6. Proposed Global Museum - Design Concept
6.1 Design Influences

Museum
The contemporary museum definition, commercial logic and visitor orientated design influences the proposed global museum design. Another important influence is connecting the museums of Pretoria on a local scale, connecting South African museums on a national scale, and connecting to the global museum map on a international scale, as well as digital incorporation into the physical world, and Analogue - Digital Interaction.

Context influences include vehicular and pedestrian movement, the urban environment, the proposed Urban Mounted Police Unit, St Alban's Cathedral, and the weather

6.2 Design Concept
An important design problem is the combination of the new functions of a digital/electronic display surface; the creation of an analogue interior space that constantly mutates along with a digital one; and also the creation of a space and a structure that appear to move to represent the constant movement and evolution of the digital world. Finally, the building and the exhibition becomes one, to create a shell for the other functions of the building.

As said in the beginning of this document the museum spaces do not represent traditional ornamental architecture. Neither should there be blobs, meshes and deconstruction created by mouse, keyboard and visual computer software. Soft contours should rather be used as a metaphor for the quality of computer-driven representations and systems. (Manovich L.2002:1)

6.2.1 Vertical Contours
The building should not be a monumental and overpowering symbol driven by politics. It finds itself within an urban environment of buildings placed like objects upon the ground. The global museum prefers to fuse itself into the ground and becomes a part of the earth so that the boundaries between earth and building disappear. The 'vertical contours' used as a metaphor for the building that tries to fuse with the earth are still artificial and only representational of the ground, just like the digital is only representational of the real world.
These vertical contours are fully integrated with the building structure and functions in both interior and exterior spaces and contribute to the structural function of the building.
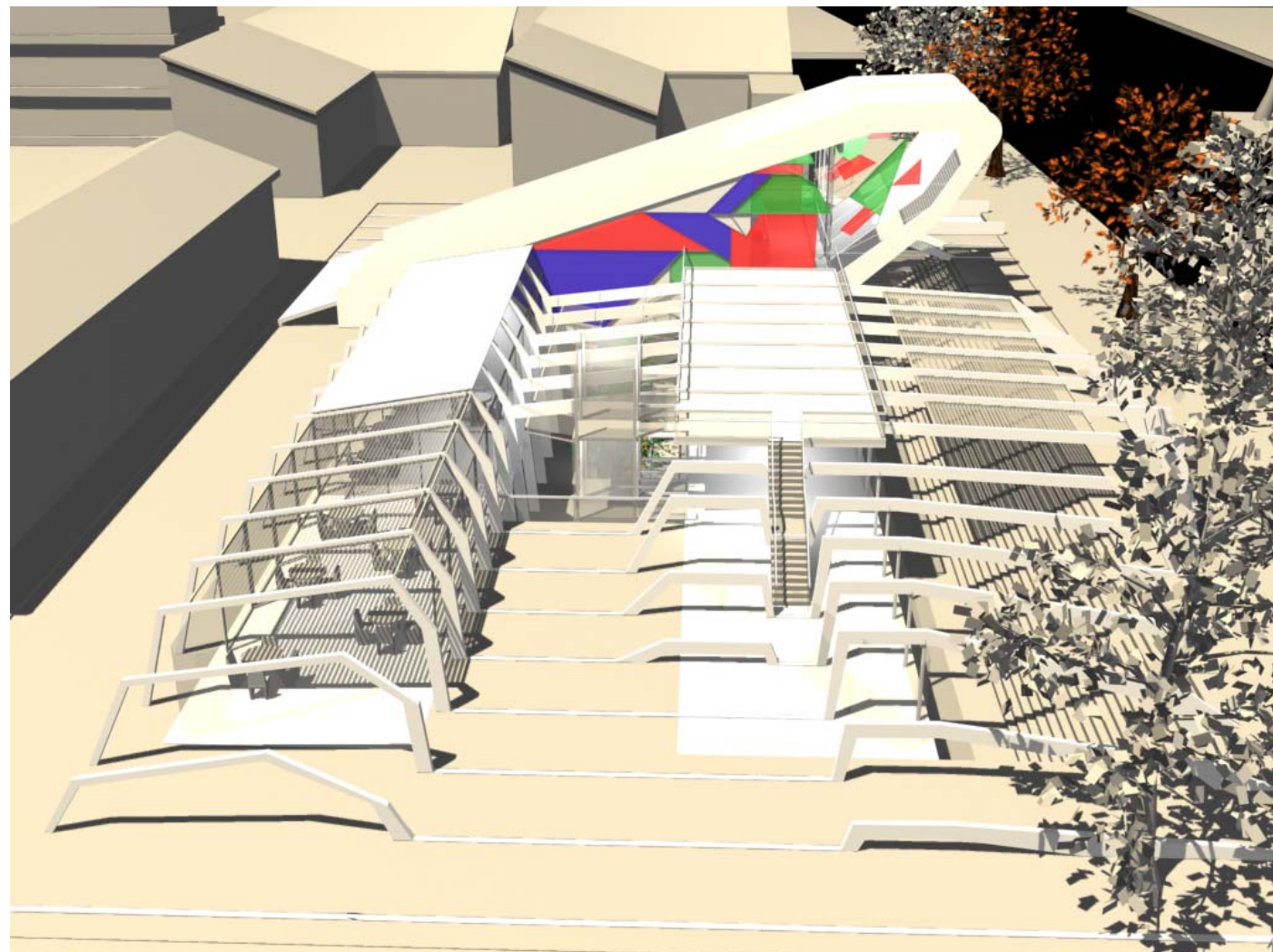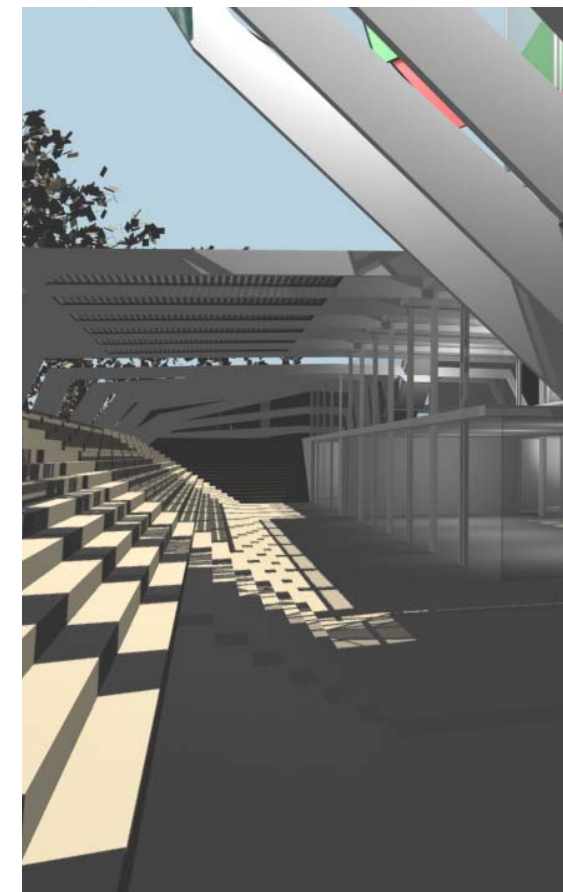

Fig 6.1 The proposed Global Museum as seen from the proposed Mounted Police Unit Station.

Design Concept

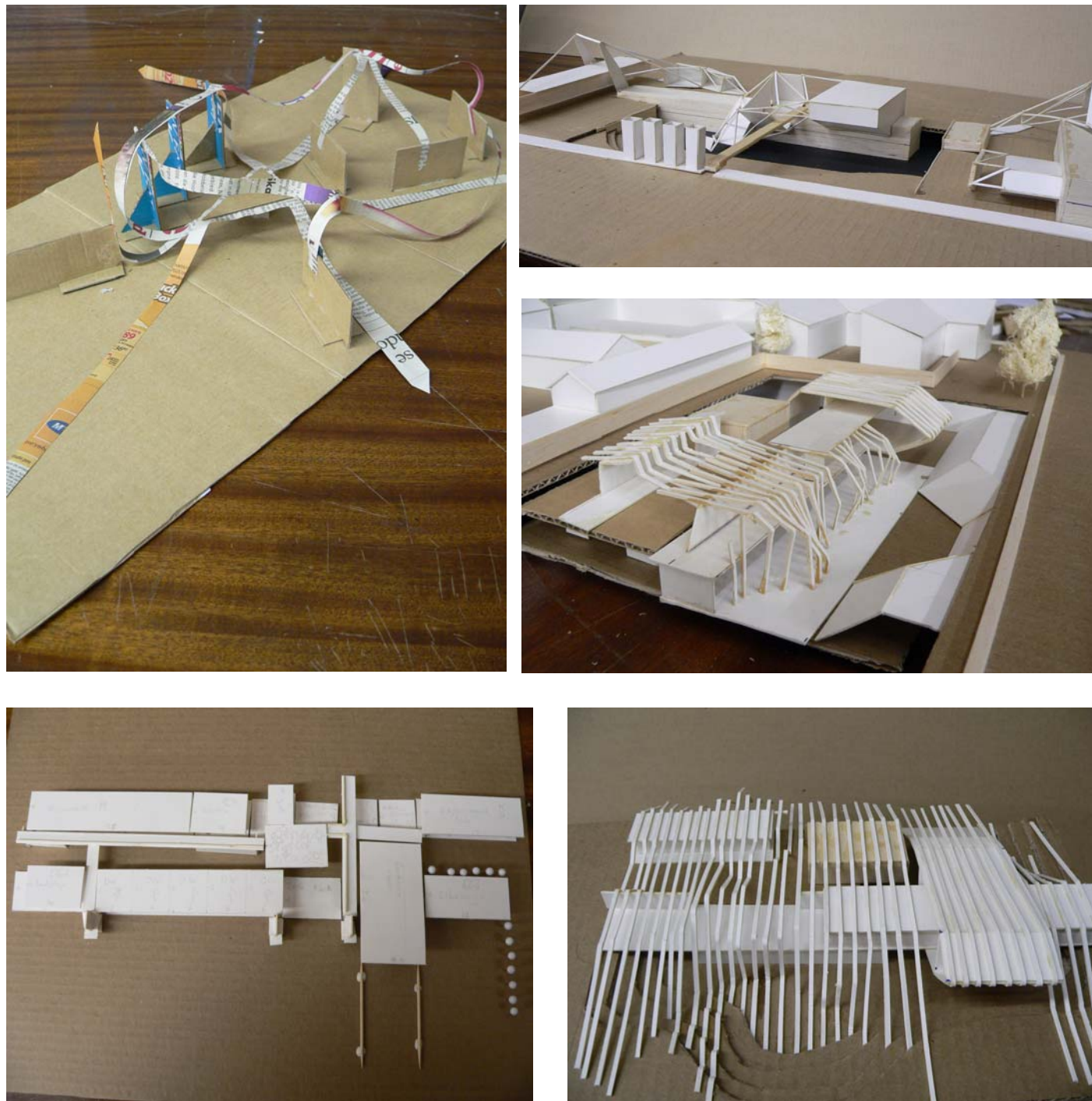## 6.3 Concept Models and Concept Development

Fig 6.2 Concept Models

6.2.2 Concept Evolution

The design of the Global Museum evolved from two different concepts: the functionality of the museum as a container for people[1] and the morpheme quality of the digital. As can be seen from the concept models the building is a result of the clash between these two different qualities that ultimately share an interlinked unity. The digital is represented by the vertical contours as mentioned in section 6.2. The functions of the building (in contrast to the contours) are geometrically and functionally organized to ensure easy access by the general public and instant access to the museum's information sources in order to eliminate museum fatigue[2].

Fig 6.3 Virtual Concept Models
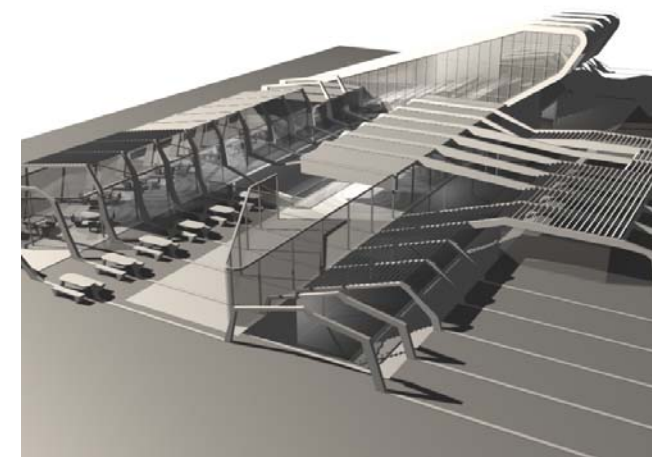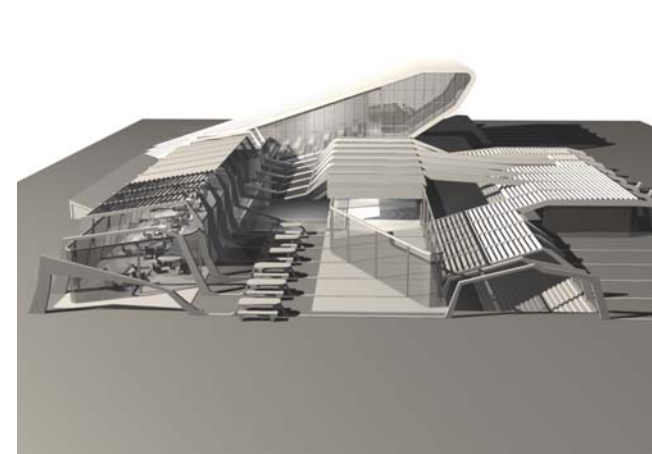
1. The contemporary museum is a people container rather than an artefact container as identified in section 2 of this document.
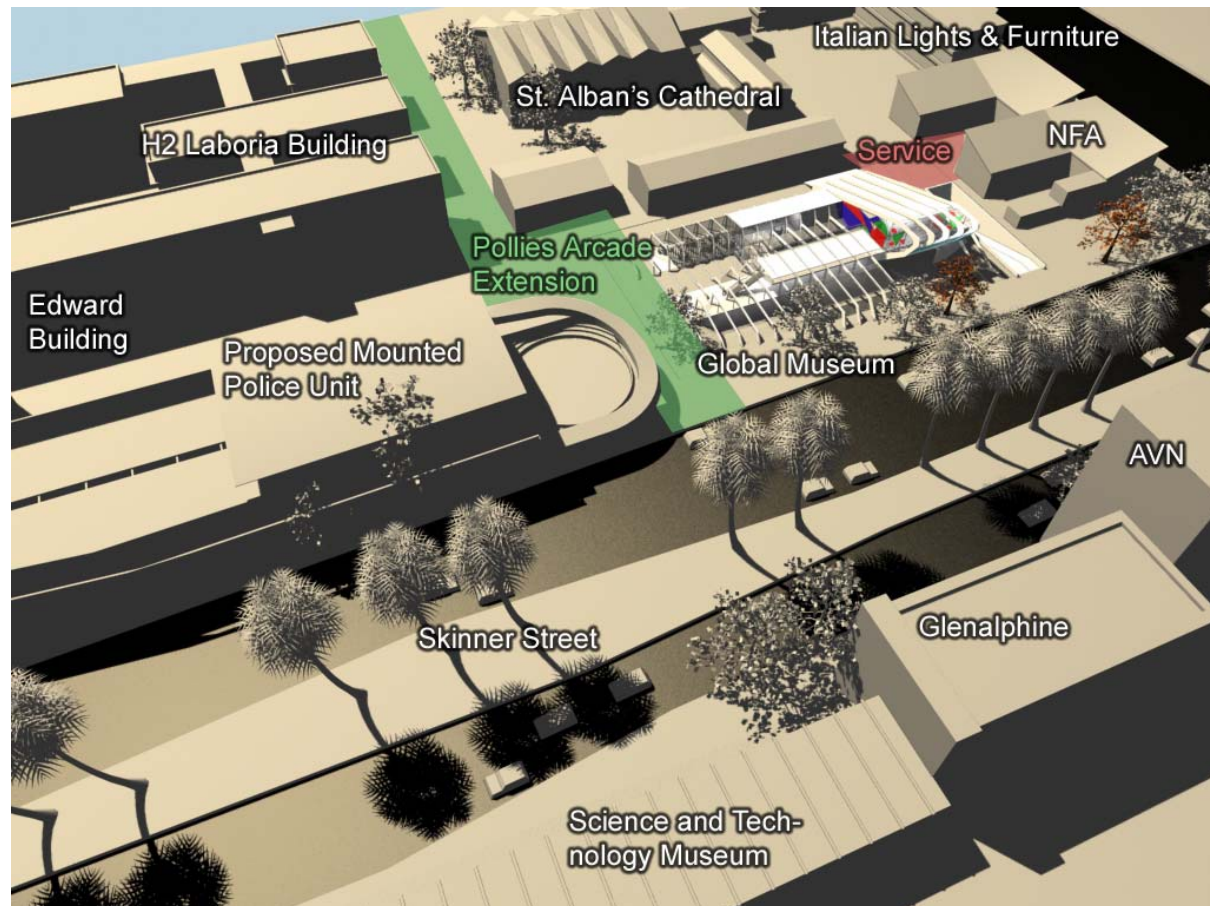2. Refer to Appendix

Design Concept

Fig 6.4 Building in context

Fig 6.5 Museum Interior - Virtual Museum Portal (Displayed images: www.deviantart.com)

6.4 The proposed Global Museum and its site

The context of the proposed Global Museum consists of buildings placed on the ground like objects upon a clear surface (Fig 6.4). The Global Museum fuses with the ground, turning the border line between building and site into a soft buffer and thus making it difficult to distinguish between the interior and exterior of the building.

The Global Museum and the Mounted Police Unit both open up to the proposed Polleys Arcade Extension (Fig 6.4), with public facilities creating a public square between the buildings. From this square access is allowed into the Global Museum. This area also contains disabled access through an elevator that connects all levels of the building.

At the north-eastern side of the building service access (Fig 6.4) is gained through an existing access route for the National Fashion Academy (NFA; Fig 6.4). These access points connect to the building's storage area through a service lift and to the restaurant service door.

Visitor vehicle access is gained via a ramp on the south-eastern side of the building that leads into the basement parking area.
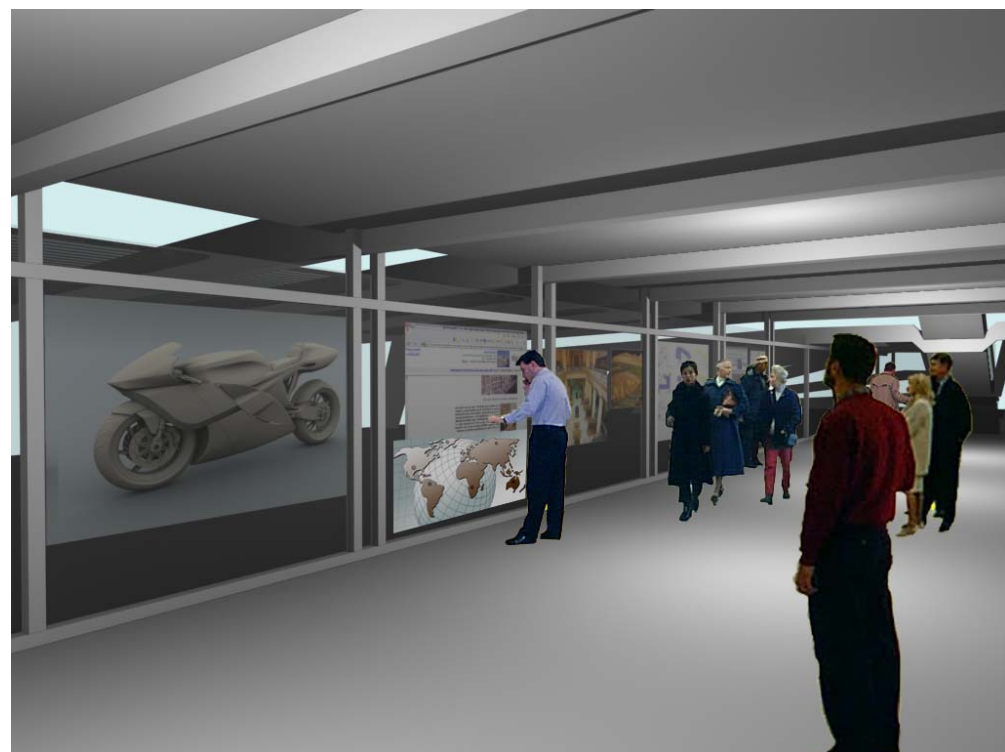
6.5 Museum Display

The digital screens in the museum display areas (Fig 6.5), whether accompanied by analogue displays or stand-alone, are fully accessible by the public. When a person requires more information on an artefact or topic, he walks over to the touch screen to browse. As his curiosity leads him through the available media the display itself changes. The interior exhibitions and the exterior screens will be interconnected so that any person looking at the museum from the outside will see the information changing as it is browsed by the visitor inside. The visitor as such takes control of the information displayed by the museum and becomes the curator. In this way the entire museum display can be changed several times a day. This ensures information about the museum is constantly changing and adapting to newly available data. The digital realm is constantly adapting even if the building structure is static. Thus, though they are interlinked, both stay true to their respective natures.

Through the Virtual Museum Portal access can be gained to a virtual model of the building, as well as to other museums on the Global Museum Network currently developing. The other international museums will have access to the proposed South African Global Museum's virtual model through the Virtual Museum Portal. This system will also link the other South African museums and their information bases into the Global Museum Network.
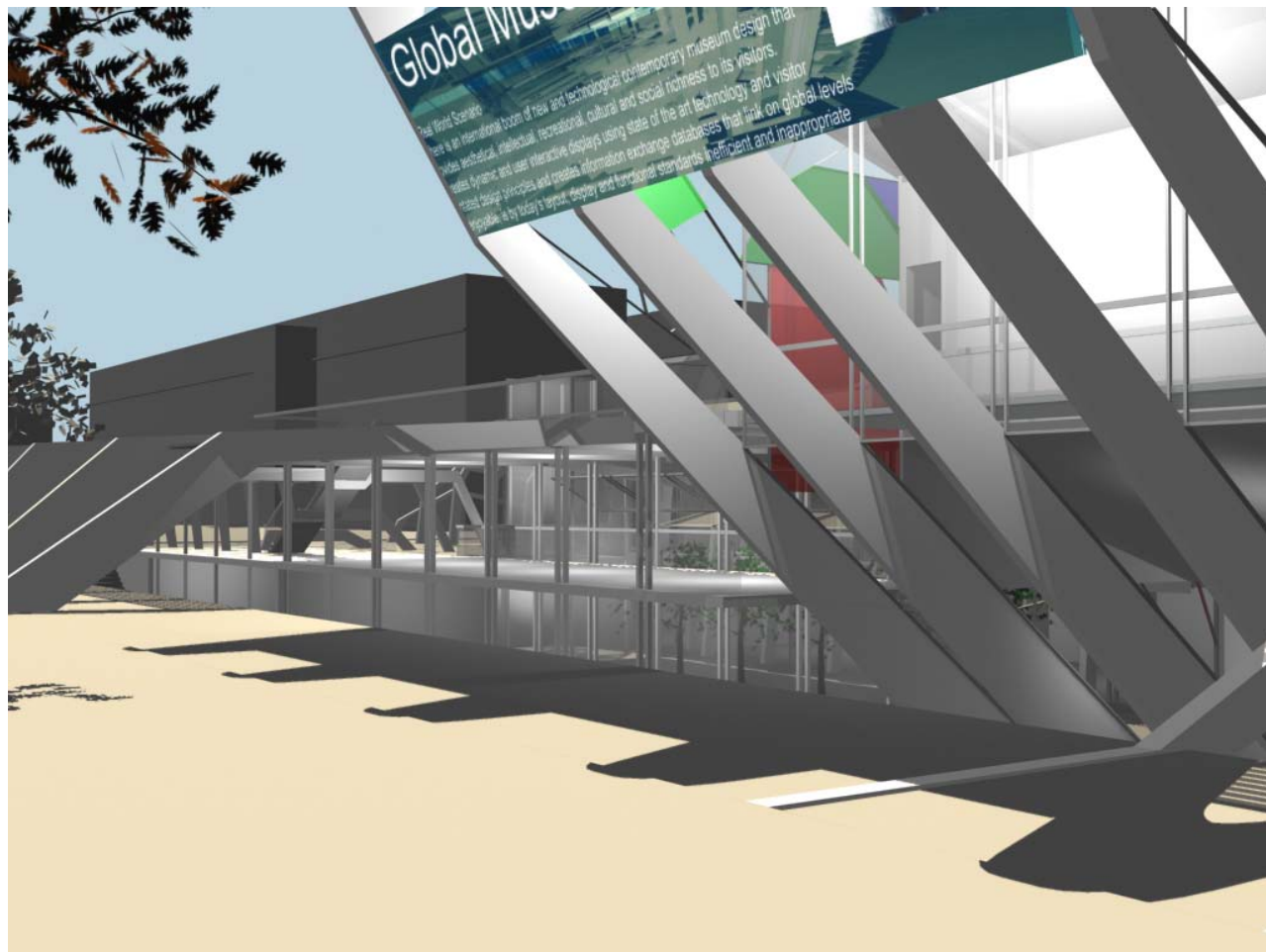
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Fig 6.6 Museum Southern Facade

6.6 Pedestrian Access
The main access point from Skinner Street to the museum (Fig 6.6) is emphasized by bending over the vertical contours and leading them down into the foyer. All specific museum-related functions[1] are centered around this area and on the ground floor, while all pedestrian-related functions[2] (Fig 6.7) are located next to the pedestrian movement route on the western side of the building.

This entrance holds a digital projection screen on the Skinner Street facade (Fig 6.8). It thus emphasizes the concept of the museum as a free communicator, thus It hides none of its information from the public. This screen will display current analogue-digital combination exhibits in the Global Museum and exhibits and upcoming events in other Pretoria museums, as well as any other important news or announcements within South Africa.

1. i.e. Computer laboratories, digital-analogue combination display areas, libraries, storage areas and security facilities.
2. i.e. Restaurant, news boards and public square. Also to accessible roof and conference area.
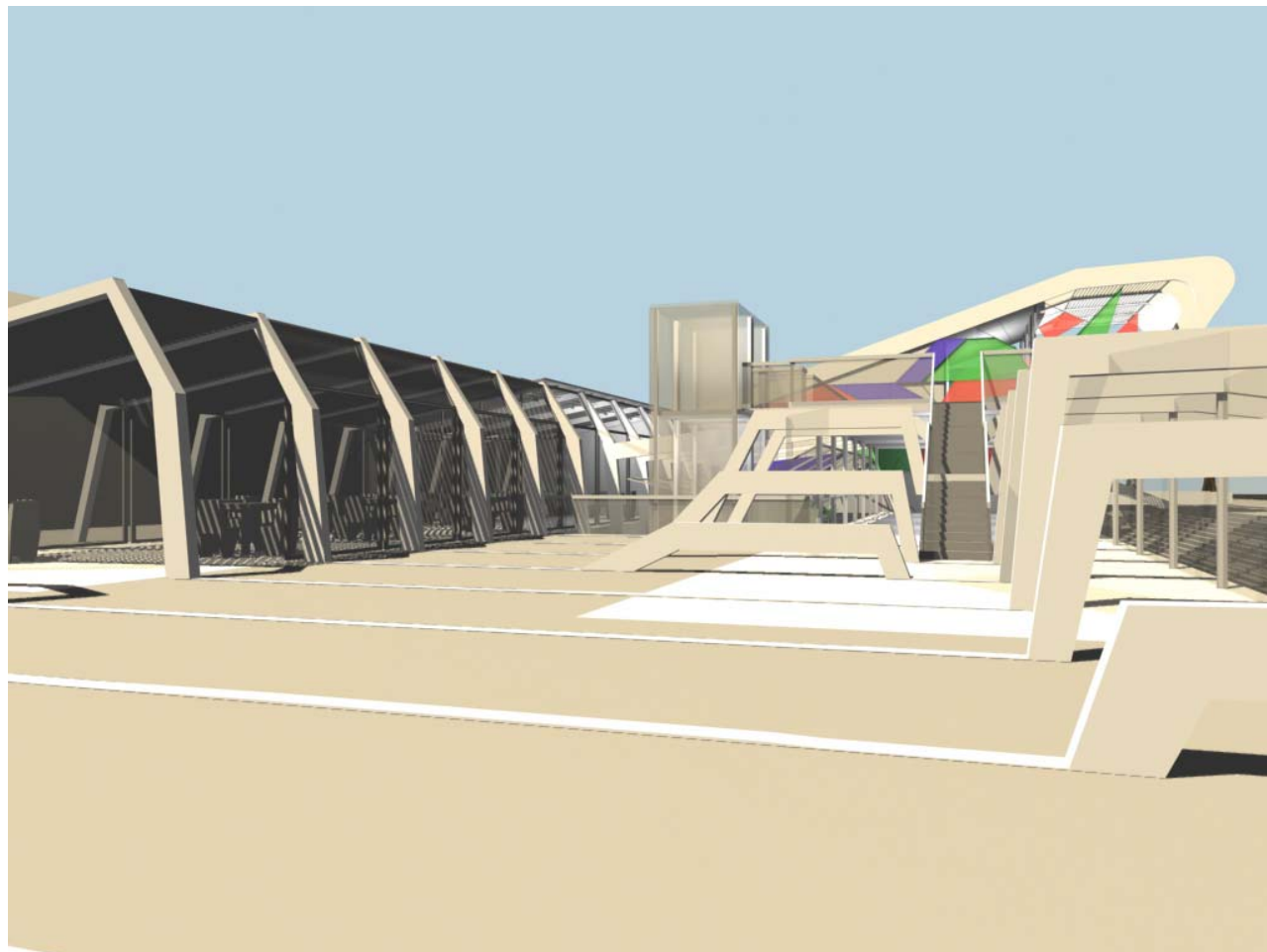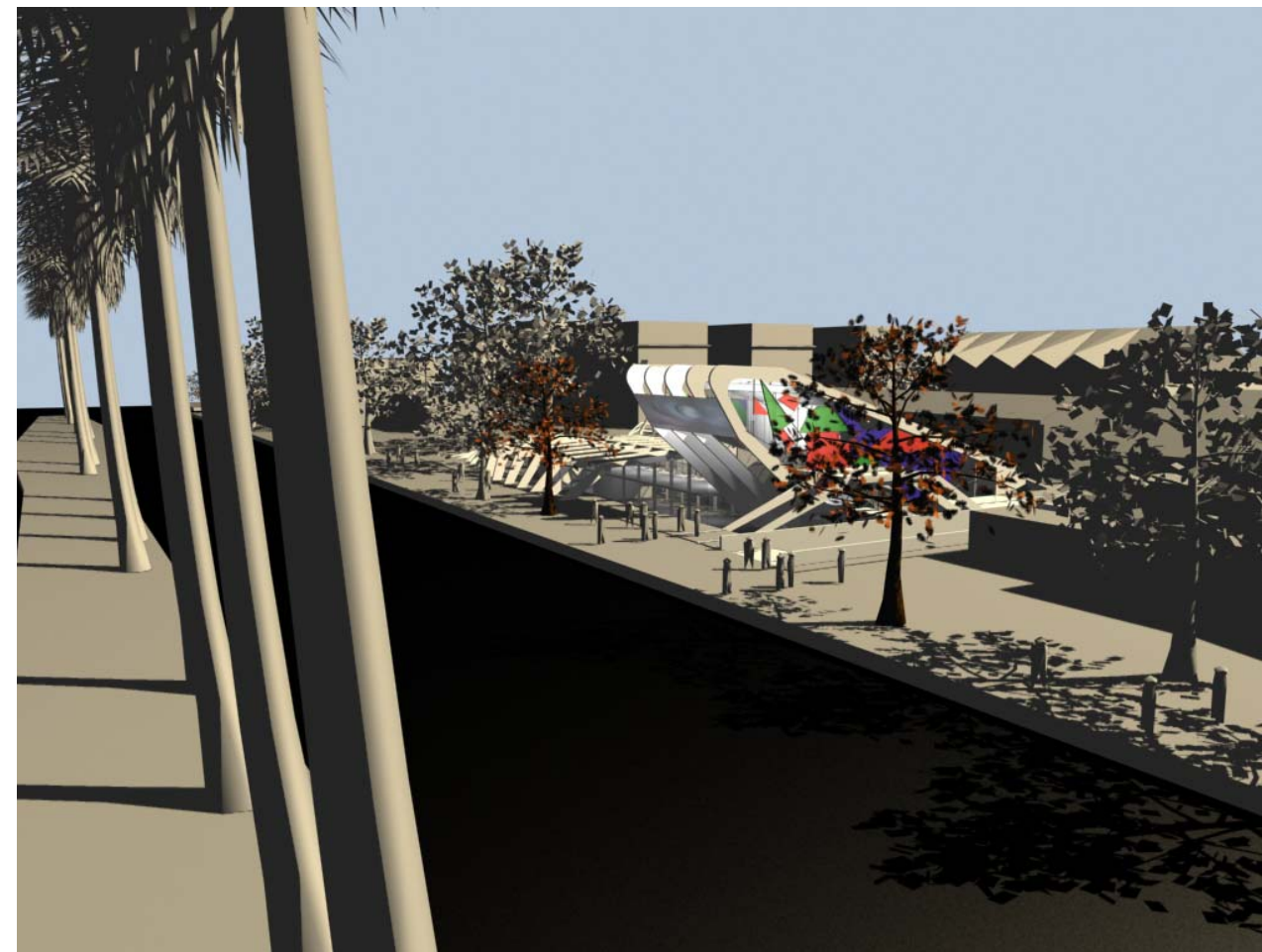

Fig 6.7 Museum Western Facade

Fig 6.8 Skinner street islands with the Global Museum to the North of Skinner Street.
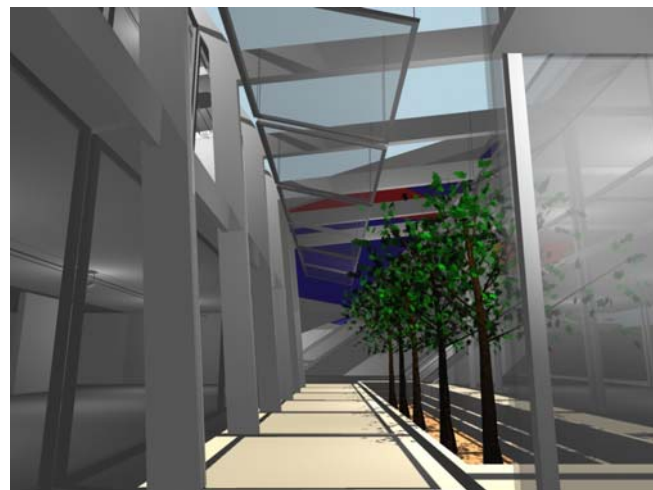
Fig 6.9a Virtual Museum Portal room
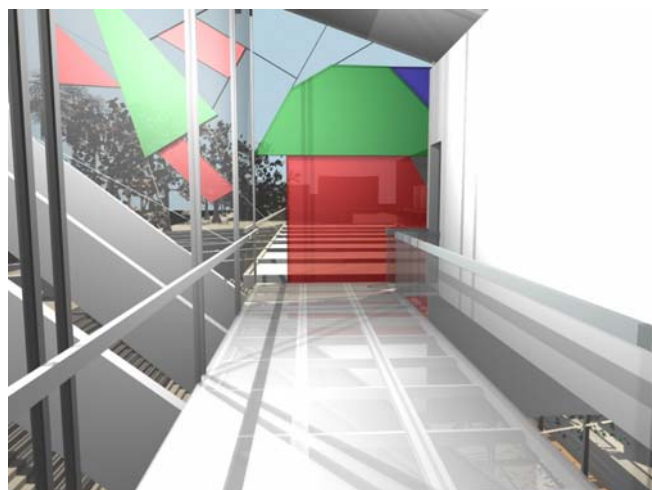
Fig 6.9b Museum Interior - Garden

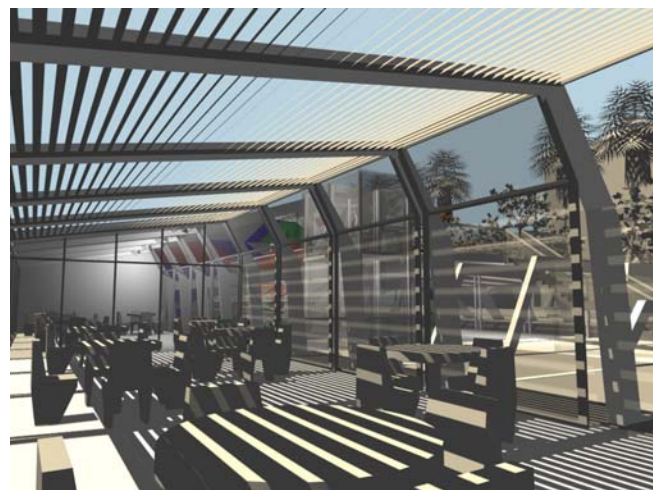Fig 6.9c Glass Bridge - Conference Foyer
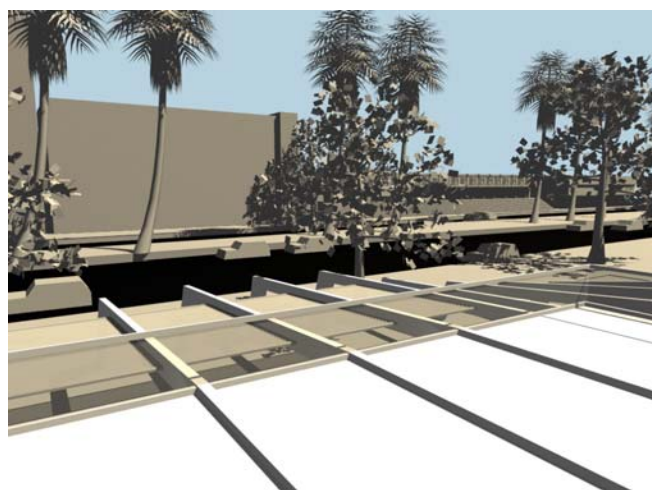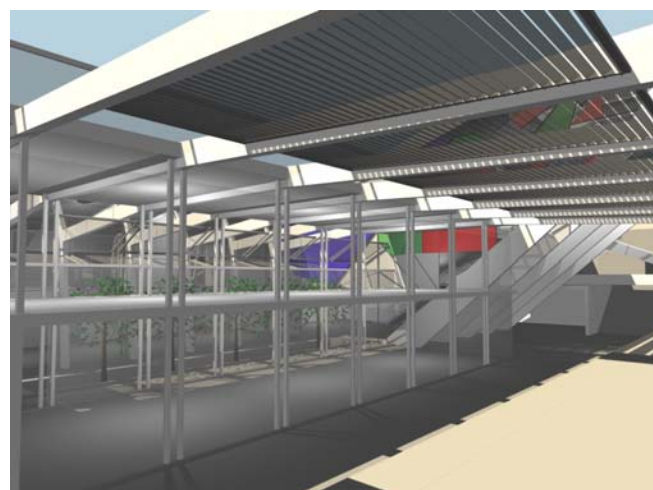
Fig 6.9d Net Restaurant

Fig 6.9e Accessible Roof

Fig 6.9f South Facade

6.7 Museum Interior

Interior spaces (Fig 6.9a) have no ornamentation so as to distract as little as possible from the exhibited information. The Virtual Museum Portal (Fig 6.9a) has a digital screen on the south side (Fig 6.9c) and opens on the north side to the courtyard garden of the museum. Access to this area is gained via the Polleys Arcade extension and the lift connecting all the museum floors.

The courtyard garden of the museum (Fig 6.9b) is open air. It gives access to the main reception area, main exhibition area, library, shop, security area, computer laboratory and mainframe. The garden itself is lined with suspended glass roofs on both sides to allow protection in harsh weather. The digital screens on the outside wall of the library display all currently browsed information in the library.

A glass bridge (Fig 6.9c) creates the foyer for the conference room (to the left of the picture). It is accessed by a staircase from the reception area and the accessible roof. Skinner Street and the staircase in front of the museum are clearly visible from this foyer and vice versa.

The Net Restaurant (Fig 6.9d) will give free wireless internet access to anybody who wishes to use the facility, provided they bring with their own laptop. It will also allow them a read-only connection to the museum network. Furthermore, there are digital screens on the southern wall of the restaurant with control panels on the restaurant tables.

From the accessible roof (Fig 6.9e) the Science and Technology Museum (to the right hand side of the picture) is clearly visible as well as Skinner Street, St. Alban's Cathedral and most of the rest of the Global Museum. This roof serves as a resting and smoking area for conference breaks.

Louvre systems on the southern side of the museum (Fig 6.9f) create shading for the continuous front stairs that lead down to the museum. When active, the digital screens on the glazed facade will transmit the information accessed within the museum (as stated in section 7.2). When inactive, one can see through the entire building past the garden to the library. The concept of transparency is thus applicable to in the building itself, as well as to the information it displays. The information displayed externally then acts as an advertisement to catch the pedestrian's attention.

Design Concept

7. Technical Investigation

7.1 Accommodation Schedule
The accommodation schedule is as follows:

Entrance
    Foyer with information counter - 80 m2
    Rest rooms
      Class A1 Occupation Building inhabited by an estimated 1 preson per m2 floor area :
      Total building size estimation: 1000 m2
      Building requires the following sanitary devices:
        Mens:
          WCs: 4
          Urinals: 12
          Hash hand basins: 4
        Ladies:
          WCs: 14
          Hash hand basins: 7
            (SABS 0400 Building Regulations - 1990)

Exhibition space
    Integrated exhibition with other museum functions
    Analogue-digital exhibition area - 150 m2
    Museum Portal - 150 m2
    Screen display - >50% of non-exhibition museum area

Computer laboratory - 100 m2
    30 Workstations
    Reception - 20% of computer laboratory area
    Security

Library - 100 m2
    15 Workstations
    Archive - 60m2
    Museum Network Access
    Security
    Reception - 20% of Library area

Auditorium - 150 m2
    Seating - 80 to 100
    Projector room - 40 m2

Services
    Service entrance
    Storage - 70 m2
    Maintenance laboratory (connected to storage facility) - 40 m2
    Security - 100 m2
      Technical and surveilance services

Material storage- 130 m2
    Data disk archives - 20 m2
    Mainframe - 40 m2
    Cooling system
    Backup System and Backup Drives

Office space
    5 Office cubicles @ 20m2 - 100 m2
    Conference room - 50 m2
    Management and administration

Public Areas
    Net restaurant - 200 m2
      Kitchen - 30% of restaurant area - 60 m2
        Stoves and Ovens
        Washup
        Vegetable preperation counter
        Freezer
        Storage
        Refuse
        Service Access
        Wine, Spirits, Beer amd Minerals Storage
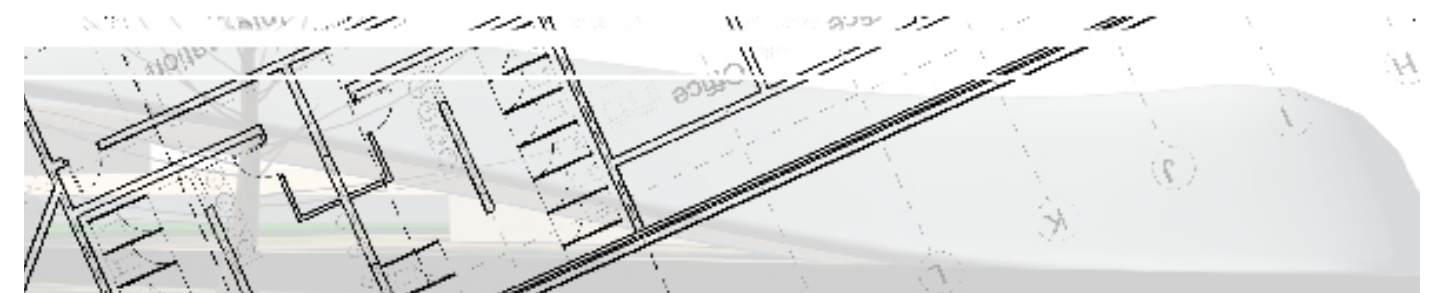   (Neufert,1980:215-230)

    Shop - 50 m2

Parking
    Site currently caters for 100 car parking bays (undeveloped)
    Parking available after intervention: 60 formal parking bays (basement)
    Bus stop

Public Square

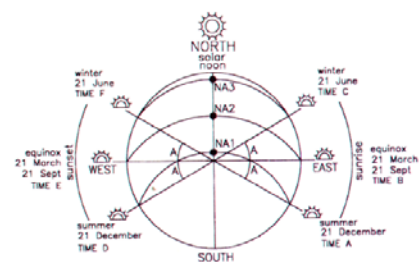Technical Investigation

Fig 7.1 Sun Angles of the Global Museum

7.2 Analysis of solar angles

The Analysis of solar angles is crucial to the Global Museum, because if direct sunlight reaches digital screens, glare will decrease their legibility and can cause physical damage to the expensive screens. However, sunlight is important in some of the public areas, and in the courtyard garden. Surfaces on which sunlight does fall have matt finishes to prevent light reflections.

Pretoria has sun agles of 88 degrees in the summer; 40 degrees in the winter; and a 64 degree sun angle at the equinox. ((NAPIER A.2000:Section 4)

Fig 7.2 South African Sun Angles
(NAPIER A, *Enviro-friendly Methods in small building design for South Africa*:4.5.1)
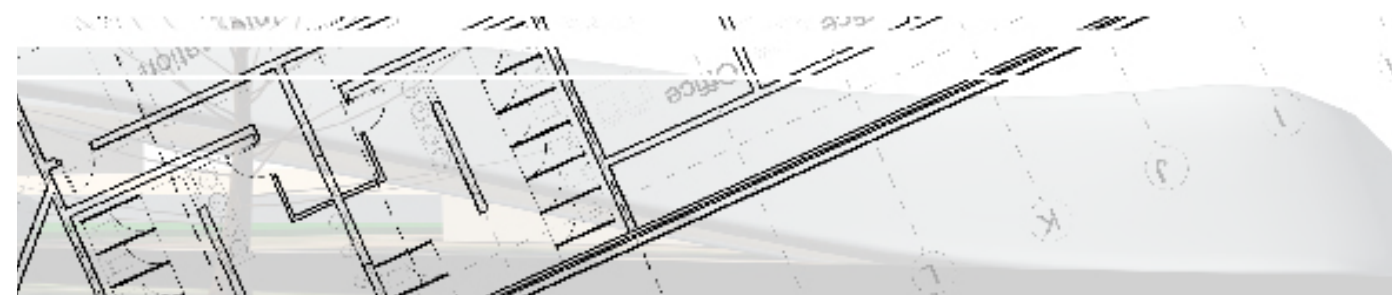

6:00am

10:00am

12:00am

2:00pm

6:00pm

Fig 7.3 Shadow analysis of the Global Museum in summer (88deg sun angle).

Technical Investigation

6:00am

2:00pm

6:00am

2:00pm

10:00am

6:00pm

10:00am

6:00pm

12:00am

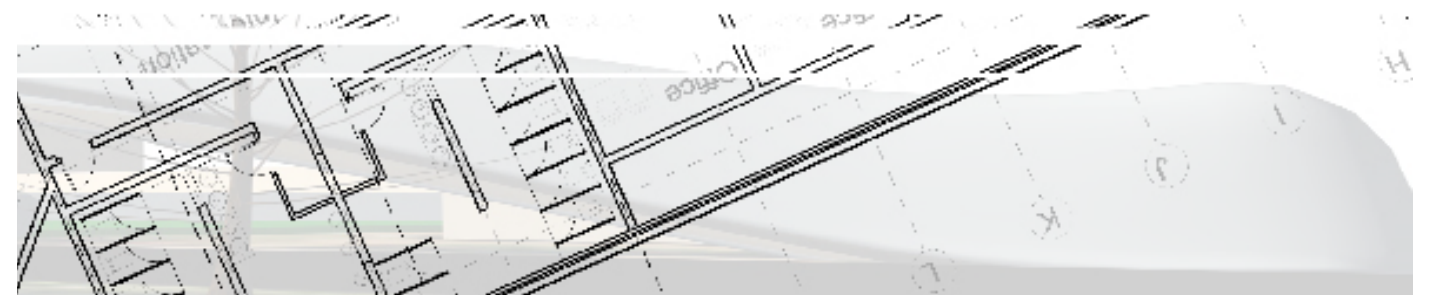Rig 7.4 Shadow analysis of the Global Museum in winter (40deg sun angle).

12:00am

Fig 7.5 Shadow analysis of the Global Museum at equinox (64deg sun angle).

Technical Investigation

7.3 Water Drainage (Fig 7.6)

Like sun analysis, water drainage of the Global Museum is of the utmost importance to ensure the safety of the many electronic devices that make up a large part of the building. Pretoria is within the Temperate Eastern Plateau of South Africa, experiencing 125mm to 375mm rainfall in summer and 62mm to 250mm rainfall in winter, and has a 30% to 50% relative humidity. (Napier A.2000:Section 9)
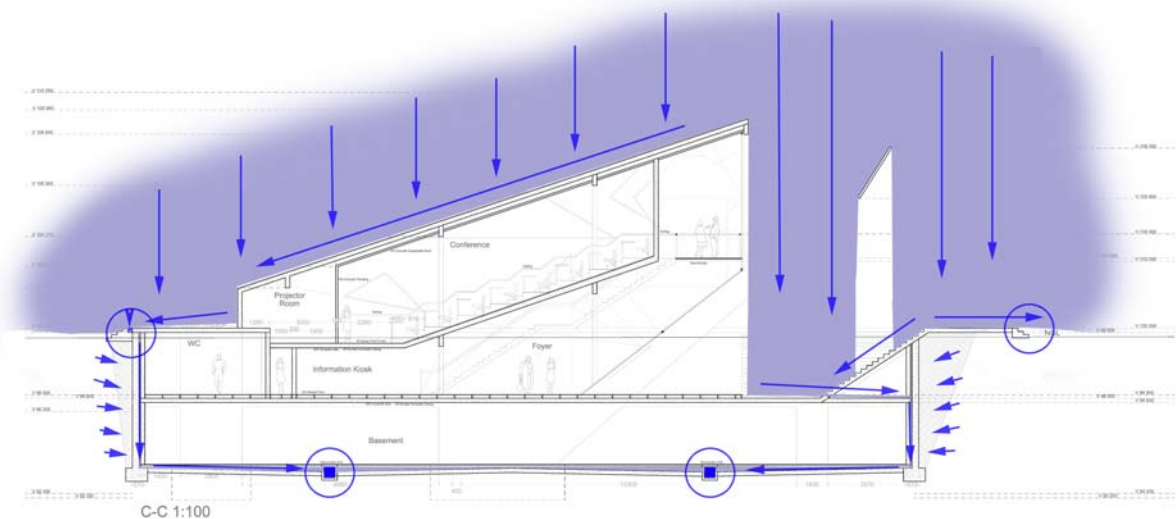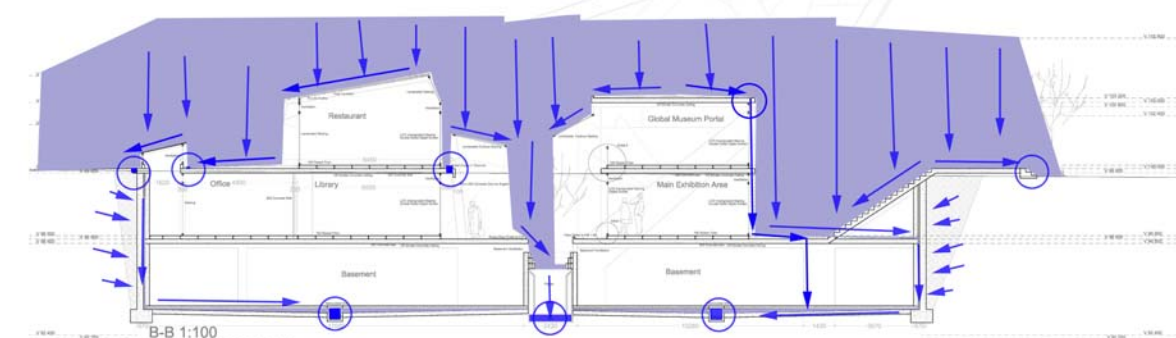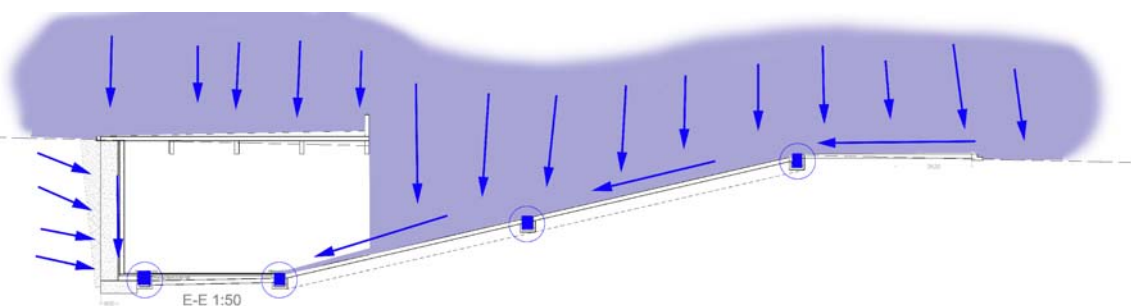

Fig 7.6a Water Drainage - Section C-C

Fig 7.6b Water Drainage - Section B-B

Fig 7.6c Water Drainage - Section E-E

7.4 Fire Escape Routes

Escape Regulations concerning two to three story buildings:
If the fire escape distance to the nearest escape door does not exceed 45m the route does not need to be equipped with a emergency escape route. (SABS 0400.1990:181)

If the fire escape distance to the nearest escape door does exceed 45m the route needs at least two different fire escape routes. These two escape routes needs to be independent from each other. (SABS 0400.1990:181)
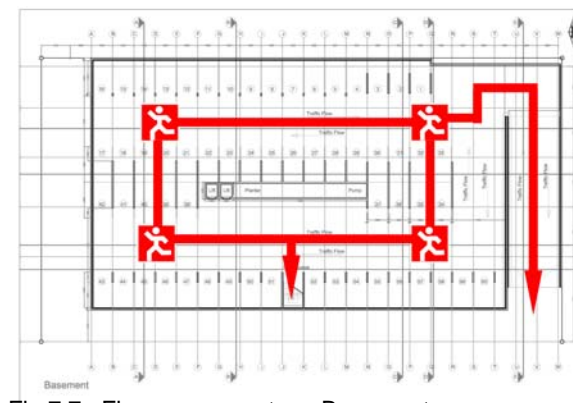

Fig 7.7a Fire escape routes - Basement

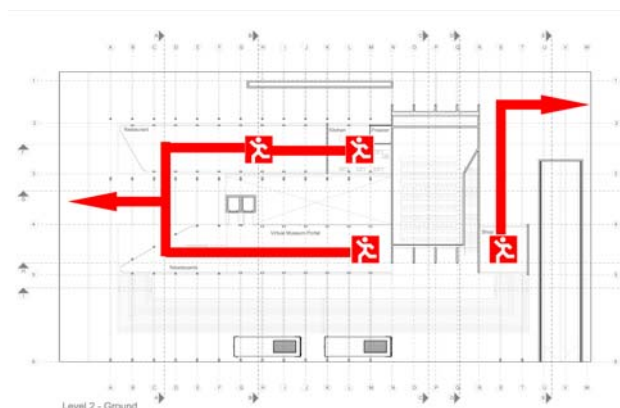Fig 7.7b Fire escape routes - Level 1
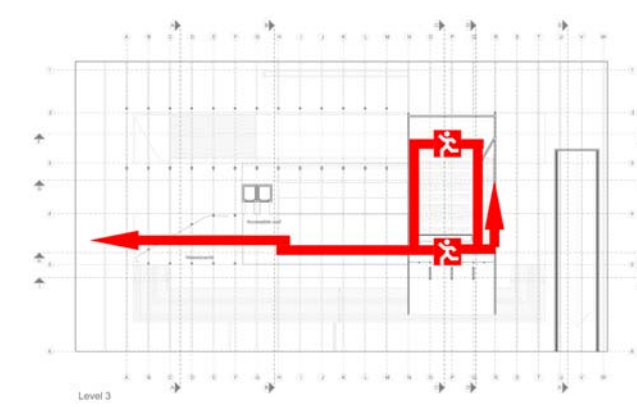

Fig 7.7c Fire escape routes - Level 2_Ground

Fig 7.7d Fire escape routes - Level 3
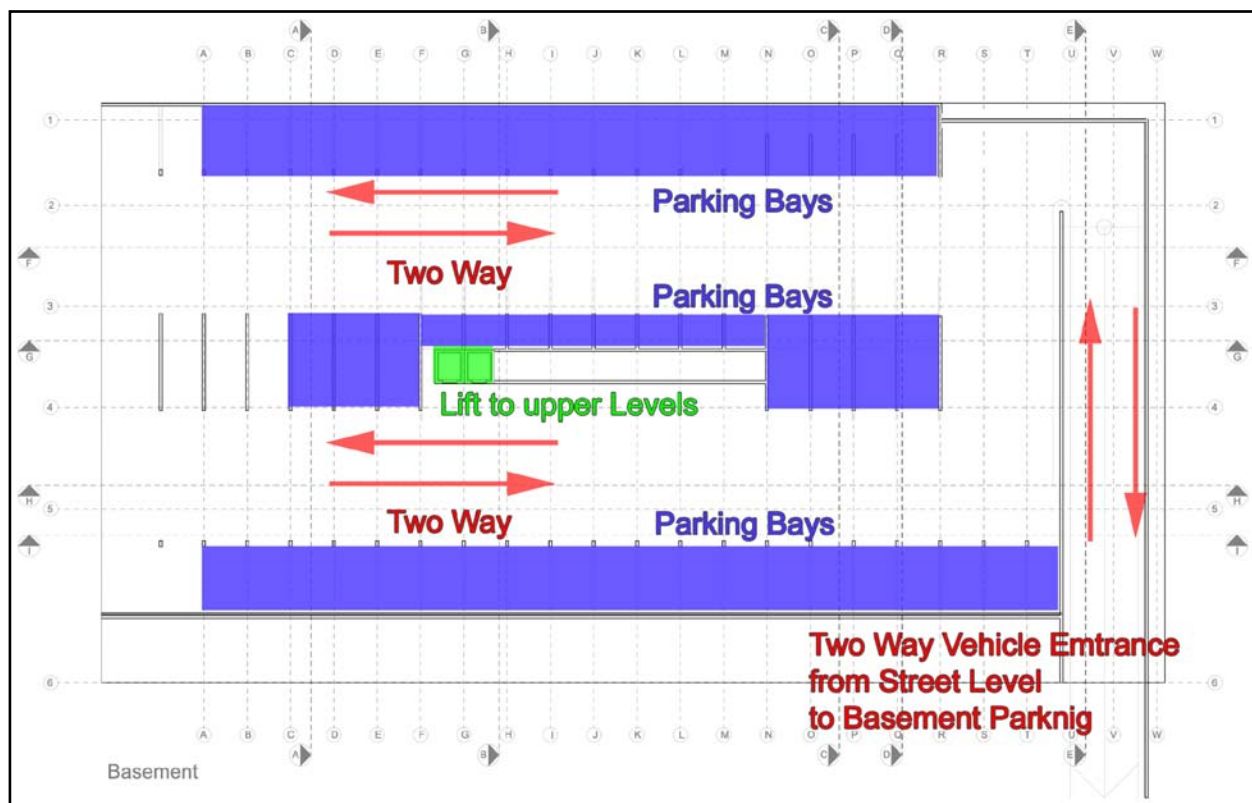
Technical Investigation
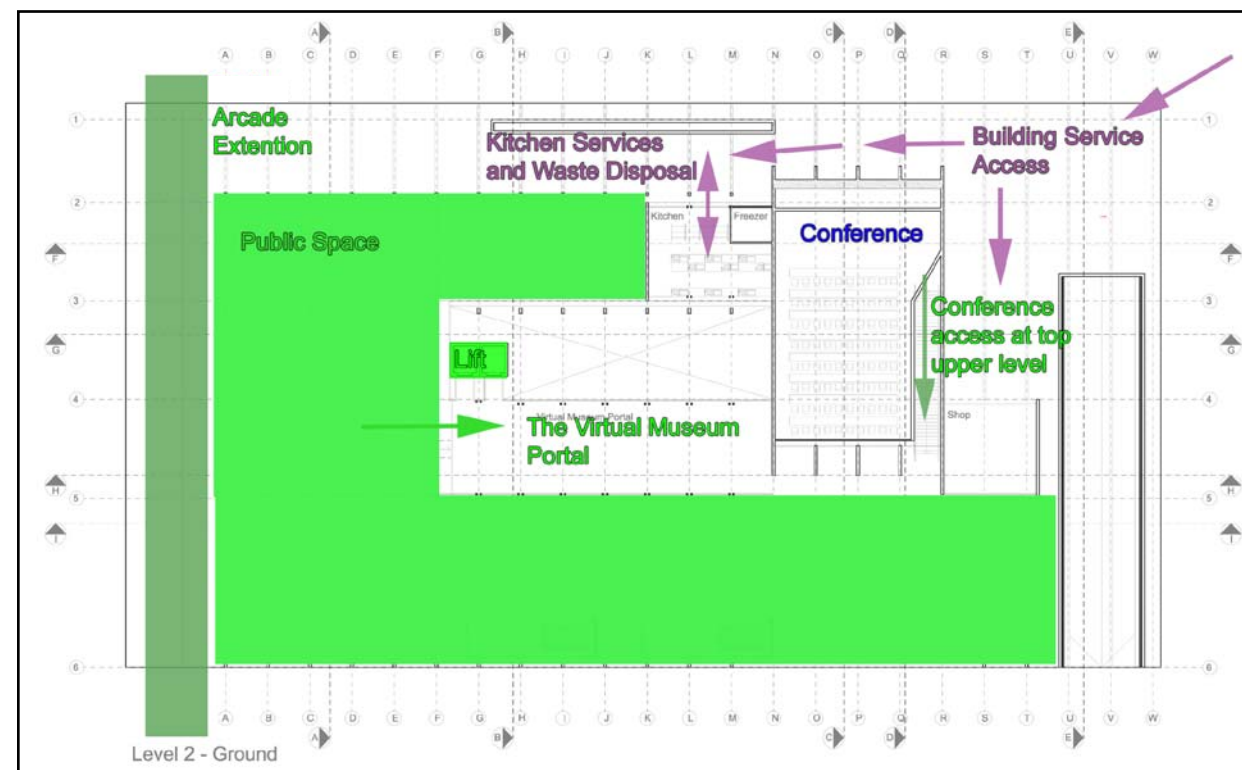
Fig 7.8a Museum Circulation Map - Basement

Fig 7.8c Museum Circulation Map - Level 2
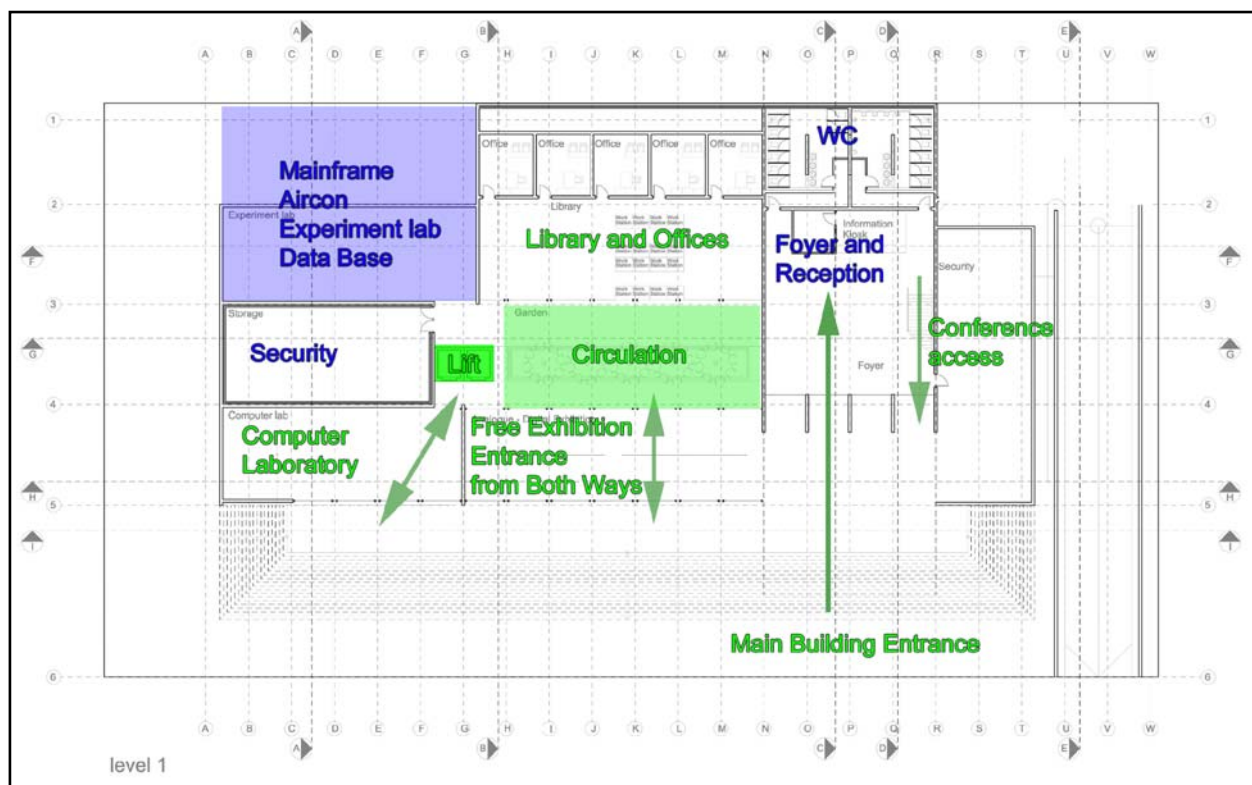
Fig 7.8b Museum Circulation Map - Level 1

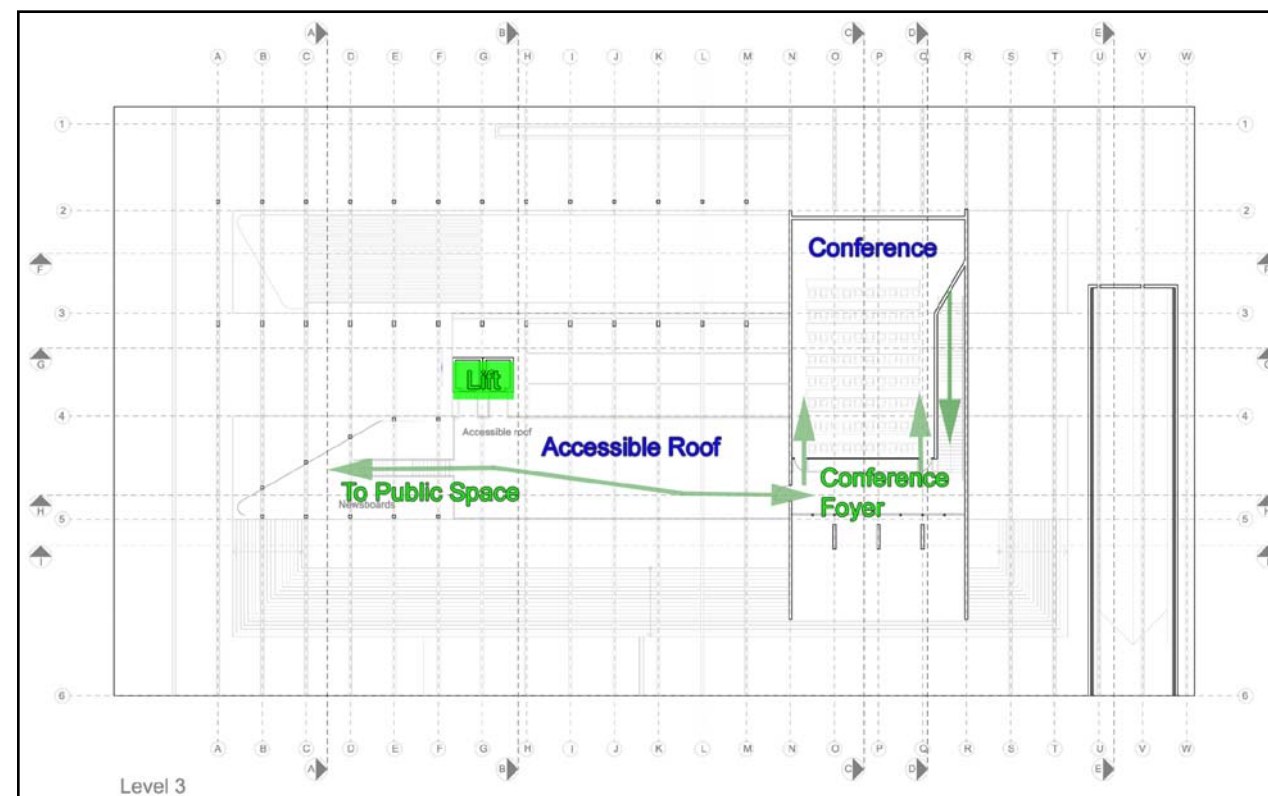Fig 7.8d Museum Circulation Map - Level 3

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Technical Investigation

8. Conclusion

9. Technical Drawings
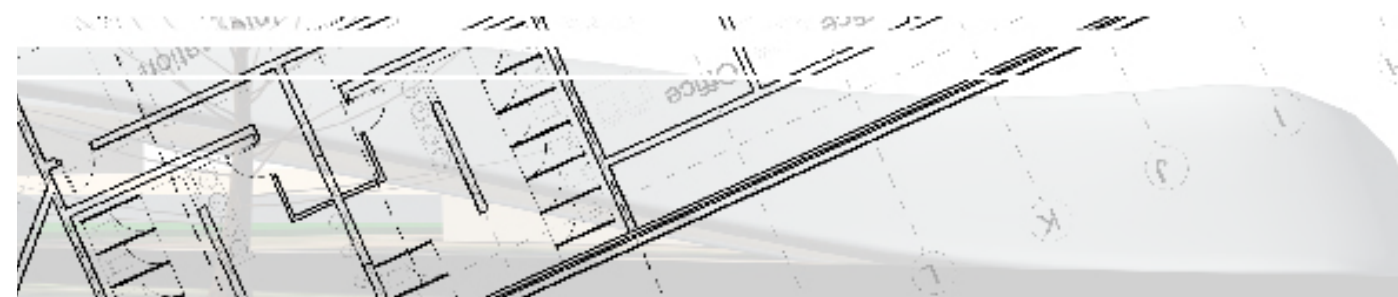
This study starts by defining the museum in general and identifying what the South African museum is. Then, it attempts to identify the international standards of museum design that are currently developing, and to identify the element missing within the South African museum. Then follow precedent studies of museums which contributed to the concepts of the currently developing museum model. Digital culture is introduced, and finally the brief for a contemporary museum which is currently in the development process is closely examined. The design of the proposed Global Museum was an attempt to incorporate that element missing from South African museums by using contemporary museum concepts.

The proposed Global Museum is ultimately highly technology driven. It used technologies that are still currently developing. Thus it would only be possible to build it successfully in the near future.

The study hopefully indicates that far too often designing with the digital tends to run away from reality and even seems to get out of control due to the lack of gravity and physics, and thanks to the visual qualities that computer software creates, but the design process in the end seems to originate much more in the designer than in the medium he/she uses. It is stated in the introduction that the design should incorporate soft contours as a metaphor for the digital and that the proposal shouldn't be geometrical like its predecessors. The proposed Global Museum is however very geometrical for functional reasons. The same can be said for some of Diller and Scofidio's designs which this study uses as precedents. Perhaps a deeper study is needed into Diller and Scofidio's work to see what makes their designs so innovative.

This study hopefully also indicates that to use conventional museum ideas to design or upgrade the current facilities of museums dooms such museums from the start. Using virtual means, however, only creates representations of the real and can never replace the physical artifact. Virtual unities of artifacts should only be considered if their physical unity is impossible.

For centuries, museums and libraries were perhaps some of the largest information sources available. Today the internet meets most of that need and museums should incorporate this highly developed communication system into their own systems. The proposed Global Museum perhaps represents the ultimate of this ideal and gives very little attention to the physical artifacts which museums are usually expected to house.