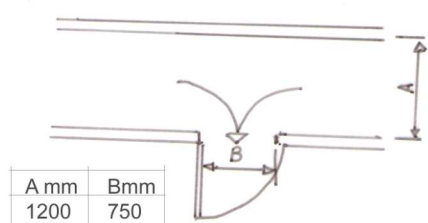


6. TECHNICAL INVESTIGATION

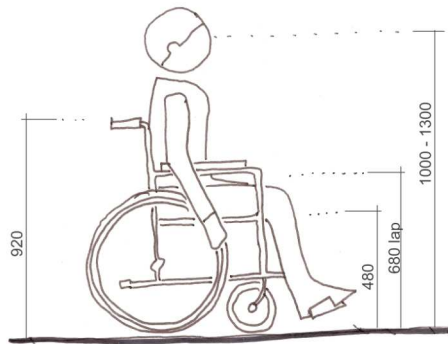
6.1 INTRODUCTION

To know the physical dimensions and proportions of a person in a wheelchair would be the appropriate start for the technical investigation for a design for disabled people.

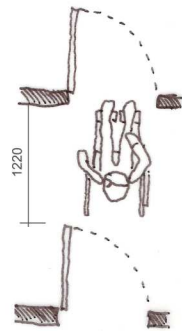
6.1.1 NORMAL WHEELCHAIR MOVEMENT



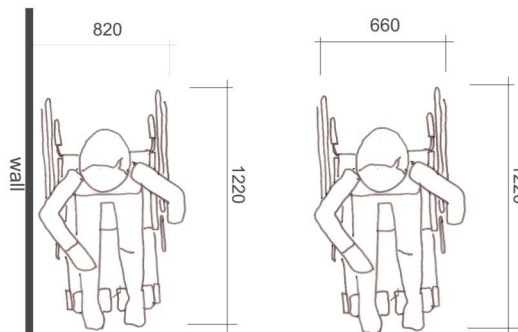
A mm	Bmm
1200	750
1100	850
1050	900
1000	950
950	1000
900	1050



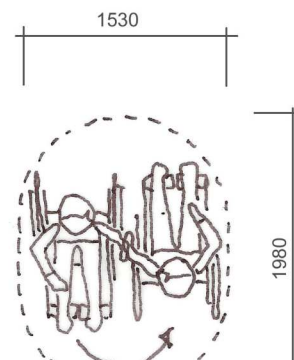
Height ergonomics of person in wheelchair



Movement dimension of wheelchair



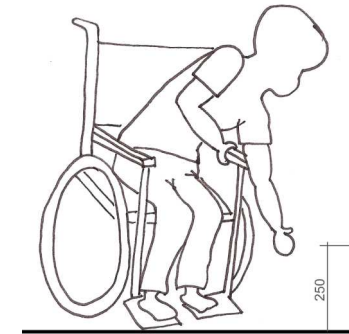
Top view of person in wheelchaire



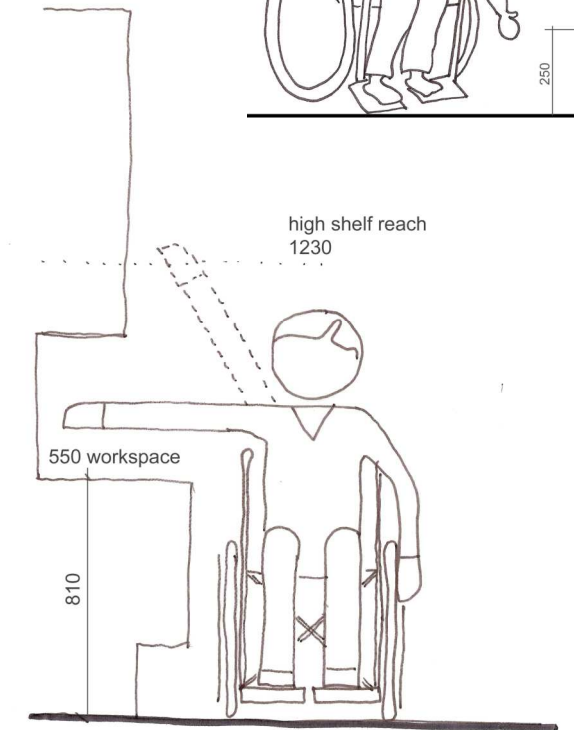
Pictures from:McMorrough J. 2006:84

SABS 0246

People in wheelchairs have different reach than able bodied people.



high shelf reach 1230



**6.2 ACCESSIBILITY, MOVEMENT
AND FUNCTIONALITY**

6.2.1 PARKING & SIDEWALK

PARKING:

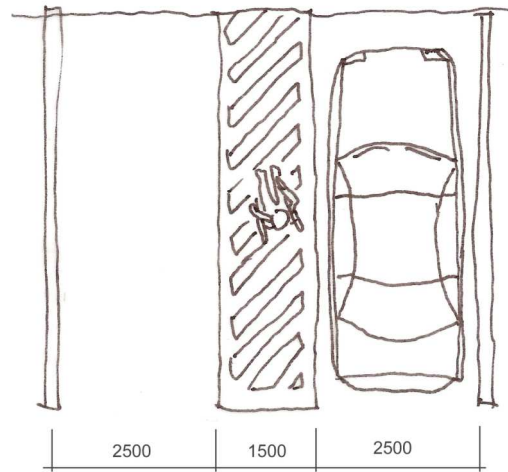
Adequate parking will be allowed for people in wheelchairs. 1500 mm Wide transfer zones should be yellow cross hatch road markings. Disabled parking spaces should be clearly marked on the ground and at eye level.

DROPPED CURB:

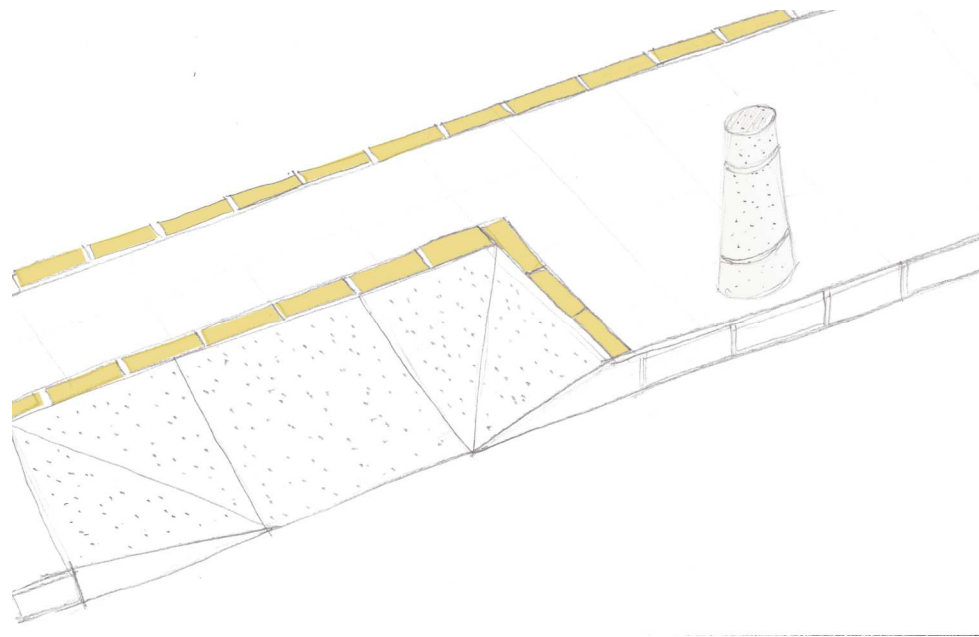
A dropped curb needs to be provided for disabled people, specially those in wheelchairs, to move from the parking area towards the pathway leading towards the building entrance.

BOLLARDS:

Protect pedestrians and playing children from vehicles in waiting park area and thus creating a definite separation between parking area and waiting park.



Parking layout



Drop curb

6. TECHNICAL INVESTIGATION

LIGHTING:

Sufficient lighting need to be provided from the parking area towards the entrance of the building. The lights indicate direction of movement. Light also make possible danger areas such as water features, level changes and balustrades visible to the visitor.

PAVING:

Ground under paving to be well compacted and leveled for sufficient drainage. Surfaces should not have sudden level changes of unprotected gaps.

RAMPS:

For two users to pass each other, a ramp needs to be 1800 mm wide. Minimum 1 m high balustrades on 75 mm up stand edge to be provided on both sides of main ramp.

Gradient: 1:20 at main ramps

1:15 at drop-off ramp

1:10 at parking areas

All ramps should be of a non-slip surface.

MOVEMENT SURFACES:

Provide a non slip exterior walkway. It should be standard practice to assist disabled people by indicating any change of surface and level. For the sensory development concept of this building it would appropriate to use different

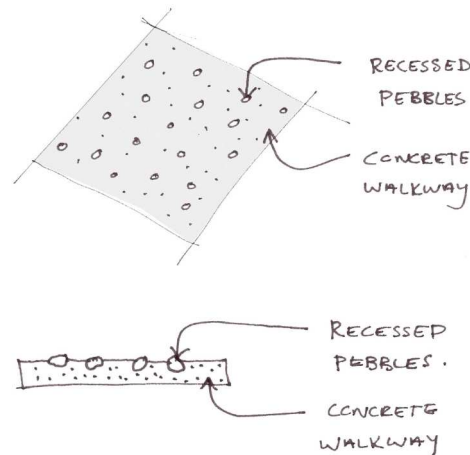


Figure 105. Walkway surfaces

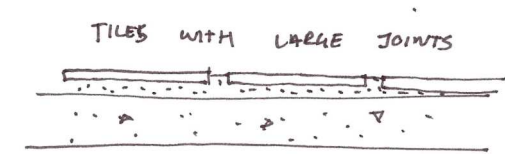


Figure 106. Walkway surfaces

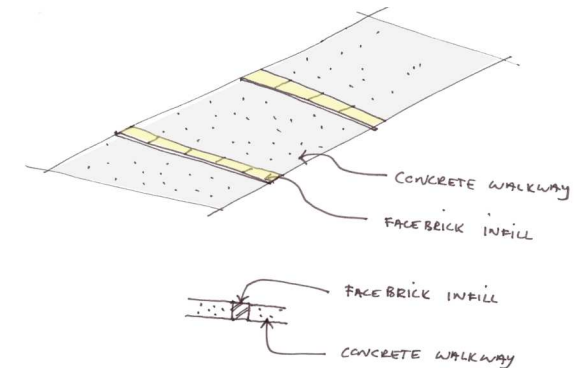


Figure 107. Walkway surfaces

walking surfaces to create different feeling sensations through the wheelchair.

VENTILATION

The simplicity of the architecture using natural ventilation would be used throughout the building.

Wind blowing from the north-east over waterkloof spruit will cool down the northern and western wing of the building .

Minimum mechanical ventilation would be provided for pool areas, care rooms, play areas and consulting rooms.

WATER COLLECTION

Rainwater to be captured on combination of chromadek and concrete roofs and channeled away through PVC rainwater down pipes towards an underground water storage system located underneath the physical therapy timber deck. This water to be used for irrigation of landscapes.

FIRE

The escape routes are in accordance with section T of the National Building Regulations. An escape route may not exceed 15 meters in one direction. Once in an escape route, two escape options exist. The total length of the escape route plus the emergency route to a safe point outside the building does not exceed 45 meters.

Fire hydrants to be placed according to section T of SABS.

Emergency sprinkler system will be installed throughout the building.

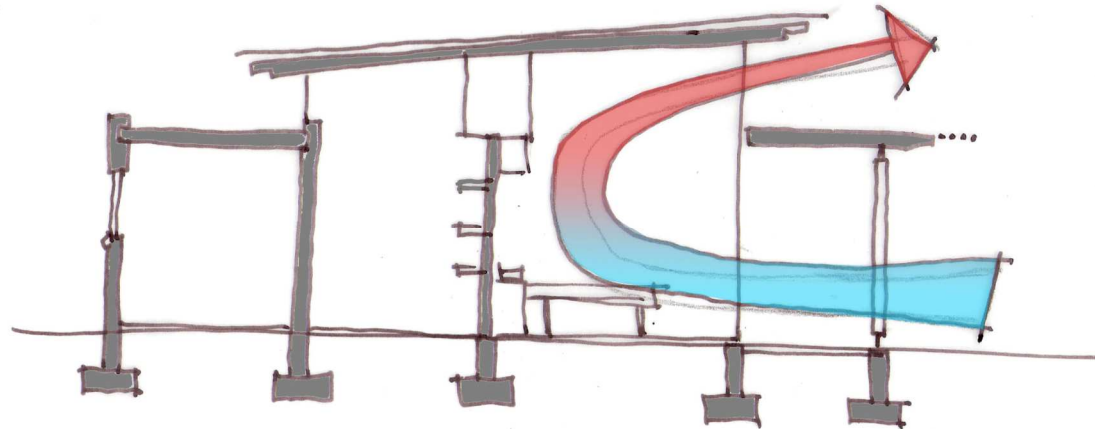


Figure: typical section indicating natural ventilation in building

6.3 ENTRANCE

The walkway to the entrance is of integral importance to create a sense of arrival.

AUTOMATIC SLIDING DOORS:

Contribute to universal design and easy access to the buildings. Sliding doors are better used in walkways for preventing accidents. Glazed areas should be sandblasted to prevent accidental collisions.

ORIENTATION:

When entering the main entrance the reception is straight in front of the visitor. Information boards and building maps indicate the location of the various facilities, as well as visible qualities of these spaces.

When standing at the reception the visitor is able to see the play area in front of them, the lounge to the right and the specialized play area to the left.

The play area forms the center of the building footprint and creates a great orientation element for any visitor.

LIGHT:

The entrance will have sufficient natural light to lessen the contrast between exterior and interior.

- Entrance Hall: 200 lux



ACOUSTICS:

With the entrance to the building the visitor will hear the sounds of play and laughter of children playing.

Acoustics according to SABS 0103

MATERIALS:

Glass, steel, timber and concrete are the main materials used in the entrance hall.

Raw timber profiled concrete wall to the back of the reception desk provides privacy for the receptionist. The desk itself has no sharp edges.

Non slip floor finish is used, but also not too porous tiles for example sandstone tiles. These tiles tend to get dirty from wheelchair marks and are very hard to clean.

SIZE:

There should be more than enough space for a medium flow visitors. The reception is an orientation space and acts as a transition area between the northern and southern wing of the building.

6.4 RESTAURANT AND LOUNGE

AREA

The restaurant and lounge area is used for social and educational purposes.

MOVEMENT AND ACCESS:

Movement between tables and chairs is easy and economical. Tables have central legs to create no obstruction for wheelchair users.

VENTILATION:

The simple and honest architectural style used for this building makes it easier to use natural ventilation only.

LIGHT:

Social area: 100—300 lux

The use of large glass facades facing the north provides this area with ample natural sunlight during the day time.

ACOUSTICS:

Sounds of play and laughter will be heard in the background coming from the central play area.

Natural sounds like birds in the trees, water flowing in Waterkloof stream and the breeze blowing through grass is heard from the lounge and restaurant area.

Natural timber ceilings with a soft underlay will soften sounds from rain and access sharp noises.

Acoustics according to SABS 0103

6.5 KITCHEN

LIGHT:

Task lighting of 150 – 300 lux to be provided. The kitchen will be provided with natural sunlight through the glass façade facing north but will be partially protected by the large existing trees.

VENTILATION:

An extractor fan is used to ventilate the cooking area in the open plan kitchen.

Natural ventilation is used throughout the restaurant, kitchen and lounge area.

OTHER:

Open plan kitchen counter tops to have rounded edges and minimum 850 mm high to accommodate bar fridges. Service counter not to be higher than 1200 mm. Non slip flooring should be used.

6.6 OFFICE AREAS

LIGHT:

500 lux needed for office area. Northern sun through top window provide good natural light into office area .

Glass façade to the east will also provide the office with morning sun into space. Interior timber louvers provide protection from sun.



ACOUSTICS:

The use of carpets and primary natural timber ceilings in the offices dampen noise.

Acoustics according to SABS 0103

VENTILATION:

Windows north, east and south provide the office space with natural cross ventilation.

PLACEMENT:

The office area is located on the most eastern corner of the building layout which is close to the office space of the existing school building. The rehab centre would operate as a function of New Hope School, thus the offices of the new and old buildings should be near each other for easy management.

6.7 POOL AREA

The pool area consist of 2 parts.

- Heated pool for exercise and physical therapy
- Hydro therapy pool for private therapy sessions

LIGHT:

100—300 Lux.

Northern glass facades allow for natural light to penetrate the pool areas. Timber slats screen will protect the pool area from glare and too much heat infiltrating the space.

No task lighting needed

MATERIALS:

Non slip natural sandstone tiles around the pool areas.

Steps in the pool would be clearly indicated with coloured imbedded pebbles.

Up stand wall around hydro therapy pool to be non slip (imbedded pebbles).

Glass dividing the pool areas from the lounge to be safety glass according to SABS 0400 part N .

Glass to be sandblasted to provide the pool area with semi-privacy properties.

Sandblasted glass makes the glass wall visible in preventing people from bumping into it.

ACOUSTICS:

Natural timber ceilings in combination with suspended rhino board ceilings dampen sound.

VENTILATION:

Natural ventilation

6.8 PHYSICAL THERAPY AREA

MATERIALS:

Large glass facades according to SABS 0400 part N.

LIGHT:

100—300 Lux.

Physio office: min 500 Lux

Northern glass façade allows natural sunlight into the physical therapy area.

Large existing trees and timber slats screens protect the physical therapy space from too much heat entering through the glass façade.

ACOUSTICS:

Carpets and stretching mats and natural timber ceilings to dampen sound.

SIZE:

Physical therapy area to accommodate small open plan office, 2 massage beds, 4m x 4m stretching mat, walking frame, treadmill and gym bicycle.

VENTILATION:

Natural cross ventilation is possible with the breeze flowing in from the northern side end exits at the western side.



6.9 PLAY AREAS

- A Free play area interior
- B Free play area exterior
- C Specialized play area

A) FREE PLAY AREA:

LOCATION:

This area forms the centre of the building and visually and functionally integrates this space with the rest of the building. The interior and exterior play areas to function as one with easy movement between each other via electronic sliding door.

MATERIALS:

The use of structural columns with glass infill and large openings on both northern and southern sides, allow the children playing to be seen from all angles. This put the play concept on a stage.

Large glass panels according to SABS 0400 part N.

Structural concrete columns and slabs according to engineer.

Carpet to be industrial type to accommodate wheelchair using.

LIGHT:

300 Lux

Natural light to infiltrate from northern, eastern and western sides. Western sun to be screened.

ACOUSTICS:

Large openings towards the lounge area will send the sounds of children's laughter and playing through the social area of the building.

Carpet dampen echo of sounds.

B) FREE PLAY AREA EXTERIOR:

MATERIALS:

The exterior play area to have combination of materials for aesthetic purposes as well as functional purposes. This enclosed exterior space floor finish can not be constructed solely of an heat absorbent material like paving or concrete.

By using soft materials like Masterfibe and with planting of trees, this exterior courtyard would not become a hot spot with an uncomfortable climate.

Using soft materials also reduce glare.

Rainwater to be channeled away from the play area via storm water drains into and underground water tank, which will be used for irrigating the green areas.

MOVEMENT AND ACCESSIBILITY:

Level changes would be indicated with security strips textured by bright imbedded pebbles. These changes not to be a step but rather a small usable ramp from exterior to interior or from play ground to covered walkway.

Masterfibre rubberized flooring to be used for exterior non slip flooring.

Masterfibre can be shaped and sculptured to provide a creative play area which would be safe and easy to move over.



C) SPECIALISED PLAY AREA

LIGHT:

Minimum 300 lux. Task lighting to be implemented at play tables and paint pit.

Natural sunlight to infiltrate space through top windows. Southern private garden to also provide natural light into specialized play area.

Dark room light to have electronic remote controlled dimmer to allow visitors eyes to adjust to change of light on his/her own time. This will also provide a safety aspect in the case where the visitor needs to switch on the light when he/she feels uncomfortable.

ACOUSTICS:

Carpets, natural timber ceilings and rhino board suspended ceilings would dampen sounds.

All windows to be double glazed to prevent outside noise from distracting the child's attention during one on one sessions with the therapist.

VENTILATION:

Although the private garden would provide some passive natural ventilation, the specialized play area would make use of mechanical cooling and heating.

SIZE:

The play area would accommodate maximum three pairs of child-therapist sessions at any one time.

The specialized rooms would only accommodate one pair per session.

6.10 CONSULTING ROOMS

LIGHT:

500 lux

Task lighting needed

Natural light from northern top windows to be provided.

VENTILATION:

Natural ventilation to be provided in all consulting rooms.

ACOUSTICS:

Carpets and natural timber ceilings would dampen sound.

Provide soundproof room in audiologist consulting room.



6.11 CARE ROOMS

LIGHT:

Minimum 300 lux. Task lighting to be implemented at nurses desks and over bed area.

Natural light to infiltrate bedroom and nurses desk area from the north. The covered walkway on the northern side of the care rooms provide protection from too much sunlight during the day.

ACOUSTICS:

Timber blinds and timber ceilings dampen sounds.

Double glazing between nurses desk and bedrooms provide a soundproof area for the nurses to do their own work and have conversations without disturbing the patients.

TV's above beds have earphones for acoustic and privacy properties.

VENTILATION:

Natural ventilation to be provided through northern windows. Cool breeze from over Waterkloof ridge to cool down room area.

Mechanical cooling and heating also to be provided.

6.12 BATHROOMS

The author looked at layouts in various disabled institutes as precedents to understand the detail needed in areas such as bathrooms.

SABS 0246 provided the necessary dimensions and standards required for a functional bathroom design.

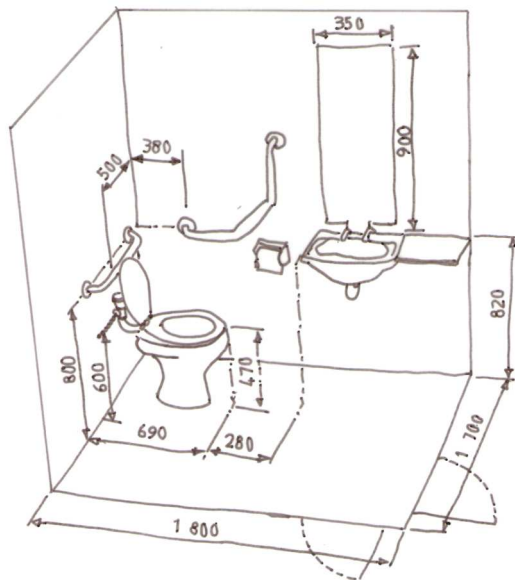
VENTILATION:

Natural ventilation

LIGHT:

100 to 300Lux

MATERIALS:



Drawings from SABS 0246

Non slip flooring, especially in showers.

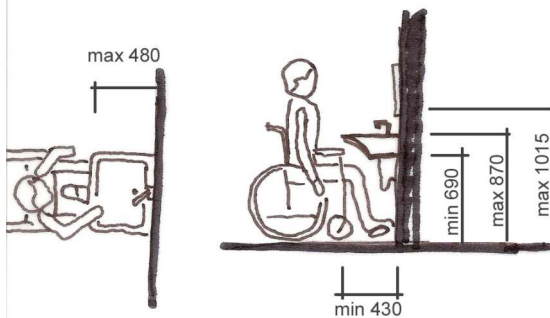
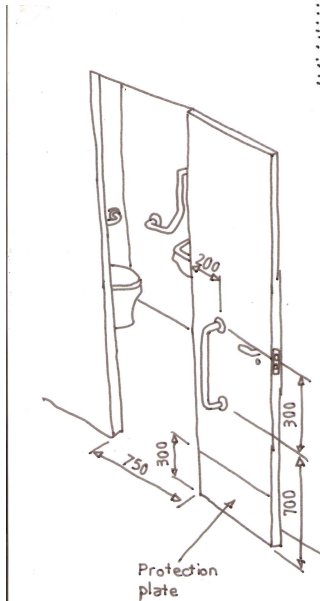
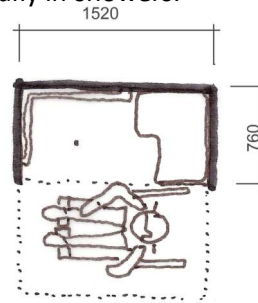


Figure 108. Bath with turn chair



Figure 109. No step in shower, enough space for shower chair



Figure 110. Grab rail for toilet layout

6.13 MATERIALS

CONCRETE

Concrete is used to construct selected roofs, covered walkway roofs, columns and selected walls.

Concrete provides versatility to building.

TIMBER

Natural Meranti timber to be used for ceilings and cladding to high interior walls.

Timber screens are used to protect glass facades from too much sunlight.

FACE BRICK

Clay FBS face brick: Berg en Dal Light Satin

Origin from Witbank, Mpumalanga

The face brick used in the existing School building needs to be respected. Although the existing face brick are not Berg en Dal FBS, this product make a positive connection to the existing school

NATURAL STONE

Natural stone originating from Ohrigstad. This stone to be used in the landscape as well as building screen walls around kitchen yards and private gardens.

These natural stone walls would provide contrast in texture and introduce natural elements into the building.

STEEL

Steel is easy to construct and add versatility with concrete. The use of thin steel columns and steel roof beams provides the opportunity for a light balanced structure with large glass facades that will allow the building and nature to integrate into each other.

GLASS

Glass gives the building a transparent feeling and thus connecting nature with the interior of the building. Tinted glass would reduce glare and heat inside the building. Double glazing also have acoustic properties to block sounds from one room to another.

ROOF SHEETING

Hulabond IBR chromadek roofsheeting will be used to connect to the existing School's architecture.

PLASTERED WALLS

Different textures could be achieved with plaster. Different finishes can be created by using different grain sand in the plaster mixture. Varieties in textures could also be provided by using different objects and techniques to apply the plaster to the walls.

CARPETS

Nylon carpets is the most popular fiber carpets used. This is a synthetic fiber that is durable and easy too clean. The under felt must be chosen to increase resilience and durability. This also reduce sound transmission. (Matthews, 2003:111)

TILES

Slip resistance would be a major factor when choosing a tile especially when disabled people will be moving on these tiles.

The author tested various tiles for slip resistance. Natural sandstone tiles would be the tile the author thought that would be the most slip resistant. However, these tiles does not support easy cleaning especially from wheelchair marks. It would be an option to seal this tile.

PAVING

Raw timber mould to make imprints into concrete walkway creating senses when moving over with wheelchair. The timber texture would also connect the use of concrete to the natural environment.

Berg en Dal clay paving bricks also to be used for paving as a change in pattern of the walkways. This would be used to connect the landscape and the building.

MASTER FIBER PLAYGROUND FLOORING

The external playground is placed between the northern and southern wings. The northern wing blocks the natural flow of wind from the north. This could generate a lot of heat in the playground courtyard.

This is a durable, safety rubber insitu “wet pour” that is a 12 to 45mm seamless application over a concrete screed or any other firm material.

The product is made from recycled materials and is durable, maintenance free, wheelchair resistant and slip resistant. See appendix.

WATER





Water would be used in the landscape to create a form of tranquility and peacefulness. Running or falling water would also be used to create sound and thus testing or stimulating the hearing senses.

GABIONS





Gabions will be used to rehabilitate existing waterkloof stream. Gabion mattresses to be used to create a new lower stream level.

6. FINISHING SCHEDULE






6.14 FINISHING SCHEDULE

MATERIAL/FINISH	SUPPLIER	LOCATION	PHOTO
PAVING			
Concrete interlocking paving	Concor technicrete	All vehicle roads	
Moulded concrete with facebrick joints	Face brick - Corobrick , PPC cement	All walkways towards enrances	
FLOORING TILES			
Natural sandstone tiles	Tile Africa	Passages Lounge and restaurant area Care rooms Waiting area Entrance Patios Pool and Hydro pool area	
Epoxy flooring	Earth cote	Bathrooms Scullary Kitchens	





6. FINISHING SCHEDULE

Carpets	Nouwens Carpets	Offices Play areas	
Masterfibre flooring	Masterfibre Specialist	Courtyard play area	
Timber decking		Open patio restaurant area Open patio care rooms	
COLUMNS			
Concrete	PPC Cement	Main entrance Care and consulting rooms entrances	
Steel IPE sections		As per plan	






6. FINISHING SCHEDULE

WALL FINISHES			
Scratch plaster		All plater walls except special indication	
Concrete walls	PPC Cement	As per plan	
Face brick walls	Corobrick	As per plan	
VERTICAL TILES			
Mosaic tiles	Tile Africa	All reception desks Care room handwash basin splash backs All basin splash backs Showers interior	
Ceramic tiles	Tile Africa	Bathroom walls Scullary walls	



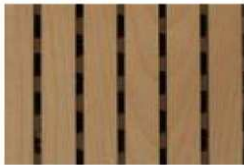



6. FINISHING SCHEDULE

Pool step tiles	Costum made	Hydro therapy upstand beam	
CLADDING			
Timber cladding		All walling above top window sill	
Natural stone	Natural stone warehouse	Yard walling Water feature walling North western loose standing signage wall Pedestrian access gateway Southern boundry wall infill sections	
WINDOWS & DOORS			
doors:			
Automatic glass sliding doors	Frost Automatic	Main Entrances Entrance to pool area Entrances to specialised play area	




6. FINISHING SCHEDULE

Alluminium framed shopfronts	Frost Automatic	All glass facades	
Specialist acoustic doors	Acoustic Systems	Audiologists - sound proof room Music room Access doors to specialised play area	
Alluminium framed interior doors	Frost Automatic	Consulting rooms Offices Care room Kitchen doors	
Bathroom doors		All bathroom doors	
windows:			
Specialist acoustic window	Acoustic Systems	Audiologist soundproof room One way soundproof window between consulting room private lounge and specialised play area Nurses desks towards care rooms Music room exterior windows	






6. FINISHING SCHEDULE

Alluminium framed windows	Frost Automatic	All exterior windows	
Glass curtain walling	Frost Automatic	Surrounding of pool and hydro pool area Infill glass wall between main reception and free play area	
CEILINGS			
Timber ceilings with accoustic underlay		All ceilings except concrete roof ceilings	
Suspended ceilings		According to ceiling plan	 
VANITIES,COUNTERTOPS & BUILD IN SHELVES			
Technistone 30mm solid surfacing	Techni stone	All build in work tops	




6. FINISHING SCHEDULE

60mm Prefabricated concrete shelf	Custom made	All book shelves	
SANITARYWARE			
Hand wash basins	Sanitary warehouse	Care rooms Bath rooms	
Prep bowls	Sanitary warehouse	Kitchen Consulting room private lounge	
Sinks	Sanitary warehouse	Scullary Care area kitchen	
Bathroom accesories	Sanitary warehouse	Bathrooms WC	

6. FINISHING SCHEDULE

Bath	Sanitary warehouse	Bathrooms	
Bath- and Basin Taps	Sanitary warehouse	Bathrooms Care rooms	
Grab rails	Sanitary warehouse	WC Bath rooms Shower rooms	
Shower Tap	Sanitary warehouse	Shower rooms	
Sink Tap	Sanitary warehouse	Kitchen Scullary	

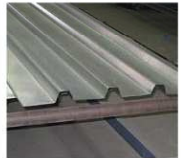
6. FINISHING SCHEDULE

WC	Sanitary warehouse	WC	
SIGNAGE			
Statutory Signage	Fusion signs		
Directional Signage	Fusion signs		
Main building signage	Fusion signs		
WATERPROOFING			
Waterproofing	Metzi Sealants	Roof Pools	


6. FINISHING SCHEDULE

Sealants	Metzi Sealants	Roof Pools	
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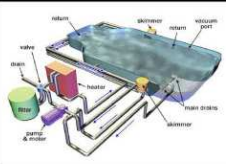
ROOFSHEETING

Roofsheets	Hula Bond	Roofs	
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GABION WALLING

Gabions	Maccaferri Africa	Stream line	
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SERVICE INSTALLATIONS

Grey water tank pump equipment		Pool area	
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Gas installation	The gas company	Kitchen	
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6. FINISHING SCHEDULE

Landscaping			
MISCELLANEOUS			
Ironmongery			
Aluminium ballustrades			 BALCONIES