ENERGY EFFICIENCY REPORT
SANS 10400 XA AND SANS 204

AMANDASIG X42

BUILDING: CLIMATIC ZONE 2: TEMPERATE INTERIOR:

**ORIENTATION:**
THE LONGER AXIS OF THE BUILDING IS ORIENTATED WITHIN THE OPTIMAL PARAMETERS OF 10 DEG. WEST AND 14 DEG. EAST, MEASURED FROM TRUE NORTH.

*CONCLUSION*
THE DESIGN COMPLIES WITH THE MIN. REQUIREMENTS OF SANS 204:2011 4.1 & 4.2 FOR ORIENTATION SECTORS

**ROOF CONSTRUCTION:**
REQUIRED MIN R-VALUE (THERMAL RESISTANCE)(m2.K/W)
CLIMATIC ZONE 2

=3.2 m2.K/W

CONSTRUCTION TYPE R-VALUE:
UNVENTILATED **CEMENT TILES** 22-45 DEG. PITCH WITH CATHEDRAL OR OPEN BEAM CEILING

| | |
|---|---|
| I **CEMENT**: COVERING MATERIAL R-VALUE: | 0.9 m2.K/W |
| R-VALUE FOR CEILING: 10mm gypsum plaster board: | 0.06 m2.K/W |
| REFLECTIVE FOIL INSULATION: | 0.74 m2.K/W |
| TOTAL R-VALUE: | 1.7 m2.K/W |

REQUIRED R-VALUE FOR INSULATION: 2.1m2.K/W

RECOMMENDED INSULATION:

**RIGID EXTRUDED POLYSTYRENE**
**DENSITY OF 32KG/M3**
**THICKNESS OF 60mm**

Note: Any insulation can be used, as long as min thermal resistance is achieved.

**HOT WATER SUPPLY:**

| | |
|---|---|
| Type of Accommodation: | Dwelling houses - Medium Rental: 115-140 L/capita/day |
| Assumed Hot Water Consumption: | 120L |
| No. of Persons: | 4 Per Day |
| Assumed Daily Hot Water Consumption: | 480L |
| Assumed Annual Hot Water Consumption: | 174.72 KL - Based on daily design occupancy per week |
| 50% of Annual Hot Water Consumption: | 87.36 KL - Minimum volume of hot water to be heated |
| by means other than electrical resistance heating | |
| Daily Hot Water Consumption: | 240L - To be heated by means other than electrical |
| resistance heating | |

**Insulation Requirements**

| | |
|---|---|
| Internal diameter of Hot Water Service Pipe: | ≤80 mm |
| Minimum Required R-Value for pipe insulation | 1 Refer SANS 204 (4.5.2) |

**A min of 50% by volume of the annual average hot water heating requirement shall be provided by means other than electrical resistance heating.**

**The heat pump system should be maintained in accordance with the requirements given in SANS 10252-1.**

**The geyser as per SABS 10254.**

**HEAT PUMP TO BE USED TOGETHER WITH TYPICAL GEYSER INSTALLATION TO SUPPLY 50% OF REQUIRED HOT WATER CONSUMPTION.**

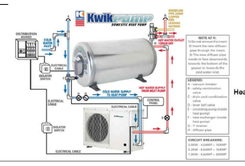
GENERAL FIRE NOTES:

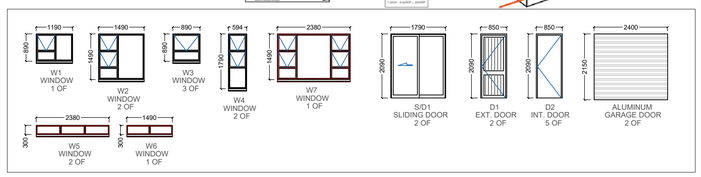
ROOFS ACCORDING TO SANS 10400-"A"
ZONE ZAR VALUE (M.K/W) =3,2 WITH A DIRECTION OF HEAT FLOW

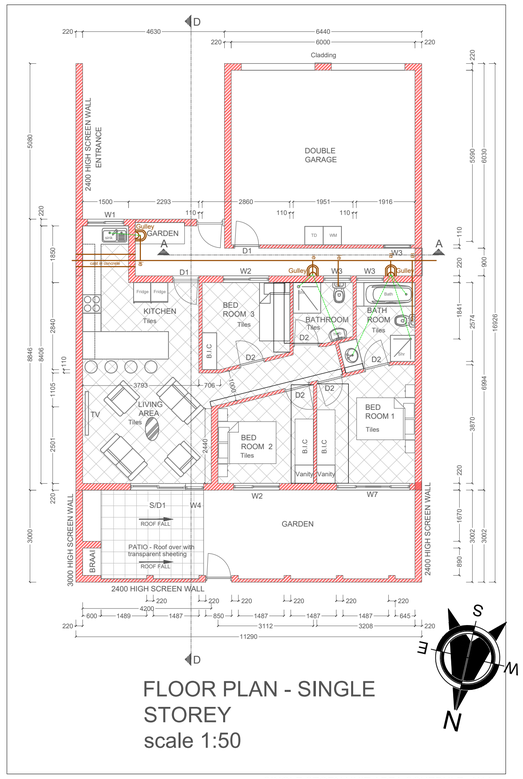
SHADING ACCORDING TO SANS 10400-"A" SANS 204

HEATING SYSTEMS ACCORDING TO SANS 10400-"A" AND SANS 10252 WITH NOT MORE THAN 50% ASSISTANCE.

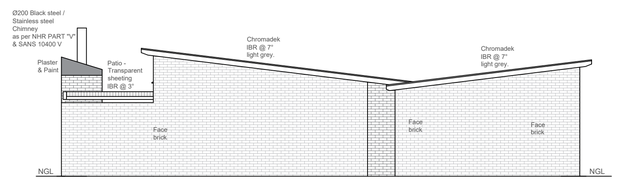
WIDTH OF ENTRANCE IS 4500MM WITH NO OBSTRUCTION



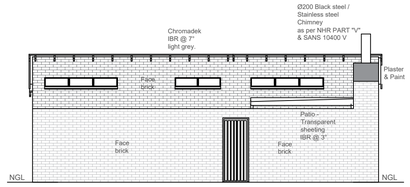



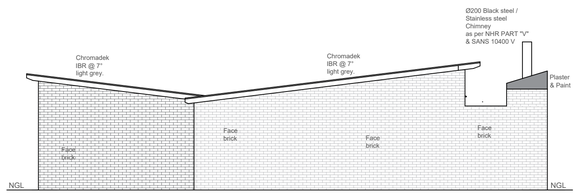

FLOOR PLAN - SINGLE STOREY
scale 1:50



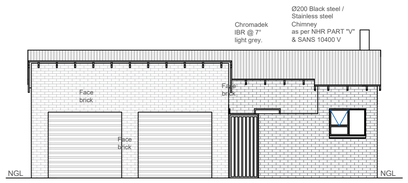

EAST ELEVATION - scale 1:100



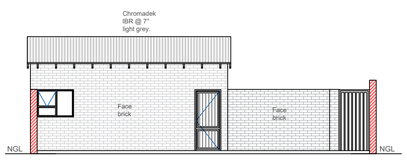

NORTH ELEVATION - scale 1:100



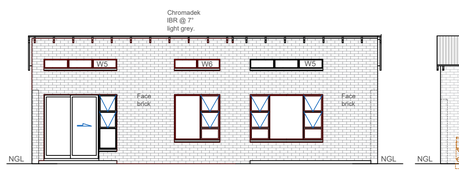

WEST ELEVATION - scale 1:100



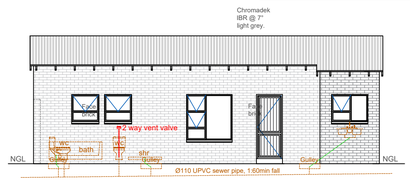

SOUTH ELEVATION - scale 1:100




SECTIONAL NORTH
ELEVATION A-A - scale 1:100




SECTIONAL NORTH
ELEVATION - scale 1:100




SECTIONAL SOUTH
ELEVATION - scale 1:100

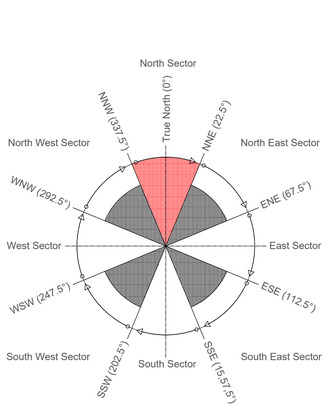



Figure 1 - Orientation Sectors

**ESTIMATED ENERGY CONSUMPTION:**
**OCCUPANCY: H4**

**THEORETICAL ANNUAL ENERGY CONSUMPTION:**

**MAX ENERGY DEMAND**
5kWh/m2 (H4) x 237m2 (NET) = 1185W
15 x HANGING LIGHT PENDANTS @ 30W = 450W
27 LOW VOLTAGE DOWNLIGHTERS @ MAX 15W = 405W
5 LOW VOLTAGE OUTDOOR WALL LIGHTS @ 11W = 55W
2 LED FLUORESCENT LIGHT FITTING @ 18W = 36W

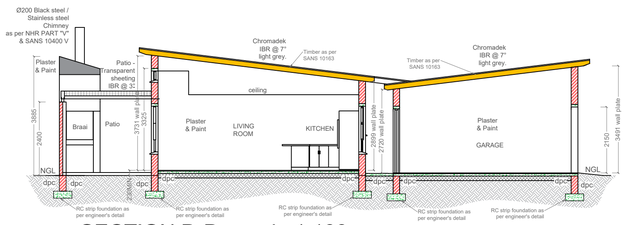
Max demand: 450 + 405 + 55 + 336 = 946W (<max demand)
946W/237m2 = 4.0W/m2

**MAX ENERGY CONSUMPTION:**
5 kWh/m2 (H4) x 237m2 (NET) = 1185W
1185 kWh/m2 per annum

On 3.5h per day 3654 days/annum = 1277.5 hours
0.9 x 1277.5 = 1150kW/a < max demand

***CONCLUSION:***
***IF LOW ENERGY DEMAND LIGHT FITTINGS ARE USED AS SHOWN THE THEORETICALLY THE LOAD SHOULD BE LESS THAN THE MAX DEMAND AS CALCULATED.***

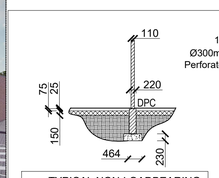
*Extruded polystyrene is recommended - isoboard on expanded polystyrene, or any other similar insulation with the required R value



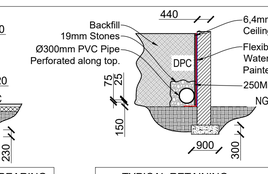

SECTION D-D - scale 1:100

WINDOW VALUE : 7,9 - ALUMINUM FRAMED SINGLE CLEAR GLASS / WINDOW VALUE : 5,73 - ALUMINUM FRAMED SINGLE LOW E GLASS
WINDOW SHGC : 0,81 - ALUMINUM FRAMED SINGLE CLEAR GLASS / WINDOW SHGC : 0,66 ALUMINUM FRAMED SINGLE LOW E GLASS

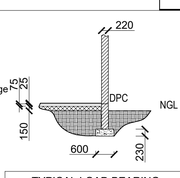
| GLAZING ELEMENT | | | | | GLAZING ELEMEMT | | SECTOR | | | SHADING | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LEVEL | ID NO. | QTY | SIZE (w x h) | AREA m² | U VALUE | SHGC | ORIENTATION | FACTOR (E) | PROJECTIO N (P) | HEIGHT (H) | CA | CB | CC | HEIGHT (G) | HEATING (SH) | PH | COOLING (SC) |
| GROUND | W1 | 1 | 1190 X 890 | 1,059 | 7,9 | 0,81 | SOUTH | 1,70 | 0,20 | 1,47 | 0,45 | 0,39 | 0,07 | 0,00 | 1,00 | 0,00 | 1,00 |
| GROUND | W2 | 2 | 1490 X 1490 | 2,22 | 7,9 | 0,81 | NORTH/SOUTH | 0,68 | 0,00 | 1,81 | 0,47 | 0,41 | 0,07 | 0,00 | 1,00 | 0,00 | 1,00 |
| GROUND | W3 | 3 | 890 X 890 | 0,79 | 7,9 | 0,81 | SOUTH | 1,30 | 0,07 | 1,32 | 0,46 | 0,40 | 0,08 | 0,00 | 1,00 | 0,00 | 1,00 |
| GROUND | W4 | 2 | 594 X 1790 | 1,056 | 7,9 | 0,81 | NORTH | 1,30 | 0,68 | 1,81 | 0,47 | 0,41 | 0,07 | 0,00 | 1,00 | 0,00 | 1,00 |
| GROUND | W5 | 2 | 2380 X 300 | 0,71 | 7,9 | 0,81 | NORTH | 1,46 | 0,06 | 1,36 | 0,52 | 0,47 | 0,04 | 0,00 | 1,00 | 0,00 | 1,00 |
| GROUND | W6 | 1 | 1490 X 300 | 0,44 | 7,9 | 0,81 | NORTH | 0,90 | 0,01 | 1,01 | 0,46 | 0,40 | 0,08 | 0,00 | 1,00 | 0,00 | 1,00 |
| GROUND | W7 | 1 | 2380 X 1490 | 3,55 | 7,9 | 0,81 | NORTH | 0,66 | 1,26 | 2,55 | 0,19 | 1,25 | 0,010 | 0,00 | 1,00 | 0,00 | 1,00 |
| GROUND | SD1 | 1 | 1790 X 2090 | 3,75 | 7,9 | 0,81 | NORTH | 0,66 | 1,26 | 2,55 | 0,09 | 1,63 | 0,001 | 0,00 | 1,00 | 0,00 | 1,00 |



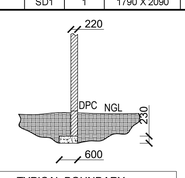

1 TYPICAL NON-LOADBEARING WALL SECTION.




2 TYPICAL RETAINING WALL SECTION.

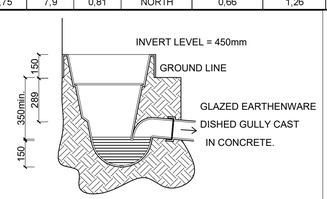



3 TYPICAL LOAD BEARING WALL SECTION.




4 TYPICAL BOUNDARY WALL SECTION.

Detail section of walls 1:100




Detail section of gully 1:20

SINGLE STORY UNIT AREA SCHEDULE: X14

| | |
|---|---|
| Ground floor | 79,0m² |
| Garage | 38,8m² |
| Total unit area | 117,8m² |
| Total single story area | 1649,2m² |
| Total single story coverage | 1649,2m² |

DOUBLE STORY UNIT AREA SCHEDULE: X87

| | |
|---|---|
| Ground floor | 36,0m² |
| First floor | 31,9m² |
| Garage | 18,0m² |
| Total unit area | 94,1m² |
| Total Double story area | 8186,7m² |
| Total double story coverage | 4698,0m² |
| Refuse area | 53,8m² |
| Gate | 119,0m² |

DEVELOPMENT AREA SCHEDULE:

| | |
|---|---|
| Site area | 20562,4m² |
| Total FAR | 10008,7m²<br>0.49 |
| Total Coverage | 6520,0m²<br>31,7% |
| Communal green area | 1273,36m² |
| Parking required | 150 |
| Parking provided | 228 |
| Allowable Height | 2 storey's |

## NOTES:

**GENERAL**
1. ALL LEVELS, DIMENSIONS AND POSITIONS TO BE CHECKED AND VERIFIED BEFORE ANY WORK IS COMMENCED.
2. ANY ERRORS, DISCREPANCIES OR OMISSIONS IS TO BE REPORTED TO THE ARCHITECT IMMEDIATELY.
3. ALL WORK TO BE IN ACCORDANCE WITH GOOD AND ACCEPTABLE LOCAL BUILDING PRACTICE.
4. FIGURED DIMENSIONS TO BE TAKEN IN PREFERENCE TO SCALED DIMENSIONS.
5. THESE ARCHITECTURAL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ENGINEERS AND CONSULTANT DRAWING WHERE APPLICABLE.
6. ALL BUILDING BY-LAWS, HEALTH AND FIRE REQUIREMENTS TO BE STRICTLY ADHERED TO.
7. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR THE CORRECT SETTING OUT OF THE WORKS. ANY DOUBT AS TO THE ACCURACY OF BOUNDARY PEGS OR LINES TO BE REPORTED TO THE ARCHITECT IMMEDIATELY.
8. FOUNDATIONS TO BOUNDARY WALLS NOT TO ENCROACH OVER BOUNDARY LINES.
9. ALL ELECTRICAL AND DRAINAGE WORK IS TO BE EXECUTED BY REGISTERED TRADESMEN.
10. CARE TO BE TAKEN WHEN EXCAVATING FOR NEW WORK. ALL EXIST. PIPES, CABLES ETC. EXPOSED TO BE POINTED OUT TO THE CLIENT AND/OR ARCHITECT, WHO SHALL ADVISE NECESSARY ACTION TO BE TAKEN.
11. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID ANY DAMAGE WHATSOEVER TO EXISTING BUILDINGS, FENCES AND PEGS.
12. ALL DRAWINGS REMAIN THE PROPERTY OF THE ARCHITECT AND ARE COPYRIGHT PROTECTED IN ACCORDANCE TO THE LAW OF ARCHITECTS.

**DRAINAGE**
1. ALL SOIL PIPES UNDER THE BUILDING OR FOOTING TO BE ENCASED IN CONCRETE OF MIN. 100mm THICK ALL AROUND PIPES.
2. INSPECTION EYES AT ALL BENDS AND JUNCTIONS OF DRAINS WITH MARKED COVERS AT GROUND LEVEL.
3. ALL WASTE PIPES TO BE ACCESSABLE OVER THE ENTIRE LENGTH.
4. NO DRAINAGE BENDS OR JUNCTIONS IN OR UNDER FLOORS.
5. PROVIDE IE'S AT EACH END OF ENCASED DRAIN WHERE SAME PASSES UNDERNEATH THE BUILDING AS NEAR AS POSSIBLE TO THE FOUNDATIONS.
6. RESEALING TRAPS TO ALL WASTE WATER WATER FITTINGS (2 PIPE SYSTEM).
7. WASTE PIPES ON SINGLE PIPE SYSTEM WILL BE FITTED WITH 65mm DEEP SEAL TRAPS AND EACH FITTING WILL BE ANTI-SYPHONED.
8. W.C. SOIL PIPES HAVING A GREATER DEPTH FROM PAN TO PIPE INVERT LVL THAN 1,220m WILL BE ANTI-SYPHONED.
9. WASTE PIPES UNDER FLOORS TO BE SLEEVED.
10. MIN. FALL OF 100mm PIPES TO BE 1:60 WITH MIN. OF 300mm COVER.
11. WASTE PIPES TO BASINS TO BE MIN. 32mm AND TO ALL OTHER FIXTURES MIN. 40mm.

**Drainage note:**

| | | |
|---|---|---|
| Sink and prep bowl | Ø40mm PVC | |
| wc | Ø110mm PVC | Note |
| hwb | Ø32mm PVC | Brass shower traps |
| bath and shower | Ø40mm PVC | -Anti siphon traps to all waste |
| w/m and d/w | Ø50mm PVC | fittings on the first floor. |
| wt | Ø40mm PVC | |

## CONSTRUCTION NOTES:

**ROOF CONSTRUCTION**
1. Chromadek IBR sheeting ON 38x38mm S.A.PINE BATTENS @ 340mm c/c.
2. 76x50 SA PINE PURLINS @ 1.2m c/c max.
3. BATTENS ON 50x152 S.A.PINE ROOF TRUSSES (GRADE 6) AT 600c.c. attached with galv. wire, built 450mm deep into walls.
4. ROOF SLOPE AT 7° AS SHOWN ON SECTIONS. WALL PLATE 76x38mm
5. 100mm GUTTERS ON THE ROOF OVERHANGS.

**WALLS**
ALL INTERIOR WALLS TO BE PLASTERED AND PAINTED.
EXTERIOR COLOUR AS PER OPTION "A" ON THE COLOUR PALETTE. INTERIOR COLOURS AS DECIDED BY THE OWNER. ALL TILES AS BY THE OWNER.

**FLOOR FINISHES**
TILES TO BE LAID ON 25mm THICK SCREED, TO BE LAID ON 75mm CONCRETE SURFACEBED ON 150mm COMPACTED EARTH FILLING. DPC UNDER ALL WALLS AND WINDOW SILLS.
250 MICRON DPC UNDER ALL FLOOR SLABS

**SITE**
NO EXISTING TREES ON THE SITE.

## FINISHING:

EXTERIOR WALLS TO BE FACE BRICK WITH PLASTERED ACCENTS.
COLOUR - AS PER SCHEDULE

ROOF COLOUR - ASHEN SKY TRP 217 NU-ROOF
BOUNDARY WALLS 220X1,8M HIGH WITH STORM WATER OUTLETS, COLOUR TO MATCH EXTERIOR WALLS.

GLAZING AS PER SANS 10400-"N".

ALL GLASS PANELS LARGERN THAN 1m² AND LOWER THAN 500mm TO FINISHED FLOOR LEVEL, AS WELL AS GLASS PANELLED DOORS, SIDELIGHTS AND TOP LIGHTS MUST BE SAFETY GLASS.

**6) GLASING NOTES:**

| 1 | 2 |
|---|---|
| THICKNESS OF GLASS, mm | MAXIMUM SIZE OF GLASS, m² |
| 3 | 0,75 |
| 4 | 1,5 |
| 5 | 2,1 |
| 6 | 3,2 |

WINDOWS BIGGER THAN 3,2M² AND SLIDING DOORS SHOULD BE MARKED WITH MARKERS.

SINGLE STORY UNIT AREA SCHEDULE: X14

| | |
|---|---|
| Ground floor | 79,0m² |
| Garage | 38,8m² |
| Total unit area | 117,8m² |

DOUBLE STORY UNIT AREA SCHEDULE: X87

| | |
|---|---|
| Ground floor | 36,0m² |
| First floor | 31,9m² |
| Garage | 18,0m² |
| Total unit area | 94,1m² |

REPORT
CONSTANTS:
CONDUCTANCE (Cn) 1,4
SOLAR NET GAIN (SHGC) 0,12
STOREY CONDUCTANCE / SOLAR HEAT GAIN
NET FLOOR AREA OF STOREY / ROOM m² 133m²
FENESTRATION AREA / ROOM m² 18m²
AVAILABLE
CONDUCTANCE (Cn) FOR UNIT - 3,068 - ACCEPTABLE + REFER SANS 204 (4,3,4)
SOLAR HEAT GAIN (SHGC) FOR UNIT - 5,346 - ACCEPTABLE + REFER SANS 204 (4,3,4)
CONCLUSION
CALCULATIONS SHOW THAT THE TOTAL WINDOW AREA OF THE UNIT IS MORE THAN 15% OF THE NET AREA OF THE HOUSE - SANS 204 APPLIES

CLIENT SIGNATURE

ARCHITECT SIGNATURE

ENGINEER SIGNATURE

ARCHITECT

**INDIGO ORANGE ARCHITECTURE & DESIGN PRACTICE**
P O Box 74101
Lynnwood Ridge PTA
0400
sacap 2455
Cell: 079 037 1267
Fax: 086 590 5904
E-mail: indigo-orange@hotmail.com

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PROJECT: PROPOSED NEW DEVELOPMENT 101@Anemoon

STAND NO.: 3552

TOWNSHIP: HOLDING 71 OF KEMPTONPARK AH X2

DRAWN:- JN
DATE:- 08/11/2023
SCALE:- 1:100
SHEET:- A1
CHECKED:- SM

DRAWING TITLE:- SS UNIT LAYOUT PLAN

DRAWING REV 0

Project Number