

TECHNICAL REPORT

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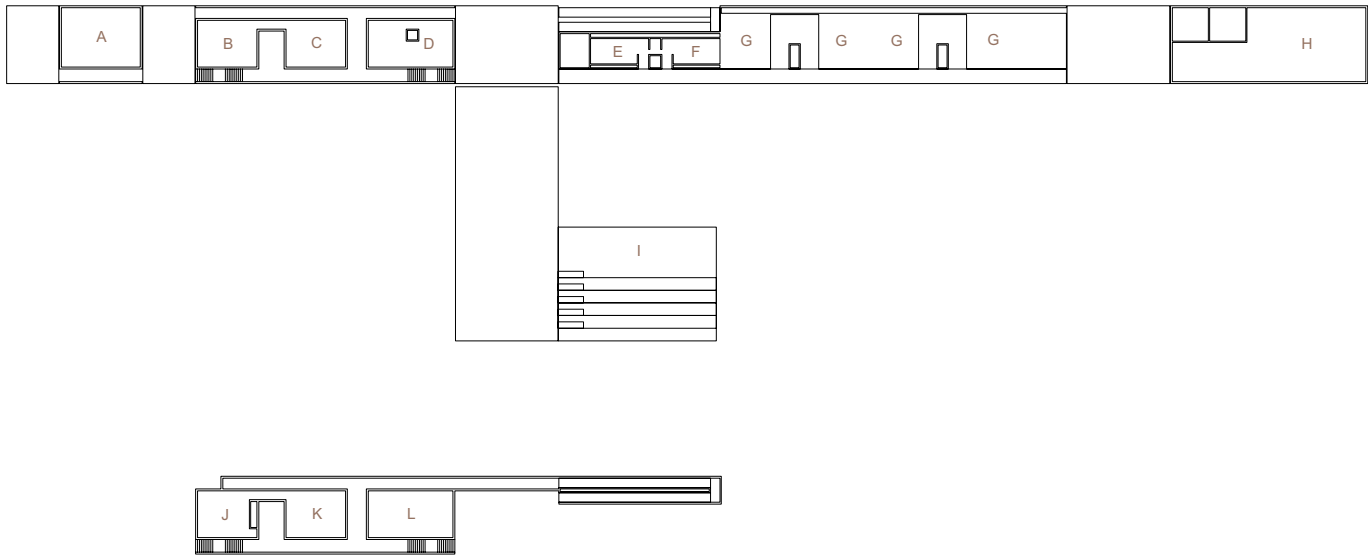


Fig. 1

LEVEL 1

- A - RECEPTION AND RETAIL
- B - COMPUTER LAB
- C - EDUCATION CENTRE LECTURE HALL
- D - STAFF OFFICES AND CONFERENCE FACILITY
- E - MALE ABLUTION
- F - FEMALE ABLUTION
- G - FOOD AND BEVERAGE OUTLETS
- H - SITE SUPPORT FACILITY
- I - OUTDOOR AMPHITHEATRE

LEVEL 2

- J - MULTI-MEDIA AUDITORIUM
- K - EXHIBITION SPACE
- L - EXHIBITION SPACE

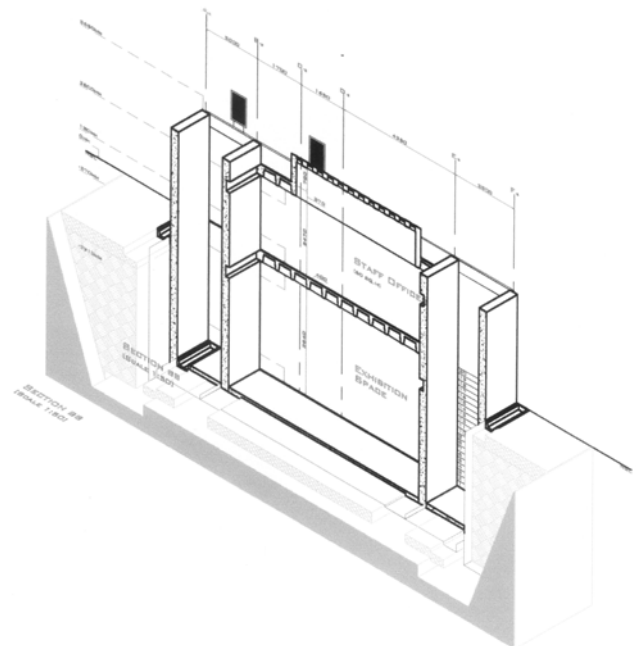


Fig. 2 Axonometric section through office and exhibition functions

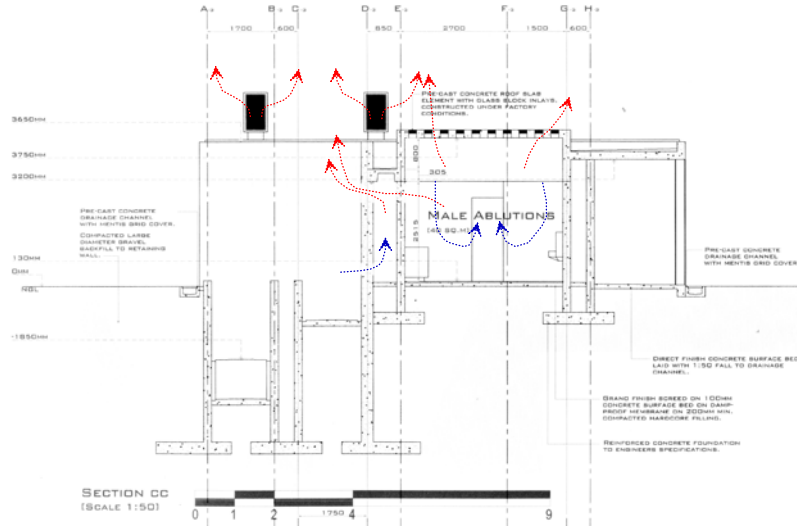


Fig. 5 Section through ablution function, indicating predicted ventilation

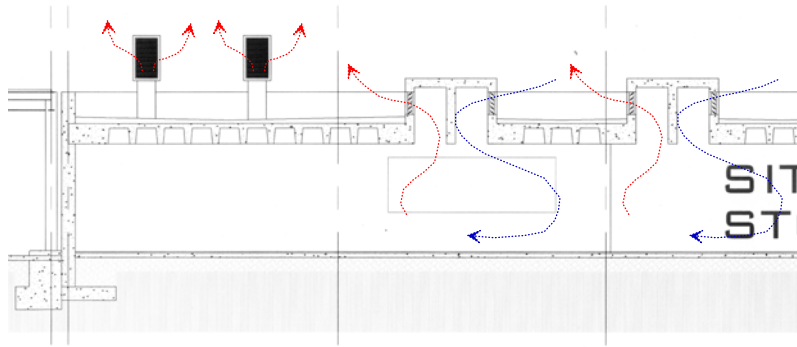


Fig. 6 Section through site support function, indicating predicted ventilation

The natural wind directions on the site were studied to inform the design of the monitor roof structures that serves as ventilators and wind directors.

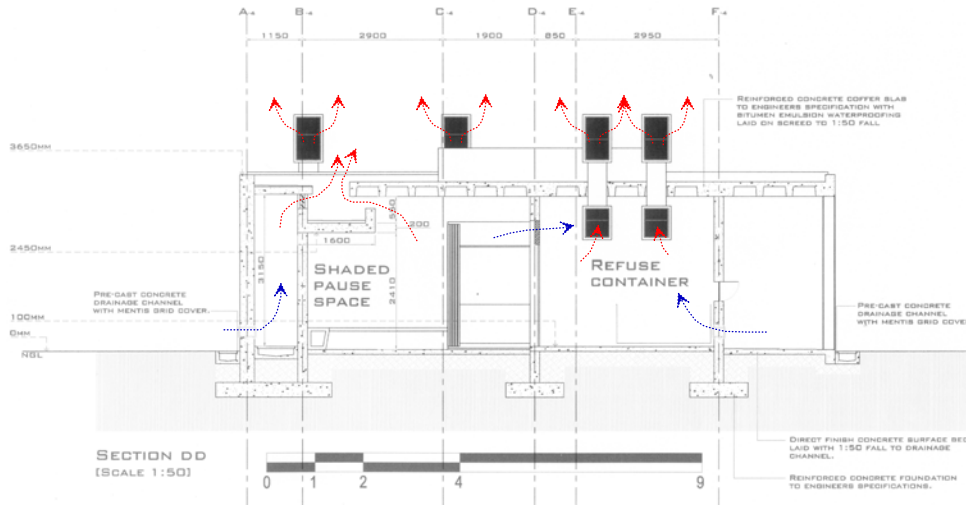


Fig. 7 Section through refuse function, indicating predicted ventilation

The refuse functions are ventilated by means of steel ventilators that rely on the convective properties of heated air. This method requires no electrical power supply input.

SO.1.2 Thermal comfort

Adjustable louver windows in the monitor structures allows building users to control their own environment. The mass quality of the concrete walls also act as thermal stores to create a equilibrium between thermal fluctuations of day and night.

SO.1.3 Views

The views indicated in the concept design is further strengthened in the latest design. Views parallel to the structure and views into the landscape forms an important part of the visitors experience.

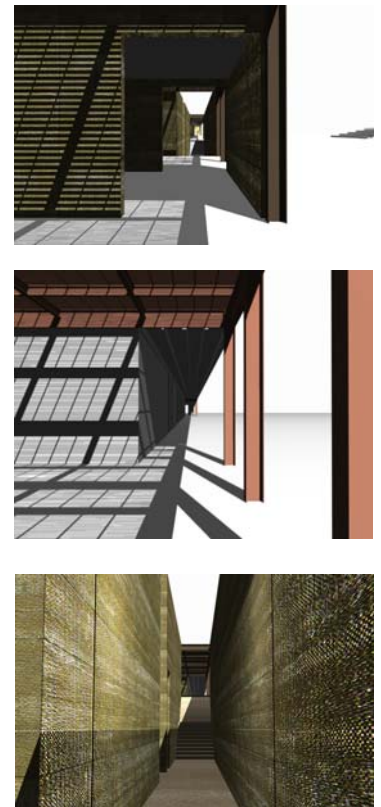


Fig. 8 Various views along the linear route

SO.1 4 Noise

Noise generated by motor vehicles on the R 563 road is the main noise source. To stop unwanted external noise from entering the office, theatre and lecture hall functions, mass wall structures is used in the design to act as deflection screens.

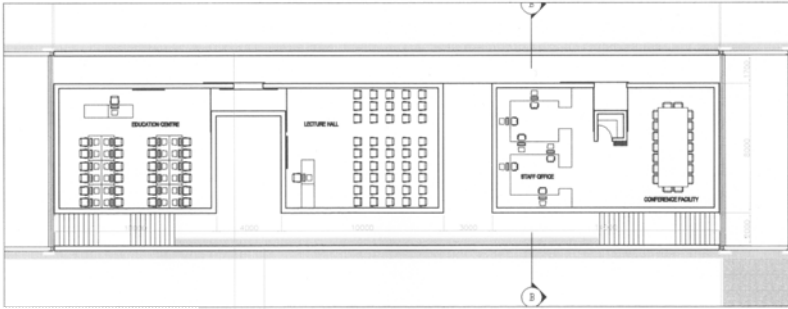


Fig. 9 Plan of education and office functions

SO.2 INCLUSIVE ENVIRONMENTS

SO.2.2 Entrance

The entrance and approach to the building is designed to guide visitors from the parking area to the building. The steel shade structure identifies the reception area and also forms the first social area.

The position and layout of the parking area between the R563 road and the Interpretation centre aims to guide views onto the building as well as into the surrounding landscape.

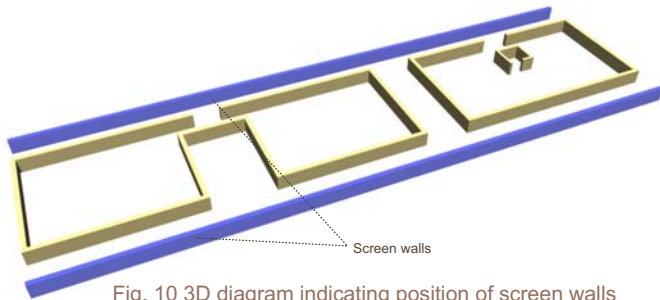


Fig. 10 3D diagram indicating position of screen walls

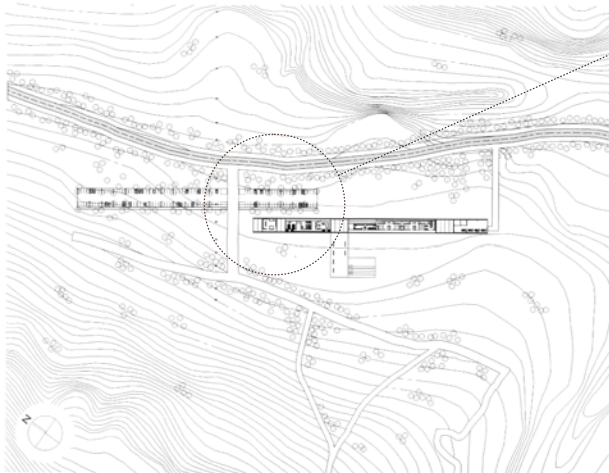


Fig. 11 Site plan indicating position of road relative to the building

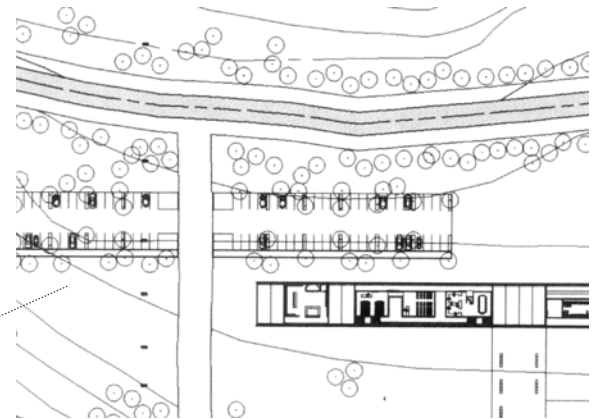


Fig. 12 Plan indicating position of building entrance and approach

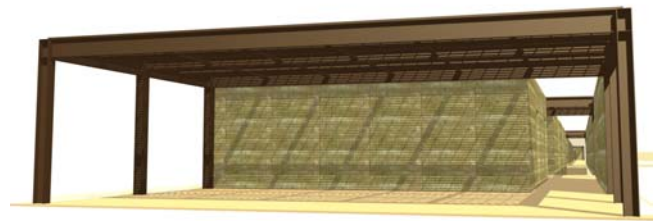


Fig. 13 3D model of building approach and entrance

SO.2.5 Toilets and kitchens

Ablution facilities are located next to the food outlet functions. This includes male/female as well as disabled ablutions. The ablutions are centrally located to facilitate easy access.

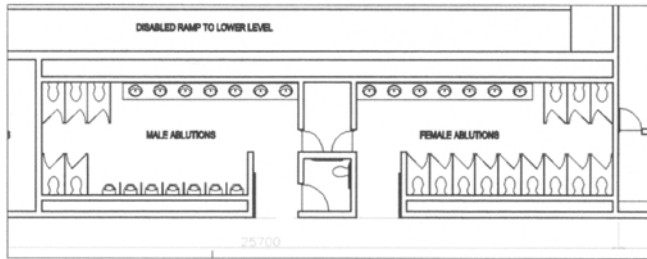


Fig. 14 Plan of ablution function

The kitchen functions forms part of the food outlet function. The equipment will be specialized according to the outlet function and will be supplied by the private businesses hiring the premises.

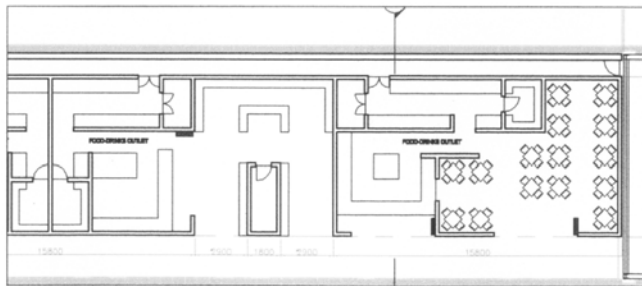


Fig. 15 Plan of food and beverage functions

SO.3 ACCESS TO FACILITIES

SO.3.2 Banking

A ATM machine will be located in the reception and retail facility. This location provides the necessary security required.

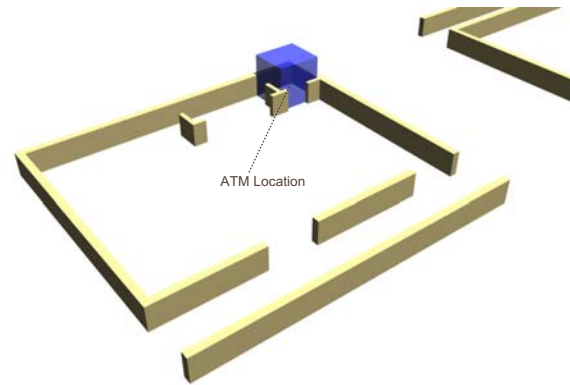


Fig. 16 3D diagram indicating position of ATM facility

SO.3.3 Retail

The retail function is located at the entrance to the facility, this ensures enough visitor exposure as well as security. (see fig. 13)

SO.4.1 PARTICIPATION AND CONTROL

SO.4.3 Social spaces

Social spaces form the transitional spaces between the different functions of the building. Some of these spaces is defined by steel shade structures providing pause spaces. The shade patterns cast by the structures emphasizes the time concept used in the design of the building.

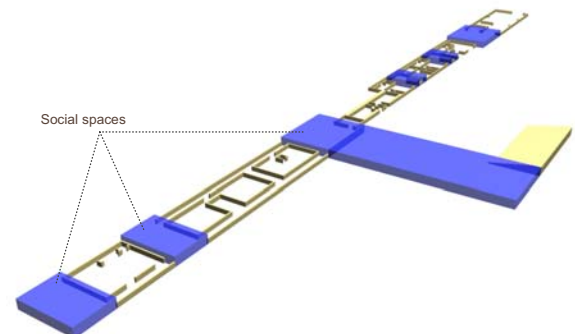


Fig. 17 3D diagram indicating position of social spaces

SO.5 EDUCATION, HEALTH & SAFETY

SO.5.1 Education

The educational function of the facility consists of a commuter laboratory with 24 computers as well as a lecture hall with seating for 45 pupils. This functions is located next to the staff offices to ensure security and supervision.

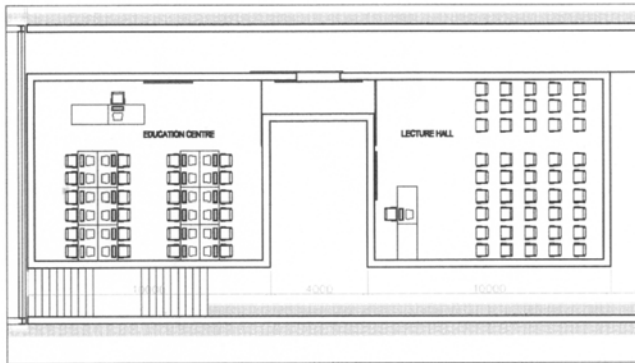


Fig. 18 Plan of education function

SO.5.5 Exercise & recreation

The site activity function is located at the southern most part of the facility with separate access to the R 563 route. From this function, tourists can go on 4x4 open-roof vehicles on drives through the COH WHS. The function also serves as store for equipment that includes off-road bicycles, abseiling and spelunking gear.

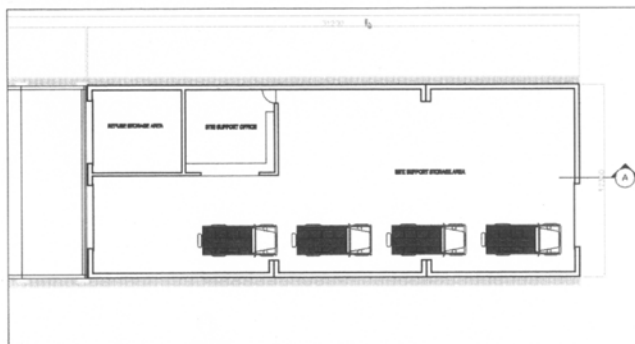


Fig. 19 Plan of site support function

EC.3 ADAPTABILITY & FLEXIBILITY

EC.3.1 Vertical dimension

The vertical dimension of the educational and office functions is 2470 mm and the floor to ceiling space of the exhibition areas is 3640mm. This heights allow for multi-functional uses. The height in the exhibition areas allow for different exhibition material to be displayed. The scale of the interior spaces adds to the visitor experience of the building and confronts the visitor in the context of the site.

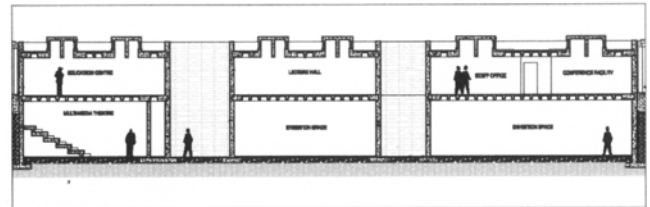


Fig. 20 Section indicating vertical dimensions

EC.3.2 Internal partitions

Movable partitions is used in the office function to separate the office function from the conference function when needed. This makes the multi-functioning of the different spaces possible according to need. Partitions will also be used in the exhibition areas, but this will be done according to the specialists that coordinate the exhibition display.

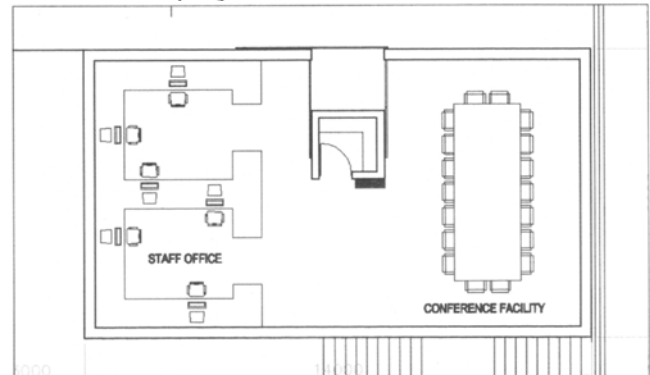


Fig. 21 Plan of office and conference facilities

EC.3.4 Structure

The main building structure consisting of a linear fragmented arrangement of functions is retained as proposed in the concept design. These linear functions is divided by steel shade structures. The building is laid out on two levels with a ground floor level and a sub-surface level housing the multi-media theatre and exhibition spaces. The walls and roofs is constructed of reinforced off-shutter concrete. The roof structures is of coffer slab construction. The shade structures is assembled of steel sections with louver modular units bolted to the super structure. The steel is galvanized and finished with a powder coating.

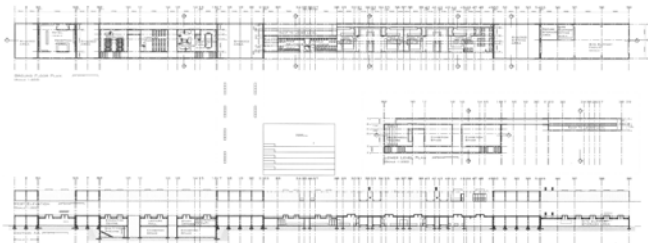


Fig. 22 Plans, section and elevation of building

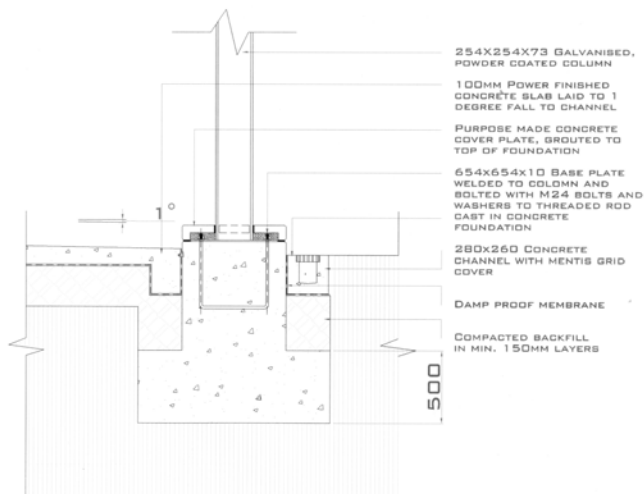


Fig. 23 Detail of shade structure foundation

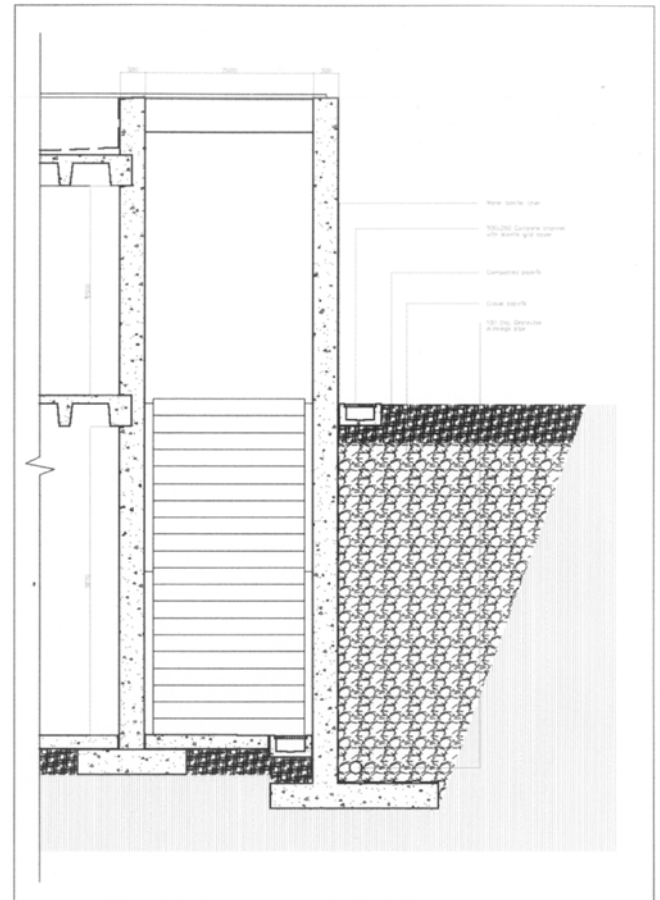


Fig. 24 Detail through retaining wall structure

EC.4 ONGOING COSTS

EC.4.1 Maintenance

The materials chosen for the construction of the facility ensures hard wearing surfaces and requires very little maintenance. Any maintenance required can be done by untrained labor.

EN.1 WATER

EN.1.1 Rainwater

Rainwater falling on roof surfaces will be collected and stored for use in the cultivation of produce next to the centre.

Potential annual rainwater harvesting volume

Total roof area =1677m²
 Approximate annual rainfall =767mm
 =1677 x 0.767
 =1286.26m³
 =128 626L

Highest monthly rainfall (January) harvesting for sizing of storage container

Total roof area =1677m²
 Rainfall in January =146mm
 =1677 x 0.146
 = 244.842m³
 =244 842L

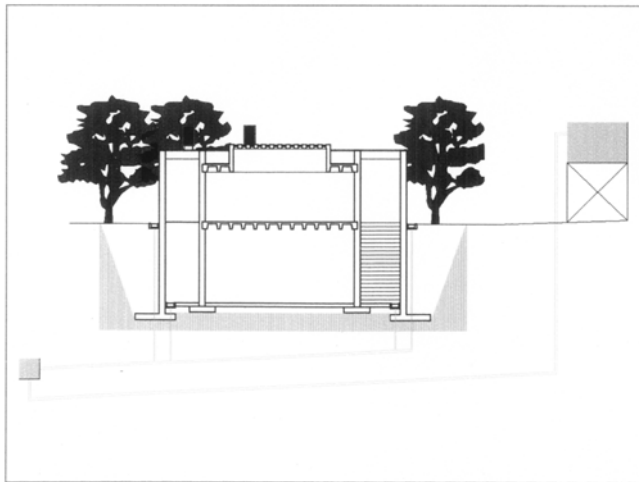


Fig. 25 Section indicating rain water capture and storage system

The rainwater collection system consists of a water level activated pump that pumps rainwater to a higher collection tank situated near the produce crop lands. The rainwater is transported in galvanized steel pipes.

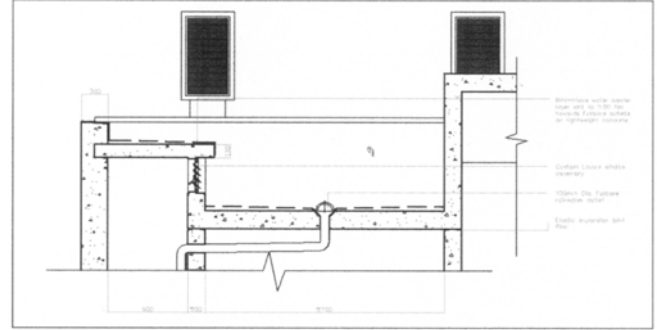


Fig. 26 Detail indicating drainage method from flat roofs

EN.1.4 Runoff

The parking area and the open social area between the main building and the open air amphitheatre will be paved with pervious grass/concrete blocks. This blocks will allow infiltration of rainwater and prevent erosion.

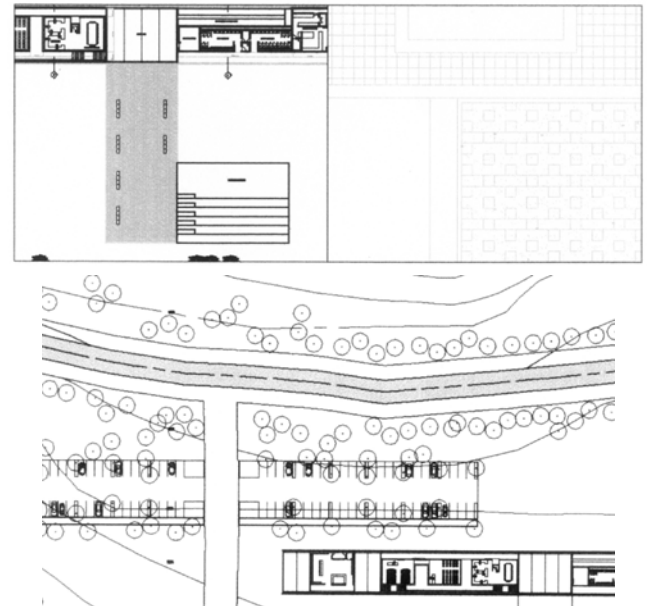


Fig. 27 Plans and detail of paved areas

EN.2 ENERGY

EN.2.5 Energy sources, renewable energy

Approximate annual electricity use of building

Predicted electricity use of centre	=200kWh.m2.a
Total building area	=1677m ²
	=200 x 1677
	=335 400kWh.a
Electricity use per day	=335 400/365
	=918 kWh

Possible solar power potential in site area

Potential	=1943kWh/m ² /a
Daily potential per m ² panel area	=1943/365
	=5.3kWh

Solar panel area required

$$=918/5.3$$

$$=173\text{m}^2$$

EN.3 WASTE

EN.3.4 Sewerage

A Septic tank in combination with a wetland construction is proposed to break down the sewerage before it is released into the stream.

The capacity of the septic tank will need to be about 30 000L, and the capacity of the wetland about 70 000L. The sewerage will be contained in the septic tank for 2-3 days before it is released into the wetland construction where it will be for 5-7 days.

The septic tank as well as the wetland will be sealed to avoid contamination of the produce cultivation.

EN.4 SITE

EN.4.5 Construction processes

Modular construction systems is used in the construction of the steel shade structures. As far as possible, all the steel components will be bolted together to allow for easy disassembly and reuse in future.

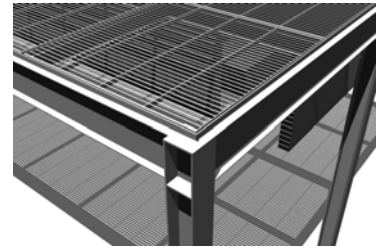


Fig. 28 Detail of shade structure

EN.5 MATERIALS & COMPONENTS

EN.5.3 Manufacturing processes

The main building material used in the construction of the centre is in-situ concrete. This construction method will use only reusable shuttering equipment to lower environmental impact. The flat roofs of the facility will consist of coffer slabs constructed with reusable plastic domes.



Fig. 29 Structure slice indicating materials and assembly

	Area m ²	Quantity	Function of space	Finishes	Special equipment	Light levels-	Norms & standards SABS 0400
Visitor info point	12.5	1	Point providing visitors with info concerning facility	Tiles, concrete walls, timber counter	Signage, computer system, intercom system	150	Part B, C, D3, DD2, DD3, H, J, K, L, M, N, O, SS1-SS4, SS7, T, U, W
Transport hub	293	1	Vehicular pick-up, drop-off point	Hard paving	Signage	150	Part B, C, D3, DD2, DD3, H, J, K, O, SS1-SS4, SS7, T, U, W
Orientation & exhibition	171	1	Permanent and temporary exhibition space	Tiles, concrete walls, timber-steel exhibition equipment	Audio-visual equipment, intercom system, special lightning effects	500	Part B, C, D3, DD2, DD3, H, J, K, L, M, N, O, SS1-SS4, SS7, T, U, W
Education centre	171	(100 p) 1	Facility presenting educational activity programmes for school children, computer room, lecture room	Tiles, concrete walls, timber-steel computer stand equipment	Computer network point, audio-visual equipment	500	Part B, C, D3, DD2, DD3, H, J, K, L, M, N, O, SS1-SS4, SS7, T, U, W
Field & site support facility	30.2	1	Recreational site activities centre, e.g hiking, mountain biking, 4x4 trails, horse riding, rock climbing, caving,	Tiles, concrete walls,	timber-steel equipment shelving-stands	500	Part B, C, D3, DD2, DD3, H, J, K, L, M, N, O, SS1-SS4, SS7, T, U, W
Conference centre	50	(25 p) 1	Conference function	Carpet, acoustic wall-ceiling finish	Audio-visual equipment, intercom system, special lightning effects	750	Part B, C, D3, DD2, DD3, H, J, K, L, M, N, O, SS1-SS4, SS7, T, U, W
Restaurant & food outlets	306	6	Sit down and take away food outlets	Tiles, concrete walls, timber-steel computer stand equipment	Computerised till point	300	Part B, C, D3, DD2, DD3, H, J, K, L, M, N, O, SS1-SS4, SS7, T, U, W
Outdoor amphitheatre	270	(min 300 p) 1	Multi-function gathering space	Hard paving-seating-stage area	Audio-visual system	100	H, J, K, M, R1, RR2, RR4-RR6, SS1-SS4, SS7, T, U, W
Retail outlet	105	1	Curio's, Gifts, Branded merchandise	Tiles, concrete walls, timber-steel counter-shelving	Computerised till point	500	Part B, C, D3, DD2, DD3, H, J, K, L, M, N, O, SS1-SS4, SS7, T, U, W
Admin Offices	50	(4+2) 6	Office space for various trust members	Tiles, concrete walls, timber-steel office furniture	Computer network point	500	Part B, C, D3, DD2, DD3, H, J, K, L, M, N, O, SS1-SS4, SS7, T, U, W
Ablution	82.8	(max 300 p) 2	Male, female, disabled ablution facilities	Tiles, concrete walls, timber-steel partitioning	Water saving equipment	100	Part B, C, D3, DD2, DD3, H, J, K, L, M, N, O, P, SS1-SS4, SS7, T, U, W
Parking	3346	Cars-144, Buses-6	Parking	Hard paving	Signage, lightning	150	Part B, C, D3, DD2, DD3, H, J, K, O, SS1-SS4, SS7, T, U, W

Fig. 30 Accommodation schedule

ESTIMATED BUILDING COST

	Area m ²	Cost per m ²	Cost of Function
Visitor info point	12.5	2200	27,500
Transport hub	293	1610	471,730
Orientation & exhibition	171	6000	1,026,000
Education centre	171	2380	406,980
Field & site support facility	30.2	2200	66,440
Conference centre	50	2800	140,000
Restaurant & food outlets	306	4500	1,377,000
Outdoor amphitheatre	270	1610	434,700
Retail outlet	105	3000	315,000
Admin Offices	50	2800	140,000
Ablution	82.8	2500	207,000
Paving	5871.6	800	4,697,280
Total Cost:			R 9,309,630.00

Fig. 31 Table of estimated building cost

MANAGING STAKEHOLDERS

	POWER			LEVEL OF CONCERN			
	Influence on others	Direct control of labour	Y-Axis	Technical	Social	Environmental	X-Axis
STAKEHOLDERS	0.35	0.65		0.2	0.4	0.4	
A. DACEL	5	0	1.75	1	3	4	3
B. Wits	3	0	3.35	2	1	5	2.8
C. Fossil Site Landowners	2	0	0.7	0	2	5	2.8
D. VIP Licence Holders	0	0	0	0	3	3	2.4
E. Local Community	1	0	0.35	0	5	2	2.8

Fig. 32 Table of management of stakeholders

STAKEHOLDER HIERARCHY

		Level Of Concern										
		0					2					4
Power	4											
	2											
	0											

Fig. 33 Table of stakeholder hierarchy

RISK MANAGEMENT

Risk	Probability	Impact	Factor (Pxl)	Risk Catagorizing
Financing	1	5	5	Low
Fire	2	5	10	Med
Vandalism	1	1	1	Low
Construction difficulties	3	4	12	Med
Unknown soil conditions	2	4	8	Med
Legal-Heritage Acts	1	4	4	Low
Community acceptance	1	4	4	Low
Crime	3	4	12	Med

Fig. 34 Table of risk management

Construction Delays

An important risk is construction delays that can be caused by unforeseen material shortages, site labor problems, construction techniques and the physical distance of the site from material supply centers. This risk could be managed by employing experienced construction management personnel. A study in the availability of building materials could be done prior to the start of construction work.

Crime

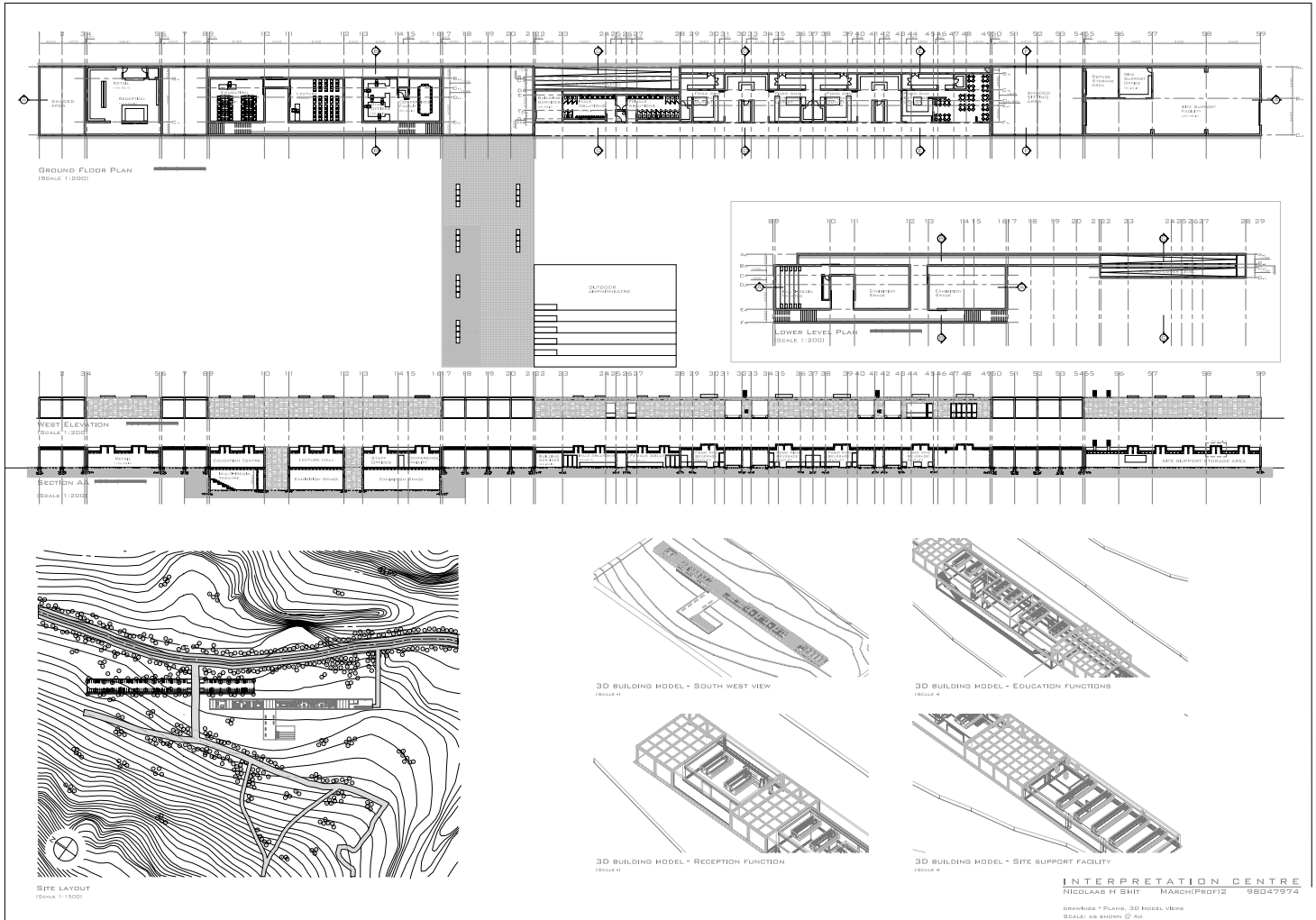
The level of isolation and lack of use of the building during nighttime is a weak point in the security program. Alarm systems and guard patrolling will need to form part of the security program. Information regarding the location of the nearest police station and medical facilities could be provided at the Visitor Info Point.

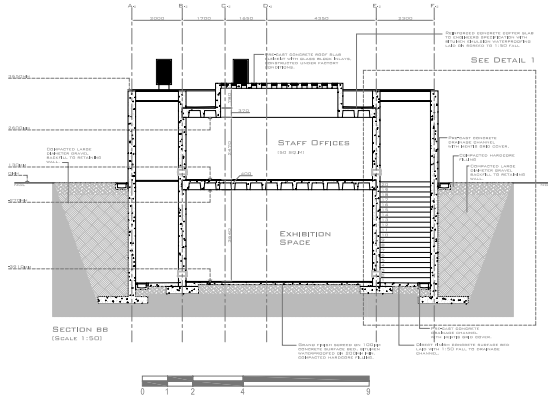
Fire

The location of the building in the natural environment, surrounded by plant material puts it at risk of run-away fires. The design of the building had to make provision for emergency exits. Fire hose reels as well as extinguishers must be visible and accessible. Training of the facility staff in emergency procedures must form part of their basic training program.

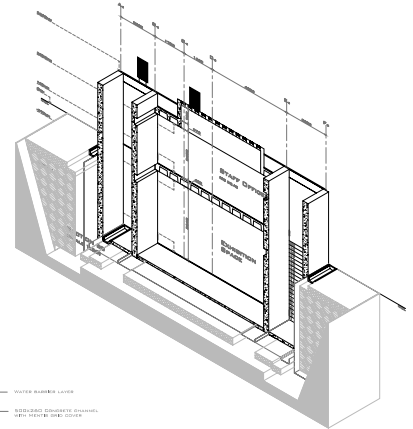
Soil Conditions

Soil conditions and the stability thereof should form part of the pre-design phase of the project. The steep slope of the site and the stability of the topsoil must be assessed to plan soil erosion prevention strategies. Construction techniques should be planned to disturb the existing, natural quality of the site as little as possible.

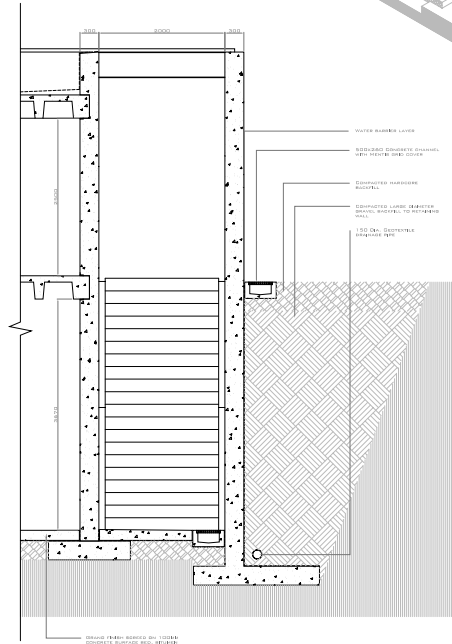




SEC DETAIL 1



EXTRUDED SECTION INDICATING POSITION OF WATERPROOFING MEMBRANE (DETAIL 01)



PARTIAL SECTION INDICATING FOUNDATION DETAIL (DETAIL 1) SCALE 1:20

