A new typology of space _ Re-imagining the civic building

Design Research Project APG5058S

Submitted in partial fulfilment of the requirements for the degree
Master of Architecture (Professional)

by

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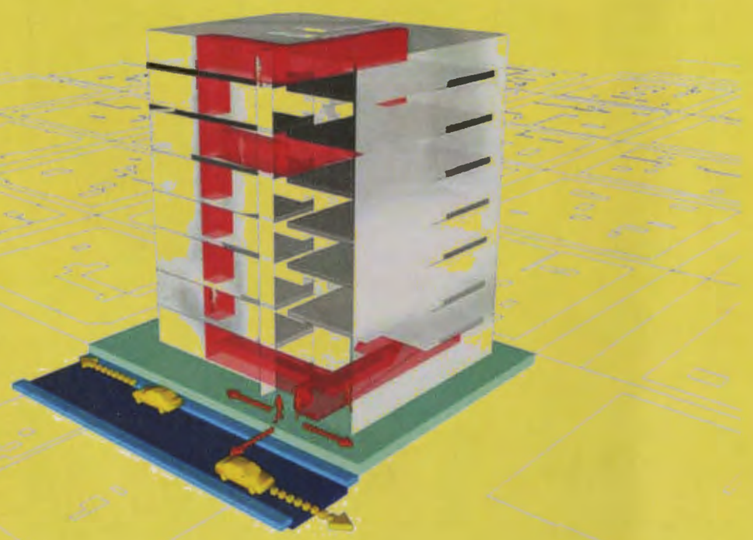


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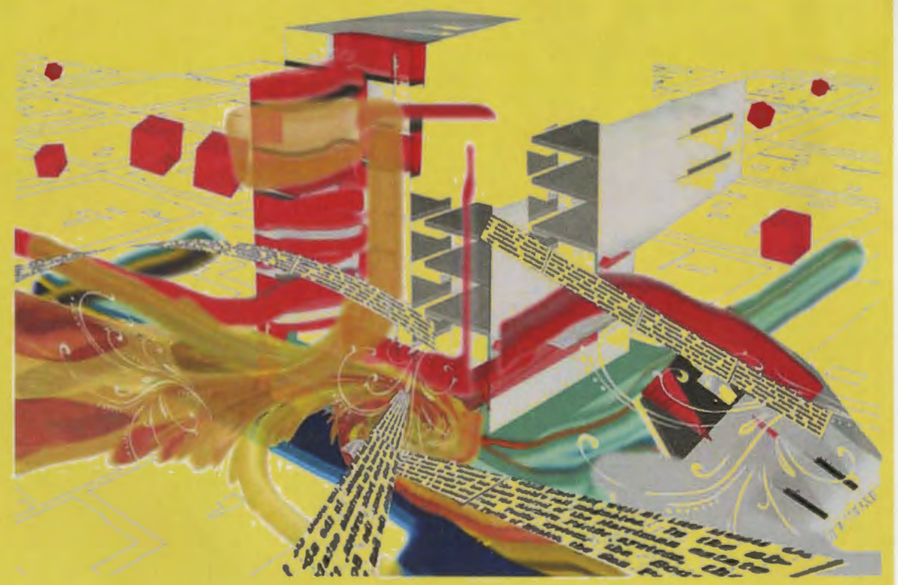

A new typology of space _ Re-imagining the civic building _ Home Affairs

Introduction to the dissertation

My personal interest in cities and their layering of spaces and functions served as a starting point for this dissertation. Cities evolve over time, and the resultant networks of movement and public spaces are the filters through which most inhabitants experience the city they live in. By examining the Cape Town CBD and surrounds, it became apparent that these networks have become secondary to other commercial systems. Whilst Cape Town has some open public spaces of historic significance such as the Grand Parade and Greenmarket Square, the public space network has become fragmented and often overwhelmed by commercial interests which inevitably limit public access and use. Upon closer examination, it seems that economic concerns have shaped the city rather than a layering and balance between public and private, access and control.

A discernible building typology can be found in the inner city, one which I have referred to as the tower block. The tower blocks have varying programmes but hold in common private ownership and controlled access, thereby limiting the connection to the city severely, and in most cases do not add anything of value to the public urban fabric. Instead, where the tower block access meets the movement and public space network of the city a hostile environment is created, where loiterers and security guards jostle for control. The inhabitants and users of the tower blocks step from the city into a controlled, sterile environment, and do not interact with the urban environment further. Most of these tower blocks naturally accommodate office space in the CBD.

Whilst it is not realistic to lay the onus on private investors and developers putting up tall buildings in the city to contribute extensively to the public urban space, civic buildings should shoulder that responsibility. Historically, as with the Old Town Hall overlooking the Grand Parade, this is how the public space network was constructed. Civic building and the publicly accessible space which they created were the generative elements of cities. By examining the CBD it became clear that the last extensive civic building done by the city was during the apartheid era, buildings such as the Civic Centre and Customs House on the foreshore. Built to deal with the growing administrative apparatus of that era, and following modernist guidelines the public spaces created by these buildings are mostly unused, due to unsuitable location and being awkwardly scaled and imposing.

The trend for the city to instead lease tower blocks of generic office space to accommodate their civic functions has further led to a deterioration of the public urban realm, as a building typology focused on disconnection from the city now has to accommodate a constant influx of people whilst still having to maintain security for its internal workings. The street, entrances and internal corridors become crowded with people which they were not designed to contain, leading to a frustrating experience for both public and public servant alike.

The focus of this thesis became to challenge the conventional tower block that makes up much of our cities today, by putting forward spatial possibilities that are flexible for alternate uses and new cross-programmatic possibilities for a partnership between private building and public building. The connection between the private and public was made through the programme of an office building, which in its generic form has already become a typology that houses both public (civic) and private.

Overview and structure of dissertation

The following document traces the research undertaken for the project of a new typology of space and re-imagining the civic building of Home Affairs.

The document is composed with the Theory and Research Documents serving as an introduction to the projects, which set up guidelines that informed the design development and siting. The design development of the project was not a linear process, and I have thus tried to order it chronologically, to show how the site constraints and programmatic complexities were grappled with.

In Chapter 7 I will attempt to critically reflect on the design development. The structure of the documents is as follows:

Chapter 1 is the theory research document, written mid-year and left unchanged.

Chapter 2 the technology research document, also written mid-year and left unchanged.

Chapter 3 comprises of siting, finding the appropriate site within the frameworks set up by the theory and technology research documents.

Chapter 4 sets out to investigate the lessons learnt from the existing Home Affairs building, in relation to the spatial and programmatic challenges set up by the research documents.

Chapter 5 shows the programmatic explorations undertaken investigating the complex Home Affairs programme.

Chapter 6 is dedicated to design development and a spatialisation of the ideas and theories constructed throughout the year, ordered chronologically.

Chapter 7 is the critical reflection and summary of the thesis investigation.

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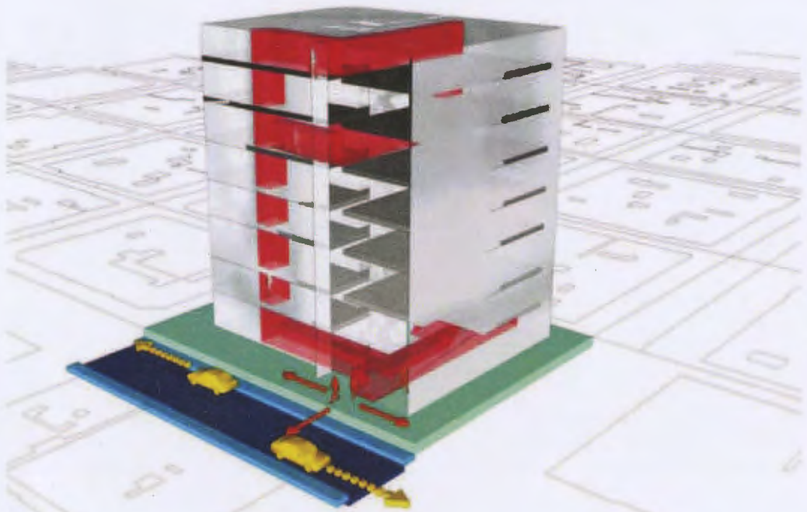
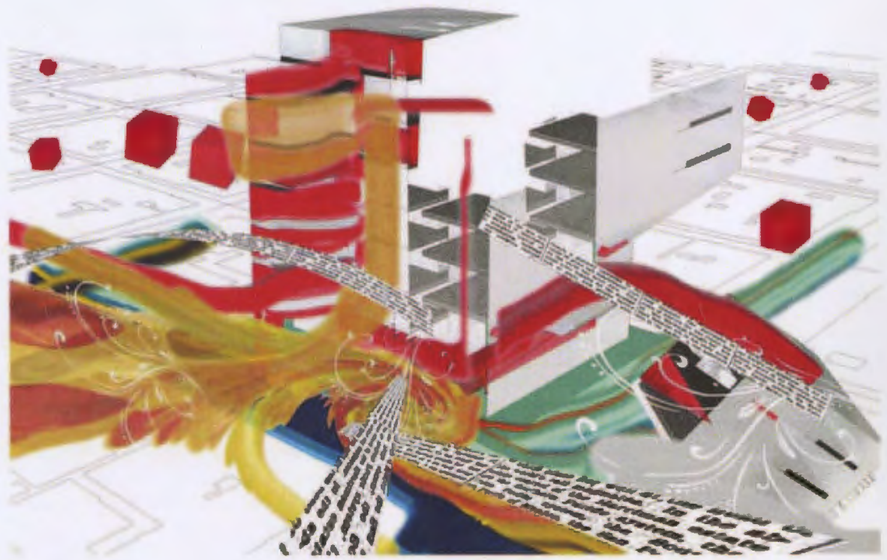


introverted building



extroverted space

CHAPTER 1
A new typology of space _ Re-imagining the civic building
Theory Research Document

Diagram 1

Diagram 1, showing examples of abstract space and differential space, spaces endemic to South Africa. On the left is a proposal made by Le Corbusier for Cape Town, along with an aerial photograph showing the ordered gridiron plan of the Cape Town CBD, and a photo taken of the highways traversing the foreshore. These images are typical of the modern city, and could be from any number of cities around the world.

Differential space, exemplified by the images on the right, is a space of difference and diversity, and more importantly a space created through everyday needs and uses. Spaces such as the make-shift taxi-ranks, open parcels of land used for impromptu games of soccer or dancing and market spaces are examples of highly specific differential spaces.

In the present situation in South Africa of developer and economic driven space production to rational standards and guidelines, public space is becoming commodified, resulting in a privatised public realm that is still exclusionary and restrictive. Although no longer affirmed by policies or politics, the so-called public realm consisting of spaces such as shopping malls and gated communities is best symbolised by the ubiquitous 'right of admission reserved' sign. The anticipated and necessary changes in public space production and the construction of the urban realm post-apartheid have simply not happened. Instead, developers motivated by fiscal concerns have practically been given a free reign to shape and mould our cities. Civic building has taken a back seat, itself governed by economics rather than by a desire to create functioning cities with useable public spaces for their inhabitants.

Civic building as a typology is no longer a structuring or important element in South African cities with many of the administrative civic functions housed in generic office buildings that could accommodate any private administrative company. The focus of this investigation is on a re-imagining of the civic administrative building type as one that has an inherent responsibility towards its citizens and its urban environment in creating a new typology of space.

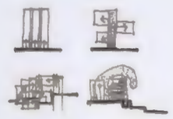
Framework of analysis

The investigation of this paper is into the production of space in South Africa today. In his paper entitled *Space and Transformation*, Iain Low explains that "space is the construct that most effectively realized and maintained apartheid's grand plan and continues to ensure the endurance of its legacy." (Low, 2002, pp 34) The idea that the production of space in the built environment is a physical manifestation of power relations, not only politically but also economically, is central to the investigation of this paper. Spatial transformation and the search for a new typology of space that allows for the unfolding of so many of the previously excluded practices are necessary to "participate in global discourse ... [and] simultaneously capture the human imagination and contribute to the evolution of local cultures." (Low, 2002, pp 34)

New forms of spatial realization, where confrontations and contradictions between the layers of history, local practice and appropriate programming allow designers to "validate a more subjective engagement with the design process", thus enriching spatial production beyond a mere rational deductive or hollow object production. (Low, 2002, pp 35)

In an article titled *(Im) mobilizing space - dreaming of change*, Jennifer Robinson analyses spatial production in South African cities through the triad of space as coined by the philosopher Henri Lefebrve. Abstract space or representations of space, as defined by Lefebrve, are spaces that have been realized to control and display power, to rationalize and dictate the built environment and its possibilities. Abstract space, besides being a product of the modernist ideas on the built environment, was also widely assumed by the repressive powers as a show of dominance and homogeneity in South Africa. Along with "capitalist commodification of land", the resulting "alienating environments in which possibilities for alternate spatialities are repressed" are ones that dominate South African cities today. (Robinson, pp 7D)



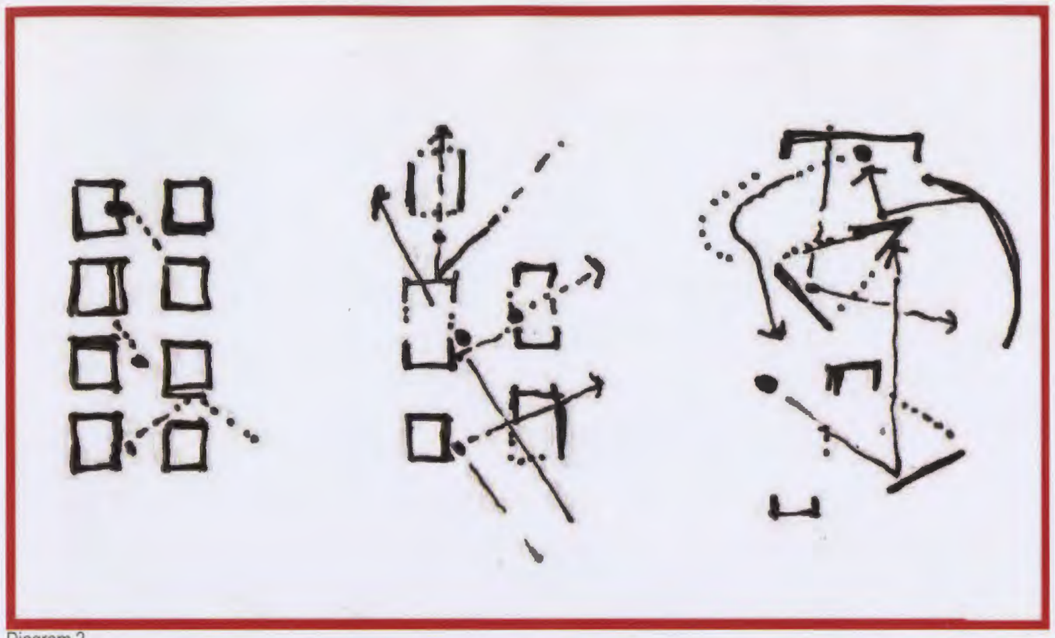


Diagram 2

Diagram 2 is an exploration of abstract gridiron controlled space, and how movement and use could break up the rigidity of space and allow for alternate spatialities to emerge, creating a new typology of spaces that are fluid.

Figure 1: own photograph

Figure 2: www.gml-art.co.uk., retrieved 19.05.2009

The old drill hall, now converted into a public library, and the municipal courts, originally the town hall, both built in the colonial era and still in use today (Figures 1 and 2)

Figure 3: own photograph

Figure 4: www.upload.wikimedia.org, retrieved 19.05.2009

The civic centre and customs house on the foreshore, both built in the 1930's. (Figures 3 and 4)

The civic building_hypothesis

A revolution that does not produce a new space has not realized its full potential; indeed it has failed in that it has not changed life itself but has merely changed ideological superstructures, institutions or political apparatuses. A social transformation, to be truly revolutionary in character, must manifest a creative capacity in its effects on daily life, on language and on space.

Henri Lefebrve

The tradition of civic building, used to symbolize the power of the state, ordering its citizenry and often creating public spaces and buildings that structure the city, has faded into banality in Cape Town. Specimens survive from the colonial era, most of them still in use for civic purposes, as do the civic administrative centers built during the expanding bureaucracy under apartheid. Since the change to democracy, however, the expected wave of a new typology of civic building and public space has failed to occur. As Henri Lefebrve put it "A revolution that does not produce a new space has not realized its full potential; indeed it has failed in that it has not changed life itself but has merely changed ideological superstructures, institutions or political apparatuses." (Robinson, pp 7D)

From the colonial model to the modernist monoliths built under apartheid, the civic building typology embodied the state and its ideology. The 'revolution' that occurred politically and socially which succeeded in overthrowing apartheid has not written itself into the urban fabric of our cities with a new type of civic building. Instead, the old civic building models are still in use today, as they should be in a country with limited resources, but a new and valid expression for these buildings has not been found.

Civic buildings in essence have always been those places and spaces to which all have access, and which all are compelled to visit, and as a result were the traditional building blocks of cities. After the advent of capitalism, a new dominant element in cities emerged, that of commercial private interests, and has since "reached a scale with which government building or community projects cannot compete with." (Schildt, 1978, pp 111)

As Alvar Aalto puts it in one of his essays titled *The decline of the public building* "Our cities are becoming amorphous masses where town halls, libraries and other communal institutions... are mere corner buildings on leased lots without the traditional imprint of government and the social contract." (Schildt, 1978, pp 112) The idea that governments have social contracts with cities and therefore with their citizenry to provide civic buildings and public spaces is one that is very far removed from the reality of the built environment today. Instead, it seems the haphazard forces of economics and private enterprise have taken on the role of structuring the urban realm.

The dominant element in South African cities, specifically in Cape Town, is the generic tower blocks, mostly corporate enterprises building towers to symbolize their prosperity and success. These private investment buildings have neither an obligation nor interest in the city in terms of the public realm, and the resulting urban environments dominated by the 'right of admission reserved' sign are an everyday experience in South Africa.

Diagram 3

Diagram 3 is illustrating the freeing of the latent energy of the civic administrative building by exploding the rational programme to make way for alternate, temporal and unexpected spatialities to emerge.

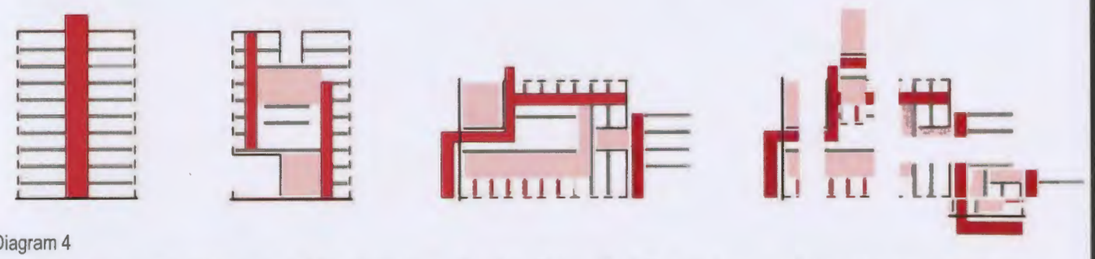


Diagram 4

Diagram 4 is a sectional diagram of a 'typical' tower block, with identical floor plates, circulation and service core at the centre shown in red. Through a conceptual dissembling of the rational building blocks of the tower, alternate spaces, no longer tightly controlled, emerge (shown in pink). Diagram becomes dissembled to the point where the ground plane itself starts breaking up.

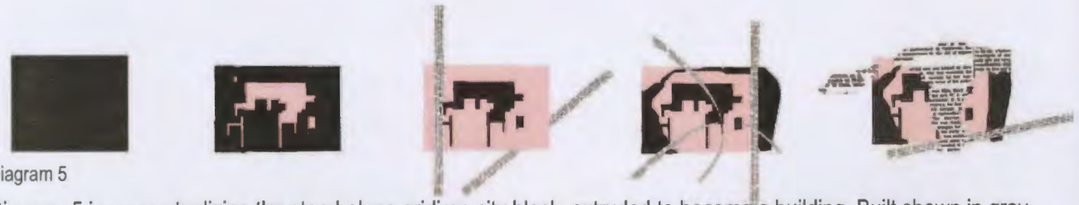


Diagram 5

Diagram 5 is conceptualizing the stand-alone gridiron city block, extruded to become a building. Built shown in gray, and open space in pink - the diagram is inverted, and dialogue across, through and within the block starts to emerge (shown as text). The block is no longer self-contained, but rather reaches out and communicates with the urban surroundings.

Mobilizing space_mobilizing programme

Civic buildings, and especially civic administrative buildings, have an inherent latent energy as every citizen is at some point compelled to visit them. The search for a new spatial and building typology for a civic administrative building that will mobilize the inherent latent energy was undertaken through an examination of the existing model in Cape Town. After investigating civic administrative buildings such as the Department of Home Affairs, the Department of Public Works and the Traffic Department, the tendency for these functions to be housed in generic tower block buildings was uncovered.

The state prefers to lease generic office space rather than take on the responsibility for maintenance and risks of investment. Generic office space refers to those buildings, mostly medium-rise tower blocks, with limited off-street access, vertical circulation achieved by a few lifts and identical floor plates of corridors and cellular offices stacked above. Cellular offices separated by curtain walls, services housed in the ceilings accessed by removable ceiling panels and signage at the lift lobbies providing directions are common characteristics of these buildings.

The premise of this developer formula is that these buildings can accommodate any administrative programme, house any private or civic functions and can be adapted to varying tenants easily. However, these buildings are faced with great difficulties when confronted with changing needs, in terms of security, access and accommodating different programmes. There is an entire state department, the Provincial Department of Public Works on Wale Street in Cape Town that deals exclusively in the shuffling and allocating of office space to other state departments. Besides being a typification of the ineffectiveness of state bureaucracy, after conducting an interview with one of the architects employed at the Provincial Department of Public Works, it was found that the main problem for the Department is that other state departments often need temporal use of space. The requests, generally the need for storage or additional office space originate more from the reality that the buildings housing most state administrative departments are inflexible in terms of temporal space usage and expanding and shrinking state departments, as well as the temporal alignment of departments for certain projects. Resultantly, there is a huge machinery of bureaucracy (the architect interviewed himself had no idea of the number of people working in his department) that has been conceived to deal with this. The charge of housing say a temporary South African Police Force Task Team in an office building accommodating the museums administration presents immense problems in terms of security and office services such as telephone lines and data cabling.

As Low suggests, a new spatial typology "demands a form of thinking that exists outside the bounds of the rational programmatic, the developer formulaic and the economic utilitarian." (Low, 2002, pp 36) The rational programmatic allocation of a certain amount of square meters per employee as used by the developers of tower blocks of generic office space are inadequate even when analyzed on purely functional terms, disregarding the social impact of these work environments on civic servants and public alike. Unlocking the latent energy these buildings have, conceptually, would be an exploding of the rational, utilitarian and functional, an expansion and freeing of the programme.






Diagram 6

Diagram 6: The space, form and programme of a typical tower block with cellular offices.

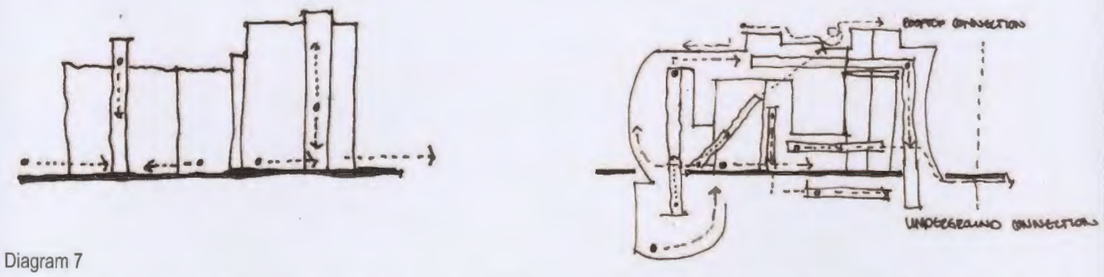


Diagram 7

Diagram 7 is a sectional diagram using horizontal and vertical movement as an energy that breaks free old building forms and plays with connections across buildings, as well as over and under buildings.

Rather than looking for a new symbol to identify the state (the creation of another object building) the production of a new space could be achieved through an interiorisation of the building. A useful analogy can be found in Bernard Tschumi's theories on space, where he compares the idea of the pyramid to that of the labyrinth. The pyramid is a dematerialized conceptualized object, purely visual without any associations and seen as a whole. It is viewed, much like the actual pyramids, as an impenetrable object standing in space. The labyrinth is spatially interiorized, space experienced piece by piece, where space relates directly to time. (Tschumi, 1990, pp 6) The labyrinth consequently has a much richer layering of possible spatial manifestations as the journey through space unfolds.

The latent energy of a civic administrative building, which is presently locked up in the pyramid of generic tower blocks can be released through allowing some of the programmatic components to unfold themselves as a labyrinth, to make space for the unknown, unplanned and temporal. The abstract homogenous spaces created both in the greater urban environment, as well as within these buildings do not allow for a layered unfolding of spaces due to their rigidity. They have been created to control and monitor the people using these buildings on an everyday basis, rationalizing the use of space to the point that there is no option for alternate uses and interactions to emerge. By exploding the functional components of these tower blocks labyrinthine energies could be released.

As Tschumi points out, the architect's role, traditionally, has been to "project on the ground the images of social institutions, translating the economic or political structure of society into buildings or groups of buildings". (Tschumi, 1990, pp 7) As discussed earlier, this has happened previously in South African cities, with the state leaving an imprint on the urban fabric. In today's globally connected and rapidly mutating cities however, there is an "ability of the metropolis to generate unexpected social or cultural manifestations", alternate spatialities that are temporal and form from multiple actions coming together. (Tschumi, 1990, pp 7) These alternate spatialities are unplanned, temporal and unpredictable, defying formal architectural expression. The alternate spatialities do, however, need urban public spaces to manifest themselves, to create spontaneous urban upheavals.

Tschumi puts forward the notion of designing for exactly such an 'urban upheaval', 'designing the condition' for a multitude of events and spontaneous functions to occur rather than 'condition the design' to a few possibilities deemed relevant by the architect and client. Architecture, and consequently spatial production, is reliant on programme, on event and on action. (Tschumi, 1990, pp 7) Civic buildings and the public space they create must be able to accommodate, facilitate and encourage these events and actions, rather than restrict them by being a projection of utopian ideal based on ideas conceived from economic or political decision makers. This would imply an investigation of many layers of pre-existing conditions to inform the design, a bottom-up proposal based on the lived and living reality rather than the top-down imposition derived from statistics.





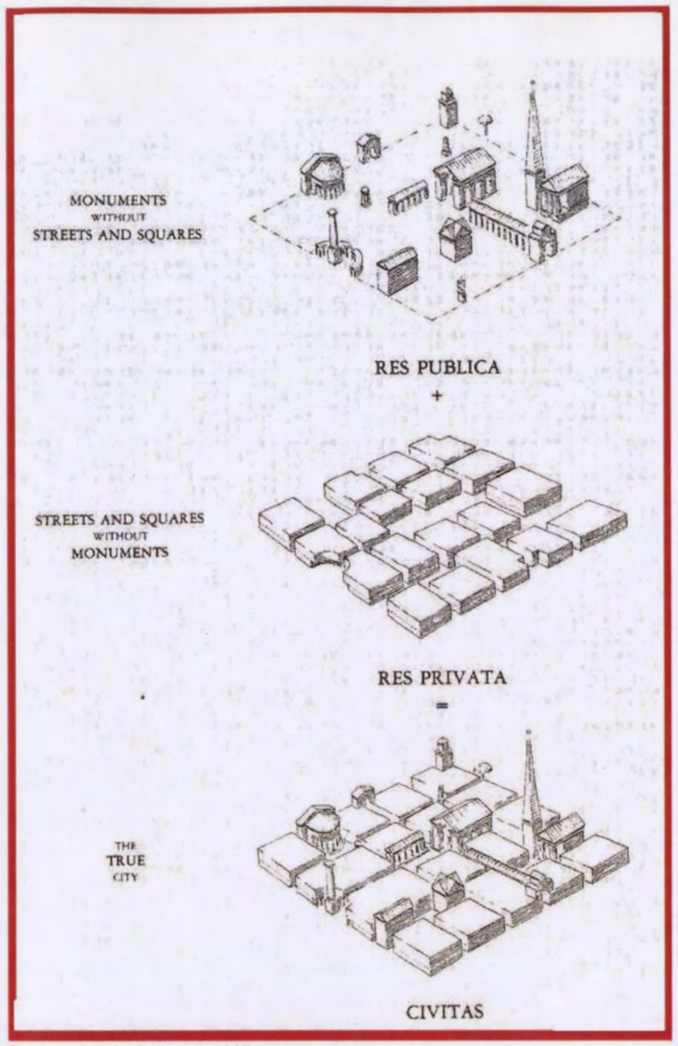



Figure 5: Jencks (ed) et al, 1987

Figure 5 is a diagram by Charles Jencks in his article showing the *res publica* as the structuring element in cities, the *res publica* being those buildings with which certain cities are most closely associated with. The infill, shown as a homogenous and undistinguished massing, is the *res privata*, the private buildings of a city. Together the *res publica* and *res privata* create cities (*civitas*) that can achieve a balance between the public and the private, between that which needs to be provided by the state for citizens and that which economics creates.

The art of *res publica*

A civic administrative building, besides having elements of an office building typology, also has a wider responsibility to both its citizens and its urban fabric. The term *res publica* stems from ancient Greece and their ideas on democracy, and literally means public property, that which is held in common by many people. (Jencks, 1987) The *res publica*, specifically the agora, were public spaces that spawned the ideas of democracy. The *res publica* became the 'marketplace of democracy', a place where decisions were discussed, regulated and implemented.

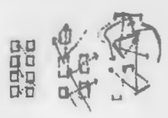
Today, democracy has evolved into the overwhelming bureaucratic apparatus familiar to everyone that has visited institutions such as Home Affairs, police stations or licensing departments. Alienating its citizens through a lack of efficiency and transparency, these bureaucratic institutions representative of democracy are in-conceitedly housed in generic and sealed tower blocks as un-transparent as the inner workings of their departments. There is no interaction between the public and the civic servant, or between civic servants themselves. It is arguable, as stated by Charles Jencks, that "systematic secrecy is the most portent form of control in an information society", with bureaucratic entanglements obscuring the intended workings and processes of these institutions. (Jencks, 1987)

The art of *res publica* then would be to give form and clarity to what goes on within, shedding light on the bureaucratic sealed towers and allowing a platform for discussion, constructive criticism and most importantly access to information. As Charles Jencks puts it in his essay on architecture and democracy:

"Democracy and its institutions have evolved over a long period as the reasoned interplay of contending forces. It may seem perverse to give such an emphasis on conflict and pluralism, since any government always tries to rule in the name of a mythic unity, but the essence of democracy is to allow difference to emerge, opposite views of the good life to coexist, and for short moments, to attain power."

This idea of allowing pluralism to emerge and manifest itself temporally ties in with the notion of Tschumi's 'urban upheaval' where multiple contending forces are given a right to spatial manifestation.

The media, and the access to information it provides to the public is an important and neglected programmatic component in the new typology of civic building. The pluralism and conflict on which our societies are based should be celebrated and exhibited, rather than suppressed and ignored as has happened in the past. The place for this exhibition is the civic building and the public realm, a space for difference and commonality to happen.

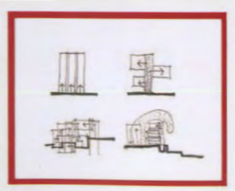


Diagram 8

Diagram 8: Programmatic diagram of a civic administrative building, done speculatively prior to visiting Home Affairs.

Diagram 9 is a more specific programmatic diagram of Home Affairs done after the interview and site visit, with the X symbolising where access is perfunctorily blocked or restricted between levels.
The red shows the circulation, while the yellow indicates space with public access, and the orange space restricted for access to employees only.

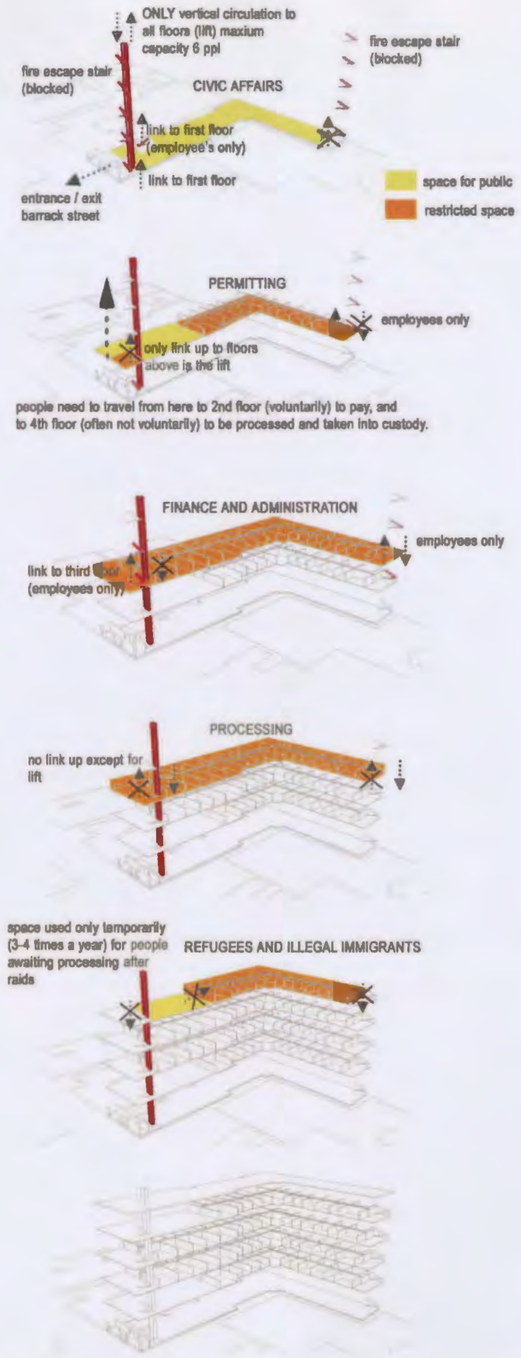


Diagram 9

The civic administrative programme

After having investigated the different state departments and having tried to understand their functions respective of each other and internal workings and dealings with each other, the Regional Department of Home Affairs was chosen for the thesis. The sub-regional Home Affairs of the Western Cape is currently housed in a leased medium rise building on Barrack Street in central Cape Town. The choice of programme was as much informed by the research as by the total unsuitability of the current Home Affairs building to its programme.

An extensive interview with the Regional Manager of Home Affairs of the Western Cape was conducted, as well as a thorough site visit of the existing building.

Generally extremely crowded with masse of people queuing and waiting, the ground floor is taken up exclusively by civic affairs, where identity papers, birth certificates, passports and the like are applied for and collected. Accessed from the street by one entrance, the overcrowding is further aggravated by the fact that a tiny side entrance off the main entrance leads to the only staircase and lift accessible to the public. The only lift in the building can accommodate a maximum of six people The permitting section is housed on the second floor, and foreigners and tourists looking for work permits or visas need to access it via the lift or staircase. The second and third floors are taken up by administrative functions such as the finance section and the administration section, processing papers and printing documents. On the fourth floor is the refugees and illegal immigrants section of Home Affairs. This floor is dedicated to the issue of aliens, and has a large space in it where Home Affairs and the Police Force process the papers of foreigners in the country illegally after raids have been undertaken. These raids are undertaken about 4 times a year, and generally detain between 50 and a 100 people. The idea is that their immigration papers are processed in terms of legal paperwork at Home Affairs within a day, and be taken to the Central Police Station holding cells to await trial. More often than not, the police station is overcrowded and the detainees are taken away to Pollsmoore prison.

The need for the public to access the first and second floors and the limited capacity of the building to accommodate vertical circulation makes access difficult to regulate, as shown in diagram 9. The detainees on the fourth floor frequently and sometimes successfully try to escape, either through the barred staircase, via the lift or by climbing into the adjacent parking garage building, causing chaos. On occasion, a foreigner or tourist, having violated the terms of their visa will be taken to the fifth floor for detention and legal action – via the only public lift. The staircase is locked to some floors, and opens to others. Many areas where confidential and important civic paperwork is processed can be accessed by simply walking in.






Diagram 10:
Programmatic diagrams showing the three components of a Home Affairs building: the functional programme as drawn up by the state, the media as the mediator and the public as the users and beneficiaries. Through an unpacking and unpeeling of the internal programme of Home Affairs as well as pulling the media and public into the programme, the diagram is further distorted until the boundaries between separate components are completely blurred.

Diagram 11:
Three programmatic components, now equally weighted, shown in sectional diagrams, first separated with separate accesses, then fragmented with mediating spaces shown dotted, the moulding of the ground plane and flowing circulation and mediatory space.

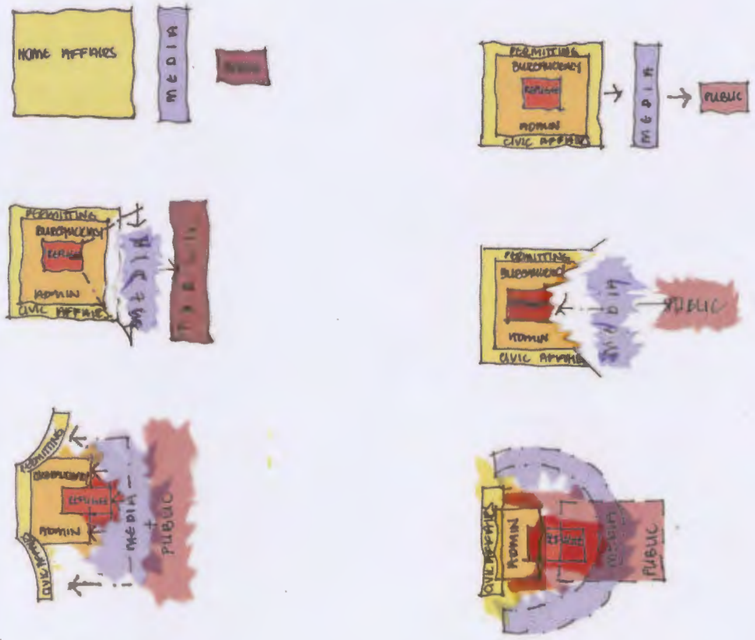


Diagram 10

The main complaint about the building by the civic employees was that a multilevel Home Affairs is not viable, as generally the other Home Affairs Regional branches in Bellville and Wynberg are two to three storey buildings. These solve the security and access problem by having enough ground floor space for all the publicly accessible functions to be housed, and security control is applied to the administrative and processing levels above. Due to the necessary proximity of the Regional Home Affairs to the Central Police Station, it has to be located in the fairly dense and established urban environment of the CBD, and consequently is housed in a multilevel tower block building.

The other complaint about the Barrack street offices is lack of useable space – there are currently 80 employees working in the building, and according to official state space allocation, this would need a space of about 1900 square meters (about 10 square meters – including amenities – per administrative employee). The building floor space totals 2400 square meters, well over official requirements. Due to the convoluted and impractical organization of cellular offices and corridors, spaces are so inflexible that their possible uses are very limited; an example being the large room used to process detainees' immigration papers, only used for a few days a year.

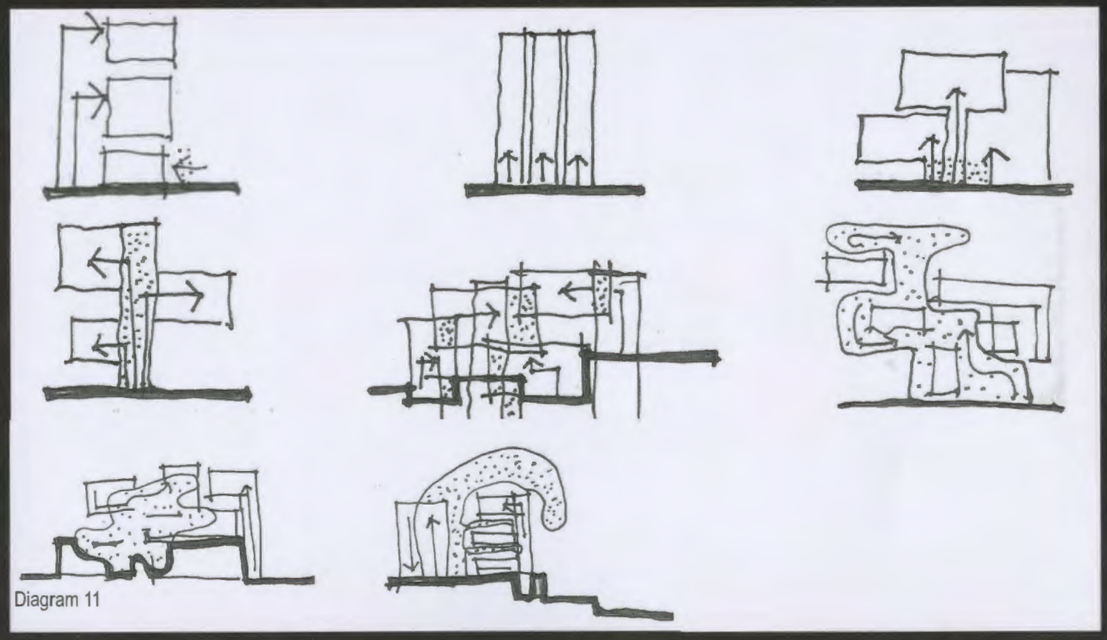


Diagram 11

Typology investigation_the office building

The following chronology is an investigation into the typology of office building. This investigation was undertaken through an examination of economic fluctuations, the industrial revolution, technological advances, social theories on the workplace and world events, as well as a look at buildings built in Cape Town and the events that shaped South African history.






Ref: Master Builders Association, Cape Peninsula, 1991, All our Yesterdays, A Tribute to 100 years of Building Excellence, 1891-1991

HOUSES OF PARLIAMENT, 1885

CITY HALL, 1905

CAPE ARCHIVES, 1908

SHELL HOUSE, 1929

> architect: WH Grant
> 8 storey high brick building
> facade been declared National Monument

SOUTH AFRICAN MUTUAL LIFE ASSURANCE SOCIETY, 1939

> architect: Louw & Louw
> 12 storey high, basement and ground floor above
> art deco style
> tallest building in the city at the time

TRUST BANK, 1958

>architect: Gilbert Colyn
>inspired by Seagram bldg
>18 storey steel frame
>glass and aluminium curtain wall
>erected in 52 working days

Gridiron Plan well established in Cape Town (Thomson Map) but certain limitations imposed due to topography — 1700

Dutch Colonialists leave, replaced by British Colonialists — 1730

Slavery abolished — 1834

Cape Town divided into 6 districts — 1867

Union of South Africa established — 1910

Native Land Act passed — 1913

National Party takes over — 1948

Group Areas Act passed — 1953

EARLY 20th CENTURY

1850 INDUSTRIAL REVOLUTION

ROARING 20's 1920's 1929 WALL STREET CRASH GREAT DEPRESSION

1914 WORLD WAR 1 1918

1938 WORLD WAR 2 1945

1950's

12 Early office: 9th century painting of St Matthew working at a desk

13 19th century high status office work

ADMINISTRATIVE REVOLUTION

> concentration of enterprise and finance
> techniques of mass production developed
> large professional corporations emerge

NEW STATUS OF OFFICE WORK

> originally performed by educated men (rarely women)
> increased levels of education of general populace
> women entering the workplace
> 'proletarisation' of office work (increasing similarity to factory work)
> emergence of 'white collar factories'

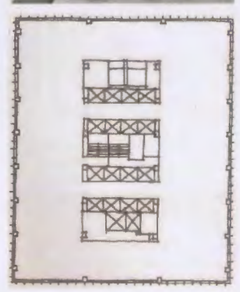
Ref: Jester, T. (ed), 1995, 20th century building materials, McGraw Hill, Washington

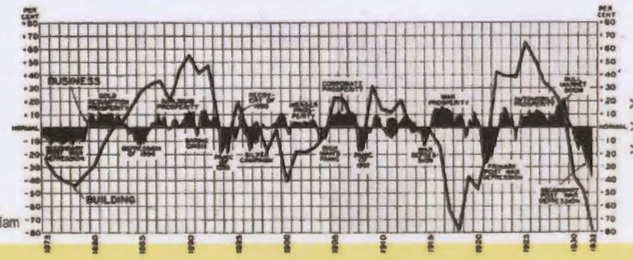
Larkin building, Frank Lloyd-Wright

' open plan office building
' skylights and basic form of airconditioning
' services arranged to bring 'comfort to the daily worker'
' seen as model administrative building

GREAT DEPRESSION
economic conditions themselves promoted standardisation and mass production
>no of raw materials in process used reduced
>narrower production lines
>simplified price structures

Union Carbide Building, Skidmore Owings and Merril, NY





Ref: Van Meel, J., 2000, The European Office, 010 Publishers, Rotterdam

Building activity has been characterized by cyclical peaks and valleys, as this graph of U.S. building cycles from 1875 to 1932 shows. Many twentieth-century building material advances occurred during periods of prosperity.

SCIENTIFIC THOUGHT APPLIED TO WORKPLACE

> industry developed ways of maximising efficiency applied to workplace
> work process divided into a series of 'repeatable steps'
> large open plan floor spaces developed

THE GLASS BOX

> continuous light glass facades
> introduction of air-conditioning and floor lighting allow deeper floors
> floors more flexible, ecomonical and easier to fill (no more 'awkward corners')

TECHNOLOGY

THEORIES

> Henri Fayol (French engineer): division of work, authority and unity of command
> Frederick Taylor (American efficiency engineer): scientific management theory emphasising the individual, performance and output
> communication and information technologies: supported a linear approach to organization in order to record, retrieve and create information

Ref: Antonelli, P. (ed), 2001, Worksphere, Design and Contemporary Work Styles, MOMA, NY

1902
PORTLAND CEMENT
first standards for gray Portland cement published
white cement developed (visual difference in concrete)
lightweight aggregates experimented with introduction of aeration
use of shale in 1920's
expaned slag in 1930's
generally concrete still mostly used in industrial or storage structures

Ref: Jester, T. (ed), 1995, 20th century building materials, McGraw Hill, Washington

> standardisation and mass production developed (esp in industry)
> typewriters, calculators and telephones become commonplace

1920's
STEEL AND METALS:
previously only 4 or 5 types of steel produced, by the 1920's an entire range of alloys was avalable. Steel-framed structures and curtain walls would develop
MATERIAL DEVELOPMENTS DURING WORLD WAR 1
Plywood (used on airplane fuselages) became important to the furniture industry
Laminated glass (used to strengthen military windshields) was adapted to buildings and motorvehicles
Military surplus of metals finds itsself disposed of as standardised parts in building industry
thermal insulation, accoustic properties and lighting scientifically researched

> non load-bearing facades, steel frame bldgs - external cladding needs to have thermal insulating properties (asbestos, cork etc used to insulate)
> curtain wall construction (moveable partitions)
> innovations in artifical lighting and climate control
> suspended luminous ceilings (services in ceiling)
> size and location of offices indicate stature/rank

MATERIAL DEVELOPMENTS IN WORLD WAR 2
> aluminum (more costly than steel in 1920's and 30's) generally used as trim or alloys in bldgs - advances in WW2 created aliminium laminates that were coated to avoid corrosion and (relatively) cheaply manufactured

Ref: Master Builders Association, Cape Peninsula, 1991, All our Yesterdays, A Tribute to 100 years of Building Excellence, 1891-1991

CARTWRIGHTS CORNER HOUSE,

Forced removals begin in District Six

1968

BP CENTRE, 1972

> architects: Revel Fox and Partners
> building twisted at an angle to city grid
> 35 storeys tall (tallest bldg at time of construction)
> 3 level parking and plant basement, major rock excavations undertaken
> central core built ahead of floors, allowing construction of one floor in 4 days

GOLDEN ACRE, 1973

> architects: Louis Karol
> original client Cape Town City Council, but building later acquired by Sanlam
> complex covers 2 acres
> 29 storey office block, 18 floors of which are office space - each floor having 860 sqm of column-free office space
> council insisted on providing the covered piazza for the general public, as well as provisions such as cinemas for public entertainment
> 20 escalators in building
> during construction, concrete ring-beam erected on columns allowing work to be done above and below, drastically cutting construction time

CUSTOMS HOUSE, 1970s

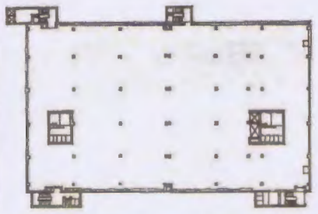
SA RESERVE BANK, 1975

> architects: Hannes van der Merwe
> tower block above four storey podium designed to allow 'breathing space' to surrounding building
> 19 storey tower block, consisting of two triangular structures, angled to face the prevailing wind
> podium clad in polished granite, tower block tinted glass and anodised aluminium window curtain walls

1960's
OFFICE LANDSCAPES

1970's
EXPERIMENTAL OFFICES

1973

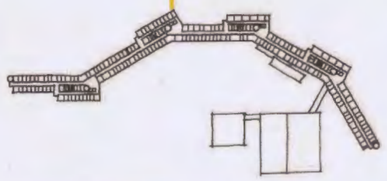


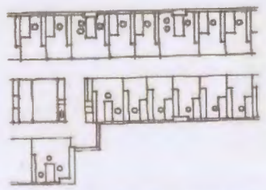
Bertelsmann Building, Guttersloh, Germany

oil crisis and economic downturn
> popularity of office landscape fades
> modern technical innovations no longer financial viable

Ref: Jester, T. (ed), 1995, 20th century building materials, McGraw Hill, Washington

1974





IBM Office Headquarters, Stockholm

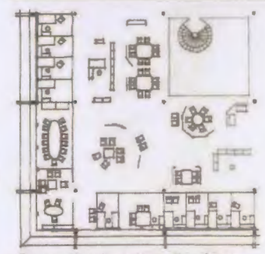
> employee's representative unions become influential
> regulations adopted regarding use of space per person, access to daylight and an outside view
> preference given to cellular offices

1972

Centraal Beheer, Herman Hertzberger, Apeldoorn, The Netherlands

> return to 'human scale'
> challenge to cellularised layout
> creation of 'working community'
> employee's encouraged to personalise space
> democratic approach to work environment
> no hierarchy expressed in building
> departure from 'furniture systems model' used in America where innovations in workspace furniture seen as key to creation of new office spaces

1978



Canon Headquarters, Tengbom Architects, Sweden

> hybrid solution - combi office
> cellular offices and open space

Ref: Van Meel, J., 2000, The European Office, 010 Publishers, Rotterdam

THEORIES (CONTINENTAL EUROPE)
> Quickborner Group (German management consulting firm) proposed more organic, fluid facilities as opposed to the rationalised, systematised organisation of boxes
- influenced by modern management theorists
- based on analyses of communication, work processes, paper flow
- free flowing floorplans (Burolandschaft)
- seen as a more democratic and non-hierarchical

Ref: Antonelli, P. (ed), 2001, Worksphere, Design and Contemporary Work Styles, MOMA, NY

THEORIES (AMERICA)
> International Style
- rationalized, cellular planning
- hierarchies expressed in building, shown by location, size and number of windows of workspace (clerical work open plan)
- expression of utility, efficiency, modernity
- emphasis on 'systems furniture'
- services (ducts) standardised and rationalised

1950's and 60's
> belief that science and technology, applied to mass production, would meet any need
> innovations in pre-stressed concrete for highways and highrises, seen as quick assembly method for reconstructive post war years
> glass and steel box construction further developed (curtain walls) but extensive use of glass for aesthetic reasons took a knock in the energy crisis of 1973
> experimentation in cantilevers, plate and shell structures, tensile roofs, geodesic domes, space frames and inflatable forms
> plastics started to develop
> material science becomes recognised as a separate discipline

Ref: Jester, T. (ed), 1995, 20th century building materials, McGraw Hill, Washington

MANAGEMENT STYLES
> X Style
- dictatorial
- punishment oriented
- discouraging individual freedom and expression
> Y Style
- premise that people have a basic propensity to seek challenge
- high performance developed through encouragement and increased opportunity

"After the second house beyond the polystyrene you'll come to a two-storey phenolformaldehyde. That's it"
Ref: Jester, T. (ed), 1995, 20th century building materials, McGraw Hill, Washington

Ref: Master Builders Association, Cape Peninsula, 1991, All our Yesterdays, A Tribute to 100 years of Building Excellence, 1891-1991

CIVIC CENTRE, 1979

> architects: Hannes van der Merwe
> gathered together variety of scattered municipal departments
> blocking of view to harbour major concern in design, later made redundant by closing down of passenger lines through the harbour
> podium block and 22 storey tower block
> tower block: 180m long, 90m high, housing about 2000 municipal office workers
> underground and aboveground parking for 2000 cars

35 WALE STREET, 1986

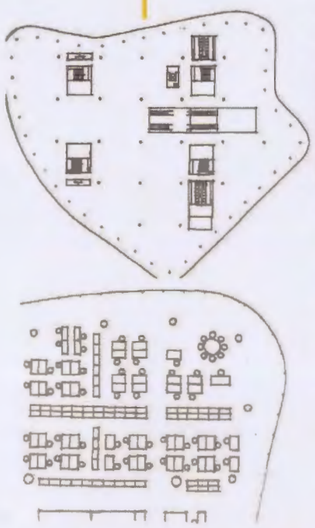
> architects: Douglas Roberts
> post-modern office block
> setbacks used to regulate bulk and allow for sunlight into bldg

THE TERRACES

> architects: Munik Visser
> post-modern office block
> 19 storeys
> face-brick facade

1980's
ELECTRONIC OFFICES

1975

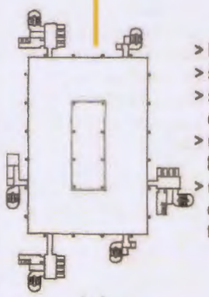


> British office market dominated by developers, as opposed to rest of Europe where corporations prefer to build their own buildings
> very controlled and 'clean' working environment, not personalised
> rigid and orthogonal arrangement of workplaces
> technologically driven: raised floors with integrated service trenches - allowing space for multitude of cabling to come in future years

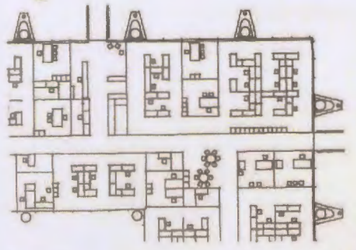
Willis Faber & Dumas, Norman Foster, Ipswitch

energy crisis draws to a close, advent of personal computers

1986

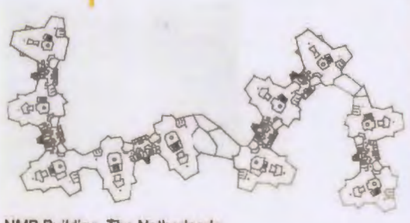


> high-tech 'style' building
> services and technology drive design
> secondary services (stairs, toilets etc) clipped onto outside of building
> raised floors and suspended ceilings house cabling and services
> regarded as first European building demonstrating how information technology could change architecture



Lloyd's Bank of London, Richard Rogers

1987



NMB Building, The Netherlands

> privacy, individual climate control, daylight, openable windows and an outside view crucial in design
> services housing information technology did not dictate form, but instead trunking along perimeter housed them as each workstation was located next to a window
> primary focus on comfort of office workers
> buildings seen as 'cities', subdivided into separate houses united by internal streets or squares, connected by atria
> European cities' historic fabric tightly knit in contrast to the newer, gridiron planned cities of America, which had an effect on the design of new office buildings

Ref: Van Meel, J., 2000, The European Office, 010 Publishers, Rotterdam

AFFECT OF COMPUTERS ON OFFICE BUILDINGS

> data cabling for equipment
> extra cooling/climate control requirements to keep cabling and equipment safe
> advent of 'intelligent' or 'smart building' with HVAC (Heating, Ventilation and Air Conditioning Systems)
> security and maintenance regulated automatically
> financial services expanding rapidly as computers change conditions of their business - demand for large, open trading floors with capacity to accomodate IT infrastructure

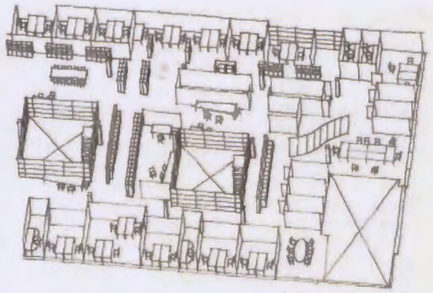
Ref: Antonelli, P. (ed), 2001, Worksphere, Design and Contemporary Work Styles, MOMA, NY

end of Apartheid

1994

1990's
VIRTUAL OFFICES

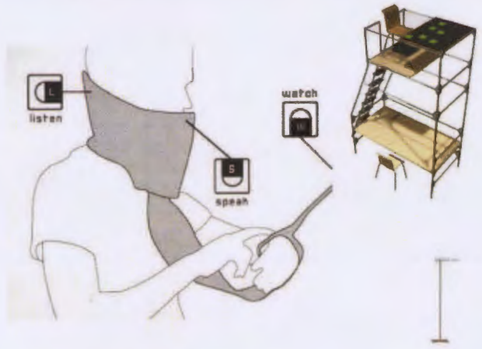
1997

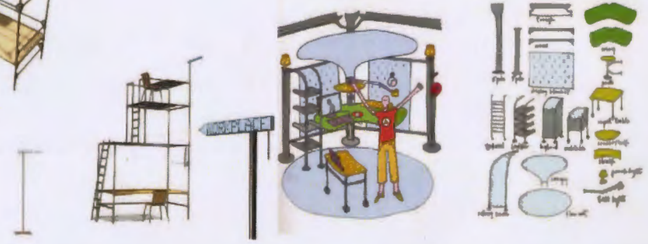


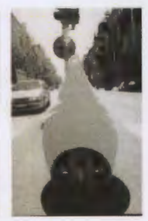
Dynamic Office, Dutch government, Uytenhaak

> combi-office concept coupled with desk sharing
> idea that employee's move around the building and use different purpose-designed workplaces for different activities
> 'cockpits' for solo activities; open spaces for group work and relaxation areas for informal conversation

Ref: Van Meel, J., 2000, The European Office, 010 Publishers, Rotterdam







Ref: Antonelli, P. (ed), 2001, Worksphere, Design and Contemporary Work Styles, MOMA, NY

AFFECT OF INFORMATION TECHNOLOGY ON OFFICE BUILDINGS

> radical new ideas on organisational developments triggered by new era of information technology
> whereas in the 1980's office design had focused on accomodating information technology, new information technology brought virtuality into the office
> mobile phones and laptops meant work no longer had to be place-specific or time-specific
> Alternative Officing emerges, creating less hierarchical and 'nimble' offices without restraints of geography or time
> social connections no longer necessary to do work
> total disconnection between the work and the work environment

Ref: Antonelli, P. (ed), 2001, Worksphere, Design and Contemporary Work Styles, MOMA, NY

FACTORS CONTRIBUTING TO SHAPING THE OFFICE BUILDING

URBAN SETTING:
cities structured and designed on grid-iron plan have larger, deeper tall structures than historically evolved cities with a tighter urban fabric

MARKET CONDITIONS
owner-occupied projects tending to be more specific in form and function can only be erected in times of economic stability. developer driven markets often not as experimental in office design

LABOUR RELATIONS
labour unions complaining about sterile and incondusive working environments can affect the quality of office space produced

CULTURE
status and social standing of corporations affect the shape their office buildings take. and the status of their employees. issues such as provision of parking and secure premises play large role

REGULATIONS
zoning and building regulations concerning natural lighting and ventilation have direct effect on the design of office buildings

ECONOMIC VIABILITY
esp in SA as a developing country, tendency for experimental design is suppressed due to investors not wanting to take risks. new building technologies and innovations regarded sceptically, as with new forms of organisation.

Typology investigation_the office building

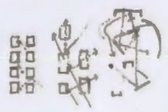
From the investigation, it can be concluded that the origin of the isolated tower block office building model is partly a result of technological innovations and rational spatial planning theories, and partly to economic concerns promulgating standardization and maximum space utilization. Human comfort and the psychological effect of these spaces and workplaces are often secondary concerns, especially in the office buildings built in the United States of America. The footprints of these building are square-shaped rather than rectangular, the resultant deep spaces not reached by natural light or ventilation. The cost of land and the efficiency and ease of construction of square structures have resulted in developers simply extruding these land parcels to maximize bulk and floor space. Strict adherence to rational deductive standards served to create non-commitant buildings that have very little interior qualities.

Alvar Aalto puts forward an apt analogy of a tubular steel chair designed in the modernist era. The chair, made from lighter and less materials than before, can easily be mass-produced. However, the chair is not a good heat conductor, and the shiny steel emits a glare; the chair is not cosy. The term 'cosy' is an irrational one, but comprised of physical criteria such as heat conduction and light reflection. The question then poses itself: is the chair rational? Or does it just solve certain rational criteria, those of structure, economy of materials and ease of mass-production? In terms of human comfort, the chair is a failure – in terms of technical innovations and solutions, it is a masterpiece. As Aalto puts it: "If we proceed from technical functionalism, we shall discover that a great many things in our present architecture are unfunctional from the point of view of psychology or a combination of psychology and physiology." (Schildt, 1978, pp 48)

The European office buildings are more progressive in terms of human comfort and social theories on work hierarchies and structures as there has been a history of influential administrative workers unions, who have been significant in campaigning for a more humane and enjoyable workspace. Resultantly, there are much more stringent laws in Europe regulating natural light and ventilation to buildings of this type, stipulating for example that each cellular office needs to have at least one opening window to the outside. Anti-hierarchical, self-managerial and non-territorial theories on the workplace resulted in experimental office spaces being allocated and subsequent workplace theories being refined.

Another finding of the investigation is the way which electronic and digital innovations fundamentally changed the nature of office work, it now being possible to work from any place or space, shifting possibilities to include the home as a workspace. However, it did not fundamentally change the typology of office building – the problem of data and electronic cabling solved by service cores and ceiling or floor ducts, the external envelopes and floor plate configurations remaining unaffected. Office buildings no longer had to locate themselves in central business districts, nor did they need an affinity with any place, but office buildings continued to be built. The digital era did have an effect on workspace planning within these buildings, allowing non-territorial offices to emerge where employees chose their workspace on a daily basis. These experimental environments, based on concepts such as hot-desking or hotelling, where the employee would receive a different allocated space every day, and connect to the networks wirelessly on portable computers, did present problems. Employees no longer had any empathy to their workspace, feeling uprooted and out of place. In such an environment, personal communication and interaction became secondary, as people communicated more easily electronically than physically having to seek someone out.

It is arguable that these virtual offices were rejected, as the technology on which employees necessarily relied was very novel, unusual and radical. Now, almost 20 years later, communications via wireless networks have expanded to reach into most people's private lives, notwithstanding the far-reaching effects they have had on the workplace. Whilst promoting personal interaction to allow for a functioning workplace, virtual technologies cannot be overlooked, especially in the context of rethinking a civic typology that needs to be connected globally but rooted locally.



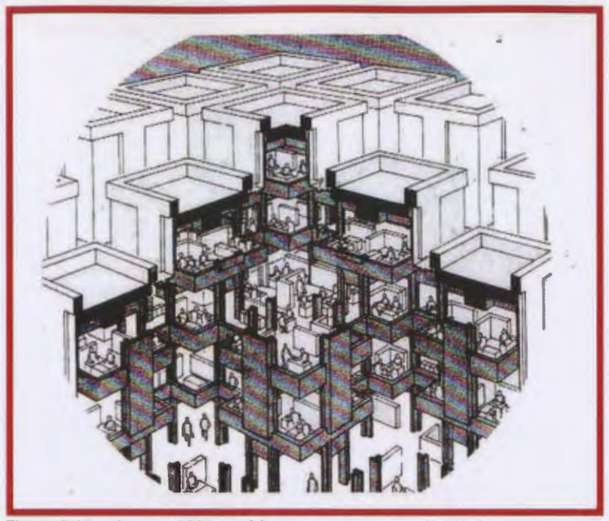


Figure 6: Hertzberger, 2001, pp 81

Figure 6: Space concept done by Herman Hertzberger, showing the composition of universal units in an axonometric.

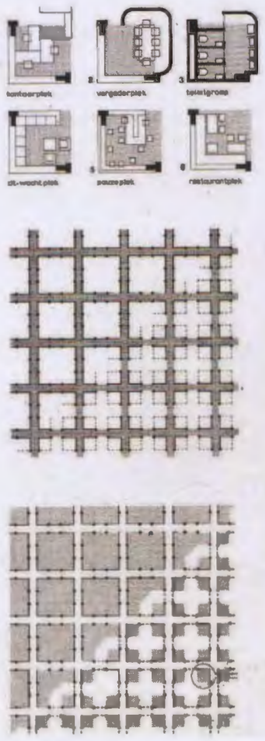


Figure 7: Hertzberger, 2001, pp 81

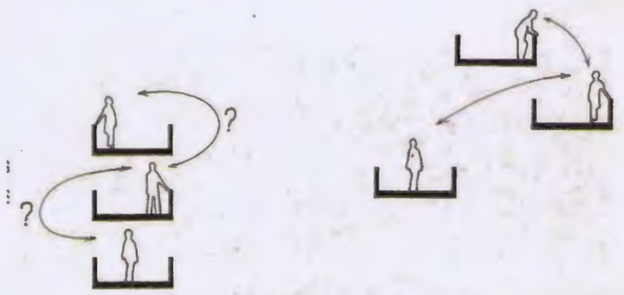


Figure 8: Hertzberger, 2001, pp 83

Figure 7:
Different configurations of the universal unit for different programmatic functions done by Hertzberger. The two diagrams below illustrate two examples of structure and interpretable zone to be filled in with the universal unit.

Figure 8:
Diagram done by Hertzberger showing the importance of visual links between levels allowing users to see each other.

Precedent study - Centraal Beheer Office Building, Herman Hertzberger

The Centraal Beheer Office building in Apeldoorn was chosen as a precedent study for an administrative building as the driving concept for the project was to create a building flexible enough to allow for the frequent changes in the needs of the company whilst still creating a coherent corporate headquarters. The idea of the building as a miniature city, with hierarchies of spaces negotiated through various layers of public and private is central to many of Hertzberger's projects. In Centraal Beheer, this was taken one step further by the building being made up of "equal spatial units, like so many islands strung together", allowing for each spatial unit to be able to accommodate different programmatic components, making the spatial units "polyvalent". (Luchinger, 1987, pp 87) By distilling the programmatic needs down to its lowest common spatial denominator, and through a multiplication of this smallest spatial unit, the building itself now "proved capable of meeting virtually all spatial requirements." (Luchinger, 1987, pp 87)

The basic structure of the building acts as a fixed spine, housing spaces such as circulation and services, contrasted by the "complementary variable and interpretative zone". (Luchinger, 1987, pp 88) The variable zone is where the programmatic flexibility stems from, allowing enough ambiguity whilst maintaining the specificity of the spatial unit. The circulation is arranged in the shape of a windmill straddling the floor plan, and the internal 'pedestrian routes' are continually criss-crossing and weaving between inside and outside. The central atrium is the point where all the circulation routes converge, and houses the escalators and amenities. The idea is that "outward appearance and inward spatiality are a transformation of each other, illustrating a metamorphosis from volume to space, and vice versa." (Hertzberger, 2001, pp 78) Hertzberger placed much emphasis on the creation of a non-hierarchical workplace, playing with fixed and fluid elements and the transmutation of volume and space as ordering elements rather than a corporate pecking order. Employees are encouraged to take ownership of their allocated workspaces, as "they must have the feeling of being part of a working community without this resulting in the anonymity of massive scale" – no small feat considering the 1000 employees working in the building. (Luchinger, 1987, pp 89)

Although the building internally seems to function as intended, with only minor alterations done in 15 years of use, it does present problems in terms of fitting into the urban environment due to its stepped boundaries creating ill-defined edges to the urban realm. In addition, when looking at the massing and ordering of the building, it seems questionable how coherent circulation and orientation are once inside the building, as the distinction between inside and outside and volume and space seem very blurred. As the building is thought of as a self-contained city, it turns itself inwards, and instead of a legible entrance has many entrances and exits throughout the complex.

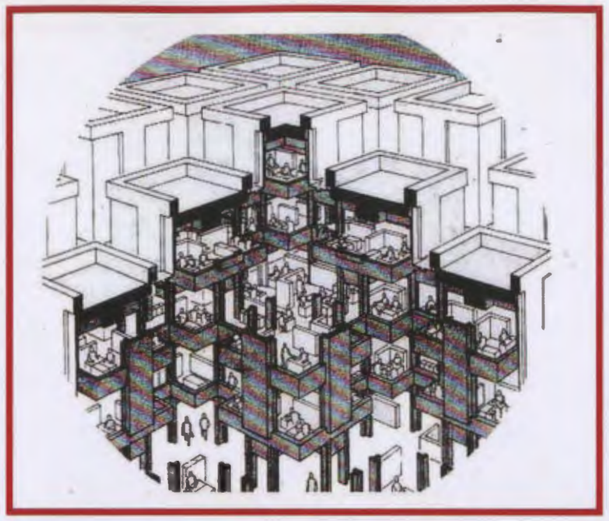


Figure 9: Luchinger, 1987, pp 118

Figure 9:
Employees personalizing their work space.

Figure 10: Hertzberger, 2001, pp 81

Figure 10:
Central atrium space.

The case study applies to the ideas discussed on civic administrative buildings in that Hertzberger successfully created an office building that could adapt, and if necessary, expand to suit changes in the needs of the company without becoming obsolete or dysfunctional. As discussed earlier, the generic tower block housing Home Affairs in Barrack Street does not allow for any spatial or programmatic flexibility, its dysfunction sometimes manifested disastrously when detainees escape into the public.

Another important aspect of Centraal Beheer is the idea of creating a workplace that allows employees to feel at home, one with which they can identify, and subsequently, one they take personal care of and take pride in. The extent to which the Centraal Beheer spaces were personalized can be seen from the photograph in Figure 9. The idea of creating spaces that were suitable for specific uses by employees would encourage them to appropriate the space, allowing "users to become inhabitants." (Luchinger, 1987, pp 119) A problem uncovered through the research of state departments is the lack of interaction between employees - many not being aware of the person in the next cubicle's responsibilities. They are alienated, as much from each other as from the work they do. Certainly partly a result of state management, as well as a general lack of interest in the workplace as an area to research and improve, this alienation is also a result of the anonymous and frustrating spaces that civic employees find themselves in. The issues state departments have with being unable to maintain their own buildings to an acceptable standard are direct consequences of their own employees feeling a lack of affinity to their workplaces.

Hertzberger's theories on space as a social catalyst came to bear fruit in the Centraal Beheer building. Collective space, Hertzberger argues, is found in cities everywhere: shopping malls, theatres and cinemas. Collective spaces, however, are not social spaces as there is no interaction between people in these spaces. Collective space transforms into social space through architectural gestures such as visual links, circulation intersections, transparency and the ambience of natural light. These spaces are ones where people will naturally pause, encouraging social interaction, allowing space for the unexpected. (Hertzberger, 2001, pp 38-39) The Barrack Street Home Affairs building does not have any such spaces, all circulation space a strict minimum, with some cellular offices perfunctorily converted to kitchenette areas for the staff.

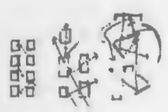
Conclusion

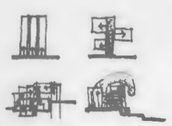
Through an investigation of the production of space in South Africa today, space was identified as the medium which embodies the ideologies of the day - be they political as in the past or socio-economic as presently. From political ideologies of oppression to the uncontrolled economically fixated developer activities, space in South Africa seems to have forgeone one exclusionary practice for another. Urban environments are fast becoming identifiable with the ubiquitous 'right of admission reserved' sign as a shrinking public realm gives way without protest to a commodified and controlled privately owned realm.

Civic building as a typology was identified as having an inherent responsibility to its citizens and urban realm, with governments having a 'social contract' with cities to provide civic buildings and public space. The post-apartheid revolution has not yet produced its own typology of civic buildings or space, has not yet succeeded in writing itself into the fabric of our cities. Instead, civic building has diminished and there is no longer a discernible typology of civic buildings.

The search for a new typology of public space and civic building led to an investigation of existing conditions in Cape Town, where many state departments are housed in leased unremarkable buildings. These commonplace buildings are as much a product of the developer formulaic of generic office building as of a lack of state reluctance to maintain and invest in their own buildings. The civic administrative building, housing Home Affairs, was chosen based on these criteria and by a realization that it has an inherent latent energy due to the fact that every citizen is compelled to visit it at some point.

Through a reading of the theories of Bernard Tschumi on space, where space is a product of event, action and the pre-existing multiplicity of conditions endemic to the urban realm, latent energies within the rational tower block can be conceptually set free, allowing a manifestation of manifold spatial typologies rather than a reduction to a few. This production of space is based on giving voice to multiplicity and indeterminacy, to that which defines our society today. The civic administrative building typology holds the key for the creation of a new typology of space that is reflective of our society, which allows pluralism to emerge without reductive and rationalist thinking.



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List of Figures

All diagrams done by Stephanie Roland

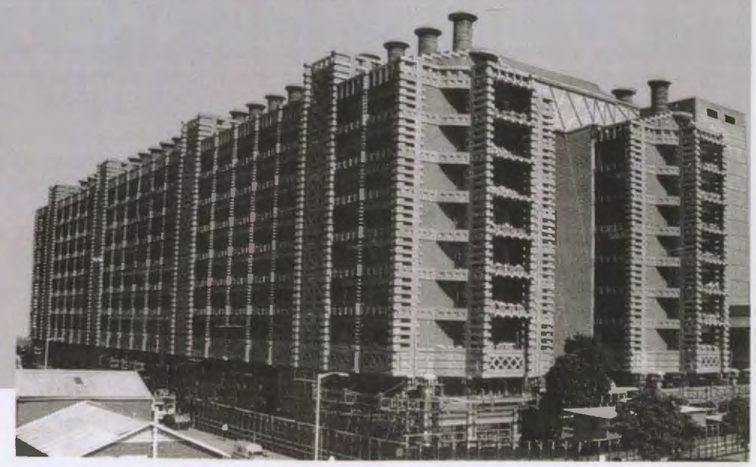




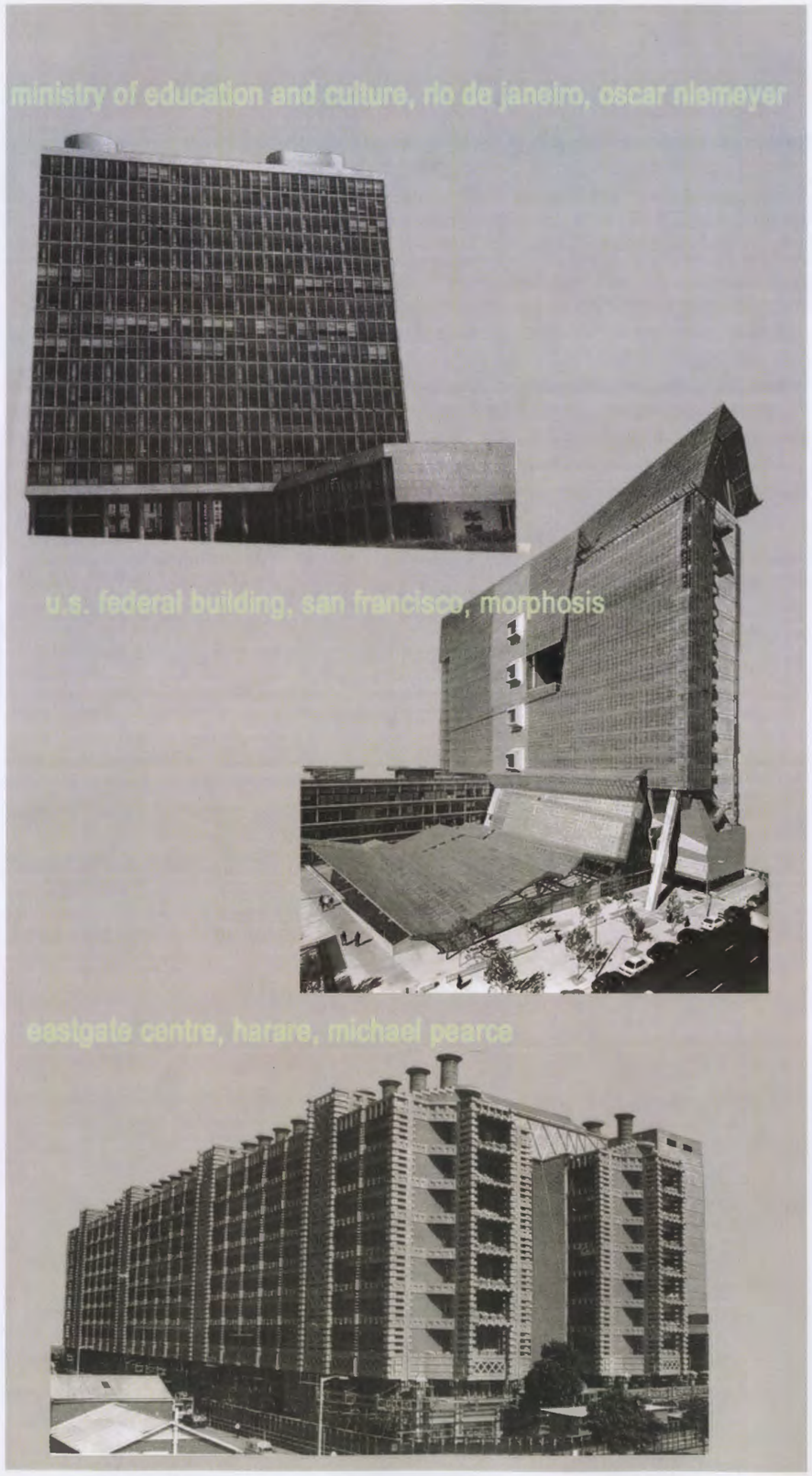

ministry of education and culture, rio de janeiro, oscar niemeyer

u.s. federal building, san francisco, morphosis

eastgate centre, harare, michael pearce



CHAPTER 2
The responsive facade_Threshold between building and public space
Technology Research Document



Introduction

The theoretical component of the thesis project is focused on the typology of the civic administrative building and public space, and how a re-imagining of this type in terms of space and programme can contribute to the urban environment. The premise of the theory is that this can be achieved by examining closely the programmatic components that make up civic administrative buildings, and break open their latent energy to create a new typology. The technology project aims to look at buildings with similar programmatic components which have a relation to public space.

Three projects were chosen as analytical case studies for this project: Lucio Costa and Oscar Niemeyer's Ministry of Education and Culture in Rio de Janeiro; The San Francisco Federal building by Morphosis in San Francisco; and the Eastgate Centre in Harare, Zimbabwe, by Michael Pearce.

Although architecturally, materially and conceptually very different, all three case studies were chosen for comparison as they are all medium-rise (the tallest being the San Francisco Federal at 18 storeys) office buildings. Having been built in very different locations around the world, and building completion spanning from the Ministry of Education and Culture in 1943 to the completion of the US Federal in 2005, the core programmatic components in each of these three buildings are nonetheless uncannily similar: the provision of a positive working environment for the office workers, within a limited budget, using the materials, resources and technology available. All three case studies locate themselves within their specific time and context by being climatically responsive. Both the Ministry of Education and Culture and the San Francisco Federal are civic administrative buildings, and both were seen at their respective times of completion as landmarks, both architecturally and technologically. Both buildings also make larger urban gestures, creating public space in the urban fabric of the city. The Eastgate Centre, whilst not being a civic administrative buildings is nonetheless a highly public building, determined both by its programme as a retail and office complex as well as by its design which gives high importance to the public space which ties the entire complex together.

The focus of this paper is the responsive facades that all three case studies have in common, not only in terms of climatic and contextual responsiveness but also in relation to the public space that is a major component of their particular programmes. By looking at the rational building components such as organization of services and circulation, floor plate configuration and structural systems, the technological realization of these facades, in terms of materiality, detailing and climatic responsiveness is analyzed.

NOTE:
As there was limited information available on all three buildings, some of the information had to be taken from less credible sources such as the internet and magazine articles. Diagrams analyzing the responsive facades had to be hand-drawn due to an unavailability of published material, and as such are personal deductions from the available information.

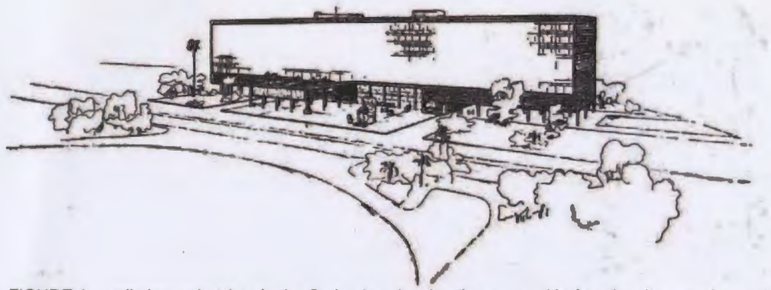


FIGURE 1 _preliminary sketches by Le Corbusier, showing the proposal before the site was changed

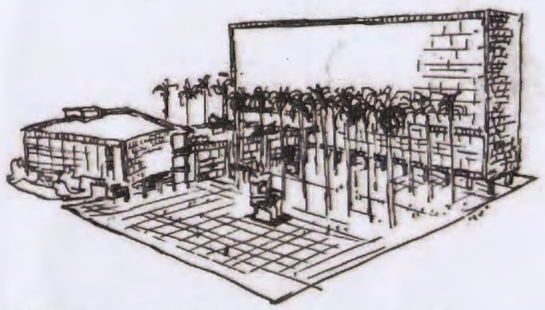


FIGURE 2 _perspective sketch of second proposal by Le Corbusier

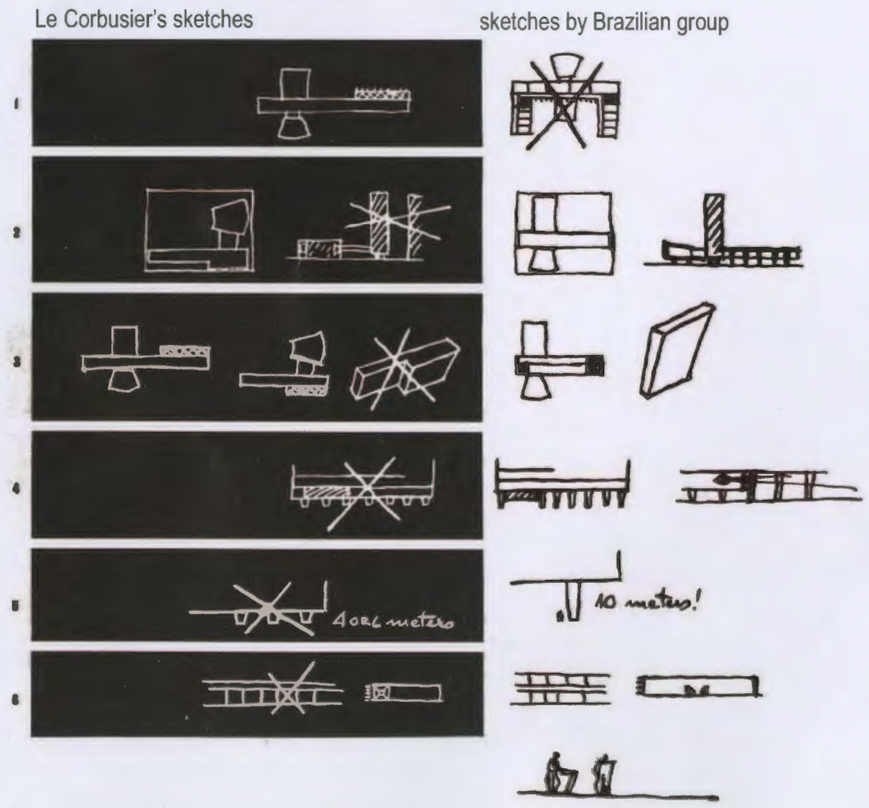


FIGURE 3 _sketches of the design development between Le Corbusier and the Brazilian group

Ministry of Education and Culture, Rio de Janeiro, Lucio Costa & Oscar Niemeyer

Overview

In 1927, the then Minister of Education and Health of Brazil, Gustavo Capanema, invited a group of Brazilian architects to participate in a competition for a new building to house the activities of the ministry. Up until that point, architecture in Brazil had mainly been colonial-style adaptations to the tropical climate, but in the 1930's, with the economy prospering, "the government [led by Getulio Vargas] was seeking to 'modernise' the country" by "bringing progressive ideas to bear." (Cavalcanti, L., 2003, pp 28) By constructing buildings for ministries and administration, the government at the time intended to create a representative civic architecture for a new Brazil emerging from the shadows of the third world.

From the conception of the brief for the ministry, there was heated debate about the 'style' in which the building should be realized, as it was "of utmost importance in a country in which the social elites and private corporations modelled their buildings on the official architecture." (Cavalcanti, L., 2003, pp 28) Most competition entries, including the winning entry by Archimedes Memoria, were traditional neoclassicist proposals. Minister Capanema himself, however, was not satisfied with the winning design, and decided to appoint local architect Lucio Costa and his team to draw up another proposal, based on the ideas of modernism. The minister also decided to appoint Le Corbusier as a consultant to the team of architects. Up to this point, a modernist building of the scale, magnitude and programme proposed by the ministry project had never before been realized, and Le Corbusier saw the project as an opportunity to champion the modernist movement and a "demonstration that Modernism was more appropriate than the historical as a style of architecture for the construction of public representative buildings." (Cavalcanti, 2003, pp 29)

Working in close collaboration with the Brazilian team of architects, Le Corbusier proposal sketches were modified to suit the particular site and climatic conditions. Figure 3 is a tabled drawing of these sketches and discussions, where line 1 shows the U-shaped plan proposed by the Brazilians, which Le Corbusier changed to a simple block. After a change in site, the layout was further modified to suit its context, there being another tall building situated on the edge of the site (line 2). Services, shown hatched in the sketches, intended by Le Corbusier to be located outside of the building form were instead housed inside the building envelope (line 3). Line 4 shows the location of the amphitheater and exhibition halls, proposed to be on the second floor but changed to be directly below the main building by the Brazilian group in order to open up the view toward the garden. After enlarging the width of the building and locating offices on both sides of the corridor, the Brazilian group also doubled the height of the pilotis from the original sketch by Le Corbusier. (Papadiki, 1950, pp 51)

The ministry building, said to be "the single building of the past decade which successfully attempted to express civic architecture with a contemporary technical medium" (Papadiki, 1950, pp 49) also gained widespread publicity for the modernist movement, being hailed as a great success, and sowed the seeds for a strong modernist influence in the built environment in Brazil. It also put Brazil on the map for an "original contribution to the annals of world architectural history." (Cavalcanti, 2003, pp 27) The monumentality without resort to ornament or decoration combined ideas of simplicity and the sublime. This notion of the purity and elegance of the self-contained prism of the building was further emphasized by its placement on a large open public square, a self-contained building elevated on pilotis intended to imbue a sense of civic importance and presence.

FIGURE 4 _North facade of the ministry building

FIGURE 5 _South facade of the ministry building

_completion of project: 1943

_programmatic components: 15 storeys of office space, flanked on one side by an exhibition hall and auditorium on the other. Private roof garden for the Minister above the exhibition hall, as well as a roof garden for employees located above the 15th floor along with a restaurant. Permanent art installations as well as exhibition hall to highlight Brazilian art.

_structure: reinforced concrete column and slab construction, with interior curtain walls

_environmental concerns: Both South and North facades consist of continuous double-hung windows, allowing for natural lighting. Sun shading provided on the South facade by a manually operable brise soleil. East and West facades solid concrete shear wall 'bookends'.

FIGURE 6 _exterior view of entrance to San Francisco Federal building

FIGURE 7 _interior view of entrance to San Francisco Federal building

FIGURE 8 _picture taken from the roof garden on the top floor of the San Francisco Federal, showing the connection of the metal scrim skin

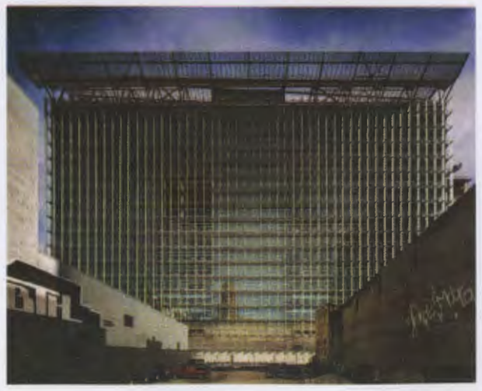


FIGURE 9 _North-West elevation

San Francisco Federal Building, San Francisco, Morphosis

Overview

The Federal Building complex, "located at a conspicuous fringe of [San Francisco's] central business district" (Carter, 2007, pp 42) had a fairly straight-forward brief - the design of efficient and economical office space for 1500 people, working under various federal government departments. The design team's intention was to "realize the potential of the large site and a substantial new public building to create a civic focus to the city." (Carter, 2007, pp 42) The intention was to design not an inaccessible monument but rather a new type of civic building that created much needed public space and interaction as opposed to the traditional American model of "removed, introverted and hermetically sealed" office space. (Carter, 2007, pp 42)

Another key driving factor in the design was sustainability, not only in compliance with the environmental codes in place in San Francisco but also as a flagship 'green' office building.

Consequently, the layout and massing of the components of the complex was equally informed by the location and size of public facilities such as the cafe and day-care centre as by natural ventilation and lighting concerns. The resulting complex is a 18 storey high narrow tower block, with a 4 storey annex and the low-slung cafe and day-care centre located on the corner of the new public plaza to attract passersby.

The interior of the tower block, naturally lit and mostly naturally ventilated, was designed around discussions with the office workers. Around the central circulation core, the sealed (and mechanically ventilated) individual office cubicles are arranged, with open-plan office space around the perimeter of the tower block. The tower is orientated with its long elevations North-West / South-East. The North-West facade has sun-shading glass fins, with a maintenance cat walk, to protect it from excessive sun yet keeping it highly transparent. The South-East facade is protected by the metal scrim skin that drapes itself over the building, creating a cover for the roof garden on top and becoming the roof element to the public elements on the plaza. Besides being an environmentally responsive skin, the metal scrim also becomes the dominant architectural element, wrapping the building and tying it to the plaza.

Circulation in the tower block is achieved by using skip-stop lifts which only stop at 3-level intervals, opening up onto sky-lobbies and generous staircases to enable and enforce interaction among office workers .

A building automation system which monitors the internal temperatures and opens windows for airflow when needed was used. Much of the building design was done in collaboration with various consultants, and extensive digital modelling, air-flow diagrams, thermal massing and environmental sustainability studies were done to ensure that the measures taken and systems implemented were effective.

FIGURE 10

FIGURE 11 _South-East elevation

_completion of project: 2005
_construction cost: 144 million US dollars
_site area: 2,880 sq m
_project size: 56, 207 sq m (tower block)
_programmatic components: 18 storey office tower (72m tall, 102m long, 19,5m wide), with a 4 storey annex, cafe and day-care centres situated on ground and lower ground levels on the public square. Public roof garden on 18th floor.
_structure: reinforced concrete, column and slab construction with upturned beam system instead of perimeter beams
_environmental concerns: natural ventilation for the upper 13 storeys of building, reducing power consumption by 33% as compared to other energy code compliant office buildings. Lighting energy reduced by 26% due to natural lighting. Use of portland cement reduced by half by using furnace slag - a by-product of steel making.

FIGURE 16 _google earth image showing the Ministry in its context

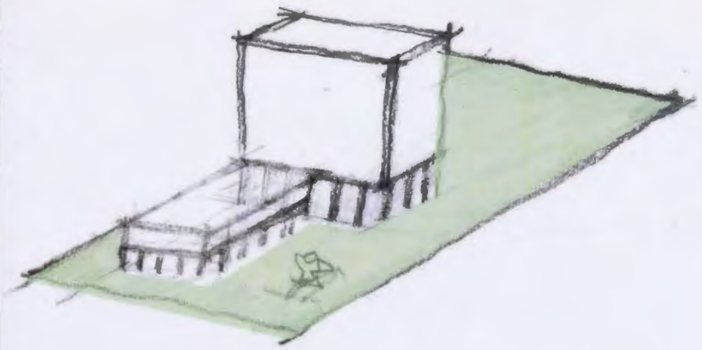


FIGURE 19 _isonometric of the Ministry and its public space indicated in green

Ministry of Education and Culture, Rio de Janeiro, Lucio Costa and Oscar Niemeyer

The bulk of the building is housed in the 15 storey office tower block, which has a 2 storey auditorium and a 1 storey exhibition hall for the promotion of local arts on either side of it. Elevated 10 metres above ground floor level, the main bulk of the Ministry building towers over the public plaza or square. Intended to be viewed as a pristine stand-alone object by careful consideration of "the development of all the structural forms, the relationship of these forms to each other, and, above all, by the way the building holds its space and takes possession of its own volume". (Papadiki, 1950, pp 49) A certain sense of monumentality and civic importance was striven for in the design of the building, and this is achieved by the scale of the building and the scale of the large, empty public plaza. Artwork displayed in the plaza is overpowered by the expanse of open space of the plaza and by the bulk of the building.

FIGURE 17 _google earth image showing the San Francisco Federal building in its context

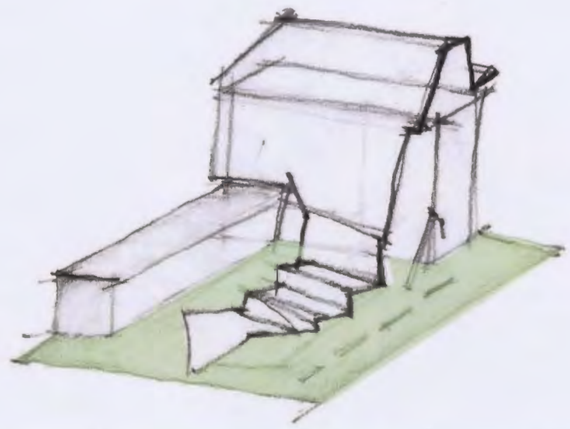


FIGURE 20 _isonometric of the San Francisco Federal and its public space indicated in green

San Francisco Federal Building, San Francisco, Morphosis

The massing of the building was intentionally broken down into three elements: the 18 storey office tower, with a 4 storey 'glass-box' annex, and the public elements such as the cafe and day-care centre, located on the ground and lower ground levels of the public plaza. The undulating metal scrim skin which wraps itself around the tower block, flowing down over it and becoming the folded canopies which shelters the public programmatic components of the plaza was intended to make reference to "those egalitarian urban rooms defined by glazed market halls and railway station concourses in Victorian cities." (Carter, 2007, pp 50) There is a material continuity between public space and the building envelope, with the boundaries between the two blurred and obscured by the metal scrim skin.

Located in the context of San Francisco's South of Market district comprising of medium-rise industrial and light industrial buildings, the 4-storey annex and plaza create a connection to the surrounding urban fabric and respond to the scale of surrounding buildings. The area had been identified as lacking public space, and thus the site was designed to give some open public space back to the district. By breaking up its programmatic components and creating a material continuity between the large tower block and public components, the San Francisco Federal fragments and disperses itself over the site, protectively framing and containing the public plaza.

FIGURE 18 _google earth image showing the Eastgate centre in context

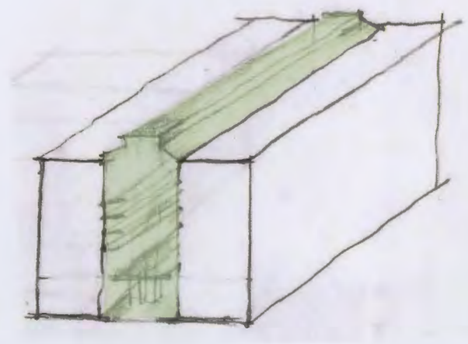
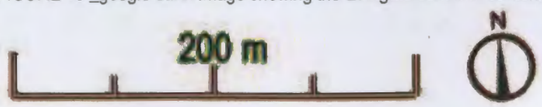


FIGURE 21 _isonometric of the Eastgate Centre and its public space indicated in green

Eastgate Centre, Harare, Michael Pearce

Wedged between the two main office tower blocks, the public space becomes an interior street. The atrium is designed and detailed to give the impression of being outside whilst still being climatically comfortable in the tropical heat of Harare. The two enclosing office blocks are detailed as heavy and separate contained buildings, and the atrium has a much lighter and more transparent material and technological quality, differentiating itself from the office blocks.

Whilst not fragmenting its massing, the Eastgate Centre manages to create public space that is both interiorised, climatically comfortable and openly accessible, still relating to the human scale.



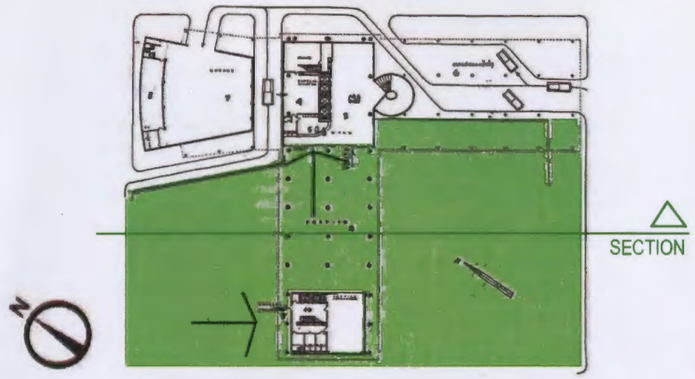


FIGURE 22 _ground floor plan Ministry of Education and Culture

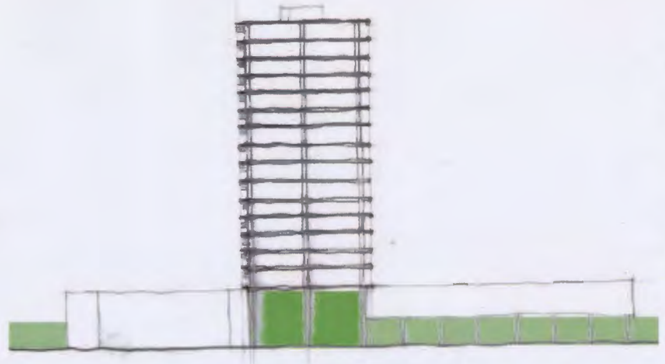


FIGURE 25 _typical cross-section, Ministry of Education and Culture. (Due to unavailability of published sections of the building, this section was drawn by myself using all available information)

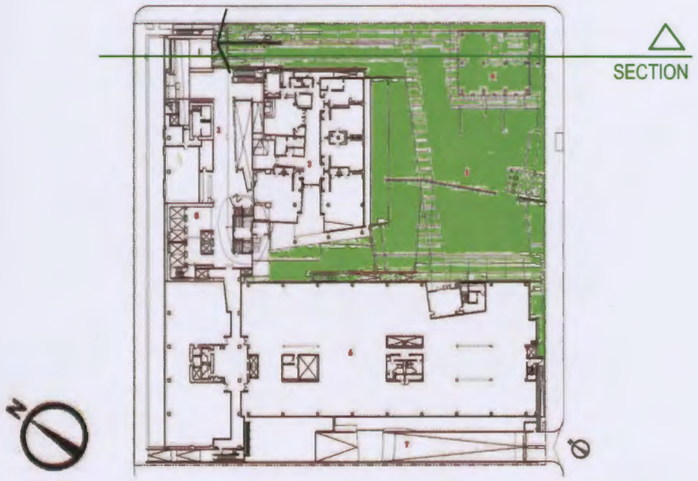


FIGURE 23_ground floor plan San Francisco Federal building

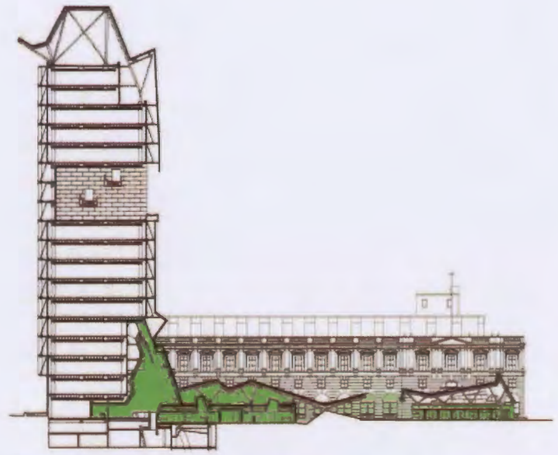


FIGURE 26 _typical cross-section, San Francisco Federal

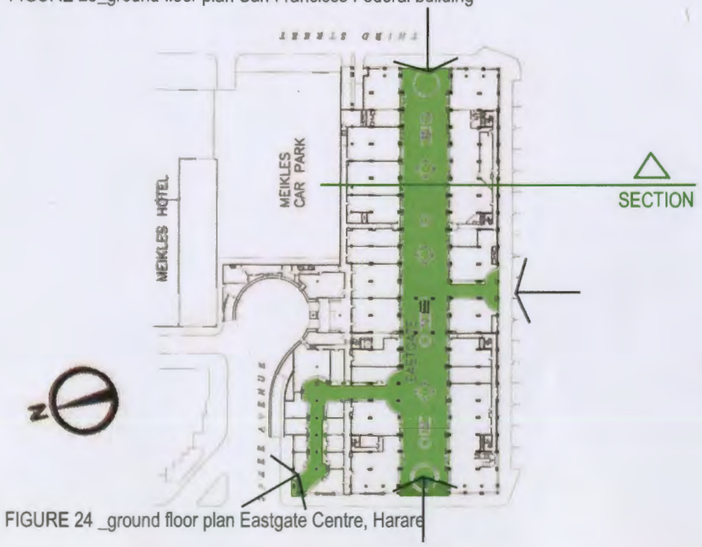


FIGURE 24 _ground floor plan Eastgate Centre, Harare

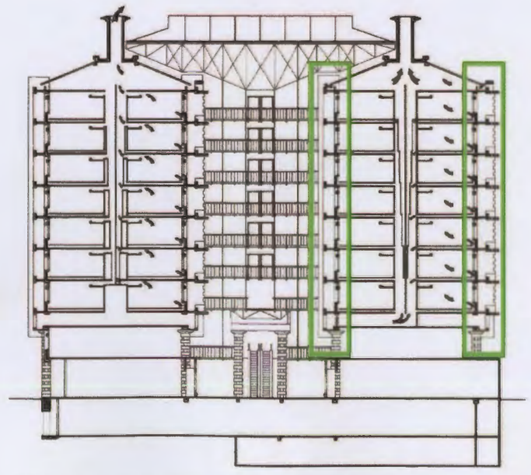


FIGURE 27 _typical cross-section, Eastgate centre

Ministry of Education and Culture, Rio de Janeiro, Lucio Costa and Oscar Niemeyer

The building gives no reference or clue to point of entry, that being tucked away under the pilotis, and as such does not offer itself to easy and welcoming public access. Through lifting the building off from the ground plane and its detailing as a self-contained box the Ministry becomes an enclosed object on a open plane.

There are two entrances to the Ministry building, as indicated by arrows on the ground floor plan. The entrance on the North-East corner to the tower block is the Minister's entrance, with some elevators reserved for him and his personal staff only, and some public elevators for visitors to the Minister. On the South-West of the plan is the employees entrance. The splitting up of the circulation was done for security and access control reasons, and thus the building has two vertical circulation cores.

San Francisco Federal Building, San Francisco, Morphosis

The entrance to the main office tower block is architecturally vaguely signalled by the massive concrete column protruding from the tower block, shown as an arrow on the ground floor plan. When approaching the building from the plaza, one expects the scrim skin to signal an entrance, and draw in the public. However, the scrim skin instead is a roof to public elements such as the day-care centre and the cafe, and the entrance to the tower block is on the edge of the site.

Although there is no 'grand' entrance gesture, the interior is spatially exciting with exposed structure and a large staircase inviting people to take a seat. "Daylight from above washes over polished concrete floors and faceted walls of reinforced fibre-cement panels", creating an environment of "raw simplicity without being austere". (Gonchar, 2007, pp 99)

Eastgate Centre, Harare, Michael Pearce

Easily accessed via four entrances off street level, the atrium space also serves as the vertical circulation space, allowing visual and physical interaction between all users of the building, between the shoppers and customers on the first two floors and the office workers above. The detailing of the atrium space differentiates itself from the heavy brick and concrete office blocks, and is reminiscent of mining shafts with thin steel elements and painted white walls. The glass roof covering the atrium allows for muted light to filter into the space.

The skywalk on the second floor provides access to all office space, which then also has internal vertical circulation cores. There is some control of who accesses the office floors through the skywalk on the second floor, but there are more limited security concerns with this building than in the two civic buildings and so added security is not necessary.

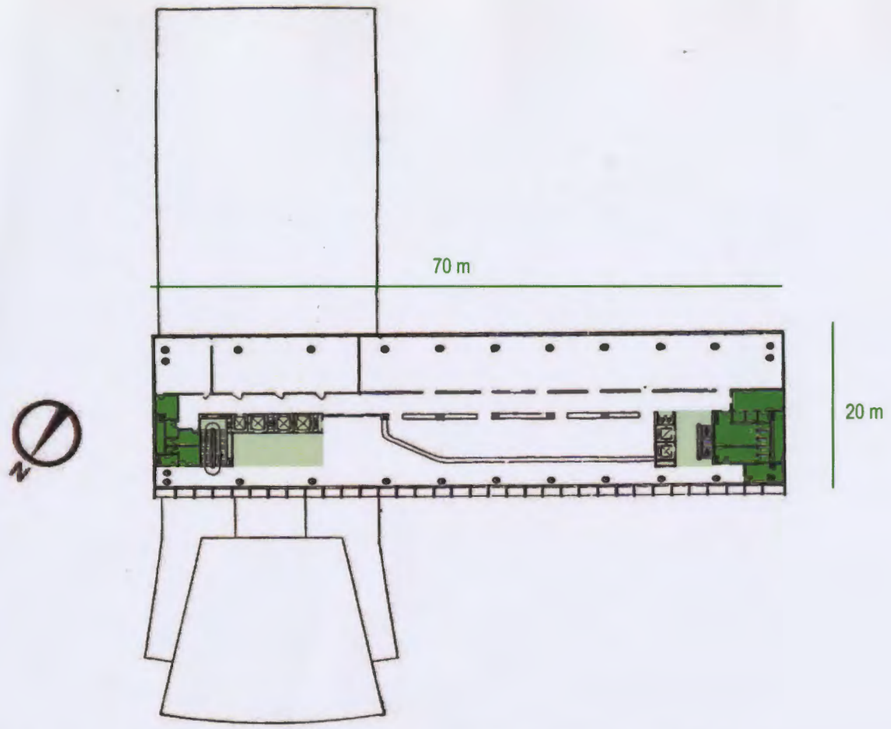


FIGURE 28_ typical floor plan of tower block of Ministry of Education and Culture by Lucio Costa and Oscar Niemeyer

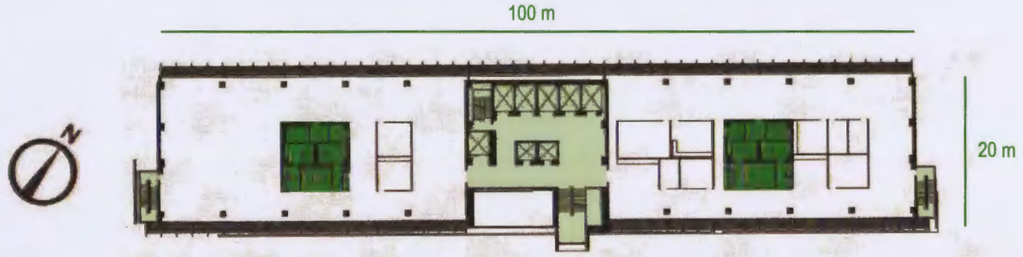


FIGURE 29_ typical floor plan of tower block of San Francisco Federal building by Morphosis

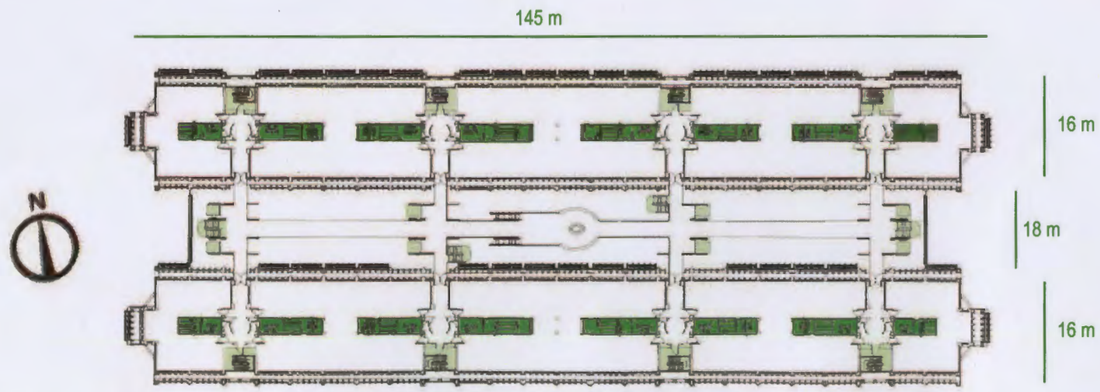


FIGURE 30_ typical floor plan of Eastgate centre by Michael Pearce

Floor plate shape and services and circulation configuration

As shown by the plans on the left, all 3 buildings, irrespective of their different programs, locations and fundamentally differing architectural ideas and starting points have ended up with similarly shaped typical tower block floor plans.

In the case of the Ministry in Rio de Janeiro, cores for bathrooms / wet services form part of the sheer wall bookends of the building, with no window openings, oriented East/West to block out excessive sunlight from these sides. Probably due to the notion of the secondary importance of service spaces (contrasted to importance accorded to 'served' spaces), attention was instead paid to creating office space with natural light and ventilation. A narrow circulation corridor divides the floor plan longitudinally, with cellular offices on the southern edge, and an open-plan office configuration on the North edge. Next to the wet core bookends respectively are the circulation cores, one at each end of the narrow rectangular floor plan.

The San Francisco Federal building locates the circulation core in the centre of the floor plate, and articulates this on the facade of the building, with generous spaces accorded to circulation lobbies and look-out points. Two fire-escape staircases are located on the shorter ends of the rectangular plan to comply with stringent fire regulations. Two small wet cores are located on either side of the circulation, almost freestanding in the plan. This was done so as not to block out any natural light to office space by services or circulation, especially as the building is located in a tight urban context where tall neighboring buildings dictated its massing to a large extent. The cellular offices, mechanically ventilated as stipulated with building regulations, are also located next to the wet cores, with the open plan office space on the edges around the floor plate.

In the Eastgate Centre, climatic considerations divided the bulk into two long narrow tower blocks, the public space wedged between the two. Heavily shaded against excessive heat gain in the tropical climate of Harare, the office space is nonetheless located around the edges of the floor plate to allow for natural light. Bathroom cores and inter-office circulation cores, due to the specific need for highly flexible office space, are spaced in many small cores along the entire 145m length of the building, and ventilated by the interior ventilation chimneys in the building. The main vertical circulation is located in the public space, once again with 4 sets of elevators spaced at regular intervals along the length of the space. Whilst this organization of services and circulation probably provides more wet service cores and circulation cores than is strictly necessary for the building, it achieves the high degree of tenant flexibility called for in the brief, with tenants being able to rent 70 sqm of office space or 5000 sqm without any modifications to the floor plan layout.

In all three case studies, natural light and natural ventilation were important consideration when designing the office tower blocks. The resultant narrow rectangular floor plates show that creating deeper floor plates necessitates mechanical ventilation and lighting, with all three buildings having very similar depths, all about 20 metres. The location and spacing of wet cores and circulation is specific to each building and linked mostly to programmatic considerations. In the Ministry building separate access for the Minister and the employees necessitated two circulation cores, the service cores set behind the solid East/West wall bookends. Morphosis chose to locate the circulation core centrally, minimizing the need for corridors and circulation space. The wet cores are also located in the middle of the floor plate, so as not to block out any natural light to work spaces located on the perimeter. The Eastgate Centre, because of its need to be extremely flexible, has multiple circulation and wet cores located both within the two tower blocks and in the atrium, also locating office spaces along the perimeter. All three buildings forfeit natural light and ventilation to the bathroom wet cores in favour of creating better office space.

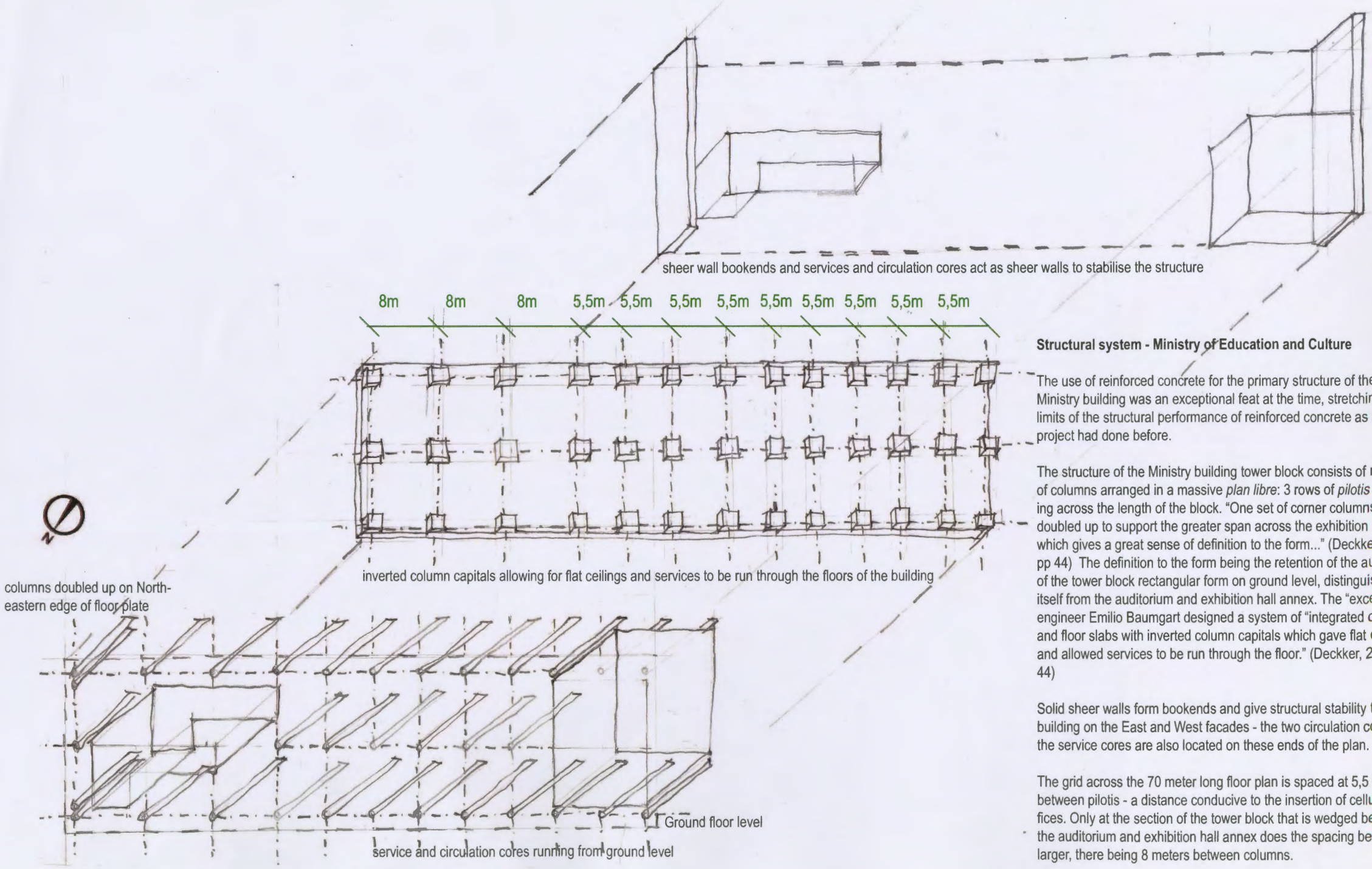


FIGURE 31_ diagrammatic axonometric sketch of the structure of the Ministry building scale 1:500

Structural system - Ministry of Education and Culture

The use of reinforced concrete for the primary structure of the Ministry building was an exceptional feat at the time, stretching the limits of the structural performance of reinforced concrete as no other project had done before.

The structure of the Ministry building tower block consists of rows of columns arranged in a massive *plan libre*: 3 rows of *pilotis* going across the length of the block. "One set of corner columns was doubled up to support the greater span across the exhibition hall, which gives a great sense of definition to the form..." (Deckker, 2001, pp 44) The definition to the form being the retention of the autonomy of the tower block rectangular form on ground level, distinguishing itself from the auditorium and exhibition hall annex. The "exceptional" engineer Emilio Baumgart designed a system of "integrated columns and floor slabs with inverted column capitals which gave flat ceilings and allowed services to be run through the floor." (Deckker, 2001, pp 44)

Solid sheer walls form bookends and give structural stability to the building on the East and West facades - the two circulation cores and the service cores are also located on these ends of the plan.

The grid across the 70 meter long floor plan is spaced at 5,5 meters between pilotis - a distance conducive to the insertion of cellular offices. Only at the section of the tower block that is wedged between the auditorium and exhibition hall annex does the spacing become larger, there being 8 meters between columns.

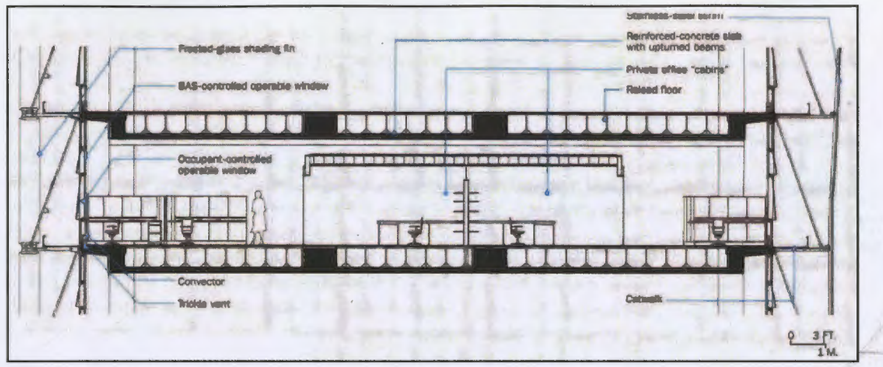
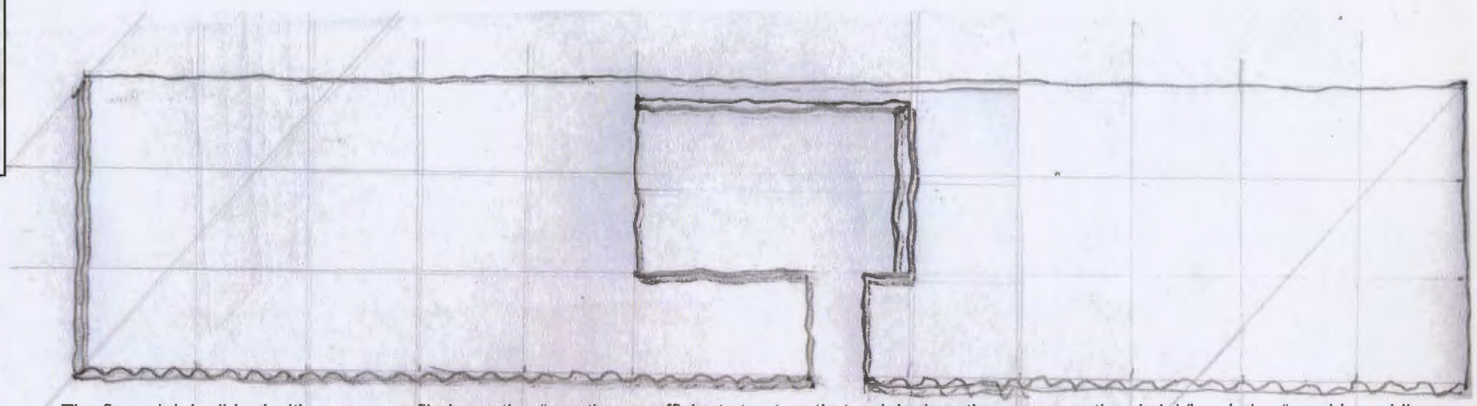
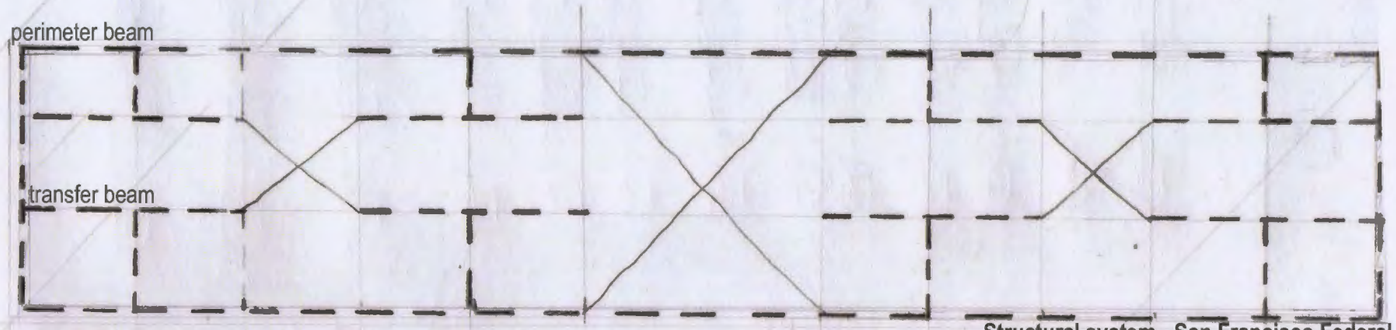


Figure 32_typical cross-section through tower block.
Section shows the perimeter upstand beam and the large transfer beams in between.



The floor slab is ribbed with a wave profile in section "creating an efficient structure that weighs less than a conventional slab" and also "provides additional concrete surface area, enhancing the slab's ability to absorb heat." (Gonchar, 2007, pp105)



Perimeter upstand beam, with transfer beams as indicated to allow for open floor space making the workspace configuration more flexible. The X indicates service and circulation cores which act as structural sheer walls

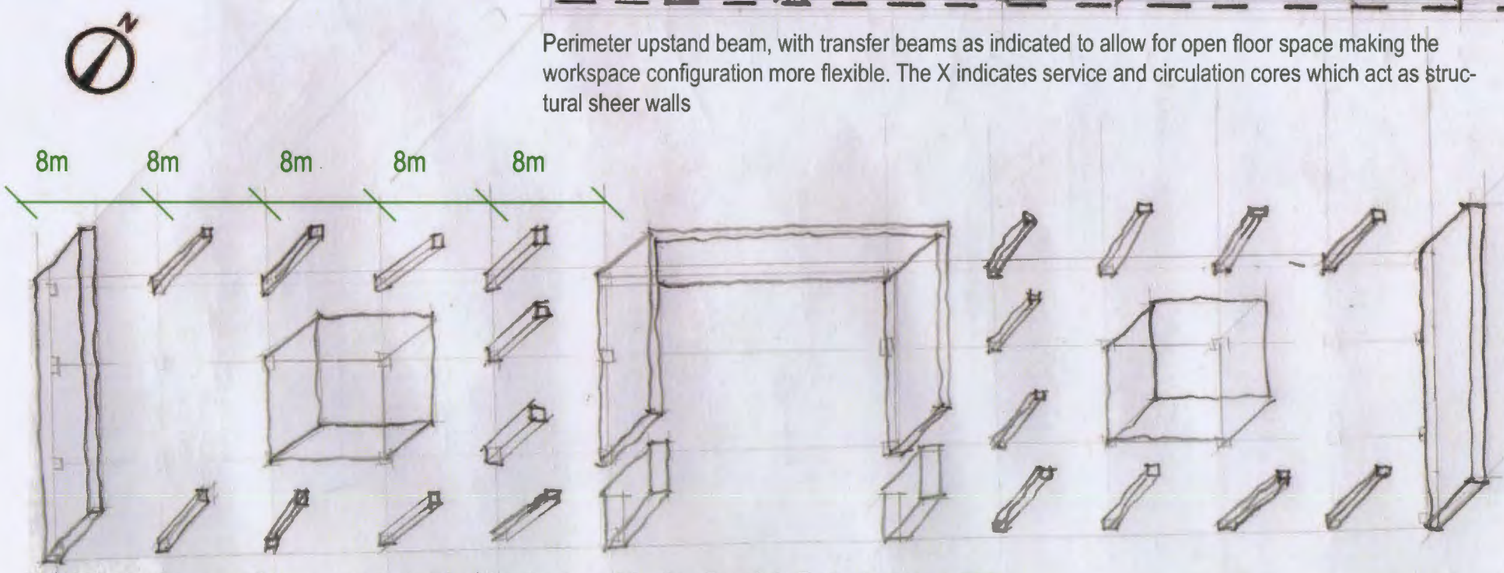


FIGURE 33_ diagrammatic axonometric sketch of the structure of the San Francisco Federal scale 1:500

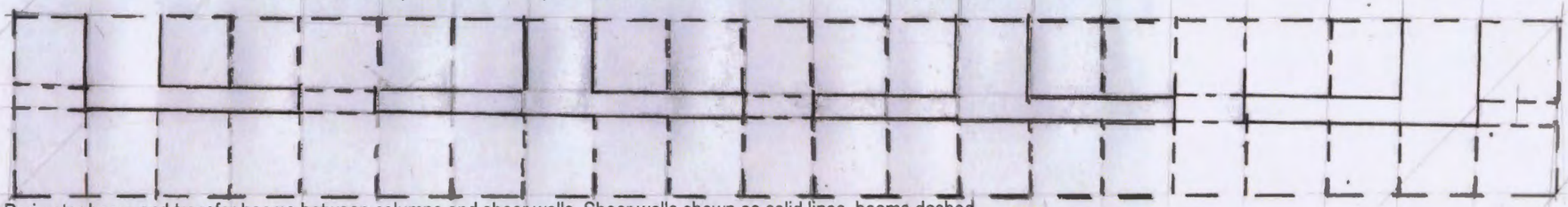
Structural system - San Francisco Federal

The structure of the building consists of 4 rows of columns across the width of the building. The service cores located centrally on either side of the circulation core act as sheer walls, and the bookend sides are solid sheer walls. The building has a large upstand perimeter beam running along the edges of the floor plates, on which the floor slabs rest. Typically, floor slabs sit on top of perimeter beams, but "such an arrangement would have blocked air flow, impeded penetration of daylight, and obstructed views." (Gonchar, 2007, pp105) Large transfer beams are used on either end of the floor plates to allow for the entire 20 meter depth of the building to be free of columns where there are no service cores.

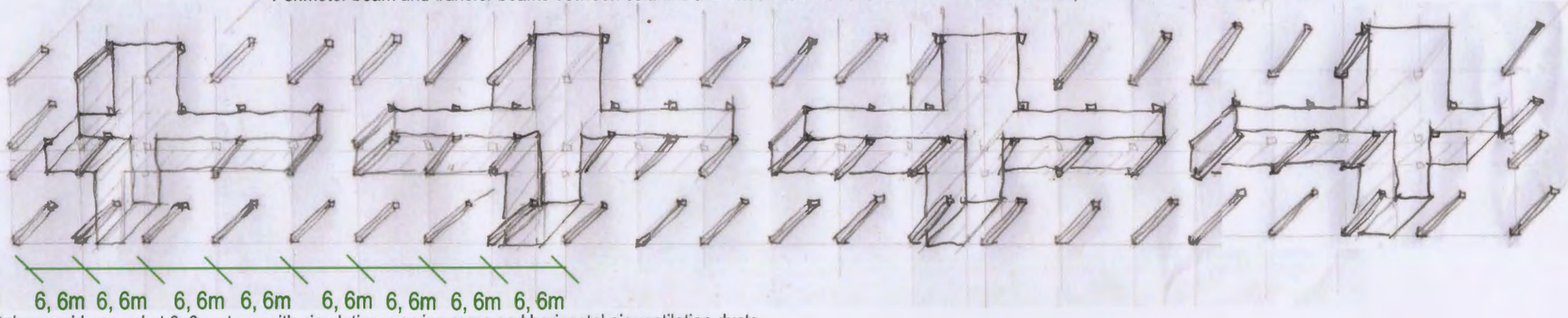
The floor slab is ribbed with a wave profile in section "creating an efficient structure that weighs less than a conventional slab" and also "provides additional concrete surface area, enhancing the slab's ability to absorb heat." (Gonchar, 2007, pp105)

The columns are spaced approximately 8 meters apart, and the cellular offices are located between service cores and the circulation core. The column and transfer beam system allows for the central floor space to be free of columns.

Floor slab with wave profile in section, penetration for the vertical air ducts.



Perimeter beam and transfer beams between columns and sheer walls. Sheer walls shown as solid lines, beams dashed.



Column grid spaced at 6, 6 meters, with circulation, service cores and horizontal air ventilation ducts.

FIGURE 34_ diagrammatic axonometric sketch of the structure of the San Francisco Federal scale 1:500

Structural system - Eastgate Centre

The primary structure consists of in-situ cast reinforced concrete beams and slabs. The columns are spaced 4 rows across the width of the floor plate. The service, circulation and air vent ducts placed in the middle of the floor plates of each tower block respectively act as sheer walls. The reason for so many service and circulation cores is the demand for a highly flexible office space, allowing multiple tenants to have access to these amenities.

The column spacing is done on a 6, 6 meter module, similar to that of the Ministry of Education and Culture building. Cellular offices can easily be slotted between these columns spaces at 5,5 - 6, 6 meters.

Ministry of Education and Culture - North Facade

The reinforced concrete columns with inverted capitals and reinforced concrete slabs allow for all internal walls as well as the external envelope to be non load-bearing. "Continuous double hung windows, uninterrupted by any structural members, are used on the North and South elevations." (Papadiki, 1950, pp 49) The windows are manually operable allowing employees to regulate their working environment.

On the North facade of the building a sunshade system was used to control the amount of sun coming into the building. The sunshade comprises of painted asbestos cement panels in a steel frame which are manually adjustable from the cellular offices, allowing each employee to regulate the amount of sun coming in. The design intention was to give a homogenous feeling to the entire facade, with the honeycomb system framing the adjustable horizontal louvres having a depth of about 800mm and the frames as well as the horizontal louvres being very slim elements. "As the [horizontal louvres] are adjusted at different angles along the height of the facade, they create an extremely animated pattern." (Papadiki, 1950, pp 56)

The idea that the building should avoid any ornamentation, in line with modernist thinking, but yet be "monumental and use luxurious materials" to signify a civic building of importance was central to the detailing of the facades. "Simplicity and the sublime were combined into a building suitable for the Ministry." (Andreas et al, 2003, pp30)

Figure 35_ Interior photograph looking out onto the sunshade

Figure 36_ Interior photograph looking out onto the sunshade and adjustable horizontal asbestos louvres

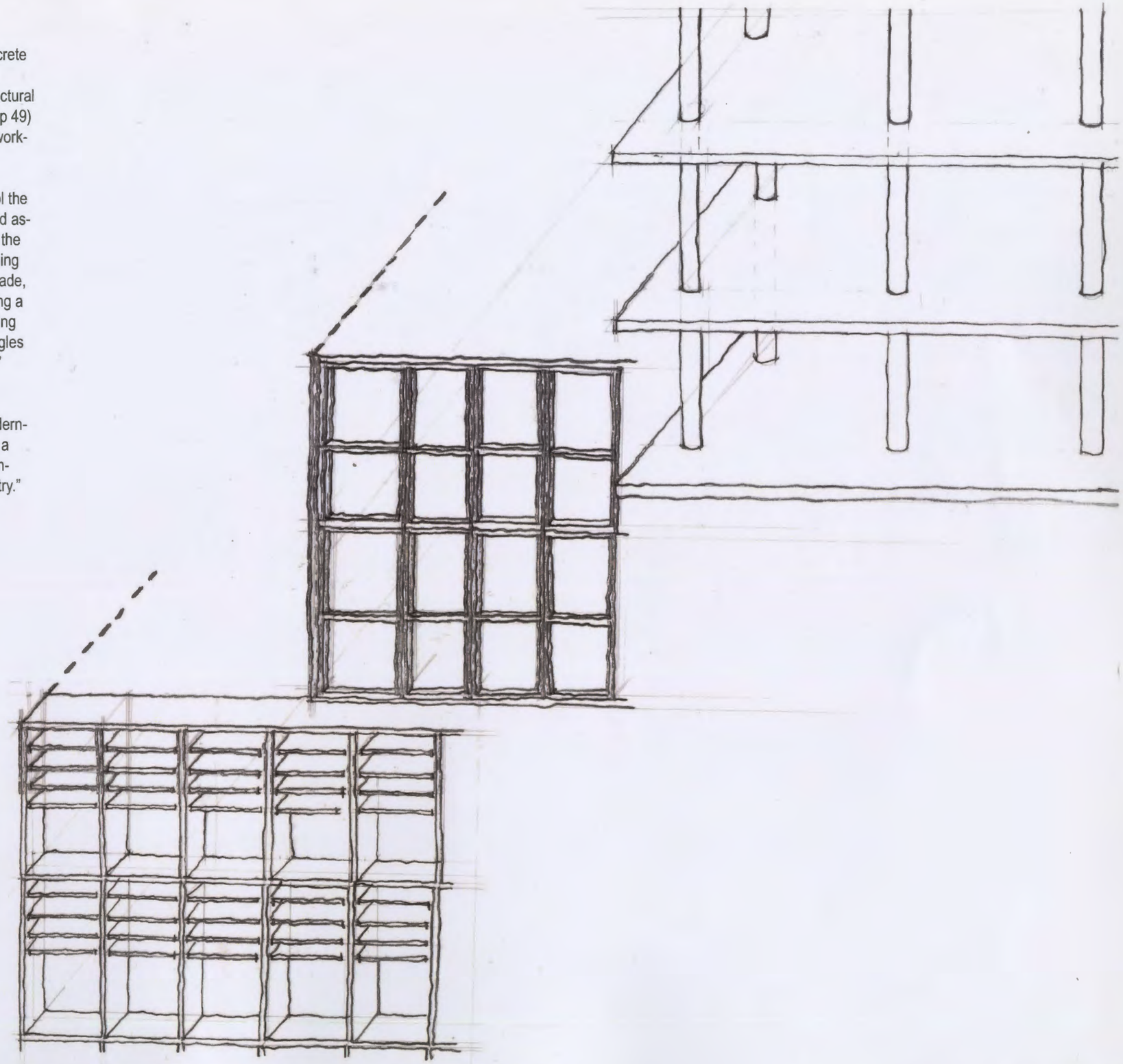


FIGURE 37_axonometric sketch showing the layering of the North facade scale 1:100

San Francisco Federal - South East Facade

The primary structural system of the San Francisco Federal consists of concrete columns, shear walls and upturned beams and wave slabs. The secondary structure, which supports the metal scrim envelope is made of tube steel framing with I-beams and rectangular hollow sections sub-frames bolted to the concrete frame of the building. A maintenance catwalk, also made of perforated metal, is supported off steel sections bolted onto the concrete frame. The perforated stainless steel sunscreen panels are fixed on a lightweight steel structure, wrapping around the entire South East facade of the building.

By designing the 'performative skin', layering of elements was an important consideration, and the creation of a "series of distinctive spaces between" facade and building was achieved. (Carter, 2007, pp 50) Some of these 'between' spaces are utilitarian access and maintenance spaces, whilst others, such as the sky-lobbies are the most memorable spaces in the building.

The shape and manufacture of this metal scrim skin was made possible only by digital modelling innovations, and the resultant form is partly determined by air-flow diagram modelling done prior to construction.

Figure 38_ Computer generated 3D, showing the entrance to the building. The layering of the facade can be seen from this image, and how the scrim skin wraps itself over the building.

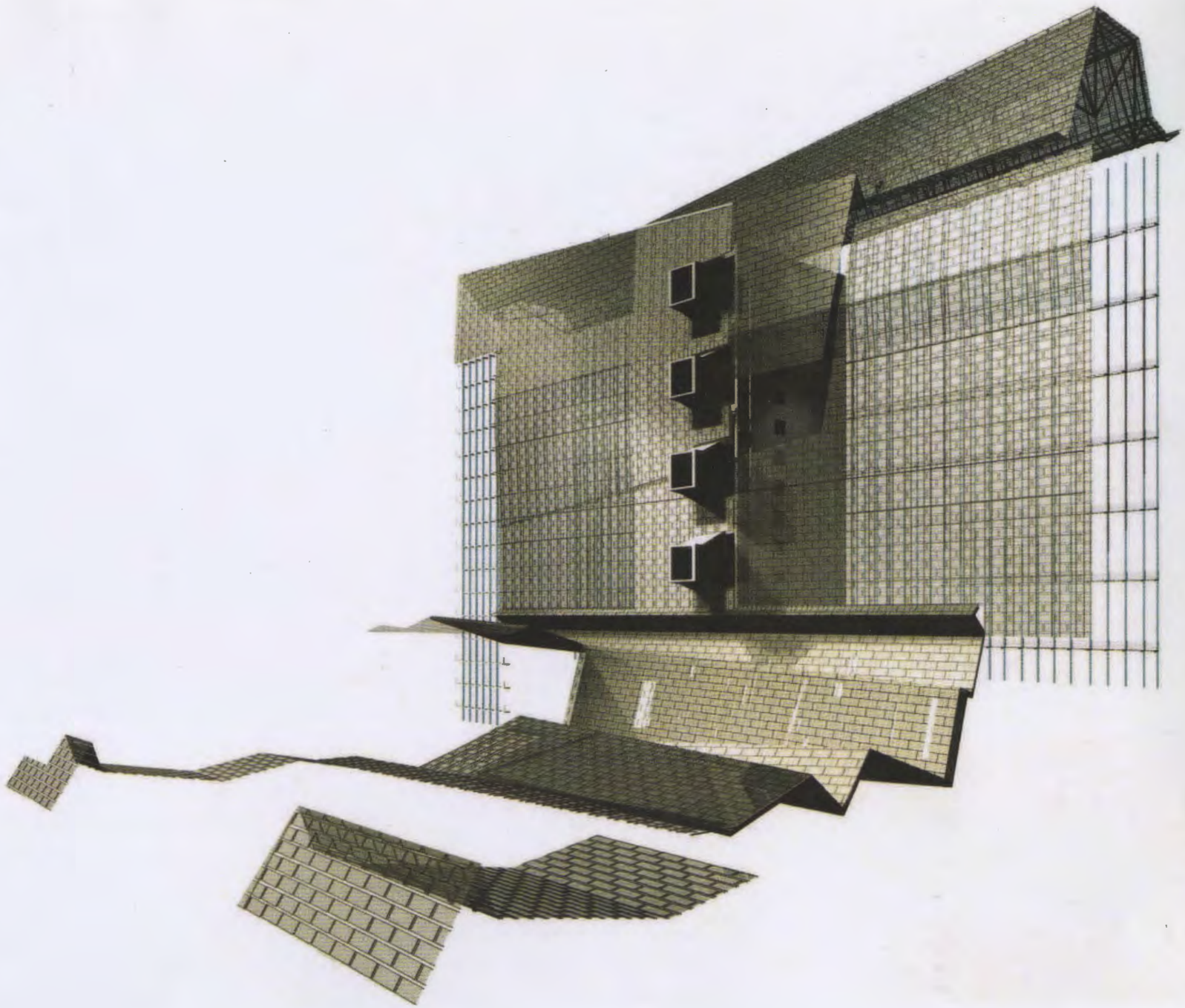


Figure 39_ Computer generated 3D facade diagram, used by the design team to determine the size and angle of metal panels and the lightweight steel supporting frame.

Eastgate Centre - internal facade to tower block

The primary structure of the Eastgate Centre is an in-situ concrete frame, clad in brick and pre-cast concrete. The brick and pre-cast concrete walls have small openings for windows ("not exceeding 25% of surface area on external faces, and 35% on the atrium side") (Unknown, 1997, pp 23)
"The external faces and windows have been shaded by extending the floor slab to form continuous balconies. These provide a ledge on which further sun-control devices have been hung on the North faces and gable ends." (Unknown, 1997, pp 23)

The Eastgate Centre facades are thickly layered with heavy materials that have a large thermal massing. The choice of materials was done as much for structural and climatic efficiency as in terms of an intelligent use of resources available in Zimbabwe, and the lower standard of skill and craftsmanship in the building industry had to be considered. The architect rejected the "ubiquitous aggressively technological approach to problem solving" as "particularly inappropriate in terms of resources in Zimbabwe." (Unknown, 1997, pp 25)

The Ministry building was seen as a masterpiece of modern technology, and innovations such as the reinforced concrete structure and curtain walls had never before been used in a building of its scale and importance. Although a thermal engineer was consulted during the design process, the Eastgate Centre present a much more traditional and vernacular approach to building and envelope than does the San Francisco Federal, which relied heavily on the 'technological approach to problem solving'. It is arguable that the Federal building had a more efficient building industry, more capital for construction and is located in a more developed country, and its digitally resolved facades are a result of this.

All three buildings work on a layering of elements to create climatically responsive facades that also make a layered threshold to the public spaces. The Ministry building is seen as the forerunner for these medium rise tower blocks, setting the standards of what was possible in terms of material efficiency and construction, as well as workplace design. Before the Ministry building, buildings of this type were brick load-bearing structures, structurally limited by their very nature, done in the Neoclassical or Beaux-arts style. Neither the Eastgate Centre nor the San Francisco Federal are drastic departures from the Ministry building in terms of basic principles: they only utilise the available resources and materials as well as the climatic response differently and in line with the technological advances of their times. The floor plate configuration, ideas of providing sun-shading devices to certain facades and lack of ornamentation on the external envelopes are derivative for the Eastgate Centre and Federal building of the lessons learned over 50 years before from the Ministry building and other following modernist buildings of that scale.

Figure 40_ Picture of internal facade

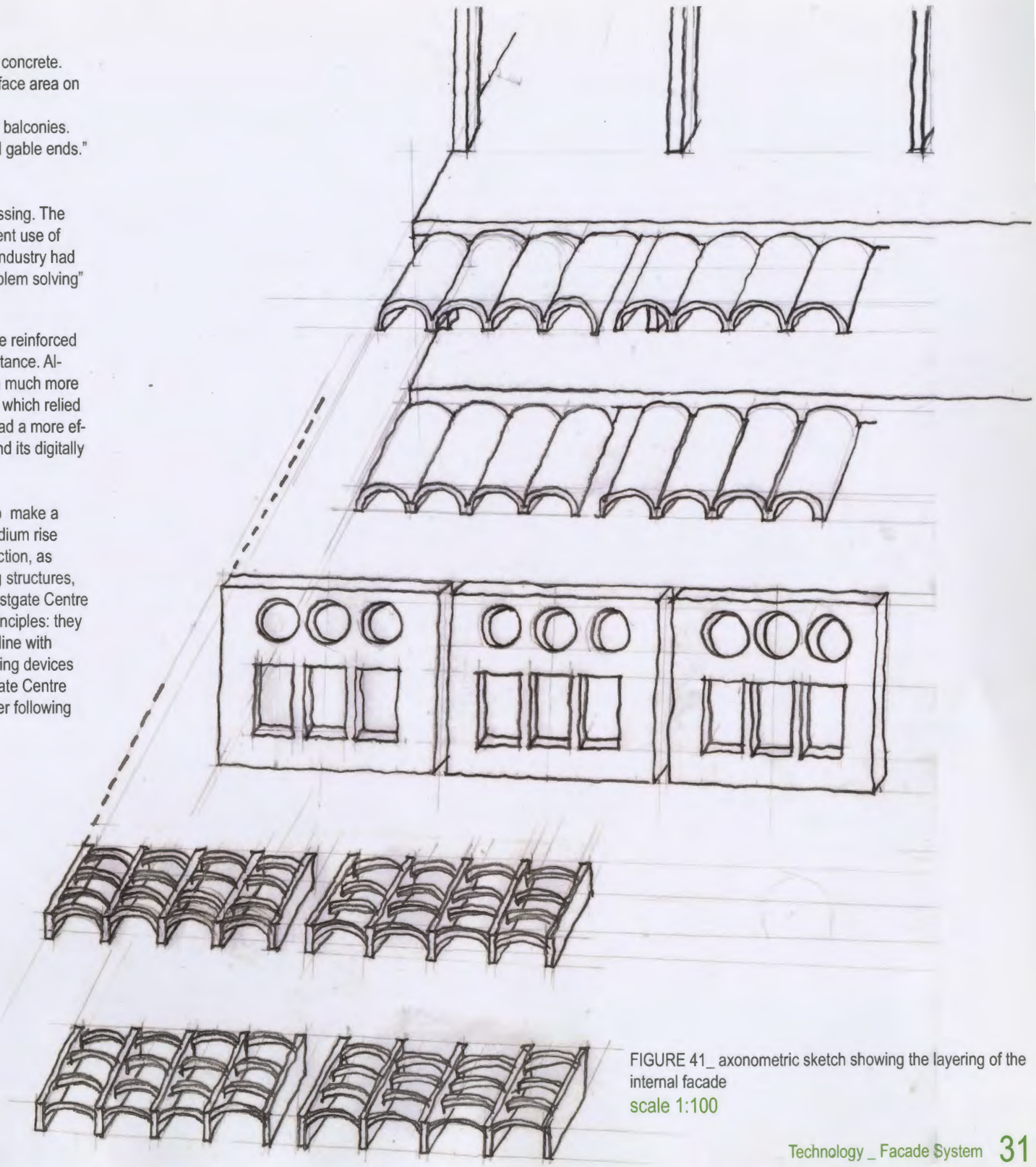


FIGURE 41_ axonometric sketch showing the layering of the internal facade
scale 1:100

Figure 42

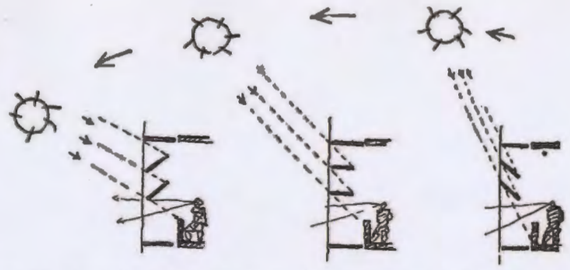


Figure 43_ Sketches of the position of louvres in relation to the sun

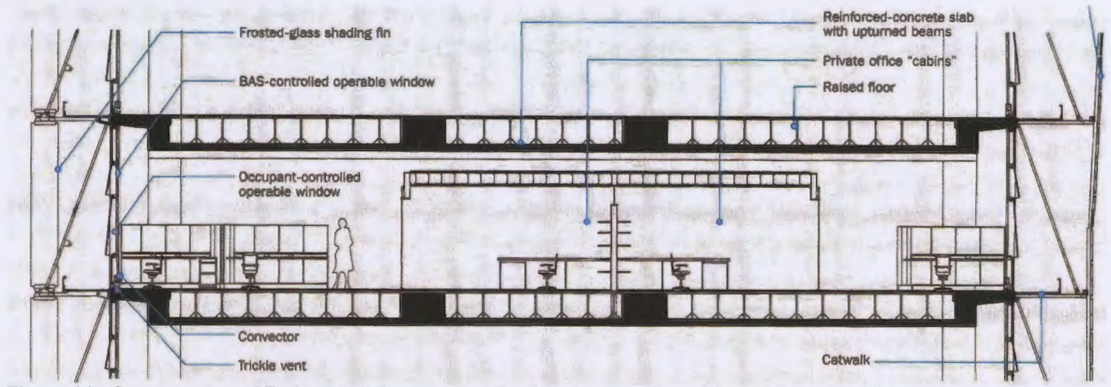


Figure 44_ Cross-section of Federal building showing the facades on either side and the raised floor

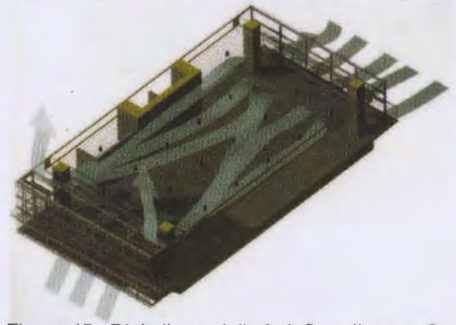


Figure 45_ Digitally modelled air flow diagram San Francisco Federal

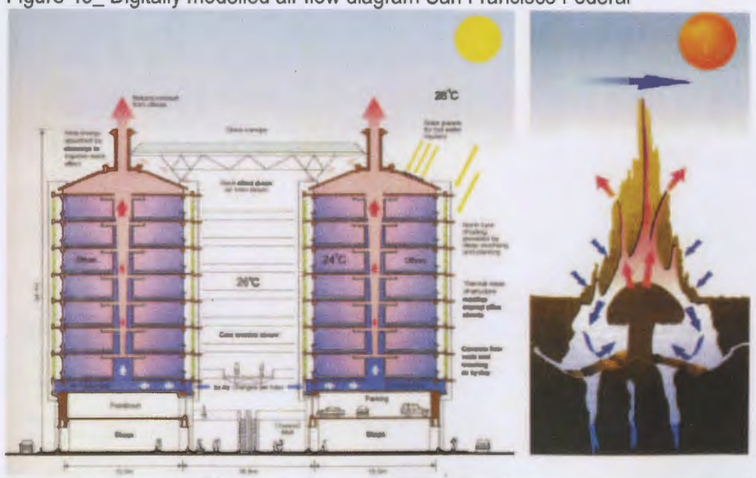


Figure 46_ Diagram of Eastgate Centre showing climatic responsiveness modelled on termite hill

Climatically responsive facades

Prior to technological advances in digital modelling allowing for air flow diagrams and thermal consultant engineers, the Ministry of Education and Culture responds to its climate in terms of orientation. The East/West axis are the two narrow sheer wall bookends, with no window openings. The South facade is entirely glazed with the double-hung window curtain-wall, allowing light into the building. The North facade has the honeycomb sunshade system with the manually operable asbestos louvres. Sketches were done to understand the sun-angles in summer and winter, and this resulted in the depth of the louvres and supporting system as well as in the number of louvres and their spacing shading each window.

Morphosis' approach to climate was to undertake extensive digital modelling, analyzing prevalent winds in air flow diagrams, the data of which informs the building automation system (BAS). This system electronically controls some of the opening windows by monitoring inside and outside temperatures. Trickle vents are located near the floors, allowing small quantities of mechanically warmed air into the building in cold weather. Some windows are mechanically operated allowing employees to control amount of outside air into the building.
Sealed glass cabin offices located in the middle of the floor plate are mechanically ventilated and lit, as this is required by the building regulations. The ceiling of these glass cabins is pulled away from the underside of the slab so as not to obstruct air flow through the width of the building.
The buildings' exposed concrete structure acts as thermal mass. "At night, when warm weather is expected the next day, the buildings' structure is 'charged; for 8-10 hours" as the BAS system opens the facade windows allowing cool air in until the concrete structure has cooled down sufficiently. (Gonchar, 1997, pp 101) During the day, heat from occupants, lighting and computers is dissipated by the floor slabs, which have a wave profile in section exposing a larger area of concrete on their underside than conventional slabs. The upturned beam system was also designed so as not to impede air flows through the building, and allowing the concrete of the underside of the slab to be exposed.

The Eastgate Centre used heavy materials with a large thermal massing on the exterior facades. This provides insulation and keeps the interior of the building at a fairly uniform temperature. Similar to the Federal building, the underside of the concrete slab has a wave profile in section, and this slab is pulled through the envelope to create a system of balconies onto which additional pre-cast concrete elements are hung as sunshade devices. The facades are thick and deep, and window surfaces are limited, with no direct sunlight entering the building. "Eastgate's ventilation costs one-tenth that of a comparable air-conditioned building." (Lefaivre, 2000, pp 89)
Above the first floor a low service storey houses large low-speed air-intake fans, which provides forced air ventilation to the offices above. The air is distributed through 32 vertical air ducts along the length of the building. Bulkheads and raised floors on the office levels allow the hot air to rise out through these vertical chimneys. This idea was taken from a model of a termite hill, as shown in the diagram on the left.

Both the Federal building and the Eastgate Centre could only be realized as climatically responsive buildings due to an understanding of the specific contextual climatic conditions. Both are located in temperate climates that do not have huge amounts of rainfall, and have sufficient sunny days to allow for natural lighting to be optimized. The designers in both cases employed specialists to calculate and model air flows and temperature changes. The Ministry building, at the time of construction, could not have the resources of thermal specialists, and research in the field was very limited. Added to that, the modernist ideas on building were not rooted in a vernacular understanding of architecture, instead preferring to dismiss local precedent in building. The group of Brazilian architects did still consider climate and orientation of the building, adapting it as much as possible to their context.

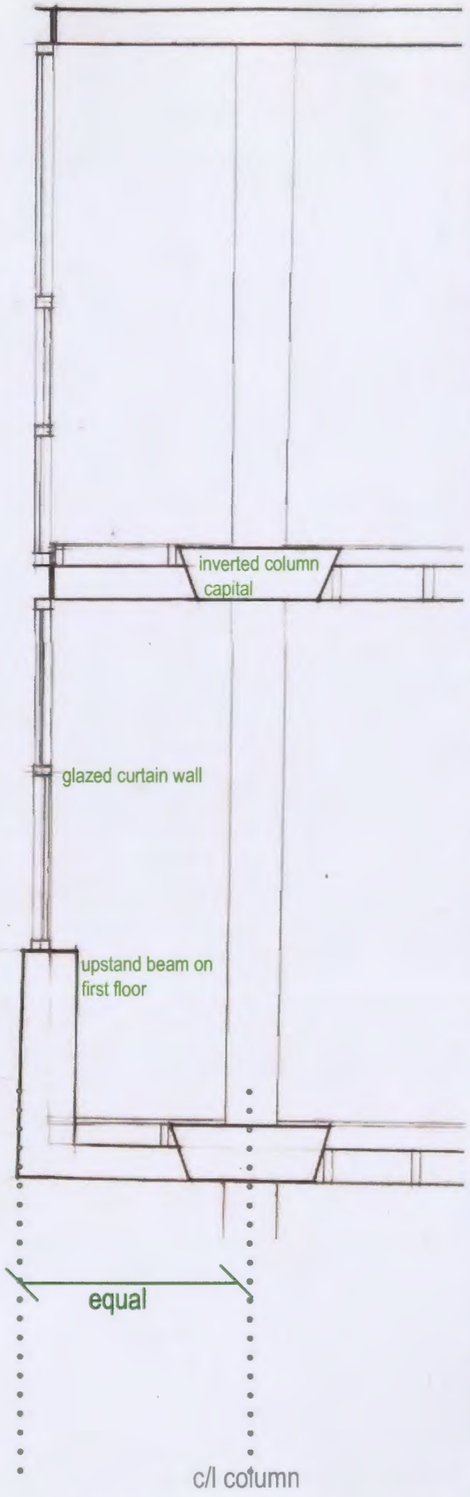


FIGURE 47_ Detail section through South Facade.

FIGURE 48_ South Facade

South facade Ministry of Education and Culture

Materiality

The reinforced concrete column with inverted capitals and slab construction as primary structure allows the floor slabs and columns to be fairly narrow in section. If the architects had decided to use a column and beam construction instead of using inverted column capitals the floor slabs seen on the facade would have been much thicker. The design intention was to create a simple yet elegantly detailed building, and great care was taken to make all horizontal and vertical elements of the facade as slim as possible. The inverted column capitals also allow for flat ceiling soffits, and the services are run in the floors.

The columns are set back from the edge of the floor plate, so as not to have a thick element in the composition of the facade. Curtain walls of the continuous double-hung steel windows form the uniform flat South facade.
The slab edges, concealed behind steel covering sections, are slender in section and do not present a much heavier aesthetic than the thin steel mullions of the glazed curtain wall, allowing the South facade to express an elegant verticality.

The exhibition hall can be seen in the foreground of Figure 48 is the same height as the pilotis for the tower block, 10 metres. This allows the exhibition hall to at once stand as a free form at right angles from the hall and not interfere with the views from the ground looking at the tower block as a contained box.

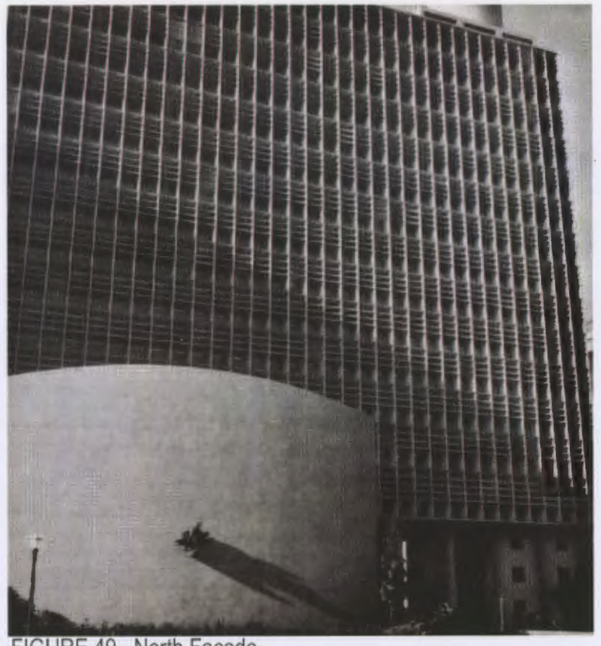


FIGURE 49_ North Facade

North facade Ministry of Education and Culture

Materiality

On the North facade of the Ministry buildings the columns are closer to the edge of the floor plate, lessening the slab edge cantilever. This was done as the honeycomb structure of the sunscreen effectively hides the columns behind, to give an impression of slenderness to the compositional elements of the facade. The supporting honeycomb structure for the horizontal louvres is painted white.
The adjustable asbestos horizontal louvres are painted blue, as the West and East facades have traditional blue ceramic tiling as part of the art display on the building. The horizontal louvres allow for an animated facade as they are adjusted.

The auditorium at right angles to the North facade can be seen in Figure 49.

The system of non load-bearing curtain walls on the facade, common in many office buildings and skyscrapers today, was first implemented in the Ministry building

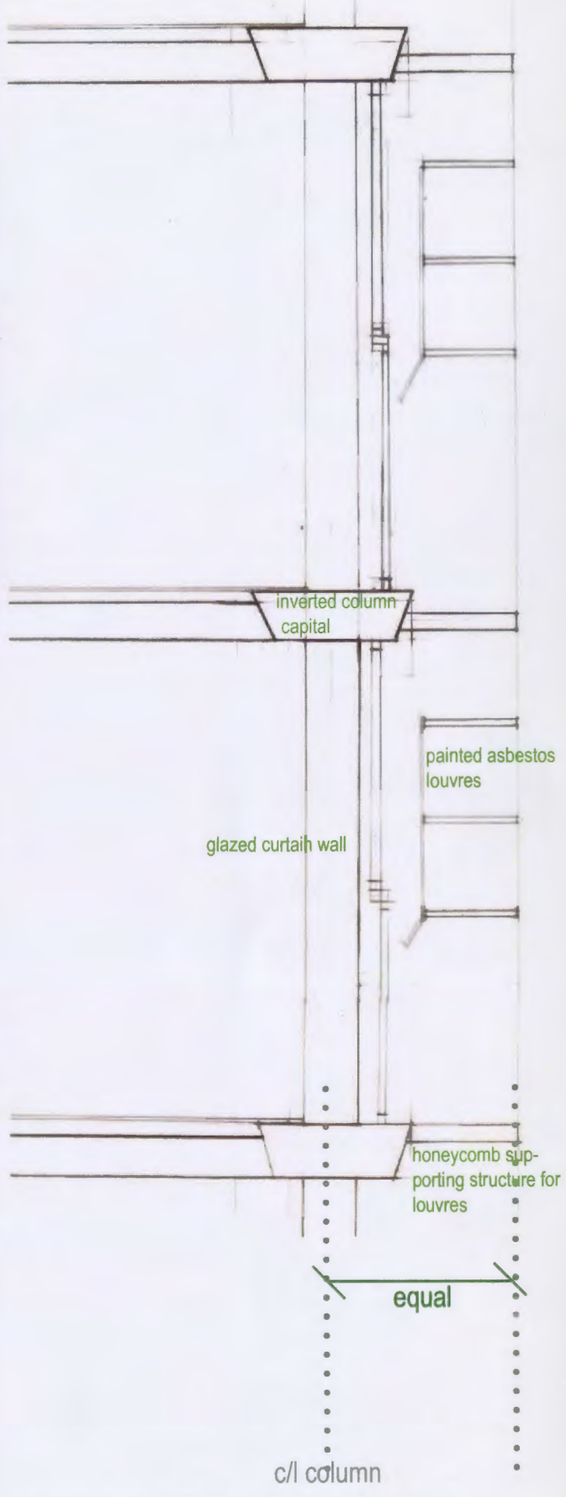


FIGURE 50_ Detail section through North Facade.

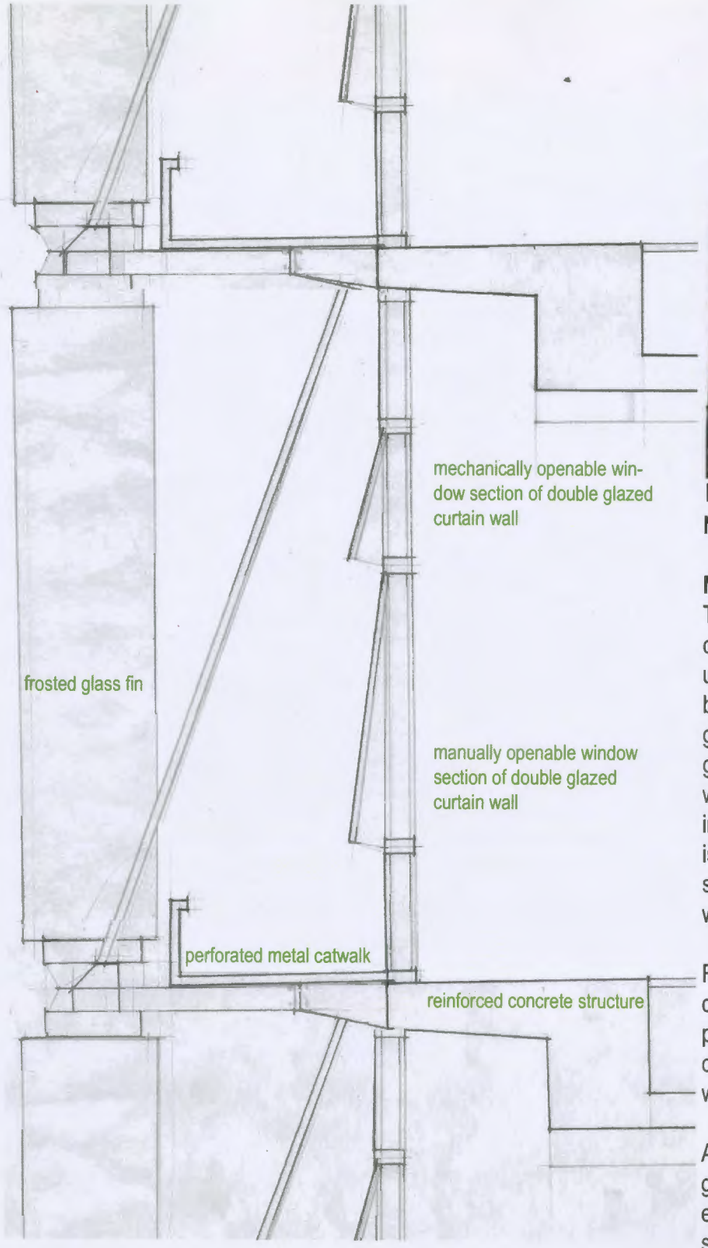


FIGURE 51_ Detail section through North-West facade.

FIGURE 52_ North-West facade.

North-West facade

Materiality

The glazed curtain wall of manually and mechanically operated opening windows makes up the North-West facade of the Federal building. The curtain wall consists of double glazing, with fin-tube convectors between the glazing that mechanically warm air in cold weather and trickle vents at floor level allowing the warm air into the building. This system is controlled by the BAS (building automation system) and is automatically switched on when necessary.

Frosted glass fins are suspended off the concrete beam structure by slim steel sections to provide sun protection to the facade, without obstructing the view out for the office workers.

A perforated metal catwalk separates the glass fins from the curtain wall, allowing for easy access and maintenance to the facade, simultaneously giving the glass fins more depth to efficiently block out direct sun. The catwalk cantilevers off the concrete structure.

The North-West facade consists mainly of glazed layers, made possible by the very temperate climate in San Francisco. The heat gain by a glazed facade would be too high to justify in a climate such as Harare.

FIGURE 53_ South-East facade.

South-East facade

Materiality

The same system of double-glazed mechanically and manually openable curtain wall is used on the South-East facade. A suspended catwalk separates the glazed curtain wall from the concrete structure.

The South-East facade is shaded by the expressive metal scrim skin which wraps itself over the entire facade. The skin is punctured only by the skylobbies for the skip-stop lifts. The skin becomes a glazed roof supported by steel girders over the daycare centre and cafe on the ground plane.
The skin is hung off the concrete frame and has a lightweight steel supporting frame fixed to rectangular hollow sections. The supporting steel frame and skin were modelled and manufactured digitally as the skin undulates.

The scale of the tower block is obscured on the South-East facade by the continuous skin, making it seem tall and imposing. The North-West facades frosted glass fins give an impression of continuity and emphasise the horizontality of the building.

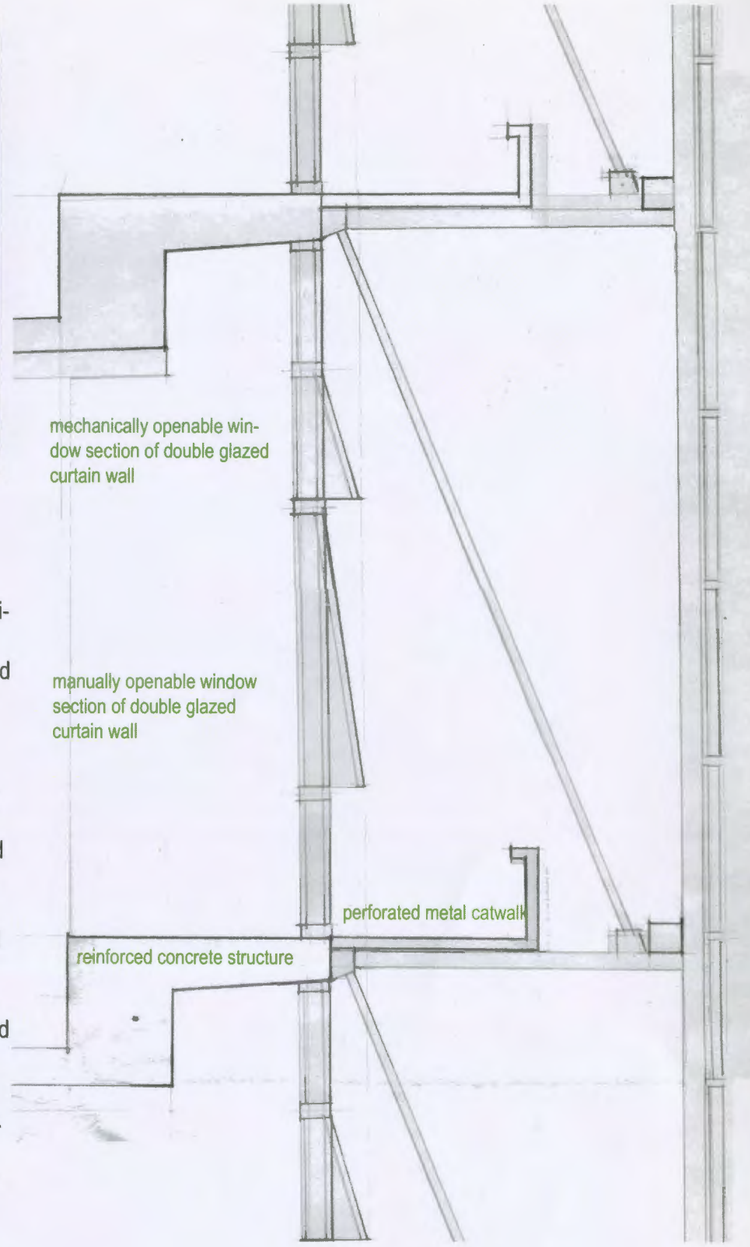


FIGURE 54_ Detail section through South-East facade.

FIGURE 55_ Detail section through external facade.

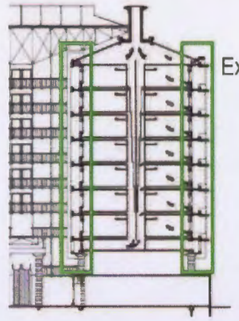


FIGURE 56

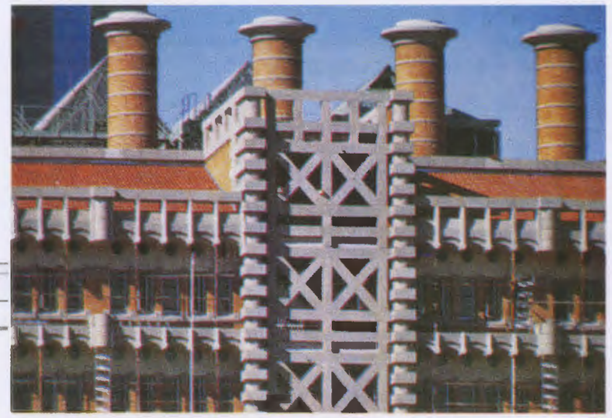


FIGURE 57_ External facade.

External facade

Materiality

The pre-cast concrete vaulted slab soffit extends beyond the envelope of the building, creating useable spaces such as balconies. A reinforced concrete beam extends across these balconies, and the pre-cast concrete sun-shading elements are fixed to this beam.

Brick and concrete panels act as infill walls, punctured by small sealed windows as the ventilation is achieved through the horizontal air ducts fed with forced air. The window area was deliberately kept to a minimum against excessive heat gain from glazed surfaces.
The raised floors also allow for air flow through the building, and allow for the vaulted soffit to be exposed as a ceiling to the interior.

The external facade creates a hard edge to the street. Robust detailing, low-maintenance and cheap materials were used which are easily accessible in Zimbabwe, and allow for a good level of finishing to be achieved.

FIGURE 58_ Internal facade.

Interior facade to atrium

Materiality

The interior facade is detailed in less heavy and thick elements, with slim flat-rolled steel sections used extensively. The concrete vaulted soffit is painted white, creating a soft ambient light, indirectly filtering through from the glazed atrium roof. Infill brick walls are also plastered and painted.
Pre-cast concrete shading elements are used, much as on the external facade, on one edge of the atrium.

The design intention was to create a softer, more intricate detailing to the interior atrium facades, with a 'mineshaft' feel. The second floor skybridge, seen in Figure 58, as well as the vertical lifts, are all steel elements.

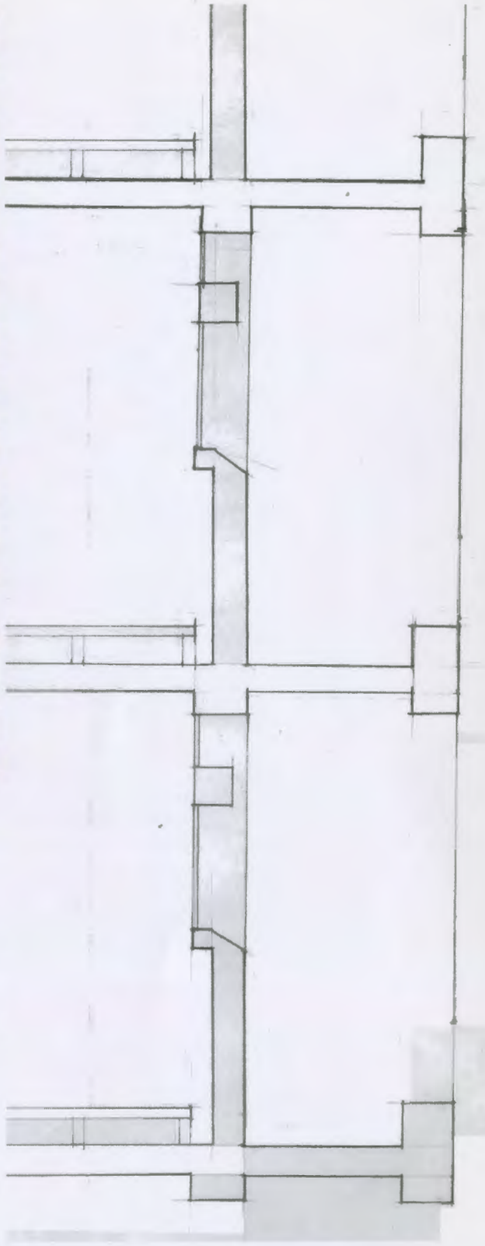
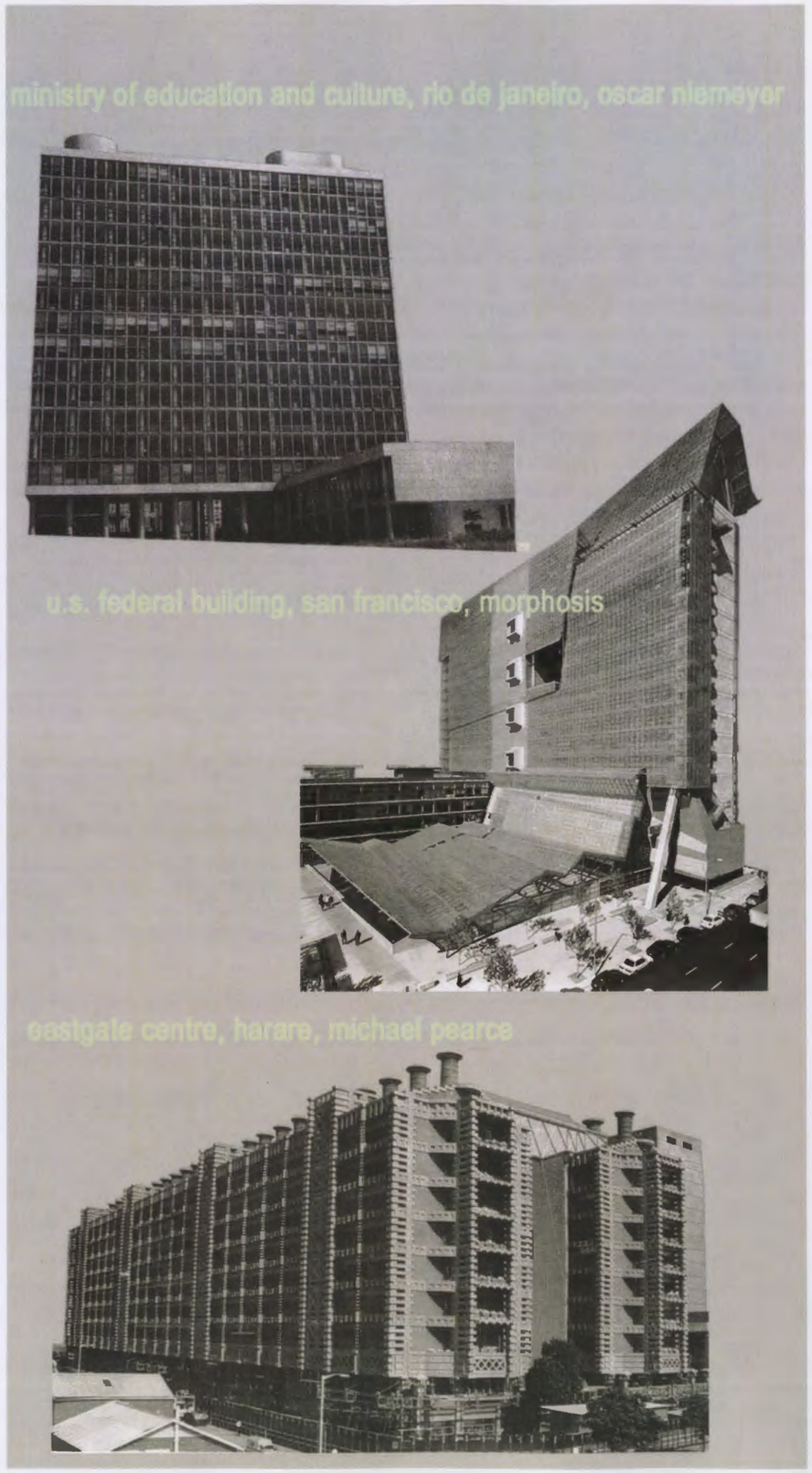


FIGURE 59_ Detail section through internal facade.



Conclusion

After analyzing the technology of the three case study buildings, specifically the responsive facades to public space many similarities have emerged. Although the architectural resolution in terms of materials and design intention is vastly different in all three cases, many basic elements are similar.

The Ministry of Education and Culture in Rio de Janeiro was chosen as at the time of its construction the building was heralded as a masterpiece of modern technology and construction. Utilizing 'new' materials such as the reinforced concrete construction and non load-bearing curtain walls, the Ministry provided the basic technological building blocks to subsequent buildings. The narrow rectangular floor plate used in the Ministry building is common to both the San Francisco Federal building and the Eastgate Centre. This shape and floor plate configuration, the width being limited to a maximum of 20 metres has obviously proven to be the most efficient for natural ventilation and light in office buildings. Circulation cores and services cores are positioned differently in the three buildings, with the basic principle being to locate them on the shorter facades acting as sheer walls or placing them centrally on the floor plate so as not to obstruct natural light. The use of reinforced concrete primary structure and facades of non load-bearing curtain walls are also inherent to all three case studies.

Whilst at the time of construction of the Ministry specialists such as the thermal engineers employed by the other two projects did not yet exist, the Ministry still has similar climatically responsive facades, if not as refined as the later projects. Although a thermal engineer was consulted during the design process, the Eastgate Centre present a much more traditional and vernacular approach to building and envelope than does the San Francisco Federal, which relied heavily on the 'technological approach to problem solving'. It is arguable that the Federal building had a more efficient building industry, more capital for construction and is located in a more developed country, and its digitally resolved facades are a result of this.

All three buildings work on a layering of elements to create climatically responsive facades that also make a layered threshold to the public spaces. The Ministry building is seen as the forerunner for these medium rise tower blocks, setting the standards of what was possible in terms of material efficiency and construction, as well as workplace design. Before the Ministry building, buildings of this type were brick load-bearing structures, structurally limited by their very nature, done in the Neoclassical or Beaux-arts style. Neither the Eastgate Centre nor the San Francisco Federal are drastic departures from the Ministry building in terms of basic principles: they only utilise the available resources and materials as well as the climatic response differently and in line with the technological advances of their times. The floor plate configuration, ideas of providing sun-shading devices to certain facades and lack of ornamentation on the external envelopes are derivative for the Eastgate Centre and Federal building of the lessons learned over 50 years before from the Ministry building and other following modernist buildings of that scale.

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Siting

The research undertaken in the theory research document set up guidelines that served to inform the choice of site for the project. The site thus needed to be located within an existing urban framework, where confrontations and contradictions of existing layers of urban and spatial systems were already in existence. The challenge to the existing tower block model should ideally locate itself within exactly such an environment, to confront head-on the same challenges and environments that the tower block buildings deal with.

The civic building also needed to relate back to an existing civic infrastructure of buildings and public spaces, which was found to be in the old, established East City. The programme of Home Affairs called for a close proximity, a comfortable walking distance, to the Police Station and Magistrates Court.

The idea of governments having social contracts with cities and their citizenry to provide civic buildings and public spaces also added a further site criteria: that of having a site that allowed for the creation of public space. In search of a site the East City area could thus be analyzed according to potential for public space creation.

The choice of site for the project thus had to fit into a set of criteria as set up by the research documents. After a thorough investigation of the existing civic district, and considering the need for proximity to other civic functions and the need for public space connecting to the existing public space network, no open site could be found to suit the criteria. A site on the corner of Mostert street and Plein street comprising of three low-rise buildings deemed to be of little value to the city was chosen, with the three buildings to be demolished completely.

historic buildings
civic buildings
education institutions
open sites

zoning border of CBD

connections through and across streets

barriers through and across streets

N

albertus street police station

old drill hall

old city hall

longmarket street from buitenkant to adderly

Siting _ The Civic District

Most of the civic administrative buildings owned by the city are located in the East city, on the old foreshore line, some stemming from colonial times, such as the old City Hall (now Municipal Courts), old Drill Hall (now library) and the Cape Town Central Police Station. These buildings have a civic character that is easily discernible and recognizable.

The 'civic administrative district' is already in existence as the Police Station, SAPS buildings, Department of Correctional Services, Magistrates Court, Municipal Court, Department of Labour and Home Affairs need to be in close proximity to each other to transfer people as well as documents and information between them.

The map above shows the 'civic district', its edges defined by the busy vehicular boundaries of Buitenkant street (also the CBD zoning boundary), Strand street, Adderley street and Roeland street. Inside this area there are mostly narrow one-way streets, dominated more by people than cars allowing for free pedestrian flows. Some streets such as Longmarket Street are entirely pedestrian. Public space amenities such as the Grand Parade and the Company Gardens form bookends to the area. The close proximity to the train station and public transport has allowed this area of the city to be less dominated by the motorcar than areas such as Long Street.

The site for Home Affairs needs to be located within walking distance from the Magistrates Court and Police Station, indicated as 100m rings on the map. As discussed in the theory and technology documents, the relation of the chosen site to open public space is very important. The only empty sites in this area of the city (indicated in blue) face the busy vehicular boundaries of the civic district, and have no opportunity for creating public open space. Thus, a site had to be chosen where the existing buildings could be demolished, and public open space created.

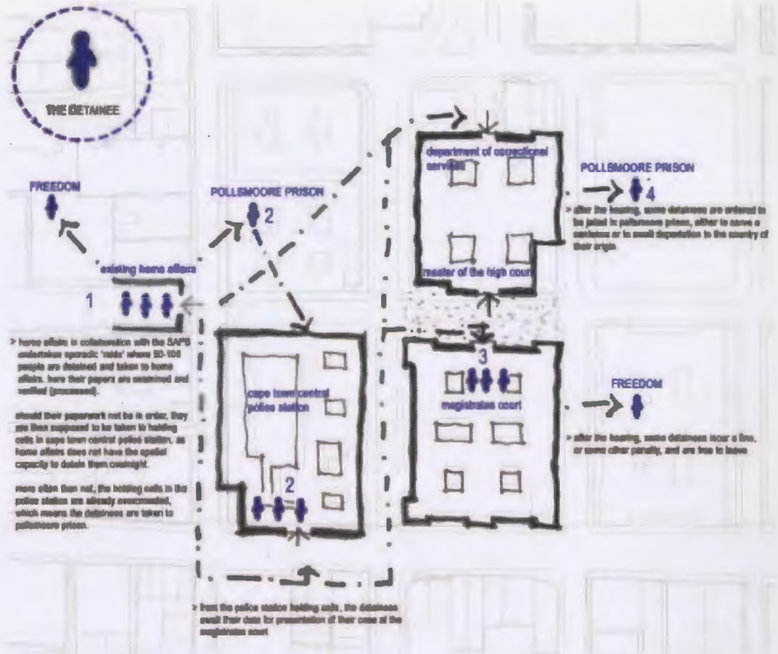
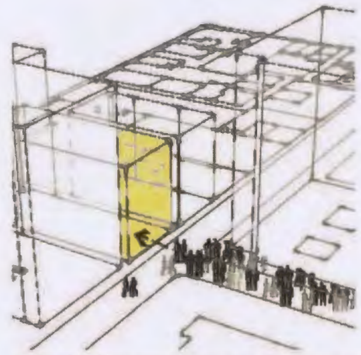


Diagram illustrating the programmatic and spatial relationship between Home Affairs, Cape Town Central Police Station and the Magistrates Court at present.



_Existing Home Affairs - crowds blocking the street, no space for dialogue

Diagram illustrating the crowds that form outside the existing Home Affairs building, demonstrators, protestors or simply crowds waiting spill onto the street as no public open space is provided for them.
Similarly, the Magistrates Court has had to permanently block of a portion of the street off to vehicular traffic to deal with crowds waiting to catch a glimpse of friends or family being led into the court.

1. Three buildings to be demolished shown hatched.

3. Building adjoining site on North-east - Townhouse Hotel.

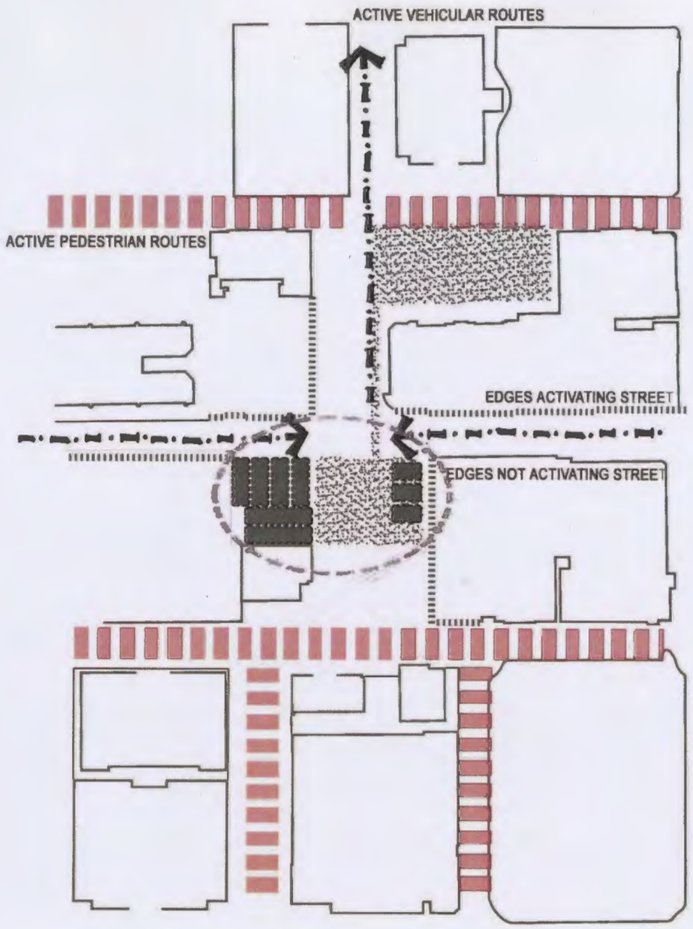
5. View up Mostert Street from Townhouse Hotel looking towards North.

2. Truworths building opposite site, Heritage building at the end of Mostert street.

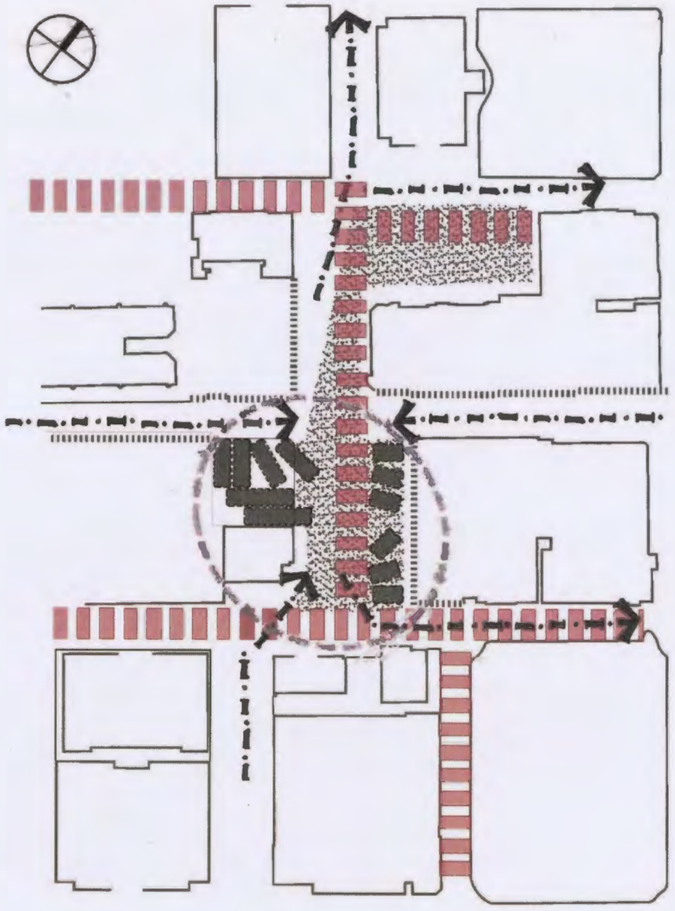
4. Building adjoining site on North-west - Pleinpark Parkade and Office Block.

6. View down Mostert Street from Church Square looking towards South.

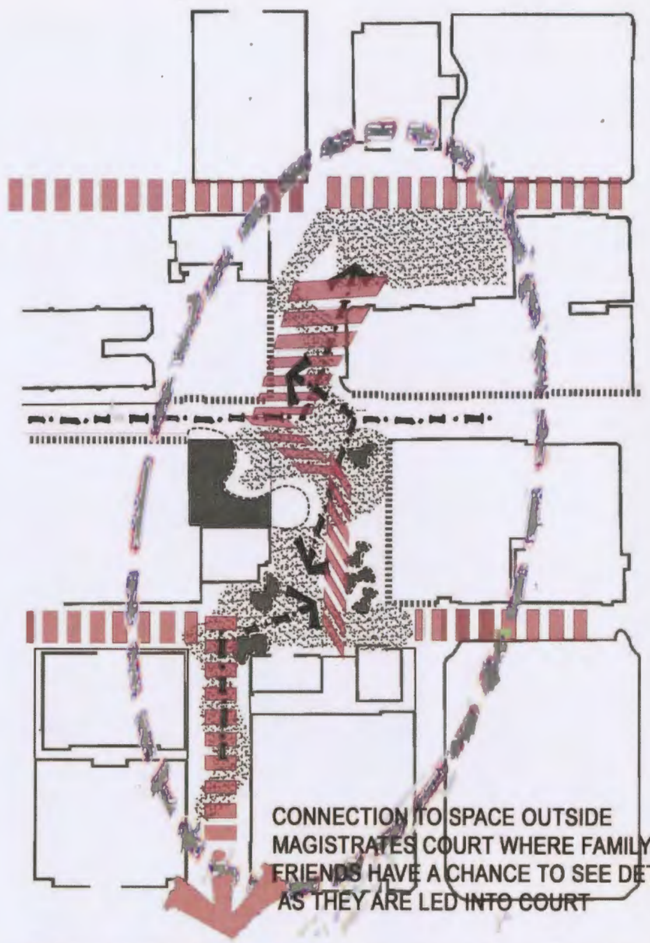
The map shows the civic buildings to which the site needs to relate to, as well as an urban public space connection between the site, the existing public space network of Church square and Parliament / Company Gardens and the functions happening outside the Police Station and Magistrates Court.
Abutting the site to the North-east is the Townhouse Hotel, a typical example of a tower block building. To the North-west of the site is Pleinpark, a public parkade and office block above, also a typification of a tower block building. Across the site is the Truworths building, currently using the space onto Mostert Street as a parking lot, leased from the city. The public open space opposite the site has already been earmarked for development by the cities Public Space Network Development Plan as a small square connecting to Church square.



Vehicular movement around the site and square, but not through it. All edges activating street and square, with programme across the square to create tension and movement.



Formal edges of site fragmented, program strewn across site and square. Vehicular movement allowed through the site, and past Church square.

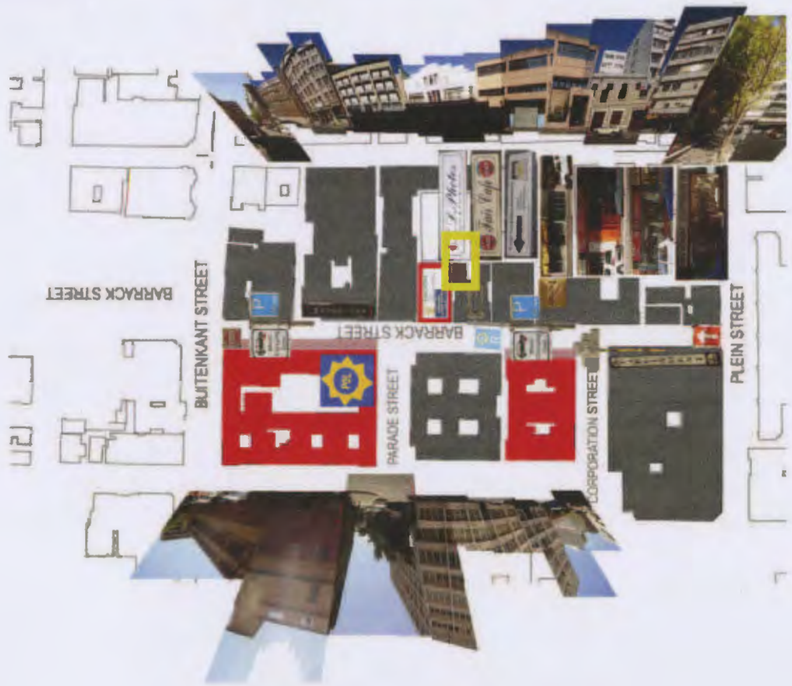


Edges rounded and fluid, allowing square or public space to flow into streets and establish a connection with the existing public space outside the magistrates court

Site explorations and site constraints. Relating building to public space.

existing Barrack Street Home Affairs

Barrack Street scene



Barrack Street scene opposite Home Affairs

Through investigating the present condition, location and building type of Home Affairs in Barrack street, a few conclusions could be drawn setting up spatial guidelines for the design:

Civic architecture

The present building in Barrack Street does not differentiate itself from its surroundings, and the architecture gives no clue as to its function, as shown by the street scene above. As discussed in the theory and technology research documents, the facades of civic buildings are important to communicate with the citizenry, to mark clearly civic functions within the city.

Attached programmes

The map on the left illustrates the additional programmes which accompany Home Affairs strewn along Barrack street: small photo-shops, cafe's and shops selling passport jackets. Not currently there but needed is a bank or atm. These functions are intrinsically linked to Home Affairs, allowing these small privately owned shops to survive, and presents interesting opportunities for cross-programming.

Need for security and legibility

The need for the internal workings of Home Affairs, which often deal with confidential paperwork and money to be secure from the general public is obvious when examining the Barrack street building, where theft and fraud are common and a direct result of inadequate vertical circulation in the building. Spatial legibility, as well as signage, is also very important as often there is no-one manning the information counter, and people waste time standing in the wrong queue .

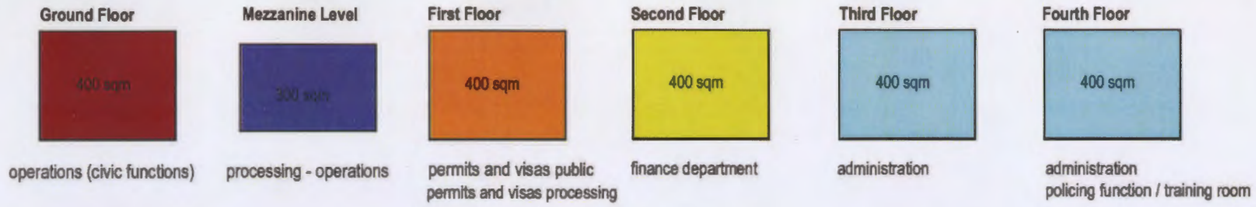
Visual Interaction

Visual interaction between public and civic servants, as well as between civic servants themselves would add additional surveillance, security and legibility to the building. Presently, there is no visual interaction, staff being housed in separate cellular offices, connected by circulation corridors accessible to the public. The case study done in the theory research document on Herman Hertzberger's Centraal Beheer building gives an architectural and spatial idea on how to connect people visually.

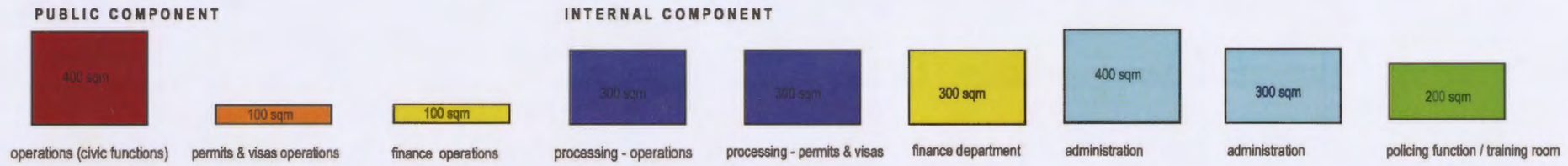
Flexible (work)space

The nature of the administrative work done in Home Affairs lends is that there are temporal needs for spaces to accommodate task teams and group work, tackling the changing needs of a government department. Spaces for the public also sometimes temporarily need to accommodate a large influx of people. Spaces to pause, rest and wait for users can become spaces where at times larger amounts of people can be accommodated. The need for spatial flexibility will then need to inform building structure, as researched in the technology document case studies.

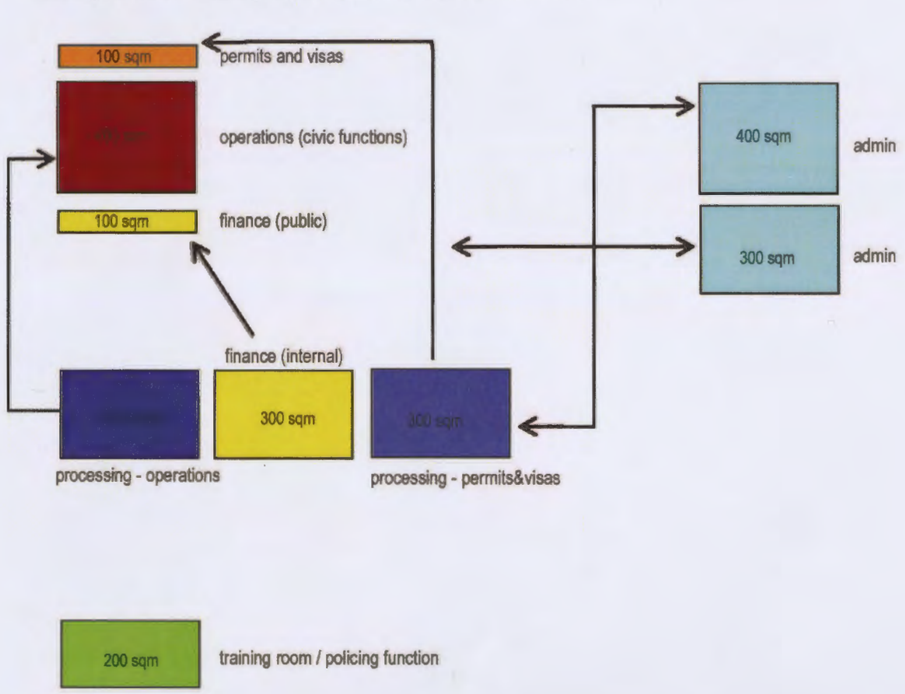
CHAPTER 4
Lessons from Home Affairs



Programmatic functions of Home Affairs as presently arranged, vertically from Ground Floor to Fourth Floor.



Programmatic functions of Home Affairs arranged from publicly accessible to private internal functions. Functions such as the permits & visas department and finance department broken up to separate public and private internal parts.
Policing function / training room separated from administration.



Programmatic functions arranged according to the relationships between them.

The Home Affairs Programme Terminology

Operations: Civic function open to the public where applications of Identity Papers, Passports and other documents are received. Collection of completed documents by public.

Permits & Visas: Applications of work permits and visas for foreigners, open to the public.

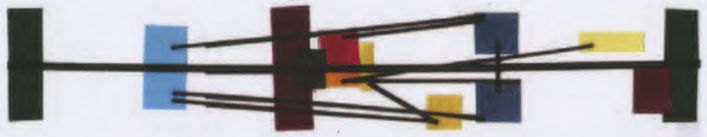
Processing: Area of Home Affairs where completed forms are processed and documents made up, internal function and needs to be secure from the public.

Finance: Department handling the payment for document applications and other finances of Home Affairs. Large amounts of cash are sometimes stored here. A small part of this department needs to locate itself within the operations programme, but the rest of the department needs to be internal and secure

Administrative: Large component of programme that deals with the internal workings and bureaucratic function of Home Affairs. This needs to be occasionally accessible to the public as in complicated cases of visas, permits and citizenship recommendations.

Policing function / Training : Temporarily used space, needs to have secure direct access as detainees need to be escorted to it. Space doubles up as a training room for internal Home Affairs training.

CHAPTER 5
Programmatic explorations

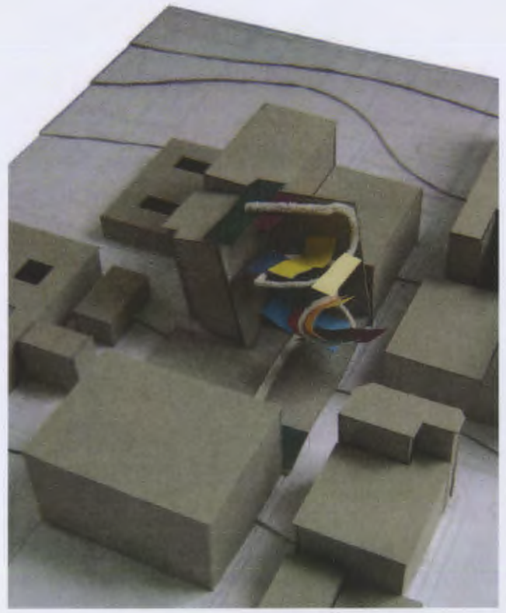


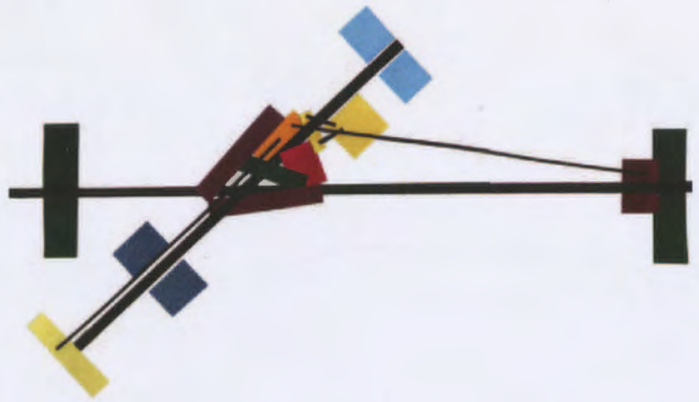
Programme spatialised as a linear progression

Public space and public function added to the programme. Public space could be waiting area, entrance hall and places to pause and rest. Public function could be shops, restaurants and internet cafe.

The black lines connect various programmatic functions, and have varying thicknesses according to their use as circulation. Problems presented in terms of a maze of crisscrossing connections.

Below the model shows the programmatic progression spatialised 3 dimensionally, to scale on the site.

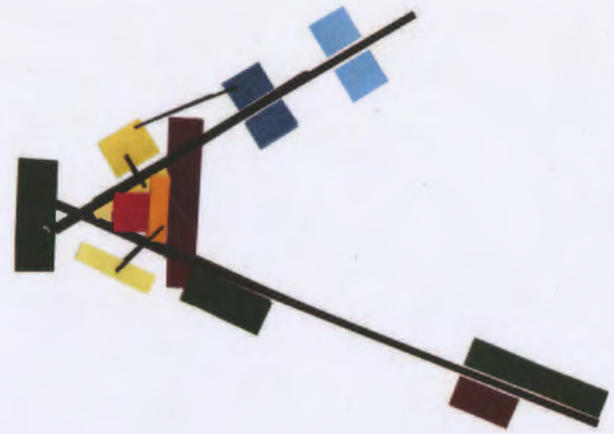




Programme spatialised as separate progressions crossing at one point

Immediately less connections between related functions are needed. The horizontal progression becomes the one housing the public functions, whilst the angled progression starts to take on internal functions,. Separating the two seems to make access and security easier.

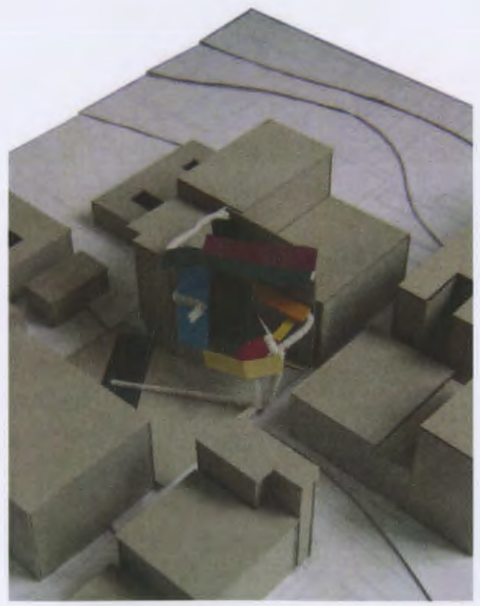
The starting point for the progressions is no longer shared, instead where the two intersect public functions conglomerate.



Programme spatialised as separate progressions originating at the same point

Connections further cut down and simplified, with the lower progression now being entirely public, and the upper one being internal Home Affairs functions. Instead of a conglomeration of the public at a crossing point, this now becomes the connector between the two lines.

All models below show the initial starting point, the public space shown in green, as situated on the square. The square is seen as the starting point for the Home Affairs journey.



Public space

Public function

Civic Operations

Permits&Visa Operations

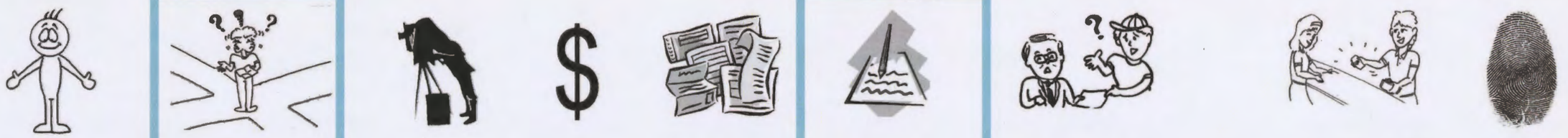
Finance

Processing

Administrative

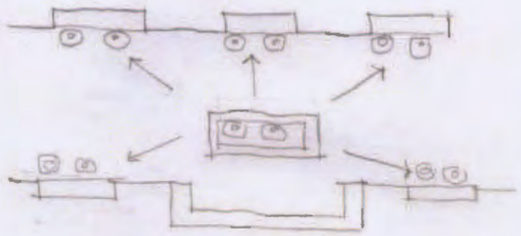
Policing Function/ Training Room

THE JOURNEY THROUGH HOME AFFAIRS



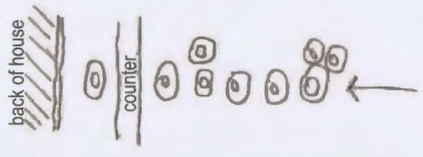
LEGIBILITY

HELP

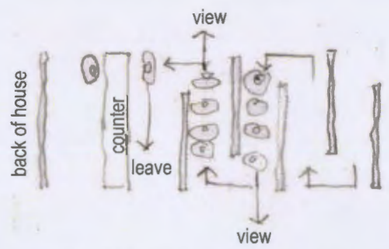


Help desk to hand out appropriate forms, and to assist when filling in these forms - shorten the operations queues considerably.

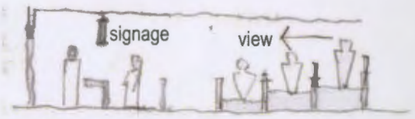
THE QUEUE

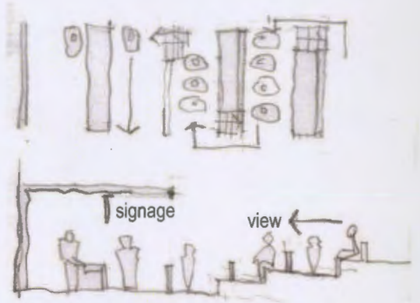


Queueing facing the counter - queues seem longer

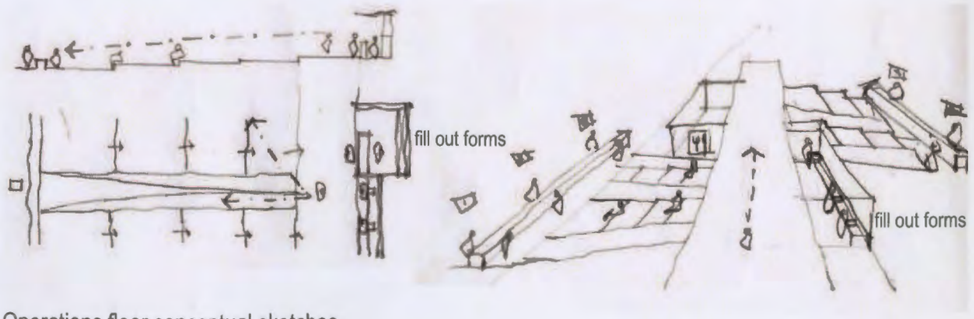


Queueing at 90 degrees to the counter - shorter queues, possibility of visual stimulation





Stepping the queue, providing seating



Operations floor conceptual sketches

Model 1

Model 2

Model 3

Model 4

Model 1 section

Model 1 sectional detail model

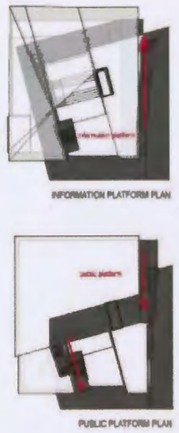
Initial design development

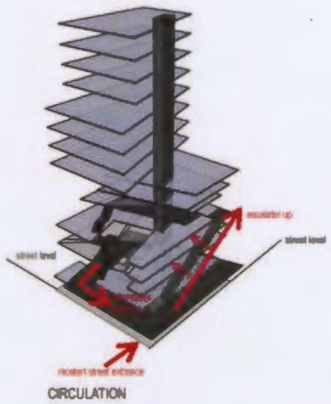
Model 1
The first design attempt shown in model 1 was done for the mid-year review, under considerable time pressure. It resorted to stacking equal floor plates, **not breaking the conventional model of a tower block**. The journey was lost. An interesting idea of the ground plane flowing from the square across the street, into the building and folding up to become a skin. The initial response to the site was only trying to negotiate with the almost square, 30 metre deep floor plate. How to get light into the space? How to allow for some natural ventilation and lighting?

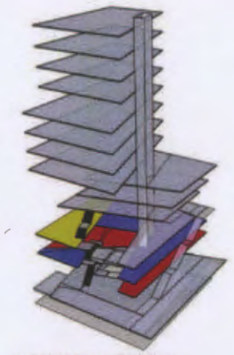
Model 2
Taking a step back from the constrictive site, conceptually this model tried to deal with how to have a system of structure and of movement, thinking back to the idea of a Home Affairs visit being a journey. It was **too abstract**.

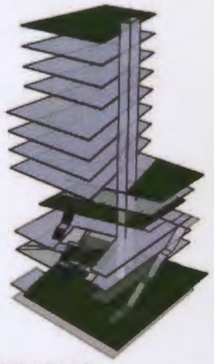
Model 3
Still trying to play with systems of climate control, movement and structure. **Realisation that the site was going to present serious difficulties in terms of fitting in all the ideas.**

Model 4
The journey through the building architecturally became a ramp that wrapped around the site. The coloured boxes showed the public functions of Home Affairs, visually linking to the square, which itself ramped down to meet the ground floor. The offices above became a different element, back to the ideas of Hertzbergers Centraal Beheer where the boxes become interactive with each other. The corner of the building starts to be articulated.









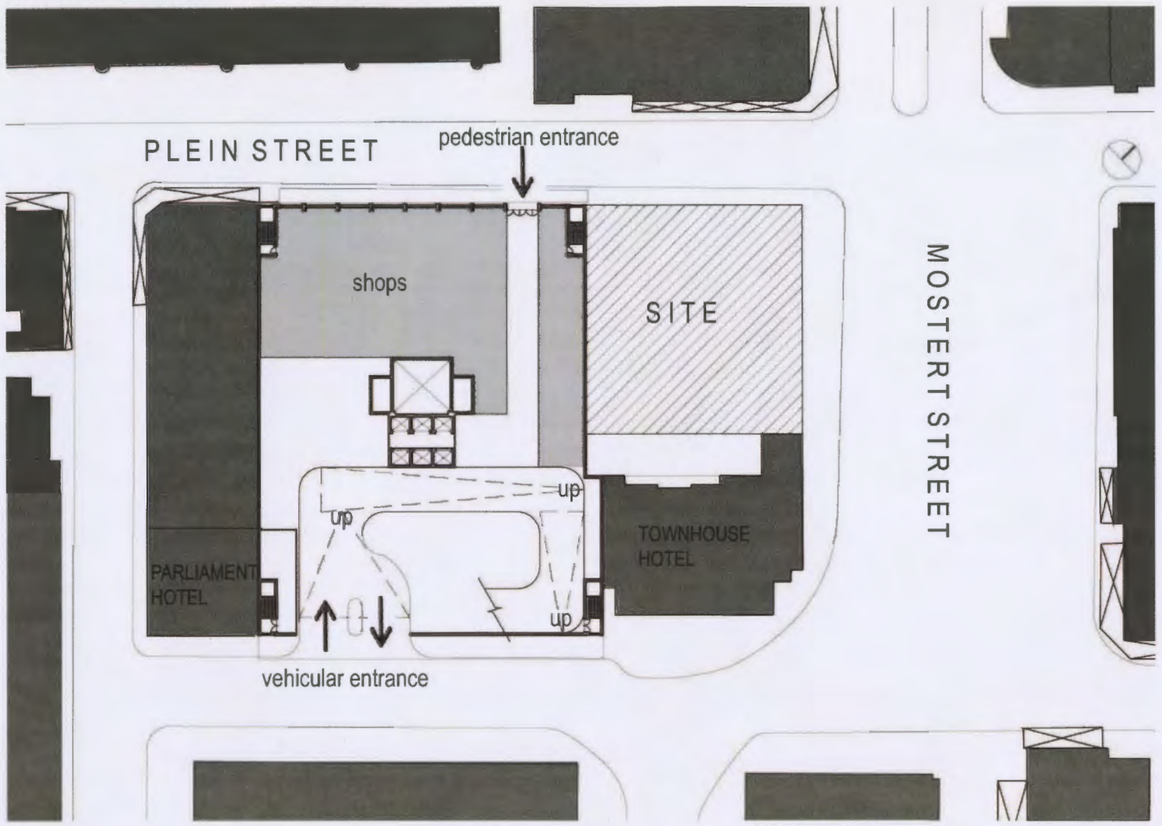
Articulating the journey through Home Affairs

The model shows Home Affairs as the lower portion of the building, exploring the **ramp as the journey**, with programmatic functions attached to it. The actual entrance to Home Affairs is thus above street level, adding a feeling of security to the users. From this entrance balcony, two separate routes up and down allow for the journey to become circular. Above that are the offices (the model was never completed to its full height) which became boxes that interact vertically with each other.

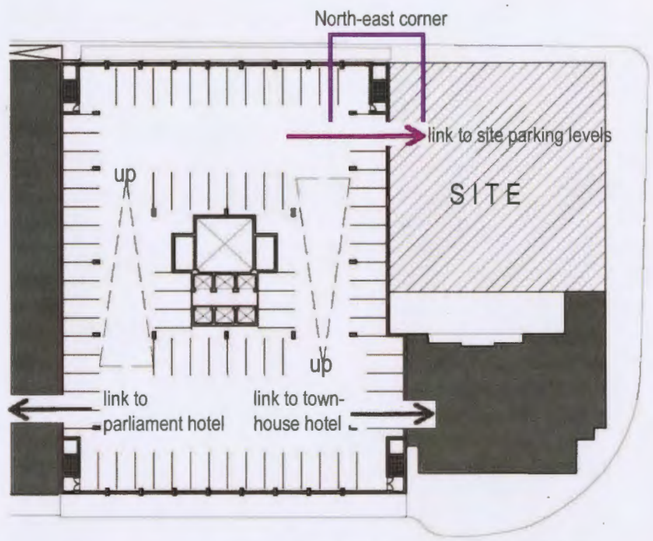
Home Affairs now became a separate entity of the building, a plinth for the offices. For security reasons and the need for a separate access for the offices the **two building programmes became disconnected**.

The model is an expression of programmatic function, but this has resulted in the building looking like two **separate entities stacked** on top of each other. There is **no civic-ness in the architecture**, no signalling of a building of importance for the city. The programme dictates the aesthetics of the building.

Additionally, the issue of **providing parking** for the offices is recalled: on a 900 square metre site, a parking ramp would take up three quarters of the ground plane. Based upon the design done for mid-term (which maximised floor area) the offices need 400 parking bays - according to council regulations. If adhered to, this would mean the site could not be developed, or would have to become a parkade building. The adjoining building, Pleinpark, is public parkade. Ignoring the need to provide additional parking in the CBD seemed as senseless as small sites in the CBD being unfeasible for development because of parking regulations.



Ground Floor Plan Pleinpark building

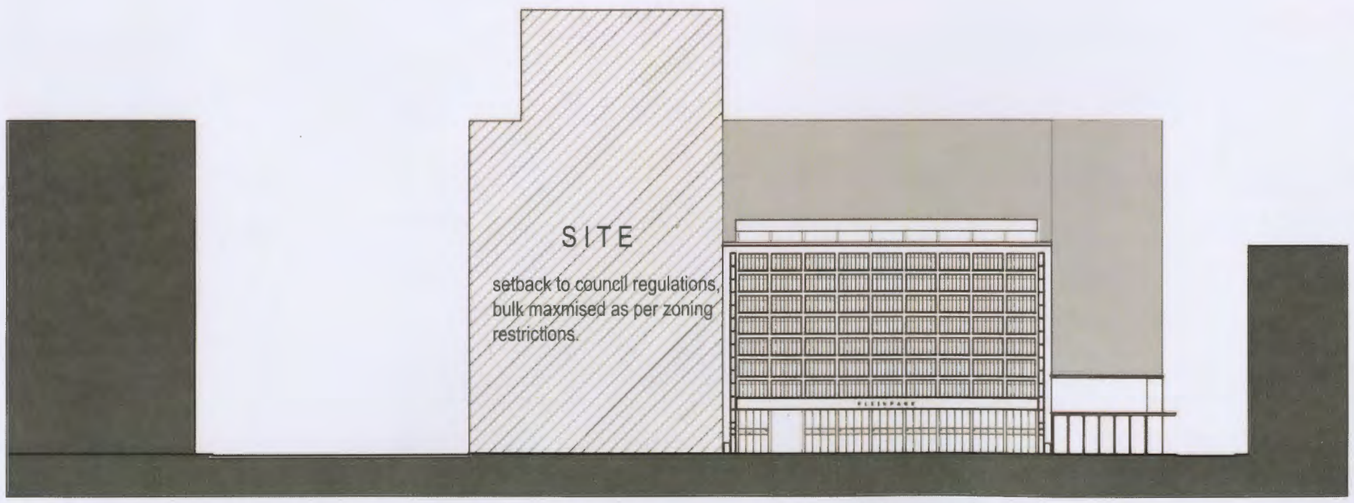


Parking levels Pleinpark building

North-east corner inside Pleinpark

Townhouse Hotel entrance from Pleinpark parking level

No ramp on North-west and South-east sides



Plein street elevation

The parking problem

The Pleinpark building adjoining the site serves as a **public parkade for the East City**. It has 7 levels of parking, above which sit 8 levels of offices.

Adjoining buildings such as the Parliament Hotel and the Townhouse Hotel, both tall buildings on small sites, have rented bays from Pleinpark and **created accesses to their buildings straight off the Pleinpark parkade**, as shown in the Parking Level Plan.

The decision was made to allow for parking above ground on my site, accessed by using the Pleinpark building parking ramp, thereby still keeping the Ground floor and above free of parking. As is shown in the Parking level plan, the floor ramps only at certain places, flattening on the North-west and South-east sides of the building, thus **allowing for an access into my site from the North-east corner**.

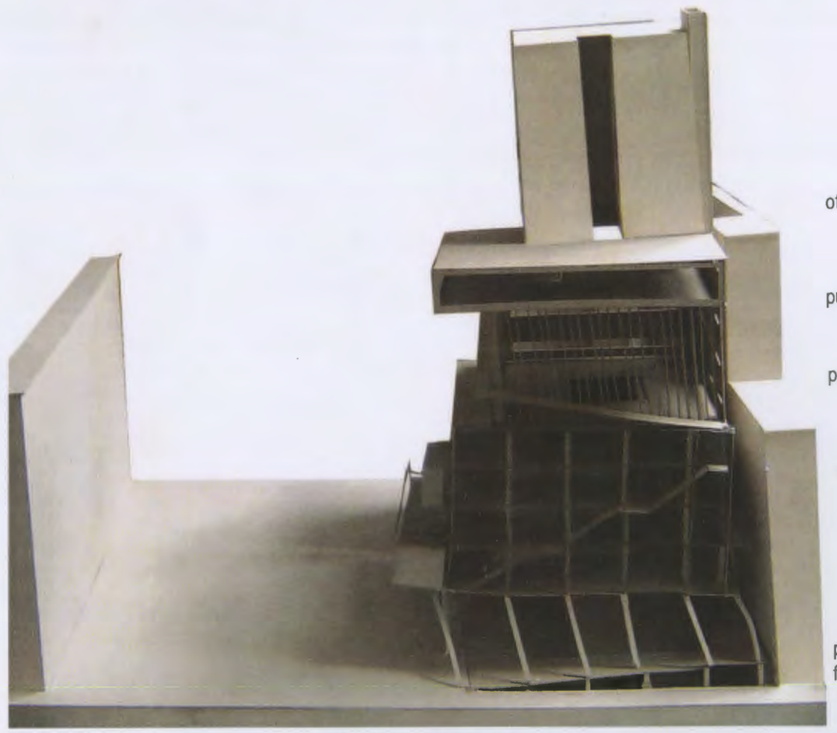
Having come to a solution for providing parking in the building without having to dedicate the entire ground plane as well as the first 4-7 floors above to it, the model shows the idea of expressing the different components as separate elements of the building.

The architecture of the building thus became that of stacked elements, facades expressing their functions.

The offices above were explored further as shown on the sketch on the left. Following on from the research undertaken in the theory research document, the offices needed to be flexible for **multi-tenant use**. This meant providing spaces that could easily be divided or amalgamated, with the tenants being able to choose to put in cellular offices or keep the space open plan. Separate access from ground floor, connected to the parking levels was provided, for security reasons and to stop the public coming into Home Affairs from mistakenly going to the offices.

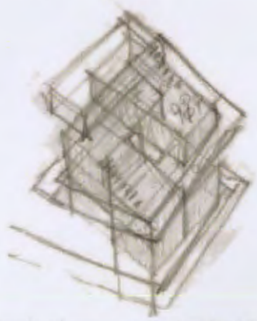
The ground floor of the building was completely open and public, with security only happening at the entrance balcony to Home Affairs. **The ground floor thus became an extension of the public square inside the building.** Realisation that leaving a ground plane in a tall building completely open would impair the security of the functions happening above. Home Affairs as a public building should inspire a feeling of safety and security to the people that visit it, rather than the feeling of complete openness and vulnerability. The ground floor might be taken over by loiterers and the homeless.

The ramp also posed problems on the small site - the only way to get a comfortable ramp up 5 meters was to put it skirting the site boundaries. Besides taking up a lot of space, this made the ground floor awkward. **The ramp was impractical, and too literal an interpretation of the programmatic journey through Home Affairs.**

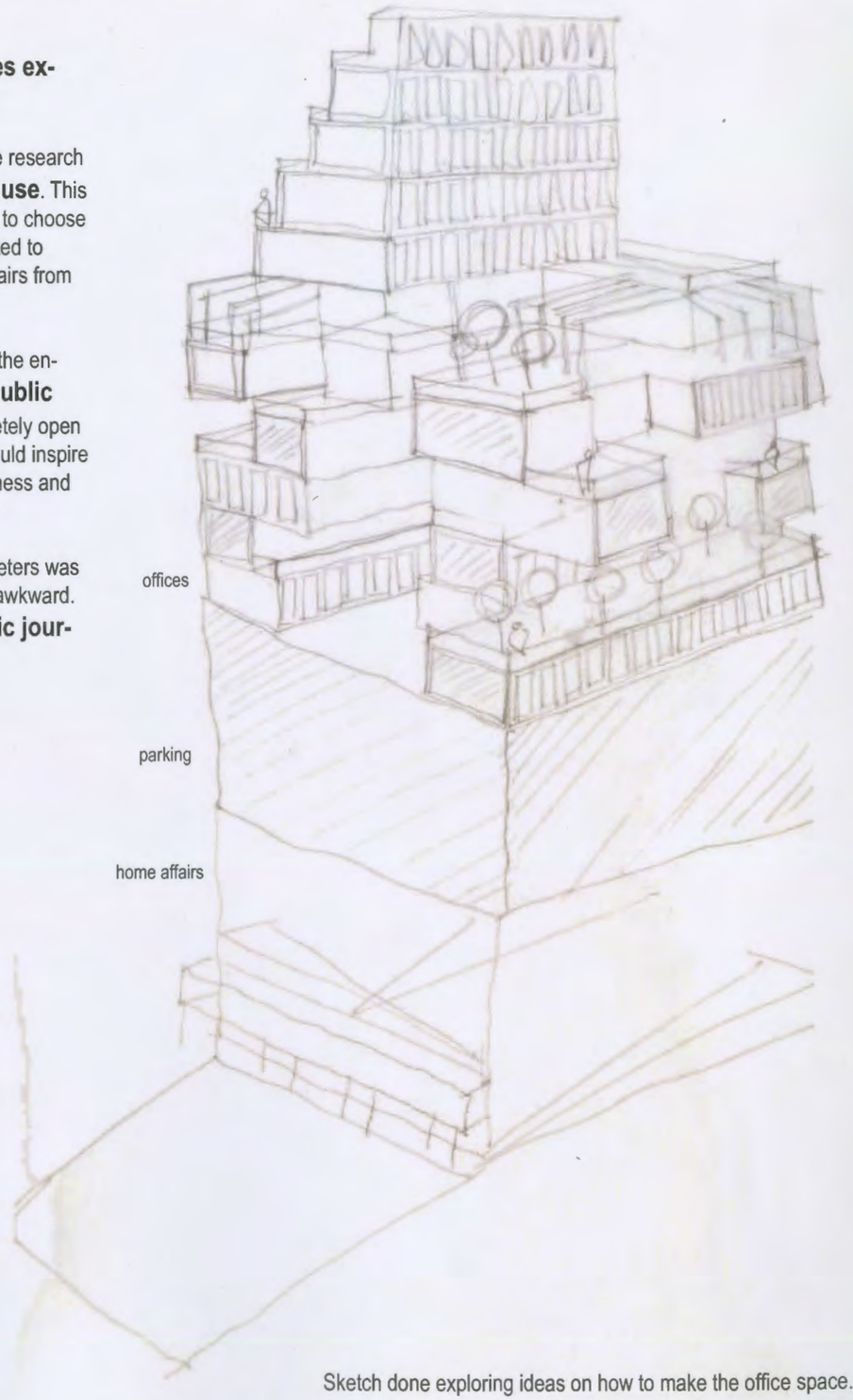


Model done at 1 : 100 scale to show facade detailing and articulate different programmatic elements

massing model of office levels



sketch of ramp wrapping building connection different parts



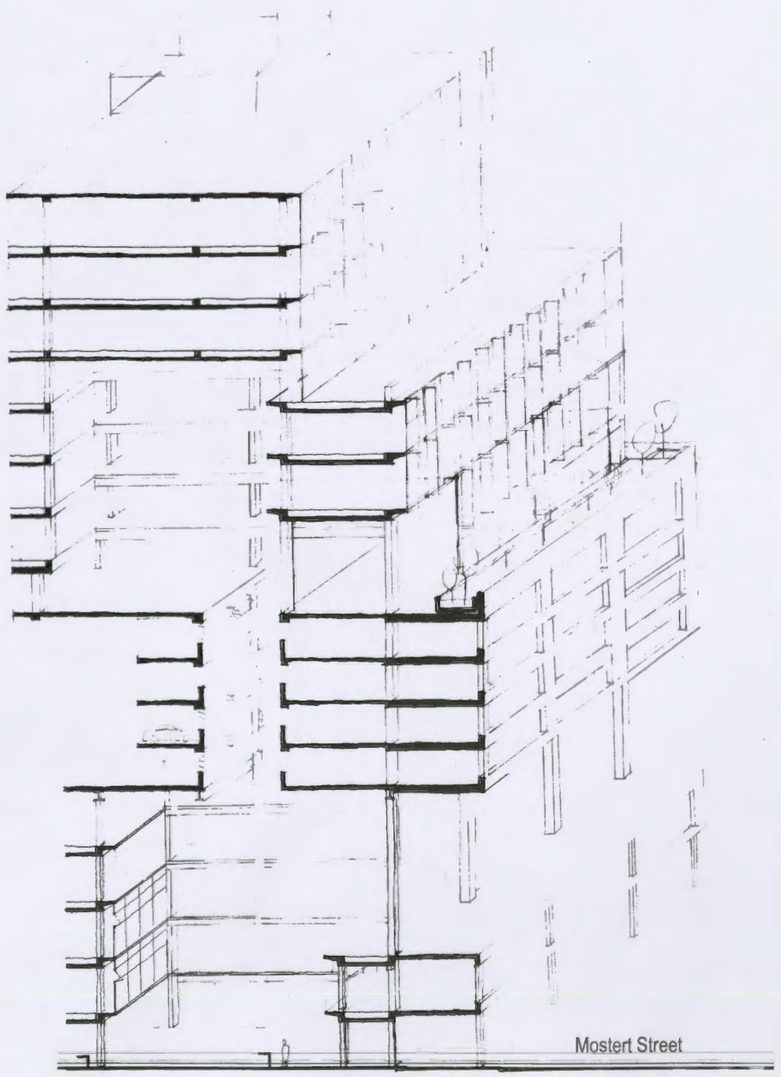
Sketch done exploring ideas on how to make the office space.

Structure

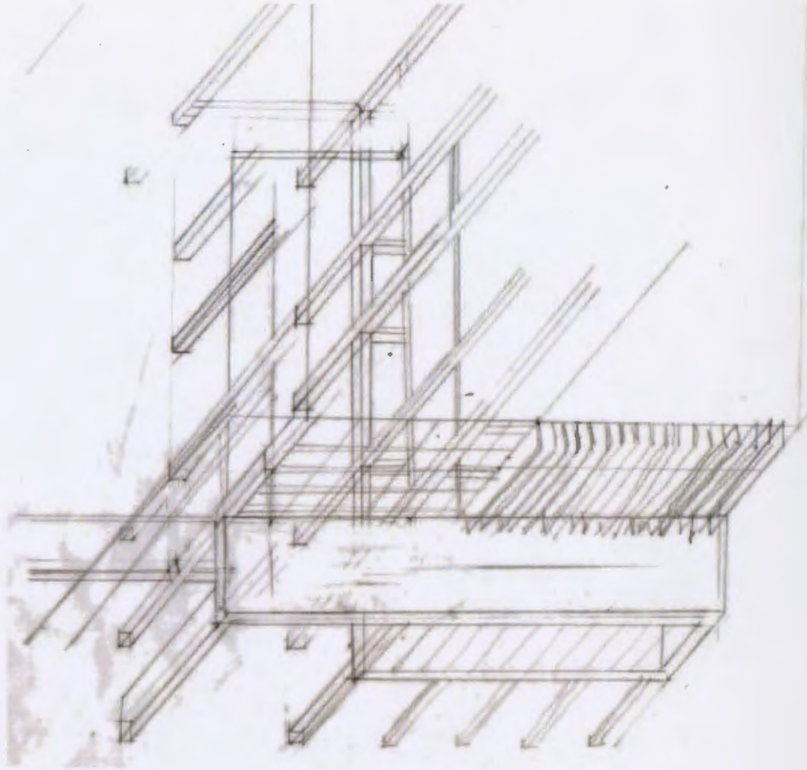
Sectional sketches exploring the idea of a void running through the building providing natural ventilation. The circulation wraps itself through and around the void, re-interpreting the idea of the ramp.

Structurally, the column grid at the parking levels needed to still work for Home Affairs below, and the offices above.

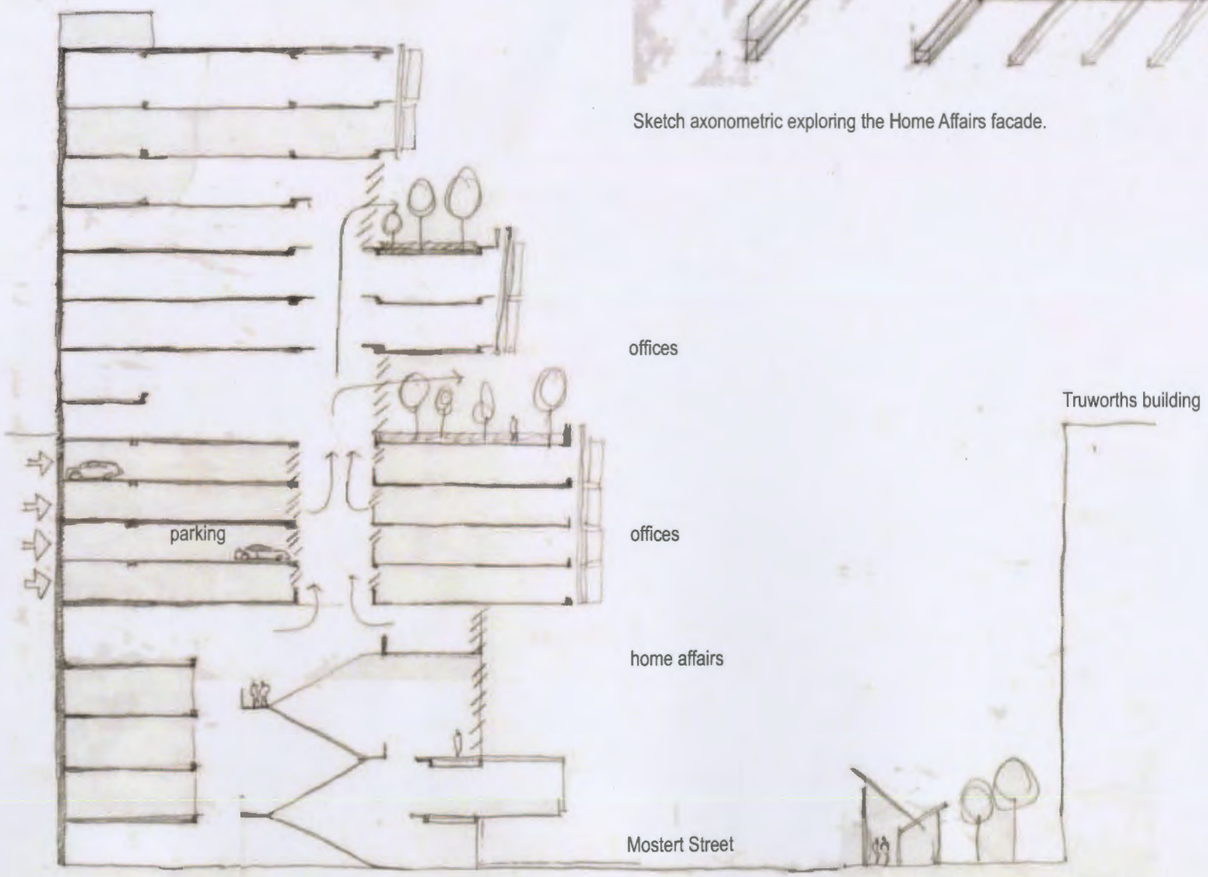
The floorplate size and square shape is not ideal for a parking layout, with a lot of wasted space, so the initial idea was to split the floorplate with a void at parking level, allowing for some office space. This presented huge problems in terms of devising a column grid that would not be too restrictive to Home Affairs below and full office levels above.



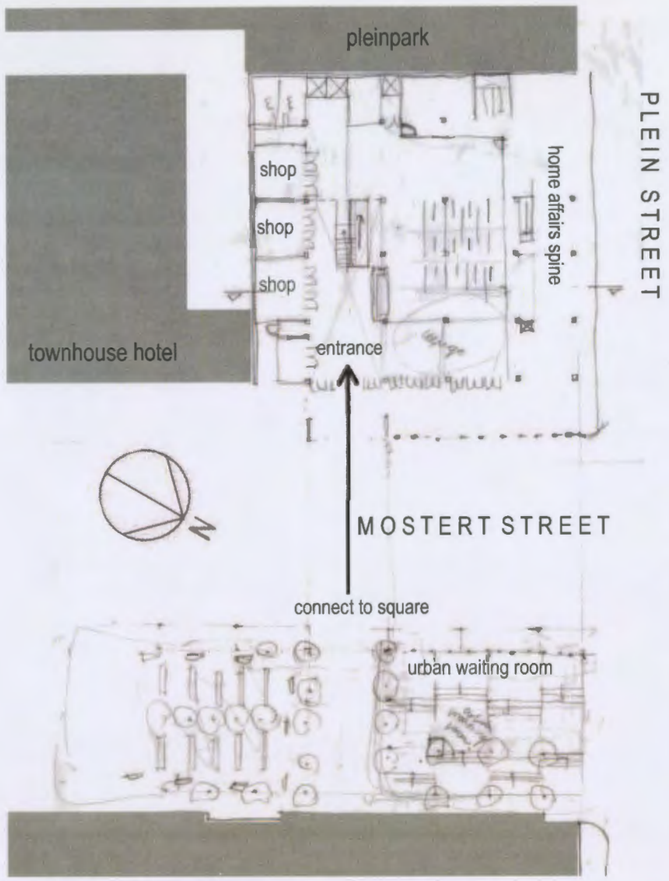
Sketch axonometric exploring the void.



Sketch axonometric exploring the Home Affairs facade.

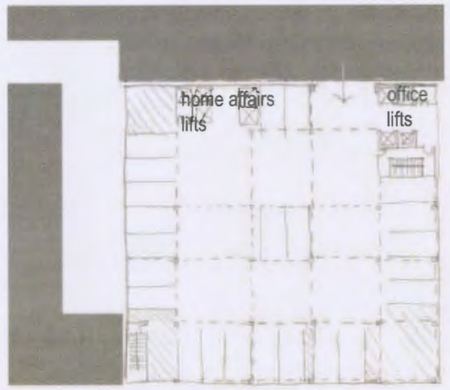


Sketch section through Mostert Street and square.

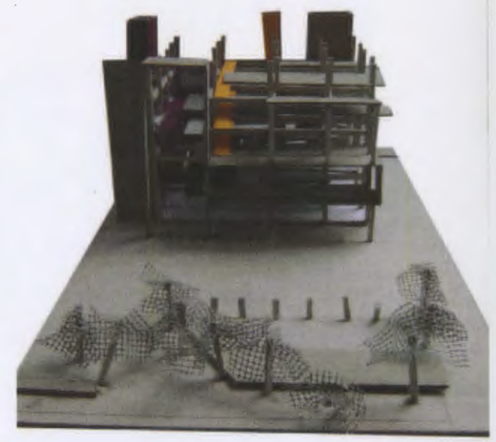


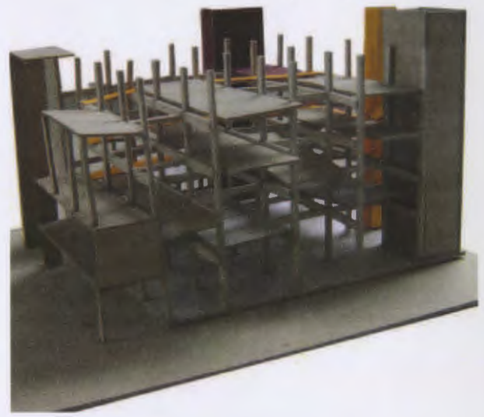
Sketch plan, Ground Floor

Sketch plan, First Floor



Sketch plan, Parking level





Order

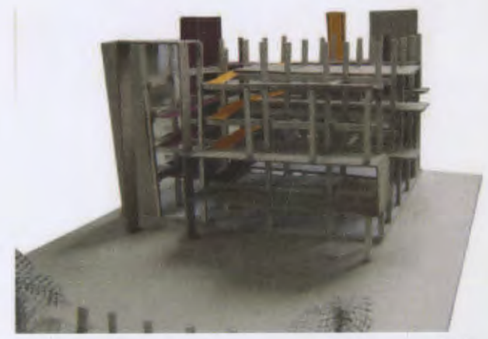
A column grid was devised that would be able to be continuous throughout the building. Parking levels are no longer split in half, but instead take up the entire floor plate. Through consulting the technology research document, it was found that the three case studies all had in common a maximum beam-span of about 8 metres. This was used as a guideline, with columns being as regularly spaced as possible.

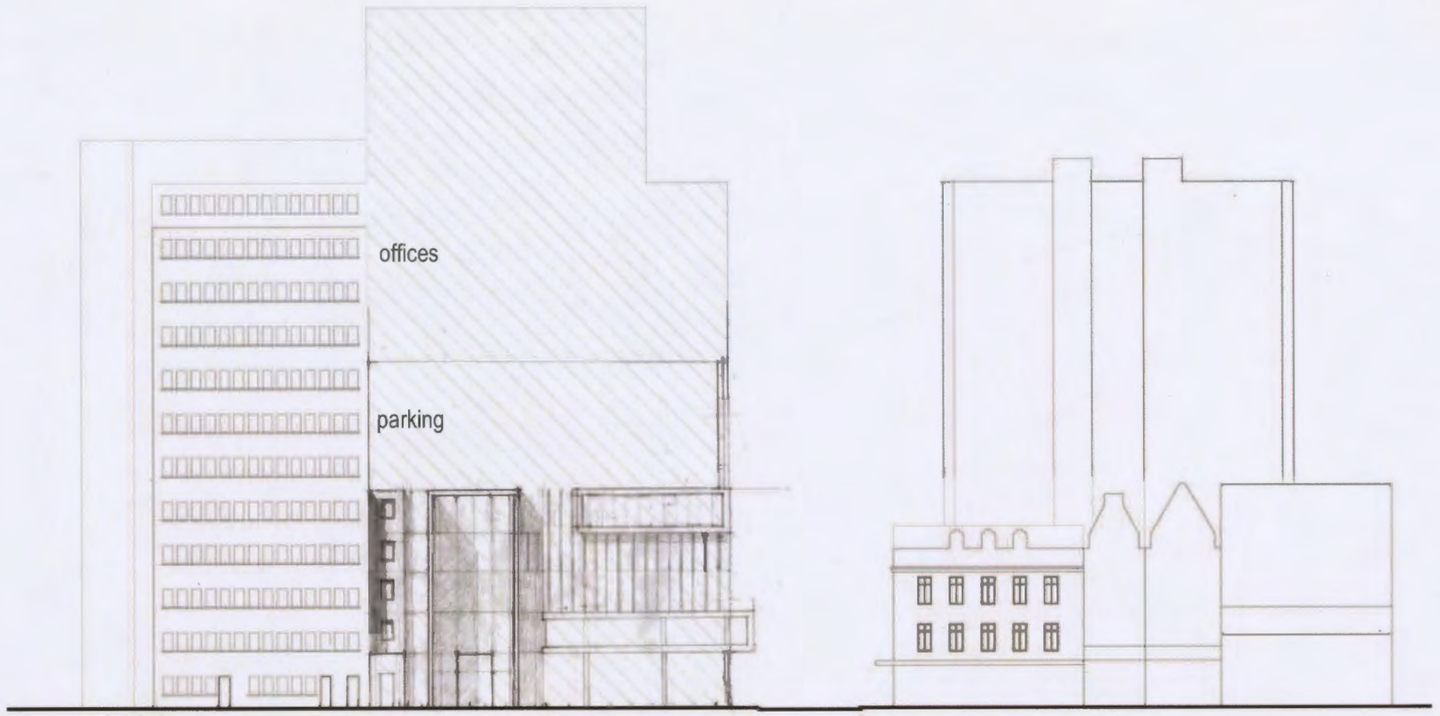
The model shows the grid, and the lower Home Affairs levels of the building: the void has shifted to one side of the floor plate, making the space fronting Plein Street which receives natural light larger than the one abutting the Townhouse Hotel.

In the model, the yellow colour represents the Home Affairs spine, of internal circulation secure from public access. Internal staircases connect where necessary certain programmes, such as the Operations and Processing Floors. Document hoists are used to make sure that when moving confidential documentation and money internally it is not necessary for employees to use the public circulation.

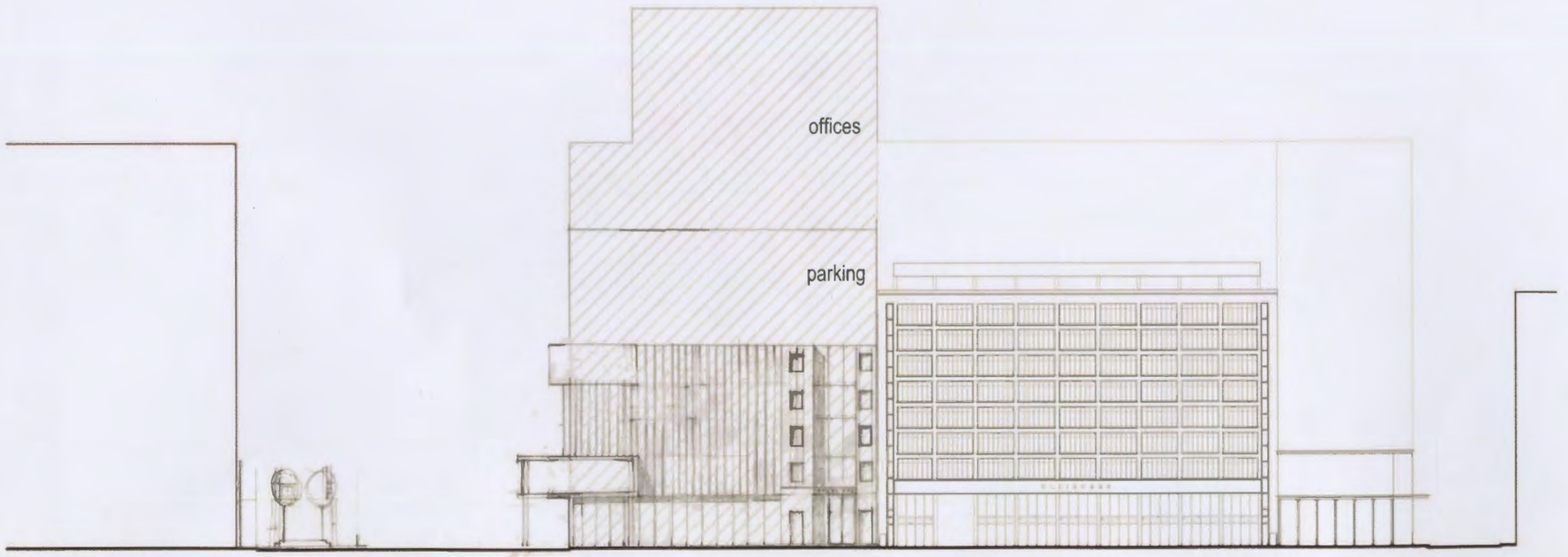
The maroon shows the public vertical circulation. Meeting rooms allowing for the public to request an interview with a civic servant without having to enter the internal departments of Home Affairs..

The model was not completed to full height, and shows only Ground Floor to Floor Four of Home Affairs.

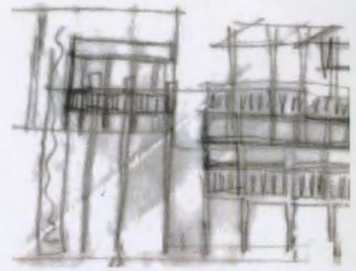


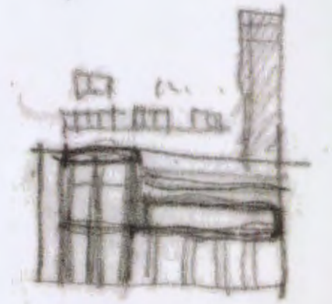


Mostert street elevation, sketch design of the Home Affairs elevation in context



Plein street elevation, sketch design of the Home Affairs elevation in context





Elevation concept sketches

Critical Reflection

The challenge to the conventional tower block, the idea which initiated this thesis, became a more complex problem as the project progressed. As can be seen in the design development, I have tried to grapple with the ideas of breaking the latent potential of a very static building typology whilst trying to balance this with a small site and many site constraints.

Some of the design ideas originally conceived had to be re-thought, some even abandoned, as the space constraints, necessity of providing security and parking, as well as a functional building and structure took hold. As the project progressed, I have realised that many features of the conventional tower block are the easiest (though certainly not the only) solutions to complex issues faced when building a tall building on a small site in an established urban environment. The design process became a constant questioning of decisions, to critically reflect whether these were resorting to falling back to conventional quick solutions of stacking identical floor plates with vertically disconnected programmes or whether they were in fact rational decisions made to design a functioning building whilst staying true to the concept of creating a new typology of space. The project is as much a result of its constraints as of the theoretical and technological research undertaken.

Spatial qualities of the building are also becoming apparent as the project of re-imagining the civic building progresses. Ideas of legibility, easy access to information and help, as well as the creation of spaces where people necessarily have to wait for periods of time (and are allowed to do this comfortably) are becoming the driving components in the design of Home Affairs.

Dedicated to my parents: for their inexhaustible patience, complete faith and financial support.
Thank you.

CHAPTER 7
Conclusion