RTTV Summary Sheet   Page 1/2

Address: No. 101 King's Road, North Point, Hong Kong	BD Ref. No. 2/3061/11

Building Type:	Residential	
RTTV calculated by	☑ 1. Registered Professional Engineers	
	☐ 2. Architect	
	☐ 3. Others, please specify :	
No. of Storeys (Residential Units)	24	

Table 1

Deemed to Satisfy RTTV_Wall								
Facade Orientation Facing	N	E	S	W				
Average Absorptivity	0.62	0.49	0.39	0.41				
Average Window to Wall Ratio	0.335	0.472	0.353	0.322				
Shading Coefficient of Glazing	0.47	0.46	0.48	0.46				
Average Shading Coefficient of Facade	0.47	0.46	0.48	0.46				
Visible Light Transmittance	51 %	51 %	51 %	50 %	%	%	%	%
External Reflectance	19 %	20 %	21 %	20 %	%	%	%	%

Table 2

$RTTV_{Wall}$							
Facade Orientation Facing	N		E		S		W
Wall Orientation Factor	0.79		1.072		0.975		1.131
Total External Wall Area (Residential Units)	631.6 m²	Window to Wall Ratio	1648 m²	Window to Wall Ratio	1280.7 m²	Window to Wall Ratio	867 m² Window to Wall Ratio
Total Window Area	212 m²	= 0.335	778 m²	= 0.472	452 m²	= 0.353	279 m² = 0.322

Heat Conduction

Heat Conduction	Opaque Wall	4.22 W/m²	3.61 W/m²	3.17 W/m²	4.69 W/m²
	Window	0.36 W/m²	0.59 W/m²	0.38 W/m²	0.43 W/m²

Window Glass Type:

Window	Glass Type				
	☐ Reflective	Area= m² SC= VLT= % ER= %	☐ Reflective Area= m² SC= VLT= % ER= %	☐ Reflective Area= m² SC= VLT= % ER= %	☐ Reflective Area= m² SC= VLT= % ER= %
	☐ Tinted	Area= m² SC= VLT= % ER= %	☐ Tinted Area= m² SC= VLT= % ER= %	☐ Tinted Area= m² SC= VLT= % ER= %	☐ Tinted Area= m² SC= VLT= % ER= %
	☑ Clear	Area= 212 m² SC= 0.47 VLT= 51% ER= 19%	☑ Clear Area= 778 m² SC= 0.46 VLT= 51% ER= 20%	☑ Clear Area= 452 m² SC= 0.48 VLT= 51% ER= 21%	☑ Clear Area= 279 m² SC= 0.46 VLT= 50% ER= 20%
	Double Glazing	☑ Yes ☐ No	☑ Yes ☐ No	☑ Yes ☐ No	☑ Yes ☐ No
	External Shading	Overhang ☐ Yes ☑ No Sidefin ☐ Yes ☑ No	Overhang ☐ Yes ☑ No Sidefin ☐ Yes ☑ No	Overhang ☐ Yes ☑ No Sidefin ☐ Yes ☑ No	Overhang ☐ Yes ☑ No Sidefin ☐ Yes ☑ No

Solar Radiation through Gazing	5.22 W/m²	9.02 W/m²	5.69 W/m²	6.35 W/m²
Average Absorptivity	0.62	0.49	0.39	0.41
$RTTV_{Wall}$ at each facade	9.8 W/m²	13.23 W/m²	9.24 W/m²	12.45 W/m²
Overall $RTTV_{Wall}$	Please refer to next page W/m²			

Table 3

$RTTV_{Roof}$					
Roof Orientation Factor	2.16				
Total Roof Area (Residential Units)	241.4	m²			
Total Skylight Area	0	m²			
Heat Conduction — Roof	1.11	W/m²			
Heat Conduction — Skylight	0	W/m²			
Skylight — Glass Type	☐ Reflective	Area= m²	SC=	VLT= %	ER= %
	☐ Tinted	Area= m²	SC=	VLT= %	ER= %
	☐ Clear	Area= m²	SC=	VLT= %	ER= %
Double Glazing	☐ Yes ☐ No				
External Shading	☐ Yes ☐ No				
Solar Radiation through Glazing	0	W/m²			
Average Absorptivity (roof)	0.9				
Overall $RTTV_{Roof}$	1.11	W/m²			

ER = External Reflectance; SC = Shading Coefficient & VLT = Visible Light Transmittance

Notes :

1. Please tick in the box as appropriate
2. Window and skylight data should represent the major proportion of its use in the development.

(9/2014)

RTTV Summary Sheet Page 2/2

Address: Proposed Composite Redevelopment at No. 101 King's Road	BD Ref. No. 2/3061/11

Building Type:	Residential	
RTTV calculated by	☑ 1. Registered Professional Engineers	
	☐ 2. Architect	
	☐ 3. Others, please specify :	
No. of Storeys (Residential Units)	24	

Table 1

Deemed to Satisfy RTTV~Wall~								
Facade Orientation Facing	NE	NW	SW					
Average Absorptivity	0.46	0.33	0.5					
Average Window to Wall Ratio	0.386	0.289	0.46					
Shading Coefficient of Glazing	0.47	0.48	0.46					
Average Shading Coefficient of Facade	0.47	0.48	0.46					
Visible Light Transmittance	51 %	51 %	51 %	%	%	%	%	%
External Reflectance	20 %	20 %	21 %	%	%	%	%	%

Table 2

$RTTV_{Wall}$								
Facade Orientation Facing	NE		NW		SW			
Wall Orientation Factor	0.924		0.965		1.092			
Total External Wall Area (Residential Units)	2442 m²	Window to Wall Ratio	846 m²	Window to Wall Ratio	1135 m²	Window to Wall Ratio	m²	Window to Wall Ratio
Total Window Area	941 m²	= 0.386	189 m²	= 0.289	439 m²	= 0.46	m²	=
Heat Conduction — Opaque Wall	4 W/m²		2.98 W/m²		3.75 W/m²			W/m²
Heat Conduction — Window	0.26 W/m²		0.3 W/m²		0.59 W/m²			W/m²

Window — Glass Type:

	NE	NW	SW	
☐ Reflective	Area= m² SC= VLT= % ER= %	Area= m² SC= VLT= % ER= %	Area= m² SC= VLT= % ER= %	Area= m² SC= VLT= % ER= %
☐ Tinted	Area= m² SC= VLT= % ER= %	Area= m² SC= VLT= % ER= %	Area= m² SC= VLT= % ER= %	Area= m² SC= VLT= % ER= %
☑ Clear	Area= 941 m² SC= 0.47 VLT= 51% ER= 20%	Area= 189 m² SC= 0.48 VLT= 51% ER= 19%	Area= 439 m² SC= 0.46 VLT= 51% ER= 21%	☐ Clear Area= m² SC= VLT= % ER= %
Double Glazing	☑ Yes ☐ No	☑ Yes ☐ No	☑ Yes ☐ No	☐ Yes ☐ No
External Shading	Overhang ☐ Yes ☑ No Sidefin ☐ Yes ☑ No	Overhang ☐ Yes ☑ No Sidefin ☐ Yes ☑ No	Overhang ☐ Yes ☑ No Sidefin ☐ Yes ☑ No	Overhang ☐ Yes ☐ No Sidefin ☐ Yes ☐ No
Solar Radiation through Gazing	4.08 W/m²	3.8 W/m²	6.98 W/m²	W/m²
Average Absorptivity	0.46	0.33	0.5	
$RTTV_{Wall}$ at each facade	9.15 W/m²	7.08 W/m²	13.95 W/m²	W/m²
Overall $RTTV_{Wall}$	10.66 W/m²			

Table 3

$RTTV_{Roof}$					
Roof Orientation Factor					
Total Roof Area (Residential Units)	m²				
Total Skylight Area	m²				
Heat Conduction — Roof	W/m²				
Heat Conduction — Skylight	W/m²				
Skylight — Glass Type	☐ Reflective	Area= m²	SC=	VLT= %	ER= %
	☐ Tinted	Area= m²	SC=	VLT= %	ER= %
	☐ Clear	Area= m²	SC=	VLT= %	ER= %
Double Glazing	☐ Yes ☐ No				
External Shading	☐ Yes ☐ No				
Solar Radiation through Glazing	W/m²				
Average Absorptivity (roof)					
Overall $RTTV_{Roof}$	W/m²				

ER = External Reflectance; SC = Shading Coefficient & VLT = Visible Light Transmittance

Notes :

1. Please tick in the box as appropriate
2. Window and skylight data should represent the major proportion of its use in the development.

(9/2014)

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

Sheet No.	1	BD Ref No. 2/3061/11
Building Address	No. 101 King's Road, North Point, Hong Kong	

Facade Orientation Facing	N	Gross Wall Area (Ao) =	631.6
Window to Wall Ratio (WWR)	0.335	Wall Orientation Factor (Gw) =	0.79

Part 1 - Calculation of Heat Conduction through Opaque Walls

Components / Details		Code No.			
Description	Units	T02	AL105		
External Finish Material		Tiles	Aluminum Cladding		
Conductivity	W/mK	1.50	160.00		
Thickness	m	0.005	0.030		
Average Absorptivity	(α)	0.8	0.4		
Intermediate component		Cement Sand	Cement Sand		
Conductivity	W/mK	0.72	0.72		
Thickness	m	0.01	0.01		
Intermediate component		R.C. Wall	R.C. Wall		
Conductivity	W/mK	2.16	2.16		
Thickness	m	0.15	0.15		
Intermediate component					
Conductivity	W/mK				
Thickness	m				
Intermediate component					
Conductivity	W/mK				
Thickness	m				
Internal Finish Material		Gypsum Plaster	Gypsum Plaster		
Conductivity	W/mK	0.38	0.38		
Thickness	m	0.01	0.01		
U-value of Opaque Area (Uwi)	W/m²K	3.61	3.65		
Opaque Wall Area (Awi)	m²	232.36	187.74		
Heat Conduction = 3.57(Awi/Ao) Uwi αwi Gw		**3.00**	**1.22**	**0.00**	**0.00**

Heat Conduction through Opaque Walls = 3.57(Awi/Ao) Uwi αwi Gw   where i= 1, 2, …, n

=   **4.22**   W/m²

Part 2 - Calculation of Heat Conduction through Glazing

Components / Details		Code No.		
Description	Units	GL101	GL102	GL105
Glazing Type		-	-	-
Thickness	m	0.032	0.028	0.008
Glazing Area (Afi)	m²	150.97	44.77	15.81
U-value of Glazing (Ufi)	W/m²K	1.82	1.84	5.73
Heat Conduction = 0.64 (Afi/Ao) Uf Gw		**0.22**	**0.07**	**0.07**

Heat Conduction through Glazing = 0.64 (Afi/Ao) Ufi Gw   where i= 1, 2, …, n

=   **0.36**   W/m²

Part 3 - Calculation of Solar Radiation through Glazing

Components / Details		Code No.		
Description	Units	GL101	GL102	GL105
Glazing Type		-	-	-
Thickness	m	0.032	0.028	0.008
Glazing Area (Afi)	m²	150.97	44.77	15.81
Shading Coefficient of Glazing (SCf)		0.45	0.47	0.70
Visible Light Transmittance (VLT)	%	50	51	56
External Reflectance (ER)	%	20	20	6
External Shading Multiplier (ESC)		1.00	1.00	1.00
Solar Radiation = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw		**3.55**	**1.10**	**0.58**

Solar Radiation through Glazing = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw   where i= 1, 2, …, n

=   **5.22**   W/m²

Summary of RTTV at N Elevation

=   4.22   +   0.36   +   5.22

=   **9.80**   W/m²

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

Sheet No.	2	BD Ref No.		2/3061/11
Building Address	No. 101 King's Road, North Point, Hong Kong			

Facade Orientation Facing	E	Gross Wall Area (Ao) =	1648.0
Window to Wall Ratio (WWR)	0.472	Wall Orientation Factor (Gw) =	1.072

Part 1 - Calculation of Heat Conduction through Opaque Walls

Components / Details		Code No.			
Description	Units	AL101	AL105	0	0
External Finish Material		Dark Gray Aluminum Cladding	Aluminum		
Conductivity	W/mK	160.00	160.00		
Thickness	m	0.030	0.030		
Average Absorptivity	(α)	0.9	0.4		
Intermediate component		Cement Sand	Cement Sand		
Conductivity	W/mK	0.72	0.72		
Thickness	m	0.01	0.01		
Intermediate component		R.C. Wall	R.C. Wall		
Conductivity	W/mK	2.16	2.16		
Thickness	m	0.15	0.15		
Intermediate component					
Conductivity	W/mK				
Thickness	m				
Intermediate component					
Conductivity	W/mK				
Thickness	m				
Internal Finish Material		Gypsum Plaster	Gypsum Plaster		
Conductivity	W/mK	0.38	0.38		
Thickness	m	0.01	0.01		
U-value of Opaque Area (Uwi)	W/m²K	3.65	3.65		
Opaque Wall Area (Awi)	m²	155.64	714.16		
Heat Conduction = 3.57(Awi/Ao) Uwi αwi Gw		1.19	2.42	0.00	0.00

Heat Conduction through Opaque Walls = 3.57(Awi/Ao) Uwi αwi Gw   where i= 1, 2, …, n

= 3.61 W/m²

Part 2 - Calculation of Heat Conduction through Glazing

Components / Details		Code No.			
Description	Units	GL101	GL101B	GL102	GL103
Glazing Type		-	-	-	-
Thickness	m	0.032	0.032	0.028	0.028
Glazing Area (Afi)	m²	151.67	236.83	116.55	273.18
U-value of Glazing (Ufi)	W/m²K	1.82	1.82	1.84	1.84
Heat Conduction = 0.64 (Afi/Ao) Uf Gw		0.11	0.18	0.09	0.21

Heat Conduction through Glazing = 0.64 (Afi/Ao) Ufi Gw   where i= 1, 2, …, n

= 0.59 W/m²

Part 3 - Calculation of Solar Radiation through Glazing

Components / Details		Code No.			
Description	Units	GL101	GL101B	GL102	GL103
Glazing Type		-	-	-	-
Thickness	m	0.032	0.032	0.028	0.028
Glazing Area (Afi)	m²	151.67	236.83	116.55	273.18
Shading Coefficient of Glazing (SCf)		0.45	0.45	0.47	0.47
Visible Light Transmittance (VLT)	%	50	50	51	51
External Reflectance (ER)	%	20	24	20	20
External Shading Miltiplier (ESC)		1.00	1.00	1.00	0.80
Solar Radiation = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw		1.85	2.89	1.49	2.79

Solar Radiation through Glazing = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw   where i= 1, 2, …, n

= 9.02 W/m²

Summary of RTTV at E Elevation

= 3.61 + 0.59 + 9.02

= 13.23 W/m²

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

Sheet No.	3	BD Ref No.		2/3061/11
Building Address	No. 101 King's Road, North Point, Hong Kong			

Facade Orientation Facing	S	Gross Wall Area (Ao) =	1280.7
Window to Wall Ratio (WWR)	0.353	Wall Orientation Factor (Gw) =	0.975

Part 1 - Calculation of Heat Conduction through Opaque Walls

Components / Details		Code No.		
Description	Units	AL101	AL105	T02
External Finish Material		Dark Gray Aluminum Cladding	Aluminum Cladding	Tiles
Conductivity	W/mK	160.00	160.00	1.50
Thickness	m	0.030	0.030	0.005
Average Absorptivity	(α)	0.9	0.4	0.3
Intermediate component		Cement Sand	Cement Sand	Cement Sand
Conductivity	W/mK	0.72	0.72	0.72
Thickness	m	0.01	0.01	0.01
Intermediate component		R.C. Wall	R.C. Wall	R.C. Wall
Conductivity	W/mK	2.16	2.16	2.16
Thickness	m	0.15	0.15	0.15
Intermediate component				
Conductivity	W/mK			
Thickness	m			
Intermediate component				
Conductivity	W/mK			
Thickness	m			
Internal Finish Material		Gypsum Plaster	Gypsum Plaster	Gypsum Plaster
Conductivity	W/mK	0.38	0.38	0.38
Thickness	m	0.01	0.01	0.01
U-value of Opaque Area (Uwi)	W/m²K	3.65	3.65	3.61
Opaque Wall Area (Awi)	m²	47.43	432.81	348.26
Heat Conduction = 3.57(Awi/Ao) Uwi αwi Gw		**0.42**	**1.72**	**1.03**	**0.00**

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

= **3.17**   W/m²

Part 2 - Calculation of Heat Conduction through Glazing

Components / Details		Code No.							
Description	Units	GL101	GL101A	GL101B	GL102	GL102A	GL103	GL105	GL108
Glazing Type		-	-	-	-	-	-	-	-
Thickness	m	0.032	0.029	0.032	0.028	0.025	0.028	0.008	0.008
Glazing Area (Afi)	m²	88.82	49.52	82.13	86.44	20.01	95.40	29.03	0.87
U-value of Glazing (Ufi)	W/m²K	1.82	2.01	1.82	1.84	2.1	1.84	5.73	5.73
Heat Conduction = 0.64 (Afi/Ao) Uf Gw		**0.08**	**0.05**	**0.07**	**0.08**	**0.02**	**0.09**	**0.08**	**0.00**

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

= **0.38**   W/m²

Part 3 - Calculation of Solar Radiation through Glazing

Components / Details		Code No.							
Description	Units	GL101	GL101A	GL101B	GL102	GL102A	GL103	GL105	GL108
Glazing Type		-	-	-	-	-	-	-	-
Thickness	m	0.032	0.029	0.032	0.028	0.025	0.028	0.008	0.008
Glazing Area (Afi)	m²	88.82	49.52	82.13	86.44	20.01	95.40	29.03	0.87
Shading Coefficient of Glazing (SCf)		0.45	0.46	0.45	0.47	0.47	0.47	0.70	0.70
Visible Light Transmittance (VLT)	%	50	50	50	51	51	51	56	56
External Reflectance (ER)	%	20	22	24	20	20	20	6	6
External Shading Multiplier (ESC)		1.00	1.00	1.00	1.00	1.00	0.65	1.00	1.00
Solar Radiation = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw		**1.27**	**0.72**	**1.17**	**1.29**	**0.30**	**0.93**	**0.65**	**0.02**

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

= **5.69**   W/m²

Summary of RTTV at S Elevation

= 3.17 + 0.38 + 5.69

= **9.24**   W/m²

Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014
Form RTTV (Wall) 1 - Calculation of RTTVwall of Each Facade

Sheet No. _____4_____ BD Ref No. _____2/3061/11_____

Building Address: No. 101 King's Road, North Point, Hong Kong

Facade Orientation Facing	W	Gross Wall Area (Ao) =	867.0
Window to Wall Ratio (WWR)	0.322	Wall Orientation Factor (Gw) =	1.131

Part 1 - Calculation of Heat Conduction through Opaque Walls

Components / Details		Code No.			
Description	Units	AL101	AL105	T02	
External Finish Material		Dark Gray Aluminum Cladding	Aluminum	Tiles	
Conductivity	W/mK	160.00	160.00	1.50	
Thickness	m	0.030	0.030	0.005	
Average Absorptivity	(α)	0.9	0.4	0.3	
Intermediate component		Cement Sand	Cement Sand	Cement Sand	
Conductivity	W/mK	0.72	0.72	0.72	
Thickness	m	0.01	0.01	0.01	
Intermediate component		R.C. Wall	R.C. Wall	R.C. Wall	
Conductivity	W/mK	2.16	2.16	2.16	
Thickness	m	0.15	0.15	0.15	
Intermediate component					
Conductivity	W/mK				
Thickness	m				
Intermediate component					
Conductivity	W/mK				
Thickness	m				
Internal Finish Material		Gypsum Plaster	Gypsum Plaster	Gypsum Plaster	
Conductivity	W/mK	0.38	0.38	0.38	
Thickness	m	0.01	0.01	0.01	
U-value of Opaque Area (Uwi)	W/m²K	3.65	3.65	3.61	
Opaque Wall Area (Awi)	m²	48.05	350.90	189.18	
Heat Conduction = 3.57(Awi/Ao) Uwi αwi Gw		1.76	2.39	0.95	0.00

Heat Conduction through Opaque Walls = 3.57(Awi/Ao) Uwi αwi Gw   where i= 1, 2, …, n

= _____4.69_____ W/m²

Part 2 - Calculation of Heat Conduction through Glazing

Components / Details		Code No.				
Description	Units	GL101	GL101B	GL102	GL102A	GL103
Glazing Type		-	-	-	-	-
Thickness	m	0.032	0.032	0.028	0.025	0.028
Glazing Area (Afi)	m²	126.56	12.87	45.72	15.02	78.71
U-value of Glazing (Ufi)	W/m²K	1.82	1.84	1.84	2.1	1.84
Heat Conduction = 0.64 (Afi/Ao) Uf Gw		0.19	0.02	0.07	0.03	0.12

Heat Conduction through Glazing = 0.64 (Afi/Ao) Ufi Gw   where i= 1, 2, …, n

= _____0.43_____ W/m²

Part 3 - Calculation of Solar Radiation through Glazing

Components / Details		Code No.				
Description	Units	GL101	GL101B	GL102	GL102A	GL103
Glazing Type		-	-	-	-	-
Thickness	m	0.032	0.032	0.028	0.025	0.028
Glazing Area (Afi)	m²	126.56	12.87	45.72	15.02	78.71
Shading Coefficient of Glazing (SCf)		0.45	0.45	0.45	0.47	0.47
Visible Light Transmittance (VLT)	%	50	50	50	51	51
External Reflectance (ER)	%	20	24	20	20	20
External Shading Miltiplier (ESC)		1.00	1.00	1.00	1.00	0.71
Solar Radiation = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw		3.10	0.32	1.12	0.38	1.43

Solar Radiation through Glazing = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw   where i= 1, 2, …, n

= _____6.35_____ W/m²

Summary of RTTV at W Elevation

= 4.69 + 0.43 + 6.35

= _____12.45_____ W/m²

Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014
Form RTTV (Wall) 1 - Calculation of RTTV_wall of Each Facade

Sheet No. 5   BD Ref No. 2/3061/11

Building Address   No. 101 King's Road, North Point, Hong Kong

Facade Orientation Facing   NE   Gross Wall Area (Ao) =   2441.9

Window to Wall Ratio (WWR)   0.386   Wall Orientation Factor (Gw) =   0.924

Part 1 - Calculation of Heat Conduction through Opaque Walls

Components / Details		Code No.			
Description	Units	AL101	AL105	T02	
External Finish Material		Dark Gray Aluminum Cladding	Aluminum	Tiles	
Conductivity	W/mK	160.00	160.00	1.50	
Thickness	m	0.030	0.030	0.005	
Average Absorptivity	(α)	0.9	0.4	0.3	
Intermediate component		Cement Sand	Cement Sand	Cement Sand	
Conductivity	W/mK	0.72	0.72	0.72	
Thickness	m	0.01	0.01	0.01	
Intermediate component		R.C. Wall	R.C. Wall	R.C. Wall	
Conductivity	W/mK	2.16	2.16	2.16	
Thickness	m	0.15	0.15	0.15	
Intermediate component					
Conductivity	W/mK				
Thickness	m				
Intermediate component					
Conductivity	W/mK				
Thickness	m				
Internal Finish Material		Gypsum Plaster	Gypsum Plaster	Gypsum Plaster	
Conductivity	W/mK	0.38	0.38	0.38	
Thickness	m	0.01	0.01	0.01	
U-value of Opaque Area (Uwi)	W/m²K	3.65	3.65	3.61	
Opaque Wall Area (Awi)	m²	198.55	1143.03	158.71	
Heat Conduction = 3.57(Awi/Ao) Uwi αwi Gw		1.05	2.26	0.23	0.00

Heat Conduction through Opaque Walls = 3.57(Awi/Ao) Uwi αwi Gw   where i= 1, 2, …, n

= 4.00   W/m²

Part 2 - Calculation of Heat Conduction through Glazing

Components / Details		Code No.				
Description	Units	GL101	GL101B	GL102	GL103	GL105
Glazing Type		-	-	-	-	-
Thickness	m	0.032	0.032	0.028	0.028	0.008
Glazing Area (Afi)	m²	319.34	82.44	136.60	384.24	19.02
U-value of Glazing (Ufi)	W/m²K	1.82	1.82	1.84	1.84	5.73
Heat Conduction = 0.64 (Afi/Ao) Uf Gw		0.14	0.04	0.06	0.17	0.03

Heat Conduction through Glazing = 0.64 (Afi/Ao) Ufi Gw   where i= 1, 2, ..where i= 1, 2, …, n

= 0.26   W/m²

Part 3 - Calculation of Solar Radiation through Glazing

Components / Details		Code No.				
Description	Units	GL101	GL101B	GL102	GL103	GL105
Glazing Type		-	-	-	-	-
Thickness	m	0.032	0.032	0.028	0.028	0.008
Glazing Area (Afi)	m²	319.34	82.44	136.60	384.24	19.02
Shading Coefficient of Glazing (SCf)		0.45	0.45	0.47	0.47	0.70
Visible Light Transmittance (VLT)	%	50	50	51	51	56
External Reflectance (ER)	%	20	24	20	20	6
External Shading Miltiplier (ESC)		1.00	1.00	1.00	1.00	1.00
Solar Radiation = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw		2.27	0.59	1.01	2.85	0.21

Solar Radiation through Glazing = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw   where i= 1, 2, …, n

= 4.08   W/m²

Summary of RTTV at NE Elevation

= 4.00 + 0.26 + + 4.08

= 9.15   W/m²

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

Sheet No.   6   BD Ref No.   2/3061/11

Building Address   No. 101 King's Road, North Point, Hong Kong

Facade Orientation Facing   NW   Gross Wall Area (Ao) =   846.1

Window to Wall Ratio (WWR)   0.289   Wall Orientation Factor (Gw) =   0.965

Part 1 - Calculation of Heat Conduction through Opaque Walls

Components / Details			Code No.		
Description	Units	T02	AL105		
External Finish Material		Tiles	Aluminum		
Conductivity	W/mK	1.50	160.00		
Thickness	m	0.005	0.030		
Average Absorptivity	(α)	0.3	0.4		
Intermediate component		Cement Sand	Cement Sand		
Conductivity	W/mK	0.72	0.72		
Thickness	m	0.02	0.01		
Intermediate component		R.C. Wall	R.C. Wall		
Conductivity	W/mK	2.16	2.16		
Thickness	m	0.15	0.15		
Intermediate component					
Conductivity	W/mK				
Thickness	m				
Intermediate component					
Conductivity	W/mK				
Thickness	m				
Internal Finish Material		Gypsum Plaster	Gypsum Plaster		
Conductivity	W/mK	0.38	0.38		
Thickness	m	0.01	0.01		
U-value of Opaque Area (Uwi)	W/m²K	3.61	3.65		
Opaque Wall Area (Awi)	m²	391.50	210.47		
Heat Conduction = 3.57(Awi/Ao) Uwi αwi Gw		1.73	1.25	0.00	0.00

Heat Conduction through Opaque Walls = 3.57(Awi/Ao) Uwi αwi Gw   where i= 1, 2, …, n

=   **2.98**   W/m²

Part 2 - Calculation of Heat Conduction through Glazing

Components / Details		Code No.				
Description	Units	GL101	GL102	GL103	GL105	GL108
Glazing Type		-	-	-	-	-
Thickness	m	0.032	0.028	0.028	0.008	0.008
Glazing Area (Afi)	m²	158.33	66.20	4.26	14.51	0.86
U-value of Glazing (Ufi)	W/m²K	1.82	1.84	1.84	5.73	5.73
Heat Conduction = 0.64 (Afi/Ao) Uf Gw		**0.21**	**0.09**	**0.01**	**0.06**	**0.00**

Heat Conduction through Glazing = 0.64 (Afi/Ao) Ufi Gw   where i= 1, 2, …, n

=   **0.30**   W/m²

Part 3 - Calculation of Solar Radiation through Glazing

Components / Details		Code No.				
Description	Units	GL101	GL102	GL103	GL105	GL108
Glazing Type		-	-	-	-	-
Thickness	m	0.032	0.028	0.028	0.008	0.008
Glazing Area (Afi)	m²	83.76	85.20	4.26	14.51	0.86
Shading Coefficient of Glazing (SCf)		0.45	0.47	0.47	0.70	0.70
Visible Light Transmittance (VLT)	%	50	51	51	56	56
External Reflectance (ER)	%	20	20	20	6	6
External Shading Miltiplier (ESC)		1.00	1.00	1.00	1.00	1.00
Solar Radiation = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw		**1.79**	**1.91**	**0.10**	**0.48**	**0.03**

Solar Radiation through Glazing = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw   where i= 1, 2, …, n

=   **3.80**   W/m²

Summary of RTTV at NW Elevation

=   2.98   +   0.30   +   =   3.80

=   **7.08**   W/m²

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

Sheet No.   7   BD Ref No.   2/3061/11
Building Address   No. 101 King's Road, North Point, Hong Kong

Facade Orientation Facing   SW   Gross Wall Area (Ao) =   1135.3
Window to Wall Ratio (WWR)   0.460   Wall Orientation Factor (Gw) =   1.092

Part 1 - Calculation of Heat Conduction through Opaque Walls

Components / Details		Code No.			
Description	Units	AL101	AL105	T02	
External Finish Material		Dark Gray Aluminum Cladding	Aluminum	Tiles	
Conductivity	W/mK	160.00	160.00	1.50	
Thickness	m	0.030	0.030	0.005	
Average Absorptivity	(α)	0.9	0.4	0.3	
Intermediate component		Cement Sand	Cement Sand	Cement Sand	
Conductivity	W/mK	0.72	0.72	0.72	
Thickness	m	0.01	0.01	0.01	
Intermediate component		R.C. Wall	R.C. Wall	R.C. Wall	
Conductivity	W/mK	2.16	2.16	2.16	
Thickness	m	0.15	0.15	0.15	
Intermediate component					
Conductivity	W/mK				
Thickness	m				
Intermediate component					
Conductivity	W/mK				
Thickness	m				
Internal Finish Material		Gypsum Plaster	Gypsum Plaster	Gypsum Plaster	
Conductivity	W/mK	0.38	0.38	0.38	
Thickness	m	0.01	0.01	0.01	
U-value of Opaque Area (Uwi)	W/m²K	3.65	3.65	3.61	
Opaque Wall Area (Awi)	m²	127.88	435.45	49.73	
Heat Conduction = 3.57(Awi/Ao) Uwi αwi Gw		2.78	2.18	0.18	0.00

Heat Conduction through Opaque Walls = 3.57(Awi/Ao) Uwi αwi Gw   where i= 1, 2, …, n
= _____ 3.75 _____ W/m²

Part 2 - Calculation of Heat Conduction through Glazing

Components / Details		Code No.			
Description	Units	GL101	GL101B	GL102	GL103
Glazing Type		-	-	-	-
Thickness	m²	0.032	0.032	0.028	0.028
Glazing Area (Afi)	m²	167.93	91.59	66.66	196.09
U-value of Glazing (Ufi)	W/m²K	1.82	1.82	1.84	1.84
Heat Conduction = 0.64 (Afi/Ao) Uf Gw		0.19	0.10	0.08	0.22

Heat Conduction through Glazing = 0.64 (Afi/Ao) Ufi Gw   where i= 1, 2, …, n
= _____ 0.59 _____ W/m²

Part 3 - Calculation of Solar Radiation through Glazing

Components / Details		Code No.			
Description	Units	GL101	GL101B	GL102	GL103
Glazing Type		-	-	-	-
Thickness	m	0.032	0.032	0.028	0.028
Glazing Area (Afi)	m²	83.76	74.16	85.20	196.09
Shading Coefficient of Glazing (SCf)		0.45	0.45	0.47	0.47
Visible Light Transmittance (VLT)	%	50	50	51	51
External Reflectance (ER)	%	20	24	20	20
External Shading Miltiplier (ESC)		1.00	1.00	1.00	0.68
Solar Radiation = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw		1.51	1.34	1.61	2.52

Solar Radiation through Glazing = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw   where i= 1, 2, …, n
= _____ 6.98 _____ W/m²

Summary of RTTV at SW Elevation

= 3.75 + 0.59 + 6.98
= _____ 13.95 _____ W/m²

Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014
Form RTTV (Wall) 2 - Summary of Overall RTTVwall of Building

Sheet No.   8   BD Ref No. 2/3061/11

Building Address   No. 101 King's Road, North Point, Hong Kong

Overall Gross Wall Area [a]   8851 m²

Facade Orientation Facing	Gross Wall Area	Heat Conduction through Opaque Walls	Heat Conduction through Glazing	Solar Radiation through Glazing	RTTVwall at Each Facade	Area-weighted RTTVwall
	(m²)	(W/m²)	(W/m²)	(W/m²)	(W/m²)	(W/m²)
	[b]	[c]	[d]	[e]	[f]=[c]+[d]+[e]	[g]=[f]x[b]/[a]
North	631.65	4.22	0.36	5.22	9.80	0.70
East	1648.03	3.61	0.59	9.02	13.23	2.75
South	1280.71	3.17	0.38	5.69	9.24	1.49
West	867.00	4.69	0.43	6.35	12.45	1.09
North East	2441.9	4.00	0.26	4.08	9.15	2.37
North West	846.1	2.98	0.30	3.80	7.08	0.68
South West	1135.3	3.75	0.59	6.98	13.95	1.48

Overall RTTVwall =   10.66   W/m²

<   14 W/m² ok.

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

Sheet No.   9   BD Ref No.   2/3061/11

Building Address   No. 101 King's Road, North Point, Hong Kong

Roof Orientation Facing   Roof   Gross Roof Area (Aro) =   241.36

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	R2	R3
External Finish Material		Tiles		
Conductivity	W/mK	1.90		
Thickness	m	0.010		
Average Absorptivity	(α)	0.9		
Intermediate component		c/s plaster		
Conductivity	W/mK	0.72		
Thickness	m	0.05		
Intermediate component		Polyurethane		
Conductivity	W/mK	0.034		
Thickness	m	0.15		
Intermediate component		R.C.		
Conductivity	W/mK	2.16		
Thickness	m	0.15		
Intermediate component				
Conductivity	W/mK			
Thickness	m			
Internal Finish Material		Paint on c/s plaster		
Conductivity	W/mK	0.72		
Thickness	m	0.01		
U-value of the Roof (Uri)	W/m²K	0.16		
Opaque Roof Area (Ari)	m²	241.36		
Heat Conduction = 3.47(Ari/Aro) Uri αri Gs		**1.11**		

Part 2 - Calculation of Heat Conduction through Skylight

Components / Details		Code No.			
Description	Units	S1	S2	S3	S4
Skylight Glazing Type		-	-	-	-
Thickness	m	-	-	-	-
Skylight Area (Asi)	m²	-	-	-	-
U-value of Skylight Glazing (Usi)	W/m²K	-	-	-	-
Heat Conduction = 0.40 (Asi/Aro) Usi Gs			-	-	-

Heat Conduction through Skylight = 0.40 (Asi/Aro) Usi Gs   where i= 1, 2, …, n

=   0   **W/m²**

Part 3 - Calculation of Solar Radiation through Skylight

Components / Details		Code No.			
Description	Units	F1	F2	F3	F4
Skylight Glazing Type		-	-	-	-
Thickness	m	-	-	-	-
Skylight Area (Asi)	m²	-	-	-	-
Shading Coefficient of Skylight Glazing (SCr)		-	-	-	-
Visible Light Transmittance (VLT)		-	-	-	-
External Reflectance (ER)		-	-	-	-
Solar Radiation = 41.10 (Asi/Aro) (SCri) Gs					

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

=   0   **W/m²**

Heat Conduction through Opaque Roof = 3.47(Ari/Aro) Uri αri Gs   where i= 1, 2, …, n

=   **1.11**   W/m²

Summary of RTTV at Roof

=   1.11   +   0.00   +   0.00

=   **1.11**   W/m²

Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014

Form RTTV (Roof) 2 - Summary of RTTVroof of Building Envelopes

Sheet No. _____10_____　　　　　　　　　　　BD Ref No. ___2/3061/11___

Building Address ___No. 101 King's Road, North Point, Hong Kong___

Overall Roof Area [a]　　　　　　241.4　　　m²

Roof Orientation Facing	Gross Roof Area (m²)	Heat Conduction through Opaque Roof (W/m²)	Heat Conduction through Skylight (W/m²)	Solar Radiation through Skylight (W/m²)	RTTVroof at Each Roof (W/m²)	Area-weighted RTTVroof (W/m²)
	[b]	[c]	[d]	[e]	[f]=[c]+[d]+[e]	[g]=[f]x[b]/[a]
Flat Roof	241.4	1.11	0.00	0.00	1.11	1.11

Overall RTTVroof =　　　1.11　　　W/m²

<　　　4 W/m²　　　ok.

广东海控特种玻璃技术有限公司
Guangdong HaiKong Special Glass Technology Co., Ltd.

GL101 - Tower Curtain Wall Vision Glass

GL101A - Precast window fix light (bedroom)

GL101B - Tower Curtain Wall Vision Glass Non typical

玻璃性能参数Performance Data

客户名称：其士　　　　项目名称：No.101-111 King's Road　　　　　　　日期：7/6-2024

玻璃产品 Class Product	可见光 Light characteristics			太阳热能 Energy characteristics					U-值
	透光率 trans (%)	反光率Reflection		热直透率 trans (%)	热反射率 Reflection(%)	热吸收率 Abs (%)	热能系数 SolarFactor	遮阳系数 Shading Coefficient	U-Value 空气 （W/M^{2}K）
		外Out (%)	内In (%)						
	L.T.	L.R.	L.R.	D.E.T	E.R	E.A.	S.F.	S.C.	AIR
GL101 10mm STB1-58A#2+12A+10mm clear	50%	20%	11%	30%	20%	50%	0.39	0.45	1.82
GL101A 10mm STB1-58A#2+9A+10mm clear	50%	20%	10%	30%	22%	48%	0.40	0.46	2.01
GL101B 8mm STB1-58A#2+12A+12mm clear	50%	20%	10%	31%	24%	45%	0.39	0.45	1.82

1. The performance data shown are nominal and subject to variations due to manufacturing tolerances.
2. A slight shift in visible light reflectance or transmission may be noticed after heat-treatment.
3. The tolerance of data with respect to photometric properties is ±3 points.
4. The U-value tolerance is ±0.1W/m2.k.
5. Specifications technical and other data are based on information available at the time of preparation this document and are subject to change without p
6. The above performance parameters calculated in accordance with WINDOW6 software.All data are just for your reference, not as an official contract.

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GUANGDONG HAIKONG SPECIAL GLASS TECHNOLOGY CO.,LTD.

Achieve Dreams with Innovation

Performance Data for Glazing Products

Project Name :其士/Mo.101-111 King s Road   File No.:   Date : 12-Apr-24

	Glazing Configuration	Thickness (mm)	Appearance Color (Ref/Trans)	Visible Light（%）			Ultra-violet Transmit-tance (%)	Solar Energy （%）		Solar Heat Gain Coefficient	Shading-Coefficient	U-factor (W/(m^2.K)) Summer/Winter
				Transmit-tance	Reflectance			Transmit-tance	Reflec-tance			
					External	Internal						Air
				L.T.	L.Re	L.Ri	Tuv	D.E.T	E.R	SHGC	S.C.	
6	8mmclear HS w/STB1-58A#2+12A+8mmclear	28		51	20	11	33	33	24	0.41	0.47	1.84/1.83
14	10mmClear	10		87	8	8	56	74	7	0.80	0.91	5.12/5.67

Item 16 - GL102A Precast Window Glass (Bedroom)

 Item 17 - GL104 Glass Barrier for openable window

Item 19 - GL108 Insitu Window Glass (Bathroom)

Item 23 - GL105 Precast Window Glass (Kitchen)

15											
16	8mmclear HS w/STB1-58A#2+9A+8mmclear	25		51	20	11	33	33	24	0.41	0.47	2.10/2.03
17	8mmclear	8		88	8	8	59	79	7	0.83	0.95	5.18/5.73
18											
19	8mmclear油砂#2	8		/	/	/	/	/	/	/	/	5.18/5.73
20											
21											
22											
23	8mmCrystal grey glass	8		56	6	6	24	46	6	0.61	0.70	5.18/5.73

Notes: 1, Simulations were ran using relevant technical softwares and complying with the standards *NFRC 100/200/300-2010* .

2, This data is based on representative samples of factory production. Products data may be vary slightly, ±1.5% for optical values and ±0.05 for thermal, due to variation in production process.

3, This data is to be used for reference/comparison purposes, and **should not** be considered as an official contract.