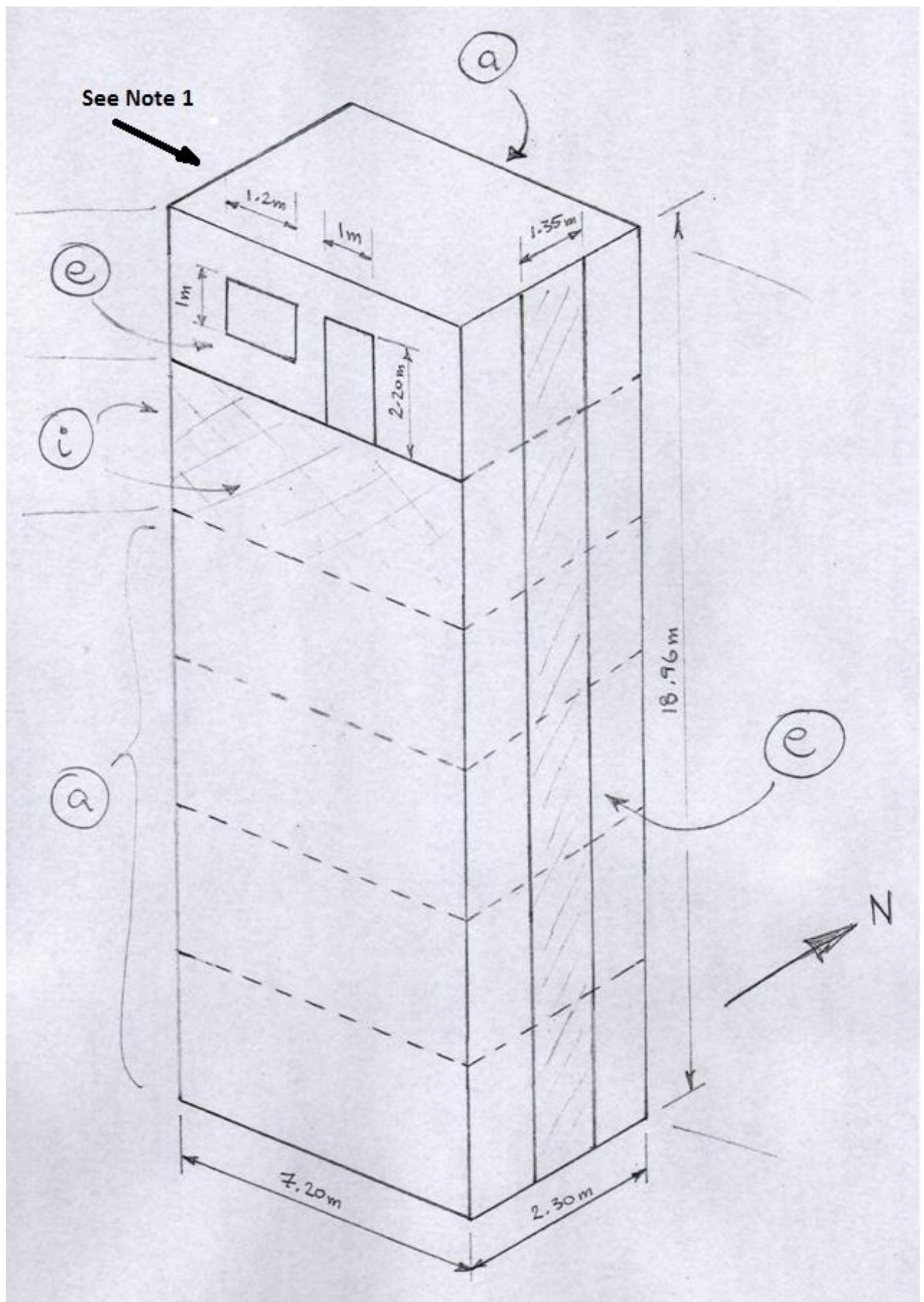


EXAMPLE ON HOW TO CALCULATE AN UNCONDITIONED SPACE



eu₁ – East fenestration – single glaze

$$A = (18.96 \times 1.35) = 25.6 \text{ m}^2$$

$$U = 6 \text{ W/m}^2\text{K}$$

$$\text{frame factor} = 0.2$$

$$g \text{ value} = 0.85$$

$$\text{Emissivity} = 0.92$$

$$\text{Light transmittance} = 0.9$$

eu₂ - East wall

$$A = (18.96 \times 2.3) - 25.6 = 18 \text{ m}^2$$

$$U = 2.488 \text{ W/m}^2\text{K}$$

$$\text{Absorptivity} = 0.4$$

$$\text{Emissivity} = 0.92$$

$$\text{Shading factor} = 1$$

eu₃ – South fenestration – single glaze

$$A = (1 \times 1.2) + (1 \times 2.2) = 3.4 \text{ m}^2$$

$$U = 6 \text{ W/m}^2\text{K}$$

$$\text{frame factor} = 0.2$$

$$g \text{ value} = 0.85$$

$$\text{Emissivity} = 0.92$$

$$\text{Light transmittance} = 0.9$$

eu₄ – South wall

$$A = (7.2 \times 3.16) - 3.4 = 19.35 \text{ m}^2$$

$$U = 2.488 \text{ W/m}^2\text{K}$$

$$\text{Absorptivity} = 0.4$$

$$\text{Emissivity} = 0.92$$

$$\text{Shading factor} = 1$$

eu₅ - Roof

$$A = (7.2 \times 2.3) = 16.56 \text{ m}^2$$

$$U \text{ value} = 2.475 \text{ W/m}^2\text{K}$$

$$\text{Absorptivity} = 0.65$$

$$\text{Emissivity} = 0.92$$

$$\text{Shading factor} = 1$$

au₁ – North adjacent wall

$$A = (7.2 \times 18.96) = 136.51 \text{ m}^2$$

$$U = 2.24 \text{ W/m}^2\text{K}$$

au₂ – South and West adjacent walls

$$A = 3.16 \times 4 \times (7.2 + 2.3) = 120 \text{ m}^2$$

$$U = 2.24 \text{ W/m}^2\text{K}$$

iu₁ – Internal wall

$$A = 3.16 \times (7.2 + 2.3) = 30 \text{ m}^2$$

$$U = 2.24 \text{ W/m}^2\text{K}$$

NOTES:

1. The West facing wall of the uppermost floor is leading towards another unconditioned space (e.g. washroom) and is therefore not considered in the calculation.
2. The floor slab is considered as leading towards an unconditioned space and is also omitted from calculations.
3. Floor height taken as $18.96\text{m}/6 = 3.16\text{m}$

Inputs for roofs, walls and glazing												
	Roof	Wall 1	Wall 2	Wall 3	Wall 4	Wall 5	Glazing 1	Glazing 2	Glazing 3	Glazing 4	Glazing 5	Glazing 6
Orientation	HOR	E	S	N	N	N	E	S	N	N	N	N
Shading factor	1	1	1				1	1				
Absorptivity	0.65	0.4	0.4									
Rse	0.04	0.06	0.06				0.06	0.06				
U-value	2.475	2.488	2.488				6	6				
Area	16.56	18	19.35				25.6	3.4				
Fr	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Emissivity	0.92	0.92	0.92				0.92	0.92				
Fw							0.9	0.9	0.9	0.9	0.9	0.9
g-value							0.85	0.85				
Frame factor							0.2	0.2				

Calculation for resultant space temperature inside unconditioned spaces									
						Cooling	Heating		
Living area temperature						25	23	degC	
Rest of dwelling temperature						28	15	degC	
Living area fraction (utilisation factor)						0.53			
		Description				U-value	Area		
						W/m ² K	m ²		
Element iu1		Apartment wall (iu1)				2.24	30		
Element iu2									
Element iu3									
Element iu4									
Element eu1		Roof (eu5)				2.475	16.56		
Element eu2		East and south wall (eu2 & eu4)				2.488	37.35		
Element eu3		East and south fenestration (eu1 & eu3)				6	29		
Element eu4									
Element au1		Wall appogg north (au1)				2.24	136.51		
Element au2		Wall appogg south and west (au2)				2.24	120		
Element au3									
Element au4									
Correction of U-values for internal walls								Corrected U-value	
Element iu1		Apartment wall (iu1)						-0.606	W/m ² K
Element iu2								#DIV/0!	W/m ² K
Element iu3								#DIV/0!	W/m ² K
Element iu4								#DIV/0!	W/m ² K