

Energy Efficiency in Buildings

Building Design – Fenestration – Buildings with Natural Environmental Control

Occupancy:

E3

Design Occupancy Time:

24

Hours per day

7

Days per week

Climatic Zone:

1

Fenestration – Buildings with Natural Environmental Control

Constants

Conductance (C_U) constant:

1.20

Solar Heat Gain (C_{SHGC}) constant:

0.15

Max. Conductance / Solar Heat Gain

Ground Storey

Net Floor Area of Storey / Room: m²

291,000

Fenestration Area of Storey / Room: m²

15,775

% Fenestration Area to Nett Floor Area: %

5,421

NOTE !!

NO FURTHER CALCULATION REQUIRED.

Max. Conductance (C_U) for Storey / Room:

349,200

Permissible

Max. Solar Heat Gain (C_{SHGC}) for Storey / Room:

43,650

Permissible

Achieved Aggregate Conductance / Solar Heat Gain

Ground Storey

Conductance (C_U) for Storey / Room:

124,62

Solar Heat Gain (C_{SHGC}) for Storey / Room:

3,86

Conductance / Solar Heat Gain Available

Conductance (C_U) for Storey / Room:

224,58

Solar Heat Gain (C_{SHGC}) for Storey / Room:

39,79

Glazing Elements					Glazing Element		Sector	Shading				Solar Exposure Factor (E)	Energy Constants			Multipliers	
Storey Level	Identifier No:	No. of Units	Size w x h	Area (m²)	U-value	SHGC		Projection (P)	Height (H)	Height (G)	P/H		C _A	C _B	C _C	Heating S _H	Cooling S _C
Ground Storey	w06	5	0.9 x 0.875	3.94	7.90	0.81	North	0.900	3.255	2.380	0.138	0.650				1.000	1.000
Ground Storey	w07	1	0.889 x 0.457	0.41	7.90	0.81	North	0.900	3.255	2.380	0.138	0.650				1.000	1.000
Ground Storey	w06	14	0.9 x 0.875	11.03	7.90	0.81	South	3.101	1.207	0.332	2.569	0.170				0.640	0.600
Ground Storey	w07	1	0.889 x 0.457	0.41	7.90	0.81	South	3.101	0.789	0.332	3.930	0.170				0.640	0.600

Worst-case whole glazing element performance figures.				
Glass Description	1	2	3	4
	Performance Values			
	Aluminium / Steel Framing	Aluminium / Steel Framing	Timber / uPVC / *Aluminium Framing	Timber / uPVC / *Aluminium Framing
Single – clear	Total U-value	SHGC	Total U-value	SHGC
Single – tinted	7.9	0.31	5.6	0.77
Single Low E	7.9	0.39	5.6	0.65
Clear Double (3/6/3)	5.73	0.66	4.06	0.63
Tinted Double	4.23	0.72	3	0.68
Clear Double Low E	4.23	0.39	3	0.56
Tinted Double Low E	5.4	0.36	2.41	0.62
Tinted Double Low E	5.4	0.54	2.41	0.51

ALL XA CALCULATIONS ARE COMPLIANT AND IN ACCORDANCE TO SANS 1400 PART XA

Refer to Electrical engineers and Mechanical engineers drawings for lighting layouts and calculations

ROOF INSULATION AS PER BUILDING SECTIONS ALL TO MECHANICAL ENGINEERS APPROVAL

No.	Description	Date
01	ISSUED FOR INFORMATION	26 / 10 / 2021

Owner/Client:
Owner/Client Signature:
Eng. Signature: _____
Arch. Signature: _____
Arch. Council no.: 7812

public works & infrastructure

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Project Title:
Trompsburg Special Needs School Establishment of New Special Needs School in Trompsburg, Free State

date : 26/10/2021 15:35:34

scale : 1 : 20

drawn : Author

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Job No. 2020

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