



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.

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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 = 遮光係數  
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 A  
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: PROPOSED RESIDENTIAL & COMMERCIAL DEVELOPMENT AT 270-286 TUNG CHAU STREET & 1-5 KWEILIN STREET, SSP, KOWLOON N.K.L.L 6559 (TOWER 1)

屋宇署檔號  
BD Ref. No. 2/4035/18

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) 19

表 1 Table 1

外牆朝向方位 Facade Orientation Facing	當作符合牆壁住宅熱傳送值 Deemed to Satisfy RTTV <sub>Wall</sub>								
	SE	SW	NW	NE					
平均吸收率值 Average Absorptivity	0.9	0.9	0.9	0.9					
窗戶與牆壁的平均比例 Average Window to Wall Ratio	1:2.68	1:1.76	1:1.89	1:2.11					
玻璃遮光係數 Shading Coefficient of Glazing	0.33/0.66	0.33/0.66	0.33/0.66	0.33/0.66					
外牆的平均遮光係數 Average Shading Coefficient of Facade	0.395	0.374	0.389	0.396					
可見光透光率 Visible Light Transmittance	62/50 %	62/50 %	62/50 %	62/50 %	%	%	%	%	%
外部反射率 External Reflectance	12/6 %	12/6 %	12/6 %	12/6 %	%	%	%	%	%

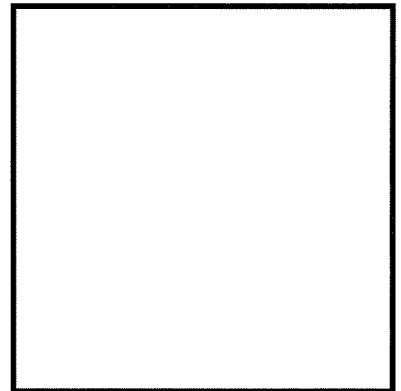



表 2 Table 2

牆壁住宅熱傳送值 RTTV <sub>Wall</sub>																			
外牆朝向方位 Facade Orientation Facing		SOUTH-EAST (SE)				SOUTH-WAST (SW)				NORTH-WEST (NW)				NORTH-EAST(NE)					
牆壁方位系數 Wall Orientation Factor		1.051				1.092				0.965				0.924					
外牆總面積 (住宅單位) Total External Wall Area (Residential Units)		1,338.72 平方米 m <sup>2</sup>		窗戶與牆壁的比例 Window to Wall Ratio = 24943:669 3		1,260.12 平方米 m <sup>2</sup>		窗戶與牆壁的比例 Window to Wall Ratio = 35695:630 0		1,236.4 平方米 m <sup>2</sup>		窗戶與牆壁的比例 Window to Wall Ratio = 65319:123 6		1,197.26 平方米 m <sup>2</sup>		窗戶與牆壁的比例 Window to Wall Ratio = 56725:119 7			
窗戶總面積 Total Window Area		498.86 m <sup>2</sup>		713.9 m <sup>2</sup>		653.19 m <sup>2</sup>		567.25 m <sup>2</sup>											
熱傳導 Heat Conduction	不透光牆 Opaque Wall	6.91 瓦特/平方米 W/m <sup>2</sup>				4.96 瓦特/平方米 W/m <sup>2</sup>				4.77 瓦特/平方米 W/m <sup>2</sup>				5.09 瓦特/平方米 W/m <sup>2</sup>					
	窗戶 Window	0.59 瓦特/平方米 W/m <sup>2</sup>				0.84 瓦特/平方米 W/m <sup>2</sup>				0.74 瓦特/平方米 W/m <sup>2</sup>				0.66 瓦特/平方米 W/m <sup>2</sup>					
窗戶 Window	玻璃類型 Glass Type	<input checked="" type="checkbox"/> 反射性 Reflective	面積 Area= 400.5 平方米 m <sup>2</sup>	SC= 0.33	VLT= 62 ER= 12 %	<input checked="" type="checkbox"/> 反射性 Reflective	面積 Area= 617.8 平方米 m <sup>2</sup>	SC= 0.33	VLT= 62 ER= 12 %	<input checked="" type="checkbox"/> 反射性 Reflective	面積 Area= 536.8 平方米 m <sup>2</sup>	SC= 0.33	VLT= 62 ER= 12 %	<input checked="" type="checkbox"/> 反射性 Reflective	面積 Area= 453.2 平方米 m <sup>2</sup>	SC= 0.33	VLT= 62 ER= 12 %		
		<input type="checkbox"/> 有色 Tinted	面積 Area= 0 平方米 m <sup>2</sup>	SC= 0	VLT= 0 ER= 0 %	<input type="checkbox"/> 有色 Tinted	面積 Area= 0 平方米 m <sup>2</sup>	SC= 0	VLT= 0 ER= 0 %	<input type="checkbox"/> 有色 Tinted	面積 Area= 0 平方米 m <sup>2</sup>	SC= 0	VLT= 0 ER= 0 %	<input type="checkbox"/> 有色 Tinted	面積 Area= 0 平方米 m <sup>2</sup>	SC= 0	VLT= 0 ER= 0 %		
		<input checked="" type="checkbox"/> 透明 Clear	面積 Area= 98.2 平方米 m <sup>2</sup>	SC= 0.66	VLT= 50 ER= 6 %	<input checked="" type="checkbox"/> 透明 Clear	面積 Area= 96.05 平方米 m <sup>2</sup>	SC= 0.66	VLT= 50 ER= 6 %	<input checked="" type="checkbox"/> 透明 Clear	面積 Area= 116.3 平方米 m <sup>2</sup>	SC= 0.66	VLT= 50 ER= 6 %	<input checked="" type="checkbox"/> 透明 Clear	面積 Area= 114 平方米 m <sup>2</sup>	SC= 0.66	VLT= 50 ER= 6 %		
	雙層玻璃 Double Glazing	<input checked="" type="checkbox"/> 有 Yes <input type="checkbox"/> 無 No				<input checked="" type="checkbox"/> 有 Yes <input type="checkbox"/> 無 No				<input checked="" type="checkbox"/> 有 Yes <input type="checkbox"/> 無 No				<input checked="" type="checkbox"/> 有 Yes <input type="checkbox"/> 無 No					
	外遮光物 External Shading	外懸伸建物 Overhang	<input checked="" type="checkbox"/> 有 Yes <input type="checkbox"/> 無 No				<input checked="" type="checkbox"/> 有 Yes <input type="checkbox"/> 無 No				<input checked="" type="checkbox"/> 有 Yes <input type="checkbox"/> 無 No				<input checked="" type="checkbox"/> 有 Yes <input type="checkbox"/> 無 No				
		側簷伸建物 Sidefin	<input type="checkbox"/> 有 Yes <input checked="" type="checkbox"/> 無 No				<input type="checkbox"/> 有 Yes <input checked="" type="checkbox"/> 無 No				<input type="checkbox"/> 有 Yes <input checked="" type="checkbox"/> 無 No				<input type="checkbox"/> 有 Yes <input checked="" type="checkbox"/> 無 No				
穿透玻璃的太陽輻射量 Solar Radiation through Glazing		6.46 瓦特/平方米 W/m <sup>2</sup>				7.94 瓦特/平方米 W/m <sup>2</sup>				8.17 瓦特/平方米 W/m <sup>2</sup>				7.06 瓦特/平方米 W/m <sup>2</sup>					
平均吸熱率值 Average Absorptivity		0.9				0.9				0.9				0.9					
各幅外牆的 牆壁住宅熱傳送值 RTTV <sub>Wall</sub> at each facade		13.95 瓦特/平方米 W/m <sup>2</sup>				13.73 瓦特/平方米 W/m <sup>2</sup>				13.69 瓦特/平方米 W/m <sup>2</sup>				12.82 瓦特/平方米 W/m <sup>2</sup>					
總牆壁住宅熱傳送值 Overall RTTV <sub>Wall</sub>		13.56 瓦特/平方米 W/m <sup>2</sup>																	

圖3 Table 3

屋頂住宅熱傳送值 RTTV <sub>Roof</sub>							
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)		113.58				平方米 m <sup>2</sup>	
天窗總面積 Total Skylight Area		0				平方米 m <sup>2</sup>	
熱傳導 Heat Conduction	屋頂 Roof	2.9				瓦特/平方米 W/m <sup>2</sup>	
	天窗 Skylight	0				瓦特/平方米 W/m <sup>2</sup>	
天窗 Skylight	玻璃類型 Glass Type	<input type="checkbox"/> 反射性 Reflective	面積= 0 Area= 0	平方米 m <sup>2</sup>	SC= 0	VLT= 0 %	ER= 0 %
		<input type="checkbox"/> 有色 Tinted	面積= 0 Area= 0	平方米 m <sup>2</sup>	SC= 0	VLT= 0 %	ER= 0 %
		<input type="checkbox"/> 透明 Clear	面積= 0 Area= 0	平方米 m <sup>2</sup>	SC= 0	VLT= 0 %	ER= 0 %
	雙層玻璃 Double Glazing	<input type="checkbox"/> 有 Yes <input type="checkbox"/> 無 No					
	外遮光物 External Shading	<input type="checkbox"/> 有 Yes <input type="checkbox"/> 無 No					
穿透玻璃的太陽輻射量 Solar Radiation through Glazing		0				瓦特/平方米 W/m <sup>2</sup>	
平均吸熱率值 (屋頂) Average Absorptivity (roof)		0.7					
總屋頂住宅熱傳送值 Overall RTTV <sub>Roof</sub>		2.9				瓦特/平方米 W/m <sup>2</sup>	

簽署\*  
Signature\*

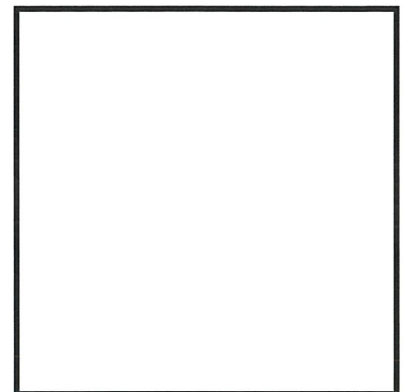


任何失實核證或聲明可引致法律行動。##  
Any false certification or declaration  
may be subject to legal action.##

日期 Date

04 01 2023

日 dd 月 mm 年 yyyy





## 任何人如作出虛假聲明或就重要事項作出失實陳述即屬觸犯刑事罪行，可能會被檢控。

### 甲. 填寫表格

1. 請填妥表格載列所有有關的部分。請附上所有證明文件。
2. 所提供的資料如有不全或錯誤，屋宇署將不能處理呈交的文件。
3. 如對本表格有任何疑問，請與屋宇署聯絡。

### 乙. 呈交方法

1. ~~0000~~ - 本表格連同有關文件應郵寄或親身呈交至屋宇署：

呈交有關勸諭信 / 命令 / 通知 / 指示的表格：

九龍油麻地海庭道11號西九龍政府合署北座屋宇署總部地下一般查詢及收件處。

呈交至拓展部有關其他事宜的表格：

香港太古城太古灣道14號7樓屋宇署收發處。

### 丙. 聯絡資料

屋宇署

地址：九龍油麻地海庭道11號西九龍政府合署北座屋宇署總部

電話：2626 1616 (由“1823”接聽)

傳真：2537 4992

電郵：enquiry@bd.gov.hk

### Matters to Note

## Any person making a false declaration or misrepresenting a material fact shall be guilty of a criminal offence and subject to prosecution.

### A. Completion of Form

1. Please ensure that all relevant parts of the form are duly completed. Please enclose all supporting documents.
2. If incomplete or erroneous information is provided in the form, the Buildings Department may not be able to process the submission.
3. Enquiries regarding this form should be addressed to the Buildings Department.

### B. Submission Methods

1. **By Post / In Person** - This form together with the relevant documents shall be posted to or submitted in person to the Buildings Department:

For submissions relating to advisory letter/order/notice/direction:

General Enquiry and Receipt Counter, G/F, Buildings Department Headquarters, North Tower, West Kowloon Government Offices, 11 Hoi Ting Road, Yau Ma Tei, Kowloon.

For other submissions to the New Buildings Division:

Receipt & Despatch Counter, Buildings Department, 7/F, 14 Taikoo Wan Road, Taikoo Shing, Hong Kong.

### C. Contact Details

Buildings Department

Address: Buildings Department Headquarters, North Tower, West Kowloon

Government Offices, 11 Hoi Ting Road, Yau Ma Tei, Kowloon

Tel No.: 2626 1616 (handled by “1823”)

Fax No.: 2537 4992

Email: enquiry@bd.gov.hk

**Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014**  
**Form RTTV (Wall) 1 - Calculation of RTTV<sub>wall</sub> of Each Facade**

Sheet No. \_\_\_\_\_ BD Ref No. 2/4035/18  
 Building Address Proposed Residential & Commercial Development at 270-286 Tung Chau Street & 1-5 Kweilin Street, Shum Shui Po, Kowloon N.K.I.L 6559 (Tower 1)

Facade Orientation Facing South East Elevations Gross Wall Area (A<sub>o</sub>) = 1338.72  
 Window to Wall Ratio (WWR) 0.373 Wall Orientation Factor (G<sub>w</sub>) = 1.051

Part 1 - Calculation of Heat Conduction through Opaque Walls		Code No.	
Components / Details	Units	SE-W1	
<b>External Finish Material</b>		5mm mosaic tiles	
Conductivity	W/mK	1.50	
Thickness	m	0.005	
U-value	W/m <sup>2</sup> K		
Average Absorptivity	(α)	0.90	
<b>Intermediate component</b>		30mm cement/sand render	
Conductivity	W/mK	0.72	
Thickness	m	0.03	
<b>Intermediate component</b>		150 mm concrete wall	
Conductivity	W/mK	2.16	
Thickness	m	0.15	
<b>Intermediate component</b>			
Conductivity	W/mK		
Thickness	m		
<b>Internal Finish Material</b>		15mm gypsum plaster	
Conductivity	W/mK	0.53	
Thickness	m	0.015	
U-value of Opaque Area (U <sub>wi</sub> )	W/m <sup>2</sup> K	3.26	
Opaque Wall Area (A <sub>wi</sub> )	m <sup>2</sup>	839.86	
<b>Heat Conduction = 3.57(A<sub>wi</sub>/A<sub>o</sub>) U<sub>wi</sub> G<sub>w</sub></b>		<b>6.91</b>	

$$\text{Heat Conduction through Opaque Walls} = 3.57(A_{wi}/A_o) U_{wi} G_w \text{ where } i = 1, 2, \dots, n$$

$$= \underline{6.91} \text{ W/m}^2$$

Part 2 - Calculation of Heat Conduction through Glazing		Code No.			
Components / Details	Units	1	2	3	4
Glazing Type		GL11	GL11	GL3	
Thickness	m	0.024	0.024	0.010	
U-value of Glazing (U <sub>fi</sub> )	W/m <sup>2</sup> K	1.63	1.63	5.28	
Glazing Area (A <sub>fi</sub> )	m <sup>2</sup>	400.55	0.00	98.32	
<b>Heat Conduction = 0.64 (A<sub>fi</sub>/A<sub>o</sub>) U<sub>fi</sub> G<sub>w</sub></b>		<b>0.328</b>	<b>0.000</b>	<b>0.261</b>	

$$\text{Heat Conduction through Glazing} = 0.64 (A_{fi}/A_o) U_{fi} G_w \text{ where } i = 1, 2, \dots, n$$

$$= \underline{0.59} \text{ W/m}^2$$

Part 3 - Calculation of Solar Radiation through Glazing		Code No.			
Components / Details	Units	1	2	3	4
Glazing Type		GL11	GL11	GL3	
Thickness	m	0.024	0.024	0.010	
Glazing Area (A <sub>fi</sub> )	m <sup>2</sup>	400.55	0.00	98.32	
Shading Coefficient of Glazing (SC)		0.330	0.330	0.660	
Visible Light Transmittance (VLT)	%	62	62	50	
External Reflectance (ER)	%	12	12	6	
External Shading Multiplier (ESC)		1.000	0.612	1.000	
<b>Solar Radiation = 41.75 (A<sub>fi</sub>/A<sub>o</sub>)(SC<sub>fi</sub>)(ESC<sub>wi</sub>)G<sub>w</sub></b>		<b>4.332</b>	<b>0.000</b>	<b>2.127</b>	

$$\text{Solar Radiation through Glazing} = 41.75 (A_{fi}/A_o)(SC_{fi})(ESC_{wi})G_w \text{ where } i = 1, 2, \dots, n$$

$$= \underline{6.46} \text{ W/m}^2$$

**Summary of RTTV at South East Elevations**

$$= 6.91 + 0.59 + 6.46$$

$$= \underline{13.95} \text{ W/m}^2$$

**Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014**  
**Form RTTV (Wall) 1 - Calculation of RTTV<sub>wall</sub> of Each Facade**

Sheet No. \_\_\_\_\_ BD Ref No. 2/4035/18  
 Building Address Proposed Residential & Commercial Development at 270-286 Tung Chau Street & 1-5 Kweilin Street, Shum Shui Po, Kowloon N.K.I.L 6559 (Tower 1)

Facade Orientation Facing South West Elevations Gross Wall Area (A<sub>o</sub>) = 1260.12  
 Window to Wall Ratio (WWR) 0.557 Wall Orientation Factor (G<sub>w</sub>) = 1.092

Part 1 - Calculation of Heat Conduction through Opaque Walls			
Components / Details		Code No.	
Description	Units	SW-W1	
<b>External Finish Material</b>		5mm mosaic tiles	
Conductivity	W/mK	1.50	
Thickness	m	0.005	
U-value	W/m <sup>2</sup> K		
Average Absorptivity	(α)	0.90	
<b>Intermediate component</b>		30mm cement/sand render	
Conductivity	W/mK	0.72	
Thickness	m	0.03	
<b>Intermediate component</b>		150 mm concrete wall	
Conductivity	W/mK	2.16	
Thickness	m	0.15	
<b>Intermediate component</b>			
Conductivity	W/mK		
Thickness	m		
<b>Intermediate component</b>			
Conductivity	W/mK		
Thickness	m		
<b>Internal Finish Material</b>		15mm gypsum plaster	
Conductivity	W/mK	0.53	
Thickness	m	0.015	
U-value of Opaque Area (U <sub>wi</sub> )	W/m <sup>2</sup> K	3.26	
Opaque Wall Area (A <sub>wi</sub> )	m <sup>2</sup>	546.26	
<b>Heat Conduction = 3.57(A<sub>wi</sub>/A<sub>o</sub>) U<sub>wi</sub> G<sub>w</sub></b>		<b>4.96</b>	

$$\text{Heat Conduction through Opaque Walls} = 3.57(A_{wi}/A_o) U_{wi} G_w \text{ where } i=1, 2, \dots, n$$

$$= \underline{4.96} \text{ W/m}^2$$

Part 2 - Calculation of Heat Conduction through Glazing					
Components / Details		Code No.			
Description	Units	1	2	3	4
Glazing Type		GL11	GL11	GL3	
Thickness	m	0.024	0.024	0.010	
U-value of Glazing (U <sub>fi</sub> )	W/m <sup>2</sup> K	1.63	1.63	5.28	
Glazing Area (A <sub>fi</sub> )	m <sup>2</sup>	243.46	374.35	96.05	
<b>Heat Conduction = 0.64 (A<sub>fi</sub>/A<sub>o</sub>) U<sub>fi</sub> G<sub>w</sub></b>		<b>0.220</b>	<b>0.338</b>	<b>0.281</b>	

$$\text{Heat Conduction through Glazing} = 0.64 (A_{fi}/A_o) U_{fi} G_w \text{ where } i=1, 2, \dots, n$$

$$= \underline{0.84} \text{ W/m}^2$$

Part 3 - Calculation of Solar Radiation through Glazing					
Components / Details		Code No.			
Description	Units	1	2	3	4
Glazing Type		GL11	GL11	GL3	
Thickness	m	0.024	0.024	0.010	
Glazing Area (A <sub>fi</sub> )	m <sup>2</sup>	243.46	374.35	96.05	
Shading Coefficient of Glazing (SC <sub>g</sub> )		0.330	0.330	0.660	
Visible Light Transmittance (VLT)	%	62	62	50	
External Reflectance (ER)	%	12	12	6	
External Shading Multiplier (ESC)		1.000	0.612	1.000	
<b>Solar Radiation = 41.75 (A<sub>fi</sub>/A<sub>o</sub>) (SC<sub>g</sub>) (ESC<sub>w</sub>) G<sub>w</sub></b>		<b>2.907</b>	<b>2.735</b>	<b>2.294</b>	

$$\text{Solar Radiation through Glazing} = 41.75 (A_{fi}/A_o) (SC_g) (ESC_w) G_w \text{ where } i=1, 2, \dots, n$$

$$= \underline{7.94} \text{ W/m}^2$$

Summary of RTTV at South West Elevations

$$= 4.96 + 0.84 + 7.94$$

$$= \underline{13.73} \text{ W/m}^2$$



**Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014**  
**Form RTTV (Wall) 1 - Calculation of RTTV<sub>wall</sub> of Each Facade**

Sheet No. \_\_\_\_\_ BD Ref No. 2/4035/18  
 Building Address Proposed Residential & Commercial Development at 270-286 Tung Chau Street & 1-5 Kweilin Street, Shum Shui Po, Kowloon N.K.I.L 6559 (Tower 1)

Facade Orientation Facing North West Gross Wall Area (A<sub>o</sub>) = 1236.38  
 Window to Wall Ratio (WWR) 0.528 Wall Orientation Factor (G<sub>w</sub>) = 0.965

Part 1 - Calculation of Heat Conduction through Opaque Walls			
Components / Details		Code No.	
Description	Units	NW-W1	
<b>External Finish Material</b>		5mm mosaic tiles	
Conductivity	W/mK	1.50	
Thickness	m	0.005	
U-value	W/m <sup>2</sup> K		
Average Absorptivity	(α)	0.90	
<b>Intermediate component</b>		30mm cement sand render	
Conductivity	W/mK	0.72	
Thickness	m	0.03	
<b>Intermediate component</b>		150 mm concrete wall	
Conductivity	W/mK	2.16	
Thickness	m	0.15	
<b>Intermediate component</b>			
Conductivity	W/mK		
Thickness	m		
<b>Intermediate component</b>			
Conductivity	W/mK		
Thickness	m		
<b>Internal Finish Material</b>		15mm gypsum plaster	
Conductivity	W/mK	0.53	
Thickness	m	0.015	
U-value of Opaque Area (U <sub>wi</sub> )	W/m <sup>2</sup> K	3.26	
Opaque Wall Area (A <sub>wi</sub> )	m <sup>2</sup>	583.19	
<b>Heat Conduction = 3.57(A<sub>wi</sub>/A<sub>o</sub>) U<sub>wi</sub> awl G<sub>w</sub></b>		<b>4.77</b>	

$$\text{Heat Conduction through Opaque Walls} = 3.57(A_{wi}/A_o) U_{wi} awl G_w \quad \text{where } i = 1, 2, \dots, n$$

$$= 4.77 \quad \text{W/m}^2$$

Part 2 - Calculation of Heat Conduction through Glazing				
Components / Details		Code No.		
Description	Units	1	2	3
Glazing Type		GL11	GL11	GL3
Thickness	m	0.024	0.024	0.010
U-value of Glazing (U <sub>fi</sub> )	W/m <sup>2</sup> K	1.63	1.63	5.28
Glazing Area (A <sub>fi</sub> )	m <sup>2</sup>	495.66	41.18	116.35
<b>Heat Conduction = 0.64 (A<sub>fi</sub>/A<sub>o</sub>) U<sub>fi</sub> G<sub>w</sub></b>		<b>0.404</b>	<b>0.034</b>	<b>0.307</b>

$$\text{Heat Conduction through Glazing} = 0.64 (A_{fi}/A_o) U_{fi} G_w \quad \text{where } i = 1, 2, \dots, n$$

$$= 0.74 \quad \text{W/m}^2$$

Part 3 - Calculation of Solar Radiation through Glazing				
Components / Details		Code No.		
Description	Units	1	2	3
Glazing Type		GL11	GL11	GL3
Thickness	m	0.024	0.024	0.010
Glazing Area (A <sub>fi</sub> )	m <sup>2</sup>	495.66	41.18	116.35
Shading Coefficient of Glazing (SC <sub>g</sub> )		0.330	0.330	0.660
Visible Light Transmittance (VLT)	%	62	62	50
External Reflectance (ER)	%	12	12	6
External Shading Multiplier (ESC)		1.000	0.772	1.000
<b>Solar Radiation = 41.75 (A<sub>fi</sub>/A<sub>o</sub>)(SC<sub>g</sub>)(ESC<sub>w</sub>)G<sub>w</sub></b>		<b>5.330</b>	<b>0.342</b>	<b>2.502</b>

$$\text{Solar Radiation through Glazing} = 41.75 (A_{fi}/A_o)(SC_g)(ESC_w)G_w \quad \text{where } i = 1, 2, \dots, n$$

$$= 8.17 \quad \text{W/m}^2$$

$$\text{Summary of RTTV at North West Elevations}$$

$$= 4.77 + 0.74 + 8.17$$

$$= 13.69 \quad \text{W/m}^2$$

**Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014**  
**Form RTTV (Wall) 1 - Calculation of RTTV<sub>wall</sub> of Each Facade**

Sheet No. \_\_\_\_\_ BD Ref No. 2/4035/18  
 Building Address Proposed Residential & Commercial Development at 270-286 Tung Chau Street & 1-5 Kweilin Street, Shum Shui Po, Kowloon N.K.I.L. 6559 (Tower 1)

Facade Orientation Facing North East Elevations Gross Wall Area (Ao) = 1197.26  
 Window to Wall Ratio (WWR) 0.474 Wall Orientation Factor (Gw) = 0.924

Part 1 - Calculation of Heat Conduction through Opaque Walls			Code No.			
Components / Details	Units					
<b>External Finish Material</b>		NE-W1				
		5mm mosaic tiles				
Conductivity	W/mK	1.50				
Thickness	m	0.005				
U-value	W/m <sup>2</sup> K					
Average Absorptivity	(α)	0.90				
<b>Intermediate component</b>		30mm cement/ sand render				
Conductivity	W/mK	0.72				
Thickness	m	0.03				
<b>Intermediate component</b>		150 mm concrete wall				
Conductivity	W/mK	2.16				
Thickness	m	0.15				
<b>Intermediate component</b>						
Conductivity	W/mK					
Thickness	m					
<b>Intermediate component</b>						
Conductivity	W/mK					
Thickness	m					
<b>Internal Finish Material</b>		15mm gypsum plaster				
Conductivity	W/mK	0.53				
Thickness	m	0.015				
U-value of Opaque Area (Uw)	W/m <sup>2</sup> K	3.26				
Opaque Wall Area (Aw)	m <sup>2</sup>	630.02				
Heat Conduction = 3.57(Aw/Ao) Uwi owi Gw		5.09				

$$\text{Heat Conduction through Opaque Walls} = 3.57(Aw/Ao) Uwi owi Gw \quad \text{where } i = 1, 2, \dots, n$$

$$= 5.09 \quad W/m^2$$

Part 2 - Calculation of Heat Conduction through Glazing				
Components / Details	Code No.			
Description	Units	1	2	3
Glazing Type		GL11	GL11	GL3
Thickness	m	0.024	0.024	0.010
U-value of Glazing (Ug)	W/m <sup>2</sup> K	1.63	1.63	5.28
Glazing Area (Agi)	m <sup>2</sup>	377.57	75.65	114.03
Heat Conduction = 0.64 (Agi/Ao) Ugi Gw		0.304	0.061	0.297

$$\text{Heat Conduction through Glazing} = 0.64 (Agi/Ao) Ugi Gw \quad \text{where } i = 1, 2, \dots, n$$

$$= 0.66 \quad W/m^2$$

Part 3 - Calculation of Solar Radiation through Glazing				
Components / Details	Code No.			
Description	Units	1	2	3
Glazing Type		GL11	GL11	GL3
Thickness	m	0.024	0.024	0.010
Glazing Area (Agi)	m <sup>2</sup>	377.57	75.65	114.03
Shading Coefficient of Glazing (SCg)		0.330	0.330	0.660
Visible Light Transmittance (VLT)	%	62	62	50
External Reflectance (ER)	%	12	12	6
External Shading Multiplier (ESC)		1.000	0.772	1.000
Solar Radiation = 41.75 (Agi/Ao)(SCg)(VLT)(ESC)Gw		4.015	0.621	2.425

$$\text{Solar Radiation through Glazing} = 41.75 (Agi/Ao)(SCg)(VLT)(ESC)Gw \quad \text{where } i = 1, 2, \dots, n$$

$$= 7.06 \quad W/m^2$$

Summary of RTTV at North East Elevations

$$= 5.09 + 0.66 + 7.06$$

$$= 12.82 \quad W/m^2$$



## Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014 Form RTTV (Wall) 2 - Summary of Overall RTTV<sub>wall</sub> of Building

Sheet No. 3 BD Ref No. 2/4035/18  
 Building Address Proposed Residential & Commercial Development at 270-286 Tung Chau Street & 1-5 Kweilin Street, Shum Shui Po, Kowloon N.K.I.L 6559 (Tower 1)

Overall Gross Wall Area [a] 5032.49 m<sup>2</sup>

Facade Orientation Facing	Gross Wall Area	Heat Conduction through Opaque Walls	Heat Conduction through Glazing	Solar Radiation through Glazing	RTTV <sub>wall</sub> at Each Facade	Area-weighted RTTV <sub>wall</sub>
	(m <sup>2</sup> )	(W/m <sup>2</sup> )	(W/m <sup>2</sup> )	(W/m <sup>2</sup> )	(W/m <sup>2</sup> )	(W/m <sup>2</sup> )
	[b]	[c]	[d]	[e]	[f]=[c]+[d]+[e]	[g]=[f]x[b]/[a]
E	0.00	0.00	0.00	0.00	0.00	0.00
SE	1338.72	6.91	0.59	6.46	13.95	3.71
S	0.00	0.00	0.00	0.00	0.00	0.00
SW	1260.12	4.96	0.84	7.94	13.73	3.44
W	0.00	0.00	0.00	0.00	0.00	0.00
NW	1236.38	4.77	0.74	8.17	13.69	3.36
N	0.00	0.00	0.00	0.00	0.00	0.00
NE	1197.26	5.09	0.66	7.06	12.82	3.05

Overall RTTV<sub>wall</sub> = 13.56 W/m<sup>2</sup> Pass

< 14 W/m<sup>2</sup>

**Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014**  
**Form RTTV (Roof) 1 - Calculation of RTTV<sub>roof</sub>**

Sheet No. 4 BD Ref No. 2/4035/18  
 Building Address Proposed Residential & Commercial Development at 270-286 Tung Chau Street & 1-5 Kweilin Street, Shum Shui Po, Kowloon N.K.I.L 6559 (Tower 1)

Roof Orientation Facing Flat Gross Roof Area (Aro) = 113.58  
 Skylight to Roof Ratio (SRR) = 0 Roof Orientation Factor (Gs) = 2.16

Part 1 - Calculation of Heat Conduction through Opaque Roof			
Components / Details		Code No.	
Description	Units	R1	
<b>External Finish Material</b>			
		25mm concrete tiles	
Conductivity	W/mK	1.10	
Thickness	m	0.025	
Average Absorptivity	(α)	0.7	
<b>Intermediate component</b>			
		50mm cement / sand screed	
Conductivity	W/mK	0.72	
Thickness	m	0.05	
<b>Intermediate component</b>			
		50mm expanded polyurethane	
Conductivity	W/mK	0.034	
Thickness	m	0.05	
<b>Intermediate component</b>			
		125mm concrete slab	
Conductivity	W/mK	2.16	
Thickness	m	0.125	
<b>Intermediate component</b>			
		10mm gypsum plaster	
Conductivity	W/mK	0.38	
Thickness	m	0.01	
U-value of the Roof (Uri)	W/m²K	0.55	
Opaque Roof Area (Ari)	m²	113.58	
<b>Heat Conduction</b> = 3.47(1-SRR) Uri ari Gs		<b>2.90</b>	

Heat Conduction through Opaque Roof = 3.47(1-SRR) Uri ari Gs where i= 1, 2, ..., n  
 = 2.90 W/m²

Part 2 - Calculation of Heat Conduction through Skylight			
Components / Details		Code No.	
Description	Units	S1	
Skylight Glazing Type		-	
Thickness	m	-	
Skylight Area (Asi)	m²	0.00	
U-value of Skylight Glazing (Usi)	W/m²K	-	
<b>Heat Conduction</b> = 0.40 (SRR) Usi Gs		<b>0.00</b>	

Heat Conduction through Skylight = 0.40 (Asi/Aro) Usi Gs where i= 1, 2, ..., n  
 = 0.00 W/m²

Part 3 - Calculation of Solar Radiation through Skylight			
Components / Details		Code No.	
Description	Units	S1	
Skylight Glazing Type		-	
Thickness	m	-	
Skylight Area (Asi)	m²	0.00	
Shading Coefficient of Skylight Glazing (SCr)		-	
Visible Light Transmittance (VLT)		-	
External Reflectance (ER)		-	
<b>Solar Radiation</b> = 41.10 (SRR) (SCri) Gs		<b>0.00</b>	

Solar Radiation through Skylight = 41.10 (Asi/Aro) (SCri) Gs where i= 1, 2, ..., n  
 = 0.00 W/m²

**Summary of RTTV at Roof**  
 = 2.90 + 0.00 + 0.00  
 = 2.90 W/m²

**Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014**  
**Form RTTV (Roof) 2 - Summary of RTTV<sub>roof</sub> of Building Envelopes**

Sheet No. 5

BD Ref No. 2/4035/18

Building Address Proposed Residential & Commercial Development at 270-286 Tung Chau Street & 1-5 Kweilin Street, Shum Shui Po, Kowloon N.K.I.L 6559 (Tower 1)

Overall Roof Area [a] 113.58 m<sup>2</sup>

Roof	Gross Roof Area (m <sup>2</sup> )	Heat Conduction through Opaque Roof (W/m <sup>2</sup> )	Heat Conduction through Skylight (W/m <sup>2</sup> )	Solar Radiation through Skylight (W/m <sup>2</sup> )	RTTV <sub>roof</sub> at Each Type of Roof (W/m <sup>2</sup> )	Area-weighted RTTV <sub>roof</sub> (W/m <sup>2</sup> )
	[b]	[c]	[d]	[e]	[f]=[c]+[d]+[e]	[g]=[f]x[b]/[a]
Flat Roof	113.58	2.90	0.00	0.00	2.90	2.90

Overall RTTV<sub>roof</sub> = 2.90 W/m<sup>2</sup> Pass

< 4 W/m<sup>2</sup>