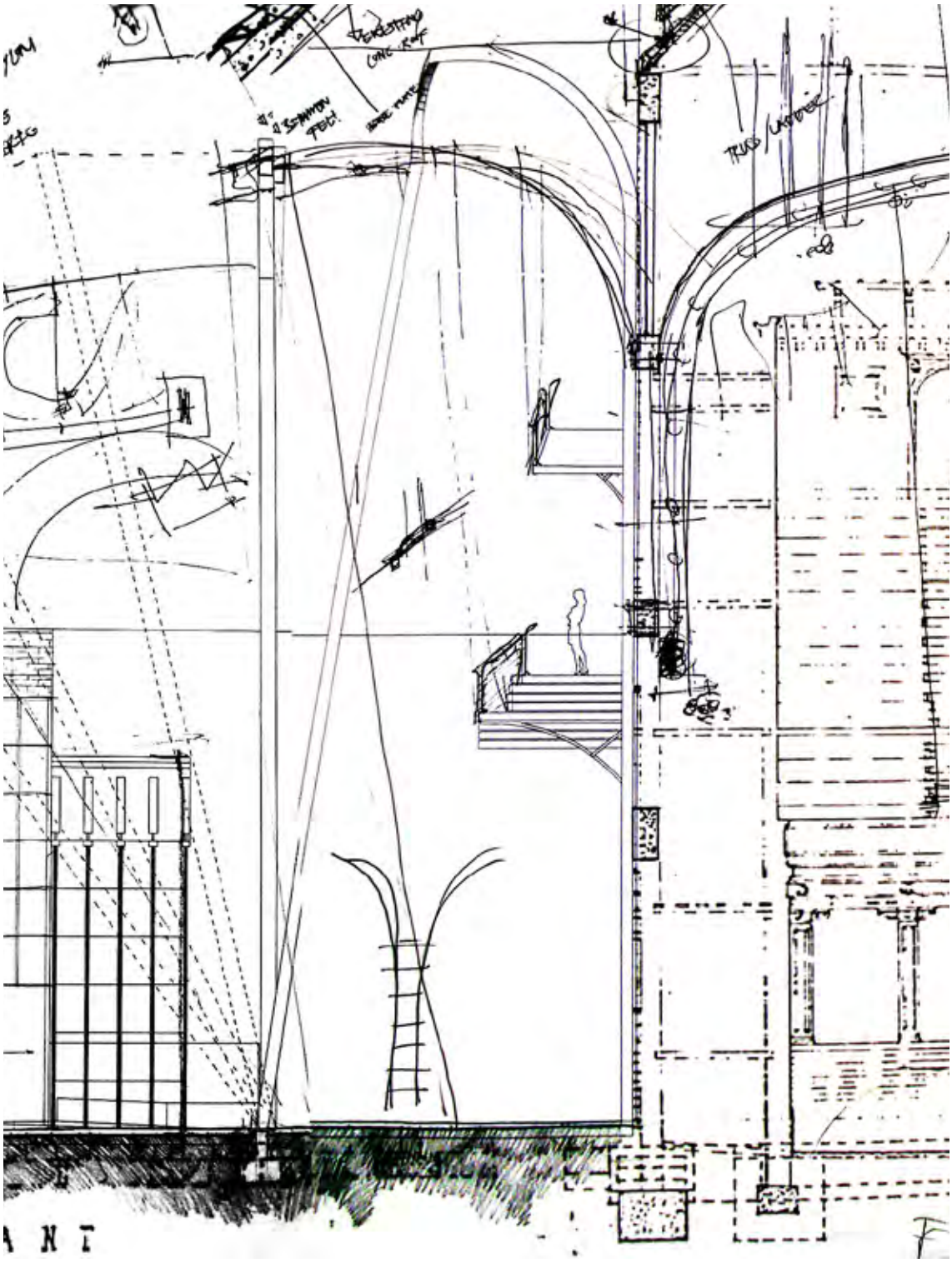
Part 9 CAPITOL Technical Documentation



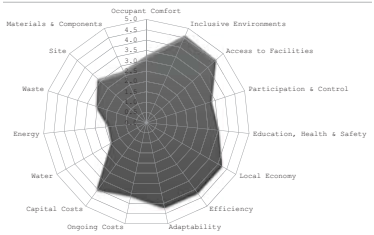


Figure 9.1 Result of SBAT analysis, 2009

Figure 9.2 Dome rising from rear of proscenium

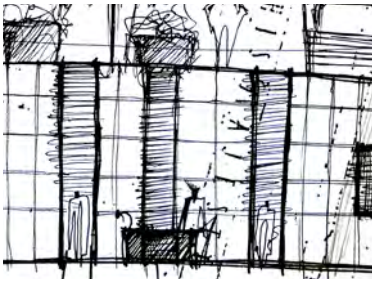


Figure 9.3 Conceptual drawing of northern facade of Entrance Foyer illustrating fenestration

Figure 9.4 View of Church Square as seen from roof terrace

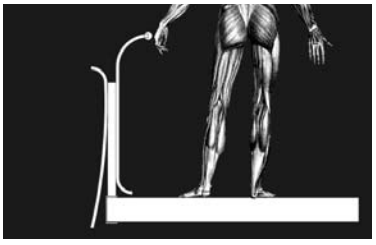


Figure 9.5 Walkway on eastern facade of auditorium

Capitol adapted SBAT System

9.1 Introduction

The SBAT System (Sustainable Building Assessment Tool) has been adapted by the author for the Capitol intervention. The assessment is intended to evaluate the performance of the intervention setting benchmarks for the project. The assessment focuses on social, environmental and economic domains, all of which are pertinent to the construction and performance of the intervention **(Figure 9.1)**.

9.1.1 Social Issues

9.1.1.1. Occupant Comfort

According to Gibberd (2005: 4) it has been shown that the quality of environments inside and around a building affect the health, mental state and productivity of people.

> "Healthier, happier, and more effective people contribute to sustainability by being more efficient and therefore reducing resource consumption and waste. However the quality of this environment needs to be achieved with minimal cost to the environment."

9.1.1.2 Acoustics

The dome structure of the Capitol has been treated with Sabinite Acoustic Plaster **(Figure 9.2)**; acoustics have also been enhanced with the electrical installation of loud speakers. The loud speakers render the sound distribution of the actual performance throughout the arena, regardless of how far from the stage the viewer sits. "The audience is assured of hearing with ease the veriest whisper."

9.1.1.3 Day Lighting

The Entrance Foyer, where the restaurant is situated receives the most natural light from the openings in its northern facade. The Grand Foyer receives natural light in the latter part of the day through textured windows on the western facade. This space is artificially lit, to enhance the space as well as the artworks and the costumes of the exhibition. The openings (entrances and exits) of the auditorium are closed during performances to reduce any natural light entering the auditorium, and the skylight can close electronically. The auditorium is by default a darker space. The stage has skylights which can be closed and receives good natural daylight. Each dressing room has a window thereby, receiving sufficient natural light.

9.1.1.4 Ventilation

The Capitol is ventilated mechanically. The current energy intensive ventilation equipment has been replaced with a more efficient system.

9.1.1.5 Thermal comfort

The internal temperature of the spaces is maintained manually and constantly controlled.

9.1.1.6 Views

The flat concrete roofs of the foyers have been redesigned as a terraced roof garden. The roof space affords the viewer a good view of Church Square as well as the extended interior. A walkway system is suspended off the eastern facade of the building which also allows for views of the extended interior and the roof terraces. From these spaces (including the walkways) viewers can watch performers. Fixed binoculars have been placed on the roof garden **(Figure 9.4)**.

9.1.2 Inclusive Environments

"Buildings should be designed to accommodate and should be accessible to everyone, or specially designed buildings need to be provided. Ensuring that buildings are inclusive supports sustainability as replication is avoided and change of use supported."(ibid).

9.1.2.1 Transport

Capitol is in close proximity to a frequently used bus stop on Church Square. This transport system connects people located elsewhere in the city as well as beyond its borders. Parking is for patrons of the Capitol are located within Church Square as well as the basement of the TPA. Parking for delivery vehicles is provided in Fountain lane on the western side of the building or in the auditorium itself depending on height restrictions.

9.1.2.2 Legibility

A well defined entry point to the extended interior is provided aside from that of the existing Foyer entrance. Spaces for staff and that for viewers (private and public) are demarcated. The buildings branding is positioned on the roof of the building, standing out to those passing by. At night this signage lights up, establishing the Capitol within Church Square **(Figure 9.7)**.

9.1.2.3 Social Spaces

The Capitol, including the foyers, auditorium and extended interior link connect together and allowing for interaction between space, user, and object. These social spaces become shared spaces where viewers can gather, relax, watch a performance and play. Capitol, although defined connects with Church Square and becomes part of a network of public spaces within the CBD **(Figure 9.9)**.

9.1.3 Access to Facilities

"Conventional living and working patterns require regular access to a range of services" (ibid: 5).
Access basic facilities such banking, retail transport and eateries services are located within a close proximity to the Capitol project. For special/specific events patrons may be brought in on busses to the interchange in Church Square. Within the SchizoCity Framework, the manipulation of the city makes it easier to access and spaces within the CBD, reducing environmental impact and creating a more dynamic environment.

9.1.4 Education, health and safety.

"Buildings need to cater for the well-being, development, health and safety of the people that use them. Learning and access to information is increasingly seen as a requirement of a competitive work force."(ibid: 6).

9.1.4.1 Education

Information will be provided on the current and forthcoming events happening at the Capitol. The Boswell Wilkie Circus School in collaboration with the Tshwane Cultural Centre will train youths into world-class performers. Access to support for learning will also be provided for the staff of the Capitol as well as the users.

9.1.4.2 Safety and security

Safety of the occupants and users is of utmost importance. Twenty four hour surveillance will be employed for the Capitol. The building must comply with all national and international health and safety regulations. A balustrade wraps around the roof terraces and the facade walkways of the building, whilst the extended interior is designed at increments of 500mm as to negate the use of balustrades within the landscape.

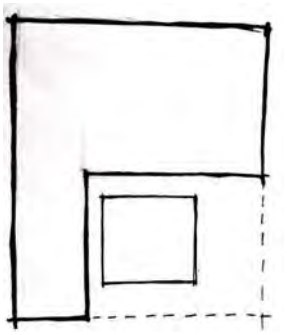


Figure 9.6 The completion and the positioning of the extended interior implied by the existing and becoming a hub of interaction

Figure 9.7 Lighting of signage at night

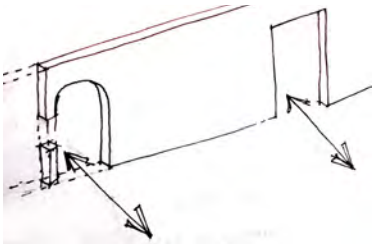


Figure 9.8 Entrances become identifiable with the spaces

Figure 9.9 The connection of vital spaces and places within the CBD. Framework group, 2009

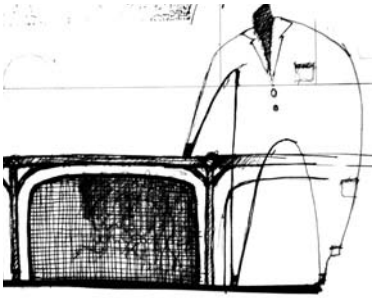


Figure 9.10 Conceptual illustration of balustrade on walkways and roof terrace

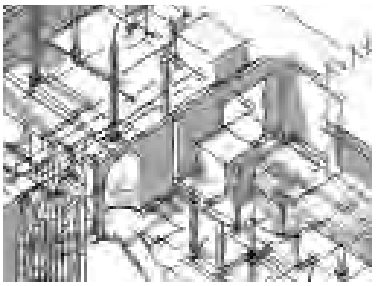


Figure 9.11 The manipulation of the ground plane. The heights of the platforms do not exceed 500mm relative to one another

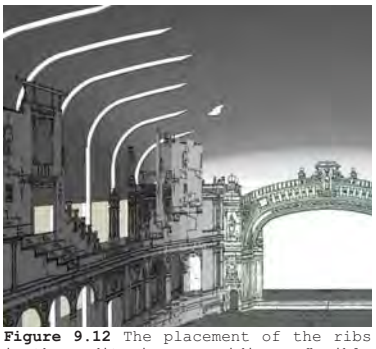


Figure 9.12 The placement of the ribs in the auditorium, providing a flexible system to aid in spatial manipulation

Figure 9.13 Conceptual illustration of a vehicle launch with the auditorium, the space can become a drive in theatre

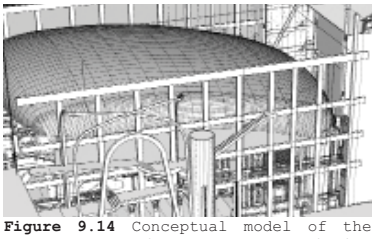


Figure 9.14 Conceptual model of the removal of brick from the building structure to reveal the interior

extending the skin

9.1.5 Economic Issues

"The adaptive-reuse and management of buildings can have a major impact on the economy of the area. The economy of an area can be stimulated and sustained by buildings that make use of, and develop, local skills and resources" (ibid: 8)

9.1.5.1 Local contractors

The intervention, as far as possible will be carried out by local contractors within the greater Tshwane area. With this, people will be trained where required to complete aspects of the intervention.

9.1.5.2 Local materials

The majority of materials, products, components and fittings specified should be manufactured and sourced from within the Greater Tshwane. If this cannot be achieved all materials should be manufactured in South Africa. For the Capitol intervention, all products are produced locally with one exception, that of the hollow core plastic. Through the use of local contractors and local materials the local economy is strengthened.

9.1.6 Efficiency of use

"Effective and efficient use of buildings supports sustainability by reducing waste and the need for additional buildings." (ibid: 8).

9.1.6.1 Occupancy

To ensure that the Capitol has a maximum occupancy the various spaces can support various functions. Space can be rented out to organisations separately even though the Boswell Wilkie Circus is the resident tenant. Events and facilities that can be accommodated include: car launches, conference facilities, fashion shows, receptions, music events and theatrical events.

9.1.7 Adaptability and flexibility

"Buildings, which can accommodate change easily, support sustainability by reducing the requirement for physical adaption and associated disruption, energy consumption and cost as well as the need for new buildings." (ibid: 9.)

9.1.7.1 Vertical Dimension

The various volumes of the space from floor to ceiling are greater than 3m. Within the auditorium the height is used effectively by performers, forming another layering of private space.

9.1.7.2 Structure and services

The intervention latches onto the existing structure of the building with minimal adaptation to the original structure, with exception of stripping the structure to reveal the dome. This alludes the viewer to the 'mystery' that the building contains.

9.1.8 Ongoing Costs

"Buildings cost money to operate. These costs include cleaning, maintenance, security and energy." (ibid)

9.1.8.1 Maintenance

Due to the fact that Capitol is within the public realm, materials selected are hardy and durable. Materials on the exterior such as the synthetic grass are UV resistant and those on the interior such as the hollow core plastic are lightweight but strong.

9.1.9 Capitol Costs

9.1.9.1 Local Need
A percentage of the capital cost of the Capitol intervention will be allocated to train people with construction skills during the implementation of the project.

9.1.9.2 Shared Need
The project is funded through a private/public partnership, the Tshwane Metropolitan Municipality and the Boswell Wilkie Circus, the initial and future costs will be shared. Maintenance costs will be generated through the sharing of the buildings facilities with other established organisations.

9.1.10 Environmental Issues

9.1.10.1 Water
Water usage is reduced to a minimum through the implementation of auto flow taps and the installation of dual flush toilets. Water saving awareness it to be promoted amongst staff as well as in the public WC's.

9.1.11 Energy

"Using less energy or using renewable energy in buildings can make a sustainable contribution" (ibid: 11)

9.1.11.1 Location
As the building is located nearby a public transport system, people that may generally use cars have the opportunity to use public transport.

9.1.11.2 Passive environmental Control
Due to the nature of the existing structure of the building, a mechanically controlled system is unavoidable.

9.1.11.3 Energy Efficiency
Old mechanical ventilation and cleaning systems have been removed and replaced with more energy efficient systems, housed in the same location. Only energy efficient light fixtures are used.

9.1.12 Site
The site on which the Capitol stands was first developed in the late 1800's. The Capitol Theatre is pump-planned to re-inject it with energy that previously made it a successful public space.

9.1.13 Materials and Components

The ecological impact of materials must be assessed to inform the selection of materials. The following are to be taken into account:

- The low embodied energy of materials such as concrete, brick and timber. Bricks removed from the facade of the building are to be re-used in the masonry construction of the extended interior.
- Locally sourced or manufactured materials
- Materials that can be recycled such, as steel and aluminium.
- Modular dimensions of materials
- Durable and low-maintenance materials

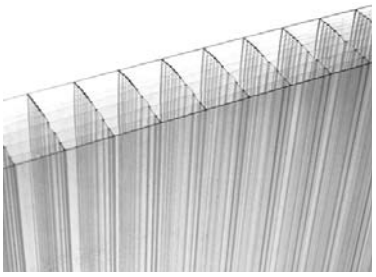


Figure 9.15 Polycarbonate sheeting used for Capitol signage.

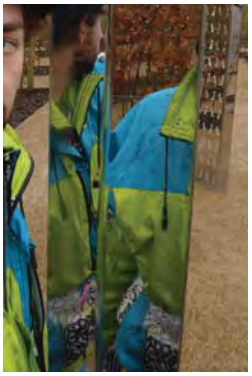


Figure 9.16 Stainless steel used for finish on columns, either brushed or polished

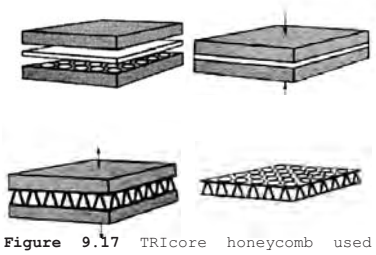


Figure 9.17 TRIcore honeycomb used for the flooring of the stage system

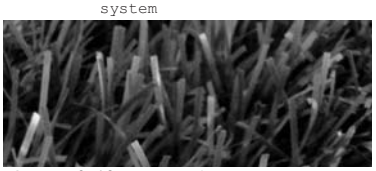


Figure 9.18 Synthetic grass, locally manufactured. Used in the extended interior as a floor and wall material

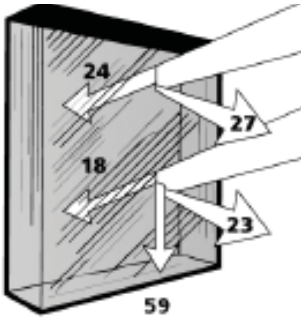


Figure 9.19 Smartglass *Solarshield* available locally. Used for the fenestration of the Entrance Foyer.

9.2 Materials

9.2.1 Polycarbonate

Classified as an engineering plastic, polycarbonate has better mechanical properties than other polymers. Although it requires a higher energy input during manufacture than other plastics and can be recycled. For the Capitol intervention, polycarbonate is used for the exterior signage (branding) of the building. To increase its strength, the polycarbonate panels have embossed ribs. The panels are fixed to a steel frame **(Figure 9.15).**

9.2.2 Stainless Steel

Used for the exterior columns in the extended interior. The metal can is either highly polished or brushed and laser cut with a Corinthian column pattern. It is selected for the columns firstly for its corrosion resistance, secondly its strength and thirdly for the ease of fabrication **(Figure 9.16).**

9.2.3 Nylon

Used as a textile in the Capitol intervention, it is combined with a low percentage of spandex to increase its flexibility. It is used as an interior and exterior application. A spattered finish has been applied which gives it a metallic finish whilst maintaining translucency under light. The nylon is treated using a spinning process through which 15% spandex is added to enhance its mechanical properties. A vacuum method of coating, called spattering, is used to add small metallic particles which create a metallic finish.

9.2.4 Hollow Core Plastic

Rigid translucent TRIcore honeycomb cores with transparent thermoplastic top sheets results in a strong panel with good optical features. Of the five types available, the clear-PEP UV PC stage is used. The clear-PEP UV PC stage consists of 2mm UV protected PC top sheets and the hollow core structure. It is suitable for flooring as it has load bearing capacity whilst being lightweight. Used for the floor system in the auditorium, various stage configurations are possible, and the stages can be lit individually. The material has a high scratch resistance and an anti slip surface**(Figure 9.17).**

9.2.5 Synthetic grass

Manufactured by attaching polyvinylchloride blades to a durable porous backing, synthetic grass has an average lifespan of 10 years. The turf is unrolled and fixed to the desired surface, and once in place a mixture of rubber and sand is raked into the turf. The rubber is manufactured from old tyres and places in a ratio of 2:1 with sand. Synthetic grass is used as cladding in the extended interior for both the floor plane and the rear of the remaining TPA wall, becoming a synthetic green wall **(Figure 9.18).**

9.2.6 Glazing

Laminated reflective coated safety glass
Solarshield® consists of a combination of a metallic coating and a clear tinted PVB (polyvinyl butyral). The PVB is designed to keep out the heat of the sun. The glazing is treated to limit the amount of light entering the building as well as blocking out damaging UV radiation. The appearance of the glazing it determined by the colour of the glass, the sun angle, reflections and the viewing angle (Smartglass, 2009). Acting as a mirror in the extended interior the glazing will create a textured quality where used on the facade of the entrance foyer **(Figure 9.19).**

9.2.7 Concrete

Concrete comprises of components from a non-renewable resource, can achieve large spans and is a low-demand material. Concrete is used for the patterned pathway as well as parts of the manipulated floor plane of the extended interior.

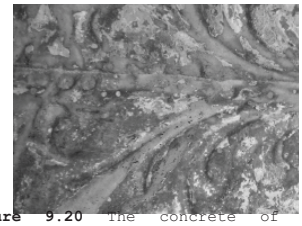


Figure 9.20 The concrete of the patterned pathway, extending from the entrance of the extended interior and through to the western interior facade is shutterd in salvaged pressed ceiling panels.

9.2.8 Rosco mirror

A lightweight and flexible substitute for heavy glass mirror, the material comprises of a tear resistant plastic film. The material has a mirror-like reflective quality and is self-extinguishing. The film is used on the rear wall of the stage. Fixed to a curved frame, the mirror reflects and distorts the stage workings as well as reflects light.

9.2.9 Timber

As the only timber used in the original build of the Capitol Theatre in 1930 in the doors and windows, the doors of the Capitol interventions are also of timber. Timber, parallel to the grain is strong and tough. The doors are fire treated and the timber selected is Pinus elliotti.

Figure 9.21 Timber doors used on the eastern facade. Photograph taken in Brick Lane, London, 2009

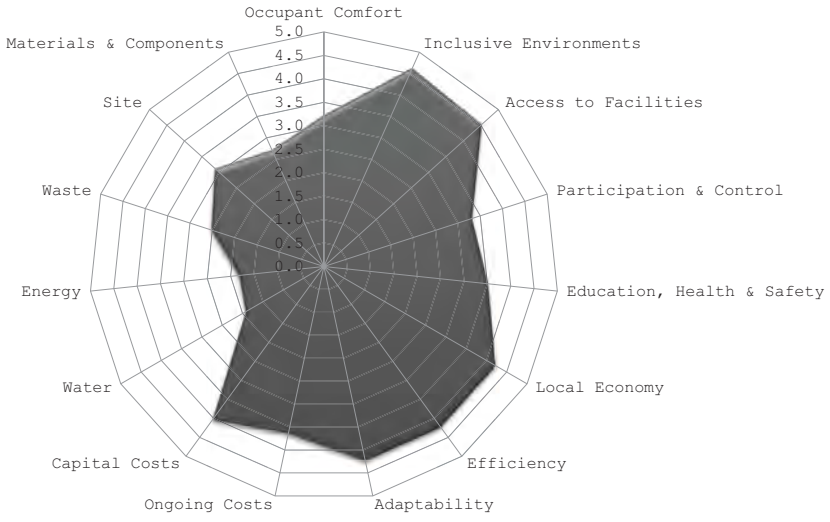
9.2.10 Polymethylmethacrylate, PMMA

PMMA, an Acrylic, is a thermoplastic material that may resemble glass. Like glass, it has a sense of fragility which is overcome by blending the PMMA with an acrylic rubber to increase its strength. PMMA can be moulded or cast in thicknesses up to 100 millimetres. As it is a thermoplastic material, it will retain the shape in which it is produced. The luminaire is designed in accordance with PMMA that has already been set as upon setting; PMMA shrinks by approximately 2% in both length and breadth. PMMA can be joined using a variety of methods such as epoxy adhesives.

Figure 9.22 Tofu table light by Tokujin Yoshioka, material same as that of niche plinth. PMMA with halogen diffuser.

9.3 Conclusion

The SBAT system was used as a guideline for the basic requirements of the building, in order to pump-plan the Capitol. Redundant equipment is to be replaced to increase its sustainability. According to the SBAT system an overall rating of 3.4 was achieved, the system however, appears to be designed toward the development of a new building, and guidelines for the pump-planning of existing buildings should be established.

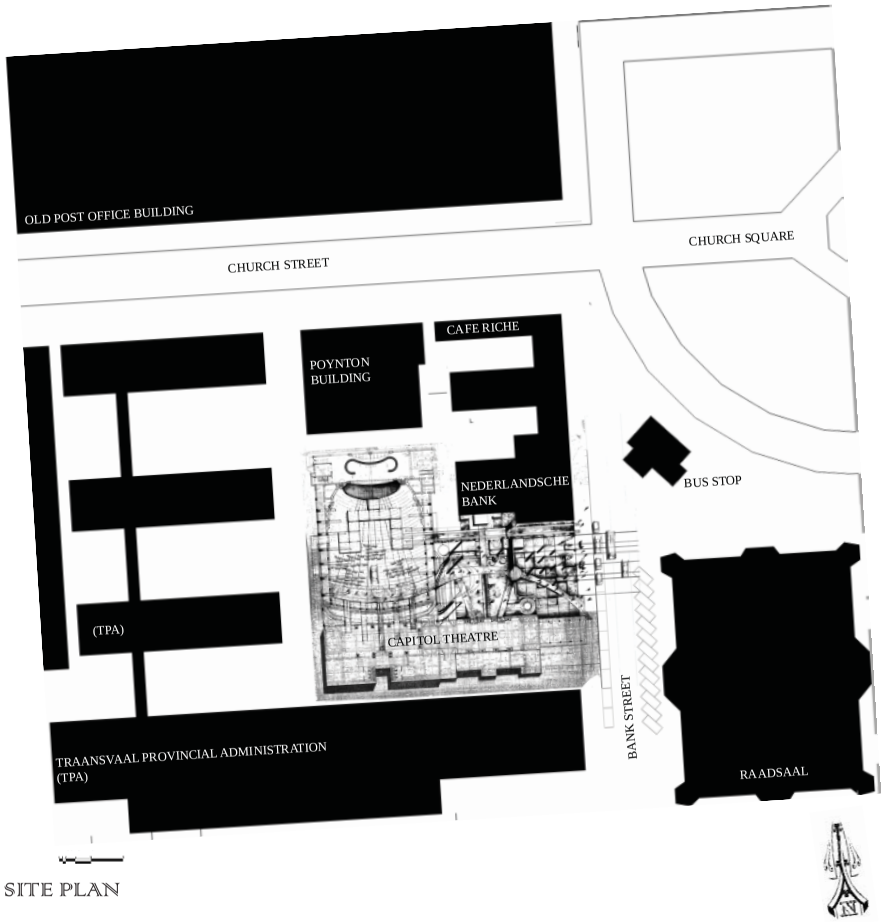


Social	3.8	Economic	4.0	Environmental	2.4

Overall 3.4

Overall value	0-1	1-2	2-3	3-4	4-5
Classification	Very Poor	Poor	Average	Good	Excellent

Figure 9.23 Result of SBAT analysis undertaken by author for Capitol

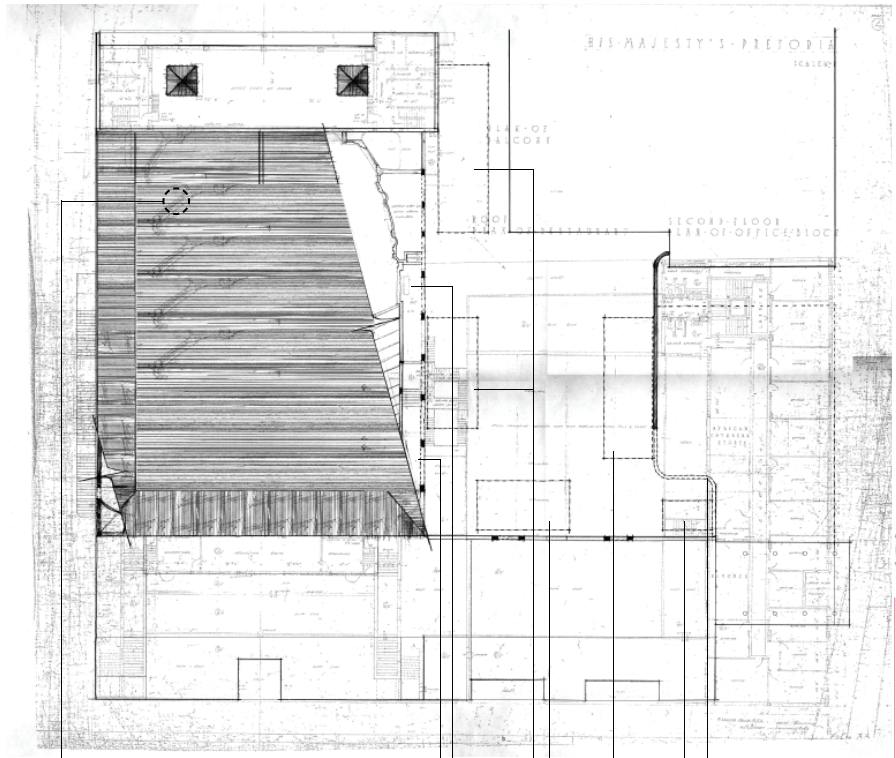


SITE PLAN

"Sympathy for context is by no means an automatic response. We have all confronted situations which require dramatic intervention, just as we have discovered those which call forth a profound regard for continuity."

HODGETTS & FUNG - Scenarios and Spaces

Figure 9.24 Site Plan, illustration location of Capitol intervention within Church Square
extending the skin



DEMOLITION PLAN

Removal of Kirkness brick infill from facade to be re-used in extended interior. Infill replaced with Saligna fire door

Removal of Kirkness brick infill from facade to be re-used in extended interior. Infill replaced with glazing

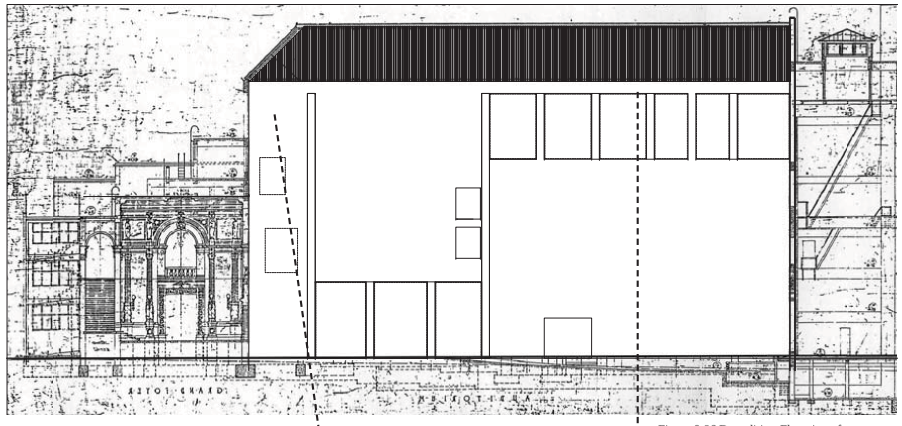
Removal of car ports

Removal of TPA wall, tiles to be fixed to northern facade of Entrance Foyer

Removal of section of and IBR and concrete roof to allow for placement of skylight. Concrete to be used as fill in extended interior.

Removed structure and infill

Figure 9.25 Demolition plan illustrating the removal of car-ports from the site and infill from the Capitol Theatre

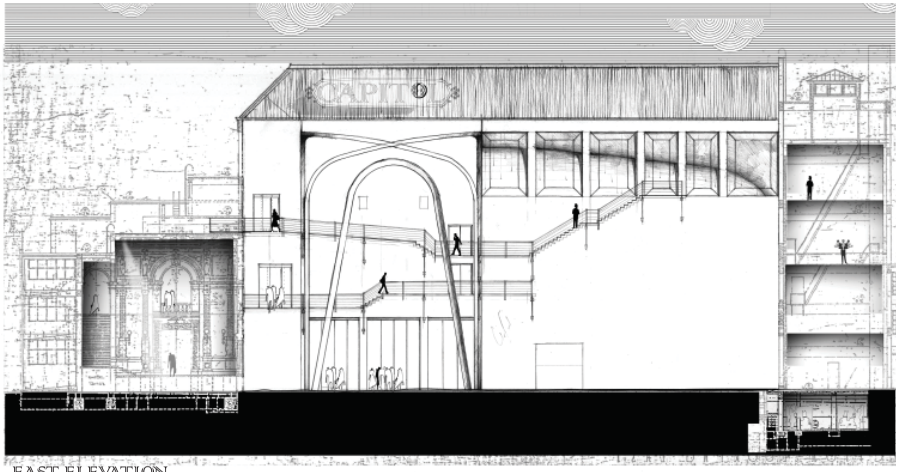


DEMOLITION ELEVATION

Figure 9.26 Demolition Elevation of eastern side of auditorium, illustrating removal of infill

Removed Structure and infill

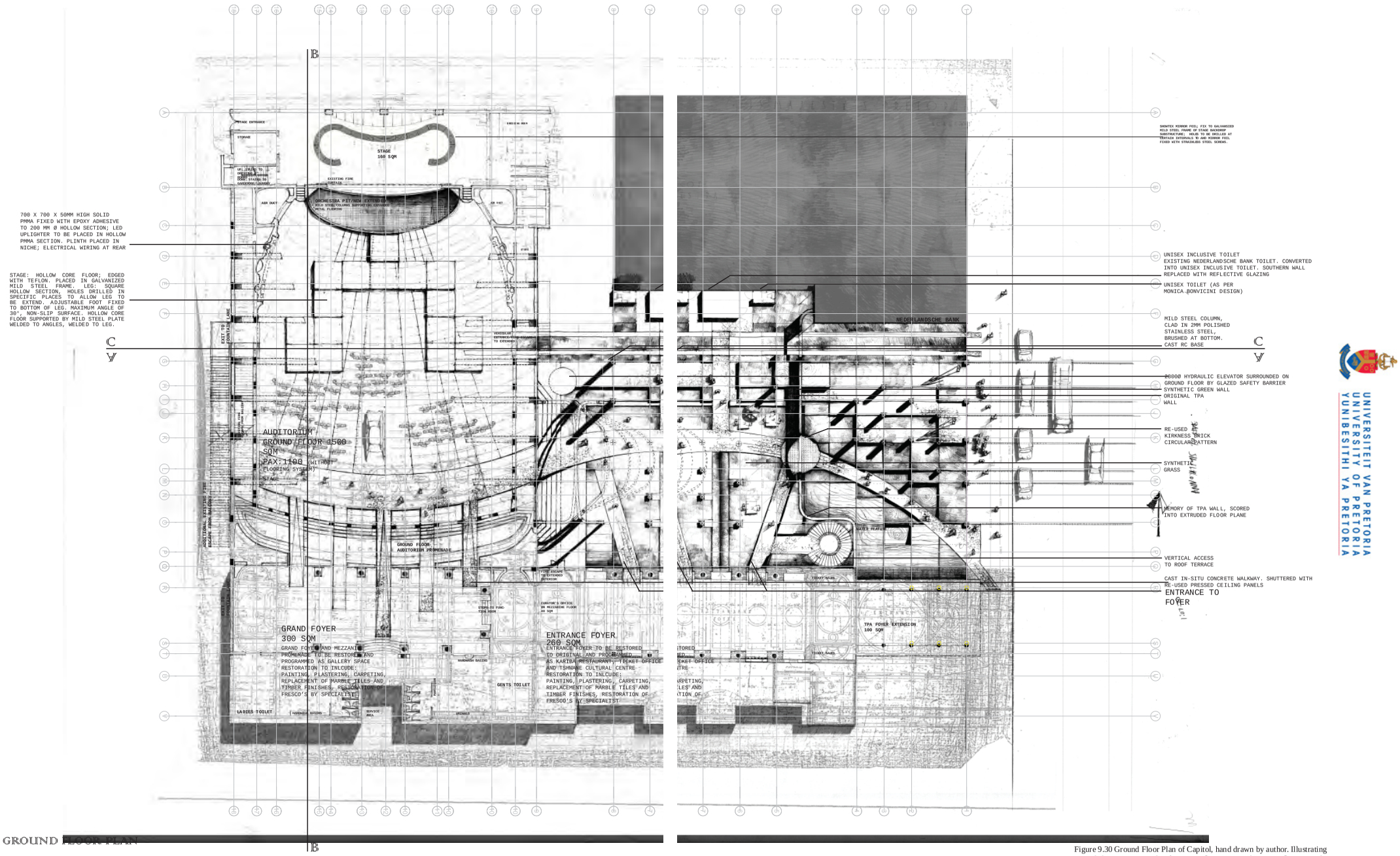
Figure 9.27 View of theatre from Church Square 2009
extending the skin



EAST ELEVATION

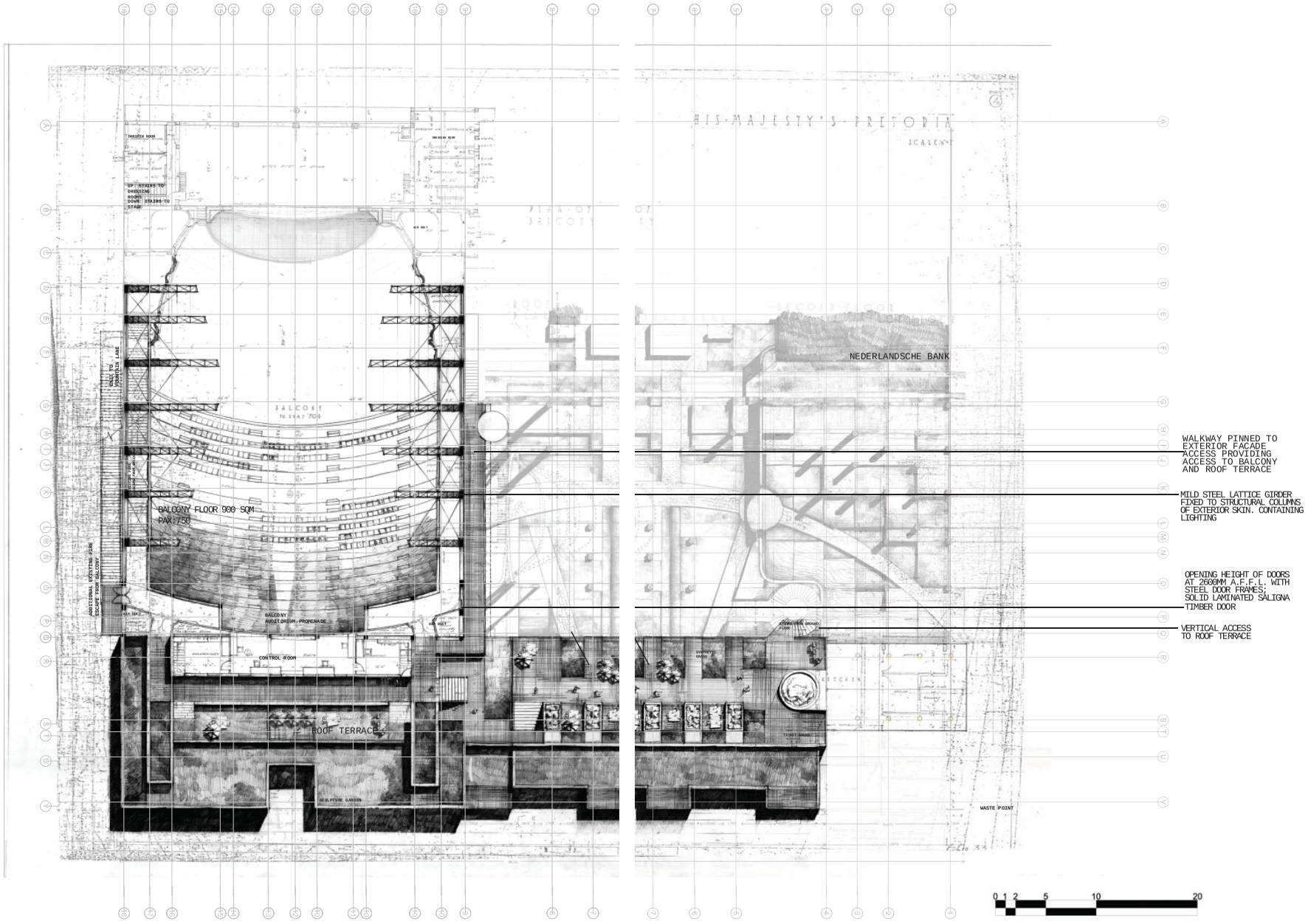
Figure 9.28 East Elevation of Capitol illustrating the intervention, refer to figure 9.26. Hand drawn by author

Figure 9.29 View of Capitol from Church Square
illustrating Capitol intervention. Refer to figure 9.27



GROUND FLOOR PLAN

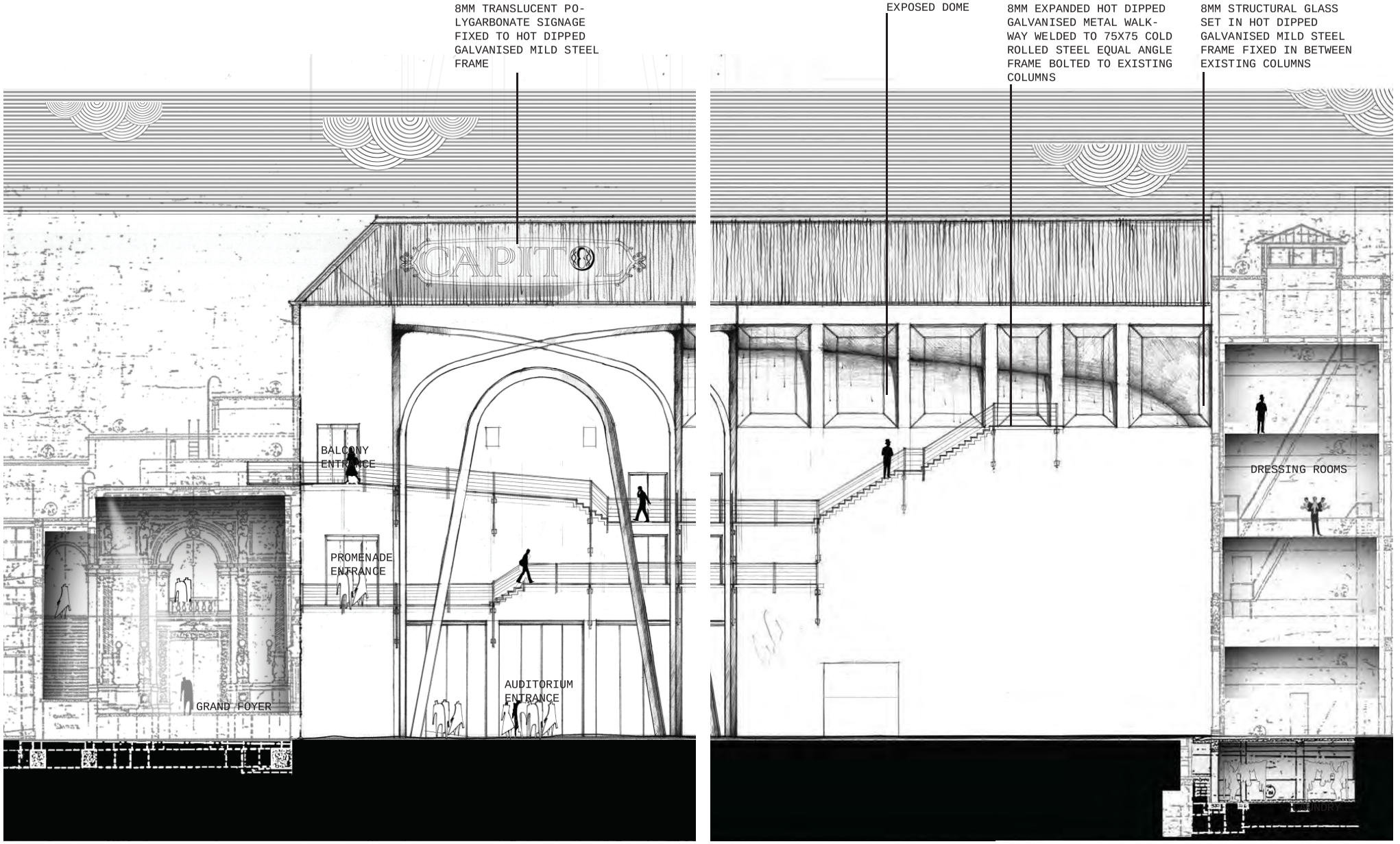
Figure 9.30 Ground Floor Plan of Capitol, hand drawn by author. Illustrating extended interior, example of stage configuration, orchestra pit flooring and mirrored backdrop



BALCONY PLAN

extending the skin

Figure 9.31 Balcony Plan of Capitol, hand drawn by author. Illustrating placement of ribs and roof terrace



EAST ELEVATION

Figure 9.32 East Elevation of Capitol illustrating the intervention, refer to figure 9.26. Hand drawn by author extending the skin

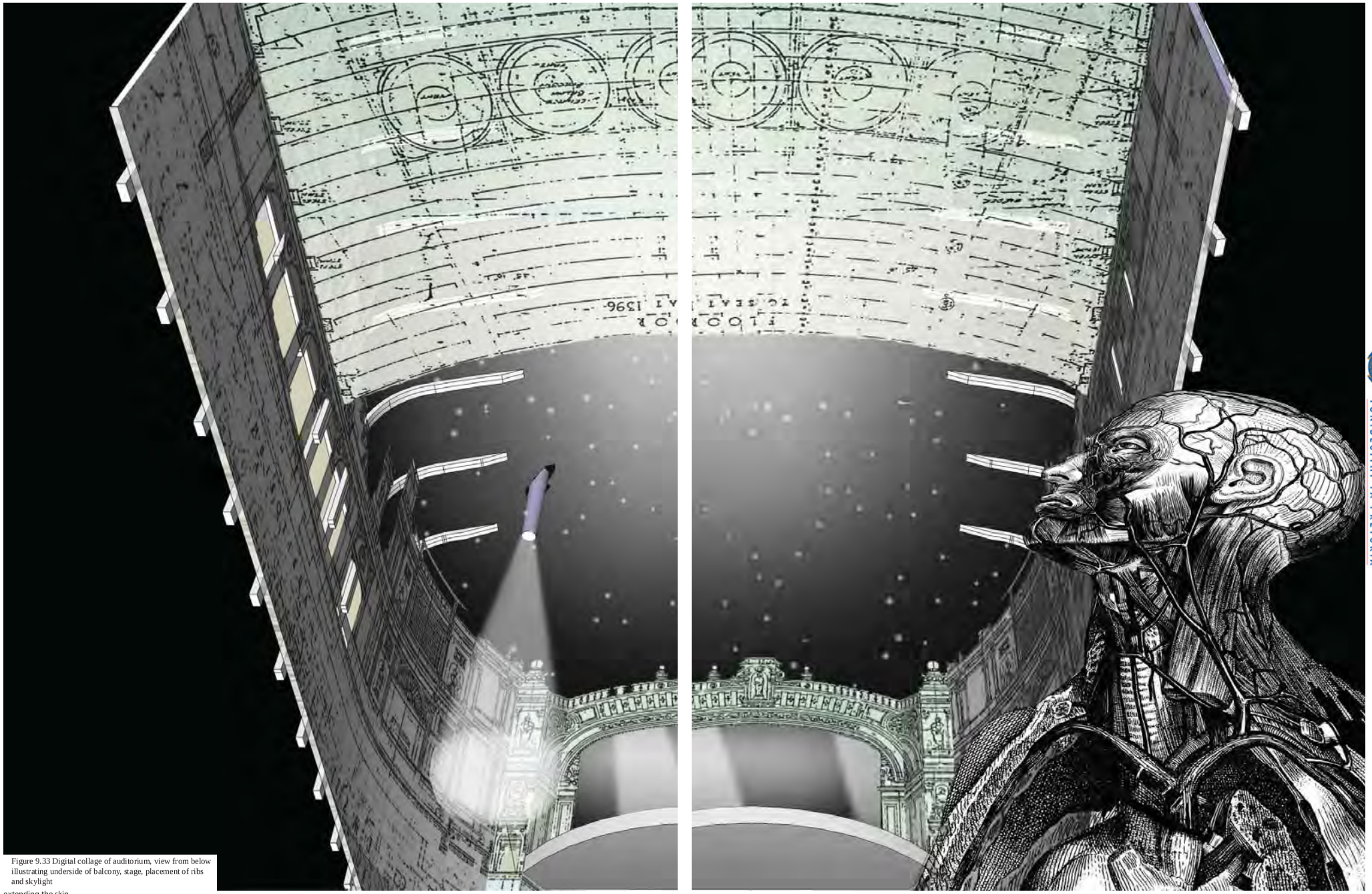
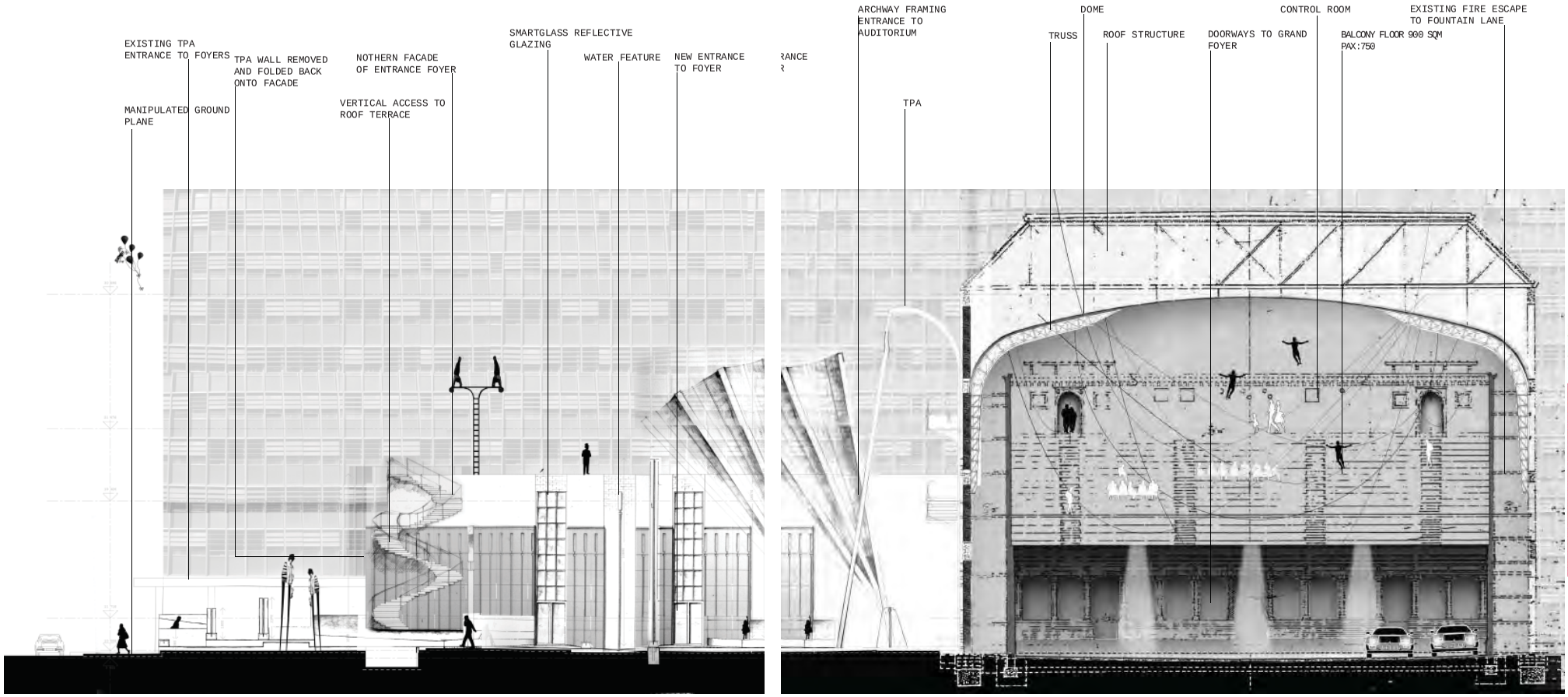
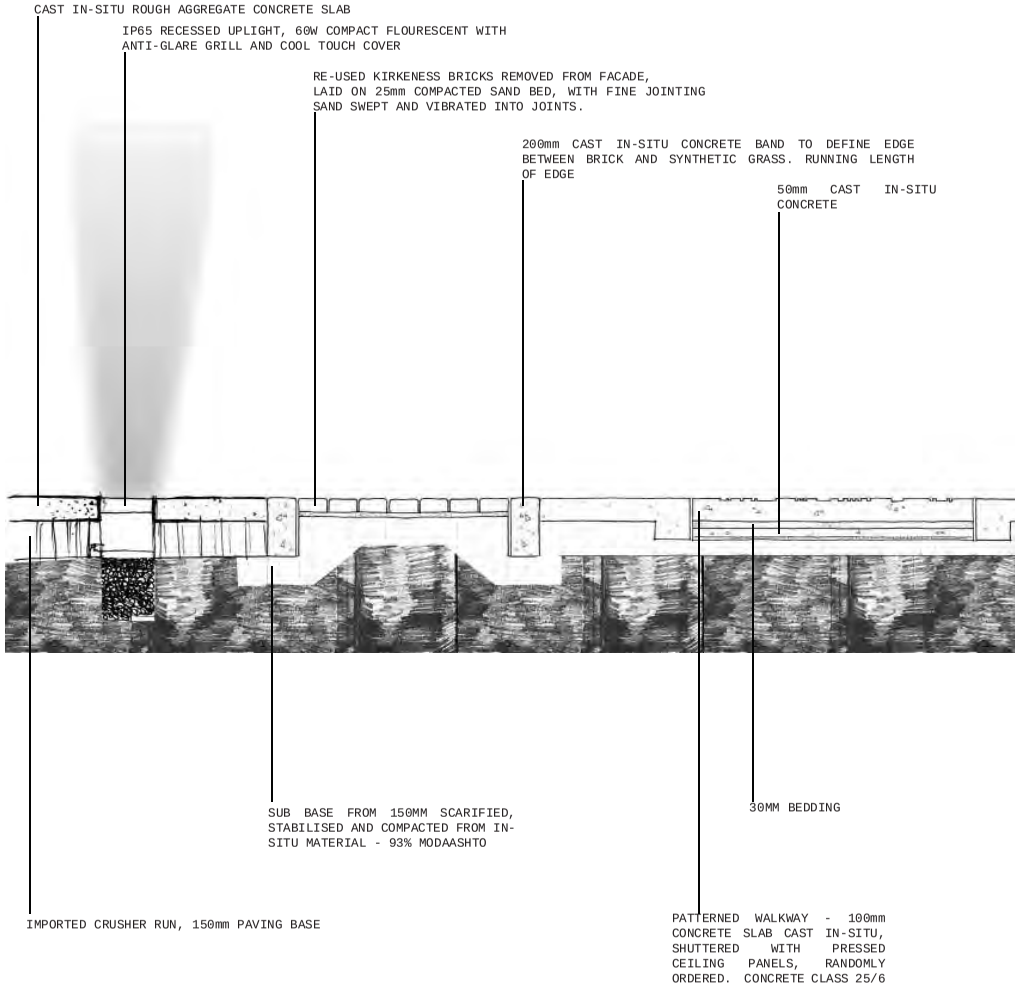


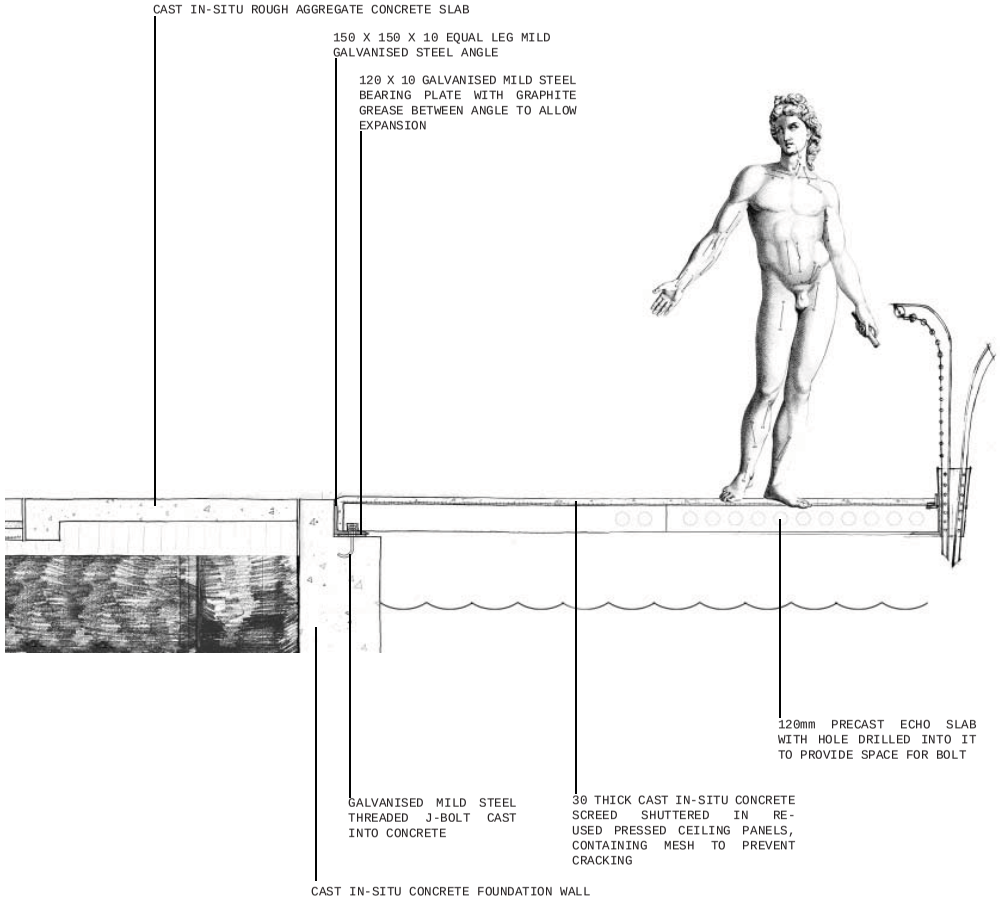
Figure 9.33 Digital collage of auditorium, view from below illustrating underside of balcony, stage, placement of ribs and skylight



SECTION A-A

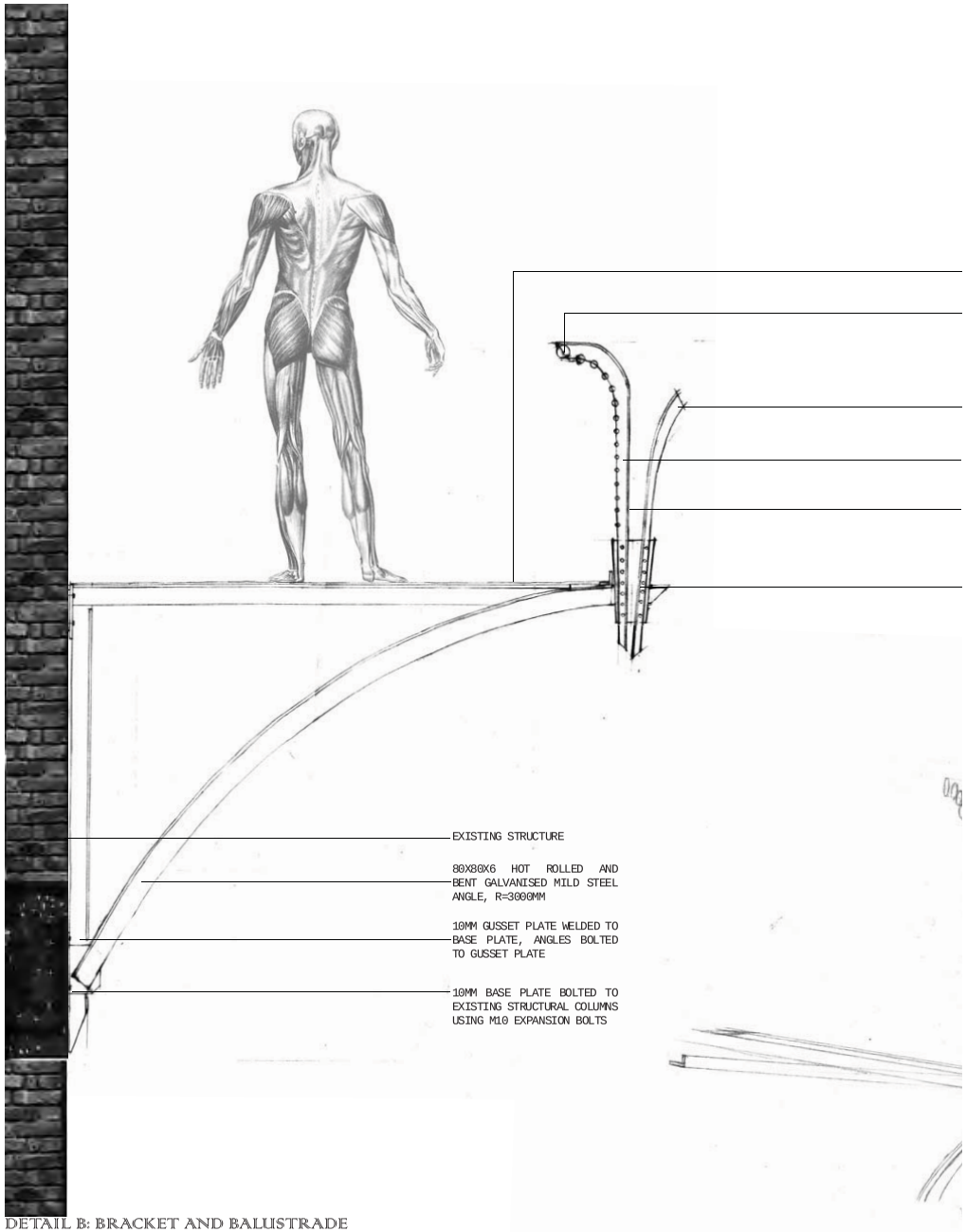
Figure 9.34 Section A-A, illustrating rear of auditorium, balcony and northern facade of Entrance Foyer. TPA building in background





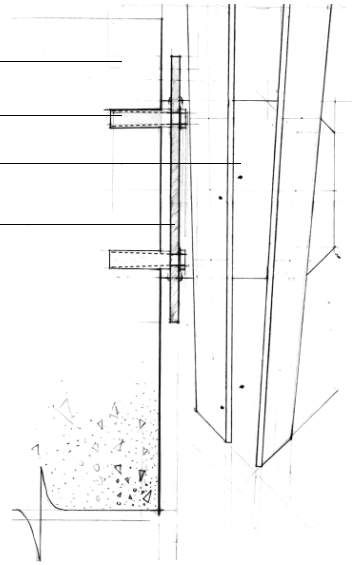
DETAIL A: ELEMENTS OF THE EXTENDED INTERIOR

Figure 9.35 Detail A: elements of the extended interior, including patterned walkway, recessed luminaire, re-used Kirkness Brick paving and walkway over water feature at entrance of space



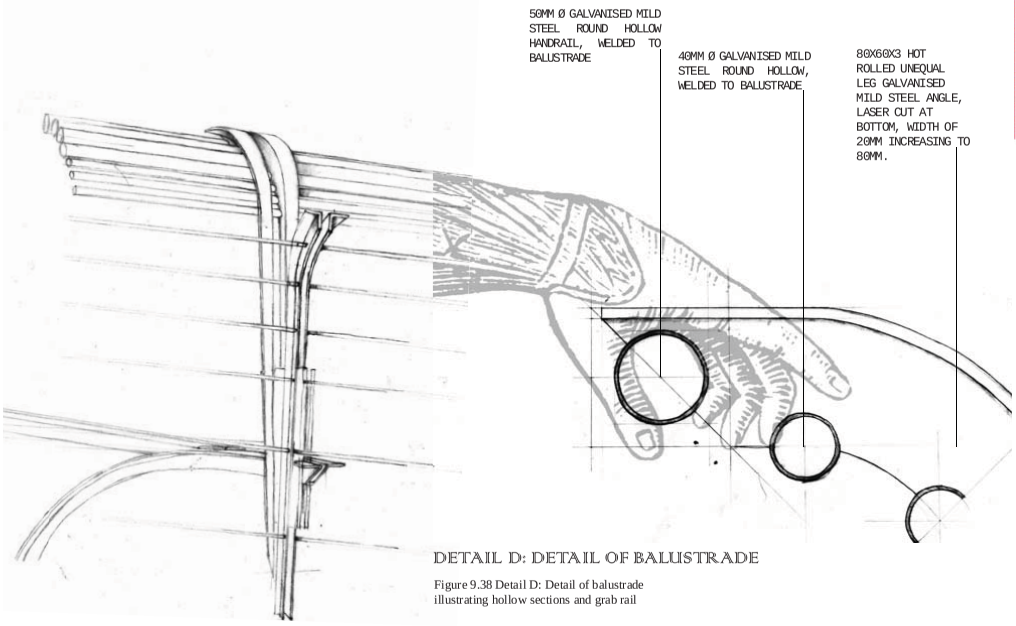
DETAIL B: BRACKET AND BALUSTRADE

Figure 9.36 Detail B: Detail of bracket and balustrade of the cantilevered walkway of eastern facade
extending the skin



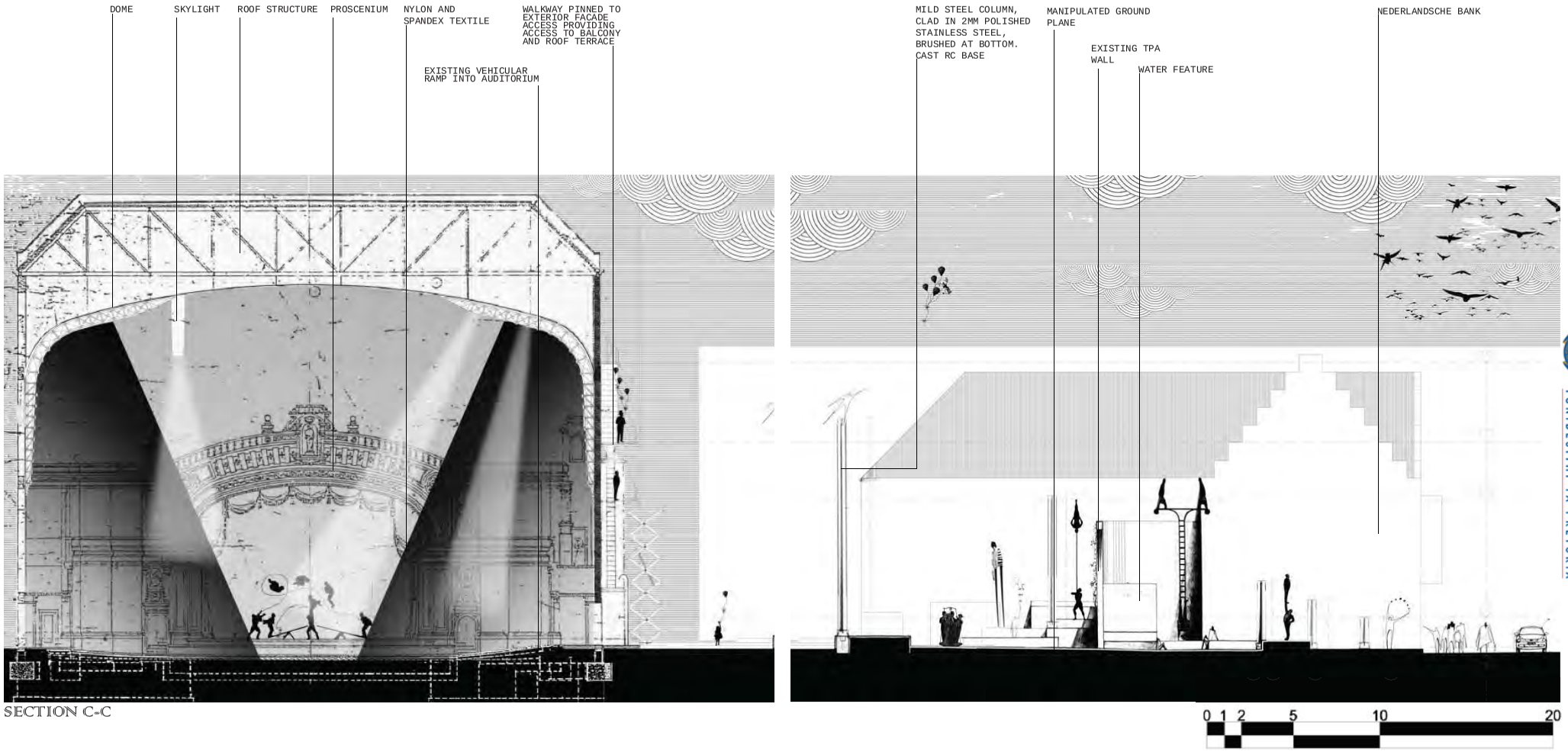
DETAIL C: FIXING OF BALUSTRADE ONTO EXISTING STRUCTURE OF ENTRANCE FOYER FACADE

Figure 9.37 Detail C: Fixing of balustrade to northern facade of entrance foyer



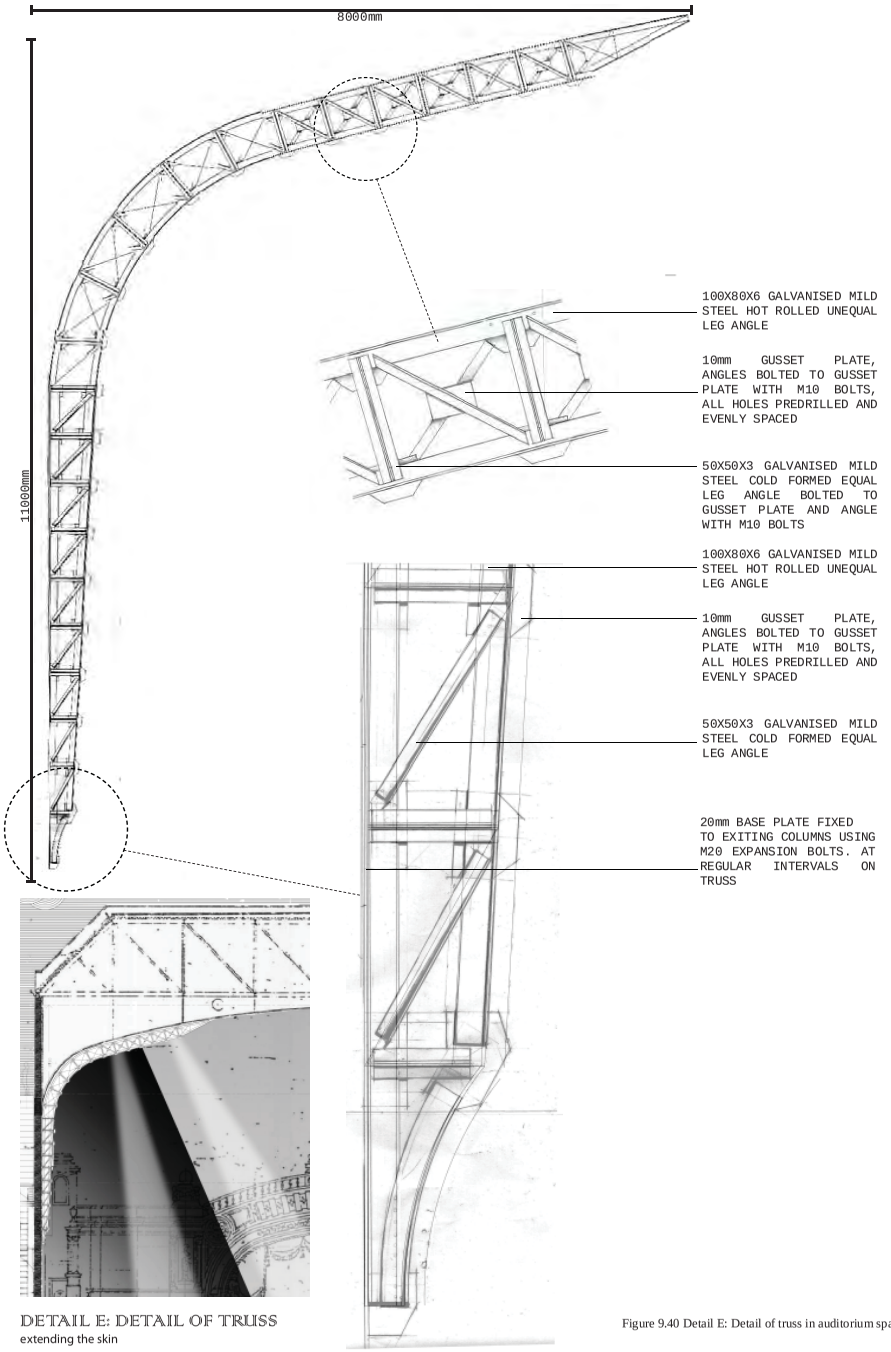
DETAIL D: DETAIL OF BALUSTRADE

Figure 9.38 Detail D: Detail of balustrade illustrating hollow sections and grab rail



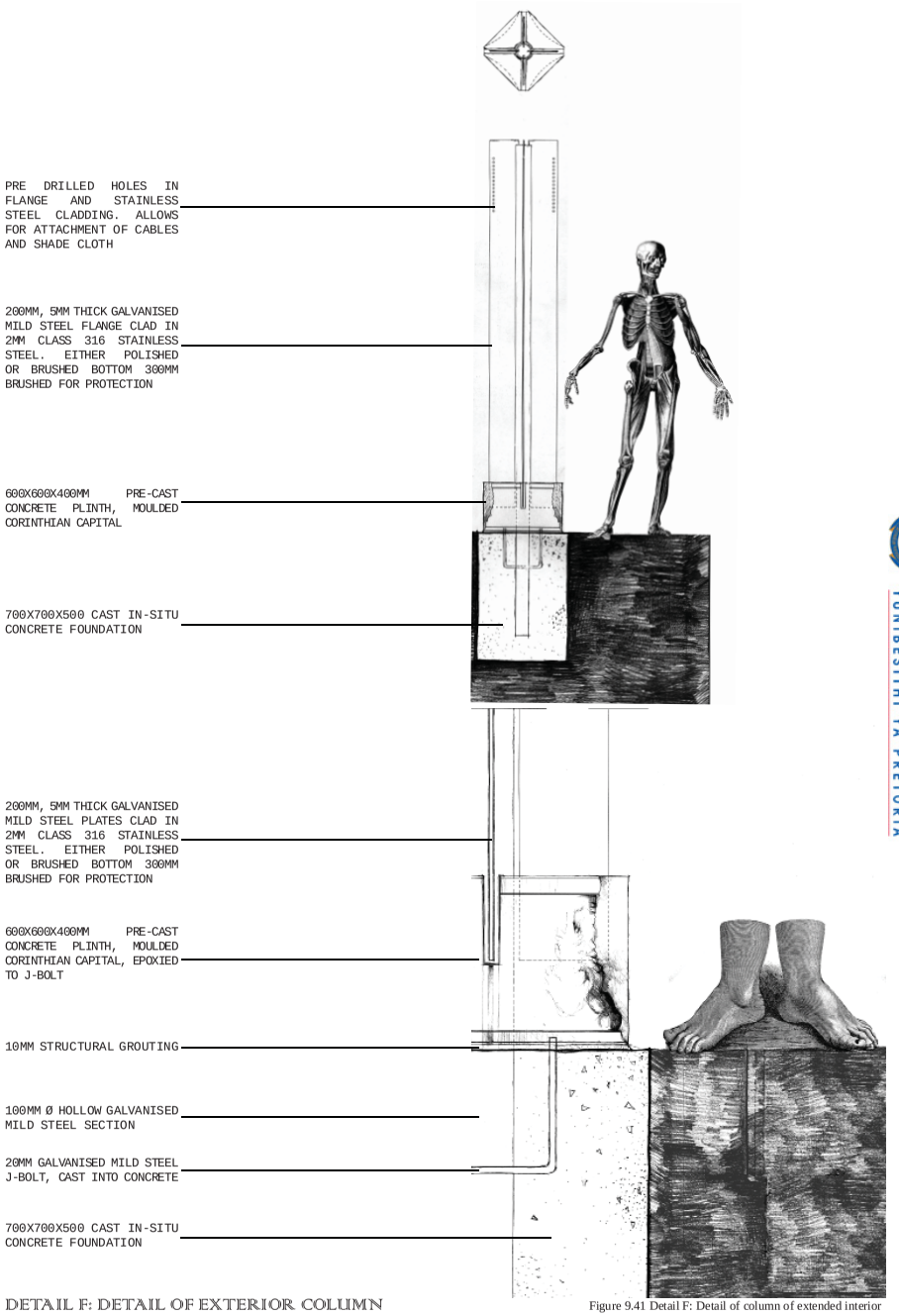
SECTION C-C

Figure 9.39 Section C-C illustrating extended interior, reflective WC's, stage and proscenium, trusses, hydraulic elevator and walkways on auditorium facade



DETAIL E: DETAIL OF TRUSS
extending the skin

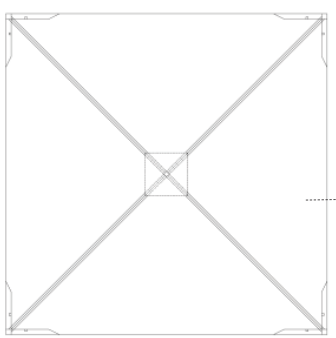
Figure 9.40 Detail E: Detail of truss in auditorium space

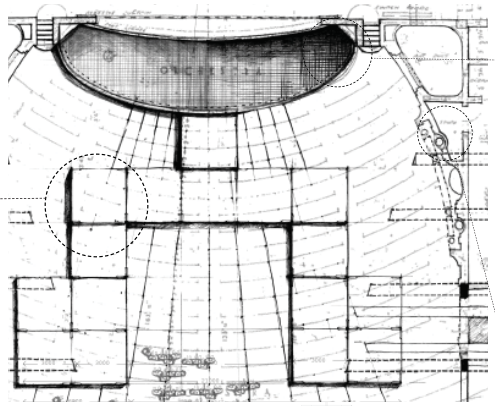


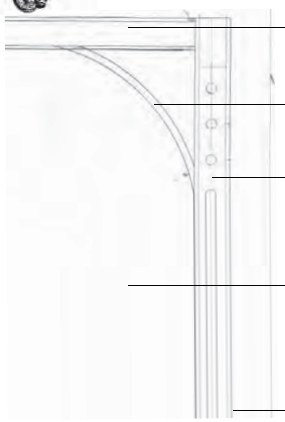
DETAIL F: DETAIL OF EXTERIOR COLUMN

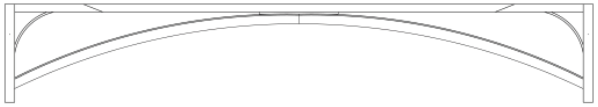
Figure 9.41 Detail F: Detail of column of extended interior

Figure 9.42 Digital collage of extended interior illustrating patterned pathway, manipulated ground plane and synthetic green wall. Church Square in background









DETAIL G: DETAIL OF FLOOR SYSTEM

STAGE: HOLLOW CORE FLOOR; EDGED WITH TEFLON. PLACED IN GALVANISED MILD STEEL FRAME. LEG: SQUARE HOLLOW SECTION, HOLES DRILLED IN SPECIFIC PLACES TO ALLOW LEG TO BE EXTENDED. ADJUSTBALE FOOT FIXED TO BOTTOM OF LEG.MAXIMUM ANGLE OF 30°, NON-SLIP SURFACE. HOLLOW CORE FLOOR SUPPORTED BY MILD STEEL PLATE WELDED TO ANGLES, WELDED TO LEG.

Figure 9.43 Detail G: Detail of floor system used in auditorium

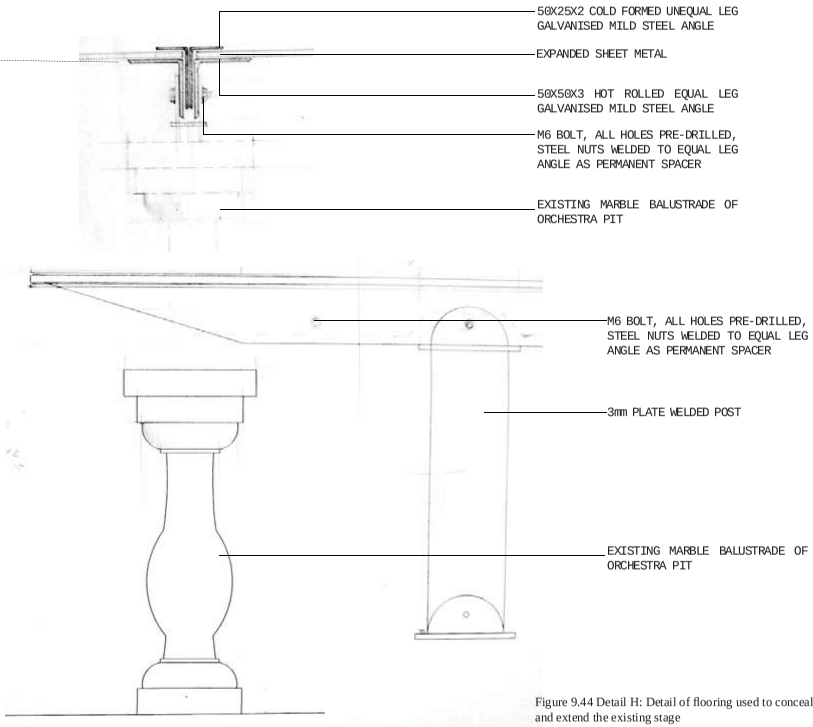
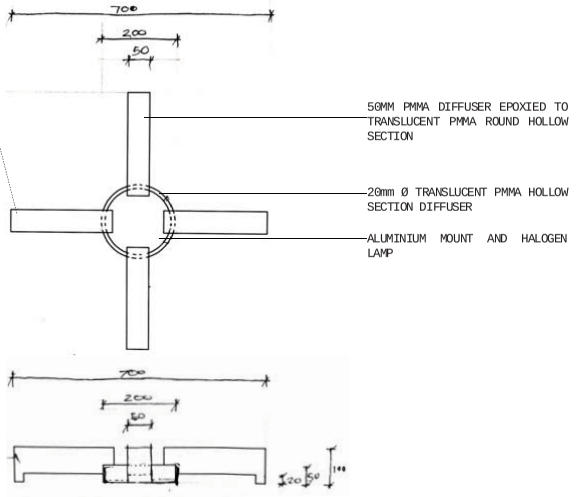


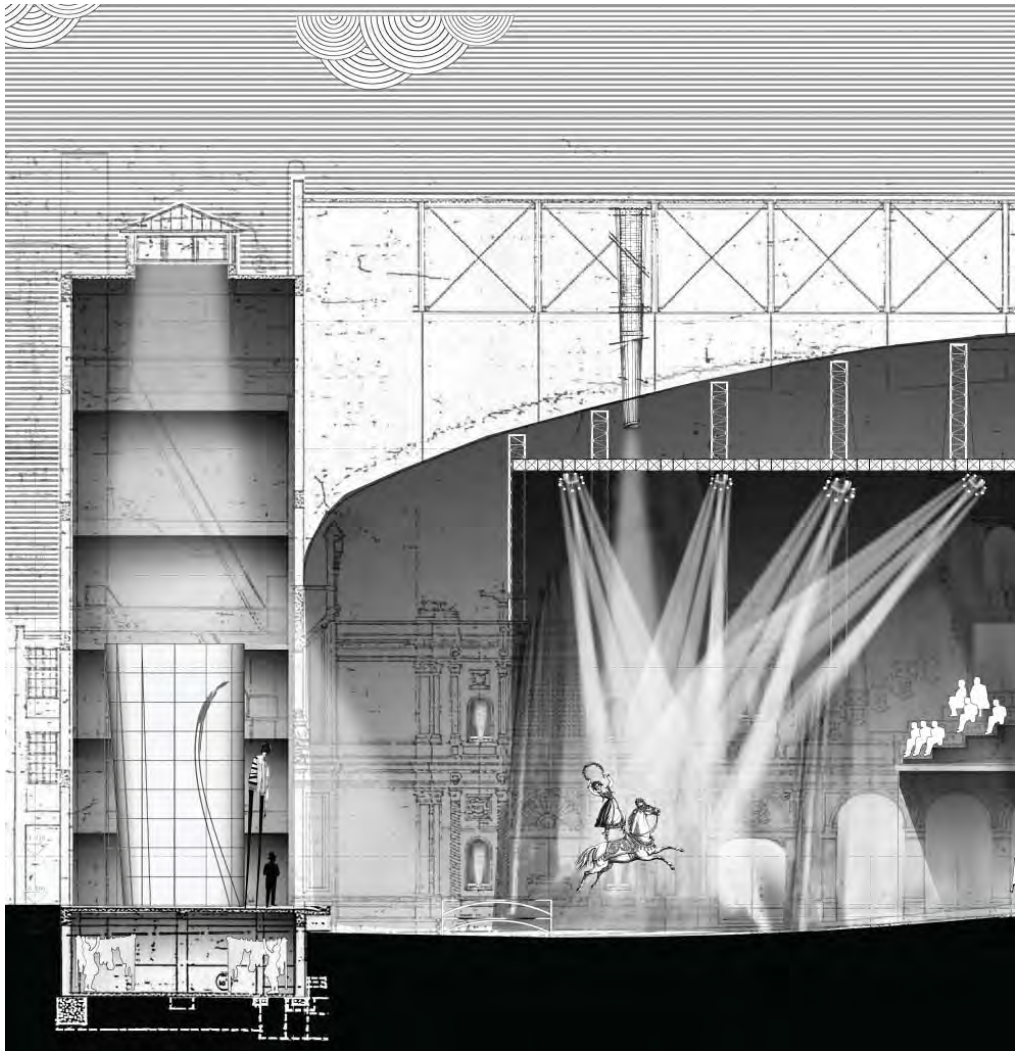
Figure 9.44 Detail H: Detail of flooring used to conceal orchestra pit and extend the existing stage

DETAIL H: DETAIL OF ORCHESTRA PIT STAGE



DETAIL I: DETAIL OF NICHE PLINTH

Figure 9.45 Detail I: Detail of plinth used in niches of auditorium, respecting the memory of previous sculptures



SECTION B-B

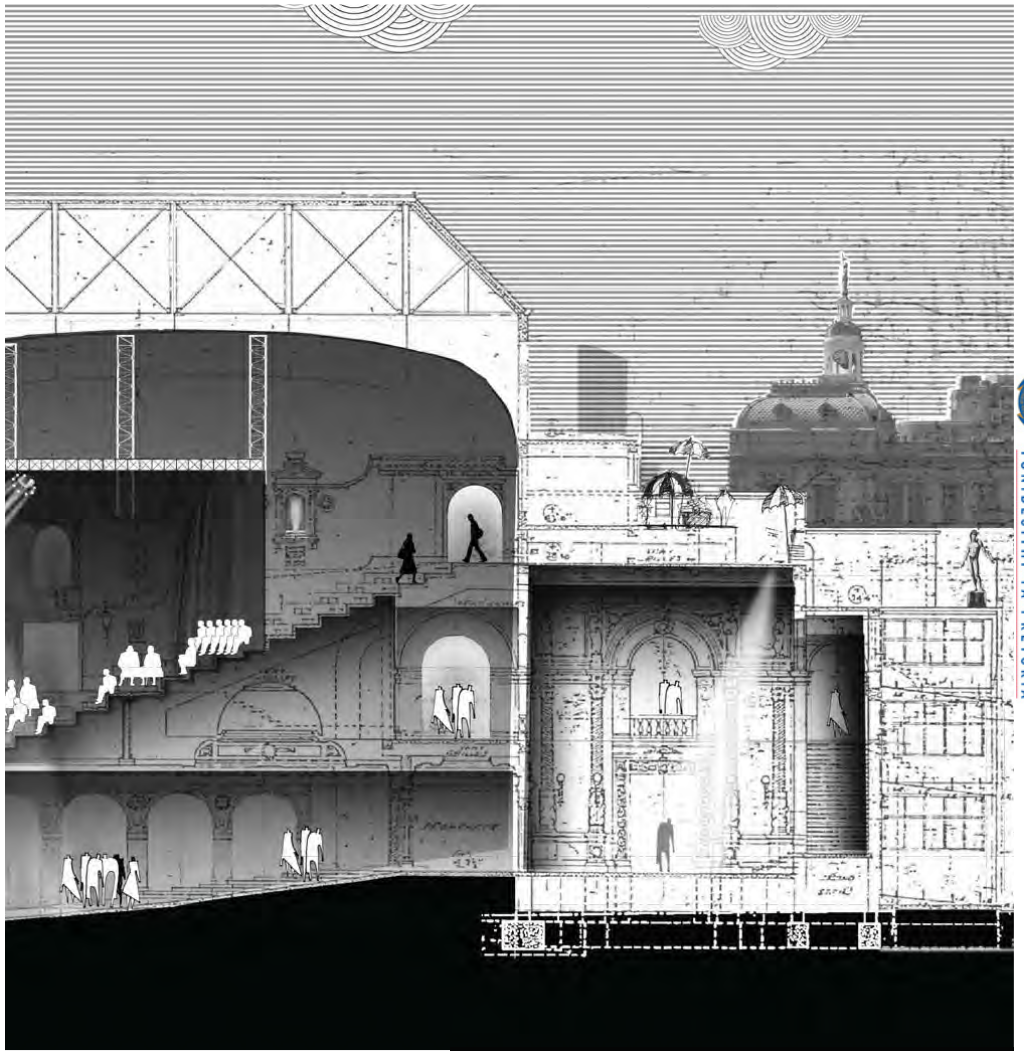
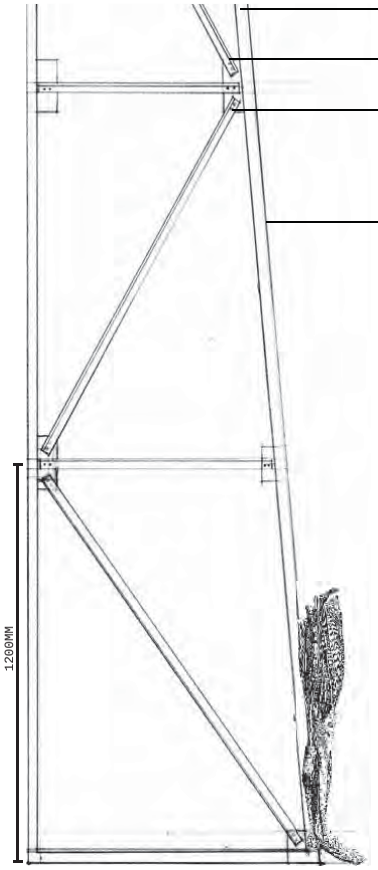


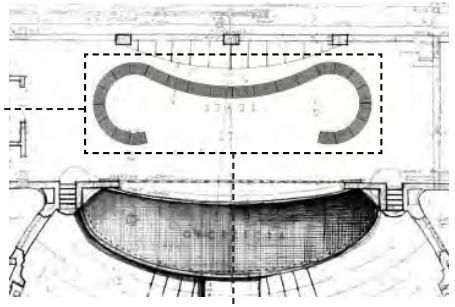
Figure 9.46 Section B-B through auditorium, illustrating ribs, stage and backdrop, use of textile skin, lighting and truss suspended from ribs as well as floor system
extending the skin

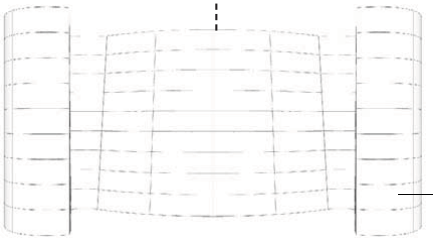
PLAN OF STAGE BACKDROP

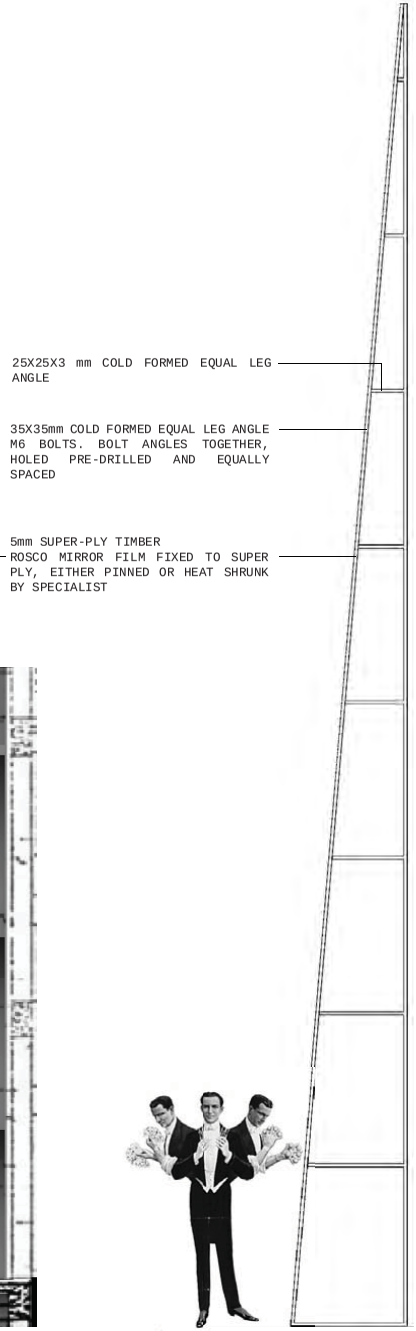


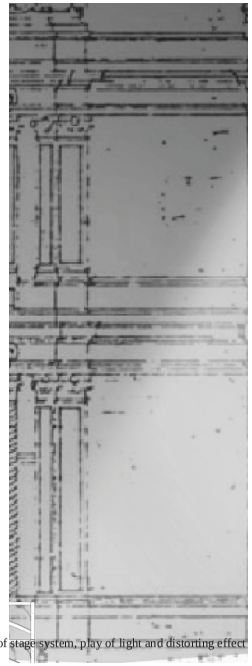
DETAIL J: DETAIL OF TRUSS SYSTEM OF STAGE BACKDROP

Figure 9.47 Detail J: detail of truss system used for stage backdrop









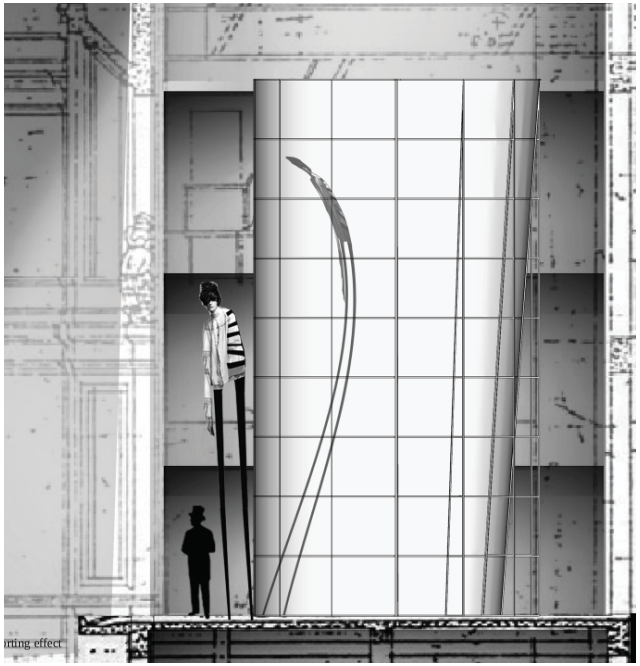


Figure 9.48 Digital collage of elevation of stage system, play of light and distorting effect

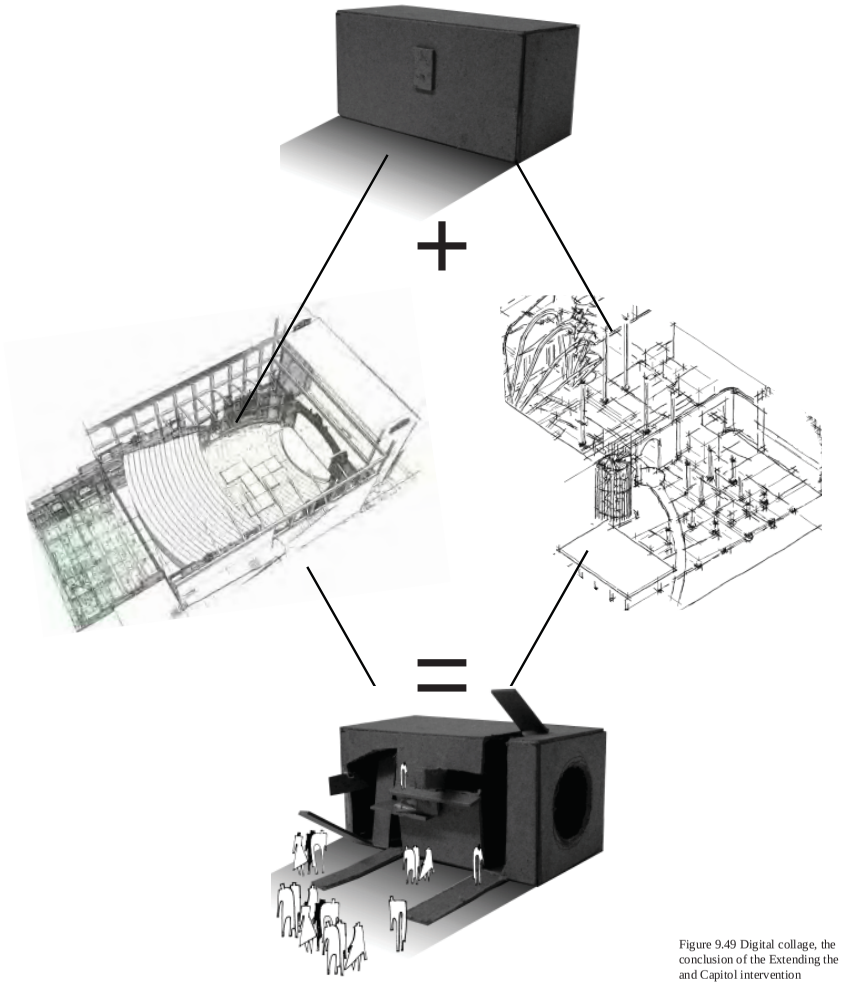


Figure 9.49 Digital collage, the conclusion of the Extending the Skin(s) and Capitol intervention

The only thing that binds me, to the pedestrians, them to each other
And those passing by is the CAPITOL.
which is interpreted by each individual differently,
the people and noise and sounds and shouts.

This tightrope made of feelings open to interpretation.
People becoming a detective of their thoughts.
Remember us is all we ask.
And if remembered be a task forget us.

Remember me is all I ask.
And if remembered be a task forget me.
But in the Capitol we all realise something and remember something,
Whether future, past or present, it does not matter.

Remember the CAPITOL is all I ask.