

7. DESIGN DEVELOPMENT

7.1. Design Proposal

'Connection' is a new interpretation of the safe study environments that the government is implementing throughout South Africa.

'Connection' moves away from being a study environment where learners complete their homework using the text books or notes that are given to them, by their school, to complete the needed requirements.

'Connection' is rather an educational facility that enables learners to further themselves, independently, through a media that is easily related to, as well as being accessible on varying academic levels.

This educational facility allows the learners the opportunity to research, investigate and analyse topics, and their related topics and themes, independently. This empowers the learners to reach the goals they set for themselves, allowing them an opportunity to reach further than just the requirements to be met by the schools.

'Connection' consists of educational components, namely:

- Public Visual Information Centre
- Educational Cinema
- Multifunctional Exhibition area
- Museum

'Connection' will optimize its utilisation through accommodating different groups using its facilities through day and night time activities.

Daytime Use:

Day outings:

The educational facility is designed to accommodate day-outings, where the school children are divided into groups to visit all the surrounding educational facilities within the Cultural Precinct.

The group outings to this area, will benefit the surrounding educational facilities by allowing Newtown to become a day outing destination, visiting all the educational facilities that are in the Precinct, rather than a mere stopover on the way to Gold Reef City and other activities within Johannesburg.

'Connection' is designed for up to a hundred learners to use the facility at a time, 50 involved in group, individual and interacting activates throughout the facility at the same time and 50 in the large auditorium space. The allows the rest of the group to be divided up to visit Sci Bono, The Youth Computer Centre, Museum Africa, Market Theatre and the Dance Workshop.

'Connection' is designed to facilitate the needs of learners in the surrounding schools, during the day, as a study aid.

The school children are welcomed in the gathering area outside, weather depending, and are lead through the facility to the auditorium for a group viewing of the facility's demonstration video.

The librarian, who would have already met with the teachers to discuss the required outcomes and learning topics, will show the class the benefits of educational films and how to benefit the most from them through a demonstration film.

The class will then be split up into varying groups, to study related topics with assistance of staff members.

The children will be required to present their findings back at school.

Afternoon Use:

The afternoons accommodate the learners, using the facility independently after school. The design also accommodates the needs of the students, studying in nearby colleges and universities.

Adults can further themselves by making use of the films based on their required learning topics and the internet facilities in the interactive area. The adult group can also benefit from the facility through basic skills being taught by film, which can be implemented in 'adult classes' in the auditorium space.



separated from the rest of the educational faculty, allowing the learners in the educational facility to be protected.

The Museum and the Multifunctional Exhibition Space allow the facility to have entertainment aspects that form part of the educational facility. These two components draw in interested viewers into the site, and through the continuous change in their film material, it allows for a steady flow of viewers into the facility.

'Connection' consists of Commercial components, namely:

- Café and Bar
- 'Art and Culture Cinema'

The commercial aspect of the facility, the café and bar and the 'Art and Culture Cinema' draw in additional groups of viewers, allowing the site to be vibrant and full of activities. The continuous changing films in the 'Art and Culture cinema' will also allow for a steady flow of visitors to the site.

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7.2. Access to the Site:

7.2.1. Linking the Two Open Public Areas:

The proposed design of the public facility completes the street grid to enable continuity of movement between the Mary Fitzgerald Square and Newtown Park, the two open public facilities within Newtown.

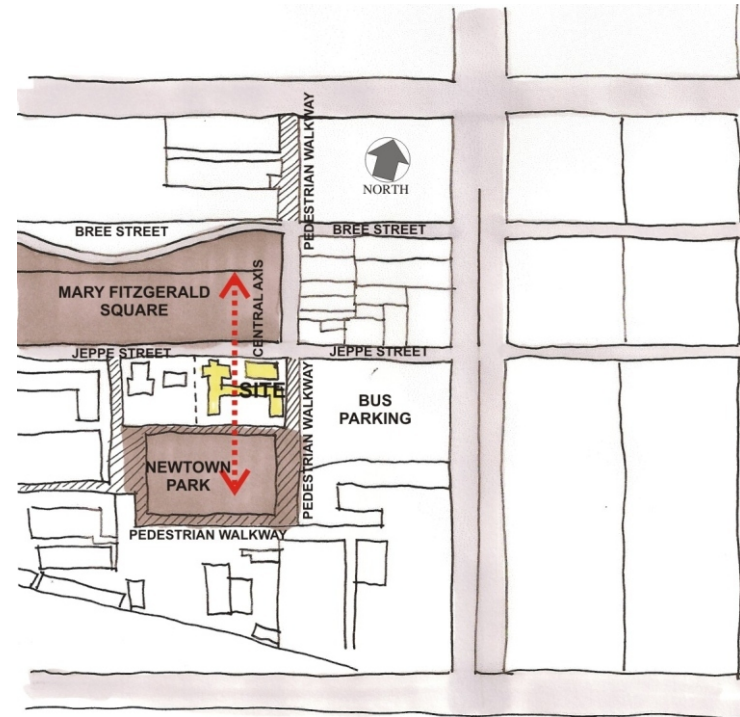
Connecting of the different areas within the site, and the movement of the users physically experiencing these areas, is made possible through a central axis running directly through the site, from the Mary Fitzgerald Square directly through to Newtown Park.

The two artisan houses on the northern side are separated by an ideal entrance way. The gap between the houses is large enough for it to be the main entrance and allows a central axis route thorough to the hostel at the back where the entrance from the quieter side is found.

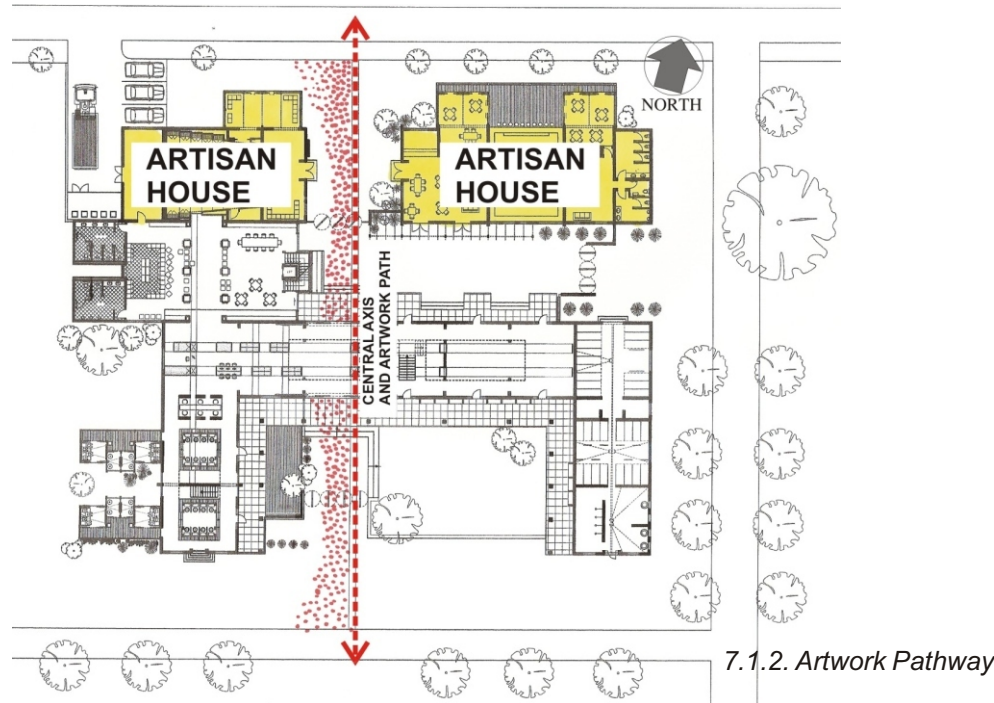
The connectivity of the pathway is emphasized in the design by allowing this central axis to be clear of any obstacles, allowing visitors to see directly through the site from one side to the other.

The openness of this axis allows the public facility to look accessible and open to all.

At night the axis is well lit, so the artistic pathways will still be visible and allow users to see how one enters the facility.



7.1.1. Linkage between the Two Open Facilities



7.2.2. Artwork in the Pathway:

As the site is situated within the heart of the Newtown Cultural Precinct, it is therefore situated within an art and culturally dominated area.

The art found within Newtown, and which defines Newtown, that surrounds the two public facilities, Mary Fitzgerald Square and the Newtown Park, can be seen in a variety of materials ranging from wood to bronze to scrap metal and smaller detailing of mosaic tiling.

The design proposal introduces the art and culture of this area, into the visual information centre, through the inclusion of mosaic artwork in the central pathway running through the site.

The mosaic tiling will be created by local mosaic artists in the Newtown area. The art of Newtown is carried through the mosaic tiling, from the outside of the site into the interior of the site, through the introduction of the vibrant colours and the variety of textures found within Newtown.

At either end the mosaic tiling spreads out, drawing people into the site with this expanded, unordered artwork.

The mosaic pathway captures passerby's attention as they walk over the 'advertisement' for the site, without blocking the pedestrian flow along the busy routes.

7.2.3. The Entrances:

The entrances gates need to draw people's attention to the site and direct them to where they can enter into the site.

There are three entrances into the site. Each entrance is opened at different times during the day and night to allow for the safety of the users of the facility.

The educational facility entrance is open during the day.

The main entrance is open during the day and the evenings

The exhibition entrance is open during the daytime.

The gates are tall, allowing them to be clearly visible, to draw people's attention towards the entrances.

When the gates are open they do not block the view of the interior site or block the view through the open central pathway. People passing by are able to see all activities and movement within the site.

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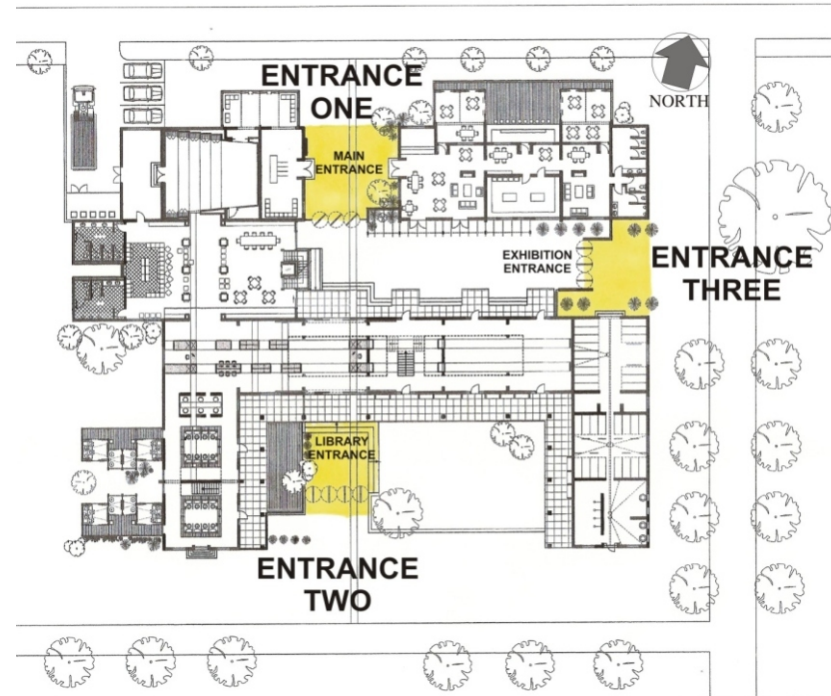
All entrances are marked by large rotating steel light boxes that define the entrances to the site.

The gates are made out of polycarbonate, as this is the material found in the additions to the existing building and needs to be carried through to the entrance, redefining that they are a new addition.

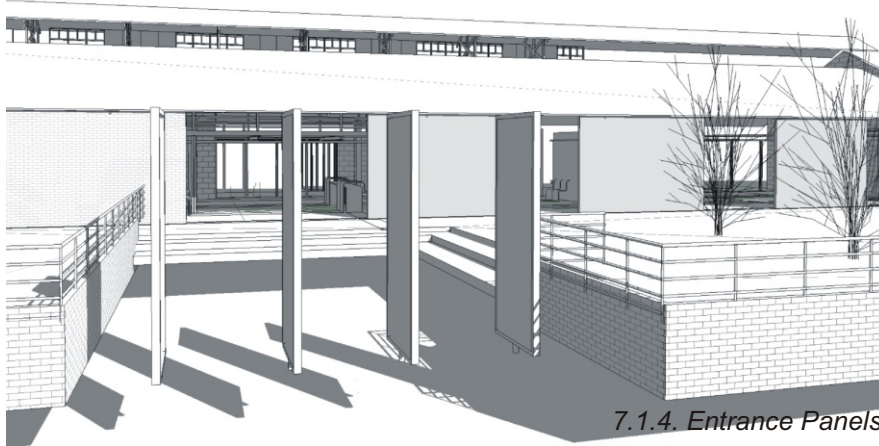
The tall boxes on steel metal tubing rotate to open and close and can be locked to the floor to secure the site at night.

Compact fluorescent lighting is installed into the polycarbonate light boxes with steel framing for the structure. At night the polycarbonate entrance panels glow.

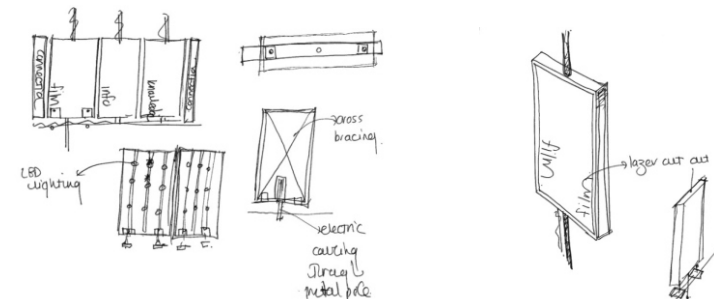
Security guards are positioned at the open gates of the facility to ensure learners protection.



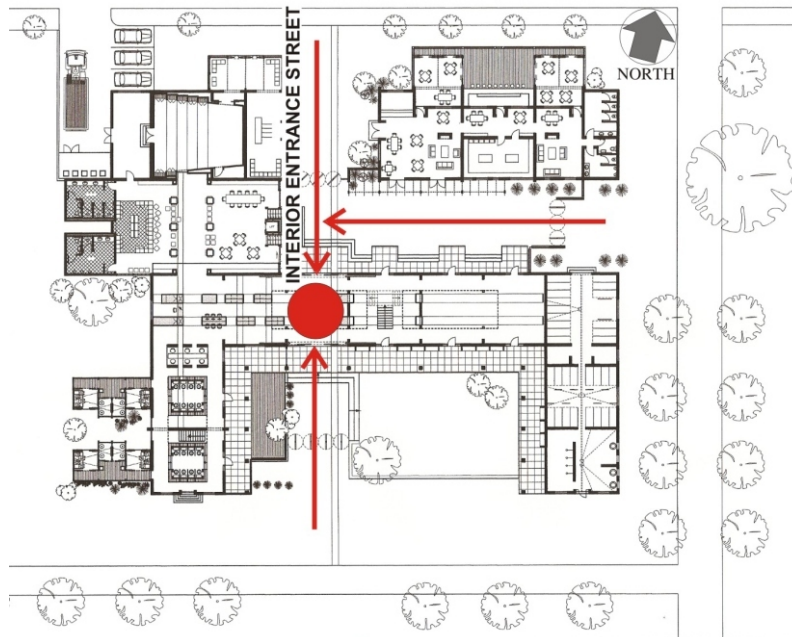
7.1.3. Plan of Three Entrances



7.1.4. Entrance Panels



7.1.5. Concept Sketches of Rotating Panels



7.1.6. Central Point

7.2.4. Central Point within the Site:

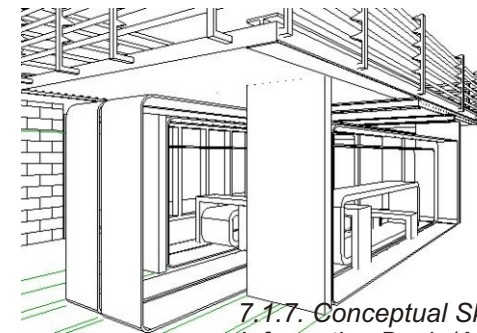
The interior entrance street is the interface between the city and the Public Visual Information Centre.

It is where the visitors come together whether they enter from the northern entrance, the southern pedestrian entrance, or the entrance to the east of the site.

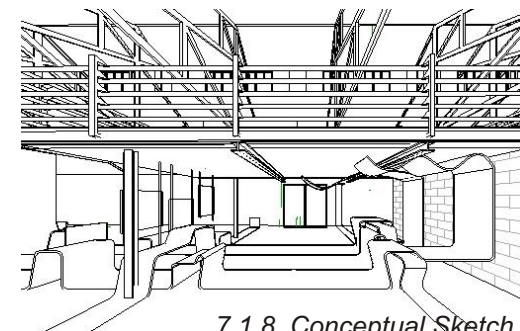
The main interior pathway, which runs perpendicular to the longitudinal axis of the building, leads all visitors to the central point.

The information station acts as a security measure with all users to the education facility having to pass through. The information desk is located at the intersecting points of the pathway with the longitudinal building.

Large frameless, toughened glass sliding doors, which allow the interior space to be linked seamlessly to the outside, open up into the existing Workers Hostel building.



7.1.7. Conceptual Sketch of Information Desk (August '07).



7.1.8. Conceptual Sketch of Information Desk (September '07).

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7.3. Education Component

The design of the educational facility has been influenced by different aspects, allowing it to function as a 'new interpretation' of a public education facility.

Formal and Informal:

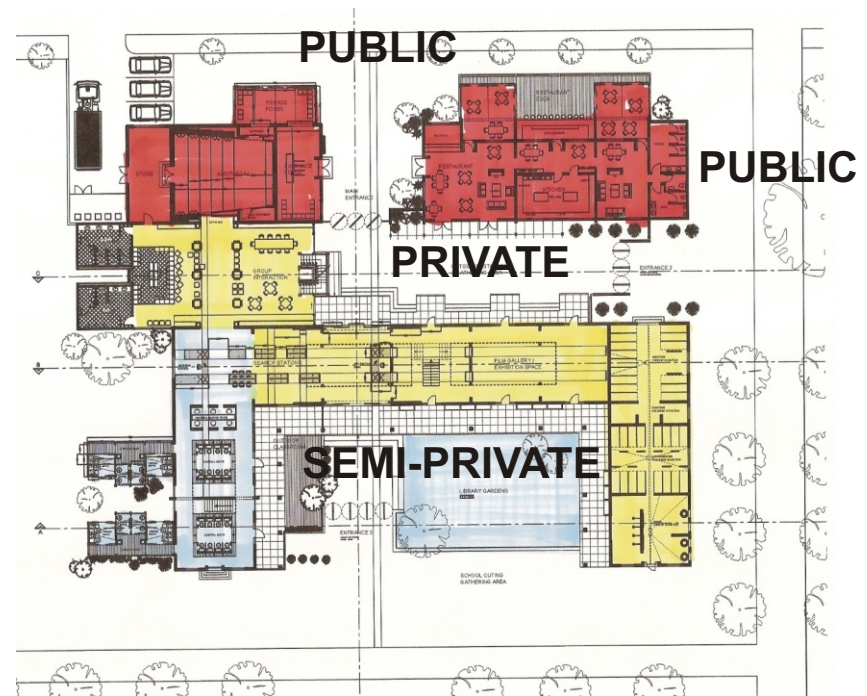
The educational facility is divided up into the more 'formal' and 'informal' spaces.

These formal and informal areas are positioned to relate to the building's surroundings, as can be seen in the intimacy gradient that is evident within the site.

The more formal area is positioned on the quieter side of the site, as it allows for the learners to experience more privacy and a calmer learning environment with less activities being a distraction.

The more informal areas are situated near the busier side of the site and are designed to function within these areas. This is made possible through the incorporation of acoustic design or allowing the area to be an informal group study area, encouraging discussions and interaction with other users.

The Outcomes Based Education System that is the country's national curriculum, emphasize, in the teachers manual, that learners need to learn the skills of :



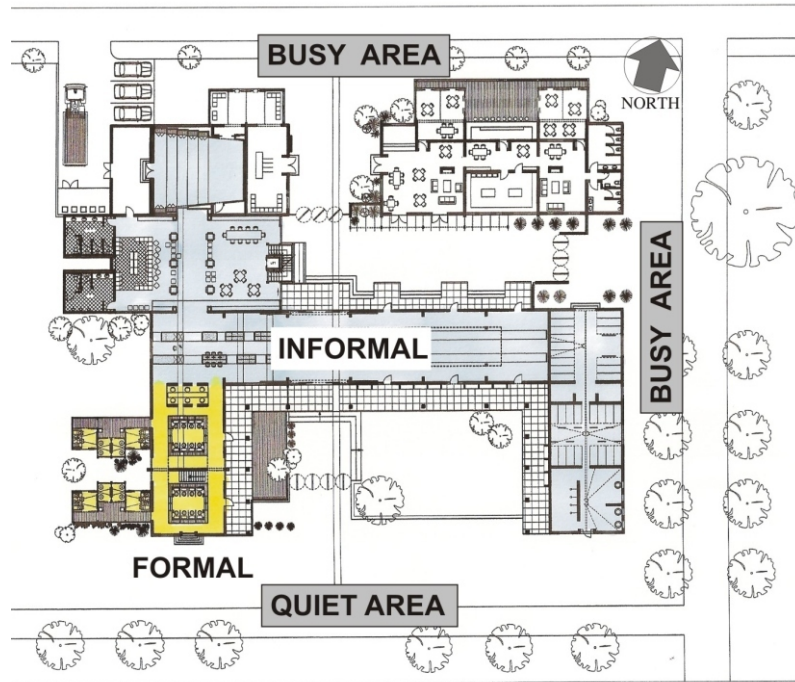
7.19. Plan of Intimacy Gradient

- *'Working effectively with others as members of a team, group, organization and community.'*
- *'Organizing and managing oneself and one's activities responsibly and effectively.'*
- *'Collecting, analyzing, organizing and critically evaluating information.'* (Miller 2001:17)

For the learners to acquire these skills, while learning in the educational facility, as well as in their schools, these points need to be interpreted into the design.

This has been done through the design of spaces for group viewing, group discussions and individual viewing and individual study areas.

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7.20. Plan of Formal and Informal Areas

7.3.1. The Formal Areas:

The formal side is divided up into individual and group viewing stations. The design of these spaces, allows viewers to learn in environments that are not distracting, through the introduction of sound systems that prevents sound from interfering with other learners, and in more enclosed stations.

The formal stations do not encourage discussion as much as the open areas within the facility, as viewers experience the films individually.

The more formal areas of the educational facility are shown in the design of symmetrical, clean lines that are free of clutter allowing the flow through the area to operate in an orderly manner. It is not as

flexible in that, the furniture cannot be rearranged to clutter the space.

The formal spaces within the educational facility are:

- the group viewing station in the additional stations
- the individual viewing stations

7.3.2. The Informal Areas:

The more informal areas are the open group discussion areas, where students are able to discuss learning in a more relaxed environment.

These informal areas are open, creating busy, vibrant spaces that are flexible and can be used for a variety of functions.

The informal spaces within the educational facility are:

- the group interactive area
- the reading areas/ classrooms
- outdoor classrooms
- the museum
- the multi-functional exhibition area

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7.3.3. Group Interactive Area

The group interactive area acts as the more informal area of the educational facility.

This space is divided up between different needed functions of the area i.e. learning area, locker room, toilets and foyer.

The 'connecting' building forms part of the education facility. The building becomes the physical connection between the two buildings on the site.

This building can clearly be seen as an addition through the introduction of the contrasting materials of a steel structure with polycarbonate walling and a concrete roof.

This area is designed to encourage group discussions, with the table layouts being able to be adjusted by the joining and pulling apart of the tables.

Two long countertops, made up of individual tables, ranging in height to accommodate all users, are joined together and run through the space.

These countertops are all fitted with electrical plug points for the use of laptops in the facility, encouraging users to work in this informal learning area. The entire site is a Wi-Fi area.

A few computers belonging to the facility are positioned along this countertop allowing users to access the internet.

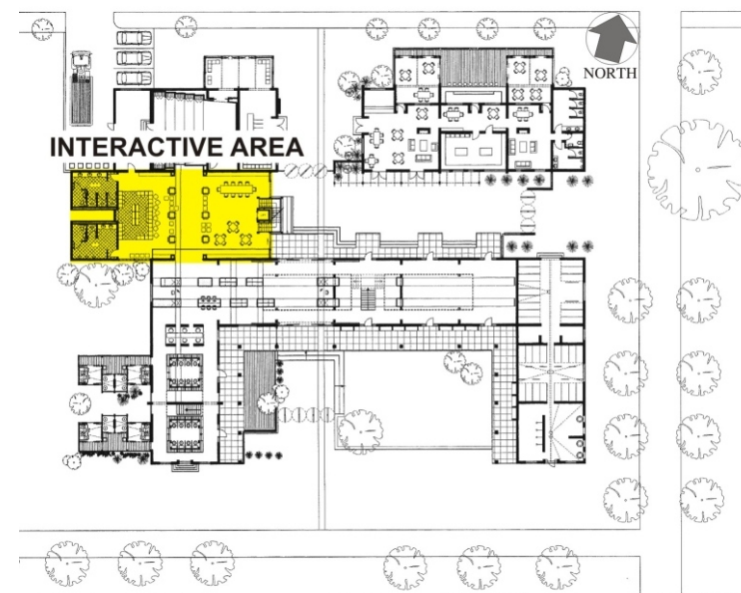
Bookcases are found containing the written summaries of the topics investigated in the films. These written documents can be read within this communal space at the provided tables, or on the stairs that double as seating. These books can be photocopied at the librarian station.

The central space of this additional connecting building doubles as a foyer area for the learners going into the auditorium. This area is adjustable with moveable ottomans allowing it to be a waiting area.

Suspended televisions showing a range of available films are accompanied by sound domes, in the foyer area, allowing the space to be a more relaxed area.

Lockers are available for the users of the facility, preventing the learners from having to carry their school bags around the facility. These lockers are made of timber with PG Bison laminates in bright colours with a metal grid backing and doors, allowing people to see through the lockers and not blocking the space. The librarian has the spare set of keys.

The toilets are situated within this communal area as they are easily accessed from all areas of the educational



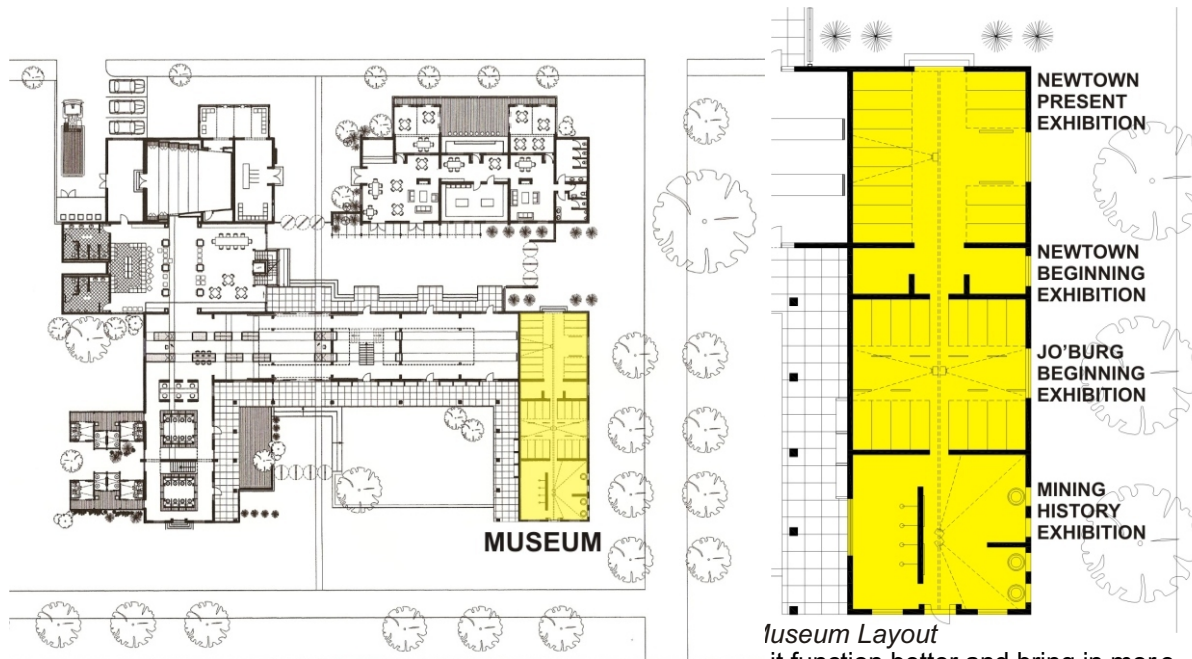
7.21. Interactive Area

facility. Disabled toilets are found in the male and female bathrooms. These toilets are solely used by the learners during the daytime and at night can be used by the users of the entire facility.

The polycarbonate sliding doors are opened at night, allowing the toilets of the facility to be accessed easily from the outside areas and the gallery space.

This building glows at night creating an ambient lighting effect that can be seen from the commercial aspects of the site.

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Museum Layout

7.3.4. The Newtown Mining Museum

The existing museum is situated on the eastern wing of the hostel building.

The museum consists of the living quarters of the migrant workers. These living spaces have been unaltered during the past alterations allowing visitors to the site to see the poor living conditions that the workers were exposed to.

The existing museum is retained in the design proposal, with a few alterations

making it function better and bring in more visitors.

The workers rooms are connected by a central axis route that allows visitors to the museum to flow from room to room.

By continuously changing and bringing in fresh new films and ideas into the museum, a constant flow of users and visitors to the museum will visit the museum on a regular basis.

The short films are projected onto the existing windows that are covered with a adhesive film that allows films to be

projected onto the glass. Films are then visible from both sides, creating interest for the people walking past.

The projectors are positioned centrally along the central axis, suspended from the ceiling, and are in cages, to combat theft.

The doors leading into the Educational Garden will be locked, preventing people from wondering into a protected area, to ensure the learners safety.

The visitors to the museum will be able to view the garden and see the activities taking place within the facility but can only access the facility through the three main entrances into the site.

The museum will be easily accessed from the busy pedestrian route to the east of the building. The museum will be a journey that allows users to walk through the museum and out the other side, instead of just walking along the pathway.

The museum is not a place where one spends a couple of hours but is rather a quick journey through a space, where Johannesburg's history is quickly depicted through short films. The museum is a place that is visited when one is hanging around Newton and has a couple of minutes to spare.

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The museum allows visitors to climb onto the existing mezzanine levels, sit and view films on the existing concrete beds of the miners, allowing visitors to become a part of the museum, viewing it on a much more interactive level than other museums.

The museum will be opening during the day and partly through the evening, when the museum will be well lit, with security guards patrolling the area, ensuring the visitors safety.

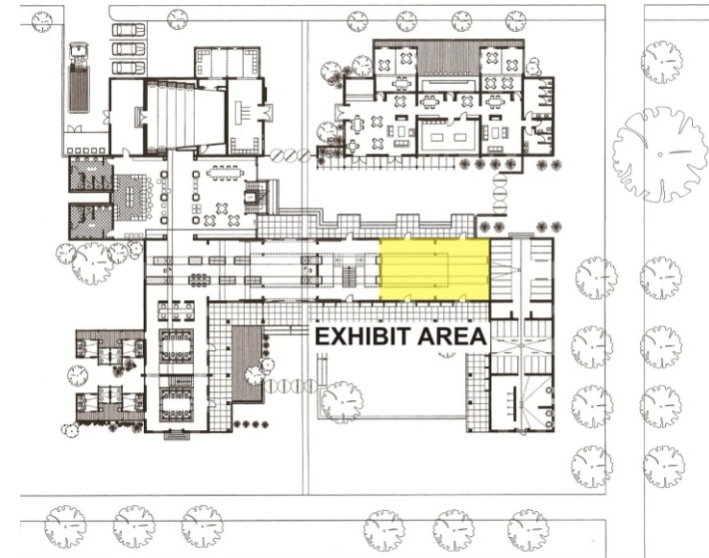
Each room deals with a part of the history relating to the mining industry in Johannesburg and Newtown.

The last room in the museum will depict Newtown in the present day. It will depict upcoming events, opening and closing times for the surrounding facilities in Newtown, what is showing at the Market theatre etc.

7.3.5. Multi-functional Exhibition Area:

The exhibition space is situated to the eastern side of the central area in the existing hostel, with its main access being via the reception area.

The exhibition area is an adjustable space that allows films of local individual's to be viewed by the public.



7.24. Multi-functional Exhibition Area

The exhibition area becomes a facility that allows all film director's, students or professionals, work to be seen. It becomes a platform for all aspiring film makers to reach new standards in South African film making.

The adjustable space is made up of sliding polycarbonate panels, on the Henderson Sliding Gear System, that allows the space to be opened up or closed depending on which films are being viewed and the numbers of film makers in the exhibition.

Suspended projectors, and adjustable lighting, are positioned centrally along the axis of the space. The films that are projected onto the polycarbonate can be viewed from both sides of the polycarbonate allowing them to be viewed from inside and outside, acting as a great advertisement encouraging all passersby to come into the space.

Sound domes are introduced into the exhibition space, allowing viewers to watch a film without being disrupted by other viewers.

Ottoman chairs can be adjusted to suit the individual exhibitions and allow the gallery to adapt with ease.

The exhibition area can be opened up and chairs brought in to allow the director to introduce and discuss the film being viewed. A stage with a portable lectern is included in the design.

The 'Ribbon' element is carried into the exhibition area by flowing onto the roof, forming the adjustable lighting, and onto the floor, forming stripes leading to the television display.

The 'Ribbon' ends, against the furthest wall, in the open area next to the mezzanine level, with it curling up acting as the support for the hanging television screens.

These televisions display past exhibitions held in the gallery, as well as showing forthcoming exhibitions. The information displayed allows viewers to obtain a more detailed knowledge of the specific film maker whose films are being exhibited.

The exhibition is positioned underneath the existing mezzanine level allowing the direct light from the clerestory windows to be blocked.

The mezzanine level allows the 'gallery' manager's and assistant's office to be positioned directly on top of the area,

allowing them to oversee all exhibitions and control the space with ease.

These open facilities have natural light pouring in through the clerestory windows above.

The exhibition space opens up into the internal courtyard, through the inclusion of doors in the hostel where windows used to be positioned. The exhibition space needs to open up and welcome people using the Café and Bar.

During the daytime the doors leading onto the Private Education Gardens are locked, keeping the garden purely for the learners and allowing for a safe, relaxing space.

During the evenings the doors are unlocked, allowing the gallery viewers to spread out into the garden. Clear views into the garden are, however, maintained during the day.

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7.4. COMMERCIAL COMPONENT:

The commercial facilities within the design need to be linked to the overall function of the site, which is primarily an educational facility.

The design needs to link the commercial with the educational facility physically, as well as linking them so their functions can feed off each other and encourage more visitors to the site.

The commercial aspects will be for the benefit of the public learners during the day time use of the site, and then for the commercial aspect during the evenings, allowing optimal utilization of the site.

The commercial facilities are positioned on the busier side of the site, i.e. the northern side, as these are the main vehicular and traffic movement areas around the site, thus creating interest and drawing people into the site.

The commercial spaces on the site are:

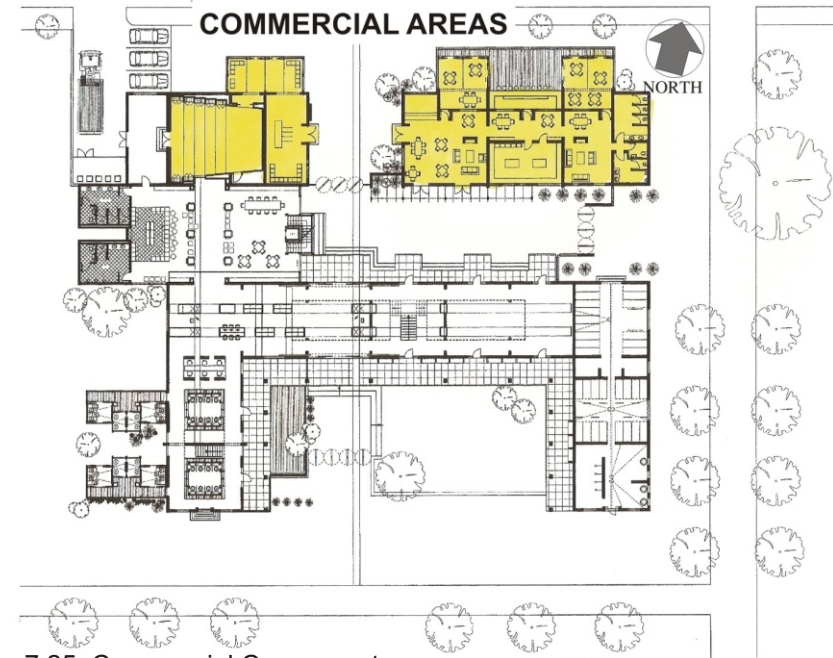
- the cinema
- the café

7.4.1. The 'Art and Culture' Cinema

The auditorium space is designed so it can be used independently as an 'Art and Culture' cinema or from part of the educational facility, allowing optimal utilization of the space.

The 50 seater auditorium is situated within the existing Manager's house facing onto Mary Fitzgerald Square and will be entered into from the main entrance in the evenings, adjacent to the café.

The foyer of the space is positioned in-between the two existing bedroom walls of the Manager's house. A ticket station is centrally positioned with a central entrance being knocked into the existing wall which is closed on the eastern side of the house.



7.25. Commercial Components

This entrance to the cinema will only be open at night, with it being closed for the protection of the learners during the daytime.

The toilets in the educational facility will be accessed by the users of the cinema at night.

Art and Culture Films:

Art and culture films will be shown as opposed to the box-office commercial films shown in regular cinemas.



7.26. Cinema Layout

The position of the site, in the heart of the Newtown Cultural Precinct, is an ideal location for art and culture films.

'Third world countries rely too heavily on western entertainment sources. The impact of TV programme is destroying the local film and TV industries. The structure of westernised films is very stylised 'problem following solution'. (Hadland 2006:45).

'Art and Culture' films viewed from the auditorium will include community films. These films provide a substantial level of

interactivity. It allows local people to be trained using video to document their lives and their problems.

Digital technologies are also lowering the barriers of entry for video producers, enabling people to produce material at a good level of technical quality at the beginning of the production- transmission chain.

The 'third cinema' is committed to political and cultural liberation of film which is what will be viewed in the auditorium.

Monthly themes will dictate the films to be viewed, allowing a variety of topics to suit everyone's preferences.

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7.4.2. The Café and Bar

The cafe is positioned on the northern side of the site, facing onto the Mary Fitzgerald Square. It is positioned within the artisan houses that are combined to form a single rectangular building.

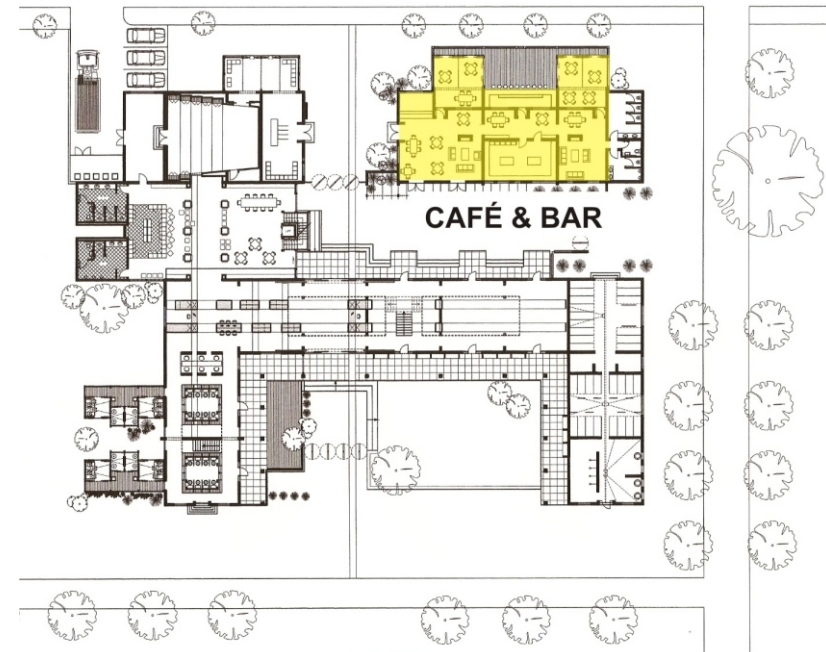
The artisan houses are ideally positioned looking onto the square, allowing the cafe to be clearly visible by all people using the Mary Fitzgerald Square.

The Cafe is positioned along a main pedestrian route and a vehicular route so will get the needed attention.

Each of the three houses that are joined to form one building are made up of small, intimate rooms that flow directly from a central space. There are no narrow passages but rather open spaces connected. The functions were able to fit easily into the existing buildings.

The artisan houses are small and the interior walls will have to be opened up to allow a bigger room that can function as a café.

Circulation needed to be introduced through the buildings to connect all three internally. This is easily done due to the fact the buildings were mirror images and all symmetrical, meaning that all their walls lined up perfectly, making the route through easy.



The small intimate spaces create a warm, homely feel, which is ideal for the restaurant to create a feel as if you are eating at home.

The three houses are divided up ideally to suit the needed requirements of the restaurant. The kitchen and bar area fill up one of the houses. Two additions of steel structure, polycarbonate walling are found on the front façade. These additional rooms of the restaurant show that a new function takes place within these existing houses.

The tables within the restaurant are equipped with electric plugs allowing the customers to work on their laptops in the restaurant which is a Wi-Fi hotspot. Some computers are positioned within the restaurant which is available to the customers to connect to the internet while in the restaurant.

The polycarbonate additions allow the people outside to see the activities in the building.

The existing building is visible through the polycarbonate.

7.29. Café and Bar

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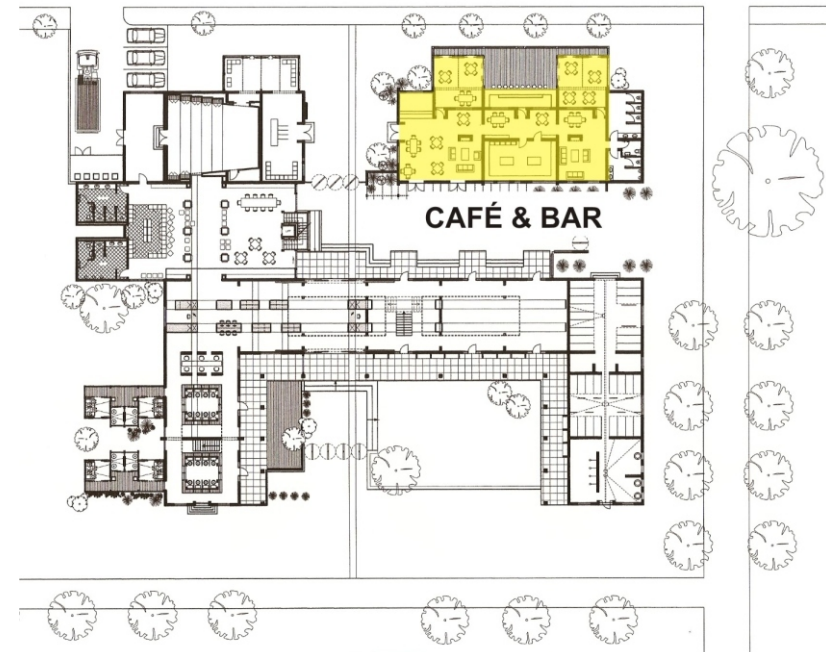
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7.4.3. Look out Tower:

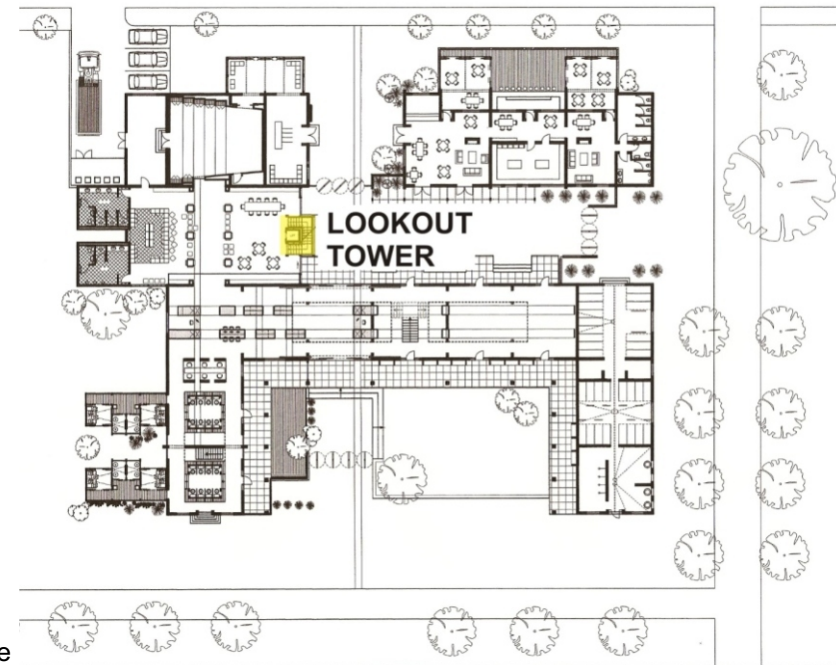
The lookout tower is centrally positioned within the site. It rises above the existing buildings on the site allowing it to be visible from the highway and the surrounding areas within Newtown.

The lookout tower allows a new function on the site to be visible. It acts as an advertisement to the sponsors of the equipment in the facility. The advertisement can be seen by many passersby and many people from the highway.

The tower consists of a lift and stair case that winds up three levels to a look out perch, where one can view Newtown.

The tower is made of steel and polycarbonate walling, which acts as the screen for the outdoor projection, which will draw a lot of attention from passersby. At night the tower is lit up, allowing it to be visible throughout Newtown and becoming a feature within the precinct.

The lift and staircase leads users vertically up to the open concrete roof of the 'connection' building. This open area can be rented out by companies for functions on the opened aired roof in Newtown.



This area can be used by the the facility during the day to get some fresh air in a safe area.

This corrugated iron wall is comprised of sleeping rooms. It is punctuated by public facilities, the church the latrines, a gateway to the hospital court and the detention building. Large areas of enclosure are screened by a wire ceiling intended to prevent inmates from throwing diamonds to

the gate, make enclosure and isolation total.

A look out tower was used to allow a view of all uncovered space, where the cooking was done, open fires, and where people ate their meals outside. The outside was the circulation space for all activities.

8. TECHNICAL DEVELOPMENT

8.1 Technical Design

A meeting was held with Technical Consultants from Omega, in August 2007, to discuss the technical aspects of the design.

The whole educational facility will be run from a Main Computer Server that will be positioned at the librarian station. 25 VGA computer feeds will link the screens within the facility.

The librarian will have to load the chosen film into the system at her desk, allowing the librarian to have control over what is watched by the learners.

The learners will be directed to a viewing station where the film will be ready when they arrive.

An automated lighting system will control the central lighting.

Group Viewing Stations:

The learners will have Windows Based Remote Control Panels in the individual viewing stations allowing the volume, lighting dimmer and play, pause stop etc. to be controlled by the user.

The projector screen is to be positioned 1500mm off the ground at eye level of viewer.

The group viewing stations have a ceiling mounted projector system situated above the last viewer in the room.

The projector screens size is calculated through the 3:4:5 ratios. The 1000 (w) x 600 (h) projector screen, found in the group viewing booths are in fixed frames.

Individual Viewing Stations:

32 inch LCD screens are positioned at 1500 mm height at eye level of viewer.

An audio feed is connected to the screen with a jack that connects the sound dome to the feed.

The Auditorium:

A fixed lectern with a laptop fixed remote will be positioned in the front of the auditorium.

Two separate lighting systems will be positioned in the auditorium. One positioned in the front, near the speaker and the rest spread throughout the seating area.

A ceiling mounted projector system is centrally situated in the auditorium. This can run a computer service, a video, DSTV or the laptop.

8.2. Acoustic Design:

A meeting was held with Ivan Lynn, an acoustic specialist from Pro-Acoustic

Consortium in September 2007, to discuss the acoustic requirements of the design.

In preventing noise from entering or escaping the auditorium a double wall with a 100mm void is built into the existing building.

This prevents the sound waves from travelling out of the room and affecting the other function within the site. It also blocks out unwanted sound from the busy surrounding areas from entering into the auditorium and disturbing the users.

The walls are slanted at a 5 degree angle which is the best angle for the acoustic purposes. The symmetry of the auditorium is an important feature in acoustic design.

Acoustic wall paneling covers the brick walls inside the auditorium. These panels are made up of fibre wool that is covered with a perforated stretch fabric, onto which images are printed by Alyos Technology - an advanced ceiling and wall system, which print on a stretchable high-tech fabric that is imported from Germany. The entry system is only 10mm thick.

Carpeted floors within the auditorium are used with solid flooring underneath preventing the lower frequency sound waves from traveling through the flooring.

Windows allow sound to escape, as well as allowing light into the space so an A/C unit is to be installed for ventilation.

A projector is suspended from the ceiling, projecting onto the projector screen positioned in the front, at a height of 1500mm from ground level.

A projection room to the south of the auditorium allows the laptop and needed equipment, to be stored in a safe, lockable room.

The sound system in the auditorium is the 5.1 surround sound that consists of one speaker behind the projector screen, one to the left and one to the right of the projector screen, one in the back left corner of the room and one to the back right.

A sound room is positioned at the commercial entrance to the auditorium, preventing the unwanted noise from directly entering into the room when the acoustic doors are opened, while the film is running

8.3. Makrolon Polycarbonate Sheeting:

The 10mm thick Multiwall polycarbonate glazing system was chosen due to its many properties.

The properties that were needed for the design were:

- a material that is lightweight
- a material that is translucent
- a material that is stronger than glass
- a material that has some form of insulation properties
- a material that is easy to install with minimal impact on the heritage site
- a material that can handle outdoor conditions.
- A material that can be placed next to electrical sockets, televisions, lighting etc.

'The multiwall polycarbonate glazing systems create diffused daylight, minimizes glare and heat gain for vertical walls in exterior and interior applications.' (Cabot Corp: 2006:1)

'The high performance polycarbonates are easily cold-formed and weigh one-sixth as much as glass, yet provide 200 times the impact strength, enabling architects to work with wider spans, lighter supports and unparalleled design flexibility in thickness, texture, colour and framing.' (Cabot Corp. 2006:2)

- Multiwall polycarbonate – ie. Makrolon Excellent resistance to breakage over a broad range of temperatures

- Its excellent impact strength and resistance to breakage are exploited for glazing wherever people and property have to be protected from injury and damage.
- Good weather resistance with a the Special Makrolon® UV-absorber concentrates can be co-extruded during the sheet extrusion process to enhance weatherability
- Freedom in design Makrolon® sheet offers a high level of freedom in design on account of its suitability for hot and cold forming.
- **Low inherent weight** Makrolon® sheet is used, among other things, for glazing on lightweight.
- **UV Protection.** Makrolon® Multiwall prevents the transmission of more than 99.9% of harmful UV radiation measured to the standard ISO 9050:2003.
- **Wind Load.** Makrolon® Multiwall is suitable for use in high wind load areas, and is tested to wind code AS/NZS 1170.2/2002.
- **Fire Performance** Makrolon® Multiwall is suitable for use in bushfire prone areas with CSIRO appraisal. It's also self extinguishing, stopping the spread of flames and has excellent fire resistant properties.

8. TECHNICAL DEVELOPMENT

Information regarding the installation requirements and instructions of the multi-wall system is found in the appendix

8.4. The Baseline Document:

The baseline document serves as a guide for design decisions and technical decisions. It allows for resolutions by prioritizing certain qualities of the design.

The design is based on the following criteria, set up with regards to the context of the project and a sustainable approach according to Jeremy Gibbert's Sustainable Building Assessment Tool (SBAT).

Different layers of the building are used to perform the needed functions of:

- 1) Social criteria
- 2) Environmental criteria
- 3) Economic criteria

8.4.1. Social Criteria:

Occupant Comfort

Human productivity varies according to the conditions in the person's immediate environment. As this is an educational facility learner's comfort is of great importance. Therefore, the more comfortable the learner, the more productive they will be, allowing the centre, therefore, to be more of a success.

Noise

There are two types of noise that affect the occupants:

- 1) Unwanted sound - annoyance with loud noise.
- 2) The sound that is generated from within the building itself.

The different facilities within the building, depending on their functions, have been positioned with the noise level and the required privacy being considered. The intimacy gradient ranges from the noisy busy side of the site, Mary Fitzgerald Square, and the quiet more private side, Newtown Park.

The noise from the Mary Fitzgerald Square façade, i.e. unwanted sound, will have to be dealt with, to allow for the facilities near that area to operate efficiently without the noise affecting their functionality.

The centre must provide efficient learning areas where the learners can concentrate but at the same time not be isolated and form part of the facilities activities.

This must be achieved, according to their position, acoustically through the introduction of sound domes and earphones. The auditorium will be designed with the necessary acoustic requirements needed in acoustic design.

Thermal Comfort

The Centres' temperature must be comfortable for the users. It is found that thermal comfort should be between 22 degrees and 24 degrees Celsius.

In order to reach the required temperatures passive design will be introduced whenever possible within the design.

Ventilation:

The design allows the learners to adapt their spaces according to their individual needs. Sliding panels allow the user to control the amount of air flowing through their booths. The booths are designed to face onto open land surrounding the building so learners can adjust their booths to accommodate as much nature into their space as needed.

Openings found throughout the existing building allow for cross ventilation to occur throughout the building. This can be adjusted according to the weather.

Mechanical ventilation will be required in certain areas of the building as the auditorium cannot have the light or the sound from outdoors pouring in. Due to the needs of all the televisions and associated equipment, mechanical ventilation may be required.

Inclusive Design

The building should be accessible and comfortable to all users ranging from the elderly, to the youth or disabled, at all times of the day and night. The Centre will adhere to the regulations found in SABS 0246.

Changes in Levels:

According to the SABS 0246, ramps must have 1:12 fall. Balustrades must be on both sides of the ramp. Lifts must be used where ever needed.

Non-slip material must cover the ramp floor. The changes in level will be visible through the omission of patterned flooring that is found in the entrance axis. Inside the building the different floor levels will be made visible through changes in colour of the flooring material for the sight impaired users.

Balustrades will be used to indicate changes in direction.

Openings:

The SABS 0246 states that the minimum clearing opening of all doorways for use of disabled individuals is 750mm. These measurements will be used in the facility.

Toilets:

Disabled toilets in the existing buildings alteration of 1996 will be torn down to return the buildings grass courtyard to resemble it's original state. The required disabled toilets will therefore be positioned with the other toilets within the facility, to avoid discrimination. In the restaurant it is a unisex disabled toilet, and in the education facility one is found in each bathroom.

Counters:

Counters throughout the education facility are positioned at different heights meeting the needs of children to adults, and the disabled.

The ribbon countertops flow from one height to the next so there will be a search station to suite everyone's needs.

Both group and individual viewing booths will accommodate the needs of wheelchair users.

Counter tops will be made adjustable in the viewing booths so that they can be lowered or raised to suite all users.

Signage:

The signage throughout the Centre needs to be clearly readable for sight impaired users. The signage also needs to be understandable, by all users, regardless of language.

Lighting needs to be incorporated into the design allowing it to be more visible.

Safety and Fire Protection: Security Guards

Many security guards are found throughout Newtown, either on foot or on motor bikes monitoring the main pedestrian routes. Although Newtown is regarded as being one of the safest areas within Johannesburg, learners needs to feel safe while walking to, being inside and leaving

the facility in order for it have optimal utilisation in the day and night.

Security guards need to be situated at all entrances to the facility, twenty four hours a day-everyday including watching the pathways linking the parking to the facility.

Children will be using the facility mostly, therefore the children's safety is very important to this facility. Children, and their parents, need to feel safe at all times.

Seeing that the centre will be utilised at nighttime as well, the users must be protected along the pathway from the facility to their destination. Lighting leading from the centre to the main gathering points around Newtown will aid the users and will be included into the design.

The quieter spaces in and around the facility must be overlooked by the more crowded spaces in order for the learners to feel secure. There must also be a clear visual link between the spaces for the learners' protection.

Transparency within the booths allows the viewers to be seen by all.

Doors and windows throughout the facility must be able to be locked properly to protect to the equipment that is housed inside.

8. TECHNICAL DEVELOPMENT

Timber shutters found in the facility allow users to open the polycarbonate sheeting up to get natural ventilation but still maintaining a safe environment without them being completely exposed. The use of multiwall polycarbonate is used as it is more difficult to break through compared to the single polycarbonate sheeting.

Fee

A system needs to be implemented whereby only learners interested in the upliftment of their education use this facility.

By forcing the learner to keep and regularly update a performance record, completed by themselves, their parents/ guardians/ teacher and the staff then the facility will be able to keep an eye on learners' progress.

Fire Equipment:

Fire equipment needs to be clearly signed according to SABS 1186. Fire hose reels need to be installed with accordance to SABS 543.

Fire escape doors need to open in the direction of the escape routes and must be at least 800mm wide. No travel distance to the exit must be more than 45m.

The emergency exits need to have artificial lighting. The public part of the building must have a fire detection system.

Natural Lighting

The use of natural lighting will be used wherever possible throughout the facility be it with direct or diffused lighting.

This will be encouraged through the use of the already existing clerestory windows.

Natural light will be entered into the building to allow learners the feeling of learning in nature as apposed to being in an isolated box.

A limited amount of natural lighting can be in a room with projection screens due to the latest technology screens that are available.

Access to the Facility

The facility is close to many educational facilities and in walking distance of all of them within Newtown. Pedestrian movements are therefore encouraged to the facility and around Newtown as a whole.

Newtown is easily accessed from the N1 connecting it to all areas of inner Johannesburg as well as surrounding areas for vehicular access. The facility is close to the Metro Mall which allows access to minibuses and buses.

Communication

The facility concentrates mainly on the media film, although computers are positioned within certain parts of the

facility, allowing film to be viewed on them, or the users to gain access to the internet.

The entire centre will be a wi- fi hotspot, including the restaurant. Power connections will be positioned into the countertops found in the communal areas of the facility encouraging users to bring their own laptops and work from the facility.

Views and Access to Green Spaces

The buildings in the facility must be connected to the outside and not be a facility that functions independently in an isolated box.

Viewing booths are connected to the outside open areas through the use of sliding panels of translucent polycarbonate sheeting. The users are able to open up the booths completely or leave the wooden shuttering closed to block out unwanted light or feel more protected. Trees planted next to the booths also provide a protection against the weather conditions.

Circulation areas will have an access to views of the outside through existing windows and additional glass panels that have been incorporated to allow a view through the building.

Learners have access to the green spaces of the library gardens that are adjacent to the education facility. This garden is protected from the commercial side of the

facility and is used only by the users of the education facility so it is a protected garden for the learners to have a break from the screens or eat their lunch, or have an outdoor classroom lesson under the trees within the garden.

At night the gallery will unlock the doors and the viewers of the gallery can spill out into the library garden but during the daytime the gallery access doors are locked and the only access to the garden and from the garden is through the main access doors past the reception desk.

The interior courtyard that is positioned on the commercial side of the site is open to the restaurant users and at night to the outdoor cinema viewers.

Tree-lined streets will allow for cool comfortable pedestrian routes with sufficient rest areas along the route to and from the facility.

8.4.2. Environmental Criteria:

Energy

There are five main design factors that influence the energy consumption in a building:

- Function
- Climate
- Occupancy
- Design
- Services

In the facility, users will have reasonable control over their environmental conditions by including sliding doors and louvers to adjust the internal climate of the buildings to reach certain comfort levels.

A media centre is not a sustainable building due to the vast amounts of energy used. All the equipment uses large amounts of valuable energy to operate. The air conditioner system needs to cool down the equipment and this contributes to energy usage.

Lighting

Daylight conditions are determined by the latitude, the time of the year, the air pollution levels, humidity, landscaping and the nearby buildings.

As the facility will be operating at night artificial lighting will be required. The choice of lamps needs to be considered according to what lighting type is best for learning. Glare must be avoided on the computer or television screens.

Lights that have a long life span minimise the cost and maintenance of the facility and use less energy; therefore, they will be used wherever possible. These artificial lamps must be low energy lamps.

Passive Ventilation

Passive systems work with nature and not against it.

Passive ventilation will decrease the energy use of the facility and will be used wherever possible by allowing the cooling down of a building to be done through natural cross-ventilation.

Airconditioners, however, will be needed to cool down the equipment in the facility. The need for air conditioners throughout the entire building will be minimised by reducing the east and west facing windows.

Cooking

By bringing in already prepared meals, i.e. meals that are prepared off site, the coffee shop will reduce the use of energy. Refrigerators and 'heating up equipment' will however still be needed.

Waste Management and Deliveries

Waste that is generated from the coffee shop needs to be sorted. Organic waste needs to be sold or donated to a farmer. The collection from the site will be funded by the farmer in return for the waste sold free of charge. Glass, paper and tin needs to be sorted and recycled.

The delivery area will be in the parking lot right next to the facility. The delivery area needs to be clearly sign posted so as not to disturb the facility. The driveway must not be obstructed by sign boards or cars etc.

8. TECHNICAL DEVELOPMENT

Recycling and Reuse of Materials

The buildings ecological footprint can be reduced by making use of recyclable materials. Materials will be chosen that can be reused or recycled and have low embodied energy

The facility will be occupying an already existing structure that will be altered only where necessary thereby reducing the amount of energy that would be wasted if the structure were to be pulled down and reconstructed.

All additions to the building are able to be easily pulled down without having an impact on the existing building.

Different layers

The facility will be made up of different 'skins' in the building from the exterior skin through to the amenities. All these 'layers' need to be replaced at different time periods as some have a longer life span than others.

The facility needs to be designed so these layers can easily be accessed and either fixed or replaced without having too much of an effect on the other layers. Through the separation of these layers large amounts of energy and materials will be saved.

Transportation

Newtown is aimed at being a pedestrianised area. The facility is in

walking distance of the public transport facilities found in the Metro Mall. Users walking on the main roads that surround the Centre will be able to catch minibuses.

A minibus will be owned by the facility which will be sponsored by one of the educational companies. The minibus will ensure the safe collection and drop-off of some of the children using the facility.

At specific times throughout the day and evening the minibus will transport the learners to specific main nodes in the surrounding areas.

Insulation

The existing structure does not have insulation therefore it is uncomfortable to use at certain times throughout the year. Insulation reduces the heat gain and the heat loss in a building. Insulation will be installed in the building.

8.4.3. Economic Criteria:

Local Economy

Local Materials

The use of scarce materials will not be used in the construction of the facility's additions. The materials that will be used in the alteration of the structure will be low embodied energy materials that are produced or supplied locally. This supports the local economy.

Local labour

Local labour must be used for construction, shop-fitting and product manufacturing as much as possible. However, by training locals for the construction of the facility the project can become expensive due to the amount of time that is lost on the actual training and must be weighed up to see whether it is a feasible option.

Employment and training of local workers for catering and the maintenance of the facility will be encouraged wherever possible.

Newtown is known to exhibit the artworks of many local artists with them being commissioned to advertise major events within the area. Local film makers works will be viewed within the facility in the gallery.

This will lead to an awareness of the local industries high standards and skills in the film industry as well as showing South Africa's forward thinking ideas in education. All this will benefit the local economy.

Film premiers of local directors will be screened within the facility so it will act as a platform for the directors to be noticed.

Locally produced educational films will be supported in the education facility and will be available to all learners interested.

Adaptability and Flexibility:

By the building being designed to accommodate change the facility will support sustainability.

By reoccupying an already existing building the new function is able to expand the life span of the structure which reduces energy costs.

Furniture and fittings in the facility must be adaptable to suite a range of functions and users. Tables and chairs must be able to be rearranged by the users, if needed, allowing the rooms to become multifunctional.

Outdoor gathering spaces must be able to be adapted into an outdoor classroom or a function other than relaxation.

Life Span of the Building

Large investments by a variety of private bodies into the facility will be made, therefore it is not likely that the building will change its structure or function within the next five years.

The building serves a needed function between now and 2013 so it will perform the same function until that date. After that date the facility may be altered to perform an additional function with another facility joining on the educational facility or will be successful and be kept as connection.

Installations and Fittings

Installations and fittings need to be flexible and easy to assemble, remove and reuse which will save energy and costs.

The equipment needs to be adjusted easily to upgrade the technology, keeping the facility up to date with rapid technological changes and future innovations. The systems need to be easily accessed without affecting other 'layers' of the facility when they are upgraded.

Ongoing Costs Maintenance

Regular inspections of fixtures and services will be made by the building manager of the facility. Through the correct maintenance and control of the building's lighting, sound and computer systems, repairs are minimized and the ongoing costs are lowered.

The materials chosen will determine the cleaning costs of the facility. All fabric must have a maintenance cycle of at least two years.

Water Saving

Water saving components will be incorporated into the design. Flushing toilets and taps must be equipped with water saving devices.

Using indigenous trees in the green spaces within the facility will allow for the sprinkler systems costs to be minimized.

Efficiency of Use

The spaces within the facility will be used as efficiently as possible and the occupancy level will be raised to the maximum. A high occupancy must be maintained and non-useable spaces kept to a minimum.

The facility must be divided up between continuous use and intermitted use (shops etc). The facilities spaces will be diverse in times of utilization.