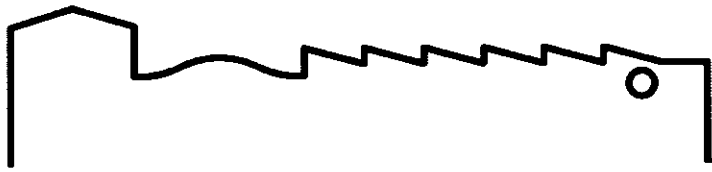


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Adaptive Reuse through Layering: Transforming the Rex Trueform Clothing Factory

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September 2009



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Design Research Project APG5058S

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Master of Architecture (Professional)

by

Rikus Louis Munday

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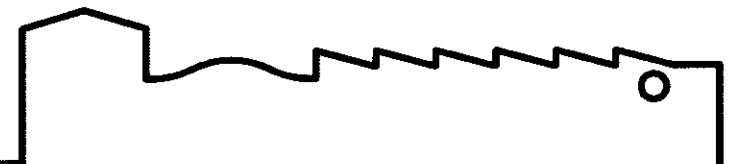
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Hypothesis

“Transforming the Rex Trueform Clothing Factory in Salt River into a Skills Training- & Workshop Facility for the Cape Town Garment Industry.”

Abstract

The announcement in March 2005 of the imminent closure of the Rex Trueform clothing manufacturing plant in Salt River created a large impact on the Cape Town economy in view of the nearly 1000 jobs that were at risk. The reason for the closure, according to management, was due to globalisation.¹

Four years have past since the last garment was produced in this factory building, which was designed in 1934 by one of Cape Town's best-known modernist architects, Max Policansky. It is now abandoned and derelict – left for dead with the possibility of demolition threatening its existence.

This thesis will focus on the **adaptive reuse** of the Rex Trueform Clothing Factory in Salt River. I am proposing to transform the Rex Trueform Factory into a Skills Training- & Workshop Facility for the Cape Town Garment Industry. This new facility will provide learning spaces for the training of those working in the garment and textile industry, as well as offer a creative workshop environment for small clothing manufacturing enterprises. In addition, residential and retail spaces will be provided, as well as a clothing market.

This project will also demonstrate how the **layering** of architectural modes of expression can produce delightful and surprising results. As cities constantly evolve through dramatic change brought by large-scale new-built re-developments, less obvious change occur as existing buildings undergo a more stable, continual mode of change and adaptation. Through this process, individual buildings can express the passage of time.

¹ Nwati, M.P. (2007): "Rex Trueform in the age of Globalisation." University of Cape Town

Preface

The purpose of this document is to serve as a design informant for the rest of the thesis design project and should be seen as an integral part of the overall design process. It should be iterated that, although the structure of this document comprises of various chapters, the design process should not be seen as a linear process as such. Each chapter thus represents a critical portion of this project's development, lending its weight to an integrated design project.

The first section, 'Theory', is intended to define the term 'adaptive reuse' and its relevance in architectural discourse as a more appropriate option oppose to demolishing abandoned or derelict buildings. This section is also concerned with the making of an architecture that expresses both continuity of the architectural history embedded in the physical built fabric and progression of the society that uses the building. The intension is thus to develop a design methodology which is concerned with 'layering' in architecture, describing its relevance to the process of adaptive reuse. In this section, the argument for layering as a design narrative is substantiated through studies of the design approaches of both Carlo Scarpa and Enric Miralles, and through the study of the 'palimpsest.'

The second section, 'Analysis', comprises of case studies of various projects where existing buildings have been adapted for different uses. The case studies are divided into four categories: Building within, Building over, Building onto and Building into. Through this analysis, the various approaches to formal, spatial and programmatic transformation will be uncovered.

The final section, 'Experiment', is concerned with finding form and appropriate structural solutions, which relates to the concept of layering through formal experiments and exploratory design using physical models.

Theoretical Position

Introduction

Throughout history, mankind has erected buildings to facilitate any desired function, functions relating to shelter, education, religion, recreation, etc. Buildings are thus one of humanity's greatest stores of material, energy and meaning.

But buildings often outlive their intended purposes. When there is a need for changing the function of a building, there is inevitably also a need to **change** the building itself to accommodate the new desired use; and since buildings are generally conceived with the idea of it containing a very specific function, not all buildings can **adapt** that easily. As a result, many buildings have been demolished to make way for new and improved specimens.

The alternative to demolition and rebuilding is **adaptive reuse**². It is important to iterate that I see adaptive reuse - the process of conversion and rehabilitation - of a derelict building as a different issue from repair and restoration. The most important aim of this thesis is not preservation, but **transformation** - with transformation describing the process of changing the form and structure, program, and the spatial experience of an existing building.

Adaptive reuse is thus an architectural, rather than a sentimental or historicist approach to create new form out of old built fabric. The challenge is not merely to save an abandoned or derelict building from demolition, but to explore ways in which it can yet again contribute to the character of a community, and serve as a cultural landmark in an area where re-generation and revitalisation is needed.

² The process of changing old structures for purposes other than those initially intended, is termed 'adaptive reuse.'

The case for adaptive reuse

The motives behind adaptive reuse in the past, were predominantly functional and financial, and often took place without regard for the history or 'character' of the building or the area.³ I am of the opinion, though, that it is important to always try and retain some of the existing architectural details that make the building unique, even if the primary function of the building is changed.

It was only quite recently that legislation, rooted in a 'romantic and historicist' philosophy, appeared which intends to protect old buildings. This return to historicism, and the 'contextual' approach that characterises architecture nowadays, is probably in reaction to the way in which the Modern Movement rejected coexistence with existing built fabric or even the wilful destruction of the latter. Past masters like Le Corbusier, Mies van der Rohe, Alvar Aalto and Frank Lloyd Wright might have made reference to the past, but they never proposed integrating their projects with existing building.⁴

Abandoned, derelict buildings – those buildings that are in danger of being demolished, have always intrigued me. The fate of such buildings are usually determined by economic change, leaving them (as well as the people inhabiting them) dislocate and disconnected. But I am not only interested in buildings that are from any distant past. I think it is important to realise that it is not only historic districts and 'old buildings' that have contemporary value. Buildings that were conceived not too long ago – modern buildings – are also potential subjects for the process of adaptive reuse.

The present is heir to a diverse and dynamic Modern tradition that is far from exhausted, and Cape Town is no different. Cape Town has a wealth of good examples of buildings from the Modern era, but they seem to be victims of contemporary urban growth and change. The fate of old, historic buildings, to be protected and reused is many times more assuring than it was in the past. There is greater awareness of the cultural loss in such rapid and often meaningless destruction and changes in the built environment, especially those caused by large-scale developments in cities resulting from commercial activities, urban motorway construction and wholesale housing renewal. But Modern buildings, such as the Customs House in the Cape Town Foreshore, the Werdmuller Centre in Claremont, and more recently the Rex Trueform Clothing Factory, are struggling to survive.

The legislation for preservation of our historic built fabric has been forged, but at the same time it must be decided what measures of change are compatible with the inheritance of our not so distant modern past.

In an article published in the Architectural Review of March 2007, William Curtis reminds us that the present is heir to a diverse and dynamic Modern tradition that is far from exhausted. He refers to the primary works of Modern architecture that are still very much present, even if we see the world that created them with a certain distance. "They", referring to modern buildings, "are not there to be mimicked, but to be submitted to a critical analysis and to creative transformation. They still communicate on many levels and we still have much to learn from them."⁵

He further states, "When this transmission across time ceases to occur, we can claim (for the hundredth time) that Modern architecture is dead."

For my thesis design project I have decided to explore the possibilities of adapting an existing, derelict, Modern building for a different use. So the question that I asked myself was this: how can this existing building be transformed – spatially, formally, and programmatically – in such a way that it can again contribute to the character of a community, or serve as a cultural landmark in an area where rehabilitation is badly needed? I also set myself the challenge of uncovering the historic layers of this building, in order to determine the heritage value of the building and to what extent formal and spatial transformation could occur.

Working with an existing building obviously requires you to first get to terms with its structure, spatial character and history – but when a new layer is added to this building, a new dialectical relationship is created between old and new. The challenge is thus to find a way to overlay old and new so that the dialogue between the two is clearly visible, both tectonically and through spatial experience.

³ Powell, K. (1990): 'Architecture Reborn, the conversion and reconstruction of old buildings.' Laurence King

⁴ Philipe, R. (1987): 'Adaptations – New uses for old buildings.' Princeton Architectural Press

⁵ Curtis, William J.R. (1948-) 'Transformation and invention: on re-reading modern architecture.' Architectural Review, 2007 Mar., p.34

Expressing continuity & change through layering old and new - Layering as a design narrative

The repair, restoration and preservation of existing buildings is the practice of specialist agencies; recognising this opens the way for transformation to be integrated into the art of architecture. Projects related to adaptive reuse have generated some very innovative and exciting work, by architects such as Frank Gehry, Bernard Tschumi, Norman Foster, Enric Miralles, Daniel Libeskind and Herzog & de Meuron.

I see adaptive reuse as a different issue from preservation. I am by no means opposed to the objectives and principals of the heritage council⁶ or the intentions of any other form of preservation or conservation act. The aim of this thesis is to discover new ways of dealing with the issue of conversion and renovation of abandoned buildings – issues relating to design and creative space- and form making.

Working with an existing building does not make the project any easier than working with an entirely new structure. One needs to come to terms with the building and understand its structural constraints and possibilities, which are additional to those arising from program requirements and building regulations.

But these additional constraints, whether relating to form or physical and spatial structure, could also act as a stimulus to the imagination; they permit further architectural solutions and existing solutions to be developed by chance. This chance element to design could never have been produced from a clean slate.

⁶ SAHRA - Sa heritage resource agency

I would like to describe this approach to design as a process of layering; the method of overlaying old and new. Layering describes the way in which existing spaces and new uses are matched; it describes the dialectical relationships between form and function: existing spaces and potential uses; the relationship between available floor area and the requirements of the program, the configuration of the building and its possible function, former appearance and new image. Adaptive reuse through layering is not about just adding the new with the old, but about the nature of the critical relationship between the two.

This layering process through time can also be described, as the 'morphological diversity' of a building.⁷ Morphological diversity is not only a characteristic of the townscape. It could also be encountered in individual buildings, making the architecture both interesting and attractive. Over the centuries the facades of numerous buildings have been repeatedly modified, with the result that they now bear witness to many different styles. There are many precedents in the history of architecture of morphological diversity, like the Doge's Palace in Venice, whose façade is a perfect example of the harmonic integration of three different styles, namely, Romanesque, Gothic and Renaissance.⁸

The architecture of adapting and reusing old buildings – the layering of old and new – is a shift away from that which is similar to the monument-obsessed nature of the Modern Movement. This layered approach is about process rather than product. It welcomes the dynamic of the future and addresses the lessons of the past. And also, it celebrates diversity, recognising the value of old and new, of modernity and tradition.

Aldo Van Eyck described the relationship between time and space in the course of adaptive reuse as follows: "Places we remember and places we anticipate are mingled in present time. Memory and anticipation, in fact, constitute the real perspective of space, giving it depth."⁹

When dealing with existing buildings, there should be an awareness of urban vitality and identity, but most importantly, **continuity**. The need to retain buildings is not only a desire for the physical form of these structures, but also a desire for a certain degree of permanence in the mental images or 'maps' that people have of their environment.

Any building, old or new, classic or modern, carries with it historic value and cultural meaning, because it was created and used by men and women of that particular day and age. Discarding of this embedded memory and meaning in our built environment is an offence to those who have gone before us, and detrimental to historic and cultural continuity.

But the expression of **progress and change** is as important as the expression of historic and cultural continuity. Adaptive reuse is thus a different issue from preservation and conservation: Adaptive reuse is not rooted in a sentimental or historicist approach to architecture. It is concerned with the transformation of the formal structure, spatial quality and programmatic requirements of an existing building.

As cities constantly evolve through dramatic change brought by large-scale new-built re-developments, less obvious change occurs as existing buildings undergo a more stable, continual mode of change and adaptation. Through this process, individual buildings can express the passage of time.

In the words of David Chipperfield:

"We should not live in a bright shining new future, any more than we should hide in a comfortable pastiche of the past. We must inhabit a ever-evolving present, motivated by the possibilities of change, restricted by the baggage of memory and experience."¹⁰

This statement sums up the challenge of this thesis.

⁷ Papageorgiou, A. (1971): 'Continuity and Change – Preservation in City Planning.' Pail Mall Press London

⁸ Papageorgiou, A. (1971): 'Continuity and Change – Preservation in City Planning.' Pail Mall Press London

⁹ Markus, T.A. (1979): 'Building Conversion and rehabilitation: Designing for change in building use.' Butterworth

¹⁰ Powell, K. (1990): 'Architecture Reborn, the conversion and reconstruction of old buildings.' Laurence King

Concept: Architecture as a palimpsest

The term palimpsest can be applied to many things: it could be a piece of parchment that has been scrubbed and reused, a painting that has been painted over a number of times, graffiti on a wall. The most important feature that defines a palimpsest, though, is the fact that it derives from 'a concept passed on and manipulated by each person who contributes to it.'¹¹ This could then also apply to architecture that has been changed, for whatever reason necessary for the building to 'survive' or serve another purpose. Thus, a palimpsest is primarily that which has come about because of changes that have occurred.

But the term 'change' can mean many things. What are the changes that could influence architecture or simply one particular building? Change could include alterations or additions, change of use or program, even social, political, economical or environmental change, whether at a local scale or global. Change could be something very simple, like changing a door handle, or it could be a change in how society is shaped (political or social ideology). The point, though, is that change almost always has a time factor related to it. The world we live in is defined by change – everything has a beginning and an eventual end. Nothing can become old unless it was originally new, 'but it is also true that without the destruction of the old, the new could not possibly come into being. In the process of creating something new, something old is always destroyed.'¹²

If one considers physics, neither mass nor energy can be created or destroyed. This means that when something new is created, it must be that a change from one thing to another is occurring. Something new cannot come into being all by itself; it must have something old to build from, a source of energy and matter.

Definition: Palimpsest

"A paper or parchment on which the original text has been partly erased or effaced to allow a new text to be written, leaving fragments of the original still visible. The term is also used in geology to describe a rock formation displaying features produced in two or more distinct periods."
Dictionary of Critical Theory. Penguin Books, 2000

Something becomes a palimpsest when the new is created through the partial destruction of the old; traces of the old still remains under, behind, inside, etc.) The old is thus given new life past its end. The new, which has been created from the old, is thus the old, but in a new, recombined or layered form.

A palimpsest is therefore not only a result of change, but also that which displays change – a palimpsest is the layered evidence of change.¹³

The human being naturally alters or changes its surroundings to achieve continuity and progression through processes of deterioration, destruction and then recreation. **Thus, palimpsest is all around us, the layered evidence of progression, continuity and change.**

The term palimpsest can be applied metaphorically to recycled buildings.

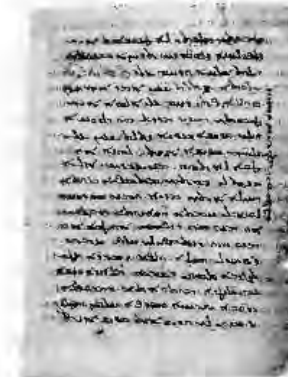


Figure 1: A parchment that has been scrubbed and reused.

Figure 2: 30 years of advertising on a display wall.



¹¹Kevin Ashton; <http://www.synapticflux.com/portfolio/palimpsest-as-a-layered-progression-of-change-through-use>

¹²Kevin Ashton; <http://www.synapticflux.com/portfolio/palimpsest-as-a-layered-progression-of-change-through-use>

¹³Kevin Ashton; <http://www.synapticflux.com/portfolio/palimpsest-as-a-layered-progression-of-change-through-use>

Tectonic dialogue through layering



The work of Carlo Scarpa

I have always been intrigued by the work of Scarpa, and it was only recently that I have had the time and, admittedly, the verve to thoroughly unravel his seemingly humble interventions. Not that I ever thought that his works are boring – by no means. I say humble, because: since most of his better known projects involve renovations and reuse of old building, it is clear that he had an immense respect and understanding of existing built fabric, to the extent that he celebrated the old, rather than impose or highlight the new. It is his subtle, yet crafty and highly innovative approach to adaptive reuse that has made me curious as to what Carlo Scarpa's projects are all about.

Reading about Scarpa's work reveals a number of very interesting design ideas: composition, multidimensional, stratification, transition and interface, overlaying elements, juxtaposition, and time-related sedimentation. All of these terms are used by various authors to describe the tectonic qualities evident in major projects like the Castelvecchio and the Banca Popolare in Verona and the Querini Foundation in Venice. But to me, these terms are reference to the dialogue between old and new, reference to Scarpa's intension to fuse past and present styles and ideas – they all refer to the process of layering.

When Scarpa worked on an existing building, he would repair a fragment of it rather than reconstruct it in its entirety. He always preferred adding to an existing building rather than designing a whole new structure; his contemporaries apparently found this odd and even perverse.¹⁴ Scarpa was not a modernist who turned his back on history; rather he wanted to build on and construct within it.

Scarpa was determined to be a 'continuer of history.'¹⁵ He believed passionately in the coexistence of his vocabulary with those of previous eras, the juxtaposition never subjective or uninformed, but always mutually beneficial. He refused to design in past styles and his work was a constant dialogue with history – an example of this is his work at Castelvecchio, where the emphasis was on adapting the building to accommodate a different use.

¹⁴ Powell, K. (1990). 'Architecture Reborn, the conversion and reconstruction of old buildings'. Laurence King

¹⁵ Murphy, R. (1990). 'Carlo Scarpa and the Castelvecchio'. Butterworth Architecture

Figure 4: The rough and smooth textures of the local stone on the exterior wall of the gallery extension. Note in the background how existing window openings have been closed off.



Figure 5: A sketch by Scarpa of the detailing

At Castelvecchio, Scarpa juxtaposed old work with new, using an extraordinary palette of materials – concrete, stone, steel, bronze, timber and plaster – and capitalised on the great variety of spaces within the old building, regarding the proper use of natural light as a major ingredient in the display of objects.

Scarpa had a very clear strategy when it came to working on existing buildings. He would always, as a preliminary stage of his work, attempt to clarify and expose the layers of history embedded in a building, through processes of 'selective excavation and creative demolition'.¹⁶ He attempted 'to cut and then disentangle one epoch's construction from another so that the building itself becomes a giant exhibit revealing its growth and change in nature'.¹⁷ Shapeless or 'in the style of' additions and decorations were removed in order to rediscover the original fabric and structure. This first step of his design process – the examination and diagnosis phase – offered him all the data needed to unleash his creativity onto that historic 'canvas'. He would then start the second phase of the design process, reassembling and juxtaposing the disjointed members in a new composition. Scarpa was not primarily interested in any concepts of restoration, but in an idea that made history clear; he made history visible through the co-existence of overlaying fragments of construction.

With most of his projects, the new elements were all constructed using materials and techniques of his own time. Scarpa worked to accommodate the required functions, reviving and redefining the environment accordingly.¹⁸ Thus, materials had to be chosen in relation to – not dependant on – the existing fabric as well as the new forms and uses of the building. The contrast between old and new is highlighted through the use of materials, orthogonal forms¹⁹ and detailing. Scarpa used well-finished textures adjacent to rougher homogeneous surfaces and further emphasised contrasting forms by using orthogonal shapes against the freer forms of previous structures.

Another interesting feature of Scarpa's work is the way in which new constructions are inserted into the existing structures, new and old are clearly distinguished by leaving a void between the two. These voids are the medium that both connects the two eras and points out their fundamental differences. The use of the void in this way is thus no more than a continuation in his attempt to separate historic structures. It is confirmation of the new being merely another layer deposited on or inserted into the existing.

I have been lucky enough to be able to visit many of Scarpa's projects, and to my opinion, Scarpa's skill of detailing is the outstanding quality that most successfully shows this layering of materials and forms. This detailing of the junction between materials with their different characteristics of texture, colour, surface, and pattern, and the joining of various 'thematic elements'²⁰ to form an expressive composition, is another aspect of Scarpa's work that I find most extraordinary. But the term 'joining' also applies to the spatial character in the buildings. This can be experienced at places where Scarpa creates thresholds between one space and another. An example of this could be at the beginnings of staircases, where he makes a special gesture of the first step. Layering in architecture is thus not only embedded in the materiality and the tectonic qualities of the building, but also in the physical composition of layers defining space.

Scarpa's work is the perfect illustration of multidimensional layering and, at the same time, good precedent of an architectural idea that revolves around the overlay of new and old. It is especially at points of transition and interface that layering becomes a narrative element that explains the tectonic qualities of the building.

I think it is important to look at the approach Scarpa took towards working with old buildings in his attempt to transform them. Scarpa was not only a pioneer in the shift in approach to new and old, which was totally different to the theory of the original Modernists, but he also paved the way for those architects in the late 20th century for whom history is 'neither irrelevant nor something to be blindly revered.'²¹

¹⁶ Santini, P.C. (1984): 'Architecture as a continuous dialogue with pre-existence', in 'Carlo Scarpa - Il progetto per Santa Caterina a Treviso', Vianello libri

¹⁷ Murphy, R. (1990): 'Carlo Scarpa and the Castelvecchio', Butterworth Architecture

¹⁸ Santini, P.C. (1984): 'Architecture as a continuous dialogue with pre-existence', in 'Carlo Scarpa - Il progetto per Santa Caterina a Treviso', Vianello libri

¹⁹ In mathematics, two vectors are orthogonal if they are perpendicular, i.e., they form a right angle. The word comes from the Greek, *orthos*, meaning "straight", and *gonia*, meaning "angle" (<http://en.wikipedia.org>)

²⁰ Albertini, B., Bagnoli, S. (1988): 'Scarpa - Architecture in detail', Architecture Design and Technology Press

²¹ Powell, K. (1990): 'Architecture Reborn, the conversion and reconstruction of old buildings', Laurence King



Figure 6: A special gesture is made of the first step of the concrete staircase in the Cangrand space, it acts as a threshold between two different spaces.

Identifying the layers: Banca Popolare

Front elevation

The front elevation of this building is a composition of various planes. These planes are distinguished from one another by means of relief, a tread of shadow or a smooth rounding off of openings. There is also a progressive shedding of weight on the façade; the solid curtain wall with rectangular opening lower down and round openings further upward, culminates in the glass fronted loggia on the second floor. The solid curtain wall is in fact 500mm deep, housing casings and plumbing units. The idea was to have this wall read as a perforated membrane.

Openings in the façade

The actual window casings are in fact square-framed; they are set back from the round openings in the exterior wall to be flush on the inside, leaving a distance of about 400mm, which is drained by a down pipe and rain water gully hidden inside the wall.

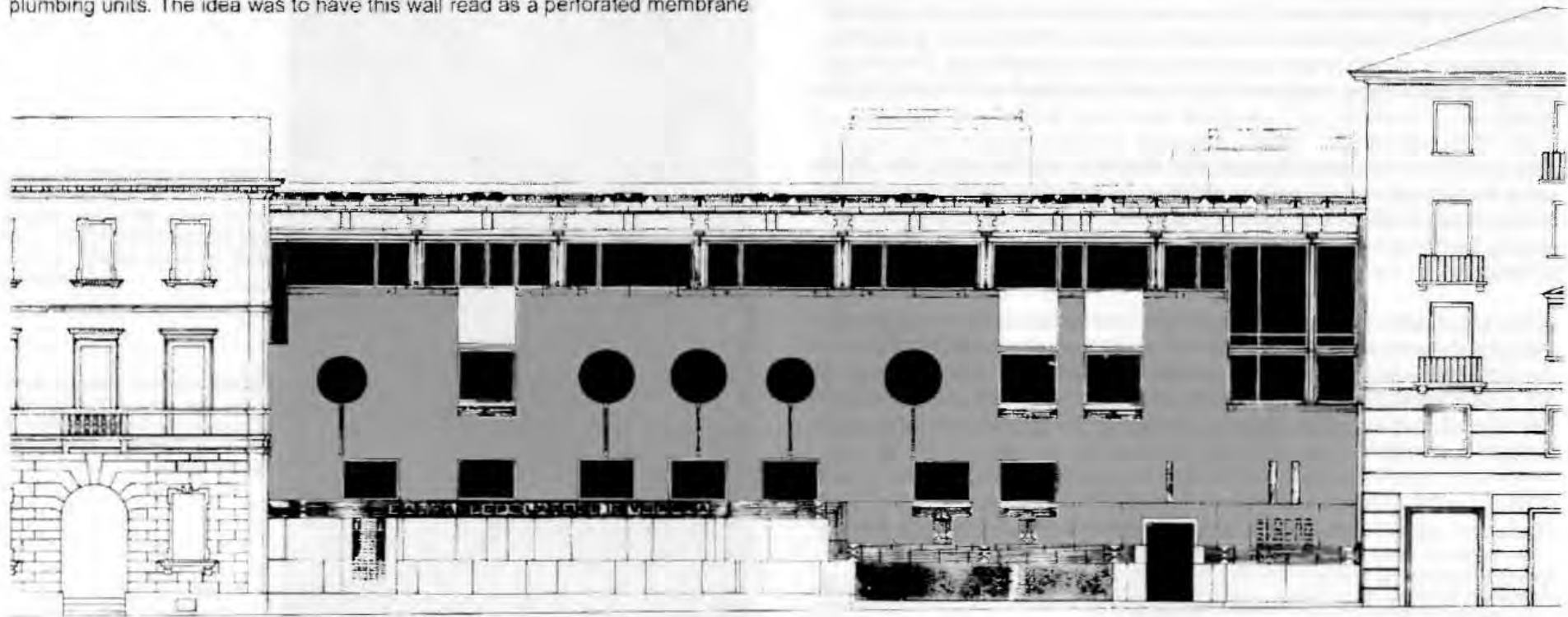


Figure 7: Front façade of the Banca Popolare, Verona.



Figure 9: The solid wall of the front elevation read as a curtain screen covering the rest of the building.

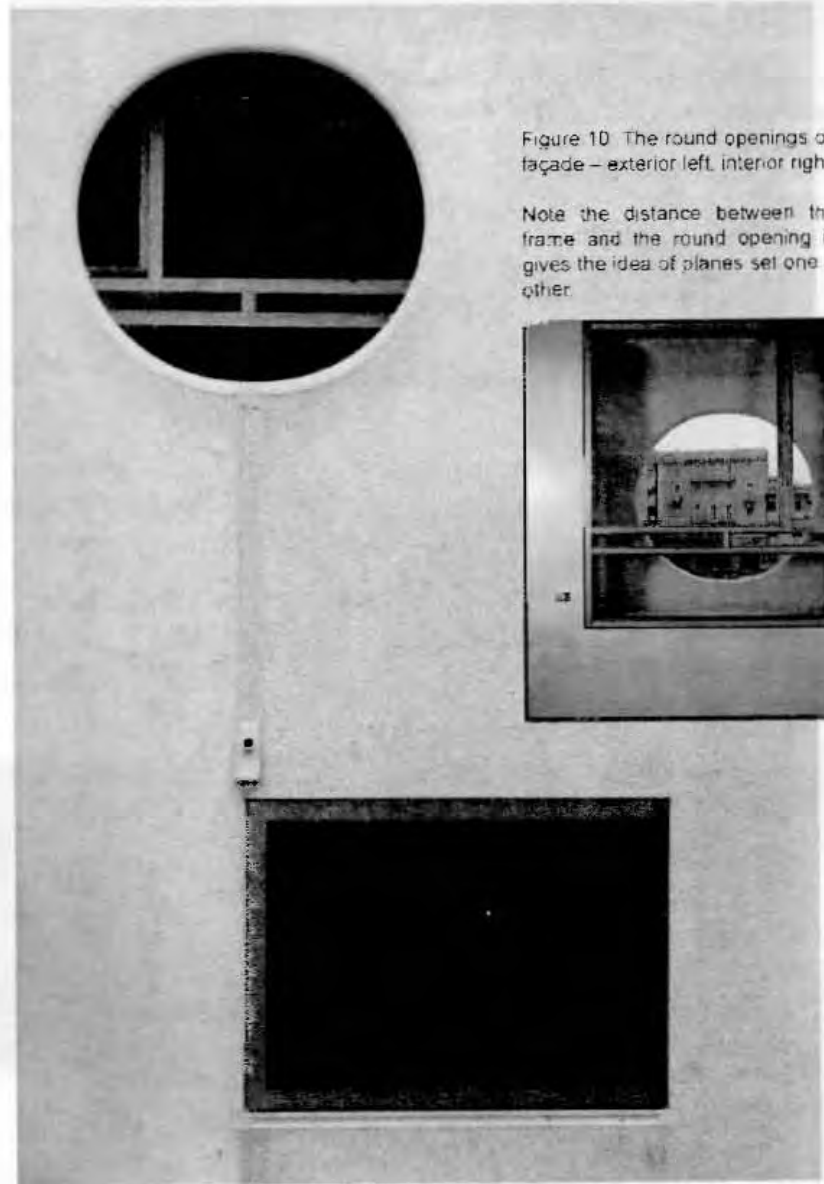


Figure 10: The round openings on the front façade – exterior left, interior right.

Note the distance between the window frame and the round opening itself. This gives the idea of planes set one behind the other.

Identifying the layers: The Castelvecchio

Juxtaposing old and new

Similar to the front façade of the Banca Popolare, the idea of layering planes is evident at the courtyard wall of the museum. There is a difference however; at the Castelvecchio, the new layers of glazed walls and opening are layered behind the façade of the existing building. This emphasises the contrast between the new and the old. The new is thus deliberately set back a fair distance, with the elaborated detailing of the openings being evidence of this. The new glazed screens appear to be one unit floating behind the existing façade.



Figure 10: Section of a new glazed screen, 'hidden' behind an existing arched opening.

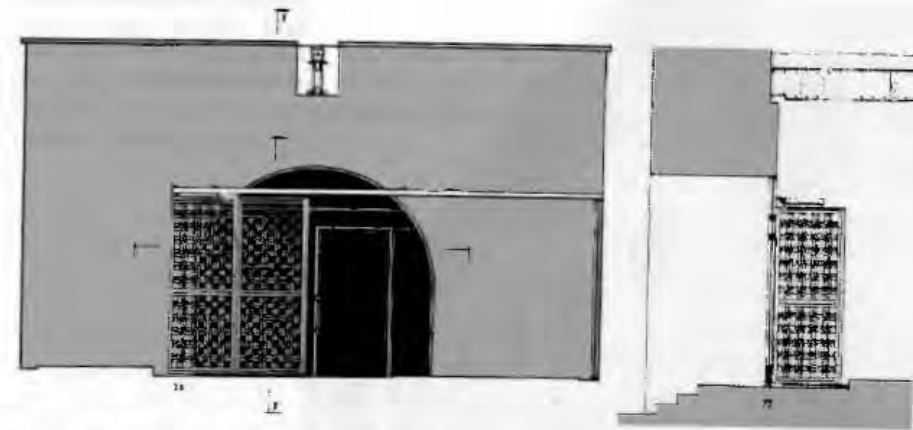


Figure 12: Exit door from gallery with steel sliding & folding internal security screen. Old and new is clearly separated, not only in terms of position, but also geometry and materiality

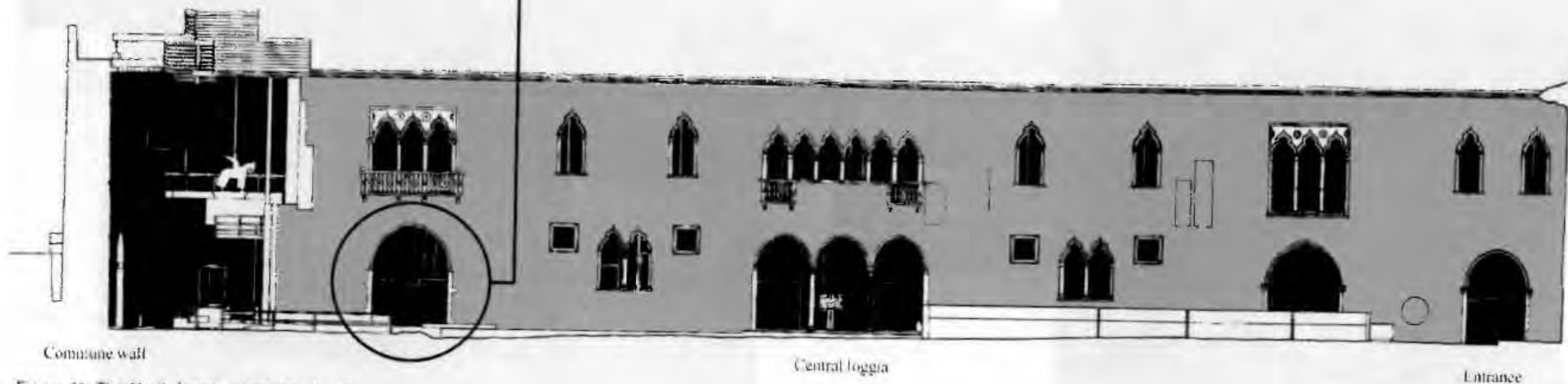


Figure 11: The North façade of the courtyard.

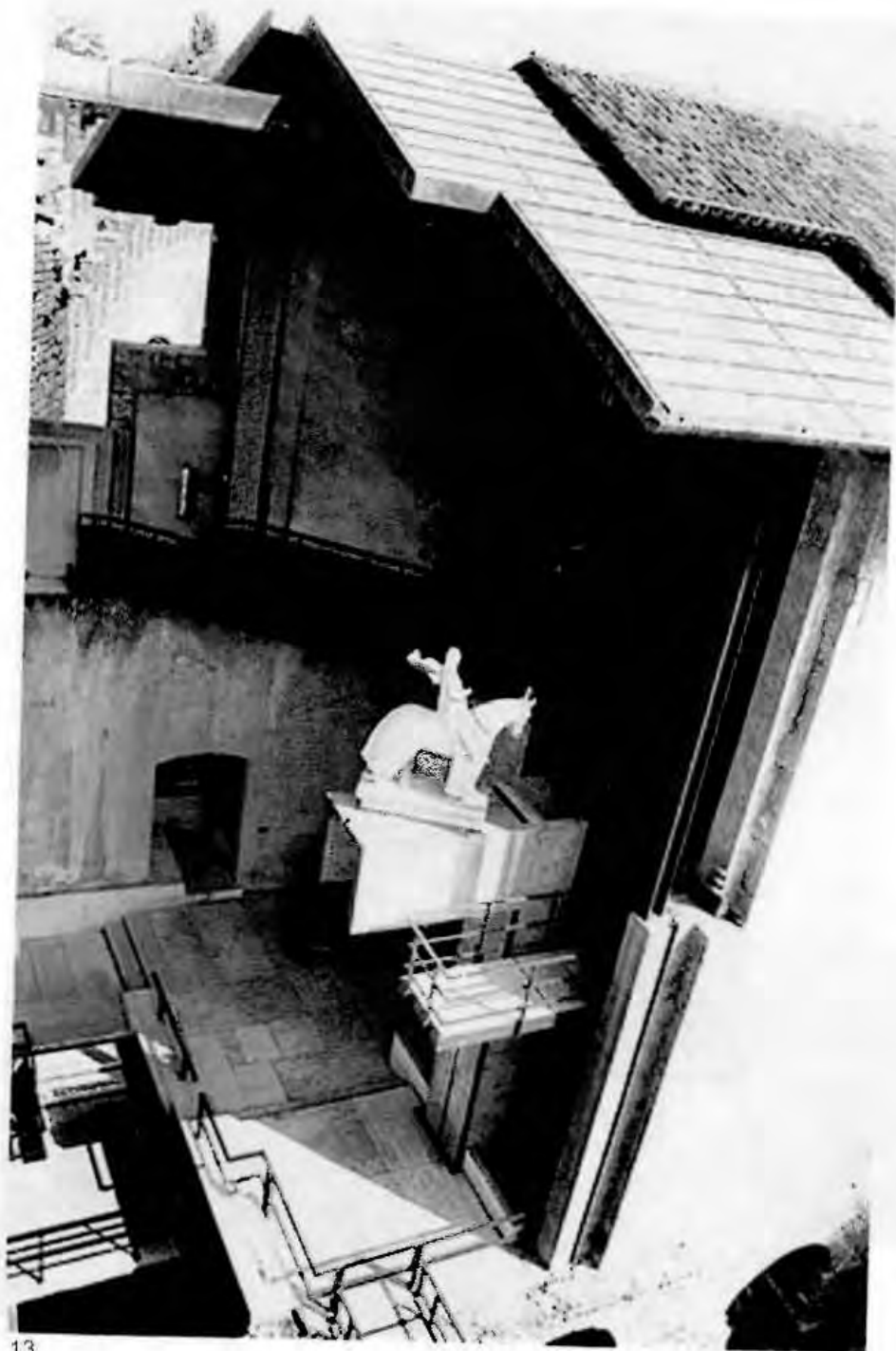


Figure 13: The central loggia on the North facade of the courtyard.

Figure 14: The exit door with steel sliding & folding screen.



Figure 15: The North facade of the courtyard.



The Cangrande space roof:

The transformation of the Cangrande space roof is one of the most extraordinary elements of this building. The eventual form delaminates its upper surface into Roman tiles, copper and exposed structure and cuts it away in an orthogonal but irregular plan. Two enormous timber ridge beams are the only remnants of the former roof-junction



Figure 16: The roof over the Cangrande space: old and new is clearly distinguished from one another.

Figure 17: View of the Cangrande space, Castelvecchio museum, from the South.

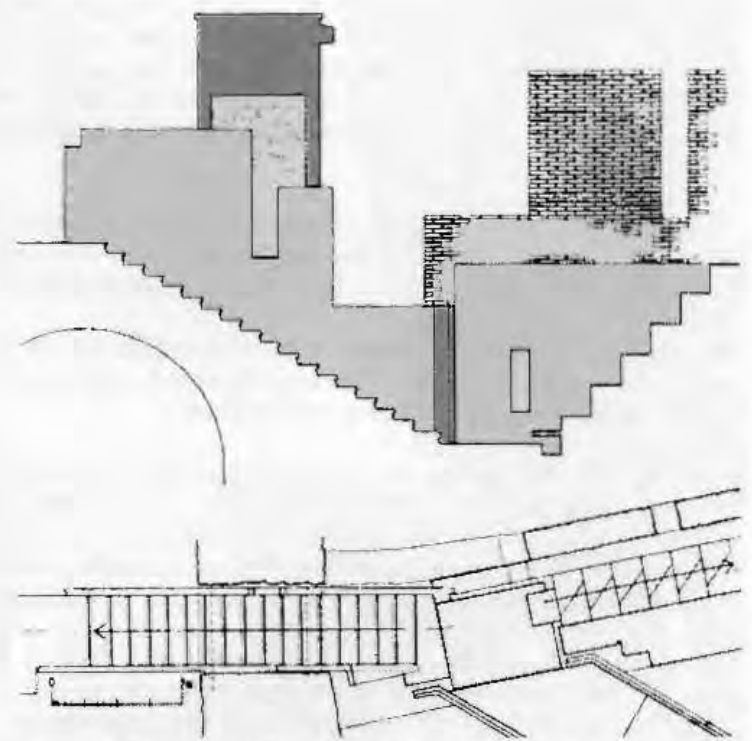
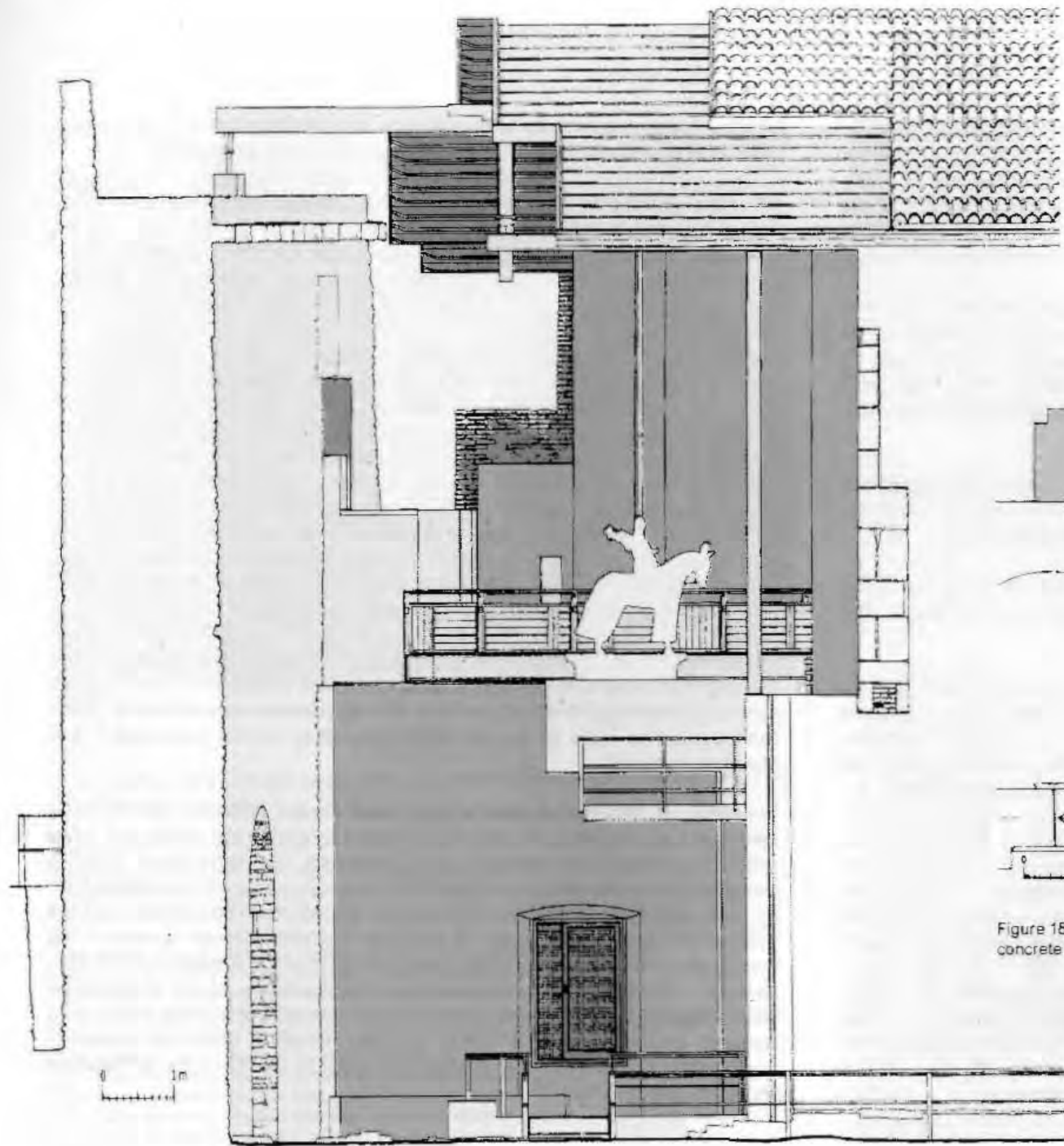


Figure 18: The diagram on the left shows the layering of brick and concrete on the riverside wall of the Cangrande space.

The work of Enric Miralles

The dim streets of Barcelona held a few surprises for me during my visit there in 2007. The Santa Caterina Market was one such surprise. I honestly did not know at the time who the architect was, or even what the history of the building was, but its colourful roof, extending over what looked like the remains of a very old building, remains in my memory. Knowing now that this new market building was a conversion project by Enric Miralles, I decided to further investigate his work.

Enric Miralles worked in association with Carme Pinos, and between 1993 and 2000 with Benedetta Tagliabue. His work emerged out of the rebuilding of Spain's cultural identity; a process that differs from an approach that focuses on iconic monumental buildings, by concentrating on many small projects.²² Miralles' rehabilitation of Santa Caterina Market in Barcelona (1999) is one such project.

Miralles criticises present planning methods by saying, that these are "incapable of addressing the complexity of the historic city. Geared for immediate results, they simplify the rules of the game to an unacceptable extreme."²³

"We tried to break with the pattern of brutal demolitions followed by rebuilding using very different typologies."²⁴ Miralles refers to the raw, simplistic slab-blocks typical of public housing elsewhere in the region.

In his work, Miralles seems to have investigated the possibilities for alternative tectonic expression by trying to extend the boundaries of conventional construction techniques to respond specifically to programmatic and site requirements. Like Scarpa, Miralles had a preoccupation with materiality and craft, which 'traces the hand and the expressive potential of construction.'²⁵

But, although there seem to be a general tendency towards formalism these days, current practice is still increasingly more concerned with generalised buildings, assembled of mass-produced and standardised components. Buildings are becoming homogenised, and the industry is becoming further removed from craft-based fabrication and the contingencies of craft and culture.

Miralles' explored ways in which construction can reach beyond the merely pragmatic, challenging the commodification and standardisation of building production. The making of the physical artefact is 'rooted in craft, culture and context.'²⁶ The Santa Caterina Market in Barcelona is an example of how changing social patterns and the increasingly hybrid character of institutions could be reflected.

Miralles saw an opportunity in Barcelona's program to adapt declining public fresh-food markets to the changing needs and lifestyles of urban families.²⁷

When the city officials announced plans to replace the badly deteriorated 19th century building that housed the market, Miralles approached them with an alternative proposal. The normal combination of form and program wasn't accepted and the building type was thus reconfigured. This, together with the juxtaposition of old and new structure, produced radically fresh results.

The use of ceramics as roof covering, reminded me of Antoni Gaudi's renovation of Casa Battlo, also in Barcelona. Gaudi used ceramics as a wall finish on that particular building, but the subtle colour pallet completely transformed the building, from a typical home to one of the most recognisable urban landmarks in Barcelona. The rich palette of the fruit and vegetable stalls occupying the market inspired the mix of colours used. There is definitely a certain affinity in Miralles' work with the very animated formal expression and tactile material aesthetic of Antoni Gaudi. But there is a difference though; where Gaudi turned away from technology and industry, placing greater value upon natural form, Miralles used the products and processes of industrialised mass production as the source of his tectonic vocabulary.²⁸

By converting the Caterina Market, Miralles successfully changed the existing building from being a monolithic structure into a new, multi-layered one. It reads less clearly as a figural whole and more as 'fragments in a field of forces'²⁹; the fixed system of order of the old was replaced by a new open-ended and changeable system.

The work of Miralles, or that of any other similar architect, shouldn't be confused as being products of a more recent Arts and Crafts movement – that which 'repudiates the materials and processes of industrialised building production in favour of the handmade'³⁰ – instead, His 'craft' developed from an understanding of contemporary materials and construction systems, and the means of manipulating these to produce something more existing. He managed to move away from the 'frame and thin-skin' architecture of the 20th century – which defined architecture in reductive terms as an 'ever-thinner assemblage of layers'³¹ – to produce buildings through the layering of standard systems in unconventional ways; 'through revealing interstitial layers of construction that are normally hidden from view; or through the play between repetition and variation.'³²



Figure 19: The Scottish Parliament in Edinburgh with its characteristic fragmented aesthetic.

Figure 20: The Santa Caterina Market in Barcelona with its new roof extending over the original walls of the old market building.



²² Le Cuyet, A. (2001). 'Radical Tectonics.' Thames & Hudson

²³ Cohn, David (2006). 'EMBT daubs an innovative urban-renewal strategy with a high-spirited riot of colour in Barcelona's Santa Caterina Market'. *Architectural Record*, Feb2006.

²⁴ Cohn, David (2006). 'EMBT daubs an innovative urban-renewal strategy with a high-spirited riot of colour in Barcelona's Santa Caterina Market'. *Architectural Record*, Feb2006.

²⁵ Le Cuyet, A. (2001). 'Radical Tectonics.' Thames & Hudson

²⁶ Le Cuyet, A. (2001). 'Radical Tectonics.' Thames & Hudson

²⁷ Cohn, David (2006). 'EMBT daubs an innovative urban-renewal strategy with a high-spirited riot of colour in Barcelona's Santa Caterina Market'. *Architectural Record*, Feb2006.

²⁸ Le Cuyet, A. (2001). 'Radical Tectonics.' Thames & Hudson

²⁹ Le Cuyet, A. (2001). 'Radical Tectonics.' Thames & Hudson

³⁰ Le Cuyet, A. (2001). 'Radical Tectonics.' Thames & Hudson

³¹ Le Cuyet, A. (2001). 'Radical Tectonics.' Thames & Hudson

³² Le Cuyet, A. (2001). 'Radical Tectonics.' Thames & Hudson

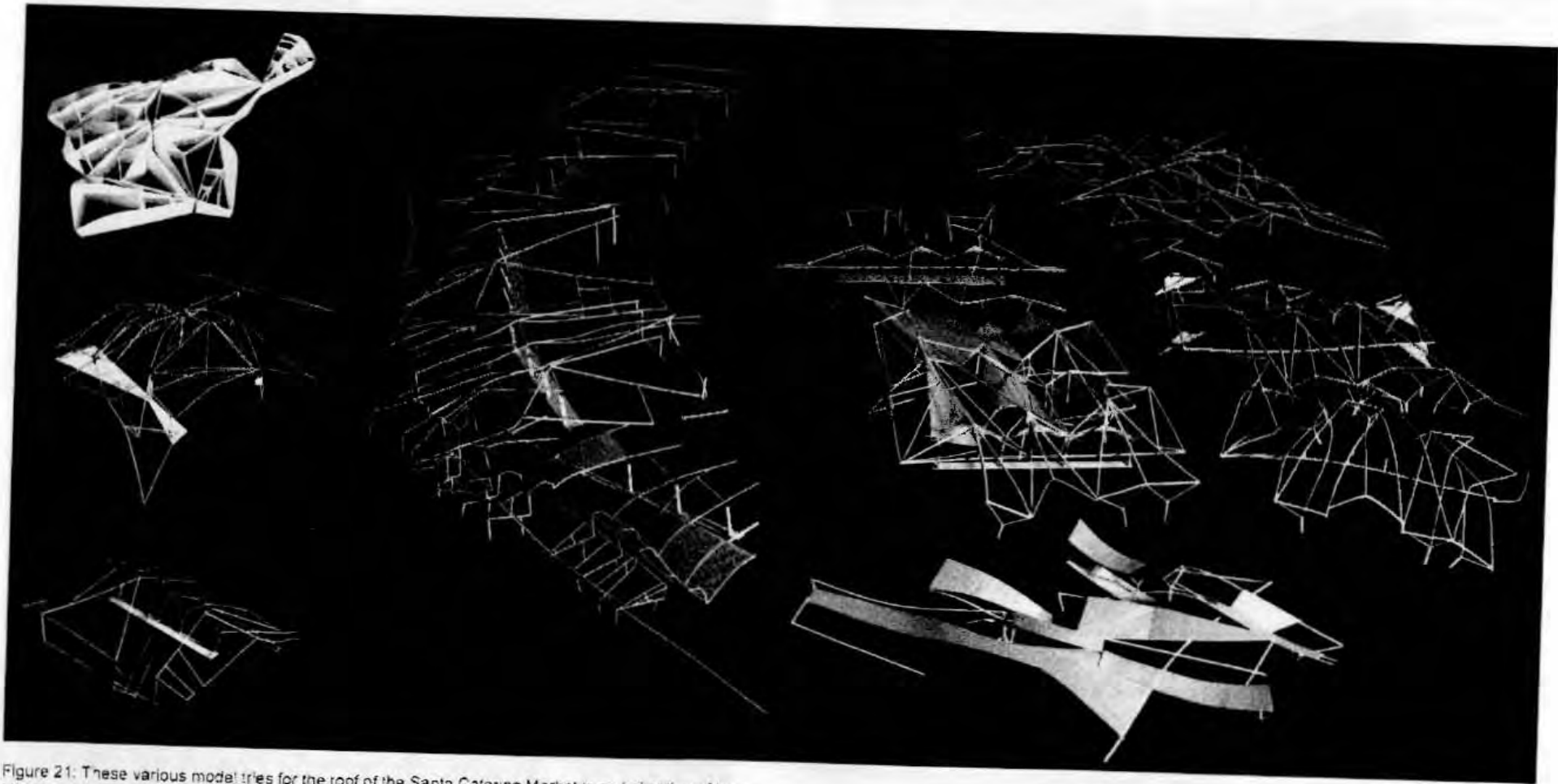


Figure 21: These various model tries for the roof of the Santa Caterina Market is an indication of how Miralles explores the formal and structural possibilities of the building.

Conclusion

Adaptive reuse is first and foremost a more sustainable alternative to both the processes of demolition and rebuilding, and the rapid development of open land on the fringes of our cities. Existing buildings, whether they are abandoned and derelict or precious urban monuments, should be regarded as a valuable resource for this generation and those that follow.

I think adaptive reuse is a design strategy in which the expression of historic and cultural continuity must be considered in similar detail as transformation and change. An architecture of fusing past and present is referred to in this document as the layering of old and new – the overlay of past and present modes of production; the overlay of past and present architectural styles. Layering is thus a design narrative, which describes a tectonic that expresses both continuity and change, old and new.

This architecture, which derives from the concept of layering the contributions of multiple designers and schools of thought throughout time, is described as a palimpsest. Architecture as a palimpsest is thus the layered evidence of change, and can therefore be applied metaphorically to reused buildings. I see in this analogy a basis for a design approach that will ultimately demonstrate my intension to formally, spatially and programmatically transform an existing building to accommodate the desired needs of a changing socio and economic environment.

Precedent analysis through case studies

The various approaches to formal, spatial and programmatic transformation

The objective of this analysis is to explore various ways of transforming an existing building for adaptive reuse through various case studies. The projects that I have chosen for this analysis represent a body of work where the aim was to transform the existing building in terms of use, spatial experience and form.

- Methodology:**
- Extract architectural idea / design concept
 - Extract fundamental structuring elements / devices
 - Identify programmatic transformation
 - Identify formal transformation
 - Identify spatial transformation
 - Identify layering of old and new

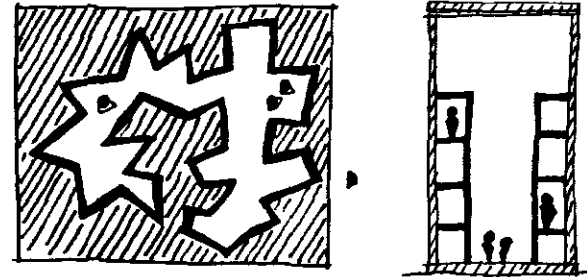
Questions to consider during case studies:

- How was the new added?
- What was attitude towards existing?
- What is the relationship between old and new?
- How is layering expressed / achieved?
- What is the physical nature of layers?

- Assembly - structure
- Composition - components
- Palette - textures / colour
- Juxtapose - old & new

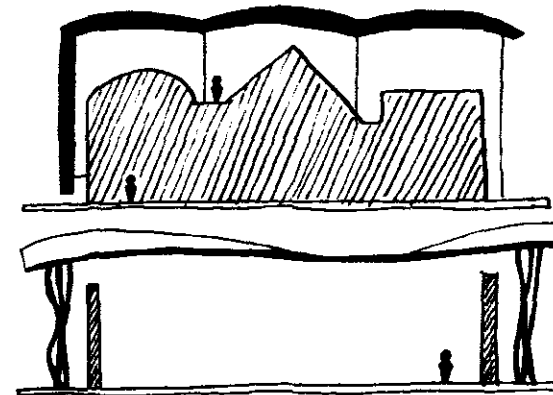
Building within

- Daniel Libeskind – Danish Jewish Museum, Denmark (2002-2004)
- Lina Bo Bardi - Oficina Theatre, Sao Paulo, Brazil (1980-1991)



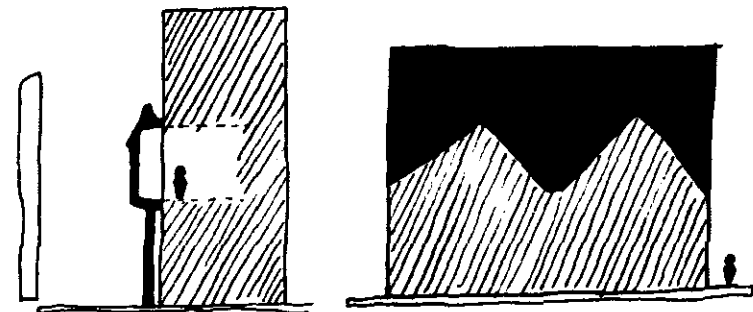
Building over

- Enric Miralles, Benedetta Tagliabue, Rehabilitation of the Santa Caterina Market, Barcelona, Spain (1999)
- Bernard Tschumi - National Studio for Contemporary Arts, Le Fresnoy, Lille, France (1991-98)



Building onto

- Antoni Gaudi – Casa Batllo, Barcelona, Spain (1904)
- Herzog & de Meuron – Caixaforum, Madrid, Spain (2006)



Case studies

Building within

- Project:** **Danish Jewish Museum**
Copenhagen, Denmark (2002-2004)
- Architect:** Daniel Libeskind
- Background:** The museum holds a collection containing the history of the Danish Jewish life in Denmark since the beginning of the 17th century.
- Program:** Exhibition space



Figure 22: View of the exhibition space, showing the contrast between the existing brick vaults and the new shiny white panels. Glazed vitrines project forward from freestanding objects. The sloping oak-plank floor seems to float between the ventilation scuppers and is carried by joists over a concrete slab.

Idea/concept

The concept of the building is based on the Hebrew word *Mitzvah* – an obligation or a good deed – which is symbolised in the form, structure and light of the museum: with the exhibition conceived as a text within a text, in the same way that the museum itself is a building within a building.³³

"The intertwining of the old structure of the vaulted brick space of the Royal Boathouse and the unexpected connection to the unique exhibition space creates a dynamic dialogue between architecture of the past and of the future – the newness of the old and the agelessness of the new."³⁴

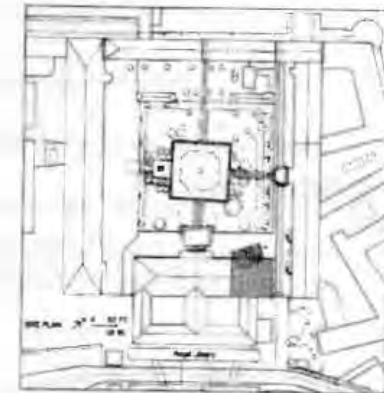
Existing structure

The Royal Boathouse built by King Christian IV in the early 17th century.

New structure

The interior was stripped down to the bare brick walls and then clad with skew panels of light brown Norwegian birch panels, which are attached to black chipboard and supported by metal stud walls.

Figure 23: Site plan



³³ Adams, Nicholas (2004): 'Danish Jewish Museum, Denmark', *Architectural Record*, April 2004.
³⁴ *Architecture & Urbanism*, September 2006.

Identify programmatic transformation

The conversion of the boathouse into museum exhibition space meant that the building was stripped from its original meaning and character. The building was transformed from a very exclusive, private institution, to a building, which is open to anyone who wishes to explore the spaces it now contains.

Identify formal transformation

The contrast between the original brick structure of the old boathouse and the folded, irregular shapes of the vitrine objects is very evident. But it is not only the contrasting shapes, but also the difference in materials and textures that makes obvious the transformation of the building.

Identify spatial transformation

The new layout of the building transforms the interior spatial arrangement completely – the vitrine walls now make now reference to the existing walls that shaped the original interior of the building. The Danish Jewish Museum can thus be described as a maze inside an enclosed shell, with no reference to the outside.

Figure 24: Ground floor plan

Key:

1. Entrance
2. Tickets
3. Coatroom
4. Exhibition
5. Vitrine objects
6. Museum shop
7. Office
8. Restroom
9. Terrace
10. Cinema

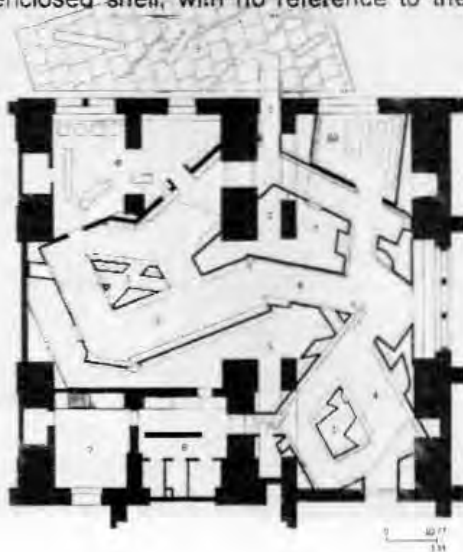


Figure 25: View of the Northwest façade from the North. The entrance is part of the brick Royal Library.

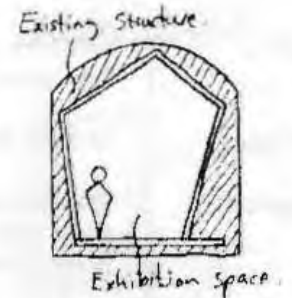


Figure 26: Model of exhibition space, coiling inside the existing structure.

Building within

Project: Oficina Teatro,
Sao Paulo, Brazil (1980-1991)

Architect: Lina Bo Bardi

Background: The Oficina Theatre Company has occupied this building since 1961. Bo Bardi redesigned the sets after the building burned down in 1966.

Program: Theatre and stage

Figure 27: Bird's eye view of the Oficina Theatre.



Idea/concept

The design of the new stage was inspired by the idea of running a street through the building from its entrance to its exit. The plan was to create a corridor through the theatre, based on the pedestrian areas typical of the Bexiga neighbourhood, Sao Paulo.

Existing structure

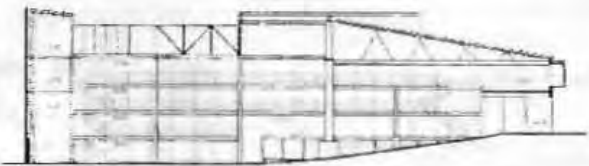
The existing building was built in 1922. The architect retained only the exterior brick walls, reducing the building to a box-like shell, 9m wide and 50m long.

New structure

A new ramp-like stage was introduced, designed as a corridor street that runs the whole length of the theatre. Running lengthwise along both existing walls is a metal structure painted 'macaw blue.' This metal structure, which forms a series of galleries extending across the height of the building serving as seating area for the audience, can be partially disassembled.³⁵



Cross section



Longitudinal section



Figure 28: Ground floor plan

³⁵De Oliveira, Olivia: "Lina Bo Bardi – Built Work." 2G Architectural Review

Identify programmatic transformation

The Oficina Theatre has changed the way people think about theatre spaces. It has broken with the typical theatre layout that we have grown accustomed to, since the seating areas are now vertically stacked, with the audience and stage now literally at arms length from each other.

Identify spatial transformation

The unorthodox layout of the theatre has transformed the spatial experience of the building. But it also the manner in which the stage links up with the exterior streets that transforms its spatial construct – the interior theatre platform and exterior street are now one continuous stage.

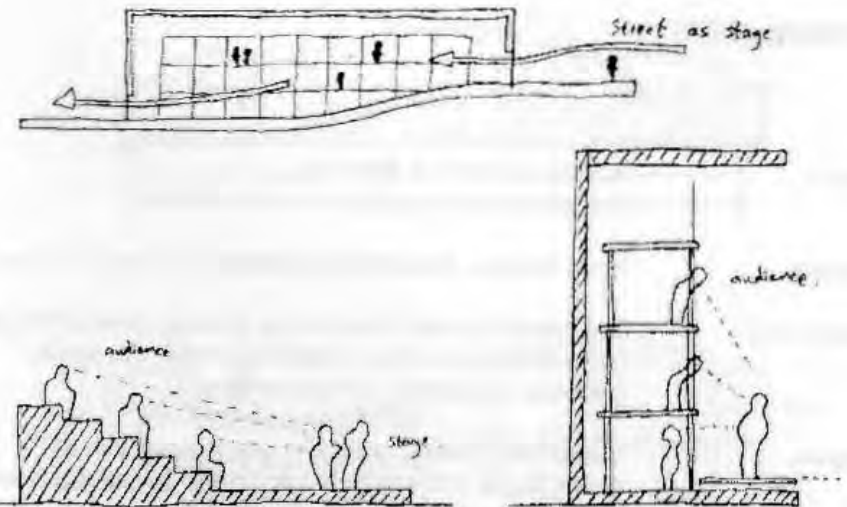


Figure 29: The view along the ramp-like stage inside the Oficina Theatre.



Figure 30: The macaw blue metal structure, which serves as seating.



Figure 31: The interior of the theatre during rehearsal.

Case studies

Building within

Project:	Santa Caterina Market, Barcelona, Spain (1999)
Architect:	Enric Miralles, Benedetta Tagliabue
Background:	The historic-centre interventions in recent years involved large-scale demolition – EMBT's work on this project grew out of a critique of these efforts.
Program:	Market: 60 vendors' stalls mix with shops, café, a supermarket, a restaurant, and community services, with underground parking.



Figure 32. The twisted, tree-branch metalwork that supports the vault structure of the new roof.

Idea/concept	The roof's fluid form is meant to suggest the canvas awnings that cover patios in southern Spain, although its heavy ceramic surface belies this effect.
Existing structure	A Neoclassical fresh-food market, with white-painted masonry walls, retained on three sides of the rectangular 1845 market structure, with many arched openings permeable to the surrounding streets.
New structure	A brightly coloured tile roof with elaborate steel supporting structure. The roof structure consists of ceramic tiles, on three layers of thin pinewood lathing which shape the curves, on hand-crafted laminated wood joists which transfers the load to long-span, tubular-metal trusses. Each layer is laid perpendicular to the other. Three arched metal trusses cross perpendicular to the vaults, with arms extending downward to suspend the valley trusses and stiffen the vault system. The arch trusses carry loads to two massive concrete beams that run under the entire roof structure, creating a very large clear span over the market stalls. The twisted, tree-branch metalwork supports the vault structure. ³⁶

Figure 33. Ground floor plan of market.



³⁶ Cohn, David (2006). 'EMBT daubs an innovative urban-renewal strategy with a high-spirited riot of colour in Barcelona's Santa Caterina Market', *Architectural Record*, Feb2006.

Identify spatial transformation

The significant change to the building is not only its formal transformation, but also the spatial experience, both inside and outside the building. The roof extends past the existing walls, creating a covered walkway, which contributes to the urban quality of the area.

The enhanced feeling of volume inside the building is very evident in pictures.

Identify formal transformation

The new roof over the market space is in stark contrast to the retained walls. The roof suggests a much freer structure to the more orthogonal form of the existing building.

The thickness of the new roof suggests that the architect's intention was to have the structure read as thin as possible. The amount of structural support to allow for the required span required an additional structural layer, as can be seen in the isometric sketch to the left.

The transformation of the market building extends further than just the roof structure covering the market space. The programmatic requirements required additional service spaces. These were placed underground, and follow the same structural layout of the existing building.

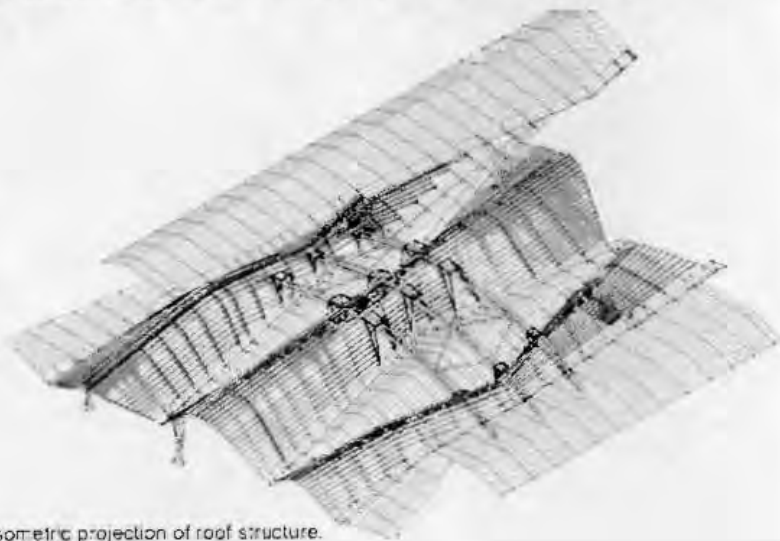


Figure 34: Isometric projection of roof structure.

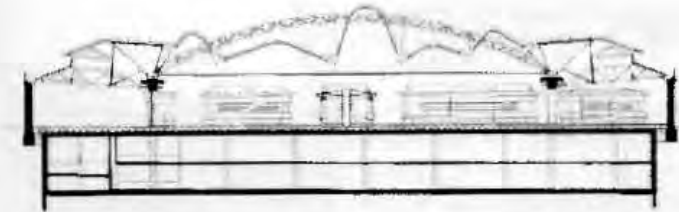


Figure 35: Cross section through the market.

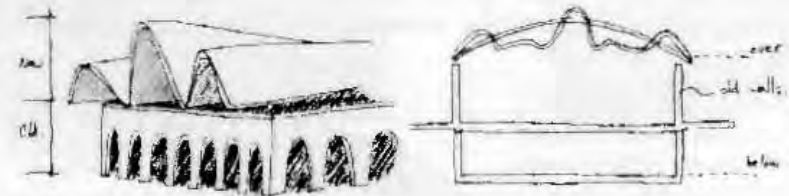
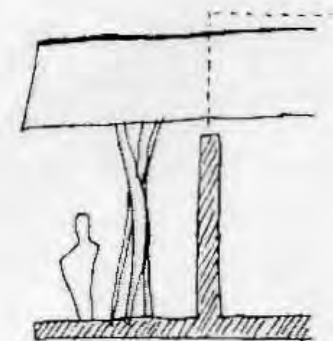


Figure 36: The new roof extends past the existing walls to form a covered walkway.



Case Studies

Building over

A characteristic of this project that is worth mentioning is way in which the existing arched openings in the retained walls are dealt with. New window and door openings set back from the walls, to create the impression of an additional, lighter plane layered behind the heavier, more solid walls.

Layering is also evident in the roof construction, where each of the three layers forming the roof - the timber sheets supporting the ceramic tiles, the timber lathing and the hand crafted laminated wood joists - are laid perpendicular to the other.



Figure 37: The roof structure as seen from below.

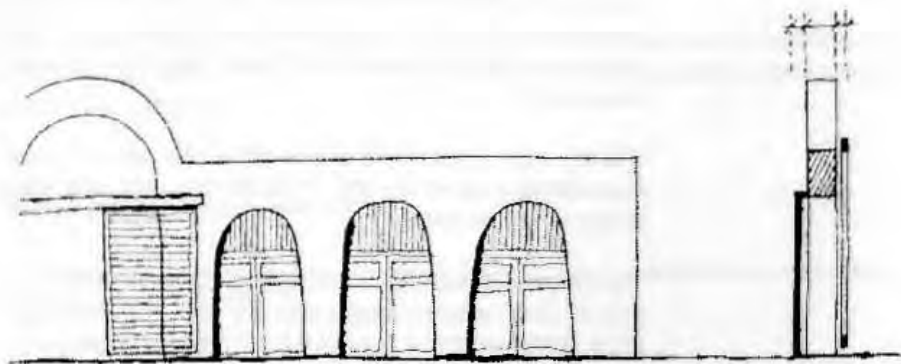


Figure 38: Exterior view of the market building.



Figure 40: The hexagonal ceramic roof covering form an abstract pixelated pattern of fruit and vegetables.



Figure 41: One of the many fruit and vegetable stalls inside the market.



Figure 39: The new roof structure as seen from above.

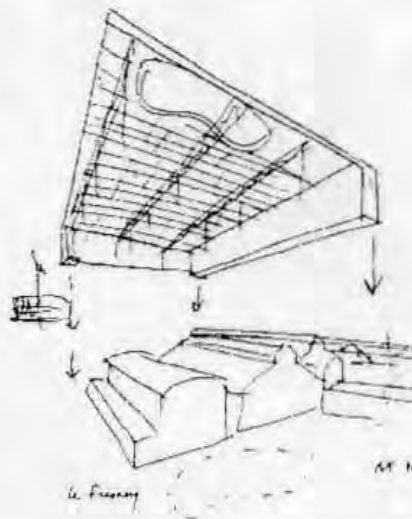
Case studies

Building over

Project:	National Studio for Contemporary Arts, Le Fresnoy, Lille, France (1991-98)
Architect:	Bernard Tschumi
Background:	The site was originally an abandoned amusement park. The town was hit by the economic slump that shut down the textile mills, which kept it alive.
Program:	Exhibition and performance spaces



Figure 42: The existing roof structures have been retained, yet penetrated to facilitate the support structure for the new roof covering.



Idea/concept

Creative umbrella: The 'in-between', inside-outside space under the new roof is seen as a zone not only for circulation but also for socialising and interaction. The existing buildings are seen as 'boxes' within the revised envelope.³⁷

The big roof suggested the possibility of a sort of 'cross programming' whereby the most diverse and disparate elements could coexist.³⁸

"This immense horizontal space questions the notions of interior and exterior suggested by the old buildings. Such multi-functional spaces will be the urban spaces of the 21st century."³⁹

Existing structure

Most of the original buildings have been retained and adapted.

New structure

The new roof is composed of corrugated steel with translucent cloud-shaped skylights; it's open to three sides and, on the fourth continues vertically to form a protective outer skin enclosing accommodation.⁴⁰ The roof structure provides a horizontal plane approximately 100m x 80m, and contains all new services

³⁷ Powell, K. (1990): 'Architecture Reborn, the conversion and reconstruction of old buildings,' Laurence King

³⁸ Architecture D' Aujourd'hui, December 1997

³⁹ Powell, K. (1990): 'Architecture Reborn, the conversion and reconstruction of old buildings,' Laurence King

⁴⁰ Architectural Review, September 1987

Identify programmatic transformation

The space between the rooftops of the retained buildings and the underside of the new roof structure is filled with service ducts and conduits, maintenance stairs and catwalks.

Identify spatial transformation

Le Fresnoy has challenged every conventional idea of reuse and established a new/old dialogue that is entirely contemporary.⁴¹

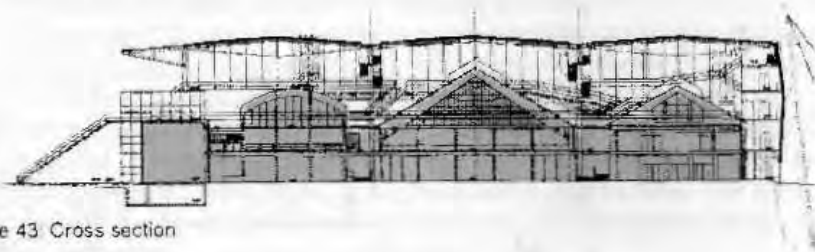
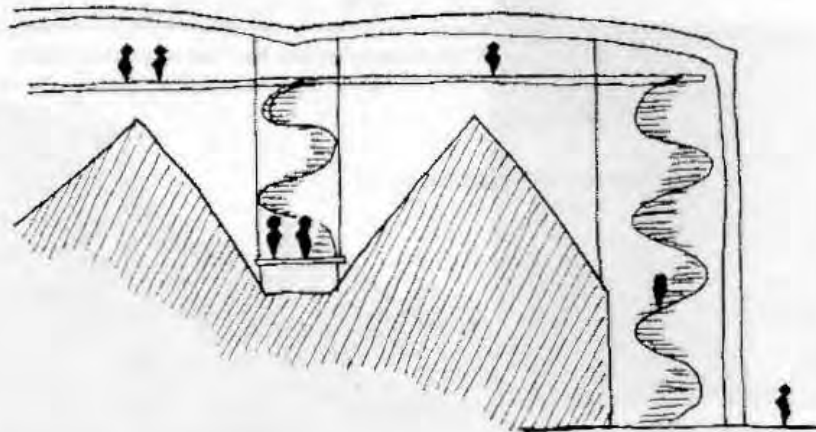


Figure 43 Cross section



⁴¹ Powell, K. (1990): 'Architecture Reborn, the conversion and reconstruction of old buildings,' Laurence King



Figure 44: It is clear to see in this picture how the existing buildings have been retained.



Figure 45: The National Studio for Contemporary Arts from the opposite street.

Case studies

Building onto

Project:	Cassa Batllo, 43 Paseo de Gracia, Barcelona, Spain (1904)
Architect:	Antoni Gaudi
Background:	The Casa Batllo was conceived at the beginning of the 20th century, in a time when European architecture in general was seeking new forms (Secessionism, Art Nouveau) that would put an end to the obviously dominant historical eclecticism 34
Program:	Residential apartments



Figure 46: A close-up of one of the stone-framed window opening on the front façade.

Idea/concept

In 1904 the owner commissioned Gaudi to remodel the building. The idea was to give it an attractive façade within the taste of the times.

Existing structure

The original house was built in 1877.

New structure

A fifth floor was added to the original four story building. Gaudi changed the interior layout of the main floor on the To break the monotony of this façade, and to enhance the overall unity. Gaudi added a whole new layer to it, consisting of stone arches and a continuous tribune that grows upward where it ends in balconies with robust iron railings.

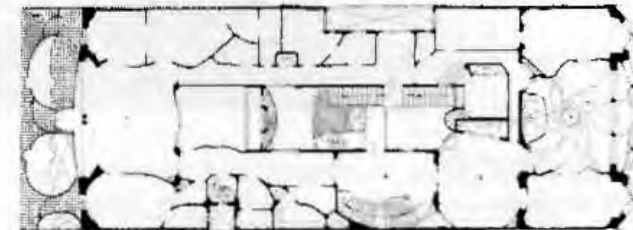


Figure 47: The transformed first floor plan of the Casa Batllo.

Figure 48: Street elevation of the Casa Batllo.



Identify programmatic transformation

Gaudi also had to change the main floor to serve as a residence for the owner's family, and 'modernise' the rest, which would be used as rented apartments with a business office located on the ground floor.⁴²

Identify formal transformation

As can be seen on the images to the left, the original façade was of an ordinary four-storey type with four rectangular balconies per floor. To break the monotony of this façade, and to enhance the overall unity, Gaudi added a whole new layer to it, consisting of stone arches and a continuous tribune that grows upward where it ends in balconies with robust iron railings. This continuous stone mass, with no distinction between supporting and supported elements, has a central bay window and two lateral ones, which extends the interior spaces on the main floor. He covered the new fifth floor with an exaggerated roof with a small tower set off centre. Thus, with the unique form of the new lower elements in stone, and the ceramic-scaled roof, the whole acquired a unified tone. The portion of the façade that was not altered was covered with coloured glass mosaic to give it greater richness.

Figure 49: Models of Casa Batllo now and before.



⁴² Martinelli, Cesar (1975); 'Gaudi - His Life, His Theories, His Work.' The MIT Press, Cambridge, Massachusetts

⁴³ Martinelli, Cesar (1975); 'Gaudi - His Life, His Theories, His Work.' The MIT Press, Cambridge, Massachusetts

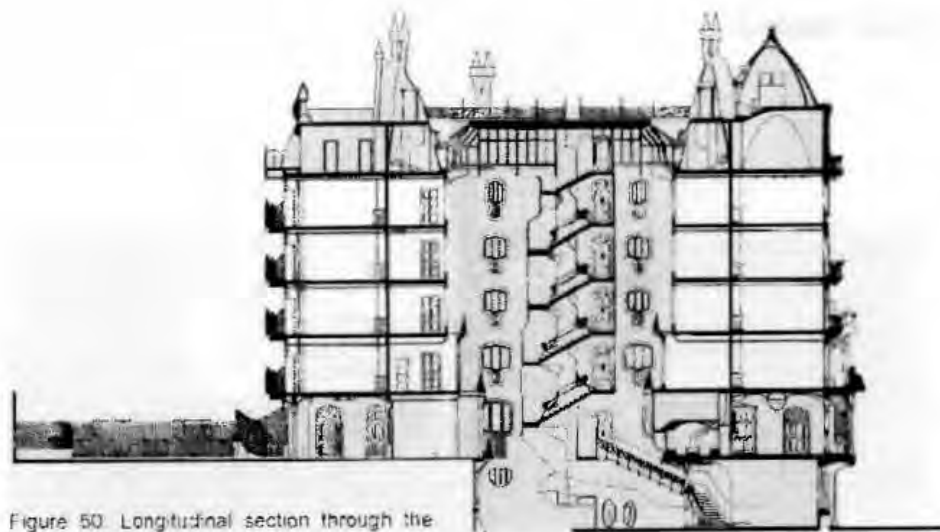
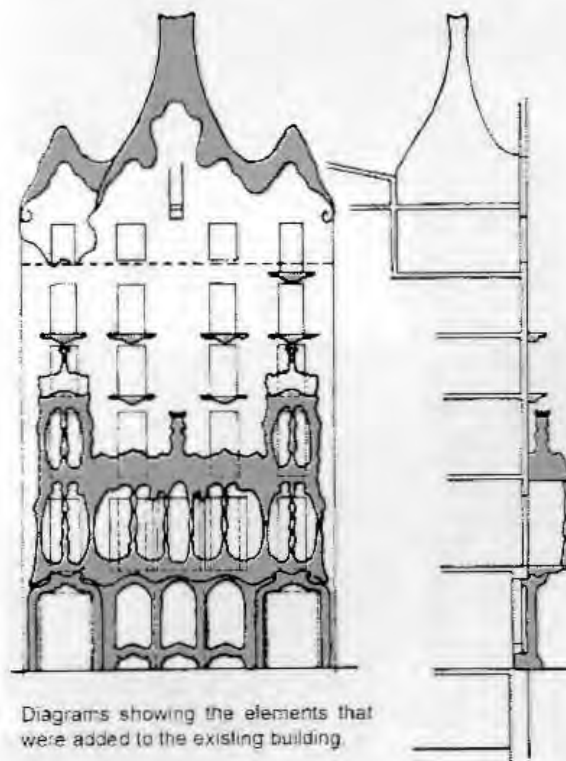


Figure 50: Longitudinal section through the building



Diagrams showing the elements that were added to the existing building.

An interesting feature of the building is the asymmetry of the upper portion of the façade, with the presence of the little terrace and turret on top. When you observe the Casa Amatller next door, it is clear to understand why Gaudi did this. He pulled Casa Batlló back, leaving the tiny terrace almost on the same level as Amatller, in order not to create a contrast that would be detrimental to the neighbouring façade.⁴³

Case studies

Building onto

Project:	CaixaForum , Madrid, Spain (2006)
Architect:	Herzog & de Meuron
Background:	The existing building was previously the Central Eléctrica Power Station.
Program:	CaixaForum Madrid is dedicated to programs in art, music, theatre, and literature.



Figure 51: The CaixaForum from the outside courtyard.



Idea/concept

The granite base of the brick exterior walls was cut away, creating the illusion that the building floats in midair, hovering over a covered entry plaza.

Herzog: "We began with a surgical operation, separating and removing the base and the parts of the building that were no longer needed."⁴⁴

"The architects developed a design strategy based on notions of character and collage, which gives each space its particular sensual and experiential personality. They develop this strategy in part through exploiting the different properties of materials, here carried to a new level in their explorations of transformation and decay. No less important is their focus on contrasting aspects of spatial experience, such as compression and suspension, the basement and the attic, the grotto and the stair"⁴⁵

Existing structure

The classified brick walls of the former power station are reminiscences of the early industrial age in Madrid – this brick shell was the only material that was reused. The architects demolished the original roof and interiors.

New structure

The addition consists of two upper stories clad in rusted cast iron and two underground levels. The building's height was doubled and the floor area increased five times.



Figure 52: Floor plans for the CaixaForum.

⁴⁴ Architecture & Urbanism, May 2008

⁴⁵ Architectural Record, June 2008

Identify programmatic transformation

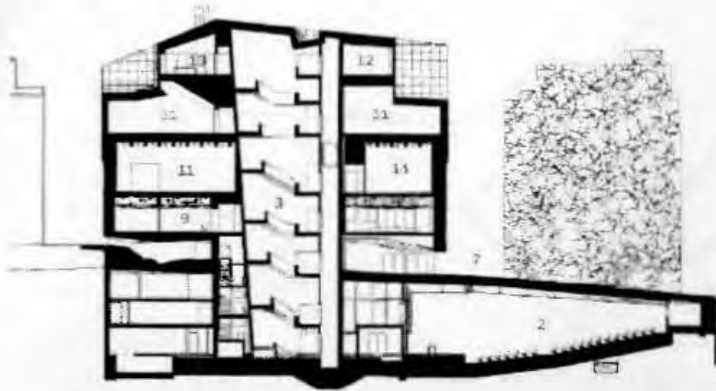


Figure 53: Longitudinal section through the building.

Identify formal transformation



Figure 54: The interior of the building has been transformed into an atrium accommodating the circulation inside the building.

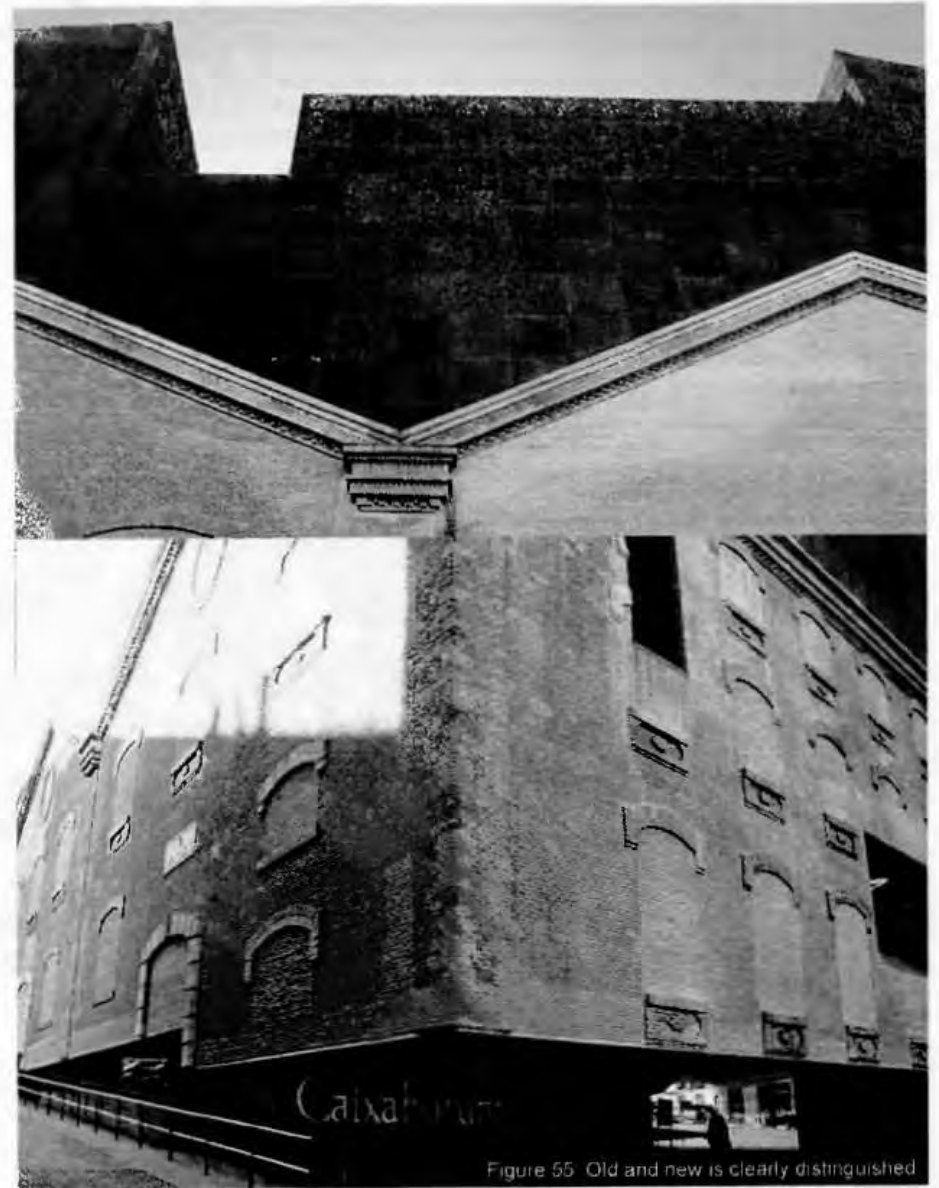


Figure 55: Old and new is clearly distinguished

The site

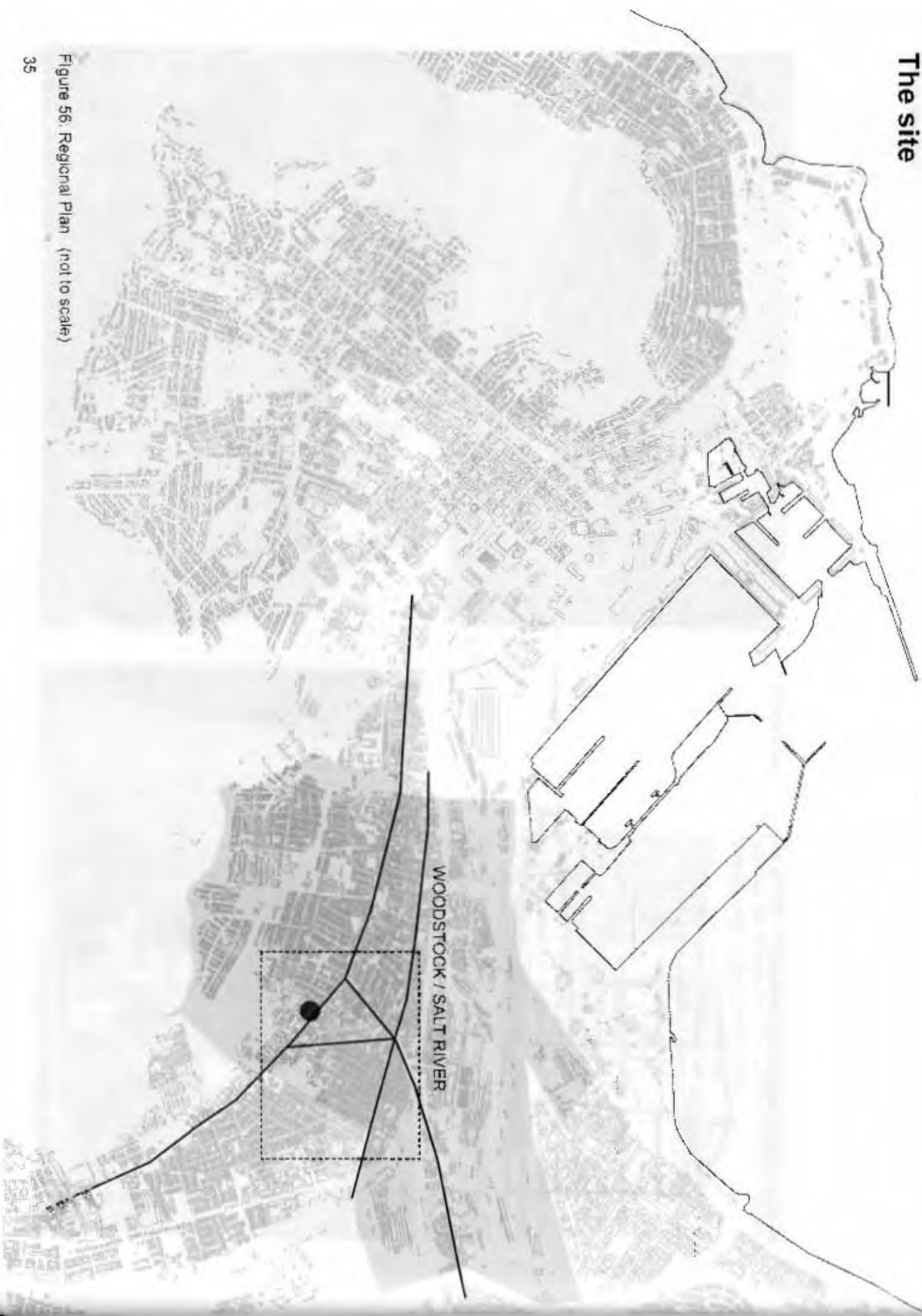


Figure 56. Regional Plan (not to scale)

Introduction

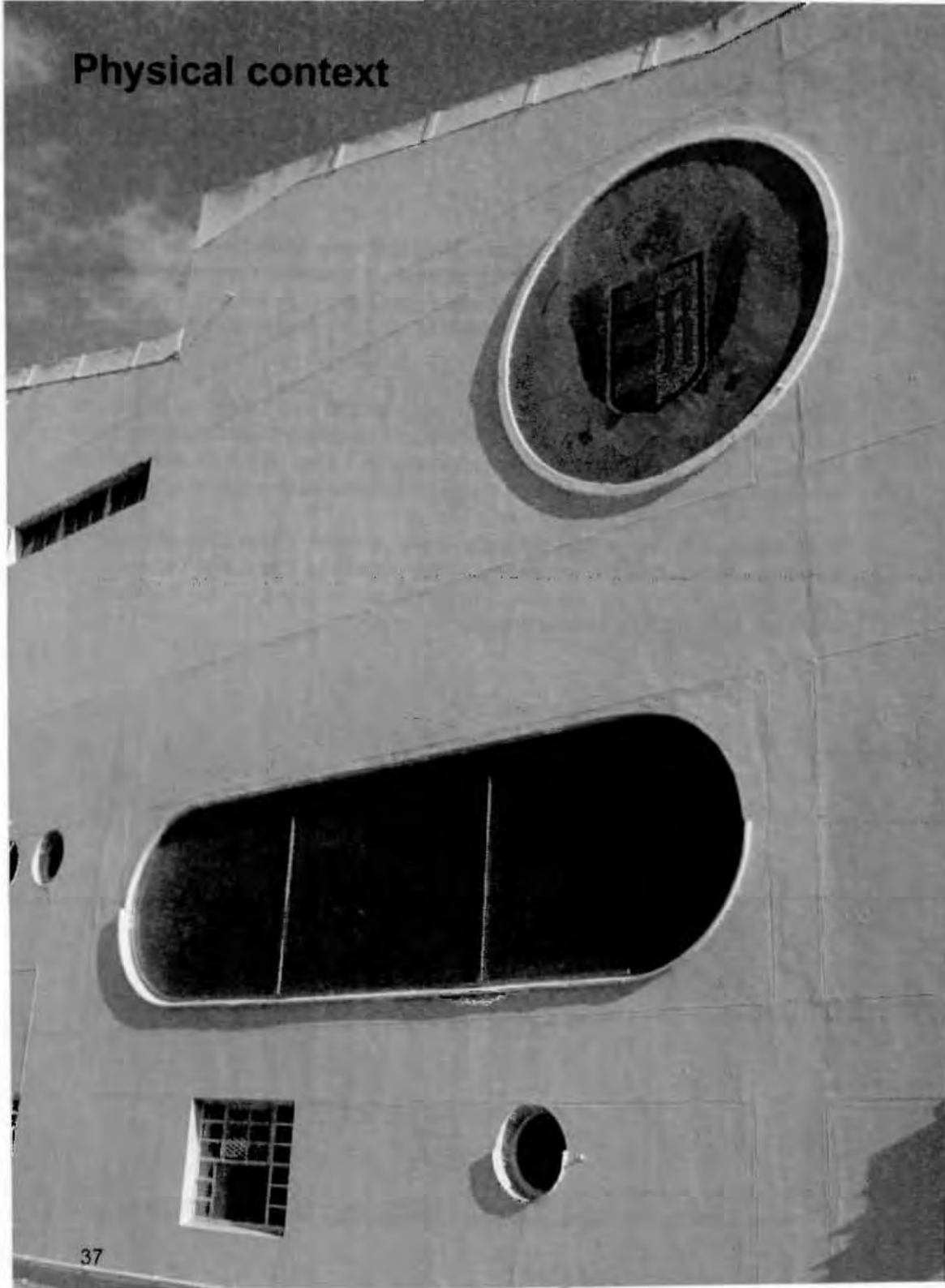
I started to map the buildings in Cape Town that were abandoned, or deemed for demolition any time soon. In the process, I stumbled upon a number of buildings in Salt River that were all derelict and seemingly left for dead. These included the Vanguard House, also known as the Duchess Clothing Factory, and the Rex Trueform Factory building.

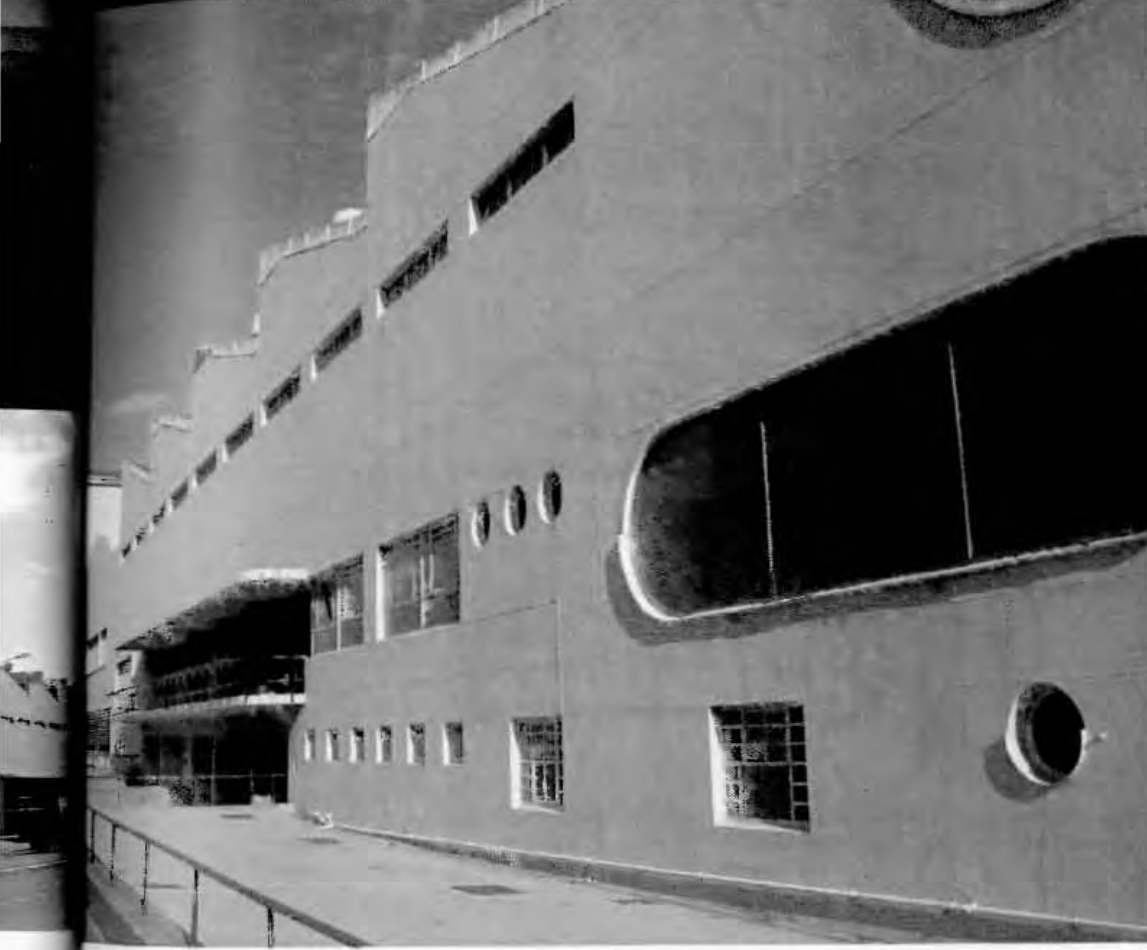
But something about the Rex Trueform appealed to me – whether it was its unusually generous setback from Main Road, or its saw-toothed façade on Main Road, I'm not sure. But as I started to investigate further into the history of the building – uncovering all its various layers – I became even more intrigued.

It all began with two Lithuanian-born Jews, a tailor, Philip Dibowitz and a salesman, Bernard Shub, who started Rex Trueform. Their first factory was called Judge Clothing and the factory in Salt River, designed by Max Policansky, was opened in 1936 by Senator Fourie.⁴⁶ ...

⁴⁶ Kaplan, D. (1987): "Industrial Development in the Western Cape, 1910 – 1940."

Physical context





The Rex Trueform Clothing Factory, Salt River

The historic local areas of Woodstock and Salt River are located approximately 3km from the Cape Town Central Business District, between the Devil's Peak mountains and the sea. The areas were established more than 250 years ago and are well - located to metropolitan Cape Town via the national and main transportation routes namely the N1, N2, and the southern and northern suburb corridors.

Woodstock and Salt River exhibit urbanisation trends typified by degrees of poverty, unemployment, crime, vandalism, vagrancy, and a lack of vision for public investment and management.⁴⁷

Located in Victoria Road (Main Road), Salt River, the Rex Trueform Clothing Factory not only finds itself a stone's throw away from the Cape Town CBD, but also at the centre of Cape Town's garment and textile industry. The Rex Trueform Factory building, as we know it today, occupies an entire city block. But it actually consists of two buildings – the Judge Clothing Company and the Cavalla Cigarette Factory, as they used to be called.

The first building, the Judge Clothing Company building, is a two-storey factory building, designed by Max Policansky in 1937. It shows the influence of Le Corbusier: a linear building organized along a north-south axis of an industrial zone peripheral to the city. Righini describes the building as being 'rigorously programmatic and designed for lateral and vertical expansion.' The movement spaces are strongly articulated and are formally reminiscent of the work of Mendelsohn's Shocker Store — a formal language that became less of a preoccupation in subsequent buildings.⁴⁸ Righini also states that the building is 'a highly mature piece of work for the then-28 year old architect and was strongly influential in introducing the modern movement to Cape Town.'

The Judge Clothing Company building was designed in such a way that lateral expansion for processing, and general vertical extension could be facilitated. The ground-floor area was used for the storage of material and finished products, whilst the 1st floor was mainly used as manufacturing space, with attendant staff amenities.

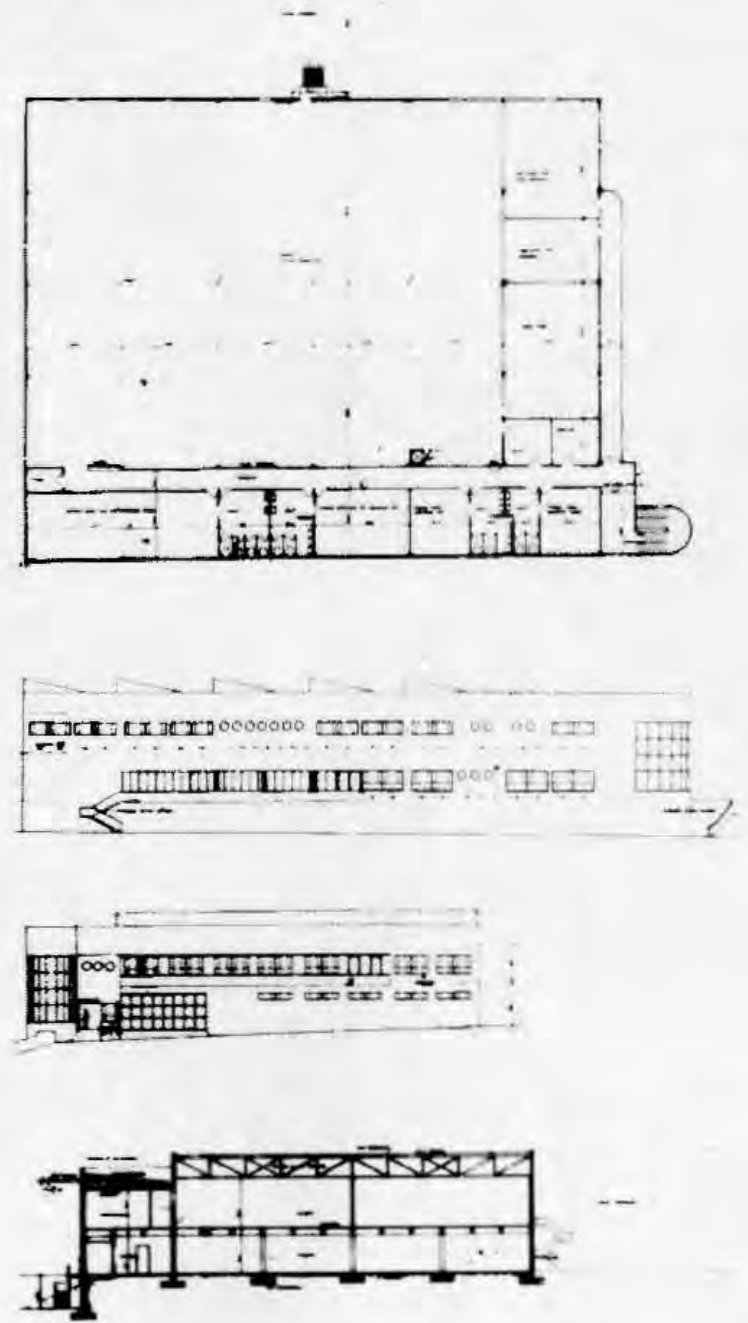
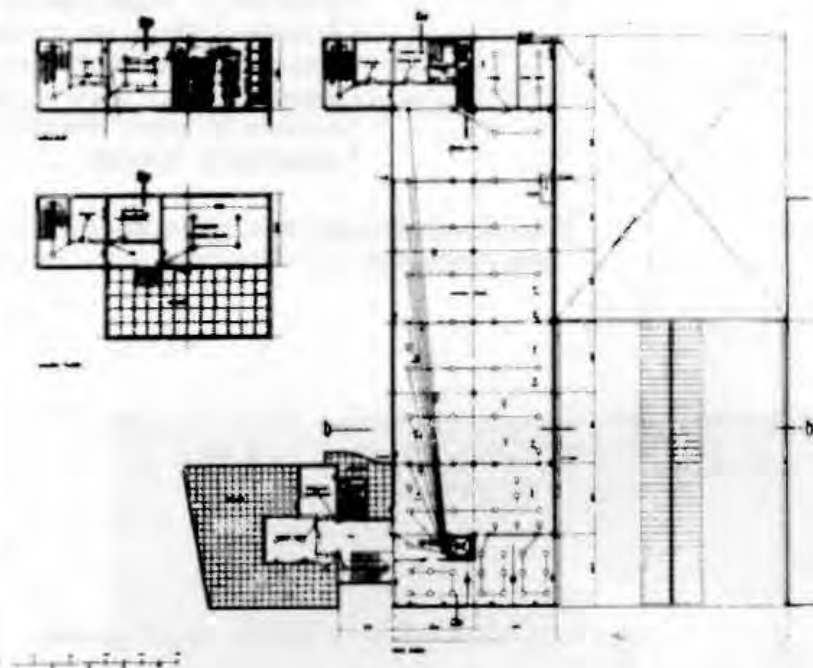
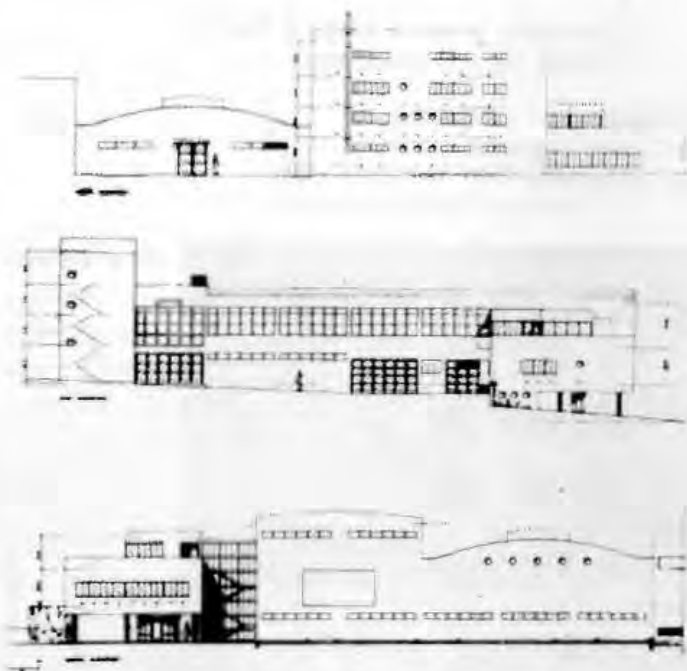


Figure 57: The original drawings of the Judge Clothing Factory, as drawn by the office of Max Policansky in 1937

Policansky designed the second building, the Cavalla Cigarette Factory, only a year after the Judge Clothing Company building. It was originally conceived to comprise essentially of three components: a multi-storeyed reinforced concrete framed building designed for vertical expansion with an appended single-storey cutting room (with lateral expansion potential) and an appended linked office block with vertical expansion possibilities. On the south side, a workers' block was later added. This block was capable of lateral and vertical expansion and consisted of toilets, change rooms and mess rooms.⁴⁹



⁴⁷ Mammon (2003): 'Inner City Revitalisation: The Woodstock & Salt River Revitalisation Framework'
⁴⁸ 'Max Polikansky.' (www.artefacts.co.za)
⁴⁹ Righini, P. (1976): 'Max Polikansky. Isilili sa sise africa'

Figure 58: The original drawings of the Cavalla Cigarette Factory, as drawn by the office of Max Polikansky in 1937.

Timeline

1933

1937 1938

1944

1953 1956

1963

A disastrous fire almost completely destroys the Judge Clothing Factory.

Extension of Judge Clothing Factory – Andrews & Niegeman Architects. Floor area of manufacturing & storage space is increased and a workers' block, which consists of toilets, change rooms and mess rooms, is added.

The Cavalla Cigarette Factory is built – Max Polikansky

The firm moves to Salt River because of need for bigger premises.

The Judge Clothing Factory is built – Max Policansky

Bernard Shub and Philip Dibowitz establish the Judge clothing company in Woodlands Road, Woodstock.

Extension of Judge Clothing Factory – Hillel Turok & Associates

Extension of Judge Clothing Factory – Hillel Turok & Associates

Extensions and alterations to the Cavalla Cigarette Factory – Max Polikansky.



Isilili sa sise africa



Isilili sa sise africa



1974

1990

2003

2005

2006

Alterations and extension to the Cavalla Cigarette Factory – Wegerif & Whittle Architects.



Dewar

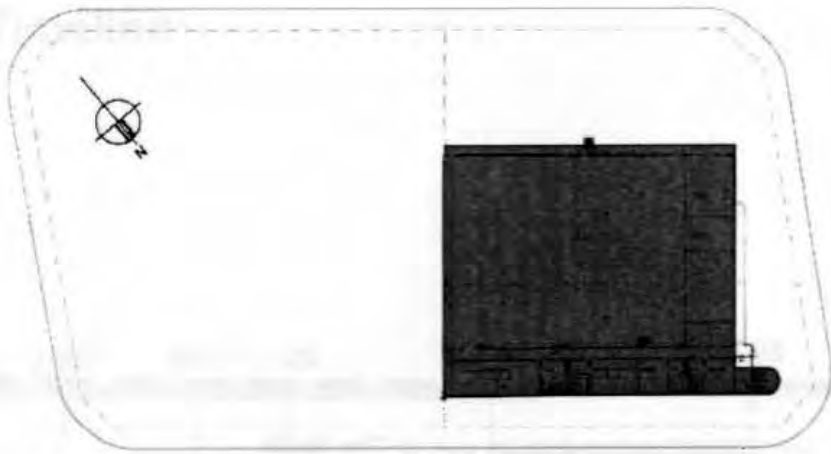
Rex Trueform establishes its own retail outlet, Queenspark

140 Rex Trueform employees are retrenched on its manufacturing operation, in order to concentrate on its retail division.

Final closure of the Rex Trueform Factory

Rex Trueform is taken over by The House of Monatic – a lease of 5 years including machinery and premises – rehiring of about 200 of the 920 retrenched staff.

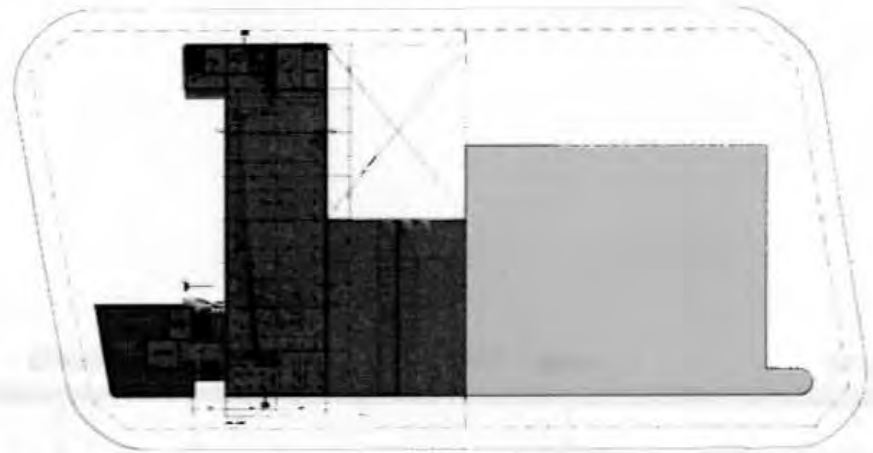




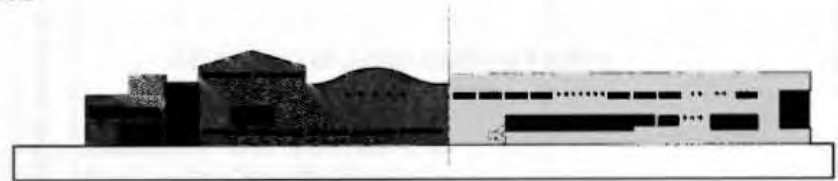
1937



1937 - Main Road Elevation



1938



1937 - Main Road Elevation



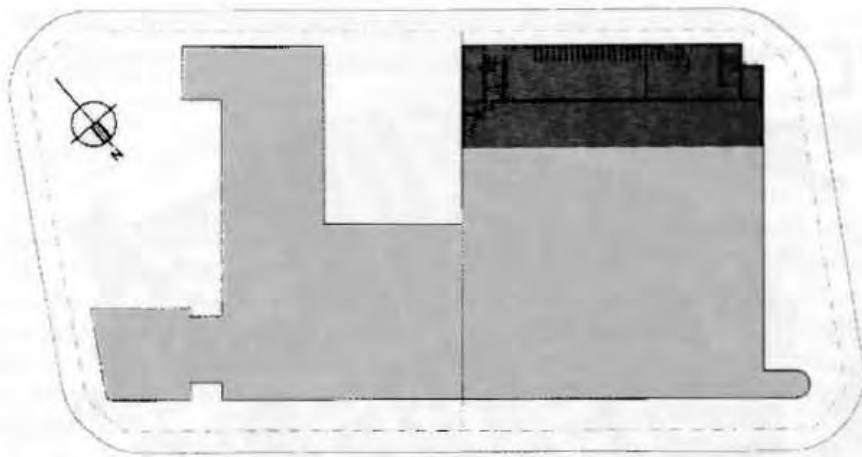
1953

1944

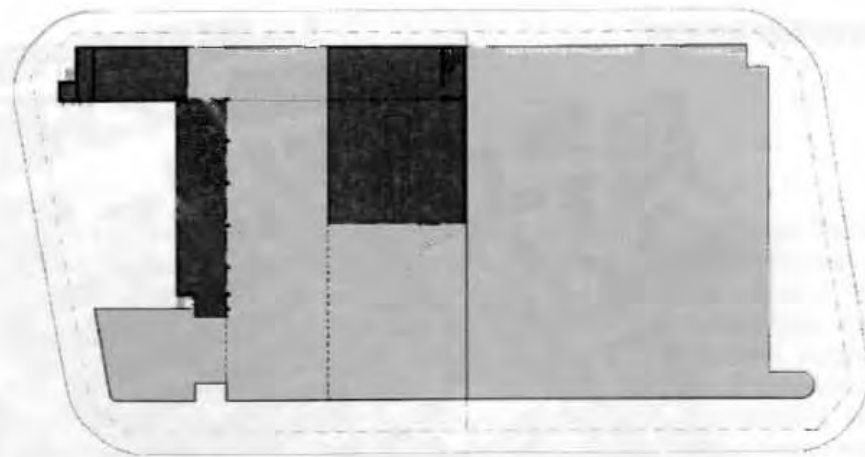


Today

Mapping the evolution of the Rex Trueform Clothing Factory building.



1944

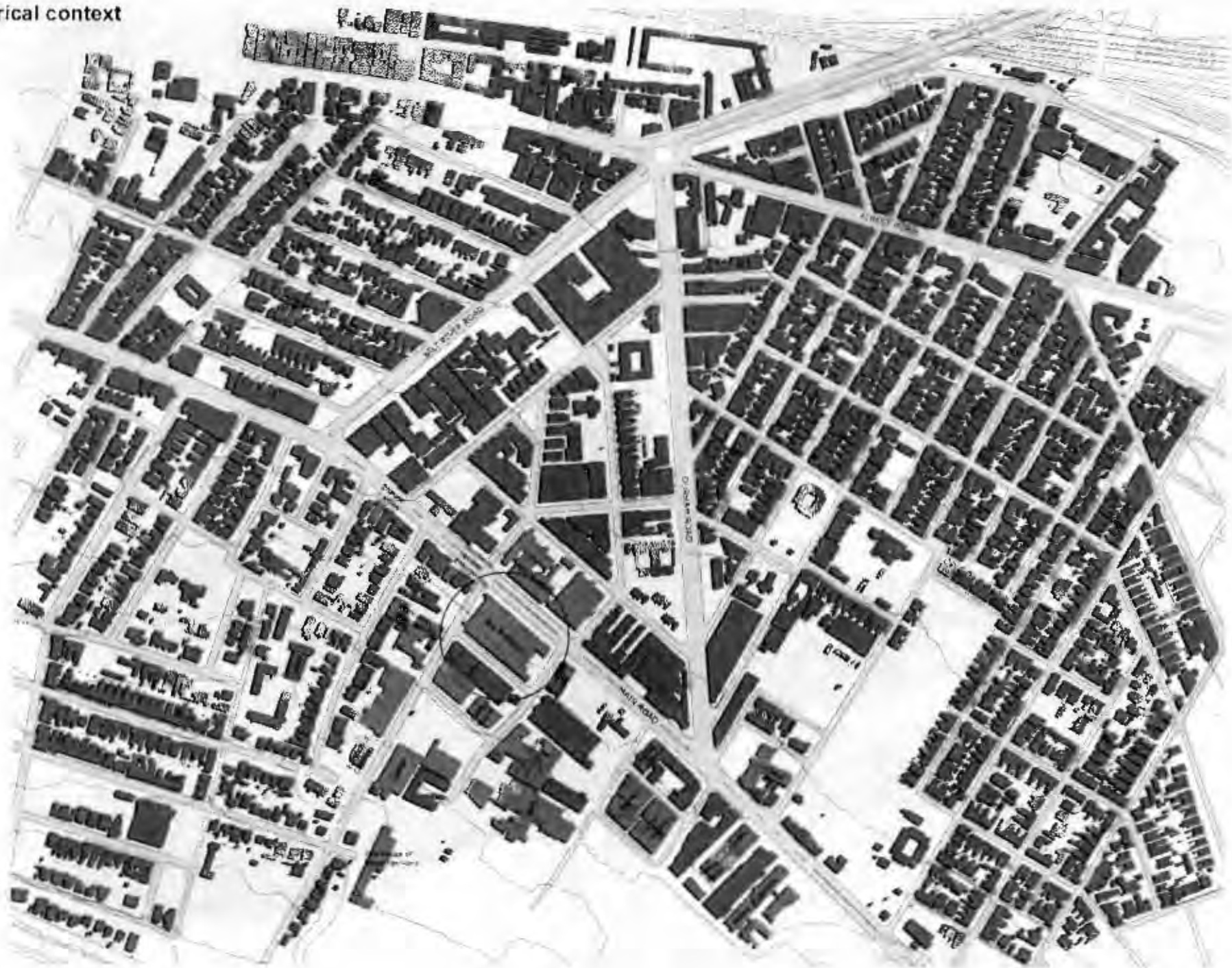


1953



Figure 59. A model of the Rex Trueform Clothing factory as it is today.

Historical context



The history of the garment industry in Cape Town

Cape Town experienced significant industrial growth during the early 1930s. The manufacturing industries focused on mainly food, drink and tobacco, clothing and paper and printing. The local economy favoured whites, Africans and women as employees above coloured men⁵⁰, but during the Depression the demographics of the workforce changed. The number of blacks declined in relation to whites. By 1936, over half the white working population of Cape Town was Afrikaner.⁵¹

During the inter-war period, the clothing industry grew immensely in importance. The legislation enacted by the Pact Government in 1924 protected workers and removed customs duty on imported raw materials, which resulted in the growth of the clothing industry.⁵²

According to Kaplan (1986), all the earliest garment manufacturers in South Africa were Jewish. There were two groups: the first group of manufacturers moved their established tailoring businesses from Britain to South Africa, and the second were Lithuanian and Polish Jewish immigrants who began garment factories here.⁵³

Kaplan points out that in the 1920s the industry had problems remaining competitive with British goods because of the lower wage structure there. At the time, the workers here were all White and the Garment Workers Union was one of the first to be established following the Industrial Conciliation Act of 1924. Coloured workers only began to be employed during the Second World War. An exception was the employment of 'Malay' tailors from the earliest days, as tailoring was considered a traditional occupation. The machinists were White from the 1920s until the war.⁵⁴

Figure 60: The RexTrueform Clothing Factory is located in the heart of Cape Town's garment & textile industry. This map indicates the cluster of buildings that are related to the industry. Most of them are now used for nothing more than retail outlets for imported garments.

The link between Salt River and the Garment Industry of Cape Town through history is thus significant. One only needs to look at the number of factories and retail outlets in the area (refer to map) to realise the importance of this industry in terms of its physical presents in Salt River's built context. But one also needs to appreciate the role the garment industry, and indeed the factories, played in shaping the cultural and social character of the area. The lives of thousands of Capetonians were influenced by the garment industry, and will continue to do so for many more years. The cluster of industrial buildings that occupy this area of Salt River therefore possess significant heritage value, not only because of their age and architectural value, but also as they represent a cultural legacy unique to Cape Town.

⁵⁰ Bickford Smith et al (1999:64)

⁵¹ Bickford Smith et al (1999)

⁵² Bickford Smith et al (1999)

⁵³ Kaplan (1986)

⁵⁴ van Graan

Modernism and functionality: Cape Town's garment industry

The development of the garment industry in Cape Town is closely linked to the introduction of modernism in its purest form in Cape Town architecture. This is probably related to the 'form follows function' maxim that determines industrial development.⁵⁵

Industry remained at the forefront of modernism. Van Graan notes that of all the 'sites of encounter', it is in the industrial development of the city that modernism took hold in its most direct form. Here there is the least sign of any 'negotiation' and the imperative to ensure that form followed function was strongest.⁵⁶ Policansky's work was largely concentrated in this field and his early buildings for both Judge's Clothing as well as the Cavalla Cigarette Factory clearly express their function in the external appearance of the building. Economy and the influence of Fordist principles of mass production ensured that aesthetics were derived from function and not from pure aesthetic considerations. In no other field, excluding possibly the healthcare buildings designed by the City Architect's Department was this as clear.⁵⁷

According to van Graan, it was in the industrial architecture of Cape Town, that the city was the forerunner of modernism in South Africa. It was ahead of similar work in Johannesburg, which did not show the same innovative approach. However, the commercial buildings of the city- and specifically the buildings erected by the assurance and insurance industry also adopted modernism, although in a more adaptive form.⁵⁸

'The morality of industry has been transformed: big business is today a healthy and moral organism. If we set this new fact against the past, we have Revolution in method and in scale of its adventure.'

Le Corbusier: Towards a new architecture

⁵⁵ van Graan
⁵⁶ van Graan
⁵⁷ van Graan
⁵⁸ van Graan



Figure 61: A map of the noteworthy elements in Salt River as noted by Todeschini and Japla

DATING

- Pre 1905
- Pre 1925
- Pre 1935
- Pre 1950
- Pre 1970



Figure 62. This map by Todeschini and Japha indicates the time of construction of all buildings in Salt River and Observatory.

Max Policansky

The shift in architectural attitude, prior to the creation of an independent School of Architecture in the mid thirties under Thornton White⁵⁹, came largely from architects who had trained abroad, particularly at the Liverpool School of Architecture under Charles Reilly. According to van Graan there was no influence from European-trained architects in Cape Town in this period, reflecting the essentially English character of Cape society. Foremost among the English-trained architects was Max Policansky (1909-2003), who is regarded by many as one of the most significant and innovative modernist architects to emerge in the mid-Thirties.⁶⁰

Policansky was born in Cape Town. He attended the School of Architecture at the University of Cape Town for a year (1928-9), whilst Professor Gregory headed it, before leaving for the Liverpool School of Architecture, England from where he graduated in 1933.⁶¹

After completing his studies abroad, and after working in Johannesburg for about six months, Policansky returned to Cape Town in 1935 where he set up practice. Among his first buildings was the CTC Bazaars in Plein St, Cape Town (1936), which he won in a limited entry competition. His design for this building was described by a contemporary source as streamlined.⁶² During the next few years he was engaged on several buildings, including the Judge Clothing Company factory building and the Cavalla Cigarette Factory. These buildings were the first of a series that, in the years to follow, were to include some of the finest works of modern architecture at the Cape.⁶³

Policansky evolved a style, which, although recognising overseas inspiration, was in many ways highly personal; its smooth surfaces and generally rounded forms constitute an architecture softer than the crisp angular buildings of the then Transvaal.⁶⁴

Policansky can be seen as the initiator of progressive European-based modernism that drew inspiration from, among other, the work of Mendelsohn, particularly in the semi-circular staircase tower used by Mendelsohn at The De la Warr Pavilion at Bexhill-on-Sea for example, and in his Schocken department stores, and incorporated into Policansky's Judge Clothing factory.⁶⁵

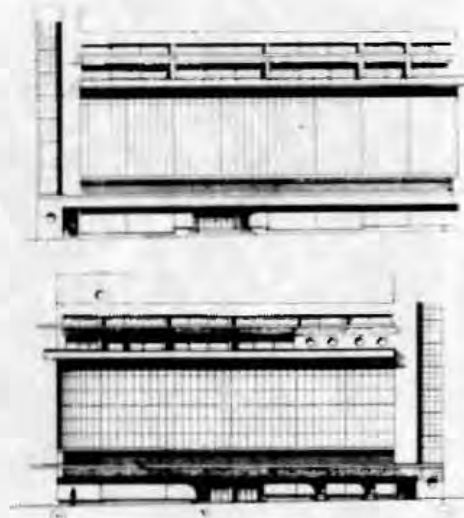


Figure 63. CTC Bazaars, Cape Town by Max Policansky - 1936

Figure 64. House Policansky, Bantry Bay Cape Town - 1947



But the Judge Clothing Factory at Salt River (1937) attracted more attention,

... "fresh in its method of functional expression ... the author of the design is obviously indulging in that architecture of adventure which is dear to the hearts of all those who have respect for the imaginative and constructive capacity underlying all creative work."⁶⁶

In 1941, early in the Second World War, Policansky closed his office and worked for the Cape Town Municipality. He re-opened his practice after the war and among his post-war work executed House Policansky, Bantry Bay (1947) and the synagogue, Schoonder St, Gardens (1947) as well as some of the most innovative industrial buildings in the city.

It was very evident throughout my readings on Max Policansky's, that many regarded his contribution to the architectural heritage of Cape Town to be of great value. The Rex Trueform Factory, as it is known today, is only one of many of his creations, but not many are as well preserved. It is thus important to assess to what extent the building can be transformed – formally, spatially and programmatically – in order for it to retain its heritage value.

By mapping the physical history of the building, I was able to determine which portions of the building Policansky designed, and which portions were added later by others, for whatever reasons. It is interesting to note that there have been many subtle changes to both the interior spaces and the facades, although these changes mostly involved the removal of partition walls and the introduction of new wall openings. The most significant changes occurred at the back of the building, where service spaces were added to accommodate toilets, lockers and storage space.

To me, the Main Road façade is the most important architectural element of the entire building. With its flat, smooth plastered surface running nearly 80m parallel to the street, and its instantly recognizable profile, the front façade of the Rex Trueform can be regarded as the 'face' of modernism in Cape Town. I have thus decided to respect not only this façade as much as possible, but also the space between it and Main Road, as I regard it as an opportunity to further highlight the stature of the façade.



Figure 65: The invincible Clothing Factory, Pennington (1937)

⁵⁹ 27Cape Town at that stage did not have a separate department of architecture and it was taught in the Michaelis School of Art. The course, headed by William Gregory was very conservative and Beaux Arts in approach.

⁶⁰ van Graan

⁶¹ "Max Polikansky." (www.artefacts.co.za)

⁶² Righini, P. (1976). "Max Polikansky." *Isilili sa sise africa* 1

⁶³ van Graan

⁶⁴ Righini, P. (1976). "Max Polikansky." *Isilili sa sise africa* 1

⁶⁵ van Graan

⁶⁶ Righini, P. (1976). "Max Polikansky." *Isilili sa sise africa* 1

Social context

The people working in the garment industry

Perhaps the most well-known, yet controversial aspect of the garment and textile industry is the nature of its workforce, which, owing to the relatively high labour intensity, but relatively low skill level, is notorious for its minimal wages.⁶⁷ Throughout its history in South Africa, the majority of the clothing industry's workers ranked amongst the lowest paid in the country, and, largely as a consequence, the industry was one of the country's largest employers with 98 875 workers in 1973, representing around 19% of total manufacturing sector employment in the country.⁶⁸ Approximately half of this employment was accounted for by the Western Cape clothing industry.

Another significant feature of the industry's labour force is the significant proportion of female workers. In 1968, 68% of Rex Trueform's workforce was female.⁶⁹ In addition, most of these women were relatively young, with a 1969 study revealing that 79% of women employed in Cape Town's clothing industry were between 15 and 35 years of age. These features of the workforce, coupled with the sheer size of the firm – by 1973 it employed over 3000 – made it a significant component of Cape Town's coloured working class community.⁷⁰

The leasing of Rex Trueform in 2005, including the loss of close to 1000 jobs, had political, social and economic ramifications within the Western Cape. Owing to the fact that a bulk of the company's employees was unskilled, mainly female bread winners of usually large families, the closure did not only mean joblessness, but the increase of poverty in already devastated working class communities.⁷¹

⁶⁷ (BUT 968 MELL)

⁶⁸ (BUT 968 MELL)

⁶⁹ (BUT 968 MELL)

⁷⁰ (BUT 968 MELL)

⁷¹ (BUT 968 MELL)

In 2005, the Salt River base radio station, Bush Radio, in conjunction with Voice Of The Cape, held a solidarity-broadcast against the job losses of a thousand people. About 100 workers from Rex Trueform joined the staff of Bush Radio and Voice Of The Cape outside their studios in Salt River, Cape Town.

Slogans such as Hands Off Our Jobs and Hands Off Rex Trueform were displayed on posters.

SACTWU regional secretary Aziza Kannemeyer told Amkelwa Mbekeni (presenter of Sakisizwe Building The Nation Bou Die Nasie) the job losses spell disaster for the workers at Rex Trueform. "A lot of homes will be affected because many of the mothers working there are single parents." Kannemeyer has said.⁷²

Workers at Rex Trueform dispelled statements by the company's management that it had run a financial loss of R60-million. Shop stewards at the factory said that Rex Trueform was in fact doing quite well, but that the Queens Park⁷³ outlet was not taking in any clothing made at Rex Trueform - it decided to rather import clothing from China.⁷⁴

Every family on the Cape Flats has a member who at one time or another has worked for Rex Trueform, and every family in South Africa who has bought formal wear for their fathers and sons has proudly worn the products made by the workers of Rex Trueform.⁷⁵ Although thousands of people have lost their jobs as a result of the crisis facing Rex Trueform and the garment industry in general, the full extent of the tragedy is only realised if one considers that every worker dismissed, on average, supports five other household members.⁷⁶

⁷² "Hands off our jobs." www.bushradio.co.za

⁷³ The establishment of Queenspark was meant to serve the manufacturing plant while at the same time using profits from cheap imported products to supplement the company's profit margin. This became company policy following the deterioration of international market conditions worsened by the volatile Rand. The company henceforth concentrated on the retail chain as its survival mechanism.

⁷⁴ "Hands off our jobs." www.bushradio.co.za

⁷⁵ "Save Rex Trueform." www.sacc.org.za

⁷⁶ "Save Rex Trueform." www.sacc.org.za



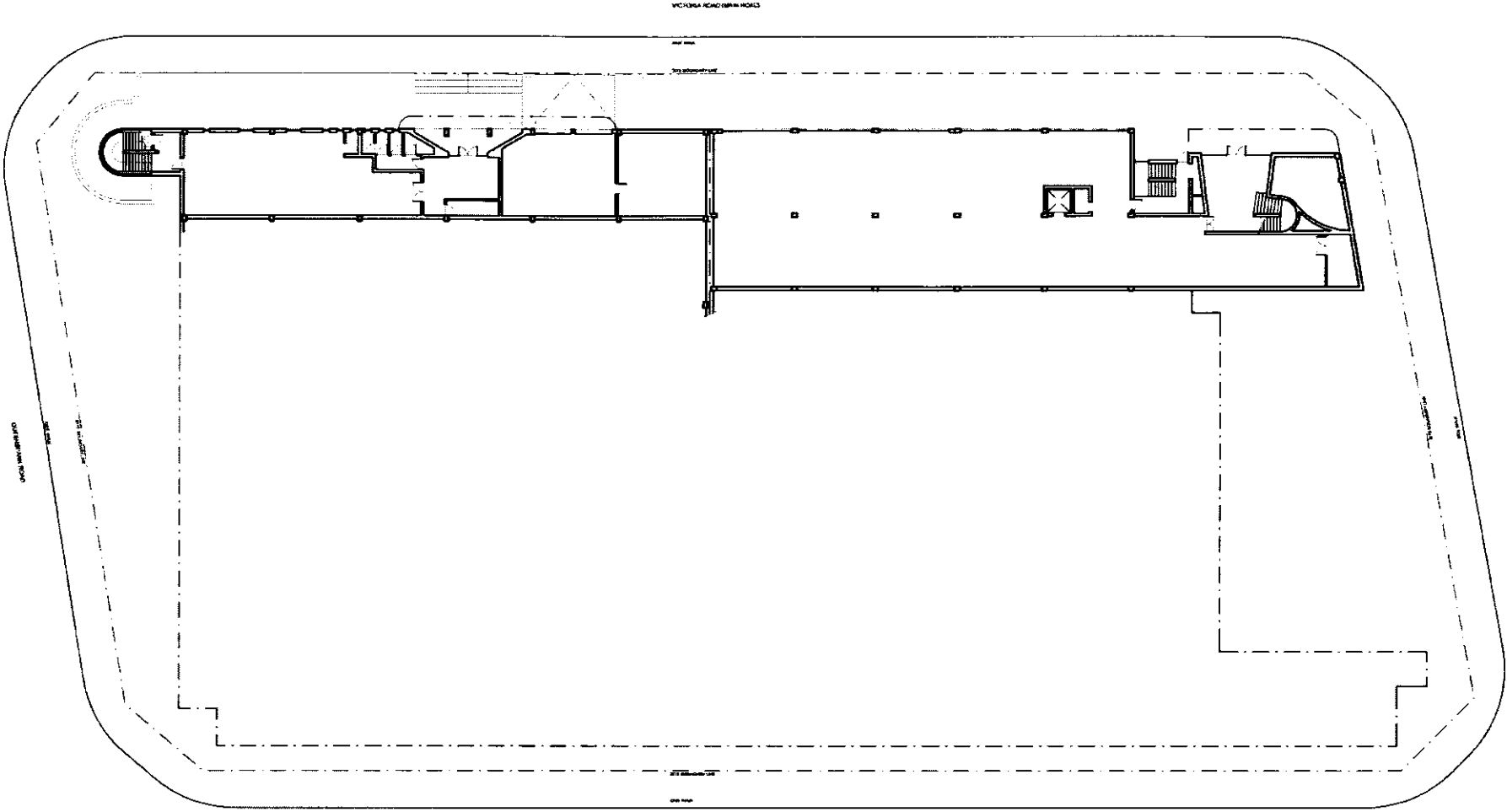
Figure 66. SACTWU regional secretary Aziza Kannemeyer speaking to Amkelwa Mbekeni (presenter of Sakisizwe Building The Nation Bou Die Nasie)



Figure 67. Victor Jantjies from Bush's morning show, It's All Good, speaks to Antie Gina.



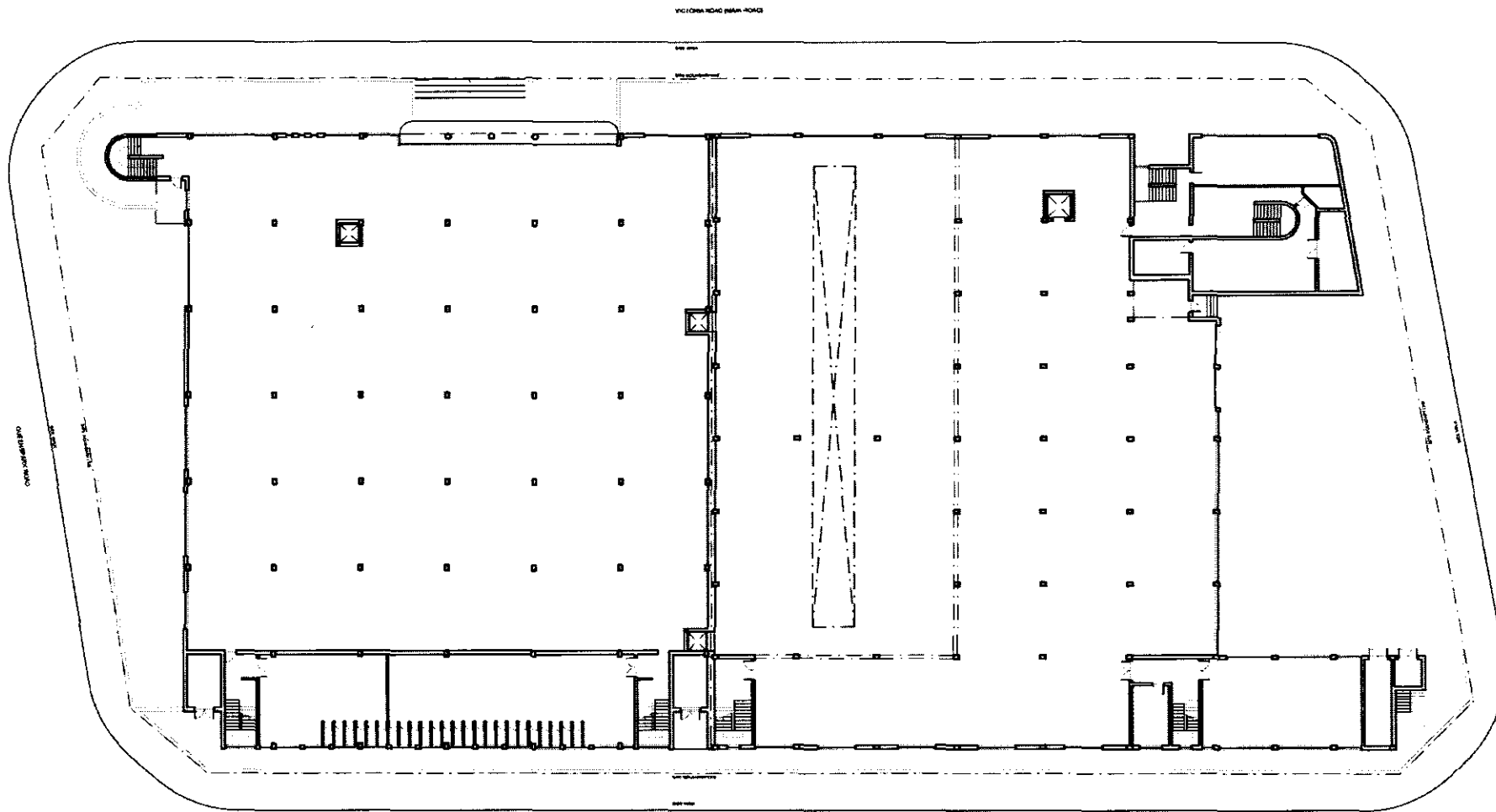
The Rex Trueform Factory - Drawings of existing structure



BASEMENT LEVEL

scale 1:500

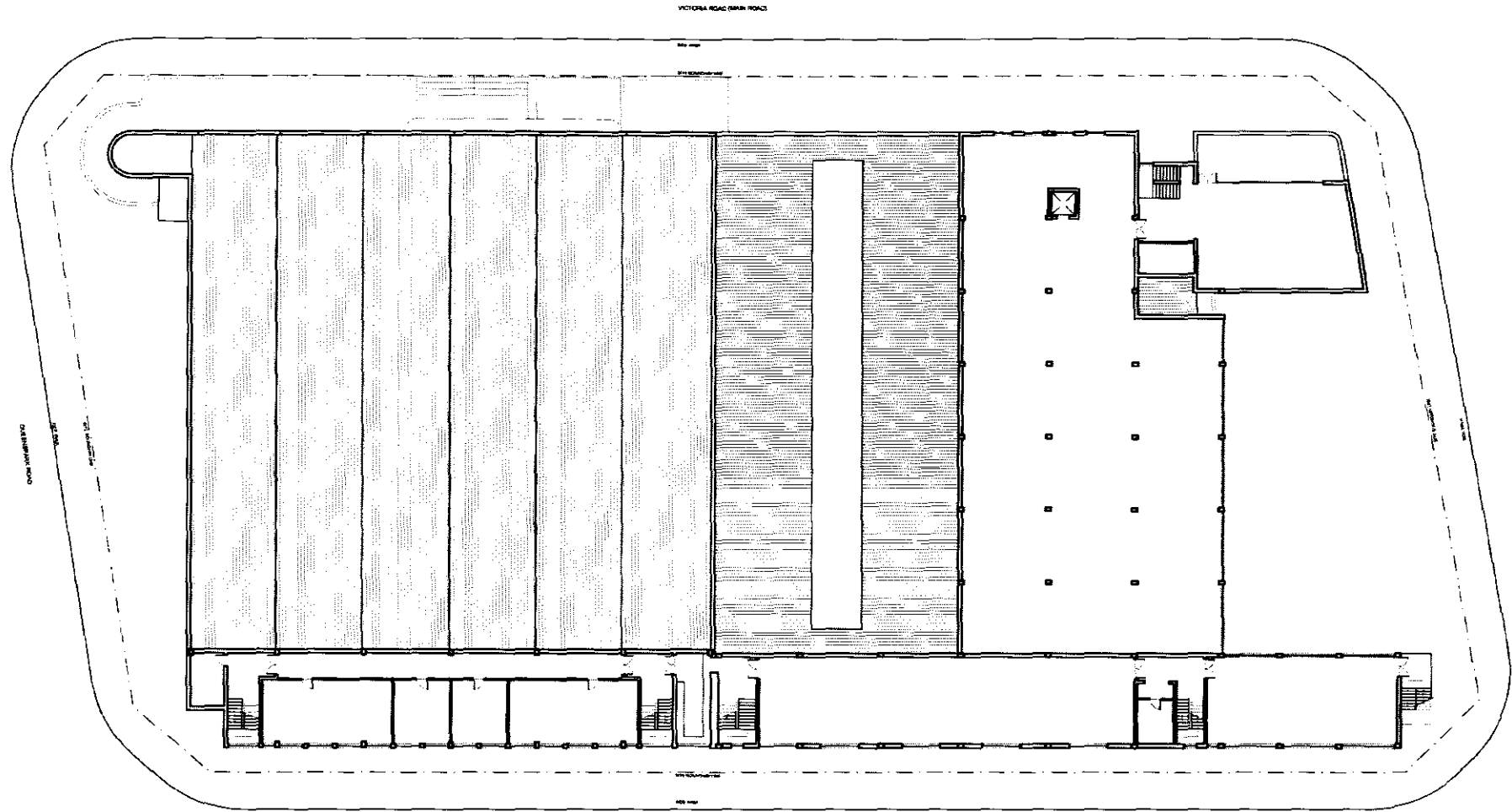
The Rex Trueform Factory - Drawings of existing structure



GROUND FLOOR LEVEL

scale 1:500

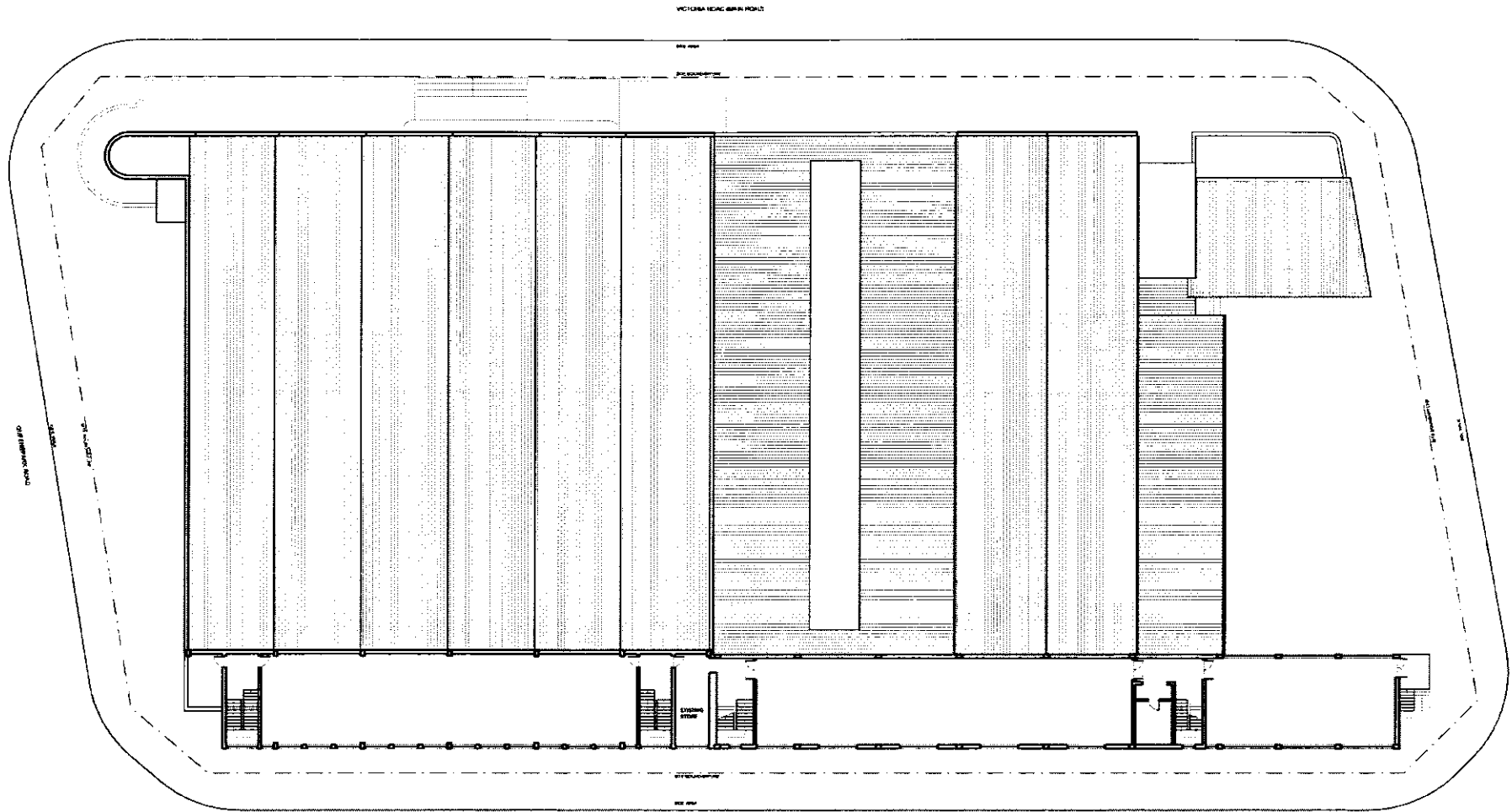
The Rex Trueform Factory - Drawings of existing structure



FIRST FLOOR LEVEL

scale 1:500

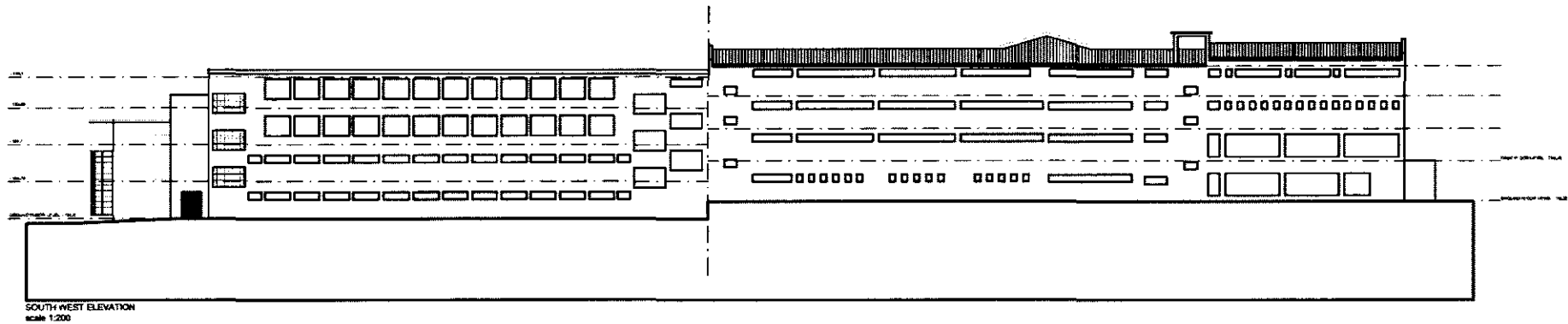
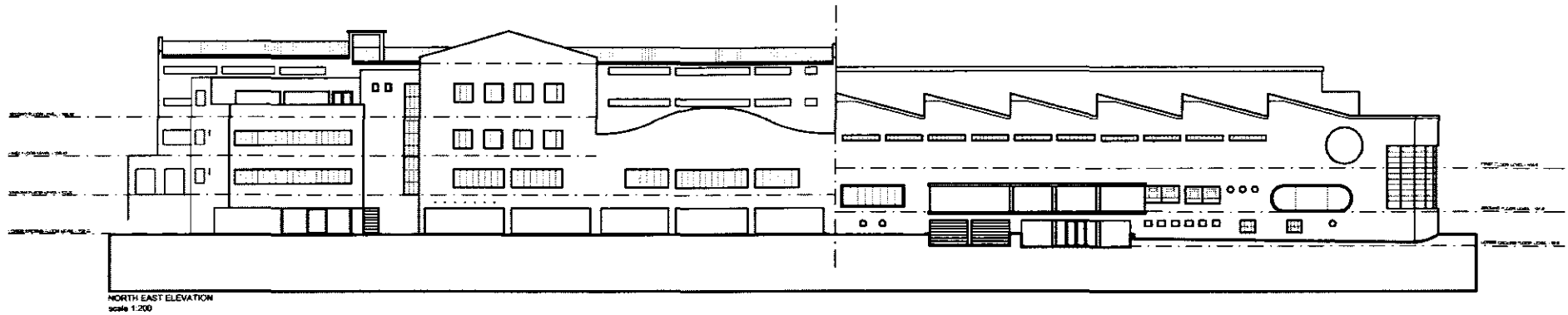
The Rex Trueform Factory - Drawings of existing structure



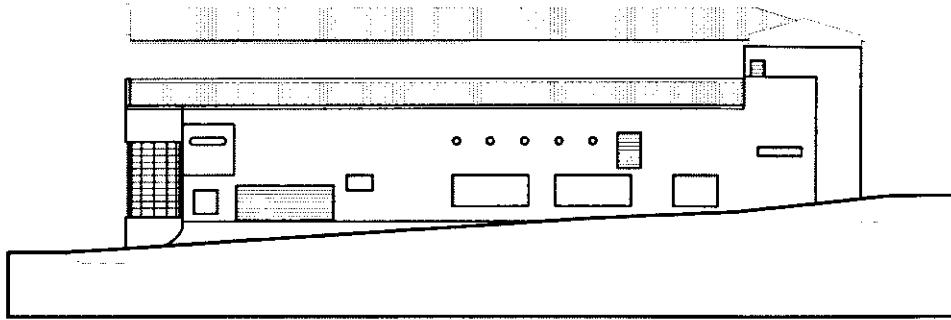
SECOND FLOOR LEVEL

scale 1:500

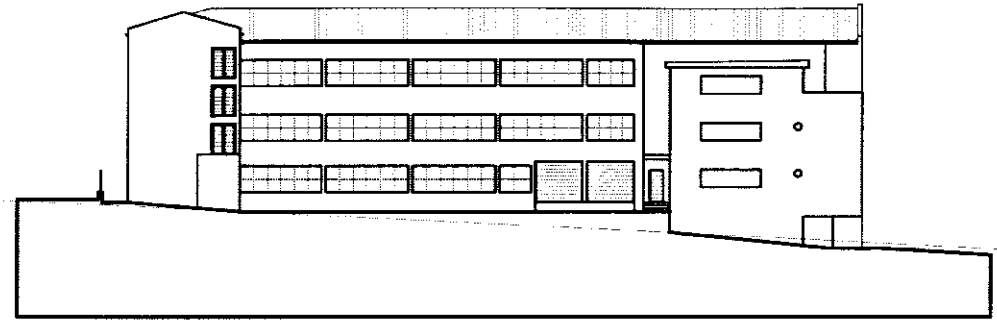
The Rex Trueform Factory - Drawings of existing structure



The Rex Trueform Factory - Drawings of existing structure



NORTH WEST ELEVATION
scale 1:200



SOUTH EAST ELEVATION
scale 1:200

Existing structure							
	BASEMENT	GROUND FLOOR	MEZZANINE	FIRST FLOOR	SECOND FLOOR		
JUDGE	AREAS SCHEDULE						
	FLOOR AREA	244m ²	2000m ²	2000m ²	188m ²	243m ²	4675m ²
	CIRCULATION	23m ²	10m ²	41m ²	71m ²	8m ²	153m ² - 3%
	VERTICAL CIRCULATION	18m ²	46m ²	46m ²	28m ²	28m ²	168m ² - 3.3%

	L / GROUND FLOOR	GROUND FLOOR	MEZZANINE	FIRST FLOOR	SECOND FLOOR		
CAVALLA	AREAS SCHEDULE						
	FLOOR AREA	533m ²	2076m ²	1215m ²	1253m ²	337m ²	5414m ²
	CIRCULATION	27m ²	48m ²	48m ²	31m ²	17m ²	171m ² - 3%
	VERTICAL CIRCULATION	26m ²	58m ²	58m ²	52m ²	25m ²	219m ² - 3.8%

TOTAL FLOOR AREA	10089m ²
SITE AREA	6050m ²
COVERAGE	73%

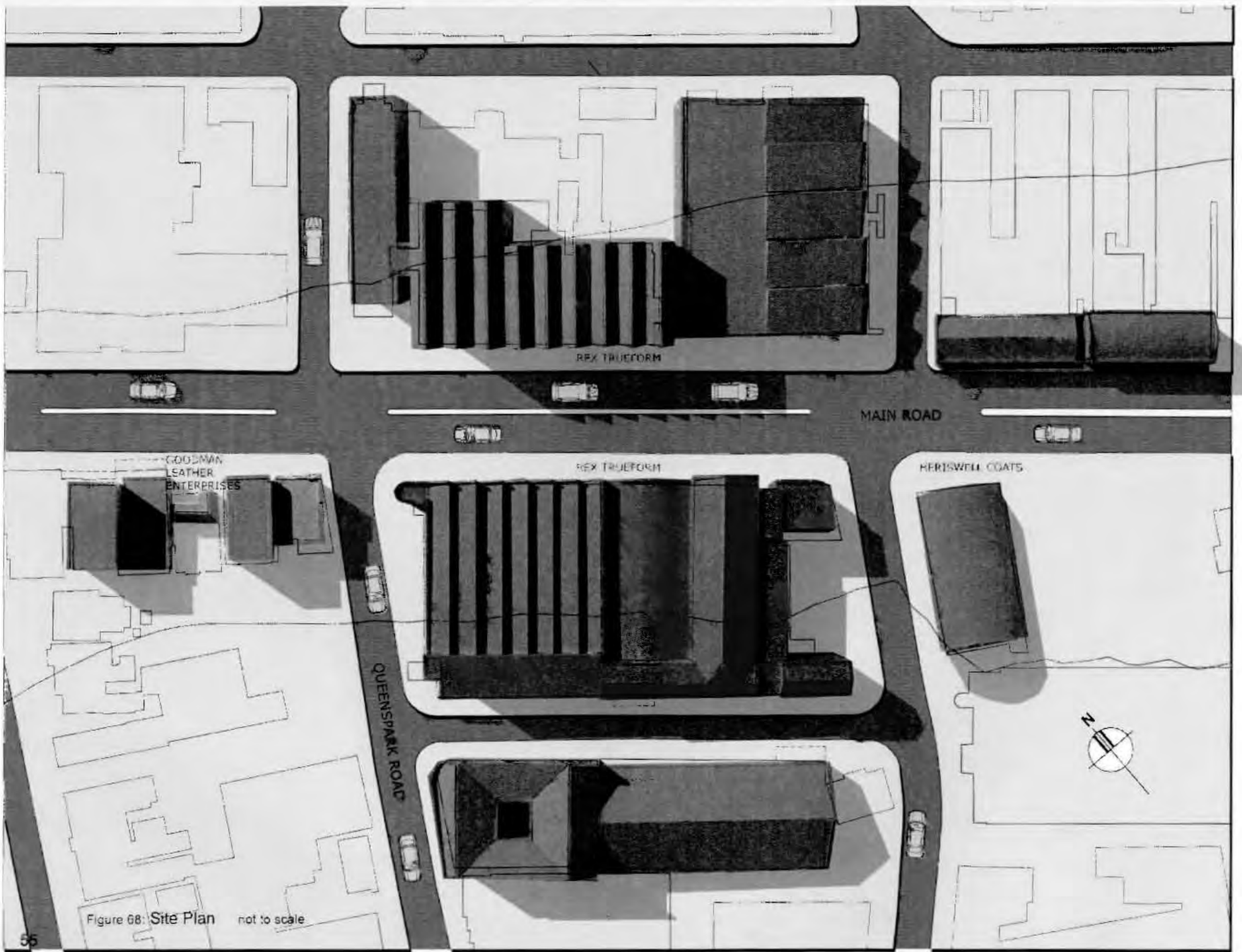


Figure 68: Site Plan not to scale

Introduction

Not too long ago in the history of architecture, the preservation of individual buildings and monuments was a campaigning cause, but increasingly, a mix of restoration, adaptive reuse and new design has regenerated entire areas.⁷⁷ The clean sweep of old cities to make way for new, improved ones, became an outmoded notion; the rediscovery of the vitality and character of old cities is a late 20th century phenomenon. 'If new architecture, the so-called 'heritage of the future', is vital to towns and cities, the rediscovery and reuse of old buildings and areas is even more significant in underpinning urban life in the 21st century.'⁷⁸

By keeping traces of the old in the form of individual buildings or groups of buildings, and by creating adequate urban conditions, the process of urban rehabilitation is an attempt to preserve the original principals of spatial organisation and to integrate it into present and future architectural creation. In doing so, this process of urban rehabilitation is much more creative and much more flexible than those used in either the preservation of monuments or urban renewal.⁷⁹

This intervention should be seen as a catalyst for future growth and investment, particularly since Salt River and Woodstock have gone through a process of decline.

⁷⁷ Powell, K. (1990): 'Architecture Reborn, the conversion and reconstruction of old buildings.'
Laurence King

⁷⁸ Powell, K. (1990): 'Architecture Reborn, the conversion and reconstruction of old buildings.'
Laurence King

⁷⁹ Papageorgiou, A. (1971): 'Continuity and Change - Preservation in City Planning.' Pall Mall Press London

Reviving the urban community of Salt River through the promotion of Creative Industries

The site of the Rex Trueform Clothing Factory falls within the study area of Cape Town's inner city revitalisation framework, which mainly focuses on the main roads. (Victoria, Albert and Salt River Road) The economic strategy in the Framework focuses on commercial revitalisation, which in many ways influences the overall investment climate for residential and other markets in the area. The program assumes that economic possibilities would be harnessed through a committed public investment and community involvement programme. It also relies on the fact that the study area is strategically located in relation to the City Centre.

With this strategy in mind, I believe that there are even further possibilities for this area, and indeed the Rex Trueform factory building. Through precedent studies I have discovered that many city authorities and urban development agencies world wide are using culture-related activities to promote the civic identity of city districts, to market these districts both nationally and internationally, and to revive the fortunes of cities and the districts within their boundaries experiencing industrial decline.

During our M-Arch class tour during the July semester break of this year, we visited Johannesburg where we were introduced to the work of the JDA – the Johannesburg Development Agency. The JDA is an agency of the City of Johannesburg that 'stimulates and supports area-based economic development initiatives throughout the metropolitan area in support of Johannesburg's Growth and Development Strategy.'⁸⁰ It was our visits to the newly renovated Turbine Hall in Newtown and the Drill Hall in central Johannesburg that made me curious as to what the intentions of this agency are in terms of urban renewal and indeed the adaptive reuse of derelict buildings.

Both the Turbine Hall and the Drill Hall are now being used for functions deferent to what their names might suggest – but both are also excellent examples of how existing, rundown buildings can serve as catalysts to inject new energy and life into areas that are in great need of urban regeneration and capital investment. Seeing and experiencing these buildings and the impact which they already have on their immediate surroundings has given me further encouragement to pursue the intentions and objectives that form the basis of my thesis design project.

The **creative industries** have emerged as a key focus area for the JDA as a number of their projects have been centred on the cultural and creative industries. I've done further investigation into the JDA and their projects in and around Johannesburg, and come across one particular project, the 'Fashion District.' The Fashion District is largely an industrial area with textile factories and clothing shops, and has been situated in the eastern part of the CBD for over half a century, with tailors and seamstresses bursting out of its buildings. This area can easily be compared with Salt River in Cape Town, as it also plays host to a very well established textile industry on the fringes of Cape Town's CBD. In its heyday the Fashion District was a focal point of the garment industry in Johannesburg, similar to what Salt River factories are for Cape Town. The Fashion District was at its peak during the 1980s, but began to decline rapidly when South Africa was re-introduced into the global economy and with the opening up of China to the world trade. Massive retrenchment occurred in the district and many people lost their jobs. Many buildings that had been purpose-built for the fashion industry were abandoned and began to deteriorate and decline.

The revival of the Fashion District meant that factories could open up again in the form of smaller, more efficient operations, and most importantly, they've now found a more secure, niche market in ethnic African designs which can't be produced by Asian sweatshops because they're very individualistic and localised.

Johannesburg's Fashion District is now regarded as the hub of South Africa's fashion industry. The district has a considerable fashion cluster comprising a mixture of design, manufacturing, sales and supply outlets. The area generates public interest in locally manufactured garments and stimulates national and international tourism.⁸¹

Many people who previously worked in the fashion District, but who lost their jobs, moved back into the district and operate as seamstresses. There are over 100 Cut, Make and Trim (CMT) operators located in or close to the District and the operators have clustered together in buildings forming impromptu production houses. It is expected that the Fashion District in Johannesburg will generate more interest in locally manufactured garments and stimulate national and international tourism.⁸²



Figure 69



Figure 70

The formation of creative industries clusters is an opportunity to revive whole sectors in areas such as Salt River where urban revitalisation is badly needed. The establishment of 'garment districts' or Fashion Districts is an extension of the benefits to be gained from clustering and is especially beneficial for smaller enterprises. Such clusters could generate competitive advantage within them.

The use of the cultural industries - such as the fashion industry - as tourist attractions presents further opportunities to diversify the tourist industry. In Johannesburg, the establishment and rejuvenation of Newtown as the arts and culture precinct, and the development of Constitutional Hill and the Drill Hall are all examples of the increasing use of cultural and heritage to attract tourists. Cultural tourism is thus a powerful way to create a distinctive image of South Africa abroad.

Fashion is progressively more understood as a global phenomenon based on the changes in the organization of garment production across the world as well as the massive economic impact of garment production in world trade. In addition, fashion has contributed to urban tourism development by attracting 'fashionistas' to particular cities. The central garment manufacturing area of Los Angeles was transformed from a collection of old factory buildings into a 'fashion district' that is now a centre of upscale production and showroom activities.⁸³ The commercial functions of the district are supported by vibrant street settings that attract crowds of tourists.

The question that one needs to ask is this. How can the Rex Trueform Factory building be transformed to act as a catalyst for the regeneration of Salt River as the Fashion District of Cape Town?

⁸⁰ www.jda.org.za

⁸¹ Gatawa (2007): "The emerging role of the fashion industry in Johannesburg's tourism development strategy."

⁸² Gatawa (2007): "The emerging role of the fashion industry in Johannesburg's tourism development strategy."

⁸³ Scott (2004): "Cultural Products Industries and Urban Economic Development."

Bridging the skills gap in the clothing and textile industry

The South African clothing and textiles industries have undergone difficult restructuring processes over the past decade under the combined impact of domestic and international factors. The negative impact of this transformation is evident in the declining contribution of our total manufacturing output, its falling export share and the significant amount of jobs that were lost. The outcome might have been different had this process of restructuring been anticipated and accompanied by a rigorous effort to up-skill remaining workers and encourage innovation. This could have enabled the sector to pursue a skill-led competitiveness strategy and assist a move towards higher-cost, high-quality items.⁸⁴

In the new global economy, a country's successful involvement in the global industry is directly related to its ability to consistently respond to customers' needs, which requires local manufacturers to upgrade their design and marketing skills and demonstrate world-class manufacturing⁸⁵ capabilities. The US International Trade Commission has identified skilled labour and management as a critical success factor, which provides countries with an advantage; as a result, there is a serious need to develop skills in the clothing and textile industry in our country. The global trend has been for less-skilled tasks to be moved to low-cost locations while high-value-added and higher-skilled tasks remain in developed countries.⁸⁶

With this in mind, it is obvious that emphasis should be placed on the need for the upgrade of our technical and production capabilities so as to compete in terms of quality, design and delivery, rather than simply on price. This thus presents the opportunity for the Rex Trueform Factory to be transformed into a facility where skills can be taught upgraded – skills related to the clothing and textile industries.

Organisations like The Clothing, Textile, Footwear and Leather Sector Education and Training Authority (CTFL SETA), are established with the aim to raise skills levels in the industry. A skills audit of the industry, done by SETA⁸⁷, concludes that there are shortages in the upper occupational strata (senior managers, professionals and technicians), and shortages of artisans and skilled workers (e. g. machine mechanics)

According to a report by R. Daniels, the 'skills shortages are not only about scarce and critical skills', but should encompass 'advanced qualifications and elementary qualifications alike.' Skills development may also be needed for different people at different stages of their life cycle, or over the business cycle, or both.⁸⁸

The demand for scarce skill, according to the SETA, is for highly skilled technical people in occupations that fall into the upper strata; furthermore, there are no skills shortages in the lower strata of the occupational sphere.⁸⁹ This statement is accurate if one considers the amount of job losses in semi-skilled and unskilled occupations. Skills gaps exist when employers recognise that their existing workforce has lower skill levels than are necessary to meet business objectives. Skills gaps therefore refer to a lack of competence of existing staff or an inability to perform their roles to the optimum level.

Both clothing and textile firms experience wide skills gaps. For clothing, the main concern is at both ends of the occupational spectrum – in management and in operative areas. Technical skills gaps occur mainly at production operative level.⁹⁰ Most firms, according to Daniels' report, have identified the shortage of machinists as their greatest problem, with other production-related positions also becoming increasingly difficult to fill. In terms of management, skills gaps are identified overwhelmingly at mid-management level, mainly relating to problem solving and team-leading. For textiles, technical skills gaps are manifest in insufficient numbers of machine operators, particularly knitters and creels. Similar to the situation in clothing firms, there is an alarming shortage of upper management skills.

It is interesting to note that skills gaps are more evident in those firms – irrespective of size or market orientation – which have actively engaged in the transition to WCM (world class manufacturing) and explicitly recruit labour within this new mould. Technical advances in the global industry and the transition to WCM practices thus demand increased training within firms.

Ultimately the future of the clothing and textile industries in this country depend on its ability to upgrade firm production capabilities and successfully align itself with global production quality, so as to achieve universal competitiveness. This requires rethinking policy to address the skills gaps and skills shortages. Otherwise the industry will not take the upward step along the ladder to international competitiveness.⁹¹



Figure 71



Figure 72

⁸⁴ Kraak, Andre (2009): "Sectors and skills – The need for policy alignment." HSRC Press

⁸⁵ WCM – world class manufacturing

⁸⁶ Kraak, Andre (2009): "Sectors and skills – The need for policy alignment." HSRC Press

⁸⁷ CTFL SETA (Clothing, Textile, Footwear and Leather Sector Education and Training Authority) (2004): "An assessment of skills needs in the clothing, textiles, footwear and leather sectors." CTFL SETA skills audit. Pine Town: CTFL SETA

⁸⁸ Daniels, R (2007): "Skills shortages in South Africa." Working Paper 07/21. Development Policy Research Unit, School of Economics, University of Cape Town.

⁸⁹ CTFL SETA (Clothing, Textile, Footwear and Leather Sector Education and Training Authority) (2004): "An assessment of skills needs in the clothing, textiles, footwear and leather sectors." CTFL SETA skills audit. Pine Town: CTFL SETA

⁹⁰ Daniels, R (2007): "Skills shortages in South Africa." Working Paper 07/21. Development Policy Research Unit, School of Economics, University of Cape Town.

⁹¹ Kraak, Andre (2009): "Sectors and skills – The need for policy alignment." HSRC Press

Conclusion

If the Rex Trueform building is to become a catalyst for the future revitalization of Salt River, then it needs to be transformed. Having looked at the success of the Fashion District in Johannesburg, and understanding the dilemma which the garment and textile industries finds itself in, an alternative program needs to be implemented to achieve this goal.

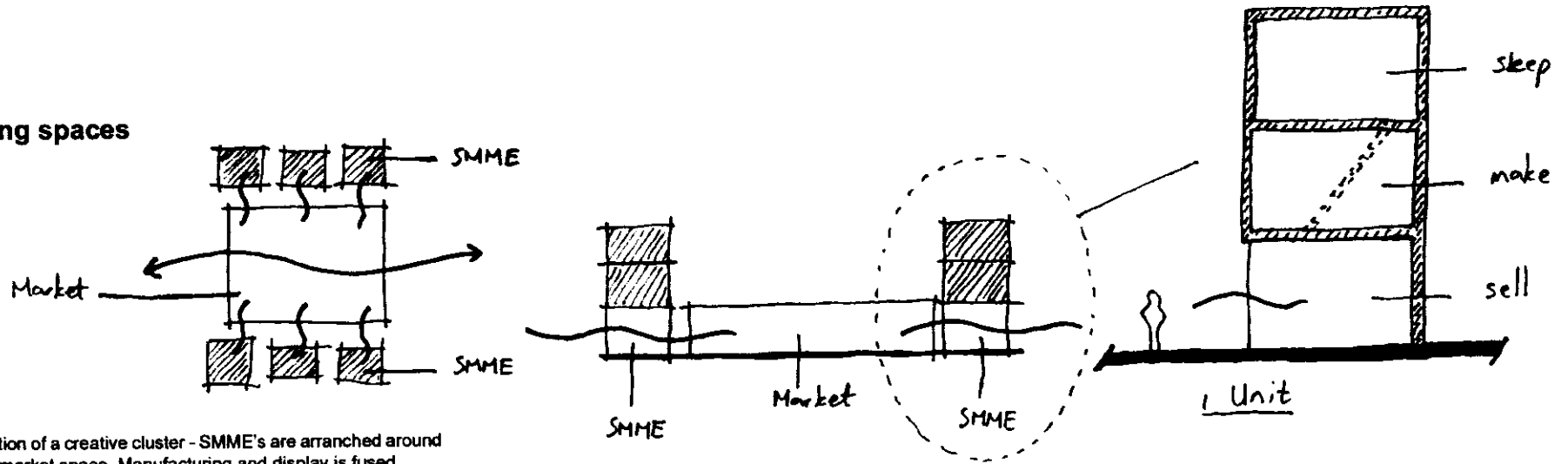
I have thus decided to change the Rex Trueform Factory from being a building where clothing items were manufactured on a mass production bases, to a facility where people in the garment and textile industries can learn new and improved skills. By employing this strategy, companies might be able to counter the negative impact of cheaper eastern imports, by participating in the shift towards catering for a global market that demands world class manufacturing capabilities. This will hopefully also relieve unemployment, as trainees could then fill positions that require higher skills levels.

Another objective of having a skills training facility for the garment and textile industries, is to promote the establishment of small, medium and micro enterprises. South Africa is in the process of overhauling its social, political and especially economic institutions. Central to this process is a strategy for economic growth and restructuring. Small, medium and micro enterprises (SMME's) development and promotion are part of the broader strategy because they are believed to absorb unemployment and to have the potential for economic growth.⁹²

The reprogramming of the Rex Trueform Factory will thus entail the designing of learning and smaller manufacturing spaces. These smaller manufacturing spaces will cater for the design and manufacturing of garments on a smaller scale. A space for a clothing market will also be provided, which will give small companies and young designers the opportunity to showcase their creations. As the Fashion District in Johannesburg has shown, the use of creative industries, such as fashion, as tourist attractions, could revive an entire area of a city.

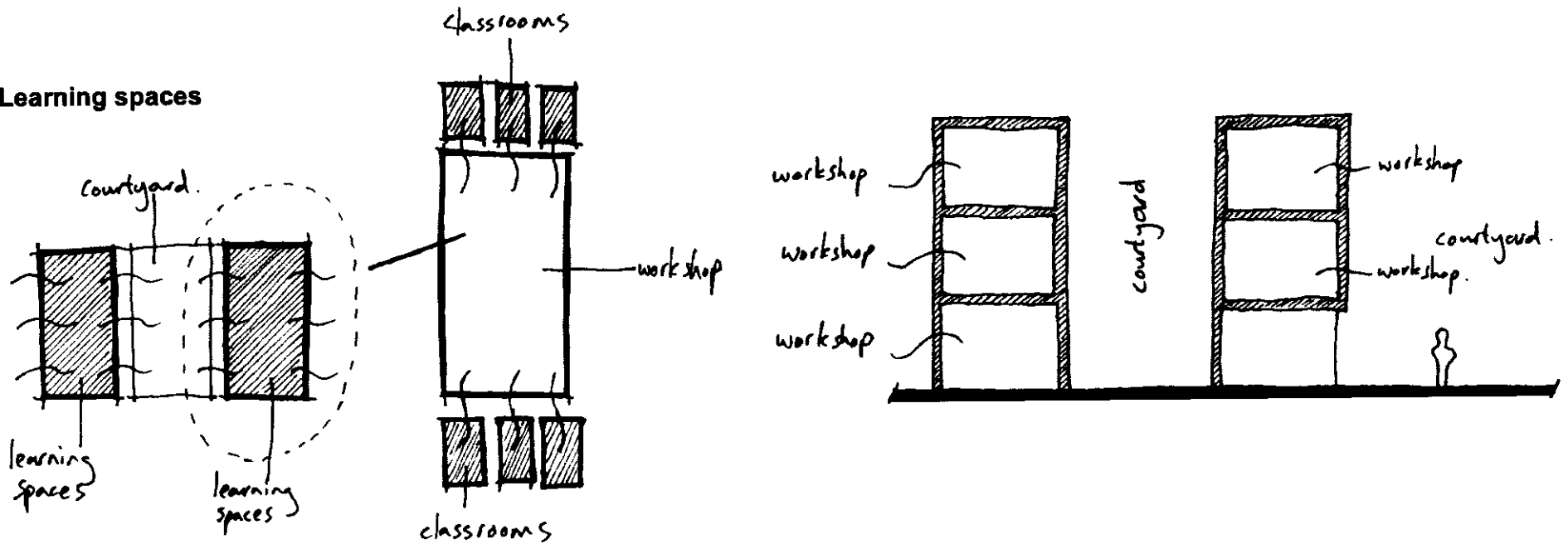
⁹² Matshediso. Knowledge Rajohane (2000): "Small, Medium and Micro Enterprise Promotion in the Western Cape Clothing Industry – The Way Forward for SMME'S Promotion in South Africa." Department of Sociology, University of Cape Town

Working spaces



Organisation of a creative cluster - SMME's are arranged around a central market space. Manufacturing and display is fused.

Learning spaces

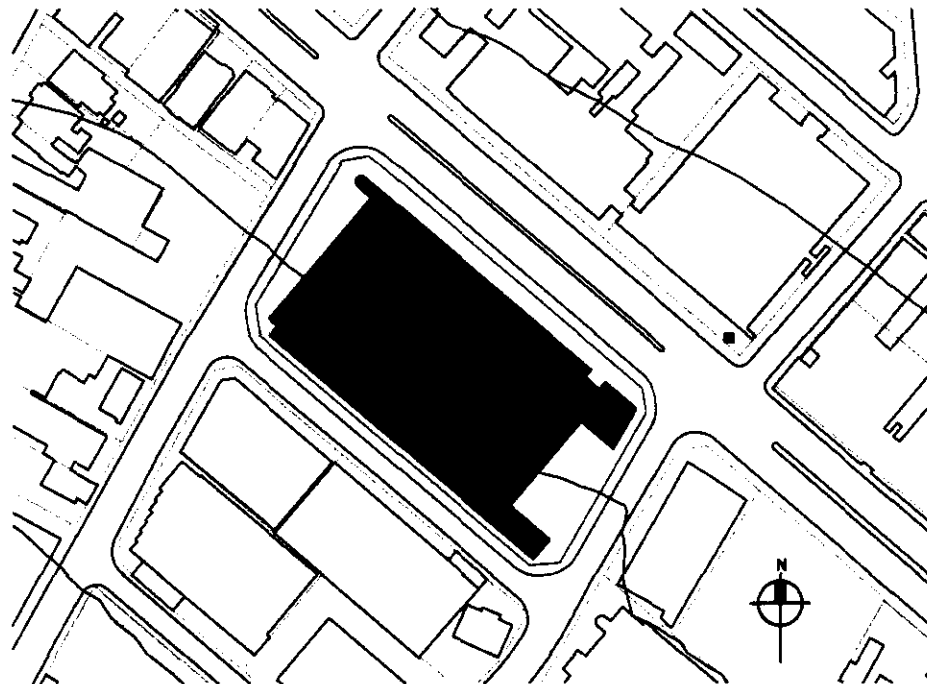


Learning spaces are arranged around a central courtyard to allow for maximum light and ventilation.

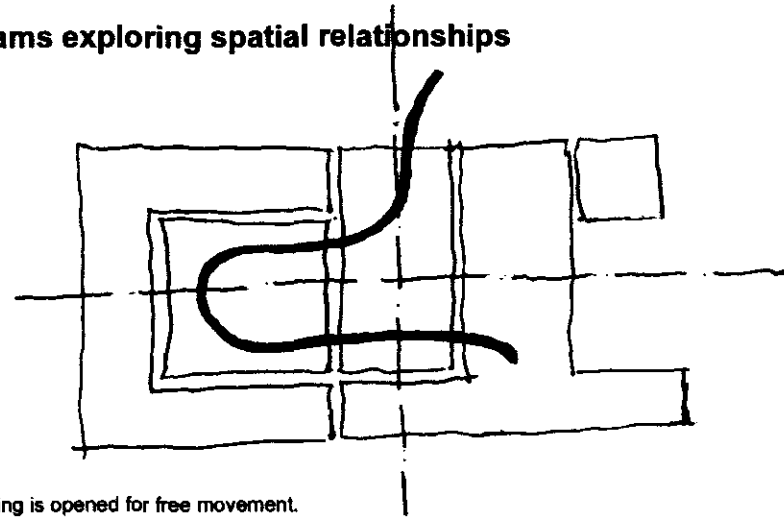
The challenge is to re-structure the Rex Trueform Factory building to facilitate the spaces that are required to achieve these objectives. In essence, the intervention will comprise of two halves: the school (skills learning) and the creative factories (design and manufacturing studios).

The relationship between these two halves is fundamental to the success of this project. It is therefore my objective to use the school as a skills and equipment resource for not only the small design and manufacturing studios in the building, but also any other company outside the premises. The school thus becomes an impromptu factory in itself, where smaller enterprises could then have access to pooled machinery and equipment that they would not otherwise be able to purchase.

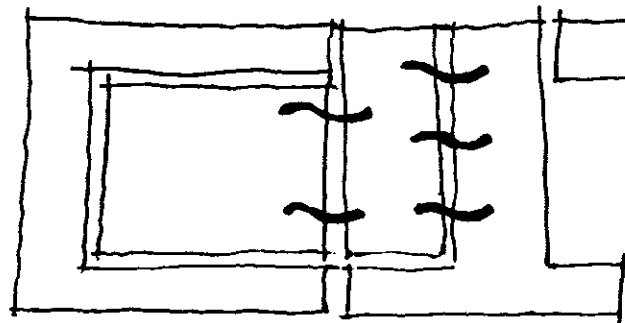
The following diagrams should be seen as an introduction to the following chapter, which maps the conceptual development of the projects.



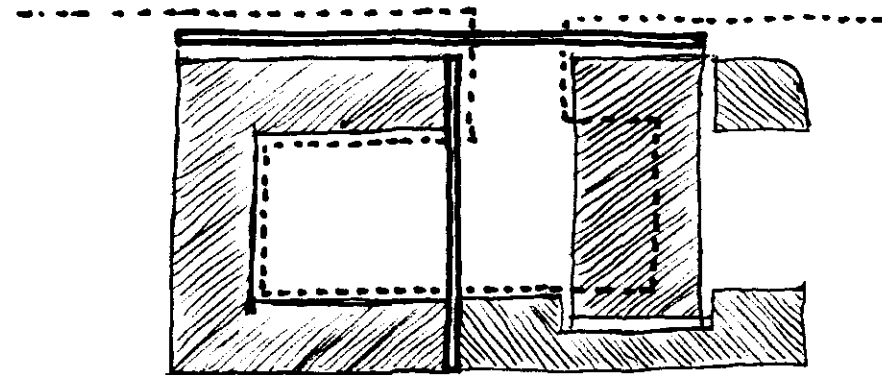
Diagrams exploring spatial relationships



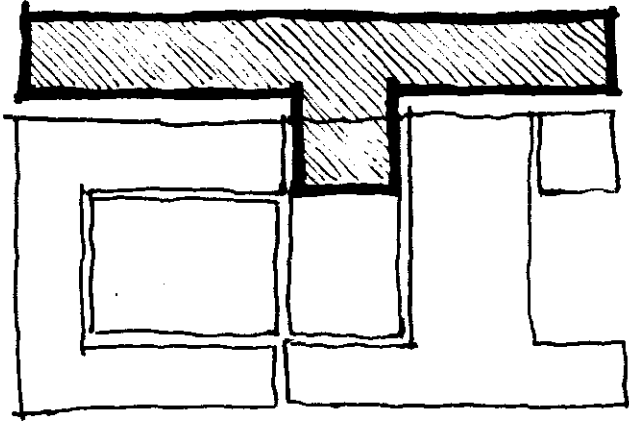
The building is opened for free movement.



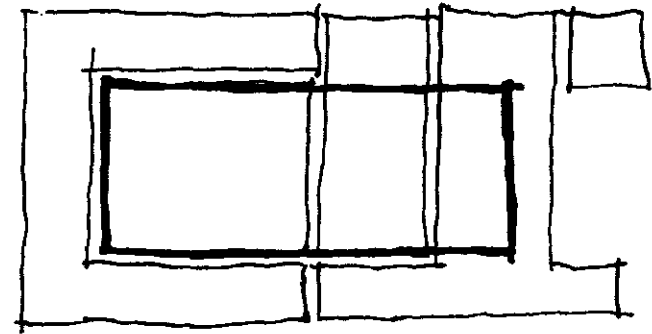
The two previously disconnected buildings are linked spatially and programmatically.



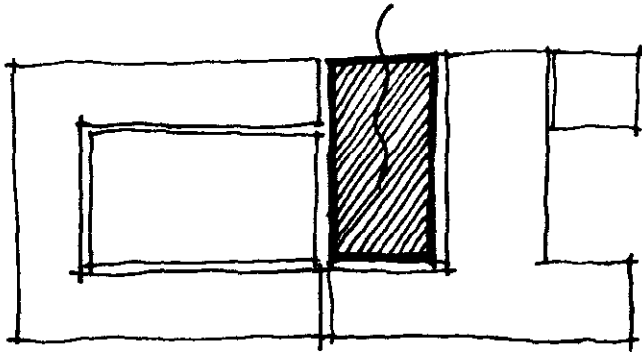
Walls are regarded as not only elements defining space, but also binding elements.



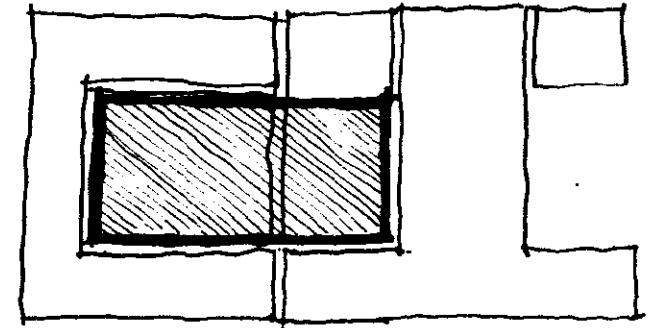
The setback space off Main Road is drawn into the building, to create a foyer space.



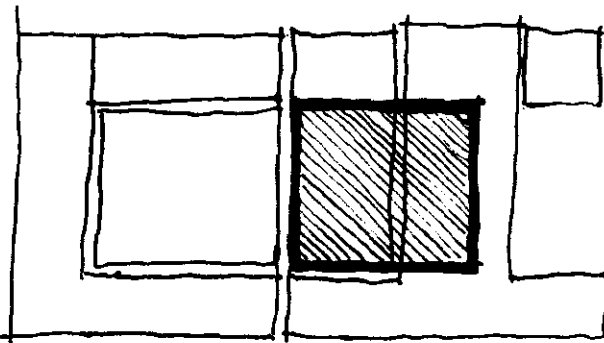
The relationship between the working and learning spaces is clear through ease of movement & visual connection.



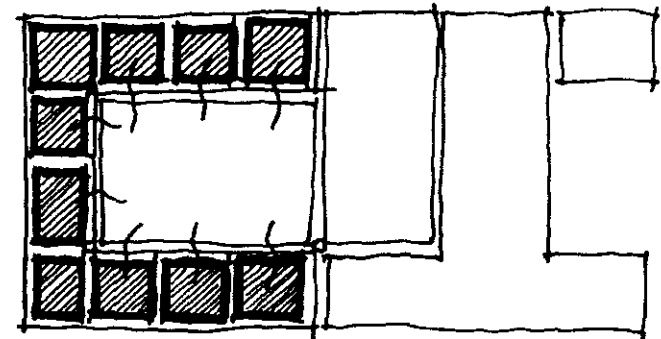
Is central courtyard space is created.



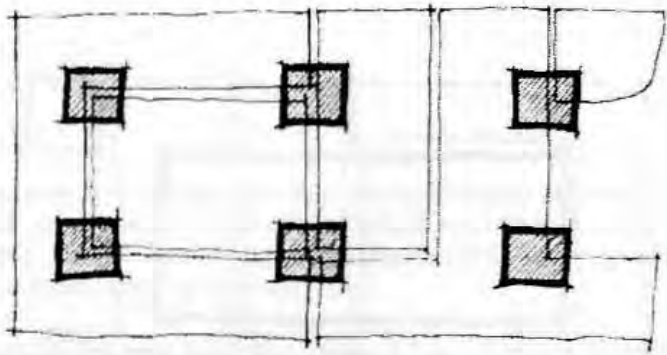
The central courtyard extends into the market space. This joint space is ideal for events.



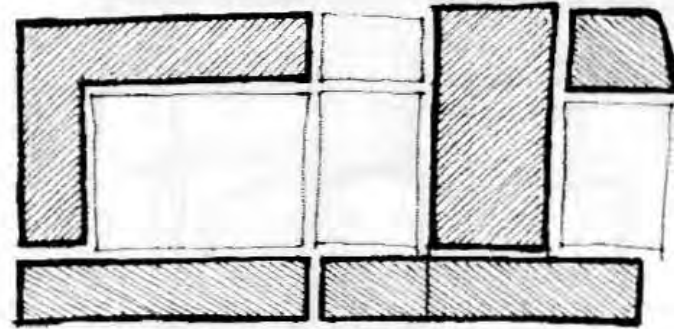
The courtyard can extend into the school, forming an exhibition space.



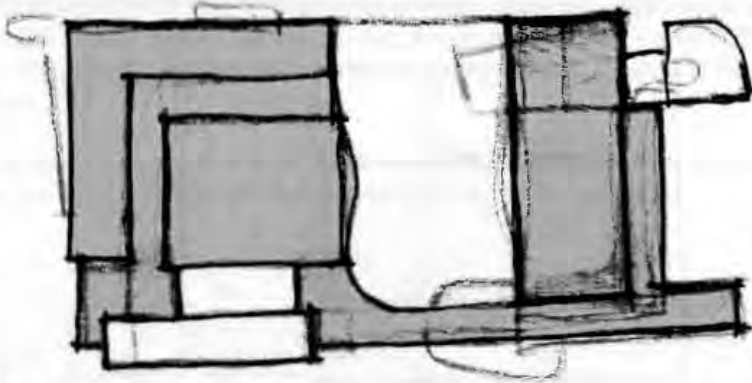
Privately owned studio units are arranged around the market space, and have easy access to the school's workshop spaces.



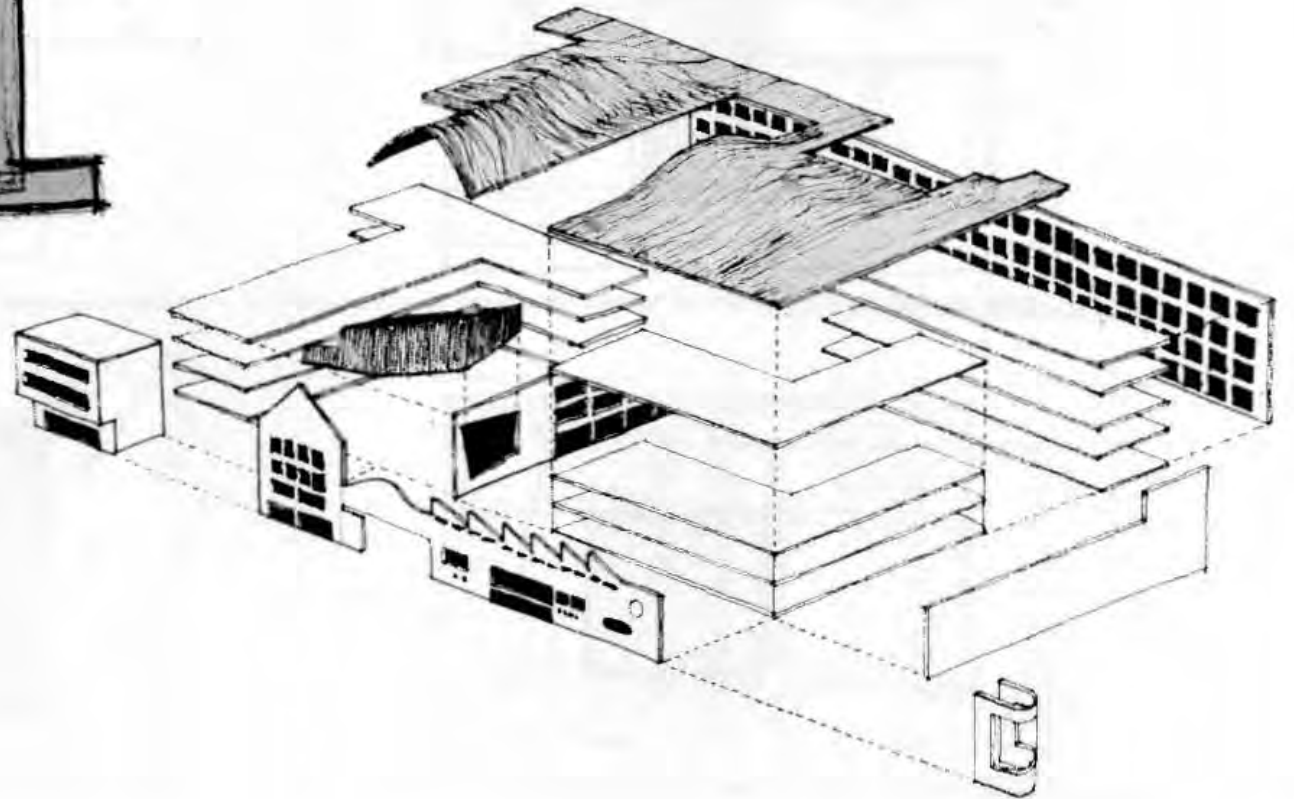
The primary circulation cores are ordered in a network of nodes.



The occupied spaces are arranged around open, free spaces. However, these 'programmed' spaces still appear to be loose and disconnected - an element is needed to link them in a coherent whole.



A new roof structure is introduced to link the disconnected spaces.



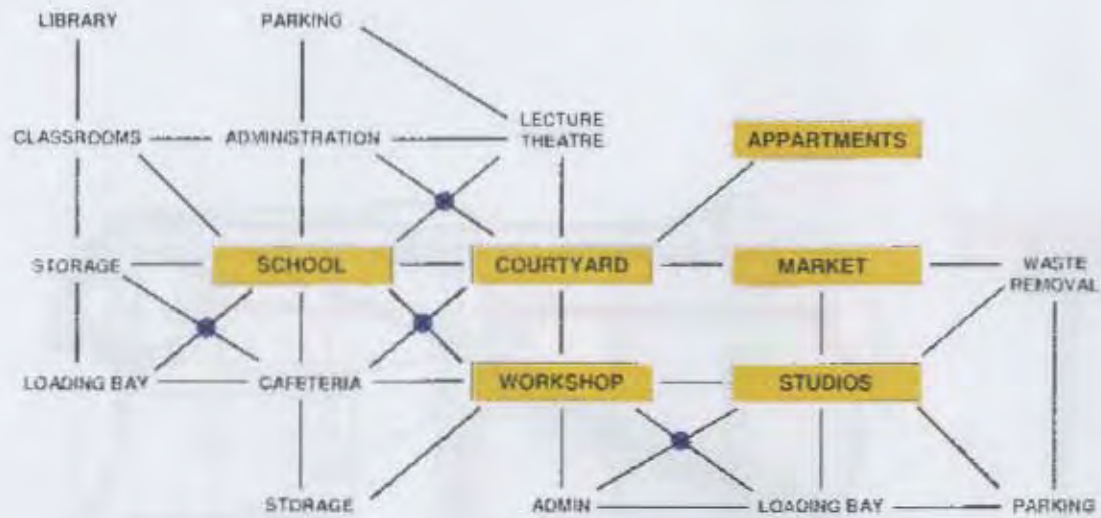


Diagram indicating the relationships between various spaces

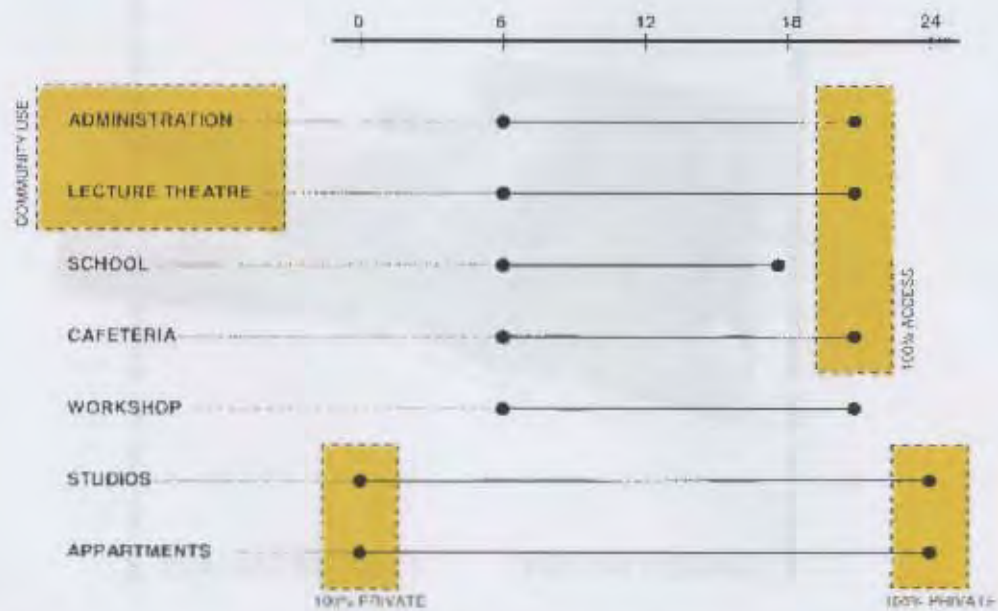
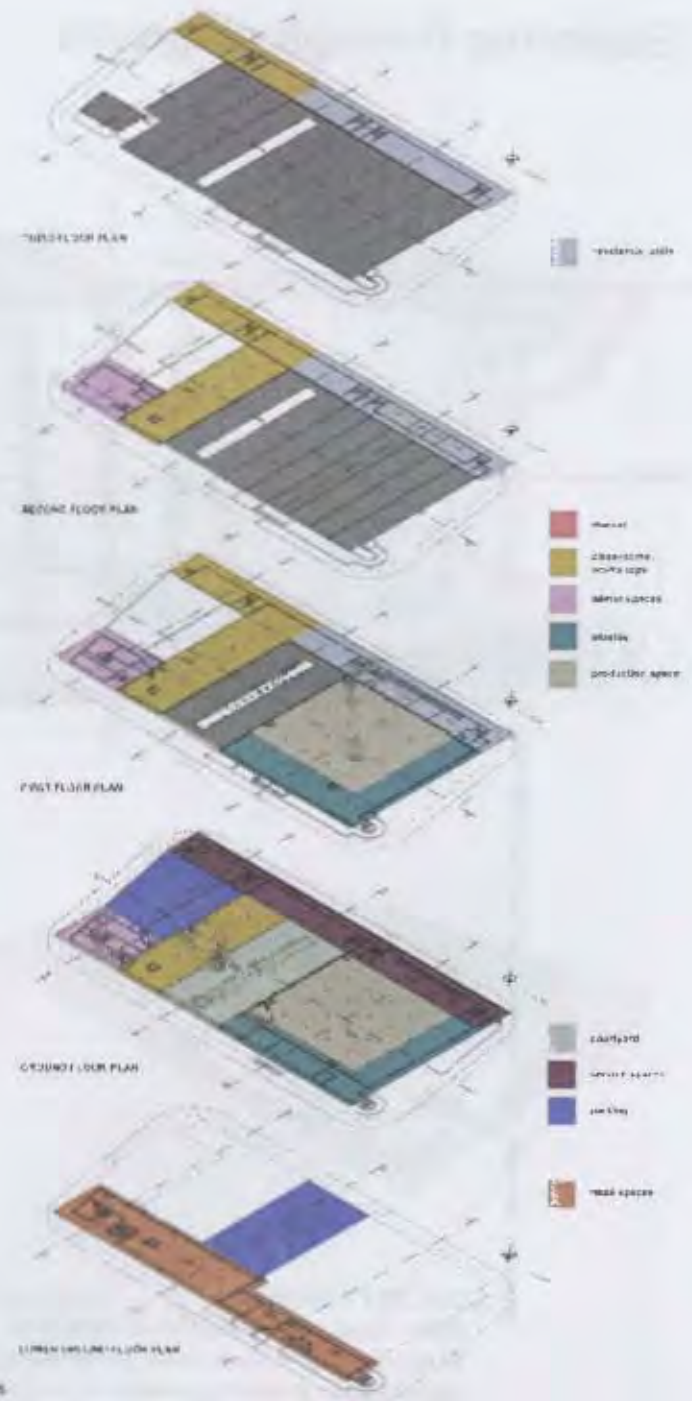
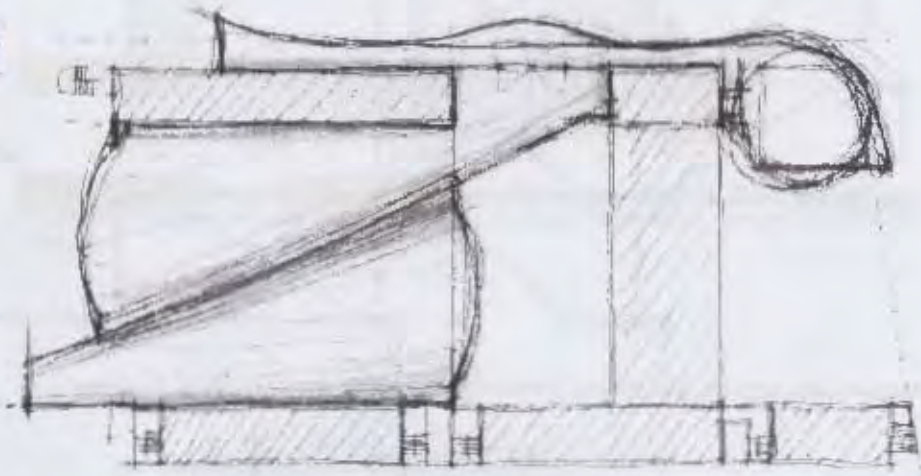
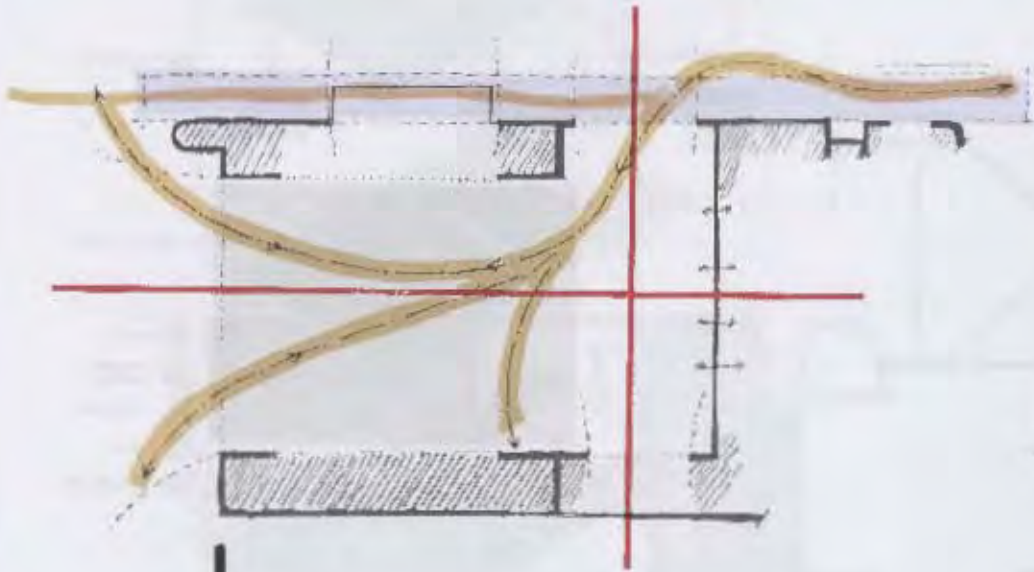


Diagram indicating the relationships between various spaces for different times of the day.



Programed spaces

Exploring through diagrams

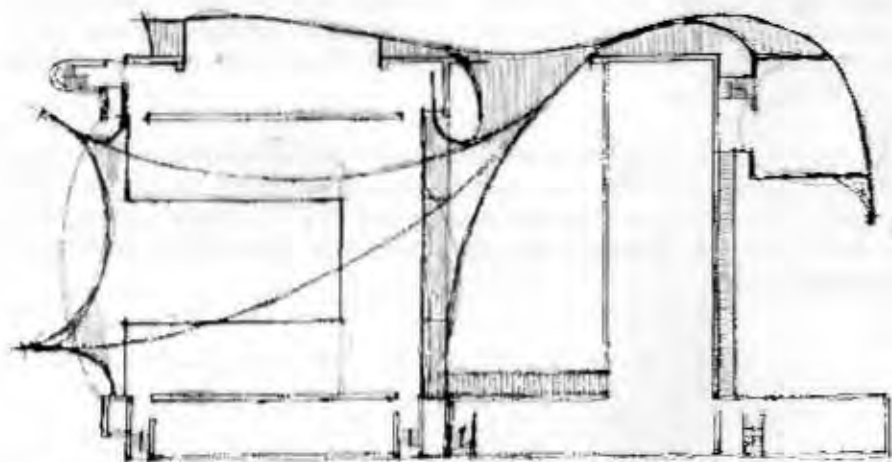


CONCEPT DIAGRAM

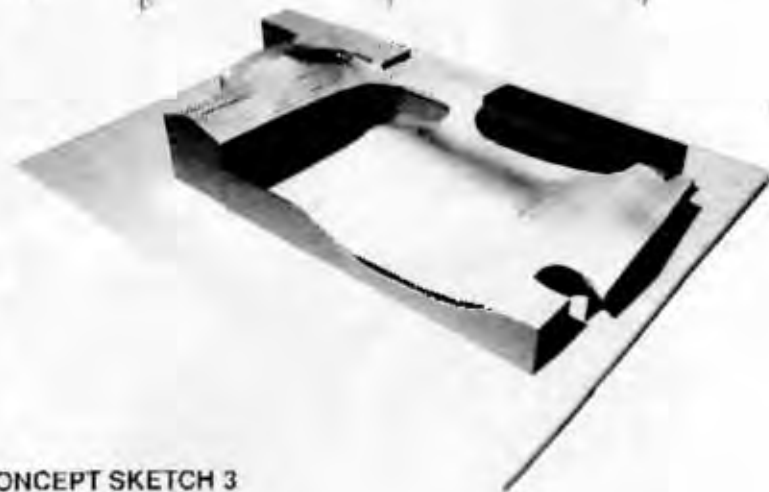
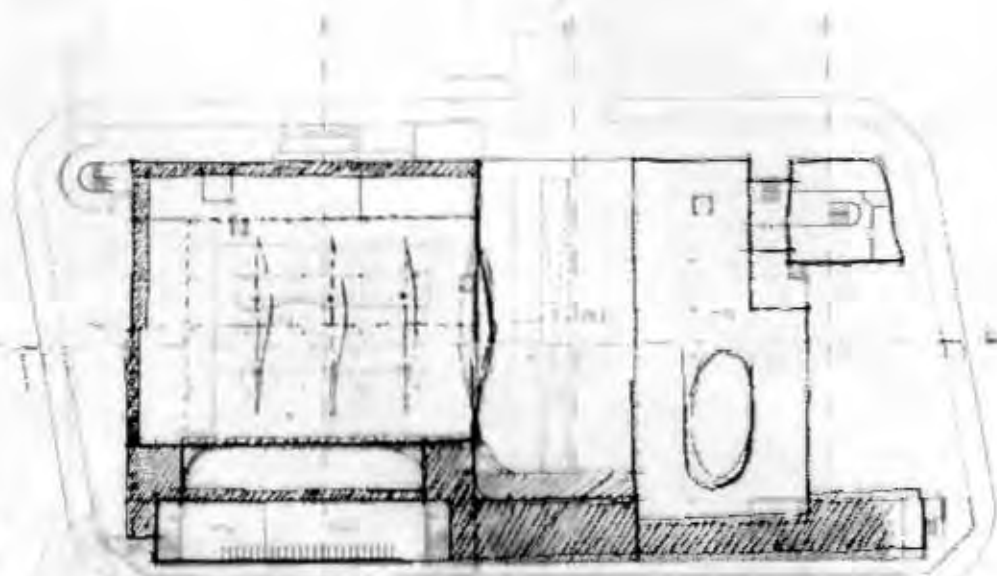
- Main Road edge as covered walkway
- Movement of people through building
- Solid edges defining spaces in the building

CONCEPT SKETCH 1





CONCEPT SKETCH 2



CONCEPT SKETCH 3

Exploring structure, finding form

The work of Antoni Gaudi

There are a number of things about Barcelona that will retrieve many fond memories of my visit there during the summer of 2007: drinking cerveza on its sandy beach, walking along the Ramblas at 12 o'clock in the evening, and the work of Antoni Gaudi.

The mere presents of La Segrada Familia sent shivers through my whole body, and strolling around Park Guëll was five hours well spent. But Casa Battlo grabbed me; so much so that I had to extend my stay in Barcelona, just in order to finish a pencil drawing of this Catalanian icon. Casa Battlo is in fact a renovated house.

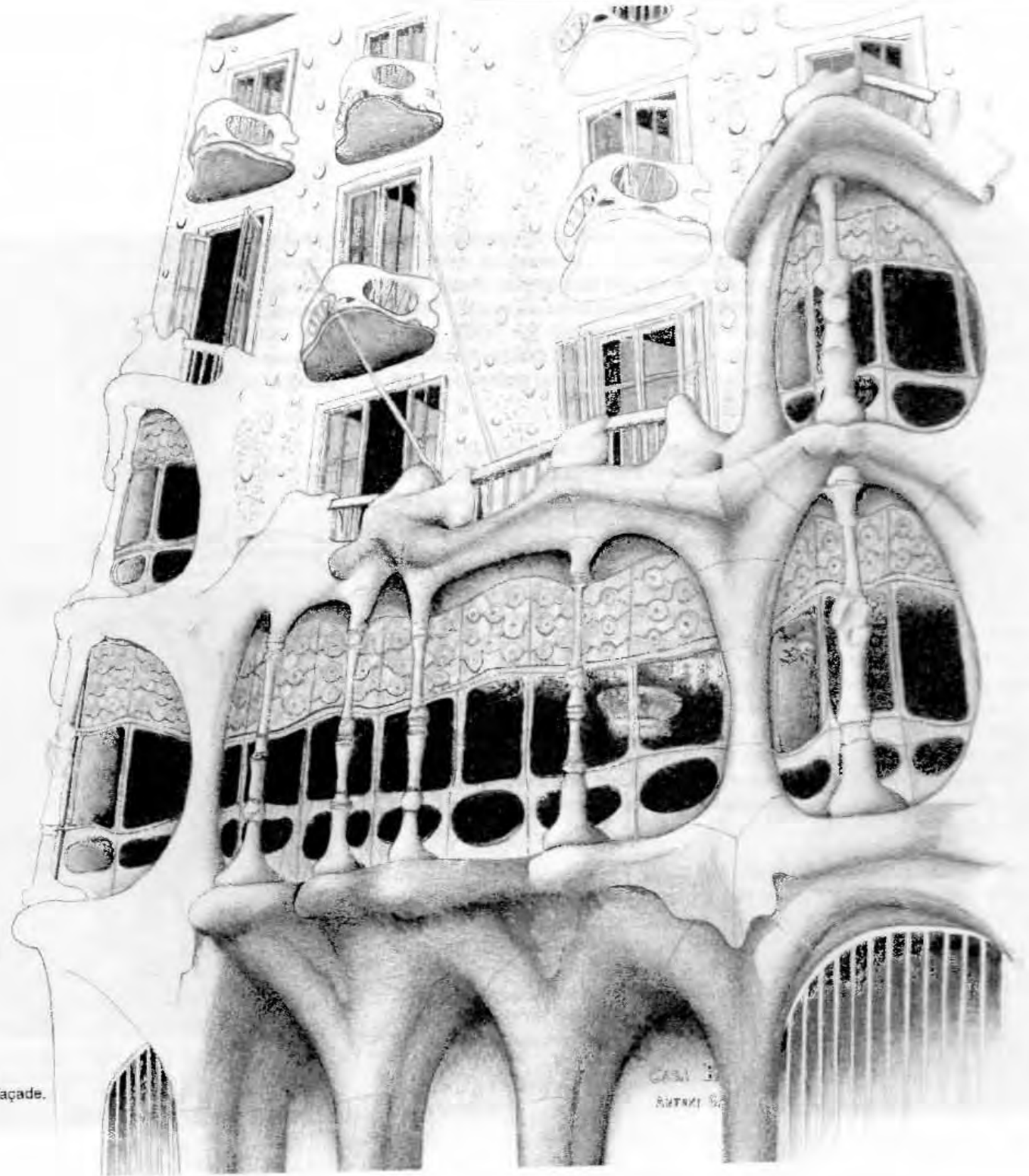


Figure 72: A pencil drawing of the Casa Batlló façade, done during my visit to Barcelona in 2007.

To me the most intriguing aspect of Gaudi's work was his exploration of form and structure. As an architect, he had an acute understanding of structural concerns. Evidence of this is the numerous innovative string and lead tensile models that Gaudi used to define, in reverse, the compressive forces in his proposals. These upside down models, with the lead weights representing the loads to be supported and the string cords representing the arches and pillars of the new building, was part of a delicate exploratory design process that sometimes took several years.

This 'experiment' and understanding of structure in Gaudi's work stands out as a clear expression of the Gothic spirit, an approach that extends well beyond the Gothic period itself. This Gothic spirit could be described as a tradition based on a certain process-orientated approach towards architectural design, which recognises the importance of structural forces and material composition.⁹³

There is today a dominant trend emerging within architectural practice: a renewed interest in the structural logic of buildings, very similar to Gaudi's understanding of design. There is without doubt a significant number of progressive architects who are seeking to step beyond a certain Post-modern sensibility, which 'celebrates scenographic properties and surface effects, and focus instead, on the structural integrity of buildings.'⁹⁴ Frank Gehry's Guggenheim Museum in Bilbao, Spain, is an example of a building that has been criticised by some, because the structural concerns are removed from aesthetic ones. 'It is as though the primary concern of the building was to achieve certain sculptural effects, and the structural support for these effects was treated as a secondary issue.'⁹⁵

This new 'Gaudian' spirit has been the basis for collaboration between architecture and engineering. These two professions, which have often been regarded as divided areas of concern, are now coming together within a culture of mutual respect, most notably in the work of engineer Cecil Balmond and well known architects like, Rem Koolhaas and Toyo Ito. The architect alone does not design the projects produced by this collaboration, with the subsequent technical assistance of the engineer, but by the architect and engineer working together. Thus, there could be no preconceived notion of how the eventual design would turn out.⁹⁶

I think there is much to learn from both Gaudi's exploratory processes and this growing synergy between architects and engineers. Working with an existing building means coming to terms with it; figuring out its structure, possible weaknesses and potential opportunities. By working with exploratory models and understanding the structural principals and techniques of structural engineers, I could gain greater insight into possible structural solutions and feasible complex forms.

Figure 73: A model in Gaudi's workshop with weights and strings to study the structure of the church of the Colonia Güell.



Figure 74: An upside-down chain model forming part of an exhibition in the Casa Mila, Barcelona.

⁹³ Leach, Neil, Turnbull, David, Williams, Chris (2004): 'Digital Tectonics,' Wiley-Academy

⁹⁴ Leach, Neil, Turnbull, David, Williams, Chris (2004): 'Digital Tectonics,' Wiley-Academy

⁹⁵ Leach, Neil, Turnbull, David, Williams, Chris (2004): 'Digital Tectonics,' Wiley-Academy

⁹⁶ Leach, Neil, Turnbull, David, Williams, Chris (2004): 'Digital Tectonics,' Wiley-Academy



Figure 75. Park Güell, Barcelona (1900-1914)

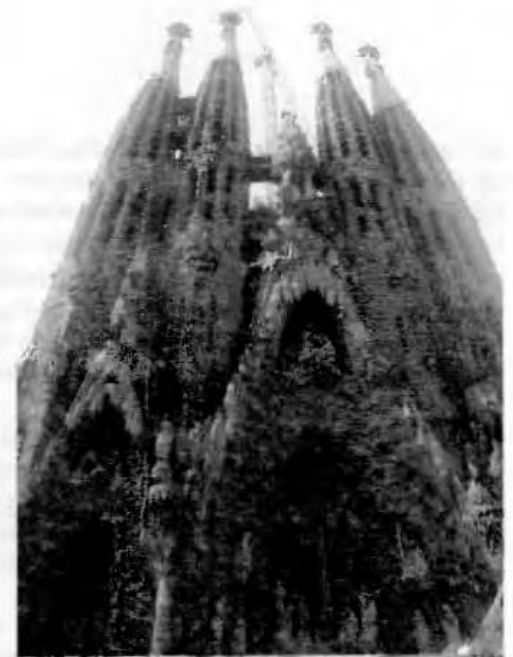


Figure 76. The Sagrada Família, Barcelona (1901-)



Figure 77. Casa Milà, Barcelona (1906-1910)

Finding a structural solution

As I started to experiment with various models to find the most appropriate form for the new roof over both the school and the market space, I decided to do further research into possible structural solutions. There were a small number of key characteristics that I wanted the new roof structure to have. firstly, I felt that the building needed to have a clear, **unobstructed space** below the roof structure, free of any columns or other forms of support. The clothing market will occupy this open space. This open space will be vastly different to the existing spatial character. The concept of spatial transformation will thus be achieved.

Secondly, I wanted to pursue a particular **form** for this roof, which I have imagined, and managed to find through these various model experiments. This form, which can only be described as being a double curvature vault, offered me the possible solution to what I perceived from the outset to be the most pleasing spatial experience for the open spaces that I pursued.

During the process of doing research on possible structural solutions, I discovered the work of Eladio Dieste. Particularly interesting was his work in Montevideo, Uruguay. Dieste embraced a technique – reinforced masonry – that in his day was little known and less exploited. Through that technique he invented appropriate structural types that he used to achieve amazing results.

One of Dieste's major structural innovations was in what he termed the "Gaussian" double-curvature vault – a vault that was derived from the normal barrel vault. The disadvantages of barrel vaults are that their rises are relatively high – typically a quarter of the span. Their spans are also relatively short in cross-section, and they rely on pre-stressing to span in the longitudinal section.

When the vault's rise and thickness is reduced, it becomes susceptible to buckling and is thus not structurally sound. Dieste increased the strength to such vaults not by increasing the size of the vault, but by making the vault in consecutive transverse (sloping) bands. Each band was given greater bending stiffness by means of three-dimensional curvature.⁹⁷ Dieste further introduced a reclining s-shape to each band in section at the centre of the span, where the forces to be resisted are greatest.

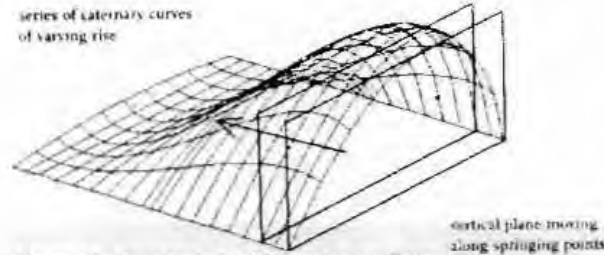


Figure 78: Development of Gaussian vault form, Anderson (2004)

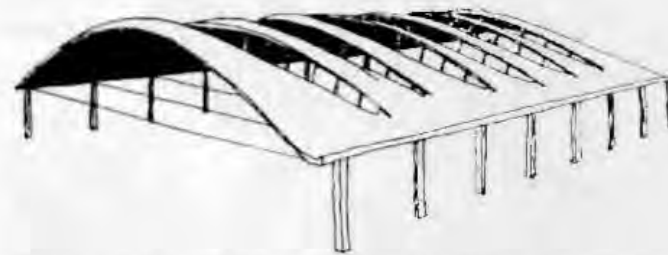


Figure 79: The Gaussian vault - one of the primary structural types built by Dieste, Anderson (2004)



Figure 80: Interior of the West wall, showing the use of the existing brick wall, Port Warehouse, Montevideo, 1977 - 79, Anderson (2004)

⁹⁷ Anderson, Stanford (2004) "Eladio Dieste - Innovation in Structural Art." Princeton Architectural Press, New York, P.33

He configured the s-shape to be lower and flatter at one side than at the other; when such bands of vaults are built next to one another, the disparity of the edges of the neighbouring s-shapes leaves a long, curving opening ideal for illumination at frequent intervals and across the width of the building.⁹⁸ The wavelike structure of the Gaussian vault is thus similar to that created by a sawtooth roof in terms of top lighting. In the areas of overlap between successive vaults, crescent-shaped slots along the span are glazed. The underside of the vault reflects and diffuses natural light into the building.⁹⁹

The full s-shape of mid-span was progressively flattened until the vault became a continuous horizontal line at its outer supports. The long span and low rise of these Gaussian vaults result in significant lateral thrusts that were usually resolved with exposed horizontal tie-bars. These ties are clearly visible at the Port Warehouse, in Montevideo. At the Don Bosco School gymnasium, also in Montevideo, Dieste succeeded in placing the ties above the roof where they are effectively invisible from within, by extending the support columns.

Gaussian vaults are supported at their spring pints by edge beams. In this type of construction, the edge beam also contains the anchorage for the building's horizontal steel tie-rods. At the Port Warehouse, the ties were a necessary compromise, as the existing walls were not strong enough to support the thrust of the vaults, and the desire to retain the character of the walls precluded the addition of the extensive buttresses that would otherwise have been needed.¹⁰⁰

I experimented with the Gaussian vault and its structural principals for a while, and found that there are a number of aspects that are worth pursuing. The fact that Dieste's techniques are specifically developed for concrete roofs, made me suspicious as to whether I could use it for the new Rex Trueform roof.

The problem lies with the existing structural support of the building. I am convinced that the existing concrete columns and roofs are strong enough to support the weight of a new roof structure, and one additional floor level. But the lateral thrust of a roof structure like Dieste's might require additional support in the form of buttresses and tension cables, which needs to be incorporated into the existing structural grid.

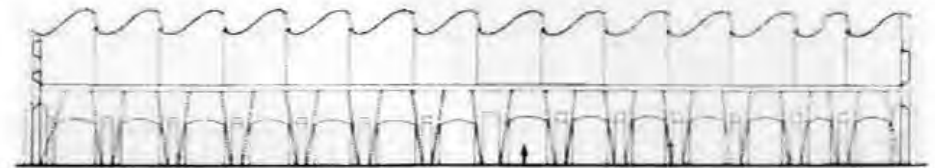


Figure 81: Longitudinal section at the center line.
Port Warehouse, Montevideo, 1977 - 79
Anderson (2004)



Detail of edge beam.

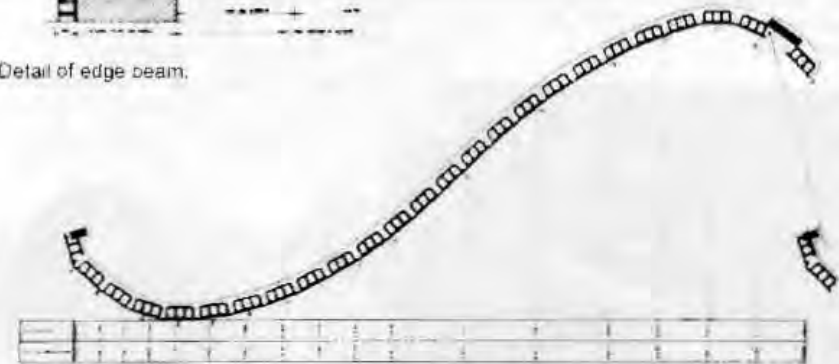


Figure 82: Section of one 'wave' of the vault.
Port Warehouse, Montevideo, 1977 - 79
Anderson (2004)

⁹⁸ Anderson, Stanford (2004), "Eladio Dieste - Innovation in Structural Art," Princeton Architectural Press, New York, P.33

⁹⁹ Anderson, Stanford (2004), "Eladio Dieste - Innovation in Structural Art," Princeton Architectural Press, New York, P.145

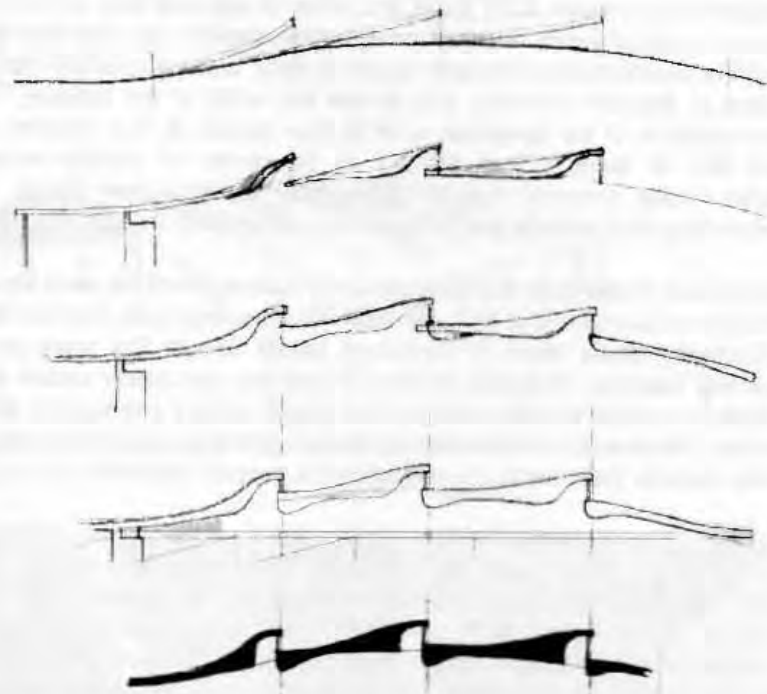
¹⁰⁰ Anderson, Stanford (2004), "Eladio Dieste - Innovation in Structural Art," Princeton Architectural Press, New York, P.145



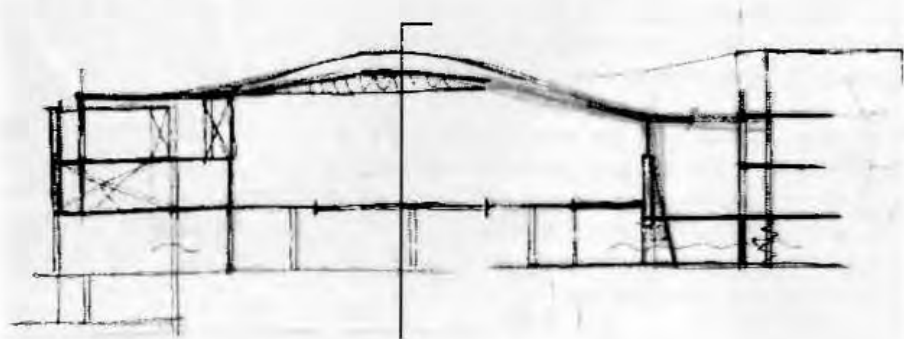
Figure 83. General view of the warehouse with discontinuous double curvature vaults, from the South. Port Warehouse, Montevideo, 1977 - 79. Anderson (2004)



Figure 84. View above the roof showing the extended columns and external tie-rods. Don Bosco School Gymnasium, Montevideo, 1983 - 84. Anderson (2004)



Experimenting with the Gaussian vault - longitudinal section.



Experimenting with the Gaussian vault - cross section.

Another aspect that worried me was the fact that I always perceived the new roof structure to be of a lighter material and structure. Steel was my initial option, as it is much lighter than concrete, and can withstand the lateral forces generated over such a large span. Although I learned a lot from my research on Dieste's work, I came to the conclusion that I might have to take a different approach. The form generated by Dieste is enticing, but structurally not viable.

I thus started looking at reciprocal structures as an alternative to the concrete Gaussian vault structures of Dieste. Reciprocal structures are created by arranging elements in a mutually supporting network pattern.¹⁰¹

According to the engineer, Cecil Balmond, an area is normally spanned using a continuous grillage that consists of a hierarchical system of primary and secondary beams. With the reciprocal grid a network of individual elements shape the load-paths in complex nested loops instead.¹⁰² The reciprocal structure might not be as efficient as an equivalent continuous grillage, but because no bending loads are transferred between elements, shorter connections can be as sufficient.

Looking at various projects where Balmond has been involved, it is clear that the use of a reciprocal structure was an obvious choice where large spans needed to be achieved using very light materials. Most of these structures are also double curved vaults, similar in geometry to those designed by Dieste. The reciprocal roof structures are, however, much more versatile in terms of their forms. A much freer form could be achieved, which enabled the architects to conceive structures that resemble their original concept designs much more.

Figure 85. The reciprocal grillage.



¹⁰¹ Architecture & Urbanism Special Addition 2006: "Cecil Balmond."
¹⁰² Architecture & Urbanism Special Addition 2006: "Cecil Balmond."

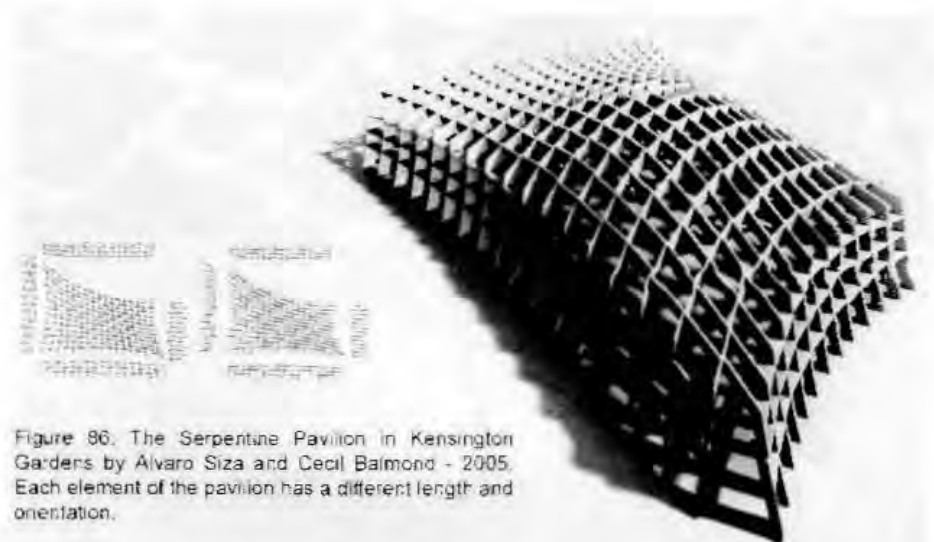


Figure 86. The Serpentine Pavilion in Kensington Gardens by Alvaro Siza and Cecil Balmond - 2005. Each element of the pavilion has a different length and orientation.

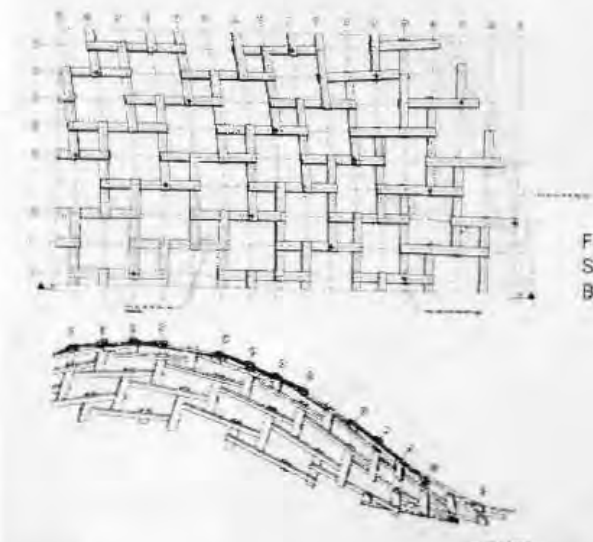


Figure 87. The Forest Park Pavilion, St Louis, Missouri, USA by Cecil Balmond - 2004-7.



Figure 89: The roof structure of one of the stations in Innsbruck designed by Zaha Hadid.

Figure 88: The reciprocal structure used for the Forest Park Pavilion.

But standard building techniques, materials and production methods are not advanced enough to comply with the demands of such conceptual work, as the reciprocal structures of Cecil Balmond tend to be. New and more advanced techniques of fabrication need to be utilized. Balmond's projects are perfect examples of how the boundaries of digital manufacturing can be pushed in order to achieve maximum results.

In order to understand how the various components of projects such as the Serpentine Gallery Pavilion and the Forest Park Pavilion were made, I investigated the process of digital manufacturing, and companies who specialise in this method of fabrication.

DesignToProduction is an example of such a practice responsible for creating a production chain that ensures that the geometrical information from the architect's design is transformed into a workable parametric database, which could be used to prefabricate complex components for such projects.

I decided to do further research into this method of prefabrication in order to be able to achieve the desired aesthetic and structural logic for the design of the new Rex Trueform roof.

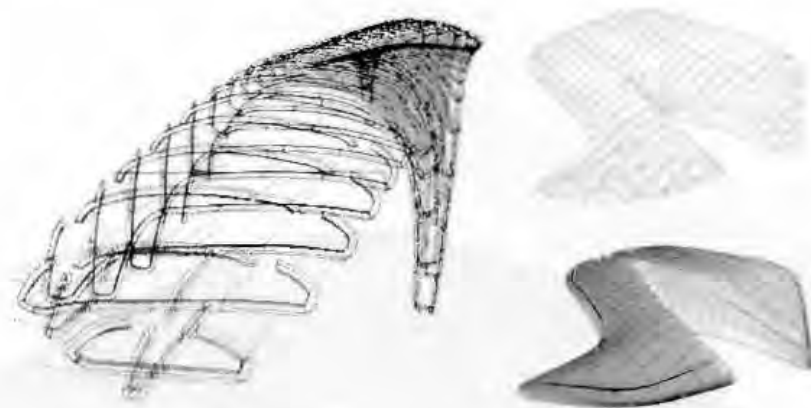
To achieve the required level of accuracy and quality, new production methods such as computer-numerical-controlled (CNC) milling had to be used to guarantee a very precise and automatic translation of the computer generated design into the built structure. Each individual component for the Serpentine Gallery Pavilion and the Forest Park Pavilion was cut to the exact size, as each piece has its own specific dimensions.

In a similar project, Zaha Hadid's Nordpark Cable Railway Stations in Innsbruck, Austria also depended on advanced digital technology in order to be realised. The architects used state-of-the-art design and manufacturing technologies developed for the automotive industry to create the streamlined aesthetics of each station. A high degree of flexibility within this language enabled the shell structures to adjust to the various parameters whilst maintaining a coherent formal logic.¹⁰³

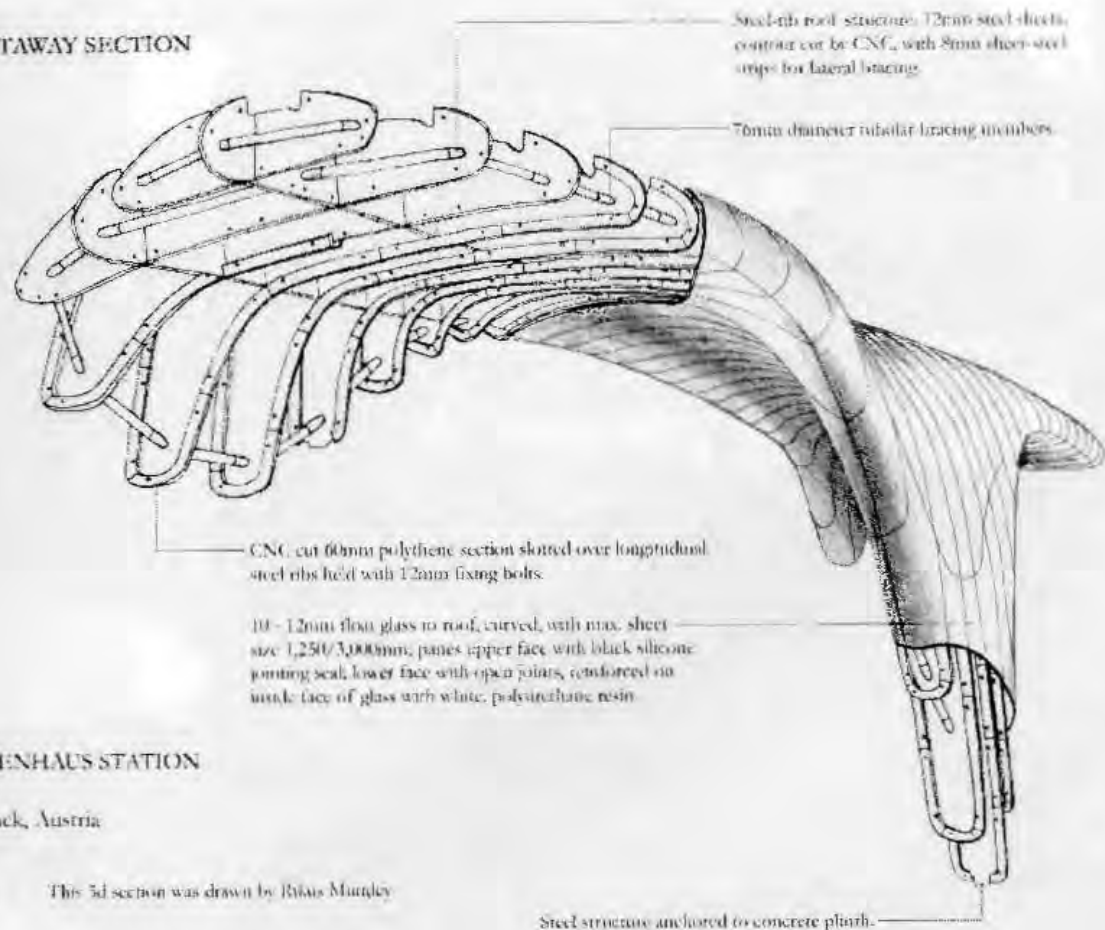
¹⁰³ www.arcspace.com - January 14, 2008

DesignToProduction was responsible for the design of the production logic for the Nordpark Stations, and it bridges the gap between architects, engineers and fabricators. The firm is founded on the understanding that all architectural forms are constructed from components that have to be created from standard materials that are usually supplied as either straight beams or flat sheets.¹⁰⁴ An enormous amount of information is needed to describe non-standard or experimental forms, and it is not always possible to reduce the degree of complexity of these 'new' forms, so the goal is to transfer it down the production chain as smoothly as possible. Time and effort spent on the design is shifted from describing the overall geometry to creating and handing the information of production. Generating the parameters of digital production for new and experimental forms can be accomplished post design, but incorporating them, as inputs to the design process will optimise experimental designs for economic production.¹⁰⁵

For the production of Hadid's Nordpark Stations, an 'adaptive building system' was used. This is a system of parametric components that are proliferated over a form and are adapted to the local geometry. The digital production chain ensured that the geometrical information travelled from design to production and that the geometrical information is completely embedded into the components so that they fit in one place and so define the geometry for their neighbouring components.¹⁰⁶



3D CUTAWAY SECTION



LOEWENHAUS STATION

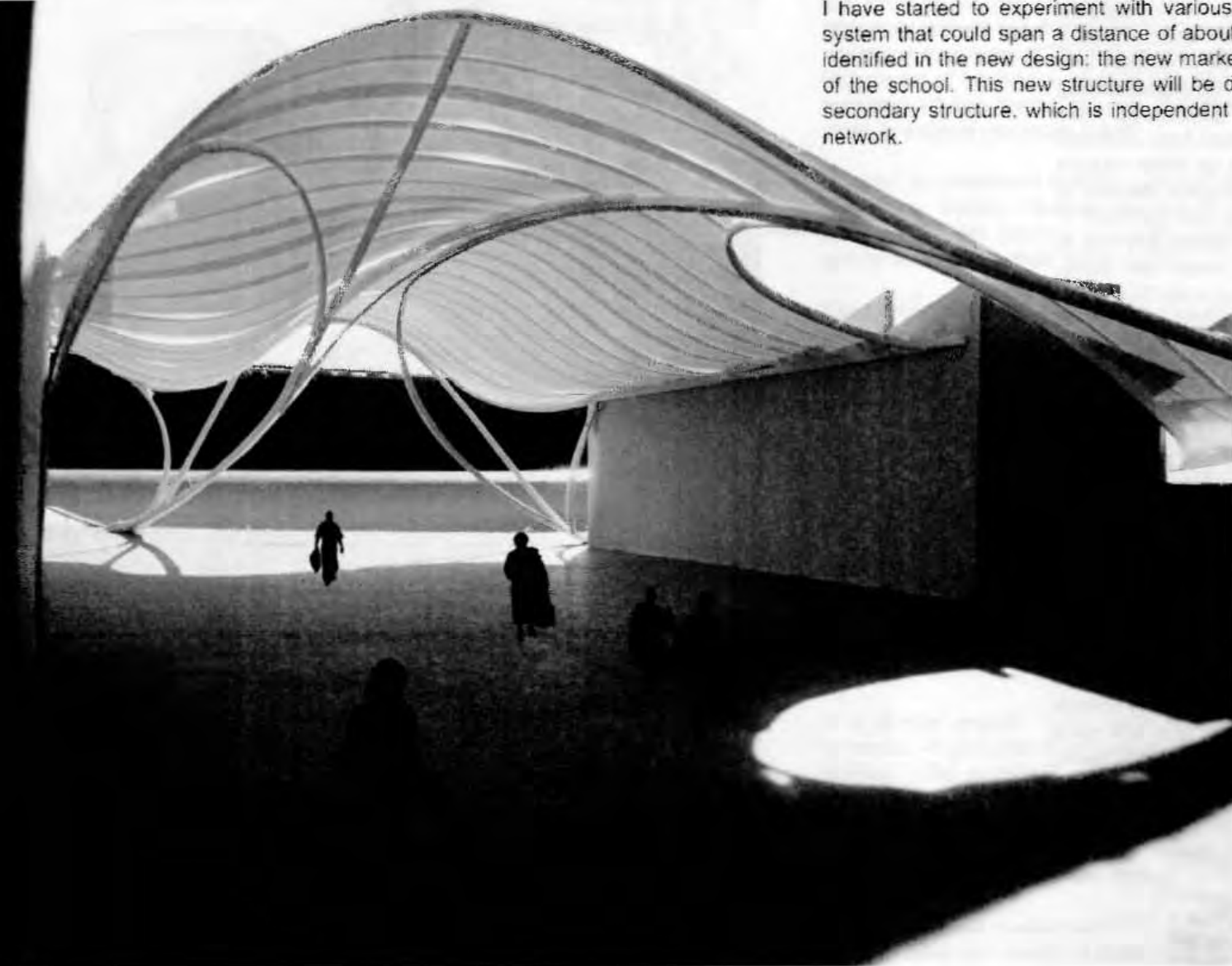
Innsbruck, Austria

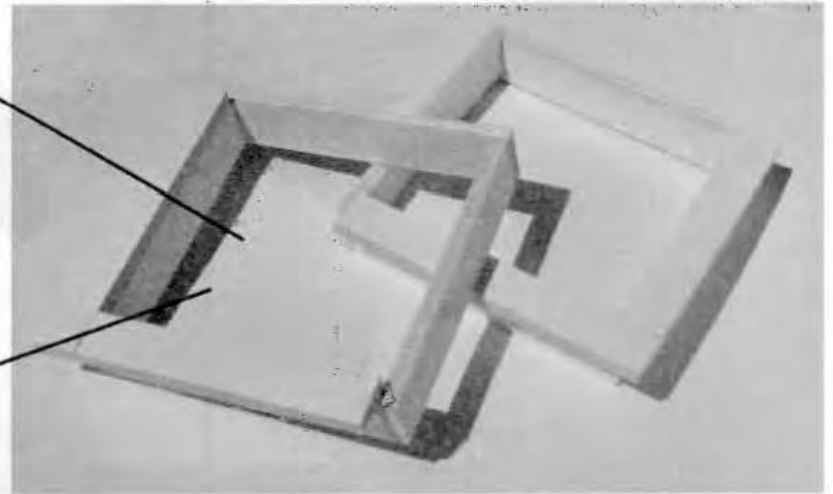
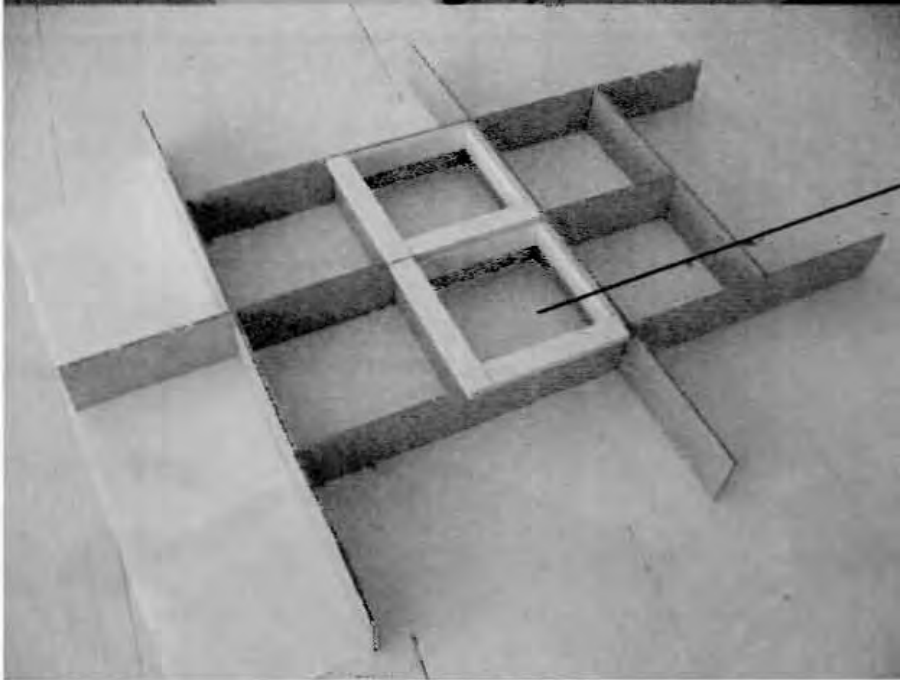
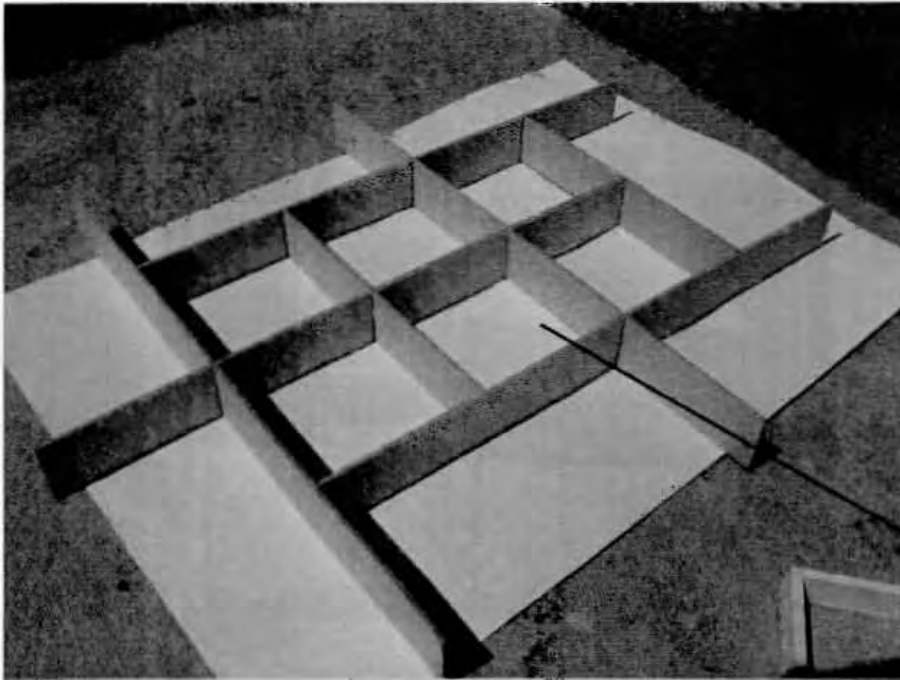
Notes: This 3d section was drawn by Rakus Murray

Steel structure anchored to concrete plinth.

¹⁰⁴ Architectural Design – 2008, Volume 78, Issue 4
¹⁰⁵ Architectural Design – 2008, Volume 78, Issue 4
¹⁰⁶ Architectural Design – 2008, Volume 78, Issue 4

I have started to experiment with various structural networks to achieve a system that could span a distance of about 30 meters. Two areas have been identified in the new design: the new market space and the workshop spaces of the school. This new structure will be double curved and supported by a secondary structure, which is independent from the existing column and wall network.

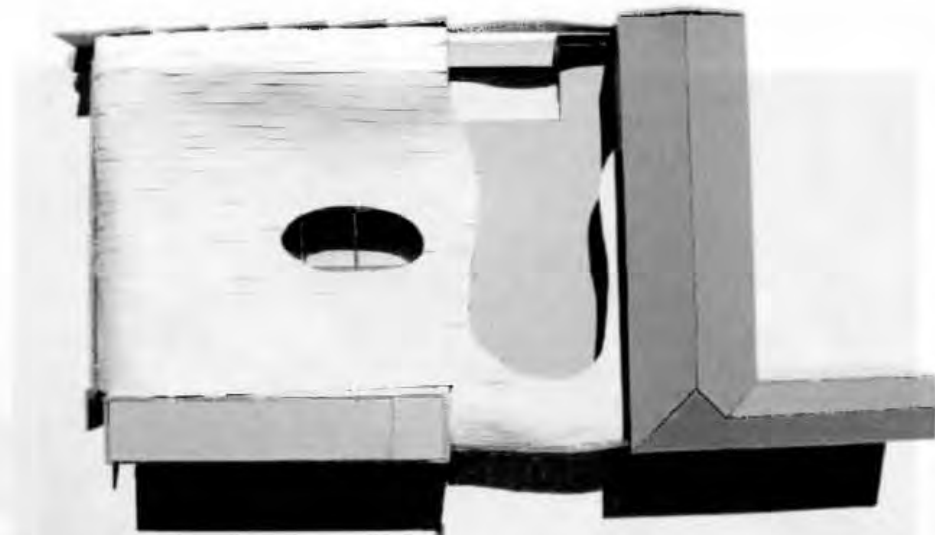




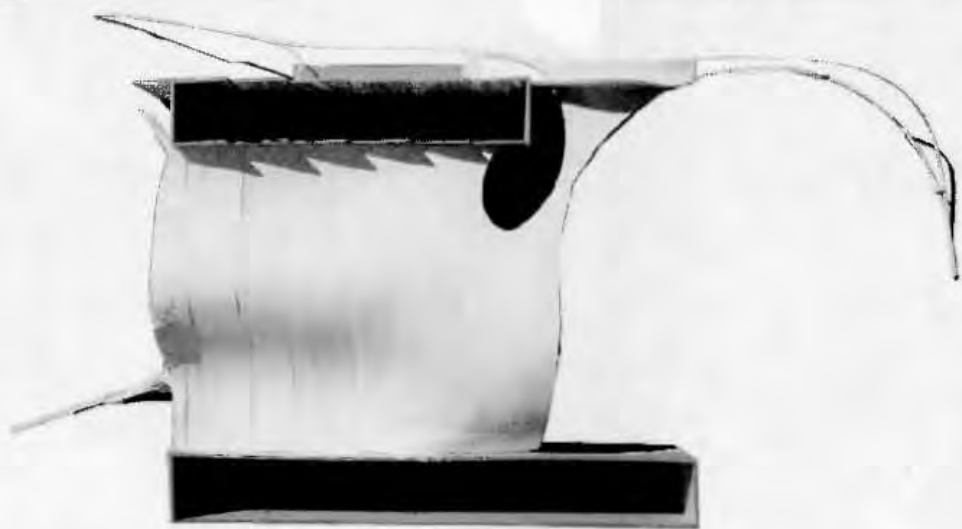
Finding form through model experiments



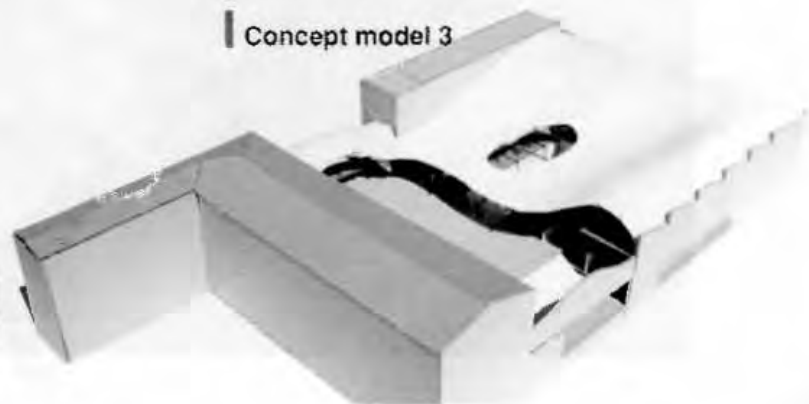
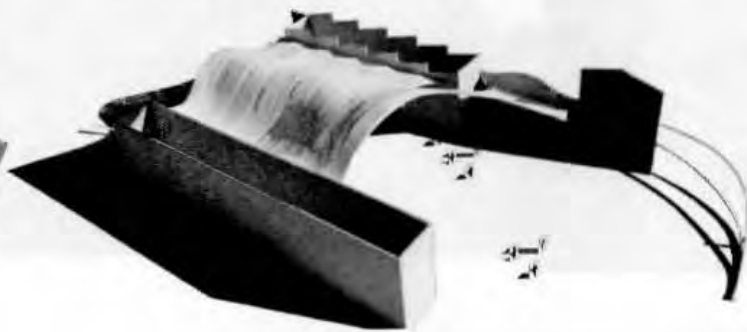
Concept model 1

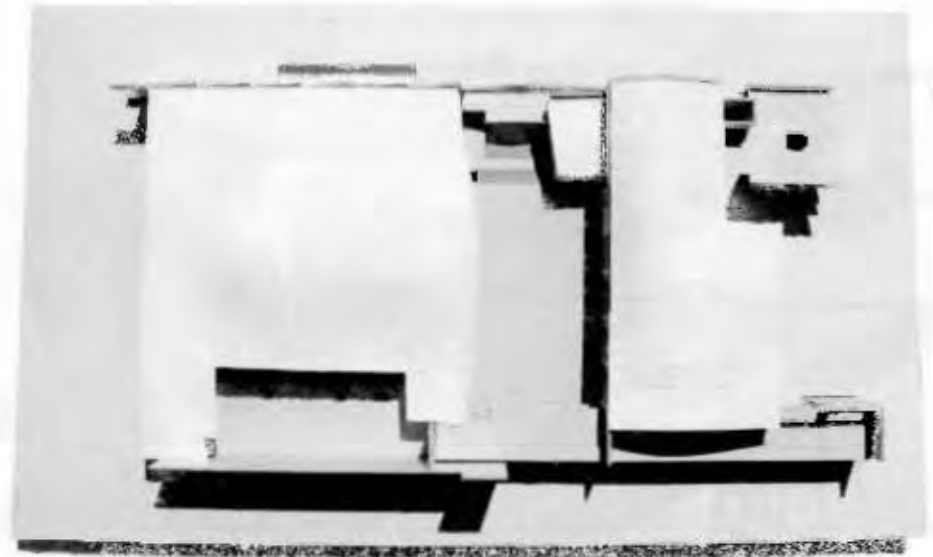


Concept model 2



Concept model 3





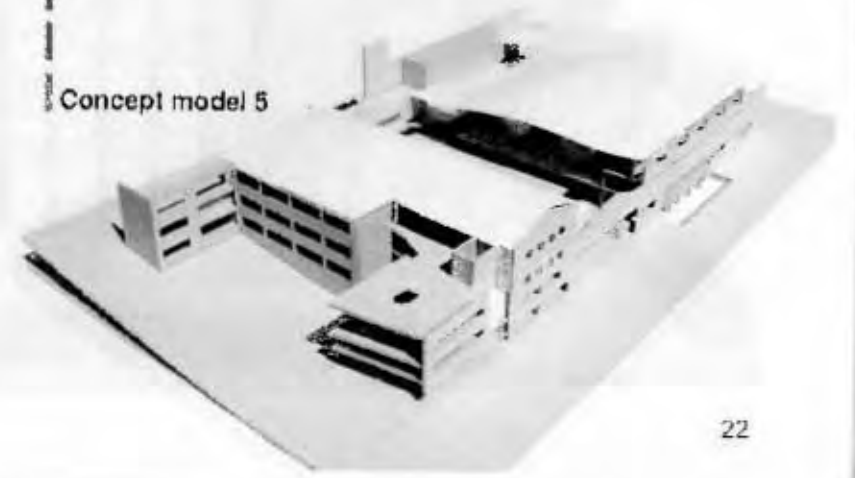
Vertical dashed line indicating the section cut for Concept model 4.

Concept model 4

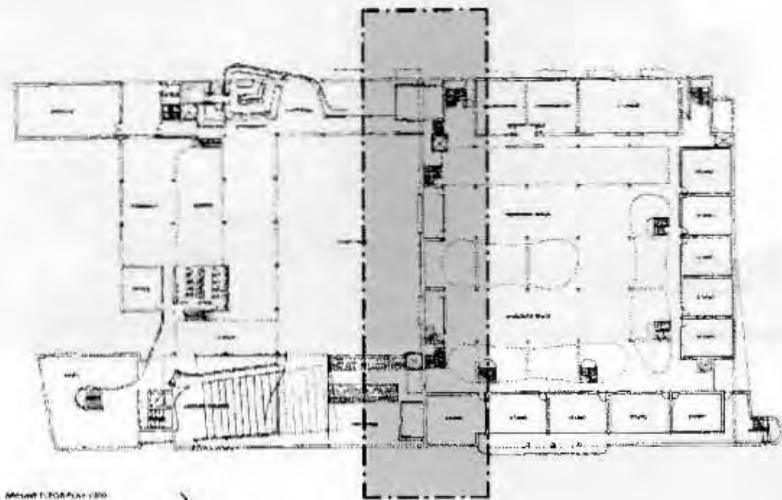


Vertical dashed line indicating the section cut for Concept model 5.

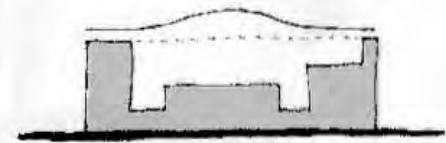
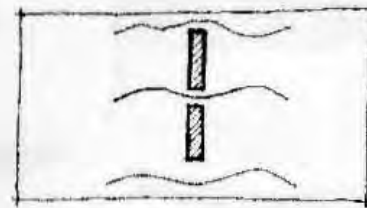
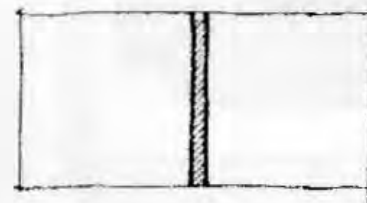
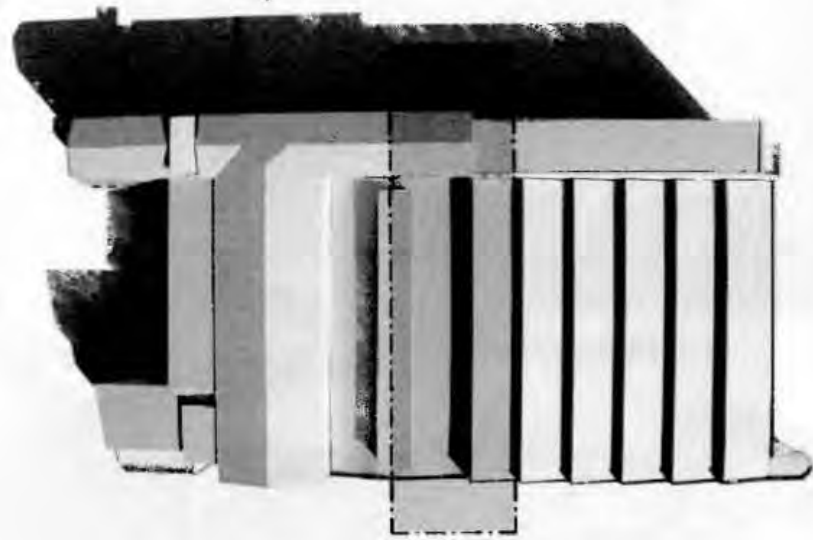
Concept model 5



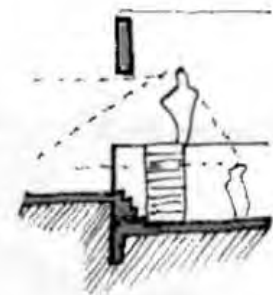
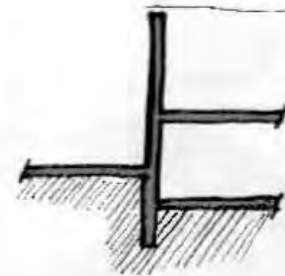
Exploring the concept of layering through models

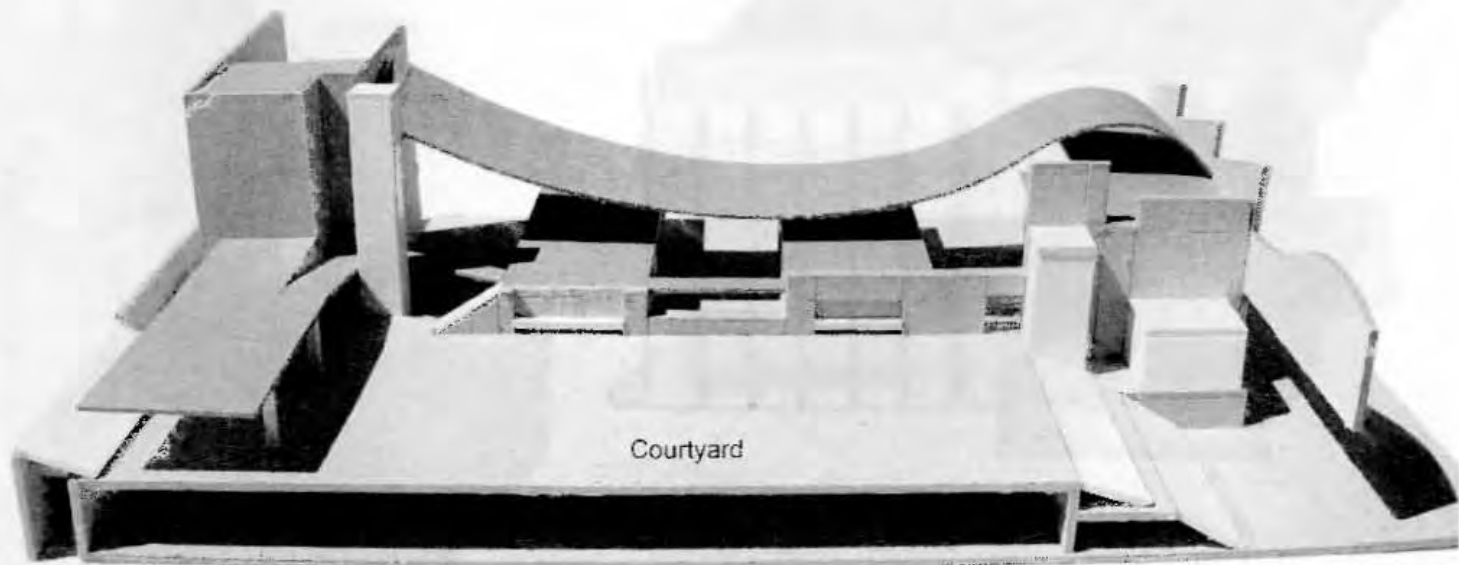
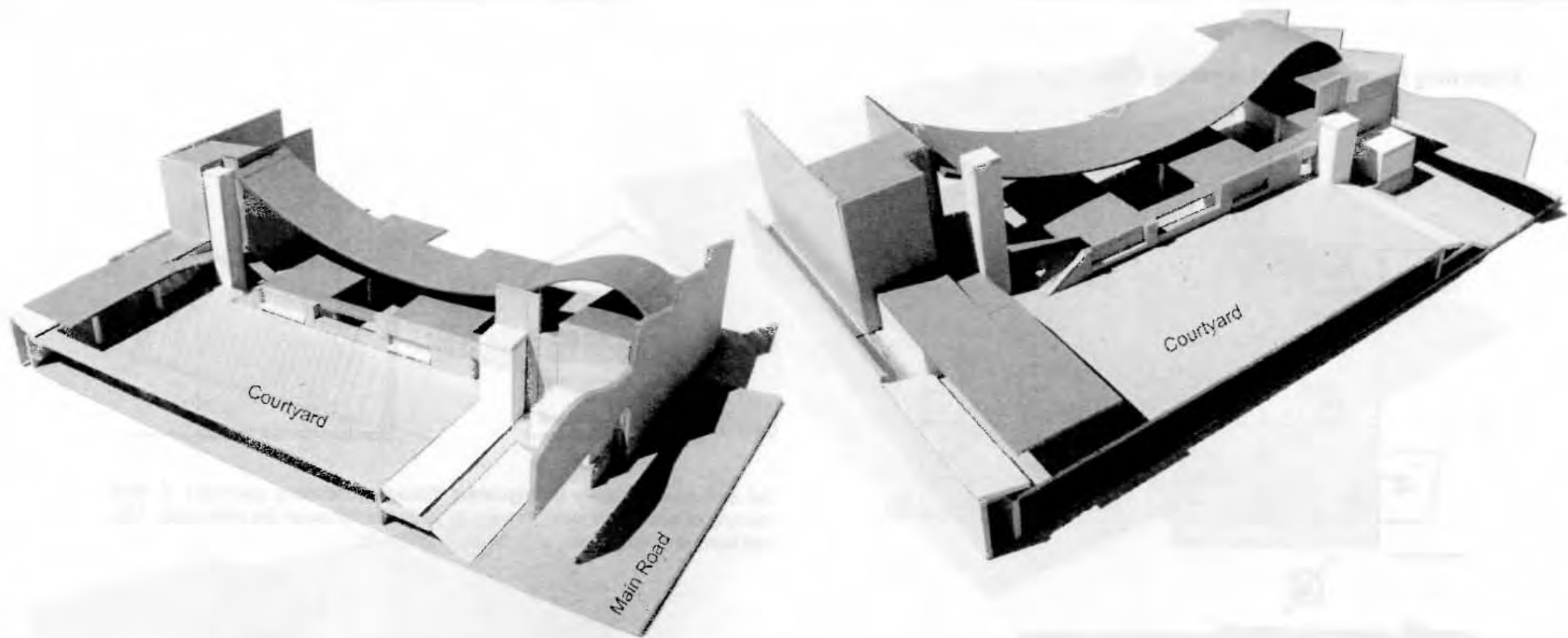


ARCHITECTURE

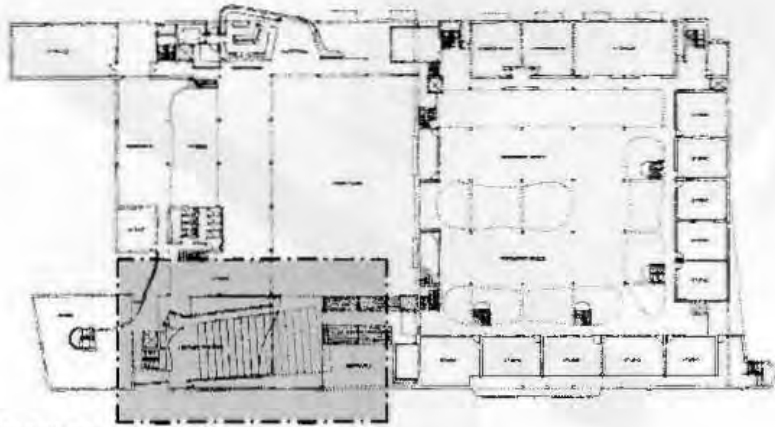


The wall that previously stood as dividing element between two buildings is now the element which links various spaces. This wall has been transformed into the 'spine' of the project.

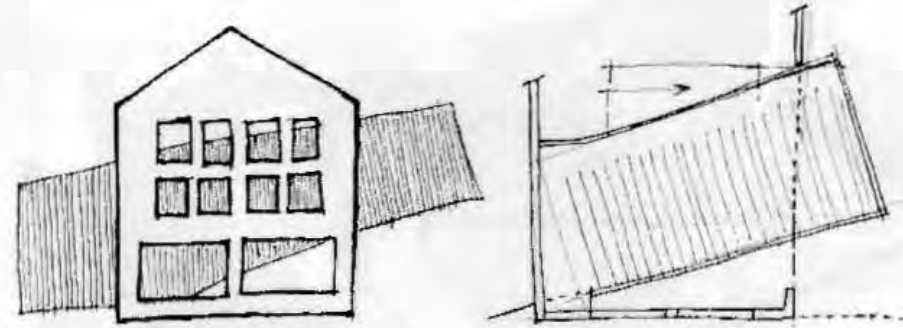
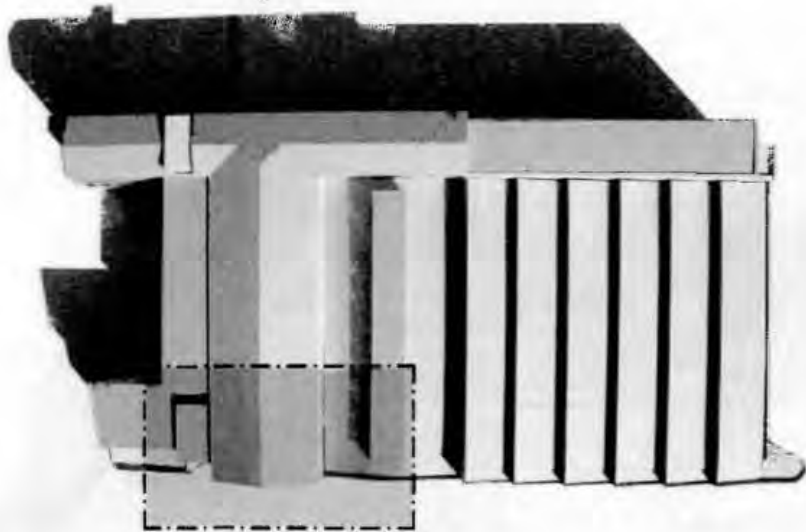




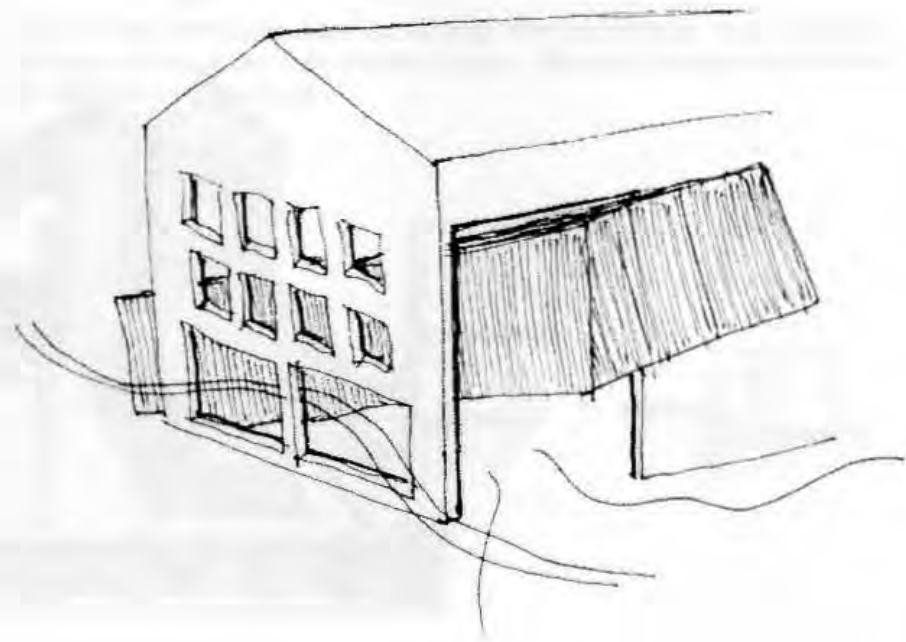
Exploring the concept of layering through models

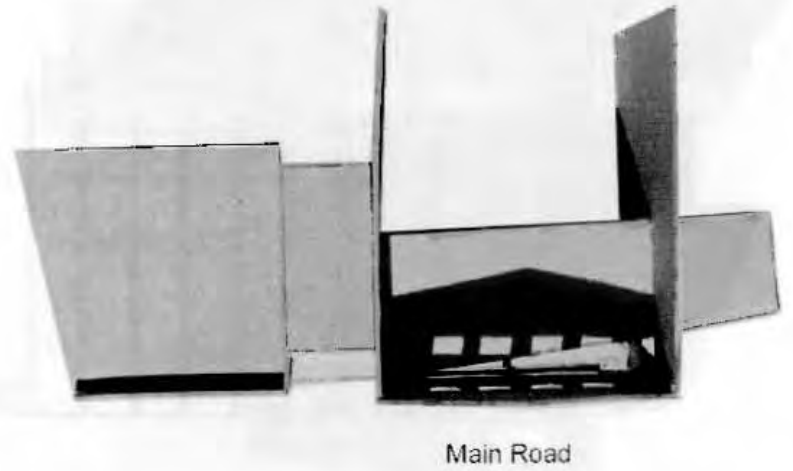
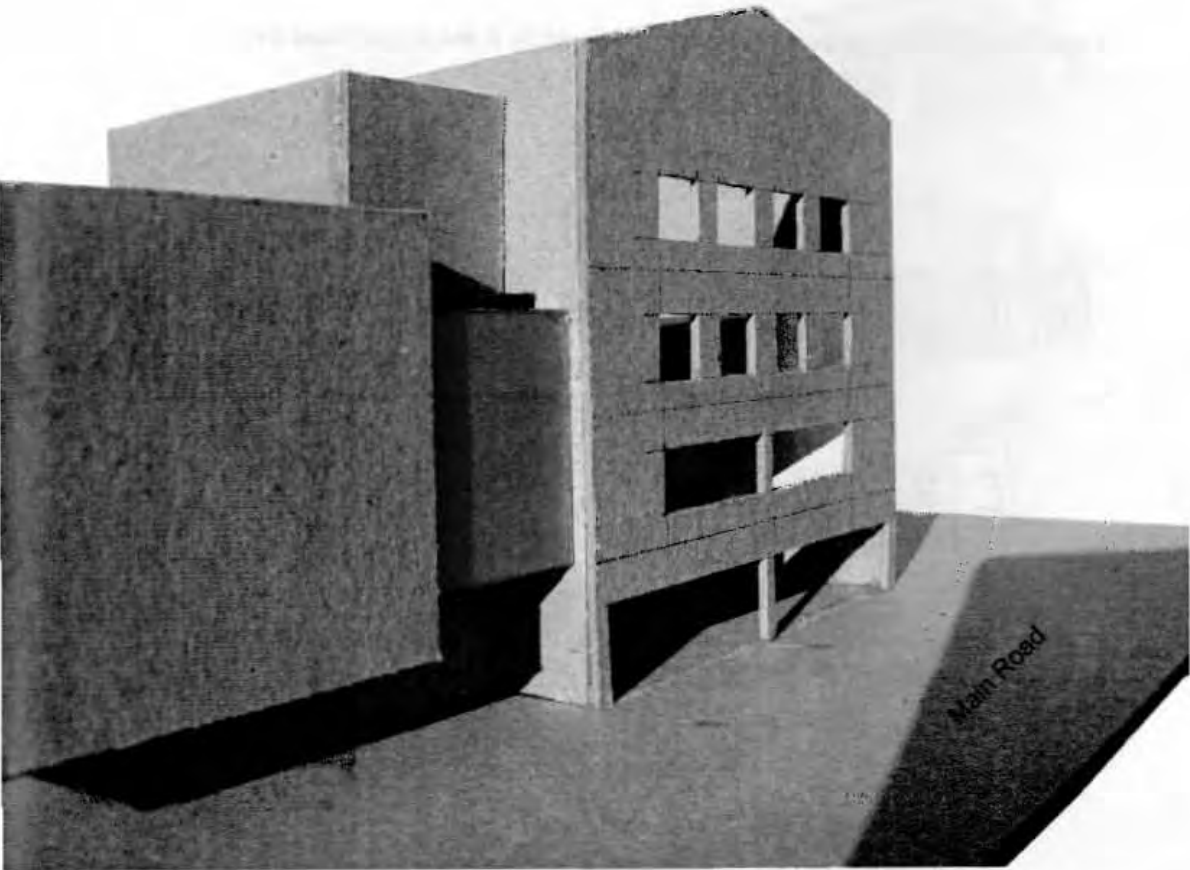
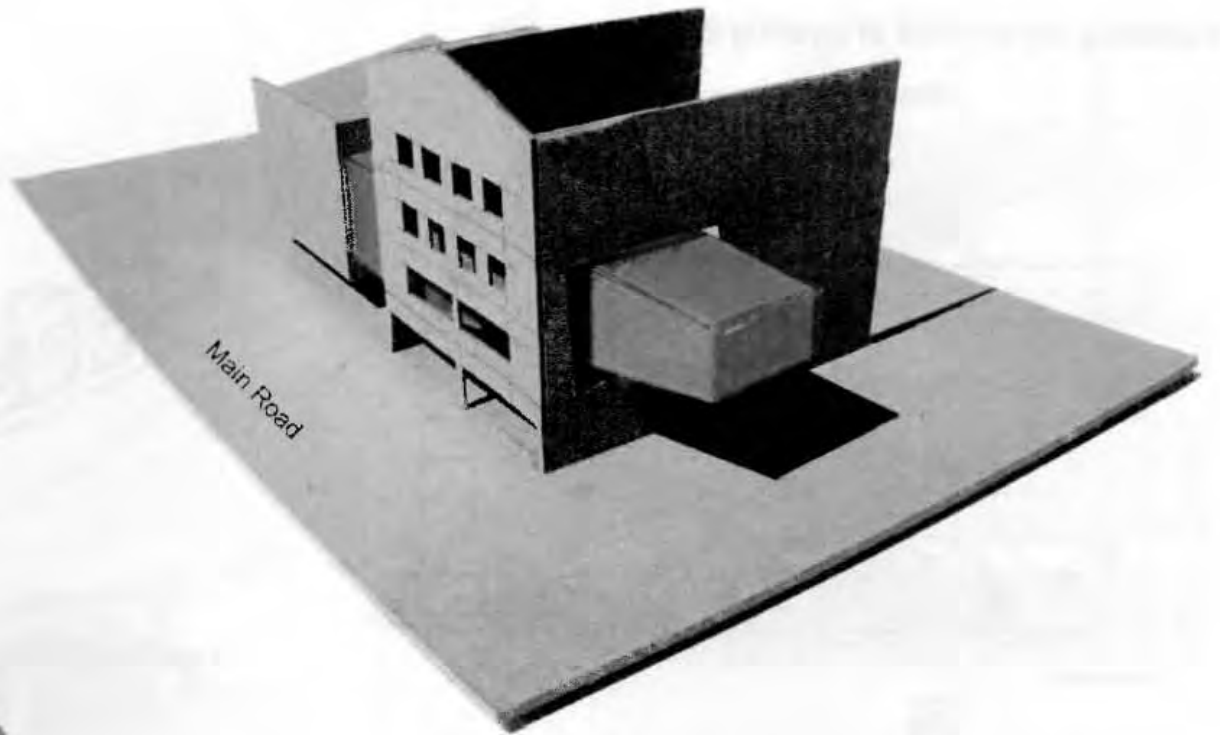


DAVID TUDOR PLEYDLE

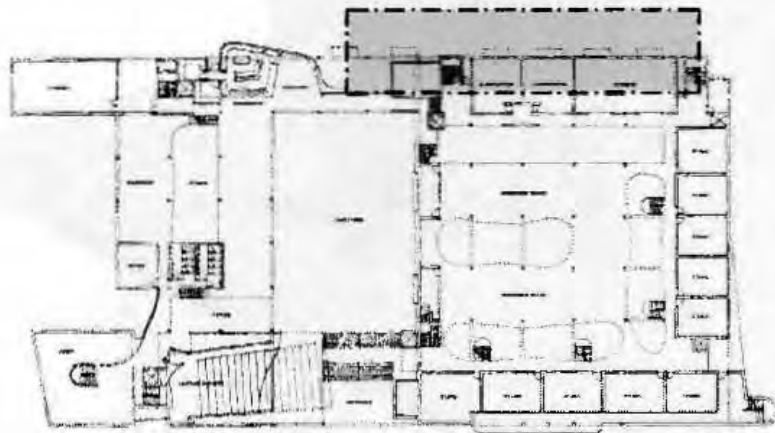


Old and new is clearly distinguished through contrasting geometry. A third layering of space, the void, is used to further emphasise the difference. This void frees the new object, yet guards the old relict.

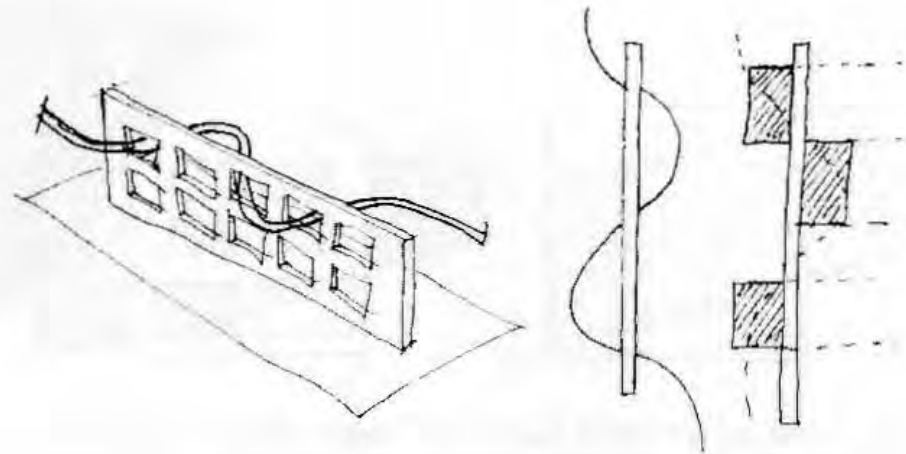
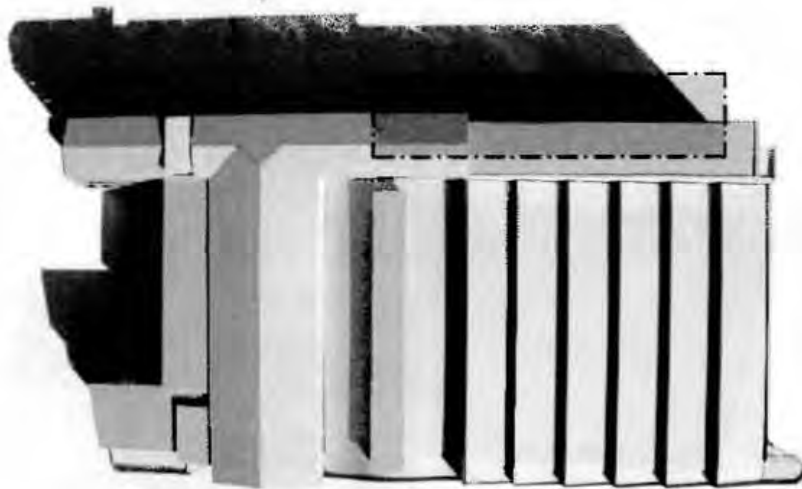




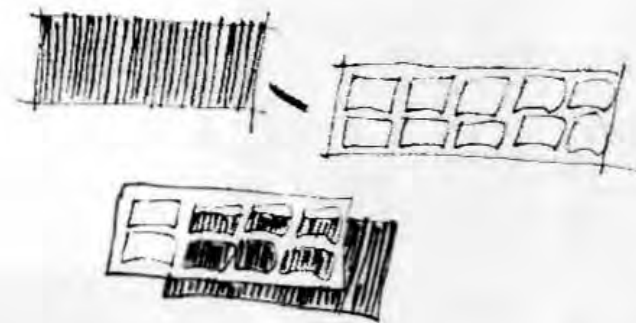
Exploring the concept of layering through models



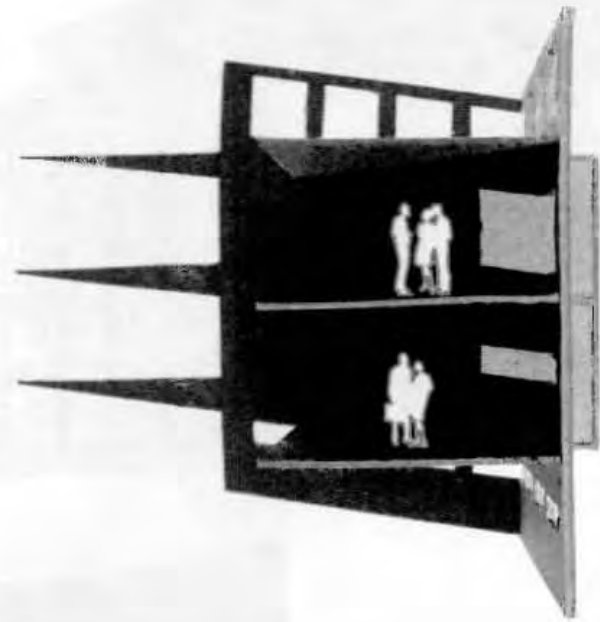
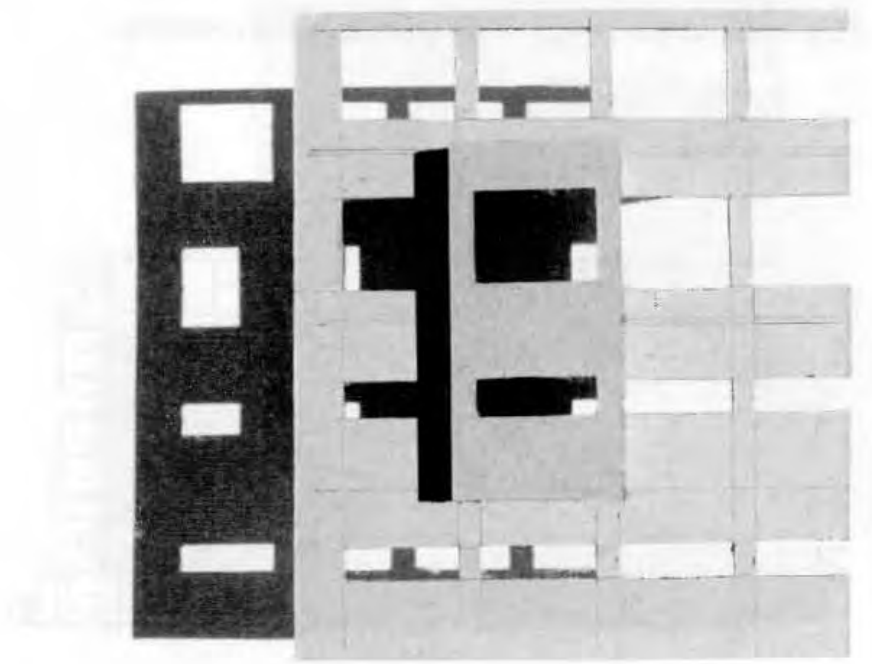
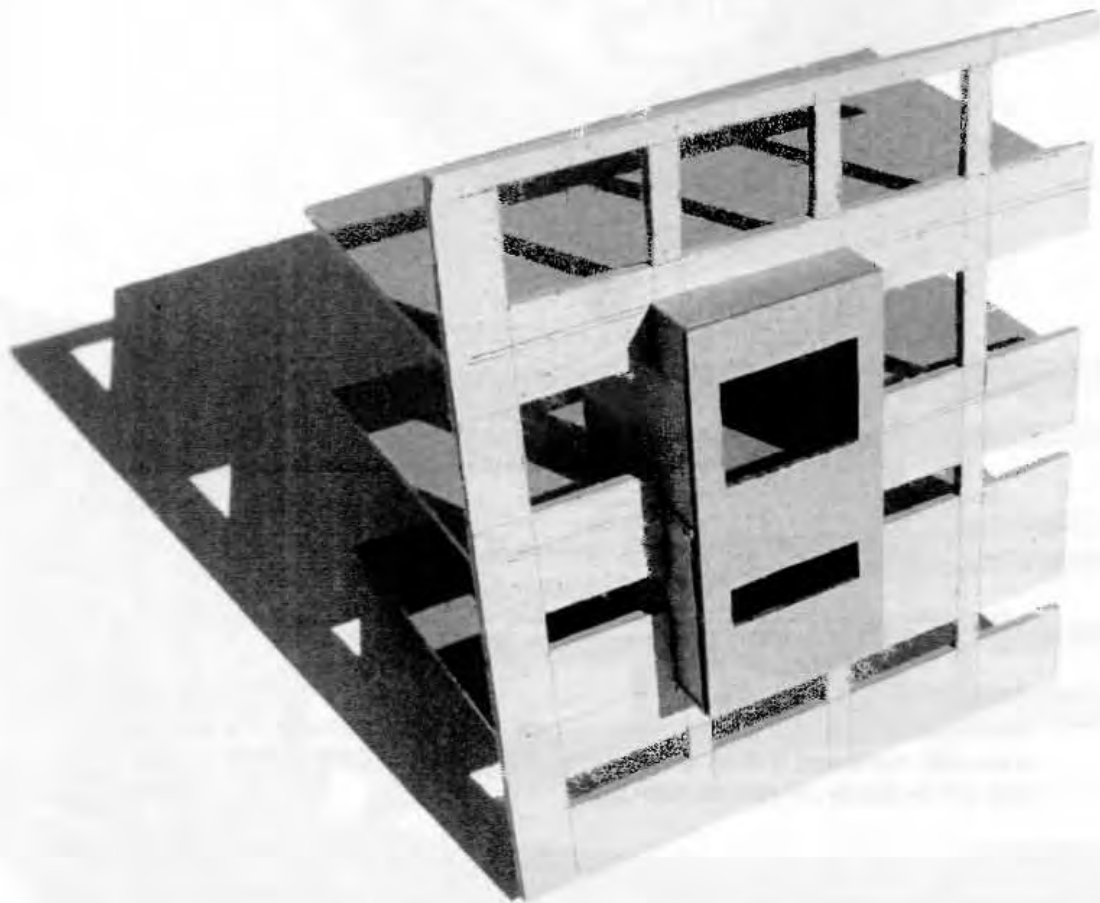
GROUND FLOOR PLAN



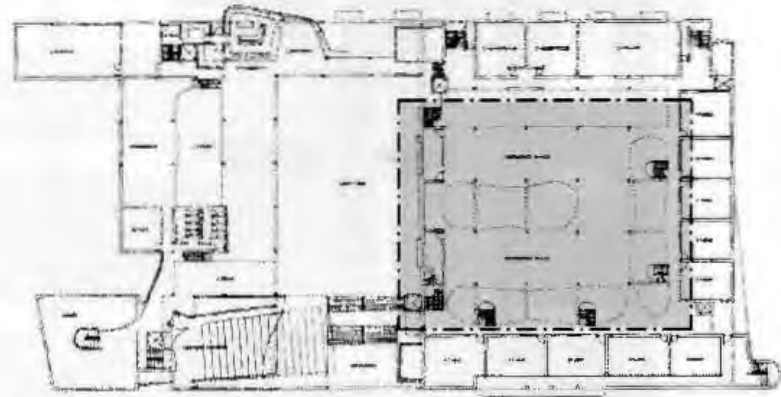
A wall becomes a free element - Space is defined by it but not confined by it.



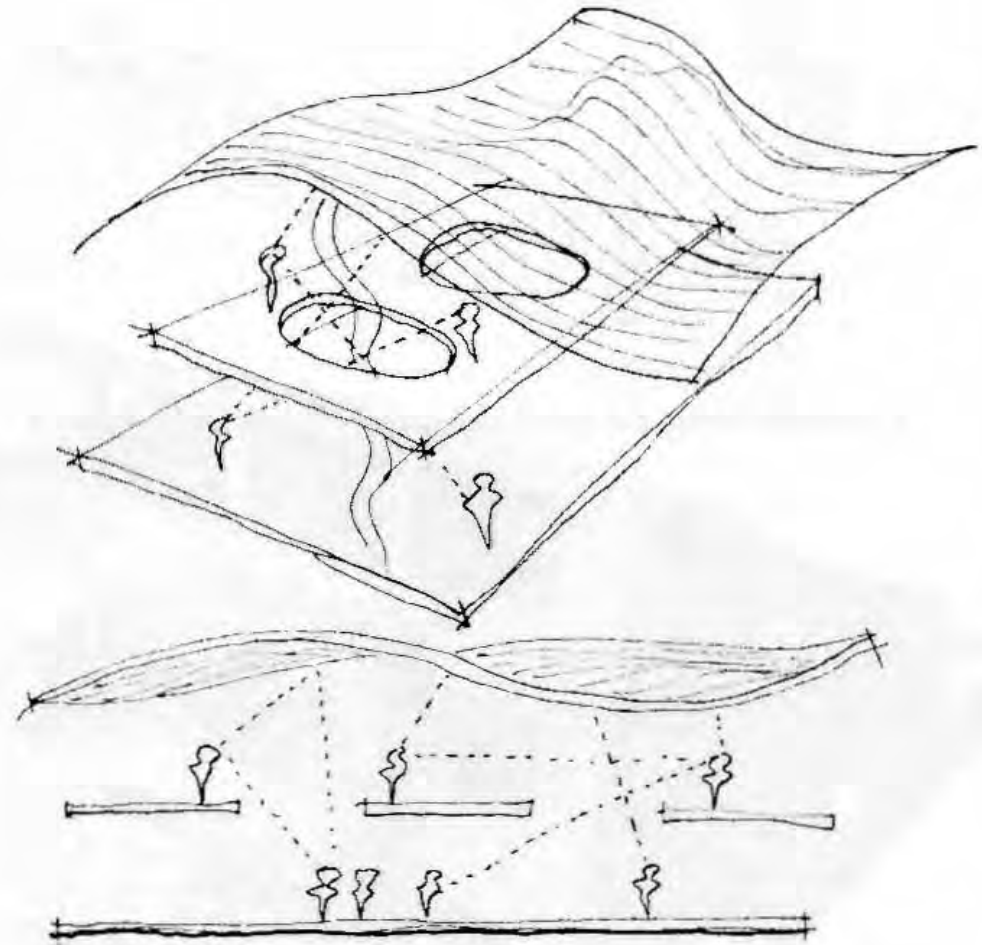
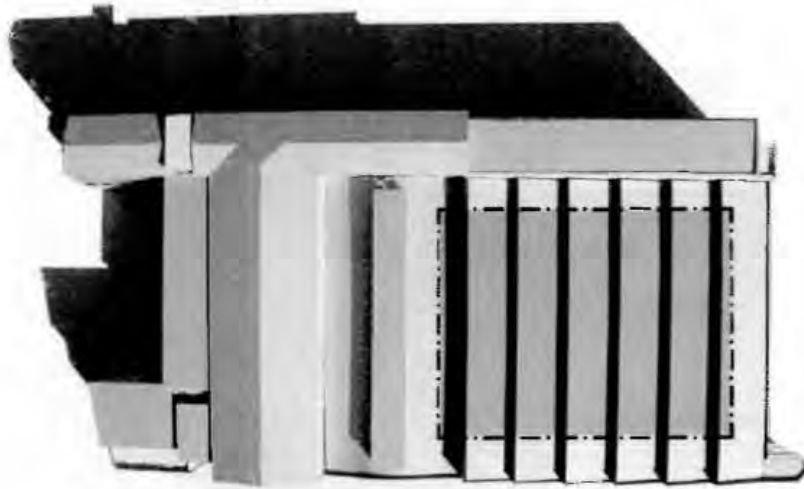
Layering occurs when the new is juxtaposed to the old - the new is different in colour, texture and sometimes geometry.



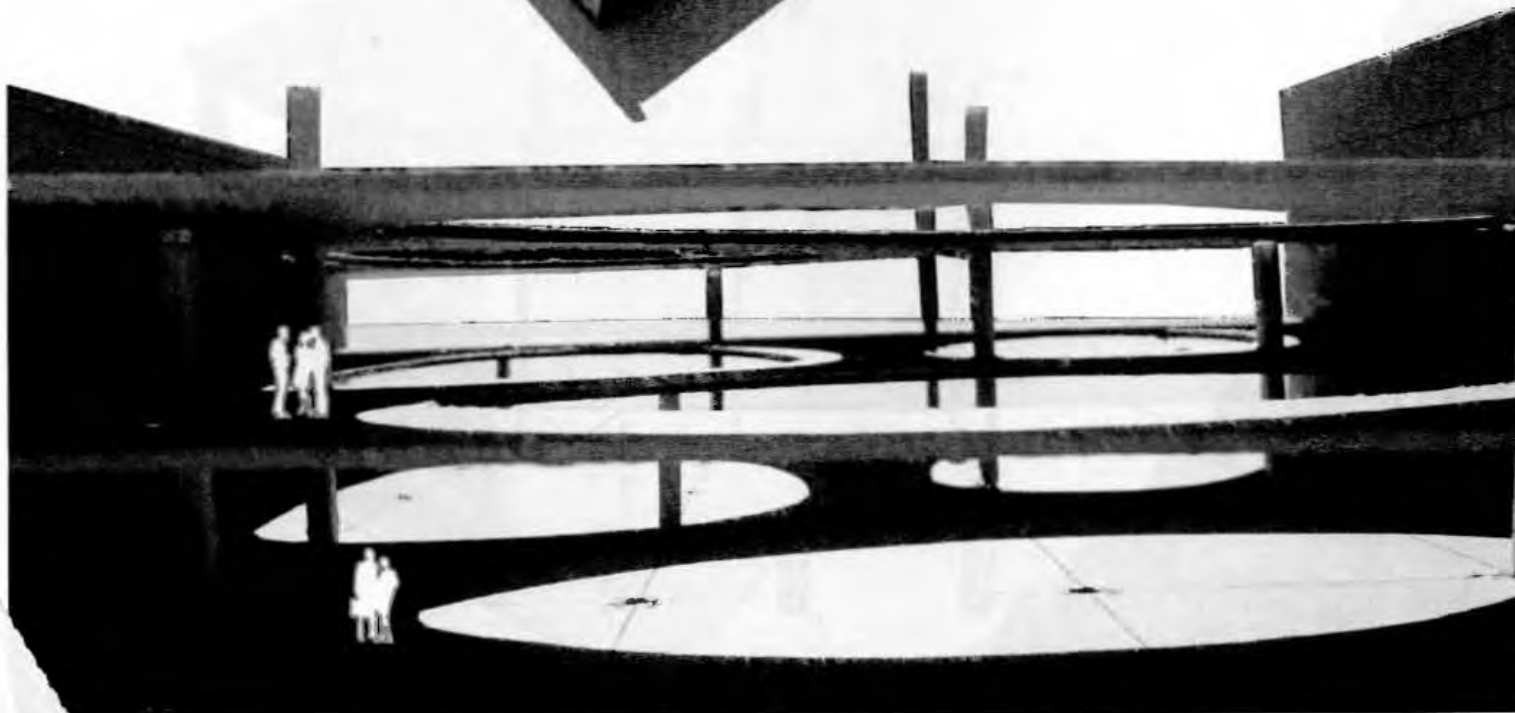
Exploring the concept of layering through models



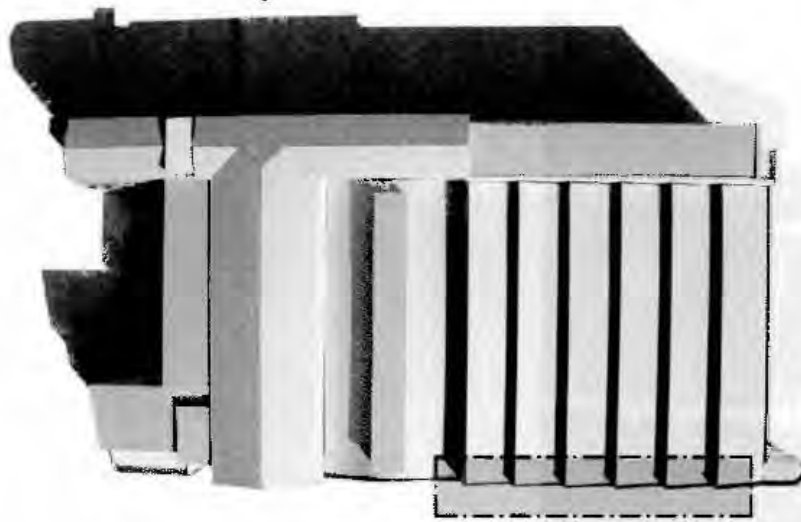
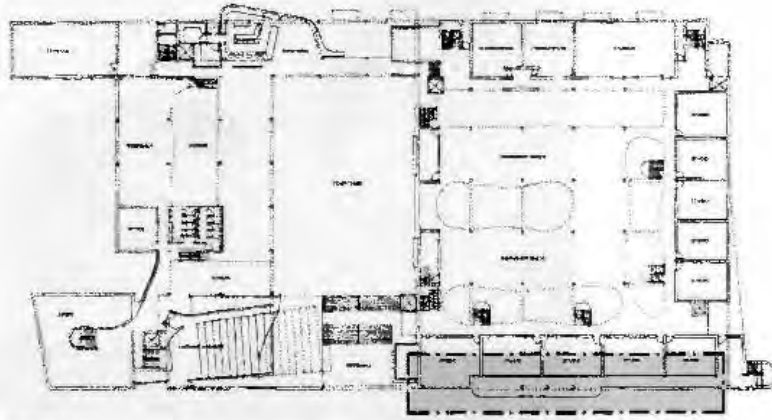
SECOND FLOOR PLAN (1988)



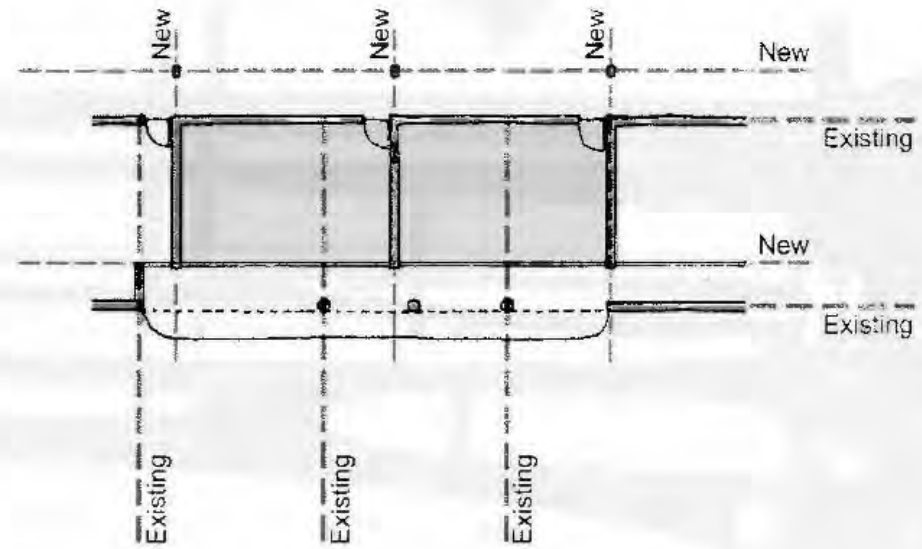
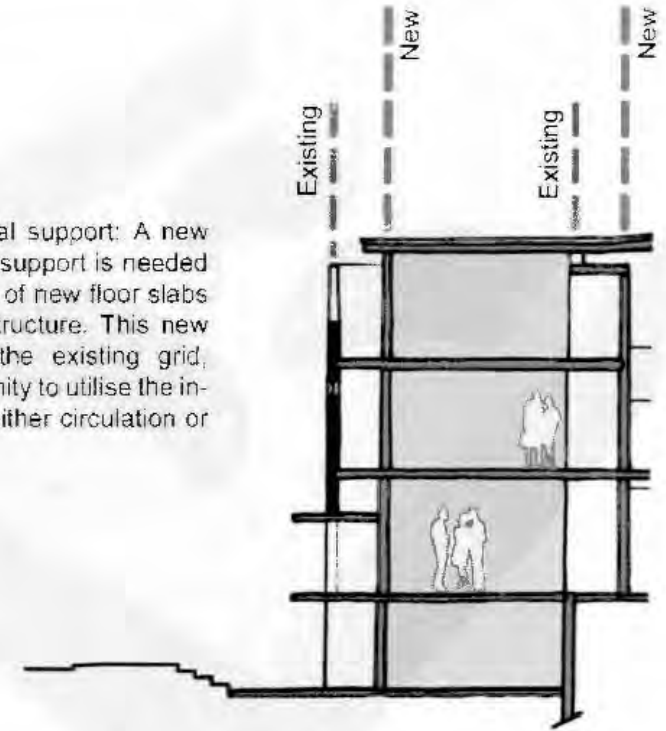
The layering of space occurs when a new dialectical relationship between previously separated spaces emerges. Through this spatial transformation, old and new is clearly set against each other.

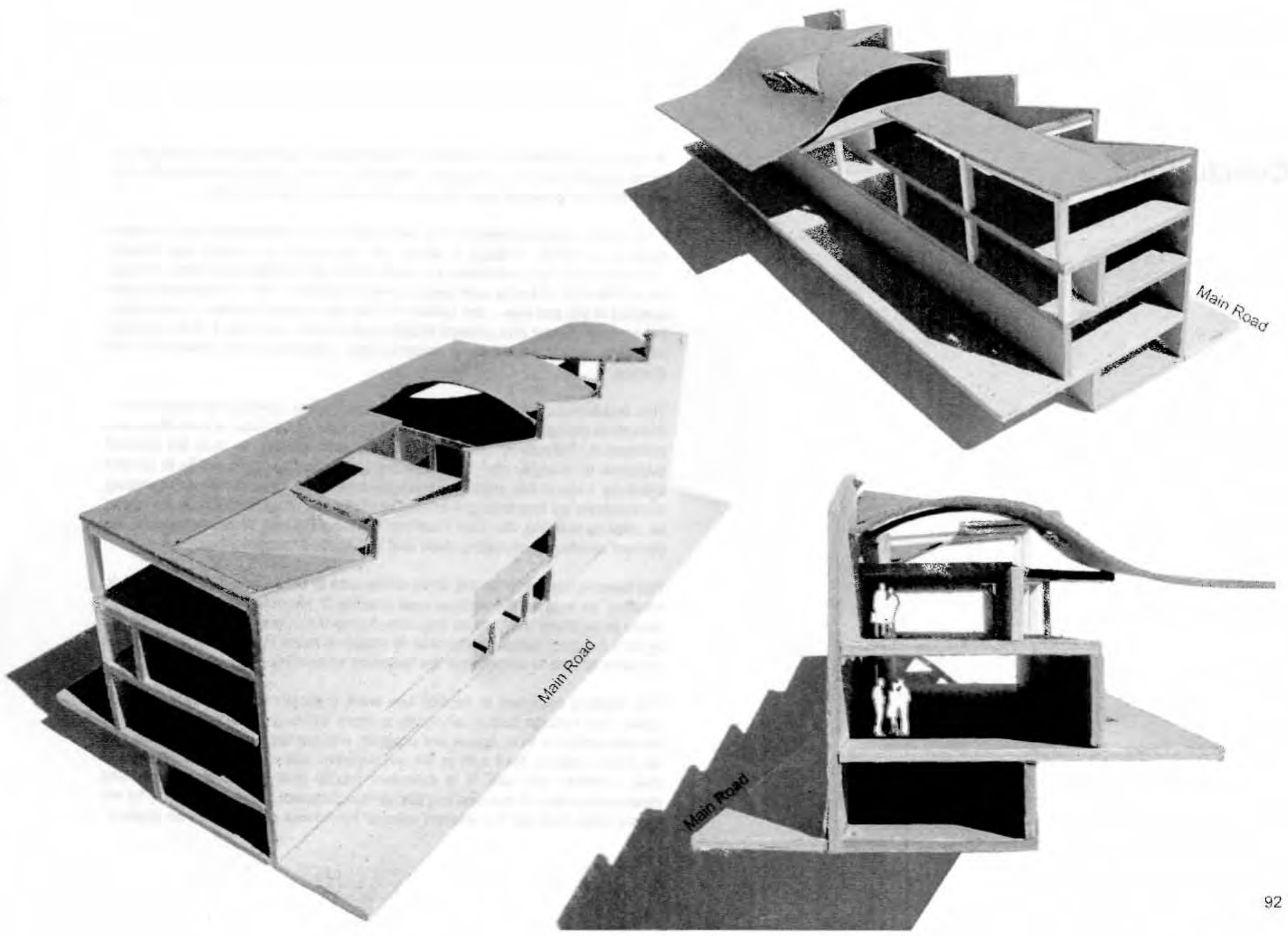


Exploring the concept of layering through models



Layering of structural support: A new system of structural support is needed to transfer the loads of new floor slabs and the new roof structure. This new system is set off the existing grid, creating the opportunity to utilise the in-between space for either circulation or services.





Conclusion

To conclude this design document, I must iterated that the next phase of this thesis project will be concerned with the making of an architecture that expresses the thoughts and intentions described in this document.

It has been stressed clearly in the first section of this document that adaptive reuse is a design strategy in which the expression of historic and cultural continuity must be considered in similar detail as transformation and change. An architecture of fusing past and present is referred to in this document as the layering of old and new – the overlay of past and present modes of production; the overlay of past and present architectural styles. Layering is thus a design narrative, which describes a tectonic that expresses both continuity and change.

This architecture, which derives from the concept of layering the contributions of multiple designers and schools of thought throughout time, is described as a palimpsest. Palimpsest, as defined in the first chapter, is thus the layered evidence of change, and can therefore be applied metaphorically to reused buildings. I see in this analogy a basis for a design approach that will ultimately demonstrate my intension to formally, spatially and programmatically transform an existing building, the Rex Trueform Clothing Factory, to accommodate the desired needs of a changing socio and economic environment.

The lessons learned from the study of the work of both Carlo Scarpa and Enric Miralles, as well as the various case studies of projects concerning adaptive reuse in sections two, will be valuable during the course of the thesis design project. I regard Scarpa's approach to adaptive reuse in particular as the most valuable source to understand the tectonics of layering.

The projects analysed in section two were originally chosen purely on face value, but through further analysis, a more thorough understanding of the transformation of form, space and program was gained. I realise, however, that all of the projects dealt with in the case studies are very different in terms of their contexts and use. It is therefore crucial that a proper analysis and investigation should precede any design development of the chosen site for my thesis. *Only then can the lessons learned from these case studies be applied.*

My analysis of the physical, historical and social context of the Rex Trueform Factory has certainly paid off, since my understanding of both its heritage value and potential value for the Salt River community stand me in good shape to make informed decisions during the design process.

It is my intention to extend the process of experimentation and exploration as proposed in the final chapter for as long as possible until the end of the design stage of my thesis. Working with the Rex Trueform building will prove to be an exiting opportunity to test various approaches of formal and spatial transformation, and to investigate the various ways in which the idea of tectonic layering can be applied.

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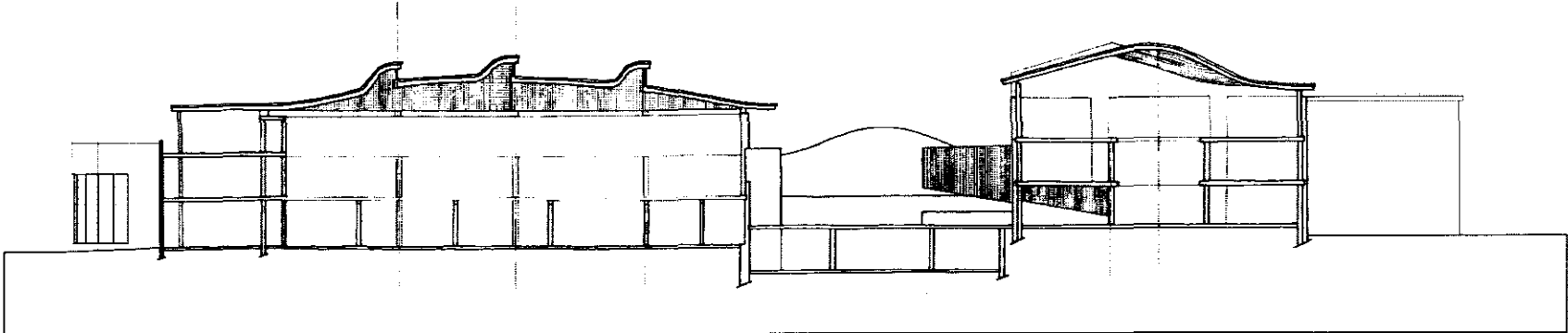
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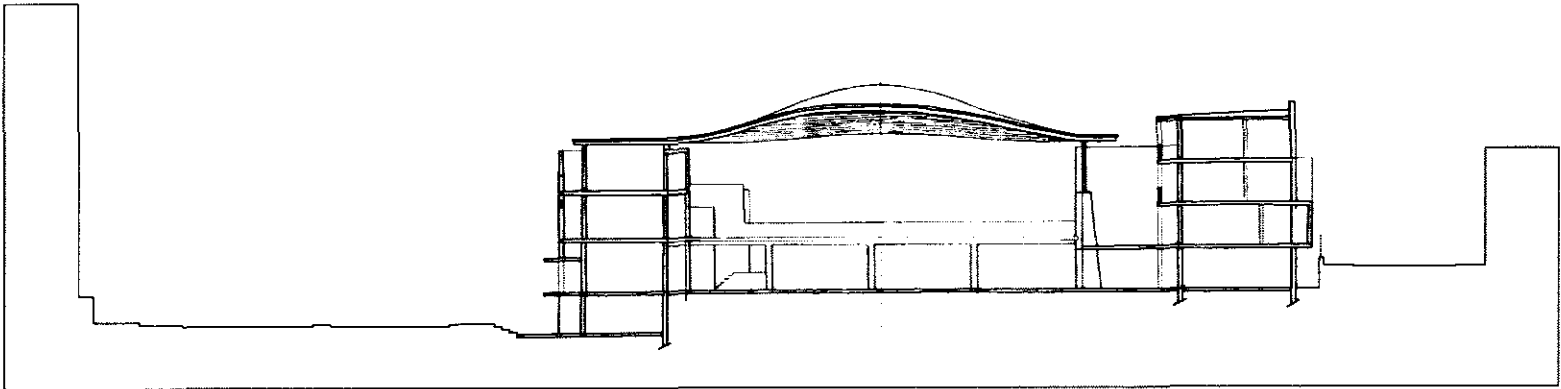
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The Rex Trueform Factory - Latest sketch design drawings

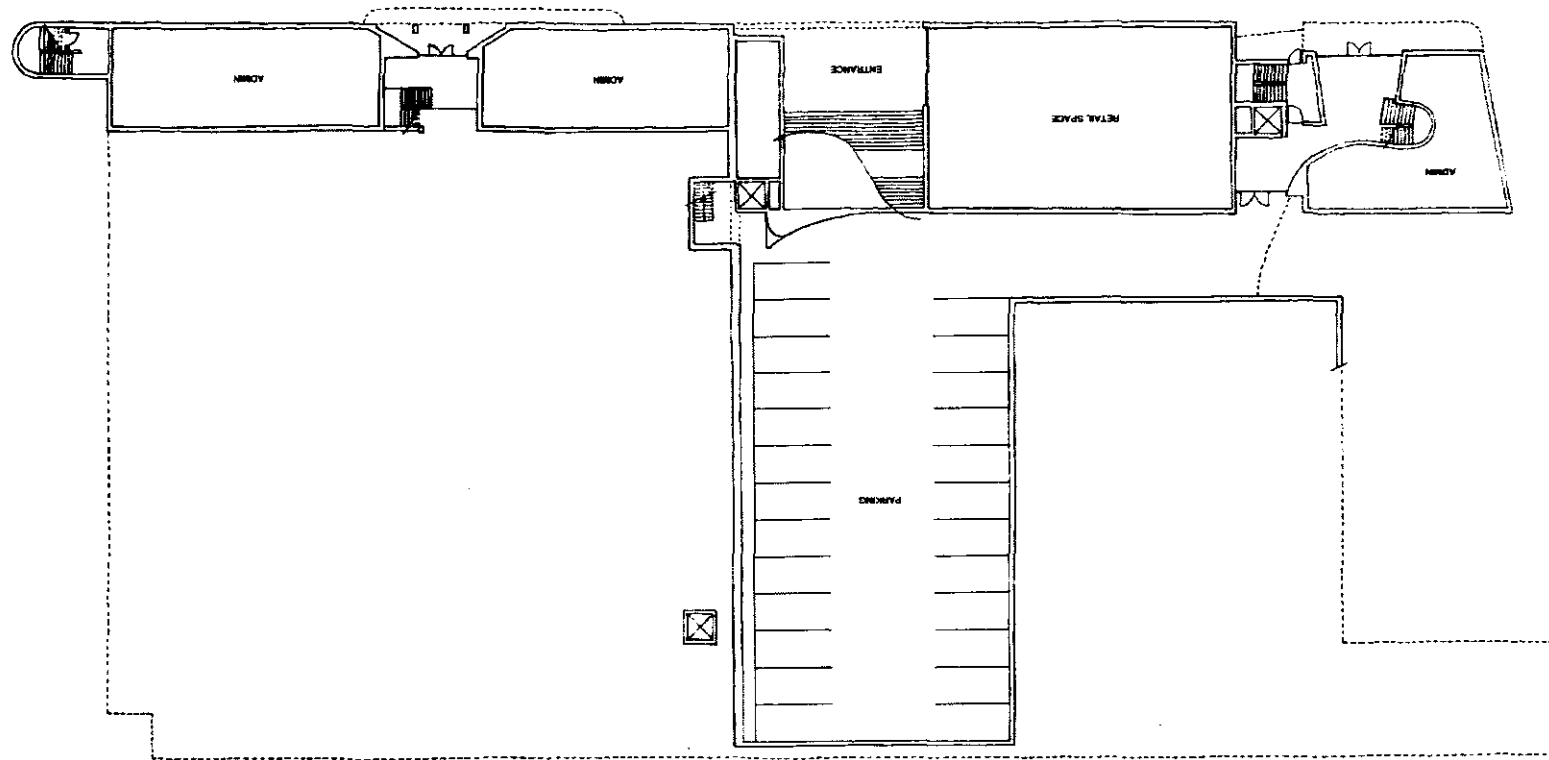


Longitudinal Section 1:500



Cross Section 1:500

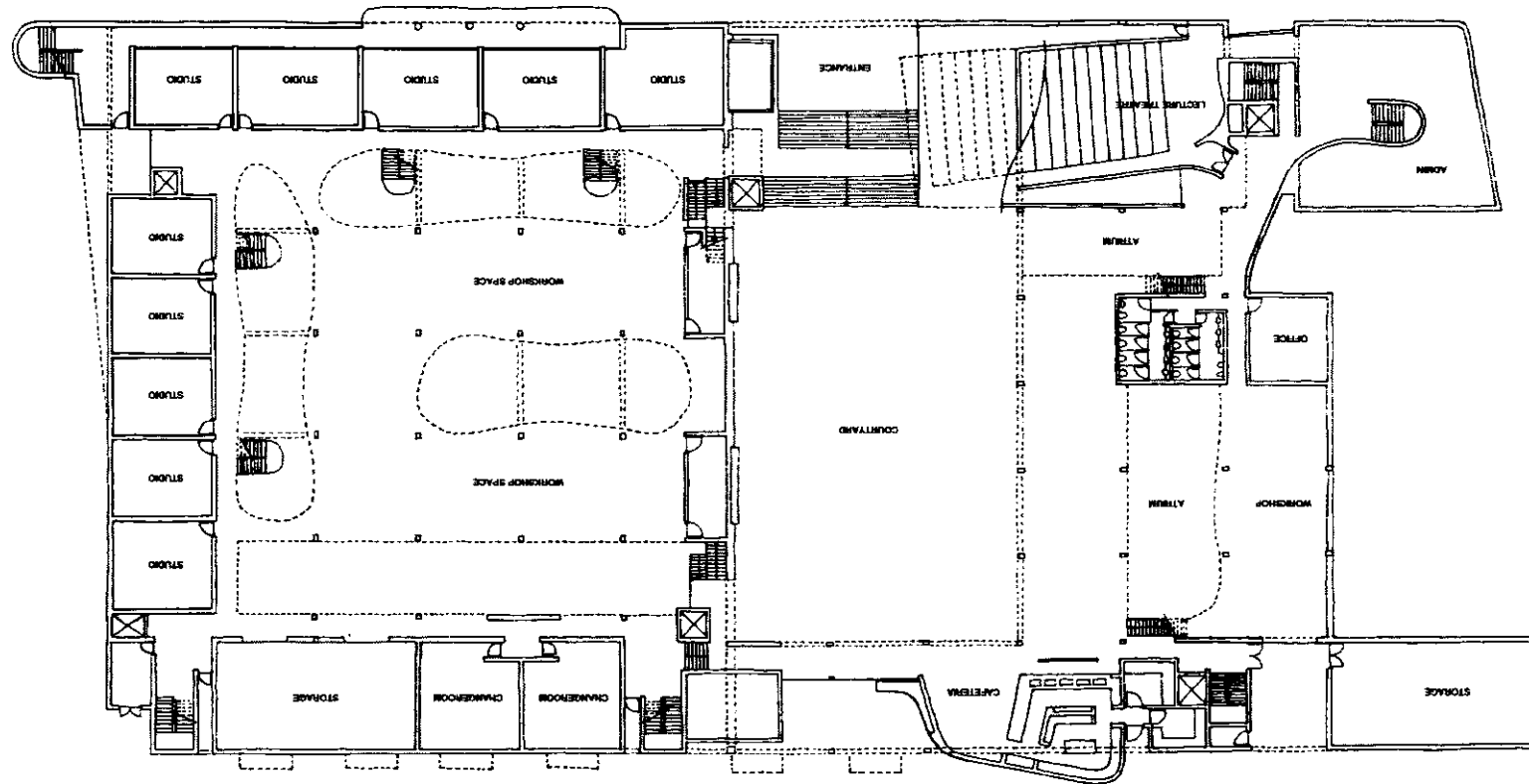
The Rex Trueform Factory - Latest sketch design drawings



BASEMENT LEVEL

scale 1:500

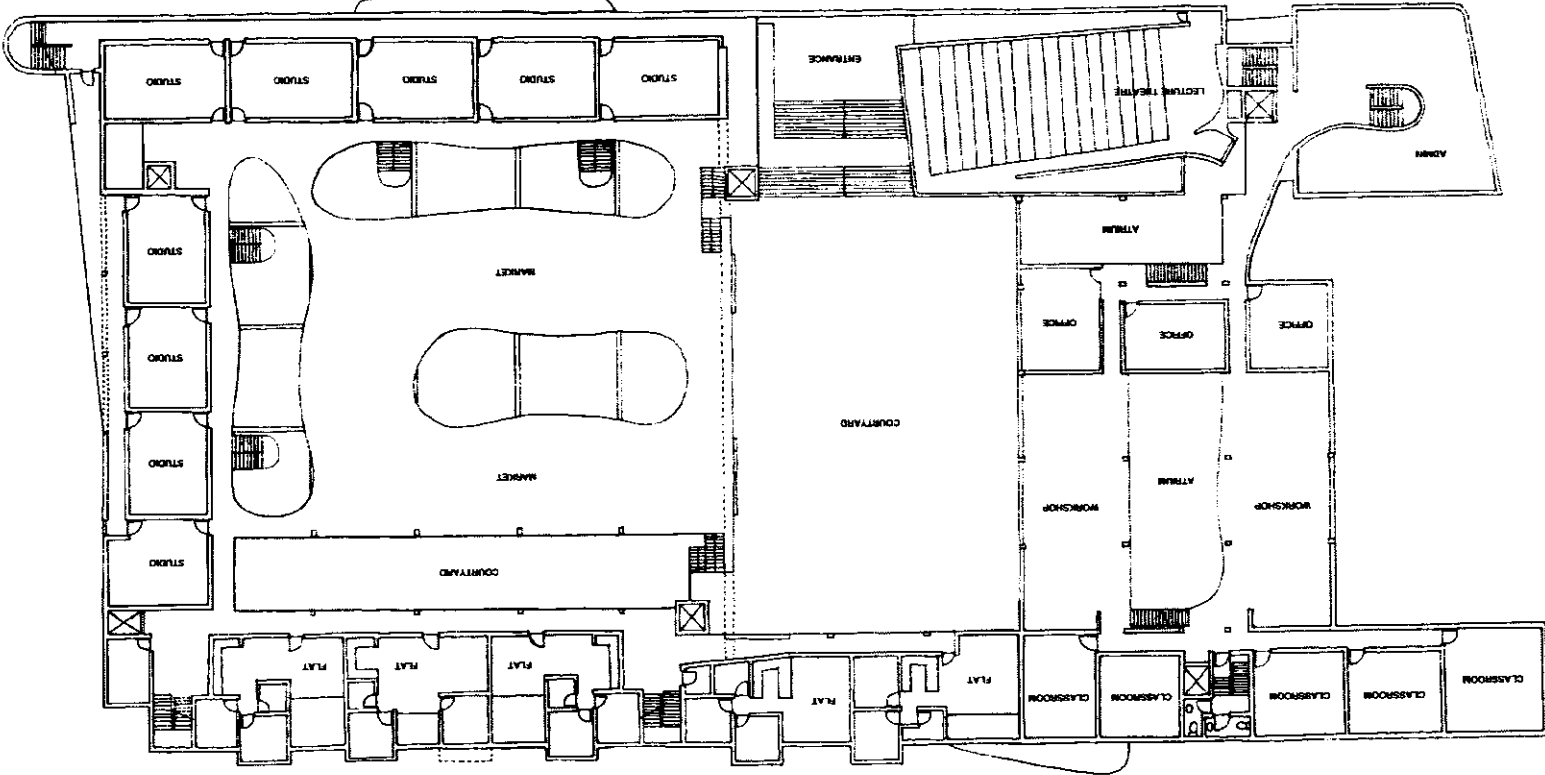
The Rex Trueform Factory - Latest sketch design drawings



GROUND FLOOR LEVEL

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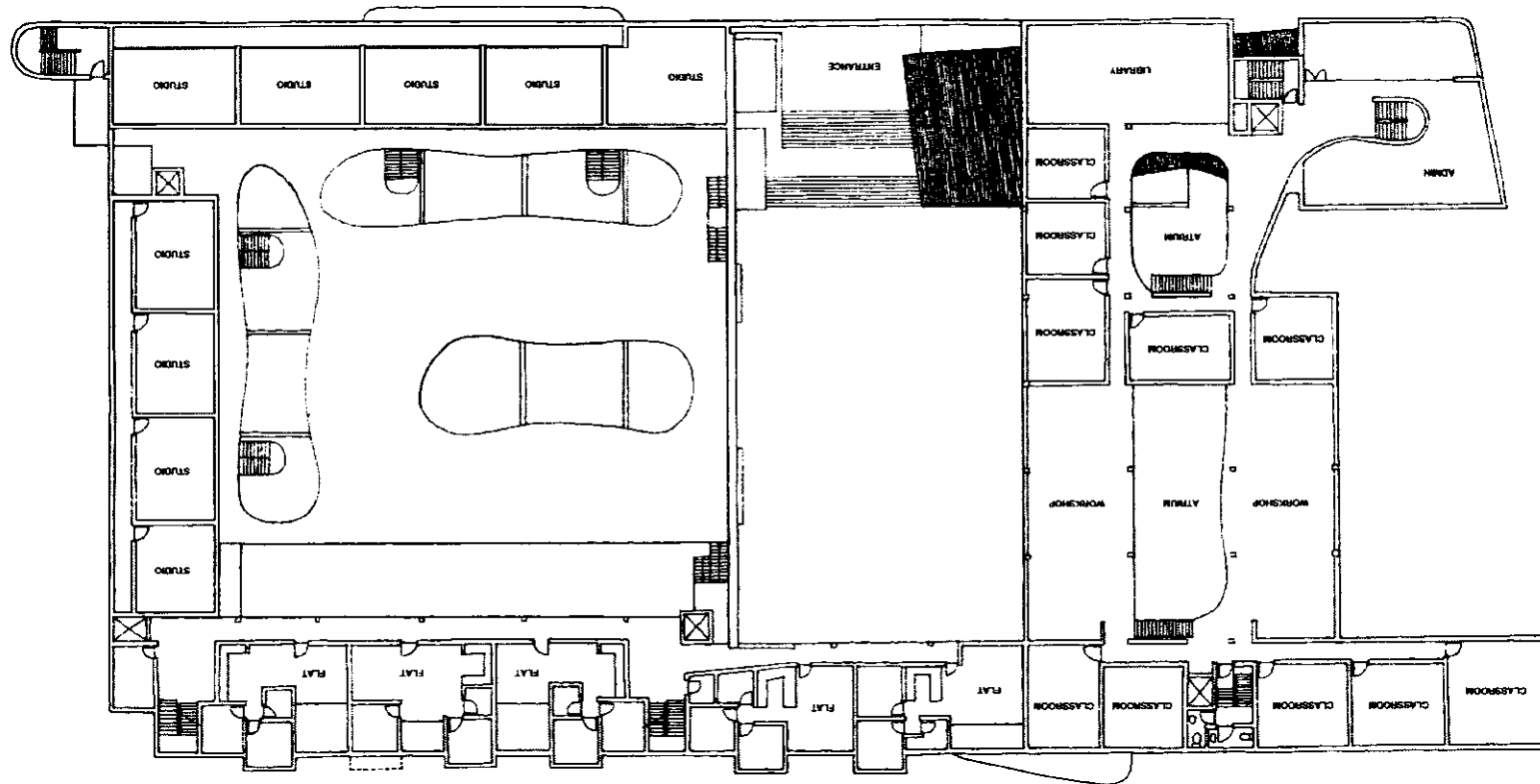
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FIRST FLOOR LEVEL

scale 1:500

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SECOND FLOOR LEVEL

scale 1:500