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:	23 Po Shan Road, Hong Kong	屋宇署檔號 BD Ref. No. BD2/2001/06
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)	10	

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	North	East	South	West				
平均吸收率值 Average Absorptivity	0.57	0.58	0.56	0.58				
窗戶與牆壁的平均比例 Average Window to Wall Ratio	0.43	0.19	0.26	0.2				
玻璃遮光系數 Shading Coefficient of Glazing	0.86	0.86	0.86	0.86				
外牆的平均遮光系數 Average Shading Coefficient of Facade	0.826	0.82	0.82	0.82				
可見光透光率 Visible Light Transmittance	75 %	75 %	75 %	75 %	%	%	%	%
外部反射率 External Reflectance	15 %	15 %	15 %	15 %	%	%	%	%

表 2 **Table 2**

牆壁住宅熱傳送值 $RTTV_{Wall}$

外牆朝向方位 Facade Orientation Facing		North	East	South	West
牆壁方位系數 Wall Orientation Factor		0.79	1.072	0.975	1.131
外牆總面積 (住宅單位) Total External Wall Area (Residential Units)		1407 平方米 m²	738 平方米 m²	668 平方米 m²	795 平方米 m²
窗戶與牆壁的比例 Window to Wall Ratio		= 608:1407	= 139:738	= 173:668	= 159:795
窗戶總面積 Total Window Area		608 m²	139 m²	173 m²	159 m²
熱傳導 Heat Conduction	不透光牆 Opaque Wall	1.33 瓦特/平方米 W/m²	2.67 瓦特/平方米 W/m²	2.12 瓦特/平方米 W/m²	2.79 瓦特/平方米 W/m²
	窗戶 Window	0.58 瓦特/平方米 W/m²	0.36 瓦特/平方米 W/m²	0.46 瓦特/平方米 W/m²	0.40 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= F1:56.22m² F2:60.88m² F2P:140.85m² F3:350.56m² SC= F1:0.83 F2:0.86 F2P:0.86 F3:0.75 VLT= F1:79, F2:79 F2P:79, F3:75 % ER= F1:12, F2:15 F2P:15, F3:14 %	☑ 透明 Clear 面積 Area= F1:57.74m² F2:1.76m² F3:35.40m² F4:41.58m² F5:3.35m² SC= F1:0.83 F2:0.86 F3:0.75 F4:0.82 F5:0.84 VLT= F1:79, F2:79 F3:75, F4:78 F5:82 % ER= F1:12, F2:15 F3:14, F4:12 F5:7 %	☑ 透明 Clear 面積 Area= F1:173.24 平方米 m² SC= F1:0.83 VLT= F1:79 % ER= F1:12 %	☑ 透明 Clear 面積 Area= F1:69.90m² F2:0.99m² F3:42.13m² F4:46.11m² SC= F1:0.83 F2:0.86 F3:0.75 F4:0.82 VLT= F1:79, F2:79 F3:75, F4:78 % ER= F1:12, F2:15 F3:14, F4:12 %
	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		11.08 瓦特/平方米 W/m²	6.84 瓦特/平方米 W/m²	8.75 瓦特/平方米 W/m²	7.62 瓦特/平方米 W/m²
平均吸熱率值 Average Absorptivity		0.57	0.58	0.56	0.58
各幅外牆的牆壁住宅熱傳送值 $RTTV_{Wall}$ at each facade		12.99 瓦特/平方米 W/m²	9.88 瓦特/平方米 W/m²	11.33 瓦特/平方米 W/m²	10.80 瓦特/平方米 W/m²
總牆壁住宅熱傳送值 Overall $RTTV_{Wall}$		11.56 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)	531.38 平方米 m²					
天窗總面積 Total Skylight Area	0 平方米 m²					
熱傳導 Heat Conduction	屋頂 Roof	2.8 瓦特/平方米 W/m²				
	天窗 Skylight	瓦特/平方米 W/m²				
天窗 Skylight	玻璃類型 Glass Type	☐ 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= %
		☐ 透明 Clear	面積= Area=	平方米 m²	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/m²					
平均吸熱率值 (屋頂) Average Absorptivity (roof)	0.7					
總屋頂住宅熱傳送值 Overall $RTTV_{Roof}$	瓦特/平方米 2.8 W/m²					

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

日 dd		月 mm		年 yyyy			
2	1	0	7	2	0	2	2

注意事項

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. 郵寄/親身呈交 - **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

RTTV Calculation

PROPOSED RESIDENTIAL DEVELOPMENT
AT 23 PO SHAN ROAD,
HONG KONG I.L. 6435 & EXTENSION

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. BD2/2001/06

Building Address 23 Po Shan Road, Hong Kong

Facade Orientation Facing North Gross Wall Area (Ao) = 1407.15

Window to Wall Ratio (WWR) 0.43 Wall Orientation Factor (Gw) = 0.79

Part 1 - Calculation of Heat Conduction through Opaque Walls				
Components / Details		Code No.		
Description	Units	N-W1	N-W2	N-W3
External Finish Material		Stone	Aluminiumc Frame	Aluminium Louvre
Conductivity	W/mK	2.00	160.00	160.00
Thickness	m	0.030	0.003	0.003
Average Absorptivity	(α)	0.60	0.50	0.50
Intermediate component		Air Gap	Air Gap	
Conductivity	W/mK	0.15	0.15	-
Thickness	m	0.06	0.08	
Intermediate component			Aluminium	
Conductivity			160.00	
Thickness			0.003	
Intermediate component				
Conductivity				
Thickness				
Intermediate component				
Conductivity				
Thickness				
Intermediate component		Concrete wall		
Conductivity	W/mK	2.16		
Thickness	m	0.15		
Internal Finish Material		Gypsum plaster		
Conductivity	W/mK	0.38		
Thickness	m	0.01		
U-value of Opaque Area (Uwi)	W/m²K	1.50	1.40	6.10
Opaque Wall Area (Awi)	m²	534.35	264.29	0.00
Heat Conduction = 3.57(Awi/Ao) Uwi αwi Gw		0.96	0.37	0.00

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

= 1.33 W/m²

Part 2 - Calculation of Heat Conduction through Glazing							
Components / Details		Code No.					
Description	Units	N-F1	N-F2	N-F2P	N-F3	N-F4	N-F5
Glazing Type		Clear	Clear	Clear	Clear	Clear	Clear
Thickness	m	0.016	0.028	0.028	0.051	0.018	0.038
Glazing Area (Afi)	m²	56.22	60.88	140.85	350.56	0.00	0.00
U-value of Glazing (Ufi)	W/m²K	2.83	2.8	2.8	2.52	2.79	4.63
Heat Conduction = 0.64 (Afi/Ao) Uf Gw		0.06	0.06	0.14	0.32	0.00	0.00

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

= 0.58 W/m²

Part 3 - Calculation of Solar Radiation through Glazing							
Components / Details		Code No.					
Description	Units	N-F1	N-F2	N-F2P	N-F3	N-F4	N-F5
Glazing Type		Clear	Clear	Clear	Clear	Clear	Clear
Thickness	m	0.016	0.028	0.028	0.051	0.018	0.038
Glazing Area (Afi)	m²	56.22	60.88	140.85	350.56	0.00	0.00
Shading Coefficient of Glazing (SCf)		0.83	0.86	0.86	0.75	0.82	0.84
Visible Light Transmittance (VLT)	%	79	79	79	75	78	82
External Reflectance (ER)	%	12	15	15	14	12	7
External Shading Miltiplier (ESC)		1.00	1.00	0.91	1.00	1.00	1.00
Solar Radiation = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw		1.09	1.23	2.60	6.16	0.00	0.00

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

= 11.08 W/m²

Summary of RTTV at North Elevations

= 1.33 + 0.58 + 11.08

= 12.99 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. BD2/2001/06

Building Address 23 Po Shan Road, Hong Kong

Facade Orientation Facing East Gross Wall Area (Ao) = 738.49

Window to Wall Ratio (WWR) 0.19 Wall Orientation Factor (Gw) = 1.072

Part 1 - Calculation of Heat Conduction through Opaque Walls				
Components / Details		Code No.		
Description	Units	E-W1	E-W2	E-W3
External Finish Material		Stone	Aluminiumc Frame	Aluminium Louvre
Conductivity	W/mK	2.00	160.00	160.00
Thickness	m	0.030	0.003	0.003
Average Absorptivity	(α)	0.60	0.50	0.50
Intermediate component		Air Gap	Air Gap	
Conductivity	W/mK	0.15	0.15	
Thickness	m	0.06	0.08	
Intermediate component			Aluminium	
Conductivity	W/mK		160.00	
Thickness	m		0.003	
Intermediate component				
Conductivity	W/mK			
Thickness	m			
Intermediate component				
Conductivity	W/mK			
Thickness	m			
Intermediate component		Concrete wall		
Conductivity	W/mK	2.16		
Thickness	m	0.15		
Internal Finish Material		Gypsum plaster		
Conductivity	W/mK	0.38		
Thickness	m	0.01		
U-value of Opaque Area (Uwi)	W/m²K	1.50	1.40	6.10
Opaque Wall Area (Awi)	m²	473.47	124.33	0.86
Heat Conduction = 3.57(Awi/Ao) Uwi αwi Gw		2.21	0.45	0.01

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

= 2.67 W/m²

Part 2 - Calculation of Heat Conduction through Glazing						
Components / Details		Code No.				
Description	Units	E-F1	E-F2	E-F3	E-F4	E-F5
Glazing Type		Clear	Clear	Clear	Clear	Clear
Thickness	m	0.016	0.028	0.051	0.018	0.038
Glazing Area (Afi)	m²	57.74	1.76	35.40	41.58	3.35
U-value of Glazing (Ufi)	W/m²K	2.83	2.8	2.52	2.79	4.63
Heat Conduction = 0.64 (Afi/Ao) Uf Gw		0.15	0.00	0.08	0.11	0.01

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	E-F1	E-F2	E-F3	E-F4	E-F5
Glazing Type		Clear	Clear	Clear	Clear	Clear
Thickness	m	0.016	0.028	0.051	0.018	0.038
Glazing Area (Afi)	m²	57.74	1.76	35.40	41.58	3.35
Shading Coefficient of Glazing (SCf)		0.83	0.86	0.75	0.82	0.84
Visible Light Transmittance (VLT)	%	79	79	75	78	82
External Reflectance (ER)	%	12	15	14	12	7
External Shading Miltiplier (ESC)		1.00	1.00	1.00	1.00	1.00
Solar Radiation = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw		2.90	0.09	1.61	2.07	0.17

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

= 6.84 W/m²

Summary of RTTV at East Elevations

= 2.67 + 0.36 + 6.84

= 9.88 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. BD2/2001/06

Building Address 23 Po Shan Road, Hong Kong

Facade Orientation Facing South Gross Wall Area (Ao) = 668.78

Window to Wall Ratio (WWR) 0.26 Wall Orientation Factor (Gw) = 0.975

Part 1 - Calculation of Heat Conduction through Opaque Walls				
Components / Details		Code No.		
Description	Units	S-W1	S-W2	S-W3
External Finish Material		Stone	Aluminiumc Frame	Aluminium Louvre
Conductivity	W/mK	2.00	160.00	160.00
Thickness	m	0.030	0.003	0.003
Average Absorptivity	(α)	0.60	0.50	0.50
Intermediate component		Air Gap	Air Gap	
Conductivity	W/mK	0.15	0.15	
Thickness	m	0.06	0.08	
Intermediate component			Aluminium	
Conductivity	W/mK		160.00	
Thickness	m		0.003	
Intermediate component				
Conductivity	W/mK			
Thickness	m			
Intermediate component				
Conductivity	W/mK			
Thickness	m			
Intermediate component		Concrete wall		
Conductivity	W/mK	2.16		
Thickness	m	0.15		
Internal Finish Material		Gypsum plaster		
Conductivity	W/mK	0.38		
Thickness	m	0.01		
U-value of Opaque Area (Uwi)	W/m²K	1.50	1.40	6.10
Opaque Wall Area (Awi)	m²	294.39	200.82	0.33
Heat Conduction = 3.57(Awi/Ao) Uwi αwi Gw		1.38	0.73	0.01

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

= 2.12 W/m²

Part 2 - Calculation of Heat Conduction through Glazing						
Components / Details		Code No.				
Description	Units	S-F1	S-F2	S-F3	S-F4	S-F5
Glazing Type		Clear	Clear	Clear	Clear	Clear
Thickness	m	0.016	0.028	0.051	0.018	0.038
Glazing Area (Afi)	m²	173.24	0.00	0.00	0.00	0.00
U-value of Glazing (Ufi)	W/m²K	2.83	2.8	2.52	2.79	4.63
Heat Conduction = 0.64 (Afi/Ao) Uf Gw		0.46	0.00	0.00	0.00	0.00

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

= 0.46 W/m²

Part 3 - Calculation of Solar Radiation through Glazing						
Components / Details		Code No.				
Description	Units	S-F1	S-F2	S-F3	S-F4	S-F5
Glazing Type		Clear	Clear	Clear	Clear	Clear
Thickness	m	0.016	0.028	0.051	0.018	0.038
Glazing Area (Afi)	m²	173.24	0.00	0.00	0.00	0.00
Shading Coefficient of Glazing (SCf)		0.83	0.86	0.75	0.82	0.84
Visible Light Transmittance (VLT)	%	79	79	75	78	82
External Reflectance (ER)	%	12	15	14	12	7
External Shading Miltiplier (ESC)		1.00	1.00	1.00	1.00	1.00
Solar Radiation = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw		8.75	0.00	0.00	0.00	0.00

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

= 8.75 W/m²

Summary of RTTV at South Elevations

= 2.12 + 0.46 + 8.75

= 11.33 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. 4 BD Ref No. BD2/2001/06

Building Address 23 Po Shan Road, Hong Kong

Facade Orientation Facing West Gross Wall Area (Ao) = 795.37

Window to Wall Ratio (WWR) 0.20 Wall Orientation Factor (Gw) = 1.131

Part 1 - Calculation of Heat Conduction through Opaque Walls				
Components / Details		Code No.		
Description	Units	W-W1	W-W2	W-W3
External Finish Material		5mm mosaic tiles	Aluminiumc Frame	Aluminium Louvre
Conductivity	W/mK	2.00	160.00	160.00
Thickness	m	0.030	0.003	0.003
Average Absorptivity	(α)	0.60	0.50	0.50
Intermediate component		Air Gap	Air Gap	
Conductivity	W/mK	0.15	0.15	
Thickness	m	0.06	0.08	
Intermediate component			Aluminium	
Conductivity	W/mK		160.00	
Thickness	m		0.003	
Intermediate component				
Conductivity	W/mK			
Thickness	m			
Intermediate component				
Conductivity	W/mK			
Thickness	m			
Intermediate component		Concrete wall		
Conductivity	W/mK	2.16		
Thickness	m	0.15		
Internal Finish Material		Gypsum plaster		
Conductivity	W/mK	0.38		
Thickness	m	0.01		
U-value of Opaque Area (Uwi)	W/m²K	1.50	1.40	6.10
Opaque Wall Area (Awi)	m²	495.19	139.05	2.00
Heat Conduction = 3.57(Awi/Ao) Uwi αwi Gw		2.26	0.49	0.03

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

= 2.79 W/m²

Part 2 - Calculation of Heat Conduction through Glazing						
Components / Details		Code No.				
Description	Units	W-F1	W-F2	W-F3	W-F4	W-F5
Glazing Type		Clear	Clear	Clear	Clear	Clear
Thickness	m	0.016	0.028	0.051	0.018	0.038
Glazing Area (Afi)	m²	69.90	0.99	42.13	46.11	0.00
U-value of Glazing (Ufi)	W/m²K	2.83	2.8	2.52	2.79	4.63
Heat Conduction = 0.64 (Afi/Ao) Uf Gw		0.18	0.00	0.10	0.12	0.00

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

= 0.40 W/m²

Part 3 - Calculation of Solar Radiation through Glazing						
Components / Details		Code No.				
Description	Units	W-F1	W-F2	W-F3	W-F4	W-F5
Glazing Type		Clear	Clear	Clear	Clear	Clear
Thickness	m	0.016	0.028	0.051	0.018	0.038
Glazing Area (Afi)	m²	69.90	0.99	42.13	46.11	0.00
Shading Coefficient of Glazing (SCf)		0.83	0.86	0.75	0.82	0.84
Visible Light Transmittance (VLT)	%	79	79	75	78	82
External Reflectance (ER)	%	12	15	14	12	7
External Shading Miltiplier (ESC)		1.00	1.00	1.00	1.00	1.00
Solar Radiation = 41.75 (Afi/Ao)(SCfi)(ESCwi)Gw		3.44	0.05	1.88	2.24	0.00

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

= 7.62 W/m²

Summary of RTTV at West Elevations

= 2.79 + 0.40 + 7.62

= 10.80 W/m²

Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2
Form RTTV (Wall) 2 - Summary of Overall $RTTV_{wall}$ of Building

Sheet No. 5 BD Ref No. BD2/2001/06

Building Address 23 Po Shan Road, Hong Kong

Overall Gross Wall Area [a] 3609.79 m²

Facade Orientation Facing	Gross Wall Area (m^2) [b]	Heat Conduction through Opaque Walls (W/m^2) [c]	Heat Conduction through Glazing (W/m^2) [d]	Solar Radiation through Glazing (W/m^2) [e]	RTTVwall at Each Facade (W/m^2) [f]=[c]+[d]+[e]	Area-weighted RTTVwall (W/m^2) [g]=[f]x[b]/[a]
North	1407.15	1.33	0.58	11.08	12.99	5.07
East	738.49	2.67	0.36	6.84	9.88	2.02
South	668.78	2.12	0.46	8.75	11.33	2.10
West	795.37	2.79	0.40	7.62	10.80	2.38

Overall RTTVwall = 11.56 W/m²

< 14 W/m^2 ok.

Guidelines on Design and Construction Requirements for Energy Efficiency of Residential Buildings 2014
Form RTTV (Roof) 1 - Calculation of $RTTV_{roof}$

Sheet No. 6 BD Ref No. BD2/2001/06

Building Address 23 Po Shan Road, Hong Kong

Roof Orientation Facing Flat Gross Roof Area (Aro) = 531.38

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		
External Finish Material		25mm concrete tiles		
Conductivity	W/mK	1.10		
Thickness	m	0.025		
Average Absorptivity	(α)	0.7		
Intermediate component		50mm cement/ sand screed		
Conductivity	W/mK	0.72		
Thickness	m	0.050		
Intermediate component		50mm expanded polystyrene		
Conductivity	W/mK	0.034		
Thickness	m	0.05		
Intermediate component		150mm concrete slab		
Conductivity	W/mK	2.16		
Thickness	m	0.15		
Intermediate component				
Conductivity	W/mK			
Thickness	m			
Internal Finish Material		10mm gypsum plaster		
Conductivity	W/mK	0.38		
Thickness	m	0.01		
U-value of the Roof (Uri)	W/m²K	0.53		
Opaque Roof Area (Ari)	m²	531.38		
Heat Conduction = 3.47(Ari/Aro) Uri αri Gs		2.80		

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

= 2.80 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				
Heat Conduction = 0.64 (Asi/Aro) Usi Gs		0.00			

Heat Conduction through Skylight = 0.64 (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)	%				
Solar Radiation = 41.10 (Asi/Aro) (SCri) Gs		0.00			

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

= 0.00 W/m²

Summary of RTTV at Roof

= 2.80 + 0.00 + 0.00

= 2.80 W/m²

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

Form RTTV (Roof) 2 - Summary of $RTTV_{roof}$ of Building Envelopes

Sheet No. 7 BD Ref No. BD2/2001/06

Building Address 23 Po Shan Road, Hong Kong

Overall Roof Area [a] 531.38 m²

Roof	Gross Roof Area (m²) [b]	Heat Conduction through Opaque Roof (W/m²) [c]	Heat Conduction through Skylight (W/m²) [d]	Solar Radiation through Skylight (W/m²) [e]	RTTVroof at Each Type of Roof (W/m²) [f]=[c]+[d]+[e]	Area-weighted RTTVroof (W/m²) [g]=[f]x[b]/[a]
Flat Roof	531.38	2.80	0.00	0.00	2.80	2.80

Overall RTTVroof = 2.80 W/m²

< 4 W/m² ok.

XINYI GLASS ENGINEERING(DONGGUAN)CO.,LTD.

THERMOTECHNICAL & OPTICS PERFORMANCE DATA

PROJECT NAME:

QCT210419007

NO.	Description of sample	Visible Light (%)			Solar Energy (%)		Abs.	U-Value ($W/m^2.k$)				Shading Co.	SHGC	Rel. Ht. Gain (W/Tran. m2)
		Tran.	Refl.		Tran.	Refl.		Winter Night		Summer Day				
			Outer	Inner				Air	Ar	Air	Ar			
F-1→E 1	8mm 白玻 + 12A + 8mm 白玻	79	12	12	64	10	17	2.69	/	2.83	/	0.83	0.72	548
2	8mm 超白玻 + 12A + 8mm 超白玻	83	14	14	79	13	4	2.67	/	2.81	/	0.95	0.82	618
3	19mm 超白玻 + 2.28PVB + 19mm 超白玻	82	7	7	62	6	32	4.63	/	4.24	/	0.84	0.73	562
F 4	19mm 超白玻 + 2.28SGP + 19mm 超白玻	81	7	7	61	6	33	4.64	/	4.24	/	0.83	0.72	558

The Data is calculated via window 5.2 which is provided by LBNL, based on ASHRAE NFRC2001 standard
Solar spectrum: 300-2500nm, visible light is 380-780nm.
Winter nighttime: Outdoor temperature: -18℃, indoor temperature: 21℃, windspeed: 5.5m/s, no sunlight.
Summer daytime : Outdoor temperature: 32℃, indoor temperature: 24℃, windspeed: 2.8m/s, solar density: 783w/m².
*The calculations are base on 1000*1000 specimen, only for reference.*
Above glass datas allow for ±3% difference as a tolerance and U-Value is ±0.2W/m2.k

XINYI GLASS ENGINEERING(DONGGUAN)CO.,LTD.
OPTICAL LABORATORY
2021-4-19

ALUMINIUM WINDOW
Group Limited

玻璃性能參數
Photometric Properties

玻璃產品 Glass Product	厚度(毫米) Thickness (mm)	可見光 Light Characteristics			太陽熱能 Energy Characteristics					U 值
		透光率 trans (%)	反光率 Reflection 外 Out (%)	反光率 Reflection 內 In (%)	熱直透率 trans (%)	熱反射率 Reflection (%)	熱吸收率 Abs (%)	熱能系數 SolarFactor	遮陽系數 Shading Coefficient	U-Value 空氣 (W/M2K)
		L.T.	L.R.	L.R.	D.E.T.	E.R.	E.A.	S.F.	S.C.	AIR
F2 → A 8mm **Xinyi** clear + 12mm Air Gap + 8mm **Xinyi** clear	28	79%	15%	15%	46%	68%	12%	0.75	0.86	2.8
8mm **Xinyi** low iron + 12mm Air Gap + 8mm **Xinyi** low iron	28	83%	15%	15%	48%	79%	14%	0.81	0.93	2.8
F3 → B 12mm **Xinyi** clear + 27mm Air Gap + 12mm **Xinyi** clear	51	75%	14%	14%	37%	53%	10%	0.65	0.75	2.52
12mm **Xinyi** low iron + 27mm Air Gap + 12mm **Xinyi** low iron	51	81%	15%	15%	41%	73%	13%	0.78	0.9	2.52

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 ±0.1 W/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 prior notice.
6. All data are just for your reference, not as an official contract.

JS Aluminium Window Group Ltd
1C, Tai King Industrial Building, 700-702 Prince Edward Road East, San Po Kong, Kowloon, Hong Kong
T 3621 0138 F 36210 338 Info@js-window.com www.JS-window.com

XINYI GLASS ENGINEERING(DONGGUAN)CO.,LTD.

THERMOTECHNICAL & OPTICS PERFORMANCE DATA

PROJECT NAME:

QCT211213005

NO.	Description of sample	Visible Light (%)			Solar Energy (%)		Abs.	U-Value ($W/m^2.k$)				Shading Co.	SHGC	Rel.Ht. Gain (W/Tran. m2)
		Tran.	Refl.		Tran.	Refl.		Winter Night		Summer Day				
			Outer	Inner				Air	Ar	Air	Ar			
P4→D 1	8mm 白玻 + 12A + 10mm 白玻	78	12	12	59	10	16	2.66	/	2.79	/	0.82	0.71	536

The Data is calculated via window 5.2 which is provided by LBNL, based on ASHRAE NFRC2001 standard
Solar spectrum: 300~2500nm, visible light is 380~780nm.
Winter nighttime: Outdoor temperature: -18℃, indoor temperature: 21℃, windspeed: 5.5m/s, no sunlight.
Summer daytime : Outdoor temperature: 32℃, indoor temperature: 24℃, windspeed: 2.8m/s, solar density: 783w/m².
*The calculations are base on 1000*1000 specimen, only for reference.*
Above glass datas allow for ±3% difference as a tolerance and U-Value is ±0.2W/m2.k

XINYI GLASS ENGINEERING(DONGGUAN)CO.,LTD.
OPTICAL LABORATORY
2021-12-13

ALUMINIUM WINDOW
Group Limited

玻璃性能參數
Photometric Properties

Project Name: Proposed Residential Redevelopment in I.L. 6435 Extension, No. 23 Po Shan Road

Glazing Configuration	Visible Light (%)			Solar Energy (%)		Solar Heat Gain Coefficient	Shading Coefficient	U-factor (W/(m2.K)
	Transmit-tance (%)	Reflectance		trans (%)	Reflection (%)			
		External	Internal					
	L.T.	L.R.	L.R.	D.E.T.	E.R.	SHGC	S.C.	Air
19mm Low-iron +2.28SGP+19mm Low-iron (Xinyi)	82%	7%	7%	62%	6%	0.73	0.84	4.63

F5 → C

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 ±0.1 W/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 prior notice.
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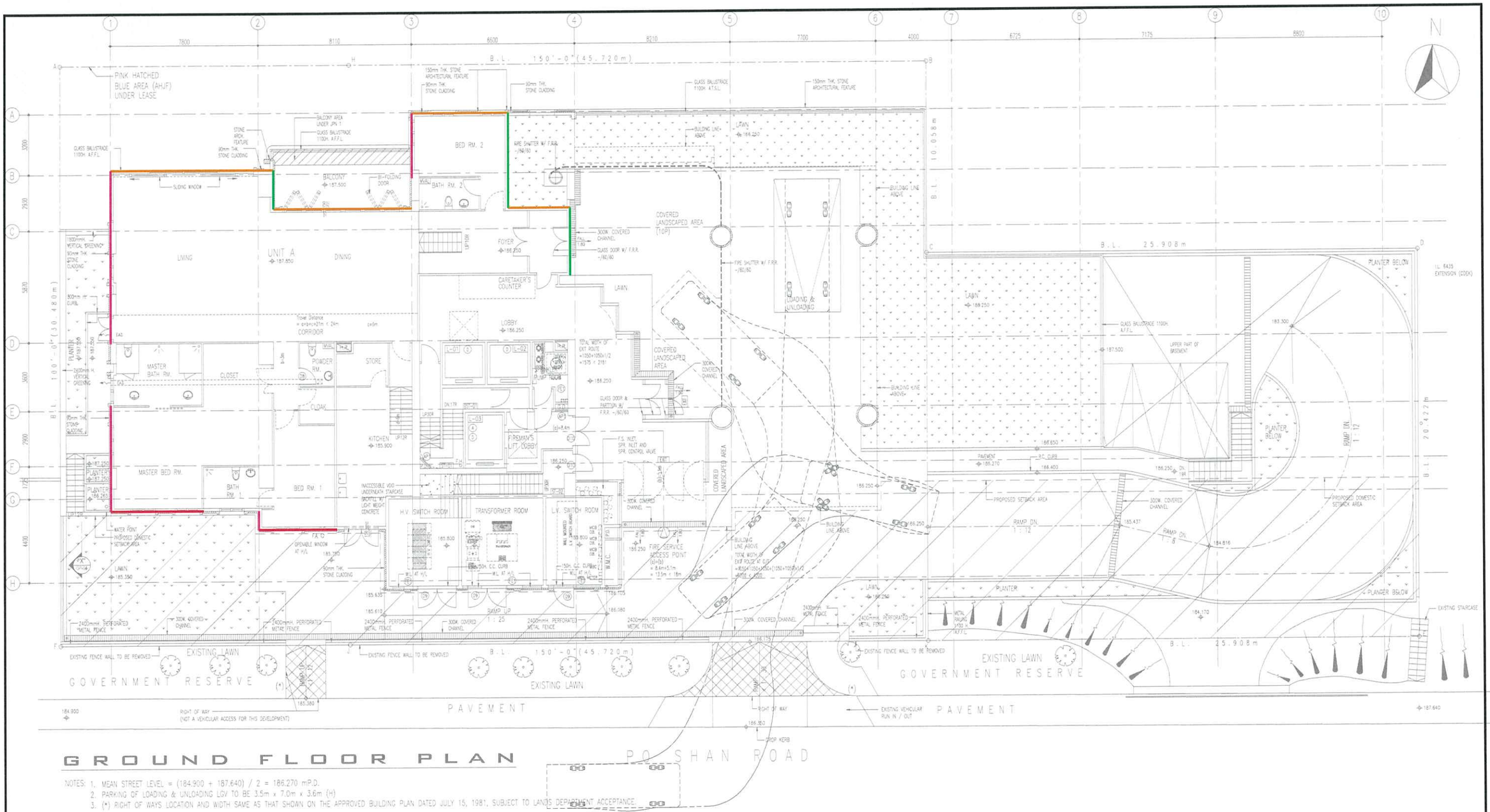

GROUND FLOOR PLAN

NOTES:
1. MEAN STREET LEVEL = (184.900 + 187.640) / 2 = 186.270 mPD.
2. PARKING OF LOADING & UNLOADING LGV TO BE 3.5m x 7.0m x 3.6m (H)
3. (*) RIGHT OF WAYS LOCATION AND WIDTH SAME AS THAT SHOWN ON THE APPROVED BUILDING PLAN DATED JULY 15, 1981, SUBJECT TO LANDS DEPARTMENT ACCEPTANCE.

LEGEND :

EXISTING RIGHT OF WAYS

EXTERNAL WALLS TO BE INCLUDED IN RTTV CALCULATION

- NORTH ELEVATION
- EAST ELEVATION
- SOUTH ELEVATION
- WEST ELEVATION
- ROOF

RTTV DRAWING FOR REFERENCE

Revisions	Description	Certified by

ARCHITECT:

ARCHIPLUS INTERNATIONAL (HK) LIMITED

CONSULTANT :

CONSOLIDATED CONSULTING ENGINEERS LTD.

PROJECT

PROPOSED REDEVELOPMENT AT 23 PO SHAN ROAD, HONG KONG

DRAWING TITLE

G/F PLAN

NOTES
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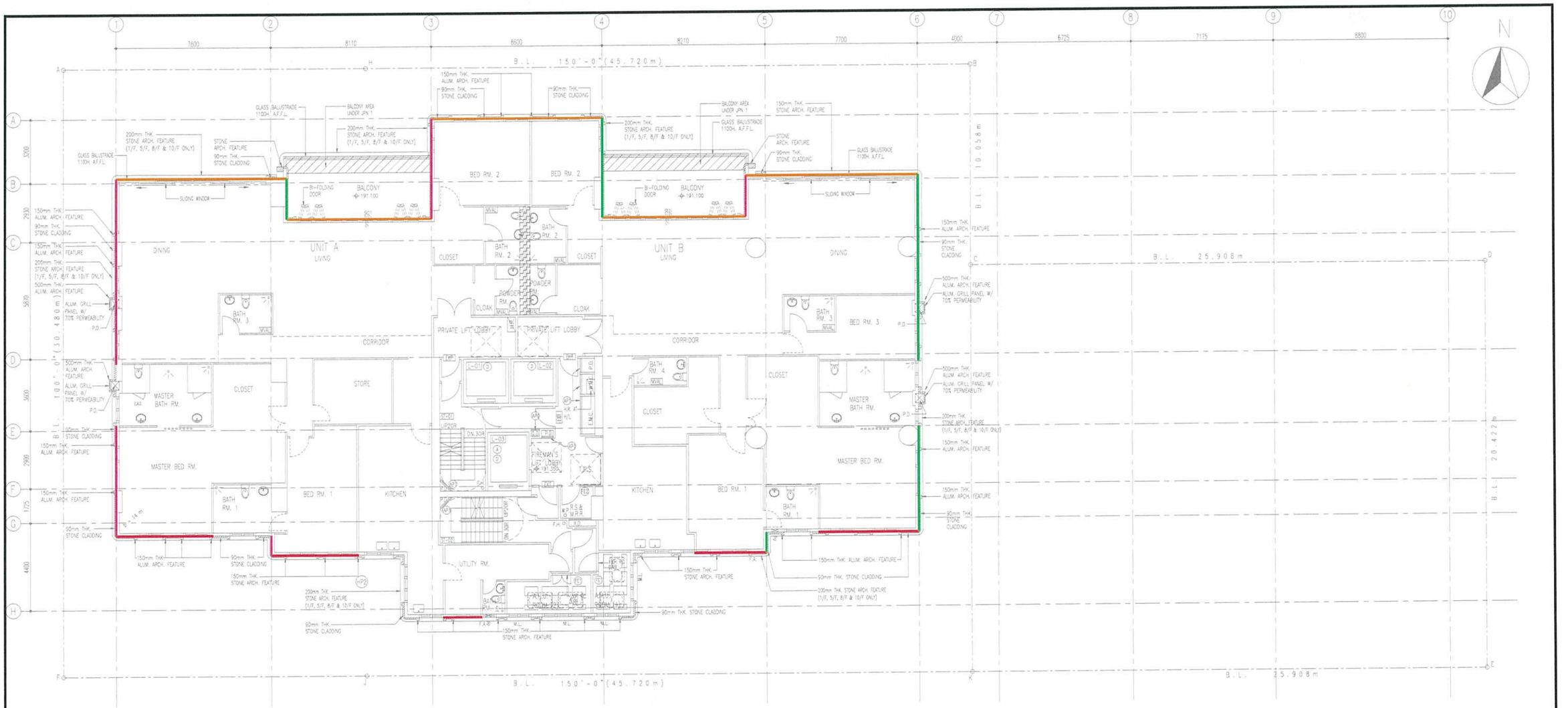

FIRST FLOOR PLAN

EXTERNAL WALLS TO BE INCLUDED IN RTTV CALCULATION

- NORTH ELEVATION
- EAST ELEVATION
- SOUTH ELEVATION
- WEST ELEVATION
- ROOF

RTTV DRAWING FOR REFERENCE

Revisions	Description	Certified by

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CONSULTANT :

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PROJECT

PROPOSED REDEVELOPMENT AT 23 PO SHAN ROAD, HONG KONG

DRAWING TITLE

1/F PLAN

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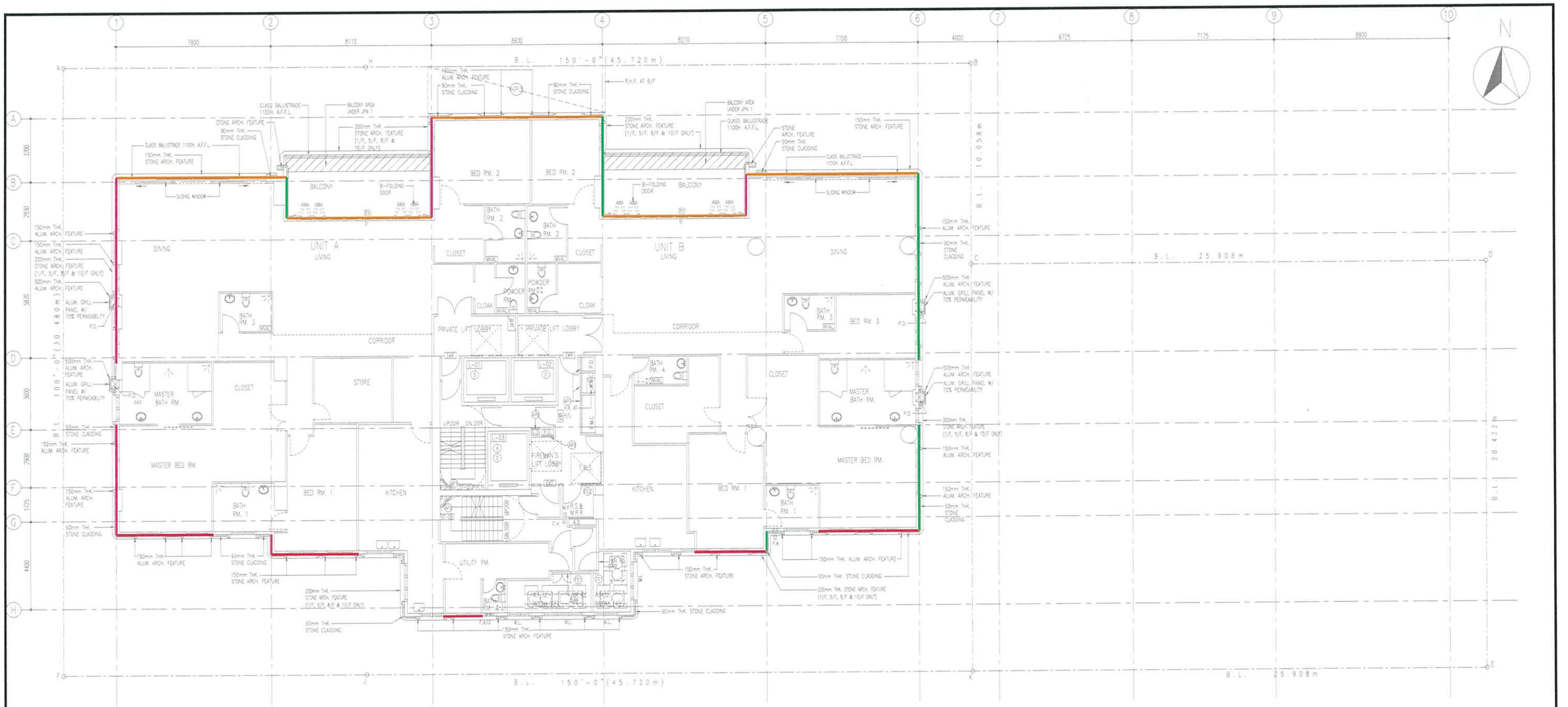

2ND - 6TH FLOOR PLAN

(FLOOR NO.4/F OMITTED)

EXTERNAL WALLS TO BE INCLUDED IN RTTV CALCULATION

- NORTH ELEVATION
- EAST ELEVATION
- SOUTH ELEVATION
- WEST ELEVATION
- ROOF

RTTV DRAWING FOR REFERENCE

Revisions	Description	Certified by

ARCHITECT:

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PROJECT

PROPOSED REDEVELOPMENT AT 23 PO SHAN ROAD, HONG KONG

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2/F-6/F PLAN (4/F OMITTED)

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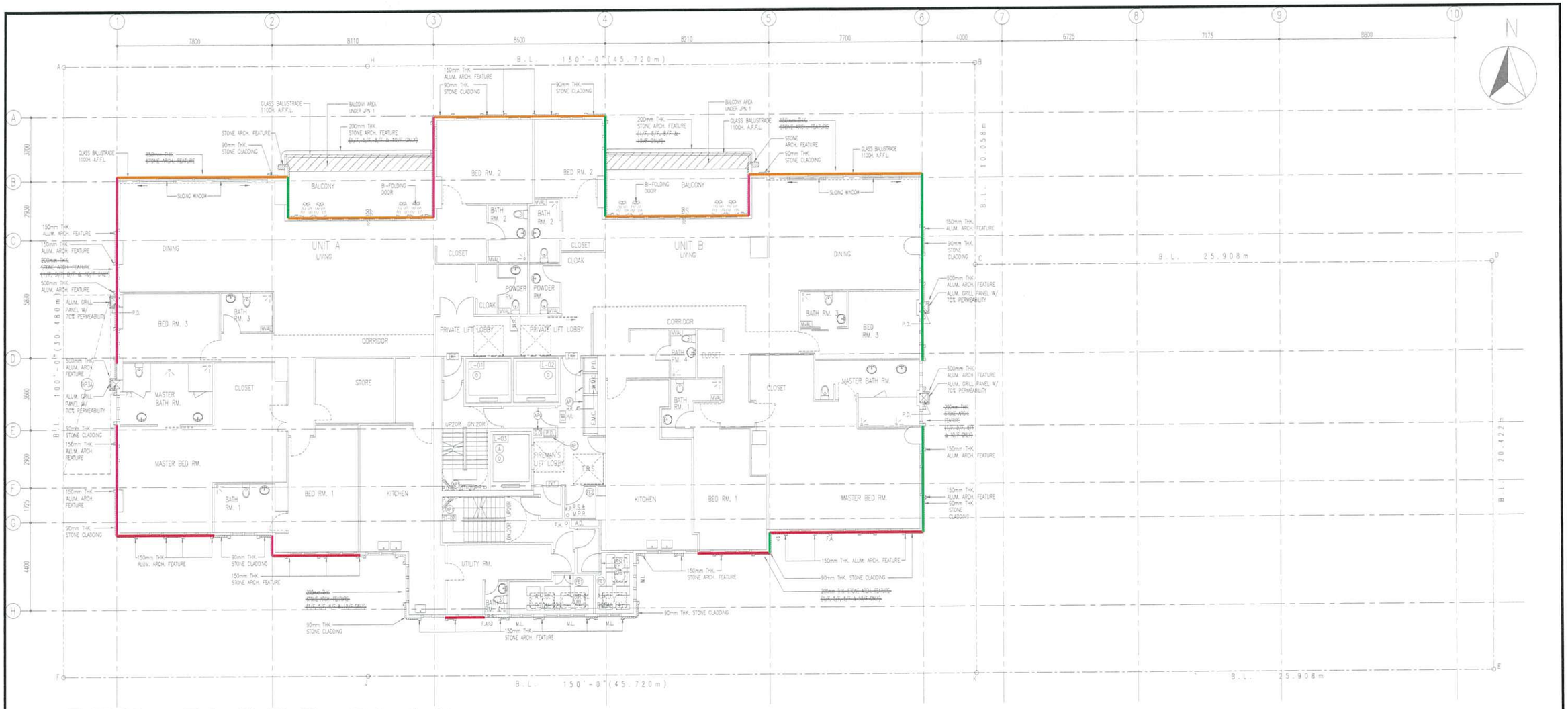

7TH FLOOR PLAN

EXTERNAL WALLS TO BE INCLUDED IN RTTV CALCULATION

- NORTH ELEVATION
- EAST ELEVATION
- SOUTH ELEVATION
- WEST ELEVATION
- ROOF

RTTV DRAWING FOR REFERENCE

Revisions	Description	Certified by

ARCHITECT:

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CONSULTANT :

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PROJECT

PROPOSED REDEVELOPMENT AT 23 PO SHAN ROAD, HONG KONG

DRAWING TITLE

7/F PLAN

NOTES

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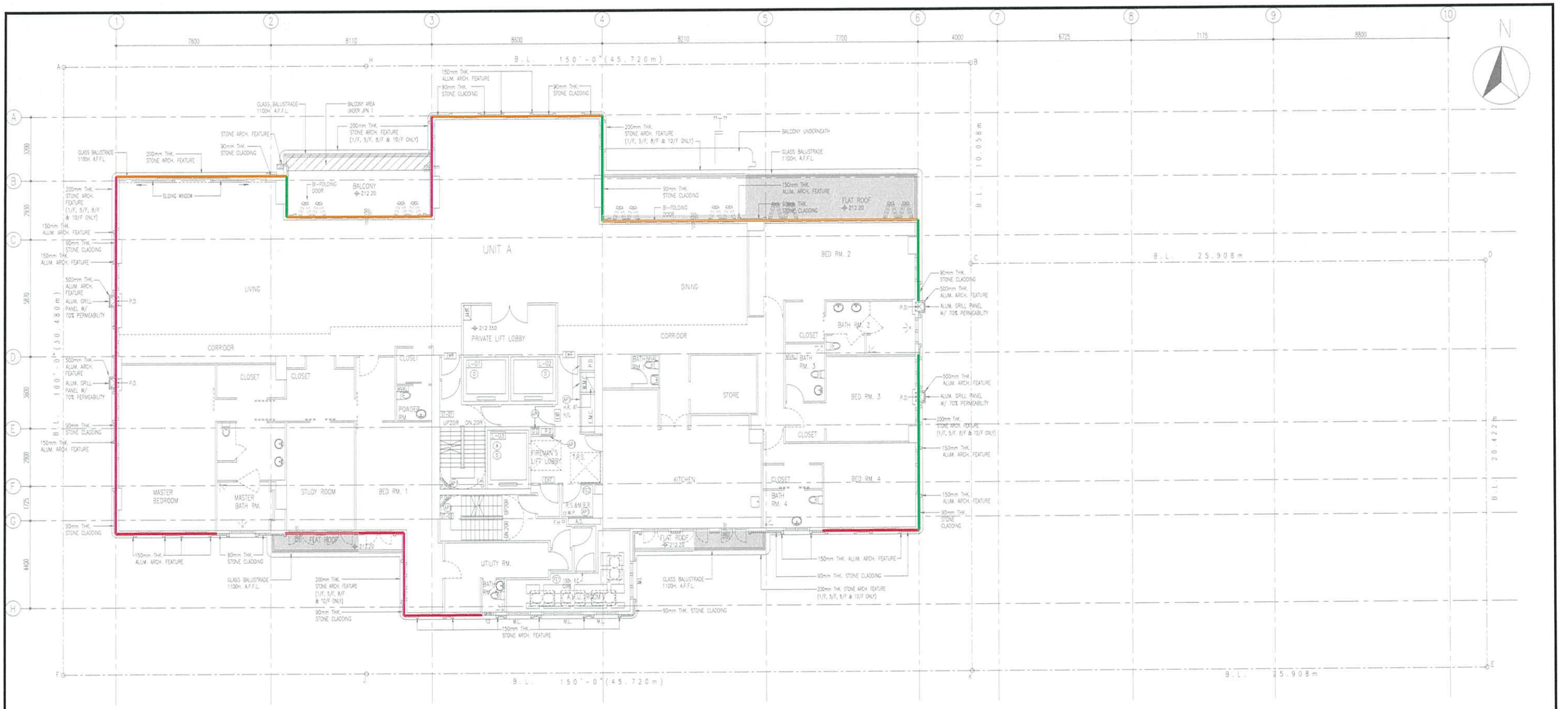

8TH FLOOR PLAN

EXTERNAL WALLS TO BE INCLUDED IN RTTV CALCULATION

- NORTH ELEVATION
- EAST ELEVATION
- SOUTH ELEVATION
- WEST ELEVATION
- ROOF

RTTV DRAWING FOR REFERENCE

Revisions	Description	Certified by

ARCHITECT:

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CONSULTANT :

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PROJECT

PROPOSED REDEVELOPMENT AT 23 PO SHAN ROAD, HONG KONG

DRAWING TITLE

8/F PLAN

NOTES

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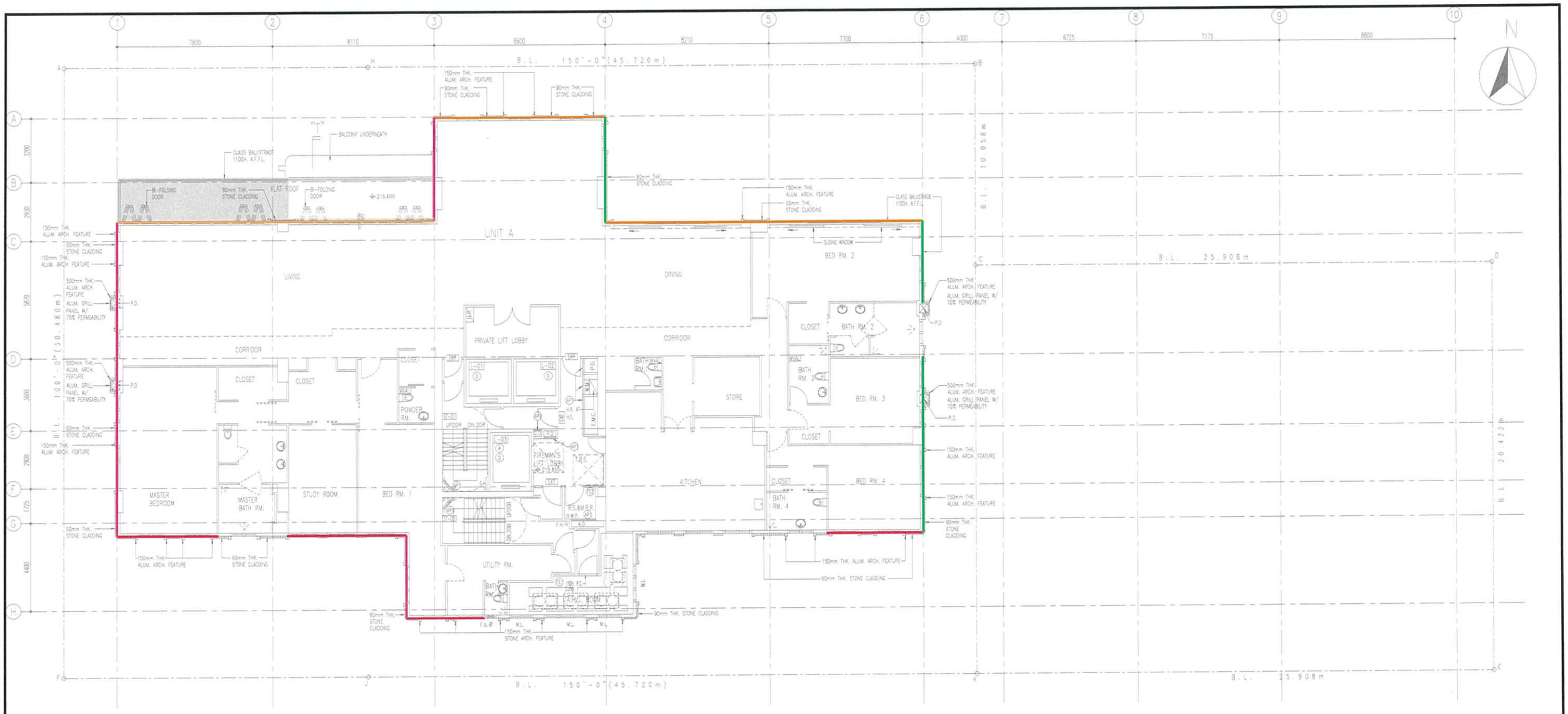

9TH FLOOR PLAN

EXTERNAL WALLS TO BE INCLUDED IN RTTV CALCULATION

- NORTH ELEVATION
- EAST ELEVATION
- SOUTH ELEVATION
- WEST ELEVATION
- ROOF

RTTV DRAWING FOR REFERENCE

Revisions	Description	Certified by

ARCHITECT:

ARCHIPLUS INTERNATIONAL (HK) LIMITED

CONSULTANT :

CONSOLIDATED CONSULTING ENGINEERS LTD.

PROJECT

PROPOSED REDEVELOPMENT AT 23 PO SHAN ROAD, HONG KONG

DRAWING TITLE

9/F PLAN

NOTES

1. THIS DRAWING SHALL BE READ CONJUNCTION WITH RELEVANT SPECIFICATIONS, CONDITIONS OF CONTRACT AND OTHER RELATED DRAWINGS. ANY DISCREPANCY FOUND THEREIN SHALL BE NOTIFIED TO THE CONSULTING ENGINEERS IMMEDIATELY.
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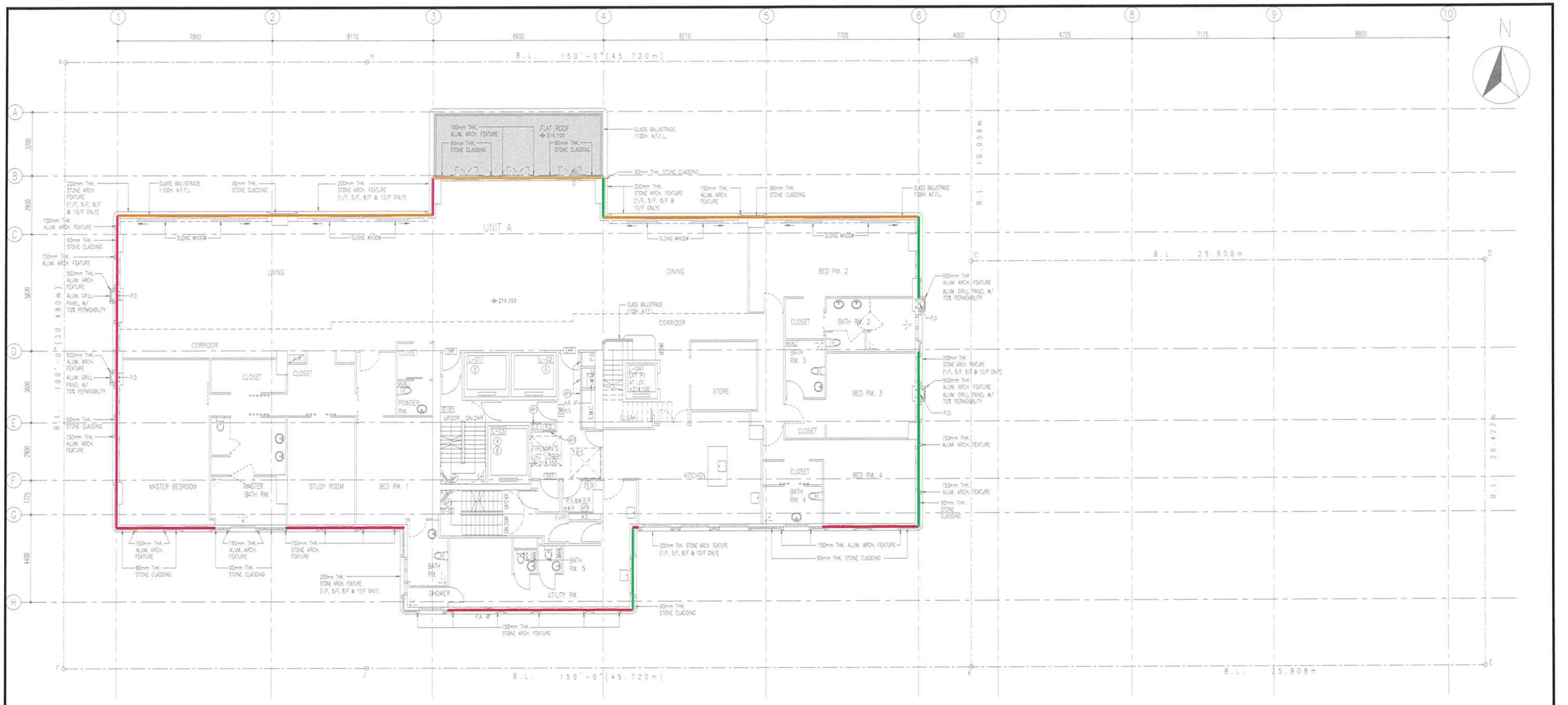

10TH FLOOR PLAN

EXTERNAL WALLS TO BE INCLUDED IN RTTV CALCULATION

- NORTH ELEVATION
- EAST ELEVATION
- SOUTH ELEVATION
- WEST ELEVATION
- ROOF

RTTV DRAWING FOR REFERENCE

Revisions	Description	Certified by

ARCHITECT:

ARCHIPLUS INTERNATIONAL (HK) LIMITED

CONSULTANT :

CONSOLIDATED CONSULTING ENGINEERS LTD.

PROJECT

PROPOSED REDEVELOPMENT AT 23 PO SHAN ROAD, HONG KONG

DRAWING TITLE

10/F PLAN

NOTES

1. THIS DRAWING SHALL BE READ CONJUNCTION WITH RELEVANT SPECIFICATIONS, CONDITIONS OF CONTRACT AND OTHER RELATED DRAWINGS. ANY DISCREPANCY FOUND THEREIN SHALL BE NOTIFIED TO THE CONSULTING ENGINEERS IMMEDIATELY.
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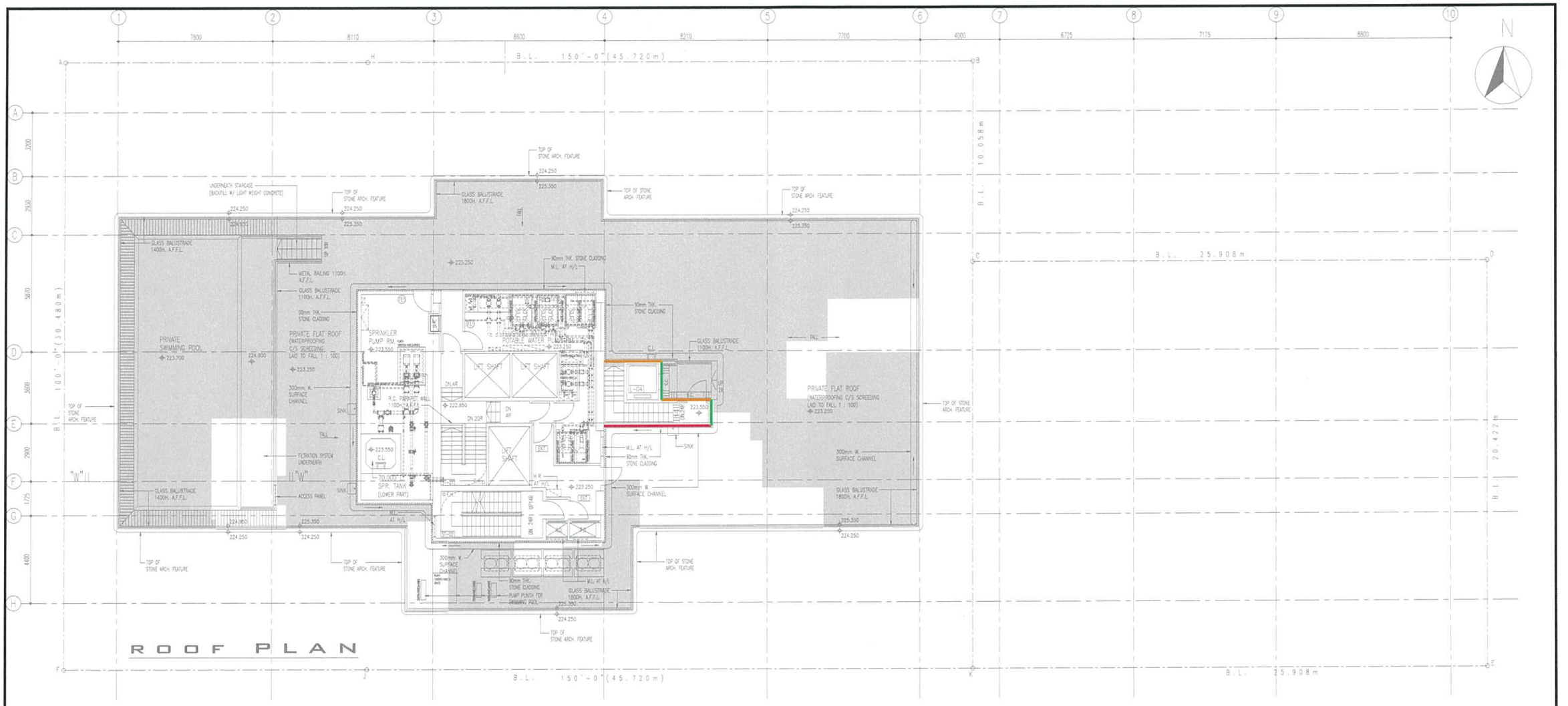
DRAWING NO.: CCE 750/RTTV-07	REVISION: -



EXTERNAL WALLS TO BE INCLUDED IN RTTV CALCULATION

- NORTH ELEVATION
- EAST ELEVATION
- SOUTH ELEVATION
- WEST ELEVATION
- ROOF

RTTV DRAWING FOR REFERENCE

Revisions	Description	Certified by

ARCHITECT:

ARCHIPLUS INTERNATIONAL (HK) LIMITED

CONSULTANT :

CONSOLIDATED CONSULTING ENGINEERS LTD.

PROJECT

PROPOSED REDEVELOPMENT AT 23 PO SHAN ROAD, HONG KONG

DRAWING TITLE

ROOF PLAN

NOTES

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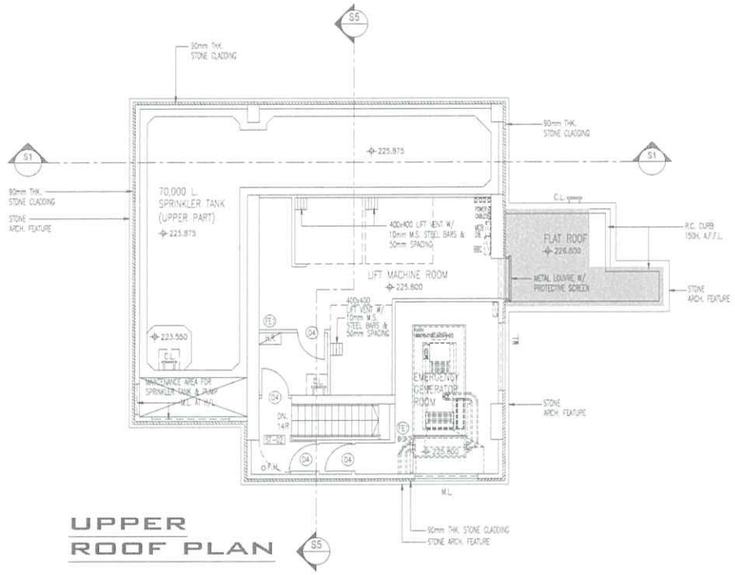
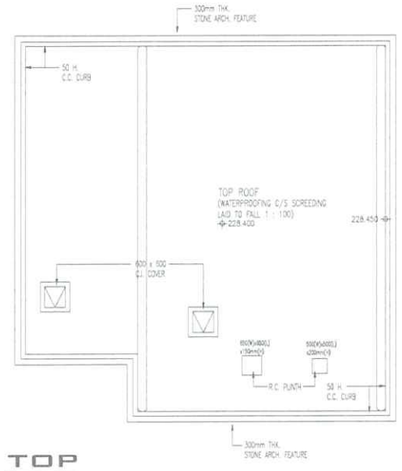
CHECKED BY:	
DRAWING NO.: CCE 750/RTTV-08	REVISION: -



UPPER
ROOF PLAN



TOP
ROOF PLN

EXTERNAL WALLS TO BE INCLUDED IN RTTV CALCULATION

- NORTH ELEVATION
- EAST ELEVATION
- SOUTH ELEVATION
- WEST ELEVATION
- ROOF

RTTV DRAWING FOR REFERENCE

Revisions	Description	Certified by

ARCHITECT:

ARCHIPLUS INTERNATIONAL (HK) LIMITED

CONSULTANT :

CONSOLIDATED CONSULTING ENGINEERS LTD.

PROJECT
PROPOSED REDEVELOPMENT AT 23 PO SHAN ROAD, HONG KONG

DRAWING TITLE
UPPER ROOF & TOP ROOF PLAN

NOTES
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DRAWING NO.: CCE 750/RTTV-09	REVISION: -