

### C.1.1 CREATIVE CURITIBA

CURITIBA IN BRAZIL IS ONE OF THE MOST REMARKABLE CITIES ANYWHERE. LED BY AN ARCHITECT MAYOR, THE CITIZENS HAVE CREATED A SERIES OF INTERLOCKING SYSTEMS OF TRANSPORT, LAND USE AND WASTE DISPOSAL THAT MAKES CURITIBA THE ECOLOGICAL CAPITAL OF THE WORLD.

ARCHITECTURAL REVIEW, MAY 1999: 92

#### PLACE

CURITIBA, A TOWN SITUATED 700KM SOUTH OF RIO, IS THE CAPITAL OF THE STATE OF PARANA AND CONTAINS 1 600 000 CURITIBANOS. ITS NATURAL SITUATION IS POOR AND ITS CLIMATE IS AVERAGE.

THE TOWN OF CURITIBA IS DISTINGUISHED FROM ANOTHER TOWN THROUGH THE ACTIONS OF ITS MAYOR, ARCHITECT, JAIME LERNER.

HE REALISED THAT GRANDIOSE SOLUTIONS NEVER PRODUCE THE PROMISED RESULTS AND THAT ABSTRACT MODERNISM SIMPLY DOES NOT WORK.

ARCHITECTURAL REVIEW, MAY 1999: 92

#### MASTER PLAN

##### 1. Transport

The new plan was linear: the town was authorized to spread only along specific lines. The historical centre, situated somewhat apart, could then become quietly pedestrianized. A ring road connected the fast north-south and east-west bus routes. Four concentric lines were added with stations at intersections. The device adopted in the plan (to deal with the express radial routes of a 60m width requirement) was to divide this flow intelligently between three neighbouring parallel streets, the first and third being one-way for private travel with the centre being reserved for the express bus, and later for the tram or surface railway when the means were available. The routes gave a structure to development without allowing it to occur anywhere at random and without impossible traffic conditions.

##### 2. Green spaces

- Maintain parks and plant many trees (5000/annum to 60 000/annum - over 20 years, green space per inhabitant will increase from 0.5sqm to 52sqm)

- The mayor organised well constructed and popular parks:

- The Iron-wire Opera;
- A new Botanical garden.

##### 3. Run-down quarters

Rehabilitation of the run-down areas started by adding the public services they lacked, with the related communities involvement. An attitude of improving the current resources, rather to ignore or demolishing them was adopted (Often new constructions proposed in place of slums are violently rejected by the inhabitants).

TOWN PLANNING BASED ON RATIONAL CONSIDERATIONS ALONE IS COMPLETELY UNSYMPATHETIC, IN CONTRAST TO PLANNING WHICH ORIGINATES IN POPULAR INSTINCTS REGARDING SPACE AND THE URBAN IMAGE. THIS FUNDAMENTAL CRITICISM, BASED ON EXPERIENCE, OF THE ALIENATION OF MODERNISM. WHICH IS THE MORE REASONABLE APPROACH?

ARCHITECTURAL REVIEW, MAY 1999: 92

(Do I believe church street in Pretoria west could be pedestrianized, with Mitchell and souter streets as the vehicle routes?)

I don't think so, because of the business typologies requiring people, but then if it is limited to public transport and semi pedestrianized, could work, i.e. Slow the traffic down --- Marabastad type)

#### 4. Public transport

Why spend so much if the bus is so efficient?

Integrated transport is the crowning success of Curitiba.

THE TRICK IN CHANGE OVER, IS TO INTEGRATE THE VARIOUS FORMS OF TRANSPORT, FROM BUSES TO BOATS, TO THE UNDERGROUND AND THE BICYCLE.

ARCHITECTURAL REVIEW, MAY 1999: 93

To increase the change over times, there was a necessity to design an original Brazilian bus:

- Levelled access and exit;
- The width of the doors to match that of the bus stops (with commuters punching their own tickets);
- Etc.

The half a million Curitiba private vehicles are no longer seen. Bicycles however, remain very important, with the 150km network of bicycle paths.

#### 5. Refuse

**'Waste which is not waste'**, The slogan used by Curitiba to get its public to recycle waste, Lerner convinced three-quarters of the population are interested in sorting their waste by hand for selective collection; 40 percent of the waste can be recycled (50kg of recycled paper avoids the need to cut down a tree). Organic waste is put aside and used as manure, producing an income. The waste is carried to a factory outside the town and is sorted for sale. Since the lorries on the road system cannot reach the paths in the city, the slum dwellers are paid for their rubbish, i.e. they sort the rubbish from the town and are repaid with vegetables, fruit, bus tickets (Green exchange).

#### 6. Economics

The finance of these city improvements was through the set-up of an industrial city, not in the form of a specialized area but as an extension of the town, inside a natural park. The old industries still polluting the centre of town, sold their premises and set-up new non-polluting installations in the mixed accommodation areas designed for them.

#### 7. Social conditions and culture

Curitiba is still faced with social problems shared by other cities. There is still a shortage of 80 000 homes, with 5000 homes being built per year, but the mayor insists on high quality accommodation and encourages do-it-yourself, as it is often cheaper and more suitable than hastily built accommodation. Curitiba's consideration in the time saved on travel, is to increase time spent on family and social events to strengthen ones culture. A strong, now in bread element of the Curitiba culture, is that of the ecological approach developed over the 20 years of Jaime Lerner's time as mayor.

THE MAYOR WHO LIMITS HIMSELF TO CURRENT PROBLEMS FAILS THE CITY OF TOMORROW, WHEREAS A MERE VISIONARY STUMBLES IN ALL THE RUTS OF TODAY.

LERNER,

ARCHITECTURAL REVIEW, MAY 1999: 95

## C.1.2 TATE MODERN

HERZOG & MEURON'S FINELY CONSIDERED ARCHITECTURE SERVES AS A STIMULUS TO CREATIVITY RATHER THAN A STATIC CONSTRAINT.

THE ARCHITECTURAL REVIEW 2000: 48

Architect: **Gilbert Scott**.

'A TRANSFORMATION OF A MODERNISTIC TAUT BRICK POWER STATION AT BANKSIDE INTO AN INTERNATIONAL POWER HOUSE FOR MODERN AND CONTEMPORARY ART.'

THE ART MAGAZINE, 2000: 26

Refurbishment Architects: **Jacques Herzog and Pierre de Meuron** (Swiss architects).

'HERZOG & DE MEURON STATED THAT THEY AIM TO USE ARCHITECTURE AS A THINKING MODEL FOR A CRITICAL PERCEPTION OF OUR WHOLE CULTURE.'

THE ART MAGAZINE, 2000: 27



Figure C.1.1  
Tate conversion

**Power station - dual advantages of:**

- Space
- Riverside setting
- Located in an area undergoing a stealthy urban regeneration.

(From the impoverished London borough of Southwark, to a district with cheap warehouse spaces occupied by artists and craftspeople and more recently, with the introduction of the landmark gallery, art lovers along with the general public)



Figure C.1.3  
Power station conversion

## HERITAGE PRECEDENT

### THE TURBINE HALL. WHERE BETTER TO HELP GENERATE POWERFUL IDEAS?

THE ART MAGAZINE, 2000: 5

#### DESIGN CONSIDERATIONS

##### Refurbishment Architects proposal:

- Adhered most closely to the buildings original organisation.
- Had no overtly willful gestures (no cutting into the building or applied decoration).
- Through a series of minimal interventions, the volumes of the former industrial building are simply and rationally converted to make a variety of spaces for art.
- The main architectural intervention is the two-story 'light beam' that runs longitudinally along the building.
- Spaces are arranged around the turbine hall, acting as a constant reference point for visitors as they circulate through the museum.
- Common character is given to the gallery spaces through maintaining a minimum room height of 5m.



Figure C.1.2  
Tate internal spaces

Total project cost: £134

### C.1.3 SAB VISITORS CENTRE - NEWLANDS

A COMPREHENSIVE TOURIST EXPERIENCE MOTIVATED THE RESTORATION OF THE OLD MARIENDAHL BREWERY BUILT IN 1859 BY LETTERSTEDT - AND THE MALT HOUSE WITH KILN - ADDED BY OHLSSON IN 1892.

THE BRIEF CALLED FOR A VISITORS CENTRE THAT WOULD RECONSTRUCT THE HISTORY OF BEER MAKING IN THE CAPE WITH PARKING FOR VISITORS AND STAFF (100 OPEN AND 100 COVERED), LECTURE, DINING AND PUB FACILITIES FOR STAFF, MEMENTO SHOP AND THE RE-USE OF THE 1863 DISTILLERY AS AN ENVIRONMENTAL CENTRE.

ARCHITECTURE S.A. 1995: 13

Intervention Architect: **Gawie Fagan.**

The restoration and adaptation process followed a specific approach to conservation. An approach of **re-use** and allowing the historic fabric to acquire a new use, that of revealing the historic fabric through contrast rather than returning to original form. The new is carefully inserted and separated from the historic fabric, coloured and added as new (blue coloured assigned to new). Of all the high technology interventions, the lift is the predominant element that the visitors return to again and again.

Circulation: (Through the beer production process)

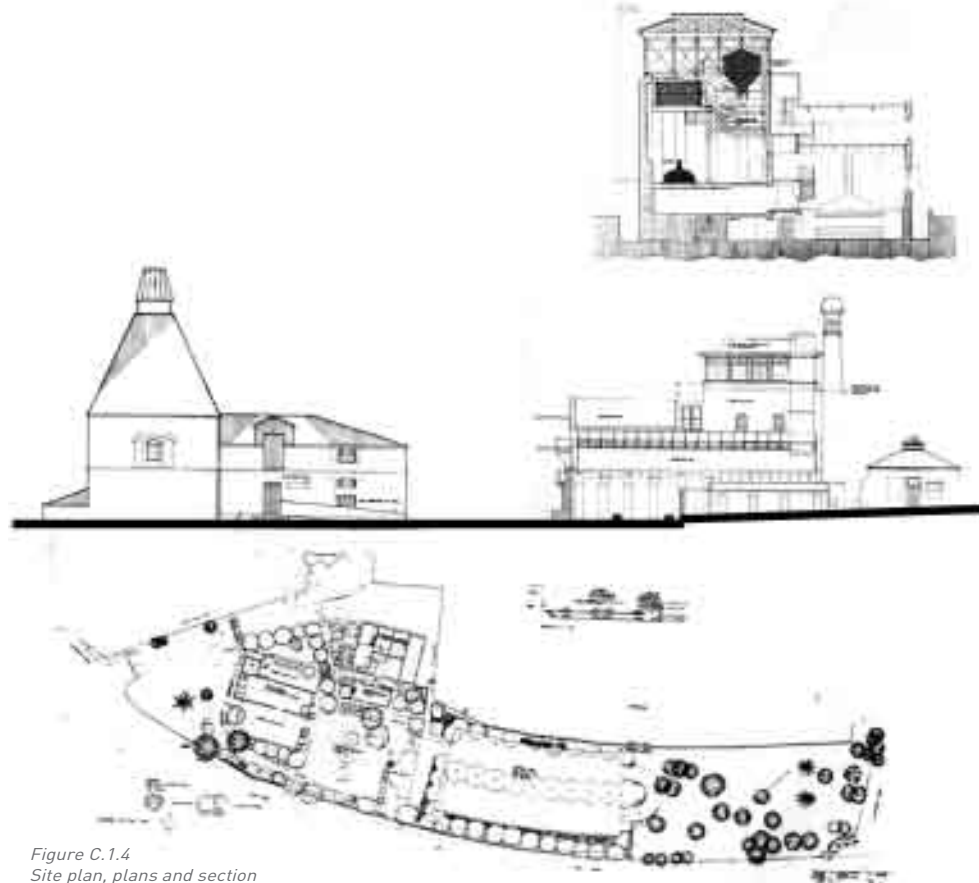


Figure C.1.4  
Site plan, plans and section

## ENVIRONMENTAL PRECEDENT

## C.1.4 THE AUTONOMOUS HOUSE

THROUGH THEIR ACADEMIC RESEARCH AND ARCHITECTURAL PRACTICE, DESIGN OF THEIR OWN HOUSE THAT HAS NO RELIANCE ON MAINS SERVICES, WITH THE BRIEF FOR A SINGLE-FAMILY HOUSE COMPRISING OF THREE CHILDREN LIVING A LIFE TYPICAL OF THE MAJORITY OF THE BRITISH POPULATION, WITH THE CENTRAL IDEA OF THE HOUSE BEING, TO SUSTAIN DOMESTIC LIFE.

HAWKES 1995:37

Intervention Architects: **Brenda and Robert Vale.**

The relevance of this precedent is that of its autonomous nature. The precedent is dependent only on the resources of the land it occupies and is of more relevance than its residential nature.

ONE OF THE ASSUMPTIONS ABOUT MODERN URBAN DEVELOPMENT IS THAT WE CAN EASILY CONNECT OUR BUILDINGS TO A 'LIFE-SUPPORT SYSTEM' OF MAINS SERVICES:

- ELECTRICITY (FROM POWER STATIONS FAR FROM URBAN CENTRES AND OFTEN FUELLED BY MATERIALS THEMSELVES TRANSPORTED LONG DISTANCES).
- WATER (TRANSPORTED OVER LONG DISTANCES THROUGH NETWORKS OF INCREASING COMPLEXITY).
- TELEPHONE.
- FOUL AND SURFACE WATER SERVICES.

HAWKES 1995:37



Figure C.1.5  
Build environment relationship

### 1. The environmental systems: of the autonomous house

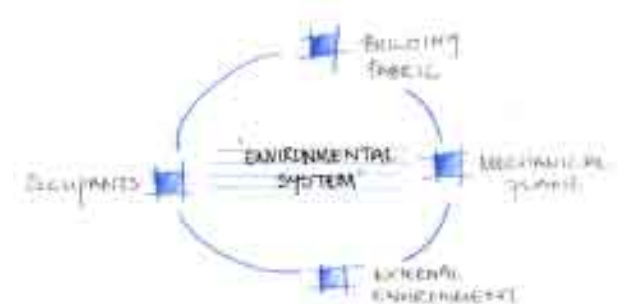


Figure C.1.6  
System relationship

### 2. House description

The house is simple, brick-built, two-storey, and rectangular with a steeply pitched, clay-tiled roof. The garden side of the house is covered by a two-storey-high conservatory and an unusual feature of a basement which extends under the whole house and the conservatory.



Figure C.1.7  
House drawings

## ENVIRONMENTAL PRECEDENT

**3. Construction Specifications**

Due to the British climate, careful attention is given to the avoidance of thermal bridging in the detailed design, with:

- Masonry cavity walls have 250mm of resin-bonded glass fibre insulation.
- Roof insulation has 500mm of blown cellulose made from recycled waste news.
- Triple glazing.
- Composting laboratory in the basement.
- Water collection and processing to meet the household's water requirements.
- Energy system

THE PHOTOVOLTAIC COLLECTOR CONSISTING OF 36 PANELS, WITH A NOMINAL OUTPUT OF 60 WATTS IN BRIGHT SUNSHINE. IMPORTANTLY, BY DETACHING IT FROM THE STRUCTURE OF THE HOUSE, IT IS POSSIBLE TO GIVE IT OPTIMUM ORIENTATION AND INCLINATION, WITH NO TECHNICAL CONSTRAINTS ON THE DESIGN OF THE HOUSE. THE ELECTRICITY PRODUCED IS USED FOR POWER, LIGHTING, COOKING AND HOT WATER SUPPLY. THERE IS A LOW-ENERGY REFRIGERATOR AND A MICROWAVE COOKER, NO FREEZER OR DISHWASHER, AND LAUNDRY IS DONE IN COLD WATER. EXTERNAL LIGHTING COMES FROM AUTONOMOUS SOLAR-POWERED FIXTURES. THE ESTIMATED ELECTRICAL LOAD OF THE HOUSE IS 1500KWH/ANNUM, PREDOMINANTLY PRODUCED BY THE PHOTOVOLTAIC COLLECTOR. THE PROBLEM IS, THE PEAK OUTPUT OF THE SYSTEM OCCURS IN THE SUMMER MONTHS, THE TIME OF LEAST DEMAND. SOME OF THE OUTPUT IS STORED IN BATTERIES TO ALLOW FOR OPERATION OF ESSENTIAL PUMPS AND FANS, BUT THE FINANCIAL IMPLICATIONS AND SPACE CONSUMPTION OF WHOLE YEAR STORAGE WOULD BE TOO GREAT. INSTEAD, THE HOUSE IS CONNECTED TO MAINS ELECTRICITY SUPPLY THROUGH AN INVERTER WHICH ALLOWS AN EXPORT OF POWER TO THE GRID WHEN THERE IS A SUMMER SURPLUS AND IMPORT FROM THE GRID AT NIGHT AND IN WINTER.

HAWKES 1995.

**4. Conclusion**

THE TRUE TEST OF THE DESIGN IS THE EXTENT TO WHICH IT MEETS THE ENVIRONMENTAL NEEDS OF ITS INHABITANTS. IS IT COMFORTABLE?

IN REPLY:

'THE OCCUPANTS ARGUE THAT THE HOUSE PROVIDES FOR NEED NOT GREED, AND SEE IT AS USING A LEGITIMATE SHARE OF THE WORLD'S RESOURCES.'

HAWKES 1995:37

The environmental strength of the building is that it is transformed from a consumer of energy into an energy producer, with obvious limits on outputs being the spatial requirements for these systems (30 per cent of the house floor area, placed within the basement).



Figure C.1.8  
Section

### C.1.5 TUKS HIGH PERFORMANCE CENTRE

Recently constructed to support programs that produce high performance athletes. Offering facilities of residential, eating, training, schooling and swimming nature for the athletes, and a hotel, restaurant, gym, admin, conference centre for the circulation of a range of people from administrators, kitchen staff, business persons and general public.

The association of the High Performance Centre to the proposed awareness centre lies in the scale of different activities within the centre. The success of the centre is through this mixed use character, the open plan nature of the building ensures the 'mingling' of the people associated with the different functions as well as ensuring a continual flow of people through it.



Figure C.1.9  
Contextual images

## CLIENT PRECEDENT

**C.1.6 MEGAWATT PARK**

Through analysing Megawatt Park, Eskom's head office in Sunninghill, Gauteng, South Africa. We will gain an indication of the selected clients commitment towards environmental issues.

In signing on to the 'Green Buildings for Africa' programme, they subjected their head office to an assessment, by means of interviews and site visits, and rated on a green scale - according to the 'Building Environmental Assessment and Rating system' (Bears), developed by Butek.

**1. The main objectives of the environmental assessment:**

- TO PROVIDE MARKET RECOGNITION FOR BUILDINGS WHERE THE ENVIRONMENTAL IMPACT HAS BEEN REDUCED;
- TO ENCOURAGE THE BEST PRACTICES IN DESIGNING, RETROFITTING, OPERATING AND MAINTAINING BUILDINGS.
- TO SET CRITERIA AND STANDARDS BEYOND THOSE REQUIRED BY LAW AND REGULATIONS.
- TO RAISE THE AWARENESS OF PROPERTY OWNERS, FACILITIES MANAGERS, DESIGNERS, AND OCCUPANTS ABOUT THE ADVERSE IMPACTS OF BUILDINGS ON THE ENVIRONMENT.

KNOLL 1999:15

**2. The assessment process in two parts:**

Part A:

The building and its services.

Part B:

The operation and management of the building (according to global environmental issues and the use of resources).

**3. Environment management systems:****- WATER CONSERVATION:**

THE MEASURES INVOLVE ECONOMY DRIVES ON URINALS, WITH REDUCED TIPPING TIMES AND THE ADDITION OF ICE TO ACT AS A FILTER THROUGH THE MELTING PROCESS, FLOW REGULATORS ON TAPS AND SHOWERS AND TOILETS HAVE BEEN SET ON LOW FLUSH TIMES OF 7,5L. THE COLLECTION OF STORM WATER IN TWO CATCHMENT DAMS FOR LANDSCAPE IRRIGATION ADDS TO THE WATER CONSERVATION MEASURES.

**- WASTE MANAGEMENT;**

INVOLVES THE SHREDDING AND BALING OF WASTE PAPER AND CARDBOARD AND SOLD FOR RECYCLING (GENERATES AN INCOME OF ± R12 000 / MONTH). FLUORESCENT TUBES ARE DISPOSED OF IN 'TUBIE BINS', A PRODUCT PRODUCED SOLELY FOR THIS PURPOSE. ALL BIODEGRADABLE ARE COLLECTED AND HANDLED BY A COMMERCIAL WASTE COMPANY AND GREASE TRAPS IN THE KITCHENS MEAN THAT THE WASTEWATER IS GREASE FREE.

**- ENVIRONMENTAL CLEANING PROCEDURES;**

ENVIRONMENTALLY SOUND MATERIALS AND PROCEDURES ARE PRESCRIBED IN ALL THE CONTRACTS FOR THE CLEANING CONTRACT COMPANY TO COMPLY TO.

**- ENERGY EFFICIENCY.**

A BUILDING AUTOMATION COMPUTER CONTROLS AND MONITORS THE UTILIZATION OF ENERGY IN THE BUILDING.

KNOLL 1999:

The air-conditioning works on a load shedding management system, with air-condition plant working earlier than the buildings peak times (i.e. before people arrive and the lighting is required).

A further management system utilised is by load rolling. Meaning that air conditioning fans and lighting start-up times are staggered at time intervals, avoiding a costly energy utilisation peak.