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## PROGRAMME

The Sandton station is one of the highest capacity stations on the Gautrain link. According to Dr. Herman Joubert it is expected to cope with 6 000 passengers at peak times. These consist of commuters using the main line between Johannesburg and Pretoria and passengers arriving from and departing to the Johannesburg International Airport station. An equal volume of incoming and outgoing passenger volumes is expected.

Located in South Africa's corporate and tourist capital, the station will aim to act as beacon and access point to Sandton central and surroundings. The station will also provide adequate basement parking facilities to serve the station itself and its adjoining trade and industries. As mentioned in the station synopsis Sandton station will offer various commercial components and tourist facilities.

## CONCEPT

The Project concept is formulated through the development of two distinctive identities within the station envelope. The first is the identity of the Gautrain and the areas in which its associated functions operate; thus the basic station configuration. The second is additional functions and activities such as retail, catering and tourist information. A dualistic approach, aimed at creating a legible and aesthetically appealing space, is applied. Commuters are to have a better comprehension of the subterranean space, which will promote circulation and prevent cluttered spaces. This double quality allows the introduction of warmer, casual and spontaneous environments with playful elements that don't conform to the predictable and pragmatic system required for efficient circulation. Hence, the station mood reflects the variety and diversity of the station's users and functions to reveal a vibrant underground culture.

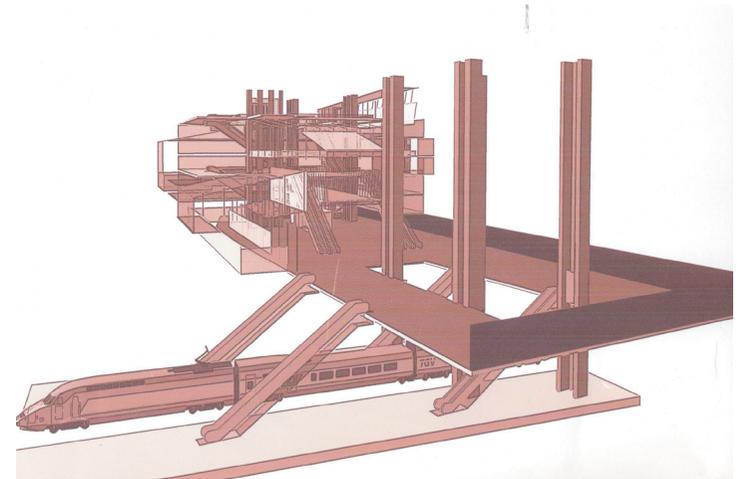
The identity of the Gautrain will manifest itself in the primary building envelope and architecture. The spaces which serve the transport system directly: entrances, ticketing areas, platforms and the areas linking the entrances to track and platform level will be designed for predictability, clarity and legibility to prevent confusion and to allow easy flow and movement of commuters.

Secondary spaces which will house activities of a commercial and catering nature will have its own architectural identity, which will be distinctive to that of the primary structure's architectural character. By presenting these spaces with their own individual character an energetic reaction and interplay between interior elements, space and objects are initiated. The commercial elements introduce the opportunity to generate intriguing and exciting spaces where commuters spontaneously engage with their surroundings, other commuters and station activities.

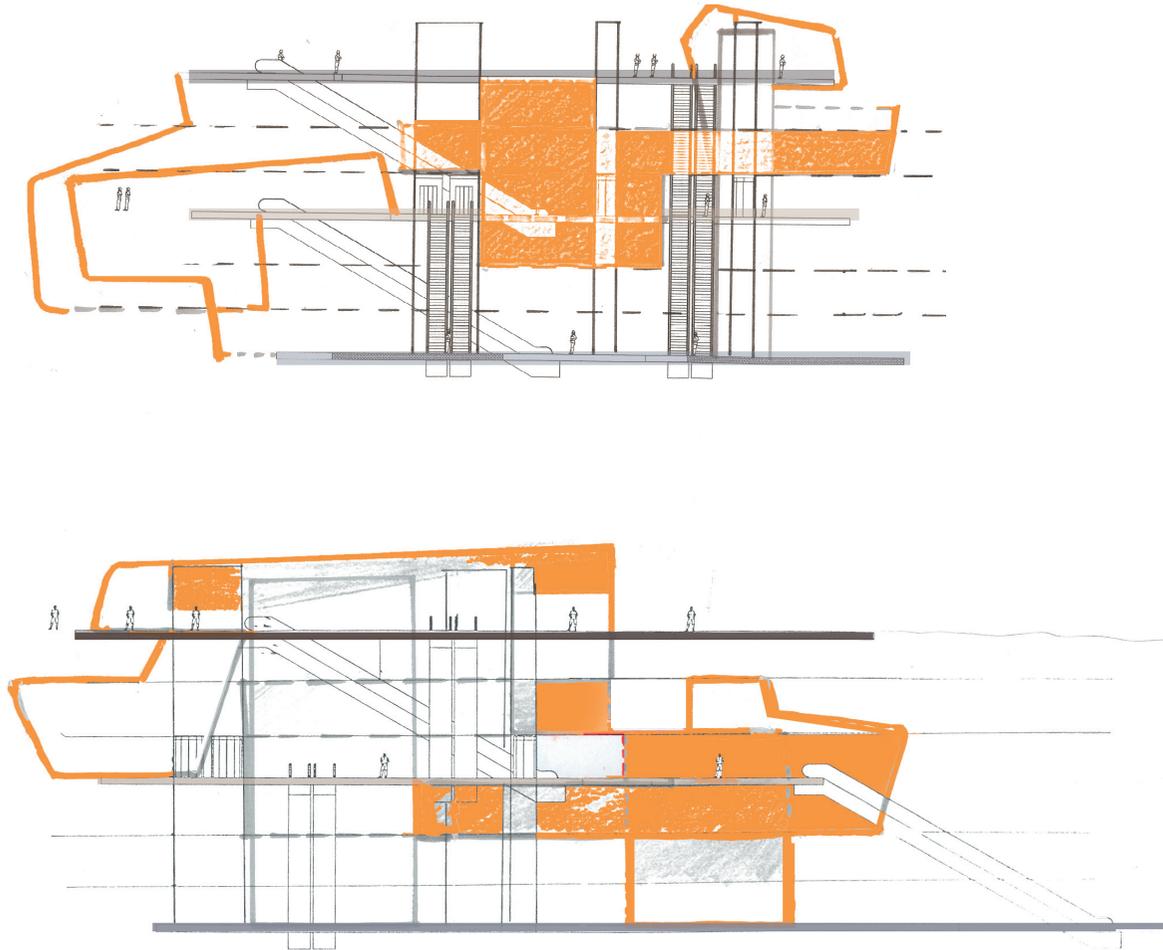
These supplementary and supporting spaces will compliment the operation and programme of the primary structure, but they will also function in their own right.

The dualistic collaboration initiates a dramatic interplay between the light and heavy, illuminated and dim, solid and transparent, and raw and refined qualities of the spaces within the holistic station space. A series of spatial layers define the spatial dynamic and embraces the linear and non-linear elements that formulate them.

New commercial ventures exclusively designed for the Gautrain rapid rail link stations will be developed. Depending on station capacity and size, each station will have the appropriate commercial components such as coffee shops, café bars and newspaper outlets.



**FIG 038**  
Concept development June 2005



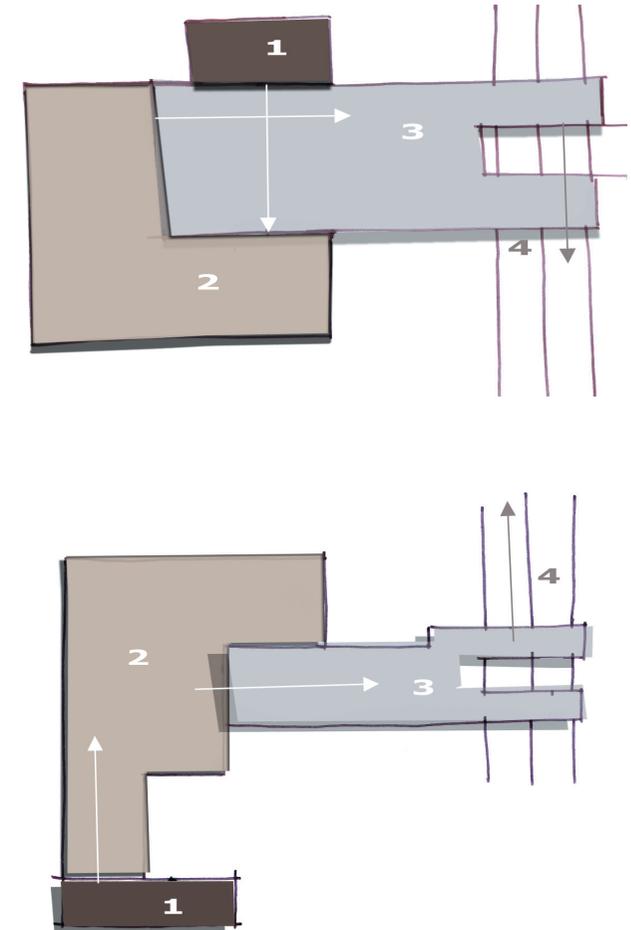
**FIG 039**  
Concept development June 2005  
Sections indicating **Retail and Catering** zones clipped on  
to the main station envelope in orange

## **DESIGN PROCESS & DEVELOPMENT**

As a building envelope did not exist, an investigation into the expected circulation and movement was done to develop a diagrammatic structure to work in. Various alternatives were weighed against one another and a suitable option was chosen and developed to more detail. A preliminary layout and zoning was proposed and then refined in order to explore the design concept and to expand the Subterranean Space strategy.

The lack of definite limitations and obvious guiding solutions regarding the formative rationale of the station envelope and with the restricted influence a response to site could offer – a difficult task was set in defining a station space. The product addresses relevant issues and delivers a capable container for the development of the interior. However, compromises can never be avoided. A solution that offers potential for one aspect can generate problems and limitations for another. Consequently, the design aims to accommodate as many issues relevant to the specific scenario. Aesthetic quality / form and functionality contend to construct an attractive and competent product.

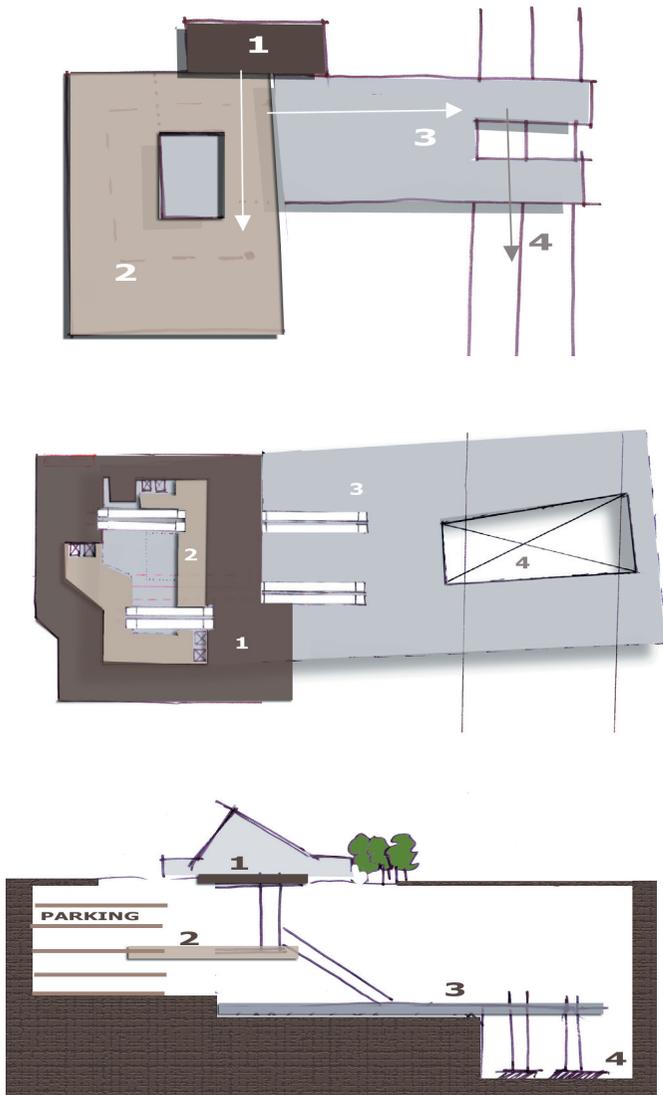
The outline of the resulting structure, as strategic product to work in, is discussed below.



**FIG 040**

diagrammatic exploration of shape and development of station circulation - movement from entrance to platform

## STATION ENVELOPE



The space has to accommodate a 30m level change from Entrance level (at ground level) to platform and track level. This level difference generates the opportunity to create an atrium. The atrium composes an open luminous vertical space around which glass elevators are situated and where escalator banks link the various levels to express passenger routes. The atrium assists the orientation process by opening up the space, placing elements in context to inform users of their surroundings and creating sightlines which indicate directions. It also acts as the station connecting point from where users can find their way. It assists the Subterranean Space approach, in which transparent spaces, where users observe while being observed by other users, are created. Additionally a tilted glass and steel louvre box canopy covering the station admits natural light that spreads through the atrium into the surrounding spaces to create a natural and ambient underground space. Natural light supports artificial lighting sources with the illumination task, while establishing a connection with the exterior. At night light from the station interior travel through the cathedral-like space to illuminate the external glass box that appears as a glowing beacon in the landscape above.

Circulation is the most essential factor in defining the station structure and hence forms the basis for the station layout. The programme allows the strategy in which the space provides direct passenger routes to the platforms as well as indirect routes that support the retail components. The station is structured accordingly, comprising an Entrance level at ground level, a double volume General Concourse level, two levels below ground level, and a triple volume Ticketing Concourse level, 5 levels below ground level before dropping another 9.5 m to reach Platform level. Passenger routes become more defined as levels descend. This vertical configuration

indicates the progression in passenger movement and flow. It reflects the reduction in the number of users closer to Platform level and the increase in user numbers closer to ground level. This is due to the location and occurrence of activities within the station. At General Concourse level, close to ground level a bigger variety of activities occur, but closer to Platform level activities become more and more specific and purpose driven.

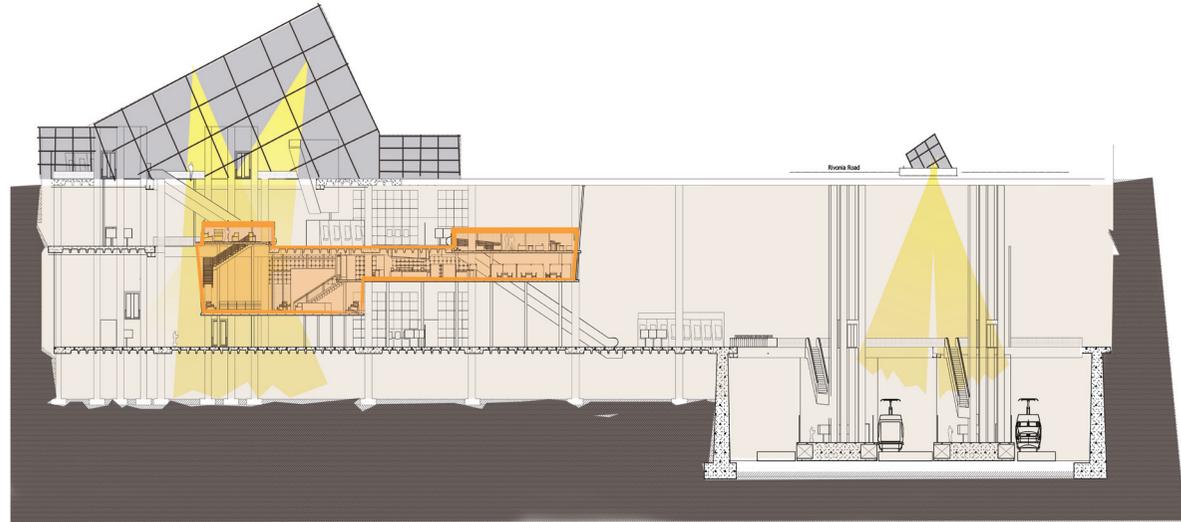
To make the space predictable, a quality required to enhance the station's legibility, the main envelope has a pragmatic design. A wide spanning concrete structure optimises circulation space to provide unobstructed walkways and large open concourses to cope with large crowds during peak hour commuter rush. The station envelope has a robust and rigid architectural character produced by the predominant use of concrete elements and raw concrete finishes sealed with epoxy varnishes. The use of glass as transparent and translucent elements also strengthens the legibility of the structure as it creates sightlines and strengthens visual connections.

Two island platforms are located on the south eastern side of the main structure beneath Rivonia road. A sculptured glass and steel structure located on the island between the two roads keeps a connection with the exterior and admits some natural light, travelling down through the punctured concrete structure, to the track level. The glass structure establishes a connection to the larger canopy located North West above the station entrance. It announces the station and subterranean activities commencing below the passing vehicles travelling along Rivonia road.

On Platform Level commuters are protected from the tracks through the provision of glass platform screens with automatic doors that open in correspondence

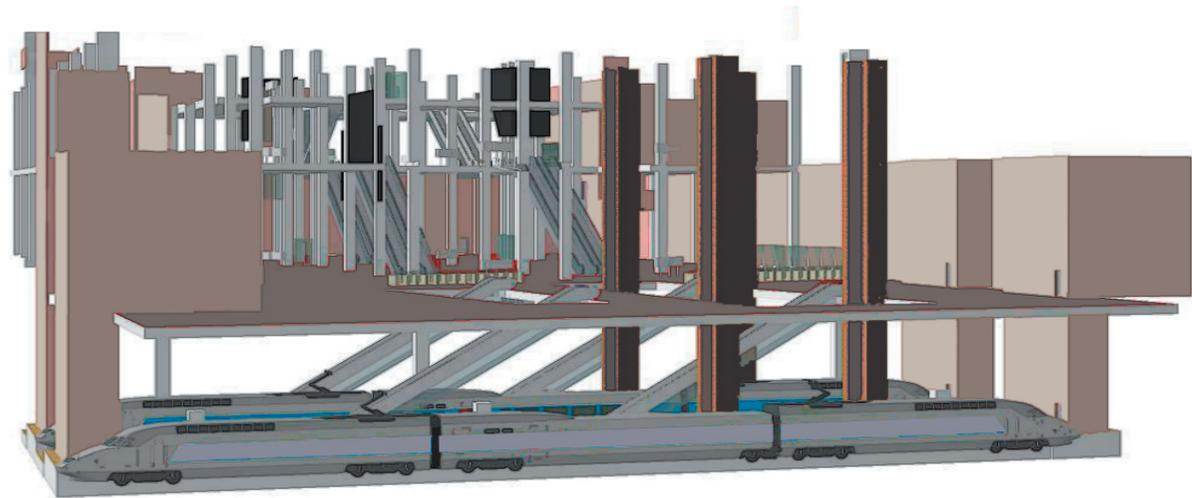
with train doors. The platform screens are sandblasted with the Sandton station name, route maps and the logos of the Gautrain and associated services as a safety feature, advertising means and information display. Programmed LED strips light up on platform edges and along platform screens to alert passengers of train arrivals. Platform edges are indicated in two strips of bright orange textured tiles on either side of the platforms. Information displays are combined with dustbins and positioned strategically, for instance beneath escalators, to keep routes clear and unobstructed.

Parking is located on two of the station's wings. In order to provide sufficient parking, basement parking levels occur consecutively in a single volume arrangement. For this reason and to avoid the cluttering of station circulation points, parking levels are provided with their own access areas. These access areas consist of elevators and stairs that connect the basement parking levels to the station's to foyers on General Concourse level.



**FIG 041**

Vertical and horizontal progression in station composition



**FIG 042**

Station envelope as framework

## LIGHTING & FINDING DIRECTION

Dark station spaces are undesirable as they influence users' perception of safety and security. As mentioned in the Brentwood Millennium Rail precedent, a well lit station and precinct is essential in offering a transport service and environment in which users feel comfortable. The use of natural light, as discussed previously, will also assist in creating a sense of luminosity.

### GENERAL LIGHTING

The station requires general illumination of the interior and its contents. As visual tasks within the main station mostly consist of a degree of detail perception proficient for movement and walking, illuminance of 300lx will be sufficient. To achieve this 150W suspended power pendant, metal halide downlights are distributed throughout the station passenger routes. In areas with more activity, such as where ticket purchasing occur, higher illuminance is provided by series of low volt dichroatic reflector lamps used as suspended spotlights.

To highlight and use the idea of being underground, ambient lighting is used to create the station mood. Indirect light sources (low volt dichroatic reflector lamps) are placed in built-in fixtures at floor level along station walls, boundaries and walkways to create a mystical atmosphere while suggesting direction.

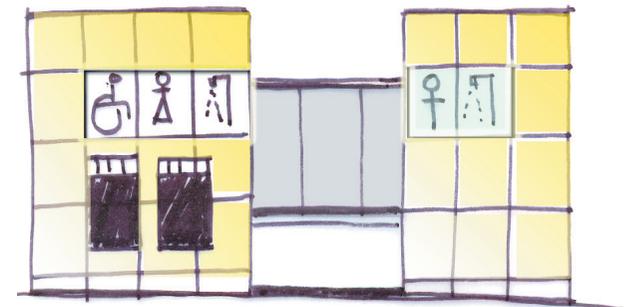
### MULTIFUNCTIONAL INFORMATION

The lightbox-wall is a concept that serves both as an aesthetic lighting feature and as guidance tool in and around the station. The lightbox-wall comprises of a translucent box fitted with several fluorescent tube lights. The box is made of translucent glass with a few engraved translucent coloured acrylic panels, fit

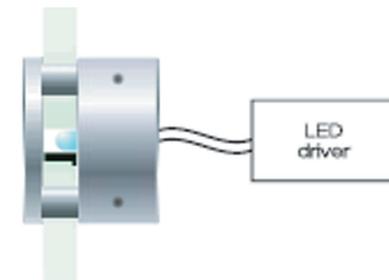
together, and to an unexposed inner steel structure, with countersunk stainless steel fittings to create an uninterrupted and illuminated outer surface. The boxes are perceived as glowing elements rising through the lofty station.

The coloured extruded acrylic panels (Plexiglas) are engraved with logos and signage symbols to function as part of the station's signage and information system. Within the station interior, the light-box-walls are positioned in front of the washroom and toilet facilities to act as screens and as facility indicator. Lightbox-walls are also used on ground level at the station's two entrances to highlight the station's entry points, especially at night.

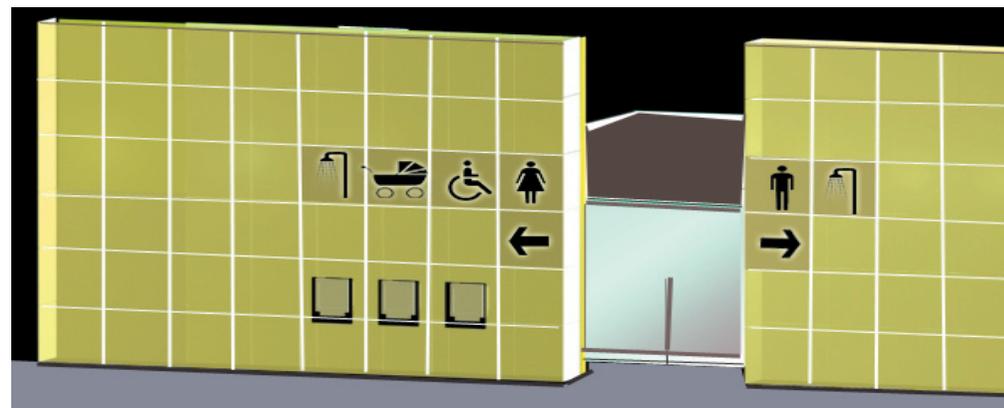
A similar concept is used to conceal the station's slab edges, while also acting as points of reference. Translucent acrylic panels are assembled to a hidden stainless steel structure that is fixed to the coffer slab edge. The stainless steel fittings used to fix the panels to the structure contain low energy, low voltage LED's that illuminate and highlight engraved information. The LED electronic driver is located up to 4000mm away in the service duct.



**FIG 043**  
concept development of lightbox-wall with integrated signage



**FIG 044**  
Stainless steel fitting with integrated LED for signage



**FIG 045**  
Lightbox-wall with integrated signage

## SIGNAGE

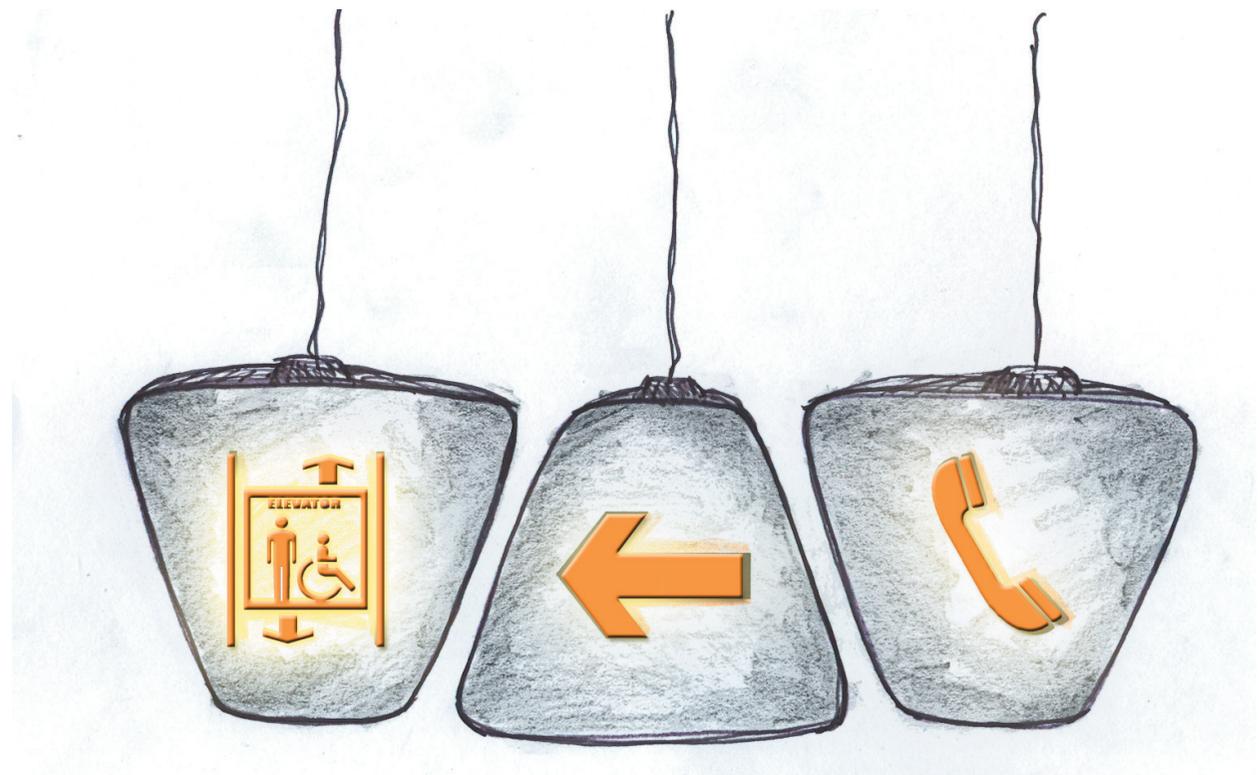
The station signage system utilises a transparent and refined architectural expression. Translucent glass and/or translucent acrylic panels are combined with stainless steel structures and fixtures. A combination of suspended and free standing units is used throughout the station.

The signage system makes a distinction between information used to indicate general direction in the station (such as the location of elevators and escalators, information desk, ticketing points, exit routes, etc.) and information that indicate specific retail activities and their products (such as the news outlet that sell airtime.) The system is structured according to a hierarchy in order to aid users in identifying the information they require.

## TEXTURES AND FINISHES

Different surface finishes and textures are used in different station zones and areas to distinguish them from one another. The transition from one zone to another is observed both visually and experienced tangibly, so to inform the user on multiple sensory levels. This approach assists the inclusive objective of the design as it supports the station's legibility and enhances accessibility and ease of use by a large spectrum of users.

The duality created between the primary activities and secondary activities relies on the use of differentiated architectural qualities, of which textures and finishes are major factors. This aspect in relation to its particular role in the integration of the commercial entities within the station will be discussed in more detail under the heading Retail and Catering Entities.



**FIG 046**  
Signage concept

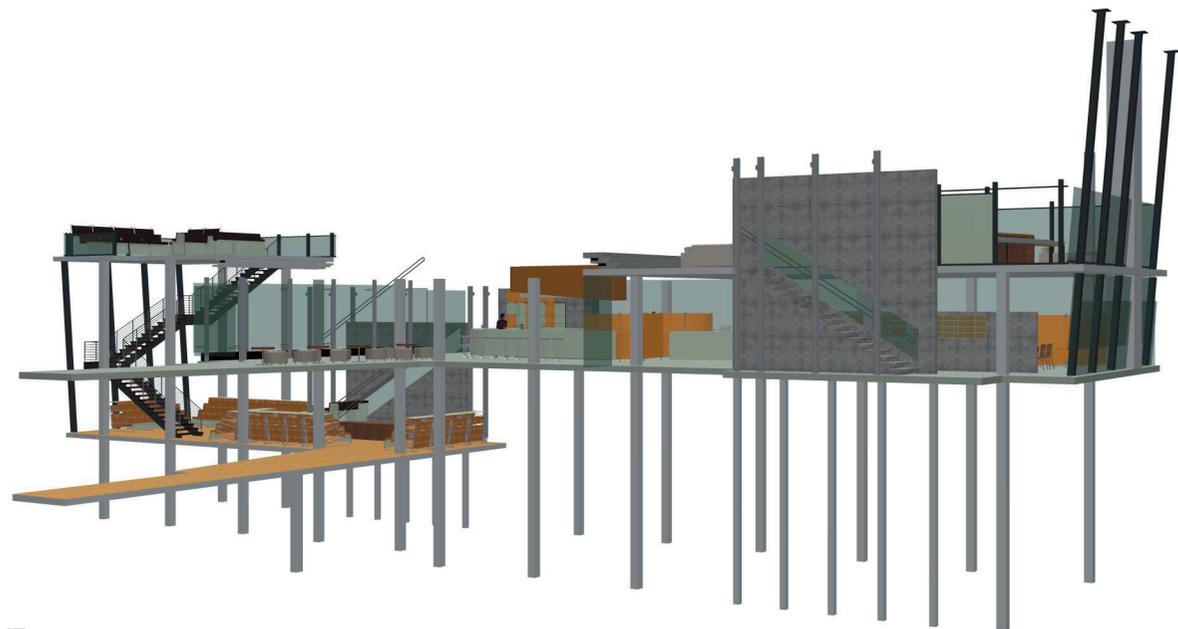
## RETAIL & CATERING ENTITIES

### RETAIL & CATERING ENTITIES

Retail and catering components are supplementary and complimenting services provided to enhance the commuting experience and will operate the same hours as the train service (expected to be from 6 am till 11 pm). They are a means to create a multifunctional and attractive station environment for users. Commercial activities offer commuters the convenience of purchasing goods on their way to their destination and the treat of having a snack and beverage while waiting for the next train. Retail goods range from a suitcase for a tourist on the way to the airport, to a gift or book on the way home. Coffee shops and cafés also provide a social environment where passengers can meet family and friends. Sandton station, because of its capacity and multidimensional user profile, offers the unique opportunity to incorporate a variety of commercial and catering facilities.

The commercial spaces are arranged from general to specific and located as a result of this. The station's General Concourse Level houses wide-ranging express facilities that are quick and easy to access. These services include banking facilities, a news agent, internet access, a small coffee bar, etc. The Ticketing Concourse Level offers a tourist information centre, foreign exchange facilities, travel agencies, car hire outlets, souvenir shops and a luggage and travelling-gear store, which are all aimed at tourist and passenger specific needs. Very particular functions, associated with "dwell time" and which are purpose motivated, like the café bar and bookshop, are accommodated on their own mezzanine levels.

The last mentioned, along with two decks on the General Concourse Level, shape an individual and more refined glass box retail environment, within



**FIG 047**  
Retail box as separate entity inserted in station envelope

the larger robust station structure. The commercial structure has a distinct character and each retail component within the “mall” also has its own brand and identity. The primary use of transparent and translucent materials throughout the retail and catering entities convey the Subterranean Space’s aim of creating transparent spaces that maintain visual connections with surroundings. The use of lucid materials create clear, radiant and receptive spaces which also function well as promoting and advertising agents to invite people passing by. These spaces present themselves as lighter, refined spaces in contrast to the heavy and rigid circulation space.

The commercial insertion is clipped onto the General Concourse Level and floats above the Ticketing Concourse Level. It acts as a pausing element within the high paced station rhythm, skipping monotonous beats to introduce the informal. Reposing links open up a continuous flow of passengers, to entice the enthusiastic to explore the paradoxical environment. Vertical inclinations and adjusted horizontals interrupt the linear and repetitive composition of the station’s uniformity and distinguish the commercial structure.

The “mall” is positioned between two escalator banks with entrances flanking the main passenger route to ensure maximum exposure. The structure is also divided into a retail and a catering section with its own dedicated circulation. Each shop (commercial or catering entity) is discussed in detail below.

#### GENERAL CONCOURSE LEVEL – **EXPRESS COFFEE BAR**

The Coffee Express bar consists of a small lounge area, preparation counter and storage space. It provides a quick and fast service. Refreshments are ordered and paid at the counter and can be enjoyed in the bar itself or in take-away format. The menu is limited to a selection of coffees, teas, non alcoholic beverages and small pre-packaged snacks like muffins and cookies that are supplied by an external source. The concept and design theme of the Coffee Express should be maintained and applied similarly in all stations throughout the Gautrain system. In small stations the Coffee Express can manifest as a take-away counter, without the lounge (with bar stools if required), along passenger routes.

The express coffee bar is inserted 530 mm below the General Concourse Level. The small level difference distinguishes the deck from the concourse walkway, though still allowing quick and easy access through a ramp and 3 reinforced pre-cast concrete steps running across the entire span of the deck entrance. Miniature fluorescent tube lights located beneath the stair treads pronounce the entrance and a transition of function and space.

The counter/ preparation space is equipped with the necessary: espresso machines, display, tap and basin, and other equipment. It is primarily used as a preparation counter and therefore a working height of 900mm screened by a 1050 wood and steel panel is maintained, except for a lowered portion at the pay point where disabled users are accommodated. The menu is displayed on a raised screen located behind the counter. The adjacent storage space is located to the side of the deck next to the staircase leading down to the Higher Mezzanine Level. It is enclosed with a translucent glass panel and exposed I-beam profile structure which is fixed to a concrete wall.

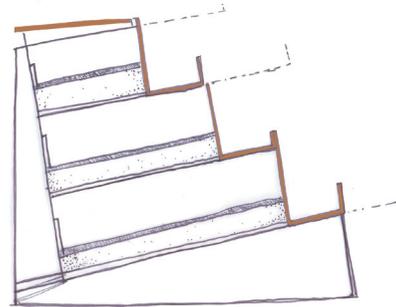
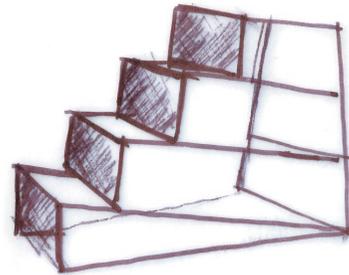
The lounge offers a few comfortable contemporary couches where customers are able to read the daily newspaper while enjoying a mocha chino or latté. The space is defined by clear glass panels fixed to exposed I-beam profiles. The glass allows a “watching ritual” where passing commuters are observed as they travel down the escalators to the platforms. This maintains a link with station surroundings and activities. The exposed I-beams remind of the steel structures used to construct early train sheds. This concept persists in the steel finished balustrade of the ramp. The floor is covered with bevelled edged natural decorative wood finish laminated flooring to create warm and natural tones. This collaboration of materials generates a retro atmosphere that celebrates the industrial revolution and the evolution of station design.

#### GENERAL CONCOURSE LEVEL – NEWS KIOSK

The news agent and bookshop is one entity. In small stations the news agent will function separately and in stations where it’s appropriate, like Sandton, the larger bookshop division is also incorporated. The kiosk offers a selection of newspapers, magazines, cell phone airtime, camera film, some stationery items and maps.

Located opposite the express coffee bar, on the other side of the concourse walkway on a raised deck, the news kiosk follows the same quick access approach as the Coffee Express. The spanning concrete steps with lighting and a ramp for wheelchair access and the bevelled edged natural decorative wood finish laminated flooring is repeated. This allows the two activities and spaces to communicate as a unity in order to establish a link that constructs the retail “mall” environment.

The kiosk is an informal space. The bent steel rod



**FIG 048**

Plywood and bent steel book display units with drawer extension for storage

and plywood newspaper and magazine stands, along with glass balustrades articulate the deck boundaries with the counter placed to observe browsing customers. The relatively small area requires optimum use of space and thus the display stands also serve as storage. The counter incorporates display and merchandising in a similar way. An exclusive staircase links the news kiosk to the bookshop on the Lower Mezzanine Level.

#### LOWER MEZZANINE LEVEL – BOOKSHOP

The bookshop provides a more established shopping environment that offers all the services and goods expected from a bookshop.

An enclosed glass corridor curves and opens up toward the bookshop to lead users directly from the elevators into the double volume shop and a pre-cast concrete block staircase cantilevering from concrete wall connects to the Higher Mezzanine Level. The staircase projects through the concrete wall to express the route to the next level. A glass insertion inclining along the stair treads imitates a balustrade and allows a glimpse of customer traffic going up and down.

Both mezzanine levels are enclosed with glass and exposed steel I- beam facades and the laminated flooring introduced in the coffee bar and news kiosk are sustained. The bookshop interior presents a refined and polished look provided by the primary use of stainless steel, translucent acrylic sheets and plywood for shop display and lighting elements. Display and storage is combined for efficient use of space, display shelves have drawers for storage and packaged goods.

The double volume allows a lighter space with ample advertising and display prospects.

### HIGHER MEZZANINE LEVEL – CAFÉ BAR

The urban-feel café bar offers a variety of wines, coffees, beverages (alcoholic as well as non alcoholic), light meals and snacks. Snacks such as sandwiches and salads are prepared from scratch, while other meals such as pies, pasta dishes, pastries, cakes and deserts are sourced in pre-prepared format, from nearby suppliers, on a daily basis. The sourced foods are then heated and prepared for serving from the café bar kitchen. Though Sandton station makes it possible to have a coffee bar and a café bar, it is assumed this is not a viable option in all the Gautrain stations. The station's capacity would determine which of the options would be more suitable.

A similar glass enclosed corridor bend and expand in the opposite direction as its counterpart below on the Lower mezzanine Level leading customers from the elevators to the café bar space. Text and images that illustrate the café mood and menu are showcased on the glass wall slanting towards the bar. On the other side of the corridor a back projection screen for advertising tilts out into the station in front of an escalator bank.

The café bar includes a cocktail bar counter with barstools, casual seating arrangements as well as a small, more traditional dining area. The bar area is a prominent feature in the space. A large illuminated bar counter swirls around the cocktail preparation counter and its transparent spirit displays shelves. A combination of stainless steel, translucent glass and coloured acrylic panels are used to split the counter in two dissimilar portions divided by a large column in the space. The bar is screened from the pay point and dining area by a coloured translucent acrylic and stainless steel structure used for spirit and liquor bottle storage. The structure is illuminated to cast bottle shaped shadows on the back of a translucent panel. This creates a screen with appealing silhouettes that indicate the bar area. A bulkhead

that highlights the cocktail preparation counter is layered in a sloping outer plywood shell that reveals an inner glowing profile.

A series of similar screens coil in the space to split the café into a casual seating area and a dining space. Casual seating is provided in the form of mobile ottomans and small tables, while the dining area involves comfortable chairs placed at shaped plywood tables that define personal space. Configurations of ottomans and tables also spill into the glass corridor.

The café bar has a galley kitchen that runs through

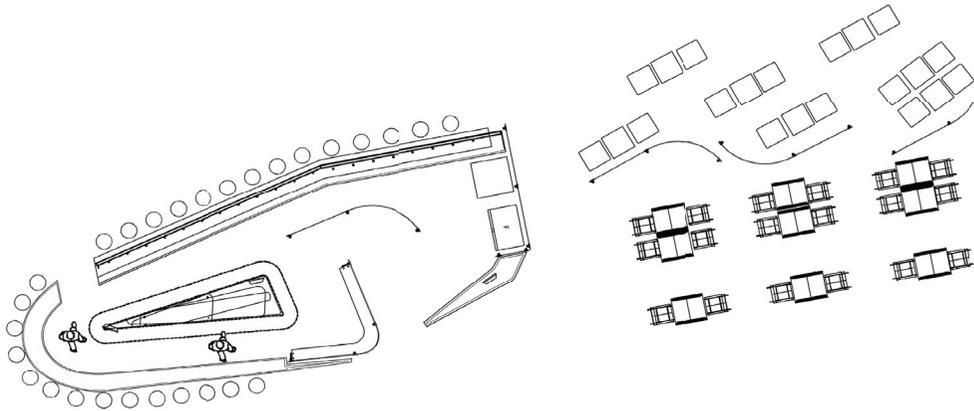
the main station space to connect with the service area (office, storage, coldroom and waste disposal facilities) located beneath the General Concourse Level next to basement parking. The kitchen and service are also covered with structural glass screens.

Two toilets are provided in front of the kitchen and service entrance. A translucent acrylic panelled wall acts as a screen that also provides signage information. On the other side of the space another concrete staircase provides access from the express coffee bar deck and General Concourse Level.



FIG 049

Interior of Cafe bar showing dining area



**FIG 050**  
Interior of Cafe bar, cocktail bar with screens



**FIG 051**  
Plywood and bent steel tables and chairs of Cafe bar dining area

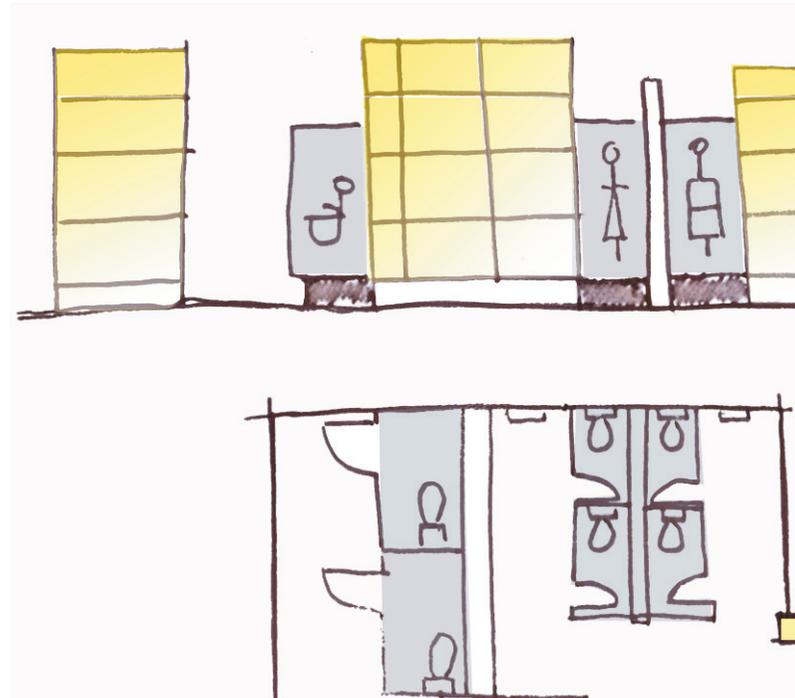
## SERVICES

### TOILETS

Washroom and toilet facilities are services that passengers and commuters expect at stations. Unfortunately public toilets are subject to vandalism and often serve as places for drug abuse and other crimes. The abuse of public toilets amplifies maintenance and repair costs which don't justify their operation ([http:// railway-technical.com/stations](http://railway-technical.com/stations)). This assumingly is the reason why none of the stations on the Jubilee Line, with the exception of Canary Wharf, provide toilet facilities.

Seeing that toilets at stations are constantly exposed to numerous users, the station scenario requires washrooms which will simplify and minimise maintenance and cleaning tasks. For this reason, the durability and properties that will influence performance in terms of hygiene should determine the choice of finishes in the washrooms. A material such as stainless steel is easy to clean, very durable and consist of low smoke and low toxicity properties, which is why it was the primary material used in Canary Wharf station's toilets, even the cubicle doors were clad in stainless steel (Building Design: p24). Glass is also a popular material in public toilets because of its easy maintenance.

Pay toilets provide a reasonable solution to the problem. Charging a fee to use the washroom decreases the opportunity for people to use the toilet for unwanted and illegal activities. It also sustains operational costs, which make it feasible to have staff permanently present to ensure that the facilities are clean and in the required condition (having staff constantly present also raises security measures). By charging for sanitary services, the toilet facilities could be seen as a self-sufficient business venture run independently from the Gautrain Concessionaire.



**FIG 052**

Concept development of toilet and washroom facilities

In Europe it is accepted to pay or tip €0,50 to use a washroom facility and these facilities are expected to be clean and in a good condition. It should be mentioned that these toilets usually consist of ultra hygienic automated tap systems and self-cleaning-automated water closets. Paying to use toilet facilities is a custom South Africans are not used to, but surely users won't mind paying a small fee if good maintenance and cleanliness is guaranteed. If a pay system is to be used, the design and specification of durable, more sustainable and therefore usually more expensive toilets, will also be substantiated. The pay system can in some ways be linked with the transport ticketing system so that valid metro tickets include limited complimentary use of the toilet and shower facilities.

In a modern-day society, conventional segregation of washrooms is no longer mandatory. Unisex toilets is a concept that recognizes the potential of integrating male and female toilets within suitable environments. It is quite successful in the TGV Aix-en-Provence station where toilets consist of pay cubicles each containing its own hand wash basin, water closet and disposable towel dispenser or dryer.

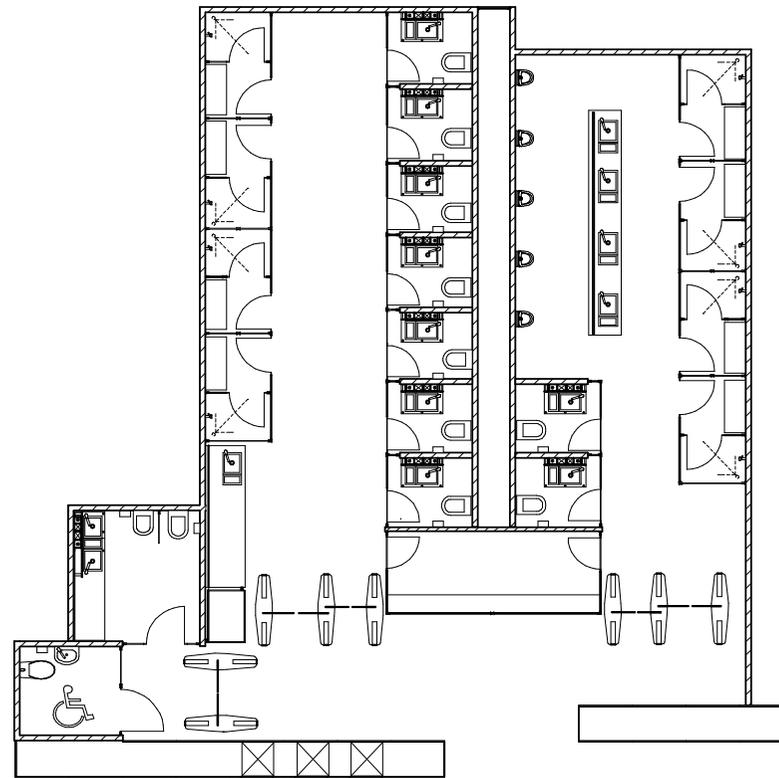
In the South African context the integration of male and female washrooms in a public space, such as the Sandton station, poses certain risks. Sexual crime is a relevant issue and should be dealt with in the design. Although the use of a pay toilet system and close circuit television monitoring will reduce the likelihood of such crimes occurring, the Sandton station design will rather take a preventive approach and avoid the use of unisex toilets. Facilities provided include male and female toilets with showers, toilets for disabled people and family toilets/ baby change rooms.

The toilets reflect the character of the main station. A combination of opaque glass (preventing visual

intrusion) with epoxy sealed concrete walls as partitions and self levelling epoxy floors are used for easy maintenance and durability. Stainless steel sanitary fixtures are chosen to achieve maximum durability and life-span.

#### WASTE AND GARBAGE

Stainless steel waste and garbage bins are situated at station entrances and in combination with signage systems throughout the station.



**FIG 053**  
Toilet and washroom facilities