

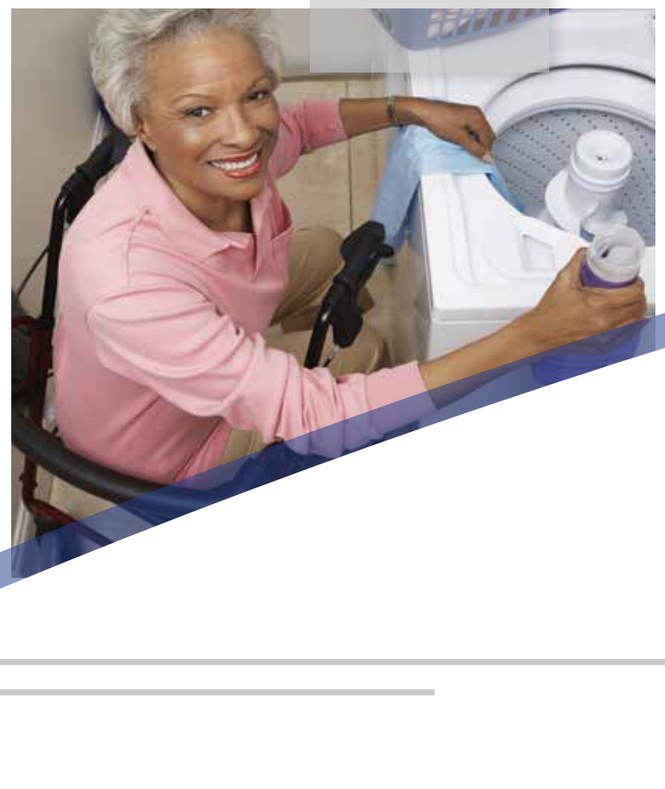


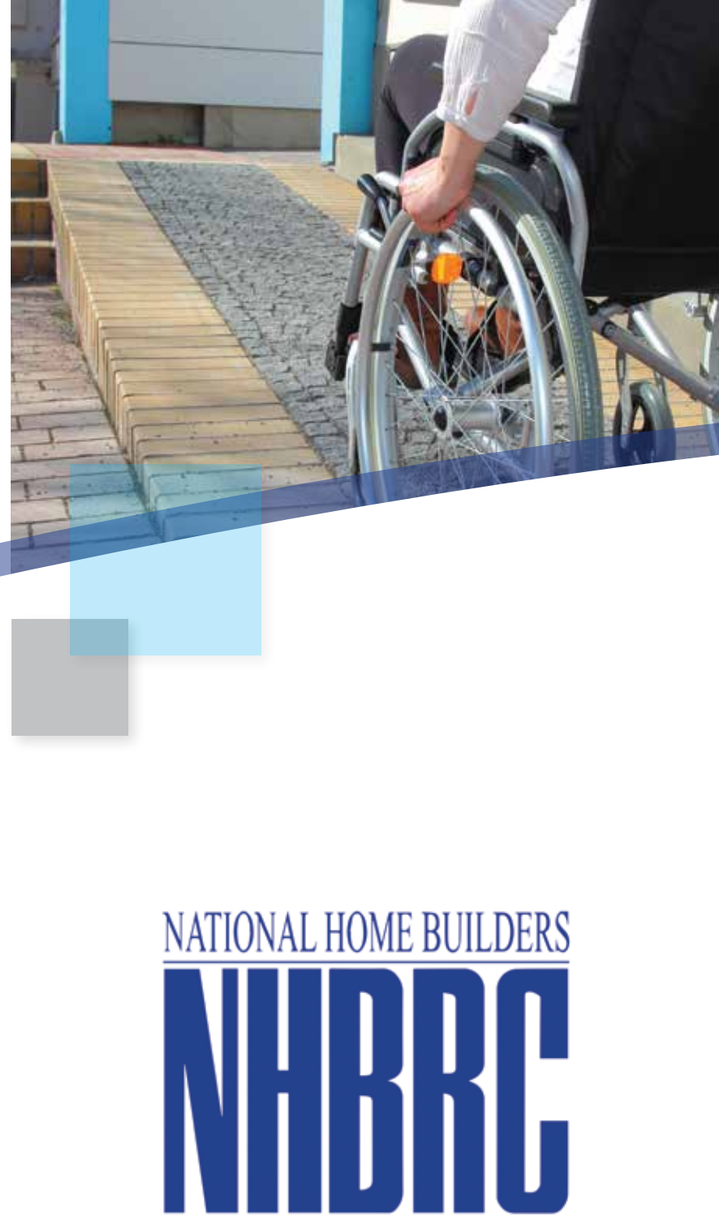

NATIONAL HOME BUILDERS
NHBRC
REGISTRATION COUNCIL

# ACCESSIBLE DESIGNS

## TYPOLOGIES FOR DIFFERENTLY **ABLED PERSONS**

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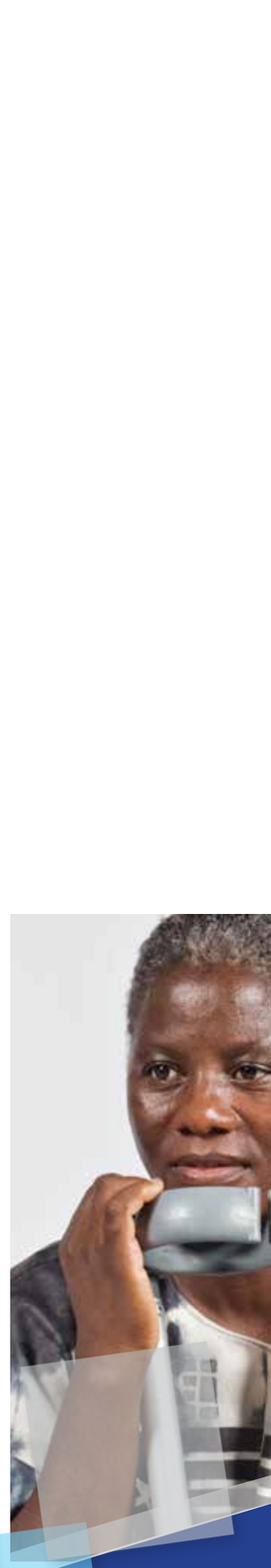
# CONTENTS





# 1 BACKGROUND

In response to the Department of Human Settlements' Comprehensive Plan in achieving sustainable human settlements, the NHBRC is providing support in developing housing typologies, amongst other functions. In this document, housing typologies are proposed for people with disabilities, better known as Accessible Designing within the context of the Universal Design approach.

The Department of Human Settlements (NDHS) has a policy that includes requirements for special housing needs for differently abled beneficiaries to enable them to live more independently. This addresses the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) that gives a clear framework in which access for people with disabilities is to be viewed. In the National Housing Code Part 3, guidelines are provided for people with disabilities, making provision for variations to the subsidy amount. Due to its importance, the NHBRC has recognised the need of facilities for people with disabilities to be included in designs for the low-income and affordable income group.

Poor people with disabilities fall under the indigent group and relevant categories were identified by the NDHS for people with mobility, dexterity and sensory impairments, falling under the A, B, C, D, E or F group. Differently abled persons who will qualify for an additional subsidy would be those with disabilities that have a monthly income of between R0- R3500, 00. The interventions to be applied to this income will also apply to the affordable income group.

# 2 APPROACH

## 2.1 Terminology

Designing for differently abled persons has become a matter of constant debate of which the terminology used to describe the removal of barriers, which exclude people to a more inclusive design approach, is a contentious issue. Two of the terminologies used are 'universal design' and 'accessibility' whereby the former originated from America and the latter from Europe. The definitions are as follows:

- *Universal design*: is the approach to design that incorporates products as well as building features which, to the greatest extent possible, can be used by everyone.
- *Accessibility*: is the umbrella issue for all parameters that influence human functioning in the environment.

In South Africa, the SANS 10400 Part S, the application of National Building Regulations' facilities for people with disabilities, has started including principles of accessibility, but these principles are still subject to further debate and improvements.

## 2.2 Design Concept

The concept of the proposal entails a modular approach that is adaptable and flexible to future additions of detached houses. A service core, consisting of an entrance, back door, two ramps, kitchen, bathroom and a living space, becomes the basis of each of the typologies. By adding rooms to the core in different configurations, it allows for variation in design.

> **"Accessibility has been improved by applying special dimensional requirements to travel paths and relevant obligatory items."**

The open plan arrangements of spaces also allow for simple manoeuvring. There are four accessible typology designs for low-income and affordable housing i.e. 45m$^2$, 60m$^2$, 70m$^2$ and 80m$^2$. For this phase only one possible design for each area has been proposed, but this does not mean other configurations will be disregarded. The 45m$^2$ typology is the minimum area proposed for subsidised low-income housing to accommodate the turning spaces and items for disabled beneficiaries, but only provides one bedroom that can accommodate a single bed. The 60m$^2$ unit is preferable as it is comprised of two bedrooms, one of which can accommodate a double bed. The more affordable houses, of which one is the 70m$^2$ unit, can accommodate two bedrooms, whilst the 80m$^2$ unit is comprised of two bedrooms and an additional living space.

### 2.2.1 Specified Items

The current items proposed in the spaces are derived from the Housing Code and include additional items consisting of two ramps, hinged timber seat, handheld shower head, basin timber shelf, recessed soap holder, toilet paper holder, kick plates to doors, grab rails, two lever action taps, two sliding doors, kitchen work tops, sink, kitchen cupboards, visual doorbell indicators and handrails. The above implies that all the differently abled categories were included in one standard design layout. A good quality product is further ensured through compliance with the requirements of the SABS 0400, SANS 10400 and SANS 10246. To achieve a more rounded product, inputs were obtained from experts in the industry.

Energy efficiency interventions have been applied to comply with SANS 10400XA Energy Usage in Buildings, which includes orientation, thermal performance of walls, roofs, windows and hot water. It needs to be emphasised that calculations for only one climate zone are indicated on the attached plans.

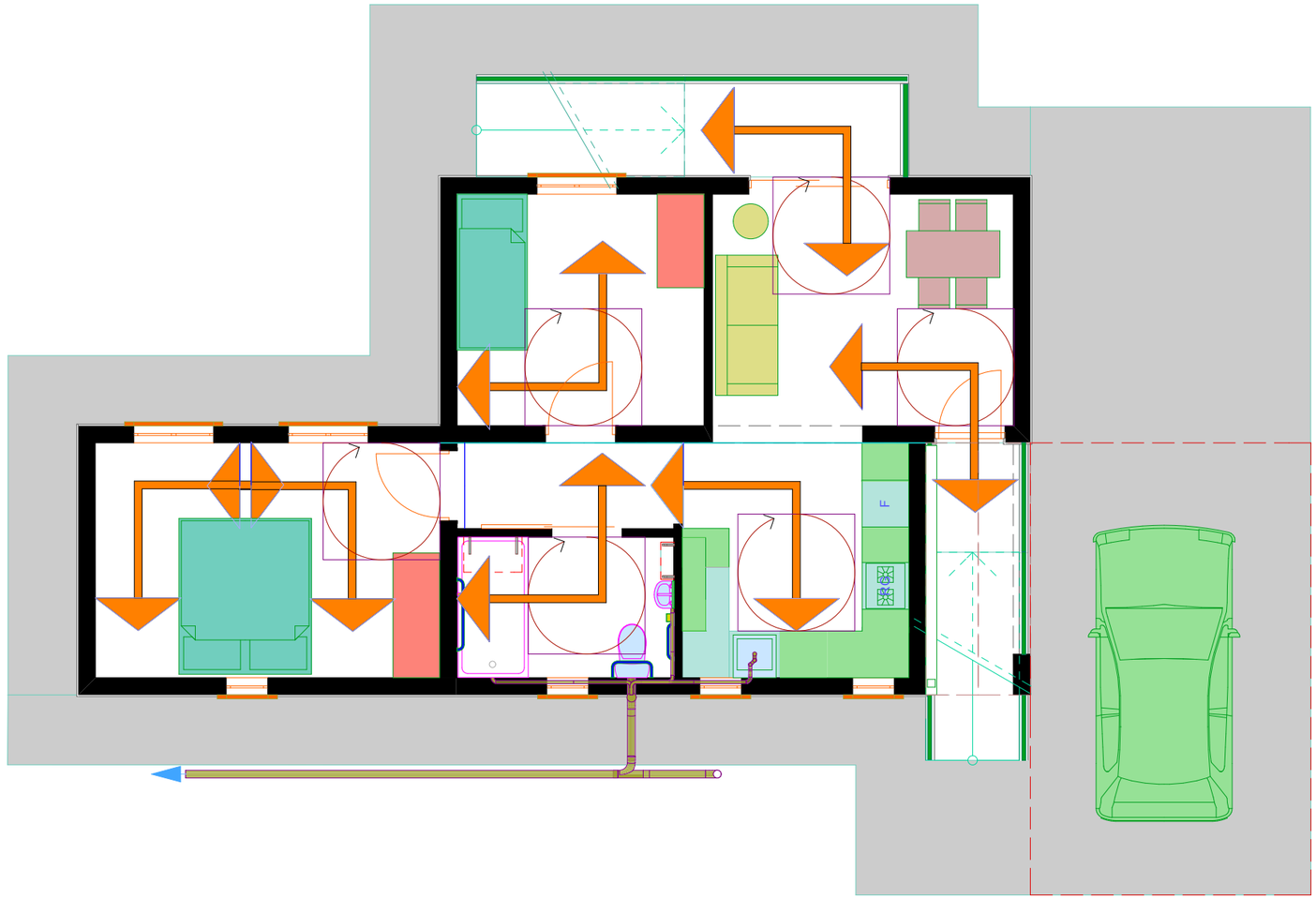
### 2.2.2 Space Requirements

Dimensional requirements for accessible space dictate the area sizes. Some of the drivers of the area sizes are the turning spaces and comfortable reaching spaces.

In this proposal, the critical categories that drive the dimensional requirements are the people with mobility impairments, especially the wheelchair users. The three parameters considered in the design are as follows:

- User space: Manual wheelchair dimensions of 1200mm x750mm.
- Full and partial turning spaces for manoeuvring: Full turning areas of 1700mm x1700mm reduced to 1500mm x1500mm and 90° angle turning spaces of 1100mm x1100mm. See Figure 1.
- Comfortable reaching heights: Table tops of 700mm from floor level and cupboards mounted at 350mm-400mm from the work top.

**Figure 1- 360° and 90° turning spaces**



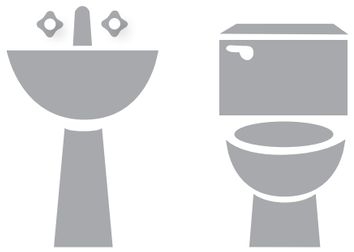
# 3 SPECIFICATIONS FOR ACCESSIBLE DESIGNS

## 3.1 General:

a) Plan layouts must allow for simple manoeuvring
b) Accessible houses for the disabled must be nearer to community facilities
c) Tonal contrasts (light and dark) to door frames, skirtings, wall edges, switches and grab rails for visually impaired
d) Half of all toilets in a development must be left handed and the other half right handed
e) Ramps must be perpendicular to entrance doors
f) Handrails to be rounded at edges
g) Sufficient lighting in passages and at front door
h) Power sockets not to be in corners
i) All grab rails must be positioned precisely
j) Provide 900mm concrete apron around house
k) Vision holes should be fitted to the front door for the deaf
l) Turning spaces must be provided in the u-shaped kitchen and behind external doors and internal doors of 1700mm x1700mm. Right angle turns are provided in the passages of 1100mm wide
m) Provision is made for comfortable reaching heights for fixed units such as kitchen table tops and mounted wall units. A section of table top that is near the sink is 700mm high and the space under the sink left open.

## 3.2 Bathroom:

a) 2.5m x1.8m clear floor space including the shower
b) Distance between toilet pan and adjacent wall must not be less than 450mm and not more than 500mm
c) Soap dispenser, mirror and toilet paper holder must be safely positioned and easily accessible
d) The top of the toilet seat must not be less than 480mm or more than 500mm from the floor
e) WC flush control must be positioned to be easy to use
f) WHB must have no pedestal or legs. The top of basin must be 820mm from floor and the clearance from the floor to the underside of the basin must be 650mm
g) Water taps must be operated by lever handles with a lever of at least 100mm long
h) Hot water taps must be on the right hand side and the cold water tap must be within reach of any person sitting on the toilet
i) Grab rails must be at suitable heights and preferably provided at the back and side of the toilet pan. On side of shower provide 900mm long and 32mm diameter stainless steel grab rails or slippery free PVC
j) The roll in shower must be 750mm wide
k) Hand held shower head should be within 1,2m reach from seat
l) The power floated or screed floor must slope 1: 60 to outlet. Vertical changes in level may not exceed 8mm
m) Vanity slab or shelf must be fitted level with top of basin with a clear height of 750mm beneath it.

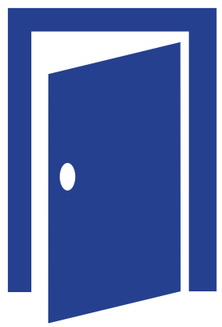


## 3.3 Ramps:

a) Any level change exceeding 15mm must have a ramp e.g. at the main entrances
b) The gradient of the ramp must not be steeper than 1:12 and must be 1,2m wide joining onto the 1,2m x1,2m landing
c) Handrails must be provided on both sides of the ramp and landing where the change in level of more than 600mm occurs.

## 3.4 Floors:

a) All floors must be slip resistant and free of irregularities achieved on the power floated floor
b) The vertical change in levels, such as the shower floor adjacent to the bathroom floor, must not be more than 5mm.



## 3.5 Doors:

a) Clear openings must not be less than 750mm. The passage width for 750mm-813mm openings must be 100mm
b) Door handles must be 150mm long at 1000mm high from the floor
c) Windows and doors must not open onto the walkways or ramps
d) Doors must be fitted with door stops
e) A sliding door/vinyl folding door must be fitted to bathroom and securely fixed at top and bottom with grooves at top and bottom. Alternatively, normal swing doors may be used
f) 300mm wide stainless steel protection plates below all doors
g) Top of sliding door handles must be 750mm from the floor with pull handles 150mm long both sides of door fitted 60mm from the side of both wall.

## 3.6 Handrails:

a) 35mm to 50mm circular grip
b) Height of top of handrail from nosing of tread must be between 900mm and 1000mm
c) Handrails must be securely fixed and rigid
d) Gripping surface must be continuous without interruptions
e) Handrails and building corners/edges must be in contrasting colour to surroundings.

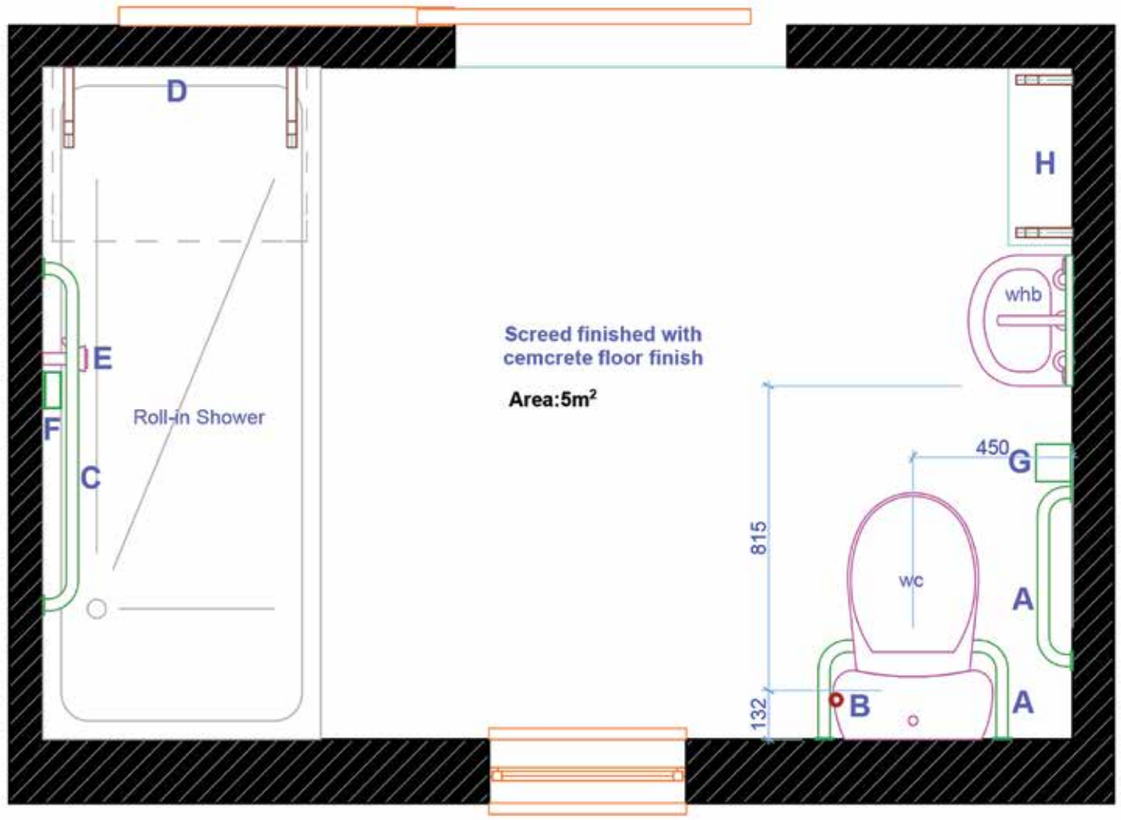
## 3.7 Security Control, Light Switches and Power Points:

a) Doorbell incl. security controls and light switches must be horizontally aligned with the door handles and other fixtures or fittings must be min. 900mm and max.1200mm above finished floor level.
b) General purpose power points must be 500mm above finished floor level or 150mm above worktop and 450mm from corners.

## 3.8 Symbols on Drawings:

a) Ⓐ - WC stainless steel grab rail
Ⓑ - Flush control 600mm from finished floor level
Ⓒ - Shower grab rail
Ⓓ - Hinged timber seat (incl. only on approval)
Ⓔ - Hand held shower head with min. 1500mm flexible shower hose
Ⓕ - Soap dispenser or recessed soap holder
Ⓖ - Toilet paper holder
Ⓗ - Shelf fitted level with WHB (incl. only on approval) See Figure 2.

**Figure 2- Typical bathroom layout**



# 4 APPENDICES

The following appendices are attached:

- Appendix A : Presentations of the 45m$^2$, 60m$^2$, 70m$^2$ and 80m$^2$ typologies for differently abled persons
- Appendix B: Working Drawings of the 45m$^2$, 60m$^2$, 70m$^2$ and 80m$^2$ typologies for differently abled persons including energy efficiency interventions.

# 5 CONCLUSION

The proposed typologies for differently abled persons with physical challenges indicate that to include all the special requirements will lead to substantial cost increases. The indigent group and relevant categories such as people with mobility, dexterity and sensory impairments would have to be considered as exceptional cases consisting of approximately 3% of South Africa's population, equivalent to approximately 1, 2 million people in total. The minimum area in a house that will accommodate all the needs of the physically disabled would be a 45m$^2$ area house, although the 60m$^2$ house would be more acceptable, due to the two bedrooms it contains.

**Peer review**

| | | | |
|---|---|---|---|
| NAME | Amanda Gibberd | Guy Davis | Jeremy Deysel<br>Dorothy- Anne Howjtson<br>Joan Seirlis<br>J van den Boogaard |
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# 6 REFERENCES


DoH (Department of Housing), 2009. *The National Housing Code. Part 3 – Technical and General Guidelines*. Pretoria: Department of Human Settlements.

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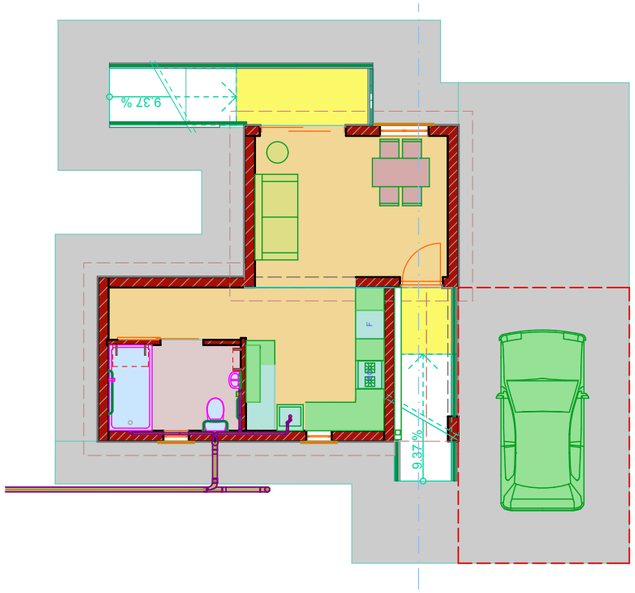
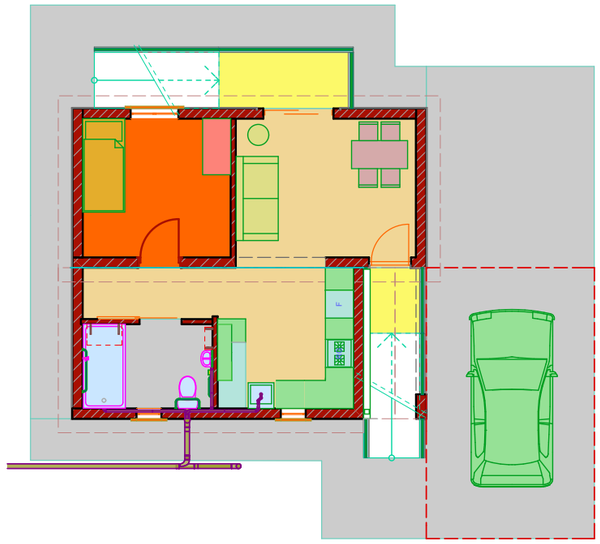
# SAMPLE PLANS

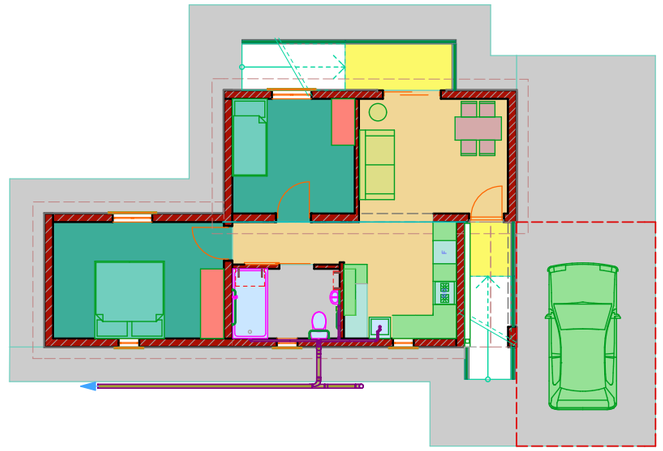
**APPENDIX A**



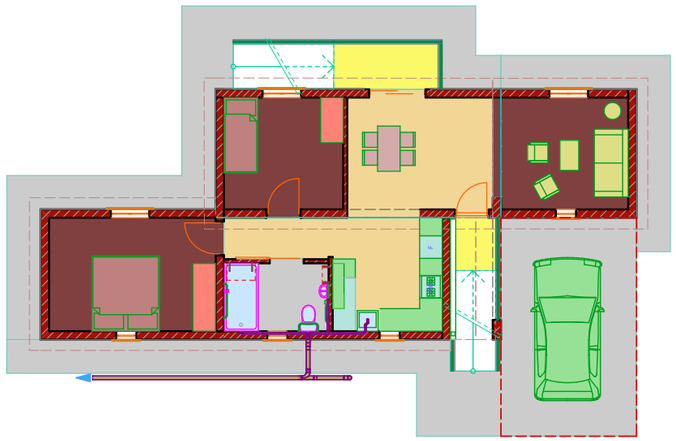

**TYPOLOGY CORE: 35m²**



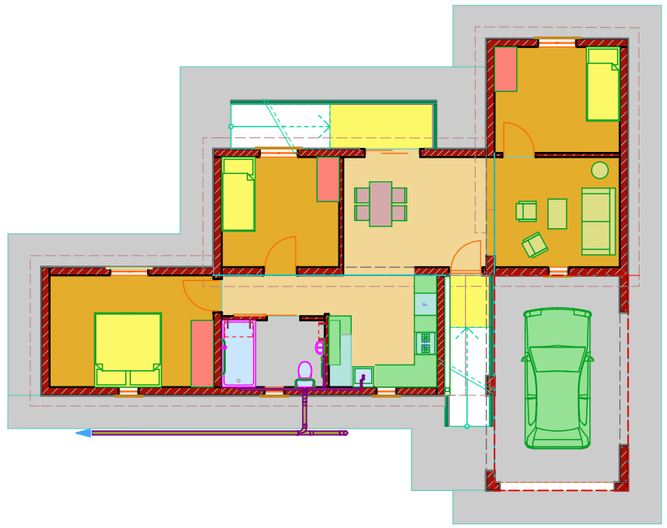
**TYPOLOGY 1: 45m²**



**TYPOLOGY 2: 60m²**



**TYPOLOGY 3: 70m²**



**TYPOLOGY 4: 80m²**

PROJECT

# ACCESSIBLE TYPLOGIES FOR DIFFERENTLY ABLED PERSONS

PREPARED BY:

National Home Builders Registration Council
5 Leeuwkop Road
Sunninghill
Johannesburg
TEL: +27 (0)11 317 0000

DESCRIPTION

**PRESENTATION LAYOUTS FOR 45m², 60m², 70m² AND 80m² TYPOLOGIES**

SCALE: 1:100

| | | | |
|---|---|---|---|
| DESIGN | | DWG NO: | REV NO: |
| DRAWN | | PROJ NO: | |
| CHECKED | | DATE: | |

**TYPOLOGY CORE: 35m$^2$**

**TYPOLOGY 1: 45m$^2$**

**TYPOLOGY 2: 60m$^2$**

**TYPOLOGY 3: 70m$^2$**

**TYPOLOGY 4: 80m$^2$**

PROJECT

# ACCESSIBLE TYPOLOGIES FOR DIFFERENTLY ABLED PERSONS

PREPARED BY:

National Home Builders Registration Council
5 Leeuwkop Road
Sunninghill
Johannesburg
TEL: +27 (0)11 317 0000

DESCRIPTION

**PERSPECTIVES FOR 45m$^2$, 60m$^2$, 70m$^2$ AND 80m$^2$ TYPOLOGIES**

SCALE: 1:100

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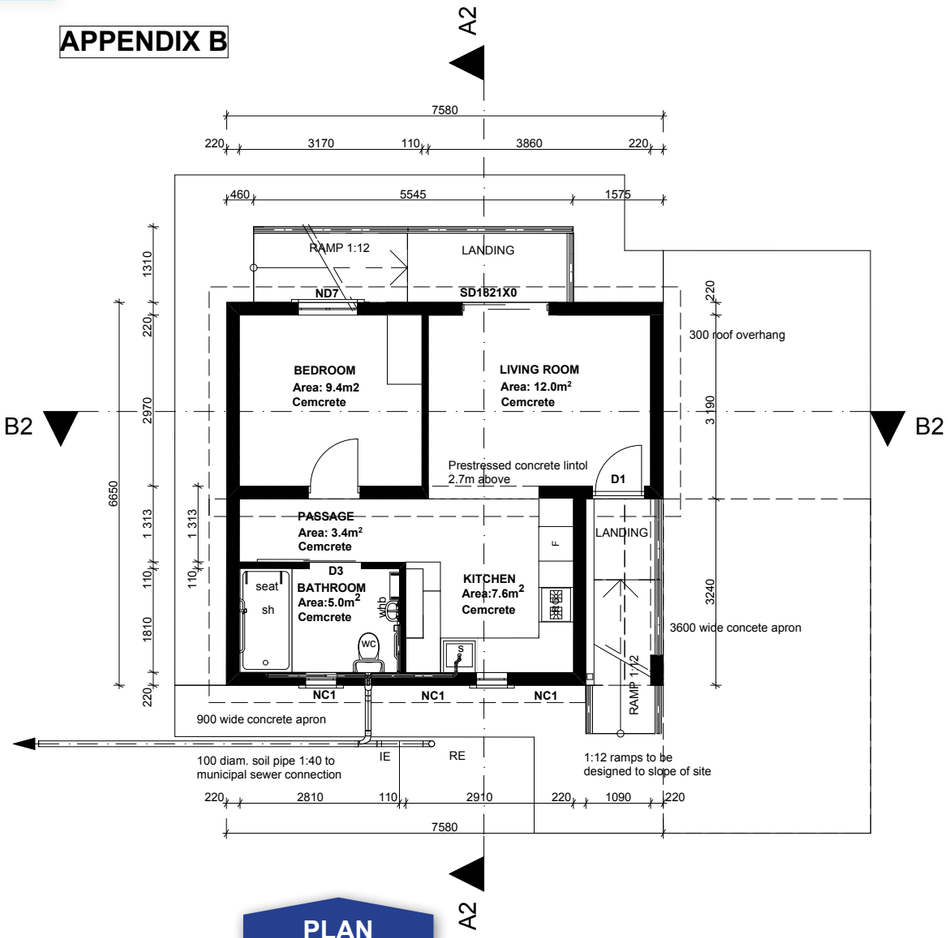
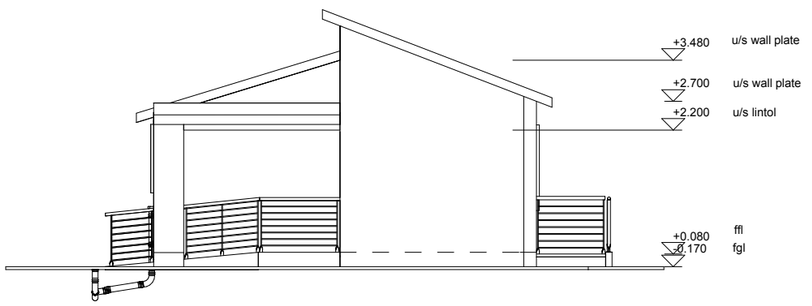
| DRAWN | | PROJ NO: | |
| CHECKED | | DATE: Sept 2014 | |

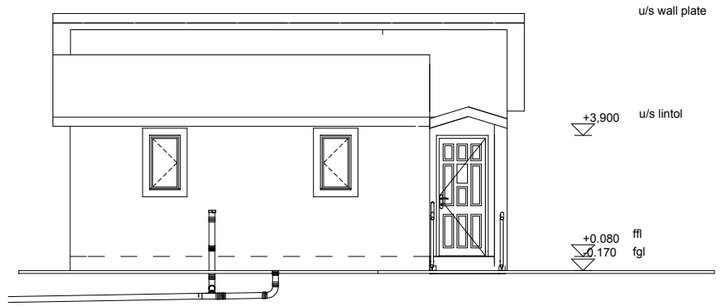
# APPENDIX B




## PLAN




## EAST ELEVATION




## SOUTH ELEVATION

**FENESTRATION CALCULATION TO SANS 10400XA 4.4.4**

| | | | |
|---|---|---|---|
| **North:** ND7 | $W_1$= | 1.022 x 1.245 | =1.272m² |
| SD | $W_2$= | 1.500 x 2.100 | =3.150m² |
| **South:** NC1 | $W_3$= | 0.949 x 0.533(2) | =1.011m² |
| **Total fenestration area** | | | **= 5.433m²** |

Unit area =45m² (excl. covered walkway)

**Net area =38.2m²**

The total floor area is checked in the calculation below:

15% of the net floor area 38.2m² =5.73m²

Total fenestration =5.433m²

**5.433m² < 5.73m² which does comply**

| ENERGY EFFICIENCY SCHEDULE | |
|---|---|
| **DESCRIPTION** | **SOLUTION** |
| HOT WATER | Collector panels of 1.25m² is required for 100litres resorting to a 1 x 100litre solar geyser |
| FENESTRATION | Monolithic- and safety glass to SANS 10400 Part N |
| ROOF ASSEMBLY | Climate zone 1: R-value = 3.7= 130mm e.g. polyester fibre |
| EXTERNAL WALLS | To manufacturers specifications. R-value: See table |

**STANDARD CONSTRUCTION NOTES:**

-ALL CONSTRUCTION AND MATERIALS TO COMPLY WITH NHBRC'S HOME BUILDING MANUAL AND SANS 10400, UNLESS OTHERWISE AGREED THROUGH RATIONAL DESIGN
-PROVISION MUST BE MADE FOR STORMWATER RUNOFFS
-WHERE ELECTRICAL INSTALLATION IS REQUIRED SPECIFICATIONS WILL BE PROVIDED
-THIS DRAWING IS NOT TO BE SCALED
-DISCREPENCIES TO BE REPORTED TO PROJECT MANAGER
-REFER TO TABLES IN DWG FOR SANS 10400XA COMPLIANCE

**SPECIFICATIONS:**
**1. GENERAL NOTES:**

1.1 ALL DIMENSIONS & LEVELS TO BE CHECKED ON SITE BEFORE ANY WORK COMMENCES

**2. FLOORS:**

2.1 75MM POWER FLOATED OR 75MM CONCRETE SURFACE BED WITH 25MM SCREED
2.2 APPLY CEMCRETE FLOOR FINISH DIVIDED INTO A BLOCK PATTERN TO MANUFACTURER'S SPECIFICATIONS

**3. FOUNDATIONS:**

3.1 ALL FOUNDATIONS, FOUNDATION WALLS, STRUCTURAL CONCRETE WORK AND SUBSOIL STORMWATER DRAINAGE TO ENGINEER'S SPECIFICATIONS

**4. WALLS:**

4.1 220MM OR 290MM BRICK WALL WITH 375 MICRON DPC
4.2 EXTERNAL WALLS- INSTALL 2.8MM DIAM. X110MM WIDE BRICKFORCE AT EVERY 4TH COURSES AND EACH COURSE ABOVE WINDOW AND DOOR LEVEL
4.3 INTERNAL WALLS INSTALL 2.8MM ØX75MM WIDE BRICKFORCE AT EVERY 2ND COURSE AND EACH COURSE ABOVE WINDOW AND DOOR FRAME LEVEL
4.4 100/140X90 PRESTRESSED CONCRETE LINTOLS ABOVE OPENINGS IN WALLS WITH 230 END BEARING, CHECKED BY AN ENGINEER
**Choice of bricks:**
4.5 220X110X75MM STOCKBRICK OR 290X135X90 MAXI CLAYBRICK OR CEMENT MAXI QUANTUM BRICK WITH A MINIMUM STRENGTH OF 7MPA CLASS II MORTAR (1:6)
4.6 INTERNAL WALLS TO BE BAGWASHED AND EXTERNAL WALLS TO BE COATED WITH CEMCRETE TO THICKNESS THAT COVERS EXPOSED ROOF TIES.
4.7 LINTELS ABOVE ALL DOORS AND WINDOW FRAMES UNLESS CLISCO FRAMES ARE USED

**5. ROOFS:**

5.1 125X50X20X2MM STEEL COLD FORMED LIPPED CHANNEL BEAMS @ 1000MM C/C OR 152X50MM S.A PINE BEAMS @ 1000MM C/C SPACING TIED WITH 4MM GALVANISED HOOP IRON TIED.75X50X2MM STEEL COLD FORMED LIPPED CHANNEL WALL PLATES OR TREATED 76X50MM S.A PINE WALL PLATE TO BE LAID FLAT AND PAINTED WITH CARBOLINIUM ON ALL SIDES
5.2 225 X 15MM THICK FIBRE CEMENT FASCIA IN LONG LENGTHS, JOINED WITH METAL JOINING PIECES AND FIXED WITH BRASS SCREWS AT MAX. 1000MM C/C TO BATTEN
5.2 ROOF COVERING (0,6MM CORRUGATED GALV. STEEL SHEETING OR CONCRETE TILES) AT 17 DEG. AND 21 DEG.WITH ROOF FLASHING AGAINST WALLS. ONLY ROOF NAILS WITH WASHERS AND CAPS TO BE USED
5.3 ROOF OVERHANGS TO BE MIN. 300MM
5.4 SLANTED 6MM FIBRE CEMENT CEILING WITH H-PROFILE STEEL JOINTING STRIPS FIXED WITH GALV. CEILING NAILS TO 38X38MM BRANDERING @ 600MM C/C
5.5 75MM FIBRE CEMENT CORNICE (NUCORNICE) GLUED WITH NC ADHESIVE

**6. WINDOW AND DOORS:**

6.1 3MM CLEAR FLOAT GLASS INCL. ENERGY EFFICIENT STEEL WINDOW FRAMES
6.2 WINDOW FRAMES BUILT IN WITH 375 MICRON DPC BELOW 15MM FIBRE CEMENT WINDOW CILLS

PROJECT

**ACCESSIBLE TYPOLOGIES FOR DIFFERENTLY ABLED PERSONS**

PREPARED BY

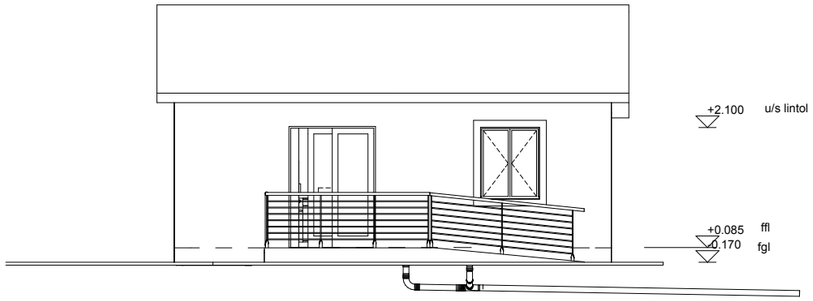
National Home Builders Registration Council
5 Leeuwkop Road
Sunninghill
Johannesburg
TEL: +27 (0)11 317 0000

DESCRIPTION

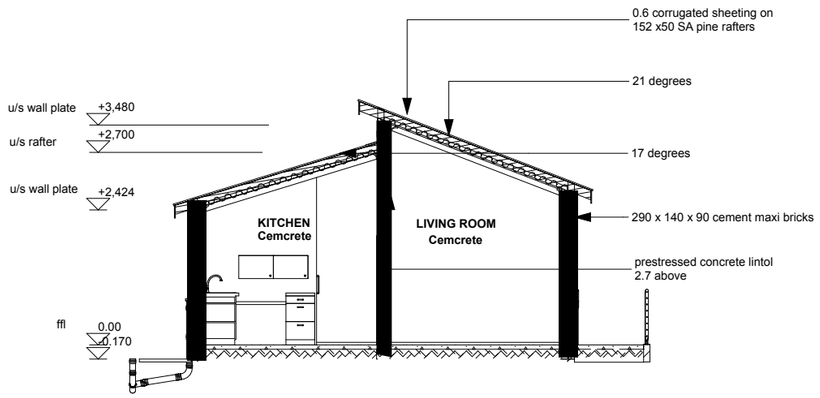
**45m²**
**PLAN, SECTION AND ELEVATIONS**

SCALE: 1:100

| | | | |
|---|---|---|---|
| DESIGN | | DWG NO: | REV NO: |
| DRAWN | | PROJ NO: | |
| CHECKED | | DATE: | |




NORTH ELEVATION




SECTION A2

**WALLS CALCULATION TO SANS 10400XA 4.4.3.2**

| NO. | THICKNESS (MM) | MATERIAL | CONDUCTIVITY W/(m.K) | R-VALUE (m2.K/W) |
|---|---|---|---|---|
| $R_a$ | | MOVING AIR FILM | | 0.03 |
| $R_1$ | 10 | PLASTER | 0.5 | 0.02 |
| $R_2$ | 140<br>220 | CONC. BRICK or BRICK | 0.7<br>0.84 | 0.2<br>0.26 |
| $R_3$ | 10 | PLASTER | 0.5 | 0.02 |
| $R_S$ | | STILL AIR FILM | | 0.11 |
| **TOTAL R-VALUE** | | | | **0.38 - 0.44** |

According to 4.4.3.2 of SANS XA a masonry wall may be used that is a double skin masonry wall with no cavity, plastered internally, and face masonry that is either plastered or not plastered externally, or a single leaf masonry wall with a nominal wall thickness greater than or equal to 140mm, plastered internally and externally will comply.

Hollow concrete block with 10mm plaster both sides is equivalent to R-Value of 0.31- 0.35.

**ROOF ASSEMBLY CALCULATION TO SANS 10400XA 4.4.3.2 (CLIMATE ZONE 1- JHB)**

| NO. | THICKNESS (MM) | MATERIAL | CONDUCTIVITY W/(m.K) | R-VALUE (m2.K/W) |
|---|---|---|---|---|
| $R_a$ | | MOVING AIR FILM | | 0.03 |
| $R_1$ | 0.6 | METAL CLADDING | | 0 |
| $R_2$ | 100-300 roof space | ROOF SPACE | | 0.15 |
| $R_3$ | 127 | INSULATION | | 3.33 |
| $R_4$ | 10 | GYPSUM BOARD | | 0.06 |
| $R_S$ | | STILL AIR FILM | | 0.11 |
| **TOTAL R-VALUE** | | | | **3.7** |

**STANDARD CONSTRUCTION NOTES:**

-ALL CONSTRUCTION AND MATERIALS TO COMPLY WITH NHBRC'S HOME BUILDING MANUAL AND SANS 10400, UNLESS OTHERWISE AGREED THROUGH RATIONAL DESIGN
-PROVISION MUST BE MADE FOR STORMWATER RUNOFFS
-WHERE ELECTRICAL INSTALLATION IS REQUIRED SPECIFICATIONS WILL BE PROVIDED
-THIS DRAWING IS NOT TO BE SCALED
-DISCREPENCIES TO BE REPORTED TO PROJECT MANAGER
-REFER TO TABLES IN DWG FOR SANS 10400XA COMPLIANCE

**SPECIFICATIONS:**
**1. GENERAL NOTES:**

1.1 ALL DIMENSIONS & LEVELS TO BE CHECKED ON SITE BEFORE ANY WORK COMMENCES

**2. FLOORS:**

2.1 75MM POWER FLOATED OR 75MM CONCRETE SURFACE BED WITH 25MM SCREED
2.2 APPLY CEMCRETE FLOOR FINISH DIVIDED INTO A BLOCK PATTERN TO MANUFACTURER'S SPECIFICATIONS

**3. FOUNDATIONS:**

3.1 ALL FOUNDATIONS, FOUNDATION WALLS, STRUCTURAL CONCRETE WORK AND SUBSOIL STORMWATER DRAINAGE TO ENGINEER'S SPECIFICATIONS

**4. WALLS:**

4.1 220MM OR 290MM BRICK WALL WITH 375 MICRON DPC
4.2 EXTERNAL WALLS- INSTALL 2.8MM DIAM. X110MM WIDE BRICKFORCE AT EVERY 4TH COURSES AND EACH COURSE ABOVE WINDOW AND DOOR LEVEL
4.3 INTERNAL WALLS INSTALL 2.8MM ØX75MM WIDE BRICKFORCE AT EVERY 2ND COURSE AND EACH COURSE ABOVE WINDOW AND DOOR FRAME LEVEL
4.4 100/140X90 PRESTRESSED CONCRETE LINTOLS ABOVE OPENINGS IN WALLS WITH 230 END BEARING, CHECKED BY AN ENGINEER
**Choice of bricks:**
4.5 220X110X75MM STOCKBRICK OR 290X135X90 MAXI CLAYBRICK OR CEMENT MAXI QUANTUM BRICK WITH A MINIMUM STRENGTH OF 7MPA CLASS II MORTAR (1:6)
4.6 INTERNAL WALLS TO BE BAGWASHED AND EXTERNAL WALLS TO BE COATED WITH CEMCRETE TO THICKNESS THAT COVERS EXPOSED ROOF TIES.
4.7 LINTELS ABOVE ALL DOORS AND WINDOW FRAMES UNLESS CLISCO FRAMES ARE USED

**5. ROOFS:**

5.1 125X50X20X2MM STEEL COLD FORMED LIPPED CHANNEL BEAMS @ 1000MM C/C OR 152X50MM S.A PINE BEAMS @ 1000MM C/C SPACING TIED WITH 4MM GALVANISED HOOP IRON TIED.75X50X2MM STEEL COLD FORMED LIPPED CHANNEL WALL PLATES OR TREATED 76X50MM S.A PINE WALL PLATE TO BE LAID FLAT AND PAINTED WITH CARBOLINIUM ON ALL SIDES
5.2 225 X 15MM THICK FIBRE CEMENT FASCIA IN LONG LENGTHS, JOINED WITH METAL JOINING PIECES AND FIXED WITH BRASS SCREWS AT MAX. 1000MM C/C TO BATTEN
5.2 ROOF COVERING (0,6MM CORRUGATED GALV. STEEL SHEETING OR CONCRETE TILES) AT 17 DEG. AND 21 DEG.WITH ROOF FLASHING AGAINST WALLS. ONLY ROOF NAILS WITH WASHERS AND CAPS TO BE USED
5.3 ROOF OVERHANGS TO BE MIN. 300MM
5.4 SLANTED 6MM FIBRE CEMENT CEILING WITH H-PROFILE STEEL JOINTING STRIPS FIXED WITH GALV. CEILING NAILS TO 38X38MM BRANDERING @ 600MM C/C
5.5 75MM FIBRE CEMENT CORNICE (NUCORNICE) GLUED WITH NC ADHESIVE

**6. WINDOW AND DOORS:**

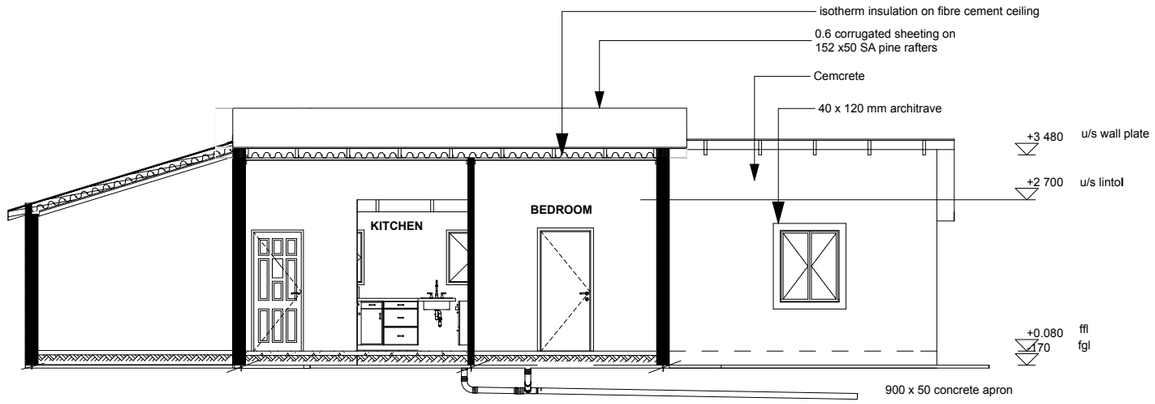
6.1 3MM CLEAR FLOAT GLASS INCL. ENERGY EFFICIENT STEEL WINDOW FRAMES
6.2 WINDOW FRAMES BUILT IN WITH 375 MICRON DPC BELOW 15MM FIBRE CEMENT WINDOW CILLS

PROJECT
**ACCESSIBLE TYPOLOGIES FOR DIFFERENTLY ABLED PERSONS**

PREPARED BY
National Home Builders Registration Council
5 Leeuwkop Road
Sunninghill
Johannesburg
TEL: +27 (0)11 317 0000

DESCRIPTION
**45m²**
**PLAN, SECTION AND ELEVATIONS**
SCALE: 1:100

| | | | |
|---|---|---|---|
| DESIGN | | DWG NO: | REV NO: |
| DRAWN | | PROJ NO: | |
| CHECKED | | DATE: | |




# SECTION B4

**FENESTRATION CALCULATION TO SANS 10400XA 4.4.4**

**North:** ND7 $W_1$= 1.022 x 1.245 (3) =3.817m²
SD $W_2$= 1.500 x 2.100 =3.150m²
**South:** NC1 $W_3$= 0.949 x 0.533 (4) = 2.03m²

**Total fenestration area = 8.997m²**
Unit area =70m² (excl. covered walkway)
**Net area =62.2m²**

The total floor area is checked in the calculation below:

15% of the net floor area of 51.4m² =9.33m²

Total fenestration =8.997m²

**8.997m² < 9.33m² which does comply**

| ENERGY EFFICIENCY SCHEDULE | |
|---|---|
| **DESCRIPTION** | **SOLUTION** |
| HOT WATER | Collector panels of 2,9m² is required for 176litres resorting to a 1 x 200litre solar geyser |
| FENESTRATION | Monolithic- and safety glass to SANS 10400 Part N |
| ROOF ASSEMBLY | Climate zone 1: R-value = 3.7= 130mm e.g. polyester fibre |
| EXTERNAL WALLS | To manufacturers specifications. R-value: See table |

**ROOF ASSEMBLY CALCULATION TO SANS 10400XA 4.4.3.2 (CLIMATE ZONE 1- JHB)**

| NO. | THICKNESS (MM) | MATERIAL | CONDUCTIVITY W/(m.K) | R-VALUE (m2.K/W) |
|---|---|---|---|---|
| $R_a$ | | MOVING AIR FILM | | 0.03 |
| $R_1$ | 0.6 | METAL CLADDING | | 0 |
| $R_2$ | 100-300 roof space | ROOF SPACE | | 0.15 |
| $R_3$ | 127 | INSULATION | | 3.33 |
| $R_4$ | 10 | GYPSUM BOARD | | 0.06 |
| $R_S$ | | STILL AIR FILM | | 0.11 |
| **TOTAL R-VALUE** | | | | **3.7** |

**WALLS CALCULATION TO SANS 10400XA 4.4.3.2**

| NO. | THICKNESS (MM) | MATERIAL | CONDUCTIVITY W/(m.K) | R-VALUE (m2.K/W) |
|---|---|---|---|---|
| $R_a$ | | MOVING AIR FILM | | 0.03 |
| $R_1$ | 10 | PLASTER | 0.5 | 0.02 |
| $R_2$ | 140<br>220 | CONC. BRICK or BRICK | 0.7<br>0.84 | 0.2<br>0.26 |
| $R_3$ | 10 | PLASTER | 0.5 | 0.02 |
| $R_S$ | | STILL AIR FILM | | 0.11 |
| **TOTAL R-VALUE** | | | | **0.38 - 0.44** |

According to 4.4.3.2 of SANS XA a masonry wall may be used that is a double skin masonry wall with no cavity, plastered internally, and face masonry that is either plastered or not plastered externally, or a single leaf masonry wall with a nominal wall thickness greater than or equal to 140mm, plastered internally and externally will comply.

Hollow concrete block with 10mm plaster both sides is equivalent to R-Value of 0.31- 0.35.

**STANDARD CONSTRUCTION NOTES:**

-ALL CONSTRUCTION AND MATERIALS TO COMPLY WITH NHBRC'S HOME BUILDING MANUAL AND SANS 10400, UNLESS OTHERWISE AGREED THROUGH RATIONAL DESIGN
-PROVISION MUST BE MADE FOR STORMWATER RUNOFFS
-WHERE ELECTRICAL INSTALLATION IS REQUIRED SPECIFICATIONS WILL BE PROVIDED
-THIS DRAWING IS NOT TO BE SCALED
-DISCREPENCIES TO BE REPORTED TO PROJECT MANAGER
-REFER TO TABLES IN DWG FOR SANS 10400XA COMPLIANCE

**SPECIFICATIONS:**
**1. GENERAL NOTES:**

1.1 ALL DIMENSIONS & LEVELS TO BE CHECKED ON SITE BEFORE ANY WORK COMMENCES

**2. FLOORS:**

2.1 75MM POWER FLOATED OR 75MM CONCRETE SURFACE BED WITH 25MM SCREED
2.2 APPLY CEMCRETE FLOOR FINISH DIVIDED INTO A BLOCK PATTERN TO MANUFACTURER'S SPECIFICATIONS

**3. FOUNDATIONS:**

3.1 ALL FOUNDATIONS, FOUNDATION WALLS, STRUCTURAL CONCRETE WORK AND SUBSOIL STORMWATER DRAINAGE TO ENGINEER'S SPECIFICATIONS

**4. WALLS:**

4.1 220MM OR 290MM BRICK WALL WITH 375 MICRON DPC
4.2 EXTERNAL WALLS- INSTALL 2.8MM DIAM. X110MM WIDE BRICKFORCE AT EVERY 4TH COURSES AND EACH COURSE ABOVE WINDOW AND DOOR LEVEL
4.3 INTERNAL WALLS INSTALL 2.8MM ØX75MM WIDE BRICKFORCE AT EVERY 2ND COURSE AND EACH COURSE ABOVE WINDOW AND DOOR FRAME LEVEL
4.4 100/140X90 PRESTRESSED CONCRETE LINTOLS ABOVE OPENINGS IN WALLS WITH 230 END BEARING, CHECKED BY AN ENGINEER
**Choice of bricks:**
4.5 220X110X75MM STOCKBRICK OR 290X135X90 MAXI CLAYBRICK OR CEMENT MAXI QUANTUM BRICK WITH A MINIMUM STRENGTH OF 7MPA CLASS II MORTAR (1:6)
4.6 INTERNAL WALLS TO BE BAGWASHED AND EXTERNAL WALLS TO BE COATED WITH CEMCRETE TO THICKNESS THAT COVERS EXPOSED ROOF TIES.
4.7 LINTELS ABOVE ALL DOORS AND WINDOW FRAMES UNLESS CLISCO FRAMES ARE USED

**5. ROOFS:**

5.1 125X50X20X2MM STEEL COLD FORMED LIPPED CHANNEL BEAMS @ 1000MM C/C OR 152X50MM S.A PINE BEAMS @ 1000MM C/C SPACING TIED WITH 4MM GALVANISED HOOP IRON TIED.75X50X2MM STEEL COLD FORMED LIPPED CHANNEL WALL PLATES OR TREATED 76X50MM S.A PINE WALL PLATE TO BE LAID FLAT AND PAINTED WITH CARBOLINIUM ON ALL SIDES
5.2 225 X 15MM THICK FIBRE CEMENT FASCIA IN LONG LENGTHS, JOINED WITH METAL JOINING PIECES AND FIXED WITH BRASS SCREWS AT MAX. 1000MM C/C TO BATTEN
5.2 ROOF COVERING (0,6MM CORRUGATED GALV. STEEL SHEETING OR CONCRETE TILES) AT 17 DEG. AND 21 DEG.WITH ROOF FLASHING AGAINST WALLS. ONLY ROOF NAILS WITH WASHERS AND CAPS TO BE USED
5.3 ROOF OVERHANGS TO BE MIN. 300MM
5.4 SLANTED 6MM FIBRE CEMENT CEILING WITH H-PROFILE STEEL JOINTING STRIPS FIXED WITH GALV. CEILING NAILS TO 38X38MM BRANDERING @ 600MM C/C
5.5 75MM FIBRE CEMENT CORNICE (NUCORNICE) GLUED WITH NC ADHESIVE

**6. WINDOW AND DOORS:**

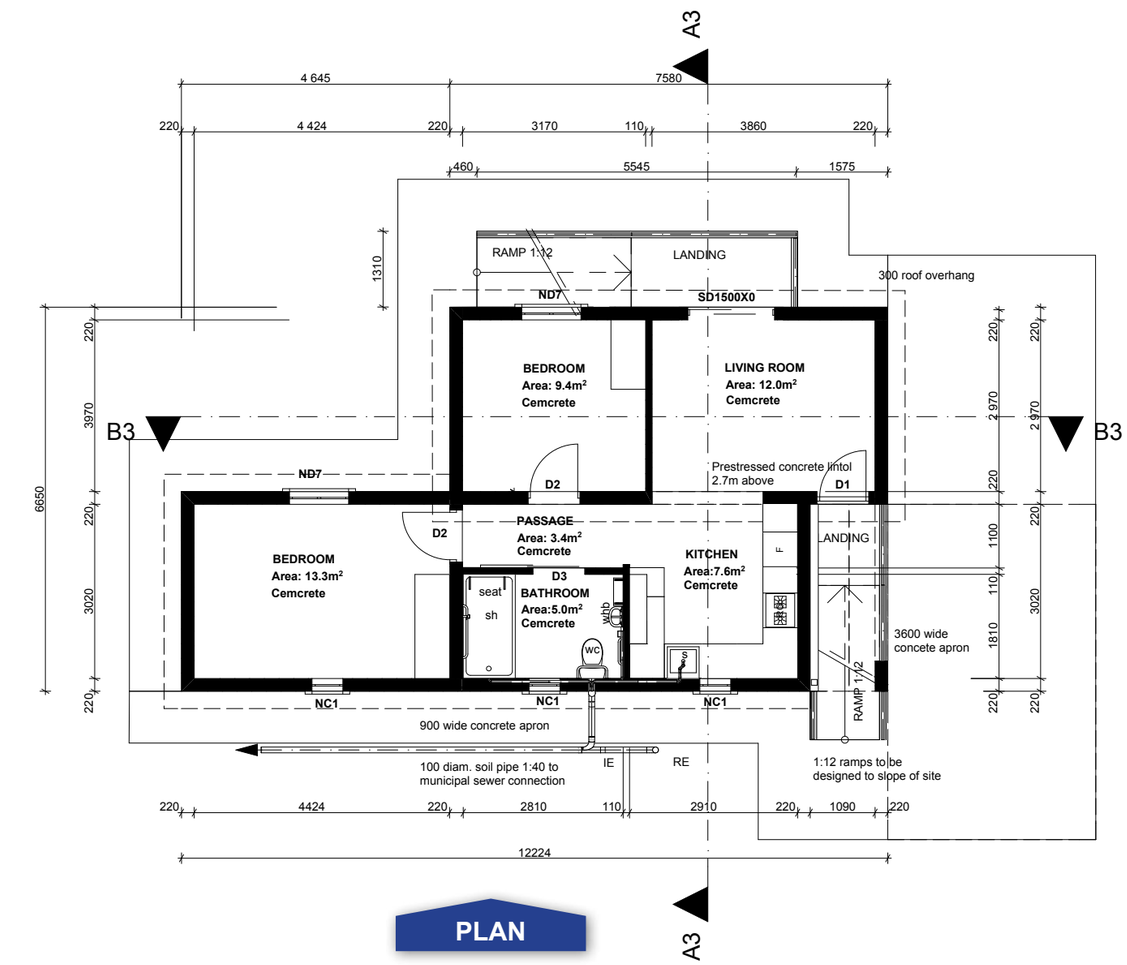
6.1 3MM CLEAR FLOAT GLASS INCL. ENERGY EFFICIENT STEEL WINDOW FRAMES
6.2 WINDOW FRAMES BUILT IN WITH 375 MICRON DPC BELOW 15MM FIBRE CEMENT WINDOW CILLS

PROJECT
**ACCESSIBLE TYPOLOGIES FOR DIFFERENTLY ABLED PERSONS**

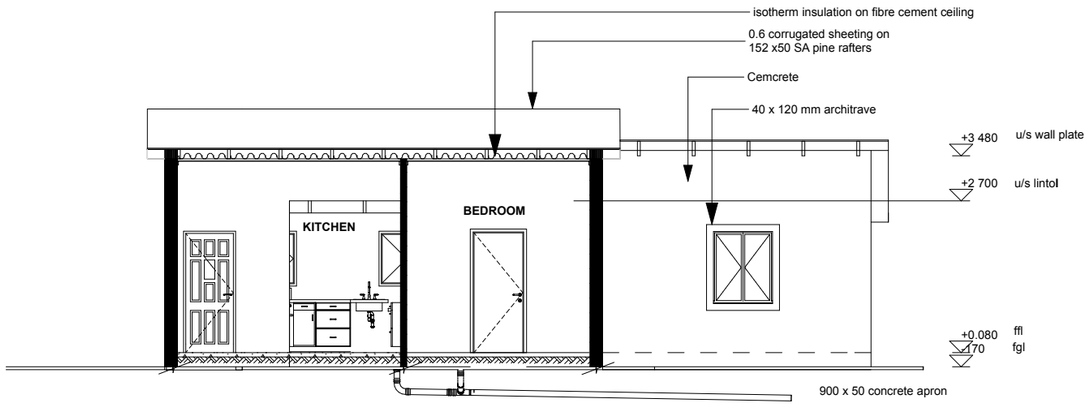
PREPARED BY
National Home Builders Registration Council
5 Leeuwkop Road
Sunninghill
Johannesburg
TEL: +27 (0)11 317 0000

DESCRIPTION
**70m²**
**SECTIONS**
SCALE: 1:100

| | | | |
|---|---|---|---|
| DESIGN | | DWG NO: | REV NO: |
| DRAWN | | PROJ NO: | |
| CHECKED | | DATE: | |




PLAN




SECTION B3

**FENESTRATION CALCULATION TO SANS 10400XA 4.4.4**

| | | | |
|---|---|---|---|
| **North:** ND7 | $W_1$= | 1.022 x 1.245 (2) | =2.545m² |
| SD | $W_2$= | 1.500 x 2.100 | =3.150m² |
| **South:** NC1 | $W_3$= | 0.949 x 0.533 (3) | =1.517m² |

**Total fenestration area = 7.212m²**

Unit area =60m² (excl. covered walkway)

**Net area =51.4m²**

The total floor area is checked in the calculation below:

15% of the net floor area of 51.4m² =7.71m²

Total fenestration =7.212m²

**7.212m² < 7.71m² which does comply**

**ENERGY EFFICIENCY SCHEDULE**

| DESCRIPTION | SOLUTION |
|---|---|
| HOT WATER | Collector panels of 2,9m² is required for 176litres resorting to a 1 x 200litre solar geyser |
| FENESTRATION | Monolithic- and safety glass to SANS 10400 Part N |
| ROOF ASSEMBLY | Climate zone 1: R-value = 3.7= 130mm e.g. polyester fibre |
| EXTERNAL WALLS | To manufacturers specifications. R-value: See table |

**STANDARD CONSTRUCTION NOTES:**

-ALL CONSTRUCTION AND MATERIALS TO COMPLY WITH NHBRC'S HOME BUILDING MANUAL AND SANS 10400, UNLESS OTHERWISE AGREED THROUGH RATIONAL DESIGN
-PROVISION MUST BE MADE FOR STORMWATER RUNOFFS
-WHERE ELECTRICAL INSTALLATION IS REQUIRED SPECIFICATIONS WILL BE PROVIDED
-THIS DRAWING IS NOT TO BE SCALED
-DISCREPENCIES TO BE REPORTED TO PROJECT MANAGER
-REFER TO TABLES IN DWG FOR SANS 10400XA COMPLIANCE

**SPECIFICATIONS:**

**1. GENERAL NOTES:**

1.1 ALL DIMENSIONS & LEVELS TO BE CHECKED ON SITE BEFORE ANY WORK COMMENCES

**2. FLOORS:**

2.1 75MM POWER FLOATED OR 75MM CONCRETE SURFACE BED WITH 25MM SCREED
2.2 APPLY CEMCRETE FLOOR FINISH DIVIDED INTO A BLOCK PATTERN TO MANUFACTURER'S SPECIFICATIONS

**3. FOUNDATIONS:**

3.1 ALL FOUNDATIONS, FOUNDATION WALLS, STRUCTURAL CONCRETE WORK AND SUBSOIL STORMWATER DRAINAGE TO ENGINEER'S SPECIFICATIONS

**4. WALLS:**

4.1 220MM OR 290MM BRICK WALL WITH 375 MICRON DPC
4.2 EXTERNAL WALLS- INSTALL 2.8MM DIAM. X110MM WIDE BRICKFORCE AT EVERY 4TH COURSES AND EACH COURSE ABOVE WINDOW AND DOOR LEVEL
4.3 INTERNAL WALLS INSTALL 2.8MM ØX75MM WIDE BRICKFORCE AT EVERY 2ND COURSE AND EACH COURSE ABOVE WINDOW AND DOOR FRAME LEVEL
4.4 100/140X90 PRESTRESSED CONCRETE LINTOLS ABOVE OPENINGS IN WALLS WITH 230 END BEARING, CHECKED BY AN ENGINEER
**Choice of bricks:**
4.5 220X110X75MM STOCKBRICK OR 290X135X90 MAXI CLAYBRICK OR CEMENT MAXI QUANTUM BRICK WITH A MINIMUM STRENGTH OF 7MPA CLASS II MORTAR (1:6)
4.6 INTERNAL WALLS TO BE BAGWASHED AND EXTERNAL WALLS TO BE COATED WITH CEMCRETE TO THICKNESS THAT COVERS EXPOSED ROOF TIES.
4.7 LINTELS ABOVE ALL DOORS AND WINDOW FRAMES UNLESS CLISCO FRAMES ARE USED

**5. ROOFS:**

5.1 125X50X20X2MM STEEL COLD FORMED LIPPED CHANNEL BEAMS @ 1000MM C/C OR 152X50MM S.A PINE BEAMS @ 1000MM C/C SPACING TIED WITH 4MM GALVANISED HOOP IRON TIED.75X50X2MM STEEL COLD FORMED LIPPED CHANNEL WALL PLATES OR TREATED 76X50MM S.A PINE WALL PLATE TO BE LAID FLAT AND PAINTED WITH CARBOLINIUM ON ALL SIDES
5.2 225 X 15MM THICK FIBRE CEMENT FASCIA IN LONG LENGTHS, JOINED WITH METAL JOINING PIECES AND FIXED WITH BRASS SCREWS AT MAX. 1000MM C/C TO BATTEN
5.2 ROOF COVERING (0,6MM CORRUGATED GALV. STEEL SHEETING OR CONCRETE TILES) AT 17 DEG. AND 21 DEG.WITH ROOF FLASHING AGAINST WALLS. ONLY ROOF NAILS WITH WASHERS AND CAPS TO BE USED
5.3 ROOF OVERHANGS TO BE MIN. 300MM
5.4 SLANTED 6MM FIBRE CEMENT CEILING WITH H-PROFILE STEEL JOINTING STRIPS FIXED WITH GALV. CEILING NAILS TO 38X38MM BRANDERING @ 600MM C/C
5.5 75MM FIBRE CEMENT CORNICE (NUCORNICE) GLUED WITH NC ADHESIVE

**6. WINDOW AND DOORS:**

6.1 3MM CLEAR FLOAT GLASS INCL. ENERGY EFFICIENT STEEL WINDOW FRAMES
6.2 WINDOW FRAMES BUILT IN WITH 375 MICRON DPC BELOW 15MM FIBRE CEMENT WINDOW CILLS

PROJECT

**ACCESSIBLE TYPOLOGIES FOR DIFFERENTLY ABLED PERSONS**

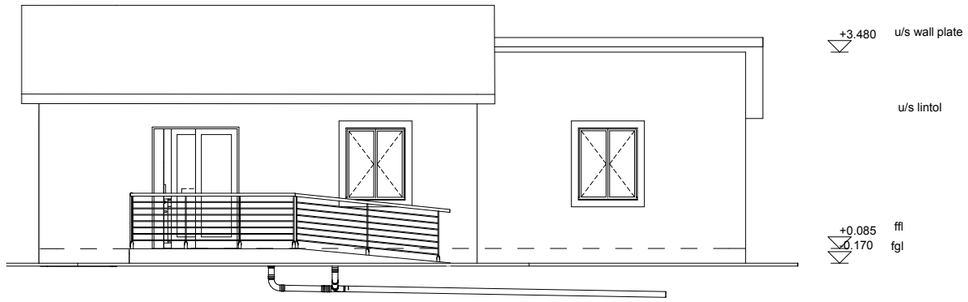
PREPARED BY

National Home Builders Registration Council
5 Leeuwkop Road
Sunninghill
Johannesburg
TEL: +27 (0)11 317 0000

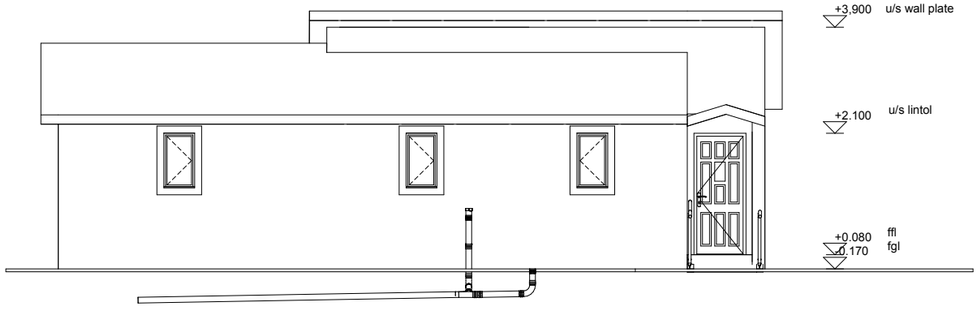
DESCRIPTION

**60m²**
**PLAN AND SECTION**
SCALE: 1:100

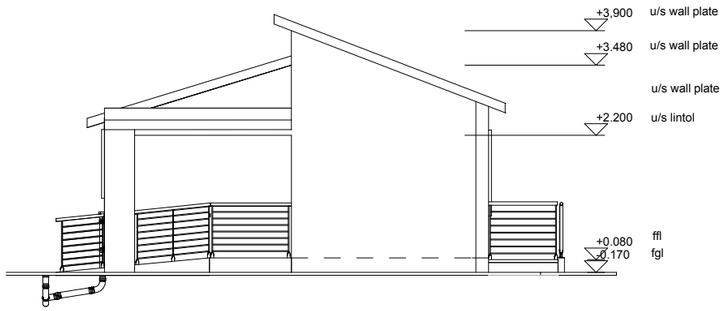
| | | | |
|---|---|---|---|
| DESIGN | | DWG NO: | REV NO: |
| DRAWN | | PROJ NO: | |
| CHECKED | | DATE: Sept 2014 | |




## NORTH ELEVATION




## SOUTH ELEVATION




## EAST ELEVATION

**WALLS CALCULATION TO SANS 10400XA 4.4.3.2**

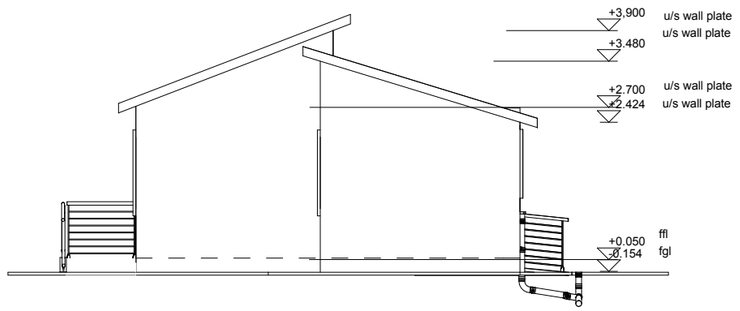
| NO. | THICKNESS (MM) | MATERIAL | CONDUCTIVITY W/(m.K) | R-VALUE (m2.K/W) |
|---|---|---|---|---|
| $R_a$ | | MOVING AIR FILM | | 0.03 |
| $R_1$ | 10 | PLASTER | 0.5 | 0.02 |
| $R_2$ | 140<br>220 | CONC. BRICK or BRICK | 0.7<br>0.84 | 0.2<br>0.26 |
| $R_3$ | 10 | PLASTER | 0.5 | 0.02 |
| $R_S$ | | STILL AIR FILM | | 0.11 |
| **TOTAL R-VALUE** | | | | **0.38 - 0.44** |

According to 4.4.3.2 of SANS XA a masonry wall may be used that is a double skin masonry wall with no cavity, plastered internally, and face masonry that is either plastered or not plastered externally, or a single leaf masonry wall with a nominal wall thickness greater than or equal to 140mm, plastered internally and externally will comply.

Hollow concrete block with 10mm plaster both sides is equivalent to R-Value of 0.31- 0.35.

**ROOF ASSEMBLY CALCULATION TO SANS 10400XA 4.4.3.2 (CLIMATE ZONE 1- JHB)**

| NO. | THICKNESS (MM) | MATERIAL | CONDUCTIVITY W/(m.K) | R-VALUE (m2.K/W) |
|---|---|---|---|---|
| $R_a$ | | MOVING AIR FILM | | 0.03 |
| $R_1$ | 0.6 | METAL CLADDING | | 0 |
| $R_2$ | 100-300 roof space | ROOF SPACE | | 0.15 |
| $R_3$ | 127 | INSULATION | | 3.33 |
| $R_4$ | 10 | GYPSUM BOARD | | 0.06 |
| $R_S$ | | STILL AIR FILM | | 0.11 |
| **TOTAL R-VALUE** | | | | **3.7** |




## WEST ELEVATION

**STANDARD CONSTRUCTION NOTES:**

-ALL CONSTRUCTION AND MATERIALS TO COMPLY WITH NHBRC'S HOME BUILDING MANUAL AND SANS 10400, UNLESS OTHERWISE AGREED THROUGH RATIONAL DESIGN
-PROVISION MUST BE MADE FOR STORMWATER RUNOFFS
-WHERE ELECTRICAL INSTALLATION IS REQUIRED SPECIFICATIONS WILL BE PROVIDED
-THIS DRAWING IS NOT TO BE SCALED
-DISCREPENCIES TO BE REPORTED TO PROJECT MANAGER
-REFER TO TABLES IN DWG FOR SANS 10400XA COMPLIANCE

**SPECIFICATIONS:**
**1. GENERAL NOTES:**

1.1 ALL DIMENSIONS & LEVELS TO BE CHECKED ON SITE BEFORE ANY WORK COMMENCES

**2. FLOORS:**

2.1 75MM POWER FLOATED OR 75MM CONCRETE SURFACE BED WITH 25MM SCREED
2.2 APPLY CEMCRETE FLOOR FINISH DIVIDED INTO A BLOCK PATTERN TO MANUFACTURER'S SPECIFICATIONS

**3. FOUNDATIONS:**

3.1 ALL FOUNDATIONS, FOUNDATION WALLS, STRUCTURAL CONCRETE WORK AND SUBSOIL STORMWATER DRAINAGE TO ENGINEER'S SPECIFICATIONS

**4. WALLS:**

4.1 220MM OR 290MM BRICK WALL WITH 375 MICRON DPC
4.2 EXTERNAL WALLS- INSTALL 2.8MM DIAM. X110MM WIDE BRICKFORCE AT EVERY 4TH COURSES AND EACH COURSE ABOVE WINDOW AND DOOR LEVEL
4.3 INTERNAL WALLS INSTALL 2.8MM ØX75MM WIDE BRICKFORCE AT EVERY 2ND COURSE AND EACH COURSE ABOVE WINDOW AND DOOR FRAME LEVEL
4.4 100/140X90 PRESTRESSED CONCRETE LINTOLS ABOVE OPENINGS IN WALLS WITH 230 END BEARING, CHECKED BY AN ENGINEER
**Choice of bricks:**
4.5 220X110X75MM STOCKBRICK OR 290X135X90 MAXI CLAYBRICK OR CEMENT MAXI QUANTUM BRICK WITH A MINIMUM STRENGTH OF 7MPA CLASS II MORTAR (1:6)
4.6 INTERNAL WALLS TO BE BAGWASHED AND EXTERNAL WALLS TO BE COATED WITH CEMCRETE TO THICKNESS THAT COVERS EXPOSED ROOF TIES.
4.7 LINTELS ABOVE ALL DOORS AND WINDOW FRAMES UNLESS CLISCO FRAMES ARE USED

**5. ROOFS:**

5.1 125X50X20X2MM STEEL COLD FORMED LIPPED CHANNEL BEAMS @ 1000MM C/C OR 152X50MM S.A PINE BEAMS @ 1000MM C/C SPACING TIED WITH 4MM GALVANISED HOOP IRON TIED.75X50X2MM STEEL COLD FORMED LIPPED CHANNEL WALL PLATES OR TREATED 76X50MM S.A PINE WALL PLATE TO BE LAID FLAT AND PAINTED WITH CARBOLINIUM ON ALL SIDES
5.2 225 X 15MM THICK FIBRE CEMENT FASCIA IN LONG LENGTHS, JOINED WITH METAL JOINING PIECES AND FIXED WITH BRASS SCREWS AT MAX. 1000MM C/C TO BATTEN
5.2 ROOF COVERING (0,6MM CORRUGATED GALV. STEEL SHEETING OR CONCRETE TILES) AT 17 DEG. AND 21 DEG.WITH ROOF FLASHING AGAINST WALLS. ONLY ROOF NAILS WITH WASHERS AND CAPS TO BE USED
5.3 ROOF OVERHANGS TO BE MIN. 300MM
5.4 SLANTED 6MM FIBRE CEMENT CEILING WITH H-PROFILE STEEL JOINTING STRIPS FIXED WITH GALV. CEILING NAILS TO 38X38MM BRANDERING @ 600MM C/C
5.5 75MM FIBRE CEMENT CORNICE (NUCORNICE) GLUED WITH NC ADHESIVE

**6. WINDOW AND DOORS:**

6.1 3MM CLEAR FLOAT GLASS INCL. ENERGY EFFICIENT STEEL WINDOW FRAMES
6.2 WINDOW FRAMES BUILT IN WITH 375 MICRON DPC BELOW 15MM FIBRE CEMENT WINDOW CILLS

PROJECT

**ACCESSIBLE TYPOLOGIES FOR DIFFERENTLY ABLED PERSONS**

PREPARED BY

National Home Builders Registration Council
5 Leeuwkop Road
Sunninghill
Johannesburg
TEL: +27 (0)11 317 0000

DESCRIPTION

**60m² ELEVATIONS**
SCALE: 1:100

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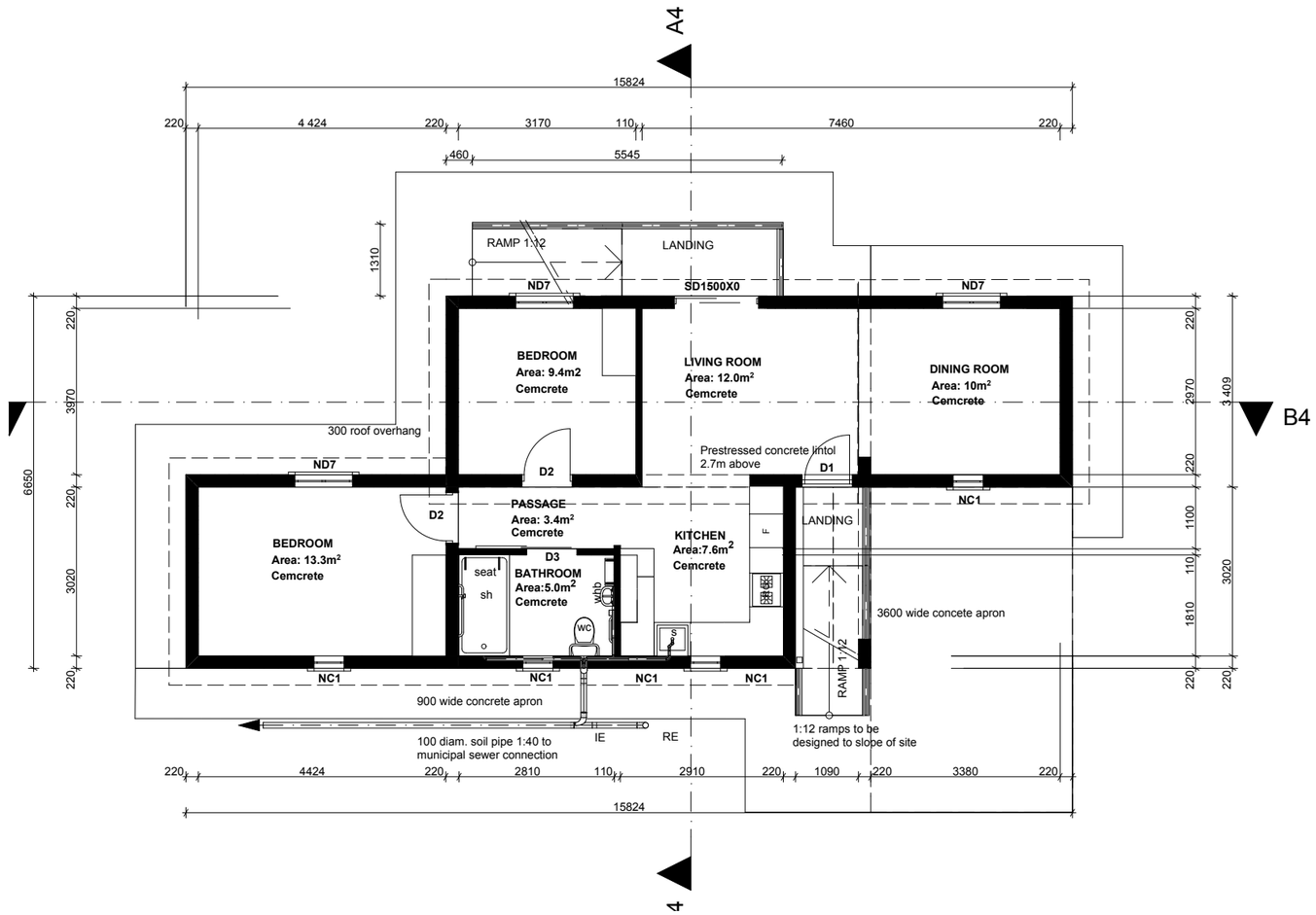


PLAN

**STANDARD CONSTRUCTION NOTES:**

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-DISCREPENCIES TO BE REPORTED TO PROJECT MANAGER
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**SPECIFICATIONS:**
**1. GENERAL NOTES:**

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**2. FLOORS:**

2.1 75MM POWER FLOATED OR 75MM CONCRETE SURFACE BED WITH 25MM SCREED
2.2 APPLY CEMCRETE FLOOR FINISH DIVIDED INTO A BLOCK PATTERN TO MANUFACTURER'S SPECIFICATIONS

**3. FOUNDATIONS:**

3.1 ALL FOUNDATIONS, FOUNDATION WALLS, STRUCTURAL CONCRETE WORK AND SUBSOIL STORMWATER DRAINAGE TO ENGINEER'S SPECIFICATIONS

**4. WALLS:**

4.1 220MM OR 290MM BRICK WALL WITH 375 MICRON DPC
4.2 EXTERNAL WALLS- INSTALL 2.8MM DIAM. X110MM WIDE BRICKFORCE AT EVERY 4TH COURSES AND EACH COURSE ABOVE WINDOW AND DOOR LEVEL
4.3 INTERNAL WALLS INSTALL 2.8MM ØX75MM WIDE BRICKFORCE AT EVERY 2ND COURSE AND EACH COURSE ABOVE WINDOW AND DOOR FRAME LEVEL
4.4 100/140X90 PRESTRESSED CONCRETE LINTOLS ABOVE OPENINGS IN WALLS WITH 230 END BEARING, CHECKED BY AN ENGINEER
**Choice of bricks:**
4.5 220X110X75MM STOCKBRICK OR 290X135X90 MAXI CLAYBRICK OR CEMENT MAXI QUANTUM BRICK WITH A MINIMUM STRENGTH OF 7MPA CLASS II MORTAR (1:6)
4.6 INTERNAL WALLS TO BE BAGWASHED AND EXTERNAL WALLS TO BE COATED WITH CEMCRETE TO THICKNESS THAT COVERS EXPOSED ROOF TIES.
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**5. ROOFS:**

5.1 125X50X20X2MM STEEL COLD FORMED LIPPED CHANNEL BEAMS @ 1000MM C/C OR 152X50MM S.A PINE BEAMS @ 1000MM C/C SPACING TIED WITH 4MM GALVANISED HOOP IRON TIED.75X50X2MM STEEL COLD FORMED LIPPED CHANNEL WALL PLATES OR TREATED 76X50MM S.A PINE WALL PLATE TO BE LAID FLAT AND PAINTED WITH CARBOLINIUM ON ALL SIDES
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5.5 75MM FIBRE CEMENT CORNICE (NUCORNICE) GLUED WITH NC ADHESIVE

**6. WINDOW AND DOORS:**

6.1 3MM CLEAR FLOAT GLASS INCL. ENERGY EFFICIENT STEEL WINDOW FRAMES
6.2 WINDOW FRAMES BUILT IN WITH 375 MICRON DPC BELOW 15MM FIBRE CEMENT WINDOW CILLS

PROJECT

**ACCESSIBLE TYPOLOGIES FOR DIFFERENTLY ABLED PERSONS**

PREPARED BY
National Home Builders Registration Council
5 Leeuwkop Road
Sunninghill
Johannesburg
TEL: +27 (0)11 317 0000

DESCRIPTION
**70m²**
**PLAN**
SCALE: 1:100

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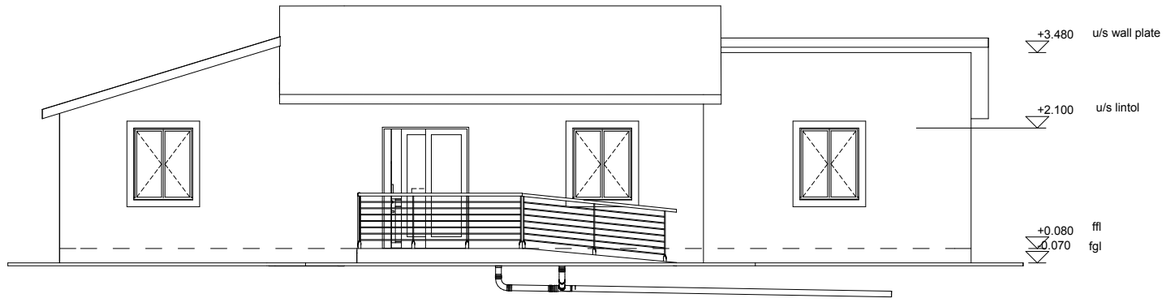
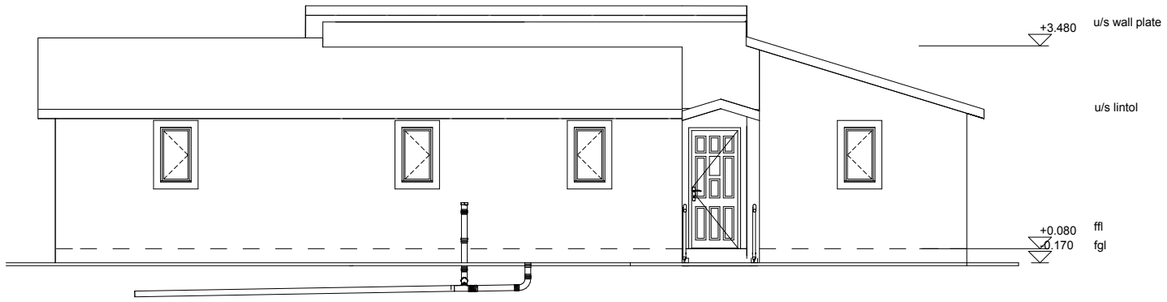
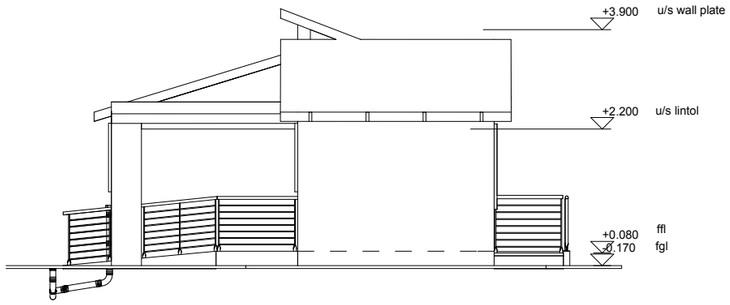


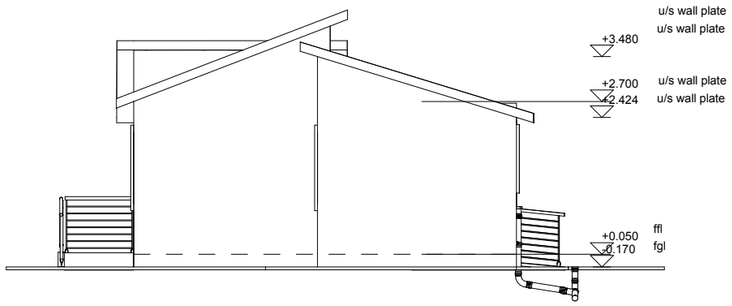

NORTH ELEVATION




SOUTH ELEVATION




EAST ELEVATION

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PROJECT

**ACCESSIBLE TYPOLOGIES FOR DIFFERENTLY ABLED PERSONS**

PREPARED BY

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Sunninghill
Johannesburg
TEL: +27 (0)11 317 0000

DESCRIPTION

**70m²**
**ELEVATIONS**
SCALE: 1:100

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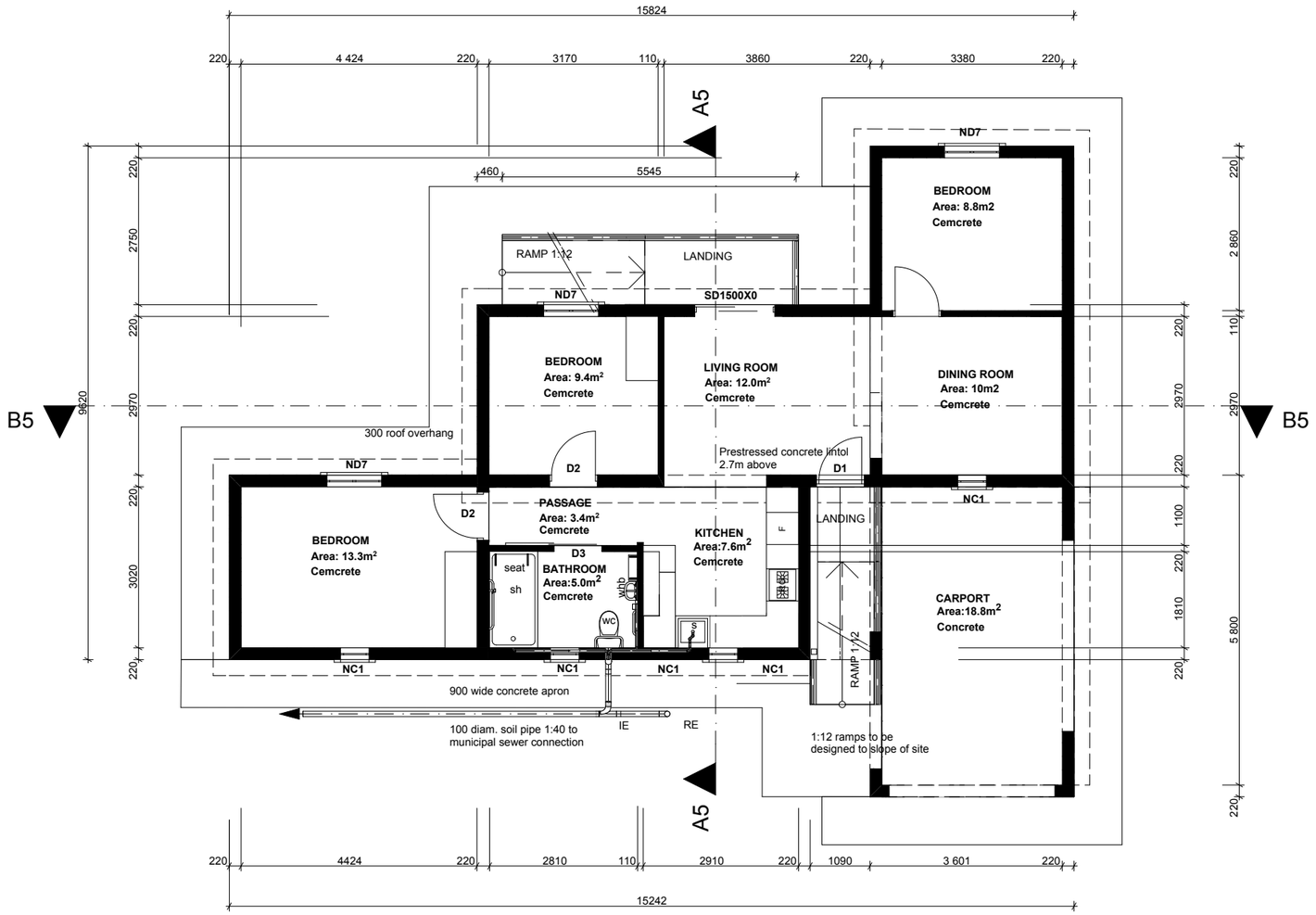


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PROJECT

**ACCESSIBLE TYPOLOGIES FOR DIFFERENTLY ABLED PERSONS**

PREPARED BY

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5 Leeuwkop Road
Sunninghill
Johannesburg
TEL: +27 (0)11 317 0000

DESCRIPTION

**80m²**
**PLAN AND SECTION**
SCALE: 1:100

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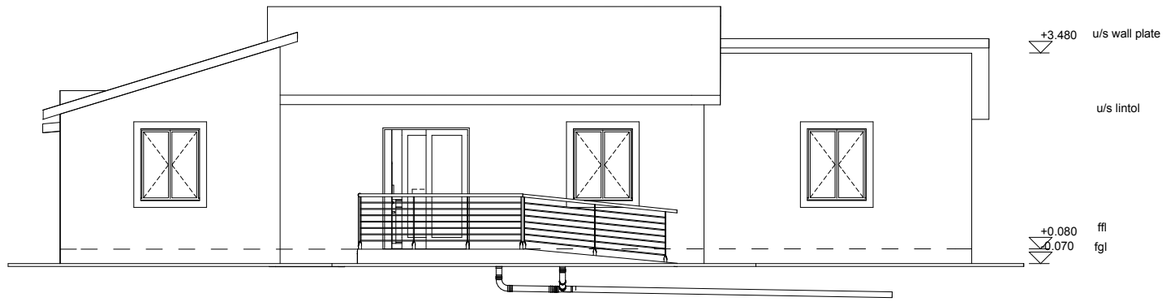
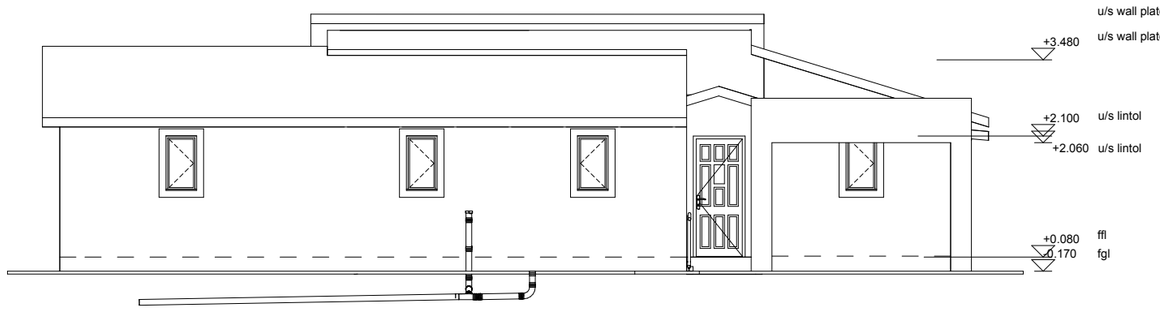
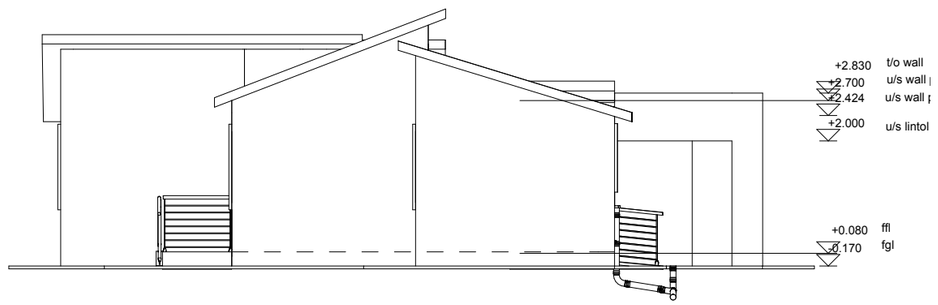



## NORTH ELEVATION




## SOUTH ELEVATION




## WEST ELEVATION

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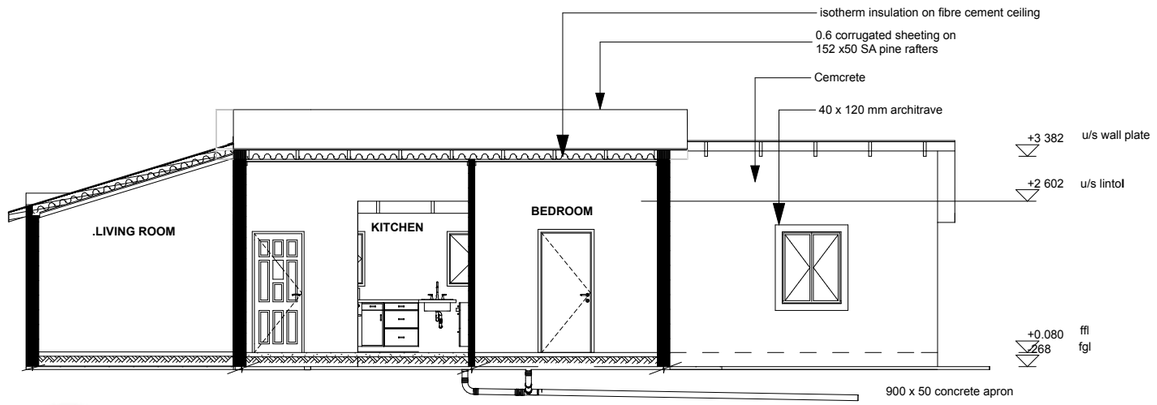


## SECTION B5

**FENESTRATION CALCULATION TO SANS 10400XA 4.4.4**

**North:** ND7 $W_1$= 1.022 x 1.245 (3) =3.817m²
SD $W_2$= 1.500 x 2.100 =3.150m²
**South:** NC1 $W_3$= 0.949 x 0.533 (4) = 2.03m²

**Total fenestration area = 8.997m²**
Unit area =80m² (excl. covered walkway)
**Net area =71.8m²**

The total floor area is checked in the calculation below:

15% of the net floor area of 51.4m² =10.77m²

Total fenestration =8.997m²

**8.997m² < 10.77m² which does comply**

| ENERGY EFFICIENCY SCHEDULE | |
|---|---|
| **DESCRIPTION** | **SOLUTION** |
| HOT WATER | Collector panels of 4.3m² is required for 264litres resorting to a 1 x 300litre solar geyser |
| FENESTRATION | Monolithic- and safety glass to SANS 10400 Part N |
| ROOF ASSEMBLY | Climate zone 1: R-value = 3.7= 130mm e.g. polyester fibre |
| EXTERNAL WALLS | To manufacturers specifications. R-value: See table |

**WALLS CALCULATION TO SANS 10400XA 4.4.3.2**

| NO. | THICKNESS (MM) | MATERIAL | CONDUCTIVITY W/(m.K) | R-VALUE (m2.K/W) |
|---|---|---|---|---|
| $R_a$ | | MOVING AIR FILM | | 0.03 |
| $R_1$ | 10 | PLASTER | 0.5 | 0.02 |
| $R_2$ | 140<br>220 | CONC. BRICK or BRICK | 0.7<br>0.84 | 0.2<br>0.26 |
| $R_3$ | 10 | PLASTER | 0.5 | 0.02 |
| $R_S$ | | STILL AIR FILM | | 0.11 |
| **TOTAL R-VALUE** | | | | **0.38 - 0.44** |

According to 4.4.3.2 of SANS XA a masonry wall may be used that is a double skin masonry wall with no cavity, plastered internally, and face masonry that is either plastered or not plastered externally, or a single leaf masonry wall with a nominal wall thickness greater than or equal to 140mm, plastered internally and externally will comply.

Hollow concrete block with 10mm plaster both sides is equivalent to R-Value of 0.31- 0.35.

**ROOF ASSEMBLY CALCULATION TO SANS 10400XA 4.4.3.2 (CLIMATE ZONE 1- JHB)**

| NO. | THICKNESS (MM) | MATERIAL | CONDUCTIVITY W/(m.K) | R-VALUE (m2.K/W) |
|---|---|---|---|---|
| $R_a$ | | MOVING AIR FILM | | 0.03 |
| $R_1$ | 0.6 | METAL CLADDING | | 0 |
| $R_2$ | 100-300 roof space | ROOF SPACE | | 0.15 |
| $R_3$ | 127 | INSULATION | | 3.33 |
| $R_4$ | 10 | GYPSUM BOARD | | 0.06 |
| $R_S$ | | STILL AIR FILM | | 0.11 |
| **TOTAL R-VALUE** | | | | **3.7** |

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4.7 LINTELS ABOVE ALL DOORS AND WINDOW FRAMES UNLESS CLISCO FRAMES ARE USED

**5. ROOFS:**

5.1 125X50X20X2MM STEEL COLD FORMED LIPPED CHANNEL BEAMS @ 1000MM C/C OR 152X50MM S.A PINE BEAMS @ 1000MM C/C SPACING TIED WITH 4MM GALVANISED HOOP IRON TIED.75X50X2MM STEEL COLD FORMED LIPPED CHANNEL WALL PLATES OR TREATED 76X50MM S.A PINE WALL PLATE TO BE LAID FLAT AND PAINTED WITH CARBOLINIUM ON ALL SIDES
5.2 225 X 15MM THICK FIBRE CEMENT FASCIA IN LONG LENGTHS, JOINED WITH METAL JOINING PIECES AND FIXED WITH BRASS SCREWS AT MAX. 1000MM C/C TO BATTEN
5.2 ROOF COVERING (0,6MM CORRUGATED GALV. STEEL SHEETING OR CONCRETE TILES) AT 17 DEG. AND 21 DEG.WITH ROOF FLASHING AGAINST WALLS. ONLY ROOF NAILS WITH WASHERS AND CAPS TO BE USED
5.3 ROOF OVERHANGS TO BE MIN. 300MM
5.4 SLANTED 6MM FIBRE CEMENT CEILING WITH H-PROFILE STEEL JOINTING STRIPS FIXED WITH GALV. CEILING NAILS TO 38X38MM BRANDERING @ 600MM C/C
5.5 75MM FIBRE CEMENT CORNICE (NUCORNICE) GLUED WITH NC ADHESIVE

**6. WINDOW AND DOORS:**

6.1 3MM CLEAR FLOAT GLASS INCL. ENERGY EFFICIENT STEEL WINDOW FRAMES
6.2 WINDOW FRAMES BUILT IN WITH 375 MICRON DPC BELOW 15MM FIBRE CEMENT WINDOW CILLS

PROJECT
**ACCESSIBLE TYPOLOGIES FOR DIFFERENTLY ABLED PERSONS**

PREPARED BY
National Home Builders Registration Council
5 Leeuwkop Road
Sunninghill
Johannesburg
TEL: +27 (0)11 317 0000

DESCRIPTION
**80m²**
**SECTIONS**
SCALE: 1:100

| | | | |
|---|---|---|---|
| DESIGN | | DWG NO: | REV NO: |
| DRAWN | | PROJ NO: | |
| CHECKED | | DATE: | |

# **NHBRC** Provincial Office Contact Details:

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**www.nhbrc.org.za**

NATIONAL HOME BUILDERS
NHBRC
REGISTRATION COUNCIL
CENTRE FOR RESEARCH AND HOUSING INNOVATION