ARE SOUTH AFRICA'S BUILDING REGULATIONS TRULY CREATING DISABLED FRIENDLY BUILDINGS OR CAN THESE BUILDING REGULATIONS BE IMPROVED ON?

By

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Declaration by student

I hereby confirm that the treatise is my own work and that any sources consulted are adequately acknowledged in the text and listed in the bibliography.

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Signature of acceptance and confirmation by student

Abstract

Title of treatise:	Are South Africa's building regulations truly creating disabled friendly buildings or can these building regulations be improved on?
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Date:	October 2009

The objective of this treatise is to establish whether the building regulations of South Africa create disabled friendly buildings. The building regulations will be assessed to determine whether these regulations can be improved on. The approval process of new buildings will be discussed to determine if strict adherence to create disabled friendly buildings are ensured for new buildings. The conversion of existing buildings into disabled friendly buildings and the cost implication thereof will also be discussed. Finally, the building regulations of South Africa are compared to the United Kingdom's building regulations.

Chapter 1
Introduction

1. A brief overview on the topic

After the 1994 elections, South Africa was faced with a challenge which it is still faced with today. Not only for a democratic country but a country where no matter what colour one is or disability one has, equal human rights exist for all people in South Africa. The apartheids era has left scars on the lives of many people, including those who have disabilities. South Africa's constitution has made a point of seeing to it that disabled people will have the same rights as non-disabled people which includes various rights such as easy access to buildings, job opportunities, the right to receive higher education etcetera.

According to Statistics South Africa's 2001 Census, the total number of disabled persons where 2,255,982 (two million, two hundred and fifty five thousand nine hundred and eighty two). This accounted for five percent of the population in 2001. There are different types of disabilities and some which will have no effect on the person's accessibility to buildings. These people are however the minority of the disabled group. That is why it is important to ensure all people have easy access to buildings.

(www.stats.gov.za, 27 Feb. 2009)

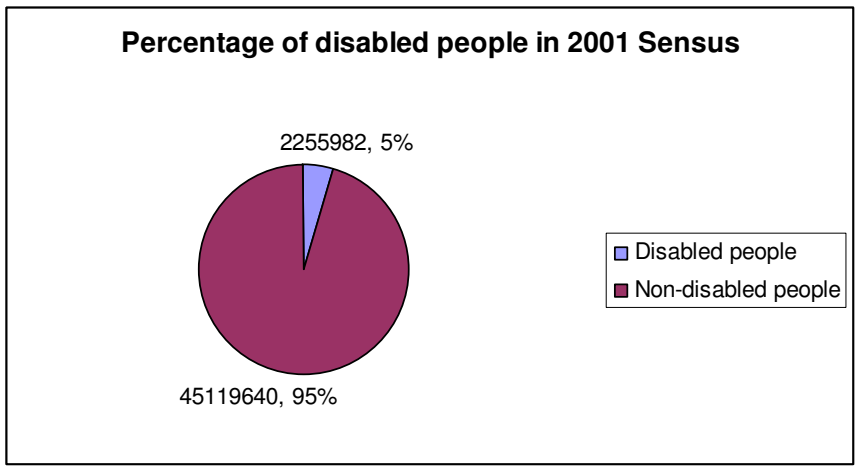

Figure 1: Percentage disabled people in South Africa

(Source: www.stats.gov.za, 27 Feb. 2009)

The National Building Regulations in South Africa make provision for public buildings to be constructed to conform to minimum standards. This results in the construction of disabled friendly buildings. How far and if the regulations are sufficient will be looked into in this treatise.

The local authority imposes certain requirements for the approval of building plans. These requirements include the safety of the building inhabitants, access to basic hygiene, fire escapes in the case of multi storey buildings and access for disabled people. The approval process and requirements will be addressed.

The conversion of existing buildings into disabled friendly buildings will be looked at. Is it possible and what complications can arise? The cost involved in this conversion will also be looked at.

South Africa has a very strong constitution which caters for the rights of its people. The question is how do we compare with England regarding accessibility to buildings for the disabled?

2. Statement of the main problem

Are South Africa's building regulations truly creating disabled friendly buildings or can these building regulations be improved on?

3. Statement of the sub problems

1. Are South Africa's legislation and building regulations catering for the disabled regarding accessibility to buildings?

2. Does the approval process of new building plans provide for strict adherence to ensure the construction of disabled friendly buildings where required?

3. Can existing buildings be converted into disabled friendly buildings and what are the costs involved?

4. How does South Africa's building regulations compare to England's building regulations regarding disabled friendly buildings?

4. Statement of the hypotheses

4.1. Sub problem : Are South Africa's legislation and building regulations catering for the disabled regarding accessibility to buildings?

Hypothesis : Yes, but there is room for improvement on these regulations especially on existing public buildings. Regulations and standards set out the minimum requirements necessary to ensure accessibility of the building.

4.2. Sub problem : Does the approval process of new building plans provide for strict adherence to ensure the construction of disabled friendly buildings where required?

Hypothesis : Yes, all the new buildings to be constructed must provide access for the disabled.

4.3. Sub problem : Can existing buildings be converted into disabled friendly buildings and what are the costs involved?

Hypothesis : Yes in most instances, but not in all existing buildings. The cost of altering existing buildings will be higher than if incorporated at the design stage.

4.4. Sub problem : How does South Africa's building regulations compare to England's building regulations regarding disabled friendly buildings?

Hypothesis : On certain levels South Africa compares fairly well but there is still a lot of work to be done on existing public buildings in South Africa.

5. Delimitations

This treatise is limited to available information at the time required. The last census carried out by Statistics South Africa was in 2001. The basic results of the "Community Survey 2007" is available but is only focused on a sample of the population. Thus the "Census 2001" is used.

6. List of abbreviations

NBR : National Building Regulations
SDP : Site Development Plan

7. Importance of study

It is important for building professionals and all the people in South Africa and the world to be aware of the difficulties disabled people face when buildings are not disabled friendly. A revision of the building regulations and standards is necessary if it is not catering for disabled people.

8. Research methodology

8.1 Previous topic used

Previous topic : Access to buildings for the disabled: Barriers faced by disabled persons in the employment sector and the costs

	involved accommodating them due to alterations made to buildings
By	: Z.F. Booysens
Year	: 2005
Approach	: "The study will focus on the cost implications if a building has to be altered after construction phase to accommodate disabled persons in the employment sector versus that of the cost if a building had considered the disabled during the design stage. Barriers in the employment sector cannot be overcome if they have not been identified and insight into these barriers will translate into an enhanced ability to accommodate and overcome them."
Topic for this treatise	: Are South Africa's building regulations truly creating disabled friendly buildings or can these building regulations be improved on?

A different angle is approached in this treatise as it does not focus on the employment of a disabled person. The main focus in this treatise is on the how sufficient the building standards and regulations are in South Africa.

There are various acts and published documents that will be used to do a theoretical analysis of the current building regulations and standards. The internet provides a lot of information on disabilities and universal or inclusive design. Interviews will also be conducted with people involved in certain processes relating to the approval of building plans.

Chapter 2
Are South Africa's legislation and building regulations catering for the disabled regarding accessibility to buildings?

1. Introduction

A disabled person is defined by national legislation as a person that is limited in one or more functional activities which includes hearing, seeing, moving, learning, communicating, intellectual and emotional activities. The disability must have long-term or frequent impairment (physical or mental) that limits the person in certain aspects such as easily entering and circulating in a building.

The constitution of the Republic of South Africa makes provision for disabled people in the "Promotion of equality and prevention of unfair discrimination Act of 2000". The Act states that no person may unfairly discriminate against any person based on disability including denying or removing from any disabled person the right to facilities necessary for their functioning in society. All obstacles that unfairly limit or restrict disabled persons from enjoying equal opportunities must be removed.

(www.info.gov.za, 27 May 2009)

Other legislation available with regards to disabled people:

- Employment Equity Act (EEA)
- Integrated National Disability Strategy (INDS)
- Reconstruction Development Program (RDP)
- Growth, Employment and Redistribution (GEAR), etcetera

2. General information and statistics on disabled people

In 2001 a census was done to determine, amongst other things, the number of disabled persons and the types of disabilities they possess. The total population in South Africa in the 2001 census was 45,119, 640 in comparison to the 2007 census where the population increased to an amount of 48, 502, 063 people. In the 2001 census the amount of disabled persons were 2, 255, 982 which is 5% of the population. The total amount of disabled people in the world today is estimated to be 650 million.

(www.stats.gov.za, 27 Feb. 2009) (www.un.org, 4 Sep. 2009)

There are different types of disabilities each affecting the access barriers for the disabled person in a different way. For example, a deaf person will have no trouble accessing the building but might have a barrier with communication once he reaches the inside of the building. The different types of disabilities are given in the following figure including the percentage of each on the total sum of disabilities.

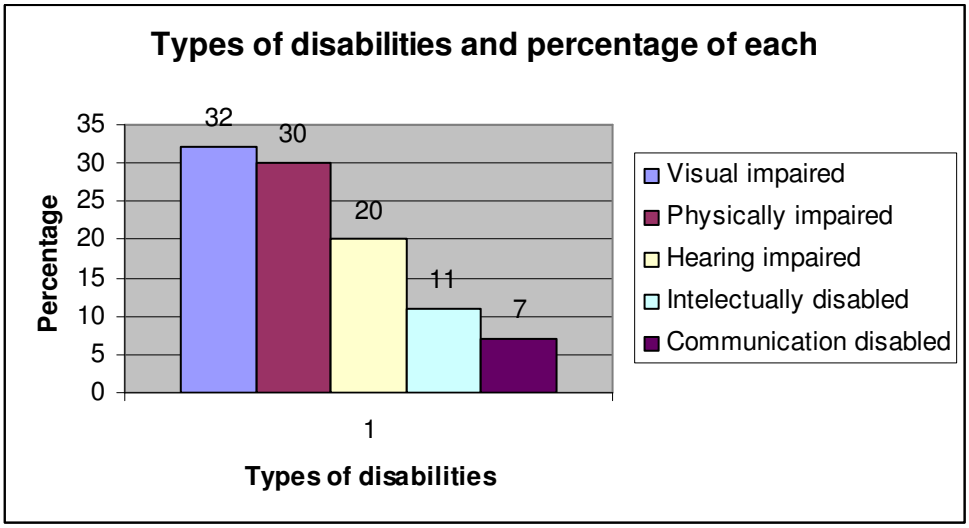

Figure 2: Types of disabilities and percentage of each

(Source: www.stats.gov.za, 27 Feb. 2009)

The following statistics regarding the access to basic services such as housing, water and electricity were also made available in the 2001 Census:

- 53% of households headed by disabled persons live in brick houses
- 37% of households headed by disabled persons live in traditional dwellings, huts and informal dwellings or shacks
- 78% of households headed by disabled persons have access to piped water
- 62% of households headed by disabled persons use electricity for lighting

(www.stats.gov.za, 27 Feb. 2009)

With regards to education only 30% of disabled people had no education while only 13% of non-disabled people had no education.

The percentage of ownership of houses headed by disabled people is given in the following figure.

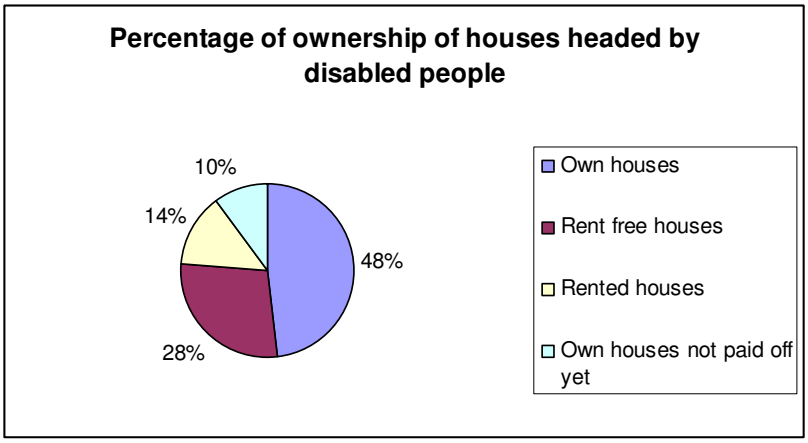

Figure 3: Percentage of ownership of houses headed by disabled people

(Source: www.stats.gov.za, 27 Feb. 2009)

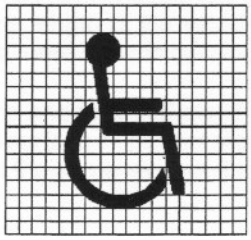

Figure 4: International symbol for accessibility

(Source: Department of Public Works, 2001:12)

3. The National Building Regulations

After 1994 the newly elected government of South Africa concentrated on formulating policies to address inequalities to empower previously disadvantaged groups including disabled people. Compliance to these acts and policies formulated is enforced by law. The NBR is linked to the "Promotion of equality and prevention of unfair discrimination Act of 2000" and is thus enforceable by law.

During 2008 the South African Bureau of Standards amended and revised the SANS 10400 building regulations including the incorporation of new building standards. The changes to the NBR are said to have a significant impact on the building industry in South Africa. The amended SANS 10400 will be published before December 2009.

The reason for the amendment of Part S in particular is because it is not in line with the Human Rights legislation. Part S is also poor in its relationship with Part T (Fire escapes). The question was asked on how much could be changed without the need for an impact assessment. The amendment of Part S now ensures a relationship to:

- Part D : Public Safety
- Part M : Stairways
- Part N : Glazing
- Part O : Lighting and Ventilation
- Part P : Toilet Facilities
- Part T : Fire (new version to include disabled people)

(www.sabs.co.za, 13 Sep. 2009) (Interview: Amanda Gibberd, 9 Sep. 2009)

4. Building classification and application

According to the amended SANS 10400, facilities that accommodate disabled persons shall be provided in all buildings except the following:

4.1. Any building of which the ground storey compromises one or a combination of the following occupancy groups

B1 : High risk commercial service

B2 : Moderate risk commercial service

D4 : Plant room

H4 : Dwelling house

J1 : High risk storage

J2 : Moderate risk storage

4.2. Any occupancy hotel (H1) not being a dwelling unit with less than 25 rooms where persons rent furnished rooms and it can be reasonably proven that it is not possible to include wheelchair access in certain parts of the design

4.3. Any domestic residence (H3) above ground floor level consisting of two or more dwelling units on a single site not provided with a lift

The amended application provides for facilities in all buildings where disabled people are likely to occur.

(South African Bureau of Standards, 1990:34, 35 & 151) (Department of Trade and Industry, 2008:66)

5. Facilities to be provided

5.1. In all the buildings mentioned under the heading “Building classification and application” where facilities for disabled persons are required the following apply:

5.1.1. A disabled person shall be able to have safe access into a building, the use of all the facilities, subject to sub-heading 5.3., and safely leave the building.

5.1.2. Suitable access from the main and additional entrances of the building to the ground floor must be provided for disabled persons.

5.1.3. Suitable egress from any point in a building to a place of safety in the event of an emergency must be provided for disabled persons.

5.1.4. Lift installations (where provided) must be capable of serving disabled persons.

5.1.5. Commonly used travel paths must be free of obstacles and dangers and must allow disabled persons to travel on it. Where obstructions are present it must be made evident to persons with impaired vision.

5.1.6. Any auditorium or hall situated in a building must have access for disabled people including enough open space to facilitate wheelchair users.

5.2. Buildings with facilities for disabled persons where parking is provided for more than 50 motor vehicles and buildings under heading 5.1. must provide adequate parking, inside or outside, for disabled persons including access to the entrance of the ground floor of the building.

5.3. In terms of regulation P1, toilet facilities for disabled persons are required in any building mentioned under the heading “Building classification and application” and have facilities for disabled persons. An adequate number of toilet facilities shall be provided for disabled people. Toilet facilities in buildings classified under H3 (domestic residence not provided with a lift) shall not be required to provide toilet facilities for the disabled in terms of regulation A20.

The amended building regulations set out the minimum requirements for a building that is required to provide facilities for disabled persons. The requirements are comprehensive in that it ensures the total use of the building for the disabled person and must be complied with.

(South African Bureau of Standards, 1990:151) (Department of Trade and Industry, 2008:66 & 67)

6. Design requirements

The SABS 0400-1990 in the National Building Regulations provide design standards that must be complied with. These are called deemed-to-satisfy requirements which state that the facilities must be provided in accordance with SANS 10400-Part S and that egress out of the building in the event of fire must be provided for disabled persons in accordance with SANS 10400-Part T. This part of the SANS 10400 has not been published and is based on the latest version available.

(South African Bureau of Standards, 1990:151) (Department of Trade and Industry, 2008:67)

6.1. Parking

For buildings providing facilities for the disabled or the site on which the building is located on, for parking of more than 50 motor vehicles the following apply:

6.1.1. One parking space per 200 parking spaces or part thereof of the total number must be provided for disabled parking.

6.1.2. The parking space width shall not be less than 3,5 metres, the length shall be approved and the parking bay shall be situated on a level surface.

6.1.3. The parking space should be as close to the entrance as possible and the travel path should be accessible to the disabled person

6.1.4. The parking space should be clearly demarcated for the use of disabled persons only.

(South African Bureau of Standards, 1990:155)

The parking provisions as set out also includes for a maximum distance from the entrance of 50m. It would be preferred to have any building providing an adequate

number of parking spaces and not provide disabled parking in ratios to the parking provided generally.

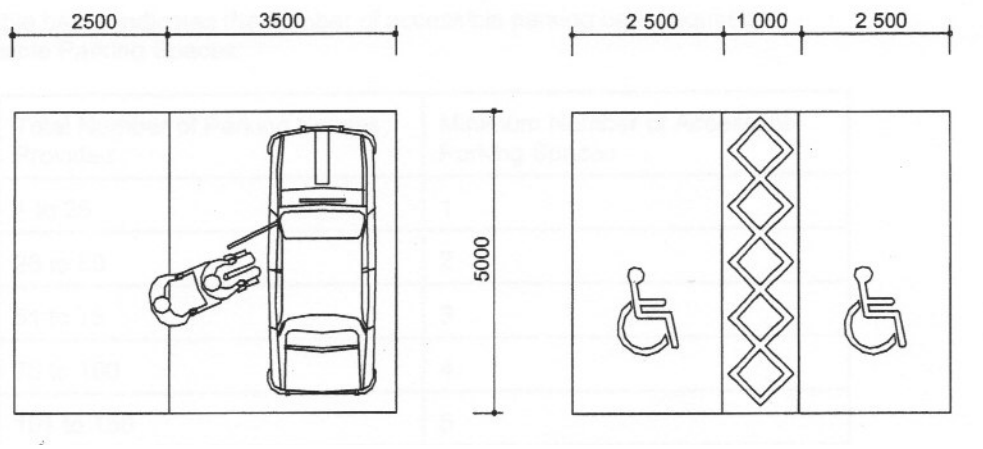

Figure 5: Disabled parking

(Source: Department of Public Works, 2001:11)

Figure 6: Disabled parking reservation signage

(Source: Department of Public Works, 2001:12)

6.2. Ramps

Ramps must be provided for persons in wheelchairs where floor levels differ. The ramp shall comply with the following:

6.2.1. The gradient must not be more than:

6.2.1.1. 1:12 where the difference in level of the ends of the ramp is more than 400mm high.

6.2.1.2. 1:10 where the difference in level of the ends of the ramp is less than 400mm high.

6.2.2. Have a width of not less than 1,1m wide.

6.2.3. The trafficable surface shall be clear, have a non-slip material.

6.2.4. At every interval of 1,5m vertical rise be provided with a landing of 1,2m long with the width of the landing not less than the width of the ramp.

6.2.5. A level surface of 2m in length must be provided at the end of the ramp adjacent to a door opening towards the ramp and where the door opens away from the ramp a level surface of 1,8m in length must be provided.

6.2.6. Any door or window leaf swinging over the level surface at the end of the ramp shall not obstruct the travel path of the disabled person.

6.2.7. A level landing of not less that 1,2m in length must be provided at any change of direction between two straight sections of ramp.

6.2.8. The ramp shall be provided with a handrail on the side where the change in level between the ends of the ramp is more than 600mm.

The handrail shall:

6.2.8.1. pursue the gradient of the ramp for the full length of the ramp

6.2.8.2. be a height of 850mm and 1000mm above the surface of the ramp

6.2.8.3. be finished off to not cause a hazard to any person using the ramp

6.2.9. Where there is a difference in the level between a ramp and any floor level at the side of the ramp:

6.2.9.1. A balustrade shall be provided where the level is more than 600mm in difference

6.2.9.2. A balustrade or kerb with a minimum height of 75mm shall be provided where the level is less than 600mm in difference

(South African Bureau of Standards, 1990:152 & 153)

It is generally preferred that the camber on ramps and walkways should have a gradient of not steeper than 1:40. This cross slope must not be provided unless necessary.

(Department of Public Works, 2001:20)

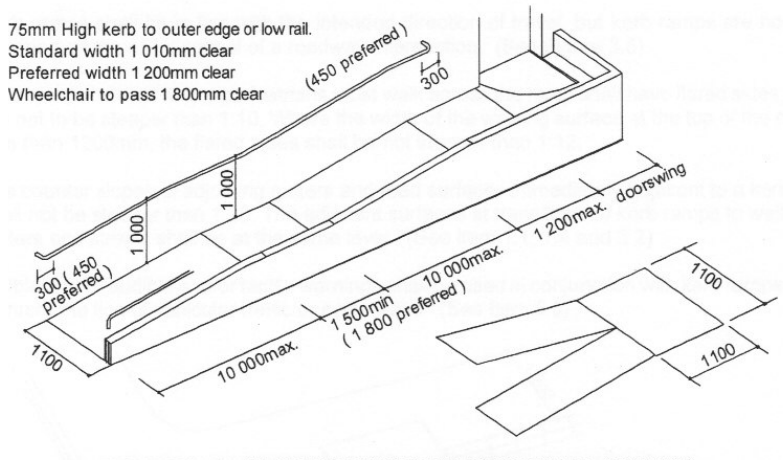

Figure 7: Ramp

(Source: Department of Public Works, 2001:21)

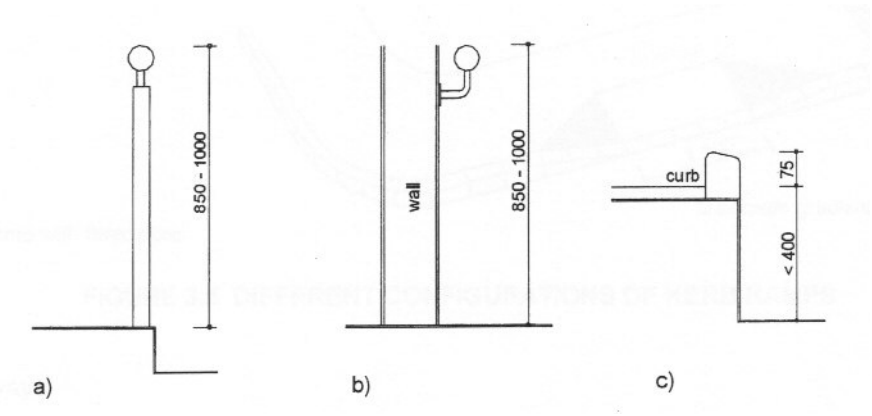

Figure 8: Handrail standards

(Source: Department of Public Works, 2001:21)

6.3. Doors

6.3.1. A door in the 90° position of either one leaf of a single door or one leaf of a double door shall provide an opening of not less than 750mm wide at right angles to the direction of travel

6.3.2. Doors shall be fitted with lever type handles at a height of not more than 1,2m above floor level on any rout including emergency escape routes for use by disabled persons

6.3.3. The difference on the level of the floor at any threshold shall not exceed 15mm.

(South African Bureau of Standards, 1990: 153)

It is preferred that all doors should comply with the above mentioned. Door handles in particular can cause great difficulty to disabled persons as they might not be able to turn the knob for example.

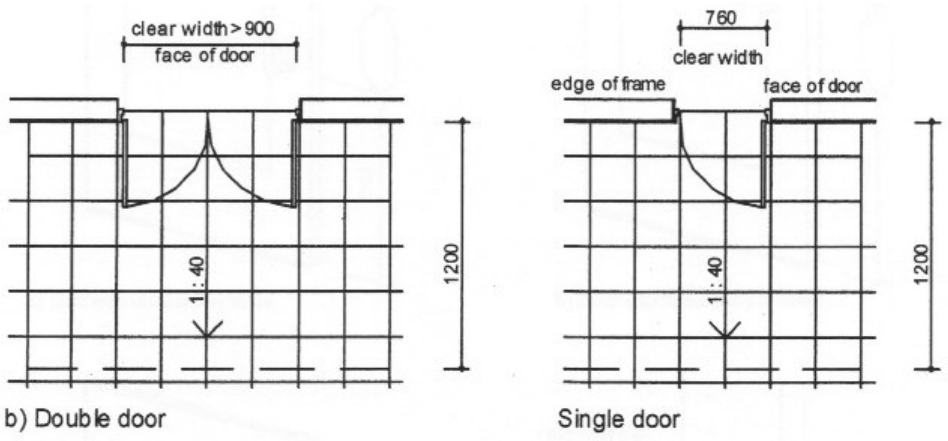

Figure 9: Door clearance

(Source: Department of Public Works, 2001:18)

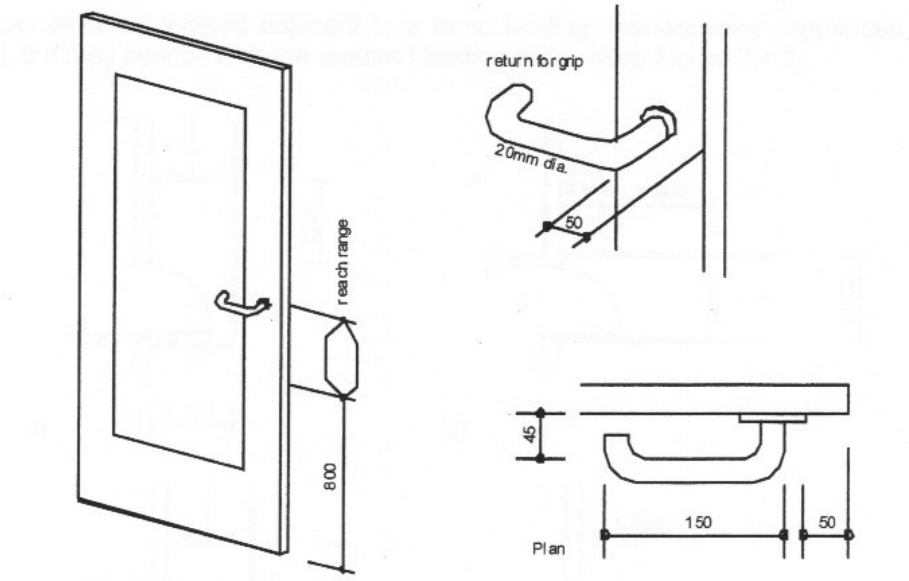

Figure 10: Door handles

(Source: Department of Public Works, 2001:19)

6.4. Toilet facilities

6.4.1. Buildings that are required to provide facilities for disabled people shall have one or more WC pans suitable for disabled persons in wheelchairs.

The following provisions apply for hotels, lodging houses or hostels:

6.4.1.1. Where bedrooms are provided with private toilet facilities, one bedroom for every 100 bedrooms or less must have a fully disabled bathroom requiring a disabled friendly WC pan, washbasin and bath or shower.

6.4.1.2. Where the bedrooms do not have their own private toilet facilities, there shall be a bathroom facility on each floor or compartment.

The following provisions apply for the remaining buildings not listed above:

6.4.1.3. Where a combined total of more than 20 WC pans and urinals are provided to serve the total population two disabled friendly WC pans or more must be provided

6.4.1.4. The distance a disabled person must travel from any point in a building to a disabled friendly bathroom or toilet shall not exceed 200m

6.4.2. The layout of the toilet or bathroom facility must be as follows:

6.4.2.1. Where separate toilet facilities are required for each sex, one compartment can be provided instead of separate facilities for male and female but it must including sanitary fixtures for both sexes.

6.4.2.2. The entrance door to a toilet or bathroom facility for disabled persons shall be either a sliding door, hinged door opening

outwards. If a door is fixed with a locking device the door must be able to open from the outside with a special device. The door shall also be fitted with an occupation indication device.

6.4.2.3. The dimensions for a paraplegic toilet facility are a minimum area of 2,9m2 and one side length minimum of 1,6m.

6.4.2.4. The minimum distance allowed between the centre line of the WC pan to the wall next to it is 450mm and not exceeding 500mm. Grab rails shall be fixed to the side and rear wall.

6.4.2.5. A distance of not less than 660mm is allowed for the front edge of the WC pan to the rear wall

6.4.2.6. The top surface of the seat on the WC pan shall be between 460mm and 480mm above the floor level.

6.4.2.7. The lid of the seat must remain in an upright position unless the WC is provided with a special back rest.

6.4.2.8. Fittings such as the flush mechanism and toilet-paper holder must be fitted on a level accessible to the disabled person.

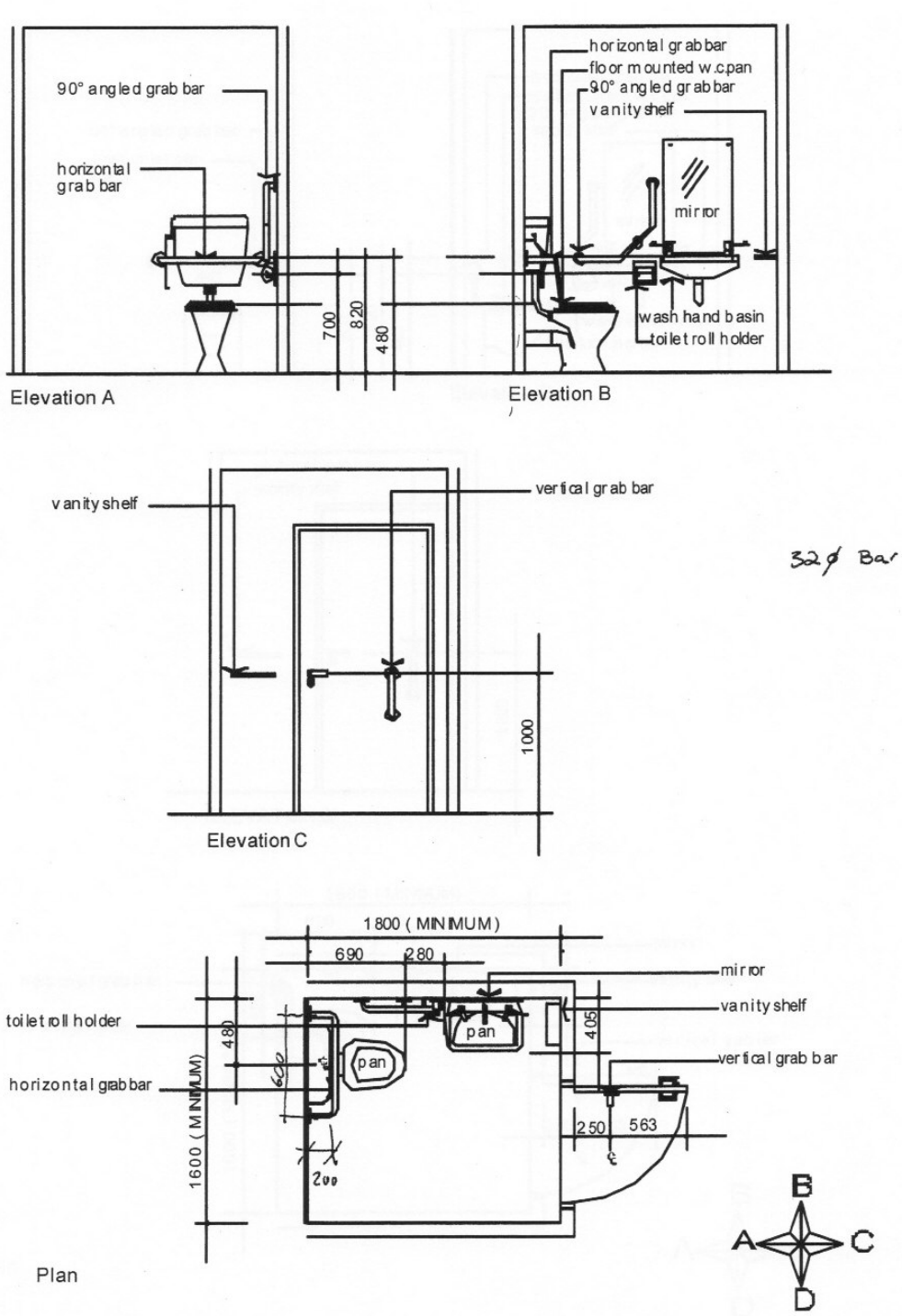

Figure 11: Toilet layout

(Source: Department of Public Works, 2001:19)

6.4.3. The hand wash basin

6.4.3.1. Must be mounted without pedestals. The top edge of the basin shall not be higher than 830mm from the finished floor level.

6.4.3.2. A vertical clearance must be left from under the basin to the floor.

6.4.3.3. If a vanity slab is fixed in the bathroom the distance form the edge of the facia to the inside of the bowl of the washbasin in such a slab shall not exceed 80mm, a vertical clearance of 680mm high must be provided from the floor to the underside of the facia.

6.4.3.4. The taps fitted for the hand wash basins must be fitted with lever handles. The cold water tap must be reachable by the person sitting on the WC pan.

6.4.4. A bath or shower cubicle must be designed and positioned to allow a person in a wheelchair to easily transfer to a seat in the cubicle.

(South African Bureau of Standards, 1990: 153 & 154)

6.5. Lifts

6.5.1. At least one passenger lift of all the lift installations must have:

6.5.1.1. a doorway width of 800mm.

6.5.1.2. handrails fitted on two sides of the lift at a height between 850mm and 1000mm from the floor level of the lift.

6.5.1.3. an internal dimension of 1,1m in width and 1,4m in depth minimum.

6.5.2. A lift operating automatically must meet the following requirements:

6.5.2.1. A clear door width of not less than 750mm wide must be provided.

6.5.2.2. Controls that must be operated by a passenger in a lift it shall be placed not higher than 1,2m above the floor level.

6.5.2.3. Warnings shall be provided for the opening and closing of the lift doors in the lift lobby.

(South African Bureau of Standards, 1990:153)

It is preferred that all buildings should be fitted with lifts able to serve any disabled person and that lifts should be installed in any multi storey building even if it only has two storeys.

6.6. Obstructions in the path of travel

6.5.1. A level change more than 25mm high shall be provided with a ramp for the use of disabled persons.

6.5.2. Any objects hanging or protruding in the pathway with a clearance of 2m above the trafficable surface shall be assisted with a barrier not higher than 300mm above such surface to indicate the presence of the obstacle.

(South African Bureau of Standards, 1990:155)

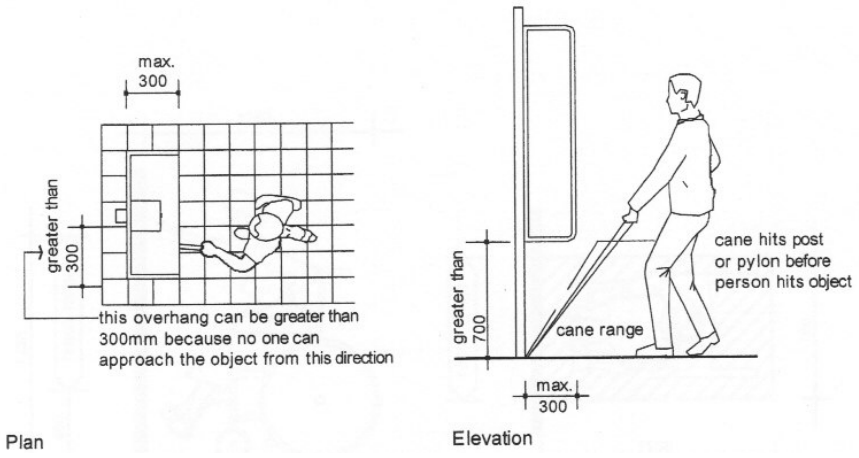

Figure 12: Objections in the path of travel

(Source: Department of Public Works, 2001:7)

6.7. Signage and other indications for the existence of facilities

6.7.1. Facilities for disabled persons must be marked with the international symbol for disabled persons inside a building as well as on the outside at the main entrance

6.7.2. Signage and other indicators must point out the route to the entrance of facilities

(South African Bureau of Standards, 1990: 155)

Figure 13: International symbol for accessibility

(Source: Department of Public Works, 2001:12)

6.8. Auditoria and Halls

In auditoriums and halls space must be set aside for persons in wheelchairs.

The following must be provided:

6.8.1. One wheelchair space for 50 or less fixed seats.

6.8.2. Two wheelchair spaces for between 50 and 400 fixed seats.

6.8.3. The greater of three wheelchair spaces or up to 0,5% of the number of fixed seats where there is more than 400 seats.

(South African Bureau of Standards, 1990: 155 & 156)

7. Provisions of the SANS 10400 to be published

In the new NBR the fire escape provisions (Part T) will state specifically that disabled persons must also be able to exit buildings in case of an emergency. The enhancing of the relationship between the different parts of the NBR is made possible with the amendments made.

8. Conclusion

The national building regulation sets out relatively clearly what is required for disabled friendly buildings. The amendments made have a great impact on what buildings are required to provide in terms of facilities. The future design of buildings will ensure a more accessible environment where a disabled person can access a building by himself.

9. Testing of hypothesis

1. Sub problem : Are South Africa's legislation and building regulations catering for the disabled regarding accessibility to buildings?

Hypothesis : Yes, but there is room for improvement on these regulations especially on existing public buildings. Regulations and standards set out the minimum requirements necessary to ensure accessibility of the building.

Research : The South African Legislation makes provision for the construction of disabled friendly buildings by law in various acts as discussed. The NBR provides standards to which new buildings must adhere to. Existing buildings that do not conform to these regulations must be altered. How this is implemented and ensured is a vague issue. This is a serious issue that must be addressed by the NBR.

Test : From the above one can see that the hypothesis is true. The South African legislation provides laws governing the construction of disabled friendly buildings. The NBR do make provision for the partial construction of disabled friendly buildings but not to the full requirement of a disabled friendly building. Thus there is room for improvement on the NBR for new buildings and regulations concerning existing public buildings.

Chapter 3

Does the approval process of new buildings provide for strict adherence to create disabled friendly buildings?

1. Introduction

The local authority has the responsibility of governing the processes of approving building plans, conducting site inspections after construction and the issuing of practical completion certificates. The "National Building Regulations and Building Standards Act No. 103 of 1977" governs the abovementioned process.

The approval process starts out with an application for the development proposal approval. The next stage is the pre-approval of the site development plan. After the pre-approval of the site development plan the approval of building plans take place. Post approval allows the commencement of construction with interim inspections done by the local authority.

2. The approval process

The approval process is governed by the National Building Regulations and Building Standards Act. The Act sets out to provide uniformity in relation to the erection of buildings. No person is allowed to erect any building for which the Act requires prior approval in writing from the local authority. The contravention of this provision is seen as an offence and a fine will be imposed per day as long as the contravention is continued.

(National Building Regulations and Building Standards Act, 2008)

The client must submit his development proposal to the local authority. The local authority concerned must evaluate the proposed development to see if it is in line with future development plans for the specific area. The client will either buy a piece of land and decide what to develop on it, or he will first find out what developments are allowed for the specific piece of land that he wants to buy. The client must also follow an approval process for the new development before the construction is allowed to commence.

(Interview: Bernice Swartz, 26 July 2009)

2.1. Application for the development proposal approval:

The process starts at the *Land-use, Legislation and Approval Management Section* of the Town and regional planner's offices. The proposed development is evaluated against the piece of land. The town and regional planners looks at the title deed, the zoning of the existing site and the rights to the property etcetera. For example; the zoning on the site may be for residential and the client wants to build offices. The client will thus have to apply for re-zoning of the site. In other cases the client will only have to apply for consent use.

On approval of the development proposal the client must put a bord up on the site to advertise the proposed new development. An advert must also be placed in the *government gazette* and a local newspaper. The public must lodge objections to the new proposed development in the set amount of days. Should the public have no objections; the client can carry on with the next phase of approvals. Should the public object; the client can appeal against the objection. If his appeal against the objection fails the client cannot continue with his proposed development.

If the application is successful the local authority will hand the client a list of certain conditions that must be met. For example; the client must see the Department of Electricity for the amount of supply available.

(Interview: Bernice Swartz, 26 July 2009)

2.2. Pre-approval (Site Development Plan)

The next step is to take a site development plan (known as a SDP) to the *Building Control offices*. The SDP must be drawn up by an architect who is required to attach his name, address and his registration number to the drawings. The approval of the SDP is the make or break stage in the total approval phase before construction can commence. If the SDP is not approved there will be no further approvals granted. It is also almost impossible to appeal successfully against a SDP rejection.

The SDP must be handed in with the following documents:

- Title deed (or Deed of Transfer)
- SG Diagram (Site plan showing the earth size and servitudes also on title deed)
- Zoning certificate
- Sewerage diagram
- Motivational memorandum stating the development plans etcetera
- One landscape drawing
- Letter of approval for consent use or re-zoning approval

Once the pre-approval is successful the client can now have detailed building drawings drawn up. It will be to the client's detriment if he has the building plans drawn up together with the SDP as once the SDP plan is rejected the building plans wont be approved. This will lead to the client paying for the drawing up of building plans which will not be approved.

The local authority may refuse to grant its approval on the following grounds:

- The application does not comply with applicable acts and laws such as the NBR
- The building will be of such an appearance that it will disfigure the area in which it will be erected.
- The building will be unsightly or objectionable
- The building will be dangerous to life or property.

The client may lodge a re-application once his plans have been amended which gave cause for refusal. The plans may not substantially differ from the plans originally submitted. Appeals against the refusal of approval may be lodged against the local authority's review board after the prescribed fees have been paid.

(Interview: Bernice Swartz, 26 July 2009) (National Building Regulations and Building Standards Act, 2008)

2.3. Approval of Building Plans

Detailed building plans must be submitted to the Building Control's offices as one can not build from a SDP.

The following is required to apply for the approval of building plans:

- Title deed
- SG Diagram
- Zoning certificate
- SDP plan and the approval letter

- Latest service statement (up to date)
- Power of attorney to the person who will handle the approval after submission of the above
- Schedule 4 Architectural compliance certificate
- Three copies of the building plans

The architect must be registered with SACAP and provide a registration number. The plans must be coloured with all the new additions in different colours.

Plans in sections: new masonry – red

new concrete – green

new iron steel – blue

new wood - yellow

new grass – black

existing materials – grey

Site plan: proposed work – red

existing work – don't colour

demolitions – black dotted lines

Drainage: drains and soil pipes – brown

waste pipes – green

soil and combined vents – red

storm water - black

Fire escape plans: escape route - green

direction of travel – indicated by arrows

On submission of the plans a reference number is given to the client for follow ups and administrative purposes. The building inspector writes a report after a site inspection to confirm that the plan is according to what is on site. The building plans are then sent to a plan examiner or an Architect from council. Within 6 weeks the plans must be scrutinised for approval or rejection. The local authority will once it is satisfied that the application complies with the requirements of any act and applicable law grant its approval. On rejection the plans will be sent to various departments to be marked for corrections. The Architect (who drew up the plan) will be notified of the required changes to be made. On approval the owner will be notified and construction may start.

The plan examiner or architect will evaluate the building drawings to see whether they conform to the National Building Regulations and Town Planning Legislation. If the building plans do not comply with the NBR requirements for the design and construction of buildings the plan examiner or architect will notify the client to adapt and rectify his drawings to comply with the municipality's standards.

(Interview: Bernice Swartz, 26 July 2009)

2.4. Post approval and commencement of construction:

The construction of the proposed development can commence after all the approvals are in place.

The local authority requires the following inspections by its own Inspectors during construction:

- Foundation inspection (before concrete is cast)
- Floor level inspection
- Sewerage inspection (with Plumber being present)
- Roof inspection
- Final inspection (Site to be complete)

The Occupation Certificate is submitted to the client with the following:

- Engineer Compliance Certificate
- Plumbing Compliance Certificate
- Certificate of Compliance (Electrician)
- Glass Certificate (Glass must be SABS approved)

(Interview with Bernice Swartz, 26 July 2009)

The process and stages of approvals governed by law but it is to no good use if the persons responsible for the carrying out of the approvals have no background or knowledge on the requirements. In an interview with a person working for the Department of City Planning, Development & Regional Services the following came to light:

The National Building Regulations and Building Standards Act No 103 of 1977 is used to evaluate and approve building plans. Each municipality uses its own criteria for the requirements of a building officer. The city of Tshwane requires the building officer to have an architectural background. A building control officer in other municipalities can be of any one of the following professions:

- Civil / Structural Engineer

- Architect
- Building Science Manager
- Building Surveyor
- Quantity Surveyor

The approval of building drawings is a very strict process as the regulation is enforced nationally and it is gazetted. Compliance with SANS 10400 - Part S is especially ensured on public buildings. No compliance – no approval! Continuous workshops are held to keep building officials updated with the amendments and new developments in the building industry.

3. Conclusion

The City Planning and Regional Services Department (all involved in the approval of new developments) work independently from each other but on the same regulations and standards. The approval process of building plans are governed and supported by the local authority. Compliance with the NBR is of utmost importance as the local authority will not approve building plans if they do not comply with it.

4. Testing of hypothesis

2. Sub problem : Does the approval process of new building plans provide for strict adherence to ensure the construction of disabled friendly buildings where required?

Hypothesis : Yes, all the new buildings to be constructed must provide access for the disabled.

Research : The approval process of building plans is governed by the National Buildings Regulations and Building Standards Act to ensure that the plans correspond to the minimum requirements as set in the NBR. Only certain types of buildings need to provide access for the disabled according to the NBR. All public buildings need to be disabled friendly.

Test : From the above one can see that the hypothesis is true. The approval process is governed by an act and is thus enforceable by law. Not all buildings need to be disabled friendly.

Chapter 4

Can existing buildings be converted into disabled friendly buildings and what are the costs involved?

1. Introduction

Most existing buildings were designed without considering disabled people. The conversion of an existing building into a disabled friendly building can be costly, partially possible or even impossible. To be able to make disabled people independent in their access to buildings, special care must be taken in the design of buildings to assure that they have easy access to their residences, work environments and leisure vicinities.

When a non-disabled person becomes a disabled person due to an illness or accident he will need to change his environment in order to continue living independently. The same applies for a disabled person moving to a new building. It will be necessary to convert or adapt the existing building into a disabled friendly environment.

When converting an existing building to a disabled friendly building the following must be considered:

- The condition of the existing building
- The requirements of a disabled friendly building
- The possibility of converting the existing building to a disabled friendly building
- The cost involved in the conversion

2. Most likely conditions of existing buildings

In the past emphasis was not placed on the provision of disabled friendly buildings. Because of this fact many existing buildings are not disabled friendly. The law and building regulations provide for easy and independent access to buildings for the disabled. The “Promotion of equality and prevention of unfair discrimination Act of 2000” is linked to the NBR that in turn provides for the alterations of existing inaccessible public buildings.

Typical conditions to expect in existing buildings are:

2.1. Entrances, access and external areas

- Parking lots do not always have an allocated parking space for persons with disabilities.
- No ramps are provided for a disabled person to easily enter the building where there is differences in floor levels
- Doors are not wide enough for a person in a wheelchair to pass through or the circulation space is not sufficient
- Emergency escape routes are not always usable for disabled persons

2.2. Internal circulation

- Low rise buildings usually do not have lifts
- Multi-storey buildings usually have lifts but there is no access for the disabled person to the lift
- There are no brail directions for blind people in public buildings
- Signs and directions not good enough for people with very weak eyesight

- Door locks and ironmongery for windows cannot be utilized by disabled people
- Different levels of floor finishes pose difficulties for people in wheelchairs and with walking disabilities
- Sufficient light for deaf people is necessary for communication
- There are no guide rails against walls for ambient disabled people
- Slippery floors pose difficulties for people in wheelchairs and with walking disabilities
- Access to materials and services inside a public and other facilities are not promoted
- There are no tactile surface indicators to warn blind people of a change in area for example to indicate the end of the sidewalk and beginning of a road

2.3. Toilets, bathrooms and kitchens

- Toilet, bathroom and kitchen facilities are not disabled orientated
- Table tops in bathrooms and kitchens are not reachable for disabled people
- Taps and door knobs can not be operated by certain types of disabled people
- Space between furniture fixtures are not sufficient for a wheelchair to pass through or other people with walking sticks
- There are no door closers in certain areas such as toilets and makes it difficult for a disabled person to close the door behind them
- Positioning of light switches are out of reach

3. The conversion of an existing building into a disabled friendly building

The most important aspect to remember when converting an existing building to a disabled friendly building is that it must be as accessible and comfortable as possible to allow the disabled person independent access without the help of another person.

3.1. Entrances, access and external areas

Parking lots do not always have an allocated parking space for persons with disabilities. It is possible to change a parking space in a residential dwelling into a parking space suitable for the disabled person if there is sufficient space. Most shopping centres, office blocks and other buildings have parking for disabled persons close to the entrance doors. The construction should be relatively easy as in most instances one would only need to paint new lines and put up disable parking signs on indicating the parking space. Signage to direct the path to the parking should be provided. Loading zones must be adjacent with the main accessible route into the building. Kerb ramps for small differences in the parking level and the entrance path can also be provided.

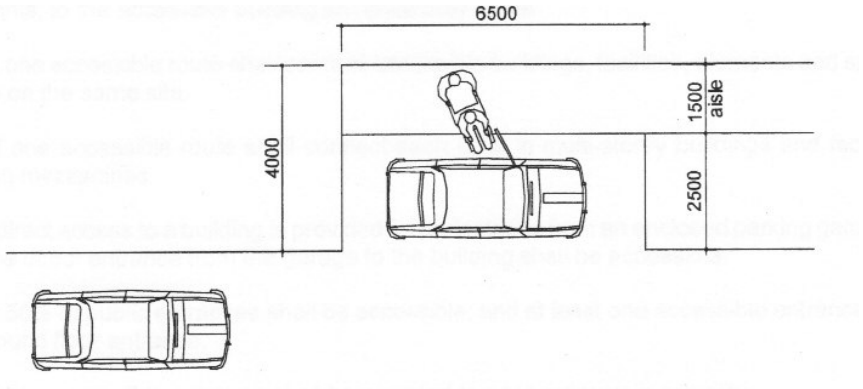

Figure 14: Loading Zones

(Source: Department of Public Works, 2001:13)

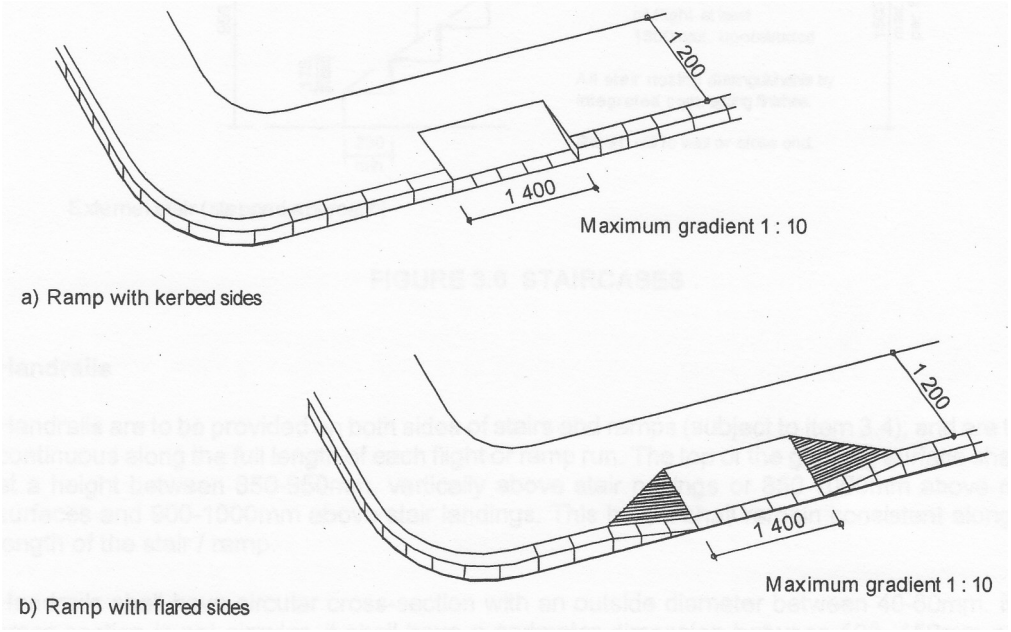

Figure 15: Kerbed ramps

(Source: Department of Public Works, 2001:22)

Normally existing buildings do not have ramps provided for a disabled person to easily enter a residential dwelling where there are differences in floor levels. For example, there are usually two entrance doors into a house. One will either need to build in a new door or break out an existing one for a wider frame and build in a ramp. In other types of buildings it is only necessary for a ramp as they normally have large entrance doors. It is not acceptable to have access into a building where the disabled person must travel further than people using the main entrance are required to travel. This is acceptable if there is no other way into an existing building.

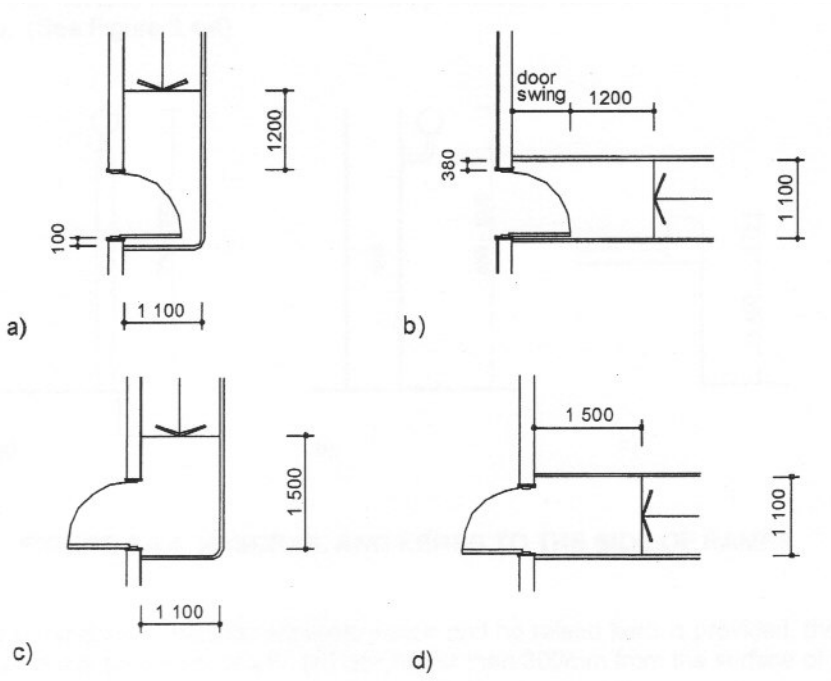

Figure 16: Ramps approaching doors

(Source: Department of Public Works, 2001:20)

A normal door size is 813mm wide. For persons in wheelchairs a door frame with a width of approximately 760mm wide is sufficient. Doors not wide enough for a person in a wheelchair to pass through can be broken out and new frames built in. The circulation space around the door must also be considered.

(National Rehabilitation Board, 1979:3 & 5) (National Rehabilitation Board, 1981:11)

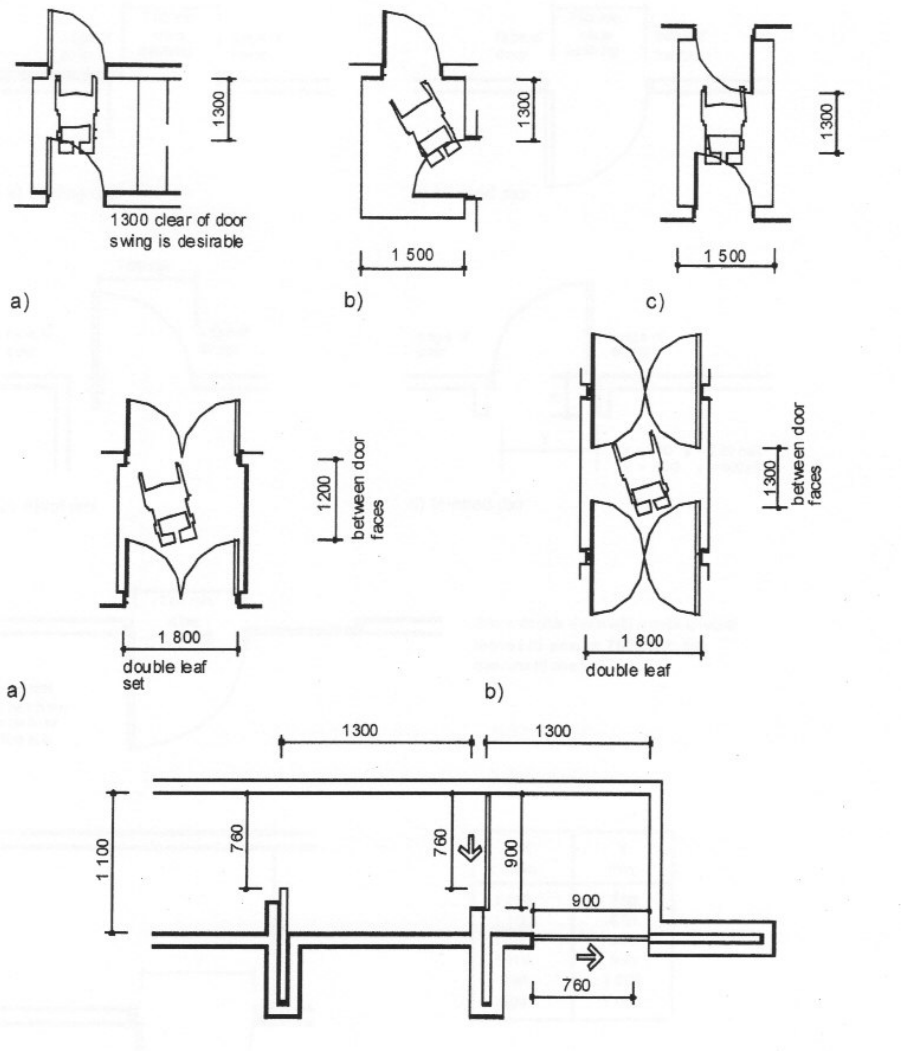

Figure 17: Door way widths

(Source: Department of Public Works, 2001:16)

3.2. Internal circulation

Low rise buildings usually do not have lifts where multi-storey buildings usually have lifts but there is not always access for the disabled person to the lift. To build in a lift in a low rise building will be very expensive but it is possible. For a multi storey building with a lift situated in a lift foyer but no access to the foyer, one can build a

ramp as discussed before. Disabled apartments in residential buildings should be located on the ground floor to provide easy access for the disabled person.

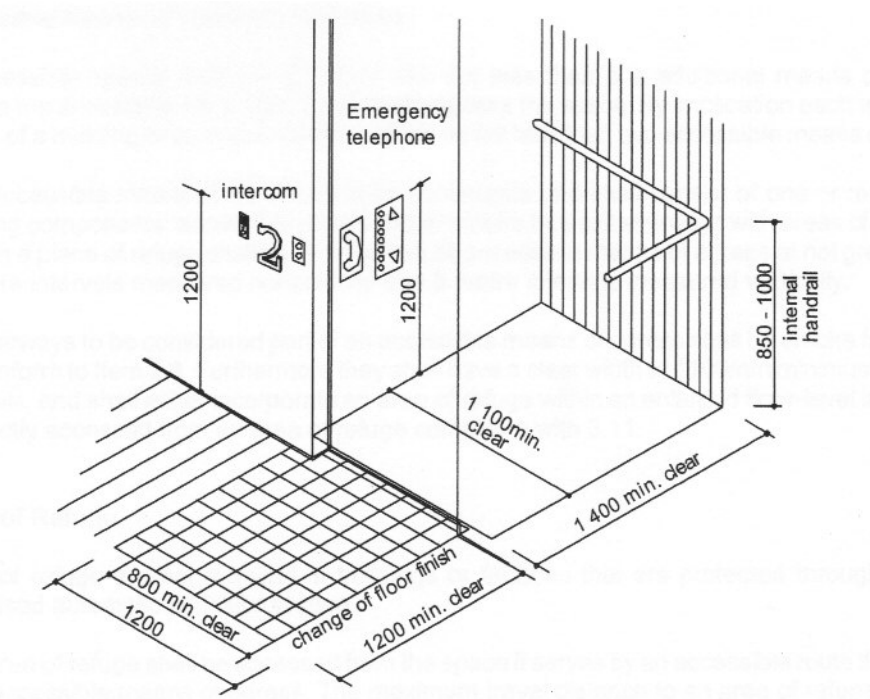

Figure 18: Lift requirements

(Source: Department of Public Works, 2001:25)

The basic necessities inside a building for easy access for the disabled can be easily installed but could be costly. These are sufficient signage and luminance for people with very bad eye sight, brail writing for blind people for example on lifts, sufficient light for deaf people necessary for communication, grab rails and guide rails against walls for ambulant disabled people. Window and door handles and ironmongery can be utilized by disabled people if they are changed to lever type ironmongery. Door knobs should be removed and replaced with lever type handles. Electrical switches and sockets must be moved to the reach range. This can be done by chasing the walls, and applying plaster and paint to make good.

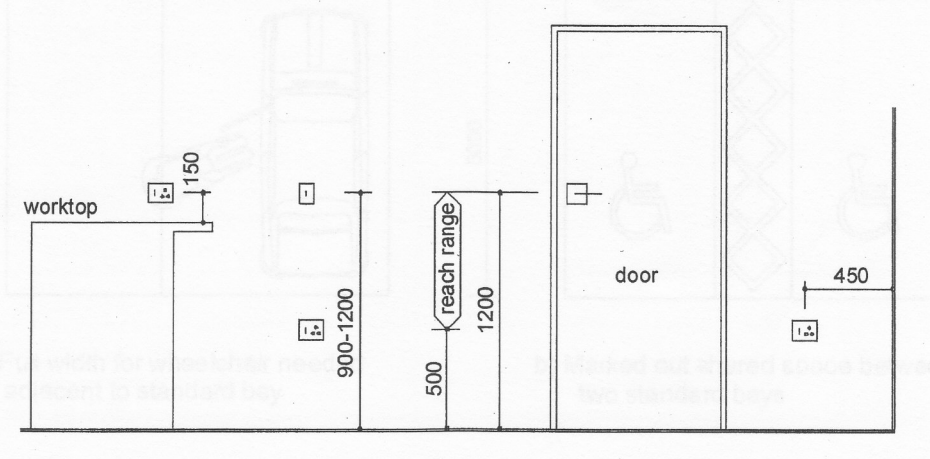

Figure 19: Reach range for switches and sockets

(Source: Department of Public Works, 2001:10)

Slippery floors can pose a risk for people in wheelchairs and with walking disabilities. Slippery floor finishes must be taken up and replaced by non-slip floor coverings. Differing floor levels can pose difficulties for people in wheelchairs and with walking disabilities. They can be altered by casting mini ramps or by thickening screeds. Tactile indication floor strips can also be installed to warn the disabled person of an approaching staircase, lift etcetera.

(National Rehabilitation Board, 1979:9 & 13)

A difficult aspect to change in an existing building is the circulation areas. It is not so easy to break out walls and widen the circulation passages etc as the walls may be load bearing.

3.3. Toilets, bathrooms and kitchens

Toilet, bathroom and kitchen facilities are not so easy to convert if they are confined to small spaces. It is especially difficult to change the layout if the walls are load

bearing or if the adjacent rooms are also very small. Table tops in bathrooms and kitchens can be easily changed as they can be removed and replaced by a new design. Grab rails are easy to install in bathrooms as they are simply fixed to the wall surface.

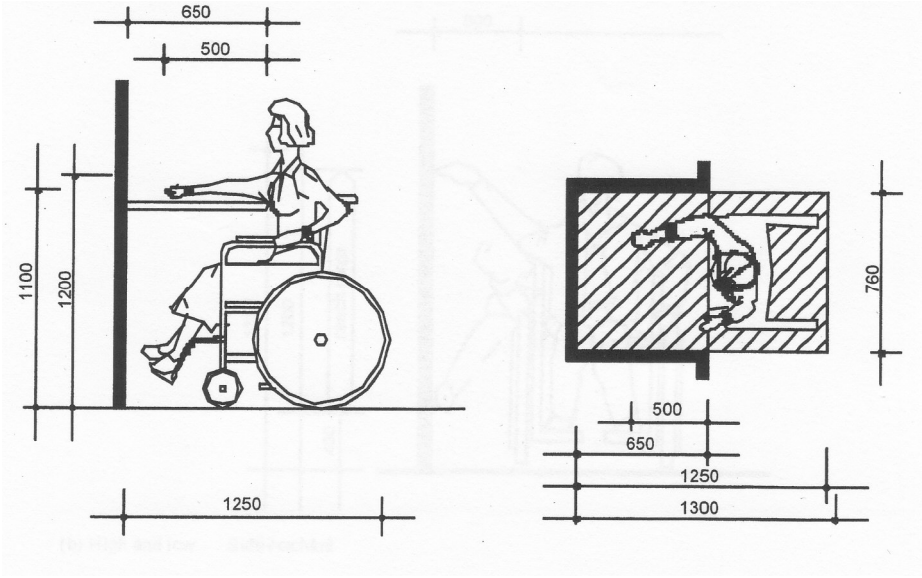

Figure 20: Reach range for table tops

(Source: Department of Public Works, 2001:8)

Furniture fixed to walls or floors can be removed and replaced by sufficiently allowing for space so that a wheelchair and ambulant disabled people can pass through with ease.

Taps and door knobs can be changed with new fittings easy for disabled use. Door closers must be fixed to toilet doors so that the disabled person does not need to close the door behind them. The door must preferably open to the outside of the toilet.

(National Rehabilitation Board, 1979:11)

4. Costs involved in making alterations to existing buildings

The following table illustrates typical costs involved in alterations. Only basic items are listed. (Based on construction costs for September 2009)

Table 1: Cost of basic items

Description	Qty	Unit	Rate (R)	Total (R)
Paint parking lines and provide signage board indicating disabled parking (1 x parking space)				
Painting of parking bay	1	Item	500,00	500,00
Signage	1	Item	300,00	300,00
Total				**800,00**
Alterations to prepare surface for ramp, construction of 1,1 x 3,0 x 0,3m high concrete ramp				
Breaking up and removing 100mm thick concrete apron	3,30	m2	20,00	66,00
Concrete in ramps	0,99	m3	800,00	792,00
Handrail	3,20	m	1200,00	3840,00
Total				**4698,00**
Taking out door and replace with 862 x 2 032mm high door and frame				
Taking out and removing door	1	no	250,00	250,00
Building in of new door and frame and making good (including door and frame)	1	no	1410,00	1410,00
Lever handles (pair) and lock set	1	no	550,00	550,00
Total				**2210,00**
Take out sanitary fittings (x 3) and install paraplegic toilet facilities				
Taking out and removing sanitary fittings	3	no	225,00	675,00
Installation of paraplegic water closet	1	no	3615,00	3615,00
Installation of paraplegic hand wash basin	1	no	2390,00	2390,00
Installation of grab rails	1	Item	1170,00	1170,00
Installation of new mirror	1	Item	350,00	350,00
Installation of door closer	1	no	1600,00	1600,00
Total				**9800,00**

(Source: own)

The total cost for the basic alteration of an existing building amounts to R9,800-00. This cost excludes VAT, making good of the surrounding areas affected by the alterations made and if it was a large project the contractors overheads and preliminaries. If the cost including labour and material of, for example, the existing sanitary fittings are brought into account the cost would be almost double. Thus it can be seen that if the disabled friendly design was incorporated from the start there would definitely a cost saving.

5. Conclusion

The inclusion of disabled people in society is a democratic right. It is thus important to provide facilities to assist disabled people in accessing buildings whether it is their home, work or leisure environment. Existing buildings can and should be converted into disabled friendly buildings. All public buildings are, if not already completed, in the process of being altered. This can especially be seen by the ramps provided at entrances.

The cost involved in converting an existing building into a disabled friendly building is relatively affordable for one storey buildings but can become very costly for multi storey buildings. It can also be seen that the cost will be less if the design includes access for disabled people before construction commences.

6. Testing of hypothesis

3. Sub problem : Can existing buildings be converted into disabled friendly buildings and what are the costs involved?

Hypothesis : Yes in most instances, but not in all existing buildings. The cost of altering existing buildings will be higher than if incorporated at the design stage.

Research : The conditions of existing buildings are evaluated to identify the barriers for disabled persons. The biggest barrier appears to be access into the building and circulation space inside. The process of converting an existing building into a disabled friendly building is discussed. The cost of converting an existing building into a disabled friendly building is more expensive than incorporating the design in the construction phase.

Test : From the above one can see that the hypothesis is true. Not all buildings can be completely disabled friendly. The cost of alterations is more expensive than when accessibility is designed before construction commences.

Chapter 5
How do South Africa's building regulations compare to England's building regulations regarding disabled friendly buildings?

1. Introduction

Disability acts around the world emerged in the late 20th early 21st centuries. Although the acts have been in circulation for a time there is still a lot of work to be done on the physical implementation thereof. The implementation of the acts is governed by law and must be adhered to.

Universal or inclusive design is commonly used worldwide to refer to disabled friendly buildings including the aesthetically pleasing component. More focus and attention is being paid to make buildings accessible to all users and not only the disabled and to protect the environment.

In South Africa the facilities for disabled persons are contained in SANS 10400 - Part S of the NBR. In England the facilities for disabled persons are contained in Part M of their national building regulations. A comparison of these two countries shows the differences, similarities and shortcomings of either one.

(www.wikipedia.org, 4 Sep. 2009)

2. Universal or inclusive design

Universal or inclusive design is the term used in most countries to indicate accessible buildings not only for the disabled but for all persons entering into and out of a building. Universal design is defined as “barrier-free” or “accessible design” or even “assistive technology”. Universal design also refers to a broad-spectrum solution that makes provision for buildings, products and environments that are effectively usable for all persons. Universal design also includes the physical appearance of the building with all the facilities provided for use by persons with disabilities.

(www.wikipedia.org, 4 Sep. 2009)

3. Disabled friendly buildings in England

In England one has to get planning permission and building regulations approval. Planning permission refers to the local authority’s city development plans. Building regulations approval refers to the approval of materials and workmanship, safety and health, conservation of natural resources and facilities for all people, including disabled people, intending to use the building.

Failure to comply with the Building Regulations in England results in the following:

- An offence of contravening the building regulations
- A receipt of enforcement notice from the building inspector
- The above resulting in a denial to issue the final certificate and cancelation of the initial notice by notifying the concerned local authority
- Enforcement requiring alteration work will be in the powers of the local authority

- A decision to take the person responsible for the building works to the magistrates' court ending up in a fine for the contravention and a daily fine for the duration of the contravention is possible

(www.planningportal.gov.uk, 6 Sep. 2009)

Service providers, employers, public owned enterprises etcetera in England had to make reasonable adjustments to their premises such as adjustments to physical features to provide for the barrier free access for disabled people by the 1st of October 2004. Resources and disruptions were factors that contributed to the extent of the adjustments made. From the 1st of October 2004 all building designs for approval must have accessibility for disabled people.
(www.goodaccessnorthwestengland.co.uk, 4 Sep. 2009)

4. Comparison between South Africa's and England's design guidelines and regulations

Table 2: A basic comparison between South Africa's and England's building regulations:

	South Africa	England
Ramps		
Provide	Change in floor level	Gradient of approach is steeper than 1:20
Width	1,10m (passing place not included)	1,80m (provision for passing place) or 1,20m on restricted sites
Gradient	1:12 if difference between level of ends of ramp is more than 400mm	1:60 along the ramps entire length Or

	Or 1:10 if difference between level of ends is less than 400mm	1:20 with level landings with a cross-fall gradient not steeper than 1:40
Flight	Not longer than 1,5m in vertical rise	Not greater than 10,00m or rise of more than 500mm
Camber gradient	Not more than 1:40	Not more than 1:40
Landings	Landing to be provided every 1,5m of vertical rise or change in direction with a length of not less than 1,2m and width not less than width of the ramp Length of landing leading to a door to be not less than 2m if the door opens towards the ramp and 1,8m if the door opens away from the ramp	Landing to be provided for every 0, 50m vertical rise or change in direction with a length of not less than 1,8m and width not less than width of the ramp 1,5m Clearance on landing of any obstructions
Surface	Clear trafficable surface constructed of non-slip resistant material	Durable, firm and slip resistant providing tactile strips to warn users of possible dangers
Handrails	Provide: difference in level is more than 600mm Height: 0,85 – 1,00m above height of ramp	Provide: on both sides
Kerbs	Provide: difference in level is less than 600mm Height: not less than 75mm high	Provide: on any open side of ramp Height: Not less than 100mm high
Parking		
Size	<3,50m x approved length	2,50m + 1,20m accessibility zone x 4,80m

		length + 1,20m accessibility zone
Doors		
Clear opening	>0,75m wide	>0,75m wide in old buildings and 0,80 in new buildings
Handles	Lever type	Should be easy to operate by people with limited manual handiness
Door closers	Silent	Force required to open door must not be greater than 20N at the leading edge
Threshold	<15mm high	
Lifts		
Internal dimensions	1,10m in width 1,40m in length	2,00 wide in width 1,40m in length
Doorway clearance	>0,80m	
Handrails	On two sides of lift Height: between 0,85m and 1,00m	
Internal control	Not higher than 1,20m from floor level	Between 0,90m and 1,10m and not further than 0,50m from any return wall
Toilet facilities		
Internal dimensions	2,9m2 of which one wall length shall be a minimum of 1,60m	2,00 x 2,20m
Taps	Lever type	Lever type
Compartment	Present to indicate occupation Must be able to open from outside with a suitable	Present to indicate occupation Must be fitted with an emergency device to open

	device	from outside
WC surrounding distances	0,45 – 0,50mm between centre line of WC pan and nearest wall with grab rails on the nearest wall and rear wall >0,65m distance from the front edge of the WC to the rear wall Top surface of the seat to be between 0,45 and 0,48m above floor level	0,50mm between centre line of WC pan and nearest wall with grab rails on the nearest wall and rear wall >0,75m distance from the front edge of the WC to the rear wall Top surface of the seat to be 0,48m above floor level
WHB	Floor to the top edge of the WHB <0,85m Installed with no pedestal or legs WHB must be reachable to the person sitting on the WC pan	Floor to the top edge of the WHB 0,72<0,74m Installed with no pedestal or legs WHB must be reachable to the person sitting on the WC pan
Travel distance to toilets	<200m in whole building	<40m on one floor

(South African Bureau of Standards, 1990:152 - 155) (www.planningportal.gov.uk, 6 Sep. 2009)

5. Conclusion

Most of the regulations are similar. Part M makes provision for almost any situation and contains most of the regulations in one set of documents. A larger number of situations and approaches are given by Part M. It would seem to appear that Part M provides a better accessible building than Part S of South African building regulations.

6. Testing of hypothesis

Sub problem : How do South Africa's building regulations compare to countries' such as Australia and the United Kingdom's building regulations regarding disabled friendly buildings?

Hypothesis : On certain levels South Africa compares fairly well but there is still a lot of work to be done on existing buildings.

Research : Part S of the NBR of South Africa is compared to the Part M of the Building Regulations of England.

Test : From the above one can see that the hypothesis is true. There are more similarities than shortcoming provisions. South Africa's NBR can be improved to compare to a higher standard.

Chapter 6
Summary, Conclusion and Recommendations

1. Introduction

Are South Africa's building regulations truly creating disabled friendly buildings or can these building regulations be improved on? The importance of this research is to establish whether or not South Africa's regulations are sufficient to create accessible buildings for the disabled.

National legislation defines a disabled person as a person that is limited in one or more functional activities such as hearing, seeing, moving, learning, communicating, intellectual and emotional activities. The "Promotion of equality and prevention of unfair discrimination Act of 2000" states that no person may unfairly discriminate against any person based on disability including denying or removing from any disabled person the right to facilities necessary for their functioning in society. There are approximately 2,2million disabled people in South Africa.

(www.info.gov.za, 27 May 2009)

2. The research

2.1. Statement of the main problem

Are South Africa's building regulations truly creating disabled friendly buildings or can these building regulations be improved on?

2.2. Statement of the sub problems and hypothesis

2.2.1. Sub problem : Are South Africa's legislation and building regulations catering for the disabled regarding accessibility to buildings?

Hypothesis : Yes, but there is room for improvement on these regulations especially on existing public buildings. Regulations and standards set out the minimum requirements necessary to ensure accessibility of the building.

Research : The South African Legislation makes provision for the construction of disabled friendly buildings by law in various acts as discussed. The NBR provides standards to which new buildings must adhere to. Existing buildings that do not conform to these regulations must be altered. How this is implemented and ensured is a vague issue. This is a serious issue that must be addressed by the NBR.

Test : From the above one can see that the hypothesis is true. The South African legislation provides laws governing the construction of disabled friendly buildings. The NBR do make provision for the partial construction of disabled friendly buildings but not to the full requirement of a disabled friendly building. Thus there is room for improvement on the NBR for new buildings and regulations concerning existing public buildings.

2.2.2. Sub problem : Does the approval process of new building plans provide for strict adherence to ensure the construction of disabled friendly buildings where required?

Hypothesis : Yes, all the new buildings to be constructed must provide access for the disabled.

Research : The approval process of building plans is governed by the National Buildings Regulations and Building Standards Act to ensure that the plans correspond to the minimum requirements as set in the NBR. Only certain types of buildings need to provide access for the disabled according to the NBR. All public buildings need to be disabled friendly.

Test : From the above one can see that the hypothesis is true. The approval process is governed by an act and is thus enforceable by law. Not all buildings need to be disabled friendly.

2.2.3. Sub problem : Can existing buildings be converted into disabled friendly buildings and what are the costs involved?

Hypothesis : Yes in most instances, but not in all existing buildings. The cost of altering existing buildings will be higher than if incorporated at the design stage.

Research : The conditions of existing buildings are evaluated to identify the barriers for disabled persons. The biggest barrier

appears to be access into the building and circulation space inside. The process of converting an existing building into a disabled friendly building is discussed. The cost of converting an existing building into a disabled friendly building is more expensive than incorporating the design in the construction phase.

Test : From the above one can see that the hypothesis is true. Not all buildings can be completely disabled friendly. The cost of alterations is more expensive than when accessibility is designed before construction commences.

2.2.4. Sub problem : How do South Africa's building regulations compare to England's building regulations regarding disabled friendly buildings?

Hypothesis : On certain levels South Africa compares fairly well but there is still a lot of work to be done on existing public buildings in South Africa.

Research : Part S of the NBR of South Africa is compared to the Part M of the Building Regulations of England.

Test : From the above one can see that the hypothesis is true. There are more similarities than shortcoming provisions. South Africa's NBR can be improved to compare to a higher standard.

2.3. Statement of the main problem and the hypothesis

Main problem : Are South Africa's building regulations truly creating disabled friendly buildings or can these building regulations be improved on?

Hypothesis : The building regulations do provide for the construction of disabled friendly buildings but the minimum requirements can be improved on certain areas.

Research : Sub problem 1 focused on the laws and building regulations applicable in South Africa. The law must be enforced more strictly especially on accessibility to existing public buildings. There are, up to date, a lot of public buildings that are not accessible to disabled people. In the past years there have been a lot of construction at shopping malls and various other public buildings and government offices to make their buildings more accessible to disabled people. The most visible changes are the ramps entering into the buildings and the presence of paraplegic toilets.

Sub problem 2 focused on the approval process of building plans. The process of checking the building plans and the process for non compliance is explained. It is clear that the process is only successful if the persons involved in the approvals of the building plans are informed and trained.

Sub problem 3 focused on the conversion of an existing building to a disabled friendly building that conforms to the

NBR. For most existing buildings the cost of the conversion is likely to be high. It is apparent that the cost for a disabled friendly building is lower when incorporated in the design phase than when it has to be incorporated in an existing building. This does not however mean that the costs involved when designing a disabled friendly building from the start is going to be slightly higher than in the case of the building not being disabled friendly. The cost for disabled friendly buildings especially if they have multiple storeys' can be fairly expensive when one considers for example special lifts etc.

Sub problem 4 focused on the provisions of the NBR of South Africa and the national building regulations Part M of England. Part M is more detailed and includes a wider range for requirements that need to be satisfied. Thus there is room for improvement in South Africa's building regulations.

Test : From the above one can see that the hypothesis is true. Currently South Africa's building regulations are providing for disabled friendly buildings but there is room for improvement on the NBR.

3. Recommendations

It is clear from the above findings that the NBR can be revised and improved. The possibility of creating one document for accessible buildings rather than having many documents that might contradict each other exists. Further research as to how this can be addressed can be conducted.

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