

# baseline *document*

---

**TRIPLE BOTTOM LINE: SOCIAL, ECONOMIC & ENVIRONMENTAL SUSTAINABILITY**

---

Buildings contribute a great deal to the use of natural resources during its construction and life. It requires consideration during the design process as it can play an important role in supporting a sustainable society, if designed correctly.

Through careful planning of the technical development of a project, in other words, evaluating design decisions and material specifications in terms of their long term impact on the economic, social and environmental sustainability (triple bottom line) of a society, an appropriate response can be developed to bridge between human needs, culture and ecology.

As part of the technical development of the Berrals intervention, the Sustainable Building Assessment Tool (SBAT), developed by Jeremy Gibberd, Neufert Architects Data and the National Building Regulations (NBR) forms the basis for target setting and setting of performance criteria. These criteria include a number of pertinent economic, social and environmental issues, particularly suited to developing countries, such as our own.

# social considerations

## TRIPLE BOTTOM LINE: SOCIAL, ECONOMIC & ENVIRONMENTAL SUSTAINABILITY

The quality of environments in and around buildings has shown to have a direct impact on the health, the happiness and the productivity of its users. Healthier, happier, more productive people contribute to sustainability by being more efficient and therefore reducing resource consumption and waste. These optimal conditions need to be achieved with minimal cost to the environment. (Gibbert 2006: 4)

### Occupant Comfort:

The facility should be well lit. Preference should be given to natural light, to minimise the use of artificial, specifically electric lighting. The design intervention should attempt to allow natural light to penetrate the structure, when possible and when artificial light is necessary, the choice of lighting needs to consider energy efficiency by specifying the use of Compact Fluorescent light bulbs (CFL) or Light Emitting Diodes (LEDs), instead of incandescent lamps. In the Mediatheque a lighting level of approximately 500 lux is required for tasks, such as reading and writing and as all workspaces are not sufficiently close to windows, to be lit by daylight, the correct lighting levels should be implemented through additional artificial light. Glare, harsh shadows, and high contrast (in terms of background), produced by very bright

light sources are undesirable, but moderate shadowing can aid perceptions of textures. Similarly, contrasts, used to a limited extent, could be used very successfully to draw attention to elements such as edges, and level differences.

Visibility achieves safety and during night times the facility must become a well lit and identifiable beacon to users. All movement paths leading up to the building and around it, must be sufficiently lit.

Thermal control and ventilation in the building are vital components in creating healthy and comfortable environments. To ensure occupant comfort, efficient ventilation can be achieved by means of natural ventilation, mechanical ventilation or full air-conditioning. Mechanical methods of ventilation, cooling and heating, though used frequently, do not provide energy efficient solutions and waste valuable resources. Passive systems should be applied to ventilate, cool and heat the facility where possible, and mechanical methods of ventilation should, if possible, be limited to areas such as toilets, kitchens and service areas. An average temperature of 22 to 24 degrees C must be maintained throughout.

Due to the location of the Berrals building on the

corner of two main traffic arteries, Nelson Mandela Drive and Skinner Street, the noise generated by the traffic will need to be addressed.

Compared to the Information Centre, the Mediatheque will require much higher sound insulation, as this facility has a library with quiet study areas, a meeting room and an exhibition space. This can be addressed with performance glazing combined with absorptive panels, carefully designed by an acoustic engineer.

A layered system of interaction will also assist with noise control within the building, by clustering the high interaction and circulation spaces together on ground level and the private and quiet spaces higher up in the building.

## Ergonomics and Inclusive Environments:

The design should provide spaces wherein the special and dimensional requirements for comfort and easy use are met. Because of the extensive user profile, the design should be able to adapt and provide solutions that are not restricted to a single group of users. The facility is a work space; consequently a productive and comfortable work environment should be created in addition to the comfortable customer/user environment. Numeric data and standards for the calculation of size and dimensions of objects, spatial relationships, sightlines and view angles should be used.

The facility should be accessible to all users. The design should provide for easy access and use by disabled persons, the elderly and children.

The creation of facilities for disabled people is an important inclusive aspect. Design for the disabled covers a large and varied spectrum. Catering for the physically impaired/wheelchair users include sufficient and well designed toilets, lowered counters levels at information desks, study spaces, shelving proportions and ATM's, etc. Elevator controls that are reachable from a wheelchair and appropriate and safe access to all levels are further considerations. Provision for the visually impaired and blind means using Braille on elevator controls, providing audio equipment to gain access to available library material, and audio announcements to make the facility more accessible and comprehensible. Visual aids such as lighting signals, indicators and appropriate signage and information systems will assist the hearing impaired and deaf.

The centre is designed to link with existing movement and circulation routes, the spatial allocation and surface of the routes are critical. All routes inside and leading up to the building must have enough space to easily navigate a wheelchair on them and the surface of the routes must be smooth and even.

In this five-storey building the change in level is catered for with a hydraulic lift and the acceptable gradient for ramps is 1: 12 and should be a slip-resistant surface.

## Access to Facilities

Conventional living and working patterns require regular access to a range of services. Ensuring that these services can be accessed easily and in environmentally friendly ways supports sustainability by increasing efficiency and reducing environmental impact. (Gibbert 2006: 5)

From a social perspective provision should be made for communication, retail, and banking within the centre. Communication, includes postal, telephone, internet and printing facilities, as well as wi-fi hotspots within the Cafe and Mediatheque. The facility's retail component includes a bookshop and refreshments available from the Cafe as well as a strong axial link with the retail and economic node, in Esselen street. Within the building banking services in the form of ATM's and Currency Exchange can be made available.

For social interaction in and around the building, the open spaces adjacent to the building, can be utilised for activities. On the inside the circulation space will be penetrated by a Cafe and in the Mediatheque a lounge and roof garden on the fourth floor will provide space for social interaction.

On each floor in the centre, a sufficient ratio of male, and female toilet facilities must be open to the public. These facilities must be accessible to all types of users.

## Education, Health and Safety

Learning and access to information is increasingly seen as a requirement of a competitive work force. All of these factors contribute to sustainability by helping ensure that people remain healthy and economically active, thus reducing the 'costs' (to society, the environment and the economy) of unemployment and ill health. (Gibbert 2006: 6)

Spaces within the Information centre can be used to educate visitors about relevant issues such as AIDS, the environment and safety concerns. This could be done through exhibitions and posters, images and messages printed on library cards and booking tickets, or even screening short audio-visual adverts.

The Information Centre provides general information on the city, its attractions and services available through a system of displays. These displays can be utilised as educational tools. The use of the billboards on the facades of the building can also reach the public in the surrounding areas and commuters in traffic.

The Mediatheque functions as a learning, business and browsing tool. It provides information through internet access and various library material, such as books, journals, newspapers, and digital media. Short courses and seminars can be presented in the meeting room via the internet.

Strict security measures need to be taken to ensure the safety of VISITORS using the facility during day and night. Visibility supports security, and well lit routes in and around the building as well as clear visual links between spaces needs to be provided. A few security measures that can be considered are:

- Crime prevention strategies (SDI's): In areas surrounding and within the building
- Secure and controlled access
- Exits
- Sprinklers
- Emergency lights
- Hidden camera security systems
- Continuous activity
- High quality computer linked key or card system
- Safety measures: fire- and electrical hazards and accidents

In terms of health, a first-aid kit is available at the information desk of the centre. There will also be information boards indicating the location of all health institutions as part of the general information service of the centre.



# economic *considerations*

## TRIPLE BOTTOM LINE: SOCIAL, ECONOMIC & ENVIRONMENTAL SUSTAINABILITY

### Local Economy

The construction and management of buildings can have a major impact on the economy of an area. The economy of an area can be stimulated and sustained by buildings that make use and develop local skills and resources. (Gibbert 2006: 8)

The design should incorporate and provide for the use of local labour, local materials, and locally manufactured components. Black economic empowerment businesses should participate in all levels of the project. It is also important to create employment by training local workers to repair and maintain the building. Cleaning, security and catering should be sourced out to small emerging businesses. Training and skills development can empower local communities through entrepreneurship development.

The facility's function as a source of education, can stimulate the area's local economy in the long run, as it provides short courses to its users.

### Efficiency of Use

Buildings cost money and make use of resources

whether they are used or not. Effective and efficient use of buildings supports sustainability by reducing waste and the need for additional buildings. (Gibbert 2006: 8)

The use of space can be optimised by implementing a space management program and policy which include shared work spaces. Within the Mediatheque this principle applies as the available spaces, are not allocated to specific users, they function on a 'hot-desking' system, where spaces can either be booked or used by anyone in a continuous cycle of change.

In terms of efficiency provided by technology, the Mediatheque offers professionals the communications and information technologies necessary to reduce space requirements in their own businesses as well as travel time and cost. These technologies include video conference and teleworking.

### Adaptability and Flexibility

Most buildings can have a life-span of at least 50 years. It is likely that within this time that the use of the building will change, or that the feasibility of this will be investigated. Buildings which can accommodate change easily supports sustainability by reducing the requirement for

sustainability by reducing the requirement for change (energy, cost etc) and the need for new buildings. (Gibbert 2006: 9)

The Berrals is a typical example why flexibility as a design consideration is important in the life span of a building. It was originally designed to accommodate, commercial activities on the ground floor and accommodation on the upper levels, but with the change in the urban fabric the building has been cut off from its original high-rise residential block and is now completely surrounded and isolated by the new busy roads. This situation has made the Berrals less ideal for safe and secure residential units, and a change in accommodation has become inevitable.

The column grid structure of the Berrals has made structural changes unnecessary, as the grid provides flexibility for changes within.

During the design of the new interior space, multifunctionality and flexibility should be considered from the start. The lifespan of materials and commercial ventures should be taken into consideration along with recycling and re-use possibilities of materials and fittings. Installations should be easy to assemble, requiring low energy input and it should be easy to take apart and remove, requiring low energy input.

### Ongoing cost:

The design should specify materials that require low maintenance and low cost maintenance.

Materials that are hard-wearing, durable and easy to clean should be used. All materials should comply with safety and standard requirements set out by the building regulations. Care should be given to ensure that maintenance, inspections, and replacements keep disruptions to a minimum.

# environmental *considerations*

## TRIPLE BOTTOM LINE: SOCIAL, ECONOMIC & ENVIRONMENTAL SUSTAINABILITY

Buildings consume about 50% of all energy produced. Conventional energy production is responsible for making a large contribution to environmental damage and non-renewable resource depletion. Using less energy or using renewable energy in buildings therefore can make a substantial contribution to sustainability. (Gibbert 2006: 11)

avoided where possible.

The use of scarce resource should be avoided. Materials with low energy inputs should be preferred to those with a high embodied energy. Recyclable materials should be used where possible.

Waste generated by the facility should be recycled. Dust and garbage bins can be divided into labelled sections to sort glass, paper, and tin cans for this purpose.

The facility should be equipped with water efficient devices and water saving components for flushing toilets. Energy efficient fittings, devices and lamps with low energy consumption such as fluorescents should be used where appropriate.

Landscaping around the facility should focus on the planting of indigenous plant species. The landscape should be easy to maintain and the use of fertilisers, and insecticides should be