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STATION CIRCULATION & ACCESS

The station design and layout has to accommodate large passengers and commuter volumes moving through the space in frequent intervals. In the Sandton station specifically, the user has to make various level changes to move from Platform level to the Entrance level and vice versa. In order to accommodate the heavy passenger traffic and to ensure good circulation, direct passenger routes equipped with two directional heavy duty high-speed high-rise escalator banks are provided. For safety reasons all escalators are angled at the standard 30° inclination.

Passenger routes are kept open and transparent to avoid confusion. Sightlines lead commuters from the Entrance level to the General Concourse Level then to the Ticketing Concourse Level, before passing through electronic access control units to reach escalators and elevators connected to the separate platforms. To accelerate travelling time from

Entrance to Platform level automatic self-service ticketing machines are provided at various points along the side of the passenger routes. Nevertheless, a conventional staffed ticket office is provided on the Ticketing Concourse Level. Ticketing points are angled according to the passenger flow direction and for optimal use of space. Departure and arrival areas are also separated on the Ticketing Concourse Level to enhance security and circulation. Atriums: double and triple volumes assist in orientating the user in the underground structure.

In addition all levels are connected with elevators that are positioned at key circulation points and a general staircase positioned in the central Atrium. Mezzanine levels are connected to the main structure with individual staircases and a main circulation elevator pair. The mezzanine service lift is accessible from the basement parking level and serves the mezzanine café exclusively.

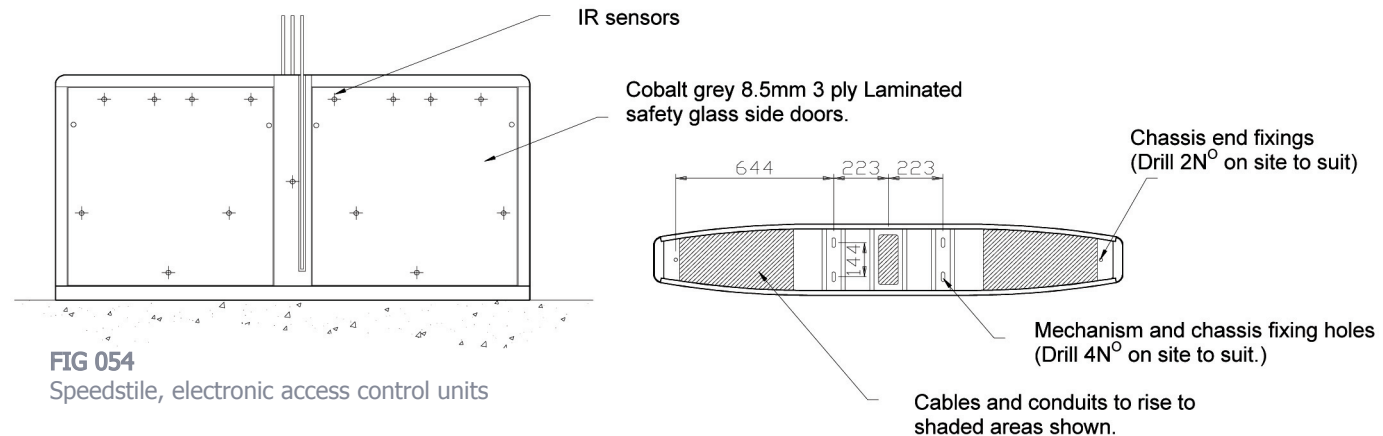


FIG 054
Speedstile, electronic access control units

FIRE & EMERGENCY SAFE AREAS

A rational approach is taken in terms of the station's fire and evacuation design. Safe areas which also serve as emergency routes unfold the station core. Emergency escape routes from the Platform Level connect to safe areas of the Ticketing Concourse Level, which are connected to all the other levels. The safe areas comply with the requirements for structural stability, fire resistance, surface finishes etc. set out for emergency routes in the SABS 0400 National Building Regulations.

The safe areas are well lit with artificial lighting powered by an emergency energy/ electricity supply to maintain the minimum illuminance of 50lx. Individual ventilation shafts and fireman's lifts with fire lobbies are provided as required and the safe areas do not comprise of any materials that have a toxic nature or emit smoke.

The station is fit with the required sprinkler, alarm and fire distinguishing systems.

Emergency fire doors providing access to the safe areas from the station interior are set out and well indicated at regular intervals. These doors comply with SABS 1253 regulations and are equipped with automatic self closing mechanisms. Doors, when opened, do not intrude more than a 100 mm in the emergency route and don't obstruct any person escaping via the route.

The walls and floors of the safe areas offer a minimum of 2 hour fire resistance and structural stability. The floors and stairs have flat unobstructed surfaces with a slip resistant finish. All staircases are 1500mm wide with solid treads and are provided with hand railing on both sides. The safe area provides sufficient head space and exceeds the minimum required width of 1800mm due to the large station capacity.

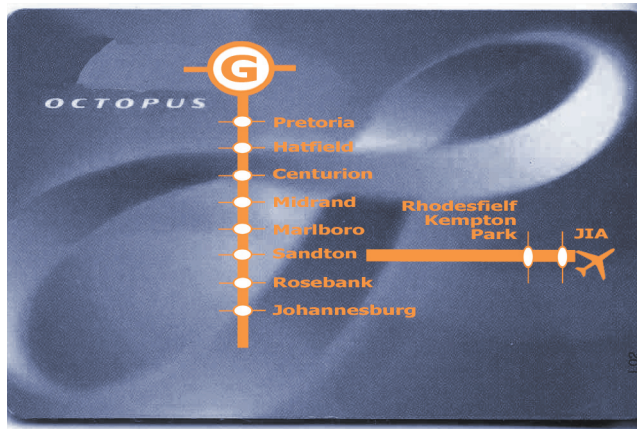
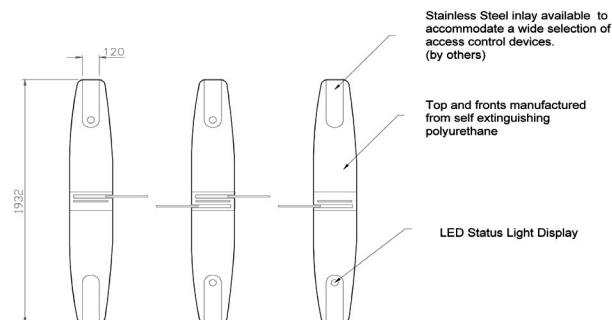


FIG 055

Modified and adapted Octopus smartcard as part of the automatic ticketing



HEATING & VENTILATION

The heating and ventilation strategy proposed below is based on a consultation with Patrick Cochler of Spoomaker and Partners Inc, an engineering company specialising in thermal control and occupancy comfort in building structures. Spoomaker and Partners Inc. were also appointed as consultants by one of the bidding concessionaires of the Gautrain project.

Stations in general are open structures in the sense that the trains moving through them constantly push air in and out of the station structure. Air also escapes through the train tunnels. For this reason thermal control of the station envelope by means of air conditioning is not viable. It is however, suitable to supply enclosed spaces such as retail components with air condition units. The introduction of platform screen doors will offer a moderate advantage in thermal control, but as the doors open frequently (every 10 – 15 min.), it still doesn't validate the use of air-conditioning and fortunately the South African climate doesn't pose the risk of extremely cold winters where heat loss becomes a critical consideration.

For general user comfort the station envelope will be ventilated and cooled by means of evaporative cooling. By implementing evaporative cooling systems humidity can be controlled, while a temperature of approximately 28°C can be maintained during summer. Infrared heating offers a suitable solution for heating in winter.

Large evaporative cooling shafts run through the entire structure and are connected to evaporative cooling plant rooms located above ground level. From these shafts air is distributed throughout the station through smaller ducts and channels.

Trains produce large amounts of heat when entering the station due to friction caused when breaking. To avoid uncomfortable conditions at platform level, the platforms are equipped with extraction fans and shafts, situated beneath the platforms next to the tracks, to extract warm air generated by the trains. The platforms are also provided with fresh air from evaporative cooling plant rooms.

INFORMATION

ESSENTIAL

Passenger Information Systems (PIS), also referred to as Passenger Information Displays (PID), play a primary role in the orientation of users and is therefore a major contributing factor in the proper functioning of a station. It is important to keep commuters informed of the services running and delayed, train destinations and connections to other stations and transport systems as well as train frequencies and intervals.

Information systems consist of constant information displays which indicate fair charges and services. Real-time information displays will show time, destination and arrival schedules ([http:// railway-technical.com/stations](http://railway-technical.com/stations)). Technology allows instant and advanced ways to display various forms of information, such as audio visual and digital information to be displayed instantly and electronically. The primary displays in the Sandton station will be two large format 300" acrylic screens (suitable for back projection) suspended over both entrances. Smaller LCD screens are also positioned along passenger routes throughout the station and at the platform areas.

ADDITIONAL

Advertisements also form part of information provided and stations are popular ad-space venues because the information displayed are exposed to large numbers of people. By designing spaces that present advertising opportunities the Gautrain system could obtain large sponsorships. Various prime locations are therefore utilised for this purpose.

The Mezzanine levels offer ample opportunity for ad-space by projecting on suitable glazing, while the LCD screens used for PID can also be used, though to a limited extent.

PROJECTION

Projectors are combined with 2 angled mirrors to minimize the space required for back projecting. Mirror reflecting angles are always less than 90° and back projection screens do not tilt more than 30° so to avoid visual disturbances in the projected material. Projection equipment is kept in isolation (in dark surfaced environments) to optimise visual quality.

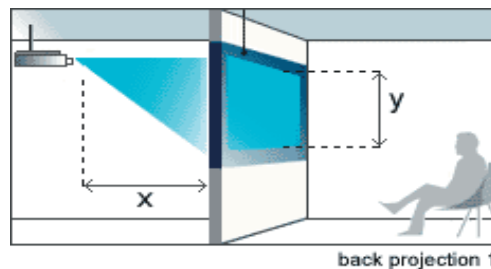
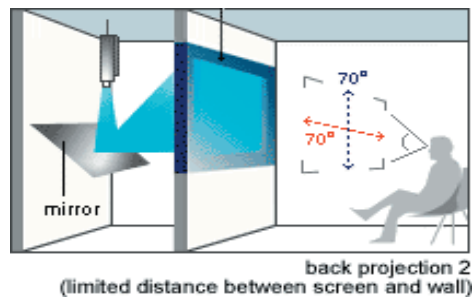


FIG 056
Diagrammatic illustrations of back projection principles

