CONSTRUCTION INDUSTRY COUNCIL
建造業議會

建築資訊化模型

為呈交建築圖則(階段一)

顧問研究報告

二零一七年二月

建造業議會為呈交建築圖則而準備的建築資訊化模型準則(階段一)

二零一七年二月

顧問:
Advanced Construction Information Development Ltd.

免責聲明

查詢

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目錄

縮寫釋義

縮寫釋義

縮寫	釋義
CIC	建造業議會
BD	屋宇署
LandsD	地政總署
AP	認可人士
RSE	註冊結構工程師
RGE	註冊岩土工程師
BCA	建築和建設局
BIM	建築資訊化模型
CAD	電腦輔助繪圖
CSWP	CAD 標準作業運作
IFC	產業基礎類別 (建築工程數據交換標準)
GBP	建築圖則
PNAP	《認可人士、註冊結構工程師及註冊岩土工程師作業備考》
G.F.A.	總樓面面積
U.F.A.	實用樓面空間
S.C.	上蓋面積
O.S.	空地
P.R.	地積比率
FS Code 2011	《**2011** 年建築物消防安全守則》

本出版對有關要求以「必需」這輔助動詞表示在句子中; 對有關建議則以「應該」這輔助動詞表示在句子中。使用「可以」這輔助動詞即表示其在技術上是可能; 而使用「可能」這一輔助動詞則表示同意。

以粗體及斜體字顯示特定的 Autodesk Revit 專用術語。

其他建築資訊化模型平台可以使用不同術語。

1 序言

使用建築資訊模型 (BIM) 的優點

建築資訊模型技術所產生的三維立體模型可用於檢查行業規則的遵從與否(或可能用作批核)。目前香港作業模式著重在書面格式進行法定及法律問題。本研究將著重於使用建築資訊模型技術來製作圖紙及計算方式以呈交法定圖則用途。

提倡建築資訊模型技術

為提倡建築資訊模型技術在建築工程項目上 , 建造業議會的委員會在環境、創新和技術方面設定工作群組，以界定如何在香港的建築業實施建築資訊模型的藍圖。

經過工作群組成員之間一系列的會議和討論後，確認了以下兩個主要工作:

a) 為那些想擴大使用建築資訊模型的用者，去策劃一組標準或規格以助建築資訊模型在建築項目的使用。

b) 提倡更多活動以針對那些項目相關人士可能不熟悉建築資訊模型的用法與優點、或是旁觀者或初學者剛開始採用建築資訊模型。

建造業議會已決定委託一間顧問研究以準備建築資訊模型呈交建築圖則建築署的標準, 其設定原則和方法可作為其他法定機構及相關部門日後所遵循。該建築資訊模型呈交建築圖則的技術，更可套用至其他相關部門。

Advanced Construction Information Development Ltd. (A.C.I.D.) 所扮演的角色

Advanced Construction Information Development Ltd.已獲委任為顧問以準備建築資訊模型的標準，在法定機構、學院或其他主要的私人公司之間組織論壇，並確保整個過程將會被完全理解並被同業採用。

軟體平台

這份報告並未強制規定任何特定的建築資訊模型平台。 通用或開放原始碼產業基礎類別 IFC 術語貫穿 Autodesk's Revit， 除了在插圖、圖表與工作流程示範外。若使用其他建築資訊模型平台以達到相同結果 ，讀者應要求其特定軟體商以取得協助。

2 背景

目標

據了解建築資訊模型技術所產生三維模型可用於檢查行業規則的遵從與否(或可能用作批核)、目前香港作業模式著重在書面格式進行法定及法律問題； 然而， 本研究將著重於使用 建築資訊模型技術來製作紙圖及計算方式以達呈交法定圖則的用途。

本諮詢顧問的目標 (階段一) 是要準備一套標準以利用建築資訊模型的優勢使簡化新發展呈交建築圖則的程序，而不是提交改動及加建工程圖則到相關法定機構及相關部門。

此 (階段一) 的目標並非要更換或取替現有法定機構及相關部門的作業模式， 卻能在正式呈交建築圖則前，透過建築資訊模型技術提供另一種快速的方法來協助業界作質量檢查。它旨在減少人為所需時間的品質檢查，並避免因電腦計算錯誤而招致拒絕批則 (如果有的話)。

本文所提供的資訊在本報告只僅供參考。 讀者如要開發計算解決方案以符合相關法令規定應向認可人士或相關專業人員查詢。

必須注意的是，本報告並不意旨亦不應被視為全面地涵蓋、重新定義、解釋或取替任何法例或規定。本報告的目的是要澄清當透過電子方式呈交建築圖則給相關部門時，建築資訊模型所擬訂的標準工具與格式以展示某些資訊。本報告中列舉法例規定的任何嘗試均是直接摘錄或總結相關建築物條例及附屬法規、實務、 及作業備考等 ，應被視為非全面的。

2.1 成果

時間範圍與項目成果概述如下：

CIC 為提交建築圖則所準備的建築資訊模型標準			
作業	項目成果	合約生效後的月份	作業佔整體項目的百份比
(I) 諮詢服務進度和研究報告	初步報告 進度報告 總結報告	兩星期 每月一次 第八個月	40%
(II) 進行各項目相關人士參與論壇	項目相關人士參與論壇	第一個月	20%
(III) 提供最新規範	草擬規範 最終規範 更新以符合規範	第四個月 第六個月 在接受最終規範的 6 個月	30%
(IV) 提供訓練講師訓練課程與技術簡介	技術訓練	第七個月	10%
總共			100%

2.2 諮詢服務範圍

A.C.I.D.需要檢閱在建築法例及其附屬法規的要求，由屋宇署、規劃署、地政總署所發行的相關實務與作業備考以擬訂標準來拓展計算機解決方案，這有助於提供半自動或自動 (較好) 檢查下列項目 :

a. **基本檢查相當於目前作業備考的標準**

- 檢查檔案中繪製真實大小；
- 檢查所有尺寸及區域中的真實數據；
- 檢查區域輸入有效的名稱 , 例ARC08240 – 非住用建築物。

b. **檢查總樓面面積 (即上蓋面積及地積比率)**

- 檢查住用建築物、非住用建築物的總樓面面積、非總樓面面積、上蓋面積及地積比率；
- 檢查住用建築物、非住用建築物的總樓面面積、非總樓面面積、上蓋面積及地積比率, 考慮到額外總樓面面積及上蓋面；
- 根據屋宇署、規劃署、地政總署的要求提供獨立檢查。

c. **檢查逃生路徑**

- 檢查實用樓面空間；
- 檢查逃生路徑及逃生門提供的數量與寬度；
- 根據人數，檢查所需提供的逃生路徑及逃生門的數量與寬度。

d. **檢查衛生設備規定**

- 檢查實用樓面空間；
- 檢查衛生設備規定的提供；
- 檢查男女數量所需提供的衛生設備。

e. **檢查防火隔室和防火建築**

- 檢查實際的防火隔室區及容量；
- 檢查要求的防火規定值和結構。

3 呈交法定圖則

當每個元素設定目標時， 建築資訊模型是一個具備明確目的的主導工具。以下部分將說明其工作流程與邏以瞭解呈交建築圖則時每個項目怎樣可建立在建築資訊模型技術的流程中。

3.1 建築資訊模型工作流程

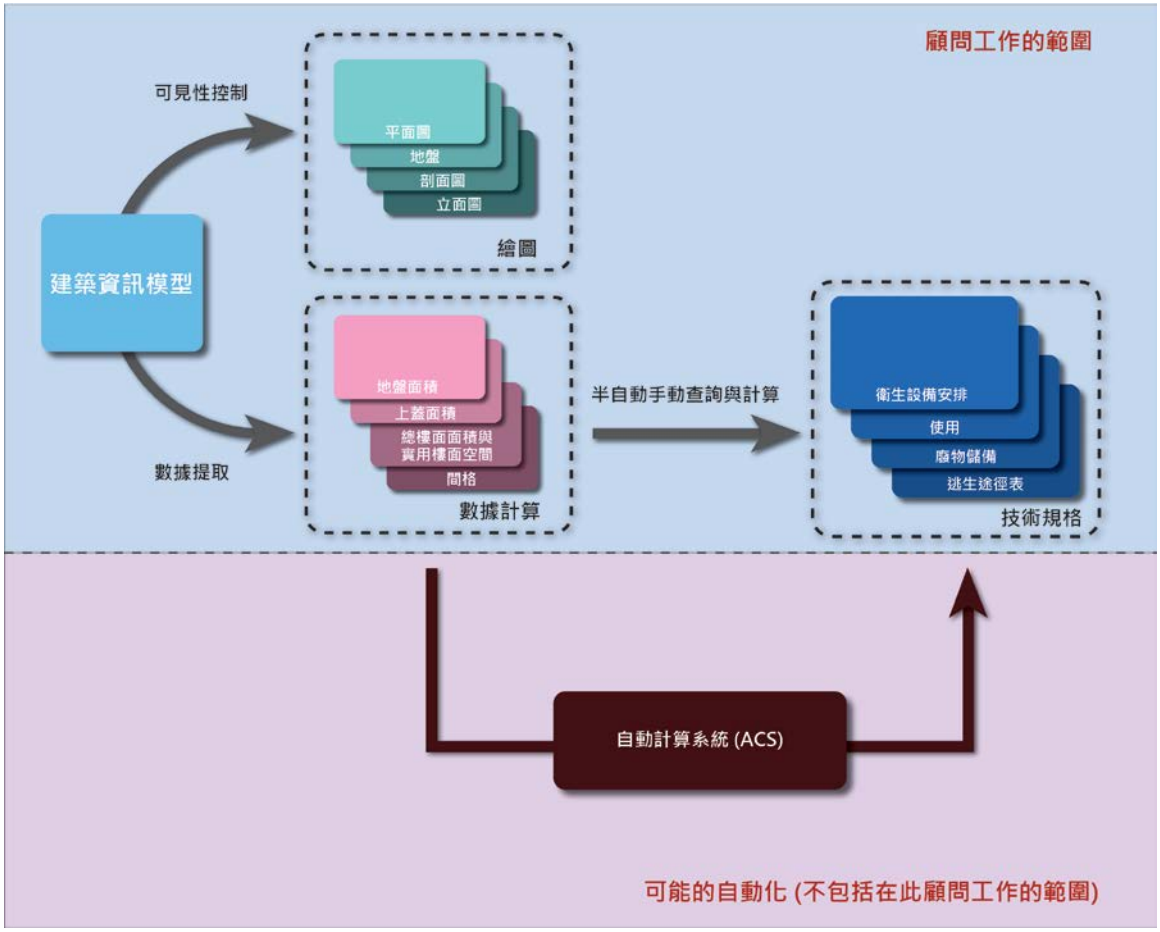


圖 3-1. 建築圖則的工作流程與構成要素

建築資訊模型工作流程基本上分成 3 個部份：

1. 製圖－在圖紙設定特定檢視如平面圖、 剖面圖、立面圖等。
2. 資料擷取 – 建立區域平面圖與房間作計算數值之用。
3. 計算 – 按計劃來計算技術規格， 例如衛生設備規定、入住率、逃生方法需求等。

3.2 繪製圖形

一個整合的建築資訊模型必須由不同的顧問合作，例如建築、結構、機械等。他們必須通過會議溝通、合作和調整他們自己各自的建築資訊模型。

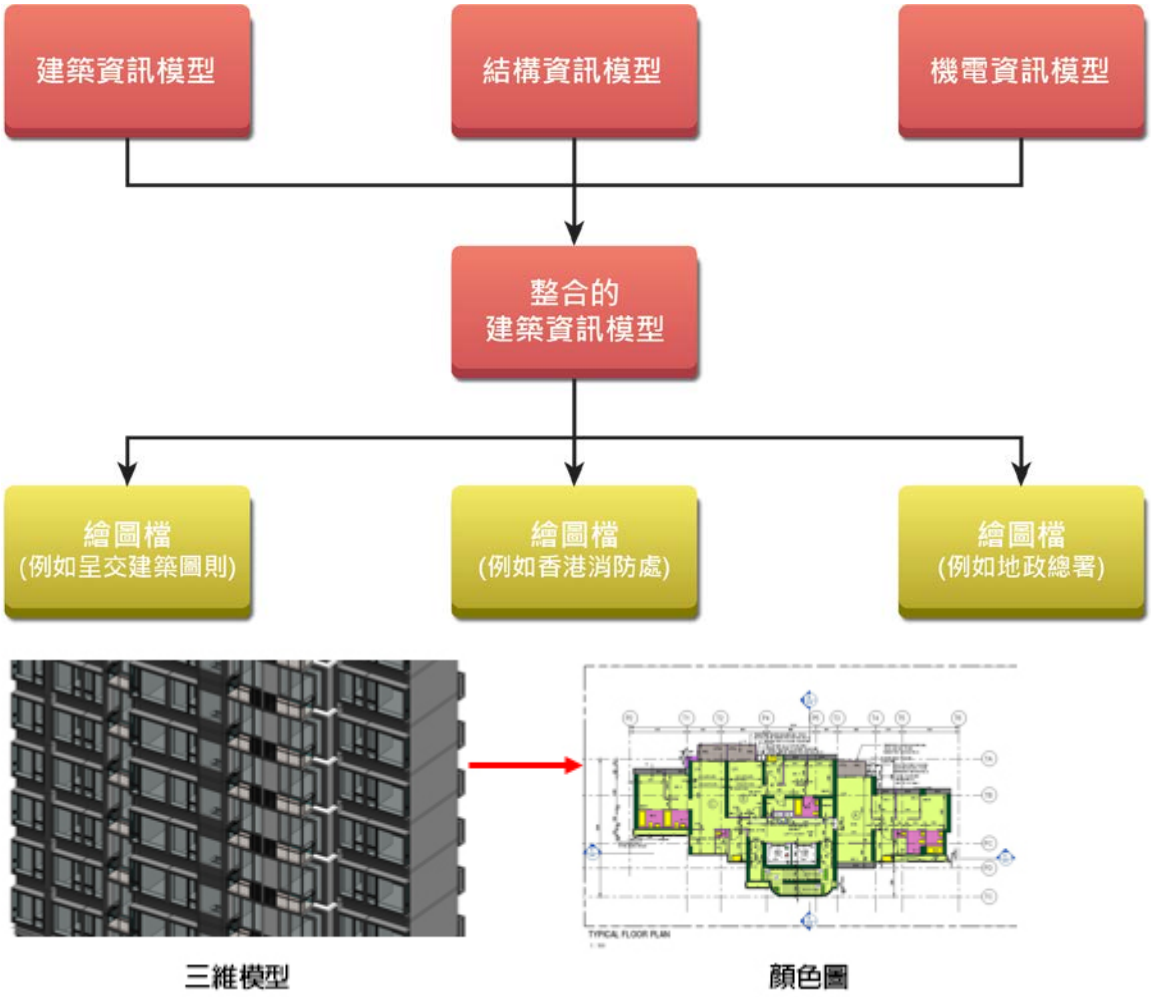


圖 3-2. 多個簡報 適用於單一整合的建築資訊模型

一個整合的建築資訊模型可以生產各式各樣的分析結果，例如呈交政府圖則、日照分析、岩土分析、地理分析及能量分析等。 作為良好的作業，建築資訊模型產業製作是將模型檔案和圖檔分開呈交，因為大部分的建築資訊模型軟體有其限制檔案大小、及應參閱其軟體商官方建議。 例如 Revit 限制為 200 Mb，每項呈交應建立獨立繪圖檔中。還應注意建築資訊模型是實作程序而非最終產品。不過，大家通常有一種誤解，認為建築資訊模型需要在生產任何成果前必須 100%完整。

在呈交建築圖則程序中，對顏色標示有一定要求。在《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADM-9 中提到每個圖則呈交以進行審核時，必須用顏色清楚區分現有工作與所建議新增的工作和所有從其他部份建議新增的工作。為對顏色使用的一貫性，應該採取首選的顏色如附錄 A 所顯示。為對已獲批核的工作作出修正，這修正應該上色以便他們可以從已獲批核的工程中被識別。

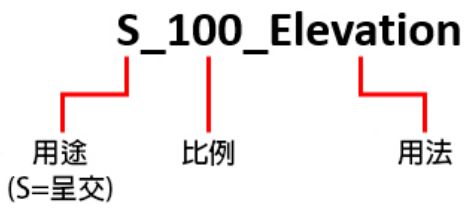
因此， 建築資訊模型將會連結到相關呈交藍圖檔案中。這些資料可以顯示在每個檢視畫面和圖中。在附錄 A 的 RGB 系統，是提供圖則中所需顏色的色表。

3.2.1 檢視設定

通過在建築資訊模型建立檢視範本，它將允許我們設置不同顏色、線重粗細，檢視範圍、特定的內容在板料將顯示或隱藏等等，以滿足不同繪圖之用，如平面圖、剖面圖、立面圖、緊急車輛通道圖、總樓面面積圖、實用樓面空間圖。

以有系統的命名方式來檢視範本，將會更有效率提供我們簡易存取各種不同的檢視 。

命名系統範例



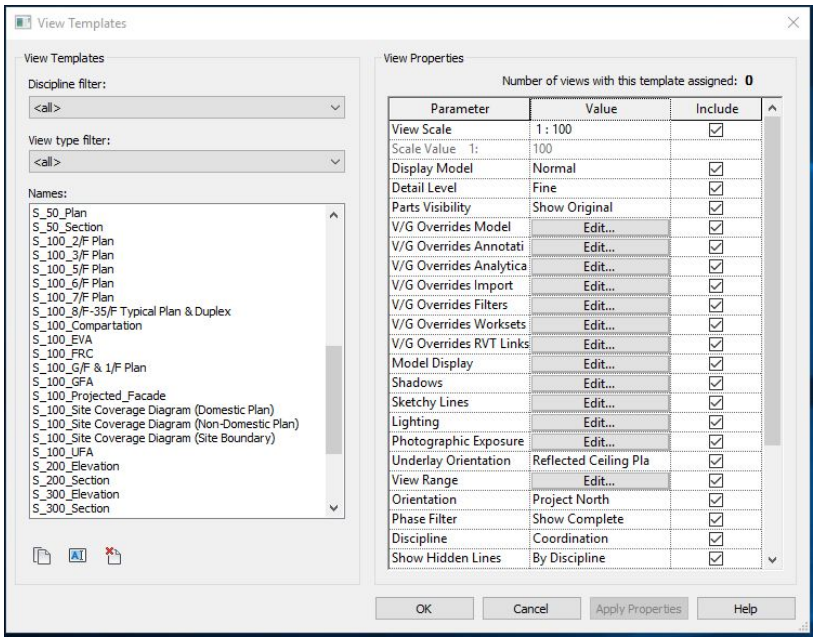


圖 3-3. 「檢視與設定」工具箱面版

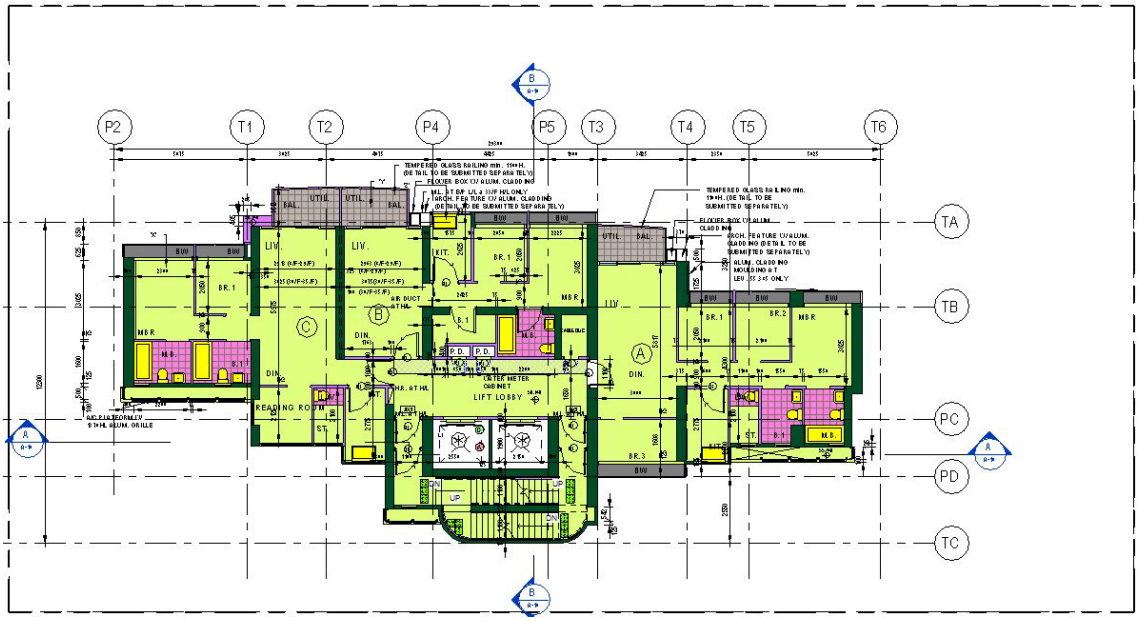


圖 3-4. 典型層平面圖視窗

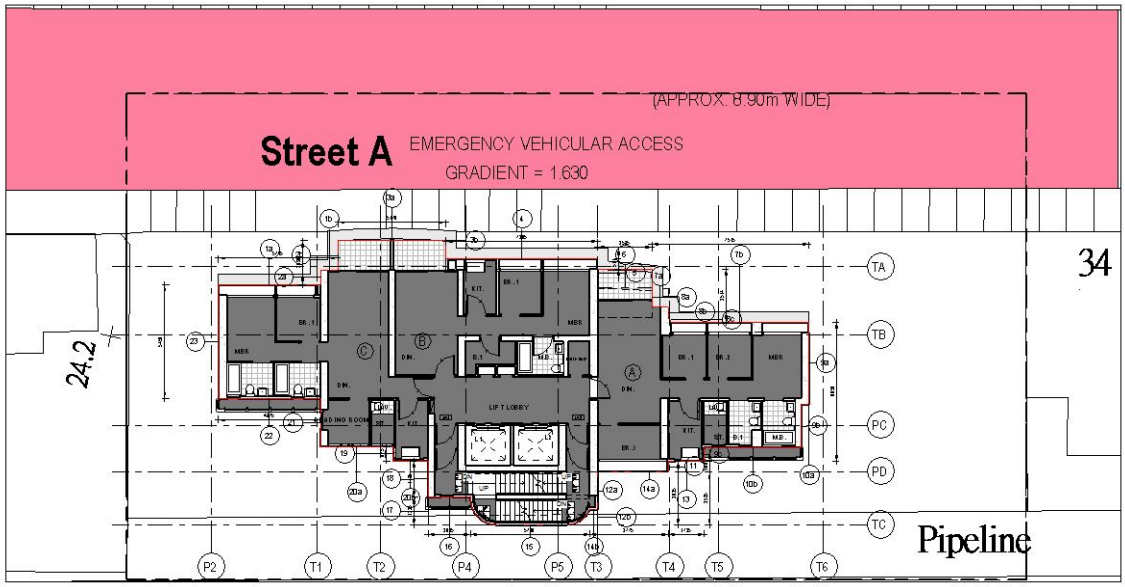


圖 3-5. 緊急車輛通道圖視窗

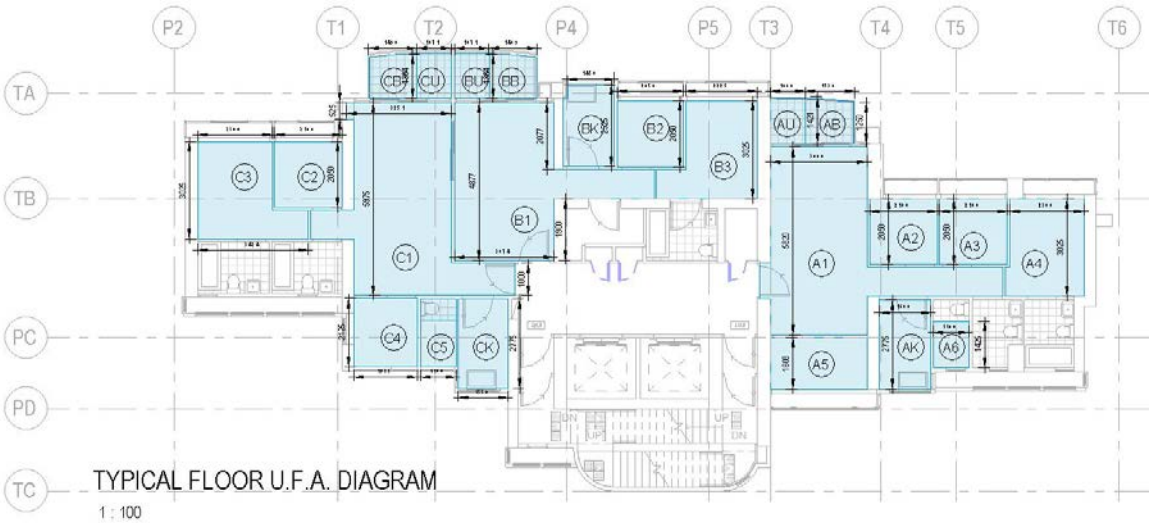


圖 3-6. 實用樓面空間圖視窗

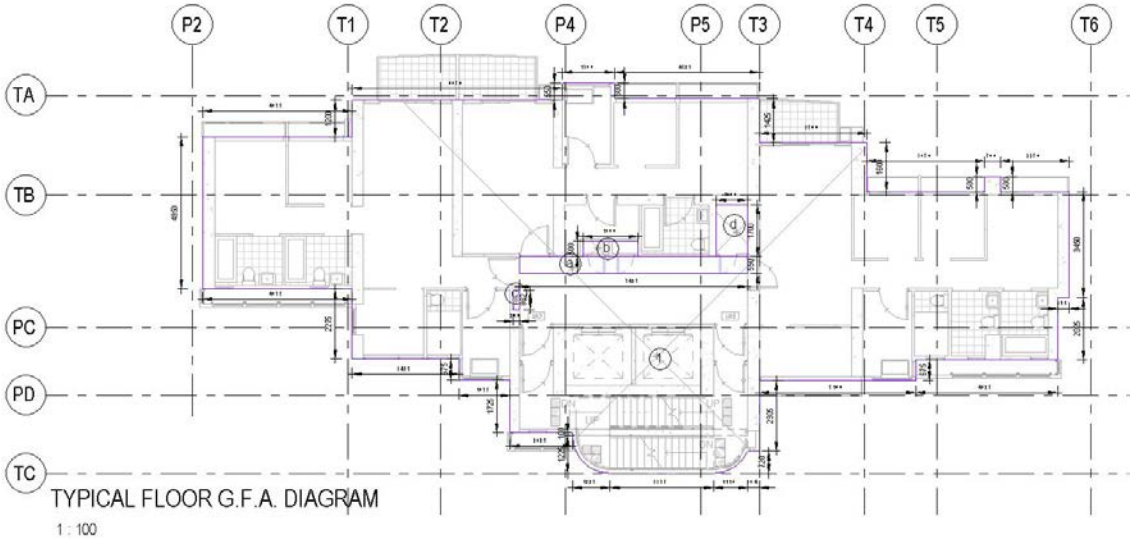


圖 3-7. 總樓面面積圖視窗

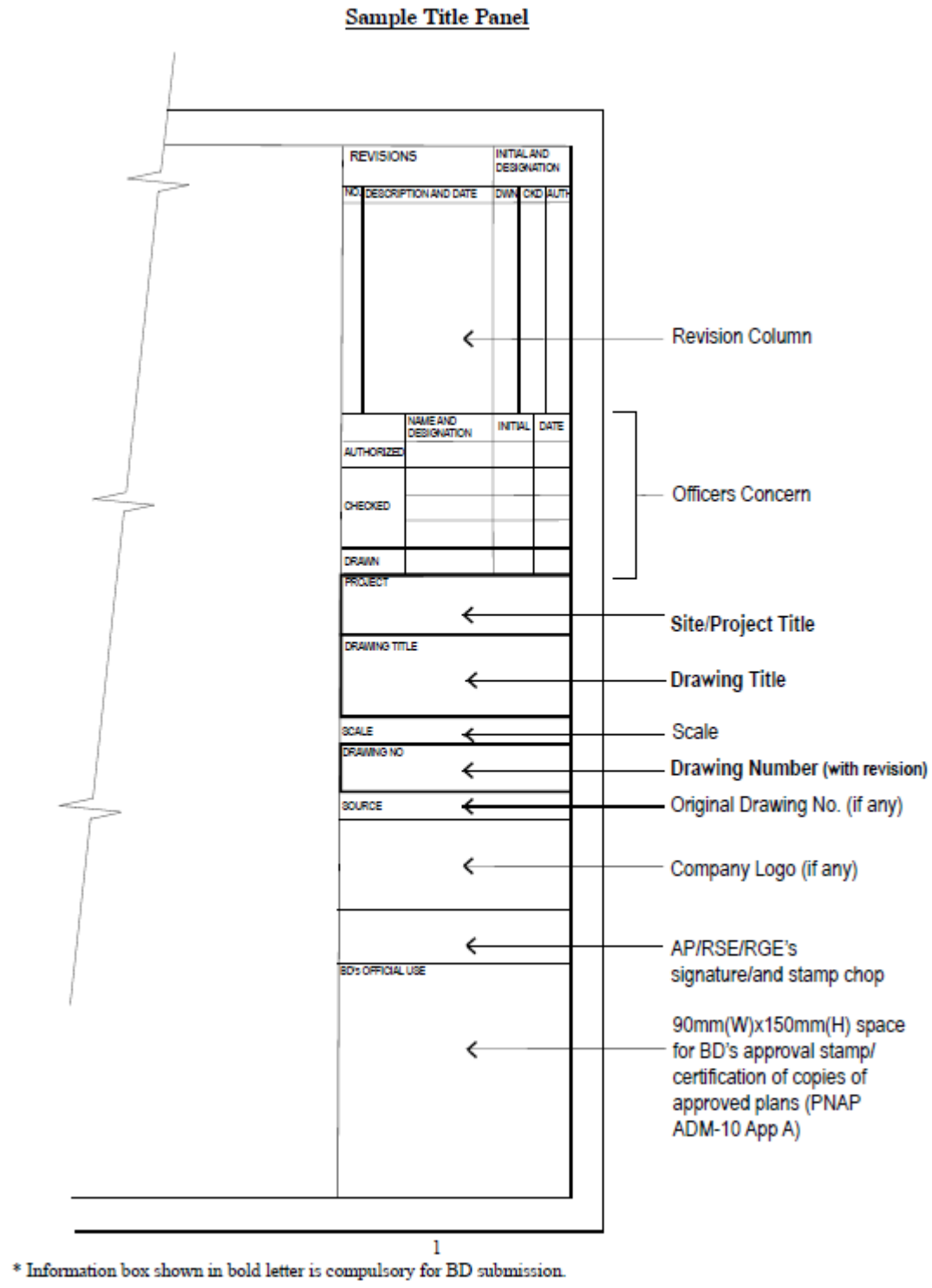


圖 3-8. 從《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADM-19 所示的工程圖明細表範例。 資訊也可擷取自模型及以工程圖明細表格式顯示

附錄 A
（《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADM-9）

理想顏色

材料／描述	理想顏色	三原色系統代碼[1]	相等的 AutoCAD 顏色索引代碼[2]
碎石底層或乾填	淺棕色	204、178、102	43
磚	橙紅色	255、63、0	20
混凝土樓板（較淺色）	青綠色	223、255、127	61
混凝土（素混凝土或鋼筋混凝土）	深綠色	0、76、38	118
實心混凝土砌塊	電藍色	127、223、255	141
空心混凝土砌塊	紫色	191、127、255	191
輕質間隔（如石膏板）	杏黃色	255、191、127	31
粉刷批盪或水泥面層	草綠色	204、204、102	53
不滲透／不吸水地板或牆身	螢光粉紅	255、127、223	221
玻璃	電藍色	127、255、255	131
木	棕色	153、133、76	45
金屬或鋼	淡紫色	223、127、255	201
石材飾面	深灰色	173、173、173	253
衞生潔具	黃色	255、255、0	50

[1] 顏色由紅、綠、藍三種顏色混合而成。
[2] 出圖過網的設定應為100（即全顏色強度）。

1

圖 3-9. 《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADM -9 呈交建築圖則時所需首選的顏色可以預先在檢視設定中設定

3.3 資料擷取

3.3.1 在繪製表建立區域圖

當區域圖已準備就緒，就只剩下最後一個步驟以生產一張正確的呈交圖則。區域圖應該集結在一起，並將其拖曳至附有室內區域計算面積的繪製表中。 一組圖則可以根據其圖則的數字來命名及審查 。

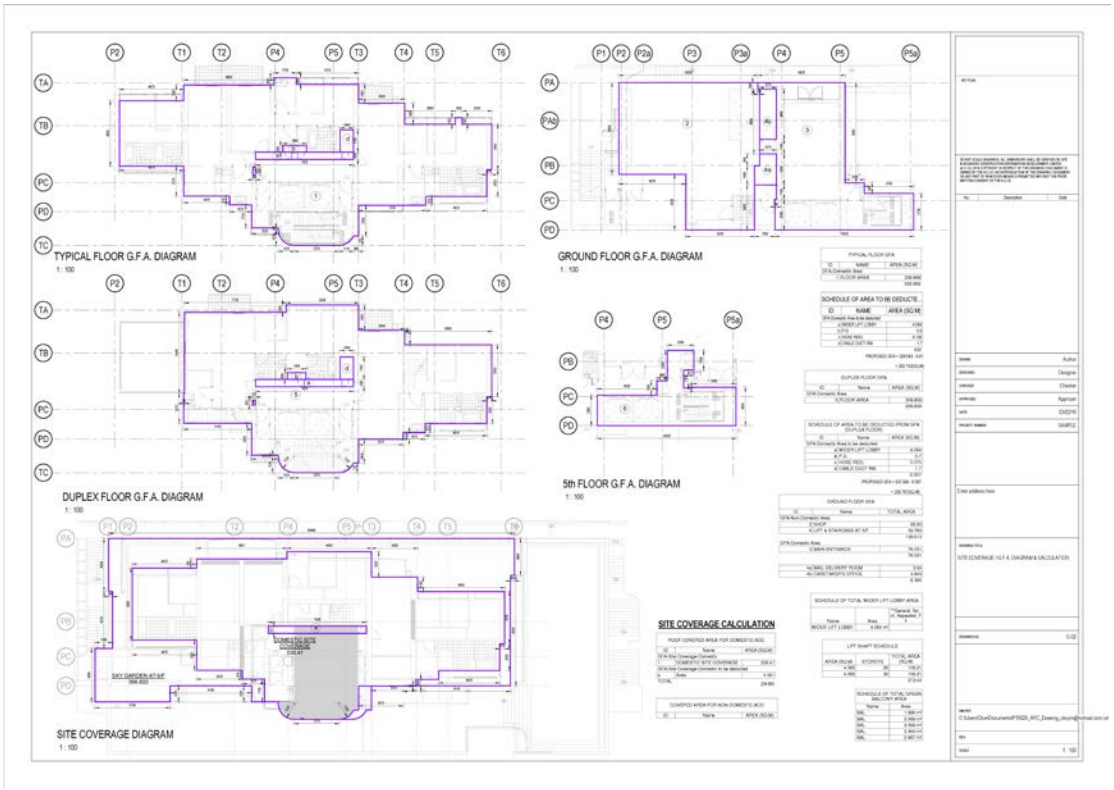


圖 3-10. 典型區域圖

3.4 運算邏輯的計算

在呈交建築圖則中，所有計算基本上根據兩個元素 :

1. 區域
2. 區域的分類

那些有關的區域，如包括 :

1 地盤面積
2 總樓面面積
3 實用樓面空間
4 上蓋面積

在屋宇署《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADM-19 中強調區域的要求並定義為計算的目的。 它要求有關的區域以輪廓顯示、區域分類、 識別碼和尺寸。

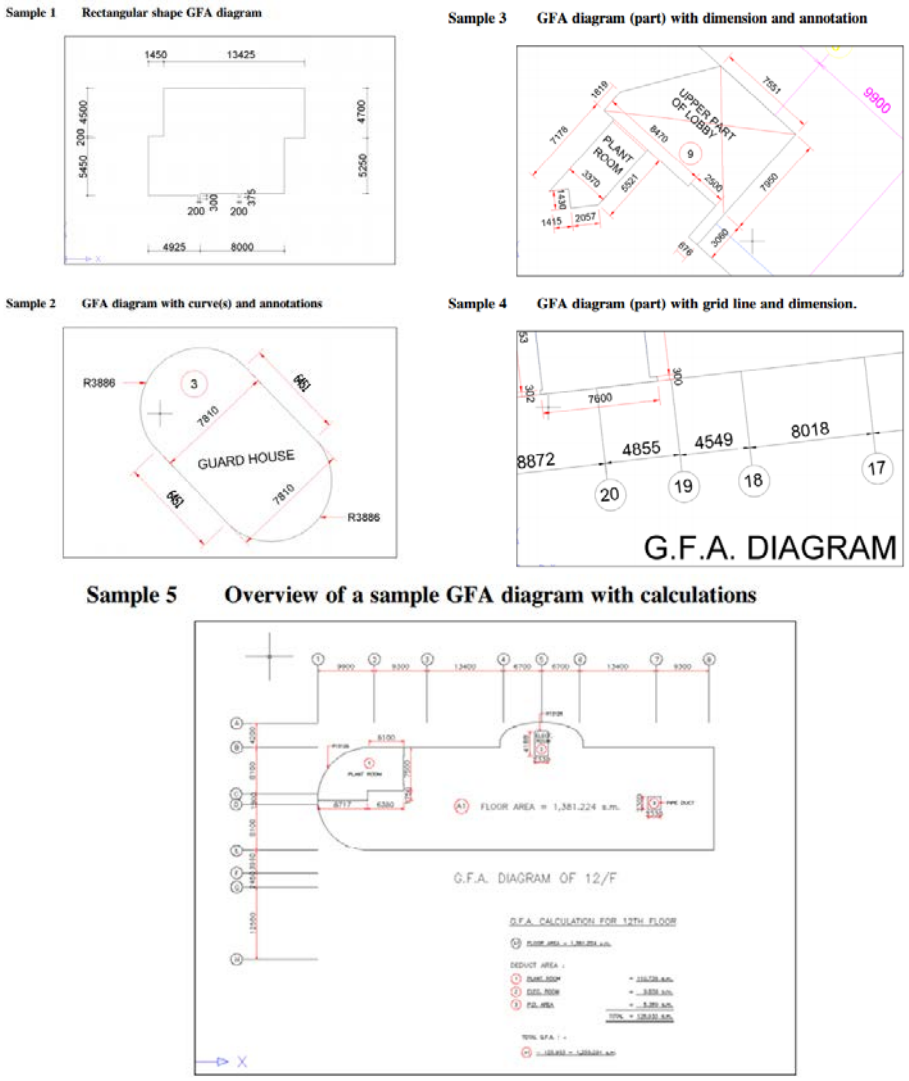


圖 3-11. 在《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADM -19 中區域圖尺寸樣式的例子

Code	Description	Remarks
*ARC*08240	Non-domestic area Layer	For outline of non-domestic GFA layer.
*ARC*08244	Non-domestic area to be deducted from area calculations	For non-domestic area to be deducted from the outline of non-domestic area layers under the Buildings Ordinance.
*ARC*08246	Non-domestic area to be deducted from area calculations	For non-domestic area to be deducted from the outline of non-domestic area layers under the Planning Department requirements.
*ARC*08250	Domestic area Layer	For outline of domestic GFA layer.
*ARC*08254	Domestic area to be deducted from area calculations	For domestic area to be deducted from the outline of domestic area layers under the Buildings Ordinance.

圖 3-12. 識別碼 (工程電腦輔助繪圖標準公約 CSWP) 根據《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADM-19 所需的區域圖例子

3.4.1 根據作業備考的基本檢查

圖 3-13. 屋宇署當前對電子呈交圖則的 4 個基本檢查

屋宇署對以工程電腦輔助繪圖軟件所呈交圖則的根本性檢查可基本上分為 4 個部份：

1. 檢查計算單位如果它是以公釐為單位。

2. 檢查尺寸如果它們是真實或是手動輸入數據。

3. 檢查所有區域圖層皆以閉合多段線繪製。

4. 檢查是否有不重疊區域製作工具並避免重複計算某一區域多次的圖檔。

以建築資訊模型呈交圖則：

1. 該軟體資料已經預先設定繪圖單位為公釐。

2. 該軟體偵測到輸入數字的數值時，尺寸無法以手動方式修改 。

3. 為了建立區域圖或房間以在該軟體產生區域圖，這「區域圖」必須是閉合區域界綫和「房間」已被預先設定為閉合物件。

4. 該軟體不允許區域圖重疊在單一檢視中。

因此，我們就可以避免那些程序以檢查單位、真實尺寸、閉合多段線條與重疊的區域圖。

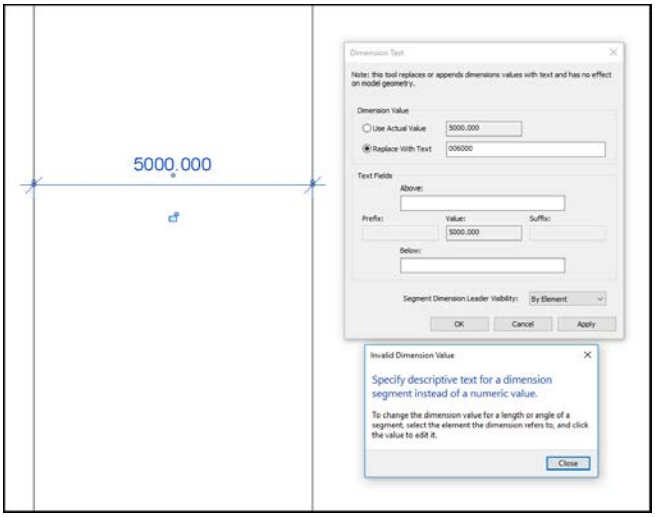


圖 3-14. 當 Autodesk Revit 軟體偵測到輸入數字時，尺寸無法以手動方式修改

3.4.2 檢查上蓋面積及地積比率

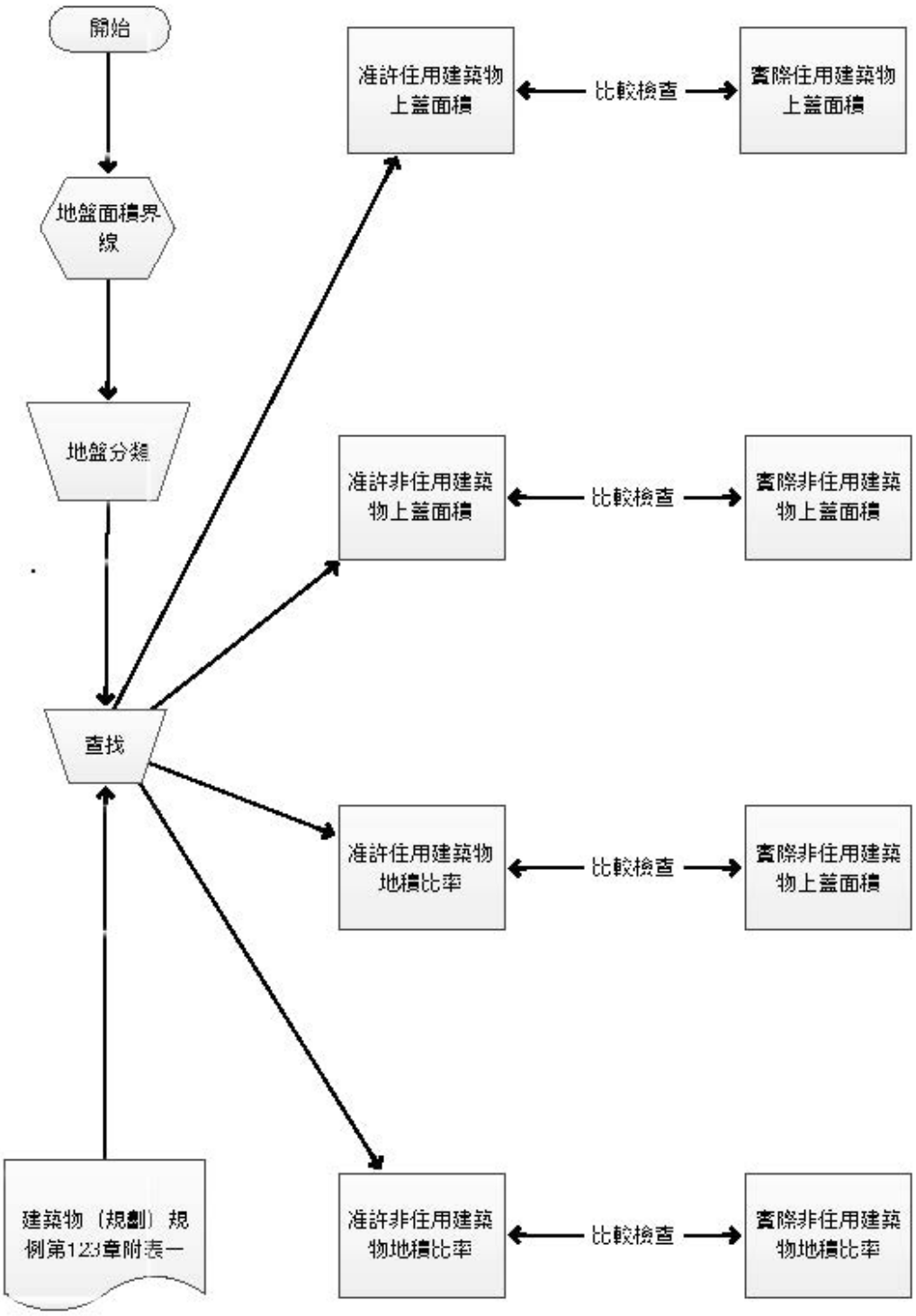


圖 3-15. 流程圖為上蓋面積及地積比率衍生出的相關資訊

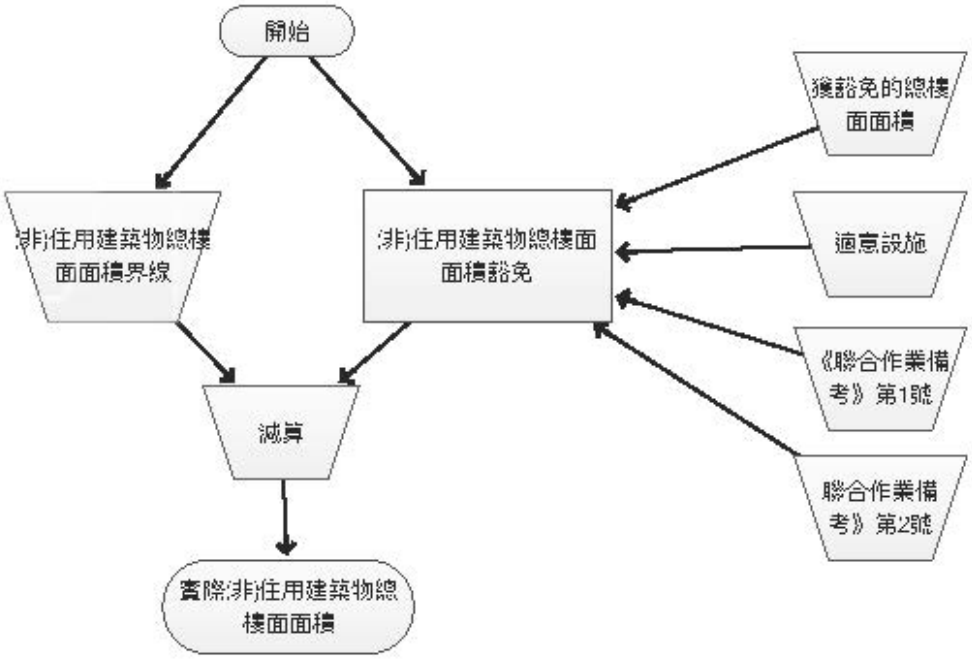


圖 3-16. 流程圖為典型的建築專案衍生出總樓面面積 (總樓面面積寬免表摘取自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》 ADM - 2)

上蓋面積及地積比率計算

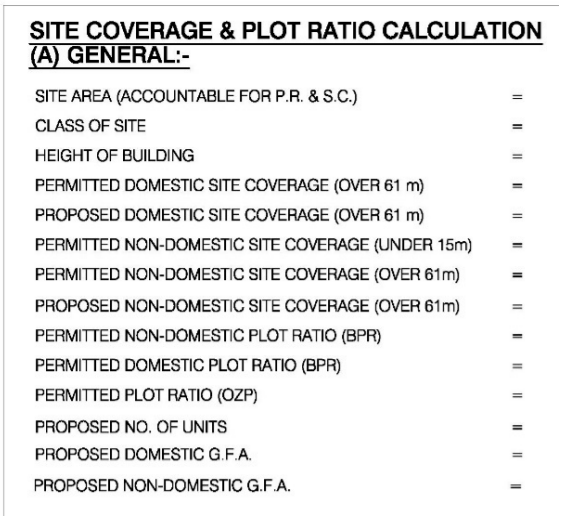
發展密度測量單位通常為建築物體積、量化為上蓋面積及地積比率。

上蓋面積指地盤被建於其上的建築物所覆蓋的面積，而就綜合用途建築物的一部分而言，指建有該建築物的地盤被該建築物的該部分所覆蓋的面積當關於一個綜合大廈時的部分使用，意味站點區域大廈被架設由大廈的那個部分包括站點的區域。 (參見《建築物（規劃）規例》第 123F 章第 2 條)

建築物的地積比率為建築物總樓面面積除以建有該建築物的地盤佔有面積所得的商數。(參見《建築物（規劃）規例》第 123F 章第 21 條)

在地盤上興建的建築物的准許上蓋面積及地積比率, 應根據 地盤的類別來釐定，而地盤分類須視乎該地盤緊連闊度不少於 4.5 米 的街道數目而定。(參見屋宇署《認可人士及註冊結構工程師作業備考 》APP-124)

作為一般實踐，所獲得的准許和實際上蓋面積和地積比率，應以一組形式計算，如以下所示的範例：



SITE COVERAGE & PLOT RATIO CALCULATION
(A) GENERAL:-

SITE AREA (ACCOUNTABLE FOR P.R. & S.C.)	=
CLASS OF SITE	=
HEIGHT OF BUILDING	=
PERMITTED DOMESTIC SITE COVERAGE (OVER 61 m)	=
PROPOSED DOMESTIC SITE COVERAGE (OVER 61 m)	=
PERMITTED NON-DOMESTIC SITE COVERAGE (UNDER 15m)	=
PERMITTED NON-DOMESTIC SITE COVERAGE (OVER 61m)	=
PROPOSED NON-DOMESTIC SITE COVERAGE (OVER 61m)	=
PERMITTED NON-DOMESTIC PLOT RATIO (BPR)	=
PERMITTED DOMESTIC PLOT RATIO (BPR)	=
PERMITTED PLOT RATIO (OZP)	=
PROPOSED NO. OF UNITS	=
PROPOSED DOMESTIC G.F.A.	=
PROPOSED NON-DOMESTIC G.F.A.	=

圖 3-17. 簡報格式從《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADV-33 所示的範例

上述流程圖所衍生出以下領域相關資訊的邏輯（例如規定及相關專案資訊），說明如下：

地盤面積（計入總樓面面積及上蓋面積內）

- 在地盤劃定邊界作為地積比率和上蓋面積的計算。
- 在模型提取面積

准許數據

1. 地盤分類

- 由認可人士釐定 “甲類地盤”、“乙類地盤” 或 “丙類地盤”

2. 准許住用建築物上蓋面積 (61 米以上)

- 於《建築物（規劃）規例》第 123F 章附表一中以地盤分類尋找

3. 准許非住用建築物上蓋面積 (61 米以上)

- 於《建築物（規劃）規例》第 123F 章附表一中以地盤分類尋找

4. 准許非住用建築物地積比率 (BPR)

- 於《建築物（規劃）規例》第 123F 章附表一中以地盤分類尋找

5. 准許住用建築物地積比率 (BPR)

- 於《建築物（規劃）規例》第 123F 章附表一中以地盤分類尋找

6. 准許建築物地積比率 (OZP)

- 由認可人士釐定，一般於相關法定分區計劃大綱圖尋找

實際供應數據

1. 實際住用總建築樓面面積 (同時適用於實際非住用總建築樓面面積)

- 衍生自實際住用建築總樓面面積的區域圖 - 總住用樓面面積豁免。 每一個都有它自己的分組計算。
    - 以「區域」劃分住用建築總樓面面積 (如被定義在 BS 1192-4:2014) 通常以各樓面劃分。
    - 以各樓面「區域」劃分總樓面面積豁免。總樓面面積豁免包括 4 個類別，分別是：不計算的總樓面面積、適意設施、《聯合作業備考》第 1 號及第 2 號。(總樓面面積豁免清單摘錄自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADM-2)

      總樓面面積豁免的 4 個類別可根據其本質而存在於「空間」、「區域」或「樓面」。

2. 實際住用建築物地積比率 (同時適用於實際非住用建築物地積比率)

- 衍生自實際住用建築樓面面積除以地盤面積

3. 檢查整體地積比率沒被超出

- 如果地盤包含住用建築和非住用建築物，則：

  實際住用建築物地積比率 <= (准許非住用建築物地積比率 - 實際非住用建築物地積比率) x 准許住用建築物地積比率 / 准許非住用建築物地積比率

4. 實際上蓋面積

- 劃定地盤上蓋界限並且減去豁免區域
- 衍生自地盤上蓋面積除以地盤面積

3.4.2.1 Autodesk Revit 為檢查總樓面面積的操作例子

通過建立適當的總樓面面積圖作計算 , 將會以幾個步驟來進行。 首先，我們要建立兩組區域圖 , 一組是總樓面面積輪廓圖；另一組是總樓面面積豁免圖。 其次，為提高區域的準確性，將已調較至半色調的樓面佈置圖放在底部作為顯示以後將被創造的區域的地點。認可人士要判斷哪一部份是總樓面面積輪廓；哪一部份是總樓面面積豁免。

在每一組區域圖中，建立其區域的輪廓。重疊兩個須計算入總樓面面積內的輪廓和總樓面面積豁免圖可以指出這兩個領域在同一畫面。

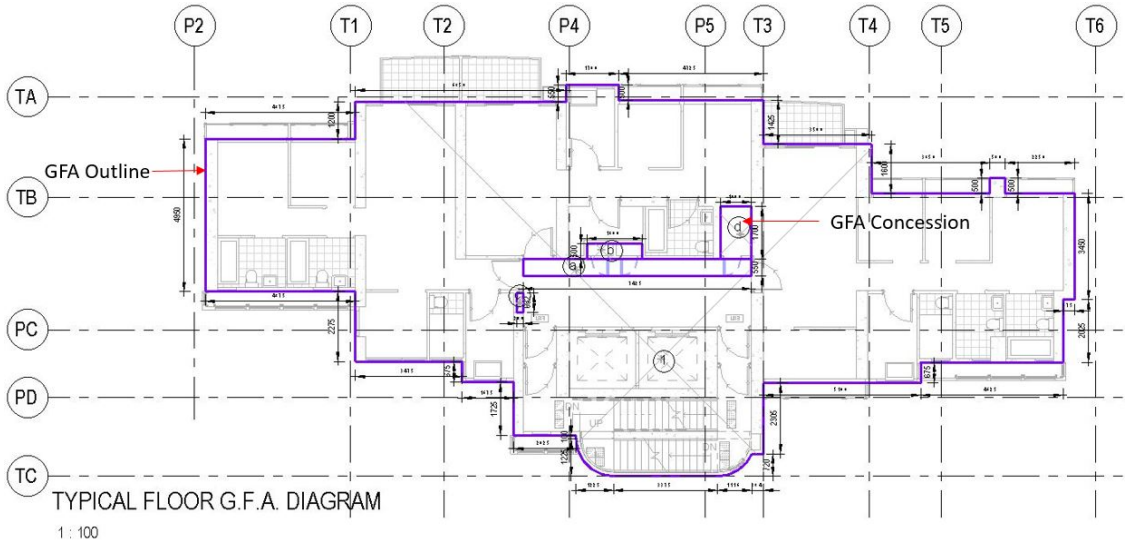


圖 3-18. 區域圖 - 重疊 2 個區域計劃在同一視窗

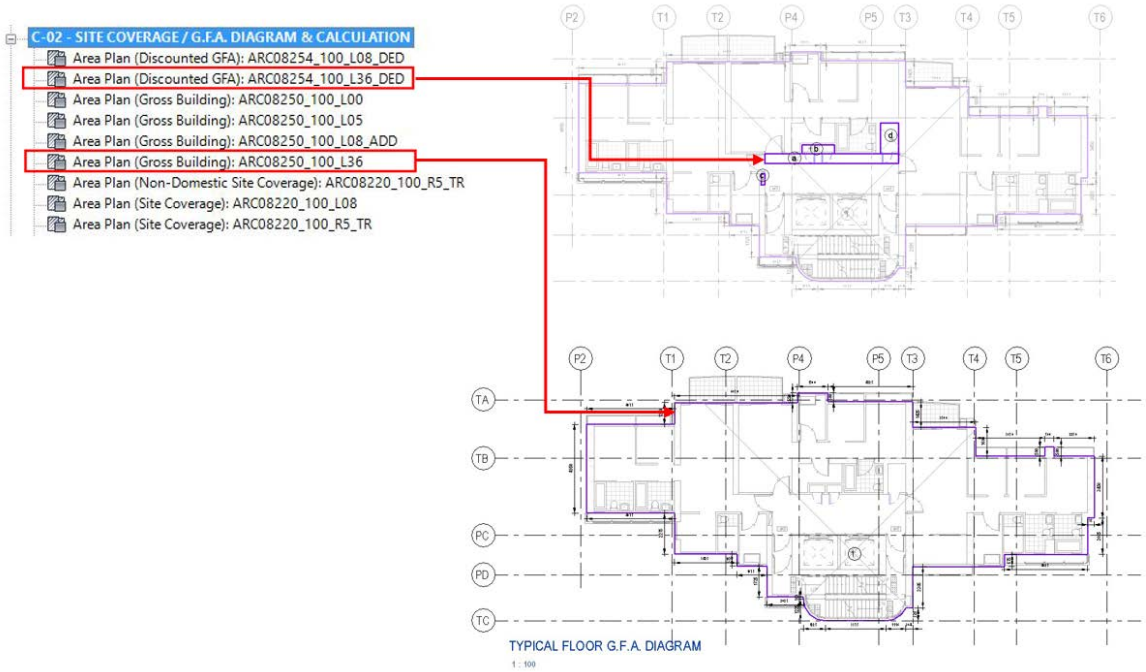


圖 3-19. 區域以輪廓顯示不同的工程電腦輔助繪圖標準公約 CSWP 的識別碼

3.4.3 檢查逃生途徑

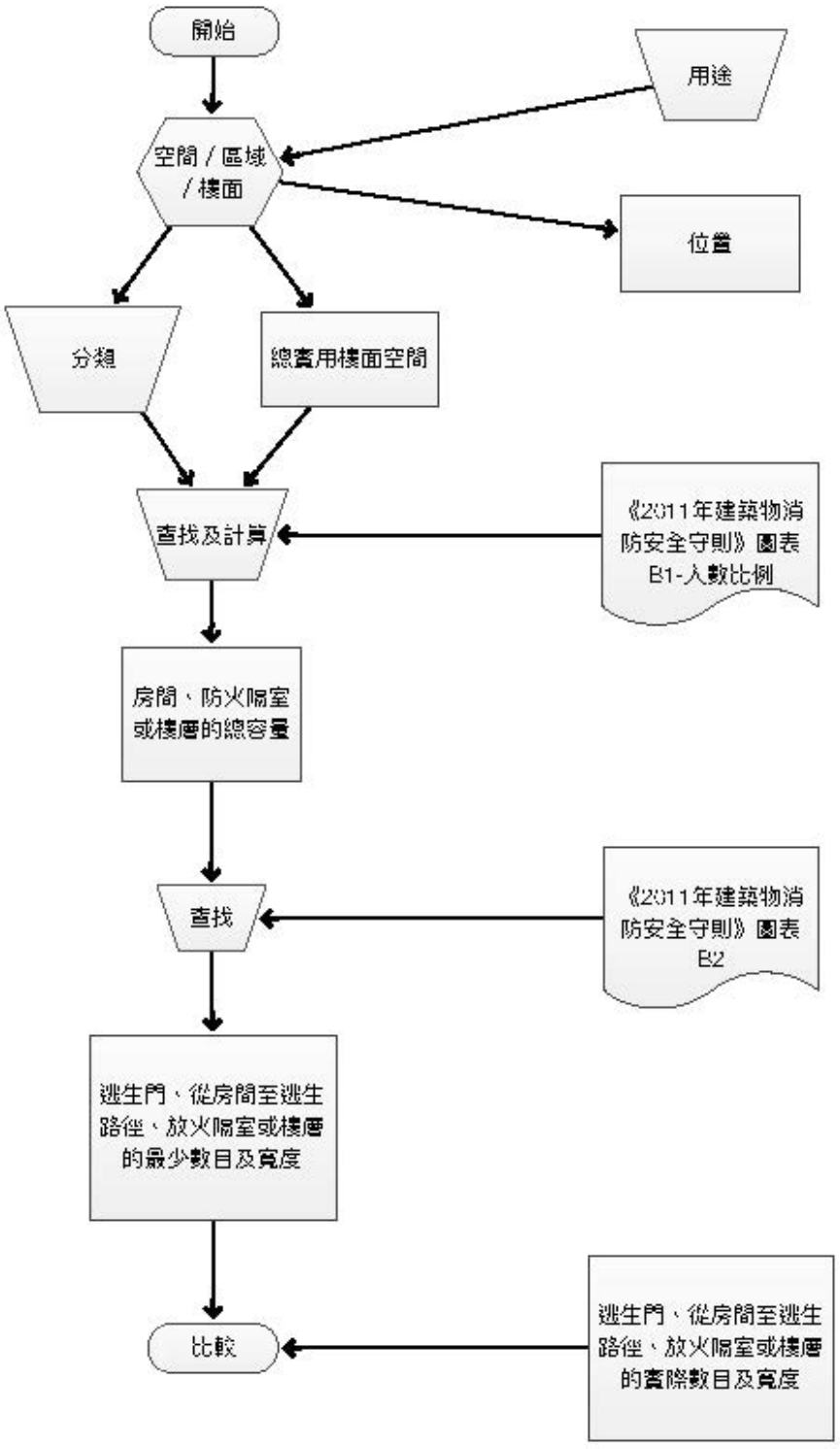


圖 3-20. 流程圖為逃生途徑衍生出的相關資訊

逃生門、從房間至逃生路徑、防火隔室或樓層的規定

每一棟建築物 , 除了那些建築物根據 B6.1 條允許只須提供一條走火梯的情況外，應該是可從每一樓層提供不小於 2 條逃生路徑或根據圖表 B2 所要求的更多。 每一條逃生路徑的寬度及所有逃生路徑的總寬度應該不低於圖表 B2 中根據佔有容量和逃生路徑的數量提供所顯示的寬度。在有關情況下:

(a) 這項規定只應適用於複式住宅的其中一層; 及

(b) 在兩個或多個逃生路徑 (圖表 B2 所要求的供應每一樓層) 有不同的寬度時，任何寬度在其群組超過最窄的逃生路徑的寬度 50 % 以上時，不應該包括在計算由圖表 B2 第 4 欄所要求的逃生路徑最低總寬度中。(參見《2011 年建築物消防安全守則》(在這一節下稱「2011 消防安全守則」 第 B8.1 條)

Table B2

Table B2: Minimum number and width of exit doors and exit routes from a room, fire compartment or storey

Occupant Capacity of room, fire compartment or storey (No. of persons)	Minimum No. of exit doors or exit routes	Minimum total width (in mm)		Minimum Width (in mm) of each	
		Exit doors	Exit routes	Exit door	Exit route
4- 30	1			750	1050
31-200	2	1750	2100	850	1050
201-300	2	2500	2500	1050	1050
301-500	2	3000	3000	1050	1050
501-750	3	4500	4500	1200	1200
751-1000	4	6000	6000	1200	1200
1001-1250	5	7500	7500	1350	1350
1251-1500	6	9000	9000	1350	1350
1501-1750	7	10500	10500	1500	1500
1751-2000	8	12000	12000	1500	1500
2001-2500	10	15000	15000	1500	1500
2501-3000	12	18000	18000	1500	1500
>3000 persons - the number of exit doors, exit routes and their width to be determined by the Building Authority					

圖 3-21. 《2011 年建築物消防安全守則》圖表 B2

作為對估計逃生途徑的要求，應該以以下圖表 B 1 為基礎來計算建築物的佔有空間或部份建築物的佔有空間。

(參見《2011 年建築物消防安全守則》 第 B4.1 條)

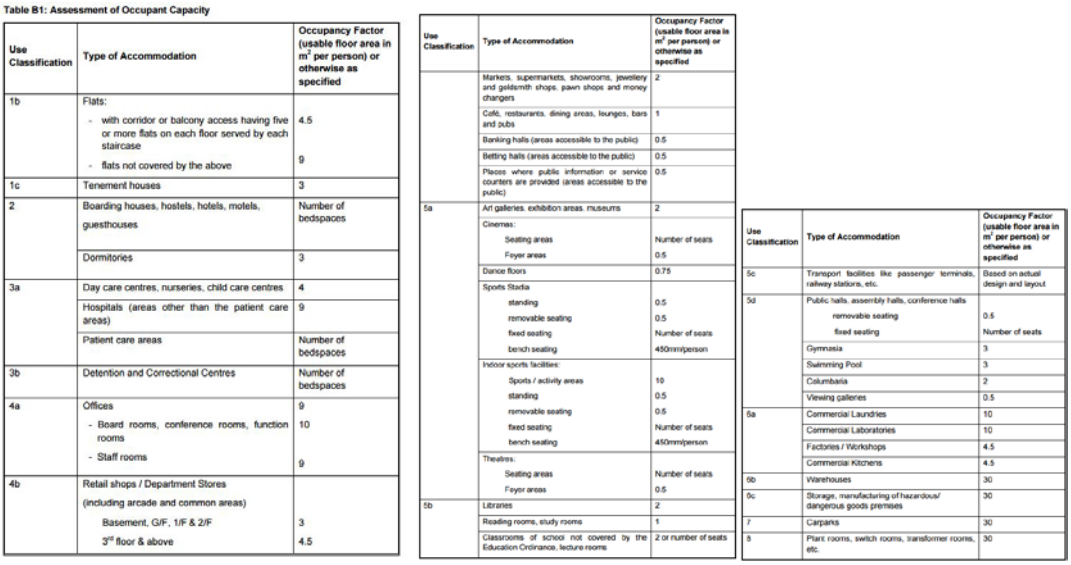


Table B1: Assessment of Occupant Capacity

Use Classification	Type of Accommodation	Occupancy Factor (usable floor area in m^2 per person) or otherwise as specified
1b	Flats: - with corridor or balcony access having five or more flats on each floor served by each staircase - flats not covered by the above	4.5 9
1c	Tenement houses	3
2	Boarding houses, hostels, hotels, motels, guesthouses	Number of bedspaces
	Dormitories	3
3a	Day care centres, nurseries, child care centres	4
	Hospitals (areas other than the patient care areas)	9
	Patient care areas	Number of bedspaces
3b	Detention and Correctional Centres	Number of bedspaces
4a	Offices - Board rooms, conference rooms, function rooms - Staff rooms	9 10 9
4b	Retail shops / Department Stores (including arcade and common areas) Basement, G/F, 1/F & 2/F 3rd floor & above	 3 4.5
5a	Markets, supermarkets, showrooms, jewellery and goldsmith shops, pawn shops and money changers	2
	Café, restaurants, dining areas, lounges, bars and pubs	1
	Banking halls (areas accessible to the public)	0.5
	Betting halls (areas accessible to the public)	0.5
	Places where public information or service counters are provided (areas accessible to the public)	0.5
	Art galleries, exhibition areas, museums	2
	Cinemas: Seating areas Foyer areas	 Number of seats 0.5
	Dance floors	0.75
	Sports Stadia standing removable seating fixed seating bench seating	 0.5 0.5 Number of seats 450mm/person
	Indoor sports facilities: Sports / activity areas standing removable seating fixed seating bench seating	 10 0.5 0.5 Number of seats 450mm/person
	Theatres: Seating areas Foyer areas	 Number of seats 0.5
5b	Libraries	2
	Reading rooms, study rooms	1
	Classrooms of schools not covered by the Education Ordinance, lecture rooms	2 or number of seats
5c	Transport facilities like passenger terminals, railway stations, etc.	Based on actual design and layout
5d	Public halls, assembly halls, conference halls removable seating fixed seating	 0.5 Number of seats
	Gymnasia	3
	Swimming Pool	3
	Columbaria	2
	Viewing galleries	0.5
6a	Commercial Laundries	10
	Commercial Laboratories	10
	Factories / Workshops	4.5
	Commercial Kitchens	4.5
6b	Warehouses	30
6c	Storage, manufacturing of hazardous/ dangerous goods premises	30
7	Carparks	30
8	Plant rooms, switch rooms, transformer rooms, etc.	30

圖 3-11. 《2011 年建築物消防安全守則》圖表 B1

作為一般實踐，應該以表格的形式取得規定的所需， 如以下所示的範例：

PROVISIONS OF EXIT DOORS & EXIT ROUTES FROM ROOM,FIRE COMPARTMENT OR STOREY

LOCATION	USE	CAPACITY OF ROOM OR STOREY (PERSON)	MIN. NO. OF EXIT DOORS (FROM ROOM) OR EXIT ROUTE (FROM STOREY)		MIN. TOTAL WIDTH OF (mm)				MIN. WIDTH OF EACH (mm)			
					EXIT DOORS		EXIT ROUTES		EXIT DOOR		EXIT ROUTE	
			REQUIRED	PROVIDED	REQUIRED	PROVIDED	REQUIRED	PROVIDED	REQUIRED	PROVIDED	REQUIRED	PROVIDED

在上述流程圖中所示的表格欄位所取得相關資訊的邏輯(例如規定及相關專案資訊)，現說明如下：

1. 位置：

- 劃定有關建議的房間、防火隔室或樓層作為分別是「空間」、「區域」或「樓面」(如被定義在 BS 1192-4 : 2014) 並使用通用名稱做為識別名稱以方便辨識。
- 在欄位輸入「空間」/ 「樓面」的位置。

2. 用途：

- 在欄位輸入「空間」/「區域」/「樓面」的識別名稱。

3. 分類：

- 根據《2011 年建築物消防安全守則》圖表 B1 把每個「空間」/「區域」/「樓面」分類。

4. 總實用樓面空間 (m^2)：

- 在有關的 「空間」/「區域」/「樓面」取得樓面面積。

5. 人數比例 (以 m^2 計算每人所需的實用樓面空間)：

- 透過查閱《2011 年建築物消防安全守則》圖表 B2 取得個別使用分類。

6. 房間、防火隔室或樓層的總容量

- 總實用樓面空間 x 人數比例

7. 從房間、防火隔室或樓層到逃生門和逃生路徑的最低數量與寬度

- 透過查閱《2011 年建築物消防安全守則》圖表 B2 取得房間或樓層的總容量。

3.4.3.1 Autodesk Revit 為檢查總實用樓面面積操作例子

例子將被說明**總**實用樓面空間的計算過程。 通過使用房間工具得出房間的面積。 然後對區域的用途分類及檢查相關的作業守則。

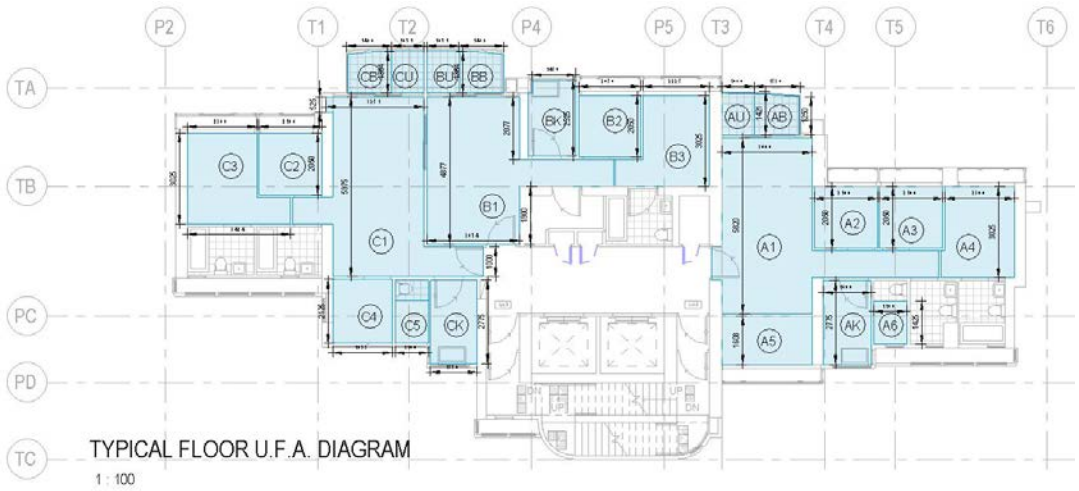


圖 3-23. 透過使用房間工具自動為房間分界

3.4.4 檢查衛生設備規定

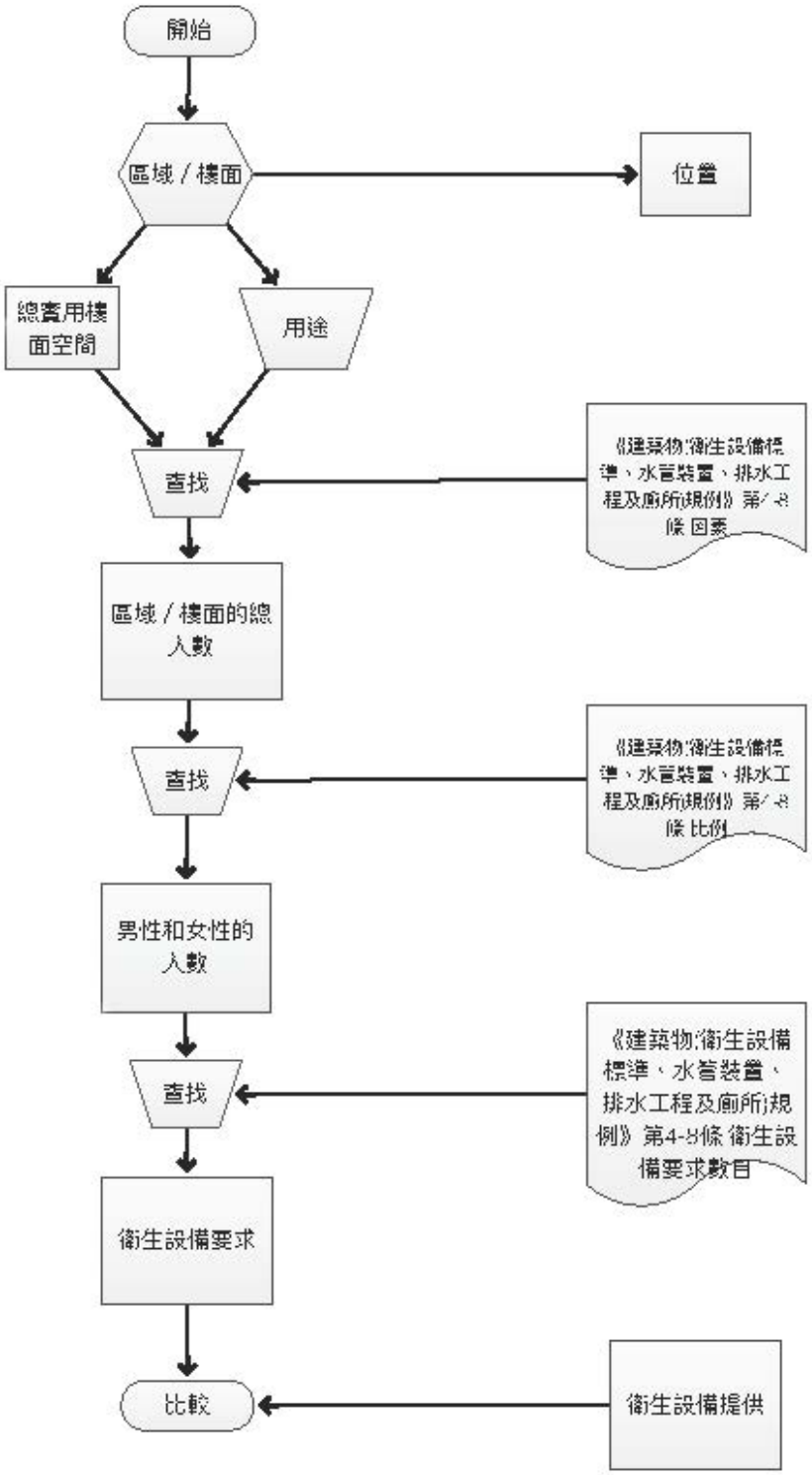


圖 3-24. 流程圖為衛生設備規定衍生出的相關資訊

《建築物（衛生設備、水管、排水工程及廁所標準）規例》(在這一節下稱「規例」) 規定在香港私有大廈的排水設備要求。這樣要求，特別包括針對各種不同類型的建築場所的衛生設備規定。

作為一般實踐，應該以表格的形式取得規定的所需， 如以下所示的範例：

SCHEDULE OF SANITARY FITMENTS

LOCATION OF FLOOR	USE	TOTAL USABLE FL. AREA (m^2)	FACTOR REPRESENTING m^2 OF USABLE FL. AREA PER PERSON	TOTAL CAPACITY PER FLOOR (PROPORTION)	NO. OF MALE PERSON AND FEMALE PERSON (PROPORTION)			SANITARY FITMENT REQUIRED				SANITARY FITMENT PROVIDED (*INCLUDE DISABLED LAV.)			
								W.C.	BATH/SHOWER BIDET	URINAL	BASIN OR WATER POINT	W.C.	BATH/SHOWER BIDET	URINAL	BASIN OR WATER POINT

在上述流程圖中所示的表格欄位所取得相關資訊的邏輯(例如規定及相關專案資訊)，現說明如下：

1. 位置或樓面：

- 識別及劃定位置或樓面作為分別是「區域」或「樓面」 (如被定義在 BS 1192-4 : 2014) 為此計算的目的 。
- 在欄位輸入位置。

2. 用途：

- 根據「規例」第 4 至 8 條，把樓宇的那個部分的位置或樓面(「區域」或「樓面」) 分類為不同的用途，其中有：
  - 住宅樓宇
  - 工業樓宇
  - 公眾娛樂場所
  - 體育場館
  - 戲院
  - 商場及百貨公司
  - 宗教機構
  - 殯儀館
  - 食肆

3. 總實用樓面空間：

- 在有關的 「區域」 /「樓面」取得及輸入樓面面積。

4. 係數代表每人的實用樓面空間的 m^2

- 通過查找「規例」第 4 至 8 條而獲得係數。

5. 位置或樓面上的總人數

- 相等於**總**實用樓面空間除以係數。

6. 男性和女性的數量

- 根據相關「規例」第 4 至 8 條中所述的「比例」，以確定男性與女性在樓宇的那個部分的數量。

7. 衛生設備要求

- 根據相關「規例」第 4 至 8 條中所述男性和女性的比率，計算出衛生設備提供數量的所需。 這些衛生設備包括：
    - 沖廁水箱
    - 小便池
    - 洗手盆
    - 浴室或沐浴

8. 衛生設備提供

- 在有關的「區域」/「樓面」獲得衛生設備的總數目。

3.4.5 檢查防火隔室和防火建築

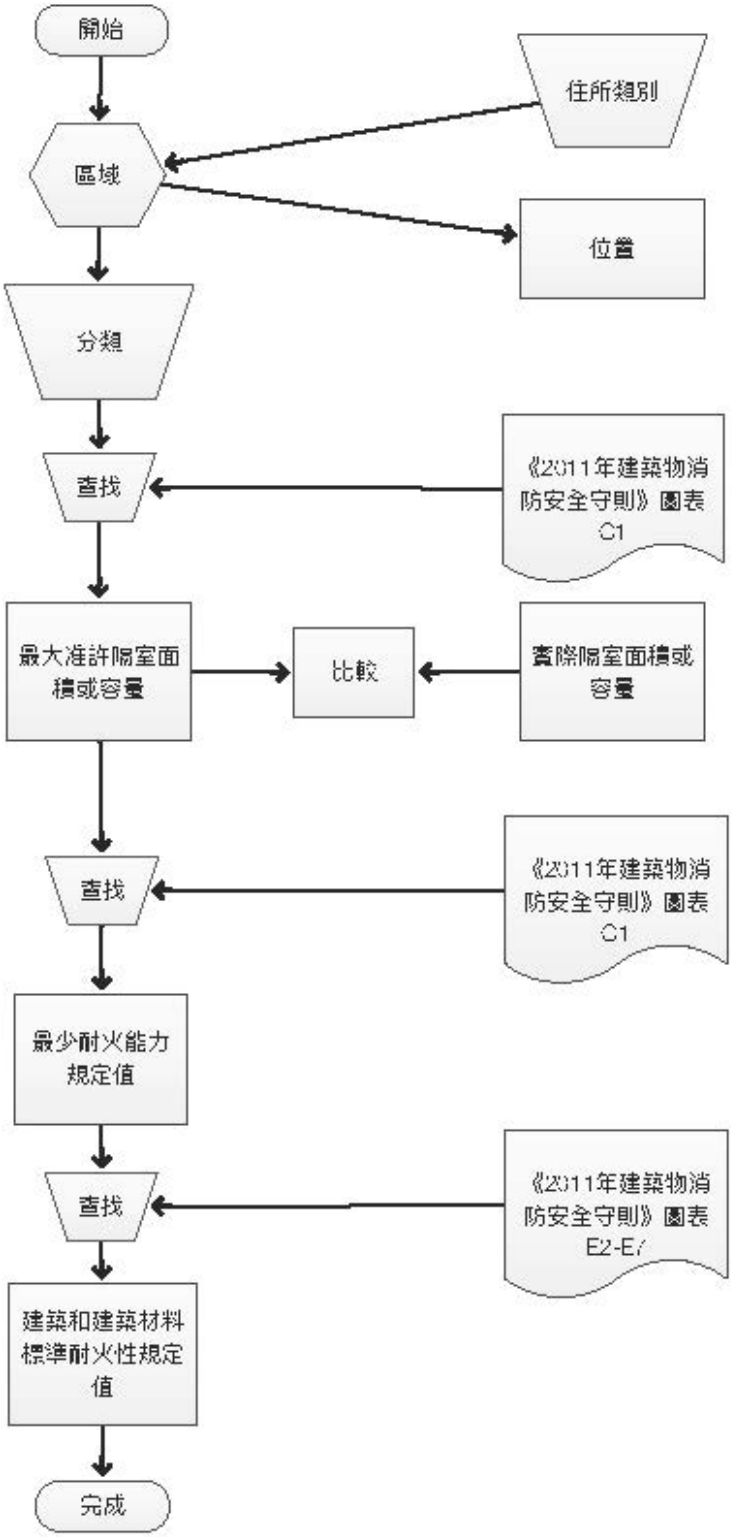


圖 3-25. 流程圖為防火隔室和防火建築衍生出的相關資訊

建築組件的防火隔室和耐火規定

每個大廈應該由防火屏障劃分成防火隔室，為了抑制火勢蔓延，不應超出《2011 年建築物消防安全守則》(在這一節下稱「2011 消防安全守則」) 表 C1 指明防火隔室的面積 / 容量。(「2011 消防安全守則」第 C3.1 條)

每個建築組件在每一防火隔室之內和每一防火屏障在每一防火隔室中，其 FRR 應該不小於《2011 年建築物消防安全守則》(在這一節下稱「2011 消防安全守則」) 表 C1 指明的時間。 (「2011 消防安全守則」第 C4.1 條)

「2011 消防安全守則」圖表 C1 被摘錄在這裡作為容易的參考：

Table C1 – Fire Resistance Rating and Fire Compartment Limitations

Use Classification	Compartment Area/ Volume	Fire Resistance Rating (minutes)
1. Residential	Not limited	60
2. Hotel and similar Transient Accommodation	Not limited	60
3. Institutional	Not exceeding 2,500m^2	60
4. Commercial:		
4a. Business Facilities	Not exceeding 10,500m^2	60
4b. Mercantile Facilities	Not exceeding 2,500m^2	60
	Exceeding 2,500m^2 but not exceeding 10,500m^2	120
5. Assembly:		
5a & 5d. PPE & Other assembly premises	Not exceeding 2,500m^2	60
	Exceeding 2,500m^2 but not exceeding 10,500m^2	120
5b.Educational establishments	Not exceeding 2,500m^2	60
	Exceeding 2,500m^2 but not exceeding 10,500m^2	120
5c. Transport facilities	Not exceeding 10,500m^2	120
6. Industrial:		
6a. Industrial workplaces	Not exceeding 10,500m^2	120
6b. Bulk storage, Warehouses	Not exceeding 28,000m^3 and 10,500m^2	120
6c. Storage, manufacturing of hazardous/dangerous goods premises	Not exceeding 7,000m^3	120
7. Carparks	Not exceeding 10,500m^2	60

圖 3-26. 「2011 消防安全守則」 圖表 C1

作為一般實踐，應該以表格的形式取得規定的所需， 如以下所示的範例：

FIRE RESISTANCE REQUIREMENT FOR ELEMENTS OF CONSTRUCTION												
LOCATION	TYPE OF ACCOMMODATION	USE CLASSIFICATION	COMPARTMENT OF BUILDING		FIRE RESISTANCE RATING(minutes) FOR ELEMENTS OF CONSTRUCTION		MINIMUM DIMENSION OF ELEMENT OF CONSTRUCTION					
							R.C. FLOORS & LANDING		R.C. BEAMS		R.C. COLUMN & CORE WALL	
			FLOOR AREA (m^2)	VOLUME (m^3)	R.C. SLAB/ CORE WALL	R.C. BEAM/ COLUMN	THICKNESS OF CONCRETE	CONCRETE COVER TO REINFORCEMENT	WIDTH OF BEAM	CONCRETE COVER TO MAIN REINFORCEMENT	MINIMUM OVERALL SIZE	CONCRETE COVER TO MAIN REINFORCEMENT

在上述流程圖中所示的表格欄位所取得相關資訊的邏輯(例如規定及相關專案資訊)，現說明如下：

1. **位置：**

- 劃定有關建議的防火隔室作為「區域」(如被定義在 BS 1192-4 : 2014) 並使用通用名稱做為識別名稱以方便辨識。
- 在欄位輸入「區域」的位置。

2. **住所類別：**

- 在欄位輸入「區域」的識別名稱。

3. **分類：**

- 根據《2011 年建築物消防安全守則》圖表 C1 把每 「區域」分類。

4. **建築的 (一部分)最大准許隔室樓面面積或容量**

- 透過查閱「2011 消防安全守則」圖表 C1 取得個別使用分類。

5. **建築的 (一部分) 實際隔室樓面面積或容量**

- 在每一「區域」取得樓面面積或容量和比較建築的 (一部分)最大准許隔室樓面面積或容量。

6. **最小耐火能力 (FRR)**

- 透過查閱「2011 消防安全守則」圖表 C1 取得個別使用分類。

7. 標準建築物和建築材料的耐火能力

- 透過查閱「2011 消防安全守則」以下圖表：

a. 圖表 E2 有關牆壁完全被修建為非易燃的材料。
b. 圖表 E3 有關牆壁不完全被修建為非易燃的材料。
c. 圖表 E4 有關樓面和樓梯平台。
d. 圖表 E5 有關鋼質柱和橫樑。
e. 圖表 E6 有關鋼筋混凝土和橫樑。
f. 圖表 E7 有關樓梯。

3.5 半自動與自動計算

而半自動程序涉及有關的區域圖的總和，由於有限的數據操作功能在最常用的建築資訊模型撰寫工具中運作，以手動方式查詢表格仍然是普遍在建築資訊模型撰寫工具以外的程序。

自動計算需要參考腳本或外加附件，且將自動地切換到法定圖表執行演算，傳回結果後並填寫所需表格。然而，這是屬於另一階段的顧問研究，將不會在這裡闡述。

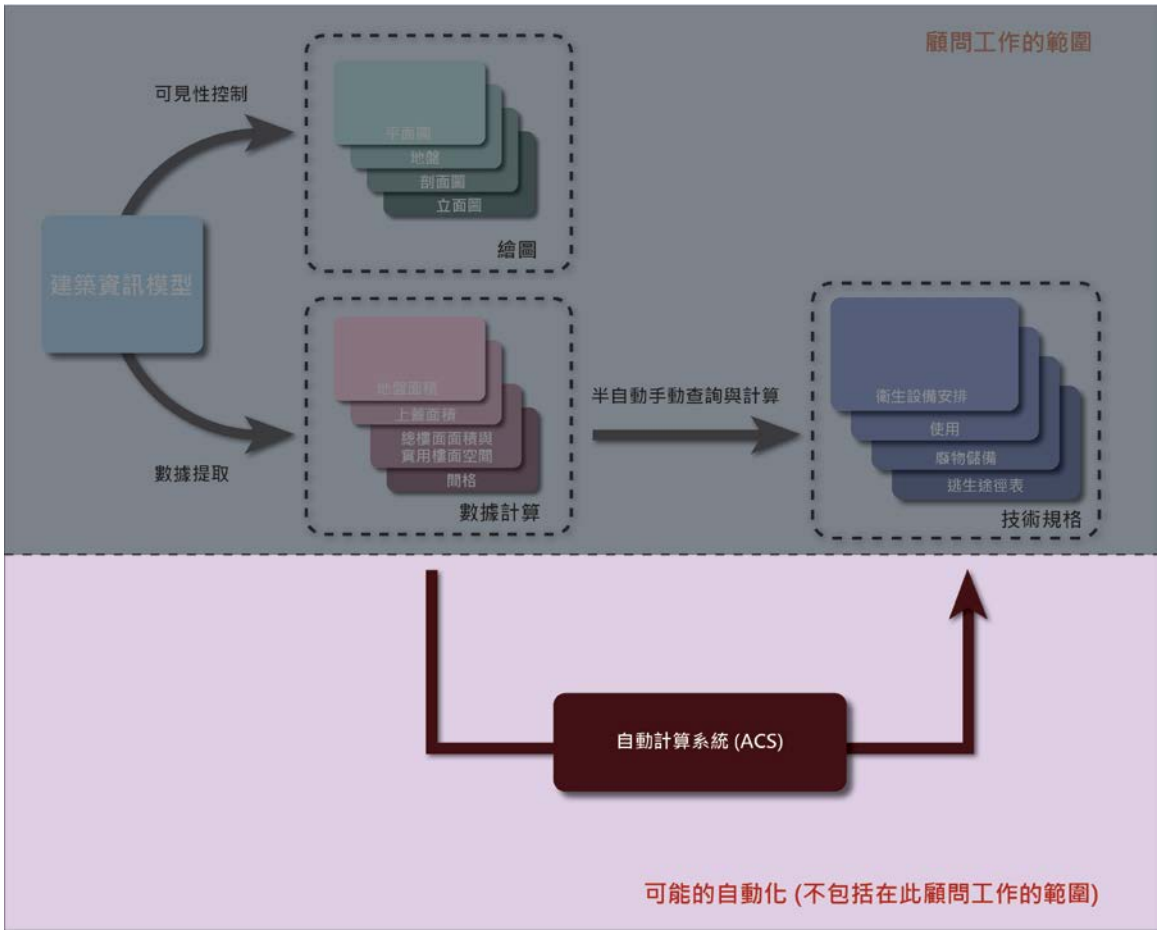


圖 3-27. 建築圖則可能自動化的工作流程與元件

4 由建築資訊模型平台數學計算的面積以電子提交時建議的額外需求 (根據《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADM-19 附錄 F)

我們意識到建築資訊模型撰寫軟體較 CAD 軟體更為複雜。建築資訊模型撰寫軟體通常需要更高的硬體與軟體成本、更多前期訓練的員工在建築資訊模型概念與實際操作知識。此程序可能需要考慮時間和精力，這將會延遲和阻礙採納計劃。因此我們站在贊成者立場提出兩個階段以採納提交建築資訊模型。

4.1 階段 1：僅模型檢視

作為模型及繪圖檢視用途，例如識別沿線區域和 3D 幾何檢視、贊成者可以接受建築資訊模型可以匯出到其原始檢視器」格式。例如，建築資訊模型繪製使用：

Autodesk Revit 可以匯出至 .DWFx 格式， 它可以在 free Autodesk Design Review 上檢視;

Graphisoft ArchiCAD 可以匯出至 .BIMx 格式，它可以在 free BIMx App on Android's or iOS 裝置上檢視。

建築資訊模型檢視者通常都是水平以下、操作簡單介面、及較淺的學習曲線。訓練時間和精力應該更小，和贊成者可以在很短的時間內掌握並採用 。

這個階段是有關被動式應用建築資訊模型。 這個階段應該當作一段寬限期為贊成者和業界以培養以建築資訊模型提交工作流程的效率。

4.2 階段 2：模型資訊擷取

在這個階段，原始建築資訊模型格式應該被接受。

有兩個目標可達成：

1. 減少業界努力為提交建築資訊模型。
根據新加坡 BCA 的經驗中所述之最新通函編號 APPBCA-2016-10 日期為 2016 年 10 月 19 日，其本土業界反饋「關於額外的努力才能恢復因壓縮原始建築資訊模型 檔案為輕量型檔案格式時的註解」。BCA 回答此意見為「接受自願以原始建築資訊模型格式提交建築資訊模型電子作品 」。

(參考: https://www.corenet.gov.sg/media/2032998/circular-on-bim-e-submission-for-plan-submission-to-bca.pdf)

2. 這個階段是關於建築資訊模型模型的現用應用程式。

須知道，一個已充分準備好的建築資訊模型含有有關建築發展的大量資訊。其中有些資訊是與公共基礎設施相關。 這類資訊應被有系統地納入政府目前的系統，例如地政總署的測繪系統，並對政府部門和公眾作出更容易的存取。

屋宇署或地政總署作為首要部門處理私人發展，可能是可接受建築資訊模型原始模型的一個契機；為進一步合併入政府的系統，要求特定的資訊井然有序的安排在一種特定的資料結構。

4.3 Proposed Appendix (只備有英文版本)

The following is a proposed additional appendix to current PNAP ADM-19 for stage 1 BIM adoption for accepting electronic submission of area calculations prepared by BIM software. The entire proposal is based on current appendix F of same PNAP with proposed modification underlined and marked in red.

Proposal:

1. The purpose of this supplementary note is to advise on the electronic format and the pre-requisites for checking of area calculations in BIM drawing files electronically.

2. When the requirements set out in the following paragraphs are complied with and clearly shown in the submitted BIM drawing files, diagrammatic breakdowns and details on calculation of the gross floor area, usable floor area, site coverage, plot ratio, refuge floor area and green feature area etc. would not be required to be included in plan submission. For avoidance of doubt, annotation and dimension of the areas concerned are required to be indicated on plans for checking purpose. Samples of the dimensioned plans are in Annex 1 for reference.

3. For area calculations computed electronically, soft copies of the building floor plans containing the area diagram layer(s) / ***"CSWP Convention" parameter*** are required to facilitate verification of the calculations. For approval purpose, hard copies of the general building plans showing floor area layouts, area diagrams and calculations without breakdowns are required. Information shown in both the soft and hard copies of the plans submitted for approval must be identical to each other. Plans may be rejected if discrepancy between the two is found. The AP should certify on each of the DVD-ROM discs with a permanent marker signifying that information in the electronic drawing files are identical to the submitted hard copies and that all files are prepared under his supervision. The disc should be finalised before submission, i.e. the contents of the disc cannot be further changed. His signature shall be deemed to be his assumption of responsibility for the electronic plans and the calculations.

4. The following minimum requirements in BIM drawing format should be observed and provided for in the area calculations computed electronically. Plans may be rejected on grounds of insufficient information if these requirements are not complied with.

4.1 Format and Software Version

(a) The submitted BIM drawing files should be stored in non-rewritable DVD-ROM discs. Except otherwise agreed by the Building Authority all other electronic submission formats are not acceptable.

(b) BIM files should be exported to lightweight ".dwf" or ".dwfx" viewer format All other compressed or zipped file formats are not acceptable.

(c) Title blocks completed with drawing number showing revision legends, site/project title, drawing title etc. should be inserted in every drawing for identification purpose. Each BIM lightweight file shall contain all hard copy drawing. Typical title block sample is attached in Annex 2 for reference.

4.2 Referencing System

File Name/Drawing Number Convention

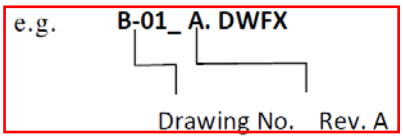
(a) Each file shall either contain full set of drawings or one drawing only, default zoomed to full drawing extent.

(b) All information for approval shall be contained in the same drawing file. The need to cross-reference or hyper-link with another BIM file to enable verification of the area calculations in the DVD-ROM is not acceptable except in situation covered in (c) below.

(c) In situation where the layering number, ***"CSWP Convention" parameter*** number and the system are limited due to software constraint, limited referencing system might be used provided that all information and BIM model files which compose the final drawings are clearly visible and intact when files are open in the computer. A clear and systematic path trial in hard copy format highlighting the list of file(s) for area checking purpose should be provided to facilitate the verification exercise. All drawing files and model files are to put into the same folder to ensure coherent path recognition. Cross-referencing and hyper-linking within folder should be kept to the minimum.

(d) Naming and numbering of drawing files in the hard copy should be identical to those in the submitted soft copy.

(e) A completed hard and soft copy of the drawing index listing all file names, drawing numbers with brief description on location and contents of the submitted drawings shall be provided. Drawings under different revision must carry a revision letter (e.g. A to Z) for identification purpose. For large and complicated project involving numerous drawing versions/amendments, a revision legend should also be provided as well.



Layering / *Area Plan* Organization

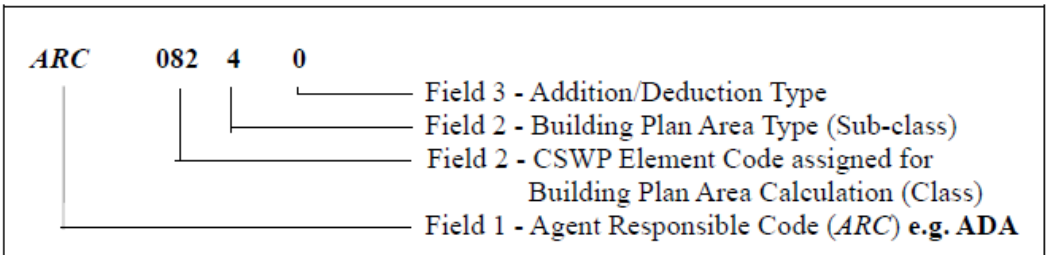
(a) BIM drawings files including floor plans, tables and calculations etc. shall contain all information identical to the hard copy. Each file shall accommodate different elements such as floor layout plans, usable floor area, gross floor area and dimension etc. into the relevant layers. The "layering" drafting technique isolates elements of a drawing and places them into separate layers for easy reference and manipulation. In BIM software without layer function, (e.g. Revit), "***area plan / room***" tools should be used for further ***"visibility control"*** for isolation and easy reference and manipulation.

(b) To facilitate checking of the area calculations, general building plans shall contain GFA and other areas diagram layers or area boundary diagram for verification and calculations. To reconcile the requirements of other government departs and to

adopt the rules under BIM Standards for Works Projects (CSWP) of Environment, Transport and Works Bureau, AP shall name the relevant layers or custom created ***"CSWP Convention" parameter*** for each area boundary for BIM software without layer function, (e.g. Revit) in a format specified below:

Layer / ***"CSWP Convention" parameter*** **Name Convention**

Diagram A: Rules of Layer / "*CSWP Convention*" Parameter Name Convention of CSWP (abstracted)



Field	Description	Length/Type	Coding
1	Agent Responsible Code	3 (alphanumeric)	See www.etwb.gov.hk/cswp
2	CSWP Element Code assigned for Building Plan Area Calculation (Class)	3 (numeric)	a) 082 for BD's area calculation, b) 086 for LandsD's area calculation
	Building Plan Area Type (Sub-class)	1 (numeric)	See Diagram B
3	Addition/Deduction Type	1 (alphanumeric)	See Diagram C

Diagram B

Code	Building Plan Area Type
1	Site Coverage (SC) – Non-domestic
2	Site Coverage (SC) –Domestic
4	Gross Floor Area (GFA) – Non-domestic
5	Gross Floor Area (GFA) – Domestic
9	Usable Floor Area (UFA)
0	Open Space (OS)
_	Elements common to all area type

Diagram C

Code	Addition/Deduction Type	Remarks
0	Base Area	
4	Deduction Area	For area to be deducted from the outline of area layers /"*CSWP Convention"* Parameter under the Buildings Ordinance.
5	Deduction Area	For area to be deducted from the outline of area layers */ "CSWP Convention"* Parameter under the Lands Department requirement.
6	Deduction Area	For area to be deducted from the outline of area layers */ "CSWP Convention"* Parameter under the Planning Department requirement.
8	Dimension	

Diagram D: Layer / "*CSWP Convention*" Parameter Names generated from the above rules for this PNAP

Code	Description	Remarks
*ARC*08240	Non-domestic ***area***	For outline of non-domestic GFA layer / ***"CSWP Convention"*** *Parameter*.
*ARC*08244	Non-domestic area to be deducted from area calculations	For non-domestic area to be deducted from the outline of non-domestic area layers / ***"CSWP Convention"*** Parameter under the Buildings Ordinance.
*ARC*08246	Non-domestic area to be deducted from area calculations	For non-domestic area to be deducted from the outline of non-domestic area layers / ***"CSWP Convention"*** Parameter under the Planning Department requirements.
*ARC*08250	Domestic ***area***	For outline of domestic GFA layer / ***"CSWP Convention" Parameter.***
*ARC*08254	Domestic area to be deducted from area calculations	For domestic area to be deducted from the outline of domestic area layer / ***"CSWP Convention"*** Paramater under the Buildings Ordinance.

ARC08256	Domestic area to be deducted from area calculations	For domestic area to be deducted from the outline of domestic area layers / ***"CSWP Convention"*** Parameter under the Planning Department requirements.
ARC082_8	Dimension layers / ***Categories***	All dimensions for the floor layout plans are automatically generated from the computer software (***not to be manually inserted by text input construction***)
ARC08210	Area for non-domestic site coverage calculations	For outline of non-domestic site coverage layer / "***CSWP Convention***" Parameter.
ARC08214	Non-domestic site coverage deducted from calculations	Deduction complying with requirements of the Buildings Department.
ARC08216	Non-domestic site coverage deducted from calculations	Deduction complying with requirements of the Planning Department.
ARC08220	Area for domestic site coverage calculations	For outline of domestic site coverage layer / "***CSWP Convention***" Parameter.
ARC08224	Domestic site coverage deducted from calculations	Deduction complying with requirements of the Buildings Department.
ARC08226	Domestic site coverage deducted from calculations	Deduction complying with requirements of the Planning Department.
ARC08200	Area for open space calculations	For outline of open space layer / ***"CSWP Convention"*** Parameter.
ARC08204	Area to be deducted from open space calculations	For area to be deducted from outline of the open space under the Buildings Ordinance.
ARC08290	Area for usable floor area calculations	For outline of usable floor area by ***Room Tool***.
ARC08294	Area to be deducted from the usable floor area calculations	For area to be deducted from outline of the usable floor area under the Buildings Ordinance.

(c) The Layer / ***"CSWP Convention" Parameter*** names required by LandsD are not listed in this PNAP and AP should make reference to the Practice Note issued by LandsD. AP should also refer to CSWP of Environment, Transport and Works Bureau (atwww.etwb.gov.hk/cswp) for other layer name convention.

(d) Layer / ***"CSWP Convention" Parameter*** file organization of the file(s) in hard copy format shall be submitted. If more layer / ***"CSWP Convention" Parameter*** description is required in the submitted general building plans, AP could lengthen the above list with additional input along similarly constructed methodology. All layering / ***"CSWP Convention" Parameter*** organizations must be clearly shown.

(e) BIM file for the floor plan shall contain all elements and information that have to be shown on the drawings to facilitate approval, including, inter alia, the area and the dimension layers. Elements such as lighting, electric appliances and the like where approval from the Building Authority is not required should not be shown in the submitted drawings.

4.4 Presentation Style

Drawing Scale

(a) BIM drawings should be drawn in true size with precision rounded up to the nearest mm unit.

Drawing Object within area diagram

(b) The position of the drawing shall be close to ***project base point, survey point 0,0*** and drawing objects in area diagram shall not be grouped or blocked.

Area boundary ***(***Area Boundaries in ***"Area Plans / Room"*** for Revit***, "Zone" for Archicad"***

(c) All area boundaries for BIM drawings intended for area calculation shall be closed

Dimension

(d) All dimensions should be true dimensions generated automatically by the software and laid in the specified layers / "***category"*** (in Revit). Text figures or figures manually inserted, amended or constructed for calculation purpose in the BIM file is not acceptable.

Decimal places of areas and volumes

(e) All areas and volumes should be presented in m^2 and m^3 units respectively and rounded up to 3 decimal places.

Suggested Text Font

(f) Text style is not compulsory. Conventional text fonts are suggested. Common type such as "Arial Narrow" font in 2.5mm size is recommended for use in the text.

Review

5. These guidelines will be refined taking into the experience gained. Suggestions to facilitate and/or to improve the electronic vetting procedures are always welcomed.

常見的建築資訊模型平台與檢視器

有許多檢視器可檢視由Autodesk提供的dwf / dwfx檔案：

	dwf	dwfx
Autodesk Design Review	✓	✓
Autodesk DWF Viewer	✓	✗
Autodesk Navisworks Freedom	✓	✓

在建築資訊模型以「工程電腦輔助繪圖標準公約CSWP 」命名慣例的樣本
(畫面擷取自 Autodesk Design Review)

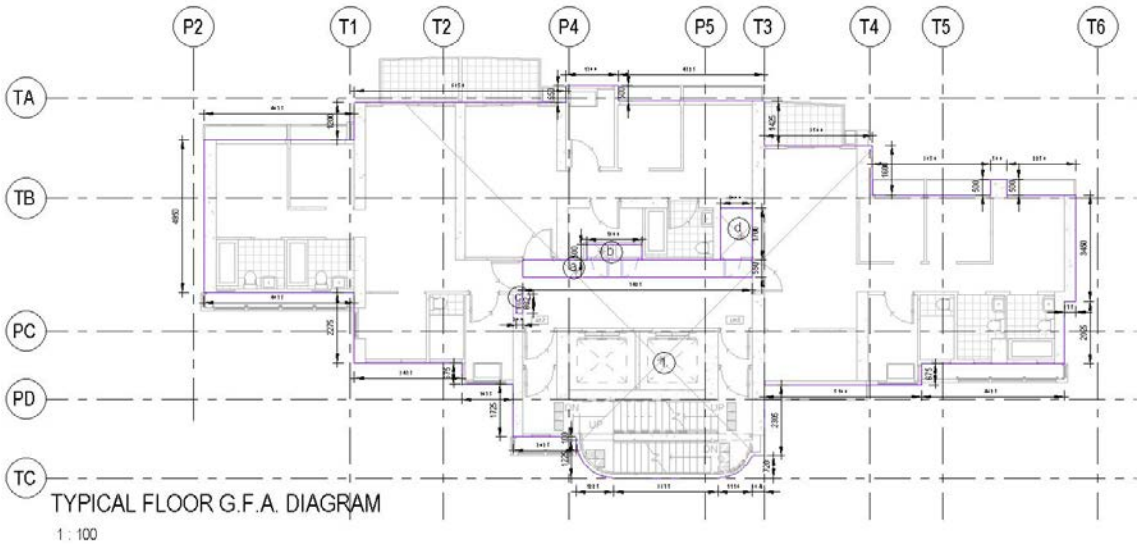
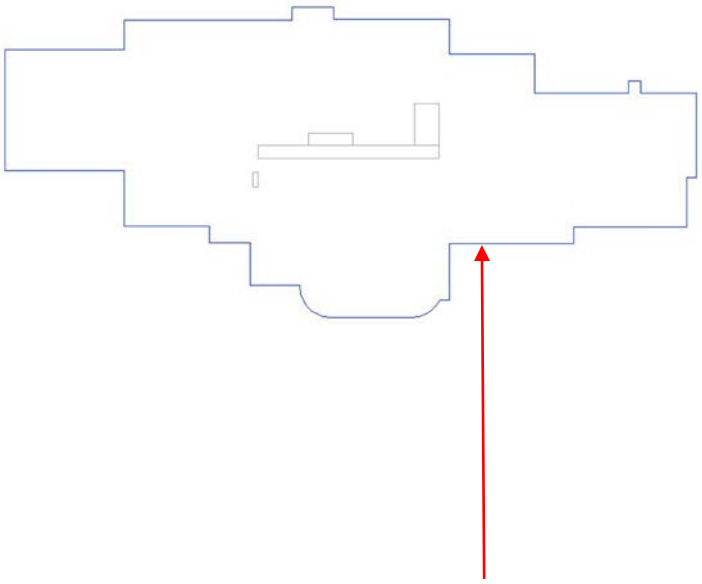


圖 4-1. 典型層的總樓面面積圖



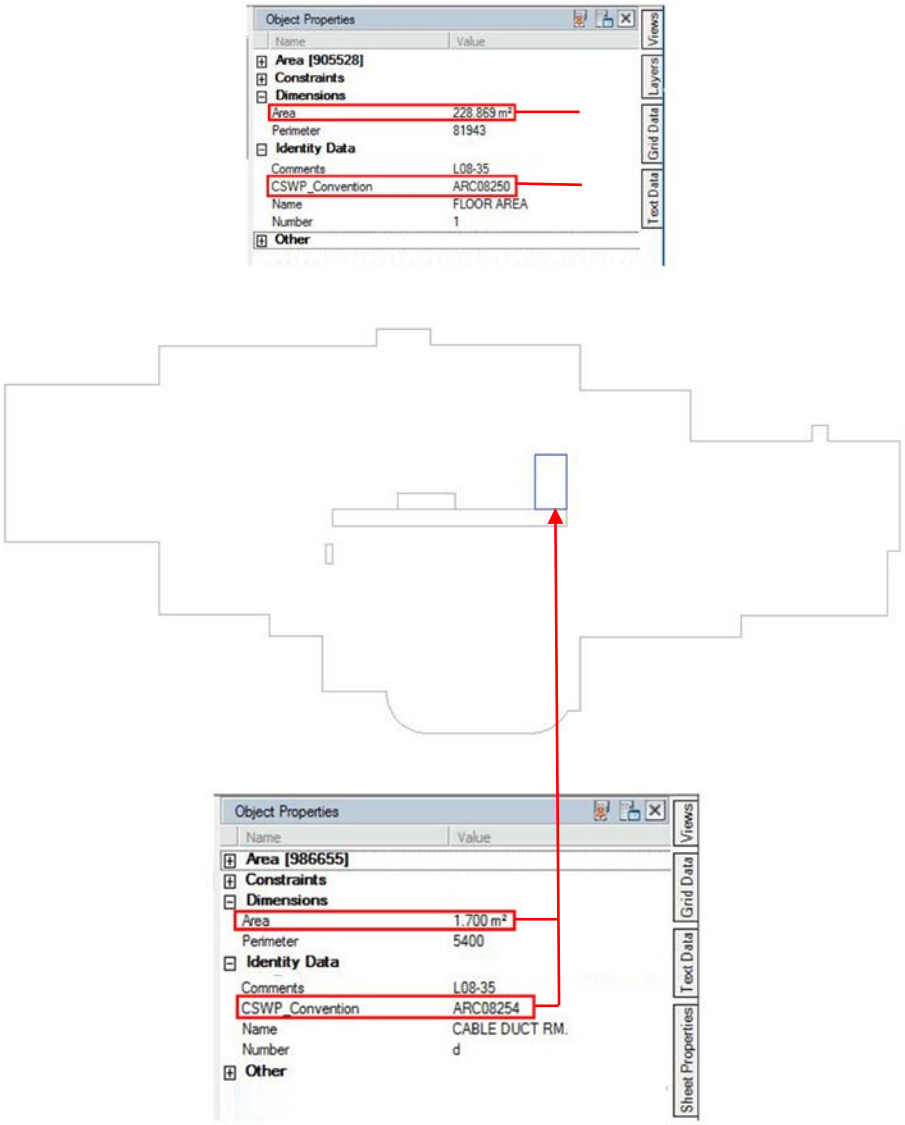


圖 4-2. 在 DWFX 檔案以「工程電腦輔助繪圖標準公約 CSWP 」命名慣例的樣本

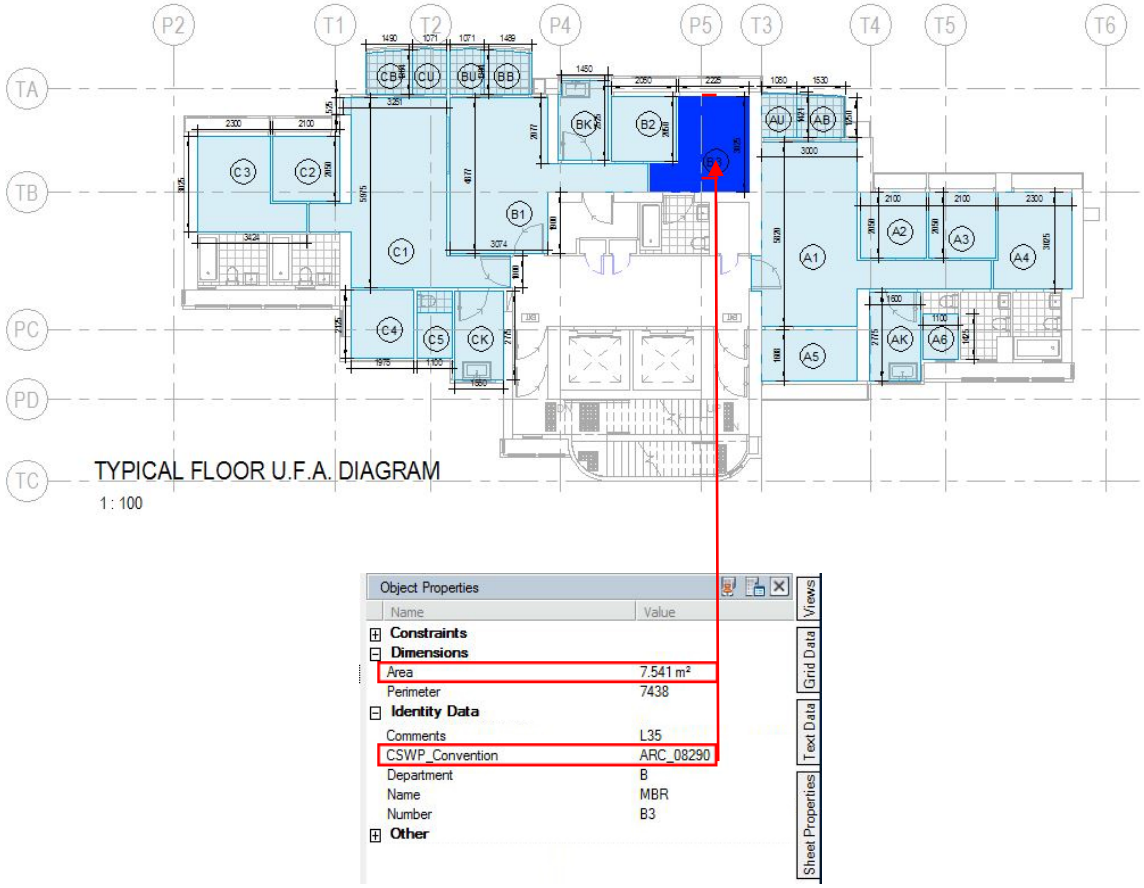
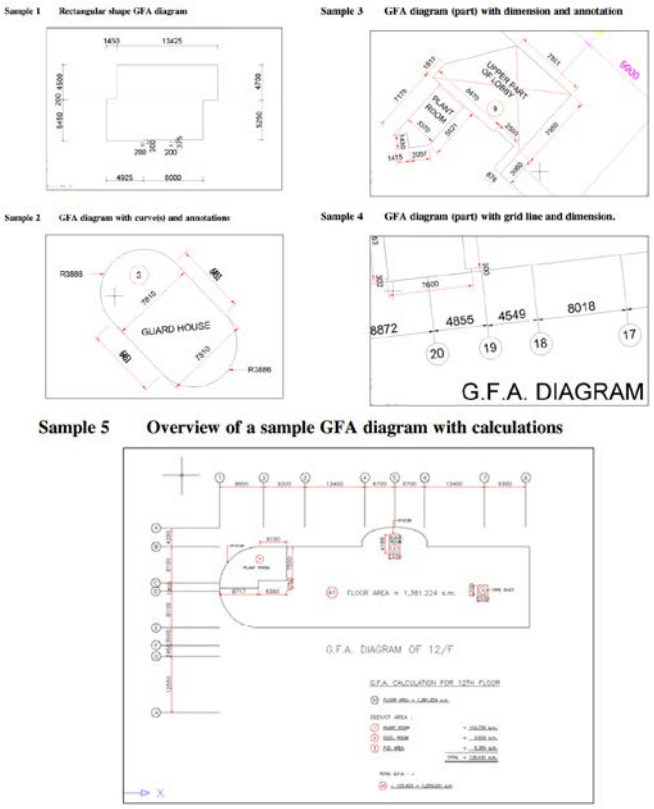
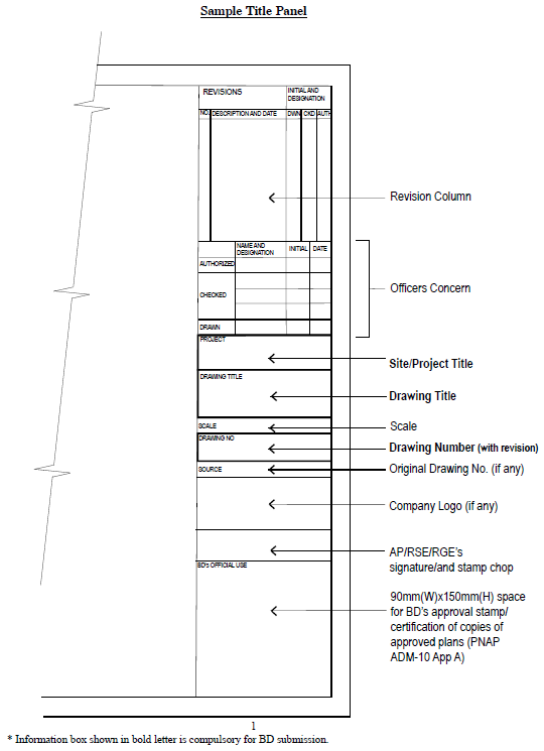


圖 4-3.　在 DWFX 檔案以「工程電腦輔助繪圖標準公約 CSWP 」命名慣例的樣本



附錄 1. 典型的尺寸樣式《認可人士、註冊結構工程師及註冊岩土工程師作業備考》

***ADM-19** 的區域圖*



*附錄 2. 從《認可人士、註冊結構工程師及註冊岩土工程師作業備考》**ADM-19** 的範例標題圖框。資訊也可以從模型中擷取並顯示為標題圖框格式*

5. 項目相關人士專題討論會

相關人士的會議已就以下會議召開

1 項目相關人士第一次會議 (7/12/2016 在房屋委員會會議室舉行)
2 屋宇署第一次工作坊 (16/8/2016 在 Advanced Construction Information Development Ltd. (A.C.I.D.) 辦公室舉行)
3 香港建築信息模擬學會董事會會議 (6/9/2016 在職業訓練局辦公室舉行)
4 房屋署獨立審查組會議 (12/9/2016 在房屋委員會獨立審查組會議室舉行)
5 屋宇署第二次工作坊(19/9/2016 在屋宇署會議室舉行)
6 項目相關人士第二次會議 (3/10/2016 在房屋委員會會議室舉行)
7 香港建築師學會 建築資訊模型及資訊展科技委員會會議 (4/10/2016 在香港建築師學會會址舉行)
8 地政總署會議 (20/10/2016 在地政總署舉行)

5.1 項目相關人士的看法與意見

以下項目在不同的項目相關人士之中已被討論：

1 項目相關人士建議在報告中那標準的模板提議應該以本地建築業的好處來創造和分佈 。
2 這個報告內容無法取代專業判斷。
3 項目相關人士在軟件平台及版本有關。
4 建築圖則的報告格式隨著各實踐之中靈活變化。報告應該只描述使用建築資訊模型軟件時所獲得的相關信息的邏輯。例如：建築資訊模型在公式格式之外使用日程表格式顯示演算。
5 認可人士提高圖則準備的效率及政府部門提高圖則的審批的效率，可能是採用建築資訊模型呈交圖則的重要誘因。
6 該報告應延伸至包含其他資訊以提交給相關部門，例如汽車停泊計算。
7 除建築圖則相關信息之外，建築資訊模型更包含大量數據。建議應該進行更多研究以整合到其他政府部門資料庫。

6. 呈交法定圖則

為改善圖則更有效率被處理及提高呈交圖則的品質，屋宇署定期回顧計劃審批流程和實施了各種各樣的措施，如省略檢查系統、預先提交查詢及會議服、 簡化程序、快速處理等等。此措施的一般原則和細節可從《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADM-19 中提供。在《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADV-33 陳述一般指引以協助認可人士、註冊結構工程師及註冊岩土工程師為針對不同類型的建築工程而準備呈交圖則的申請。

在本節中，我們將展示比較圖表與格式介乎於《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADV-33 與建築資訊模型繪圖之間。

6.1 比較屋宇署《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADV-33 相對於建築資訊模型繪圖

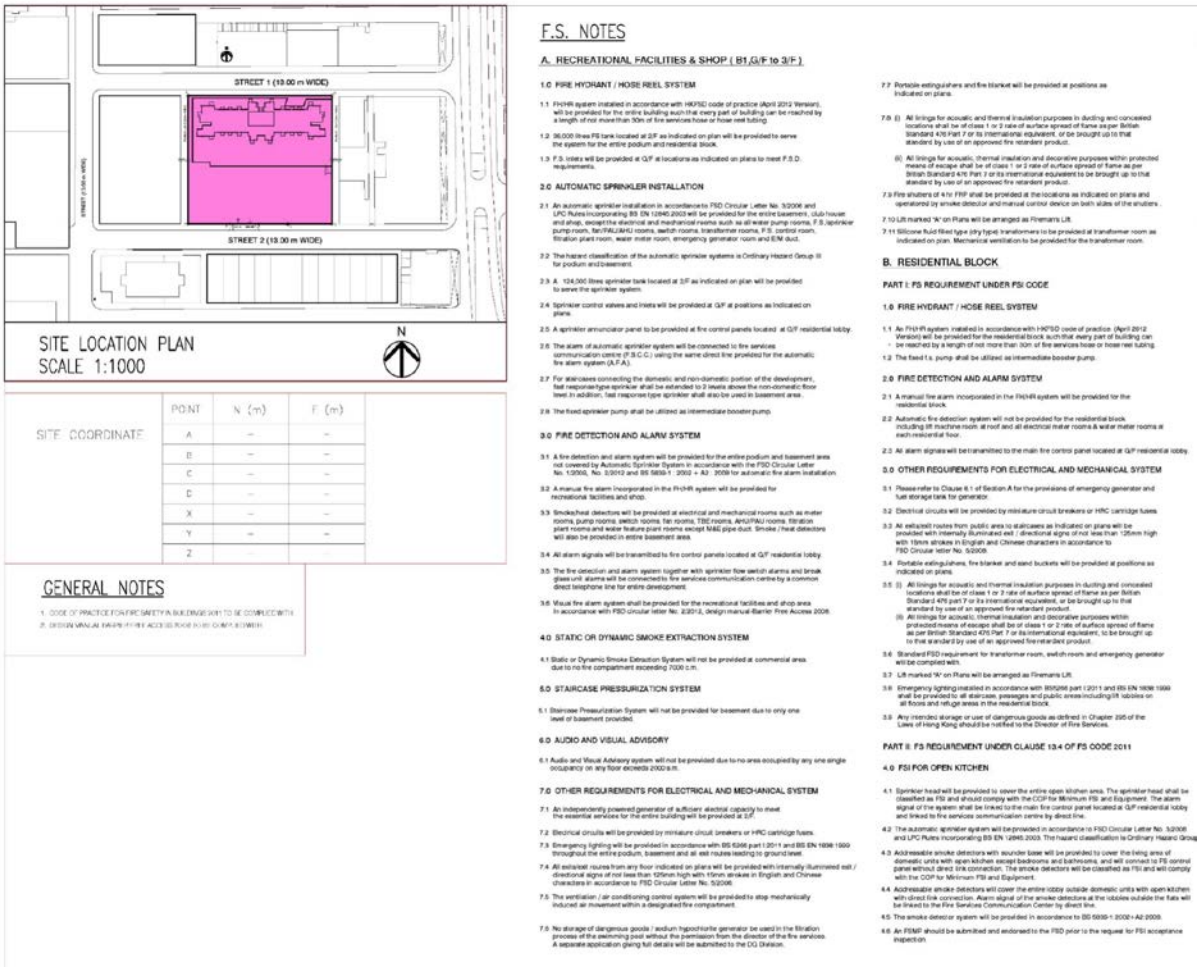
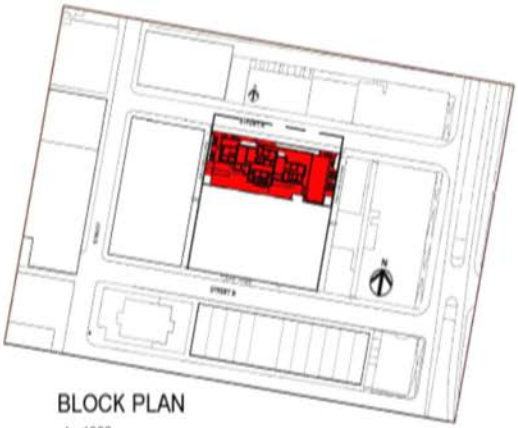


圖 6-1. 地盤位置平面圖和注釋摘錄自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADV-33



BLOCK PLAN

1 : 1000

SITE AREA CALCULATIONS:

SITE AREA (FROM LEASE)

I.L. 897 S.B ss.1 S.A	=1081.67 s.ft.
I.L. 897 S.B ss.5 S.A	=270.43 s.ft.
I.L. 897 S.B ss.5 R.P	=1353.98 s.ft.
I.L. 897 S.B ss.8	=3291.37 s.ft.
I.L. 897 S.B ss.9	=1936.89 s.ft.
TOTAL	=7934.34 s.ft. (706.460 s.m.)

GENERAL NOTES:

1. ALL DIMENSIONS SHOWN ON DRAWINGS ARE STRUCTURAL MEASUREMENT IN MILLIMETRES AND ALL LEVELS SHOWN IN METERS ABOVE PRINCIPAL DATUM UNLESS OTHERWISE STATED.

2. EVERY REQUIRED STAIRCASE SHALL:
(a) HAVE A CLEAR HEIGHT OF NOT LESS THAN 2000mm.
(b) BE CONSTRUCTED WITH TREADS NOT LESS THAN 280mm IN WIDTH AND RISERS NOT EXCEEDING 150mm IN HEIGHT FOR THE RESTAURANT
(c) BE PROVIDED WITH HANDRAILS ON BOTH SIDES AT A HEIGHT NOT LESS THAN 850mm NOR MORE THAN 950mm AND EXTENDED 300mm TO LANDING IN ACCORDANCE WITH CODE OF
PRACTICE FOR FIRE SAFETY IN BUILDINGS 2011 (FSB 2011) CLAUSE B14.6 & (BFA 2008) CLAUSE 28-30.

3. ALL DOORS REQUIRED TO HAVE AN FRR SHALL COMPLY WITH B(C)R 90 & (FSB 2011) CLAUSE C16.

4. THE LOCKING DEVICE PROVIDED FOR EXIT DOORS, IF NECESSARY, SHALL BE OF THE TYPE, WHICH IS CAPABLE OF BEING OPENED FROM THE INSIDE WITHOUT USING A KEY.

5. PROTECTIVE BARRIERS (SUCH AS PARAPET WALL AND RAILING) SHOULD BE PROVIDED IN ACCORDANCE WITH B(P)R 3A & B(C)R 8.

6. A VERTICAL BARRIER PROVIDED TO SURROUND THE INTERNAL UNPROTECTED OPENING IN FLOORS WITHIN A COMPARTMENT FOR AGAINST SPREAD OF FIRE, SUCH AS THOSE FOR
ESCALATORS, CIRCULATION STAIRCASES OR WALKWAYS IN AN ATRIUM, SHALL HAVE AN FRR OF NOT LESS THAN 60 MIN. AND EXTEND NOT LESS THAN 450mm FROM THE UNDERSIDE OF
THE FLOOR OR BELOW THE FALSE CEILING IF THE FALSE CEILINGS ARE HUNG IN THE VICINITY OF THE OPENING (FSB 2011) CLAUSE C10.1

7. THE GLAZING MATERIALS IN SKYLIGHT SHALL MEET THE FOLLOWING CRITERIA :-
(a) IT SHOULD NOT BE OF THE TYPE WHICH WILL MELT AND FORM BURNING DROPLETS UNDER FIRE SITUATIONS; AND
(b) WHEN IT IS SHATTERED, IT DOES NOT FORM SHARPENING AND HARMFUL PIECES.

8. EVERY PART OF AN EXIT ROUTE SHOULD BE PROVIDED WITH ARTIFICIAL LIGHTING PROVIDING A HORIZONTAL ILLUMINANCE AT FLOOR LEVEL OF NOT LESS THAN 30 LUX
(AND COMPLY WITH CoP FOR MIN. F.S. INSTALLATION AND EQUIPMENT.)

9. EVERY OPENING FORMED FOR DUCTS OR PIPES PASSING THROUGH FIRE BARRIERS WOULD COMPLY WITH (FSB 2011) CLAUSE C8.

10. ELEMENTS OF CONSTRUCTION OTHER THAN REINFORCED CONCRETE FOR SEPARATING COMPARTMENTS TO BE PROVIDED WITH STABILITY, INTEGRITY AND INSULATION AS STATED
IN (FSB 2011) TABLE C2.

11. ONE LEAF OF A PAIR OF DOUBLE DOORS SHALL HAVE A CLEAR WIDTH OF NOT LESS THAN 800mm BETWEEN THE OPEN DOOR AND THE OTHER LEAF.

12. OAT LADDER AT PUBLIC ACCESSIBLE AREA WOULD BE PROVIDED WITH LOCKABLE PLATE.

13. DOORS OF ALL PROTECTED LOBBY SHOULD BE PROVIDED WITH SMOKE SEALS (FSB 2011) CLAUSE C16.5.

14. ALL LIFT WELLS & DUMB WAITER SHAFT SHOULD BE SEPARATED FROM THE REST OF THE BUILDING BY FIRE BARRIERS HAVING AN FRR OF NOT LESS THAN 120/120/120, AND ALL DOORS
PROVIDED AT A LIFT LANDING SHOULD HAVE AN FRR OF NOT LESS THAN -/120/- IN ACCORDANCE WITH (FSB 2011) CLAUSE C9.1.

15. WHERE THE HEADROOM IS 2000mm OR LESS FROM THE FINISHED FLOOR LEVEL, A WARNING GUARDRAIL OR OTHER BARRIER SHALL BE PROVIDED FOR DETECTION, HAVING ITS
LEADING EDGE AT OR BELOW 680mm ABOVE THE FINISHED FLOOR LEVEL (BFA 2008 CLAUSE 36).

16. ALL EXISTING DISABLED RAMP SHOULD COMPLY WITH BFA 2008.

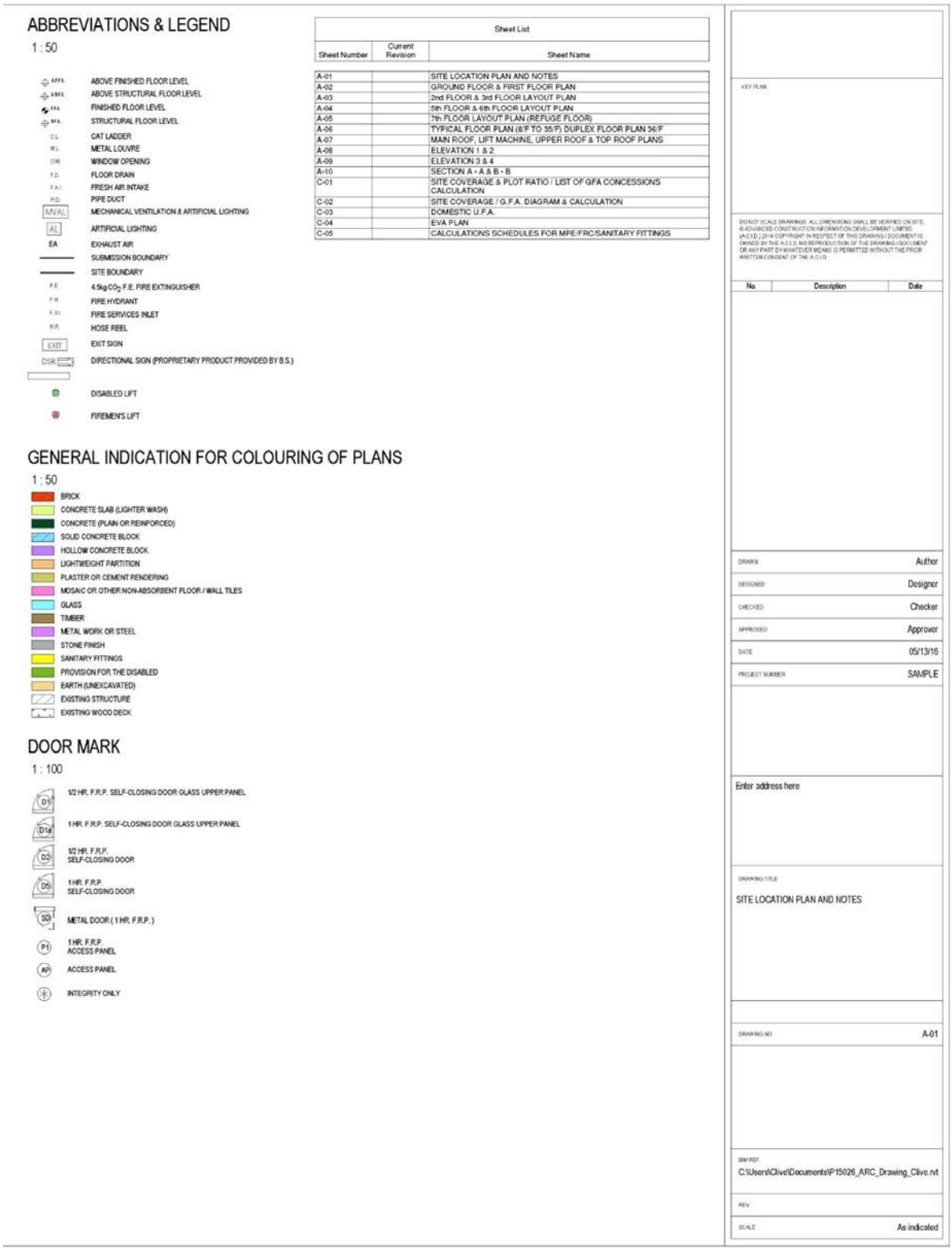
F.S. NOTES :

1.0 FIRE HYDRANT / HOSE REEL SYSTEM
1.1 FHHR system installed in accordance with HKFSD code of practice (April 2012 Version), will be provided for the entire building such that every part of building can be reached by a length of not more than 30m of fire services hose or hose reel tubing.
1.2 36,000 litres FS tank located at 2/F as indicated on plan will be provided to serve
1.3 F.S. inlets will be provided at G/F at locations as indicated on plans to meet F.S.D. requirements.
2.0 AUTOMATIC SPRINKLER INSTALLATION
2.2 The hazard classification of the automatic sprinkler systems is Ordinary Hazard Group III
2.3 A 124,000 litres sprinkler tank located at 2/F as indicated on plan will be provided to serve the sprinkler system.
2.4 Sprinkler control valves and inlets will be provided at G/F at positions as indicated on plans.
2.5 A sprinkler annunciator panel to be provided at fire control panels located at G/F residential lobby.
2.6 The alarm of automatic sprinkler system will be connected to fire services communication centre (F.S.C.C.) using the same direct line provided for the automatic fire alarm system (A.F.A.)
2.7 For staircases connecting the domestic and non-domestic portion of the development, fast response type sprinkler shall be extended to 2 levels above the non-domestic floor level. In addition, fast response type sprinkler shall also be used in basement area.

3.0 FIRE DETECTION AND ALARM SYSTEM
3.1 A fire detection and alarm system will be provided for the entire podium and basement area not covered by Automatic Sprinkler System in accordance with the FSD Circular Letter No. 1/2009, No. 3/2012 and BS 5839-1 : 2002 + A2 : 2008 for automatic fire alarm installation.
3.2 A manual fire alarm incorporated in the FHHR system will be provided for recreational facilities and shop.
3.3 Smoke/heat detectors will be provided at electrical and mechanical rooms such as meter rooms, pump rooms, switch rooms, fan rooms, TBE rooms, AHU/FAU rooms, filtration plant rooms and water feature plant rooms except MEE pipe duct. Smoke / heat detectors
3.4 All alarm signals will be transmitted to fire control panels located at G/F residential lobby.
3.5 The fire detection and alarm system together with sprinkler flow switch alarms and break glass unit alarms will be connected to fire services communication centre by a common direct telephone line for entire development.
4.0 STATIC OR DYNAMIC SMOKE EXTRACTION SYSTEM
4.1 Static or Dynamic Smoke Extraction System will not be provided at commercial area.
5.0 STAIRCASE PRESSURIZATION SYSTEM
level of basement provided.
6.0 AUDIO AND VISUAL ADVISORY
6.1 Audio and Visual Advisory system will not be provided due to no area occupied by any one single
7.0 OTHER REQUIREMENTS FOR ELECTRICAL AND MECHANICAL SYSTEM
7.2 Electrical circuits will be provided by miniature circuit breakers or HRC cartridge fuses.
7.3 Emergency lighting will be provided in accordance with BS 5266 part 1:2011 and BS EN 1838:1999 throughout the entire podium, basement and all exit routes leading to ground level.
7.4 All exits/exit routes from any floor indicated on plans will be provided with internally illuminated exit / directional signs of not less than 125mm high with 15mm strokes in English and Chinese characters in accordance to FSD Circular Letter No. 5/2008.
7.5 The ventilation / air conditioning control system will be provided to stop mechanically induced air movement within a designated fire compartment.
7.8 (i) All linings for acoustic and thermal insulation purposes in ducting and concealed locations shall be of class 1 or 2 rate of surface spread of flame as per British Standard 476 Part 7 or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
(ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of class 1 or 2 rate of surface spread of flame as per British Standard 476 Part 7 or its international equivalent to be brought up to that standard by use of an approved fire retardent product.
7.10 Lift marked "A" on Plans will be arranged as Fireman's Lift.
B. RESIDENTIAL BLOCK
1.0 FIRE HYDRANT / HOSE REEL SYSTEM
1.1 An FHHR system installed in accordance with HKFSD code of practice. (April 2012 Version) will be provided for the residential block such that every part of building can be reached by a length of not more than 30m of fire services hose or hose reel tubing.
3.0 OTHER REQUIREMENTS FOR ELECTRICAL AND MECHANICAL SYSTEM
3.1 Please refer to Clause B.1 of Section A for the provisions of emergency generator and fuel storage tank for generator.
3.2 Electrical circuits will be provided by miniature circuit breakers or HRC cartridge fuses.
3.3 All exits/exit routes from public area to staircases as indicated on plans will be with 15mm strokes in English and Chinese characters in accordance to FSD Circular letter No. 5/2008.
3.4 Portable extinguishers, fire blanket and sand buckets will be provided at positions as indicated on plans.
3.5 (i) All linings for acoustic and thermal insulation purposes in ducting and concealed locations shall be of class 1 or 2 rate of surface spread of flame as per British Standard 476 part 7 or its international equivalent, or be brought up to that standard by use of an approved fire retardant product.
(ii) All linings for acoustic, thermal insulation and decorative purposes within protected means of escape shall be of class 1 or 2 rate of surface spread of flame as per British Standard 476 Part 7 or its international equivalent, to be brought up to that standard by use of an approved fire retardant product.
3.6 Standard FSD requirement for transformer room, switch room and emergency generator will be complied with.
3.7 Lift marked "A" on Plans will be arranged as Fireman's Lift.
3.8 Emergency lighting installed in accordance with BS5266 part 1:2011 and BS EN 1838:1999 shall be provided to all staircase, passages and public areas including lift lobbies on all floors and refuge areas in the residential block, the system for the entire podium and residential block.
7.11 Silicone fluid filled type (dry type) transformers to be provided at transformer room as indicated on plan. Mechanical ventilation to be provided for the transformer room.
7.6 No storage of dangerous goods / sodium hypochlorite generator be used in the filtration process of the swimming pool without the permission from the director of the fire services. A separate application giving full details will be submitted to the DG Division.
2.0 FIRE DETECTION AND ALARM SYSTEM
2.1 A manual fire alarm incorporated in the FHHR system will be provided for the residential block.
2.2 Automatic fire detection system will not be provided for the residential block including lift machine room at roof and all electrical meter rooms & water meter rooms at each residential floor.
2.3 All alarm signals will be transmitted to the main fire control panel located at G/F residential lobby.
7.7 Portable extinguishers and fire blanket will be provided at positions as indicated on plans.
2.1 An automatic sprinkler installation in accordance to FSD Circular Letter No. 3/2006 and LPC Rules incorporating BS EN 12845:2003 will be provided for the entire basement, club house and shop except the electrical and mechanical rooms such as all water pump rooms, F.S./sprinkler pump room, fan/PA/UPS/U rooms, switch rooms, transformer rooms, F.S. control room, filtration plant room, water meter room, emergency generator room and E/M duct.
3.6 Visual fire alarm system shall be provided for the recreational facilities and shop area in accordance with FSD circular letter No. 3/2012, design manual-Barrier Free Access 2008.
7.1 An independently powered generator of sufficient electrial capacity to meet the essential services for the entire building will be provided at 2/F.
3.9 Any intended storage or use of dangerous goods as defined in Chapter 295 of the Laws of Hong Kong should be notified to the Director of Fire Services.
will also be provided in entire basement area.
due to no fire compartment exceeding 7000 c.m.
5.1 Staircase Pressurization System will not be provided for basement due to only one occupancy on any floor exceeds 2000 s.m.
provided with internally illuminated exit / directional signs of not less than 125mm high for podium and basement.
7.9 Fire shutters of 4 hr FRP shall be provided at the locations as indicated on plans and operatored by smoke detector and manual control device on both sides of the shutters.
PART I: FS REQUIREMENT UNDER FSI CODE
PART II: FS REQUIREMENT UNDER CLAUSE 13.4 OF FS CODE 2011
4.0 FSI FOR OPEN KITCHEN
4.1 Sprinkler head will be provided to cover the entire open kitchen area. The sprinkler head shall be classified as FSI and should comply with the COP for Minimum FSI and Equipment. The alarm signal of the system shall be linked to the main fire control panel located at G/F residential lobby and linked to fire services communication centre by direct line.
4.2 The automatic sprinkler system will be provided in accordance to FSD Circular Letter No. 3/2006 and LPC Rules incorporating BS EN 12845:2003. The hazard classification is Ordinary Hazard Group I
4.3 Addressable smoke detectors with sounder base will be provided to cover the living area of domestic units with open kitchen except bedrooms and bathrooms, and will connect to FS control panel without direct link connection. The smoke detectors will be classified as FSI and will comply with the COP for Minimum FSI and Equipment.
4.5 The smoke detector system will be provided in accordance to BS 5839-1:2002+A2:2008.
4.4 Addressable smoke detectors will cover the entire lobby outside domestic units with open kitchen with direct link connection. Alarm signal of the smoke detectors at the lobbies outside the flats will be linked to the Fire Services Communication Center by direct line.
2.8 The fixed sprinkler pump shall be utilized as intermediate booster pump.
1.2 The fixed f.s. pump shall be utilized as intermediate booster pump.
4.6 An FSMP should be submitted and endorsed to the FSD prior to the request for FSI acceptance inspection

圖 6-2. 由建築資訊模型方法繪製的地盤位置平面圖和注釋

圖 6-3. 圖標、列表及注釋摘錄自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADV-33



ABBREVIATIONS & LEGEND

1 : 50

A.F.L.	ABOVE FINISHED FLOOR LEVEL
A.S.L.	ABOVE STRUCTURAL FLOOR LEVEL
F.F.L.	FINISHED FLOOR LEVEL
S.F.L.	STRUCTURAL FLOOR LEVEL
C.L.	CAT LADDER
M.L.	METAL LOUVRE
O.W.	WINDOW OPENING
F.D.	FLOOR DRAIN
F.A.I.	FRESH AIR INTAKE
P.D.	PIPE DUCT
M/A/L	MECHANICAL VENTILATION & ARTIFICIAL LIGHTING
A/L	ARTIFICIAL LIGHTING
EA	EXHAUST AIR
	SUBMISSION BOUNDARY
	SITE BOUNDARY
F.E.	4.5kg CO_2 F.E. FIRE EXTINGUISHER
F.H.	FIRE HYDRANT
F.S.I.	FIRE SERVICES INLET
H.R.	HOSE REEL
EXIT	EXIT SIGN
DSR	DIRECTIONAL SIGN (PROPRIETARY PRODUCT PROVIDED BY B.S.)
	DISABLED LIFT
	FIREMEN'S LIFT

Sheet List

Sheet Number	Current Revision	Sheet Name
A-01		SITE LOCATION PLAN AND NOTES
A-02		GROUND FLOOR & FIRST FLOOR PLAN
A-03		2nd FLOOR & 3rd FLOOR LAYOUT PLAN
A-04		5th FLOOR & 6th FLOOR LAYOUT PLAN
A-05		7th FLOOR LAYOUT PLAN (REFUGE FLOOR)
A-06		TYPICAL FLOOR PLAN (8/F TO 35/F) DUPLEX FLOOR PLAN 36/F
A-07		MAIN ROOF, LIFT MACHINE, UPPER ROOF & TOP ROOF PLANS
A-08		ELEVATION 1 & 2
A-09		ELEVATION 3 & 4
A-10		SECTION A - A & B - B
C-01		SITE COVERAGE & PLOT RATIO / LIST OF GFA CONCESSIONS CALCULATION
C-02		SITE COVERAGE / G.F.A. DIAGRAM & CALCULATION
C-03		DOMESTIC U.F.A.
C-04		EVA PLAN
C-05		CALCULATIONS SCHEDULES FOR MPE/FRC/SANITARY FITTINGS

GENERAL INDICATION FOR COLOURING OF PLANS

1 : 50

- BRICK
- CONCRETE SLAB (LIGHTER WASH)
- CONCRETE (PLAIN OR REINFORCED)
- SOLID CONCRETE BLOCK
- HOLLOW CONCRETE BLOCK
- LIGHTWEIGHT PARTITION
- PLASTER OR CEMENT RENDERING
- MOSAIC OR OTHER NON-ABSORBENT FLOOR / WALL TILES
- GLASS
- TIMBER
- METAL WORK OR STEEL
- STONE FINISH
- SANITARY FITTINGS
- PROVISION FOR THE DISABLED
- EARTH (UNEXCAVATED)
- EXISTING STRUCTURE
- EXISTING WOOD DECK

DOOR MARK

1 : 100

D1	1/2 HR. F.R.P. SELF-CLOSING DOOR GLASS UPPER PANEL
D1a	1 HR. F.R.P. SELF-CLOSING DOOR GLASS UPPER PANEL
D2	1/2 HR. F.R.P. SELF-CLOSING DOOR
D5	1 HR. F.R.P. SELF-CLOSING DOOR
SD	METAL DOOR (1 HR. F.R.P.)
P1	1 HR. F.R.P. ACCESS PANEL
AP	ACCESS PANEL
	INTEGRITY ONLY

KEY PLAN

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No.	Description	Date

DRAWN	Author
DESIGNED	Designer
CHECKED	Checker
APPROVED	Approver
DATE	05/13/16
PROJECT NUMBER	SAMPLE

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DRAWING TITLE

SITE LOCATION PLAN AND NOTES

DRAWING NO.	A-01

BIM REF.
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REV.

SCALE	As indicated

圖 6-4. 由建築資訊模型方法繪製的圖標、列表及注釋

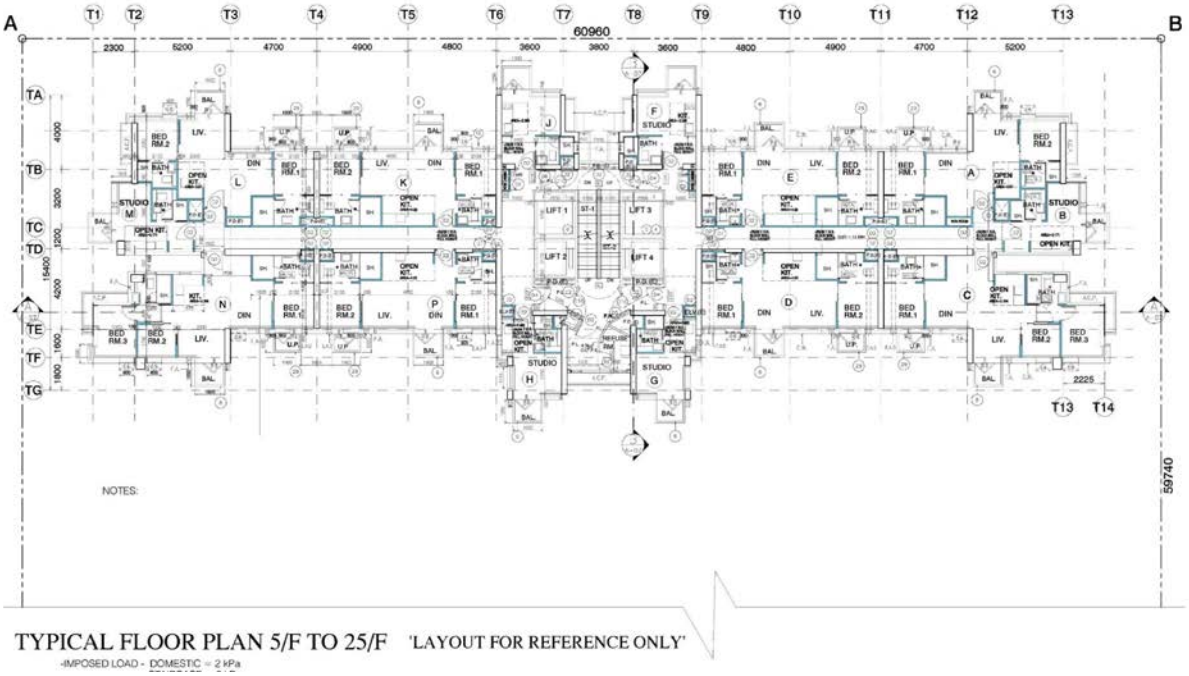


圖 6-5. 典型層平面圖摘錄自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADV-33

圖 6-6. 由建築資訊模型方法繪製的典型層平面圖

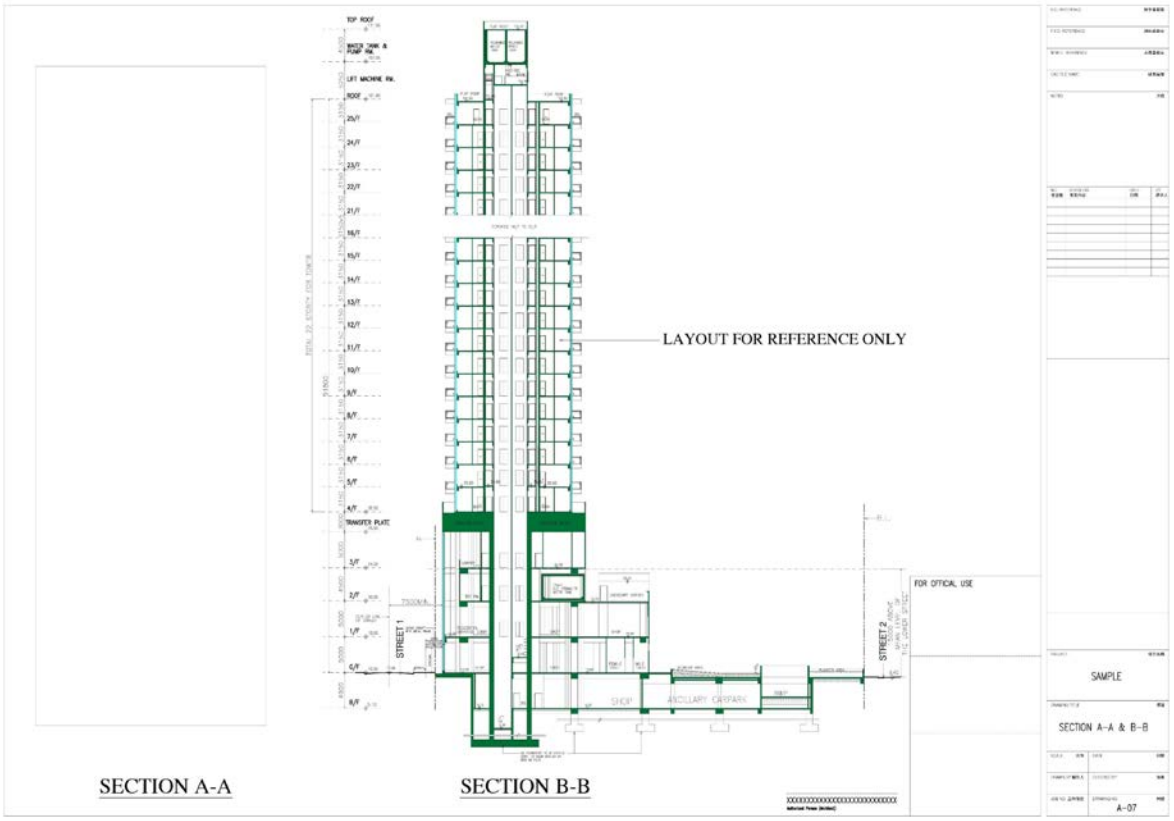


圖 6-7. 剖面圖摘錄自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》

ADV-33

圖 6-8. 由建築資訊模型方法繪製的剖面圖

圖 6-9. 立面圖摘錄自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》

ADV-33

圖 6-10. 由建築資訊模型方法繪製的立面圖

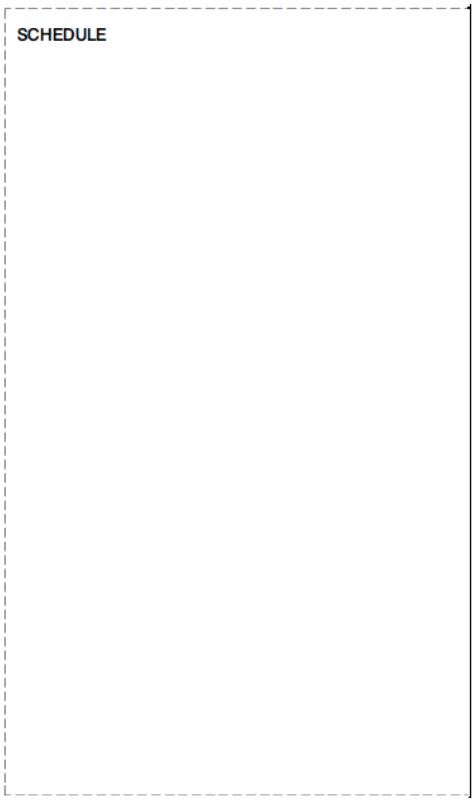
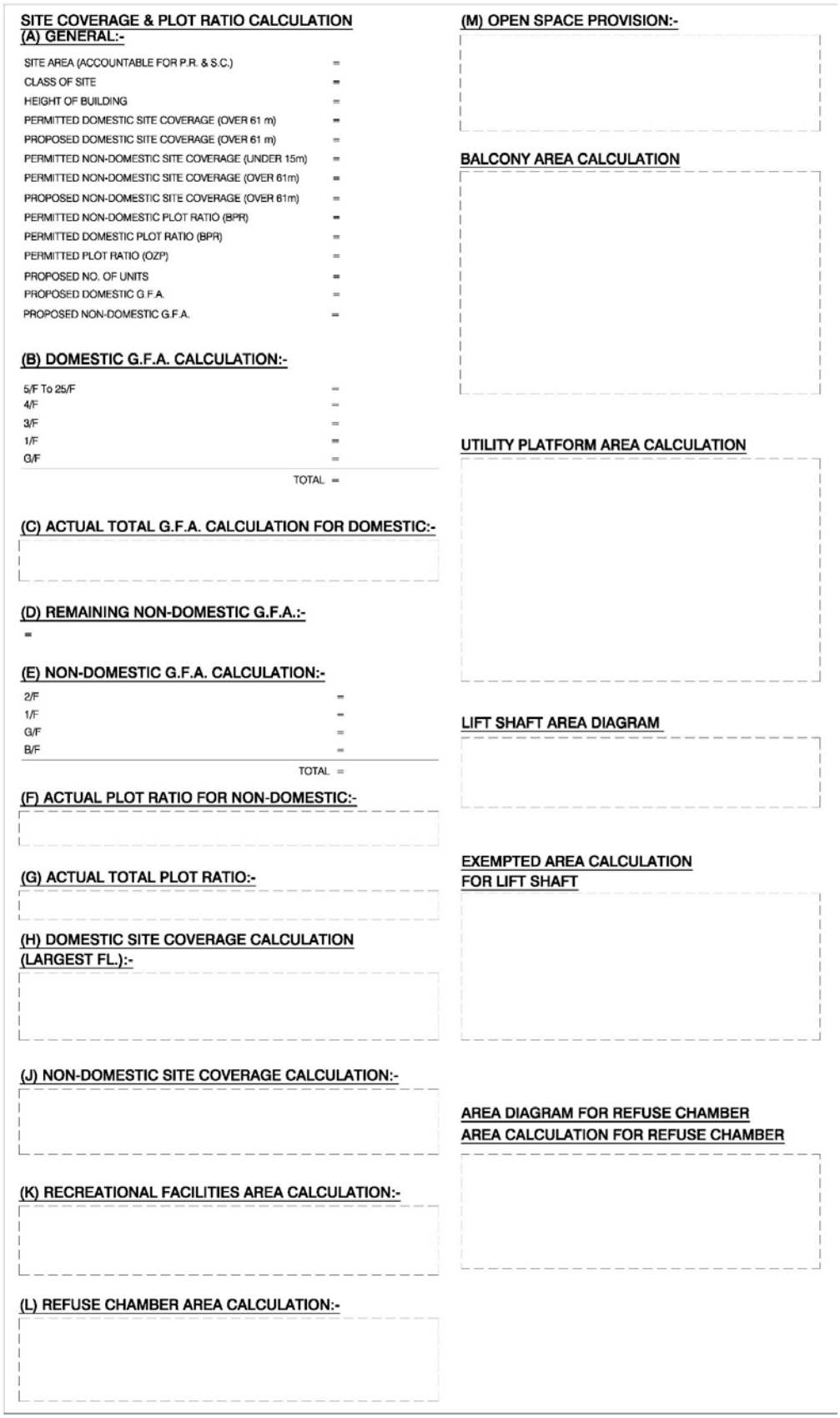


圖 6-11. 總樓面面積寬免表摘錄自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADV-33

AREA OF GFA CONCESSIONS	
Name	AREA (SQ.M)
TBE ROOM	23.455 m²
POTABLE & FLUSHING WATER TANK TRANSFER PUMP ROOM	37.307 m²
ELECTRICAL ROOM	9.720 m²
MAIN SWITCH ROOM	20.494 m²
TRANSFORMER ROOM	25.753 m²
TRANSFORMER ROOM	22.446 m²
SPRINKLER PUMP RM.	27.943 m²
ELECTRICAL ROOM	3.950 m²
FILTRATION PLANT ROOM	49.183 m²
CLEANSING WATER PUMP RM	19.653 m²
WATER METER RM.	3.500 m²
ELECT. RM.	2.849 m²
ELEC. RM.	1.457 m²
EMERGENCY GENERATOR ROOM	25.980 m²
NON-ESSENTIAL GENEARATOR RM.	16.745 m²
LOADING/ UNLOADING	24.500 m²
METER ROOM	2.821 m²
REFUSE STORAGE MATERIAL RECOVERY CHAMBER	13.517 m²
METER ROOM	2.010 m²
TOTAL	333.284 m²

圖 6-12. 由建築資訊模型方法計出總樓面面積寬免表



SITE COVERAGE & PLOT RATIO CALCULATION

(A) GENERAL:-

SITE AREA (ACCOUNTABLE FOR P.R. & S.C.)	=
CLASS OF SITE	=
HEIGHT OF BUILDING	=
PERMITTED DOMESTIC SITE COVERAGE (OVER 61 m)	=
PROPOSED DOMESTIC SITE COVERAGE (OVER 61 m)	=
PERMITTED NON-DOMESTIC SITE COVERAGE (UNDER 15m)	=
PERMITTED NON-DOMESTIC SITE COVERAGE (OVER 61m)	=
PROPOSED NON-DOMESTIC SITE COVERAGE (OVER 61m)	=
PERMITTED NON-DOMESTIC PLOT RATIO (BPR)	=
PERMITTED DOMESTIC PLOT RATIO (BPR)	=
PERMITTED PLOT RATIO (OZP)	=
PROPOSED NO. OF UNITS	=
PROPOSED DOMESTIC G.F.A.	=
PROPOSED NON-DOMESTIC G.F.A.	=

(B) DOMESTIC G.F.A. CALCULATION:-

5/F To 25/F	=
4/F	=
3/F	=
1/F	=
G/F	=
TOTAL	=

(C) ACTUAL TOTAL G.F.A. CALCULATION FOR DOMESTIC:-

(D) REMAINING NON-DOMESTIC G.F.A.:-

=

(E) NON-DOMESTIC G.F.A. CALCULATION:-

2/F	=
1/F	=
G/F	=
B/F	=
TOTAL	=

(F) ACTUAL PLOT RATIO FOR NON-DOMESTIC:-

(G) ACTUAL TOTAL PLOT RATIO:-

(H) DOMESTIC SITE COVERAGE CALCULATION (LARGEST FL.):-

(J) NON-DOMESTIC SITE COVERAGE CALCULATION:-

(K) RECREATIONAL FACILITIES AREA CALCULATION:-

(L) REFUSE CHAMBER AREA CALCULATION:-

(M) OPEN SPACE PROVISION:-

BALCONY AREA CALCULATION

UTILITY PLATFORM AREA CALCULATION

LIFT SHAFT AREA DIAGRAM

EXEMPTED AREA CALCULATION FOR LIFT SHAFT

AREA DIAGRAM FOR REFUSE CHAMBER

AREA CALCULATION FOR REFUSE CHAMBER

圖 6-13. 計算摘錄自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADV-33

SITE COVERAGE & PLOT RATIO CALCULATION

(A) GENERAL:

CLASS OF SITE:	A
SITE AREA (SQ.M):	706.46
BUILDING HEIGHT (M):	114.5 >61m
PERMITTED NON-DOMESTIC SC (%):	60
PERMITTED DOMESTIC SC (%):	33.33
PERMITTED NON-DOMESTIC PR:	15
PERMITTED DOMESTIC PR:	8

(D) REMAINING NON-DOMESTIC G.F.A.:

(E) NON-DOMESTIC G.F.A. CALCULATION:

(F) ACTUAL PLOT RATIO FOR NON-DOMESTIC::

ACTUAL NON-DOMESTIC GFA (SQ.M):	128.613
ACTUAL NON-DOMESTIC PR:	128.613/706.46
	0.182

(G) ACTUAL TOTAL PLOT RATIO::

REMAINING DOMESTIC PR:	(15-0.182)x9/15
	7.903
ACTUAL DOMESTIC GFA (SQ.M):	5378.653
ACTUAL DOMESTIC PR:	5378.653/706.46
	7.614<7.903

(H) DOMESTIC SITE COVERAGE CALUILATION:

ACTUAL DOMESTIC	234.319
SITE COVERAGE OVER 15M (SQ.M):	
ACTUAL DOMESTIC	234.319/706.46x100
SITE COVERAGE IN %	33.168<33.33

(J) NON-DOMESTIC SITE COVERAGE CALCULATION:

ACTUAL NON-DOMESTIC	366.822
SITE COVERAGE OVER 15M (SQ.M):	
ACTUAL NON-DOMESTIC	366.822/706.46x100
SITE COVERAGE IN %	51.924<60

(C) ACTUAL TOTAL G.F.A. CALCULATION FOR DOMESTIC:

DOMESTIC ACCOMMODATION	
OVERALL DOMESTIC GFA (SQ.M):	5451.568
OVERALL NON-DOMESTIC GFA (SQ.M):	128.613
OVERALL TOTAL GFA (SQ.M):	5451.568+128.613
	5580.181
DOMESTIC LIFT SHAFT AREA (SQ.M):	212.420
MAXIMUM EXEMPTED GFA (SQ.M):	5580.181x3.5%
	195.306
ACTUAL EXEMPTED GFA (SQ.M):	212.420<5580.181x2.5%
	72.915 (MAX.195.306)
ACTUAL DOMESTIC GFA (SQ.M):	5451.568-72.915
	5378.653

(B) DOMESTIC G.F.A. CALCULATION

TOTAL DOMESTIC GFA

ID	NAME	AREA (SQ.M)	STOREY	TOTAL AREA (SQ.M)
1	FLOOR AREA	228.869	24	5492.856
3	MAIN ENTRANCE	76.051	1	76.051
5	FLOOR AREA	209.809	1	209.809
				5778.716

UNDER OUTLINE ZONING PLAN

ZONE	=R(A)
PROPOSED USE	=RESIDENTIAL & SHOP ON G/F (ALWAYS PERMITTED)
PERMISSIBLE BUILDING HEIGHT	=140mPD
PROPOSED BUILDING HEIGHT	=135.240mPD < 140mPD

(K) RECREATIONAL FACILITIES AREA CALCULATION

5/F RECREATIONAL FACILITIES DIAGRAM

ID	NAME	AREA (SQ.M)
1	RECREATIONAL FACILITIES FLOOR AREA	278.88

(N) BALCONY AREA CALCULATION

46.822 x 4%=1.952 s.m. or 2.0 s.m.
WHICHEVER IS THE GREATER

GREEN BALCONY AREA CALCULATION (UNIT A)

Number	Name	Area	
AB	BAL.	1.996 m²	<2.000 s.m.

33.052 x 4%=1.322 s.m. or 2.0 s.m.
WHICHEVER IS THE GREATER

GREEN BALCONY AREA CALCULATION (UNIT B)

Number	Name	Area	
BB	BAL.	1.997 m²	<2.000 s.m.

43.023 x 4%=1.721 s.m. or 2.0 s.m.
WHICHEVER IS THE GREATER

GREEN BALCONY AREA CALCULATION (UNIT C)

Number	Name	Area	
CB	BAL.	1.998 m²	<2.000 s.m.

SCHEDULE OF UFA & UFS UNIT A (FOR 36F) EXEPTED AREA (BALCONY)

Number	Name	Area
AB	BAL.	2.464 m²

SCHEDULE OF UFA & UFS UNIT B (FOR 36F) EXEPTED AREA (BALCONY)

Number	Name	Area
BB	BAL.	2.987 m²

(O) OUTILITY PLATFORM AREA CALCULATION

TOTAL UTILITY PLATFORM & GREEN BALCONY AREA (UNIT A)

Number	Name	Area
AB	BAL.	1.996 m²
AU	UTIL.	1.499 m²
TOTAL		3.494 m²

TOTAL UTILITY PLATFORM & GREEN BALCONY AREA (UNIT B)

Number	Name	Area
BB	BAL.	1.997 m²
BU	UTIL.	1.500 m²
TOTAL		3.497 m²

TOTAL UTILITY PLATFORM & GREEN BALCONY AREA (UNIT C)

Number	Name	Area
CU	UTIL.	1.500 m²
CB	BAL.	1.998 m²
TOTAL		3.498 m²

SCHEDULE OF UFA & UFS UNIT A (FOR 36F) EXEPTED AREA (UTILITY PLATFORM)

Number	Name	Area
AU	UTIL.	1.084 m²

SCHEDULE OF UFA & UFS UNIT B (FOR 36F) EXEPTED AREA (UTILITY PLATFORM)

Number	Name	Area
BU	UTIL.	1.500 m²

EXEMPTED U.P. AREA CALCULATION UNDER JPN2 (UNIT A)

Number	Name	Area	
AU	UTIL.	1.499 m²	<1.500 s.m.

EXEMPTED U.P. AREA CALCULATION UNDER JPN2 (UNIT B)

Number	Name	Area	
BU	UTIL.	1.500 m²	<1.500 s.m.

EXEMPTED U.P. AREA CALCULATION UNDER JPN2 (UNIT C)

Number	Name	Area	
CU	UTIL.	1.500 m²	<1.500 s.m.

(Q) EXEMPTED AREA CALCULATION FOR LIFT SHAFT

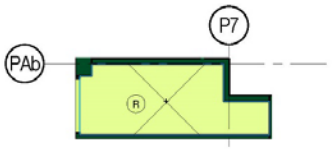
LIFT SHAFT SCHEDULE

AREA (SQ.M)	STOREYS	TOTAL AREA (SQ.M)
4.085	26	106.21
4.085	26	106.21
		212.42

(R) AREA DIAGRAM FOR REFUSE CHAMBER
AREA CALCULATION FOR REFUSE CHAMBER

REFUSE STORAGE & MATERIAL RECVERY CHAMBER AREA CALCULATION

Number	Name	Area
R	REFUSE STORAGE MATERIAL RECOVERY CHAMBER	13.517 m²



REFUSE AREA DIAGRAM
1 : 100

圖 6-14. 由建築資訊模型方法計出的計算

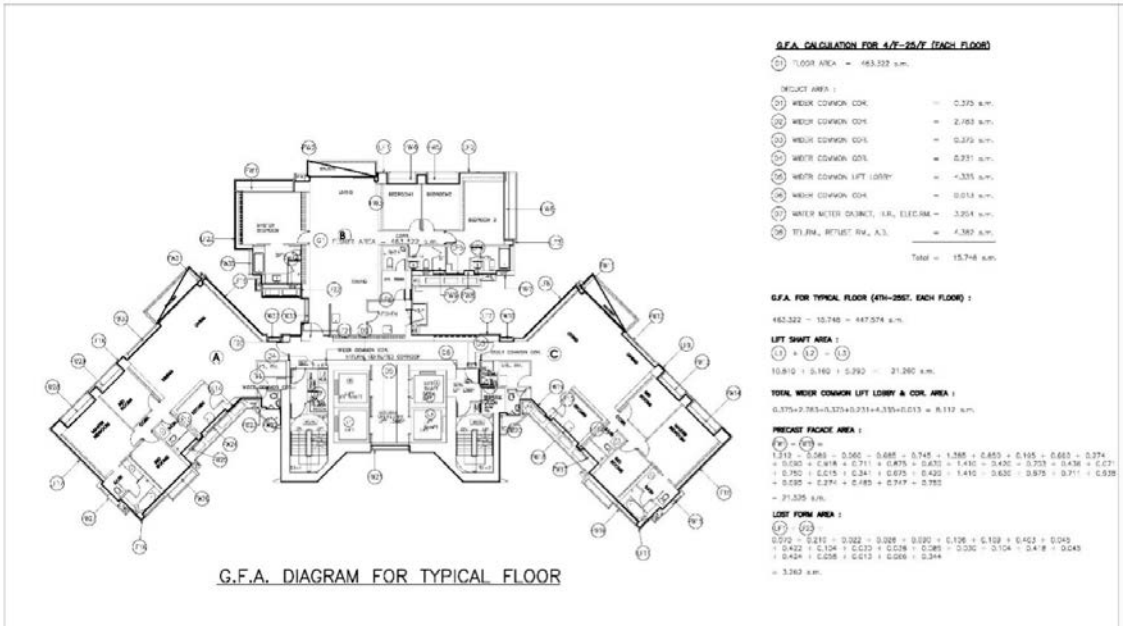


圖 6-15. 總樓面面積及計算摘錄自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADV-33

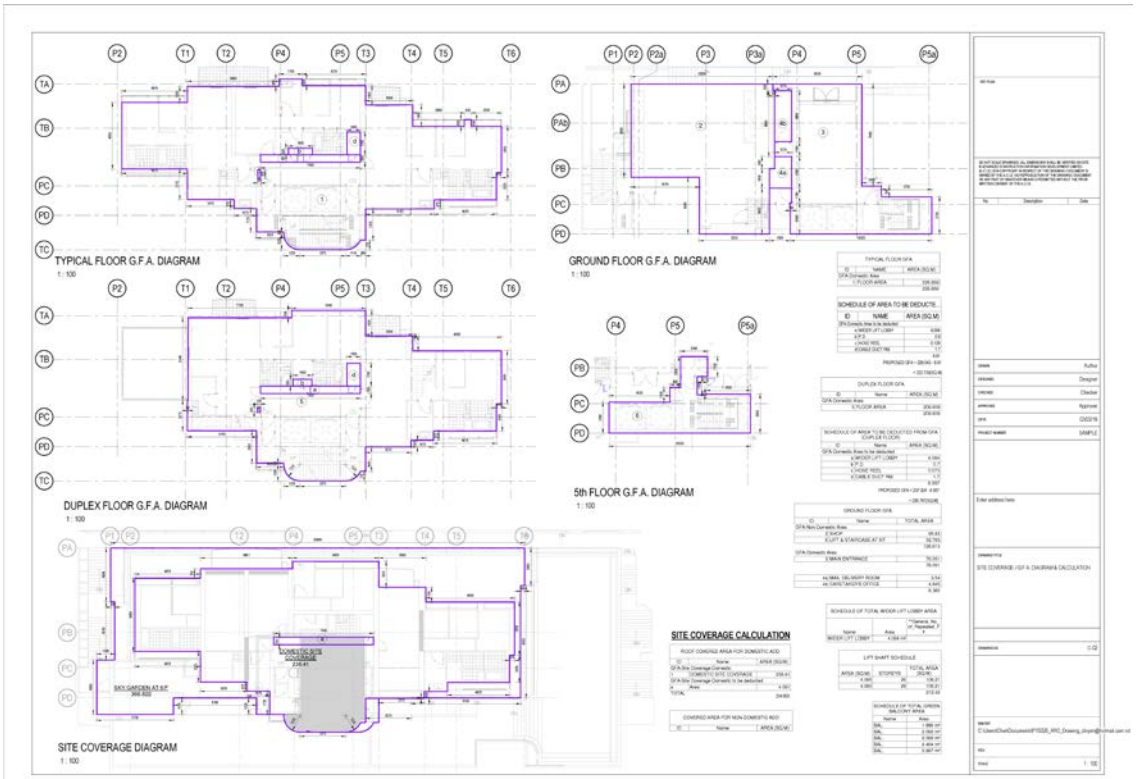


圖 6-16. 由建築資訊模型方法計出的總樓面面積及計算

實用樓面空間圖及計算

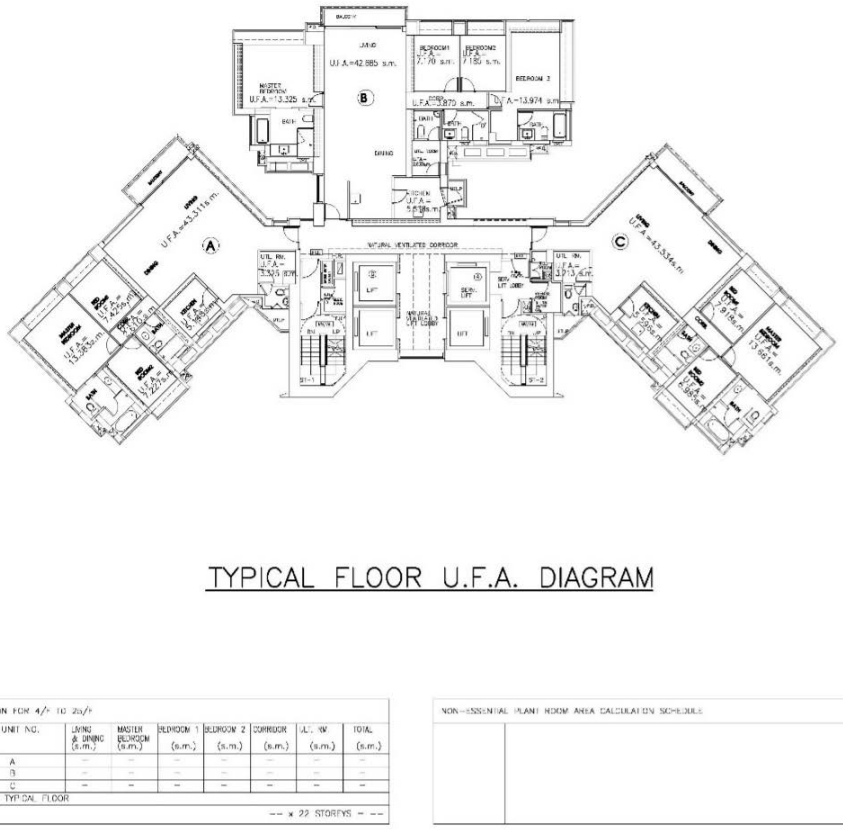


圖 6-17. 實用樓面空間圖及計算摘錄自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》》ADV-33

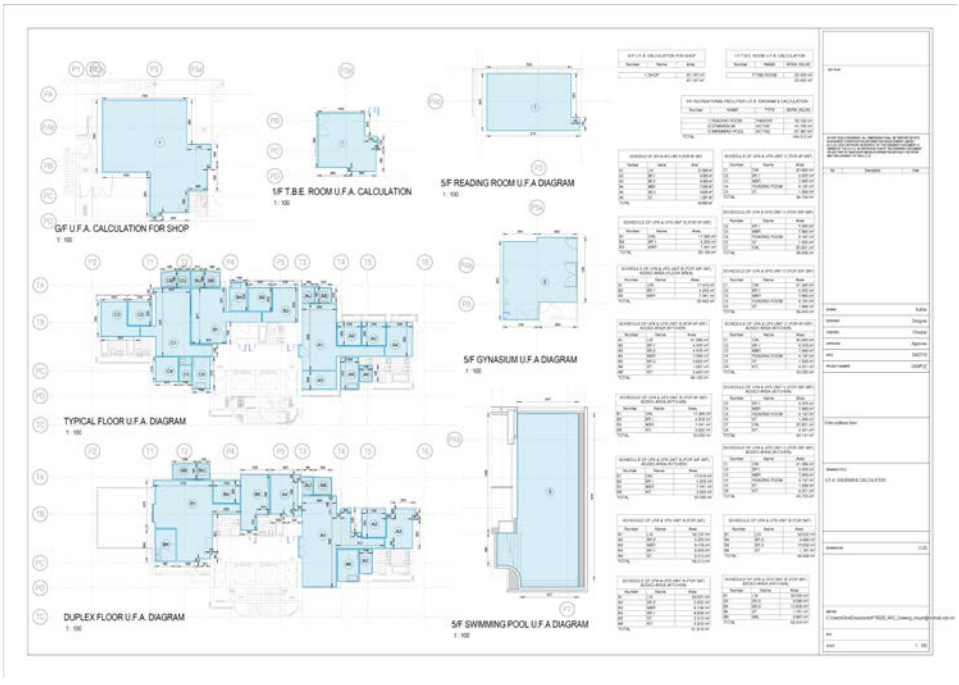


圖 6-18. 由建築資訊模型方法計出的實用樓面空間圖及計算

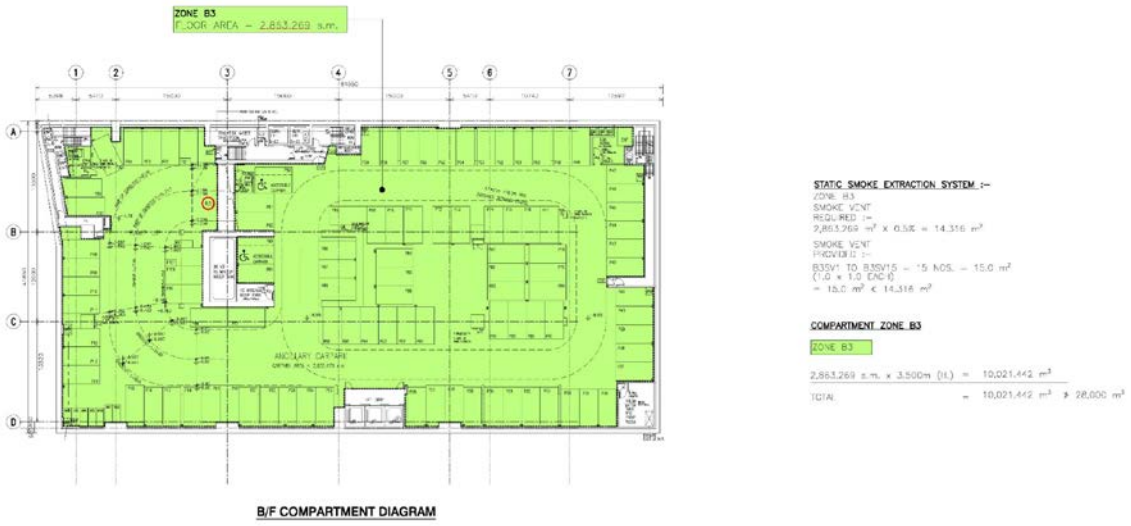


圖 6-19. 防火隔室圖摘錄自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADV-33

圖 6-20. 由建築資訊模方法繪製的防火隔室圖

緊急車輛通道圖及計算

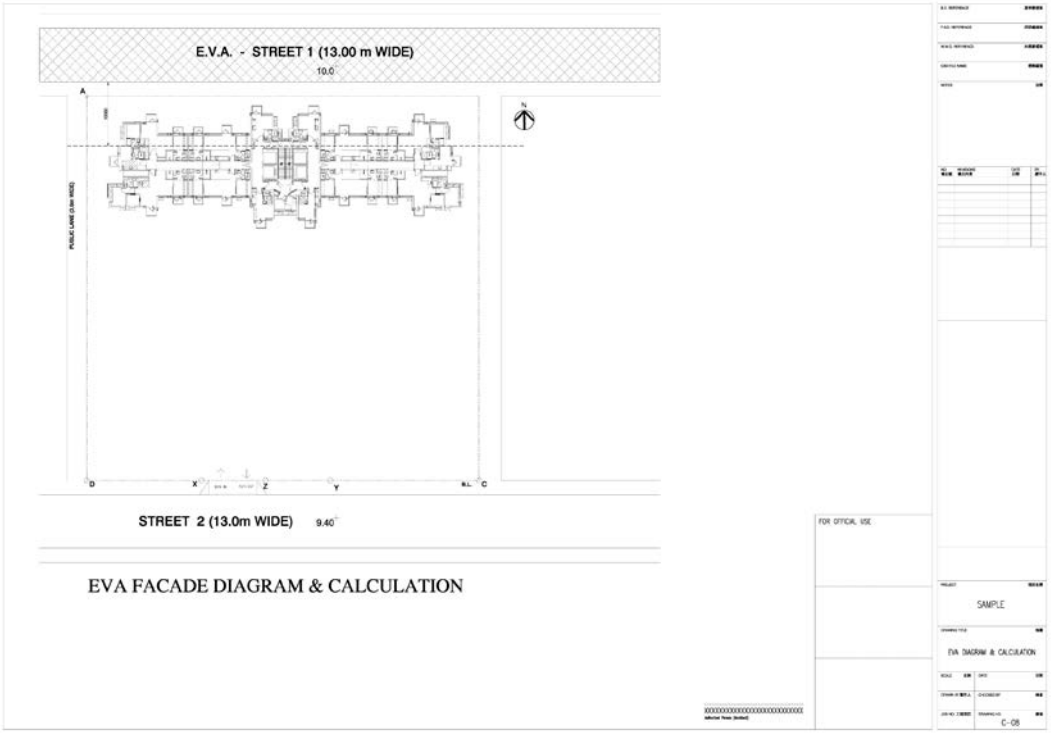


圖 6-21. 緊急車輛通道圖及計算摘錄自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADV-33

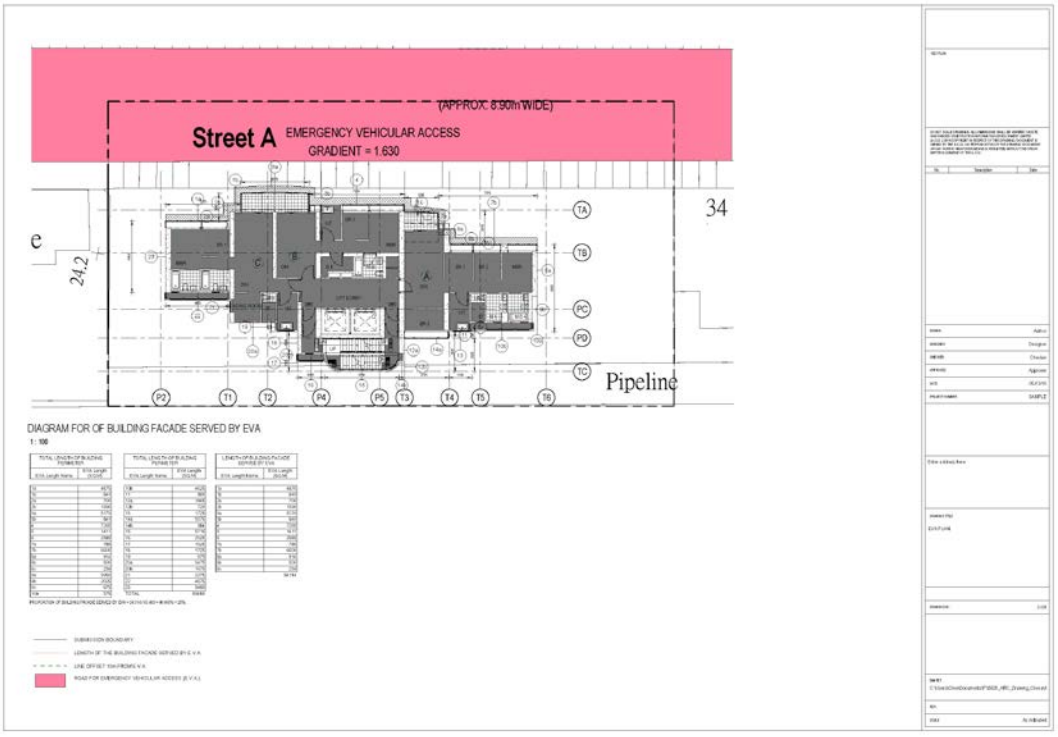
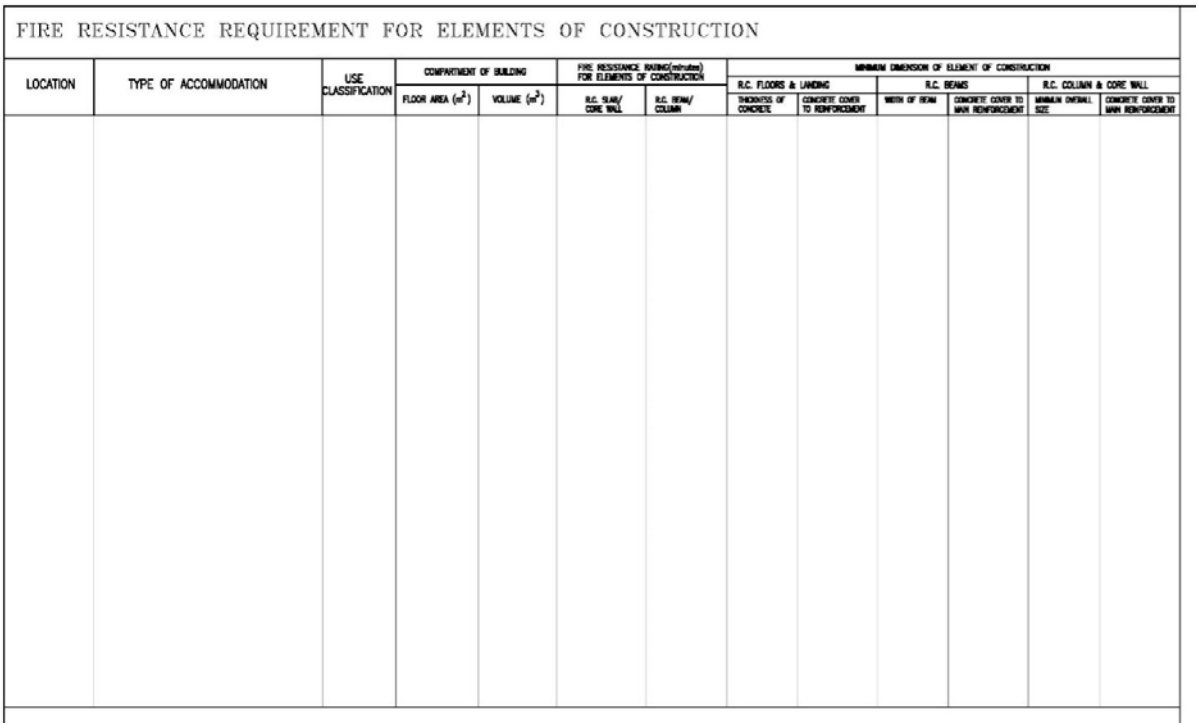


圖 6-22. 由建築資訊模型方法繪製的緊急車輛通道圖及計算



FIRE RESISTANCE REQUIREMENT FOR ELEMENTS OF CONSTRUCTION

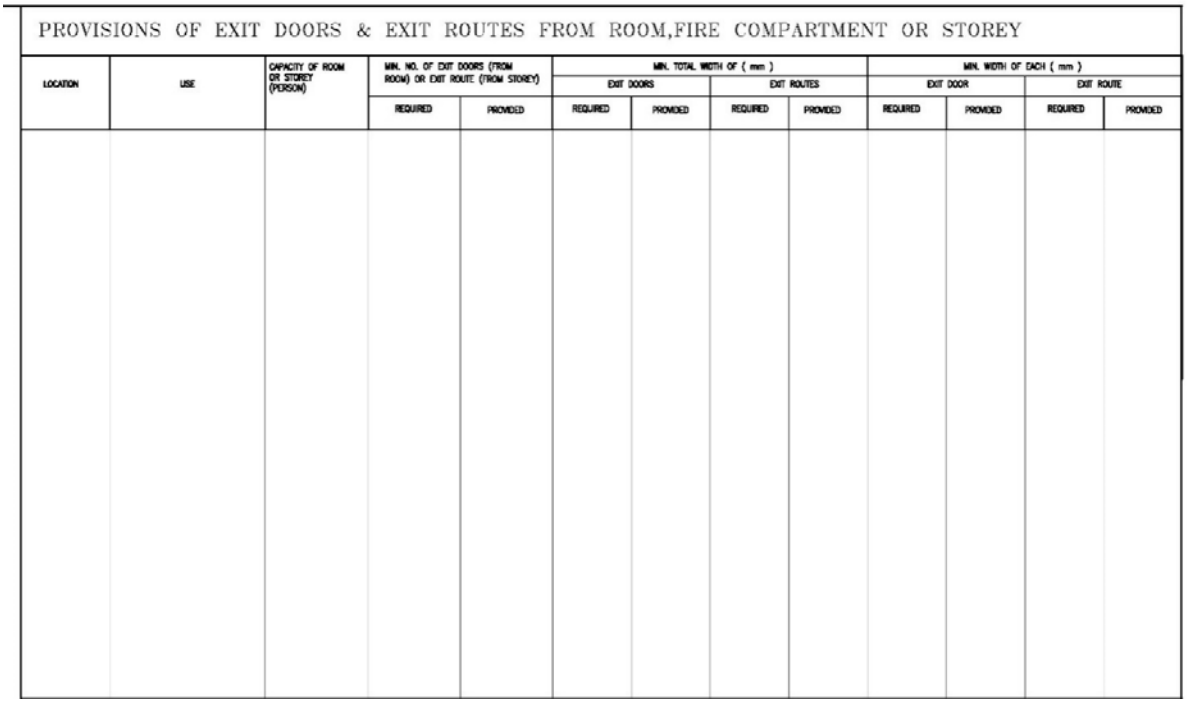
LOCATION	TYPE OF ACCOMMODATION	USE CLASSIFICATION	COMPARTMENT OF BUILDING		FIRE RESISTANCE RATING(minutes) FOR ELEMENTS OF CONSTRUCTION		MINIMUM DIMENSION OF ELEMENT OF CONSTRUCTION					
							R.C. FLOORS & LANDING		R.C. BEAMS		R.C. COLUMN & CORE WALL	
			FLOOR AREA (m^2)	VOLUME (m^3)	R.C. SLAB/ CORE WALL	R.C. BEAM/ COLUMN	THICKNESS OF CONCRETE	CONCRETE COVER TO REINFORCEMENT	WIDTH OF BEAM	CONCRETE COVER TO MAIN REINFORCEMENT	MINIMUM OVERALL SIZE	CONCRETE COVER TO MAIN REINFORCEMENT

圖 6-23. 最小耐火能力附表摘錄自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADV-33

FIRE RESISTANCE REQUIREMENT FOR ELEMENTS OF CONSTRUCTION

LEVEL	NAME	CLASS	FRP REQ'D	R.C. WALL => 1% V.R.		R.C. SLAB		R.C. BEAM		R.C. COLUMN		R.C. STAIR	
				THK.	COVER TO STEEL	THK.	COVER TO STEEL	THK.	COVER TO STEEL	THK.	COVER TO STEEL	THK.	COVER TO STEEL
G/F	LOADING/UNLOADING		60	75	15	100	20	200	30	200	25	95	20
G/F	MAIN ENTRANCE	1a (Residential - House type dwellings)	60	75	15	100	20	200	30	200	25	95	20
G/F	SHOP	4a (Commercial - Business facilities)	60	75	15	100	20	200	30	200	25	95	20
1/F	TRANSFER PUMP ROOM		120	100	25	125	25	200	40	300	35	125	35
1/F	ELECTRICAL ROOM		120	100	25	125	25	200	40	300	35	125	35
1/F	TBE ROOM		120	100	25	125	25	200	40	300	35	125	35
1/F	MAIN SWITCH ROOM		120	100	25	125	25	200	40	300	35	125	35
1/F	TRANSFORMER ROOM		240	100	25	170	40*	280	60*	450	35	170	55*
2/F	SPRINKLER PUMP RM		120	100	25	125	25	200	40	300	35	125	35
2/F	MAIN SWITCH ROOM		120	100	25	125	25	200	40	300	35	125	35
2/F	TRANSFORMER ROOM		240	100	25	170	40*	280	60*	450	35	170	55*
3/F	FS PUMP RM		120	100	25	125	25	200	40	300	35	125	35
3/F	CLEANSING WATER PUMP RM		120	100	25	125	25	200	40	300	35	125	35
5/F	E/M ROOM		120	100	25	125	25	200	40	300	35	125	35
5/F	E/M ROOM		120	100	25	125	25	200	40	300	35	125	35
5/F	E/M ROOM		120	100	25	125	25	200	40	300	35	125	35
5/F	READING ROOM	5a (Assembly - Places of Public Entertainment)	60	75	15	100	20	200	30	200	25	95	20
5/F	SWIMMING POOL	5a (Assembly - Places of Public Entertainment)	60	75	15	100	20	200	30	200	25	95	20
5/F	GYMNASIUM	5d (Assembly - Other Assembly Premises)	60	75	15	100	20	200	30	200	25	95	20
6/F	E/M ROOM		120	100	25	125	25	200	40	300	35	125	35
6/F	SKY GARDEN		60	75	15	100	20	200	30	200	25	95	20
7/F LOWER FLOOR	REFUGE FLOOR	1a (Residential - House type dwellings)	120	100	25	125	25	200	40	300	35	125	35
7/F LOWER FLOOR	REFUGE FLOOR	1a (Residential - House type dwellings)	120	100	25	125	25	200	40	300	35	125	35
8/F	DOMESTIC	1b (Residential - Flats)	60	75	15	100	20	200	30	200	25	95	20
LIFT MACHINE ROOM LEVEL	LIFT MACHINE ROOM		120	100	25	125	25	200	40	300	35	125	35
LIFT MACHINE ROOM LEVEL	METER ROOM		120	100	25	125	25	200	40	300	35	125	35
EMERGENCY GENERATOR & WATER PUMP ROOM	LIFT MACHINE ROOM		120	100	25	125	25	200	40	300	35	125	35
EMERGENCY GENERATOR & WATER PUMP ROOM	PUMP ROOM		120	100	25	125	25	200	40	300	35	125	35

圖 6-24. 由建築資訊模型方法計算的最小耐火能力附表



PROVISIONS OF EXIT DOORS & EXIT ROUTES FROM ROOM,FIRE COMPARTMENT OR STOREY

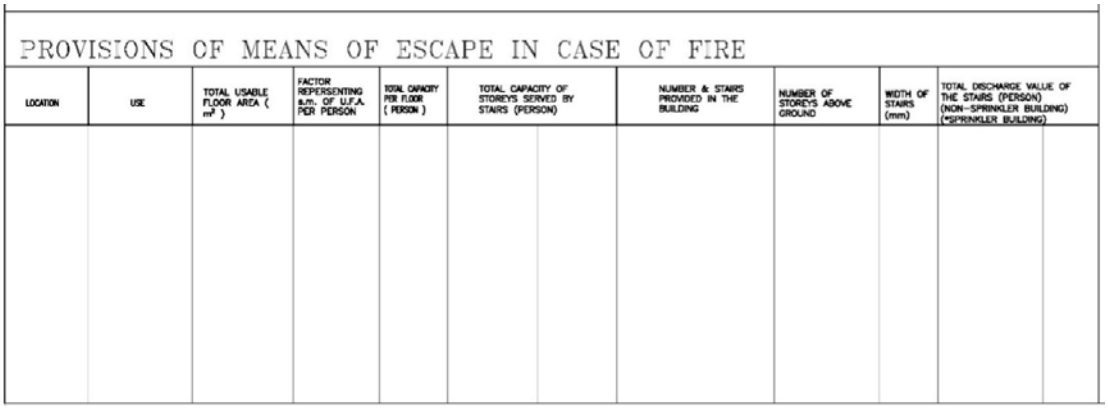
LOCATION	USE	CAPACITY OF ROOM OR STOREY (PERSON)	MIN. NO. OF EXIT DOORS (FROM ROOM) OR EXIT ROUTE (FROM STOREY)		MIN. TOTAL WIDTH OF (mm)				MIN. WIDTH OF EACH (mm)			
					EXIT DOORS		EXIT ROUTES		EXIT DOOR		EXIT ROUTE	
			REQUIRED	PROVIDED	REQUIRED	PROVIDED	REQUIRED	PROVIDED	REQUIRED	PROVIDED	REQUIRED	PROVIDED

圖 6-25. 逃生門、逃生路徑的規定附表摘錄自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADV-33

SCHEDULE OF MINIMUM NUMBER & WIDTH OF EXIT DOOR & EXIT ROUTE FROM EACH FLOOR

LEVEL	FLOOR CAPACITY	MIN. NO. OF EXIT ROUTE		MIN. TOTAL WIDTH OF				MIN. WIDTH OF EACH			
		REQ'D	PRO'D	EXIT DOORS		EXIT ROUTES		EXIT DOOR		EXIT ROUTE	
				REQ'D	PRO'D	REQ'D	PRO'D	REQ'D	PRO'D	REQ'D	PRO'D
5/F		2	2	1750	1750	2100	2100	850	875	1050	1050
26/F	39	2	2	1750	1750	2100	2100	850	875	1050	1050

圖 6-26. 由建築資訊模型方法計算的逃生門、逃生路徑的規定附表



PROVISIONS OF MEANS OF ESCAPE IN CASE OF FIRE

LOCATION	USE	TOTAL USABLE FLOOR AREA (m^2)	FACTOR REPERSENTING a.m. OF U.F.A. PER PERSON	TOTAL CAPACITY PER FLOOR (PERSON)	TOTAL CAPACITY OF STOREYS SERVED BY STAIRS (PERSON)	NUMBER & STAIRS PROVIDED IN THE BUILDING	NUMBER OF STOREYS ABOVE GROUND	WIDTH OF STAIRS (mm)	TOTAL DISCHARGE VALUE OF THE STAIRS (PERSON) (NON-SPRINKLER BUILDING) (*SPRINKLER BUILDING)

圖 6-27. 逃生途徑的規定摘錄自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADV-33

SCHEDULE OF DISCHARGE VALUE								
	DISCHARGE VALUE OF STAIRCASE IN A SPRINKLERED BUILDING	DISCHARGE VALUE OF STAIRCASE IN A SPRINKLERED BUILDING	DISCHARGE VALUE OF STAIRCASE IN A SPRINKLERED BUILDING	DISCHARGE VALUE OF STAIRCASE IN A SPRINKLERED BUILDING			DISCHARGE VALUE OF STAIRCASE IN A SPRINKLERED BUILDING	DISCHARGE VALUE OF STAIRCASE IN A SPRINKLERED BUILDING
STAIR NO.	WIDTH OF STAIRCASE (mm)	PERMITTED	PERMITTED	CALCULATED PERMITTED	CALCULATED WIDTH OF STAIRCASE	CALCULATED PERMITTED	TOTAL NO. OF FLOOR SERVED ABOVE G/F	ACTUAL
ST-1		0					48	

圖 6-28. 由建築資訊模型方法計算的逃生途徑的規定

SCHEDULE OF SANITARY FITMENTS

LOCATION OF FLOOR	USE	TOTAL USABLE FL. AREA (m^2)	FACTOR REPRESENTING m^2 OF USABLE FL. AREA PER PERSON	TOTAL CAPACITY PER FLOOR (PROPORTION)	NO. OF MALE PERSON AND FEMALE PERSON (PROPORTION)			SANITARY FITMENT REQUIRED				SANITARY FITMENT PROVIDED (*INCLUDE DISABLED LAV.)			
								W.C.	BATH/SHOWER BIDET	URINAL	BASIN OR WATER POINT	W.C.	BATH/SHOWER BIDET	URINAL	BASIN OR WATER POINT

圖 6-29. 衛生設備規定附表摘錄自《認可人士、註冊結構工程師及註冊岩土工程師作業備考》ADV-33

SCHEDULE OF SANITARY FITMENTS PROVISIONS																			
			CAPACITY			W.C.				BASIN				URINAL		BATH			
						M.		F.		M.		F.				M.		F.	
LOCATION	USE	AREA (SQ.M)	TOTAL	M.	F.	REQ'D	PRO'D	REQ'D	PRO'D	REQ'D	PRO'D	REQ'D	PRO'D	REQ'D	PRO'D	REQ'D	PRO'D	REQ'D	PRO'D
G/F	SHOP/DEPARMENT STORE	67.167	5	3	2	1	1	1	1	1	1	1	1	0	-	0	-	0	-
5/F RECREATIONAL FASCILITIES GYMNASIUM	DOMESTIC	40.739	14	7	7	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5/F RECREATIONAL FASCILITIES READING ROOM	DOMESTIC	39.192	39	20	19	2	2	2	1	2	2	2	2	2	2	2	2	2	2
5/F RECREATIONAL FASCILITIES RECEPTION LOBBY	DOMESTIC	51.516	6	3	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5/F RECREATIONAL FASCILITIES SWIMMING POOL	DOMESTIC	67.38	30	15	15	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8/F - 35/F (DOMESTIC) (LARGEST UNIT) * UNIT A	DOMESTIC		10	-	-	2	2	0	-	2	2	0	-	0	-	2	2	0	-
8/F - 35/F (DOMESTIC) (LARGEST UNIT) * UNIT B	DOMESTIC		7	-	-	1	2	0	-	1	2	0	-	0	-	1	2	0	-
8/F - 35/F (DOMESTIC) (LARGEST UNIT) * UNIT C	DOMESTIC		9	-	-	2	2	0	-	2	2	0	-	0	-	2	2	0	-
36/F (DOMESTIC) UNIT A	DOMESTIC		8	-	-	1	1	0	-	1	1	0	-	0	-	1	1	0	-
36/F (DOMESTIC) UNIT B	DOMESTIC		9	-	-	2	2	0	-	2	2	0	-	0	-	2	2	0	-

圖 6-30. 由建築資訊模型方法計算的衛生設備規定附表

6.2 屋宇署在採用建築資訊模型的最新發展

屋宇署於 2016 年 9 月發布最新《認可人士、註冊結構工程師及註冊岩土工程師作業備考》 ADV-34。此作業備考為認可人士、註冊結構工程師及註冊岩土工程師提供以建築資訊模型呈交建築提案的指導方針，作為補充資訊以協助屋宇署對圖則審批的過程。

Buildings Department	Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers	ADV-34

Building Information Modelling

The use of Building Information Modelling (BIM) is a relatively new and innovative approach to building design and construction. The Buildings Department (BD) encourages authorized persons (AP), registered structural engineers (RSE) and registered geotechnical engineers (RGE) to consider adopting BIM in their building projects under the Buildings Ordinance. This practice note provides general guidelines on BIM submissions for building proposals as supplementary information to facilitate plan processing by the BD.

BIM Submissions

2. There is a wide range of applications of BIM on new building development and alteration and addition works which are considered useful to facilitate the BD in processing plan submissions. Some examples of BIM applications are given in **Appendix A** and the project AP/RSE/RGE are encouraged to provide the BD with a soft copy of the computer modelling information under the specified format for consideration.

Format and Software Version

3. In addition to the statutory requirement of plan submission in paper format, AP/RSE/RGE are encouraged to present their building and/or building works proposals by the computer aid of BIM information in digital format compatible with BIM viewing software or real-time simulation to enhance illustration of the proposals and/or the construction sequence of the proposed works in the following manner and format:-

(a) The data files should be stored in non-rewritable CD-ROM in ISO 9660 format (i.e. CD format) or non-rewriteable DVD-ROM in ISO/IEC 13346:1995 format (i.e. DVD format);

(b) BIM viewing software (but not web based BIM viewer) shall be available for free download from the Internet for viewing the BIM submission. The link to download the viewing software should also be provided by the AP/RSE/RGE. Each individual file for viewing on BIM viewing software should also be limited to the size of 30 MB; and

(c) The real-time simulation should be in Windows Media Video (wmv) or Audio Video Interleave (avi) format and supported by Windows Media Player 11 or above.

BIM Submission as Reference Material

4. Whilst BIM is submitted as a kind of supplementary information for reference, the BD processes approval of plans under the Buildings Ordinance based on the information contained in the plans. In case of any discrepancy between the plans and BIM submitted, the plans shall prevail. To keep pace with the development of BIM in the building industry, the BD will, from time to time, review the extent of BIM application and evaluate its effectiveness in the plan submission.

(HUI Siu-wai)
Building Authority

Ref. : BD GR/1-125/11/1

First Issue : September 2016 (AD/NB2)

Appendix A
(PNAP ADV-34)

Examples of application of BIM to supplement Plan Submissions

Types of Plan Submission	Examples of Building Information to be illustrated by BIM	
	Building Information Model	**Real-time Simulation**
General Building Plans	● innovative building design, irregular/twisted building form; ● projecting features on external wall; ● relationship between site profiles/street levels and proposed building; ● arrangement of means of escape and compartmentation; ● spatial arrangement of building; ● relationship between existing building and proposed alteration and addition (A&A) works.	● sequence and phasing of various stages[Note 1] of new building development; ● sequence and phasing of A&A works.
Drainage Plans	● complex drainage systems and/or connections ● relationship between proposed underground drainage works and foundation works/site formation works etc.	● sequence and phasing of various stages[Note 1] of new building development; ● sequence and phasing of A&A works.
Superstructure Plans	● complex steel structures and/or connections; ● arrangement of transfer structures and illustration of load path; ● basement structures supporting adjoining ground and/or existing geotechnical features; ● assembly sequence, structural arrangement and/or connection of façade/glass wall/curtain wall/cladding works, etc.; ● relationship between existing structures and proposed A&A works; ● working space, temporary supports and strengthening in A&A works.	● sequence and phasing of various stages[Note 1] of new building development; ● sequence and phasing of A&A works.
Foundation Plans Excavation and Lateral Support (E&LS) Plans	● relationship between proposed foundations, sub-structures, E&LS works and geological ground profiles, adjoining existing foundations, geotechnical features, sensitive structures, etc.	● sequence and phasing of various stages[Note 1] of new building development; ● top-down construction.
Site Formation Plans	● relationship between site profiles, geological ground profiles and proposed works.	● sequence and phasing of various stages[Note 1] of new building development.
Demolition Plans	● final stage of partial demolished structures.	● sequence and phasing of works, method statements and temporary precautionary measures.

Notes : Relevant stages of new building development may include demolition, foundation, E&LS, site formation, sub-structure and superstructure construction, as the case may be.

6.3 即時建議

建築資訊模型的技術可以促進描述平面圖上的常規測算。 例如，在建築資訊模型中可輕鬆計算出解散值和逃生途徑距離的測算。

SCHEDULE OF DISCHARGE VALUE			
	DISCHARGE VALUE OF STAIRCASE IN A SPRINKLERED BUILDING		
STAIR NO.	WIDTH OF STAIRCASE (mm)	PERMITTED	TOTAL NO. OF FLOOR SERVED ABOVE G/F
ST-1	1125	420	1
ST-4	1688	640	1

TOTAL PERMITTED DISCHARGE VALUE = 420 + 640
= 1060
TOTAL ACTUAL DISCHARGE VALUE = 425

TOTAL : 1060 > 425

圖 6-31. 解散值附表

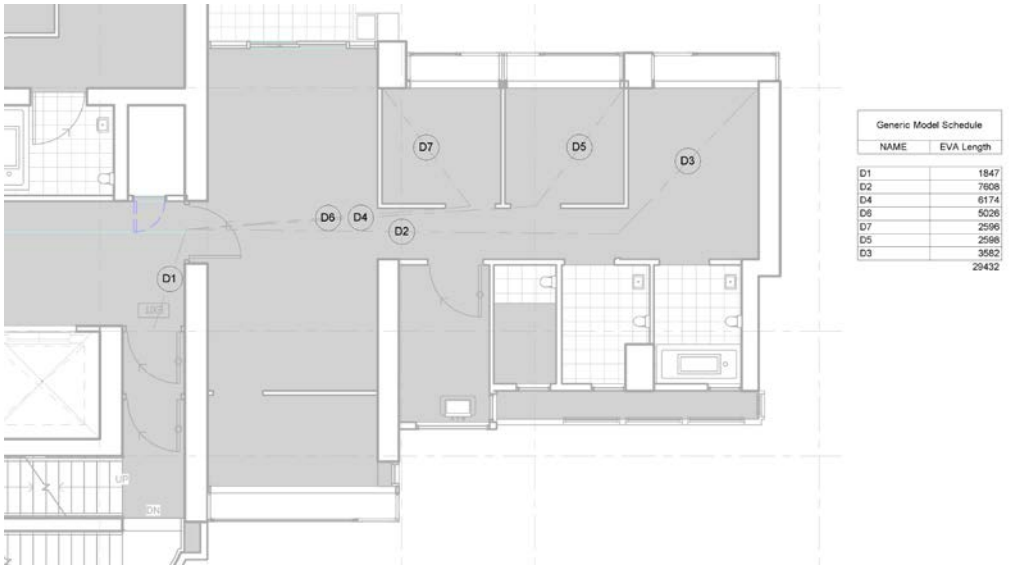


圖 6-32. 逃生距離圖

6.4 中期建議

在傳統的二維繪圖簡報，以三維繪圖簡報作圖解說明目的是相當耗時。

若使用建築資訊模型繪製，由於其模型已是由三維模式，所以發行三維繪圖時並不會增添很多額外工作。因此 ，為顯示不同部份的專案時，不論是從整體建築外型以至最小組件，建築資訊模型可以是一種常見的三維圖解。

建築資訊模型除了製作二維繪圖,也將自動執行相關資訊計算。 這三維模型可以促進防火隔室的計算，以支援防止有問題的建築外型或不規則天花板。

三維簡報搭配最新技巧例如隱藏元素、使元素透明或暫時打破不同的元件以獲取更好的清晰度，揭示了新的通訊可提供比傳統二維方式簡報有更好的資訊。

Fire Computational Calculation Schedule

Level	Department	Number	Name	Area	Room Height	Volume
8/F	A	A5	BR.3	4.824 m²	3000	14.472 m³

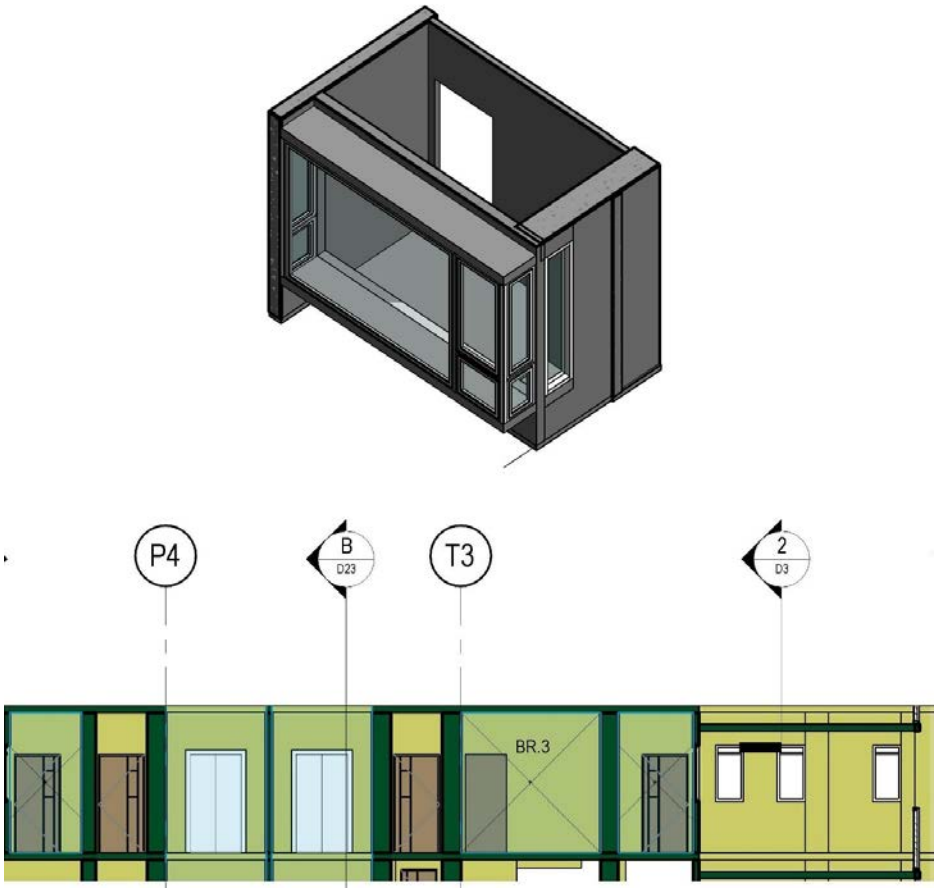


圖 6-33. 防火隔室圖

6.5 長遠建議

長遠目標是使用建築資訊模型作為呈交建築圖則和檢查《建築物規例》。提供建築資訊模型檢查是相當有效的方法以檢查各政府部門。它能輕易展現隱藏在平面圖的建築元素。 它可減少錯的誤導圖所引申的成本更改工程指令，並盡可能降低項目工程的整體開支及項目工期所需時間。

使用建築資訊模型，我們可製作建築、結構與屋宇裝備繪圖。繁體計畫、上升及部份可產生、顯示所有其他方面的 BIM 模型。傳統平面圖、立面圖和剖面圖可以更輕鬆地製作，以顯示建築資訊模型的所有不同方面。

沒有圖層功能的建築資訊模型軟體 (例如 Revit) 可透過建立視窗而創製出二維繪圖。然後，這些圖紙可以發佈成 DWFX 或 PDF 格式。

此外，產業基礎類別 (IFC) 檔案也可以是呈交建築資訊模型的另一選擇。 它是跨平台建築資訊模型檔案格式且可以在軟件中協同合作。

其中一種模型質量檢查應用程式是 Solibri (為建築資訊模型驗證、法規遵循控管、設計審查、分析、獲得建築資訊模型相關資訊與程式碼檢查。 它已經在美國作為模型使用的檢查，如出入口和佔用人數及無障礙控制等。

7. 附錄 – 規格

7.1 序言

此部份說明呈交建築圖則報告中所使用的術語與它們如何被翻譯成建築資訊模型專有名詞。

7.2 建築資訊化模型術語 (規格結構)

附上的附錄-規格(只備有英文版本)解釋建築資訊模型方法為每項法定呈交項目。

每個規格包含下列項目：

a. 關注的範疇屬於呈交類別並描述在第 3.4.1-3.4.5 部分。
b. 法定呈交是指法定呈交當中所使用的術語。
c. 相關法規的目標中所述之解釋是為了某一特定呈交。
d. 邏輯是演算方法定義在《建築物條例》及《認可人士、註冊結構工程師及註冊岩土工程師作業備考》上。
e. 規格把「邏輯」部份翻譯為常見建築資訊模型術語。
f. 建築資訊模型方式解釋法定呈交如何可以由建築資訊模型技術以完成，並提供建築資訊模型軟體的例子以支持。