屋宇署 BUILDINGS DEPARTMENT

住宅熱傳送值的摘要匯表
RTTV Summary Sheet

請在適當的方格內填上『√』號。
please tick in box as appropriate.

Notes:
ER = External Reflectance
SC = Shading Coefficient
VLT = Visible Light Transmittance
Window and skylight data should represent the major proportion of its use in the development.

註:
ER = 外部反射率
SC = 遮光系數
VLT = 可見光透光率
應以發展項目中使用比例最高的窗戶和天窗的資料為準。

PNAP APP-156
附錄 Appendix A

電郵地址 E-mail Address	ⓘ 作認收電郵之用 (電子呈交適用) For acknowledgement email (e-submission)

地址 Address:	36A BRAGA CIRCUIT, HO MAN TIN, KOWLOON	屋宇署檔號 BD Ref. No.	BD 2/4020/19

建築物類型： Building Type:	住宅 Residential
住宅熱傳送值計算者 RTTV calculated by	☑ 1. 註冊專業工程師 1. Registered Professional Engineers
	☐ 2. 建築師 2. Architect
	☐ 3. 其他，請註明： 3. Others, please specify:
層數（住宅單位） No. of Storeys (Residential Units)	

表 1 Table 1

當作符合牆壁住宅熱傳送值 Deemed to Satisfy $RTTV_{Wall}$								
外牆朝向方位 Facade Orientation Facing	NW	NE	SE	SW				
平均吸收率值 Average Absorptivity	0.5	0.5	0.5	0.5				
窗戶與牆壁的平均比例 Average Window to Wall Ratio	1:5.35	1:2.55	1:12.19	1:2.58				
玻璃遮光系數 Shading Coefficient of Glazing	0.44	0.44	0.44	0.44				
外牆的平均遮光系數 Average Shading Coefficient of Facade	0.44	0.38	0.44	0.32				
可見光透光率 Visible Light Transmittance	55 %	55 %	55 %	55 %	%	%	%	%
外部反射率 External Reflectance	18 %	18 %	18 %	18 %	%	%	%	%

表 2 Table 2

牆壁住宅熱傳送值 $RTTV_{Wall}$

		NW	NE	SE	SW
外牆朝向方位 Facade Orientation Facing					
牆壁方位系數 Wall Orientation Factor		0.965	0.924	1.051	1.092
外牆總面積 (住宅單位) Total External Wall Area (Residential Units)		97.49 平方米 m²	103.06 平方米 m²	95.88 平方米 m²	106.83 平方米 m²
窗戶與牆壁的比例 Window to Wall Ratio		= 1823:9749	= 2020:5153	= 787:9588	= 4139:10683
窗戶總面積 Total Window Area		18.23 m²	40.4 m²	7.87 m²	41.39 m²
熱傳導 Heat Conduction	不透光牆 Opaque Wall	4.12 瓦特/平方米 W/m²	3.17 瓦特/平方米 W/m²	4.7 瓦特/平方米 W/m²	3.7 瓦特/平方米 W/m²
	窗戶 Window	0.2 瓦特/平方米 W/m²	0.41 瓦特/平方米 W/m²	0.1 瓦特/平方米 W/m²	0.48 瓦特/平方米 W/m²
窗戶 Window	玻璃類型 Glass Type	☐ 反射性 Reflective 面積 Area= 平方米 m² SC= VLT= % ER= %	☐ 反射性 Reflective 面積 Area= 平方米 m² SC= VLT= % ER= %	☐ 反射性 Reflective 面積 Area= 平方米 m² SC= VLT= % ER= %	☐ 反射性 Reflective 面積 Area= 平方米 m² SC= VLT= % ER= %
		☐ 有色 Tinted 面積 Area= 平方米 m² SC= VLT= % ER= %	☐ 有色 Tinted 面積 Area= 平方米 m² SC= VLT= % ER= %	☐ 有色 Tinted 面積 Area= 平方米 m² SC= VLT= % ER= %	☐ 有色 Tinted 面積 Area= 平方米 m² SC= VLT= % ER= %
		☑ 透明 Clear 面積 Area= 18.23 平方米 m² SC= 0.44 VLT= 55 % ER= 18 %	☑ 透明 Clear 面積 Area= 40.35 平方米 m² SC= 0.44 VLT= 55 % ER= 18 %	☑ 透明 Clear 面積 Area= 7.87 平方米 m² SC= 0.44 VLT= 55 % ER= 18 %	☑ 透明 Clear 面積 Area= 41.36 平方米 m² SC= 0.44 VLT= 55 % ER= 18 %
	雙層玻璃 Double Glazing	☑ 有 Yes ☐ 無 No	☑ 有 Yes ☐ 無 No	☑ 有 Yes ☐ 無 No	☑ 有 Yes ☐ 無 No
	外遮光物 External Shading	外懸伸建物 Overhang ☐ 有 Yes ☑ 無 No	外懸伸建物 Overhang ☐ 有 Yes ☑ 無 No	外懸伸建物 Overhang ☐ 有 Yes ☑ 無 No	外懸伸建物 Overhang ☐ 有 Yes ☑ 無 No
		側鰭伸建物 Sidefin ☐ 有 Yes ☑ 無 No	側鰭伸建物 Sidefin ☐ 有 Yes ☑ 無 No	側鰭伸建物 Sidefin ☐ 有 Yes ☑ 無 No	側鰭伸建物 Sidefin ☐ 有 Yes ☑ 無 No
穿透玻璃的太陽輻射量 Solar Radiation through Glazing		3.31 瓦特/平方米 W/m²	5.71 瓦特/平方米 W/m²	1.58 瓦特/平方米 W/m²	6.86 瓦特/平方米 W/m²
平均吸熱率值 Average Absorptivity		0.5	0.5	0.5	0.5
各幅外牆的牆壁住宅熱傳送值 $RTTV_{Wall}$ at each facade		7.64 瓦特/平方米 W/m²	9.29 瓦特/平方米 W/m²	6.38 瓦特/平方米 W/m²	11.04 瓦特/平方米 W/m²
總牆壁住宅熱傳送值 Overall $RTTV_{Wall}$		8.66 瓦特/平方米 W/m²			

表 3 Table 3

屋頂住宅熱傳送值 $RTTV_{Roof}$						
屋頂方位系數 Roof Orientation Factor	2.16					
屋頂總面積 (住宅單位) Total Roof Area (Residential Units)	134.01 平方米 m^2					
天窗總面積 Total Skylight Area	0 平方米 m^2					
熱傳導 Heat Conduction	屋頂 Roof	1.1 瓦特/平方米 W/m^2				
	天窗 Skylight	0 瓦特/平方米 W/m^2				
天窗 Skylight	玻璃類型 Glass Type	☐ 反射性 Reflective	面積= Area=	平方米 m^2	SC=	VLT= % ER= %
		☐ 有色 Tinted	面積= Area=	平方米 m^2	SC=	VLT= % ER= %
		☐ 透明 Clear	面積= Area=	平方米 m^2	SC=	VLT= % ER= %
	雙層玻璃 Double Glazing	☐ 有 Yes ☐ 無 No				
	外遮光物 External Shading	☐ 有 Yes ☐ 無 No				
穿透玻璃的太陽輻射量 Solar Radiation through Glazing	瓦特/平方米 W/m^2					
平均吸熱率值 (屋頂) Average Absorptivity (roof)	0.5					
總屋頂住宅熱傳送值 Overall $RTTV_{Roof}$	1.1 瓦特/平方米 W/m^2					

簽署*
Signature*

CHAO Chi Man B. Arch
Authorized Person-List of Architects

任何失實核證或聲明可引致法律行動。##
Any false certification or declaration may be subject to legal action.##

日期 Date

1	2	0	3	2	0	2	5

日 dd 月 mm 年 yyyy

SHENBO
GLASS

PERFORMANCE DATA

Project: 36A Braga Circuit, Ho Man Tin, Kowloon.

Date: 10-Mar-25

Prepared by: Alex Lau

NO	COMPOSITION	Type	Visible Light (%)			Shading Coefficient	SHGC	U-Value (W/m2·K)
			Transmittance	Reflectance				
				Outdoor	Indoor			
1	8mm SBTS61B#2 HS+12A+8mm Clear TP Glass	IGU	55%	18%	10%	0.44	0.38	1.76

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NW ELEVARION DRAWING

ELEVATION C

LEGEND

- ST 01 STONE CLADDING
- ST 02 STONE CLADDING
- AL 01 ALUMINIUM CLADDING AND WINDOW SECTION
- GL 01 GLASS PANEL
- GL 02 GLASS BALUSTRADE

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AI-MC-29

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PROJECT	ELEVATION C
DWG TITLE	PROPOSED RESIDENTIAL REDEVELOPMENT AT 36A BRAGA CIRCUIT, HO MAN TIN, KOWLOON
SCALE	1:50(A1)/1:100(A3)
DATE	02/11/2023
DWG NO	E03
REVISION	H

NORTH-WEST Elevations

Gross Wall Areas (Opaque Walls + Glazing Areas) (Ao)		**at**	**NORTH-WEST**	**Elevations**			=	**97.49** m^2
Glazing Areas		**at**	**NORTH-WEST**	**Elevations**			=	**18.23** m^2
Breakdown of Glazing Areas								
Glazing Areas	**Unshaded**			(**NW-F1**)			=	**18.23** m^2
G/F		0.75	x	2.063	x	1 =		1.55 m^2
		0.75	x	1	x	1 =		0.75 m^2
		3.404	x	2.985	x	1 =		10.16 m^2
1/F		1.018	x	2.965	x	1 =		3.02 m^2
		0.944	x	1.865	x	1 =		1.76 m^2
		0.944	x	1.05	x	1 =		0.99 m^2
Opaque Wall Areas		**at**	**NORTH-WEST**	**Elevations**			=	**79.26** m^2
Breakdown of Opaque Wall Areas								
Stone Cladding 200mm RC Wall Areas				(**NW-W1**)			=	**32.28** m^2
G/F		2.195	x	3.5	x	1 =		7.68 m^2
		2.325	x	3.05	x	1 =		7.09 m^2
1/F		3.935	x	4.45	x	1 =		17.51 m^2
Stone Cladding 125mm RC Wall Areas				(**NW-W2**)			=	**23.17** m^2
G/F		0.875	x	3.5	x	1 =		3.06 m^2
		0.5	x	3.565	x	1 =		1.78 m^2
1/F		2.325	x	4.45	x	1 =		10.35 m^2
		0.875	x	4.45	x	1 =		3.89 m^2
		4.364	x	0.935	x	1 =		4.08 m^2
Aluminium Cladding RC Wall				(**NW-W3**)			=	**7.56** m^2
1/F		2.152	x	3.515	x	1 =		7.56 m^2
Aluminium Window Frame				(**NW-W4**)			=	**16.25** m^2
G/F								1.20 m^2
								11.98 m^2
1/F								3.07 m^2
Window to Wall Ratio (WWR)		=		18.23	/	97.49	=	**0.19**

Sheet no. _____

Wall Orientation Factor Gw = 0.965 (Refer to **Table 9**)

Average Absorptivity (α) of the External Opaque Wall **at** **NORTH-\ Elevations**

External Wall Material (Colour / Finish)	% of wall area	α Absorptivity (Refer to **Table 5**)
Granite	80%	0.5
Alumnium	20%	0.5
-		0
-		0
-		0
		0.50

U' vlaue of Opaque Wall Areas

$U = 1 / (Ri + x_1 / k_1 + x_2 / k_2 + \dots + x_n / k_n + Ra + Ro)$ where

- Ri — Surface film resistance of internal surface (Refer to **Table 2**)
- Ro — Surface film resistance of external surface (Refer to **Table 2**)
- Ra — Air space resistance (Refer to **Table 3**)
- x — Thickness of building materials
- k — Thermal conductivity of building materials (Refer to **Table 1**)

NW-W1 Description: Stone Cladding 200mm RC Wall Areas

Wall Material	x		k	R		
External surface film resistance				Ro	=	0.044
Air space resistance				Ra	=	0.11
Granite	0.03	/	2.9		=	0.010
Air gap	0.06	/	-		=	0.000
Normal weight aggregate concrete	0.2	/	2.16		=	0.093
-	0	/	-		=	0.000
Internal surface film resistance				Ri	=	0.12
Total						**0.377**

$$Uw1 = \frac{1}{0.377} = \mathbf{2.65}\ W/m^2K$$

NW-W2 Description: Stone Cladding 125mm RC Wall Areas

Wall Material	x		k	R		
External surface film resistance				Ro	=	0.044
Air space resistance				Ra	=	0.11
Granite	0.03	/	2.9		=	0.010
Air gap	0.06	/	-		=	0.000
Normal weight aggregate concrete	0.125	/	2.16		=	0.058
-	0	/	-		=	0.000
Internal surface film resistance				Ri	=	0.12
Total						**0.342**

$$Uw2 = \frac{1}{0.342} = \mathbf{2.92}\ W/m^2K$$

NW-W3 Description: Aluminium Cladding RC Wall

Wall Material	x		k	R		
External surface film resistance				Ro	=	0.044
Air space resistance				Ra	=	0.11
Aluminum alloy typical	0.03	/	160		=	0.000
Air gap	0.06	/	-		=	0.000
Normal weight aggregate concrete	0.2	/	2.16		=	0.093
-		/	-		=	0.000
Internal surface film resistance				Ri	=	0.12
Total						**0.367**

$$Uw3 = \frac{1}{0.367} = \mathbf{2.73}\ W/m^2K$$

NW-W4 Description: Aluminium Window Frame

Wall Material	x		k	R		
External surface film resistance				Ro	=	0.044
Air space resistance				Ra	=	0.11
Aluminum alloy typical	0.03	/	160		=	0.000
-		/	-		=	0.000
-		/	-		=	0.000
-		/	-		=	0.000
Internal surface film resistance				Ri	=	0.12
Total						**0.274**

$$Uw4 = \frac{1}{0.274} = \mathbf{3.65}\ W/m^2K$$

Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014
For RTTV (Wall) 1 - Calculation of $RTTV_{wall}$ of Each Facade

Sheet No. 2 BD Ref No. BD 2/4020/19
Building Address 36A BRAGA CIRCUIT, HO MAN TIN, KOWLOON

Façade Orientation Facing NORTH-WEST Gross Wall Area (Ao) = 97.49
Window to Wall Ratio (WWR) 0.19 Wall Orientation Factor (Gw) = 0.965

Part 1 - Calculation of Heat Conduction through Opaque Walls					
Components / Details		**Code No.**			
Description	**Units**	**NW-W1**	**NW-W2**	**NW-W3**	**NW-W4**
External Finish Material		Granite	Granite	Aluminum alloy typical	Aluminum alloy typical
Conductivity	W/mk	2.9	2.9	160	160
Thickness	m	0.03	0.03	0.03	0.03
Average Absorptivity	(α)	0.50	0.50	0.50	0.50
Intermediate component		Air gap	Air gap	Air gap	
Conductivity	W/mk	-	-	-	
Thickness	m	0.06	0.06	0.06	
Intermediate component					
Conductivity	W/mk				
Thickness	m				
Intermediate component					
Conductivity	W/mk				
Thickness	m				
Intermediate component		Normal weight aggregate	Normal weight aggregate	Normal weight aggregate	-
Conductivity	W/mk	2.16	2.16	2.16	-
Thickness	m	0.20	0.125	0.2	
Internal Finish Material		-	-	-	-
Conductivity	W/mk	-	-	-	-
Thickness	m	-	-	-	-
U-value of Opaque Area (Uwi)	W/m^2K	2.65	2.92	2.73	3.65
Opaque Wall Area (Awi)	m^2	32.28	23.17	7.56	16.25
Heat Conduction = 3.57(Awi/Ao) Uwi αwi Gw		**1.51**	**1.20**	**0.36**	**1.05**

Heat Conduction through Opaque Walls = 3.57(Awi/Ao) Uwi awi Gw where i= 1, 2, ..., n
= **4.12** W/m^2

Part 2 - Calculation of Heat Conduction though Glazing				
Components / Details		**Code No.**		
Description	**Unit**	**NW-F1**		
Glazing Type		IGU		
Thickness	m	0.028		
Glazing Area (Afi)	m^2	18.23		
U-valueof Glazing (Ufi)	W/m^2K	1.76		
Heat Condution = 0.64 (Afi/Ao) Uf Gw		**0.20**		

Heat Conduction through Glazing = 0.64 (Afi/Ao) Uf Gw where i= 1, 2, ..., n
= **0.20** W/m^2

Part 3 - Calculation of Solar Radiation though Glazing				
Components / Details		**Code No.**		
Description	**Unit**	**NW-F1**		
Glazing Type		IGU		
Thickness	m	0.028		
Glazing Area (Afi)	m^2	18.23		
Shading Coefficient of Glazing (SCf)		0.44		
Visible Light Transmittance (VLT)	%	55		
External Reflectance (ER)	%	18		
External Shading Multiplier (ESC)		1.00		
Solar Radiation = 41.75 (Afi/Ao)(Scfi)(ESCwi)Gw		**3.31**		

Solar Radiation through Glazing = 41.75 (Afi/Ao)(Scfi)(ESCwi)Gw where i= 1, 2, ..., n
= **3.31** W/m^2

Summary of RTTV at NORTH-WEST Elevations

= 4.12 + 0.2 + 3.31
= **7.64** W/m^2

NE ELEVATION DRAWING

ELEVATION A

LEGEND

- ST 01 STONE CLADDING
- ST 02 STONE CLADDING
- AL 01 ALUMINIUM CLADDING AND WINDOW SECTION
- GL 01 GLASS PANEL
- GL 02 GLASS BALUSTRADE

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PROJECT	ELEVATION A
DWG TITLE	PROPOSED RESIDENTIAL REDEVELOPMENT AT 36A BRAGA CIRCUIT, HO MAN TIN, KOWLOON
SCALE	1:50(A1)/1:100(A3)
DATE	28/03/2024
DWG NO	E01
REVISION	H

NORTH-EAST Elevations

Gross Wall Areas (Opaque Walls + Glazing Areas) (Ao) at NORTH-EAST Elevations = **103.06** m^2

Glazing Areas at NORTH-EAST Elevations = **40.35** m^2

Breakdown of Glazing Areas

Glazing Areas — **Unshaded** (NE-F1) = **7.84** m^2

Glazing Area = Length of Glazing x Glazing Height x No. of Storeys

1/F	(	0.6			)x	1.035	x	1	=	0.62	
	(	0.6			)x	1.035	x	1	=	0.62	
	(	0.6			)x	1.865	x	1	=	1.12	
	(	0.6			)x	1.865	x	1	=	1.12	
	(	1.47			)x	2.965	x	1	=	4.36	

Glazing Door Areas — **Shaded by balcony & Built-Fin (Projection on Right)** (NE-F2) = **8.01** m^2

Glazing Area = Length of Glazing x Glazing Height x No. of Storeys

G/F	(	2.685				)x	2.985	x	1	=	8.0147	m^2
	OPF	=	0.49	/	2.985	=	0.16		$ESC_{overhang}$	=	0.884	
	SPF-L	=	0.5	/(	0.635	+	2.682	)=	0.151	ESC_{fin}	=	0.921
	ESC	=	0.884	x	0.921						=	**0.814**

Glazing Door Areas — **Shaded by balcony & Built-Fin (Projection on Left)** (NE-F3) = **8.01** m^2

G/F	(	2.685				)x	2.985	x	1	=	8.01473	m^2
	OPF	=	0.49	/	2.985	=	0.16		$ESC_{overhang}$	=	0.884	m^2
	SPF-R	=	0.5	/(	0.635	+	2.685	)=	0.151	ESC_{fin}	=	0.921
	ESC	=	0.884	x	0.921						=	**0.814**

Glazing Door Areas — **Shaded by Cover of Balcony** (NE-F4) = **5.62** m^2

G/F	(	0.965				)x	2.91	x	2	=	5.6163	m^2
	OPF	=	1.595	/	2.91	=	0.55		$ESC_{overhang}$	=	0.789	
	ESC										=	**0.789**

Glazing Areas — **Shaded by Cover of Balcony** (NE-F5) = **10.86** m^2

1/F	(	1.95				)x	2.785	x	2	=	10.8615	m^2
	OPF	=	0.45	/	2.785	=	0.16		$ESC_{overhang}$	=	0.862	
	ESC										=	**0.862**

Opaque Wall Areas at NORTH-EAST Elevations = **62.72** m^2

Breakdown of Opaque Wall Areas

Stone Cladding 200mm RC Wall Areas — **Unshaded** (NE-W1) = **27.10** m^2

G/F	(	2.85			)x	3.565	x	1 =	10.16	m^2
1/F	(	2.83			)x	4.45	x	1 =	12.59	m^2
	(	4.65			)x	0.935	x	1 =	4.35	m^2

Stone Cladding 125mm RC Wall Areas — **Unshaded** (NE-W2) = **4.97** m^2

G/F	(	0.61			)x	3.565	x	1 =	2.17	m^2
	(	0.51			)x	3.065	x	1 =	1.56	m^2
	(	0.81			)x	1.525	x	1 =	1.24	m^2

Aluminium Window Frame — **Unshaded** (NE-W3) = **30.64** m^2

G/F	22.74	m^2
1/F	7.903	m^2

Window to Wall Ratio (WWR) = 40.35 / 103.06 = **0.39**

Wall Orientation Factor Gw = 0.924 (Refer to **Table 9**)

Average Absorptivity (α) of the External Opaque Wall at NORTH-I Elevations

External Wall Material (Colour / Finish)	% of wall area	α Absorptivity (Refer to **Table 5**)
Granite	80%	0.5
Alumnium	20%	0.5
-		0
-		0
-		0
		0.50

U' vlaue of Opaque Wall Areas

$U = 1 / (Ri + x_1 / k_1 + x_2 / k_2 + \ldots + x_n / k_n + Ra + Ro)$ where

Ri	Surface film resistance of internal surface (Refer to **Table 2**)
Ro	Surface film resistance of external surface (Refer to **Table 2**)
Ra	Air space resistance (Refer to **Table 3**)
x	Thickness of building materials
k	Thermal conductivity of building materials (Refer to **Table 1**)

NE-W1 Description: Stone Cladding 200mm RC Wall Areas

Wall Material	x		k	R		
External surface film resistance				Ro	=	0.044
Air space resistance				Ra	=	0.11
Granite	0.03	/	2.9		=	0.010
Air gap	0.06	/	-		=	0.000
Normal weight aggregate concrete	0.2	/	2.16		=	0.093
-	0	/	-		=	0.000
Internal surface film resistance				Ri	=	0.12
Total						**0.377**

$Uw1 = \frac{1}{0.377} = 2.65$ W/m^2K

NE-W2 Description: Stone Cladding 125mm RC Wall Areas

Wall Material	x		k	R		
External surface film resistance				Ro	=	0.044
Air space resistance				Ra	=	0.11
Granite	0.03	/	2.9		=	0.010
Air gap	0.06	/	-		=	0.000
Normal weight aggregate concrete	0.125	/	2.16		=	0.058
-	0	/	-		=	0.000
Internal surface film resistance				Ri	=	0.12
Total						**0.342**

$Uw2 = \frac{1}{0.342} = 2.92$ W/m^2K

NE-W3 Description: Aluminium Window Frame

Wall Material	x		k	R		
External surface film resistance				Ro	=	0.044
Air space resistance				Ra	=	0.11
Aluminum alloy typical	0.03	/	160		=	0.000
-		/	-		=	0.000
-		/	-		=	0.000
-		/	-		=	0.000
Internal surface film resistance				Ri	=	0.12
Total						**0.274**

$Uw3 = \frac{1}{0.274} = 3.65$ W/m^2K

Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014
For RTTV (Wall) 1 - Calculation of $RTTV_{wall}$ of Each Facade

Sheet No. 4 BD Ref No. BD 2/4020/19
Building Address 36A BRAGA CIRCUIT, HO MAN TIN, KOWLOON

Façade Orientation Facing NORTH-EAST Gross Wall Area (Ao) = 103.06
Window to Wall Ratio (WWR) 0.39 Wall Orientation Factor (Gw) = 0.924

Part 1 - Calculation of Heat Conduction through Opaque Walls

Components / Details		Code No.		
Description	**Units**	**NE-W1**	**NE-W2**	**NE-W3**
External Finish Material		Granite	Granite	Aluminum alloy typical
Conductivity	W/mk	2.9	2.9	160
Thickness	m	0.03	0.03	0.03
Average Absorptivity	(α)	0.50	0.50	0.50
Intermediate component		Air gap	Air gap	
Conductivity	W/mk	-	-	
Thickness	m	0.06	0.06	
Intermediate component				
Conductivity	W/mk			
Thickness	m			
Intermediate component				
Conductivity	W/mk			
Thickness	m			
Intermediate component		Normal weight aggregate concrete	Normal weight aggregate concrete	-
Conductivity	W/mk	2.16	2.16	-
Thickness	m	0.2	0.125	-
Internal Finish Material		-	-	-
Conductivity	W/mk	-	-	-
Thickness	m	0	0	-
U-value of Opaque Area (Uwi)	W/m^2K	2.65	2.92	3.65
Opaque Wall Area (Awi)	m^2	27.10	4.97	30.64
Heat Conduction = 3.57(Awi/Ao) Uwi αwi Gw		**1.15**	**0.23**	**1.79**

Heat Conduction through Opaque Walls = 3.57(Awi/Ao) Uwi awi Gw where i= 1, 2, ..., n
= **3.17** W/m^2

Part 2 - Calculation of Heat Conduction though Glazing

Components / Details		Code No.						
Description	**Unit**	**NE-F1**	**NE-F2**	**NE-F3**	**NE-F4**	**NE-F5**		
Glazing Type		IGU	IGU	IGU	IGU	IGU		
Thickness	m	0.028	0.028	0.028	0.028	0.028		
Glazing Area (Afi)	m^2	7.84	8.01	8.01	5.62	10.86		
U-valueof Glazing (Ufi)	W/m^2K	1.76	1.76	1.76	1.76	1.76		
Heat Condution = 0.64 (Afi/Ao) Uf Gw		**0.08**	**0.08**	**0.08**	**0.06**	**0.11**		

Heat Conduction through Glazing = 0.64 (Afi/Ao) Uf Gw where i= 1, 2, ..., n
= **0.41** W/m^2

Part 3 - Calculation of Solar Radiation though Glazing

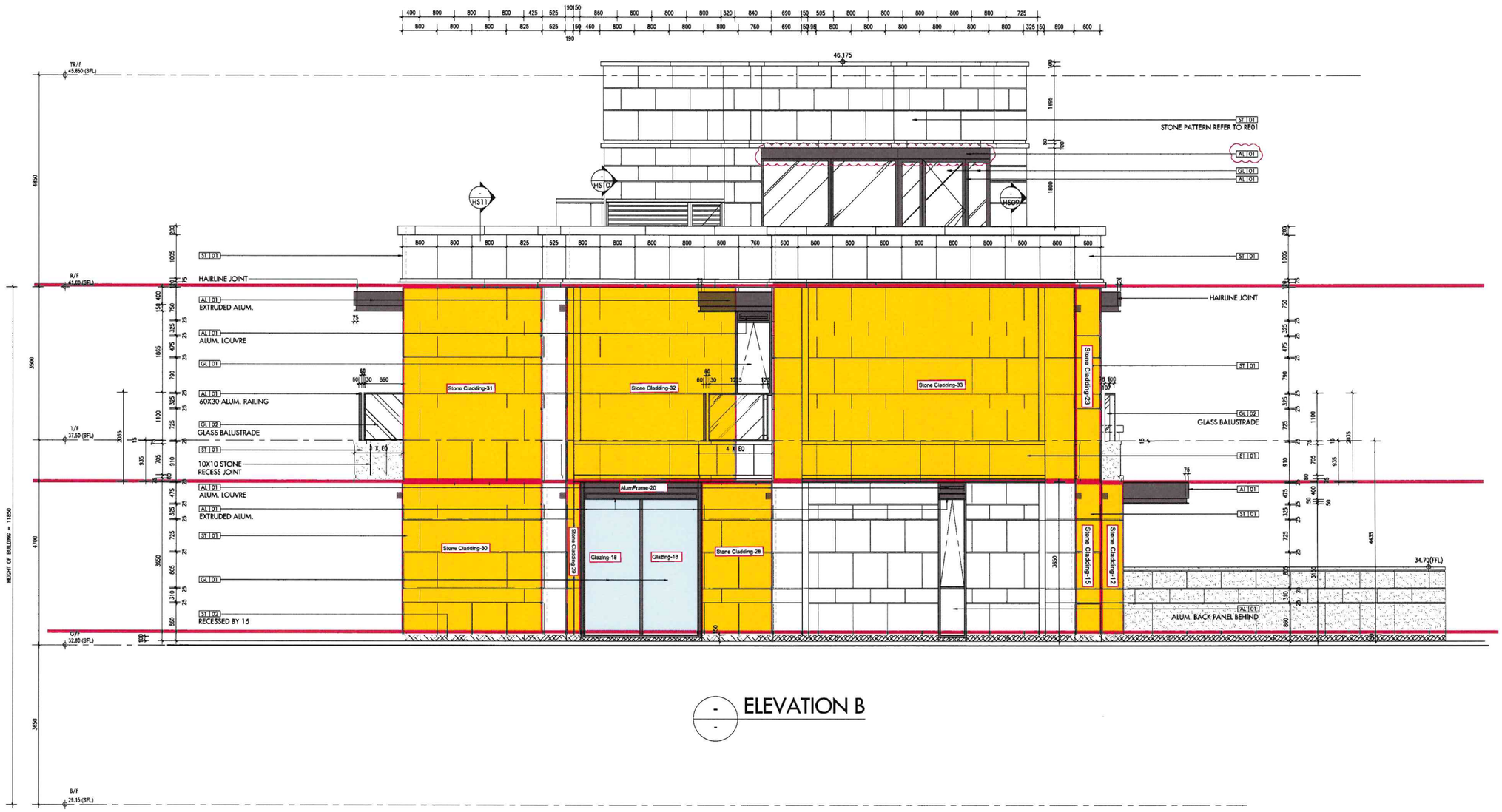
Components / Details		Code No.						
Description	**Unit**	**NE-F1**	**NE-F2**	**NE-F3**	**NE-F4**	**NE-F5**		
Glazing Type		IGU	IGU	IGU	IGU	IGU		
Thickness	m	0.028	0.028	0.028	0.028	0.028		
Glazing Area (Afi)	m^2	7.84	8.01	8.01	5.62	10.86		
Shading Coefficient of Glazing (SCf)		0.44	0.44	0.44	0.44	0.44		
Visible Light Transmittance (VLT)	%	55	55	55	55	55		
External Reflectance (ER)	%	18	18	18	18	18		
External Shading Multiplier (ESC)		1.00	0.814	0.814	0.789	0.862		
Solar Radiation = 41.75 (Afi/Ao)(Scfi)(ESCwi)Gw		**1.29**	**1.07**	**1.07**	**0.73**	**1.54**		

Solar Radiation through Glazing = 41.75 (Afi/Ao)(Scfi)(ESCwi)Gw where i= 1, 2, ..., n
= **5.71** W/m^2

Summary of RTTV at NORTH-EAST Elevations

= 3.17 + 0.41 + 1.29
= **9.29** W/m^2

SE ELEVATION DRAWING



ELEVATION B

LEGEND

- ST 01 STONE CLADDING
- ST 02 STONE CLADDING
- AL 01 ALUMINIUM CLADDING AND WINDOW SECTION
- GL 01 GLASS PANEL
- GL 02 GLASS BALUSTRADE

SPIRAL
architectural design limited
思博建築設計有限公司

AI-MC-29

PROJECT
ELEVATION B

DWG TITLE
PROPOSED RESIDENTIAL REDEVELOPMENT
AT 36A BRAGA CIRCUIT,
HO MAN TIN, KOWLOON

SCALE	1:50(A1)/1:100(A3)
DATE	02/11/2023
DWG NO	E02
REVISION	G

SOUTH-E Elevations

Gross Wall Areas (Opaque Walls + Glazing Areas) (Ao)	**at**	**SOUTH-E Elevations**				=	**95.88** m^2
Glazing Areas	**at**	**SOUTH-E Elevations**				=	**7.87** m^2

Breakdown of Glazing Areas

Glazing Areas	**Unshaded**			(**W-F1**)		=	**7.87** m^2
G/F	2.526	x	3.115	x	1 =		7.87 m^2

Opaque Wall Areas	**at**	**SOUTH-E Elevations**				=	**88.01** m^2

Breakdown of Opaque Wall Areas

Stone Cladding 200mm RC Wall Areas				(**W-W1**)		=	**68.01** m^2
G/F	0.6	x	3.565	x	1 =		2.14 m^2
	5.285	x	3.5	x	1 =		18.50 m^2
1/F	10.645	x	4.45	x	1 =		47.37 m^2
Stone Cladding 125mm RC Wall Areas				(**W-W2**)		=	**18.43** m^2
G/F	0.5	x	3.565	x	1 =		1.78 m^2
1/F	3.74	x	4.45	x	1 =		16.64 m^2
Aluminium Window Frame				(**W-W3**)		=	**1.58** m^2
G/F							1.58 m^2

Window to Wall Ratio (WWR)	=		7.87	/	95.88	=	**0.08**

Wall Orientation Factor	Gw	=	1.051 (Refer to **Table 9**)

Average Absorptivity (α) of the External Opaque Wall **at** **SOUTH-E Elevations**

External Wall Material (Colour / Finish)	% of wall area	α Absorptivity (Refer to **Table 5**)
Granite	80%	0.5
Alumnium	20%	0.5
-		0
-		0
-		0
		0.50

U' vlaue of Opaque Wall Areas

$U = 1 / (Ri + x_1 / k_1 + x_2 / k_2 + \ldots + x_n / k_n + Ra + Ro)$ where

Ri	Surface film resistance of internal surface (Refer to **Table 2**)
Ro	Surface film resistance of external surface (Refer to **Table 2**)
Ra	Air space resistance (Refer to **Table 3**)
x	Thickness of building materials
k	Thermal conductivity of building materials (Refer to **Table 1**)

W-W1 Description: Stone Cladding 200mm RC Wall Areas

Wall Material	x		k	R		
External surface film resistance				Ro	=	0.044
Air space resistance				Ra	=	0.11
Granite	0.03	/	2.9		=	0.010
Air gap	0.06	/	-		=	0.000
Normal weight aggregate concrete	0.2	/	2.16		=	0.093
-	0	/	-		=	0.000
Internal surface film resistance				Ri	=	0.12
Total						**0.377**

Uw1 = $\frac{1}{0.377}$ = 2.65 W/m^2K

W-W2 Description: Stone Cladding 125mm RC Wall Areas

Wall Material	x		k	R		
External surface film resistance				Ro	=	0.044
Air space resistance				Ra	=	0.11
Granite	0.03	/	2.9		=	0.010
Air gap	0.06	/	-		=	0.000
Normal weight aggregate concrete	0.125	/	2.16		=	0.058
-	0	/	-		=	0.000
Internal surface film resistance				Ri	=	0.12
Total						**0.342**

Uw2 = $\frac{1}{0.342}$ = 2.92 W/m^2K

W-W3 Description: Aluminium Window Frame

Wall Material	x		k	R		
External surface film resistance				Ro	=	0.044
Air space resistance				Ra	=	0.11
Aluminum alloy typical	0.03	/	160		=	0.000
-		/	-		=	0.000
-		/	-		=	0.000
-		/	-		=	0.000
Internal surface film resistance				Ri	=	0.12
Total						**0.274**

Uw3 = $\frac{1}{0.274}$ = 3.65 W/m^2K

Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014
For RTTV (Wall) 1 - Calculation of $RTTV_{wall}$ of Each Facade

Sheet No. 6 BD Ref No. BD 2/4020/19
Building Address 36A BRAGA CIRCUIT, HO MAN TIN, KOWLOON

Façade Orientation Facing SOUTH-EAST Gross Wall Area (Ao) = 95.88
Window to Wall Ratio (WWR) 0.08 Wall Orientation Factor (Gw) = 1.051

Part 1 - Calculation of Heat Conduction through Opaque Walls				
Components / Details		**Code No.**		
Description	**Units**	**W-W1**	**W-W2**	**W-W3**
External Finish Material		Granite	Granite	Aluminum alloy typical
Conductivity	W/mk	2.9	2.9	160
Thickness	m	0.03	0.03	0.03
Average Absorptivity	(α)	0.50	0.50	0.50
Intermediate component		Air gap	Air gap	
Conductivity	W/mk	-	-	
Thickness	m	0.06	0.06	
Intermediate component				
Conductivity	W/mk			
Thickness	m			
Intermediate component				
Conductivity	W/mk			
Thickness	m			
Intermediate component		Normal weight aggregate concrete	Normal weight aggregate concrete	-
Conductivity	W/mk	2.16	2.16	-
Thickness	m	0.2	0.125	-
Internal Finish Material		-	-	-
Conductivity	W/mk	-	-	-
Thickness	m	0	0	0
U-value of Opaque Area (Uwi)	W/m^2K	2.65	2.92	3.65
Opaque Wall Area (Awi)	m^2	68.01	18.43	1.58
Heat Conduction = 3.57(Awi/Ao) Uwi αwi Gw		**3.53**	**1.05**	**0.11**

Heat Conduction through Opaque Walls = 3.57(Awi/Ao) Uwi awi Gw where i= 1, 2, ..., n
= **4.70** W/m^2

Part 2 - Calculation of Heat Conduction though Glazing				
Components / Details		**Code No.**		
Description	**Unit**	**W-F1**		
Glazing Type		IGU		
Thickness	m	0.028		
Glazing Area (Afi)	m^2	7.87		
U-valueof Glazing (Ufi)	W/m^2K	1.76		
Heat Condution = 0.64 (Afi/Ao) Uf Gw		**0.10**		

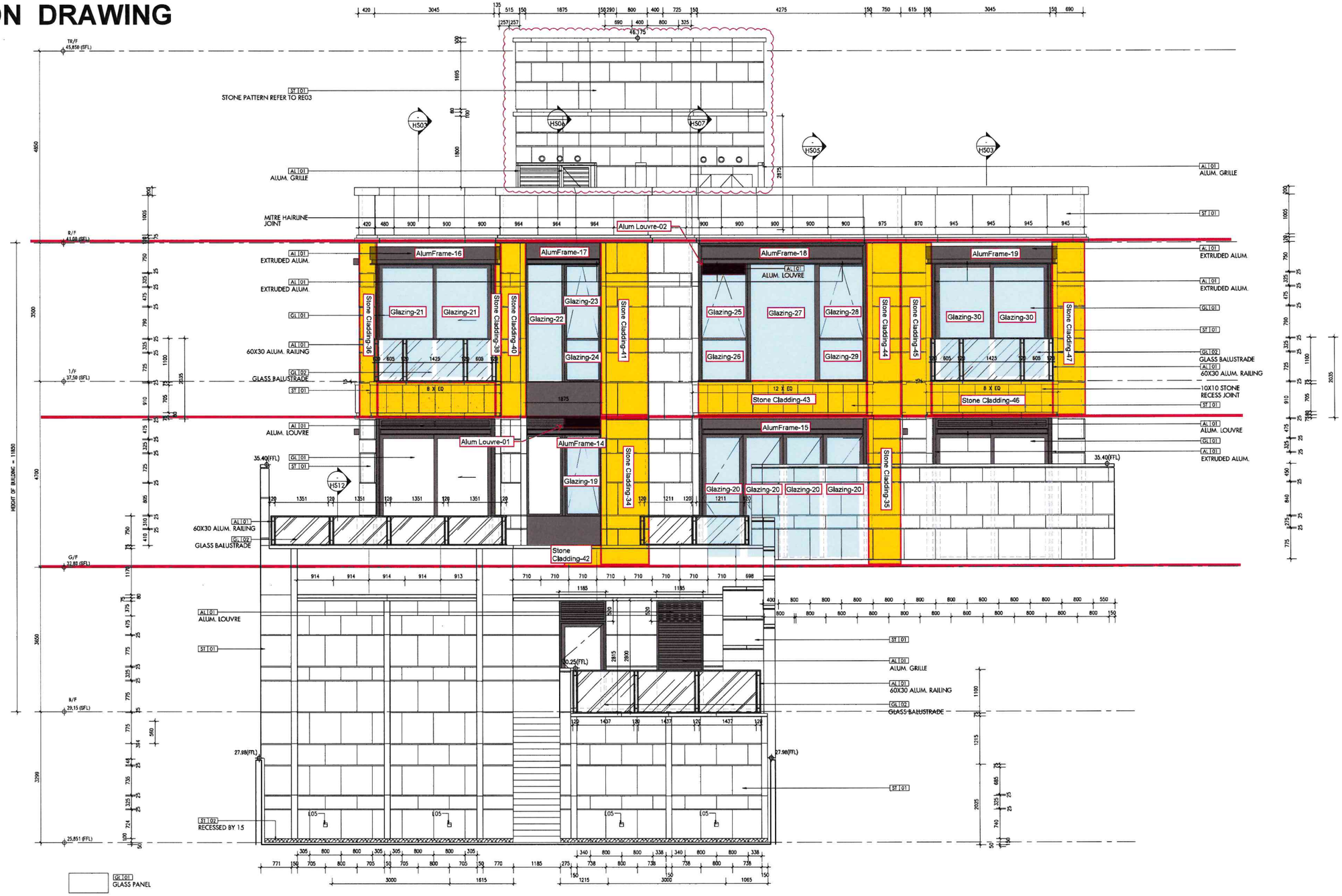
Heat Conduction through Glazing = 0.64 (Afi/Ao) Uf Gw where i= 1, 2, ..., n
= **0.10** W/m^2

Part 3 - Calculation of Solar Radiation though Glazing				
Components / Details		**Code No.**		
Description	**Unit**	**W-F1**		
Glazing Type		IGU		
Thickness	m	0.028		
Glazing Area (Afi)	m^2	7.87		
Shading Coefficient of Glazing (SCf)		0.44		
Visible Light Transmittance (VLT)	%	55		
External Reflectance (ER)	%	18		
External Shading Multiplier (ESC)		1.00		
Solar Radiation = 41.75 (Afi/Ao)(Scfi)(ESCwi)Gw		**1.58**		

Solar Radiation through Glazing = 41.75 (Afi/Ao)(Scfi)(ESCwi)Gw where i= 1, 2, ..., n
= **1.58** W/m^2

Summary of RTTV at SOUTH-EAST Elevations
= 4.70 + 0.1 + 1.58
= **6.38** W/m^2

SW ELEVATION DRAWING



ELEVATION D

LEGEND

- ST 01 STONE CLADDING
- ST 02 STONE CLADDING
- AL 01 ALUMINIUM CLADDING AND WINDOW SECTION
- GL 01 GLASS PANEL
- GL 02 GLASS BALUSTRADE

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PROJECT	ELEVATION D
DWG TITLE	PROPOSED RESIDENTIAL REDEVELOPMENT AT 36A BRAGA CIRCUIT, HO MAN TIN, KOWLOON
SCALE	1:50(A1)/1:100(A3)
DATE	09/10/2023
DWG NO	E04
REVISION	H

SOUTH-W Elevations

Gross Wall Areas (Opaque Walls + Glazing Areas) (Ao) at **SOUTH-W Elevations** = **106.83** m^2

Glazing Areas at **SOUTH-W Elevations** = **41.39** m^2

Breakdown of Glazing Areas

Glazing Areas **Unshaded** (**SW-F1**) = **27.06** m^2

Glazing Area = Length of Glazing x Glazing Height x No. of Storeys

G/F	(	0.8	)x	1.955	x	1	=	1.56			
	(	3.36	)x	3.025	x	1	=	10.16			
1/F	(	3	)x	1	x	1	=	3.00			
	(	2.2	)x	1.61	x	1	=	3.54			
	(	0.8	)x	1.813	x	1	=	1.45			
	(	2.475	)x	2.965	x	1	=	7.34			

Glazing Areas **Shaded by Balcony** (**SW-F2**) = **14.30** m^2

Glazing Area = Length of Glazing x Glazing Height x No. of Storeys

1/F	(	1.29			)x	2.785	x	2	=	7.1853	m^2
	(	1.278			)x	2.785	x	2	=	7.11846	m^2
	OPF	=	1.59	/ 2.785	=	0.57		$ESC_{overhang}$	=	0.661	
	ESC								=	**0.661**	

Opaque Wall Areas at **SOUTH-WEST Elevations** = **65.44** m^2

Breakdown of Opaque Wall Areas

Stone Cladding 200mm RC Wall Areas (**SW-W1**) = **23.03** m^2

G/F	(	0.835	)x	3.55	x	1	=	2.96	m^2	
	(	0.8	)x	0.35	x	1	=	0.28	m^2	
1/F	(	2.94	)x	4.45	x	1	=	13.08	m^2	
	(	7.17	)x	0.935	x	1	=	6.70	m^2	

Stone Cladding 125mm RC Wall Areas (**SW-W2**) = **17.84** m^2

G/F	(	1.075	)x	3.55	x	1	=	3.82	m^2	
1/F	(	2.532	)x	4.45	x	1	=	11.27	m^2	
	(	2.945	)x	0.935	x	1	=	2.75	m^2	

Aluminium Window Frame (**SW-W3**) = **24.60** m^2

G/F	1.915	m^2
	4.835	m^2
	0.16	m^2
1/F	5.92	m^2
	4.241	m^2
	0.22	m^2
	4.071	m^2
	3.234	m^2

Window to Wall Ratio (WWR) = 41.39 / 106.83 = **0.39**

Wall Orientation Factor Gw = 1.092 (Refer to **Table 9**)

Average Absorptivity (α) of the External Opaque Wall at **SOUTH-W Elevations**

External Wall Material (Colour / Finish)	% of wall area	α Absorptivity (Refer to **Table 5**)
Granite	80%	0.5
Alumnium	20%	0.5
-		0
-		0
-		0
		0.50

U' vlaue of Opaque Wall Areas

$U = 1 / (Ri + x_1 / k_1 + x_2 / k_2 + \dots + x_n / k_n + Ra + Ro)$ where

Ri	Surface film resistance of internal surface (Refer to **Table 2**)
Ro	Surface film resistance of external surface (Refer to **Table 2**)
Ra	Air space resistance (Refer to **Table 3**)
x	Thickness of building materials
k	Thermal conductivity of building materials (Refer to **Table 1**)

SW-W1 Description: Stone Cladding 200mm RC Wall Areas

Wall Material	x		k	R		
External surface film resistance				Ro	=	0.044
Air space resistance				Ra	=	0.11
Granite	0.03	/	2.9		=	0.010
Air gap	0.06	/	-		=	0.000
Normal weight aggregate concrete	0.2	/	2.16		=	0.093
-	0	/	-		=	0.000
Internal surface film resistance				Ri	=	0.12
Total						**0.377**

Uw1 = 1 / 0.377 = 2.65 W/m^2K

SW-W2 Description: Stone Cladding 125mm RC Wall Areas

Wall Material	x		k	R		
External surface film resistance				Ro	=	0.044
Air space resistance				Ra	=	0.11
Granite	0.03	/	2.9		=	0.010
Air gap	0.06	/	-		=	0.000
Normal weight aggregate concrete	0.125	/	2.16		=	0.058
-	0	/	-		=	0.000
Internal surface film resistance				Ri	=	0.12
Total						**0.342**

Uw2 = 1 / 0.342 = 2.92 W/m^2K

SW-W3 Description: Aluminium Window Frame

Wall Material	x		k	R		
External surface film resistance				Ro	=	0.044
Air space resistance				Ra	=	0.11
Aluminum alloy typical	0.03	/	160		=	0.000
-		/	-		=	0.000
-		/	-		=	0.000
-		/	-		=	0.000
Internal surface film resistance				Ri	=	0.12
Total						**0.274**

Uw2 = 1 / 0.274 = 3.65 W/m^2K

Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014
For RTTV (Wall) 1 - Calculation of $RTTV_{wall}$ of Each Facade

Sheet No. 8 BD Ref No. BD 2/4020/19
Building Address 36A BRAGA CIRCUIT, HO MAN TIN, KOWLOON

Façade Orientation Facing SOUTH-WEST Gross Wall Area (Ao) = 106.83
Window to Wall Ratio (WWR) 0.39 Wall Orientation Factor (Gw) = 1.092

Part 1 - Calculation of Heat Conduction through Opaque Walls

Components / Details		**Code No.**		
Description	**Units**	**SW-W1**	**SW-W2**	**SW-W3**
External Finish Material		Granite	Granite	Aluminum alloy typical
Conductivity	W/mk	2.9	2.9	160
Thickness	m	0.03	0.03	0.03
Average Absorptivity	(α)	0.50	0.50	0.50
Intermediate component		Air gap	Air gap	
Conductivity	W/mk	-	-	
Thickness	m	0.06	0.06	
Intermediate component				
Conductivity	W/mk			
Thickness	m			
Intermediate component				
Conductivity	W/mk			
Thickness	m			
Intermediate component		Normal weight aggregate concrete	Normal weight aggregate concrete	-
Conductivity	W/mk	2.16	2.16	-
Thickness	m	0.2	0.125	-
Internal Finish Material		-	-	-
Conductivity	W/mk	-	-	-
Thickness	m	0	0	0
U-value of Opaque Area (Uwi)	W/m^2K	2.65	2.92	3.65
Opaque Wall Area (Awi)	m^2	23.03	17.84	24.60
Heat Conduction = 3.57(Awi/Ao) Uwi αwi Gw		**1.11**	**0.95**	**1.64**

Heat Conduction through Opaque Walls = 3.57(Awi/Ao) Uwi awi Gw where i= 1, 2, ..., n
= **3.70** W/m^2

Part 2 - Calculation of Heat Conduction though Glazing

Components / Details		**Code No.**		
Description	**Unit**	**SW-F1**	**SW-F2**	
Glazing Type		IGU	IGU	
Thickness	m	0.028	0.028	
Glazing Area (Afi)	m^2	27.06	14.30	
U-valueof Glazing (Ufi)	W/m^2K	1.76	1.76	
Heat Condution = 0.64 (Afi/Ao) Uf Gw		**0.31**	**0.16**	

Heat Conduction through Glazing = 0.64 (Afi/Ao) Uf Gw where i= 1, 2, ..., n
= **0.48** W/m^2

Part 3 - Calculation of Solar Radiation though Glazing

Components / Details		**Code No.**		
Description	**Unit**	**SW-F1**	**SW-F2**	
Glazing Type		IGU	IGU	
Thickness	m	0.028	0.028	
Glazing Area (Afi)	m^2	27.06	14.30	
Shading Coefficient of Glazing (SCf)		0.44	0.44	
Visible Light Transmittance (VLT)	%	55	55	
External Reflectance (ER)	%	18	18	
External Shading Multiplier (ESC)		1.00	0.661	
Solar Radiation = 41.75 (Afi/Ao)(Scfi)(ESCwi)Gw		**5.08**	**1.78**	

Solar Radiation through Glazing = 41.75 (Afi/Ao)(Scfi)(ESCwi)Gw where i= 1, 2, ..., n
= **6.86** W/m^2

Summary of RTTV at SOUTH-WEST Elevations
= 3.70 + 0.48 + 5.08
= **11.04** W/m^2

Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014
For RTTV (Wall) 1 - Calculation of $RTTV_{wall}$ of Each Facade

Sheet No. 9 BD Ref No. BD 2/4020/19

Building Address 36A BRAGA CIRCUIT, HO MAN TIN, KOWLOON

Overal Gross Wall Area [a] 403.262245 m^2

Façade Orientation Facing	Gross Wall Area m^2	Head Conduction Through Opaque Walls (W/m^2)	Head Conduction Through Glazing (W/m^2)	Solar Radiation Through Glazing (W/m^2)	RTTVwall at Each Façade (W/m^2)	Area-weighted RTTVwall (W/m^2)
	[b]	[c]	[d]	[e]	[f]=[c]+[d]+[e]	[g]=[f]*[b]/[a]
NORTH-WEST	97.49	4.12	0.20	3.31	7.64	1.85
NORTH-EAST	103.06	3.17	0.41	5.71	9.29	2.37
SOUTH-EAST	95.88	4.70	0.10	1.58	6.38	1.52
SOUTH-WEST	106.83	3.70	0.48	6.86	11.04	2.92

Overall RTTVwall = 8.66 W/m^2

< 14W/m^2 OK.

ROOF

Gross Roof Areas = **134.01** m^2
(Opaque Walls + Skylight Areas) (Aro) **at** **ROOF**

Skylight Areas at **ROOF** = **0.00** m^2

Breakdown of Skylight
Skylight Areas **Unshaded** (**S1**) = **0.00** m^2

Opaque Areas **at** **ROOF** = **134.01** m^2

Breakdown of Opaque Roof Areas

Stone Roof Area (**R1**) = **134.01** m^2

1/F Flat Roof	6.65	m^2
R/F Flat Roof	26.829	m^2
	34.62	m^2
	16.068	m^2
	49.844	m^2

Skylight to Roof Ratio (SRR) = 0.00 / 134.01 = **0.00**

Roof Orientation Factor Gs = 2.16 (Refer to **Table 9**)

Average Absorptivity (α) of the External Opaque Wall **at** **ROOF**

External Wall Material (Colour / Finish)	% of roof area	α Absorptivity (Refer to **Table 5**)
Granite	100%	0.5
-		0
-		0
-		0
-		0
	Average Absorptivity =	**0.50**

U' vlaue of Opaque Roof Areas
$U = 1 / (Ri + x_1 / k_1 + x_2 / k_2 + \ldots + x_n / k_n + Ra + Ro)$ where

Ri	Surface flim resistance of internal surface (Refer to **Table 2**)
Ro	Surface flim resistance of external surface (Refer to **Table 2**)
Ra	Air space resistance (Refer to **Table 3**)
x	Thickness of building materials
k	Thermal conductivity of building materials (Refer to **Table 1**)

R1 Description: Stone Roof Area

Roof Material	x		k	R		
External surface flim resistance				Ro	=	0.055
Air space resistance				Ra	=	0
Granite	0.025	/	2.9		=	0.009
Cememt/sand	0.05	/	0.72		=	0.069
Polyurethane foam	0.04	/	0.026		=	1.538
Cememt/sand	0.025	/	0.72		=	0.035
Polystyrene expanded	0.05	/	0.034		=	1.471
Normal weight aggregate concrete	0.125	/	2.16		=	0.058
Internal surface film resistance				Ri	=	0.162
Total						**3.397**

Uri1 = $\frac{1}{3.397}$ = **0.29** W/m^2K

Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014
For RTTV (Roof) 1 - Calculation of RTTVroof

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Building Address 36A BRAGA CIRCUIT, HO MAN TIN, KOWLOON

Façade Orientation Facing Flat Gross Roof Area (Aro) = 134.01

Skylight to Roof Ratio (SRR) 0.00 Roof Orientation Factor (Gs) = 2.16

Part 1 - Calculation of Heat Conduction through Opaque Roof				
Components / Details		**Code No.**		
Description	**Units**	**R1**		
External Finish Material		Granite		
Conductivity	W/mk	2.9		
Thickness	m	0.025		
Average Absorptivity	(α)	0.50		
Intermediate component		Cememt/sand		
Conductivity	W/mk	0.72		
Thickness	m	0.05		
Intermediate component		Polyurethane foam		
Conductivity	W/mk	0.026		
Thickness	m	0.04		
Intermediate component		Cememt/sand		
Conductivity	W/mk	0.72		
Thickness	m	0.025		
Intermediate component		Polystyrene expanded		
Conductivity	W/mk	0.034		
Thickness	m	0.05		
Internal Finish Material		Normal weight aggregate concrete		
Conductivity	W/mk	2.16		
Thickness	m	0.125		
U-value of Roof (Uri)	W/m^2K	0.29		
Opaque Roof Area (Ari)	m^2	134.01		
Heat Conduction = 3.47(Ari/Aro) Uri αpi Gw		**1.10**		

Heat Conduction through Roof Walls = 3.47(Ari/Aro) Uri ari Gr where i= 1, 2, ..., n

= **1.10** **W/m^2**

Part 2 - Calculation of Heat Conduction though Skylight				
Components / Details		**Code No.**		
Description	**Unit**	**R1**		
Skylight Glazing Type		-		
Thickness	m	-		
Skylight Area (Asi)	m^2	0.00		
U-valueof Skylight (Usi)	W/m^2K	5.7		
Heat Condution = 0.4 (Asi/Aro) Usi Gs		**0.00**		

Heat Conduction through Glazing = 0.4 (Asi/Aro) Usi Gs where i= 1, 2, ..., n

= **0.00** **W/m^2**

Part 3 - Calculation of Solar Radiation though Skylight				
Components / Details		**Code No.**		
Description	**Unit**	**R1**		
Skylight Glazing Type		-		
Thickness	m	-		
Skylight Area (Asi)	m^2	0.00		
Shading Coefficient of Skylight Glazing (SCr)		-		
Visible Light Transmittance (VLT)	%	-		
External Reflectance (ER)	%	-		
Solar Radiation = 41.10 (Asi/Aro)(Scr)Gs		**0.00**		

Solar Radiation through Skylight = 41.10 (Asi/Aro)(SCri)Gs where i= 1, 2, ..., n

= **0.00** **W/m^2**

Summary of RTTV at Roof

= 1.10 + 0 + 0

= **1.10** **W/m^2**

Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014
For RTTV (Roof) 2 - Summary of RTTVroof of Building Envelopes

Sheet No. 12

Building Address 36A BRAGA CIRCUIT, HO MAN TIN, KOWLOON

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Overal Roof Area [a] 134.01 m^2

Roof	Gross Roof Area m^2	Head Conduction Through Opaque Roof (W/m^2)	Head Conduction Through Skylight (W/m^2)	Solar Radiation Through Skylight (W/m^2)	RTTVwall at Each Type of Roof (W/m^2)	Area-weighted RTTVroof (W/m^2)
	[b]	[c]	[d]	[e]	[f]=[c]+[d]+[e]	[g]=[f]*[b]/[a]
Flat Roof	134.01	1.10	0.00	0.00	1.10	1.10

Overall RTTVroof = 1.10 W/m^2

< 4W/m^2 OK.