Geometry in architecture
Geometry within Architecture

Can a harmony be achieved between the social and physical aspects of a design when designing through geometry and, if so, how is this to be accomplished? The problem with this design method is that it appears to emphasise the method of design and construction rather than the social and humanist implications of the project. Therefore, the most important aspect of our work becomes the recognition of the limitations of geometry for each individual project and its eventual translation into three dimensional space.

Contents

Introduction 2
Architecture and the social environment 2
Architecture and the physical environment 3
Formal Aesthetic 3
New plan of Rome 4
Landscape and Topography 5
Designing from the inside out 5
Attributes 6
Movement and Intensity 6
Primer Projects
Shannon Airport, Co. Clare 7
Tempelhof Airport, Berlin 8
University of Limerick, Limerick 9
San Carlo Alle Quattro Fontane, Rome 10
Limerick City Centre and Periphery 12
Site 12
Brief 13
Design 13
References 32
Bibliography 33
Introduction

How do we begin to design? We begin with an idea which must manifest itself in some form. These ideas will be further enriched as designs progress. To generate this original idea with a geometrical premise could add a layer of coherence or logic to a project.

If, as Carlos Ferrater suggests, “the Architect’s work lies in the act of moving from geometry to space”, then should we not approach every design from a geometrical starting point? Is that not the strongest move we, as architects, can make.

And can we use this geometric tool further; can we use it on all scales from overall system design to object detail? Can this system which tends to be inflexible and rigid adjust to the demands of construction, site, climate, programme and aesthetic?

Through analysis of a precedent study and within my projects throughout the year, I wish to observe different geometries through to actualisation, to get a better appreciation of all geometry has to contribute within architecture. In doing this, I also hope to challenge the limitations to a geometric approach in architectural design.

Architecture and the social environment

In an essay by Ruth Levitas, she remarks that “it is not what we imagine but that we imagine” and that the fact that we strive for a better way of living is the most important thing. It is the creative mind of the architect which attempts to visualise alternatives through a process of self criticism and an indepth knowledge or awareness of the existing social conditions. Nathaniel Coleman refers to this utopian method, described by Ruth Levitas as a developing of a mindset rather than a method. In this case, the use of a geometric starting point would seem almost meaningless unless that geometry was allowed to adjust and develop to the programme requirements. The strength of an architectural proposal will be greater if the geometry in design has an important significance to the social aspects of the site and its surrounding area.

Nathaniel Coleman remarks that “the decidedly vocational character of architecture education, which is skills based and thoroughly embedded within the dominant economic system, generally precludes the development of such a humanistic and holistic approach”. As a result, Nathaniel Coleman argues that we, as architects, need a deep social understanding of what we are doing so our designs are less aesthetic and more ethical.
Architecture and the physical environment

The creation of a mathematical geometry and a method of calculation gave rise to the profession of the architect. It allowed him to put drawings together. Robin Evans notes that architecture “remodels nature on the pattern of geometry’s fabricated truths.” The straight lines of geometry are made by us and do not exist naturally. Guarino Guarini writes about the idea that geometry is the foundation of architecture and “that it gives architecture a reasonable ground but does not confine it to rationality”. He explains that architecture is dependent on mathematics. The use of geometry forms the substructure or the starting point from which a design can be developed. It allows us to work in abstract form, to create conceptual ideas and how we convert these ideas to a piece of architecture is up to the individual. Our first thoughts put from pen to paper will generate the type of geometrical forms we will use.

The type of geometry used will have a big impact on our designs. The types range the simple straight line, to ideal geometries such as circles, squares and triangles which are found in classical architecture to the more complex geometrical forms such as ovals, ellipses and others formed from multiple geometries. The nature of the forms generated will always have certain spatial qualities and social conditions.

‘Formal Aesthetic’ in Classical Architecture

Ideal geometrical shapes such as the triangle, square and circle are easily recognisable and familiar to us. They have strong attributes. Spaces that are designed using these ideal shapes are often more likely to be preserved from outside interference. Ferrater remarks that “the initial assumption of a strong geometry (one capable of generating an intrinsic order to the project) will render the intrusion of outside and alien factors difficult or impossible, thus producing a sort of armament.” In Classical Architecture, ideal geometric shapes were a symbol of power and wealth. Structurally, they provide a more rigid form, as can be seen in arches, domes, vaults used in this time. Classical Architecture based its designs around the structural qualities and social aspects of these ideal geometries. The overall forms created with this type of design were motivated by this “formal aesthetic”. Their strength was displayed in the beauty of ideal forms of their creations. They are typically associated with places of significance including important social events, public landmarks and places where people gather, for example the Pantheon and the Colosseum in Rome.
New Plan of Rome

This idea of strengthening nodes to redevelop a city was used by Sixtus V in the 1500s. Pope Sixtus planned the new streets of Rome as a spine, strengthened by structures at intersections or nodes. The strength of these nodes ensured the integrity of the new streets. Visual connections were made throughout the city from intersection to intersection. Essentially, the plan for Rome could be reduced to a series of connections between places of significance or worship. He took the topographical nature of the city into consideration when creating these new routes and views with each node or place of interest directing you to the next. The spaces between would eventually flourish thanks to their location on the new plan of Rome in relation to these strong areas of worship or civic interest. Pope Sixtus encouraged building activities along these routes, knowing the commercial advantage that would then become available. In his short few years as Pope, Sixtus V achieved more for Rome than any of his predecessors.

These areas of significance or civic interest were the basis for the Nolli map of Rome. This Nolli map was created in the eighteenth century and shows a figure ground representation of the city of Rome as can be seen in fig. 4. The map highlights the civic buildings and spaces within the city both interior and exterior. There is no distinction between the interior civic spaces or the exterior so the relationship of all these spaces can be read easily. Their relationship to their individual blocks which they occupy can also be seen clearly. It also shows the amount and types of left over spaces around these civic spaces located within the city. These nodes or areas of significance show the importance of geometry in urban planning as these were areas where roads or lines converged. Focault observes that “the notion of a number of lines meeting at one point is a form of control in itself.” For the plan of Rome, these new roads developed around these nodes were the means of controlling the development of an entire city fabric.
Landscape and Topography

Geometrical form, especially the straight line, indicates man’s existence in the landscape. He will change the existing landscape. The method by which he does this depends on his sensitivity to what exists already. David Leatherbarrow remarks that “a building cannot be internally defined” as this creates the isolated object 14. In this case the occupant becomes introverted. Therefore, it must react to the landscape it is set in. It must situate itself in such a position as to compliment itself and what surrounds it. The geometrical forms used for an artificial landscape can have a big impact on the spatial forms generated.

But can we approach something as large as a landscape design using geometry? Ferrater remarks that “contrasting the initial ideas of a project with a geometrical premise will help us to recognise the place and pick out its hidden needs, forcing its authentic condition to surface” 15. This implies that the initial idea will lack a scale, which will generally be regained through further thoughts on construction.

The scale of landscape design typically suggests a design approach which works from the outside inwards.

Designing from the inside out

These days, some performance spaces are designed using geometry’s principles but have a composite geometrical form. These irregular spaces are designed with a particular purpose in mind. It is almost assumed that irregular form must follow function. For example, concert halls have been designed around the idea of best acoustical and visual performance for the audience. The hierarchy is further broken down in the seating arrangement and location of the performance area. Scharoun started this idea of the centralised stage in relation to concert halls where the seating encompasses the stage. The resultant geometries are generated in attempting to create the best views, acoustics or movement. In this case the lines of sight or sound are virtual geometrical lines which order the unbuilt space. Scharoun focused 2,218 points of perception from the interior of the hall to the main stage. 16 Though the space may appear more free from restrictions and constraints, it still must adhere to geometric rules or lines. Scharoun was successful in creating these complex spaces, which were almost impossible to represent in two dimensional drawings. 17 Robin Evans notes that “Architecture as we know it can only escape the flatness imposed by drawing through drawing”. 18 Evans also notes that Scharoun’s complexity in the Philharmonie illustrates how “individual genius can overcome the tyranny of industrial repetition”. 19 In Post-war Germany this type of architecture represented a more humanist form with no apparent front, symmetry, rectangularity or axiality. 20 Each seat in the concert hall was of equal acoustical importance.
Geometrical Attributes

By their nature, structures based in ideal geometries are difficult to interrupt or challenge. This trait can be seen in the beauty and power of buildings designed using ideal geometries in Classical Architecture. Formal geometries or spaces are those which are ordered by a single ideal geometry. They are often ceremonious, symmetrical and highly organised. They are often seen as stand-alone monuments or impenetrable voids due to the nature of their form. They leave little room for expansion or addition, being perceived as a complete object or a perfect form. They have a very strong presence and create a hierarchy. They are predictable forms which produce certain emotions and reactions. We look for the unusual to orientate ourselves. However, repeated use of the unusual will inevitably lead to illegibility and to us feeling threatened.

It is not only single ideal geometries which evoke certain emotions. A number of overlapping geometries can have a strong presence. As discussed later in the text, San Carlo Alle Quattro Fontane in Rome by Borromini was designed using multiple overlapping ideal geometries, which in effect, created a theatrical, energetic space. Much of Baroque architecture of the 17th Century also attempted this. 21

Movement and Intensity

Bridget Riley, an English artist, developed the idea of using geometric form to produce sensations of movement and colour. These areas of intensity within the paintings can often form optical allusions.

In these paintings, Riley says that "the object doesn’t exist factually but in the performance of the painting of the viewer". 22 This method of painting creates a type of active space. Though two-dimensional, it can be perceived as three-dimensional due to the intensity if lines or colours. This can be seen in "Movement in Squares (1961)" as shown in fig. 7. This method of spatial creation can also be employed in terms of architectural design. Riley remarks that "perception is the medium", not the canvas and the paint. 23

From these original thoughts about geometry, I began my three primer projects. These projects dealt with ideal geometries in relation to topography, structure, movement, hierarchy of spaces and their isolating proprieties. Though of short duration, they were extremely beneficial in understanding the types of spaces which a strong geometry can create.

Fig. 7 Movement in Squares 1961
Primer Projects

Shannon Airport, Co. Clare

The scale and topography of the site in Shannon Airport prevented you from experiencing its geometry. Despite its size, the circular shape of the lagoon is hardly noticed on approach. The diameter of the circular lagoon exceeds 800 metres. The site along the estuary was extremely flat, the ideal topography for the establishment of an airport. The situation at Shannon meant that the new proposed warehousing had the advantage of being seen from above, although the majority of the people who experience this place will be at ground level. The proposal attempted to challenge the formal geometry embedded in the construction of the site by the placement of the similar ideal geometry within its curtilage. Unfortunately, the proposed circular structure neglected to accommodate any change in level which was necessary on this site. The design around the two dimensional plan needed further development, especially in terms of its section and consequently its roofline. However, the organisation of the proposal showed the breaking down of the large scale site into a more human scale, where ideas on structure and movement could be developed.

On a large scale, the proposal considered the existing circular geometry of the lagoon and its scale and consisted of a stand-alone building, anchored at one point, the structure of which was ordered around this geometry. The form of the proposal attempts to heighten your awareness of the shape of the lagoon through the use of scale, proportion and the relationship of points in space. The connection to land or anchor point is located on the circumference of the lagoon, the point of which all circles radiate. From this point, the ordering of the space can be seen.

The theoretical attachment point does not exist in reality. It is just a point in space where all circumferences meet. Its importance exists on paper or in drawing but in reality it is not even noticed. Its importance exists but is not felt.

The arrangement of the incrementing circles organises the spaces located within the lagoon by attempting to create zones of different intensities which reflect the formal geometry of the site. They are arranged incrementally, beginning with a roundabout of similar scale to the existing, including an area to accommodate the turning circle of a vehicle and consisting of warehousing ordered in terms of the limits of possible structure.
Tempelhof Airport, Berlin

Similarly, the site at Tempelhof Airport in Berlin presented another strong geometrical man-made form in both the building and the overall site. The Airport Terminal redesigned in the 1930s reflected the typical architecture of Berlin during the Nazi rise to power, being extremely large in scale and authoritarian in presence through use of a strong geometry and symmetry. The building heightens the form of the space. Similar to Shannon, the scale and topography of the site hinders your perception of the geometry of the space. The middle of the space was a void due to sheer scale of the site. People seemed to gather or spend their time closer to the perimeter of the site while the centre contained a small number of protected species found in the area. The centre of the site presented a dilemma. The two existing runways, both exceeded two kilometres in length, cut right through the centre of the site. It appeared the scale of these runways had contributed to the preservation of the site, stretching from the West to the East. The site was clearly in use by a large number of people for activities such as cycling, jogging and kite surfing along these runways. Interference with the runways could allow the external conditions of the surrounding area to put pressure on this space.

The proposal of a strong circular geometry helps to preserve some of the park with a rigid form. The existing oval shape is too big and loose as a shape to work on that scale. The smaller circle is a stronger ideal form, has a greater structure and is tighter and more resistant to any external forces. The proposal also considered a straight permanent piece of infrastructure tangential to the circumference of the circle which crosses the existing runways. This piece of infrastructure could begin with something as small as a foot path and could develop over time and may eventually take priority over the runways. It alters your perception of the space by introducing a change in level along its route and making you more aware of the geometry of the building and the preserved circular park. This piece of infrastructure also acts as a barrier to external forces which may attempt to penetrate the park while the minor routes gently reinforce the geometry of the circle.

Fig. 10 Tempelhof plan

Fig. 11 Model proposal

Fig. 12 Site model

Fig. 13 Section through proposal
University of Limerick, Limerick

Again further exploration of ideal geometries, the formal spaces they create and their effects on the surrounding environment were evident in my proposal for the redesign of a new entrance to the University of Limerick. The expanse of the campus of the University meant that it is often difficult for a person to orientate themselves. The chief areas comprise of the Main building, the Library and Foundation building, which all align with the orientation of Plassey House, the first building on campus. As a result the existing main entrance faces Southwest with the height of the surrounding building casting deep shadows on the courtyard to the front. The stair cores become the means of orientation of this building. The building appears as a collection of different volumes all connected through these stair cores. The cruciform shape of the column structure adds to the difficulty in manoeuvring through the building.

The proposal for a new entrance to the University attempts to challenge notion of a circular geometry becoming an isolated and impenetrable object which cannot be interrupted. This is done by overlapping the circular geometry with that of the existing University column structure.

Similar to the Shannon project, the incrementing circles created more inviting expanding areas at the entrance and the overall proposal has an advantage of being viewed from an elevated level. The gradual change in level and overlapping of structure broke down the formality of

the overall space. The areas of overlap became distorted due to the two intersecting orders which have two very different structural grids. The existing University grid cruciform grid is easily distinguishable from the circular column grid of the intervention. The effects of the imposed geometry can be seen on the existing arrangement in the layout of the existing offices which encompass it.

Primer development

The scale and short duration of the primer projects did not allow for enough development of design. The resulting projects were providing for structure but had not quite reached a scale where a more humanist design could be explored. However, from these earlier observations on geometry and particularly from my work with the University project, I began to focus on the intersecting and overlapping of ideal geometries such as circles and squares to create more complex geometries and how these geometries can order a space and consequently the surrounding built environment including the ordering of any irregular spaces which may result. These principles form the basis of Baroque Architecture and can be seen in particular in Borromini’s San Carlo Alle Quattro Fontane in Rome which is a centrally planned church with neighbouring cloisters and courtyard. Baroque Architecture and Borromini’s church in particular show this breaking down of formal spaces based on ideal geometries through overlapping and intersecting these geometries and also aided by ornamentation and bold contrasts in materials and form.
San Carlo alle Quattro Fontane, Rome

Internal space

It is not always necessary to experience the interior of a central space from the exact perfect centre of the form as was discovered in the earlier projects in Shannon Airport, Templehof and the University. The perspective will never give a true image of a site. Geometric perspectives were designed to be viewed from one point only. This prioritises vision as the apparatus for experiencing a space when in reality a space is experienced through the hybrid of things such as materials, topography, light, temperature and smells. Space is not always determined by surveyable dimensions.

A centralised arrangement can be seen in Baroque churches such as Francesco Borromini’s San Carlo Alle Quattro Fontane in Rome (Fig. 15) which rejects the typical church plan or order of many of its predecessors. Baroque architecture was associated with notions of wonder or deviations from the expected norm of the time such as the use of pure form as found in Classical Architecture. Baroque translates to ‘misshapen pearl’. Baroque architecture was adventurous and subjected the idea of the centralised plan to many tests. The initial geometric forms used to order the space can be seen in the built structure. Here, the centralising of a space and the use of overlapping geometries within a restricted zone, generates a number of irregular spaces which are still heavily ordered around the main church space. As Evans notes, the interior of the church of San Carlo Alle Quattro Fontane has so many focal points and centres that control of the space is relinquished. As a result, it becomes difficult to survey. No two plans for the space appear the same. The forms created cannot be calculated or replicated easily without prior knowledge or understanding of the guiding geometries that were used to order the space. Exactness of form is no longer a priority. Each geometry and subsequent built form supplements the next while continually stimulating the observer within the space. This arrangement in San Carlo and consequent deformation of formal space by overlapping of ideal geometries attempts to express an emotion and a sense of wonder to the observer through the unexpected situations which occur throughout.

The geometry of the internal space is almost divided into three areas with the darkest at the base, the middle intermediate layer and the brightest layer at the top. Fig 16(a) shows how the geometry orders the highest layer and hence the light entering the space. Borromini rejected the notion of architecture as a reflection of the proportions of the human body in favour of the proportions of nature. The height and proportion of the columns on the ground floor emphasise vertical movement towards a celestial place. This proportioning system also contributes to the exaggerated theatrical and unanticipated effects of the spaces found both internally and externally at the church. He also rejected the traditional order found in clas-
sical capitals and used a more abstract capital instead. The resultant completed church shows a new enriched form with many elements where fragments of the original geometries can still be seen.

External influence

San Carlo alle Quattro Fontane church seems to be bursting from its enclosure within the interior. This arrangement has a subsequent affect on the neighbouring area, the exterior warps a little to indicate something unusual happening within. This can be seen in fig. 16(c) The wall to the rear of the altar similarly bulges to the exterior indicating the refusal to stick with the generally accepted formal ideas of the time. The main interior has a similar effect creating a number of enclaves within the space and leaving as little left over space as possible. This can be seen in fig 16(b) where the interior spaces appears almost carved out of the existing block. The person finds it difficult to rest their eyes on anything as there is no one focal point but many focal points. The church reads as a sum of parts and also as an overall enclosure. The exploding space of the church area and enclaves can be almost considered as the most extreme type of Baroque architecture where overlapping geometries are constantly at odds with each other. The neighbouring cloisters and courtyard of the church do not echo this explosion and create a perfect balance between the spaces.

A more durable space today can be one which is memorable, not physically formal. Baroque architecture attempted to break away from the forms at the time by experimenting with the language it had been given. Architecture must continue to change and adapt like any fashion of its time to remain exciting and interesting. This forms the basis for the Utopian Method which emphasises the need to change as being the fundamental characteristic for any social or physical improvements. David Harvey remarks that “through changing the world, we change ourselves” so we need to be prepared to change our attitudes. He feels that the development of computer technology and design may in fact alienate us further from designs as they are produced with more speed and less thought.
Limerick City

Centre and Periphery

Considering my previous work in the primer projects and including my analysis of San Carlo alle Fontane and the plan of Rome by Sixtus V, I chose to look at Limerick city to see if I could apply what I had learned. Limerick is an area with a number of ordering factors. These originated with the Shannon River, the natural topography of the landscape, King’s Island, the oldest part of the town, the Georgian Quarter, New Town Pery and the development of the new motorway system. The axes which result from these early imposed orders forms the patterns of development in the area. The introduction of the new motorway creates a barrier to continued expansion. The speed of movement becomes the driving factor for this ordering of this newest network. I began to focus, not on the city itself which had a strong geometric grid, but on the areas around the city. The further you go from the city, the looser the form. The areas which interest me are these lesser defined areas where the city order does not quite influence the space, where orientation is difficult and hierarchy of roads are non-existent.

Site

The Southern Ring Road or Childers’ Road has numerous intersections or nodes, all with the same condition, large scale industry, roads of equal width and fenced enclosures on all sides. In particular the intersection near Punches Cross represents one of these areas of confusion but is in closer proximity to the city centre than the rest, being located on the periphery. At present the 25, 500 sq m site consists of a small number of retail units, some large scale commercial units, an ESB substation, some HSE offices and an unused storage facility and petrol station. Punches Cross used to form the old boundary of Limerick City before it was extended to Doonraghadoyle. This axis, originating in the city, connects the largest suburb of Limerick to its centre. Along this route, there also exists a number of significant nodes including the largest shopping centre in Limerick, the Regional Hospital and a large an Industrial Estate. Therefore this axis and Childers’ Road are constantly in use and form two of the boundaries to the site. A third route, though much less used, forms the other border to the site. All three routes contribute to the isolated nature and the dereliction of much of the site. The level changes around and within the site contribute to keeping the site disconnected from the surrounding communities and to the other elements within the site itself. The areas surrounding the site range from the
very disadvantaged to the extremely affluent. Fig. 18 shows this distribution with the site highlighted in the centre. The site is almost equal in proximity to the City Centre and the Crescent Shopping Centre and is capable of accommodating the wider range of communities located in the area.

**Brief**

The location of the site in relation to the centre of the city and at the centre of a range of diverse communities allows it to have a dual function. Firstly, it becomes a hub for the surrounding areas, facilitating a range of necessary functions. These include:

A number of allotment gardens for the wider community as the community felt this was something they would like integrated into the site.
A small cemetery for the community, the size of which is determined by the existing adjoining Quaker graveyard.
A number of retail units for the area, of similar scale to the existing small retail units.
Both an indoor and outdoor performance area for the communities with exhibition space.
A bike terminal for purchasing or hiring of bicycles due to close proximity to retail areas of the City Centre and the Crescent Shopping Centre.
An extensive library due to the large number of schools in the surrounding area.
An Urban intervention consisting of a range of cafes and/or restaurants.

Secondly, the location within the city boundary allows for the site to become a new type of urban landscape or park. Its proximity to a number of city centre schools and its location on two major axes within the city guarantees its usage.

The community and urban programmes must be in harmony on the site and must not appear as two separate identities.

**Design**

Similar to San carlo Alle Quattro Fontane in Rome, the design involved the use of geometry in the carving of space into a site with tight constraints. The strongest attribute to the site is its gradient. The orientation of the site is ideal being south facing. There exists a nine metre difference from the South-Eastern tip of the site to the Northern tip. I chose to work with this gradient as it represented what was unique to the site. Early contour models attempted to generate a new organisational idea for the site as can be seen in fig. 20. Fig. 19 shows early attempts to generate forms within the site. These led to a development of an artificial urban landscape with the buildings integrated. Their position of the buildings on the site was determined by the conditions of the existing major roads, the extremes of the slope and the views from the site over the surrounding area.
Views
At present, the site contains a number of buildings, the largest of which are Lidl and Chadwicks. Their scale obscures any views of the surrounding landscape while creating a distorted perception of the scale of the site.

Existing Road Network
The busy nature of the bordering roads isolated the site creating an island. To address this situation, the road to the East of the site is no longer in use. Access remains to the North to facilitate entrance to the existing housing to the East. The ground condition of the plaza to the Northern tip of the site attempts to bridge the road to the Western side of the site and the openness of the site to the Southern edge allows for future bridging to occur. The resulting site is no longer one which is isolated but integrated into its surroundings.

Programme
Section A: The building is located adjacent to the allotment gardens and directly behind the Urban Plaza. It can accommodates storage of equipment and a market stalls.
Section B: The building at the lowest point of the site provides an area for bike rental, purchasing and storage.
Section C: This sheltered centralised space accommodates an outdoor exhibition space as well
as performance area.

Section D: Adjacent to the graveyard, this building can accommodate prayer and meditation with spaces lit from above. The building is orientated away from the busy Urban route to offer protection from noise and distraction.

Section E: This building, which breaks the boundary of the site, accommodates both an interior theatre space and also seating above for viewing the activities of the proposed all-weather pitch.

Section F: Located on an area of the site furthest from the City Centre, the retail building can accommodate a number of small shopping units.

Section G: The Urban Plaza is located directly across from Punches Hotel, the facade of which aligns with the main street. The restaurants are orientated towards this street to strengthen the urban facade along the busy city axis.

Structure
Each building is designed with its own grid system. A concrete waffle slab system is used with exposed diagonals underneath. The grid structure of some of the buildings can be seen in Fig. 27.

In order to get light into the structures, it was necessary to be able to remove a piece of the concrete waffle grid and to replace this with something transparent. Fig 23 shows model studied of how this could be achieved, first—
ly through a light frame work and secondly, through maintaining a heavy structure.

Drainage
The variations in ground level and also in roof level allowed for a system of drainage to occur where the retaining walls used in the formation of the landscape can retain the water and channel it through to the roadside. Within the roof structure, the water collected within each waffle slab filters through narrow openings to reach the drainage channels before being directed towards the retaining walls. This detail can be seen in Fig 29.

The model images of Fig 28 show the extent of the proposal for the site. The spaces within the site are open, though sheltered. The external conditions of the site offer both protection where necessary and filtration. The internal level changes facilitate movement through the site, where they once obscured and a harmony is created between very different activities both on the site and in the immediate surroundings.
Fig. 24 Site Plan

Fig. 25 Site Model 1:500
Fig. 26 Site Elevations A, B & C
Fig. 28 Final Model 1:200
Fig. 29 1:20 Detail Section through Library showing roof light construction

Fig. 30 Site Perspective as you walk past site

Fig. 30 Site Perspective within allotment area of site
Fig. 31 Process Models 1:200
References

Bibliography


