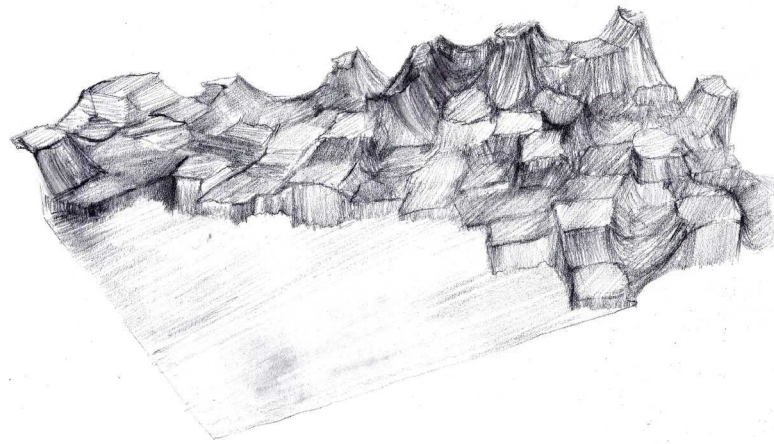


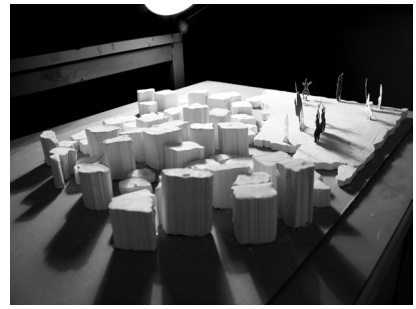
Diagram of Carpet "Hierarchy"

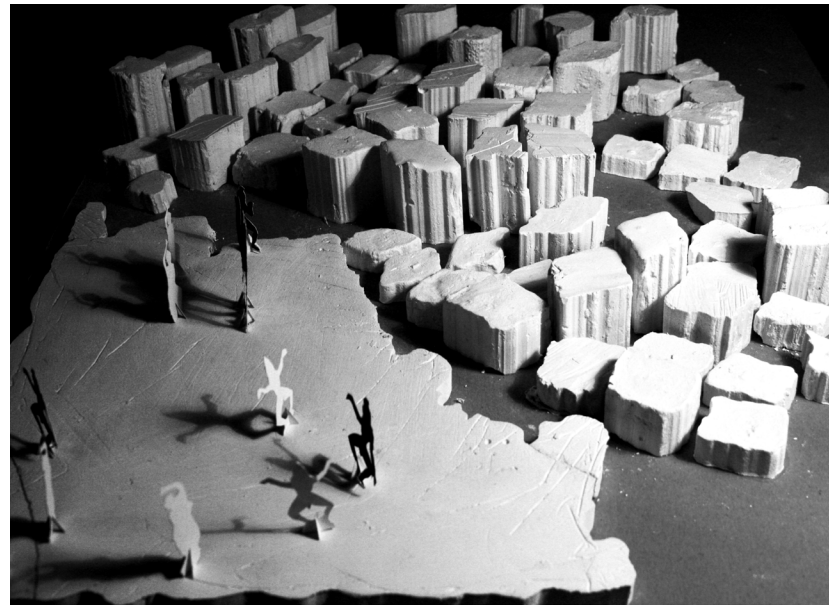


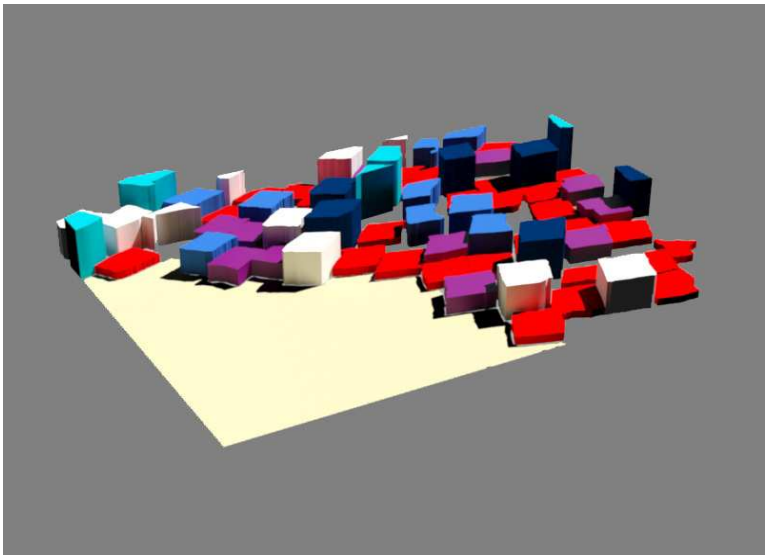
"Terrain" Drawing

Studying the photographs I initially found it interesting how the aerial perspective and harsh sunlight creates the effect of making the carpets on the right side look like a landscape that has no clear sense of depth and height. Therefore I started by trying to organise the carpets in the photograph by separating them into layers and putting them into diagrams that related to the rhythm and pattern that runs through the photograph. This was so that I could start to assign different heights to the carpets according to the varying frequency of the colours.

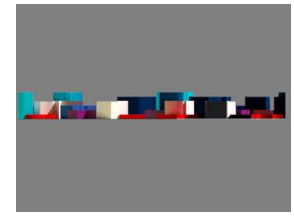
I thought it would be interesting architecturally to think of each carpet as a potential "marker" within the space, and that this would be emphasised more clearly if I assigned a larger height to the carpets with the lowest frequencies.





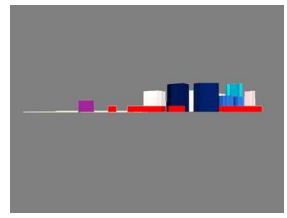


3D Model



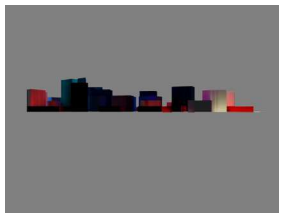
Section A

Back Elevation

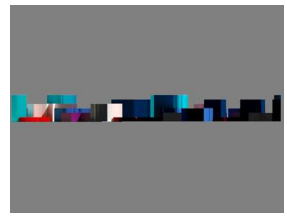


Section B

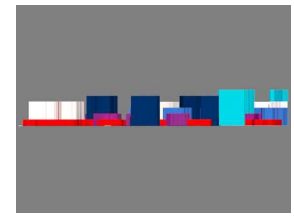
Side Elevation ~Left~



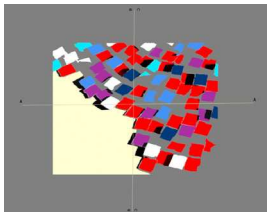
Section A



Front Elevation

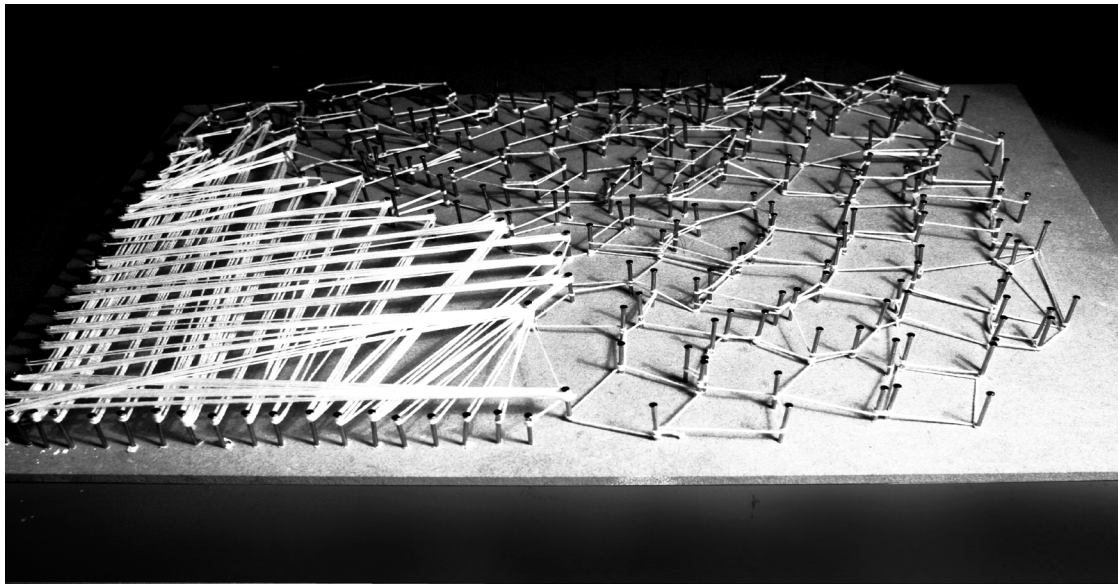


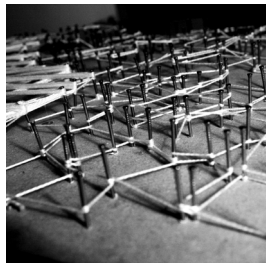
Side Elevation ~Right~

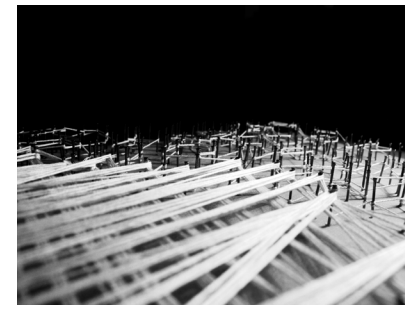


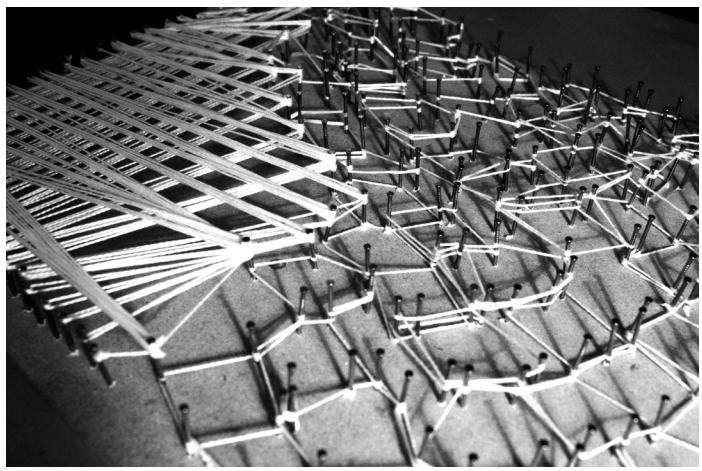
Plan

The lowest frequency of coloured carpets are at the top of this hierarchy.
I created the first model with plaster, as I felt that the imperfect material quality of plaster would portray it as a natural landscape in my photographs. From making this model, I took away an understanding of the different voids between the spaces of each carpet; pathways through this varying topography and spatial markers. Another thing that this model pointed out was the way that the distorted shadows of women occupying the left side of the photograph changed my perception of the area they occupied by giving a sense of scale and height, in this instance, flattening the landscape they are standing on.
I continued working with these solid shapes, creating a 3D model on "AutoCad" and "3DS Max, which I could then render and take sections and different view points from. The images I gained from this give the impression of a study into density, with the varying numbers, spaces occupied and heights of the pieces. In addition, it allowed me to see more precisely in this 3D model, where light is able to penetrate and fill spaces.



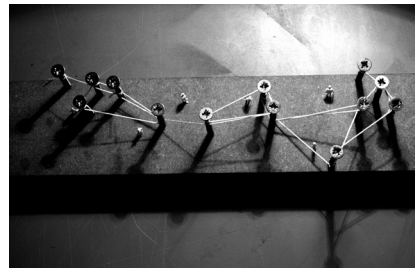


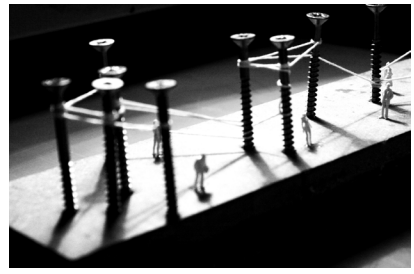


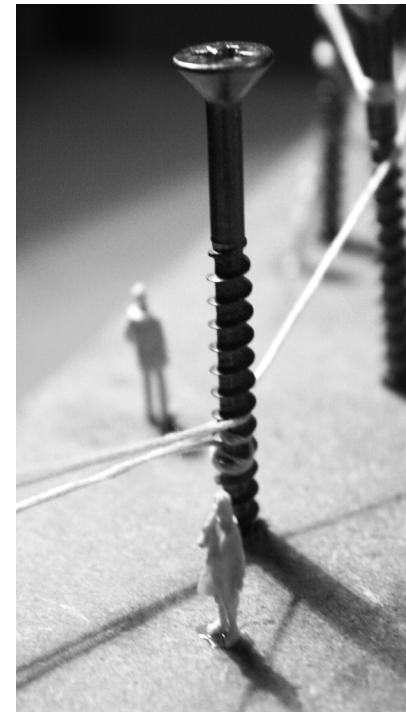


My next model picked up on the idea of using distorted shadows to help create a terrain of varying depth and voids. The string model follows the same principles of assigning different heights to the carpets according to the frequency of the colours, however, there is more of a unity between each potential space, and a flow through the “site.” In some of the photographs you can also get the impression that the string model stretches off into the distance infinitely.

My last model is a scaled up version of part of my string model, with the nails becoming the size of five metre high structures and the string acting as connecting beams. I wanted to convey how a person would navigate through a structure like this and highlight a tectonic relationship between the string and the nail; the building and the beam.







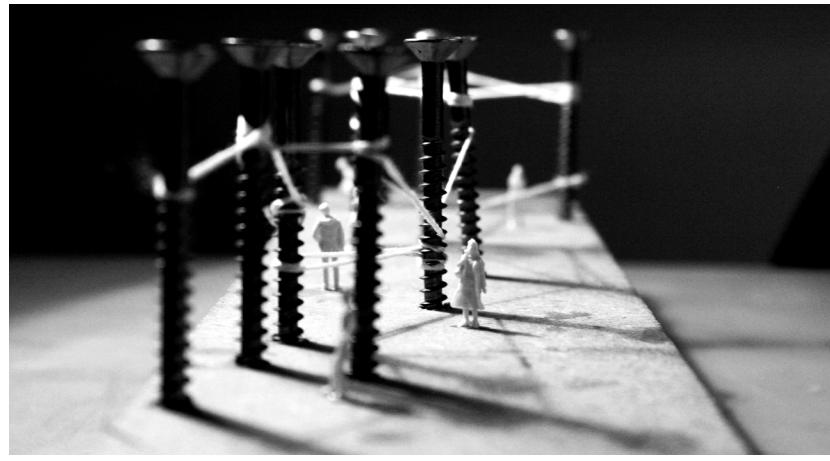
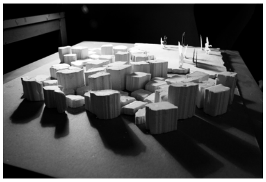
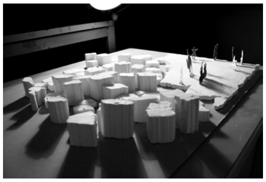


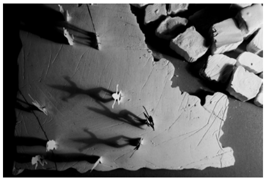
Photo Collection

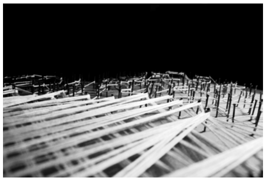
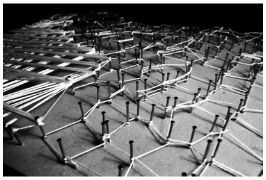
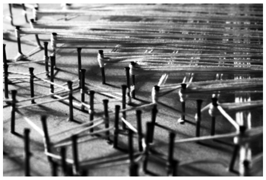
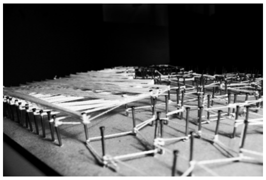
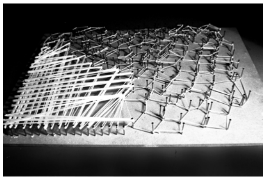


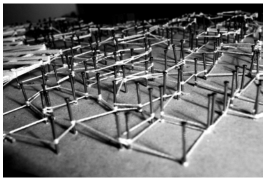
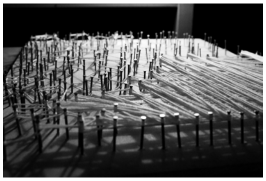



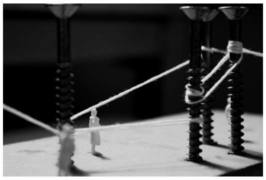
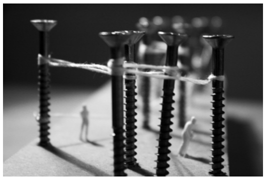




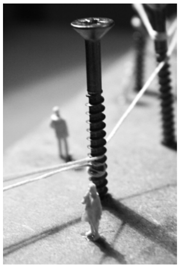
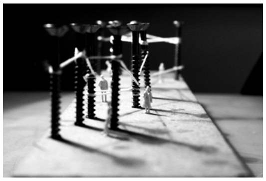
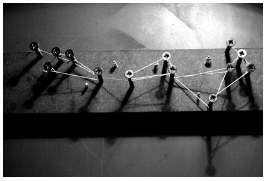
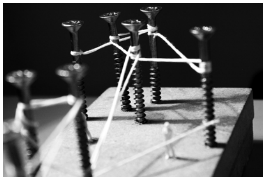


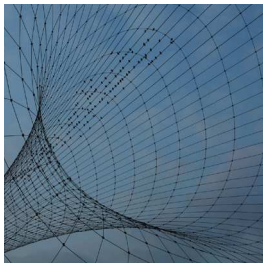



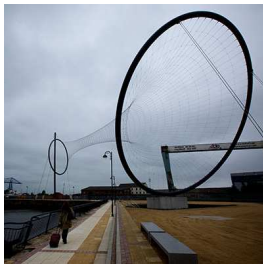


Chaos & Order | Network & Nodes

Neil Waring





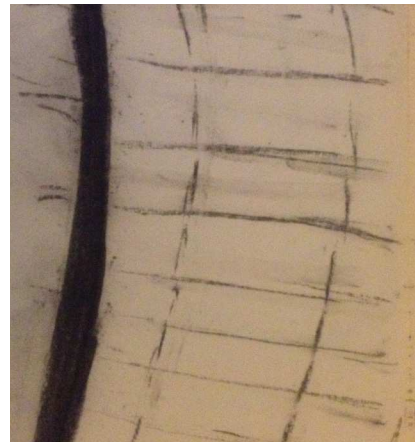
Scale & Context

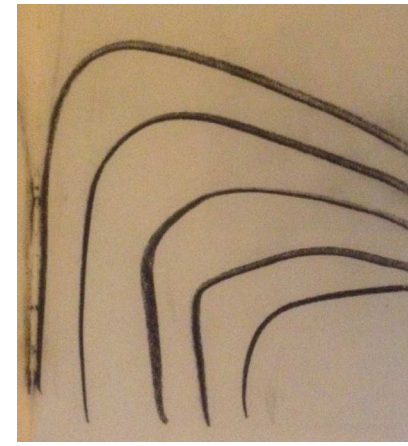
This vast sculptural "butterfly net" designed by Anish Kapoor and engineered by Cecil Balmond, was installed on a site within the post-industrial dockside regeneration area in Middlesborough. The £2.7million project was aimed at attracting people back to the area and has been compared to the Angel of the North in nearby Gateshead.

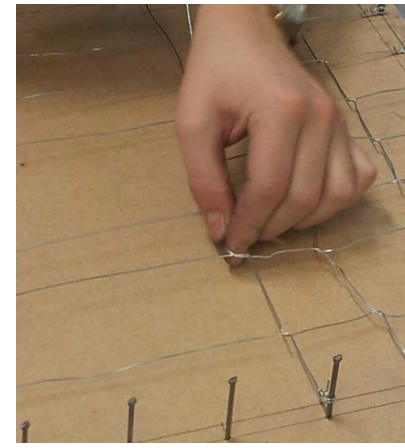
Temenos is an ancient Greek term meaning 'sacred ground', it would have been an area isolated from everyday living spaces reserved for the worship of deities. In this instance Kapoor's sculpture suggests a nod to Middlesborough Football Club's Riverside Stadium that sits as a backdrop

The scale of the project relative to the context which retains elements of its industrial past was key to it's conception. The surrounding skyline is dominated by the Middlehaven Crane, moored container ships and a large transport bridge. Kapoor therefore needed a design that could compete on this crowded, urban scape that is unaccommodating to small-scale intervention. At 50m high and 110m long, the two steel hoops are joined by a steel wire mesh that appears comparatively delicate.

Temenos sculpture on the Middlesborough dockside







Method

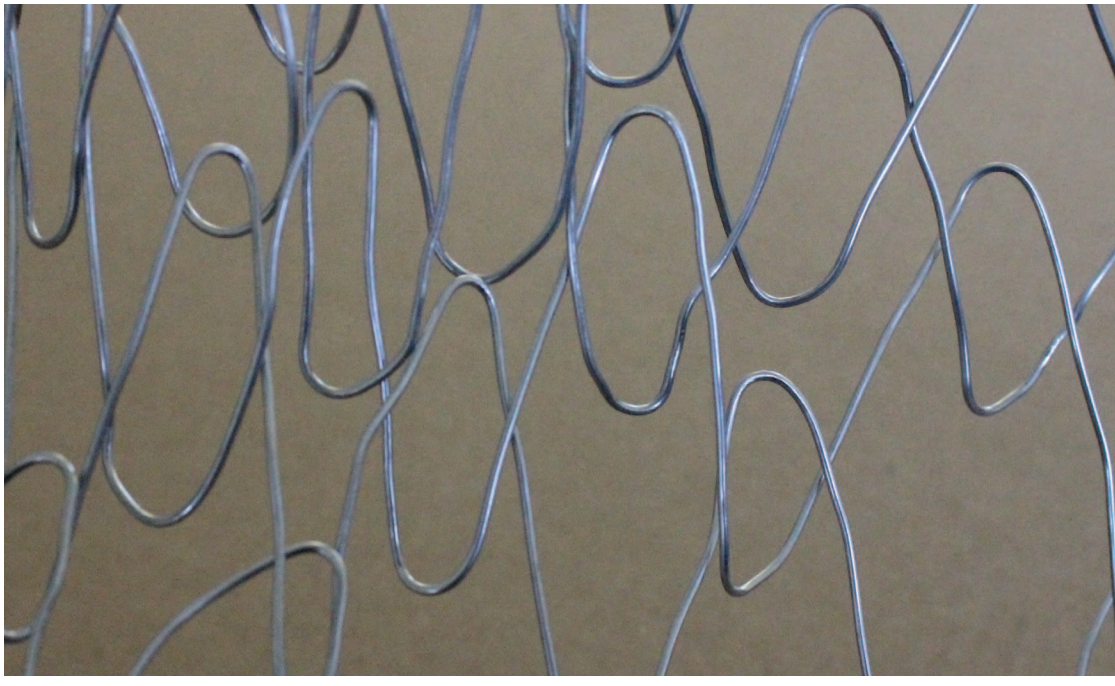
My initial studies focused on the steel cable mesh that spans between the two hoops. From a distance it appears delicate and organic in shape, however this is juxtapose by the regimented grid structure one finds in detail. Following experimentation I constructed a 500x500mm frame that would allow me to test the construction of a section of grid. I specified guidelines with regard to density and wire joints, then testing one variable against the other.

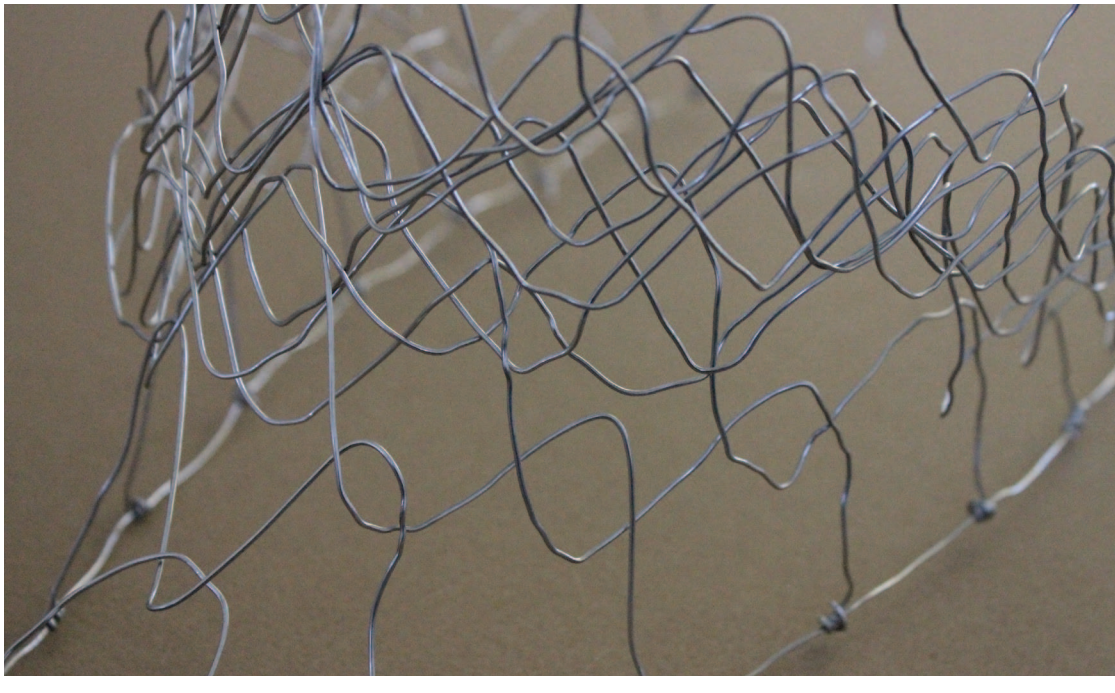
The initial pair of grids compared a single twisted joint against a double twisted joint, the results were stress tested to understand the nature of the weave. The double twist holds a strong structure, whilst the single twist created an aesthetically intriguing pattern of chaos within order.

Carrying forward the single twist, I then tested the effects of density. The wire on the initial grids were set at 50mm intervals, I therefore made grids of 100mm and 25mm intervals. With increased density, comes increased strength.

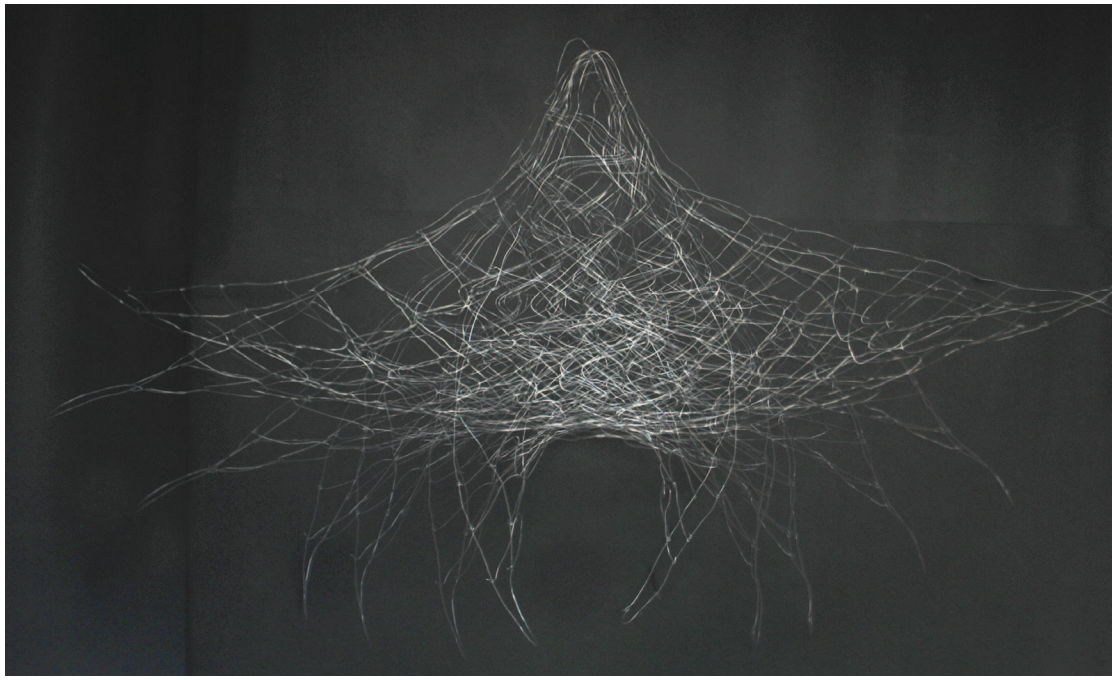
Experimental sketchbook studies in charcoal

Wire weaving process using handmade frame

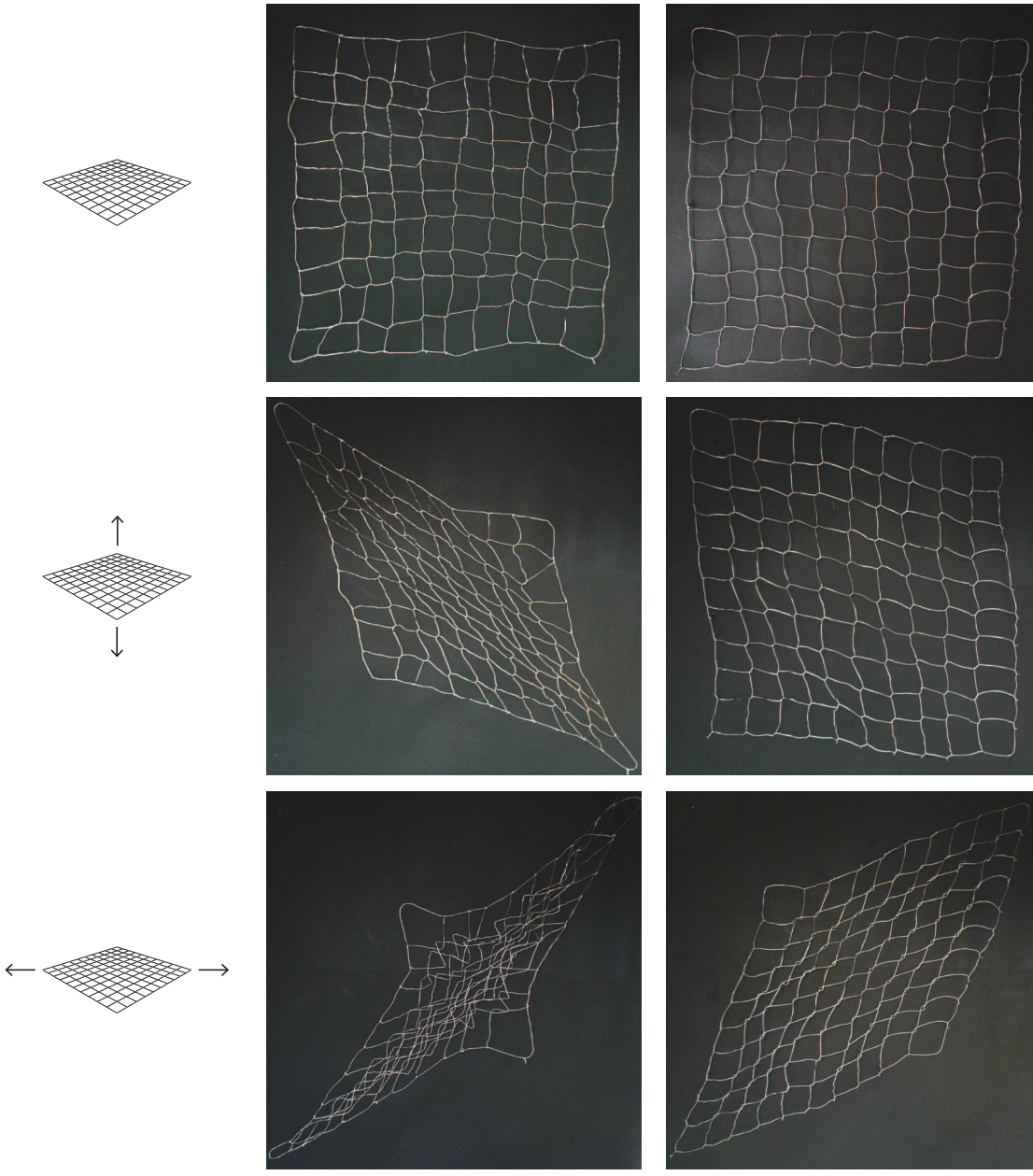




Form manipulation with
single-twist grid



Testing the tensile nature of the wire material and a completed grid



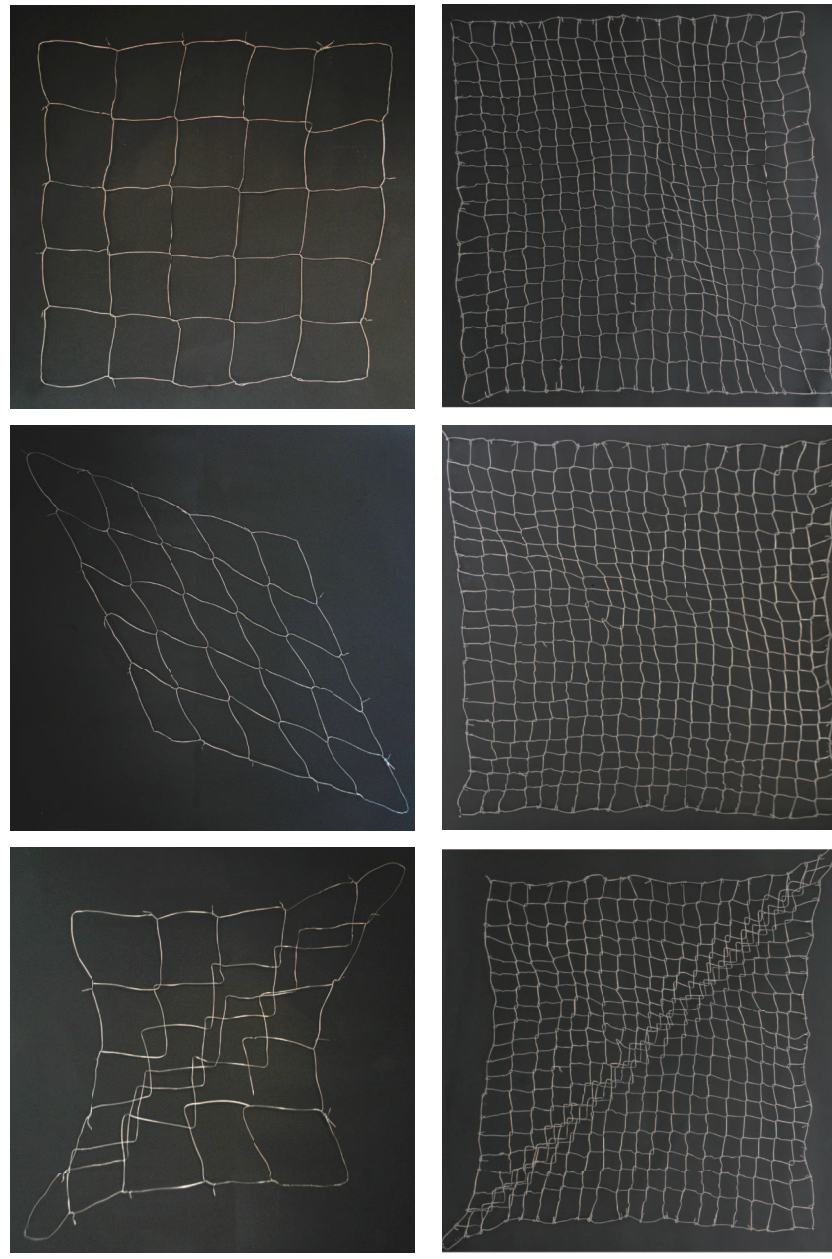
Wire joints as a variable; left column shows single twist, right column double twist

Mechanism for Density Mapping

As a masterplanning tool, the resultant grids can be applied to a prospective site to show the convergence of different land use densities.

A residential zone that hosts a large number of small units with private open spaces would be mapped as a high-density grid. A business park accommodating headquarters or an industrial unit is considered lower density as it has fewer, but larger buildings.

Mapping in this way allows a straightforward understand of the conflicts of land use affecting a given site.



Grid Density as a variable;
left column is 100mm
squares, right column 25mm

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