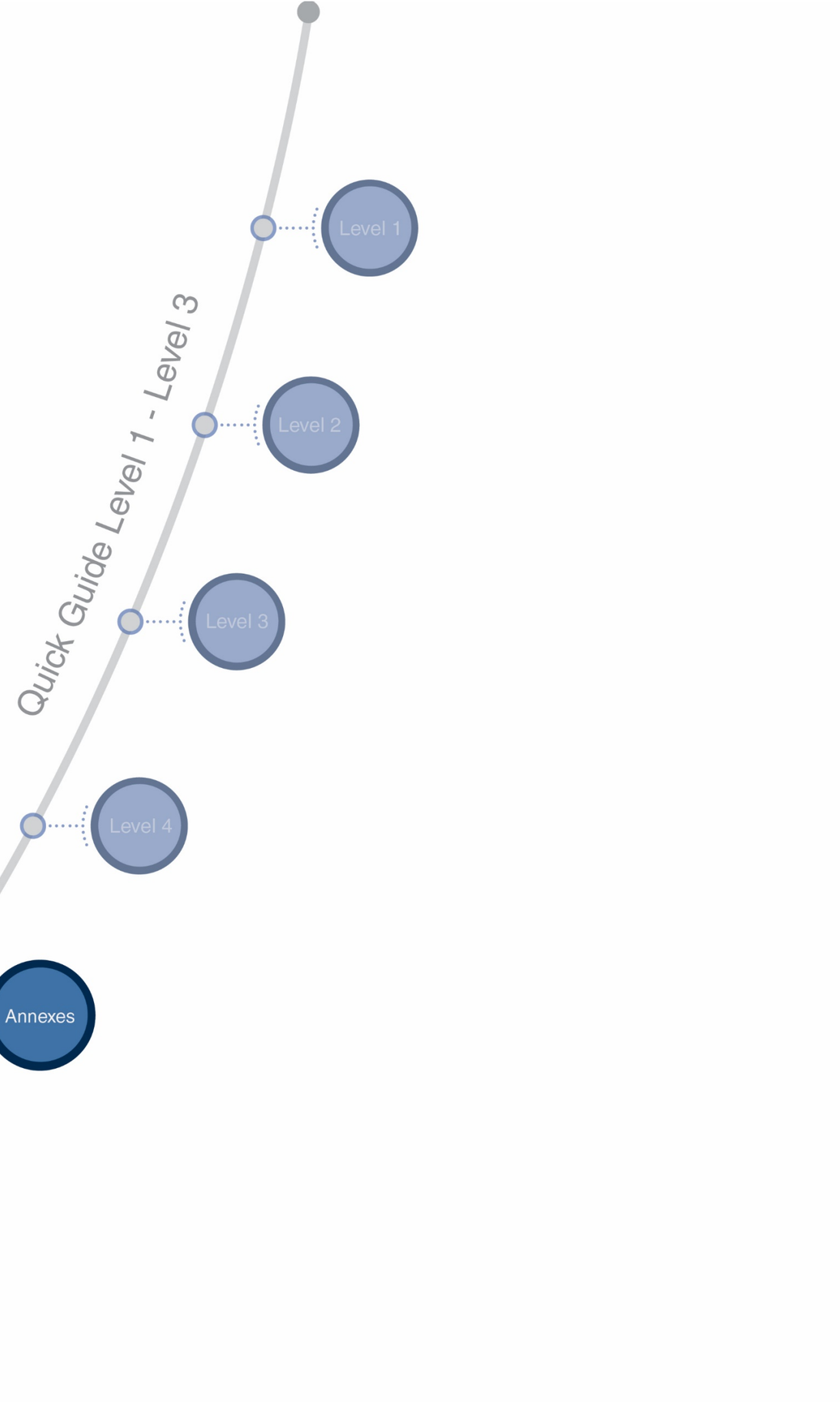
ANNEXES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1 BIM Studies Done by Various Professional Disciplines in DCD of the HA

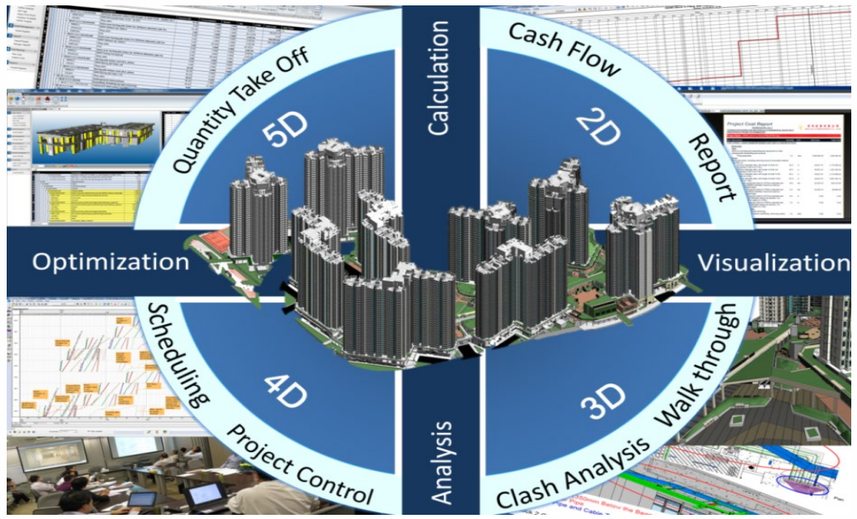
Item	Section	Title of BIM Studies	Contact Point for the Discipline Design Guides	Sources of Write-up
1	CA/D&S	Towards Customization with Standard Modular Flats in Mass Housing Design	A/66	Autodesk BIM Awards 2009
2	CA/2	Pilot use of BIM in New Public Housing Project of Tung Tau Cottage Area East	SA/26	Autodesk BIM Awards 2010
3	CA/D&S, CSE/1 and CSE2	Innovative Use of BIM for Sustainable Construction in Public Housing Development of the following Projects (i) Tai Pak Tin Street Public Housing Development; (ii) Redevelopment of Lower Ngau Tau Kok Estate; and (iii) Redevelopment of So Uk Estate.	CA/D&S, CSE/1 and CSE2	Autodesk BIM Awards 2011
4	CQS/2	Pioneering BIM for Quantity Surveying in Public Rental Housing - Shui Chuen O Phase 1	SQS/PS	Autodesk BIM Awards 2012, buildingSMART BIM Awards 2015
5	CA/4, CSE/2,CQS/2	Optimization of design options by value management with BIM technology for Hin Tin Street HOS project	SA/12	Autodesk BIM Awards 2013
6	CSE/2	3D print-out of the Site Sub-soil BIM model - Wang Yip Street West HOS site	SE/75	Autodesk BIM Awards 2013
7	CGE/2	Integrated Use of BIM and GIS - Civil 3D/GIS/Revit (CAR Approach)	SGE/5	Autodesk BIM Awards 2014
8	CQS/2	Lighting Simulation and Rendering by DiaLUX	SBSE/C3	Autodesk BIM Awards 2014
9	CSE/2	RFID and BIM-Enabled Logistic and Supply Chain Management of Prefabricated Housing Production In Hong Kong	SSE/4	Autodesk BIM Awards Submission 2015
10	CSE/1	Demolition for Redevelopment of Lower Ngau Tau Kok Estate	CSE/1	buildingSMART BIM Awards 2015
11	CA/3	5D BIM at Anderson Road Site A & B (ARAB)	SA/18	
12	CSE/2	BIM-enabled Semi-automatic Foundation Design (SAFD)	SSE/4	
13	CBSE/2	Using BIM Model to obtain Building Data for RTTV Calculation	SBSE/C3	
14	SLA/1	Customization of Soft Landscape Library for BIM	SLA/1	

2 BIM Study - Public Rental Housing Development at Anderson Road Site A and B Phases 1 & 2 - Innovative item - 5D BIM Application

Background

In Hong Kong construction industry, BIM has been adopted for many years to increase collaboration between different stakeholders along the building lifecycle.

Primarily BIM uses like visualization (including renderings, walkthroughs, mass model studies, and simplistic 4D animations used primarily for presentations), design documentation, design coordination, clash detection, model-based analyses like 4D simulations to establish relationship between schedule and sequence on construction activities are being used.



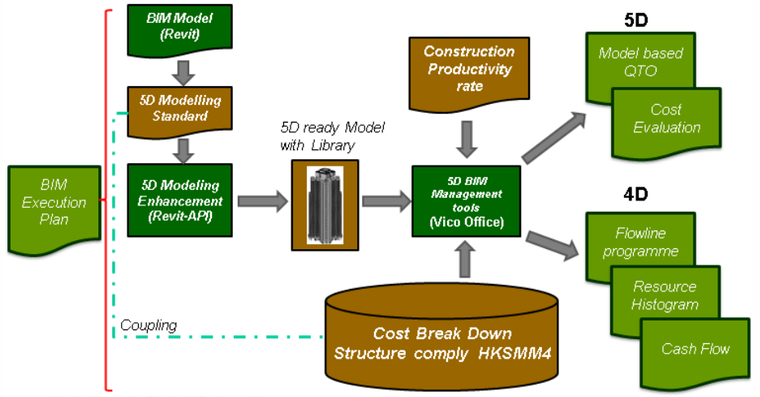
Above mentioned BIM uses lack integration analysis that would combine project information like design, cost, programme, estimates, etc, into one analysis (which is also termed as 5D BIM).

In 5D BIM, stakeholders can analyse cost and time impact to aid in design decision, resulting in fewer changes and delays and ultimately greater benefits to the project owner. 5D BIM can be utilized for quantity take off (QTO), generating estimates, creating flowline programme and generating cash flow analysis. It also enables the project team to make informed project management decisions like generating cost & resource loaded schedules, iterative estimates & schedules for project team to quickly compare target cost vs. actual cost and analyse of project risks, leading to improved understanding of project progress and enabling effective and informed decision-making.

Objectives

- Implementing 5D BIM Technologies and Work Flows in both Design and Execution Stages of this project.
- Developing 5D BIM Modelling Standard – Define modelling requirement of each element, naming principle and most importantly the linkage of QTO in relation to Hong Kong Standard of Measurement of Building Works (HKSMM4) principles.
- Creating cost breakdown database in compliance with HKSMM4 for automatic extract of component quantities.
- Exploring new construction scheduling approaches – Location-based management system (LBMS) and flowline scheduling concept.
- Project management.
- Model-based QTO to facilitate cost estimation & programme optimization.
- Developing project productivity rate for different trades of works.

Methodology



(Light Green) *Project Deliverables*
(Brown) *Deliverables that can be reused for other projects and adopted by other software.*

- Reviewing local and overseas standards of Cost Breakdown Structure, including Elemental based Quantity Takeoff system NRM (New Rules of Measurement) from UK, Uniformat from the United States, SMM2 from Malaysia and Singapore, etc.
- Examining limitations and opportunities for HKSMM4 to facilitate model-based QTO.
- Developing a Hong Kong specific Cost Breakdown Structure (CBS). The CBS maps between the trade-based (from Hong Kong construction practice) and elemental-based QTO (from BIM).
- Reviewing the HA in-house modelling standards to identify gaps with the proposed modelling approach, i.e. “Standard Approach of Modelling (SAM) for Creating Building Information Structural Model” version 1 published on March 2014, and FLIP Revit Family Naming Approach.
- Building 3D BIM models according to normal practice.
- Developing model enhancement standards (including geometry, naming and attribute requirements) that would upgrade the Basic BIM of ARAB project to 5D BIM models from 3D BIM models, and allow extraction of building quantities comply with HKSMM4.
- Implementing the established model enhancement standards for various locations and trades. Sharing the incremental results with the HA core team, and refining the approach and requirements based on feedback.
- Reviewing construction process according to the as-planned programme to monitor site progress based on model-based quantity and task productivity rates by using a 5D BIM management platform (Trimble VICO Office).
- Refining the works sequence and/or productivity rates to accelerate the site progress in the 5D BIM model for project management use.

Scope of Application and Status

Model-based Cost Evaluation –

(1) Developing Methodology – Under development
(2) Scope of Application
    a. BLK 3 – Ready for Final Review
    b. BLK 9 – Under development

Programme Monitoring –

(1) Developing Methodology – Ready for Final Review
(2) Scope of Application
    a. Site B Large Diameter Bored Piles - Completed
    b. Site B Socket H Piles - Completed
    c. BLK 1 to 9 Structural Framing – Completed
    d. BLK 3 Major Trades – Under Development
    e. BLK 9 Major Trades – Under Development

Programme Optimization –

(1) Developing Methodology – Ready for Final Review
(2) Application for ARAB Project Management
    a. BLK 1 Roof Level (LMR to UR) – Completed
    b. Site B Wet Market Building Services Installation – Under Development

Restrictions and Limitations

- For basic modelling, some structural elements are not modelled, for example, rebar, formwork, conceal conduit and temporary structure. The reason is that they are not within the scope of BIM Specification of HA standard and they are not being modelled in general practice in Hong Kong. Although these elements are within the bill of qualities, they are not in model and therefore cannot make use of the 5D BIM Model based QTO function.
- The ARAB basic 3D BIM models did not comply with HKSMM4. For 5D BIM Model based QTO, model enhancement has to be applied to meet the requirements.
- In the beginning, it took longer to gather information such as detail task breakdown and productivity rates from site team members to develop the 4D BIM construction programme. It also required personnel with actual project management experience to execute the process.
- As this is an IPA project, PQS has to use the Bills of Quantities (BQ) agreed at the start of the project based on preliminary design information, rather than an updated BQ based on the finalized design. Therefore, the payment amount and interim payment report generated by the 5D BIM could not be used to reference or compare with PQS's version.

Results / Findings

- Using the bimSCORE Framework and the four areas of Planning, Adoption, Technology, and Performance, the value of 5D BIM was measured to objectively assess its benefits to the overall project management goals. Detailed findings for each of the four areas are described as followed *(see Figure 1 below: bimSCORE 5D BIM Evaluation for ARAB)*

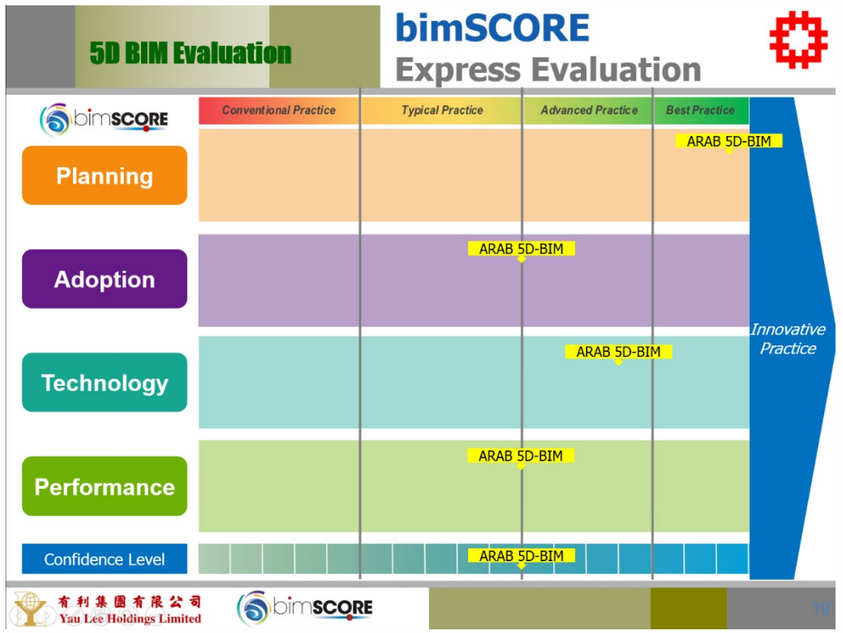


Figure 1

Planning:

Assessing different standards for 5D BIM execution, staff training, preparation of IT infrastructure for 5D BIM adoption, and setting up objectives for development of 5D BIM models.

- **Quantifiable objectives** were established that benefited a broad range of stakeholders such as client, main contractor, sub-contractors and suppliers etc.
- **Project-specific and Region-specific Standards** were developed that would contribute to Industry Standards, e.g. 5D BIM modelling approaches and modelling guidelines for model-based quantity take-off complying with HKSMM4 will be documented for ARAB and future HA projects.

Adoption:

Defining required deliverables delivery methods, and phases of BIM involvement.

- **Understanding of project progress** during Weekly Project Meetings by using 5D BIM-generated results.
- Enabling **effective** and **informed** decision-making.
    - For example, the 5D BIM generated results that projected the schedule would be delayed in the construction of Socket H Piles. The Main Contractor (MC) conducted multi-stakeholder discussion sessions to resolve the issue based on the 5D BIM report. As a result, this risk was mitigated before construction of the piles reducing project delay.
- P**roject risks** were analysed with model-based quantities and agreed upon production rates.
    - Slow productivity rates were identified in the flowline diagram for construction of large diameter bored piles. This allowed the team to adjust the programme and resources. The team was able to generate reports based on model quantities and agree productivity rates of each week (normally would take 3 weeks) via Vico Office Reporting Modules. These reports enabled the team to evaluate the impact of the additional socket H piles to plan better site logistics and materials procurement, understand the cost variation and time implication for different alternatives.
- **Exploring alternative construction method** with sub-consultants
    - MC projected a delay in Block 1, and in order to mitigate the delay, alternative rooftop construction was explored with sub-consultants. HA and MC could decide to adopt a precast option within one meeting. Using 5D BIM, MC only used one man-day to retrieve relevant data, produced programme and cost estimation for the pre-cast option. The estimates projected significant savings in construction time, which allowed MC to confidently adopt the precast option with a clear understanding of the expected savings in construction time. The 5D BIM forecasted 117 days and 63 days for the traditional construction approach and the precast option respectively. The actual rooftop construction using the precast option took 65 days, achieving a 44% programme savings when compared against traditional construction.

Technology:

Evaluating the maturity of BIM applications, how well BIM covers the project scope, and the integration of data and models between different BIM applications.

- Explored and implemented **model-based estimates**, **programme planning and monitoring**, and **risk analysis** to a wide range of elements of different trades
  - **Model-based Construction QTO**
    - Generate Bill of Quantities quickly
    - Update quantities quickly when design changes
    - Trace measurement details to support payment application during construction
  - **Model-based Estimation**
    - Support the estimation to make use of historical cost data
    - Visualize each building element's estimation details
    - Check the budget against actual cost for certain items during construction
  - **Model-based construction Process Simulation**
    - Simulate the construction procedure for better planning and design coordination
    - Support clash detection to avoid any conflicts and abortive works
  - **5D Simulation**
    - Visualize and monitor the comparison between actual and planned programme
    - Overview the total and key resources expenditure during construction
  - **Model-based Risk Management and Project Control**
    - Identify risks early
    - Real-time overview of performance to support critical business and management decisions
  - **Developed Automation Tools in REVIT** to speed up model enhancement processes needed for local compliance of estimates

Performance:

Focusing on qualitative and quantitative tracking of objectives with performance metrics

- Achieved **satisfactory QTO accuracy** through iterative and continuous collaboration with HA Q.S. Service Team
- Highlighted deficiencies in conventional work flow and the importance of using 5D BIM to validate feasibility of programme proposed by sub-contractors

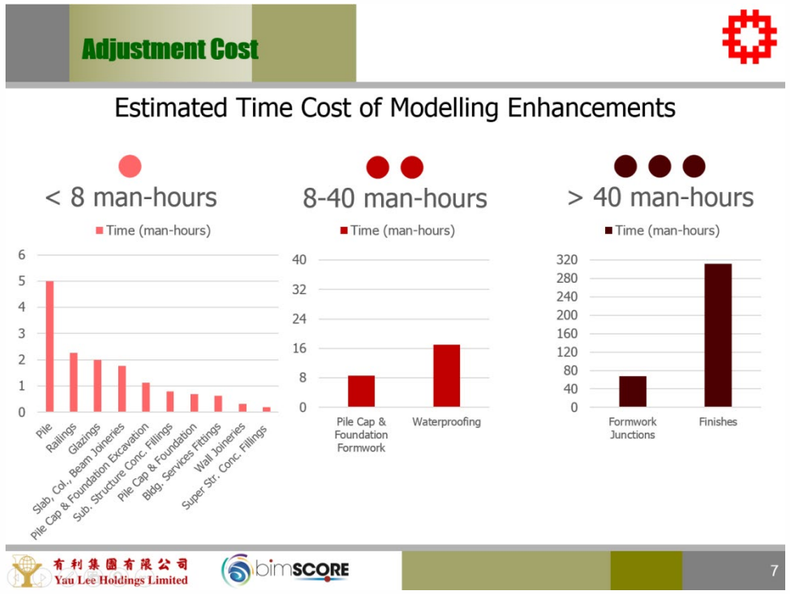


Figure 2

Study of BIM for Quantity Takeoff to Support Cost Estimation:

Domestic Block 3 (substructure and superstructure) and Domestic Block 9 (substructure) models were used to study the modelling enhancements required to support quantity takeoffs (QTO) for cost estimation. 78% of QTO BQ items were based on model quantities, with the remaining 22% of QTO BQ items based on non-model quantities from 2D drawings. Out of the 78% QTO BQ items that were model-based, 43% required modelling enhancements for the QTO to comply with HKSMM4 standards.

Modelling enhancements required for QTO were studied to understand the time required to perform the adjustments for the objects associated with each QTO BQ item. The calculation of additional modelling time included various steps, e.g. reviewing of reference documents, filtering and searching of elements, editing, and reviewing the model adjustments by domain specific consultants. See *Figure 2 below: Estimated Time Cost of Modelling Enhancements* showing time required for modelling adjustments.

3 BIM Study - BIM-enabled Semi-Automatic Foundation Design (BIM-SAFD)

Brief Description of the Application

In conventional foundation design, Structural Engineers use various discrete software, such as ETABS, SAFE, Surfer or Civil3D (***Figure 1***), for performing structural analysis and design. Even though there is clear proliferation of a wide variety of design tools, there has never been a platform available for data interoperability through which different software work together effectively for instant information exchange, not only to ensure seamless information flow but also to improve the accuracy and enhance the efficiency of design process.

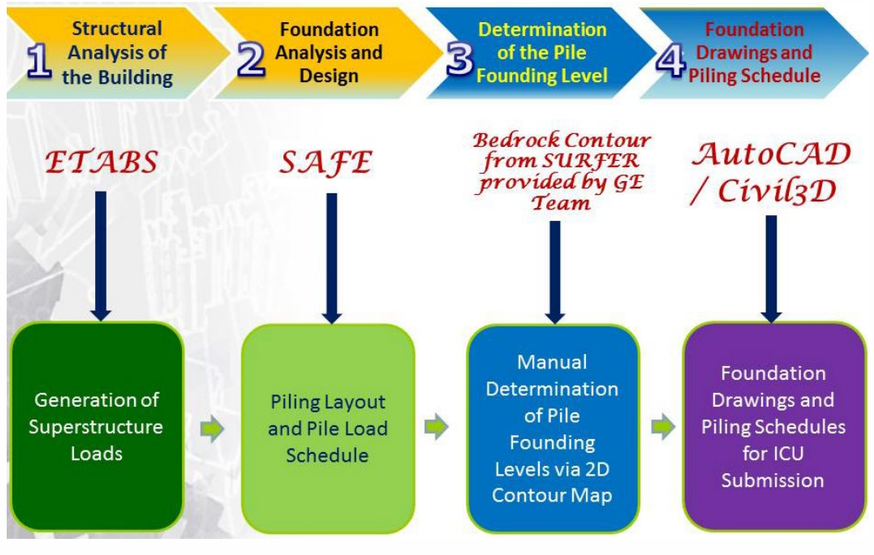


Figure 1 – Workflow of Conventional "One-way" Foundation Design

The Structural Engineering Section therefore developed more responsive solutions with one-stop integrated foundation design with Building Information Modeling (BIM) for providing designers a platform for data interoperability, and devising a set of standard approach of modeling and method of measurement to bridge the gap of a BIM-based estimation or quantities take-off that is compatible with the standard and practices of measurement in the industry. This one-stop design solution: **Semi-Automated Foundation Design** (**SAFD**) using Surfer, and its integration with BIM REVIT, brings about a revolution in the way the foundations are designed, drawings are produced and quantities are measured to achieve design and drawing production optimization, and most importantly, enhancing design accuracy and efficiency. ***Figure 2*** shows the conceptual workflow of **BIM-SAFD** in comparison with the manual design approach.

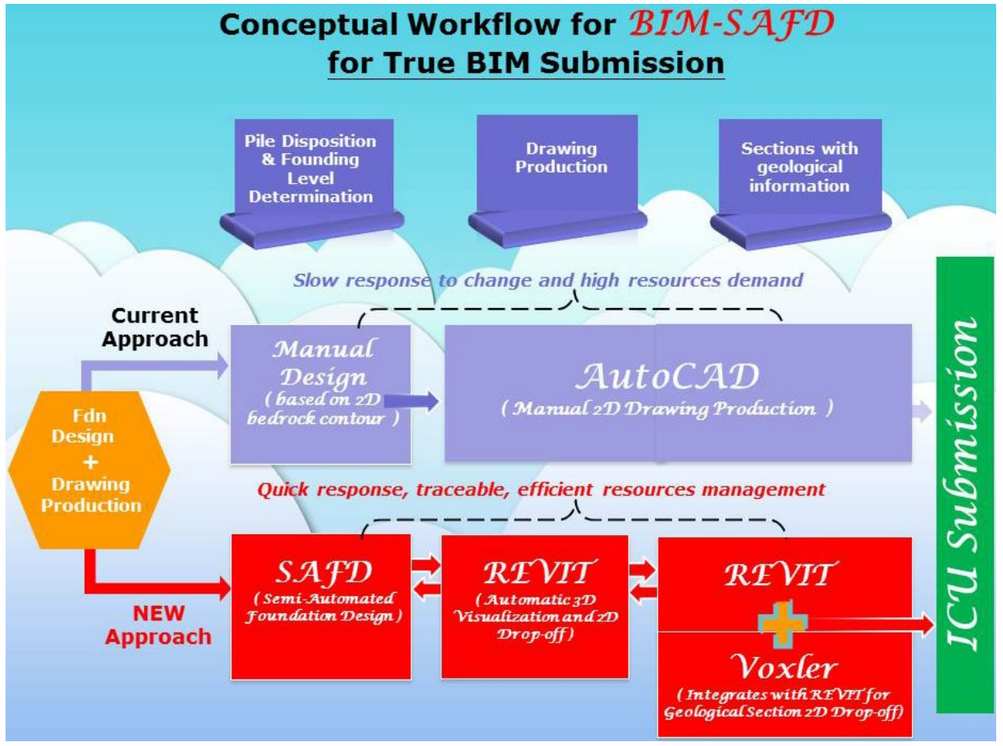


Figure 2 – Conceptual Workflow for BIM-SAFD

BIM-SAFD is ready for use for foundation design and preparation of submission to the Independent Checking Unit (ICU). In fact, there are a number of projects with foundation plans already approved by the ICU. The application will be used for forthcoming foundation submissions and quantity estimation.

Methodology

Semi-Automated Foundation Design (SAFD)

While BIM can detect if two objects are clashing in space, there is no built-in function in Autodesk REVIT to ascertain whether a pile object is "clashing" or "penetrating" through the rockhead contour, as only a 3D surface is viewable in Autodesk REVIT. In addition, Autodesk REVIT does not have function to determine the rockhead level of each pile based on the rockhead contour surface and location of piles (***Figure 3***).

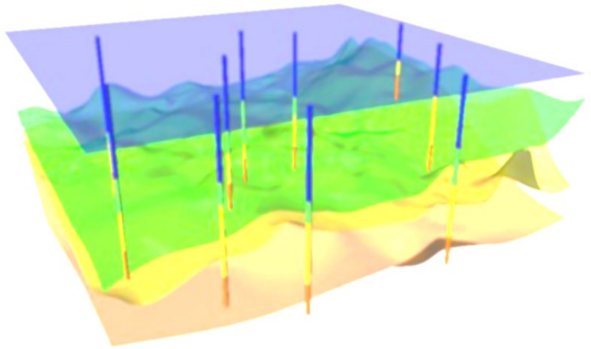


Figure 3 – Drillholes and Rockhead Contour Surface

SAFD consists of two main design tools: ***Surfer (ver. 12)*** - a full-function 3D visualization, contouring and surface modelling software which is used extensively for 3D surface mapping; and an ***Add-on Programme of Microsoft Excel workbook*** for correlating the design output from Surfer with the design constraints. **SAFD** enables the determination of rockhead level of each pile and automatically identifies the coordinates/levels of the intersection of the piles with the rockhead. It provides a platform through which the results output from analytical software can be shared and interacted proactively with BIM to facilitate Engineers to make a prompt, systematic and precise decision.

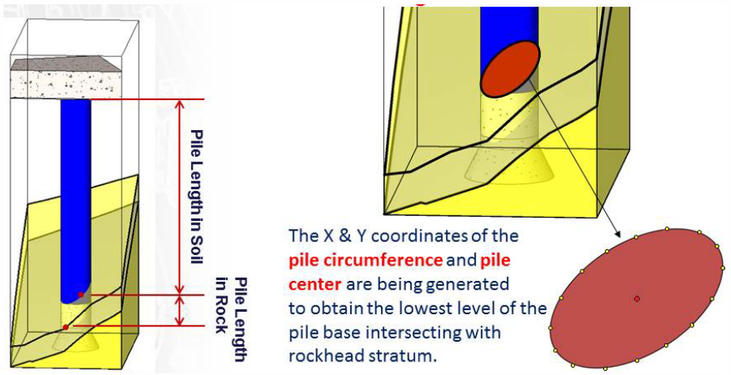


Figure 4 – "Grid Residual" by Surfer

Using the 3D functions in Surfer, Engineers generate the 3D rockhead contour from geological data, allowing automatic determination of the intersecting points of the pile with the rockhead stratum (i.e. the rockhead level of each pile) at fixed coordinates along the pile circumference by "Grid Residual" function as illustrated in ***Figure 4***.

Once the rockhead level of each pile is determined by Surfer and the founding level of each pile are fixed, design constraints such as "stepping" effect due to stress overlapping with adjacent piles and adverse bedrock contour of founding level can be visualized through the aid of the add-on programme.

In ***Figure 5***, piles which are affected by the overlapping stress of adjacent piles are highlighted in different colours. A summary of the stepping effect among the piles can also be generated for subsequent overlapping stresses checking.

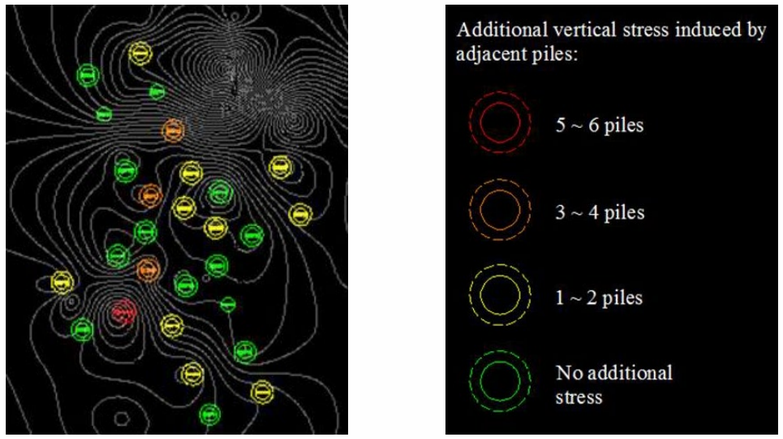


Figure 5 – Summary of Pile Stepping Effect

To check if there is adverse bedrock contour, twelve sections of bedrock profiles each at 15° intervals on plan will be examined as illustrated in ***Figure 6(a)***. Any rockhead profile with gradient greater than the pre-determined threshold angle (e.g. 45°) is highlighted in red in ***Figure 6(b)***. Such steep bedrock profile underground will have to be further investigated by Geotechnical Engineer to ascertain whether there is sufficient factor of safety against sliding.

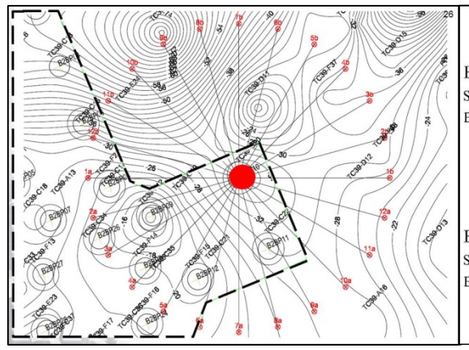


Figure 6(a) – Checking of Steep Bedrock

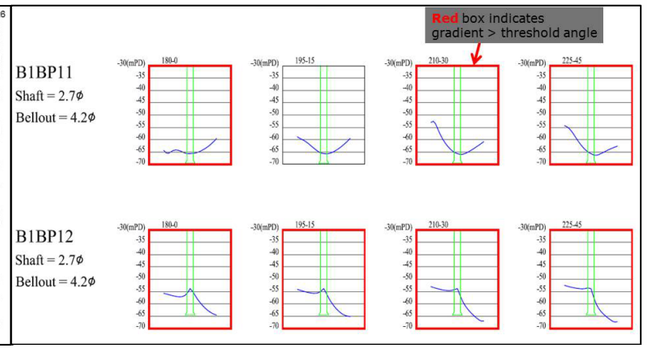


Figure 6(b) – Steep Bedrock exceeding Threshold Angle

It is particularly important as these constraints may affect the disposition and depth of substantial number of piles within a domestic block where several localized weak seams, stepping effect and steep bedrock are found. All these have to be separately considered by Structural Engineers. With the automatic detection of founding level with visualization of different critical design constraints, pile optimization can easily be completed with increase in confidence on design accuracy.

Integration of SAFD with BIM in enhancing efficiency and accuracy of Foundation Design

Design development through the **SAFD** is further incentivized by integration with BIM, bringing in benefits such as interactive visualization platform, automated drawing productions in either 3D or 2D form, and standardized data exchange interfaces for quantity measurement.

Standard Approach to Modeling (SAM)

To provide an easy startup for BIM model construction, BIM Service Team (BIMST) has devised an Autodesk REVIT Structure project template as part of the Standard Approach to Modelling (SAM) in which there is a component library with shared parametric files developed for building the Autodesk REVIT models. The construction of Autodesk REVIT families for customization of all foundation–related elements is the key to standardization. Appropriate foundation-related family categories will be applied to the modelling of different structural elements with details as shown in ***Table 1*** below –

Table 1 – Autodesk REVIT Family Categories for Structural Elements

Structural Element	Autodesk REVIT Family Category
Column, post and hanger	Structural Column
Shear wall, core wall, bearing wall, hanger wall, stud wall, screen wall, parapet	Wall (Structural Wall type)
Beam and lintel	Structural Framing or Beam System
On-grade slab and mechanical plant base	Structural Foundation (Slab type)
Cap, footing and pile	Structural Foundation
Other elements (e.g. plinth, mass fill, fillet and curb, etc.)	Generic Model (In-Place)

2D Drop-off for Statutory Submission

Upon completion of the foundation design, ground investigation (GI) logs and contour information in DXF format will be exported through a geotechnical software, Voxler (**Figure 7**), to Autodesk REVIT model (**Figure 8**) for 2D drop-off, including plans, geological sections and piling schedules.

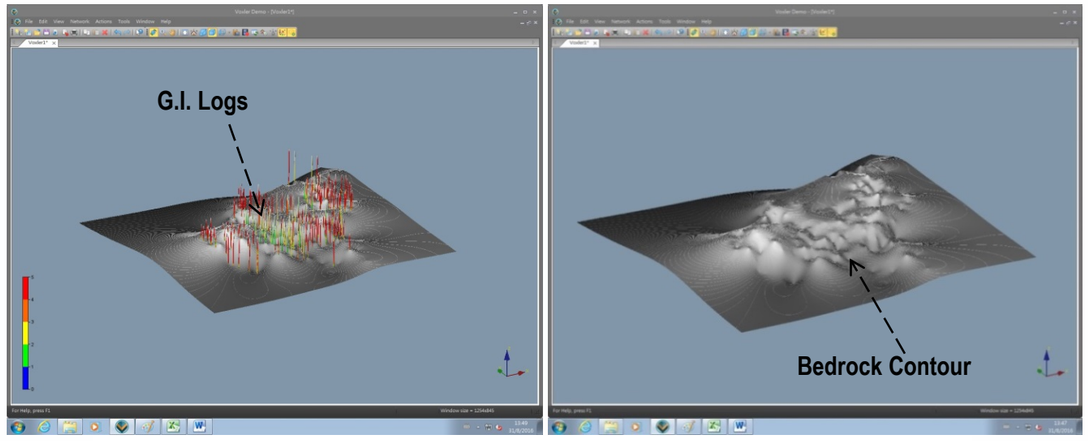


Figure 7 - GI logs and Bedrock Contour Information generated by Voxler

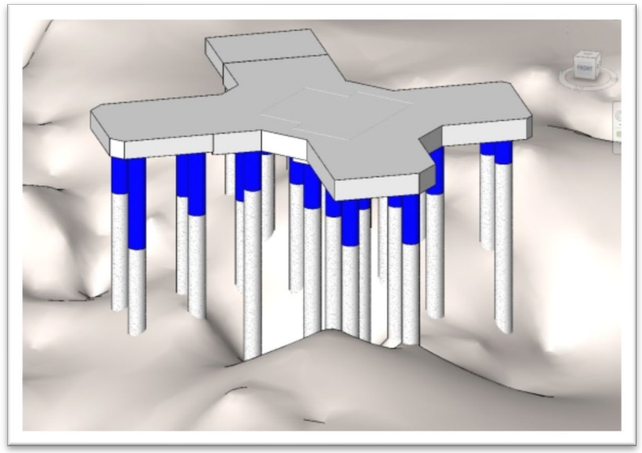


Figure 8 - Bedrock Contour Visualization by BIM with Data exported from Voxler

Figures 9(a) to (d) compare the manual drafting with AutoCAD and automatic 2D drop-off from Autodesk REVIT on piling layout plan, pile cap layout plan, geological sections and piling schedules respectively. The presentation and quality of drawings from Autodesk REVIT 3D model not only remain the same as before, but are also free from discrepancies amongst plans, sections, details and schedules as they will automatically tally with one another. Any revisions in the 3D model and any changes in one file will be instantly updated and reflected in the others.

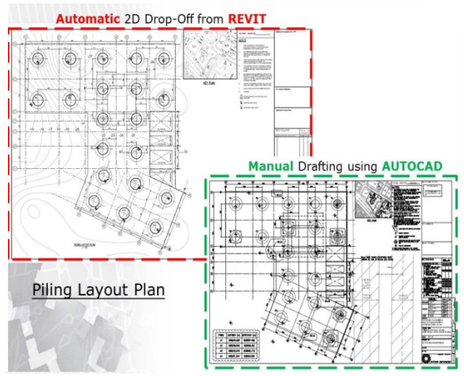
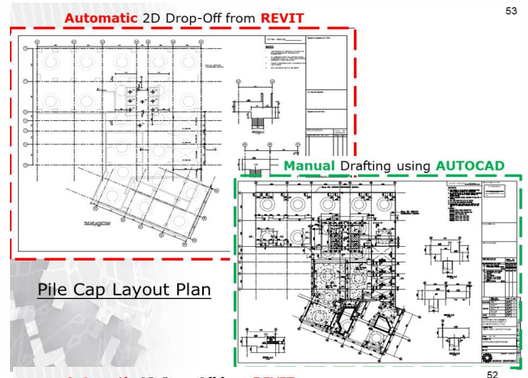


Figure 9(a) – Piling Layout Plan (REVIT vs AutoCAD)



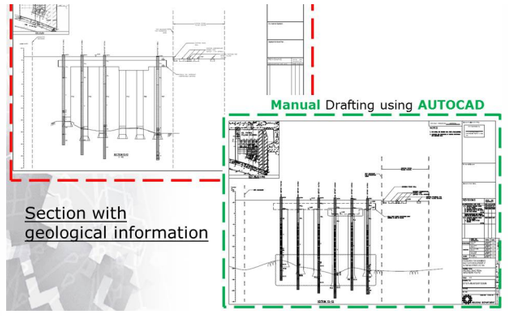


Figure 9(c) – Geological Section (REVIT vs AutoCAD)

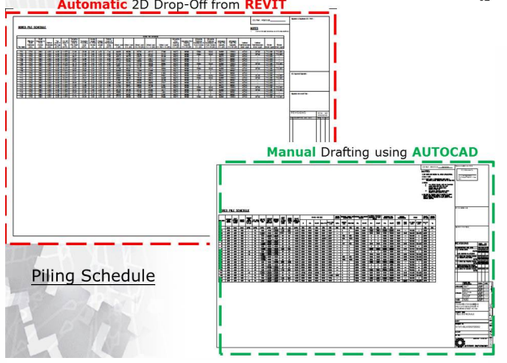


Figure 9(d) – Piling Schedule (REVIT vs AutoCAD)

As a result, the 2D drop-off with combination of structural elements, rockhead contours and GI data merges into one single 3D model, which will then be used (see the workflow in ***Figure 10***) for foundation submission to the ICU.

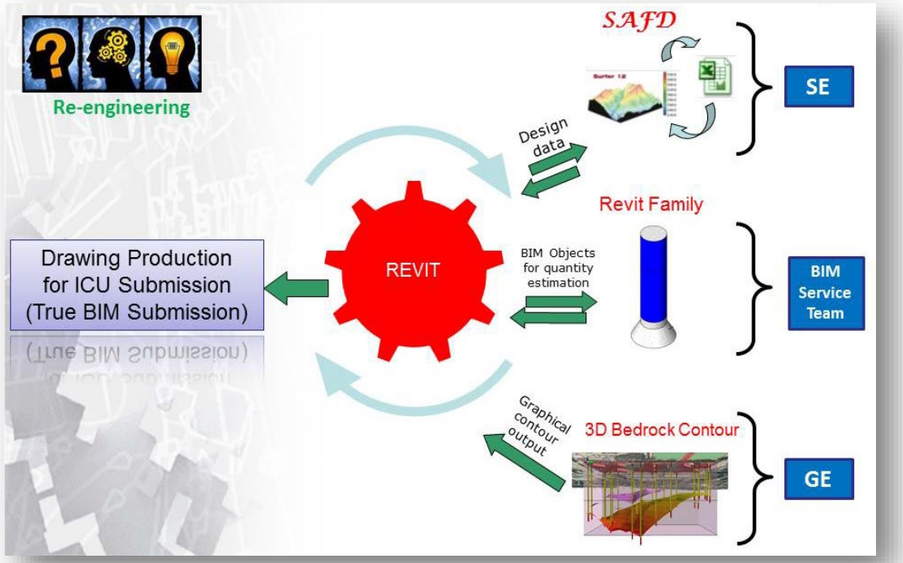
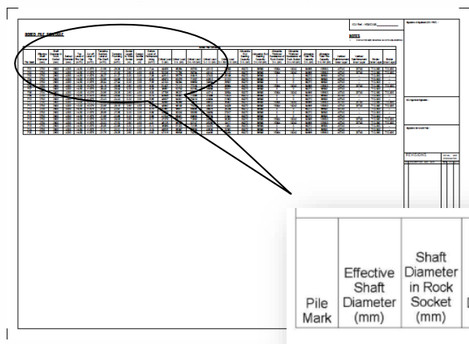


Figure 10 – Workflow of BIM-SAFD for ICU Submission

BIM-SAFD Assisted Quantity Take-off (QTO)

Through **BIM-SAFD** upon completion of the foundation design, the Autodesk REVIT model will be passed to the Quantity Surveyors for cost planning and estimation for tendering preparation (**Figure 11**). SAM has incorporated the necessary modelling techniques to facilitate direct quantities extraction from the BIM model (**Figure 12**) for quick value engineering analysis. As such, all Autodesk REVIT families including data such as length of piles, material type, volume, surface area and basic dimensions can be extracted for measurement purpose.



Pile Mark	Effective Shaft Diameter (mm)	Shaft Diameter in Rock Socket (mm)	Bellout Diameter (mm)	Sleeving from Bottom Level of Pile Cap (mPD)	Top Level of Pile Cap (mPD)	Cut off Level of Pile (mPD)	Tentative Bedrock Level at Pile Shaft (mPD)	Tentative Founding Level (mPD)	Shaft Length in Rock Socket (SLIR) (m)	Design Socket Length (DSL) (m)
P01	2700	2800	4200	--	+4.50	+1.875	-24.00	-27.00	1.30	3.00
P02	2700	2800	4200	--	+4.50	+1.575	-19.50	-28.23	** 7.03	8.73
P03	2700	2800	4200	--	+4.50	+1.875	-30.40	-32.40	0.30	2.00
P04	2700	2800	4200	--	+4.50	+1.875	-38.00	-40.00	0.30	2.00

Figure 11 – Piling Schedule for Automatic Quantity Measurement in BIM

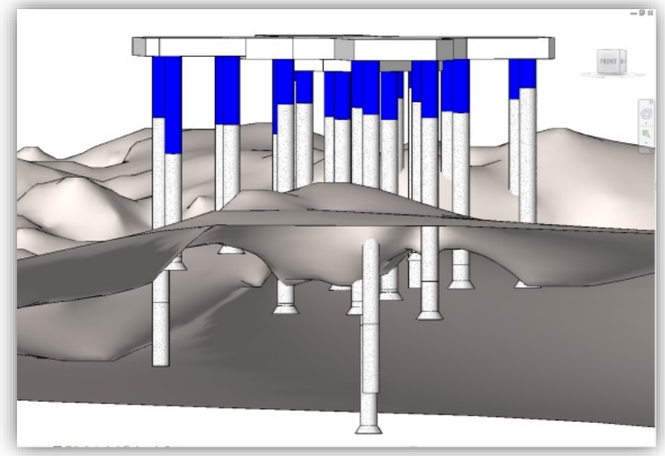


Figure 12 – 3D REVIT Model for Quantity Measurement

With **BIM-SAFD** based quantity take-off, the information in the Autodesk REVIT model can also be shared and exchanged across disciplines. With any changes in geological information resulting from new predrilling data available and changes in block disposition automatically assessed and extracted for verification, the updated cost variation can also be easily quantified with the new techniques of QTO (***Figure 13***). **BIM-SAFD** based QTO enables the information contained in the model to be exchanged amongst different disciplines spontaneously which shortens the time to assess the cost implications associated with any updates in design.

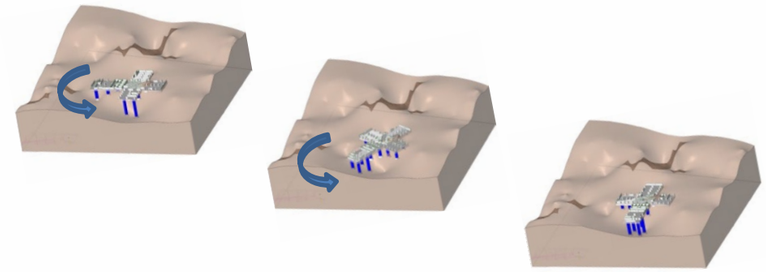


Figure 13 - Different Block Disposition for Achieving Optimum Pile Layout

Integrating **SAFD** and **BIM** brings about a breakthrough on design solution in terms of data interoperability. It effectively optimizes and streamlines the workflow of the engineering and quantity surveying professions: from manual computation by individual disciplines through design automation to multi-disciplinary collaboration via fully interchangeable information database. The introduction of BIM, a 3D interface, allows visualization of the spatial arrangement of pilings, drill holes and rockhead surface, and enables the designers to proceed with the foundation design more efficiently. Also, the design workflow becomes more traceable to supervisors or independent checkers and minimizes the risk of human errors, while ensuring the finalized BIM model containing the required quality and quantity of information is sufficient for quantity measurement.

Scope of Application

BIM-SAFD can be applied throughout the whole building construction life cycle. During the site planning and feasibility stages, different block dispositions and/or orientations can be examined to achieve the most economical design and the optimum piling layout arrangement. The 3D Revit model and the 2D drop off function are essential for drawing production in detailed design and submission stages. **BIM-SAFD** based QTO enables direct extraction of elemental data from the REVIT model for quantity estimation in tendering stage. For contract administration in construction stage, **BIM-SAFD** is highly useful as a quick tool to assess the cost implication of each variation order due to revision in pile length, prior to actual issuance of site instructions. Also, BIM-SAFD can provide quick response to any design changes due to unexpected ground condition for any informed decision to be made interactively.

Restrictions and Limitations

As **SAFD** makes use of the “Grid Residual” function of Surfer to determine the rockhead level of the piles, it is applicable to all types of piles which derived the capacities from end-bearing, such as LDBPs, socketed steel H-piles and minipiles, etc. In other words, **SAFD** is not applicable to driven piles which derive their capacities from frictional resistance.

4 BIM Study - Retrieving Building Parameters from BIM Model in Calculation of Residential Thermal Transfer Value (RTTV)

Introduction

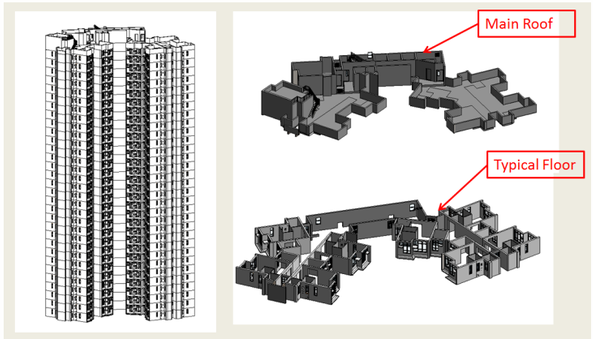
The Building Department issued PNAP APP-156 and Guidelines on "Design and Construction Requirements for Energy Efficiency of Residential Buildings" in year 2014. The assessment on the Residential Thermal Transfer Value (RTTV) is one of the requirements in applications for building consent and Occupation Permit if GFA concession is required.

Currently there is no simulation software available for the calculation of RTTV. As residential buildings form the major business profile of the HA, a more accurate and efficient method to calculate the RTTV is desired.

Since the building envelop design has direct influence to the thermal comfort of residents, our building services engineering team had an innovative venture in retrieving building parameters such as areas of wall, window and roof and required shading coefficient factors to facilitate the RTTV calculation from BIM model with the help of built-in function of Autodesk Revit, a free plug-in to identify orientations and a Quantity Take Off (QTO) plug-in to retrieve the required data.

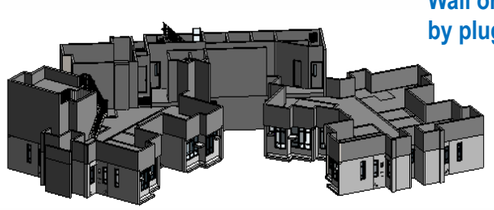
Detailed Steps of Building Data Retrieval

1. Multiple architectural model and structural model are combined into a single model to enable all external facades and internal walls can be identified without error.

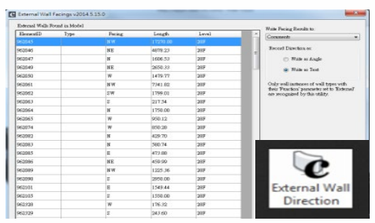


2. Currently there is no built-in function in Revit to identify the orientations of walls and windows. Our staff successfully tested a free plug-in "CASE" which can be used to identify the external wall orientations automatically. The eight directions (N, E, W, S, NE, NW, SE, SW) are indicated in the properties of the wall. The orientation of window attached to wall could therefore be identified with reference to the wall it attached as well.

Revit model



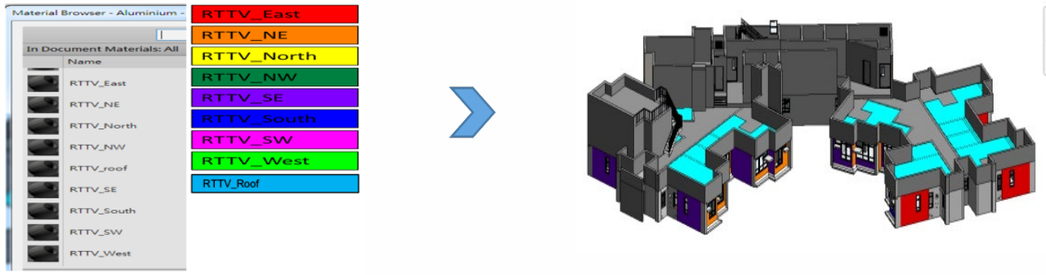
Wall orientation identified by plug-in "CASE"



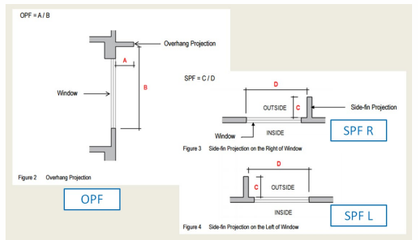
3. Nine different materials are assigned to represent the eight directions of the external wall and roof.

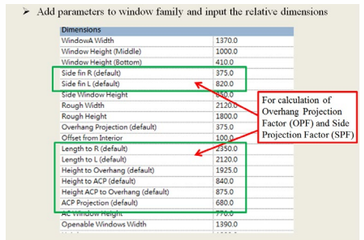
4. Apply Autodesk Revit "Paint" function to external walls and roof, according to the material assigned for each directions and roof. The function is originally used for assigning materials to different building components, but we used the materials assigned to represent orientations so as to facilitate quantity take off.

Assign different materials to roof and walls with corresponding orientations and apply "Paint"

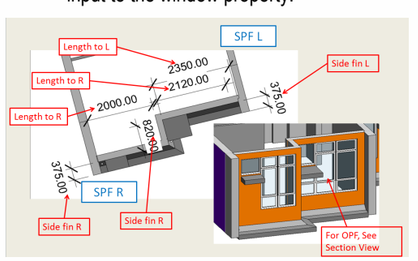


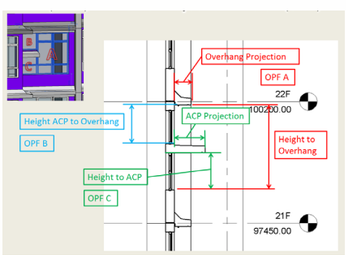
5. The Overhang Projection Factor (OPF) and Side Projection Factor (SPF) required in RTTV calculation can also be calculated by using the information contained in the window property.





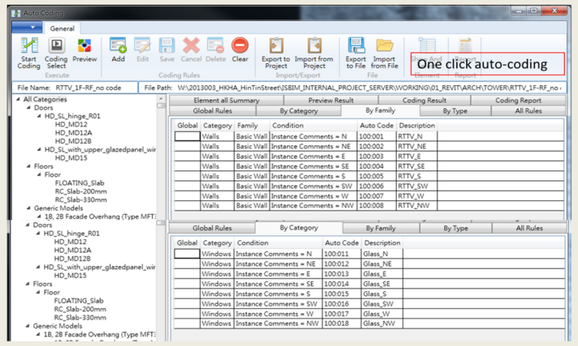
6. Window parameters such as their orientations and details of fins which have significant effect on the external shading coefficient are input to the window property.





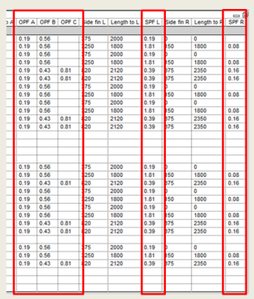
7. Perform the "Auto-coding" function of the QTO plug-in "EqBQ" to assign code for each painted elements. The sum of areas of different orientations (materials assigned) can be automatically retrieved and ready to be exported for further operation.

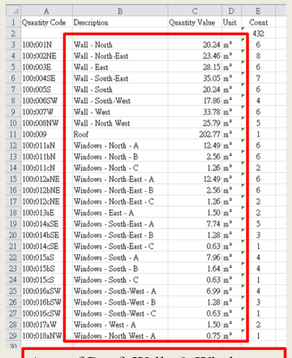
➢ Applying codes automatically to relevant external walls and windows with directions by a plug-in "EqBQ", which was orignally designed for QTO. The coding can be completed in a few minutes.



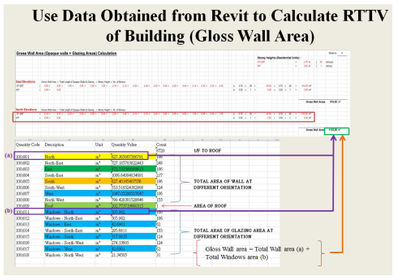
8. The area of external surfaces can be determined by exporting data to MS Excel format.

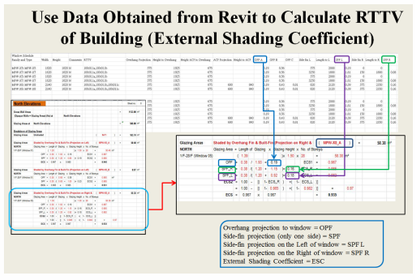
➢ All the required data are exported to Excel and ready to be input to the RTTV calculation sheet.





9. The data obtained, including the required external shading coefficients can be exported to the MS Excel to perform detailed calculation.





Conclusion

The successful trial of retrieving building parameters from BIM model to facilitate RTTV calculation brings the following benefits to our organization:

(i) The speed, traceability and accuracy of the RTTV calculation could be enhanced.
(ii) The manpower resource to perform the calculation could be reduced.
(iii) A building envelop design of better energy efficiency and human comfort could be developed through design optimization.

Way Forward

There is room to further automate the calculation in using retrieved data and the various formulae in the Guidelines on "Design and Construction Requirements for Energy Efficiency of Residential Buildings". The acceptability of ICU on this application will be further explored.

5 BIM Study - Shading Analysis and Glare Analysis of PV Panel

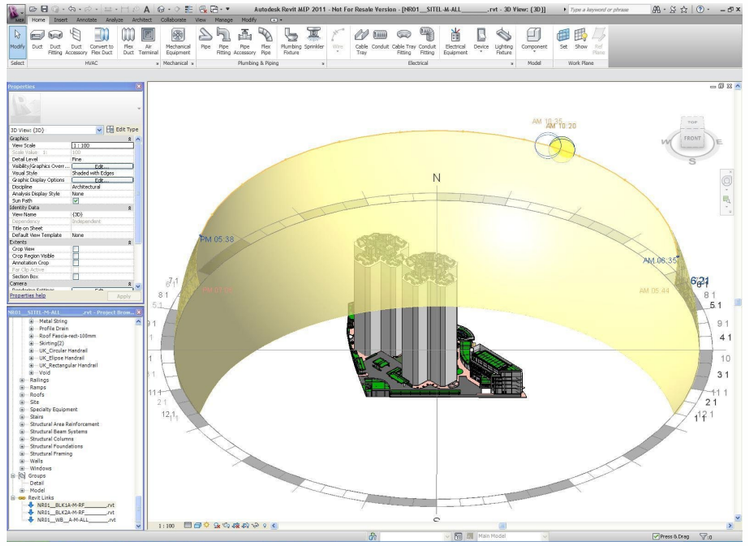
(a) Shading Analysis of PV Panel

Introduction

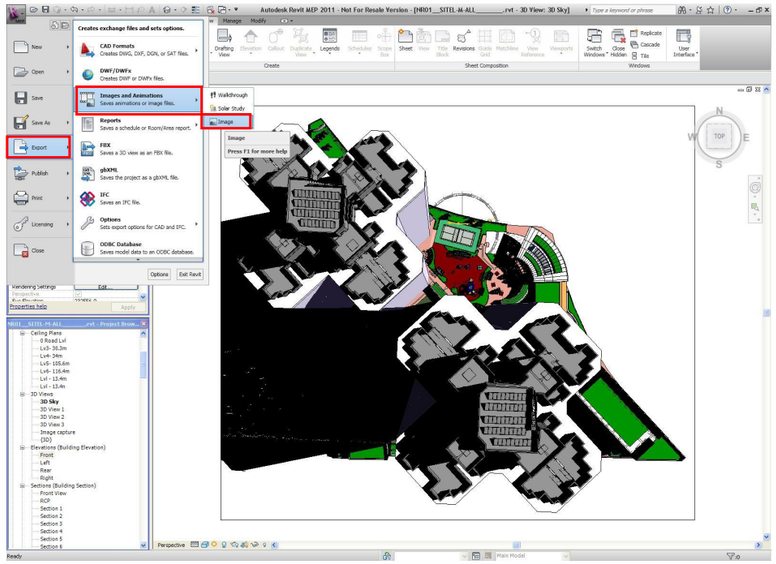
Shading analysis is a very crucial step in finalizing panel locations in distributed PV panel installation by BIM. The extent of rooftop area required by PV panels is factor of panel efficiency and extent of shading. A shade in one panel not only reduces the efficiency of that panel but cuts short supply from entire string. Therefore Revit can perform a solar study to simulate a sun path from sunrise to sunset. The entire process can be export to an animation.

Export the Image and Animation of Sun shading Study

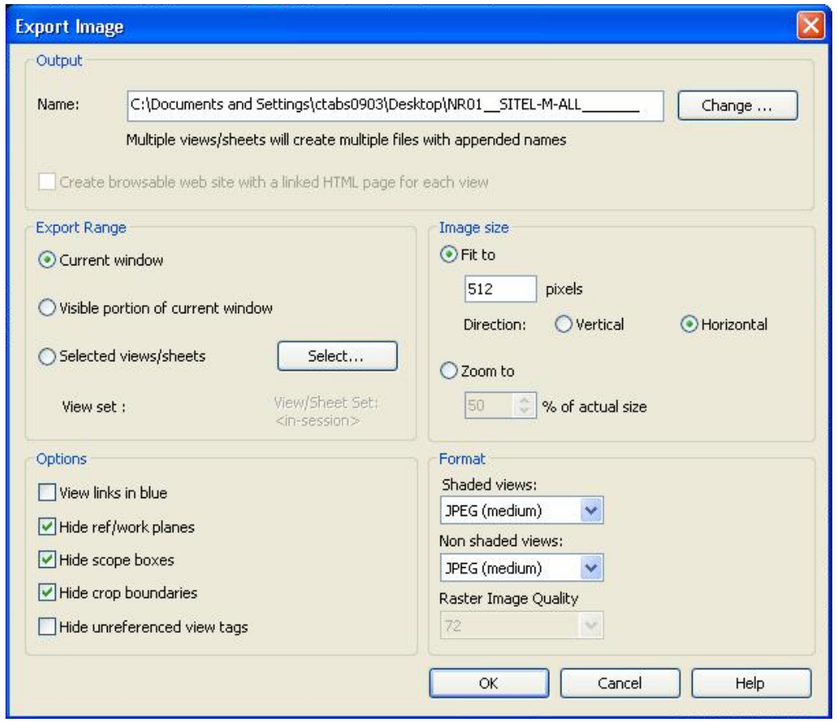
a. Instance dragging of Sun Position in 3D View, Sun Path Simulation



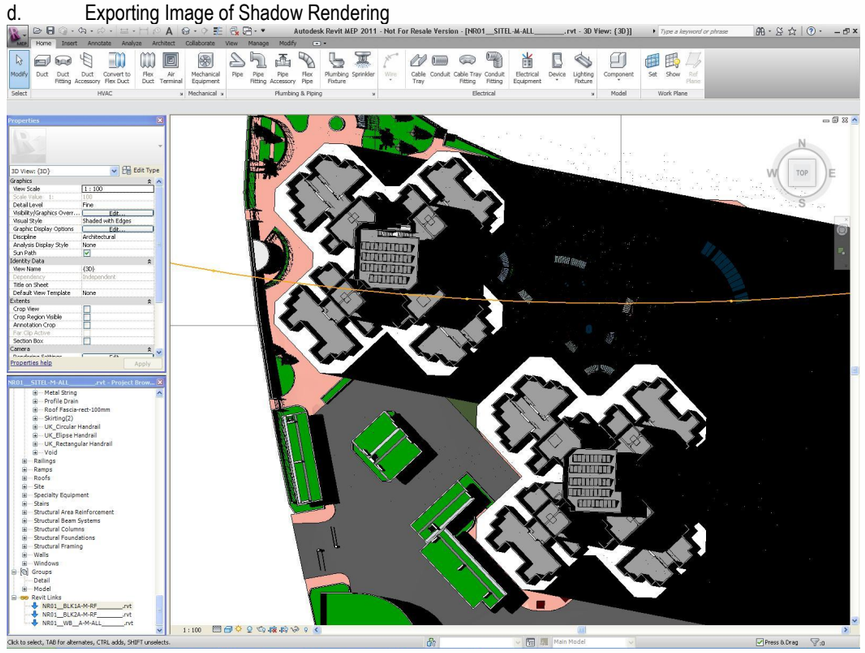
b. Set to Camera View, Click  > Export > Images and Animation



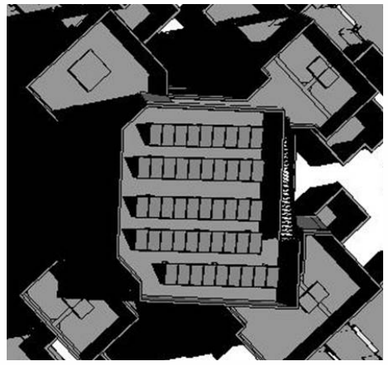
c. At Export Image Dialog, user can set export format in bmp, jpg, Png, targa & tiff



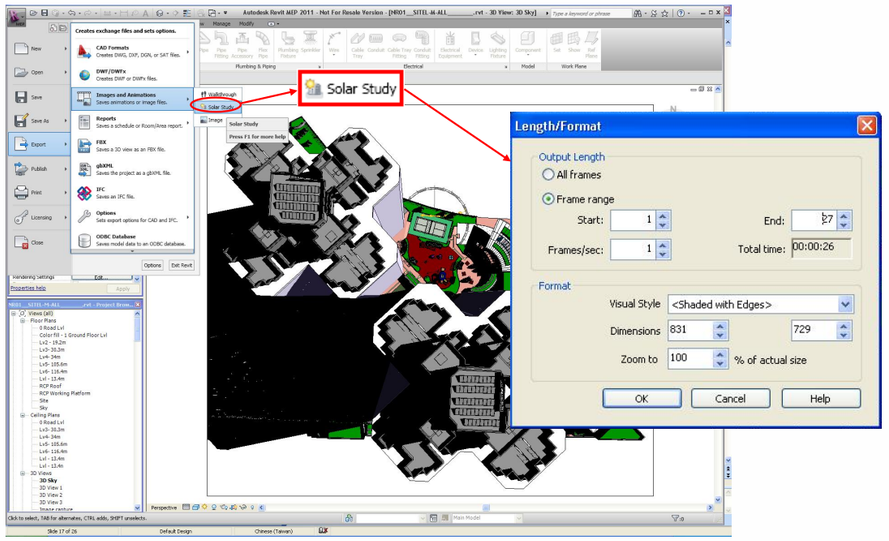
d. Exporting Image of Shadow Rendering



e. Check and ensure PV panels are not located in shading area



f. Exporting Animation, Click Click  > Export > Images and Animation.



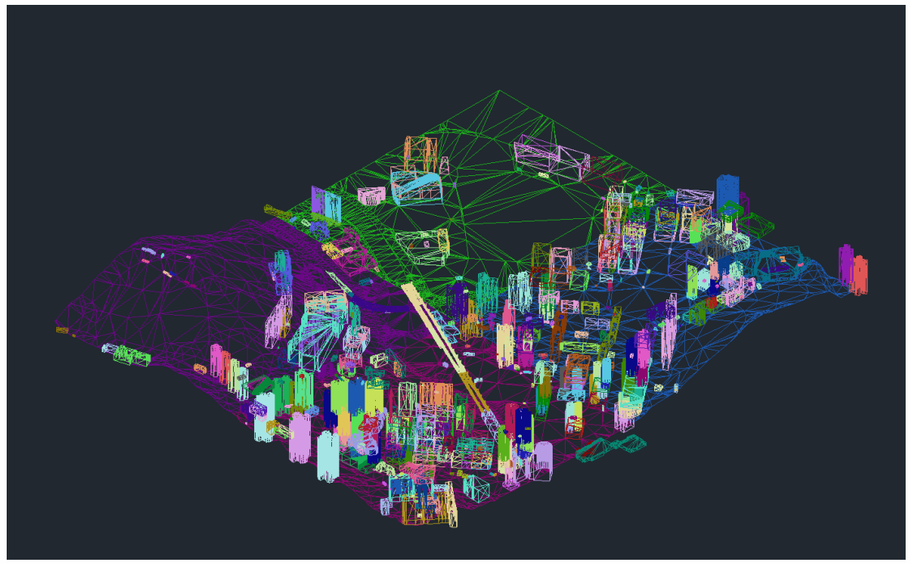
(b) Glare Analysis of PV Panel

Introduction

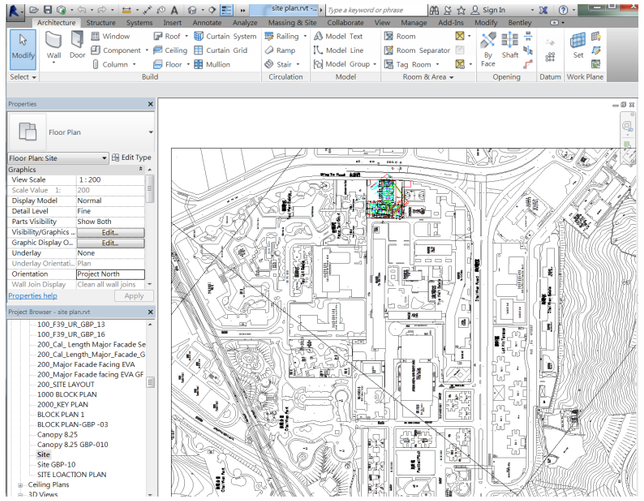
Glare can give a visual discomfort to someone if the sunlight from the PV panels reflects to surrounding buildings. Thus Glare analysis is simulating a reflection from the PV panel to surrounding building. The selected date always uses the Winter Solstice because the location of the sun is most tilted.

Detailed Steps of Glare Analysis

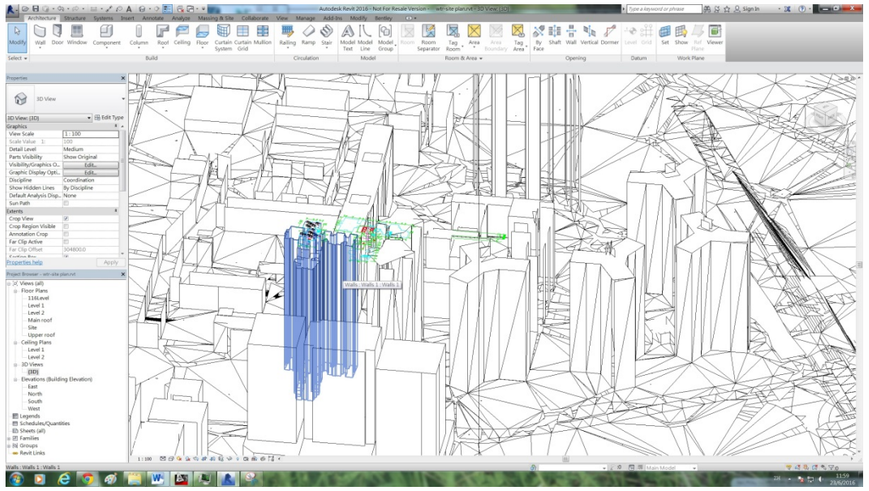
a. Receive the 3D spatial data in 3ds format from arch section, this file is the Digital map data from Land surveying unit, and then change the format 3ds to drawing using Autocad.



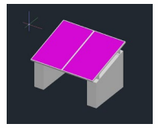
b. In Revit 2016, import the dwg file to fit the site model of Revit file.
(Make sure the site model is set to “True North”)

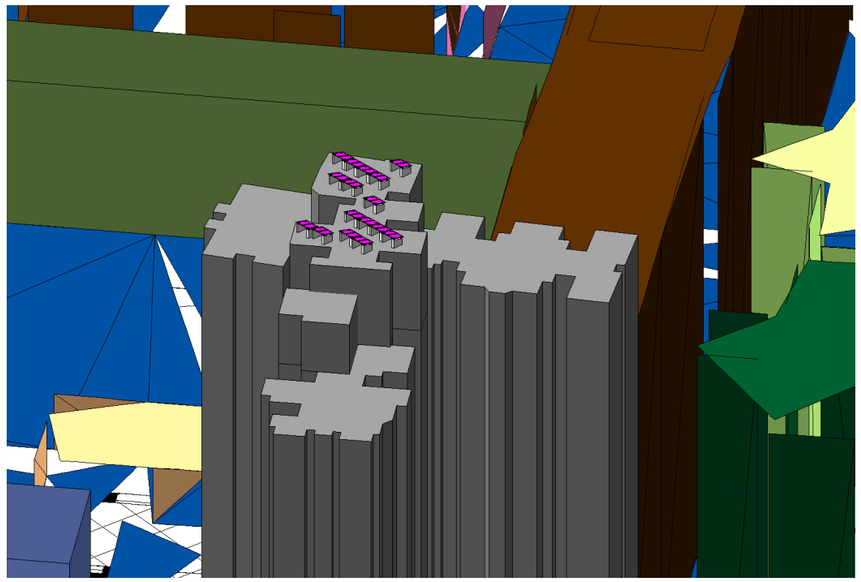


c. Create the building using Extrusion

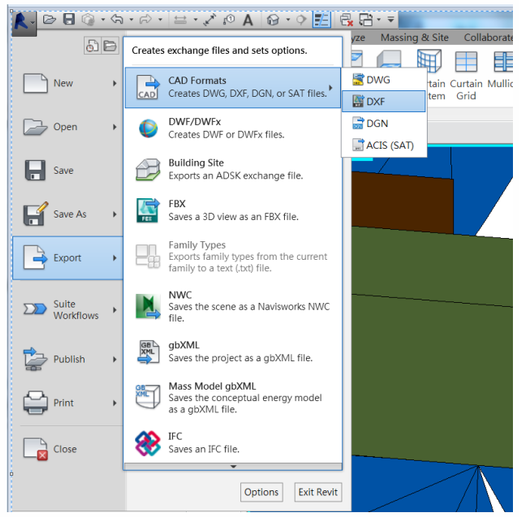


d. Place the PV panels on the Upper roof

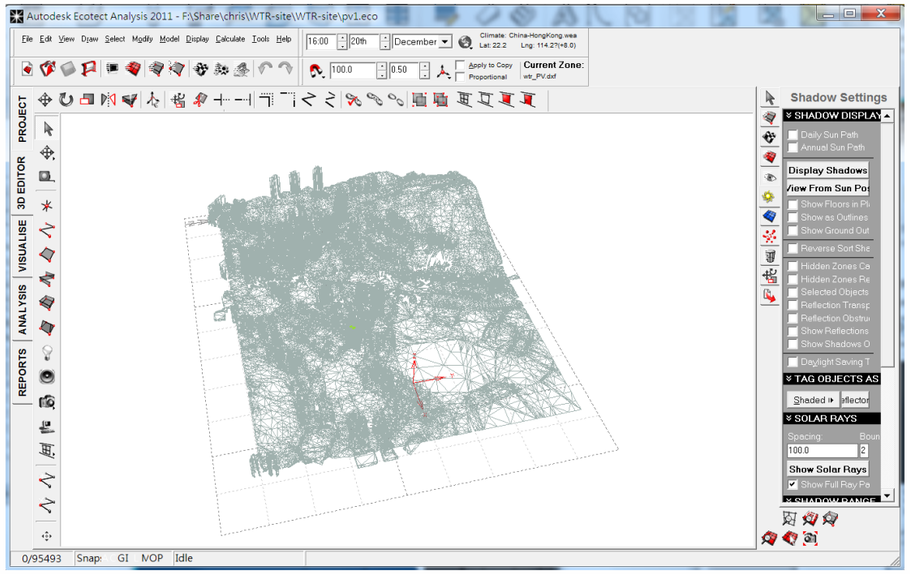




e. Export the the model to DXF format file for Ecotect

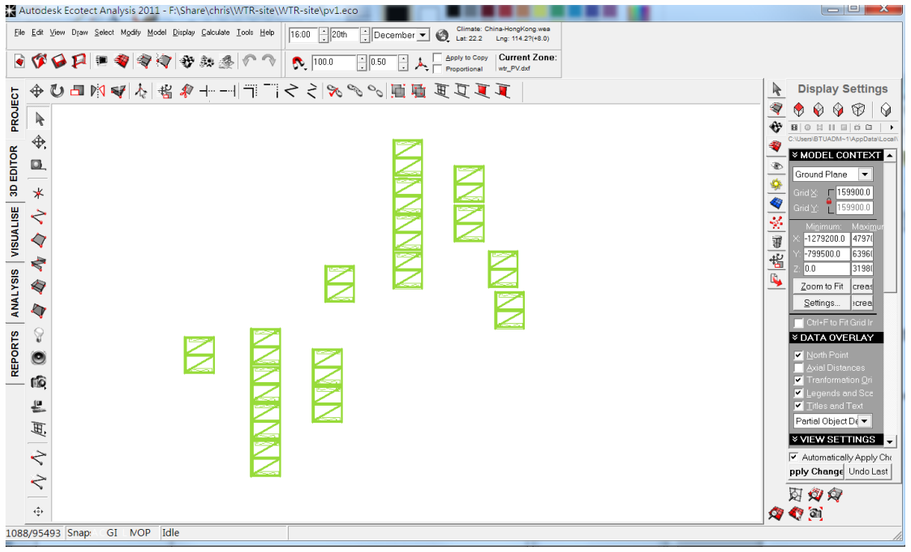


f. In Ecotect 2011, import the 3D CAD Geometry



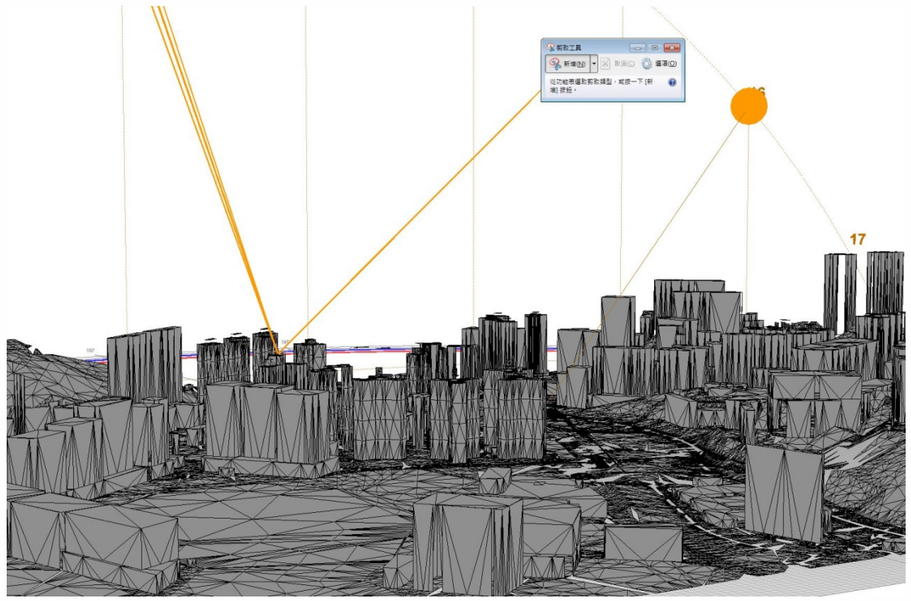
g. Set the Climate data to Hong Kong,

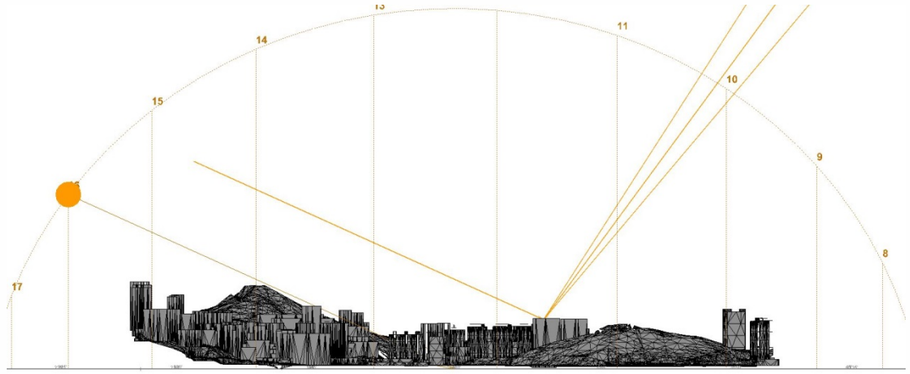
h. Set the Plan view(F5), Select all face of the PV panels

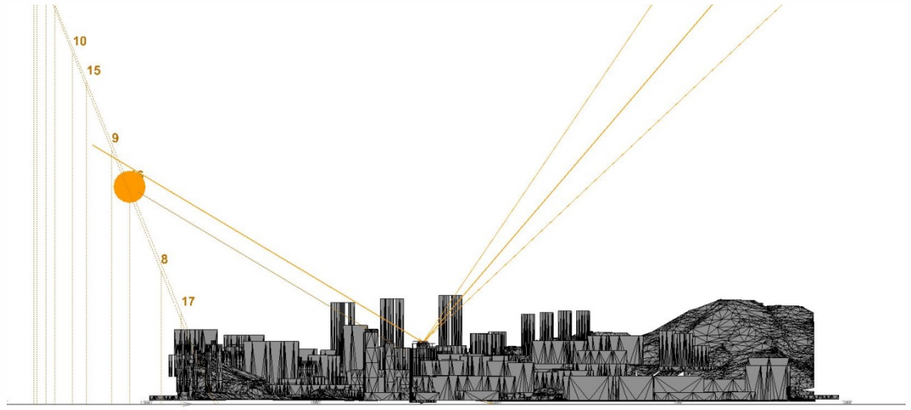


ANNEXES

i. The software was calculated the Shading and Shadows and finally Display Solar Rays







6 BIM Study - Customization of Soft Landscape Library for BIM

Objectives

Landscape detailed designs generally involve planting various species, placing of planters, modifying local topography and other hard landscape features. In designing each specific landscape area with expecting greening effect, the application of huge numbers of species of plants is required.

In 2013, Landscape section started the study of customization of soft landscape library for BIM application in DCD. Although similar resources are available on the internet, general issues such as the following are encountered and considered inappropriate for government body:

(a) incomplete regional planting species database;
(b) no necessary information stored inside the components;
(c) no intellectual property rights; and
(d) subscription fee annually.

Status of the Study

Customization of soft landscape library 2013 has been completed. About 150 plant species in 3 catalogues (trees, shrubs and groundcovers) were developed.

Methodology

a) It involves three main steps namely, trimming tree photographs, generation of a RPC file and creation of a tree family file in Revit.
b) Trimming photos in Photoshop may take around 15 minutes per tree. It is pretty challenging to trim a natural tree edge for a sparse-leaved tree, e.g. the Willow.
c) Generating a RPC file using the RPC Creator is simple and fast. The RPC Creator 2013 was free software. There is a technical issue on repeated request for entering the authorization code.
d) Revit 2011 version does not update the RPC library automatically. This has to be done via administrator account. User might find it rather troublesome to import his/her own RPC file since Revit 2011 needs to restart the whole program to update the library.
e) The plant family file created contains different heights of the same type of plant. For shrubs, it is recommended to create a symbol representing more than one shrub, in order to reduce the time for placing the shrubs one by one.

Scope of Applications

1. Presentation showing initial planting concept and greening effect.
2. Variety of local species selection based on HD's Basic Plant List.
3. Availability of the most common plant species for handover and long term maintenance by EMD.
4. Incorporation of softwork elements into integrated BIM model.

Restrictions and Limitation

1. The colour of the photo is determined by the quality of rendering. The colour tends to fade out after rendering. The photo size for a high quality RPC can be up to 1MB or more. Angle change function cannot change the view of the plant species. The product might look artificial and not realistic enough. Top view will show the RPC as a linear element only.
2. Mixed planting area has to be done manually by placing the plants one by one.
3. Revit 2011 / 2013 version does not update the RPC library automatically.
4. RPC 2017 version requires annual subscription; license verification process with RPC server during rendering will be prohibited by HA security system.

Conslusion and Recommendation

Landscape design and greening effects as shown on certain projects presentation are impressive. However, the compatibility of software's different version can be reviewed by both the software developer and the users to enhance its applicability in different stage of landscape design.

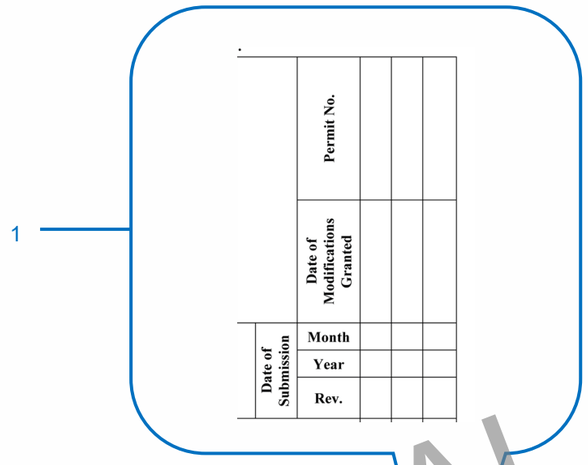
Way Forward

More plant species are being under development to enrich the amount and varieties of species in soft landscape library.

7 Statutory Submission by using Revit for GBP and Foundation Plan Submission

BIMST conducted the trial statutory submissions of GBP and Foundation Plan using Revit. It is noted that the proposed presentation style of GBP and Foundation Plan by using Revit is only slightly different from those drawings prepared by CAD. Despite the slight difference in the presentation style, the GBP and Foundation Plan produced by Revit can fulfill all the essential requirements stipulated in the Buildings Ordinance and its subsidiary regulations, relevant codes of practice and PNAPs. In other words, the content and result of the submissions produced by Revit are equivalent to the counterparts produced by CAD. Some of the differences in presentation formats and experiences of using Revit to achieve the desired approval formats are highlighted below for Project Teams' reference. (Please note that the presentation style of Foundation Plan using Revit has already been agreed with the SE team of ICU previously and are being adopted in a number of on-going projects. Consequently the examples below are related to GBP only.)

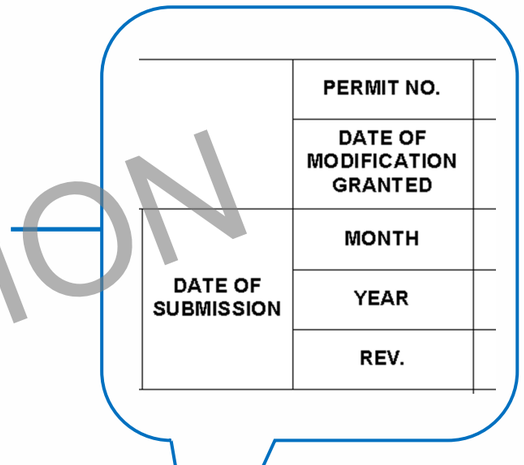
Description	Conventional Submission Format using CAD	BIM Submission Format using Revit as agreed by ICU
1. Some texts (e.g. Date of Submission, Permit No. and Date of Modification Granted) in the Modification Table generated by Revit can only be aligned horizontally instead of vertically.	MODIFICATION TABLE AS REFERRED TO IN PNAP ADV-33	MODIFICATION TABLE AS REFERRED TO IN PNAP ADV-33



MODIFICATIONS / EXEMPTIONS GRANTED and

AMENDMENT TO LOCATION (if any) IN THE CURRENT SUBMISSION

Description	Condition	Location with Modification/Exemption Granted	Date of Submission	Permit No.			
				Date of Modifications Granted			
				Month			
				Year			
				Rev.			



MODIFICATIONS / EXEMPTIONS GRANTED AND
AMENDMENT TO LOCATION (IF ANY) IN THE CURRENT SUBMISSION

ITEM	DESCRIPTION	CONDITION	LOCATION WITH MODIFICATION/ EXEMPTION GRANTED	DATE OF SUBMISSION	PERMIT NO.			
					DATE OF MODIFICATION GRANTED			
					MONTH			
					YEAR			
					REV.			

Description	Conventional Submission Format using CAD	BIM Submission Format using Revit as agreed by ICU
2. Revit 2016 does not provide an option for setting a legend symbol with filled color concurrently with hatch patterns. User is required to combine two separate legend symbols, each filled by a desired color and a desired hatch pattern to achieve the required legend symbol. Remark: Revit 2019 has such function of setting a legend symbol with customized color choice and hatch patterns.	LEGEND HARDCORE OR DRY FILL BRICK CONCRETE SLAB (LIGHTER WASH) CONCRETE (PLAIN OR REINFORCED) SOLID CONCRETE BLOCKS HOLLOW CONCRETE BLOCKS LIGHTWEIGHT PARTITION (e.g. PLASTERBOARD) PLASTER OR CEMENT RENDERING IMPERMEABLE / NON-ABSORBENT FLOOR OR WALL GLASS TIMBER METAL WORK OR STEEL STONE FINISH SANITARY FITTINGS DEMOLITION WORKS / DELETION OF APPROVED WORKS UNDERLINE FOR REVISION PLANTER PROVISION FOR THE BARRIER FREE (TACTILE WARNING STRIPS)	LEGEND HARDCORE OR DRY FILL BRICK CONCRETE SLAB (LIGHTER WASH) CONCRETE (PLAIN OR REINFORCED) SOLID CONCRETE BLOCKS HOLLOW CONCRETE BLOCKS LIGHTWEIGHT PARTITION (e.g. PLASTERBOARD) PLASTER OR CEMENT RENDERING IMPERMEABLE / NON-ABSORBENT FLOOR OR WALL GLASS TIMBER METAL WORK OR STEEL STONE FINISH SANITARY FITTINGS DEMOLITION WORKS / DELETION OF APPROVED WORKS UNDERLINE FOR REVISION PLANTER PROVISION FOR THE BARRIER FREE (TACTILE WARNING STRIPS) (a) Red solid fill color (b) Brick hatch pattern Overlap (a) and (b) above to produce the required legend symbol for Brick 2

Description	Conventional Submission Format using CAD	BIM Submission Format using Revit as agreed by ICU
3. Cells cannot be merged in the FRR table generated by using the “Schedule” function in Revit. Each row of the FRR table has to be presented.	FIRE RESISTANCE REQUIREMENT (FRR) FOR ELEMENTS OF CONSTRUCTION	FIRE RESISTANCE REQUIREMENT (FRR) FOR ELEMENTS OF CONSTRUCTION

FIRE RESISTANCE REQUIREMENT FOR ELEMENT OF CONSTRUCTION

FLOOR	USE	CLASS	COMPARTMENT OF BUILDING FLOOR AREA (S.M.)	MIN. DIMENSIONS OF ELEMENT OF CONSTRUCTION											
				BLOCKWORK	R.C.C. SLAB		R.C.C. BEAM		R.C.C. COLUMN		R.C.C. WALL		R.C.C. STAIR	
				THICKNESS	THICKNESS [F.R.R.]	COVER TO STEEL	WIDTH [F.R.R.]	COVER TO STEEL	THICKNESS [F.R.R.]	COVER TO STEEL	THICKNESS [F.R.R.]	COVER TO STEEL	THICKNESS [F.R.R.]	COVER TO STEEL
GRD.	LIFT LOBBY	1	120.404	100 [-/60/60]	100 [60/60/60]	20	100 [-/60/60]	30	200 [60/-/-]	25	75(120) [60/60/60] [-/60/60]#	15 (25)	95 [60/60/60]	20
	MAC ROOM	N/A	20.0											
	MAIN T.B.E. ROOM	N/A	45.829											
	FRESH AND FLUSH WATER PUMP ROOM	N/A	98.417											
	FS UPFEED WATER AND FS BOOSTER PUMP ROOM	N/A	55.044											
	JCP/MRP	SPECIAL HAZARD	23.7	225 [-/120/120]	225 [120/120/120]	35	200 [120/-/-]	50~	300 [120/-/-]	35	100(160) [120/120/120] [-/120/120]#	20 (25)	170 [240/240/240]	55
	RS&MRC	SPECIAL HAZARD	57.216											
	MAIN SWITCH ROOM	SPECIAL HAZARD	91.147											
	TRANSFORMER ROOM	SPECIAL HAZARD	150.617											
1/F~36/F	DOMESTIC	1	–	100 [-/60/60]	100 [60/60/60]	20	100 [-/60/60]	30	200 [60/-/-]	25	75(120) [60/60/60] [-/60/60]#	15 (25)	95 [60/60/60]	20
	ELECTRIC METER ROOM	N/A	–											
	TELECOM ROOM	N/A	–											
	REFUSE STORAGE & MATERIAL RECOVERY ROOM	SPECIAL HAZARD	8.457	225 [-/120/120]	225 [120/120/120]	35	200 [120/-/-]	50~	300 [120/-/-]	35	100(160) [120/120/120] [-/120/120]#	20 (25)	170 [240/240/240]	55
MAIN ROOF	REFUGE FLOOR	N/A	–	100 [-/60/60]	100 [60/60/60]	20	100 [-/60/60]	30	200 [60/-/-]	25	75(120) [60/60/60] [-/60/60]#	15 (25)	95 [60/60/60]	20
	CABLE ROOM	N/A	–											
	VENT DUCT ROOM	N/A	–											
	EMERGENCY GENERATOR ROOM	SPECIAL HAZARD	–	225 [-/120/120]	225 [120/120/120]	35	200 [120/-/-]	50~	300 [120/-/-]	35	100(160) [120/120/120] [-/120/120]#	20 (25)	170 [240/240/240]	55
LOWER ROOF	LIFT MACHINE ROOM	SPECIAL HAZARD	–											
	FRESH WATER BOOSTER PUMP ROOM	N/A	–	100 [-/60/60]	100 [60/60/60]	20	100 [60/-/-]	30	200 [60/-/-]	25	75(120) [60/60/60] [-/60/60]#	15 (25)	95 [60/60/60]	20
	PV METER ROOM	N/A	–											
G/F ~ ROOF	LIFT SHAFT	N/A	–	–	–	–	200 [120/-/-]	50~	300 [120/-/-]	35	100(160) [120/120/120] [-/120/120]#	20 (25)	–	–
	STAIRCASE	N/A	–	100 [-/60/60]	100 [60/60/60]	20	100 [-/60/60]	30	200 [60/-/-]	25	75(120) [60/60/60] [-/60/60]#	15 (25)	95 [60/60/60]	20

3

BLOCKWORK	R.C.C. SLAB	
THICKNESS	THICKNESS [F.R.R.]	COVER TO STEEL
100 [-/60/60]	100 [60/60/60]	20

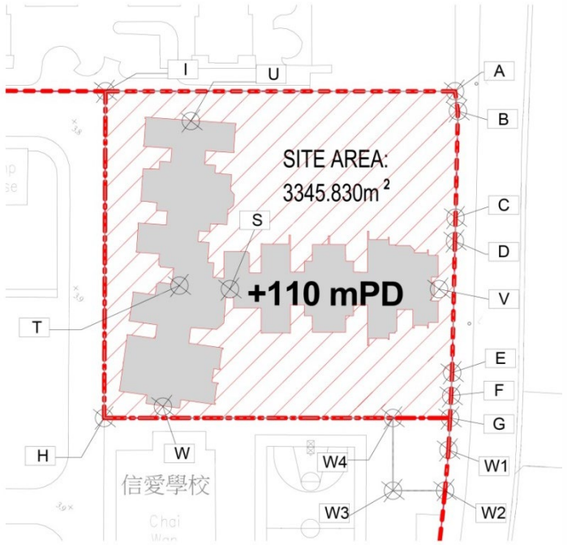
FIRE RESISTANCE REQUIREMENT FOR ELEMENTS OF CONSTRUCTION

LOCATION	USE	CLASS	COMPARTMENT OF BUILDING FLOOR AREA (m^2)	MIN. DIMENSIONS OF ELEMENT OF CONSTRUCTION									
				BLOCK	R.C.C SLAB		R.C.C BEAM		R.C.C COLUMN		R.C.C WALL => 1% V.R.		R.C.C STAIR	
				THK.	THK.	COVER TO STEEL	THK.	COVER TO STEEL	THK.	COVER TO STEEL	THK.	COVER TO STEEL	THK.	COVER TO STEEL
G/F	LIFT LOBBY	1	153.403	100 [-/60/60]	100 [60/60/60]	20	100 [60/-/-]	30	200 [60/-/-]	25	75 (120) [60/60/60] [-/60/60]#	15 (25)	95 [60/60/60]	20
G/F	F.S UPFEED WATER AND F.S BOOSTER PUMP ROOM	N/A	66.247	100 [-/60/60]	100 [60/60/60]	20	100 [60/-/-]	30	200 [60/-/-]	25	75 (120) [60/60/60] [-/60/60]#	15 (25)	95 [60/60/60]	20
G/F	FRESH AND FLUSH WATER PUMP ROOM	N/A	93.029	100 [-/60/60]	100 [60/60/60]	20	100 [60/-/-]	30	200 [60/-/-]	25	75 (120) [60/60/60] [-/60/60]#	15 (25)	95 [60/60/60]	20
G/F	MAC ROOM	N/A	19.489	100 [-/60/60]	100 [60/60/60]	20	100 [60/-/-]	30	200 [60/-/-]	25	75 (120) [60/60/60] [-/60/60]#	15 (25)	95 [60/60/60]	20
G/F	MAIN T.B.E ROOM	N/A	45.588	100 [-/60/60]	100 [60/60/60]	20	100 [60/-/-]	30	200 [60/-/-]	25	75 (120) [60/60/60] [-/60/60]#	15 (25)	95 [60/60/60]	20
G/F	EMR 1	SPECIAL HAZARD	5.519	225 [-/120/120]	225 [120/120/120]	35	200 [120/-/-]	50~	300 [120/-/-]	35	100 (160) [120/120/120] [-/120/120]#	20 (25)	170 [240/240/240]	55
G/F	EMR 2 AT MEZZ LEVEL	SPECIAL HAZARD	12.739	225 [-/120/120]	225 [120/120/120]	35	200 [120/-/-]	50~	300 [120/-/-]	35	100 (160) [120/120/120] [-/120/120]#	20 (25)	170 [240/240/240]	55
G/F	J.C.P./M.R.P.	SPECIAL HAZARD	23.229	225 [-/120/120]	225 [120/120/120]	35	200 [120/-/-]	50~	300 [120/-/-]	35	100 (160) [120/120/120] [-/120/120]#	20 (25)	170 [240/240/240]	55
G/F	MAIN SWITCH ROOM	SPECIAL HAZARD	85.422	225 [-/120/120]	225 [120/120/120]	35	200 [120/-/-]	50~	300 [120/-/-]	35	100 (160) [120/120/120] [-/120/120]#	20 (25)	170 [240/240/240]	55
G/F	RS & MRC	SPECIAL HAZARD	54.059	225 [-/120/120]	225 [120/120/120]	35	200 [120/-/-]	50~	300 [120/-/-]	35	100 (160) [120/120/120] [-/120/120]#	20 (25)	170 [240/240/240]	55
G/F	TRANSFORMER ROOM (HV SWITCHGEAR COMPARTMENT)	SPECIAL HAZARD	68.413	225 [-/120/120]	225 [120/120/120]	35	200 [120/-/-]	50~	300 [120/-/-]	35	100 (160) [120/120/120] [-/120/120]#	20 (25)	170 [240/240/240]	55
G/F	TRANSFORMER ROOM (TRANSFORMER COMPARTMENT)	SPECIAL HAZARD	80.494	225 [-/120/120]	225 [120/120/120]	35	200 [120/-/-]	50~	300 [120/-/-]	35	100 (160) [120/120/120] [-/120/120]#	20 (25)	170 [240/240/240]	55
1/F-36/F	DOMESTIC	1	-	100 [-/60/60]	100 [60/60/60]	20	100 [60/-/-]	30	200 [60/-/-]	25	75 (120) [60/60/60] [-/60/60]#	15 (25)	95 [60/60/60]	20

3

BLOCKWORK	R.C.C SLAB	
THICKNESS	THICKNESS [F.R.R.]	COVER TO STEEL
100 [-/60/60]	100 [60/60/60]	20
100 [-/60/60]	100 [60/60/60]	20
100 [-/60/60]	100 [60/60/60]	20
100 [-/60/60]	100 [60/60/60]	20
100 [-/60/60]	100 [60/60/60]	20

Description	Conventional Submission Format using CAD	BIM Submission Format using Revit as agreed by ICU
4. 4(a) The Easting/Northing values presented in the table generated by Revit should be the same as the survey points provided by the Lands Department. User has to input the Easting/Northing values of the survey points manually into Revit and present them in table format by using the “Schedule” function in Revit. 4(b) The distance between the points along the Phase Boundary will be automatically calculated by Revit and should be presented in a separate table by using the “Schedule” function in Revit.	SETTING OUT CO-ORDINATES OF PHASE BOUNDARY	SETTING OUT CO-ORDINATES OF PHASE BOUNDARY



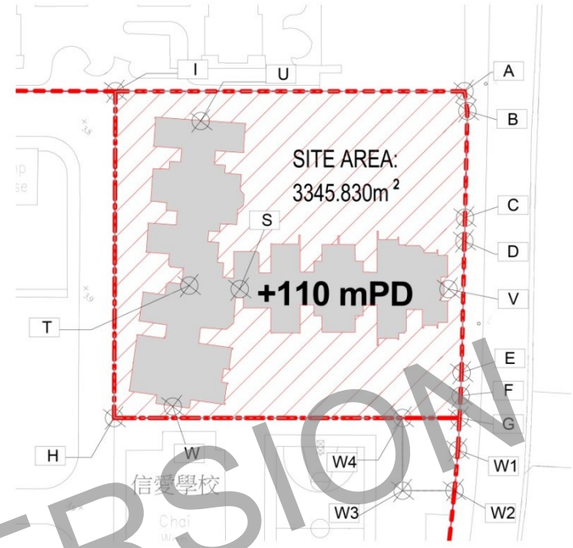
KEY PLAN

SCALE 1 : 500

SETTING OUT CO-ORDINATES OF PHASE BOUNDARY

POINT	EASTING	NORTHING	DISTANCE (m)
A	842 991.618	814 290.391	
			LINEAR = 3.423
B	842 994.093	814 288.026	
			LINEAR = 18.260
C	843 005.066	814 273.431	
			LINEAR = 4.029
D	843 007.480	814 270.204	
			LINEAR = 22.542
E	843 021.029	814 252.189	
			LINEAR = 3.969
F	843 023.349	814 248.970	
			LINEAR = 3.805
G	843 025.557	814 245.870	
			LINEAR = 59.118
H	842 979.102	814 209.306	
			LINEAR = 55.975
I	842 944.665	814 253.434	
			LINEAR = 59.753
A	842 991.618	814 290.391	

4(a) and (b)



KEY PLAN

SCALE 1 : 500

SETTING OUT COORDINATES OF PHASE BOUNDARY

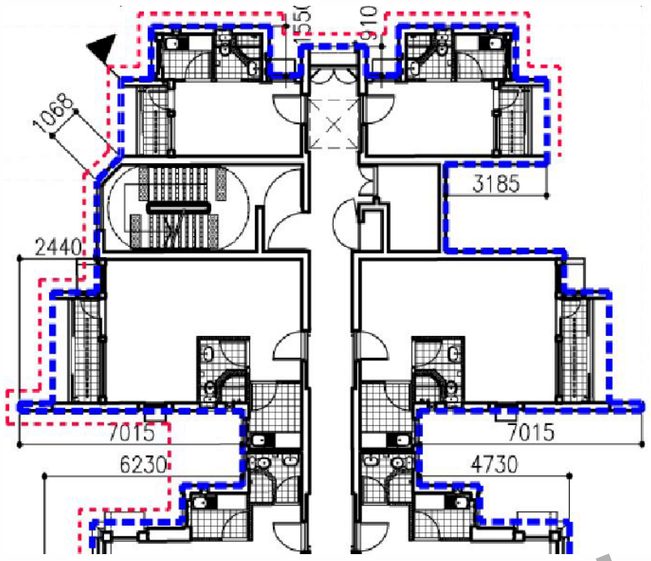
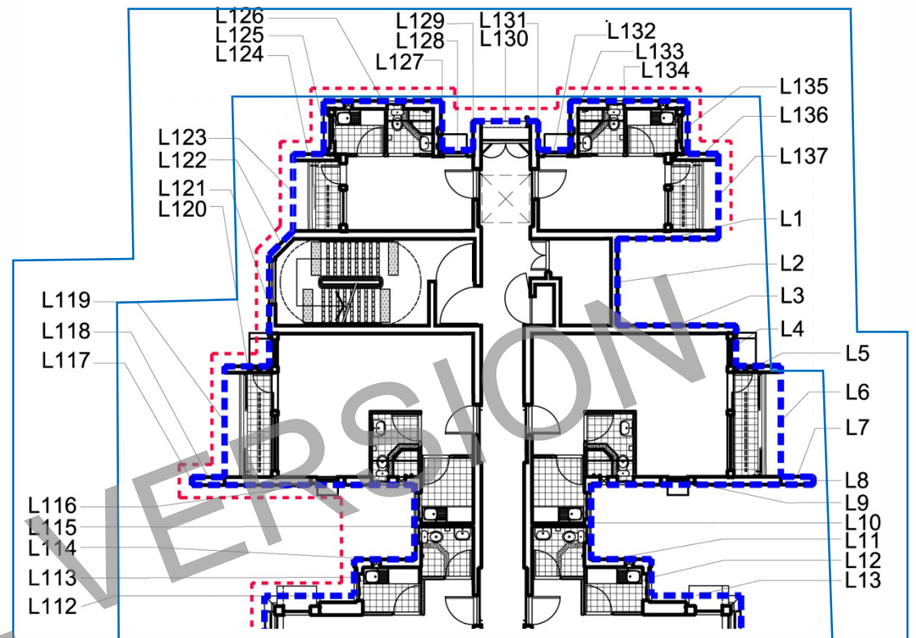
POINT	EASTING	NORTHING
A	842991618	814290391
B	842994093	814288026
C	843005067	814273431
D	843007480	814270204
E	843021029	814252190
F	843023350	814248970
G	843025557	814245870
H	842979102	814209306
I	842944665	814253434

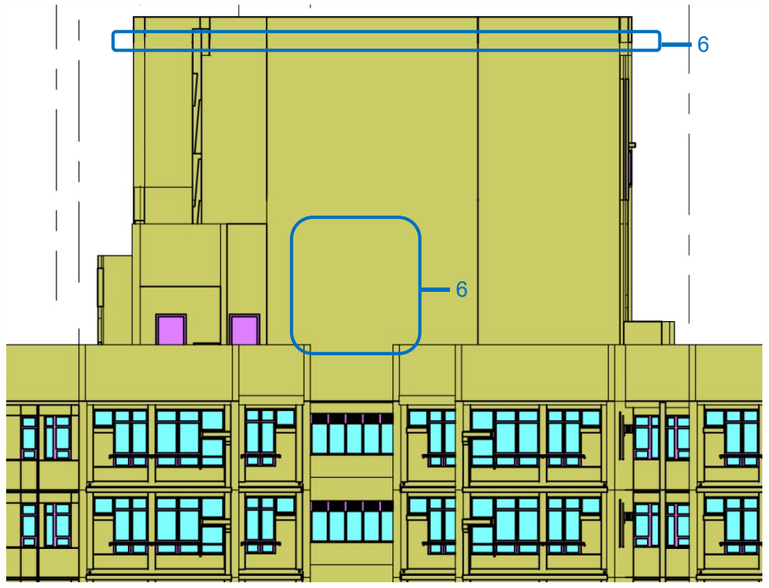
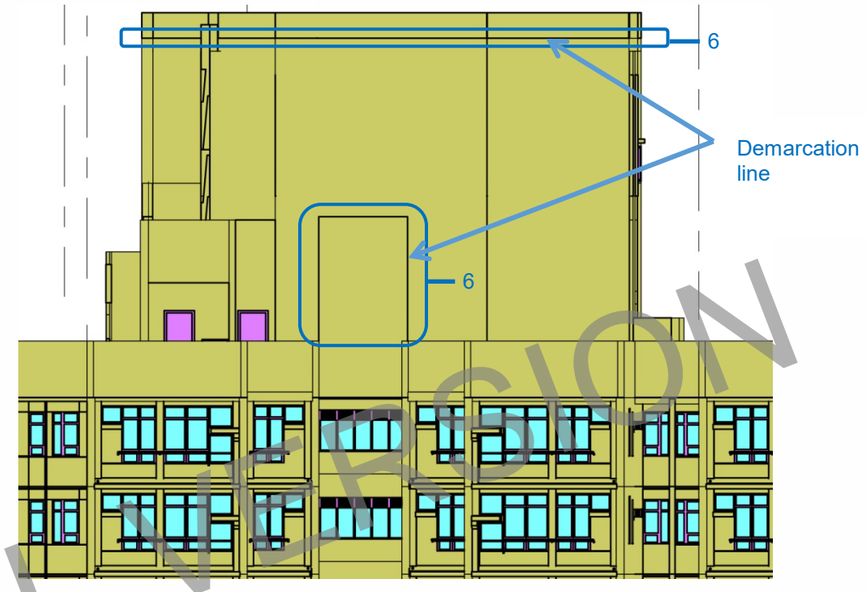
4(a)

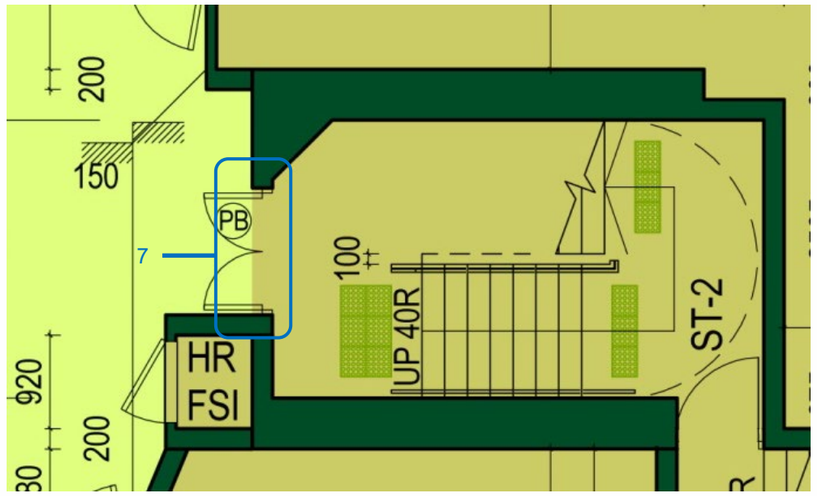
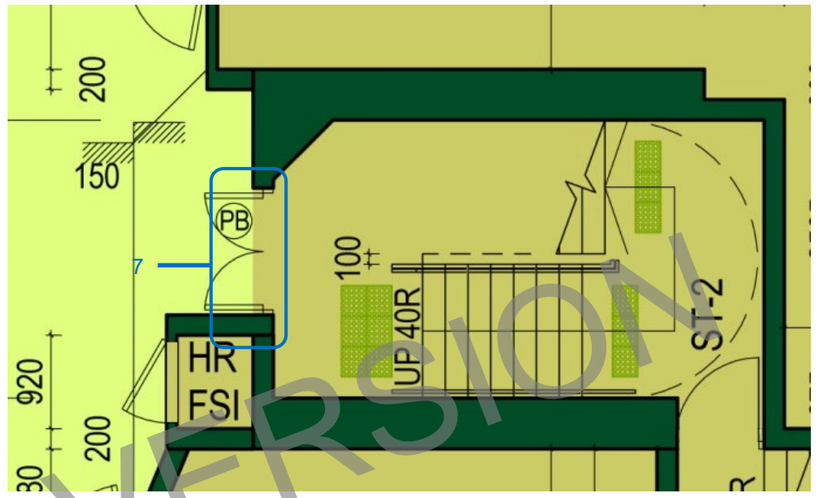
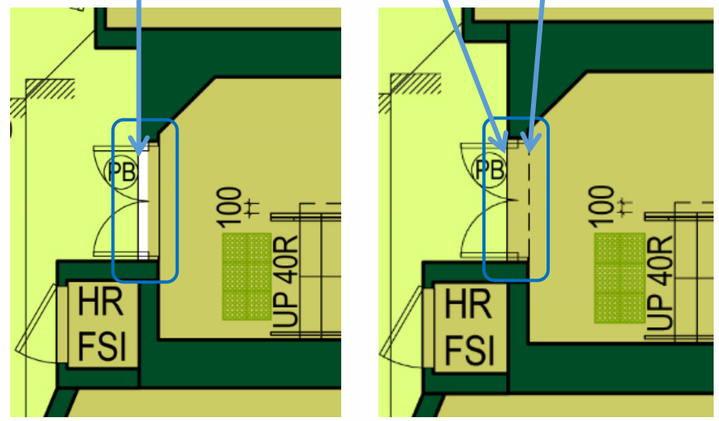
PHASE BOUNDARY

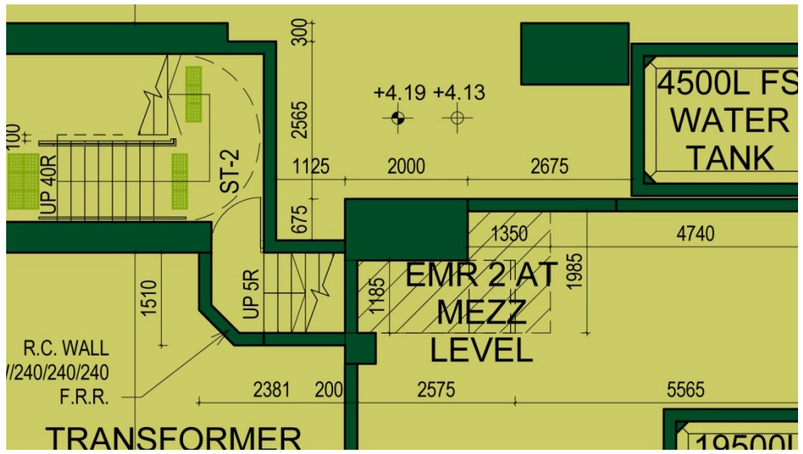
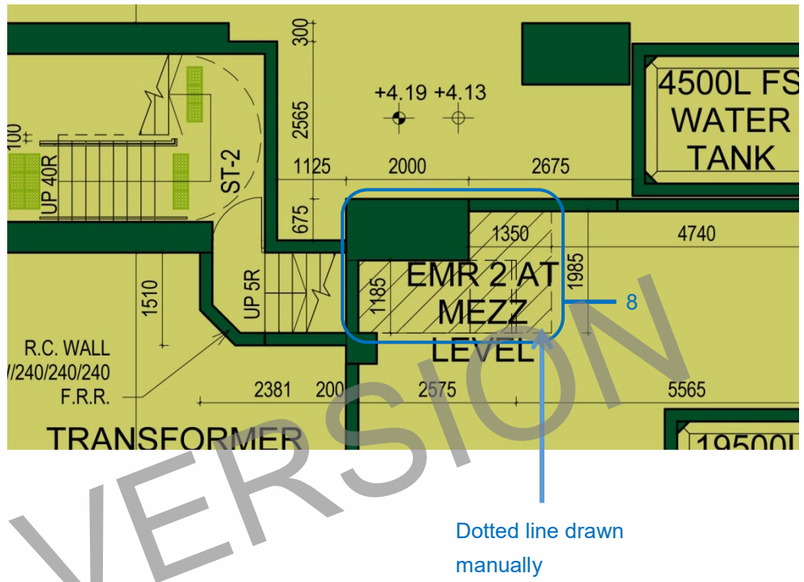
FROM	TO	DISTANCE (m)
A	B	3.423
B	C	18.260
C	D	4.029
D	E	22.542
E	F	3.969
F	G	3.805
G	H	59.118
H	I	55.975
I	A	59.753

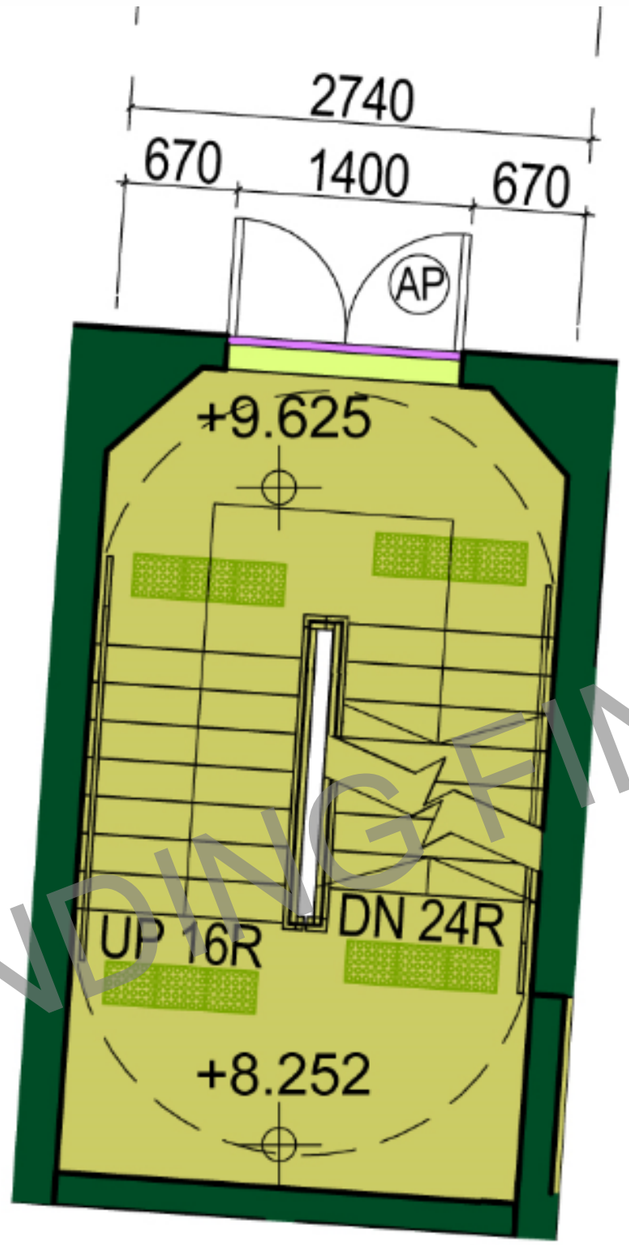
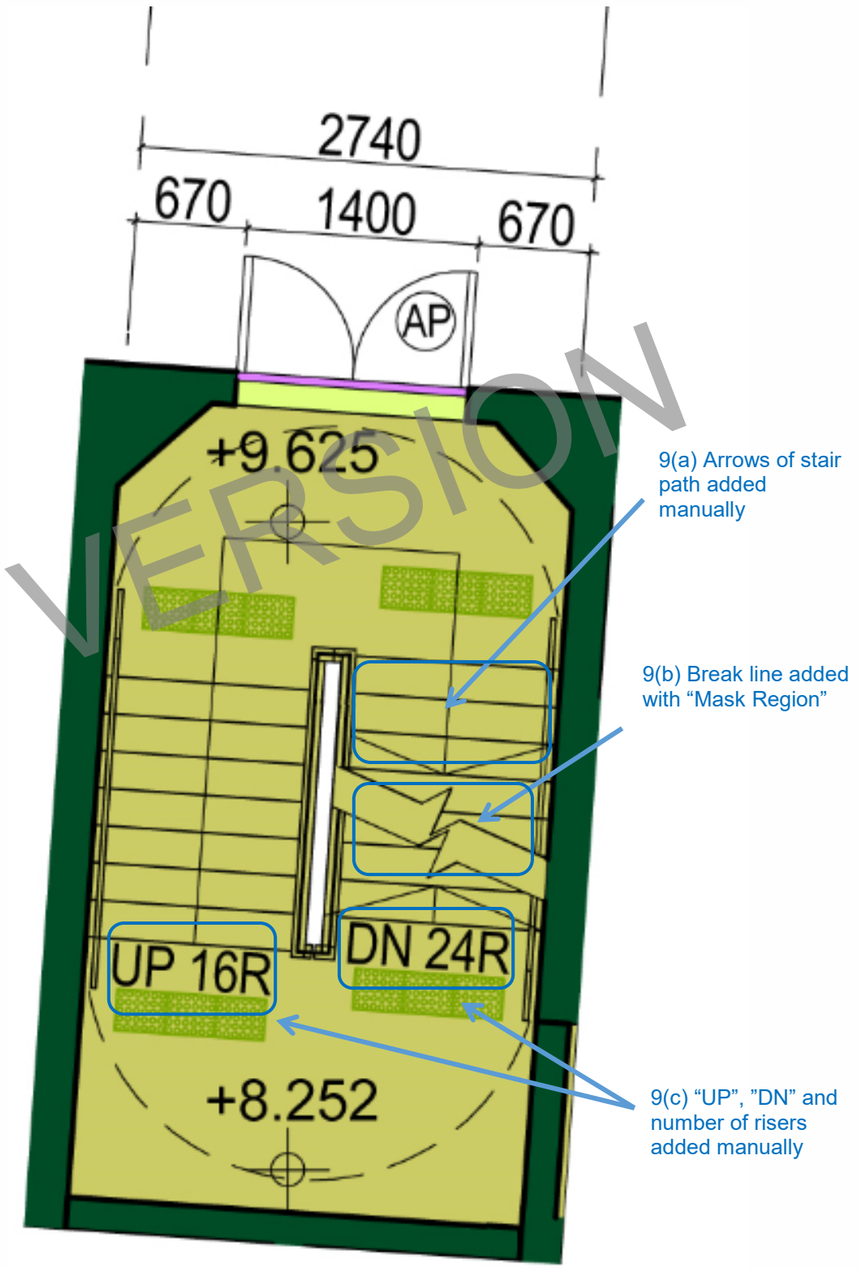
4(b)

Description	Conventional Submission Format using CAD	BIM Submission Format using Revit as agreed by ICU
5. 5(a) Instead of showing the length of each line segment along the building perimeter on the plan, Revit annotates the name of each line segment (e.g. L1, L2, …L137) along the building perimeter. 5(b) The length of each line segment and their total length along the building perimeter will be automatically calculated by Revit and presented in table format by using the “Schedule” function.	LENGTH OF BUILDING FACADES ACCESSIBLE BY EVA  TOTAL LENGTH OF PERIMETER OF BUILDING AT TYPICAL FLOOR :- 5(a) 16415 + 1550 + 910 + 910 + 1550 + 36344 + 3185 + 3185 + 7015 + 4730 + 4730 + 4895 + 4335 + 1765 + 4385 + 1657 + 4405 + 13930 + 5985 + 1410 + 1410 + 16765 + 1630 + 1630 + 20890 + 4845 + 4845 + 6390 + 2762 + 6624 + 25450 + 4875 + 4710 + 4710 + 4875 + 16550 + 1440 + 1440 + 11475 + 5895 + 4730 + 990 + 1880 + 933 + 11880 + 4970 + 4852 + 4567 + 31785 + 3675 + 6530 + 6375 + 6230 + 6230 + 7015 + 2440 + 1068 + 4100 = 382752 mm 5(b)	LENGTH OF BUILDING FACADES ACCESSIBLE BY EVA  TOTAL LENGTH OF PERIMETER OF BUILDING AT TYPICAL FLOOR: 5(a) 5(b) MARK | DISTANCE (mm) L1 | 3258 L2 | 2740 L3 | 3740 L4 | 1280 L5 | 1458 L6 | 3495 L7 | 1105 MARK | DISTANCE (mm) | MARK | DISTANCE (mm) | MARK | DISTANCE (mm) L1 3258 | L47 4845 | L93 1887 L2 2740 | L48 5025 | L94 4567 L3 3740 | L49 9874 | L95 4350 L4 1280 | L50 2250 | L96 3675 L5 1458 | L51 2566 | L97 2000 L6 3495 | L52 2762 | L98 5025 L7 1105 | L53 2610 | L99 4775 L8 250 | L54 2250 | L100 1499 L9 7140 | L55 4015 | L101 250 L10 2350 | L56 5025 | L102 6374 L11 1902 | L57 4925 | L103 2350 L12 1350 | L58 2350 | L104 1898 L13 2830 | L59 1950 | L105 1350 L14 5750 | L60 1350 | L106 2807 L15 2830 | L61 2610 | L107 2750 L16 1350 | L62 5750 | L108 1524 L17 1902 | L63 2610 | L109 250 L18 2350 | L64 1350 | L110 1499 L19 4897 | L65 1950 | L111 2955 L20 5025 | L66 2350 | L112 2832 L21 4335 | L67 4925 | L113 1145 L22 4700 | L68 5025 | L114 1903 L23 1765 | L69 6990 | L115 2350 L24 1354 | L70 990 | L116 7145 L25 4385 | L71 1550 | L117 250 L26 1657 | L72 990 | L118 1105 L27 4405 | L73 7011 | L119 3495 L28 2665 | L74 5025 | L120 1462 L29 5750 | L75 4896 | L121 3515 L30 3745 | L76 2350 | L122 1066 L31 1175 | L77 1900 | L123 2427 L32 2309 | L78 1350 | L124 972 L33 1175 | L79 2830 | L125 1675 L34 3746 | L80 2750 | L126 3700 L35 5750 | L81 990 | L127 1550 L36 1465 | L82 1880 | L128 1015 L37 2115 | L83 1309 | L129 910 L38 1630 | L84 2485 | L130 2050 L39 1550 | L85 2805 | L131 910 L40 1630 | L86 1350 | L132 1015 L41 2115 | L87 1900 | L133 1550 L42 1465 | L88 1830 | L134 3700 L43 4875 | L89 1900 | L135 1675 L44 9600 | L90 3435 | L136 1043 L45 4845 | L91 1065 | L137 2675 L46 2350 | L92 2515 | TOTAL= 379498

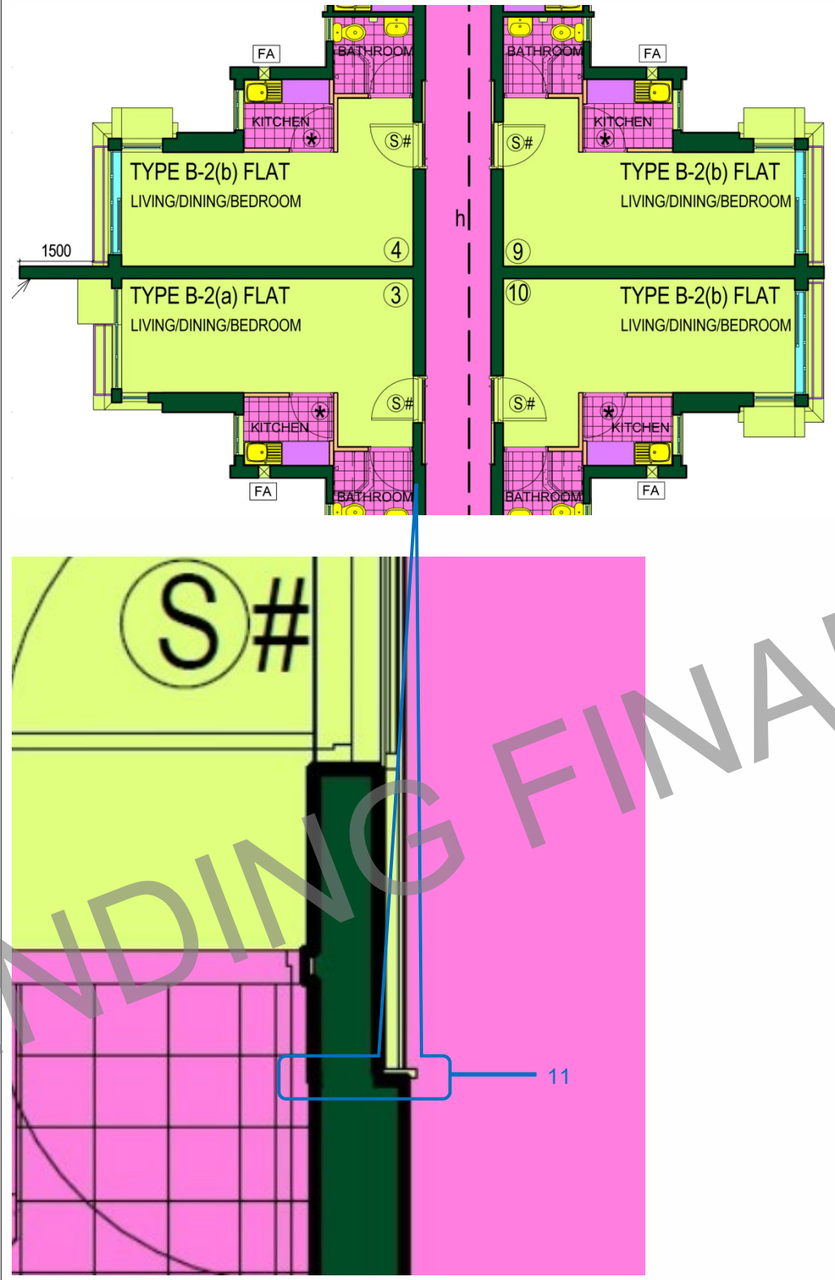
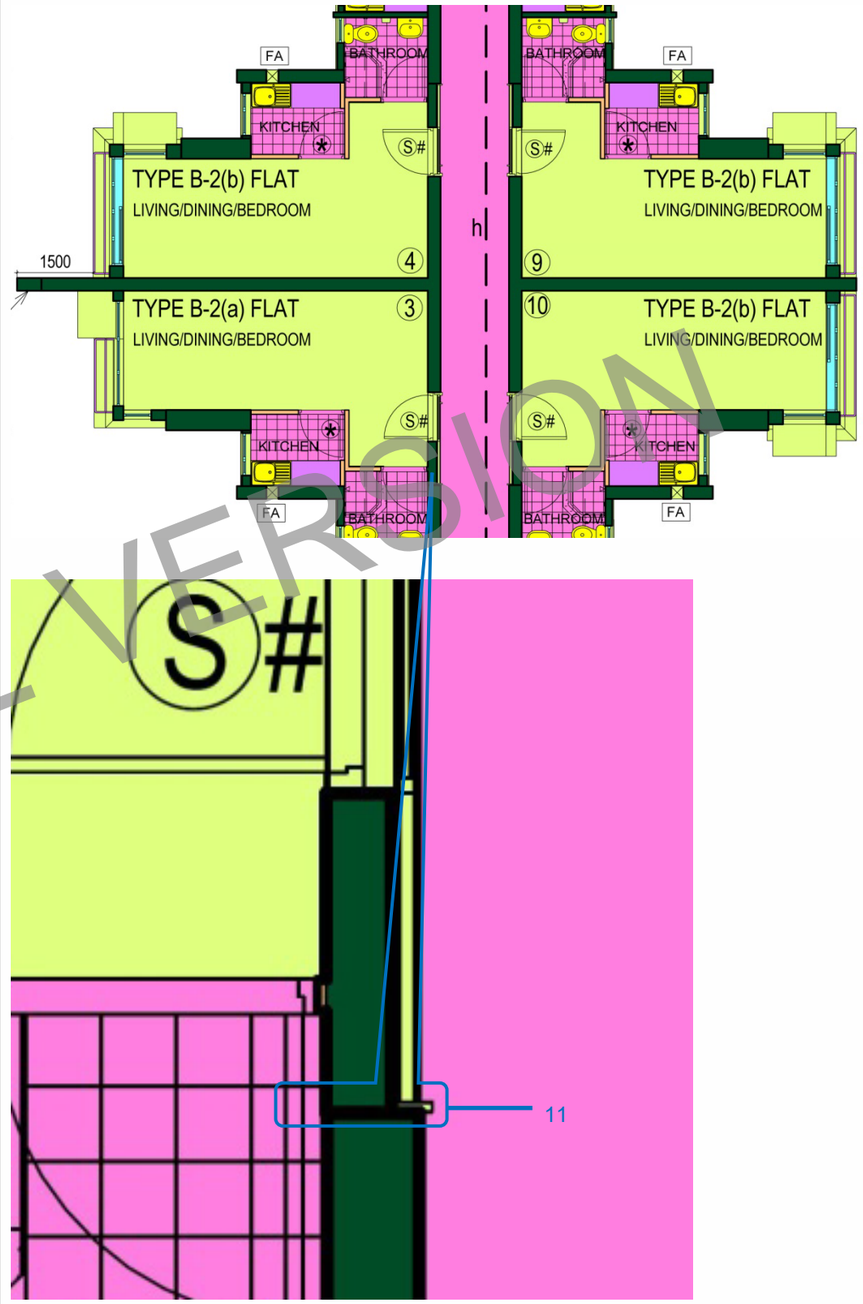
Description	Conventional Submission Format using CAD	BIM Submission Format using Revit as agreed by ICU
6. By linking the SE Revit file with the Arch Revit file, a demarcation line will appear on the elevation to indicate the extent of the Architectural Wall.	NO DEMARCATION LINE ON ELEVATION 	DEMARCATION LINE ON ELEVATION 

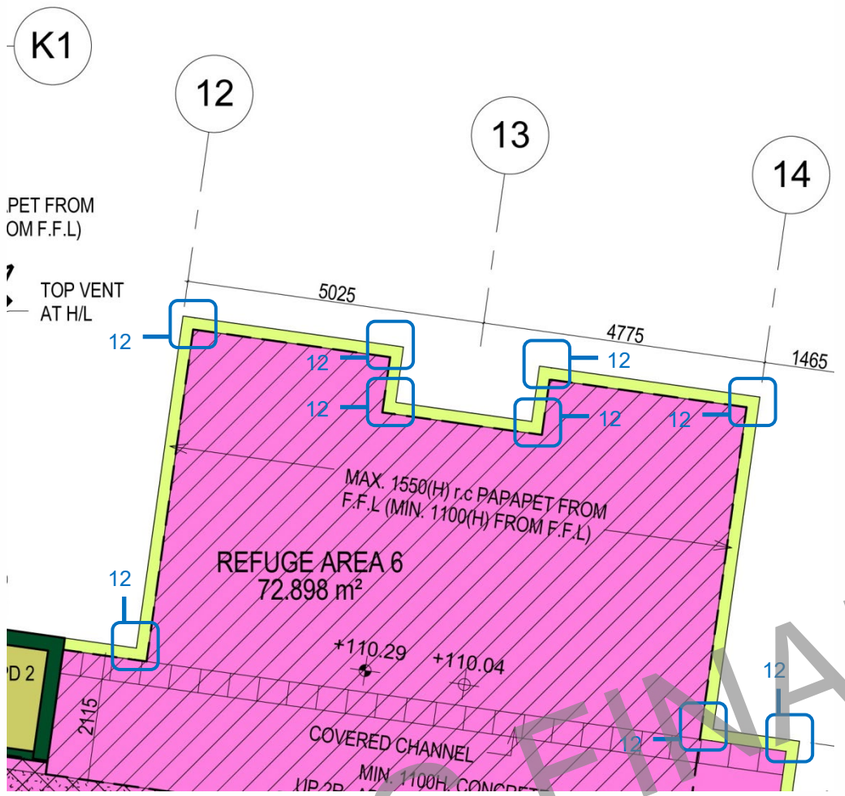
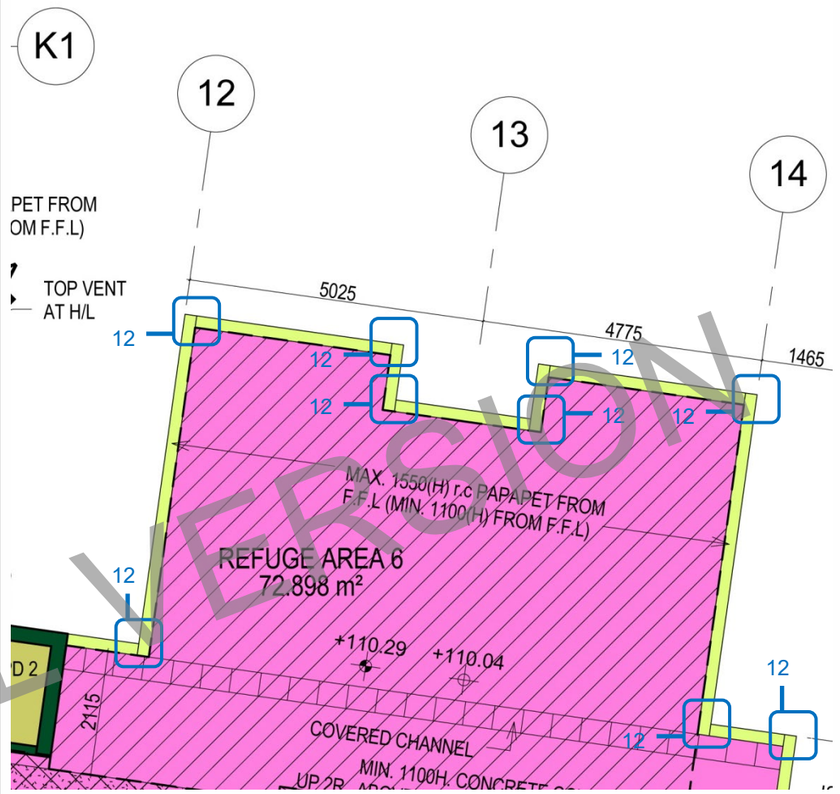
Description	Conventional Submission Format using CAD	BIM Submission Format using Revit as agreed by ICU
7. In order to achieve the conventional presentation format of the floor area below a door (door curb area), the following has to done: 7(a) "Mask Region" has to be added to the door families to eliminate the default door curb lines, and to reset the color of the floor area based on its building material. 7(b) To eliminate the solid and dotted lines, which represent the extent of floor slab and the supporting beam respectively, the "Invisible Lineworks" function is to be applied manually to hide these unwanted lines from the floor plan.	<u>NO DOOR CURB AND UNWANTED LINES</u> 	<u>NO DOOR CURB AND UNWANTED LINES</u>  

Description	Conventional Submission Format using CAD	BIM Submission Format using Revit as agreed by ICU
8. User has to manually draw the dotted lines to show the extent of the building lines of the floor above. For example, dotted lines are drawn manually to demarcate the extent of the Electrical Meter Room (EMR) at the Mezzanine floor located above.	DOTTED LINE FOR BUILDING LINE ABOVE 	DOTTED LINE FOR BUILDING LINE ABOVE 

Description	Conventional Submission Format using CAD	BIM Submission Format using Revit as agreed by ICU
9. 9(a) Stair Path and Arrow have to be drawn manually by using “Lineworks” on the staircase plan produced by Revit. 9(b) Break lines with “Mask Region” are to be added to hide the unwated line within it. 9(c) The staircase related text “UP”, “DN”, “16R” and “24R” have to be annotated manually on the staircase plan produced by Revit.	ANNOTATION OF STAIRCASE 	ANNOTATION OF STAIRCASE 

Description	Conventional Submission Format using CAD	BIM Submission Format using Revit as agreed by ICU
10. The travel distance from one point to another will be automatically calculated by Revit and presented in table format by using the “Schedule” function in Revit.	TRAVEL DISTANCE TRAVEL DISTANCE FROM EXIT OF FLAT NO.13 TO THE NEAREST REQUIRED STAIRCASE TOTAL PROVIDED = u+v+w+x+y = 1.03+11.26+0.57+1.52+0.69 = 15.07 <24m(MAX ALLOWED) 10	TRAVEL DISTANCE TRAVEL DISTANCE FROM EXIT OF FLAT NO.13 TO THE NEAREST REQUIRED STAIRCASE MARK | DISTANCE PROVIDED (m) u | 1.030 v | 11.260 w | 0.570 x | 1.520 y | 0.690 TOTAL= | 15.070 < 24m (MAX ALLOWED) 10

Description	Conventional Submission Format using CAD	BIM Submission Format using Revit as agreed by ICU
11. By linking the SE Revit file with the Arch Revit file, a demarcation line (wall joint) will appear on the plan to indicate the extent of the Architectural Wall.	NO WALL JOINT 	WALL JOINT 

Description	Conventional Submission Format using CAD	BIM Submission Format using Revit as agreed by ICU
12. Compared to conventional drawings, a demarcation line is present between each segment of parapet walls on the plan generated by Revit. While different segments of the parapet walls may be drawn by using "Wall Element" or "Beam element" as appropriate, "Join" function is not applicable to the different elements to eliminate extra lines (parapet wall joints).	NO PARAPET WALL JOINT 	PARAPET WALL JOINT 

Description	Conventional Submission Format using CAD	BIM Submission Format using Revit as agreed by ICU
13. 13(a) Instead of presenting the Non-Accountable Domestic GFA as negative values, the Domestic GFA and the Non-Accountable Domestic GFA will be presented in two separate tables with areas automatically generated by Revit. 13(b) The Total Domestic GFA has to be presented manually.	GFA	GFA

DOMESTIC GFA OF GROUND FLOOR

PORTION	USAGE	AREA (m^2)
1	COVERED AREA	1,900.707
A	PIPE DUCT (PD)	-1.185
B	PIPE DUCT (PD)	-1.225
C	PIPE DUCT (PD)	-1.586
D	PIPE DUCT (PD)	-1.880
E	PIPE DUCT (PD)	-1.586
F	PIPE DUCT (PD)	-1.880
G	PIPE DUCT (PD)	-1.039
H	PIPE DUCT (PD)	-2.578
J	PIPE DUCT (PD)	-1.523
K	PIPE DUCT (PD)	-1.378
L	PIPE DUCT (PD)	-0.564
M	PIPE DUCT (PD)	-1.187
N	PIPE DUCT (PD)	-3.426
P	PIPE DUCT (PD)	-1.732
Q	PIPE DUCT (PD)	-1.045
R	PIPE DUCT (PD)	-0.564
S	FS UPFEED WATER AND FS BOOSTER PUMP ROOM	-55.044
T	FRESH AND FLUSH WATER PUMP ROOM	-98.417
	TRANSFORMER ROOM	
U1	(HV SWITCHGEAR COMPARTMENT)	-68.550
U2	(TRANSFORMET COMPARTMENT)	-82.067
V	MAIN SWITCH ROOM	-91.147
W	MAIN T.B.E. ROOM	-45.829
X	ELECTRICAL METER ROOM 1 (EMR 1)	-5.475
Y	ELECTRICAL METER ROOM 1 (EMR 2) AT HIGH LEVEL	-13.421
Z	TELECOM ROOM	-16.884
AA	REFUSE STORAGE & MATERIAL RECOVERY CHAMBER (RS&MRC)	-57.216
AB	MASTER WATER METER CHAMBER (MWMC)	-2.821
AC	DRAIN PIT	-0.490
AD	DRAIN PIT	-0.670
AE	HOSE REEL (HR) F.S. INLET (FSI)	-0.736
AF	HOSE REEL (HR) F.S. INLET (FSI)	-0.823
AG	HOSE REEL (HR)	-0.855
AH	HOSE REEL (HR)	-0.874
	TOTAL =	1,335.010

13(a) and (b)

DOMESTIC G.F.A. OF GROUND FLOOR (D1a)

PORTION	USAGE	AREA (m^2)
3	COVERED AREA	1900.707

NON-ACOUNTABLE DOMESTIC G.F.A. OF GROUND FLOOR (D1b)

A	PIPE DUCT(PD)	1.100
AA	REFUSE STORAGE & MATERIAL RECOVERY CHAMBER (RS & MRC)	54.059
AB	MASTER WATER METER CHAMBER (MWMC)	3.067
AD	DRAIN PIT	0.620
AE	HOSE REEL (HR) F.S.INLET (FSI)	0.690
AF	HOSE REEL (HR) F.S.INLET (FSI)	0.687
AG	HOSE REEL (HR)	0.715
AH	HOSE REEL (HR)	0.896
B	PIPE DUCT(PD)	0.903
C	PIPE DUCT(PD)	1.586
D	PIPE DUCT(PD)	2.112
E	PIPE DUCT(PD)	1.586
F	PIPE DUCT(PD)	1.880
G	PIPE DUCT(PD)	1.041
H	PIPE DUCT(PD)	2.492
J	PIPE DUCT(PD)	1.701
K	PIPE DUCT(PD)	1.405
L	PIPE DUCT(PD)	0.494
M	PIPE DUCT(PD)	1.045
N	PIPE DUCT(PD)	4.003
P	PIPE DUCT(PD)	1.880
Q	PIPE DUCT(PD)	1.274
R	PIPE DUCT(PD)	0.495
S	F.S. UPFEED WATER AND F.S. BOOSTER PUMP ROOM	66.247
T	FRESH AND FLUSH WATER PUMP ROOM	93.029
U1	TRANSFORMER ROOM (HV SWITCHGEAR COMPARTMENT)	68.413
U2	TRANSFORMER ROOM (TRANSFORMER COMPARTMENT)	80.494
V	MAIN SWITCH ROOM	85.422
W	MAIN T.B.E ROOM	45.588
X	ELECTRICAL METER ROOM 1 (EMR 1)	5.519
Y	ELECTRICAL METER ROOM 1 (EMR 2) AT HIGH LEVEL	12.739
Z	TELECOM ROOM	16.675
	TOTAL=	565.697

13(a)

TOTAL DOMESTIC G.F.A. OF GROUND FLOOR (D1)
= D1a - D1b
= 1900.707 - 565.697
= 1335.010 m²

13(b)

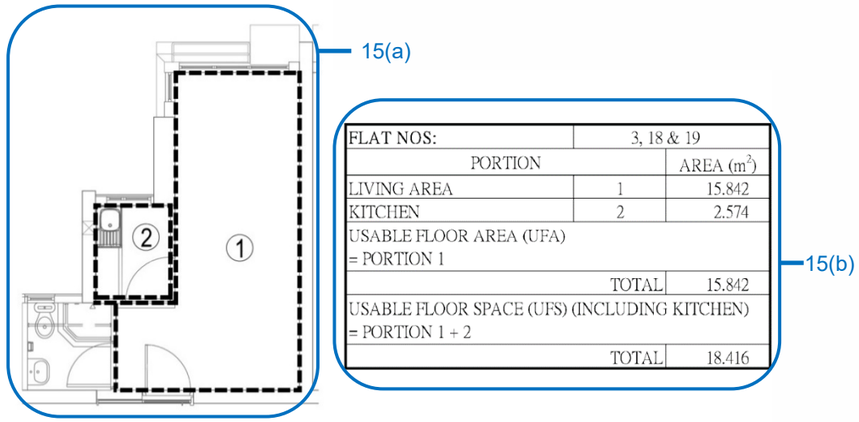
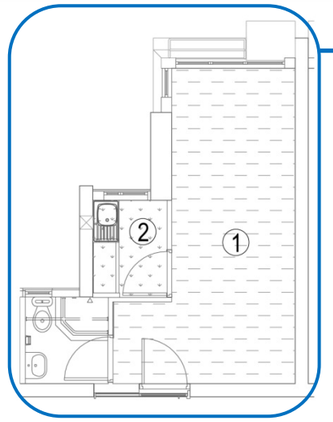
Description	Conventional Submission Format using CAD	BIM Submission Format using Revit as agreed by ICU
14. 14(a) Cells cannot be merged in the UFA table generated by using the “Schedule” function in Revit. Each row of the UFA table has to be presented. 14(b) The UFA Per Floor and the Total UFA will be presented in a column within the same table generated by the “Schedule” function in Revit.	UFA TOTAL USABLE FLOOR AREA (UFA) PER FLOOR 14(a) 14(b)	UFA TOTAL USABLE FLOOR AREA (U.F.A.) PER FLOOR 14(a) 14(b)

TOTAL USABLE FLOOR AREA (UFA) PER FLOOR

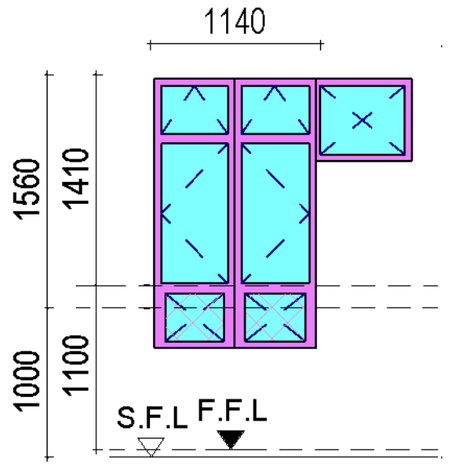
FLOOR	FLAT NUMBER	AREA PER FLAT (m^2)	NOS. THUS	AREA PER FLOOR (m^2)
F1 - F34	1	9.400	1	9.400
	6 & 7	11.240	2	22.480
	4, 9, 10, 22 & 23 3, 18 & 19	15.842	8	126.736
	2, 14 & 20	23.533	3	70.599
	5, 8, 12 & 13	26.010	4	104.040
	15 & 21	23.206	2	46.412
	11, 16 & 17	27.941	3	83.823
		TOTAL =	23	463.490
U.F.A. AT F1 TO F34 =				
463.490 x 34 STOREYS				15,758.660

TOTAL USABLE FLOOR AREA (U.F.A.) PER FLOOR

FLOOR	FLAT NOS.	AREA PER FLAT(m²)	NOS. OF FLATS	U.F.A. PER FLOOR (m²)	U.F.A. PER FLOOR (m²) x 34 STOREYS
F1-F34	1	9.371	1	9.371	318.614
F1-F34	2,14,15 & 20	23.339	4	93.356	3174.104
F1-F34	3, 18 & 19	15.834	3	47.502	1615.068
F1-F34	4, 9 ,10, 22 & 23	15.847	5	79.235	2693.990
F1-F34	5, 8 ,12 & 13	26.293	4	105.172	3575.848
F1-F34	6 & 7	11.478	2	22.956	780.504
F1-F34	11	27.795	1	27.795	945.030
F1-F34	16	27.803	1	27.803	945.302
F1-F34	17	27.952	1	27.952	950.368
F1-F34	21	23.036	1	23.036	783.224
TOTAL=		208.748	23	463.490	15758.660

Description	Conventional Submission Format using CAD	BIM Submission Format using Revit as agreed by ICU
15. 15(a) In Revit, instead of using a dotted line, hatch patterns are adopted to demarcate different floor usages. 15(b) The UFA and the UFS have to be presented by using the “Schedule” function and manually.	UFS  FLAT NOS: 3, 18 & 19 PORTION / AREA (m^2) LIVING AREA 1 15.842 KITCHEN 2 2.574 USABLE FLOOR AREA (UFA) = PORTION 1 TOTAL 15.842 USABLE FLOOR SPACE (UFS) (INCLUDING KITCHEN) = PORTION 1 + 2 TOTAL 18.416 TYPE B-2 (a) FLAT (FLAT NO:3,18 & 19 FROM F1 TO F36)	UFS  FLAT NOS. / PORTION / AREA (m^2) 3, 18 & 19 LIVING AREA 1 15.842 3, 18 & 19 KITCHEN 2 2.574 TOTAL= 18.416 USABLE FLOOR AREA(U.F.A.) = PORTION 1 = 15.842 m^2 USABLE FLOOR SPACE(U.F.S.)(INCLUDING KITCHEN) = PORTION 1+2 =18.416 m^2 15(b) TYPE B-2 (a) FLAT (FLAT NO:3,18 & 19 FROM F1 TO F36)

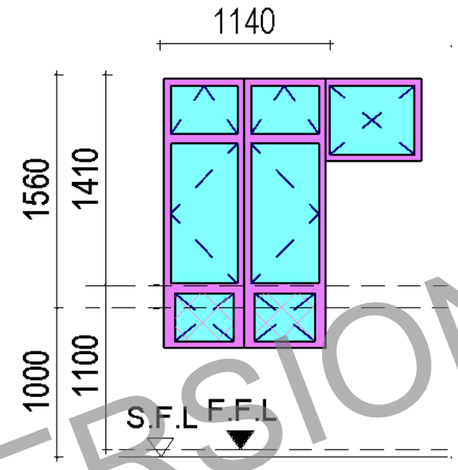
Description	Conventional Submission Format using CAD	BIM Submission Format using Revit as agreed by ICU
16. The Glazing Area of Flat Windows has to be presented by using the “Schedule” function in Revit.	GLAZING AREA	GLAZING AREA



TYPE C-2(a) , D-2(a) & D-2(b) FLAT
WINDOW FOR BEDROOM AREA

16

FLAT NO.	2, 11, 14, 15, 16, 17, 20 & 21
MARK	MPW-X14
GLAZING AREA (1.140 x 1.560) x 0.68 = 1.209 m²	
OPENABLE AREA (1.140 x 1.410) x 0.68 = 1.093 m²	



TYPE C-2(a) , D-2(a) & D-2(b) FLAT
WINDOW FOR BEDROOM AREA

16

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING LENGTH (m)	GLAZING WIDTH (m)	AREA PROVIDED(m²) (GLAZING LENGTH x GLAZING WIDTH) x 0.68
2, 14, 15, 16, 17 & 20	MPW-X14	GLAZING AREA	1.140	1.560	1.209
2, 14, 15, 16, 17 & 20	MPW-X14	OPENABLE AREA	1.140	1.410	1.093

ICU Ref.: HD(ICU)_____

Signature of Applicant (HD / PSP) :

ICU Approved Signature :

Signature for Record Plan :

NOTES:

GENERAL NOTES

1. ALL DIMENSIONS SHALL BE READ BUT DO NOT SCALE.
2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS (mm) AND ARE STRUCTURAL TO STRUCTURAL UNLESS OTHERWISE STATED.
3. ALL LEVELS INDICATED ON DRAWINGS ARE IN METERS (m) AND THE LEVELS MARKED ARE STRUCTURAL CONCRETE LEVELS, UNLESS OTHERWISE STATED.
4. ALL DRAINAGE PROVISIONS SHOWING ON GENERAL BUILDING PLANS ARE FOR REFERENCE WITH REGARDS TO MODIFICATION APPLICATIONS, CORRESPONDING DRAINAGE PLANS SHALL BE SUBMITTED TO INCORPORATE SUCH PROVISIONS ACCORDINGLY.
5. ALL STRUCTURAL PLANS, CALCULATION & DETAILS SHALL BE SUBMITTED SEPARATELY.
6. THIS SET OF GENERAL BUILDING PLANS IS PREPARED IN COMPLIANCE WITH THE REQUIREMENTS AS STIPULATED IN:

	ORDINANCE/REGULATIONS/CODE OF PRACTICE (COP)	ISSUE / REVISION
i.	BUILDINGS ORDINANCE	LATEST ISSUES
ii.	BUILDINGS REGULATION	LATEST ISSUES
iii.	COP FOR FIRE SAFETY IN BUILDINGS 2011 (FS CODE)	SEPTEMBER 2011 / OCTOBER 2015
iv.	COP FOR BUILDING WORKS FOR LIFTS AND ESCALATORS 2011 (CoP BWLE 2011)	JULY 1993 / NOVEMBER 2011
v.	DESIGN MANUAL : BARRIER FREE ACCESS 2008	2008
vi.	BUILDING (STANDARD OF SANITARY FITMENTS, PLUMBING, DRAINAGE WORKS AND LATRINES) REGULATIONS	DECEMBER 2015 AMENDMENT

NOTES ON BUILDING CONSTRUCTION REQUIREMENTS

1. MINIMUM FLOOR HEIGHT FROM FLOOR TO CEILING SHALL BE 2500mm FOR ANY ROOM OF HABITATION AND OFFICE USE.
2. MINIMUM CLEAR HEIGHT FROM FLOOR TO UNDERSIDE OF ANY BEAM SHALL BE 2300mm FOR ANY ROOM OF HABITATION AND OFFICE USE.
3. ALL KITCHENS SHALL HAVE TILE FLOORING AND THEIR INTERNAL WALL SURFACES SHALL BE FACED WITH GLAZED TILES UP TO A HEIGHT OF 1200mm (MIN.) FROM FINISHED FLOOR LEVEL.
4. STAIRCASES SHALL BE PROVIDED WITH HANDRAIL ON BOTH SIDES, WIDTH OF TREAD SHALL BE 225mm MINIMUM, HEIGHT OF RISER SHALL BE 175mm MAXIMUM, AND CLEAR HEADROOM OF NOT LESS THAN 2000mm.
5. THE TOP OF ALL PROTECTIVE RAILINGS/ PARAPETS SHALL BE 1100mm (MIN.) HIGH ABOVE THE ADJACENT FINISHED LEVELS UNLESS OTHERWISE SPECIFIED.
6. FOR ANY WINDOW PANEL (WHETHER OPENABLE OR FIXED) WITH BOTTOM LEVEL AT HEIGHT LESS THAN 1100mm, PROTECTIVE BARRIERS SHALL BE PROVIDED.
7. EVERY PART OF AN EXIT ROUTE SHALL BE PROVIDED AT ALL TIME WITH LIGHTING OF A HORIZONTAL ILLUMINANCE AT FLOOR LEVEL OF NOT LESS THAN 30 LUX. THE LIGHTING CAN BE A COMBINATION OF NATURAL AND ARTIFICIAL LIGHTING SYSTEM AND SHALL BE BACKED UP BY AN EMERGENCY LIGHTING THAT COMPLIES WITH THE COP FOR MINIMUM FIRE SERVICE INSTALLATIONS AND EQUIPMENT.
8. DIRECTIONAL AND EXIT SIGNS SHALL BE PROVIDED TO INDICATE THE LOCATION OF PROTECTED EXITS AND ASSIST OCCUPANTS WITH THEIR PATH OF TRAVEL ALONG THE EXIT ROUTE. SUCH SIGNS SHALL COMPLY WITH THE REQUIREMENTS IN THE COP FOR MINIMUM FIRE SERVICE INSTALLATIONS AND EQUIPMENT.
9. EACH RESIDENTIAL FLAT SHOULD BE SEPARATED FROM ADJOINING FLATS BY FIRE BARRIERS HAVING AN FRR OF NOT LESS THAN 60/60/60.
10. WHERE RESIDENTIAL FLATS ARE CONNECTED TO A COMMON INTERNAL CORRIDOR (CIC) AS PROTECTED CORRIDOR, THE CIC SHALL BE PROVIDED WITH FIRE BARRIERS HAVING AN FRR OF NOT LESS THAN 60/60/60 UNLESS OTHERWISE STATED; AND DOOR OF EACH FLAT LEADING TO SUCH CIC SHALL HAVE AN FRR OF NOT LESS THAN THAT, WITH REGARDS TO THE CRITERIA OF INTEGRITY AND INSULATION, OF THE FIRE BARRIER OF THE CIC AND WITH SMOKE SEAL.
11. WHERE RESIDENTIAL FLAT PROVIDED WITH A SINGLE EXIT DOOR, A KITCHEN ADJACENT TO SUCH EXIT DOOR SHOULD BE SEPARATED FROM THE REST OF THE FLAT BY WALLS HAVING AN FRR OF NOT LESS THAN -/30/30. AND THE ENTRANCE TO THE KITCHEN SHOULD BE PROVIDED WITH A FIRE RATED DOOR HAVING AN FRR OF NOT LESS THAN -/30/30.
12. ELECTRICAL METER ROOMS AT TYPICAL RESIDENTIAL FLOORS AND ARE CONNECTED TO A CIC AS PROTECTED CORRIDOR, SHALL BE PROVIDED WITH FIRE BARRIER HAVING AN FRR OF NOT LESS THAN 60/60/60 UNLESS OTHERWISE STATED. ALL DOORS FOR ELECTRICAL METERS ROOMS AT TYPICAL RESIDENTIAL FLOORS SHALL HAVE AN FRR OF NOT LESS THAN THAT, WITH REGARDS TO THE CRITERIA OF INTEGRITY AND INSULATION, OF THE FIRE BARRIER OF THE CIC.
13. ALL DOORS PROVIDED AT LIFT LANDINGS TO GIVE ACCESS TO THE LIFT-CAR AND ANY OTHER DOOR TO LIFTWELL WALLS SHALL HAVE AN FRR OF NOT LESS THAN THAT OF THE FIRE BARRIERS THEREIN WITH REGARDS TO INTEGRITY, OR NOT LESS THAN -/120/-, FROM LANDING SIDE ONLY.
14. EVERY RS&MRR AT TYPICAL RESIDENTIAL FLOORS OPENED TO A CIC AS PROTECTED CORRIDOR SHALL BE PROVIDED WITH FIRE BARRIER HAVING AN FRR OF NOT LESS THAN 120/120/120. ANY ACCESS OPENINGS FOR RS&MRR SHALL HAVE AN FRR OF NOT LESS THAN THAT, WITH REGARDS TO THE CRITERIA OF INTEGRITY AND INSULATION, OF THE FIRE BARRIER THEREIN.
15. EVERY RS&MRC SHALL BE PROVIDED WITH FIRE BARRIER HAVING AN FRR OF NOT LESS THAN 120/120/120. RS&MRC (AS SPECIAL HAZARD AND BEING ADJACENT TO THE PROTECTED LOBBY/ EXIT/ STAIR) SHALL BE PROVIDED WITH FIRE BARRIER HAVING AN FRR OF NOT LESS THAN 240/240/240.
16. AREAS OF A BUILDING ACCOMMODATING A SPECIAL HAZARD SHALL BE SEPARATED FROM THE REST OF THE BUILDING BY FIRE BARRIERS HAVING AN FRR OF NOT LESS THAN 120/120/120. IF THE SPECIAL HAZARD AREA IS CONNECTED DIRECTLY TO A PROTECTED EXIT, THE FIRE BARRIERS SHALL HAVE AN FRR OF NOT LESS THAN 240/240/240.
17. THE MAIN ROOF OR ANY PART OF THE BUILDING WHICH IS USED OR INTENDED TO BE USED AS A REFUGE FLOOR OR PART OF REFUGE FLOOR SHOULD HAVE AN FRR OF NOT LESS THAN THAT OF THE STOREY BELOW AND IT SHALL HAVE MINIMUM HEADROOM OF 2300mm FOR REFUGE USE / ACCESS AREA
18. ALL FIRE RATED DOORS (W/ FRAMES & FIXING) SHALL BE SELF-CLOSING AND TESTED TO COMPLY WITH THE REQUIREMENTS IN PART E OF THE FS CODE AND "TAGGED" OR OTHERWISE LABELED TO ENSURE EASE OF IDENTIFICATION.
19. EVERY OPENING FOR THE PASSAGE OF ANY SERVICES THROUGH ANY FIRE BARRIER SHALL BE PROTECTED WITH FIRE DAMPERS OR OTHER SUITABLE FORM OF FIRESTOP TO MAINTAIN THE REQUIRED FRR OF THAT BARRIER.
20. TELECOMMUNICATION AND BROADCASTING EQUIPMENTS (TBE) SERVICES
    a. THE TBE ROOM SHALL BE LINKED UP WITH THE VERTICAL BLOCK WIRING SYSTEM OF THE BUILDING
    b. THE TBE ROOM SHALL HAVE A MINIMUM CLEAR HEIGHT OF 2.8 METERS AT THE REQUIRED AREA
    c. NO WATER PIPES, WATER SEWAGE & DRAINAGE PIPES, WATER SPRINKLER, HIGH VOLTAGE POWER SUPPLY CABLES AND POWER TRANSFORMERS SHALL BE INSTALLED IN THE TBE ROOM.
    d. THE DESIGN OF TBE ROOM SHALL COMPLY WITH PNAP APP-84.
21. A CLOSED CIRCUIT TELEVISION AND DIRECT INTERCOM LINK, BOTH BACKED UP BY EMERGENCY POWER FOR AT LEAST 1 HOUR SHOULD BE PROVIDED TO EVERY TEMPORARY REFUGE SPACE FOR COMMUNICATION WITH THE MANAGEMENT OFFICE OF THE BUILDING.

NOTES ON FIRE SERVICES INSTALLATIONS AND EQUIPMENT (FOR REFERENCE ONLY)

1. GENERAL REQUIREMENTS
1.1. ALL LININGS FOR ACOUSTIC AND THERMAL INSULATION PURPOSE IN DUCTING OR CONCEALED LOCATIONS SHALL BE OF CLASS 1 OR 2 RATE OF SURFACE SPREAD OF FLAME AS PER BRITISH STANDARD 476: PART 7 (CURRENT EDITION) OR ITS' INTERNATIONAL EQUIVALENT, OR BE BROUGHT UP TO THAT STANDARD BY USE OF AN APPROVED FIRE RETARDED PRODUCT.
1.2. 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 (CURRENT EDITION) OR ITS INTERNATIONAL EQUIVALENT, OR BE BROUGHT UP TO THAT STANDARD BY USE OF AN APPROVED FIRE RETARDED PRODUCT.
1.3. THE TOTAL CAPACITY OF TRANSFORMERS SHALL NOT BE MORE THAN 4500 kVA FOR EACH TRANSFORMER ROOM. THE POWER COMPANY SHALL INSTALL OIL-LESS SWITCHGEAR AND SF6 TRANSFORMER IN THIS SUBSTATION
1.4. ALL FSI SHALL BE PROVIDED IN COMPLIANCE WITH THE COP FOR MINIMUM FIRE SERVICE INSTALLATIONS AND EQUIPMENT (APRIL 2012).

2. COMPARTMENTATIONS
2.1. ALL COMPARTMENTS SHALL NOT EXCEED 28,000 m³ IN VOLUME.

3. EMERGENCY LIGHTINGS AND EXIT SIGNS
3.1. EMERGENCY LIGHTING SYSTEM SHALL BE PROVIDED IN COMPLIANCE WITH THE COP FOR MINIMUM FIRE SERVICE INSTALLATIONS AND EQUIPMENT (APRIL 2012) AND IN ACCORDANCE WITH BRITISH STANDARD 5266: PART 1 AND BS EN 1838 EXCEPT THAT EXIT SIGN PROVISION SHALL BE IN ACCORDANCE WITH BRITISH STANDARD 5499: PART 10.
3.2. EMERGENCY LIGHTING SHALL BE PROVIDED TO MAC ROOM, ALL STAIRCASES, PASSAGES AND PUBLIC AREAS INCLUDING LIFT LOBBIES ON ALL FLOORS AND REFUGE AREAS. JCPA/MPP, RS&MRC AND THE COVERED CPA.
3.3. SUFFICIENT DIRECTIONAL AND EXIT SIGNS ARE PROVIDED TO INDICATE CLEARLY EXIT ROUTES TO STAIRCASES AS SHOWN ON PLANS.
3.4. EMERGENCY LIGHTING, EXIT AND DIRECTIONAL SIGNS ARE FED FROM EMERGENCY GENERATOR WITHOUT BATTERY BACK UP UNLESS OTHERWISE STATED.
3.5. FOR MAC ROOM, THE EMERGENCY LIGHTING AND EXIT SHALL BE FED FROM NORMAL SUPPLY AND BACKED UP BY BATTERY ONLY.
3.6. EMERGENCY GENERATOR IS PROVIDED TO HAVE SUFFICIENT ELECTRICAL CAPACITY TO MEET ESSENTIAL FIRE SERVICE INSTALLATIONS.

4. HOSE REEL AND FIRE HYDRANT SYSTEM
4.1. FIRE HYDRANTS SHALL BE PROVIDED IN ALL APPROACH LOBBIES TO REQUIRED STAIRCASES OR REQUIRED STAIRCASE ENCLOSURES. HOSE REELS SHALL BE PROVIDED TO ENSURE THAT EVERY PART OF THE BUILDING CAN BE REACHED BY A LENGTH OF NOT MORE THAN 30M OF HOSE REEL TUBING.
4.2. A MANUALLY OPERATED FIRE ALARM SYSTEM IS PROVIDED THROUGHOUT THE BUILDING AND IS INCORPORATED IN THE FH/HR INSTALLATION.
4.3. A FIRE HYDRANT / HOSE REEL INSTALLATION IS CONSISTING OF FIRE SERVICES INLET (FSI), HOSE REEL POINTS, FIRE HYDRANT POINTS AND A 36,000L F.S. WATER TANK AT ROOF TO BE PROVIDED AS SHOWN ON PLANS.
4.4. THE FH/HR SYSTEM FOR THIS DOMESTIC BLOCK SHALL INCLUDE TWO ELECTRICAL DRIVEN F.S. INTERMEDIATE BOOSTER PUMPS LOCATED ON G/F TO MAINTAIN A RUNNING PRESSURE OF NOT LESS THAN 350kPa WITH A FLOW RATE OF 900L/min FROM ANY TWO HYDRANTS OUTLETS AT ANYTIME, THE SYSTEM PRESSURE AT ANY FIRE HYDRANT OUTLET CANNOT BE GREATER THAN 850kPa.
4.5. THE INTERMEDIATE BOOSTER PUMPS SHALL ALSO BE UTILIZED AS THE FIXED FIRE PUMPS AND ARRANGED TO PERFORM BOTH FUNCTIONS AS STIPULATED.
4.6. ALL F.S. INLETS PROVIDED AT G/F SHALL BE INTER-CONNECTED.
4.7. A SPRINKLER HEAD (AUTOMATIC IN OPERATION AT A TEMPERATURE OF 57 °C) TO BE PROVIDED AT THE TOP OF THE REFUSE CHUTE AND WATER SUPPLY FED FROM FH/HR SYSTEM.
4.8. SPRINKLERS HEADS (AUTOMATIC IN OPERATION AT A TEMPERATURE OF 57 °C) SHALL BE PROVIDED IN G/F REFUSE STORAGE AND MATERIAL RECOVERY CHAMBER (RS&MRC) AND JCPA/MPP, WITH WATER SUPPLY FED FROM FH/HR SYSTEM.

5. FIREMAN'S LIFT
5.1. FIREMAN'S LIFT SHALL BE PROVIDED WITH FIREMAN'S SWITCH SO THE OPERATION CAN OVER-RIDE THE INSTRUCTIONS REGISTERED INSIDE THE LIFT AND RETURN TO G/F (FIREMAN'S ACCESS POINTS).
5.2. FIREMAN'S LIFT SHALL BE PROVIDED WITH SUITABLE SWITCHES ENABLING THE FIREMAN TO OBTAIN COMPLETE CONTROL IN CASE OF EMERGENCY AND COMPLY WITH REQUIREMENT LAID DOWN IN RELEVANT SECTION OF THE COP ON THE DESIGN AND CONSTRUCTION OF LIFTS AND ESCALATORS PUBLISHED BY EMSD.
5.3. FIREMAN'S LIFT SHALL BE PROVIDED AS LABELED "Ⓐ" ON PLANS.
5.4. LIFT NO. 1 AND 4 ARE FIREMAN'S LIFT.
5.5. FOR LIFT OPENINGS, REFER TO LIFT SCHEDULE.

6. DANGEROUS GOOD STORES
6.1. 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.
6.2. NO STORAGE OF DANGEROUS GOODS AS DEFINED IN CHAPTER 295 OF THE LAWS OF HONG KONG.

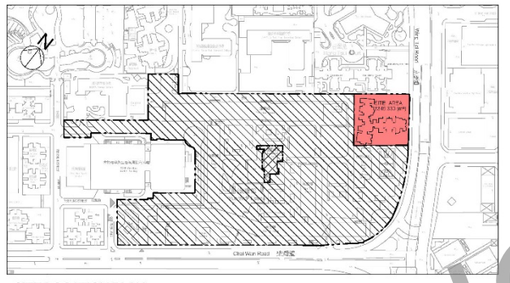
7. PORTABLE HAND OPERATED APPLIANCES
7.1. PORTABLE HAND OPERATED APPROVED APPLIANCE SHALL BE PROVIDED AT POSITION AS INDICATED ON PLAN.
7.2. 4.5kg CO2 PORTABLE EXTINGUISHERS SHALL ONLY BE PROVIDED TO THE ELECTRICAL METER ROOMS ACCOMMODATED WITH SWITCHGEARS FOR PURPOSE OTHER THAN POWER DISTRIBUTION TO DOMESTIC FLATS AS SHOWN ON PLANS.

8. VISUAL FIRE ALARM SYSTEM
8.1. NO VISUAL FIRE ALARM SYSTEM SHALL BE PROVIDED FOR THE DOMESTIC BLOCK.
8.2. VISUAL FIRE ALARM SYSTEM SHALL BE PROVIDED WITHIN THE MAC, JCPA/MPP, RS&MRC AND THE COVERED CPA, IN ACCORDANCE WITH THE DESIGN MANUAL: BARRIER FREE ACCESS 2008.
8.3. THE SYSTEM SHALL CONFORM TO THE CLAUSE 17 OF BS 5839: PART 1: 2002 + A2: 2008 AND FSD CIRCULAR LETTER NO. 2/2012.

9. STREET FIRE HYDRANT
9.1. AN EXISTING PUBLIC STREET FIRE HYDRANT WITHIN 100m FROM THE F.S. INLETS IS PROVIDED ALONG WING TAI ROAD AND SERVES THE EVA LOCATED WITHIN THE DEVELOPMENT AS SHOWN ON THE PLAN. THIS SHALL BE PROVIDED BY WATER SUPPLIES DEPARTMENT AND INSTALLED IN ACCORDANCE WITH THE REGULATIONS OF WSD.
9.2. A NEW STREET FIRE HYDRANT TEE-OFF FROM TOWN MAINS SHALL BE PROVIDED AT POSITION AS SHOWN ON PLANS, CAPABLE OF DELIVERING NOT LESS THAN 2,000 LITRE/MIN. WITH MINIMUM RUNNING PRESSURE OF 170kPA AT ONE 65mm OUTLET. THE MINIMUM OUTPUT AND PRESSURE AVAILABLE FROM TWO 65mm OUTLETS OF THE NEW FIRE HYDRANT SHOULD NOT BE LESS THAN 4,000 LITRE/MIN. IN TOTAL WHEN DELIVERING AT THE SAME TIME.

10. SPRINKLER INSTALLATION
10.1. NO SPRINKLER SYSTEM SHALL BE PROVIDED AS TOTAL FLOOR AREA OF MAC, JCPA/MPP, RS&MRC AND THE COVERED CPA IS 167m² WHICH IS NOT EXCEEDING 230m².

11. FIRE DETECTION SYSTEM
11.1. NO AFA SYSTEM IS PROVIDED FOR THIS DOMESTIC BUILDING.



SITE LOCATION PLAN

SCALE 1 : 2000

LEGEND

REFER TO DESCRIPTION 2 OF ANNEX 7

- VESTING ORDER BOUNDARY
- PROPOSED PHASE BOUNDARY
- EXISTING FLOOR LEVEL
- STRUCTURAL FLOOR LEVEL (S.F.L)
- FINISHED FLOOR LEVEL (F.F.L)
- FH — FIRE HYDRANT
- FSI — FIRE SERVICE INLET
- HR — HOSE REEL (WING TYPE COMPLETE WITH 30m HOSE)
- FL — ILLUMINATED FIREMAN'S LIFT SIGN AT HIGH LEVEL
- (PE) — PORTABLE FIRE EXTINGUISHER
- EXISTING P.S. STREET HYDRANT
- NEW P.S. STREET HYDRANT
- RELOCATED P.S. STREET HYDRANT
- FIRE ALARM BELL
- FIRE ALARM BELL PUSH BUTTON / BREAK GLASS
- EMERGENCY LIGHTING POINT
- DIRECTIONAL SIGN / DIRECTIONAL EXIT SIGN (DETAIL REFER TO COP FOR MINIMUM FIRE SERVICE INSTALLATIONS AND EQUIPMENT)
- EXIT — INTERNALLY ILLUMINATED EXIT SIGN AT HIGH LEVEL
- EXIT → — DIRECTIONAL SIGN / DIRECTIONAL EXIT SIGN (E DENOTE BOTH SIDES) (DETAIL REFER TO COP FOR MINIMUM FIRE SERVICE INSTALLATIONS AND EQUIPMENT)
- DIGITAL LOCK DOOR WITH FIRE ALARM UNLOCK SYSTEM
- FA — 240 x 240mm OPENING FOR FLUE APERTURE (FOR DOMESTIC FLATS) & 380 x 380mm OPENING (NON-DOMESTIC)
- XYWZ — FIRE RESISTANCE RATING IN MINUTES (FRR)
  X - STABILITY
  Y - INTEGRITY
  Z - INSULATION
  WHERE * REQUIRED FOR LOAD BEARING ELEMENTS ONLY
- */-/- — -/30/30 FRR SELF-CLOSING DOOR
- (D) — -/30/30 FRR SELF-CLOSING DOOR WITH VIEW PANEL
- # — -/60/60 FRR SELF-CLOSING DOOR
- (E) — -/60/60 FRR SELF-CLOSING DOOR WITH VIEW PANEL
- ACCESS -/60/60 FRR SELF-CLOSING DOOR, SELF-LOCKING, KEY OPEN ONLY FROM INDOOR (FOR MAINTENANCE ACCESS ONLY)
- ACCESS SELF-CLOSING DOOR, SELF-LOCKING, KEY OPEN ONLY FROM INDOOR (FOR MAINTENANCE ACCESS ONLY)
- -/120/120 FRR SELF-CLOSING DOOR
- -/120/120 FRR SELF-CLOSING DOOR WITH VIEW PANEL
- -/120/120 FRR SELF-CLOSING DOOR WITH VIEW PANEL, SELF-LOCKING, KEY OPEN ONLY FROM OUTDOOR
- (PB) — DOOR WITH PANIC BOLT
- (S) — DOOR WITH SMOKE SEAL
- (A) — FIREMAN'S LIFT
- (D) — LIFT FOR PERSON WITH A DISABILITY
- DIRECTION OF FALL
- FALL 1:100 — DIRECTION OF FALL 1:100 (MIN.) (FLOOR FINISHING)
- P — PLANTER
- EXISTING TREE TO BE RETAINED
- AREA EXCLUDED FROM V.O.106
- EARTH
- TACTILE WARNING STRIPS
- TACTILE WARNING STRIPS

	HARDCORE OR DRY FILL
	BRICK
	CONCRETE SLAB (LIGHTER WASH)
	CONCRETE (PLAIN OR REINFORCED)
	SOLID CONCRETE BLOCKS
	HOLLOW CONCRETE BLOCKS
	LIGHTWEIGHT PARTITION (e.g. PLASTERBOARD)
	PLASTER OR CEMENT RENDERING
	IMPERMEABLE / NON-ABSORBENT FLOOR OR WALL
	GLASS
	TIMBER
	METAL WORK OR STEEL
	STONE FINISH
	SANITARY FITTINGS
	DEMOLITION WORKS / DELETION OF APPROVED WORKS
	UNDERLINE FOR REVISION
	PLANTER
	PROVISION FOR THE BARRIER FREE (TACTILE WARNING STRIPS)

ABBREVIATION

EVA :	EMERGENCY VEHICULAR ACCESS
MAC :	MUTUAL AID COMMITTEE ROOM
J.C.P. :	JUNK COLLECTION POINT
MR.P. :	MATERIAL RECOVERY POINT
RS&MRR :	REFUSE STORAGE & MATERIAL RECOVERY CHAMBER
L/UL :	LOADING & UNLOADING BAY
T.B.E. :	TELECOMMUNICATION AND BROADCASTING EQUIPMENTS
MV.A.P. :	MECHANICAL VENTILATION & AIR PURIFYING SYSTEM
MV.A.L. :	MECHANICAL VENTILATION & ARTIFICIAL LIGHTING
P :	PLANTER
KP :	CURB PLANTER
RP :	RAISE PLANTER
AD :	AIR DUCT
CD :	CABLE DUCT
EMR :	ELECTRICAL METER ROOM
PD :	DRAINAGE PIPE DUCT
PRV :	PRESSURE REDUCING VALVE
VD :	VENT DUCT
WMC :	WATER METER CUPBOARD
MWMC :	MWSTER WATER METER CUPBOARD
T.O.P. :	TOP OF PARAPET
T.O.S. :	TOP OF SOIL
CPA :	CHILDREN PLAY AREA
SB :	SITTING BENCH
MSM :	MULTI SENSORY MAP

REFER TO DESCRIPTION 1 OF ANNEX 7

MODIFICATIONS / EXEMPTIONS GRANTED AND AMENDMENT TO LOCATION (IF ANY) IN THE CURRENT SUBMISSION

PERMIT NO. | DATE OF MODIFICATION GRANTED: MONTH / YEAR / REV.

ITEM	DESCRIPTION	CONDITION	LOCATION WITH MODIFICATION / EXEMPTION GRANTED	DATE OF SUBMISSION			
1	BUILDING (CONSTRUCTION) REGULATION 30	THE LEVEL OF INTERNAL FLOOR TO BE LESS THAN 150MM ABOVE THE LEVEL OF THE ADJOINING EXTERNAL GROUND AT THE ENTRANCE TO THAT FLOOR.	(i) ALL ENTRANCE ON LEVEL 1				
2	BUILDING (PLANNING) REGULATION 23(3)A	EXEMPTION OF PIPE DUCTS FOR MANDATORY FEATURES OR ESSENTIAL PLANT ROOMS AT COMMON AREAS OF DOMESTIC BUILDING SHALL BE EXCLUDED FROM GFA CALCULATIONS					
3	BUILDING (PLANNING) REGULATION 30 & 31	TO PERMIT USE OF PERFORMANCE-BASED APPROACH ON THE PROVISION OF NATURAL LIGHTING AND VENTILATION IN BEDROOMS AND LIVING AREA OF DOMESTIC FLATS.					
4	BUILDING (PLANNING) REGULATION 30	OMISSION OR REDUCTION IN STANDARD OF NATURAL LIGHTING AND VENTILATION IN MAC ROOM OF THE DOMESTIC BUILDING.					
5	BUILDING (PLANNING) REGULATION 36A	TO MODIFY THE PROVISION OF GAS APERTURES LOCATED ON THE EXTERNAL WALL OF KITCHENS (INSTEAD OF BATHROOMS) FOR ALL NON-STANDARD TYPE A, ALL TYPE B AND NON-STANDARD TYPE B FLATS ON DOMESTIC FLOORS.					
6	BUILDING (REFUSE STORAGE AND MATERIAL RECOVERY CHAMBERS AND REFUSE CHUTES) REGULATIONS 9	ACCEPTANCE OF REFUSE STORAGE AND MATERIAL RECOVERY CHAMBER (RS&MRC) TO BE NOT FULLY ENCLOSED.					

LEGEND

FIRST GRANTED
√ STILL APPLICABLE
X NOT APPLICABLE
Δ AMENDMENT TO THE LOCATION OF THE EXEMPTION/ MODIFICATION PREVIOUSLY GRANTED. DEPENDING ON THE EXTENT OF THE AMENDMENT, NEW FORM BA16 AND BD106 MAY BE REQUIRED.

REVISIONS

NO	DESCRIPTION AND DATE	INITIAL AND DESIGNATION: DWN	CKD	AUTH
A	1 ADDITIONAL MAIN DOOR AND STAIRCASE LOCATED ACCESS AT G/F PLAN (NO. 1 ADDITIONAL ON-OFF OF DRAWING SHEET 2 AMENDED) 2 CHANGE NOTE OF AS BUILT PLAN TBC 04/2017	[illegible]	[illegible]	[illegible]
B	1 LOCATION REVISED ACCORDING TO PNAP ADM-30 02/2021	[illegible]	[illegible]	[illegible]
C	1 LOCATION CHANGE OF G/F REVISED 21/04/2021	[illegible]	[illegible]	[illegible]
D	1 MODIFICATION TABLE FORMAT 2 ADDITIONAL 4/F VENT [illegible]	TSAI [illegible]	[illegible]	[illegible]

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	EDMUND CHAN SWMTC	ORIGINAL SIGNED	01/2017
CHECKED	S.M. CHOI A/30	ORIGINAL SIGNED	01/2017
	S.K. CHAN STC/30/STC	ORIGINAL SIGNED	01/2017
DRAWN	JASON WONG TO(A)/95	ORIGINAL SIGNED	01/2017

PROJECT
YUE WAN ESTATE
PHASED DEVELOPMENT -
WING TAI ROAD, CHAI WAN

DRAWING TITLE
GENERAL NOTES,
FS NOTES & KEY PLAN

SCALE 1:2000 (A0)

DRAWING NO.
ET06/ICU/A/GBP-01/D

SOURCE

ICU NO.

HOUSING DEPARTMENT

DATE OF ISSUE: C/E ☐ CONS. ☐ R/E ☐ LD/RC/OM ☐ PM/PSP/CE ☐ S/E ☐ Contractor ☐ Architect ☐ COPY FOR

AREAS OF GFA CONCESSIONS (APPENDIX, G OF PNAP ADM-2)		TO BE SPECIFIED ON PLANS IN MAKING APPLICATION FOR GFA CONCESSIONS (m²)	TO BE SPECIFIED IN THE FINAL AMENDMENT PLANS PRIOR TO THE APPLICATION FOR OCCUPATION PERMIT	SUBJECT TO THE OVERALL CAP (PNAP APP-151)
DISREGARDED GFA UNDER BUILDING (PLANNING) REGULATIONS 23(3)(b)				
1	CARPARK AND LOADING/ UNLOADING AREA EXCLUDING PUBLIC TRANSPORT TERMINUS	-	-	-
2	PLANT ROOMS AND SIMILAR SERVICES			
2.1	MANDATORY FEATURE OR ESSTANTIAL PLANT ROOM, AREA OF WHICH IS LIMITED BY RESPECTIVE PNAP OR REGULATION			
	TELECOM ROOM	106.027	Yes	No
	REFUSE STORATE & MATERIAL RECOVERY ROOM (RS & MRR)	340.632	Yes	No
	REFUSE STORAGE & MATERIAL RECOVERY CHAMBER (RS & MRC)	54.959	Yes	No
	MAIN T.B.E ROOM	45.588	Yes	No
	LIFT MACHINE ROOM	97.333	Yes	No
2.2	MANDATORY FEATURE OR ESSTANTIAL PLANT ROOM, AREA OF WHICH IS NOT LIMITED BY RESPECTIVE PNAP OR REGULATION			
	TRANSFORMER ROOM			
	(HV SWITCHGEAR COMPARTMENT)	68.413	Yes	No
	(TRANSFORMER COMPARTMENT)	80.494	Yes	No
	CABLE ROOM	4.740	Yes	No
	ELECTRICAL METER ROOM (EMR)	460.914	Yes	No
	EMERGENCY GENERATOR ROOM	70.536	Yes	No
	F.S.WATER TANK	23.075	Yes	No
	FRESH & FLUSH WATER PUMP ROOM	93.029	Yes	No
	FRESH & FLUSH WATER TANK	55.934	Yes	No
	FRESH AND FLUSH WATER PUMP ROOM	47.322	Yes	No
	FS UPFEED WATER AND FS BOOSTER PUMP ROOM	66.247	Yes	No
	HOSE REEL (H/R)	85.945	Yes	No
	HOSE REEL (H/R) F.S. INLET (FSI)	1.377	Yes	No
	MAIN SWITCH ROOM	85.422	Yes	No
	MASTER WATER METER CHAMBER (MWMC)	3.067	Yes	No
	VENT DUCT ROOM	13.194	Yes	No
	WATER METER CUPBOARD (WMC)	102.376	Yes	No
2.3	NONAMANDATORY/NON-ESSENTIAL PLANT ROOM SUCH AS A/C PLANT ROOM, AHU ROOM ETC.	Nil	No	No
DISREGARDED GFA UNDER BUILDING (PLANNING) REGULATIONS 23A(f)				
3	AREA FOR PICKING UP AND SETTING DOWN PERSONS DEPARTING FROM OR ARRIVING AT THE HOTEL BY VEHICLE	Nil	No	No
4	SUPPORTING FACILITIES FOR A HOTEL	Nil	No	No
GREEN FEATURES UNDER JPN 1 AND 2				
5	BALCONY FOR RESIDENTIAL BUILDINGS	Nil	No	No
6	WIDER COMMON CORRIDOR AND LIFT LOBBY	Nil	No	No
7	COMMUNAL SKY GARDEN	Nil	No	No
8	COMMUNAL PODIUM GARDEN FOR NON-RESIDENTIAL BUILDINGS	Nil	No	No
9	ACOUSTIC FIN	Nil	No	No
10	WING WALL, WIND CATCHER AND FUNNEL	Nil	No	No
11	NON-STRUCTURAL PREFABRICATED EXTERNAL WALL	Nil	No	No
12	UTILITY PLATFORM	Nil	No	No
13	NOISE BARRIER	Nil	No	No
AMENITY FEATURE				
14	COUNTER, OFFICE, STORE, GUARD ROOM AND LAVATORY FOR WATCHMAN AND MANAGEMENT STAFF	Nil	No	No
15	RESIDENTIAL RECREATIONAL FACILITIES INCLUDING VOID, PLANT ROOM, SWIMMING POOL FILTRATION PLANT ROOM, COVERED WALKWAY ETC SERVING SOLELY THE RECREATIONAL FACILITIES	Nil	No	No
16	COVERED LANDSCAPED AND PLAY AREA	Nil	No	No
17	HORIZONTAL SCREEN/ COVERED WALKWAY, TRELLIS	Nil	No	No
18	LARGER LIFT SHAFT	Nil	No	No
19	CHIMNEY SHAFT	Nil	No	No
20	OTHER NON-MANDATORY OR NON-ESSENTIAL PLANT ROOM, SUCH AS BOILER ROOMS SIMILTY ROOM	Nil	No	No
21	PIPE DUCT, AIR DUCT FOR MANDATORY FEATURE OR ESSENTIAL PLANT ROOM	166.160	Yes	No
22	PIPE DUCT, AIR DUCT FOR NON MANDATORY OR NON-ESSENTIAL PLANT ROOM	Nil	No	No
23	PLANT ROOM, PIPE DUCT, AIR DUCT FOR ENVIRONMENTALLY PLANT ROOM	Nil	No	No
24	HIGH HEADROOM AND VOID IN FRONT OF CINEMA, SHOPPING ARCADE ETC. IN NON-DOMESTIC DEVELOPMENT	Nil	No	No
25	VOID OVER MAIN COMMON ENTRANCE (PRESTIGE ENTRANCE) IN NON- DOMESTIC DEVELOPMENT	Nil	No	No
26	VOID IN DUPLEX DOMESTIC FLAT AND HOUSE	Nil	No	No
27	OTHER PROJECTIONS SUCH AS AIR-CONDITIONING BOX AND PLATFORM WITH A PROJECTION OF MORE THAN 750mm FROM THE EXTERNAL WALLS	Nil	No	No
OTHER EXEMPTED ITEM				
28	REFUGE FLOOR INCLUDING REFUGE FLOOR CUM SKY GARDEN	Nil	No	No
29	OTHER PROJECTIONS	Nil	No	No
30	PUBLIC TRANSPORT TERMINUS (PTT)	Nil	No	No
31	PARTY STRUCTURE AND COMMON STAIRCASE	Nil	No	No
32	HORIZONTAL AREA OF STAIRCASE, LIFT SHAFT AND VERTICAL DUCT SOLELY SERVING FLOOR ACCEPTED AS NOT BEING ACCOUNTABLE FOR GFA	Nil	No	No
33	PUBLIC PASSAGE	Nil	No	No
34	COVERED SET BACK AREA	Nil	No	No
BONUS GFA				
35	BONUS GFA	Nil	No	No
	TOTAL	2049.984		

*BREAK DOWN REFER TO DWG NO.ETO6/ICU/A/GBP-16&17

PLOT RATIO AND SITE COVERAGE CALCULATION FOR YUE WAN ESTATE				
		UNDER BUILDING REGULATION	UNDER OUTLINE ZONING PLAN	UNDER PLANNING BRIEF
SITE AREA OF YUE WAN ESTATE				
V.O. BOUNDARY AREA OF YUE WAN ESTATE (NCL. WING TAI ROAD) (m²)		44963.32	44963.320	45000 APPROX.
BOUNDARY AREA OF WING TAI RAOD: (m²)		3345.830	3345.830	3300 APPROX.
CLASS OF SITE		B	-	-
MEANS STREET LEVEL OF WING TAI ROAD = 4.8 mPD				
HEIGHT OF BUILDING (m).		MAIN ROOF LEVEL - MEAN STREET LEVEL = 110-4.8 =105.2 (OVER 81m)	-	110mpd (AT MAIN ROOF)
SITE COVERAGE	PERMITTED SITE COVERAGE FOR			
	DOMESTIC (OVER 81m) (%)	37.5	N.A.	
	NON-DOMESTIC (OVER 81m) (%)	62.5	N.A.	
	TOTAL NON-DOMESTIC SITE COVERAGE AREA FOR YUE WAN ESTATE (m²)	647.207		
	PERMITTED REMAINING SITE COVERAGE FOR ACTUAL NON-DOMESTIC (%)	= 647.207/44963.32x100 = 1.439=62.5		
	PERMITTED REMAINING SITE COVERAGE FOR DOMESTIC (%)	= (62.5% -1.439%)x37.5%/62.5% = 36.636		
	ACTUAL DOMESTIC COVERED AREA (EXISTING BLOCKS) (m²)	= 9781.899+		
	DOMESTIC COVERED AREA FOR WING TAI ROAD (m²)	1911.499+28.351		
	TOTAL COVERED AREA (m²)	=11721.740		
	ACTUAL DOMESTIC SITE COVERAGE (EXISTING BLOCKS) + (PROPOSED) (%)	= 11721.740/44963.32x100 = 26.070<36.636		
PLOT RATIO	PERMITTED PLOT RATIO FOR			
	DOMESTIC (OVER 81m):	9		
	NON-DOMESTIC (OVER 81m):	15		
	TOTAL NON-DOMESTIC GFA FOR YUE WAN ESTATE (EXISTING RECORD) (m²)	= 18758.103-4348.260 (FUNG YIU HING MEMORIAL PRIMARY SCHOOL) =14409.843		
	NON - DOMESTIC GFA FOR WING TAI ROAD (m²)	0.000		
	TOTAL NON - DOMESTIC GFA (m²)	14409.843		
	ACTUAL NON-DOMESTIC PLOT RATIO:	=14409.843/44963.32 =0.320<15 (PERMIT)		
	REMAINING PERMITTED DOMESTIC PLOT RATIO	=(15-0.320)x9/15 =8.808	N.A.	
	ACTUAL DOMESTIC GFA (EXISTING BLOCKS) (m²)	= 69227.860+		37000
	TOTAL GFA FOR WING RAI ROAD (m²)	36689.550+28.351		
	TOTAL GFA:	= 135845.761		
	ACTUAL DOMESTIC PLOT RATIO:	= 135845.761/44963.32 = 3.023<8.808 (PERMIT)		3.4

REFER TO DESCRIPTION 3 OF ANNEX 7

FIRE RESISTANCE REQUIREMENT FOR ELEMENTS OF CONSTRUCTION

LOCATION	USE	CLASS	COMPARTMENT OF BUILDING FLOOR AREA (m²)	MIN. DIMENSIONS OF ELEMENT OF CONSTRUCTION: BLOCKWORK THICKNESS	R.C.C SLAB THICKNESS [F.R.R]	R.C.C SLAB COVER TO STEEL	R.C.C BEAM THK.	R.C.C BEAM COVER TO STEEL	R.C.C COLUMN THK.	R.C.C COLUMN COVER TO STEEL	R.C.C WALL =< 1% V.R. THK.	R.C.C WALL =< 1% V.R. COVER TO STEEL	R.C.C STAIR THK.	R.C.C STAIR COVER TO STEEL
G/F	LIFT LOBBY	1	153.403	100 [-/60/60]	100 [60/60/60]	20	100 [600/-]	30	200 [600/-]	25	75 (120) [60/60/60] [-/60/60]#	15/(25)	95 [60/60/60]	20
G/F	F.S.UPFEED WATER AND F.S BOOSTER PUMP ROOM	N/A	66.247	100 [-/60/60]	100 [60/60/60]	20	100 [600/-]	30	200 [600/-]	25	75 (120) [60/60/60] [-/60/60]#	15/(25)	95 [60/60/60]	20
G/F	FRESH AND FLUSH WATER PUMP ROOM	N/A	93.029	100 [-/60/60]	100 [60/60/60]	20	100 [600/-]	30	200 [600/-]	25	75 (120) [60/60/60] [-/60/60]#	15/(25)	95 [60/60/60]	20
G/F	MAC ROOM	N/A	19.489	100 [-/60/60]	100 [60/60/60]	20	100 [600/-]	30	200 [600/-]	25	75 (120) [60/60/60] [-/60/60]#	15/(25)	95 [60/60/60]	20
G/F	MAIN T.B.E ROOM	N/A	45.588	100 [-/60/60]	100 [60/60/60]	20	100 [600/-]	30	200 [600/-]	25	75 (120) [60/60/60] [-/60/60]#	15/(25)	95 [60/60/60]	20
G/F	EMR 1	SPECIAL HAZARD	5.519	225 [-/120/120]	225 [120/120/120]	35	200 [1/2hr/-]	50~	300 [1/2hr/-]	35	100 (160) [120/120/120] [-/120/120]#	20/(25)	170 [240/240/240]	55
G/F	EMR 2 AT MEZZ LEVEL	SPECIAL HAZARD	12.739	225 [-/120/120]	225 [120/120/120]	35	200 [1/2hr/-]	50~	300 [1/2hr/-]	35	100 (160) [120/120/120] [-/120/120]#	20/(25)	170 [240/240/240]	55
G/F	J.C.P./M.R.P.	SPECIAL HAZARD	23.229	225 [-/120/120]	225 [120/120/120]	35	200 [1/2hr/-]	50~	300 [1/2hr/-]	35	100 (160) [120/120/120] [-/120/120]#	20/(25)	170 [240/240/240]	55
G/F	MAIN SWITCH ROOM	SPECIAL HAZARD	85.422	225 [-/120/120]	225 [120/120/120]	35	200 [1/2hr/-]	50~	300 [1/2hr/-]	35	100 (160) [120/120/120] [-/120/120]#	20/(25)	170 [240/240/240]	55
G/F	R/S & MRC	SPECIAL HAZARD	54.659	225 [-/120/120]	225 [120/120/120]	35	200 [1/2hr/-]	50~	300 [1/2hr/-]	35	100 (160) [120/120/120] [-/120/120]#	20/(25)	170 [240/240/240]	55
G/F	TRANSFORMER ROOM (HV SWITCHGEAR COMPARTMENT)	SPECIAL HAZARD	68.413	225 [-/120/120]	225 [120/120/120]	35	200 [1/2hr/-]	50~	300 [1/2hr/-]	35	100 (160) [120/120/120] [-/120/120]#	20/(25)	170 [240/240/240]	55
G/F	TRANSFORMER ROOM (TRANSFORMER COMPARTMENT)	SPECIAL HAZARD	80.494	225 [-/120/120]	225 [120/120/120]	35	200 [1/2hr/-]	50~	300 [1/2hr/-]	35	100 (160) [120/120/120] [-/120/120]#	20/(25)	170 [240/240/240]	55
1/F-36/F	DOMESTIC	1	-	100 [-/60/60]	100 [60/60/60]	20	100 [600/-]	30	200 [600/-]	25	75 (120) [60/60/60] [-/60/60]#	15/(25)	95 [60/60/60]	20
1/F-36/F	ELECTRIC METER ROOM	N/A	-	100 [-/60/60]	100 [60/60/60]	20	100 [600/-]	30	200 [600/-]	25	75 (120) [60/60/60] [-/60/60]#	15/(25)	95 [60/60/60]	20
1/F-36/F	TELECOM ROOM	N/A	-	100 [-/60/60]	100 [60/60/60]	20	100 [600/-]	30	200 [600/-]	25	75 (120) [60/60/60] [-/60/60]#	15/(25)	95 [60/60/60]	20
1/F-36/F	REFUSE STORAGE & MATERIAL RECOVERY ROOM	SPECIAL HAZARD	9.482	225 [-/120/120]	225 [120/120/120]	35	200 [1/2hr/-]	50~	300 [1/2hr/-]	35	100 (160) [120/120/120] [-/120/120]#	20/(25)	170 [240/240/240]	55
MAIN ROOF	CABLE ROOM	N/A	-	100 [-/60/60]	100 [60/60/60]	20	100 [600/-]	30	200 [600/-]	25	75 (120) [60/60/60] [-/60/60]#	15/(25)	95 [60/60/60]	20
MAIN ROOF	REFUGE FLOOR	N/A	-	100 [-/60/60]	100 [60/60/60]	20	100 [600/-]	30	200 [600/-]	25	75 (120) [60/60/60] [-/60/60]#	15/(25)	95 [60/60/60]	20
MAIN ROOF	VENT DUCT ROOM	N/A	-	100 [-/60/60]	100 [60/60/60]	20	100 [600/-]	30	200 [600/-]	25	75 (120) [60/60/60] [-/60/60]#	15/(25)	95 [60/60/60]	20
MAIN ROOF	EMERGENCY GENERATOR ROOM	SPECIAL HAZARD	-	225 [-/120/120]	225 [120/120/120]	35	200 [1/2hr/-]	50~	300 [1/2hr/-]	35	100 (160) [120/120/120] [-/120/120]#	20/(25)	170 [240/240/240]	55
LOWER ROOF	FRESH WATER BOOSTER PUMP ROOM	N/A	-	100 [-/60/60]	100 [60/60/60]	20	100 [600/-]	30	200 [600/-]	25	75 (120) [60/60/60] [-/60/60]#	15/(25)	95 [60/60/60]	20
LOWER ROOF	PV METER ROOM	N/A	-	100 [-/60/60]	100 [60/60/60]	20	100 [600/-]	30	200 [600/-]	25	75 (120) [60/60/60] [-/60/60]#	15/(25)	95 [60/60/60]	20
LOWER ROOF	LIFT MACHINE ROOM	SPECIAL HAZARD	-	225 [-/120/120]	225 [120/120/120]	35	200 [1/2hr/-]	50~	300 [1/2hr/-]	35	100 (160) [120/120/120] [-/120/120]#	20/(25)	170 [240/240/240]	55
G/F-ROOF	LIFT SHAFT	N/A	-	-	-	-	200 [1/2hr/-]	50~	300 [1/2hr/-]	35	100 (160) [120/120/120] [-/120/120]#	20/(25)	-	-
G/F-ROOF	STAIRCASE	N/A	-	100 [-/60/60]	100 [60/60/60]	20	100 [600/-]	30	200 [600/-]	25	75 (120) [60/60/60] [-/60/60]#	15/(25)	95 [60/60/60]	20

REMARKS:
1. [ ] R.C. WALL CONTAINING LESS THAN 1% OF VERTICAL REINFORCEMENT
2. [ ] FRR REQUIRMENT FOR ELEMENTS OF CONSTRUCTION
3. [#] FRR REQUIRMENT FOR NON-LOAD BEARING WALL BEING A FIRE BARRIER
4. ~ REINFORCEMENT CONSISTING OF EXPANDED METAL LATH OR A WIRE FABRIC NOT LIGHTER THAN 0.5kg/m² WITH 2mm DIAMETER WIRE AT NOT MORE THAN 100mm CENTRES OR A CONTINUOUS ARRANGEMENT OF LINKS AT NOT MORE THAN 200mm CENTRES SHOULD BE INCORPORATED IN THE CONCRETE COVER AT A DISTANCE NOT EXCEEDING 20mm FROM THE FACE
5. THE R.C. WALL SHOULD HAVE AN FRR OF NOT LESS THAN -/240/240 IF THE SPECIAL HAZARD AREA IS CONNECTED DIRECTLY TO A PROTECTED EXIT.
6. THE R.C. WALL SHOULD HAVE AN FRR OF NOT LESS THAN -/240/240 IF THE SPECIAL HAZARD AREA IS ADJOINING TO THE FIRE EXIT STAIRCASE.

DIMENSIONS FOR LIFT INSTALLATION

LIFT NO.	RATED LOAD (kg)	NO. OF PASSENGERS (Note.)	RATED SPEED (m/s)	CAR INTERNAL SIZES: WIDTH (Cw) REQUIRED (mm)	WIDTH (Cw) PROVIDED (mm)	DEPTH (Cd) REQUIRED (mm)	DEPTH (Cd) PROVIDED (mm)	MAX. AREA Ca) REQUIRED (m²)	MAX. AREA Ca) PROVIDED (m²)	HEIGHT REQUIRED (mm)	HEIGHT PROVIDED (mm)	WALL DIMENSIONS: WIDTH (Ww) REQUIRED (mm)	WIDTH (Ww) PROVIDED (mm)	DEPTH (Wd) REQUIRED (mm)	DEPTH (Wd) PROVIDED (mm)	CLEAR ENTRANCE: WIDTH (Ew) REQUIRED (mm)	WIDTH (Ew) PROVIDED (mm)	HEIGHT (Eh) REQUIRED (mm)	HEIGHT (Eh) PROVIDED (mm)
1	900	12	1.6	1600	1500	1350	1400	2.200	2.100	2300	2600	2100	2165	2100	2285	900	900	2100	2100
2	900	12	1.6	1600	1500	1350	1400	2.200	2.100	2300	2600	2100	2165	2100	2285	900	900	2100	2100
3	900	12	2.5	1600	1500	1350	1400	2.200	2.100	2300	2600	2100	2165	2100	2285	900	900	2100	2100
4	900	12	2.5	1600	1500	1350	1400	2.200	2.100	2300	2600	2100	2165	2100	2285	900	900	2100	2100
5	900	12	2.5	1600	1500	1350	1400	2.200	2.100	2300	2600	2100	2165	2100	2285	900	900	2100	2100

LIFT NO.	PIT DEPTH (Ph) REQUIRED (mm)	PIT DEPTH (Ph) PROVIDED (mm)	HEADROOM (Gh) REQUIRED (mm)	HEADROOM (Gh) PROVIDED (mm)	MACHINE ROOM MINIMUM DIMENSIONS (SEE NOTES ON LIFT INSTALLATION): AREA(Ra) REQUIRED (m²)	AREA(Ra) PROVIDED (m²)	WIDTH(Rw) REQUIRED (mm)	WIDTH(Rw) PROVIDED (mm)	DEPTH(Rd) REQUIRED (mm)	DEPTH(Rd) PROVIDED (mm)	HEIGHT(Rh) REQUIRED (mm)	HEIGHT(Rh) PROVIDED (mm)	OVERALL HEADROOM (Uh) REQUIRED (mm)	OVERALL HEADROOM (Uh) PROVIDED (mm)
1	1800	1800	4850	5300	15.000	87.800	2500	8683	3700	10619	2600	3800	7650	67875
2	1800	1800	4850	5300	15.000	87.800	2500	8683	3700	10619	2600	3800	7650	67875
3	2800	2800	5850	8050	15.000	87.800	3200	8683	4900	10619	2600	3800	8450	40375
4	2800	2800	5850	8875	15.000	87.800	3200	8683	4900	10619	2600	3800	8450	12875
5	2800	2800	5850	8875	15.000	87.800	3200	8683	4900	10619	2600	3800	8450	12875

SCHEDULE OF SANITARY FITMENTS

FLOOR	USAGE	USABLE FLOOR SPACE (m²)	FACTOR PER PERSON (m²)	MALE TO FEMALE RATIO	NUMBER OF PERSONS	WC REQUIRED	WC PROVIDED	BATH/SHOWER REQUIRED	BATH/SHOWER PROVIDED	BASIN REQUIRED	BASIN PROVIDED	URINAL REQUIRED	URINAL PROVIDED	ACCESSIBLE TOILET REQUIRED
G/F	GUARD COUNTER	7.894	9	-	1	-	-	-	-	-	-	-	-	1
G/F	MAC	19.489	9	-	3		-		-		-		-	
F1-F36	DOMESTIC(FOR EACH FLAT)	31.350	4.5	-	7		1		1		1		-	

CALCULATION OF NO. OF PERSONS IN BUILDING							
LOCATION	CLASSIFICATION	FLAT NOS.	UFA PER FLAT (m²)	OCCUPANCY FACTOR (0.7 A.M m² PER PERSON)	TOTAL UFA (m²)	NO. OF PERSON PER FLAT	NO. OF PERSON PER FLOOR	TOTAL NO. OF PERON USING THE BUILDING (BLOCK)
F1-F34	Class 1b typical flats	1	9.371	4.5	9.371	3	3	102
F1-F34	Class 1b typical flats	6 & 7	11.478	4.5	22.956	3	6	204
F1-F34	Class 1b typical flats	3, 18 & 19	15.834	4.5	47.502	4	12	408
F1-F34	Class 1b typical flats	4, 9,10, 22 & 23	16.847	4.5	50.235	4	20	680
F1-F34	Class 1b typical flats	21	23.036	4.5	23.036	8	8	204
F1-F34	Class 1b typical flats	2,14,15 & 20	23.339	4.5	93.356	6	24	816
F1-F34	Class 1b typical flats	5, 8,12 & 13	26.293	4.5	105.172	6	24	816
F1-F34	Class 1b typical flats	11	27.795	4.5	27.795	7	7	238
F1-F34	Class 1b typical flats	16	27.803	4.5	27.803	7	7	238
F1-F34	Class 1b typical flats	17	27.952	4.5	27.952	7	7	238
		SUB-TOTAL:			466.178		116	3944
F35-F36	Class 1b typical flats	1	9.371	4.5	9.371	3	3	6
F35-F36	Class 1b typical flats	6 & 7	11.478	4.5	22.956	3	6	12
F35-F36	Class 1b typical flats	3, 18 & 19	15.834	4.5	47.502	4	12	24
F35-F36	Class 1b typical flats	4, 9,10, 22 & 23	16.847	4.5	79.230	4	20	40
F35-F36	Class 1b typical flats	21	23.036	4.5	23.036	6	6	12
F35-F36	Class 1b typical flats	2,14 & 15	23.339	4.5	70.017	6	18	36
F35-F36	Class 1b typical flats	5, 8, 12 & 13	26.293	4.5	105.172	6	24	48
F35-F36	Class 1b typical flats	11	27.795	4.5	27.795	7	7	14
F35-F36	Class 1b typical flats	16	27.803	4.5	27.803	7	7	14
F35-F36	Class 1b typical flats	17	27.952	4.5	27.952	7	7	14
		SUB-TOTAL:			440.839		110	220
		TOTAL:			904.681		225	4164

* 116 PERSON FOR TYPICAL FLOOR F1-F34
* 110 PERSON FOR F35-F36

PERMITTED DISCHARGE VALUE OF STAIRCASE (NON- SPRINKLERED BUILDING)					
STAIRCASE NO.	FLOOR	STOREY ABOVE GROUND	MIN. WIDTH OF EXIT PROVIDED (mm)	PERMITTED DISCHARGE VALUE (REFER TO FIRE SAFETY IN BUILDING 2011)	TOTAL PERMITTED (PERSON)
ST-01	F1-F36	36	1200	582 + 38 x 26 = 1570	1570 x 3 =4710 (PERMITTED) > 4156 (PROVIDED)
ST-02	F1-F36	36	1200	582 + 38 x 26 = 1570	
ST-03	F1-F36	36	1200	582 + 38 x 26 = 1570	

SCHEDULE OF MINIMUM NUMBER & WIDTH OF EXIT DOOR & EXIT ROUTE FROM EACH FLOOR 1-36												
FLOOR	USAGE	USABLE FLOOR AREA (m²) (FOR EACH FLOOR)	CAPACITY OF EACH FLOOR	MIN. NO. OF EXIT ROUTE REQD	PROV'D	MIN. TOTAL WIDTH OF EXIT DOORS REQ'D	EXIT DOORS PROV'D	EXIT ROUTES REQ'D	EXIT ROUTES PROV'D	MIN. WIDTH OF EACH EXIT DOOR REQ'D	EXIT DOOR PROV'D	EXIT ROUTE REQ'D	EXIT ROUTE PROV'D
F1-F36 *	DOMESTIC	484.178	116	2	3	1750	3300	2100	3800	850	1100	1050	1200

* ASSUMED NO. OF PERSON PER FLOOR FOR F35 TO F36 AS SAME AS F1 TO F34 (116/EACH FLOOR)

ICU Ref.: HD(ICU)_____

GENERAL NOTES FOR BUILDING WORKS FOR LIFTS

1. REFER TO THE NOTE 7 ON TABLE 1 OF THE CoP BWLE 2011, FOR THE LIFTS (NO. 1, 2, 3, 4 AND 5 FOR DOMESTIC BLOCK) TO BE INSTALLED, THE FOLLOWING MACHINE ROOM CLEARANCES WILL BE PROVIDED IN ACCORDANCE WITH THE CODE OF PRACTICE FOR BUILDING WORKS FOR LIFTS AND ESCALATORS
   a. A CLEAR HORIZONTAL AREA IN FRONT OF THE PANELS / CABINETS WITH DEPTH NOT LESS THAN 0.7m AND WIDTH NOT LESS THAN 0.5m AND THE FULL WIDTH OF THE CABINET / PANEL.
   b. A CLEAR HORIZONTAL AREA OF AT LEAST 0.5m x 0.6m FOR SERVICING AND INSPECTION OF MOVING PARTS AND MINIMAL EMERGENCY OPERATION WHERE NECESSARY.
   c. ACCESS WAYS TO THESE CLEAR SPACES, WITH A WIDTH NOT LESS THAN 0.5m OR, IN AREAS WHERE THERE ARE NO MOVING PARTS, 0.4m.

LIFT SCHEDULE

LIFT NUMBER		1	2	3	4	5
FEATURE		PASS (LIFT 1 OF PASS 2 LIFT)	PASS (LIFT 2 OF PASS 2 LIFT)	PASS (HSE LIFT)	PASS (LIFT 1 OF PASS 2 LIFT)	PASS (LIFT 2 OF PASS 2 LIFT)
CAPACITY		900 kg / 12 PERSONS				
SPEED		1.6 m/s			2.5 m/s	
NO. OF STOPS ABOVE G/F		18	18	10	20	10
TOTAL TRAVEL DISTANCE		49100	49100	75600	100100	100100
LIFT CAR DIMENSION		1500(W) x 1400(D)				
LIFT SHAFT DIMENSION		2165(W) x 2285(D)				
DOOR OPENING		2100(H) x 900(W) CLEAR CENTRE OPENING				
CONTROL		DUPLEX DOWN COLLECTIVE		DOUBLE DUPLEX DOWN COLLECTIVE		
MACHINE ROOM LEVEL	-	LIFT MACHINE ROOM				
ROOF	110.000					
F36	107.250	T	T	T		
F35	104.500					
F34	101.750					
F33	99.000					
F32	96.250	T	T	T		
F31	93.500					
F30	90.750					
F29	88.000			M (ACCESS BY MAIN CONTRACTOR)		
F28	85.250	T	T			
F27	82.500					
F26	79.750					T
F25	77.000					
F24	74.250	T	T			
F23	71.500					E
F22	68.750					
F21	66.000					
F20	63.250	T	T			E
F19	60.500					
F18	57.750	M (ACCESS BY MAIN CONTRACTOR)	M (ACCESS BY MAIN CONTRACTOR)			
F17	55.000					E
F16	52.250					
F15	49.500					
F14	46.750			E	E	E
F13	44.000					
F12	41.250					
F11	38.500			F	F	F
F10	35.750					
F9	33.000					
F8	30.250			E	E	E
F7	27.500					
F6	24.750					
F5	22.000			E	E	E
F4	19.250					
F3	16.500					
F2	13.750			E	E	E
F1	11.000					
G/F (TERMINAL FLOOR)	4.150					
DEPTH OF LIFT PIT		1.800		2.800		

ACCUMULATED STRUCTURAL FLOOR LEVEL (mm)

LEGEND (FOR LIFT SCHEDULE)

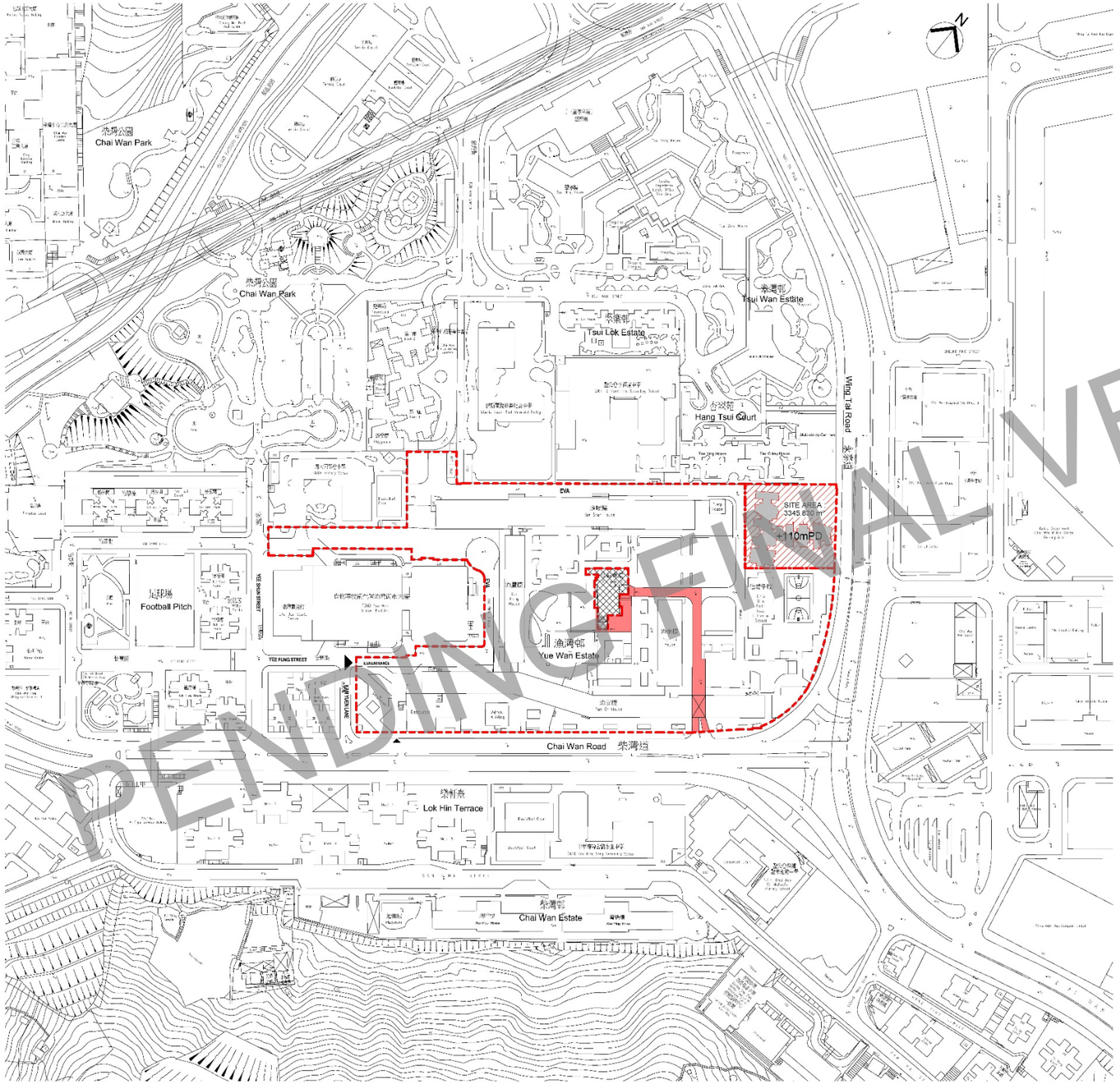
- ☐ LIFT LANDING OPENING BY MAIN CONTRACTOR
- [M] ACCESS OPENING BY MAIN CONTRACTOR REQUIRED FOR SUSPENSION ROPES INSPECTION
- [E] EMERGENCY OPENING BY MAIN CONTRACTOR
- [T] TEMPORARY ACCESS OPENING TO LIFT SHAFT DURING BUILDING CONSTRUCTION PERIOD FOR WORKMEN'S SAFETY IN CASE OF EMERGENCY. DIMENSION AND SETTING-OUT SAME AS THAT OF LANDING OPENING. THE OPENING IS TO BE BACK-FILLED, TOUCHED UP AND MADE GOOD BOTH INTERNAL AND EXTERNAL SURFACES TO MATCH VICINITY BY MAIN CONTRACTOR AFTER THE COMPLETION OF LIFT INSTALLATION.

AREA CALCULATION OF MAIN T.B.E. ROOM		
DOMESTIC BLOCK		
NOS. OF FLAT	RECOMMENDED AREA (m²)	AREA PROVIDED (m²)
826	MIN 43 : MAX 54	45.588

SCHEDULE OF ACCOMMODATION NO. OF FLAT					
FLOOR	FLAT TYPE				
	A	B	C	D	TOTAL
1/F - 34/F	3	8	9	3	23
35/F - 36/F	3	8	8	3	22

TOTAL NO. OF FLAT: 23 x 34 + 22 x 2 = 826 (800±10% UNDER PLANNING BRIEF)

| CAR PARKING SCHEDULE | | | |
|



BLOCK PLAN

SCALE 1 : 1000

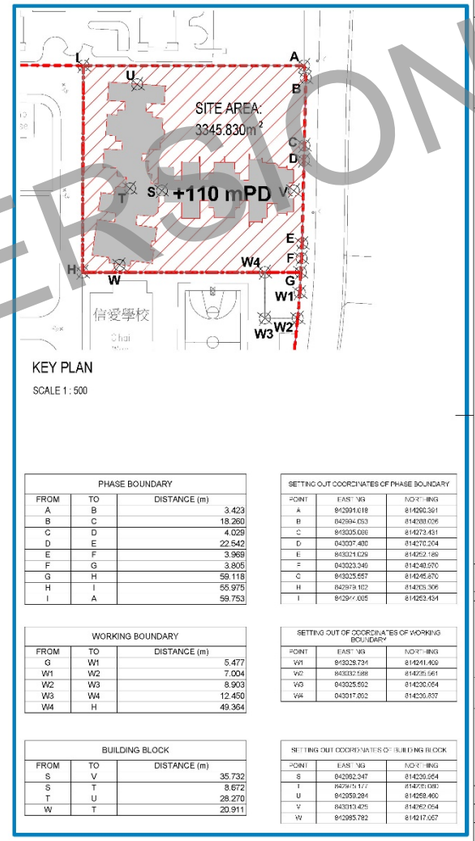
LEGEND

- PROPOSED PHASE BOUNDARY
- WORKING AREA BOUNDARY
- AREA EXCLUDED FROM V.O. 108/SITE BOUNDARY
- RIGHT OF WAY FOR COMMUNITY HALL

N = NORTHING COORDINATE

E = EASTING COORDINATE

REFER TO DESCRIPTION 4 OF ANNEX 7



KEY PLAN

SCALE 1 : 500

PHASE BOUNDARY		
FROM	TO	DISTANCE (m)
A	B	3.423
B	C	18.260
C	D	4.029
D	E	22.542
E	F	3.969
F	G	3.805
G	H	59.118
H	I	55.975
I	A	59.753

SETTING OUT COORDINATES OF PHASE BOUNDARY		
POINT	EASTING	NORTHING
A	842991.618	814260.561
B	842994.053	814280.026
C	843025.006	814272.431
D	843027.480	814252.504
E	843021.629	814252.189
F	843023.946	814240.570
G	843025.667	814246.870
H	842978.162	814255.306
I	842977.605	814253.434

WORKING BOUNDARY		
FROM	TO	DISTANCE (m)
G	W1	5.477
W1	W2	7.004
W2	W3	8.903
W3	W4	12.450
W4	H	49.364

SETTING OUT OF COORDINATES OF WORKING BOUNDARY		
POINT	EASTING	NORTHING
W1	843028.734	814241.409
W2	843032.588	814235.561
W3	843025.602	814230.064
W4	843017.602	814230.837

BUILDING BLOCK		
FROM	TO	DISTANCE (m)
S	V	35.732
S	T	8.672
T	U	28.270
W	T	20.911

SETTING OUT COORDINATES OF BUILDING BLOCK		
POINT	EASTING	NORTHING
S	842992.347	814230.564
T	842975.127	814251.080
U	842953.284	814258.460
V	843013.425	814262.054
W	842985.782	814217.057

ICU Ref.: HD(ICU)_____

Signature of Applicant (HD / PSP) :

ICU Approved Signature :

Signature for Record Plan :

NOTES:

REVISIONS

NO.	DESCRIPTION AND DATE	INITIAL AND DESIGNATION		
		MTR	CKD	AUTH
A	1. CHANGE IN WORK OR DRAWING NAME IS MADE ACCORDING TO PROPOSITION 2. APPROVED CROP OF DRAWING SHEET IS DELETED 3. NAME CHANGE OF ROAD CLOSURE 4. ADD SETTING OUT OF COORDINATES OF PHASE BOUNDARY IS REVISED 5. NO BOUNDARY LINE IS REVISED IF ONLY ONE UNIT OF BOUNDARY LINE IS REVISED 4/05/2017	TOANG	STOCK DTC	AGS
B	1. LEGEND ADDED 2. ADD EDGE OF SETTING OUT COORDINATE REVISED 15/12/2017	TOANG	STOCK DTC	AGS
C	1. SITE BOUNDARY LINE REVISED AS PHASED 2. SCHEDULE OF SETTING OUT COORDINATES ADDED 4/05/2018	STW	STOCK DTC	AGS

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	EDMUND CHAN SM/BTC	ORIGINAL SIGNED	31/2017
CHECKED	S.M. CHOI AGS	ORIGINAL SIGNED	31/2017
	S.K. CHAN STO/BTC	ORIGINAL SIGNED	31/2017
DRAWN	JASON WONG TO/LWS	ORIGINAL SIGNED	31/2017

PROJECT

YUE WAN ESTATE
PHASED DEVELOPMENT -
WING TAI ROAD, CHAI WAN

DRAWING TITLE

MASTER LAYOUT PLAN & COORDINATES OF BOUNDARY

SCALE AS SHOWN (A3)

DRAWING NO.

ET06/ICU/A/GBP-03/C

SOURCE

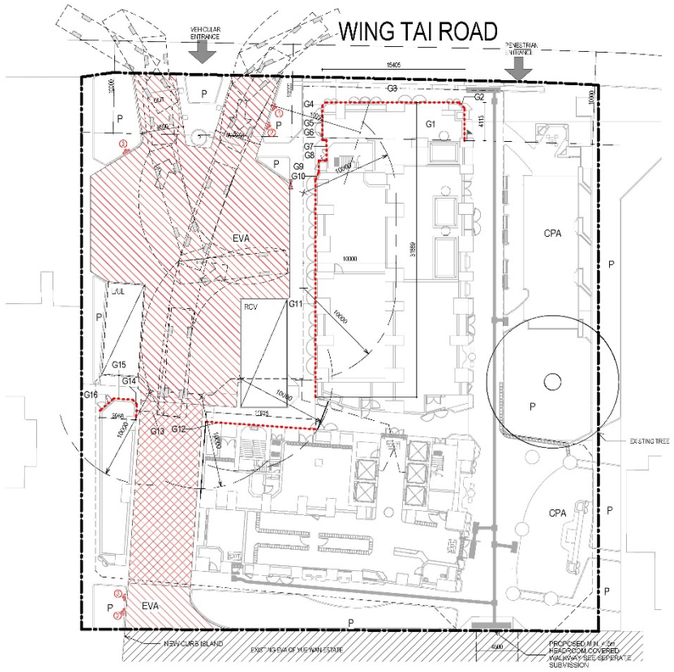
EDMS NO.

HOUSING DEPARTMENT

DATE OF ISSUE:

FOR CHECKING: ☐ D.E.E. ☐ C.E. ☐ LO/KC/CM ☐ S.E. ☐ Contractor ☐ Others

COPY FOR: ☐



MAJOR FACADE AT GROUND FLOOR PLAN SERVED BY EVA WITHIN 10m

SCALE 1 : 200

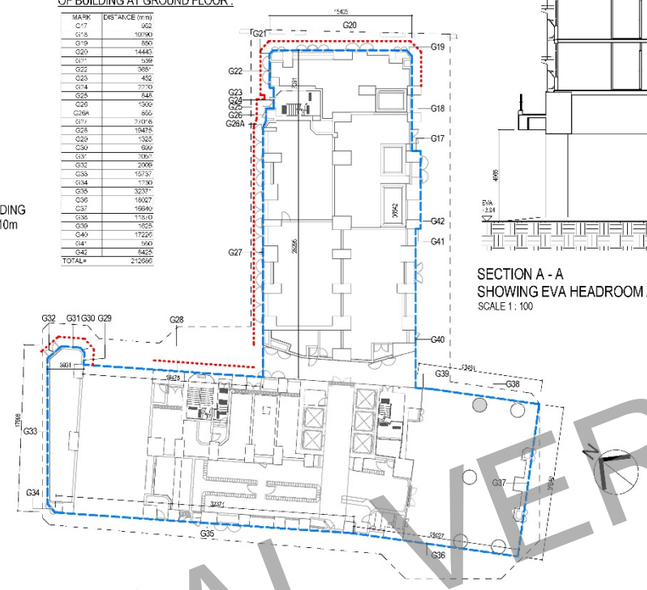
TOTAL LENGTH OF PERIMETER OF BUILDING AT GROUND FLOOR:

MARK	DISTANCE (mm)
G1	3512
G2	550
G3	14443
G4	530
G5	3551
G6	452
G7	2220
G8	545
G9	1309
G10	655
G11	23519
G12	11975
G13	1325
G14	600
G15	2062
G16	2309
TOTAL=	70208

TOTAL PERCENTAGE OF PERIMETER OF BUILDING AT GROUND FLOOR SERVED BY EVA WITHIN 10m
=(70208/212686)x100%
=33.010% > 25%

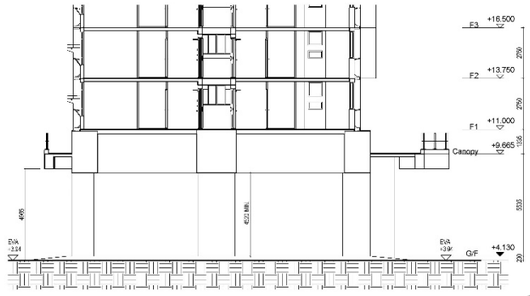
TOTAL LENGTH OF PERIMETER OF BUILDING AT GROUND FLOOR :

MARK	DISTANCE (mm)
G17	952
G18	10190
G19	550
G20	14445
G21	530
G22	3551
G23	452
G24	2220
G25	545
G26	1309
G26A	655
G27	21076
G28	19475
G29	1325
G30	600
G31	2062
G32	2309
G33	15730
G34	1790
G35	3237
G36	16927
G37	16940
G38	11340
G39	3825
G40	17226
G41	550
G42	5425
TOTAL=	212686

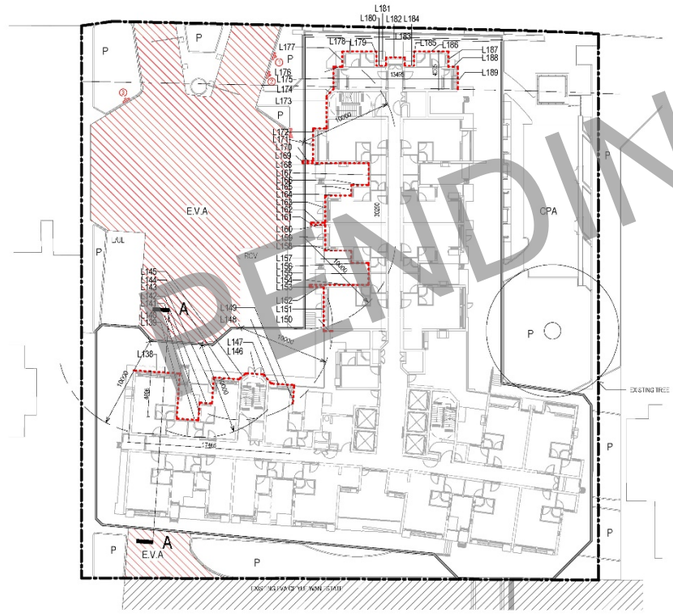


TOTAL PERIMETER OF BUILDING AT GROUND FLOOR

SCALE 1 : 200



SECTION A - A
SHOWING EVA HEADROOM AT DOMESTIC BLOCK
SCALE 1 : 100



MAJOR FACADE AT TYPICAL FLOOR PLAN SERVED BY EVA WITHIN 10m

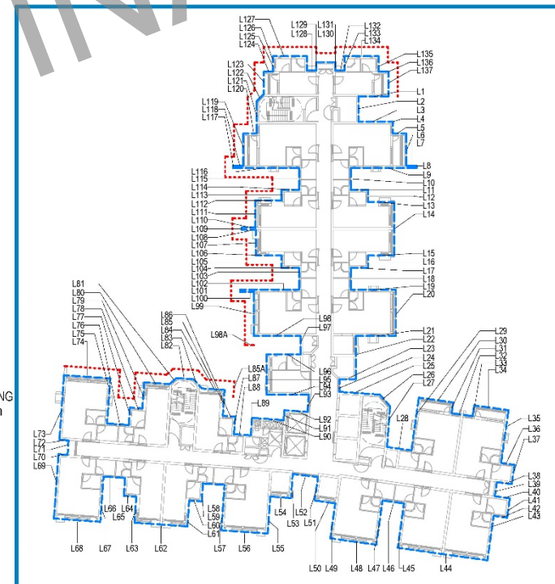
SCALE 1 : 200

TOTAL LENGTH OF PERIMETER OF BUILDING AT TYPICAL FLOOR:

MARK	DISTANCE (mm)	MARK	DISTANCE (mm)
L1	5025	L93	1140
L2	4500	L94	1905
L3	2550	L97	2300
L4	1900	L98	7140
L5	1350	L99	750
L6	1100	L73	1100
L7	2100	L11	3495
L8	900	L72	1460
L9	1950	L73	3615
L10	1300	L77	1000
L11	2485	L75	7437
L12	1953	L76	977
L13	973	L77	1670
L14	4775	L78	3700
L15	1400	L79	1500
L16	250	L80	1050
L17	3314	L81	1050
L18	2350	L82	2000
L19	1606	L83	900
L20	1350	L84	1050
L21	2801	L85	1500
L22	2750	L86	3700
L23	1524	L87	1670
L24	750	L88	1043
L25	1400	L89	2420
L26	2955	TOTAL=	113882
L27	2832		

TOTAL PERCENTAGE OF PERIMETER OF BUILDING AT TYPICAL FLOOR SERVED BY EVA WITHIN 10m
=(113882/379496)x100%
=30.009 > 25%

REFER TO DESCRIPTION 5 OF ANNEX 7



TOTAL PERIMETER OF BUILDING AT TYPICAL FLOOR

SCALE 1 : 200

TOTAL LENGTH OF PERIMETER OF BUILDING AT TYPICAL FLOOR:

MARK	DISTANCE (mm)	MARK	DISTANCE (mm)	MARK	DISTANCE (mm)
L1	5025	L42	4545	L83	1050
L2	2790	L43	5025	L84	4957
L3	3740	L44	3824	L85	4350
L4	1900	L50	2250	L86	3825
L5	1450	L51	2595	L87	7000
L6	3400	L52	2702	L88	6032
L7	1100	L53	2610	L89	4175
L8	250	L54	2250	L100	1450
L9	7140	L55	4015	L101	250
L10	2350	L60	5525	L102	6374
L11	1900	L57	4625	L103	2354
L12	1350	L58	2250	L104	1856
L13	2830	L59	1950	L105	1350
L14	5750	L60	1350	L106	2801
L15	2850	L61	2810	L107	2750
L16	1350	L62	5750	L108	1524
L17	1900	L63	2610	L109	750
L18	2350	L64	1350	L110	1450
L19	4857	L65	1050	L111	2955
L20	5025	L66	2955	L112	2832
L21	4335	L67	4525	L113	1140
L22	4700	L68	5025	L114	1905
L23	1765	L69	6550	L115	2300
L24	1354	L70	550	L116	7140
L25	4385	L71	1950	L117	750
L26	1057	L72	950	L118	1100
L27	4405	L73	7011	L119	3495
L28	1995	L74	1525	L120	1460
L29	5750	L75	4050	L121	3615
L30	3740	L76	2350	L122	1000
L31	1175	L77	1900	L123	2437
L32	7300	L78	1350	L124	922
L33	1175	L79	2830	L125	5675
L34	3740	L80	2750	L126	3700
L35	5750	L81	550	L127	1554
L36	1450	L82	1900	L128	1015
L37	2115	L83	1309	L129	910
L38	1630	L84	2485	L130	7012
L39	1500	L85	2829	L131	910
L40	1630	L86	1350	L132	1015
L41	2115	L87	1900	L133	1550
L42	1450	L88	1630	L134	3700
L43	4875	L89	1500	L135	1675
L44	9800	L90	2405	L136	1043
L45	4645	L91	1095	L137	2625
L46	2350	L92	2515	*TOTAL=	379496

ICU Ref.: HD(ICU)

Signature of Applicant (HD / PSP) :

ICU Approved Signature :

Signature for Record Plan :

NOTES:

LEGENDS

- SITE BOUNDARY
- VESTING ORDER BOUNDARY
- HARD PAVING EVA ACCESS ROAD (CAPABLE OF WITHSTANDING 20.0T(g LOADING & MAX. 1.5V GRADIENT)
- HARD PAVING EVA ACCESS ROAD UNDER COVER (CAPABLE OF WITHSTANDING 20.0T(g LOADING 4.5m HEADROOM & MAX. 1:12 GRADIENT)
- EXISTING E.V.A. OF YUE WAN ESTATE
- AUTOMATIC DROP GATE
- PERIMETER OF BUILDING
- PERIMETER OF MAJOR FACADE OF BUILDING TO BE SERVED BY E.V.A.
- PROPOSED E.V.A. SHELTER OVERHEAD
- EMERGENCY VEHICULAR ACCESS - LAYOUT SIGN AT ENTRANCE OF EVA
- EMERGENCY VEHICULAR ACCESS - INDICATION SIGN & DIRECTION IN THE FORM OF CARRIAGEWAY
- EMERGENCY VEHICULAR ACCESS - NO PARKING SIGN
- 10m DISTANCE FROM EVA
- STARTING POINT OF CALCULATIONS
- SWEPT PATH FOR FIRE ENGINE ACCESS AND DRILLS

REVISIONS

NO.	DESCRIPTION AND DATE	INITIAL AND DESIGNATION		
		MIN.	CHK.	AUTH.
A	1. CLARIFIED MARK OF DRAWING INVALID / ADDED ACCORDING TO PNAP APP-15 2. APPROVED COPY OF DRAWING IS SET IN SHEETING 3. HYPOTHESIS OF NEW CLIMATHEAD 4. ADDED NOTE FOR SHEETING INSTALLED 5. ADJUSTED THE DRILLS CALCULATED 6. EVA CALCULATION FORMAT IMPROVED 19/09/2017	CHAN S.C. ETC	CHOI A.S.B. ETC	ADS
B	1. SHEET ON A-A REVISED 2. LEGEND OF FIRE ENGINES REVISED 15/12/2017	ICTW ADS	ETC/CHOI ETC	ADS
C	1. LAYOUT REVISED. 2. LEVEL CLARIFIED 29/3/2018	TCAAS ADS	ETC/CHOI ETC	ADS
D	1. SHEET ON A-A REVISED 2. SECTION DATA REVISED 3. DIMENSION ADDED 4. WATER PATTERN REMOVED 14/09/2018	ICTW ADS	ETC/CHOI ETC	ADS

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	EDMUND CHAN SM/BTC	ORIGINAL SIGNED	31/2017
CHECKED	S.M. CHOI ADS	ORIGINAL SIGNED	31/2017
	S.K. CHAN BTC/SBTC	ORIGINAL SIGNED	31/2017
DRAWN	JASON WONG TO/ARS	ORIGINAL SIGNED	31/2017

DATE OF ISSUE:

PROJECT
YUE WAN ESTATE
PHASED DEVELOPMENT-
WING TAI ROAD, CHAI WAN

DRAWING TITLE
EVA PLAN & CALCULATIONS

SCALE AS SHOWN (A3)

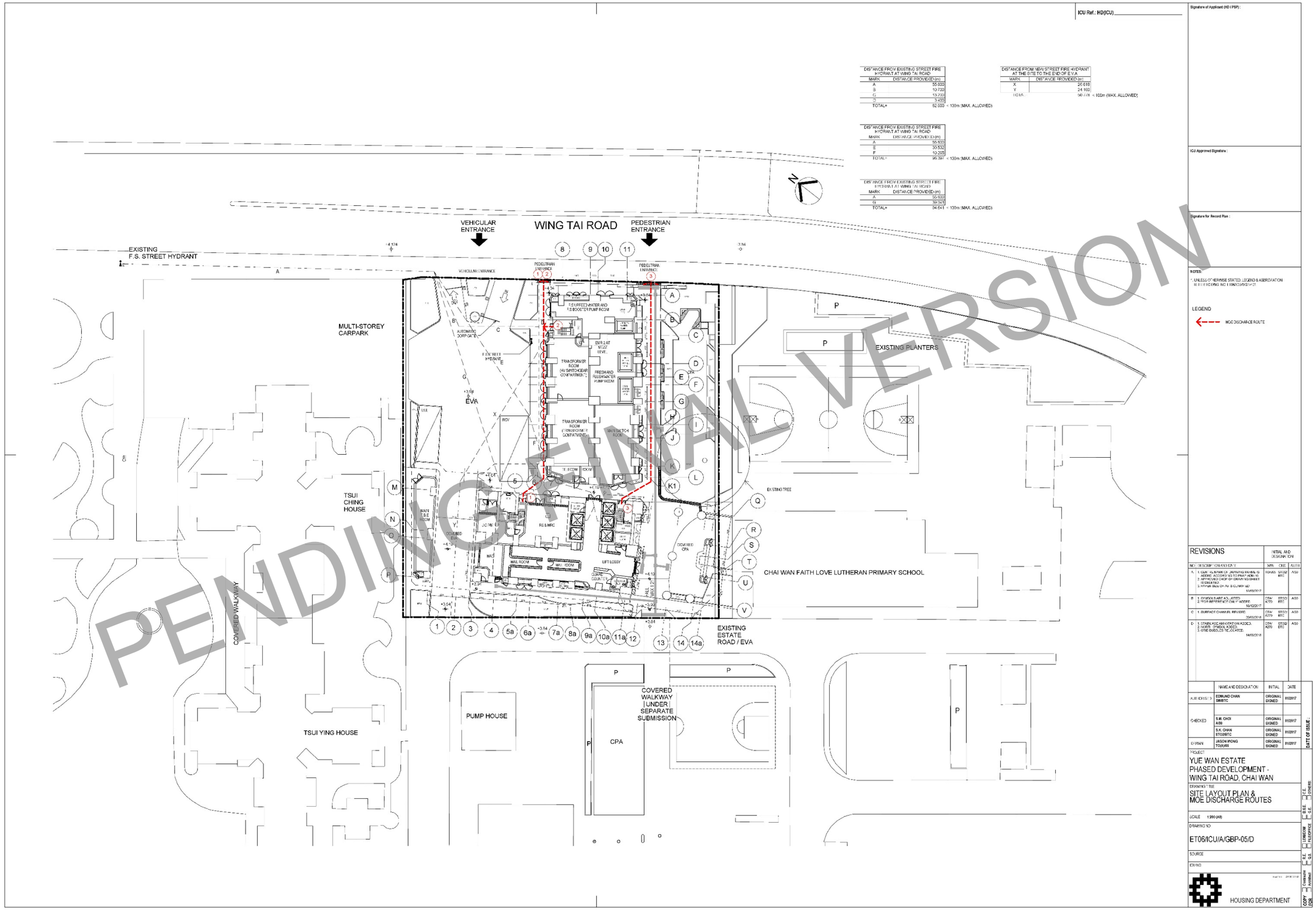
DRAWING NO.
ET06/ICU/A/GBP-04/D

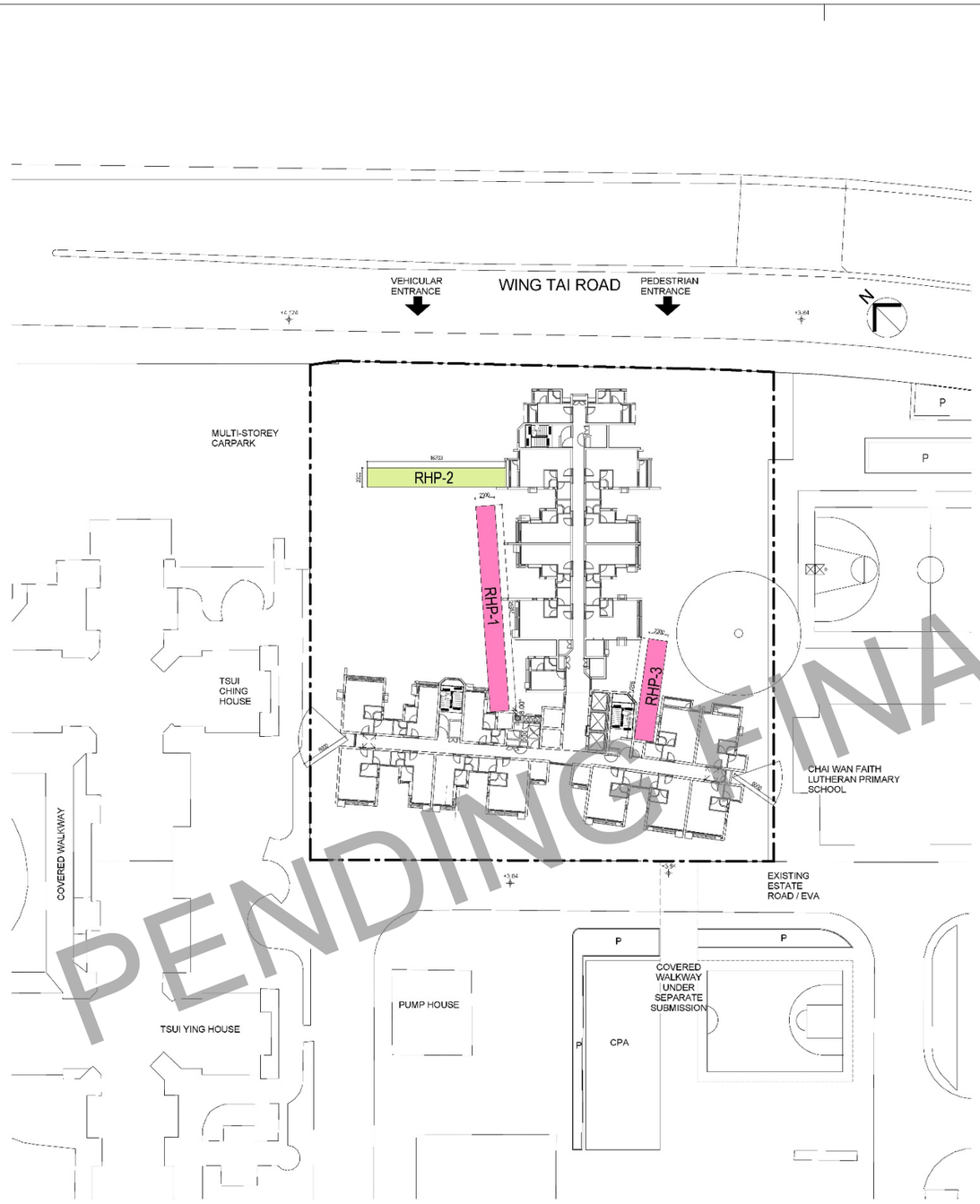
SOURCE

EDM NO.

HOUSING DEPARTMENT

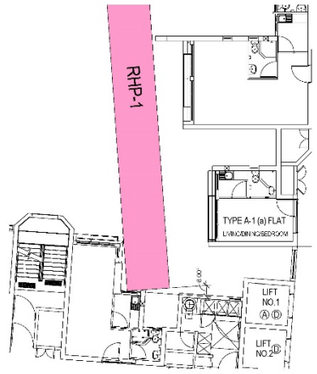
COPY FOR: Contractor / Consultant / Others


ICU Ref.: HD(ICU)
DISTANCE FROM EXISTING STREET FIRE HYDRANT AT WING TAI ROAD
MARK DISTANCE PROVIDED (m)
A 55.600
B 10.720
C 13.720
D 3.420
TOTAL= 82.000 < 100m (MAX. ALLOWED)
DISTANCE FROM NEW STREET FIRE HYDRANT AT THE SITE TO THE END OF E.V.A
MARK DISTANCE PROVIDED (m)
X 20.618
Y 24.160
TOTAL= 90.778 < 100m (MAX. ALLOWED)
DISTANCE FROM EXISTING STREET FIRE HYDRANT AT WING TAI ROAD
MARK DISTANCE PROVIDED (m)
A 55.600
E 30.532
F 10.205
TOTAL= 96.397 < 100m (MAX. ALLOWED)
DISTANCE FROM EXISTING STREET FIRE HYDRANT AT WING TAI ROAD
MARK DISTANCE PROVIDED (m)
A 55.600
G 39.041
TOTAL= 94.641 < 100m (MAX. ALLOWED)
Signature of Applicant (HD / PRP) :
ICU Approved Signature :
Signature for Record Plan :
NOTES:
1. UNLESS OTHERWISE STATED, LEGEND & ABBREVIATION REFER TO DRAWING NO. ET06/ICU/A/GBP-01
LEGEND
MOE DISCHARGE ROUTE
VEHICULAR ENTRANCE
WING TAI ROAD
PEDESTRIAN ENTRANCE
EXISTING F.S. STREET HYDRANT
MULTI-STOREY CARPARK
EXISTING PLANTERS
EVA
TSUI CHING HOUSE
EXISTING TREE
CHAI WAN FAITH LOVE LUTHERAN PRIMARY SCHOOL
COVERED WALKWAY
EXISTING ESTATE ROAD / EVA
PUMP HOUSE
COVERED WALKWAY UNDER SEPARATE SUBMISSION
CPA
TSUI YING HOUSE
PENDING GMT
NOT FINAL VERSION
REVISIONS
INITIAL AND DESIGNER, ETC
NO. DESCRIPTION AND DATE
A 1. CLARIFY ALIGNMENT OF DRAWING NUMBERING ADDED ACCORDING TO PRAP ADM-NO 2. ADDED REVISED SHOP DRAWINGS SHEET NO. 3. APPROVAL BASIS OF PLAN & CLARIFIED 04/05/2017
B 1. DIMENSIONS ADDED 2. YEAR REFERENCE ON 1ST ADDED 16/12/2017
C 1. SURFACE CHANNEL REVISED 29/05/2018
D 1. STAIRCASE ANNOTATION ADDED 2. NOTES SYMBOL ADDED 3. GFNE BARS LIES TO CONFIRM 14/06/2018
AUTHORISED: EDMUND CHAN SM/ST/C ORIGINAL SIGNED 31/2/2017
CHECKED: S.M. CHOI AD/S ORIGINAL SIGNED 31/2/2017
S.K. CHAN ST/CS/ST/C ORIGINAL SIGNED 31/2/2017
DRAWN: JASON WONG TO/AR/S ORIGINAL SIGNED 31/2/2017
DATE OF ISSUE :
PROJECT
YUE WAN ESTATE
PHASED DEVELOPMENT -
WING TAI ROAD, CHAI WAN
DRAWING TITLE
SITE LAYOUT PLAN &
MOE DISCHARGE ROUTES
SCALE 1:200 (A0)
DRAWING NO.
ET06/ICU/A/GBP-05/D
SOURCE
EDMS NO.
HOUSING DEPARTMENT
COPY FOR: Contractor / Partners, C.E. / C/S, E.E. / E/S, OTHERS:



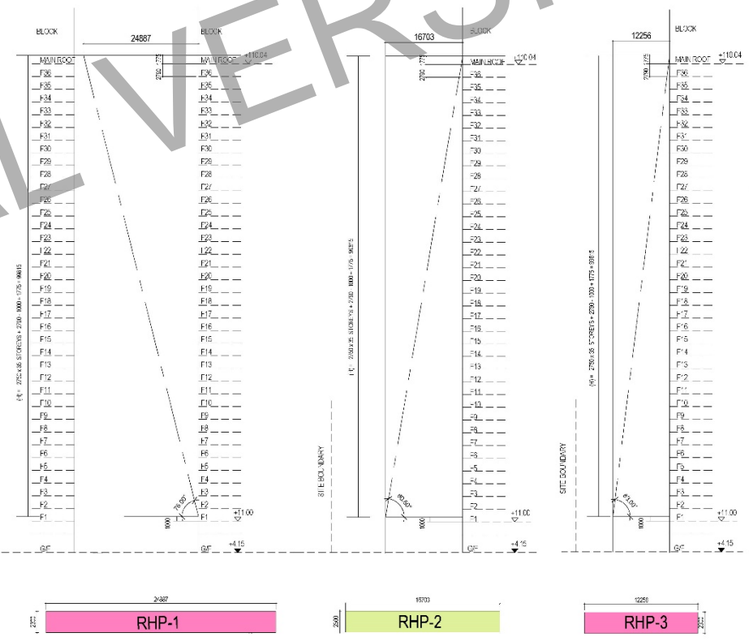
SITE LAYOUT PLAN

SCALE 1 : 200



PART PLAN OF RHP-1

SCALE 1 : 100



PRESCRIBED WINDOW CALCULATION FOR REQUIRED RECTANGULAR HORIZONTAL PLANE (RHP)

LOCATION	MARK	HEIGHT (H) (mm)	ANGLE (°)	DISTANCE REQUIRED (mm) (HEIGHT OF RHP / TAN (ANGLE))
KITCHEN FACING BUILDING	RHP-1	99815	76.0°	24887
HABITABLE ROOM FACING SITE BOUNDARY	RHP-2	99815	80.5°	16703
KITCHEN FACING SITE BOUNDARY	RHP-3	99815	83.0°	12256

ICU Ref.: HD(ICU)_____

Signature of Applicant (HD / PSP) :

ICU Approved Signature :

Signature for Record Plan :

NOTES:

REVISIONS

NO.	DESCRIPTION AND DATE	INITIAL AND DESIGNATION		
		MTN	CHOI	AUTH
A	1. CO-TYPE MARK OF DRAWING IT NAME IS ADDED ACCORDING TO PHASE NO.&S1 2. APPROVED CHOP OF DRAWING SHEET IS DELETED 3. PAPER SIZE OF A3 IS CHANGED 4. CALCULATION FORMAT OF RHOW TO BE WINDOW REVISED.	TO/MK	STOCH STC	ASS
1	1. DUMPLINGS OF DRESSMAKING WINDOW REVISED	KT/MK AS/TA	STOCH STC	ASS

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	EDMUND CHAN SM/BTC	ORIGINAL SIGNED	31/2/17
CHECKED	S.M. CHOI A/SD	ORIGINAL SIGNED	31/2/17
	S.K. CHAN STC/DSTC	ORIGINAL SIGNED	31/2/17
DRAWN	JASON WONG TO/AS/S	ORIGINAL SIGNED	31/2/17

PROJECT
YUE WAN ESTATE
PHASED DEVELOPMENT -
WING TAI ROAD, CHAI WAN

DRAWING TITLE
CALCULATION FOR PRESCRIBED WINDOW

SCALE AS SHOWN (A3)

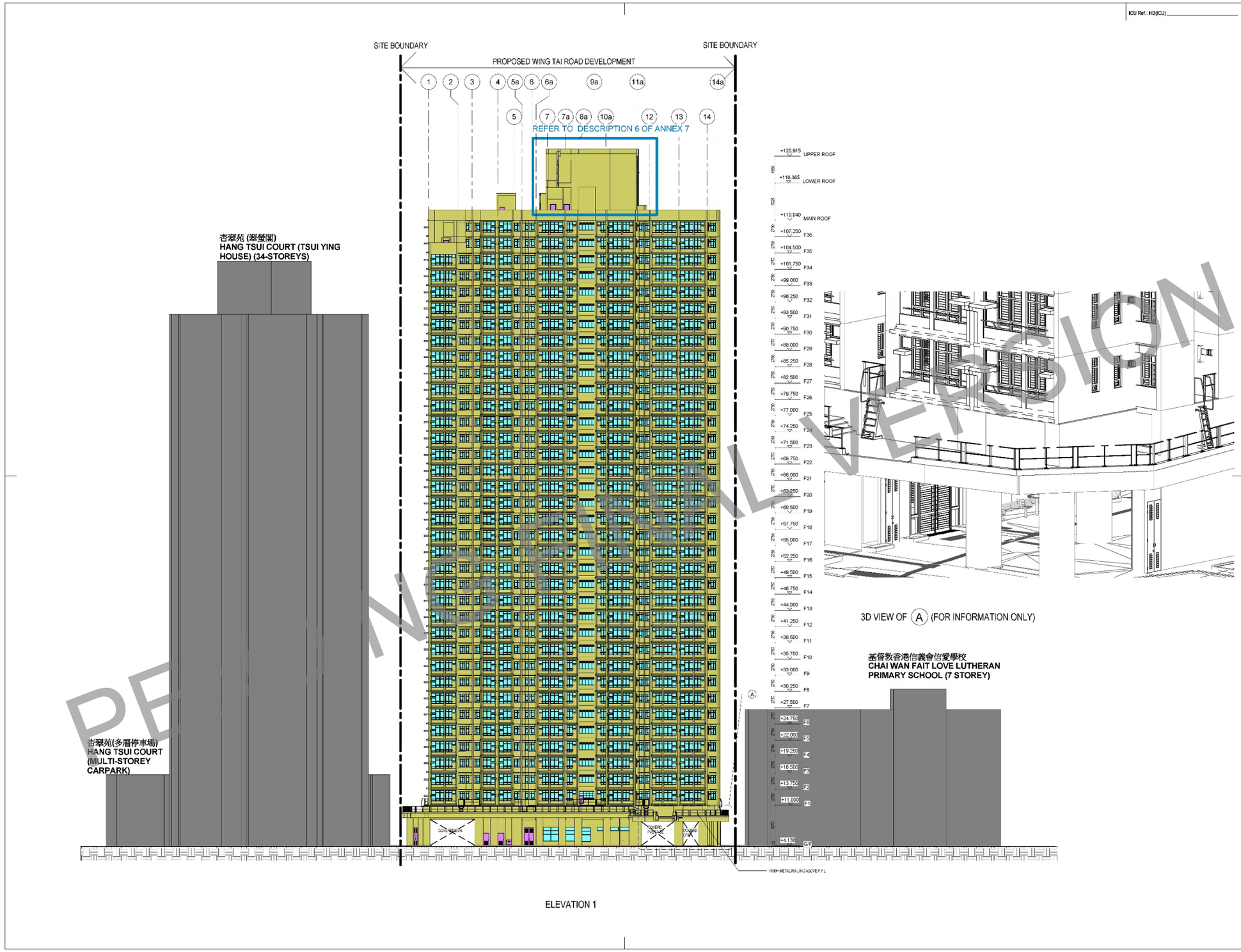
DRAWING NO.
ET06/ICU/A/GBP-06/B

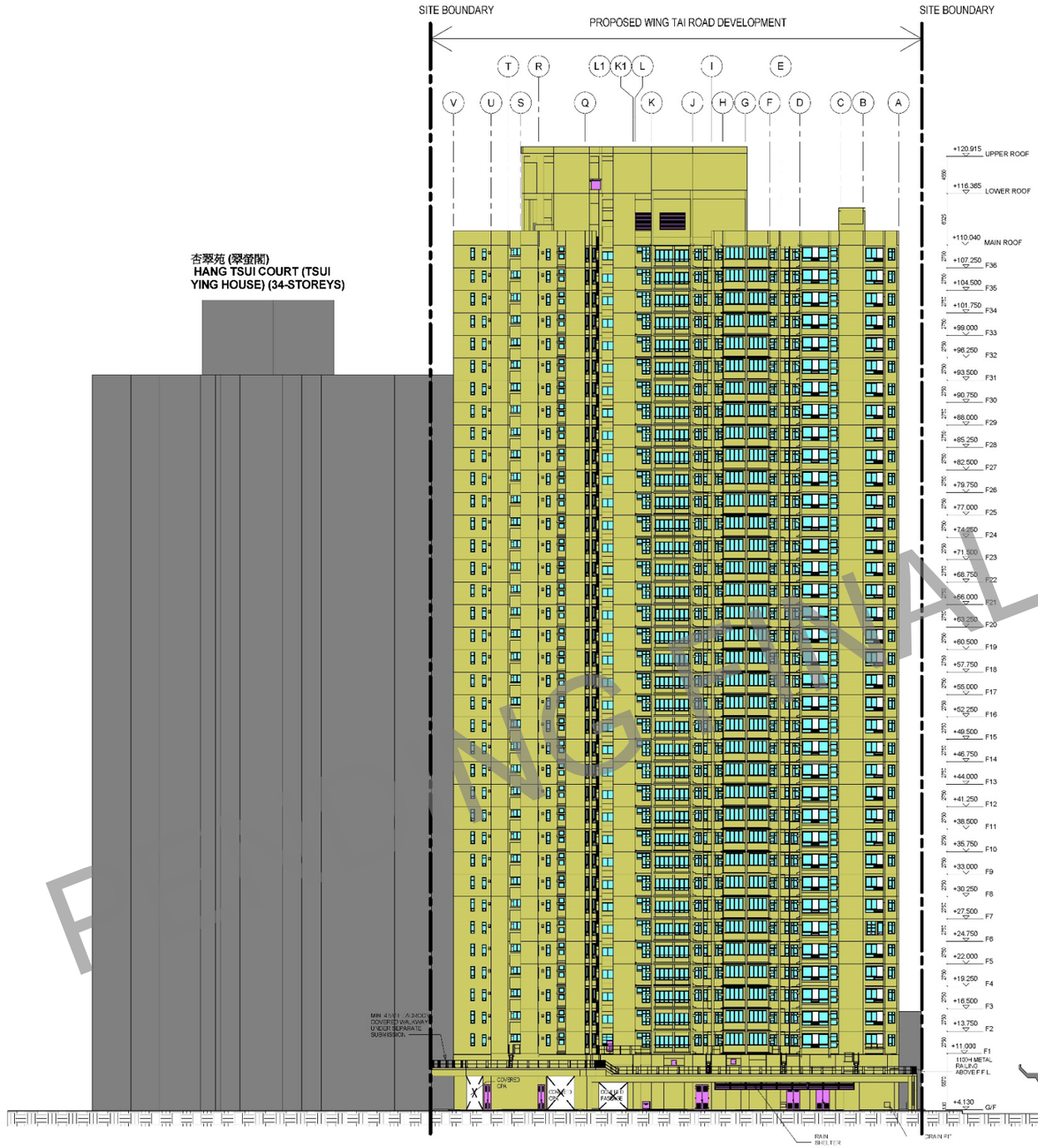
SOURCE

EDI NO.

HOUSING DEPARTMENT

DATE OF ISSUE: 31/2/17





ELEVATION 2

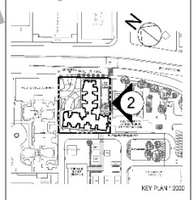
ICU Ref.: HD(ICU)_____

Signature of Applicant (HD / PSP) :

ICU Approved Signature :

Signature for Record Plan :

NOTES:
1. UNLESS OTHERWISE STATED, LEGEND AND SCHEDULES



REVISIONS

NO.	DESCRIPTION AND DATE	INITIAL AND DESIGNATION		
		MAN	CKD	AUTH
A	1. CLOUDING WORK OR ANYWHERE REVISED IS ABOVE ACCORDING TO PNAP ADM-33 2. ADDITIONAL BATCH SHOP DRAWINGS EXHIBIT IS DELETED 3. HYPHEN BLOCK OF F2 TO CLARK HD 4. GOLDY TEXT IN ILLUSTRATION IS REVISED ACCORDING TO PNAP ADM-3 5. SITE BOUNDARY OF KEY PLAN IS ADDED 15/09/2017	NAHAS	SHUM BTC	ADM
B	1. OVERLAPPING OUTLINE AND GROUND LINE ARE RECTIFIED 28/09/2017	CHU ADM	SHUM BTC	ADM
C	1. GRID LINE ADDED 2. ELEVATION REVISED 14/09/2018	CHU ADM	SHUM BTC	ADM

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	EDMUND CHAN SM/BTC	ORIGINAL SIGNED	01/2017
CHECKED	S.M. CHOI ADM	ORIGINAL SIGNED	01/2017
	S.K. CHAN STO/BTC	ORIGINAL SIGNED	01/2017
DRAWN	JASON WONG TOU/H6	ORIGINAL SIGNED	01/2017

PROJECT
YUE WAN ESTATE
PHASED DEVELOPMENT -
WING TAI ROAD, CHAI WAN

DRAWING TITLE
SITE ELEVATION 2

SCALE 1:200 (A0)

DRAWING NO.
ET06/ICU/A/GBP-08/C

SOURCE

EDM NO.

HOUSING DEPARTMENT

DATE OF ISSUE : | C.E. | S.E. | HKWCDR | R.E. | S.E. | Contractor | Partnered | COPY ISSUED


WING TAI ROAD
MULTI-STOREY CARPARK
TSUI CHING HOUSE
CHAI WAN FAITH LUTHERAN PRIMARY SCHOOL
EXISTING ESTATE ROAD / EVA
COVERED WALKWAY
OUT
IN
EVA
COVERED EVA
COVERED CPA
CRA
COVERED PASSAGE
F.S UPFEED WATER AND
REFER TO DESCRIPTION 7 OF ANNEX 7
REFER TO DESCRIPTION 8 OF ANNEX 7
4500L FS WATER TANK
EMR 2 AT MEZZ LEVEL
TRANSFORMER ROOM (HV SWITCHGEAR COMPARTMENT)
19500L FLUSH WATER TANK
FRESH AND FLUSH WATER PUMP ROOM
9500L FRESH WATER TANK
TRANSFORMER ROOM (TRANSFORMER COMPARTMENT)
MAIN SWITCH ROOM
TELECOM ROOM
STORE ROOM
MAIN T.B.E ROOM
J.C.P/M.R.P
M/C ROOM
RS & MRC
MAIL ROOM
LIFT LOBBY
GUARD COUNTER
GROUND FLOOR PLAN
SCALE 1 : 100
PART PLAN OF ELECTRIC METER ROOM 2 AT MEZZ LEVEL (+6.78)
SCALE 1 : 100
SECTION A-A
SCALE 1 : 100
TYPICAL ELEVATION OF RAIN SHELTER
SCALE 1 : 50
ACCESS TO FIREMAN'S LIFT (LIFT NO.1 & 4) A" C/F
MARK | DISTANCE PROVIDED (m)
TOTAL= 17.041 < 18m (MAX. ALLOWED)
ICU Ref.: HD(ICU)
Signature of Applicant (HD / PSP) :
ICU Approved Signature :
Signature for Record Plan :
NOTES:
1. UNLESS OTHERWISE STATED, LEGEND & ABBREVIATION REFER TO DWG. NO. ET06/ICU/A/GBP-01
REVISIONS
INITIAL AND DESIGNATION
NO. | DESCRIPTION AND DATE | MIN. | CHO | AUTH
AUTHORISED
CHECKED
DRAWN
NAME AND DESIGNATION | INITIAL | DATE
EDMUND CHAN SM/BTC | ORIGINAL SIGNED | 31/2/2017
S.M. CHOI AOM | ORIGINAL SIGNED | 31/2/2017
S.K. CHAN STO/BTC | ORIGINAL SIGNED | 31/2/2017
JASON WONG TO/AMS | ORIGINAL SIGNED | 31/2/2017
DATE OF ISSUE
PROJECT
YUE WAN ESTATE
PHASED DEVELOPMENT -
WING TAI ROAD, CHAI WAN
DRAWING TITLE
GROUND FLOOR PLAN
SCALE AS SHOWN (A0)
DRAWING NO.
ET06/ICU/A/GBP-09/D
SOURCE
EDM NO.
HOUSING DEPARTMENT
PENDING FINAL VERSION

ICU Ref.: HD(ICU)

Signature of Applicant (HD / PSP) :

ICU Approved Signature :

Signature for Record Plan :

NOTES:
* UNLESS OTHERWISE STATED, LEGEND & ABBREVIATION REFER TO DWG. NO. ET06/ICU/A/GBP-01.

REVISIONS

NO.	DESCRIPTION AND DATE	INITIAL AND DESIGNATION	
		MTR	CHOI
3	1. UNDERSIDE OF WALL AND ADJUSTED 2. RAILING ADDED 3. COLOURING OF METAL LADDER AND DECK ARE REVISED 4. LIFT NO.1 TO LIFT NO.4 ARE REVISED 5. ALTERNATIVE NOTED (LAYOUT REVISED)	KTW	CHOI
4		KTW	CHOI
5	1. TURN CLOCKWISE 2. GRID LINE CLARIFIED 3. STAIRCASE ANNOTATION ADDED 4. NORTH SYMBOL ADDED	TSWMO	CHOI

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	EDMUND CHAN SM/BTC	ORIGINAL SIGNED	01/2017
CHECKED	S.M. CHOI AD/I	ORIGINAL SIGNED	01/2017
	S.K. CHAN STO/BTC	ORIGINAL SIGNED	01/2017
DRAWN	JASON WONG TOU/W6	ORIGINAL SIGNED	01/2017

PROJECT
YUE WAN ESTATE
PHASED DEVELOPMENT -
WING TAI ROAD, CHAI WAN

DRAWING TITLE
FIRST FLOOR PLAN

SCALE 1:100 (A3)

DRAWING NO.
ET06/ICU/A/GBP-10/D

SOURCE

EDMS NO.

HOUSING DEPARTMENT

DATE OF ISSUE: 01/2017

COPY TO: Contractor / Consultant / Others — D.E. / S.E. / LO/HC/CM — D.E. / S.E. / Others

PART PLAN AT F36

DEADEND TRAVEL DISTANCE WITHIN FLAT NO.8	
MARK	DISTANCE PROVIDED (m)
a	1.050
b	4.340
TOTAL=	5.390 < 24m (MAX. ALLOWED)

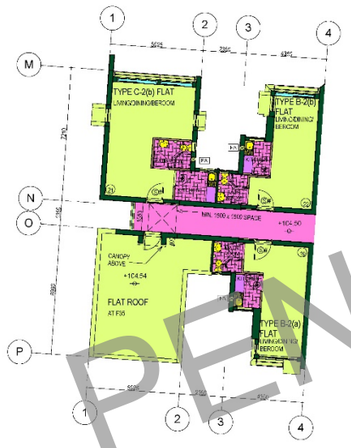
DEADEND TRAVEL DISTANCE FROM EXIT OF FLAT NO.8 TO A POINT, FROM WHICH TRAVEL IN DIFFERENT DIRECTION	
MARK	DISTANCE PROVIDED (m)
c	1.150
d	3.838
TOTAL=	4.988 < 15m (MAX. ALLOWED)

TRAVEL DISTANCE FROM EXIT OF FLAT NO.8 TO THE NEAREST REQUIRED STAIRCASE	
MARK	DISTANCE PROVIDED (m)
c	1.150
d	3.838
e	0.874
f	0.850
g	0.564
TOTAL=	7.376 < 24m (MAX. ALLOWED)

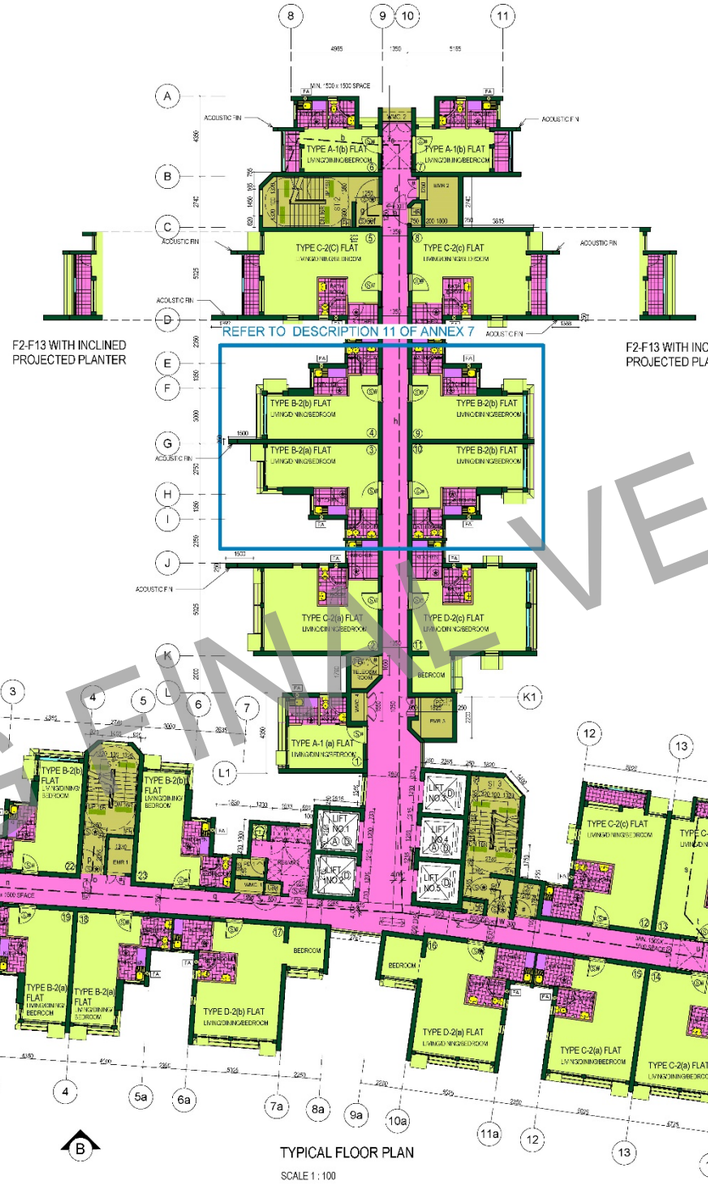
DEADEND TRAVEL DISTANCE WITHIN FLAT NO.21	
MARK	DISTANCE PROVIDED (m)
j	3.652
k	1.571
l	3.440
TOTAL=	8.663 < 24m (MAX. ALLOWED)

DEADEND TRAVEL DISTANCE FROM EXIT OF FLAT NO.21 TO A POINT, FROM WHICH TRAVEL IN DIFFERENT DIRECTION	
MARK	DISTANCE PROVIDED (m)
m	1.017
n	9.315
TOTAL=	10.367 < 15m (MAX. ALLOWED)

TRAVEL DISTANCE FROM EXIT OF FLAT NO.21 TO THE NEAREST REQUIRED STAIRCASE	
MARK	DISTANCE PROVIDED (m)
m	1.017
n	9.315
o	1.156
p	1.506
TOTAL=	13.029 < 24m (MAX. ALLOWED)



PART PLAN AT F35



TYPICAL FLOOR PLAN

SCALE 1 : 100

F2-F13 WITH INCLINED PROJECTED PLANTER

F2-F13 WITH INCLINED PROJECTED PLANTER

STAIRCASE SEPERATION BETWEEN ST-2 AND ST-3	
MARK	DISTANCE PROVIDED (m)
u	0.674
f	0.850
g	0.564
h	35.177
	7.57
w	0.565
x	1.374
c	0.725
z	5.134
TOTAL=	47.988 < 48m (MAX ALLOWED); > 6m (MIN REQUIRED)

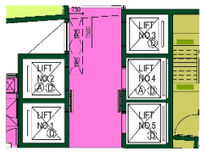
STAIRCASE SEPERATION BETWEEN ST-1 AND ST-3	
MARK	DISTANCE PROVIDED (m)
o	1.136
p	1.506
q	16.907
w	0.565
x	9.374
c	0.725
z	5.134
TOTAL=	35.357 < 48m (MAX ALLOWED); > 6m (MIN REQUIRED)

DEADEND TRAVEL DISTANCE WITHIN FLAT NO.13	
MARK	DISTANCE PROVIDED (m)
r	3.204
s	5.257
t	1.694
TOTAL=	10.156 < 24m (MAX. ALLOWED)

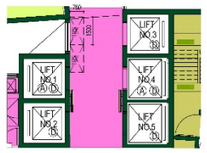
DEADEND TRAVEL DISTANCE FROM EXIT OF FLAT NO.13 TO A POINT, FROM WHICH TRAVEL IN DIFFERENT DIRECTION	
MARK	DISTANCE PROVIDED (m)
u	1.372
v	11.265
TOTAL=	12.637 < 24m (MAX. ALLOWED)

REFER TO DESCRIPTION 10 OF ANNEX 7

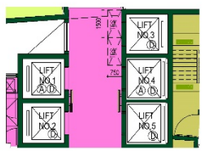
TRAVEL DISTANCE FROM EXIT OF FLAT NO.13 TO THE NEAREST REQUIRED STAIRCASE	
MARK	DISTANCE PROVIDED (m)
u	1.372
v	11.265
w	0.565
x	1.374
y	0.725
TOTAL=	15.301 < 24m (MAX. ALLOWED)



PART PLAN OF LIFT LOBBY AT HIGH ZONE (F27-F36)



PART PLAN OF LIFT LOBBY AT MIDDLE ZONE (F17-F26)



PART PLAN OF LIFT LOBBY AT LOW ZONE (F1-F16)

FLAT NO.	ACOUSTIC BALCONY	NOS. OF FLAT
13	1/F - F36	36
12		36
8		36
7		36
6		36
5		36
TOTAL		216

FLAT NO.	ACOUSTIC WINDOW	NOS. OF FLAT
23	1/F - F36	36
22		36
21		36
11		36
10		36
9		36
4		36
TOTAL		252

TABLE SHOWING ACOUSTIC WINDOW AND ACOUSTIC BALCONY FLATS

ICU Ref.: HD(ICU)_____

Signature of Applicant (AD / PRP) :

ICU Approval Signature :

Signature for Record Plan :

NOTES:

1. UNLESS OTHERWISE STATED, LEGEND & ABBREVIATION REFER TO DWG NO. E-22(CUA)CB-01.
2. MIN. VENTILATION REQUIREMENT FOR ACOUSTIC WINDOWS REFER TO "ENVIRONMENTAL STUDY FOR THE PUBLIC HOUSING DEVELOPMENT AT WING TAI ROAD, CHAI WAN(EACH HABITABLE ROOM/KITCHEN/BATHROOM IN DOMESTIC FLATS WITH ACOUSTIC WINDOWS GATED ZONE)" THE RESULTS INDICATE THAT ALL MITIGATED ROOMS COMPLY WITH THE REQUIREMENT OF 1.5ACH AS STIPULATED IN THE EIA-EP APP-12.

REVISIONS		INITIAL AND DESIGNATION	
NO.	DESCRIPTION AND DATE	MTK	CKC
4	1. COLOURING OF MTRC PLAN AND FLOOR PLAN ARE REVISED. 2. DELETION OF TOP FLOOR PLAN IS REVISED. TYPICAL FLOOR PLAN IS REVISED. 15/12/2017	ICTW A079	ETCH BTCC
3	1. TBS DIMENSIONS REVISED. 2. ORIENTATION OF PART PLAN, TYPICAL FLOOR PLAN AND STAIRCASE DISTRIBUTION REVISED. 29/9/2017	TCAW/S	ETCH BTCC
2	1. GRID JNK CLARIFIED. 2. ACOUSTIC BALCONY REVISED. 11/7/2017	ICTW A079	ETCH BTCC

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	EDMUND CHAN SM/ITC	ORIGINAL SIGNED	31/2/017
CHECKED	S.M. CHOI AD/S	ORIGINAL SIGNED	31/2/017
	S.K. CHAN ST/D/ITC	ORIGINAL SIGNED	31/2/017
D'MAN	JASON WONG TO/A/R5	ORIGINAL SIGNED	31/2/017

PROJECT
YUE WAN ESTATE
PHASED DEVELOPMENT -
WING TAI ROAD, CHAI WAN

DRAWING TITLE
TYPICAL FLOOR PLAN

SCALE 1:100 (A3)

DRAWING NO.
ET06/ICU/A/GBP-11/D

SOURCE

ICU NO.

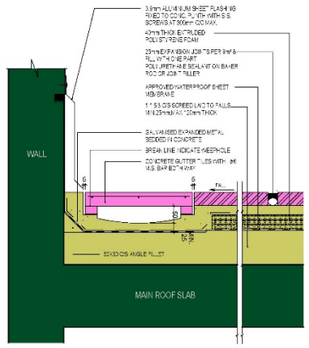
HOUSING DEPARTMENT

DATE OF ISSUE : D.E. / Others / S.E. / H/W(CON) / S.E. / Contractor / Architect

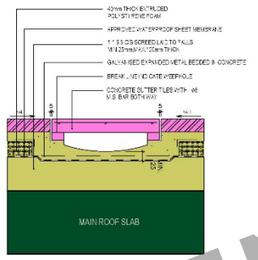
COPY / USE

REFUSE AREA REQUIRED		
G.F.A. OF TYPICAL FLOOR (m²)	FACTOR	G.F.A. OF TYPICAL FLOOR (m²) x FACTOR = AREA REQUIRED (m²)
1012.836	0.5	506.418

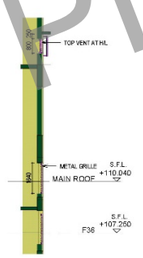
REFUSE AREA PROVIDED	
USAGE	AREA (m²)
REFUGE AREA 1	18.359
REFUGE AREA 2	27.847
REFUGE AREA 3	28.785
REFUGE AREA 5	75.517
REFUGE AREA 4	40.996
REFUGE AREA 6	72.899
REFUGE AREA 7	63.271
REFUGE AREA 8	39.263
REFUGE AREA 9	200.974
TOTAL=	567.910 > 506.418 (REQUIRED)



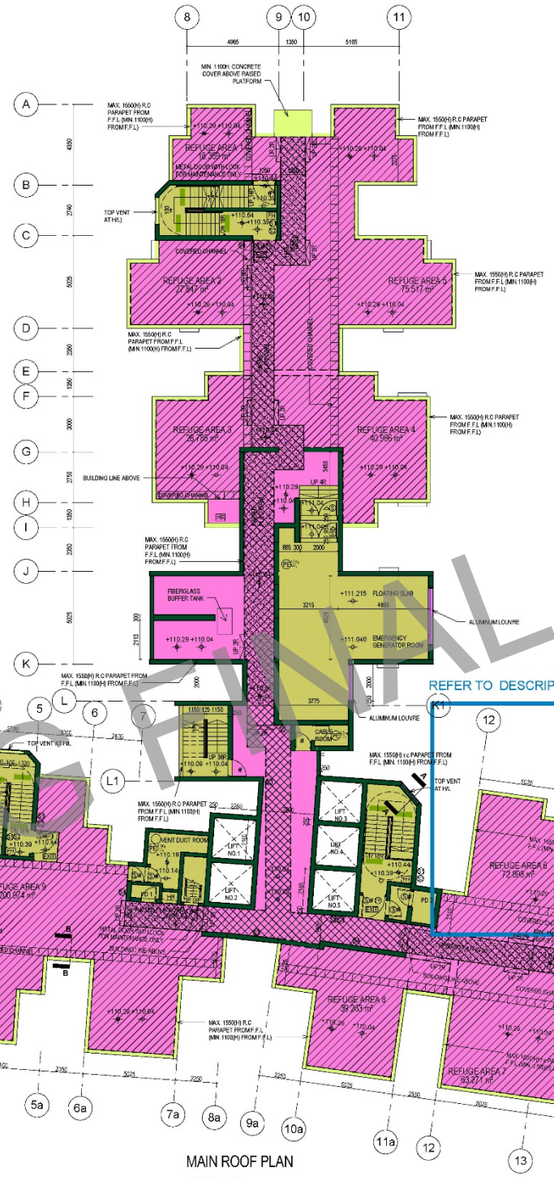
TYPICAL SECTION B OF ROOF CHANNEL
(FOR REFERENCE ONLY)
SCALE 1 : 5



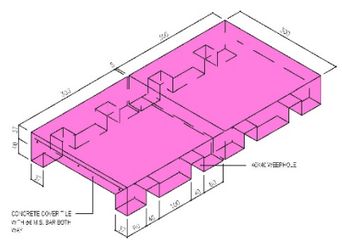
TYPICAL SECTION C OF ROOF CHANNEL
(FOR REFERENCE ONLY)
SCALE 1 : 5



TYPICAL SECTION A OF TOP VENT AT STAIRCASE
SCALE 1 : 100



MAIN ROOF PLAN
SCALE 1 : 100



ISOMETRIC VIEW OF ROOF CHANNEL COVER TILES
(FOR REFERENCE ONLY)
SCALE 1 : 5

ICU Ref.: HD(ICU)_____

Signature of Applicant (HD / PSP) :

ICU Approved Signature :

Signature for Record Plan :

NOTES:

1. UNLESS OTHERWISE STATED, LEGEND & ABBREVIATION REFER TO DWG. NO. ET06/ICU/A/GBP-01.

LEGEND

- REFUGE AREA DEMARCATED FROM NON REFUGE AREA BY FLOOR MARKING
- UNOBSTRUCTED AREA CONNECTING REFUGE AREA
- UNOBSTRUCTED AREA CONNECTING REFUGE AREA WITH RAISED PLATFORM
- S1 SIGN PANEL FOR REFUGE FLOOR
- S2 SIGN PANEL FOR STAIRCASE FLOOR
- S3 DIRECTIONAL SIGN PANEL FOR EXIT TO STAIRCASE
- S4 DIRECTIONAL SIGN PANEL FOR EXIT TO REFUGE FLOOR

REVISIONS		INITIAL AND DESIGNATION		
NO	DESCRIPTION AND DATE	DWN	CKD	AUTH
B	1. TYPICAL SECTION B ADDED 2. LEVEL OF ROOF CHANNEL ADDED 3. ADDED "REFER TO DWG. NO. ET06/ICU/A/GBP-01" REVISED 19/1/2017	LEW ALEX	HWONG BRC	AUTH
C	1. TO ADD TYPICAL SECTION C OF ROOF CHANNEL 2. TOP VENT DETAILS REVISED 3. ISOMETRIC VIEW ADDED 4. PART SECTION ADDED 23/3/2017	CHU ALEX	EDWD BRC	AUTH
D	1. TO ADD TYPICAL SECTION A OF TOP VENT AT STAIRCASE 2. DWG. NO. REVISED 14/4/2017	LEW ALEX	HWONG BRC	AUTH

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	EDMUND CHAN DM&TC	ORIGINAL SIGNED	01/2017
CHECKED	S.M. CHOI AU50	ORIGINAL SIGNED	01/2017
	S.K. CHAN ET/GBP/TC	ORIGINAL SIGNED	01/2017
DRAWN	JASON WONG TO/AM6	ORIGINAL SIGNED	01/2017

PROJECT
YUE WAN ESTATE
PHASED DEVELOPMENT -
WING TAI ROAD, CHAI WAN

DRAWING TITLE
MAIN ROOF PLAN

SCALE AS SHOWN (A0)

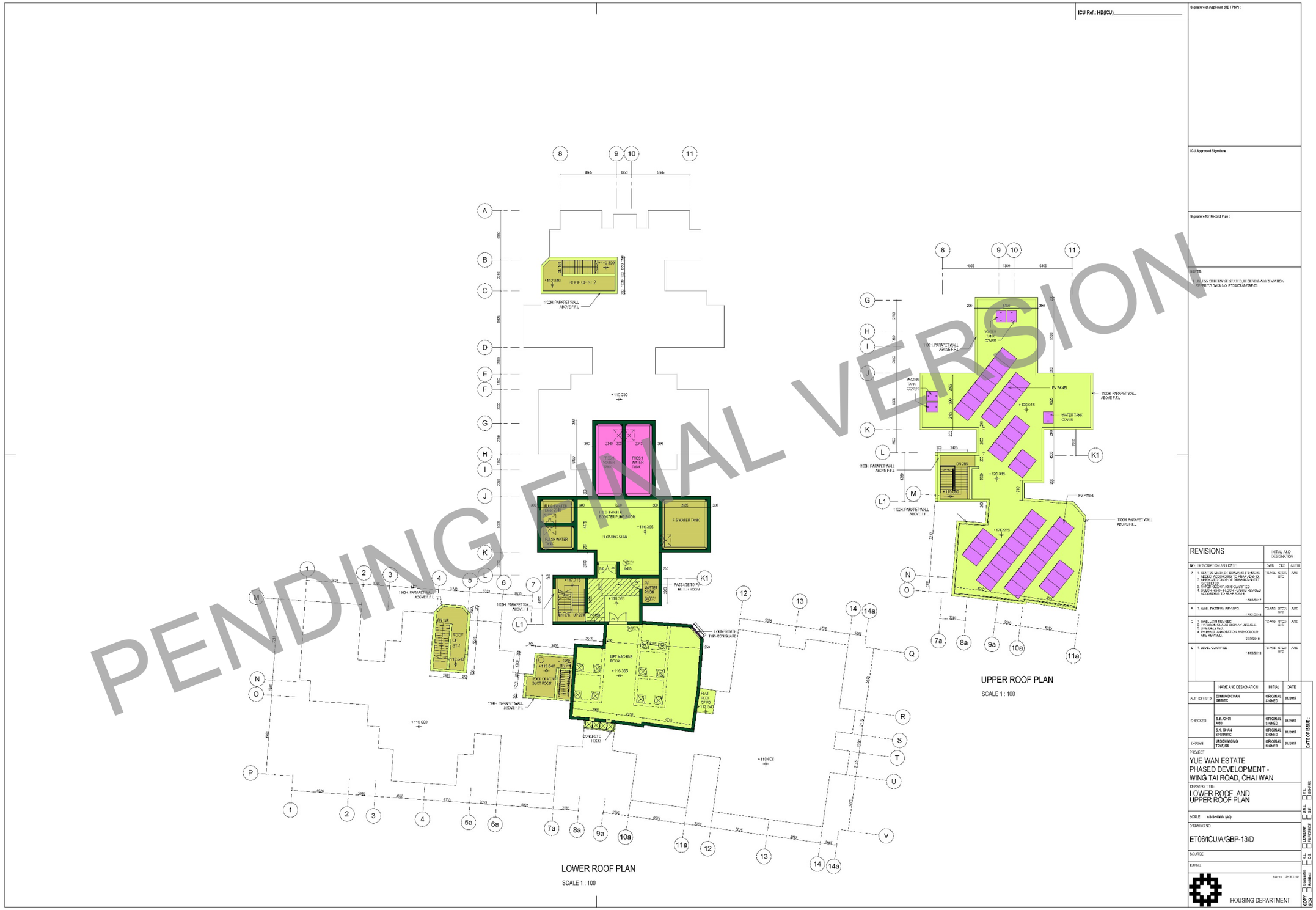
DRAWING NO.
ET06/ICU/A/GBP-12/D

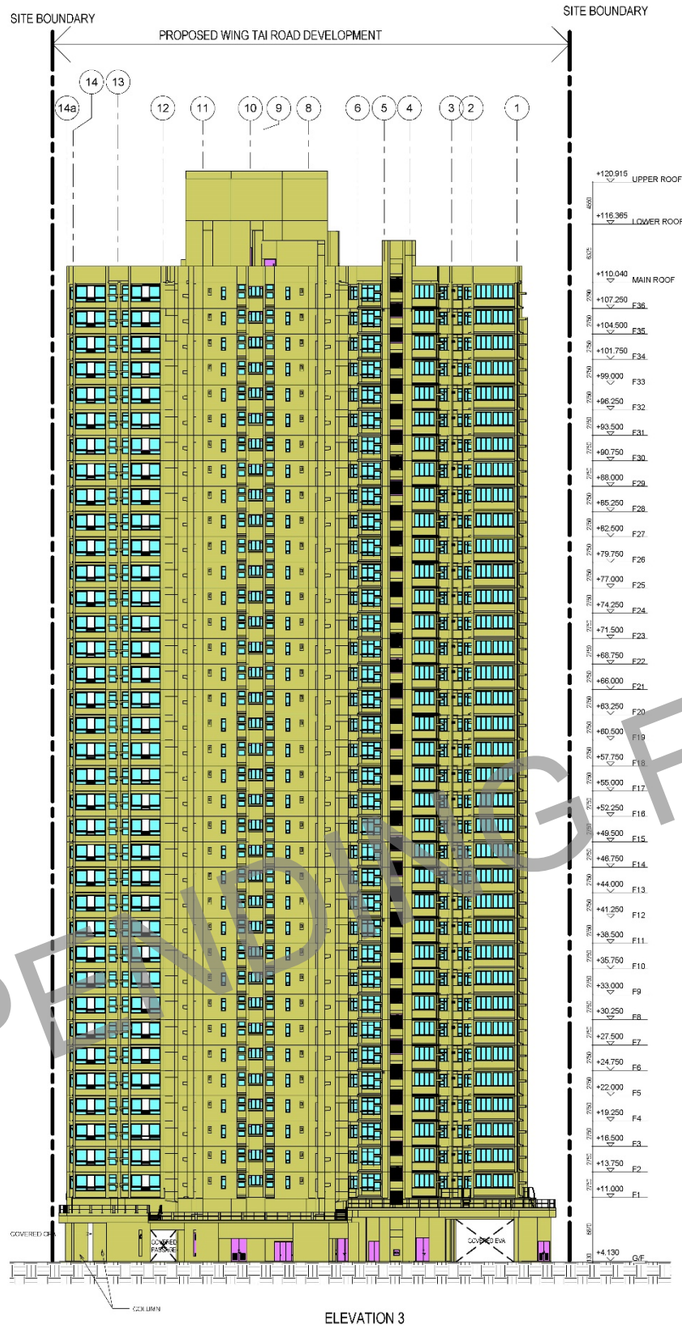
SOURCE

ICU NO.

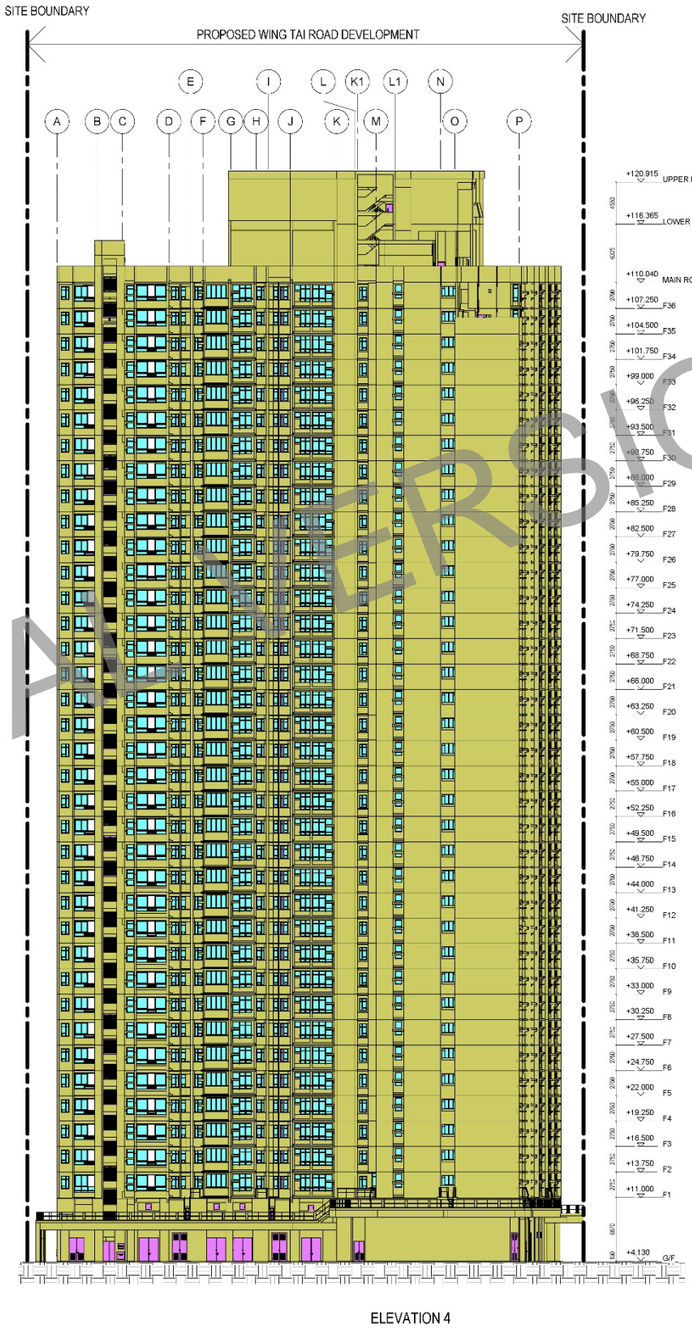
HOUSING DEPARTMENT

DATE OF ISSUE : C/E ☐ CHKD ☐ B/E ☐ CHKD ☐ R/E ☐ CHKD ☐ Contractor ☐ CHKD ☐ COPY ISSUED


ICU Ref.: HD(ICU)
Signature of Applicant (HD / PRP) :
ICU Approved Signature :
Signature for Record Plan :
NOTE:
1. FOR ROOF DRAINAGE SYSTEM, LEGEND & ANNOTATION REFER TO DWG NO. ET06/ICU/A/GBP-01
LOWER ROOF PLAN
SCALE 1 : 100
UPPER ROOF PLAN
SCALE 1 : 100
PENDING FINAL VERSION
REVISIONS
INITIAL AND DESIGNATION
NO. DESCRIPTION AND DATE
PROJECT
YUE WAN ESTATE
PHASED DEVELOPMENT -
WING TAI ROAD, CHAI WAN
DRAWING TITLE
LOWER ROOF AND
UPPER ROOF PLAN
SCALE AS SHOWN (A0)
DRAWING NO.
ET06/ICU/A/GBP-13/D
SOURCE
EDM NO.
HOUSING DEPARTMENT



ELEVATION 3



ELEVATION 4

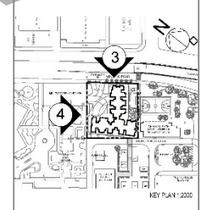
ICU Ref.: HD(ICU)_____

Signature of Applicant (HD / PSP) :

ICU Approved Signature :

Signature for Record Plan :

NOTES:
1. UNLESS OTHERWISE STATED LEGEND AND SCHEDULES REFER TO DWG. NO. ET00/CUR/GBP-01&02.



REVISIONS		INITIAL AND DESIGNATION		
NO.	DESCRIPTION AND DATE	MPK	CKC	AUTH
A	1. GSA ON WORK OR DRAWING 1 WALING AREAS ACCORDING TO PAVEMENT TO ADDED 2.REVISED CHOP FOR DRAWING SHEET 03 DELETED 3. PARCEL DESC AT ABS CLAUSE (2) 4. COLOURING OF BEAM, SONG WALL HATCHING ACCORDING TO PAVEMENT 5. SITE BOUNDARY OF KEY PLAN 3 ADDED 15/05/2017	TCK/MS	SYC/CKC	ADW
B	1. HATCH ON PAVEMENT 26/09/2016	TCK/MS	SYC/CKC	ADW
C	1. HATCH ON PAVEMENT 2. GRADE LINE ADDED 14/06/2016	CKC/CKC	SYC/CKC	ADW

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	EDMUND CHAN SM/ITC	ORIGINAL SIGNED	01/2017
CHECKED	S.M. CHOI ASD	ORIGINAL SIGNED	01/2017
	S.K. CHAN STO/SITC	ORIGINAL SIGNED	01/2017
DRAWN	JASON WONG TCK/JRS	ORIGINAL SIGNED	01/2017

DATE OF ISSUE: JAN 2017

PROJECT
YUE WAN ESTATE
PHASED DEVELOPMENT -
WING TAI ROAD, CHAI WAN

DRAWING TITLE
ELEVATION 3 & 4

SCALE 1:200 (A0)

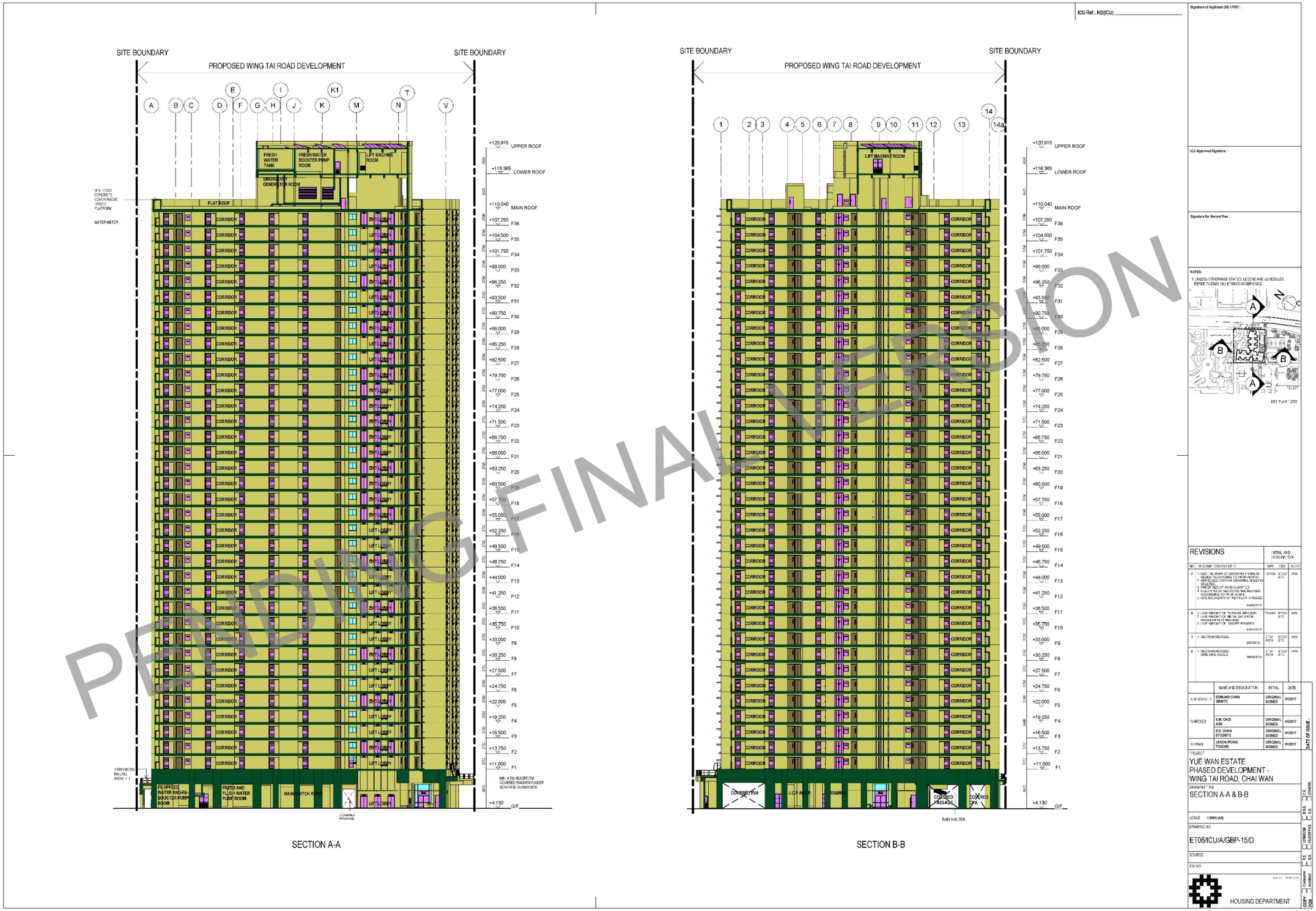
DRAWING NO.
ET06/ICU/A/GBP-14/C

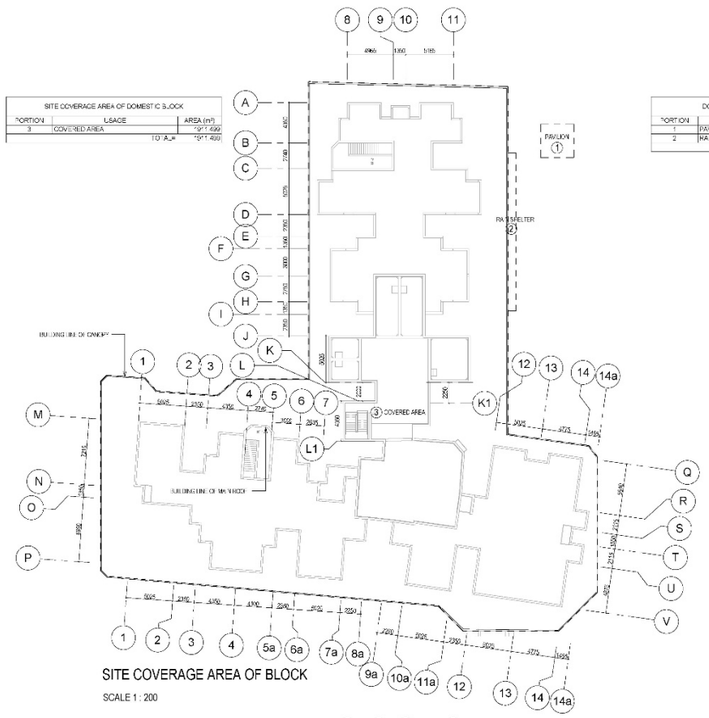
SOURCE

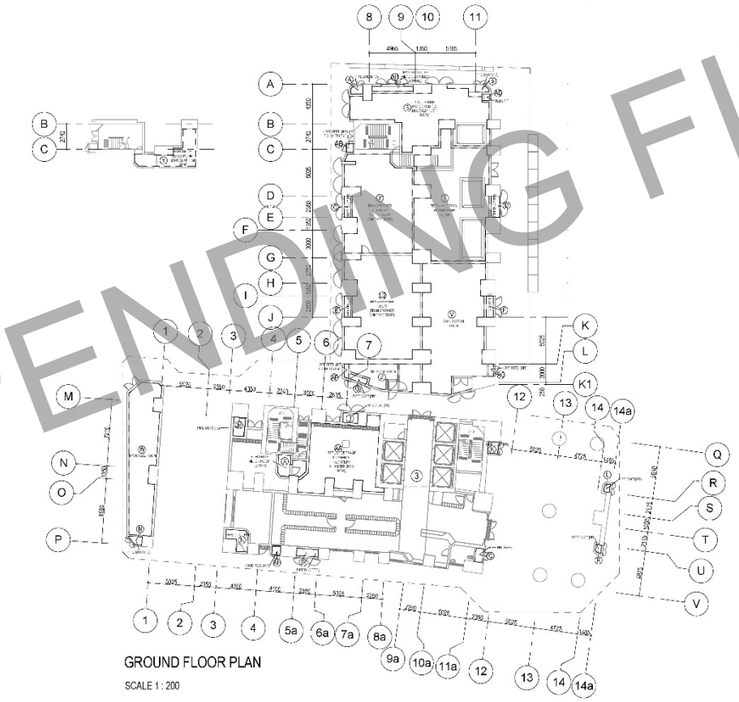
EDI NO.

HOUSING DEPARTMENT

COPY FOR: Contractor / Vendors; S.I.E. & C.; LANDSCAPE / MAINTENANCE; S.I.E. & C.; OTHERS







ICU Ref.: HD(ICU)_____

AREAS OF G.F.A. CONCESSIONS UNDER PNAP ADM-2 APPENDIX G

DISREGARDED G.F.A. UNDER BUILDING (PLANNING) REGULATIONS 23 (3) (b)

2. PLANT ROOMS AND SIMILAR SERVICES

USAGE	LOCATION	PORTION	AREA(m²)	NOS. OF STOREY	TOTAL(m²)
2.1					
REFUSE STORAGE & MATERIAL RECOVERY CHAMBER (RSRC)	GF	AA	64.099	1	64.099
LIFT MACHINE ROOM	LOWER ROOF	L	97.333	1	97.333
TELECOM ROOM	F1 TO F36	L	2.442	36	87.912
REFUSE STORAGE & MATERIAL RECOVERY ROOM (RS & MRR)	F1 TO F36	P	9.467	36	340.830
MAIN T.S.E ROOM	GF	W	45.588	1	45.588
R.I.E.COM ROOM	GF	Z	16.615	1	16.615
2.2					
EMERGENCY GENERATOR ROOM	MAIN ROOF	A	70.536	1	70.536
WATER METER CUPBOARD 1 (WMC 1)	F1 TO F36	A	0.621	36	21.636
MASTER WATER METER CHAMBER (MWMC)	GF	AB	3.067	1	3.067
HOSE REEL (WET) & TOILET (FSI)	GF	AE	0.690	1	0.690
HOSE REEL (WET) & TOILET (FSI)	GF	AI	0.587	1	0.587
HOSE REEL (WR)	GF	AG	0.715	1	0.715
HOSE REEL (WR)	GF	AH	0.866	1	0.866
CABLE ROOM	MAIN ROOF	B	4.740	1	4.740
WATER METER CUPBOARD 2 (WMC 2)	F1 TO F36	B	0.581	36	20.916
VENT DUCT ROOM	MAIN ROOF	C	13.194	1	13.194
WATER METER CUPBOARD 3 (WMC 3)	F1 TO F36	C	0.581	36	20.916
WATER METER CUPBOARD 4 (WMC 4)	F1 TO F36	D	1.078	36	38.808
HOSE REEL 1 (WR1)	F1 TO F36	E	0.548	36	19.728
HOSE REEL	MAIN ROOF	F	0.660	1	0.660
HOSE REEL 2 (WR2)	F1 TO F36	F	0.693	36	24.948
FRESH WATER TANK	LOWER ROOF	G	37.283	1	37.283
HOSE REEL 3 (WR3)	F1 TO F36	G	0.539	36	19.404
ELECTRICAL METER ROOM 1 (EMR 1)	GF	H	2.543	1	2.543
TELECOM R.I. TANK	LOWER ROOF	H	17.741	1	17.741
ELECTRICAL METER ROOM 2 (EMR 2)	F1 TO F36	J	5.624	36	202.464
FLUSHWATER TANK	LOWER ROOF	J	23.075	1	23.075
ELECTRICAL METER ROOM 3 (EMR 3)	F1 TO F36	K	4.104	36	147.744
FRESH WATER BOOSTER PUMP ROOM	LOWER ROOF	K	47.322	1	47.322
F.S. (UPFEED WATER AND F.S. BOOSTER PUMP ROOM	GF	S	60.247	1	60.247
FRESH AND FLUSH WATER PUMP ROOM	GF	T	93.029	1	93.029
TRANSFORMER ROOM (HV SWITCHGEAR COMPARTMENT)	GF	U1	68.113	1	68.113
TRANSFORMER ROOM (TRANSFORMER COMPARTMENT)	GF	U2	80.494	1	80.494
MAIN SWITCH ROOM	GF	V	85.422	1	85.422
ELECTRICAL METER ROOM (EMR 1)	F1 TO F36	X	5.579	36	5.579
ELECTRICAL METER ROOM 1 (EMR 2) AT HIGH LEVEL	GF	Y	12.739	1	12.739
				TOTAL=	1993.624

AMENITY FEATURES

21. PIPE DUCT FOR MANDATORY FEATURE OR ESSENTIAL PLANT ROOM

USAGE	LOCATION	PORTION	AREA(m²)	NOS. OF STOREY	TOTAL(m²)
PIPE DUCT (PD)	GF	A	1.102	1	1.102
PIPE DUCT (PD)	GF	B	0.903	1	0.903
PIPE DUCT (PD)	GF	C	1.586	1	1.586
PIPE DUCT (PD)	GF	D	2.112	1	2.112
PIPE DUCT 1 (PD1)	MAIN ROOF	D	1.628	1	1.628
PIPE DUCT (PD)	GF	E	1.044	1	1.044
PIPE DUCT 2 (PD2)	MAIN ROOF	E	3.527	1	3.527
PIPE DUCT (PD)	GF	G	1.660	1	1.660
PIPE DUCT (PD)	GF	I	1.041	1	1.041
PIPE DUCT (PD)	GF	H	7.497	1	7.497
PIPE DUCT (PD)	GF	J	1.701	1	1.701
PIPE DUCT (PD)	GF	K	1.405	1	1.405
PIPE DUCT (PD)	GF	L	0.494	1	0.494
PIPE DUCT 1 (PD1)	F1 TO F36	M	1.661	36	59.796
PIPE DUCT (PD)	GF	M	1.060	1	1.060
PIPE DUCT 2 (PD2)	F1 TO F36	N	2.127	36	76.572
PIPE DUCT (PD)	GF	N	4.003	1	4.003
PIPE DUCT (PD)	GF	P	1.660	1	1.660
PIPE DUCT (PD)	GF	Q	1.274	1	1.274
PIPE DUCT (PD)	GF	R	0.495	1	0.495
				TOTAL=	155.196

*BREAK DOWN REFER TO DWG.NO. ET06/ICU/A/GBP-16 & 17

REFER TO DESCRIPTION 13 OF ANNEX 7

DOMESTIC G.F.A. OF GROUND FLOOR (D1a)

PORTION	USAGE	AREA (m²)
3	COVERED AREA	1911.400

NON-ACCOUNTABLE DOMESTIC G.F.A. OF GROUND FLOOR (D1b)

A	PIPE DUCT(PD)	1.102
AA	REFUSE STORAGE & MATERIAL RECOVERY CHAMBER (RSRC & MRR)	64.099
AB	MASTER WATER METER CHAMBER (MWMC)	3.067
AD	DRAIN PIT	3.625
AE	HOSE REEL (WR) F.S.INLET (FSI)	0.690
AF	HOSE REEL (WR) F.S.INLET (FSI)	0.587
AG	HOSE REEL (WR)	0.715
AH	HOSE REEL (WR)	0.866
B	PIPE DUCT(PD)	0.903
C	PIPE DUCT(PD)	1.586
D	PIPE DUCT(PD)	2.112
E	PIPE DUCT(PD)	1.506
F	PIPE DUCT(PD)	1.660
G	PIPE DUCT(PD)	1.041
H	PIPE DUCT(PD)	7.497
I	PIPE DUCT(PD)	1.701
K	PIPE DUCT(PD)	1.405
L	PIPE DUCT(PD)	3.494
M	PIPE DUCT(PD)	1.060
N	PIPE DUCT(PD)	4.003
P	PIPE DUCT(PD)	1.660
Q	PIPE DUCT(PD)	1.274
R	PIPE DUCT(PD)	0.495
S	F.S. UPFEED WATER AND F.S. BOOSTER PUMP ROOM	60.247
T	FRESH AND FLUSH WATER PUMP ROOM	93.029
U1	TRANSFORMER ROOM (HV SWITCHGEAR COMPARTMENT)	68.113
U2	TRANSFORMER ROOM (TRANSFORMER COMPARTMENT)	80.494
V	MAIN SWITCH ROOM	85.422
W	MAIN T.S.E ROOM	45.588
X	ELECTRICAL METER ROOM 1 (EMR 1)	5.579
Y	ELECTRICAL METER ROOM 1 (EMR 2) AT HIGH LEVEL	12.739
Z	TELECOM ROOM	16.615
	TOTAL=	559.857

TOTAL DOMESTIC G.F.A. OF GROUND FLOOR (D1)
= D1a - D1b
= 1911.400 - 559.857
= 1351.543 m²

Signature of Applicant (AR / PBP) :

ICU Approved Signature :

Signature for Record Plan :

NOTES:
1. NOTES AND LEGENDS REFER TO DRAWING NO. ET06/ICU/A/GBP-01.

REVISIONS		INITIAL AND DESIGNATION		
NO.	DESCRIPTION AND DATE	MTK	CKC	AUTH
A	1. GFA CALCULATION DRAWING FINALIZED ACCORDING TO PNAP ADM-2 2. APPROVED COPY OF DRAWING SHEET 02 DELETED 3. ADDITION OF AS INSCRIPTION 4. FACILITIES SUCH AS MAIN ROOF TO 3 UNDERFUL PURPOSE 5. CANCELLATION FORMAT OF GFA & SC REVISED 15/09/2017	YCWS	SYCW	AON
B	1. ANNOTATION AND AREA REVISED 29/3/2018	YCWS	SYCW	AON
C	1. GRID LINE AND DIMENSION ADDED 11/09/2018	KTAI	SYCW	AON

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	EDMUND CHAN SM/ETC	ORIGINAL SIGNED	31/2/2017
CHECKED	S.M. CHOI AD6	ORIGINAL SIGNED	31/2/2017
	S.K. CHAN ST/GM/ETC	ORIGINAL SIGNED	31/2/2017
D/MAN	JASON WONG TO/AM6	ORIGINAL SIGNED	31/2/2017

PROJECT
YUE WAN ESTATE
PHASED DEVELOPMENT
WING TAI ROAD, CHAI WAN

DRAWING TITLE
CALCULATION OF GFA & SITE COVERAGE

SCALE AS SHOWN (A0)

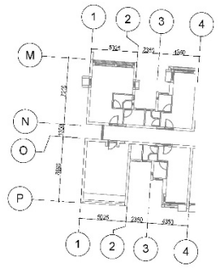
DRAWING NO.
ET06/ICU/A/GBP-16/C

SOURCE

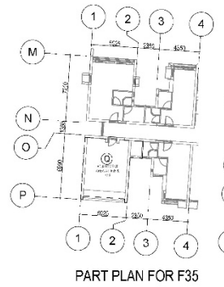
EDMS NO.

HOUSING DEPARTMENT

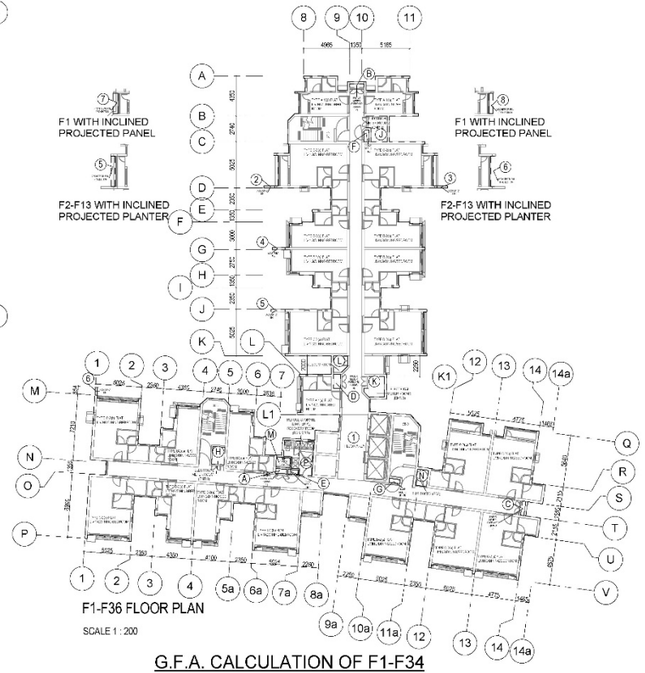
DATE OF ISSUE :
C.E. ☐ OTHERS
S.E.E. ☐
T.H/W/C/NW ☐ T.H/E/NP/KC ☐
S.E. ☐
COPY ☐ Contractor ☐ Architect



PART PLAN FOR F36



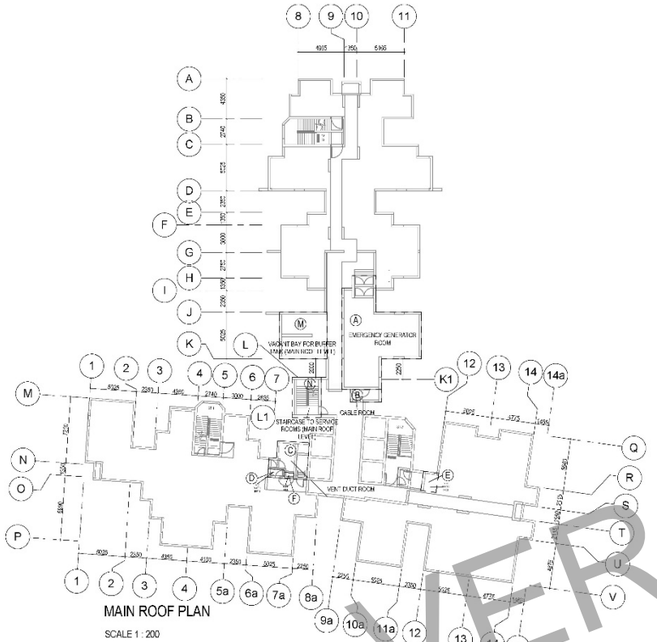
PART PLAN FOR F35



F1-F36 FLOOR PLAN

SCALE 1 : 200

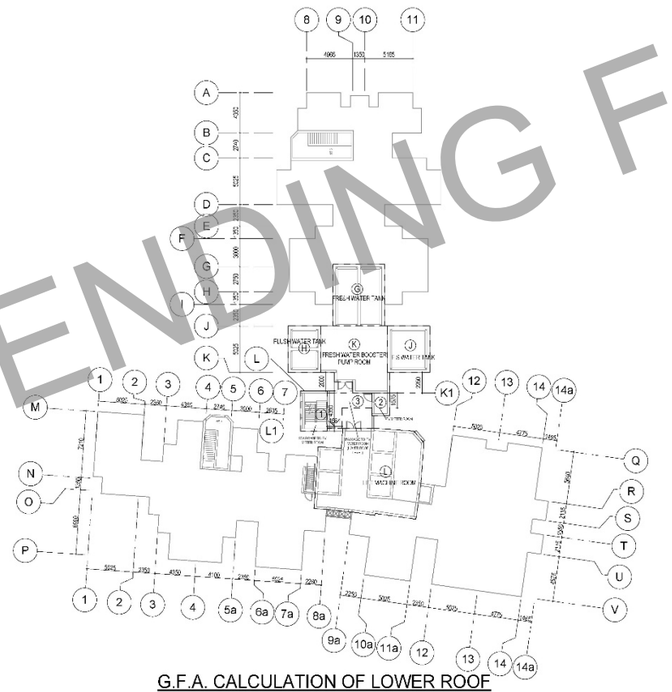
G.F.A. CALCULATION OF F1-F34



MAIN ROOF PLAN

SCALE 1 : 200

G.F.A. CALCULATION OF MAIN ROOF



G.F.A. CALCULATION OF LOWER ROOF

DOMESTIC G.F.A. OF F1 TO F34 FLOOR (S1a)

PORTION	USAGE	AREA (m²)
1	FLOOR AREA	1012.636

NON-ACCOUNTABLE DOMESTIC G.F.A. OF F1 TO F34 FLOOR (S1b)

PORTION	USAGE	AREA (m²)
A	WATER METER CUPBOARD 1 (WWC 1)	0.601
B	WATER METER CUPBOARD 2 (WWC 2)	0.581
C	WATER METER CUPBOARD 3 (WWC 3)	0.581
D	WATER METER CUPBOARD 4 (WWC 4)	1.078
E	HOSE REEL 1 (HR1)	0.548
F	HOSE REEL 2 (HR2)	0.693
G	HOSE REEL 3 (HR3)	0.526
H	ELECTRICAL METER ROOM 1 (EMR 1)	2.543
J	ELECTRICAL METER ROOM 2 (EMR 2)	5.424
K	ELECTRICAL METER ROOM 3 (EMR 3)	4.104
L	TELECOM ROOM	2.462
M	PIPE DUCT 1 (PD1)	1.651
N	PIPE DUCT 2 (PD2)	2.127
P	MAIN CABLE SIGNAL & MATERIAL RECOVERY ROOM (RS & MRR)	9.462
	TOTAL=	32.505

DOMESTIC G.F.A. PER FLOOR (S1) :
= S1a - S1b
= 1012.636 - 32.505
= 980.253 m²

TOTAL G.F.A. OF F1 TO F34 (D2)
= S1 X 34
= 33327.922 m²

DOMESTIC G.F.A. OF F35 TO F36 FLOOR (S2a)

PORTION	USAGE	AREA (m²)
1	FLOOR AREA	1012.636

NON-ACCOUNTABLE DOMESTIC G.F.A. OF F35 & F36 FLOOR (S2b)

PORTION	USAGE	AREA (m²)
A	WATER METER CUPBOARD 1 (WWC 1)	0.601
B	WATER METER CUPBOARD 2 (WWC 2)	0.581
C	WATER METER CUPBOARD 3 (WWC 3)	0.581
D	WATER METER CUPBOARD 4 (WWC 4)	1.078
E	HOSE REEL 1 (HR1)	0.548
F	HOSE REEL 2 (HR2)	0.693
G	HOSE REEL 3 (HR3)	0.526
H	ELECTRICAL METER ROOM 1 (EMR 1)	2.543
J	ELECTRICAL METER ROOM 2 (EMR 2)	5.424
K	ELECTRICAL METER ROOM 3 (EMR 3)	4.104
L	TELECOM ROOM	2.462
M	PIPE DUCT 1 (PD1)	1.651
N	PIPE DUCT 2 (PD2)	2.127
P	MAIN CABLE SIGNAL & MATERIAL RECOVERY ROOM (RS & MRR)	9.462
Q	ADJUSTMENT AREA AT F35 & F36	34.562
	TOTAL=	67.162

DOMESTIC G.F.A. PER FLOOR (S2) :
S2a - S2b
= 1012.636 - 67.162
= 945.471 m²

TOTAL G.F.A. OF F35 TO F36 (D2)
= S2 X 2
= 1891.342 m²

DOMESTIC G.F.A. OF ACOUSTIC FIN OF F1 TO F36 (S3)

PORTION	USAGE	AREA (m²)
2	ACOUSTIC FIN	0.085
3	ACOUSTIC FIN	0.285
4	ACOUSTIC FIN	0.335
5	ACOUSTIC FIN	0.375
6	ACOUSTIC FIN	0.210
	TOTAL=	1.500

TOTAL G.F.A. OF ACOUSTIC FIN OF F1 TO F36 (D4)
= S3 X 36
= 54.072 m²

DOMESTIC G.F.A. OF INCLINED PROJECTED PLANTER (IPP) AT F1 FOR FLAT NO. 6 & 7 (D5)

PORTION	USAGE	AREA (m²)
7	ARCHITECTURAL PROJECTION	1.167
8	ARCHITECTURAL PROJECTION	1.033
	TOTAL=	2.200

TOTAL G.F.A. OF F1 (D5)
= S1+ D5
= 602.453 m²

DOMESTIC G.F.A. OF INCLINED PROJECTED PLANTER (IPP) AT F2 TO F13 FOR FLAT NO. 5 & 8 (S6)

PORTION	USAGE	AREA (m²)
5	ARCHITECTURAL PROJECTION	1.464
6	ARCHITECTURAL PROJECTION	1.412
	TOTAL=	2.876

TOTAL IPP G.F.A. OF F2 TO F13 (D6)
= S5 X 12
= 33.792 m²

TOTAL G.F.A. FOR F2 TO F13 (S3)
= S1+ S6
= 980.045 m²

DOMESTIC G.F.A. OF INDOOR FLOORS (S7)

PORTION	USAGE	AREA (m²)
1	STAIRCASE TO PV METER ROOM	17.515
2	PV METER ROOM	4.514
3	PASSAGE TO PV METER ROOM (LOWER ROOF LEVEL)	11.161
	TOTAL=	78.563

NON-ACCOUNTABLE G.F.A. OF MAIN ROOF AND LOWER ROOF FLOORS

PORTION	USAGE	AREA (m²)
A	EMERGENCY GENERATOR ROOM	70.535
B	CABLE ROOM	4.710
C	VENT DUCT ROOM	13.164
D	PIPE DUCT 1 (PD1)	1.526
E	PIPE DUCT 2 (PD2)	3.527
I	HOSE REEL	0.563
G	FRESH WATER TANK	57.265
H	FLUSH WATER TANK	17.741
J	E.S.W.W.T. TANK	73.375
K	FRESH WATER BOOSTER PUMP ROOM	47.322
L	LIFT MACHINE ROOM	57.333
M	VACANT BAY FOR BUFFER TANK (MAIN ROOF LEVEL)	25.753
N	STAIRCASE TO SERVICE ROOMS (MAIN ROOF LEVEL)	13.502
	TOTAL=	366.384

TOTAL DOMESTIC G.F.A. OF BLOCK

REF. CODE	USAGE	AREA (m²)
D1	DOMESTIC G.F.A. OF GROUND FLOOR	1361.542
D2	DOMESTIC G.F.A. OF F1 TO F34	33327.922
D3	DOMESTIC G.F.A. OF F35 TO F36	1891.342
D4	DOMESTIC G.F.A. OF ACOUSTIC FIN OF F1 TO F36	54.072
D5	DOMESTIC G.F.A. OF IPP AT F1 FOR FLAT NO. 6&7	2.200
D6	DOMESTIC G.F.A. OF IPP G.F.A. OF F2 TO F13	33.792
D7	DOMESTIC G.F.A. OF ROOF FLOORS	28.880
	TOTAL=	36609.550

*BREAKDOWN REFER TO DWG.NO.ET06/ICU/A/GBP-16&17

ICU Ref.: HD(ICU)_____

Signature of Applicant (AD / PBP) :

ICU Approved Signature :

Signature for Record Plan :

NOTES:
1. NOTES AND LEGENDS REFER TO DRAWING NO. ET06/ICU/A/GBP-01

REVISIONS

NO.	DESCRIPTION	DATE	INITIAL AND DESIGNATION	
			MIN	CKD
A	1. GFA CALCULATION DRAWING HAVE BEEN AMENDED ACCORDING TO PAM PLAN 2. ADDED LEGEND FOR DRAWING SHEET 3. REVISED TITLE OF DRAWING 4. GFA CALCULATION AS PER LATEST PLANNING 5. PARTIAL ADD OF ACOUSTIC FIN 6. CALCULATION FORMAT OF GFA AS PER PNAP	MAR/2017	CHAN SIU CHI	ADS
B	ACOUSTIC FIN ADDED			

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	EDMUND CHAN SIM/ITC	ORIGINAL SIGNED	31/2/2017
CHECKED	S.M. CHOI ADS	ORIGINAL SIGNED	31/2/2017
	S.K. CHAN STO/SITC	ORIGINAL SIGNED	31/2/2017
DRAWN	JASON WONG TO(A)/65	ORIGINAL SIGNED	31/2/2017

DATE OF ISSUE: 31/2/2017

PROJECT
YUE WAN ESTATE
PHASED DEVELOPMENT
WING TAI ROAD, CHAI WAN

DRAWING TITLE
CALCULATION OF G.F.A.

SCALE 1:200 (A3)

DRAWING NO.
ET06/ICU/A/GBP-17/C

SOURCE

EDI NO.

C.E. (Works) / C.E. (Buildings) / C.E. (Landscape) / C.E. (Geotechnical) / Contractor / Others

COPY ISSUED

HOUSING DEPARTMENT

TYPE A-1 (a) FLAT

POF MODIFIED
(FLAT NO.1 FROM 1/F TO 6/F)

FLAT NOS.	PORTION		AREA (m²)
*	LIVING AREA	1	9.371
	KITCHEN	2	2.229
		*TOTAL=	11.600

USABLE FLOOR AREA(U.F.A.)
= PORTION 1
= 9.37 m²

USABLE FLOOR SPACE(U.F.S.)(INCLUDING KITCHEN)
= PORTION 1+2
= 11.60 m²

TYPE A-1 (b) FLAT

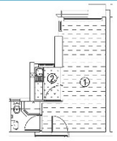
(WITH ACOUSTIC WINDOW)
(FLAT NOS.6 & 7 / 1/B2/F.1 TO 1/B6)

FLAT NOS.	PORTION		AREA (m²)
6 & 7	LIVING AREA	1	11.478
	KITCHEN	2	2.222
		*TOTAL=	13.71

USABLE FLOOR AREA(U.F.A.)
= PORTION 1
= 11.478 m²

USABLE FLOOR SPACE(U.F.S.)(INCLUDING KITCHEN)
= PORTION 1+2
= 13.7 m²

REFER TO DESCRIPTION 15 OF ANNEX 7



TYPE B-2 (a) FLAT

(FLAT NO.3,16 & 18 FROM 1/F TO 6/F)

FLAT NOS.	PORTION		AREA (m²)
3, 16 & 18	LIVING AREA	*	10.824
3, 16 & 18	KITCHEN	2	2.939
		*TOTAL=	13.413

USABLE FLOOR AREA(U.F.A.)
= PORTION 1
= 10.824 m²

USABLE FLOOR SPACE(U.F.S.)(INCLUDING KITCHEN)
= PORTION 1+2
= 13.41 m²

TYPE B-2 (b) FLAT

(WITH ACOUSTIC WINDOW)
FLAT NOS.4, 9 & 22 TO 23 FROM 1/F TO 6/F)

FLAT NOS.	PORTION		AREA (m²)
4, 9, 22 & 23	LIVING AREA	1	15.647
4, 9, 22 & 23	KITCHEN	2	2.573
		TOTAL=	18.220

USABLE FLOOR AREA(U.F.A.)
= PORTION 1
= 15.647 m²

USABLE FLOOR SPACE(U.F.S.)(INCLUDING KITCHEN)
= PORTION 1+2
= 18.220 m²

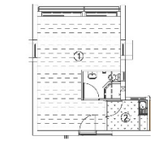
TYPE C-2 (a) FLAT

(FLAT NO.2,8,14,15 FROM 1/F TO 6/F)
(FLAT NO.20 FROM 1/F TO 6/F)

FLAT NOS.	PORTION		AREA (m²)
2, 14 & 20	LIVING AREA	1	23.330
2, 14, 15 & 20	KITCHEN	2	3.402
		TOTAL=	26.732

USABLE FLOOR AREA(U.F.A.)
= PORTION 1
= 23.330 m²

USABLE FLOOR SPACE(U.F.S.)(INCLUDING KITCHEN)
= PORTION 1+2
= 26.74 m²



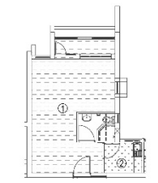
TYPE C-2 (b) FLAT

(WITH ACOUSTIC WINDOW)
(FLAT NOS.5,8,10 & 13 FROM 1/F TO 6/F)

FLAT NOS.	PORTION		AREA (m²)
2*	LIVING AREA	1	29.930
2*	KITCHEN	2	3.943
		*TOTAL=	33.681

USABLE FLOOR AREA(U.F.A.)
= PORTION 1
= 29.930 m²

USABLE FLOOR SPACE(U.F.S.)(INCLUDING KITCHEN)
= PORTION 1+2
= 33.681 m²



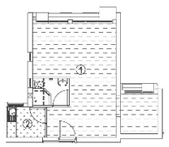
TYPE C-2 (c) FLAT

(WITH ACOUSTIC WINDOW)
(FLAT NOS.5,8,10 & 13 FROM 1/F TO 6/F)

FLAT NOS.	PORTION		AREA (m²)
5, 8, 10 & 13	LIVING AREA	1	26.253
5, 8, 10 & 13	KITCHEN	2	3.399
		*TOTAL=	29.652

USABLE FLOOR AREA(U.F.A.)
= PORTION 1
= 26.252 m²

USABLE FLOOR SPACE(U.F.S.)(INCLUDING KITCHEN)
= PORTION 1+2
= 29.652 m²



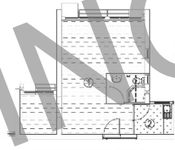
TYPE D-2 (a) FLAT

(FLAT NO.16 FROM 1/F TO 6/F)

FLAT NOS.	PORTION		AREA (m²)
*5	LIVING AREA	1	27.823
*5	KITCHEN	2	3.480
		*TOTAL=	31.303

USABLE FLOOR AREA(U.F.A.)
= PORTION 1
= 27.823 m²

USABLE FLOOR SPACE(U.F.S.)(INCLUDING KITCHEN)
= PORTION 1+2
= 31.303 m²



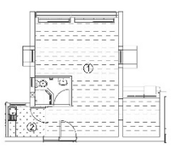
TYPE D-2 (b) FLAT

(FLAT NO.17 FROM 1/F TO 6/F)

FLAT NOS.	PORTION		AREA (m²)
*7	LIVING AREA	1	27.952
*7	KITCHEN	2	3.398
		*TOTAL=	31.350

USABLE FLOOR AREA(U.F.A.)
= PORTION 1
= 27.952 m²

USABLE FLOOR SPACE(U.F.S.)(INCLUDING KITCHEN)
= PORTION 1+2
= 31.350 m²



TYPE D-2 (c) FLAT

(WITH ACOUSTIC WINDOW)
(FLAT NO.17 FROM 1/F TO 6/F)

FLAT NOS.	PORTION		AREA (m²)
**	LIVING AREA	1	27.725
**	KITCHEN	2	3.480
		*TOTAL=	31.201

USABLE FLOOR AREA(U.F.A.)
= PORTION 1
= 27.725 m²

USABLE FLOOR SPACE(U.F.S.)(INCLUDING KITCHEN)
= PORTION 1+2
= 31.201 m²

REFER TO DESCRIPTION 14 OF ANNEX 7

TOTAL USABLE FLOOR AREA (U.F.A.) PER FLOOR

FLOOR	FLAT NOS.	AREA PER FLAT (m²)	NOS. OF FLATS	U.F.A. PER FLOOR (m²)	U.F.A. PER FLOOR (m²) x 2 STOREYS
1/F-3/F	1	9.371	1	9.371	2,618.14
1/F-3/F	2,14,15 & 20	23.330	4	93.320	3174.124
1/F-3/F	3, 16 & 18	15.824	3	47.502	1615.068
1/F-3/F	4, 9, 10, 22 & 23	15.977	5	79.235	2693.990
1/F-3/F	5, 8, 12 & 13	26.250	4	105.172	3575.848
1/F-3/F	6 & 7	11.478	2	22.955	780.524
1/F-3/F	11	27.796	1	27.796	945.032
1/F-3/F	16	27.900	1	27.900	948.372
1/F-3/F	17	27.952	1	27.952	950.368
1/F-3/F	21	23.036	1	23.036	783.224
TOTAL=		208.745	23	454.179	15762.053

TOTAL USABLE FLOOR SPACE (U.F.S.) PER FLOOR

FLOOR	FLAT NOS	AREA PER FLAT(m²)	NOS. OF FLATS	U.F.S PER FLOOR (m²)	U.F.S. PER FLOOR (m²) x 2 STOREYS
1/F-3/F	1	11.600	1	11.600	394.400
1/F-3/F	2,14,15 & 20	28.741	4	109.964	3636.776
1/F-3/F	3, 16 & 18	15.824	3	47.502	1615.068
1/F-3/F	4, 9, 10, 22 & 23	19.426	5	92.100	3131.400
1/F-3/F	5, 8, 12 & 13	29.662	4	118.788	4038.792
1/F-3/F	6 & 7	13.790	2	27.420	932.280
1/F-3/F	11	27.796	1	27.796	945.064
1/F-3/F	16	31.200	1	31.200	1060.800
1/F-3/F	17	31.350	1	31.350	1065.900
1/F-3/F	21	26.561	1	26.561	902.954
TOTAL=		253.026		531.353	17727.022

TOTAL USABLE FLOOR AREA (U.F.A.) PER FLOOR

FLOOR	FLAT NOS	AREA PER FLAT(m²)	NOS. OF FLATS	U.F.A. PER FLOOR (m²)	U.F.A. PER FLOOR (m²) x 2 STOREYS
F35-F36	1	9.371	1	9.371	18.742
F35-F36	2, 14 & 15	23.330	3	70.011	140.022
F35-F36	3, 16 & 18	15.824	3	47.502	95.004
F35-F36	4, 9, 10, 22 & 23	15.947	5	79.735	159.470
F35-F36	5, 8, 12 & 13	26.250	4	105.172	210.344
F35-F36	6 & 7	11.478	2	22.955	45.912
F35-F36	11	27.795	1	27.795	55.590
F35-F36	16	27.900	1	27.900	55.800
F35-F36	17	27.952	1	27.952	55.904
F35-F36	21	23.039	1	23.039	46.078
TOTAL=		208.778	22	440.899	881.678

TOTAL USABLE FLOOR SPACE (U.F.S.) PER FLOOR

FLOOR	FLAT NOS	AREA PER FLAT(m²)	NOS. OF FLATS	U.F.S PER FLOOR (m²)	U.F.S. PER FLOOR (m²) x 2 STOREYS
F35-F36	1	11.600	1	11.6	23.2
F35-F36	2, 14 & 15	28.741	3	86.223	160.446
F35-F36	3, 16 & 18	15.824	3	47.502	95.004
F35-F36	4, 9, 10, 22 & 23	19.426	5	92.1	184.1
F35-F36	5, 8, 12 & 13	29.662	4	118.788	237.576
F35-F36	6 & 7	13.790	2	27.42	54.84
F35-F36	11	27.796	1	27.796	55.59
F35-F36	16	31.200	1	31.200	62.406
F35-F36	17	31.350	1	31.35	62.7
F35-F36	21	26.561	1	26.561	53.302
TOTAL=		253.026		464.942	989.284

FOR USABLE FLOOR SPACE (U.F.S.) PER FLOOR
= U.F.S.(F.1/F-F.3/F) - U.F.A.(F35-F36)
= 15,762.053 - 881.678
= 14880.73 m²

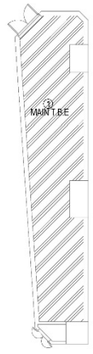
FOR USABLE FLOOR SPACE (U.F.S.) PER FLOOR
= U.F.S.(F.1/F-F.3/F) - U.F.S.(F35-F36)
= 17727.022-989.284
= 16736.305 m²

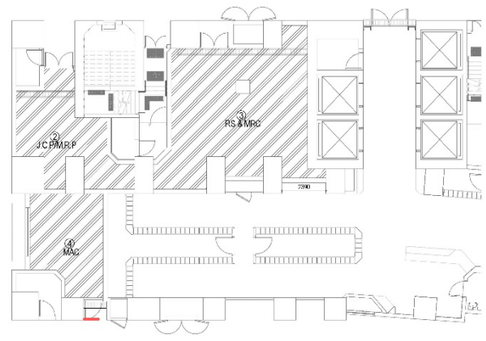
GROUND FLOOR

USABLE FLOOR AREA/ADJUSTABLE FLOOR SPACE(U.F.S.) PORTION		AREA (m²)
MAINTB/E	1	45.582
JC/PMRP	2	26.000
RS & MRC	3	54.000
MAC	4	19.405

UNDER-BALLUSTRAL SPACE (U.F.S.) FOR REFERENCE ONLY	
PORTION	AREA (m²)
1/F-3/F (DOMESTIC FLOORS)	187.16.35
MAC (GROUND FLOOR)	19.482
TOTAL	1606.796

AREA CALCULATION OF REFUSE STORAGE & MATERIAL RECOVERY CHAMBER (RS & MRC)
FLOOR SPACE OF RS & MRC REQUIRED
= TOTAL U.F.S. OF DOMESTIC AREA PER BLOCK / 347+ TOTAL U.F.S. OF DOMESTIC AREA ON GROUND FLOOR / 347
= 187.16.3067 / 347 + 19.482 / 347
= 53.994m² (EQUIVALENT)
FLOOR SPACE OF RS & MRC PROVIDED
54.0m² (PROVIDED)





U.F.A./U.F.S. OF GROUND FLOOR

ICU Ref.: HD(ICU)_____

Signature of Applicant (HD / PSP) :

ICU Approved Signature :

Signature for Record Plan :

NOTES:
1. NOTES AND LEGENDS REFER TO DRAWING NO. ET06/ICU/A/GBP-01

LEGEND

LIVING AREA / BEDROOM / BALCONY (U.F.A./U.F.S. AREA)

KITCHEN (U.F.S. ONLY)

MAIN TIE / JCP/MRP / MAC / RS & MRC (U.F.S. AREA)

PENDING FINAL VERSION

REVISIONS

NO.	DESCRIPTION AND DATE	INITIAL AND DESIGNATION: MPN	CKD	AUTH
A	1. CENTRE MARK OF DRAWING FRAME IS ADDED ACCORDING TO PAR ADVICE 2. REVISION CLOUD OF DRAWING SHEET IS DELETED 3. PARTICULARS OF AS BUILT ADDED 4. FIGURE IN BLOCK ARE REVISED TO 3 DECIMAL PLACES 5. CALCULATION FORMAT OF UFA & UFS REVISED 16/06/2017	TCWAS	EPCW EPD	ADM
B	1. LEGEND IS ADDED 19/12/2017	KTAY APS	EPCW EPD	ADM
C	1. ROOF ON WINDOW 2. UFA & UFS REVISED 28/02/2018	TCWAS	EPCW EPD	ADM
D	1. WINDOW ADDED 2. HATCHING PATTERN REVISED 11/09/2018	TCWAS	EPCW EPD	ADM

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	EDMUND CHAN DIM/ETC	ORIGINAL SIGNED	31/2/2017
CHECKED	S.M. CHOI AD/II	ORIGINAL SIGNED	31/2/2017
	S.K. CHAN ETO/DBTC	ORIGINAL SIGNED	31/2/2017
DRAWN	JASON WONG TO/AR6	ORIGINAL SIGNED	31/2/2017

PROJECT
YUE WAN ESTATE
PHASED DEVELOPMENT -
WING TAI ROAD, CHAI WAN

DRAWING TITLE
CALCULATION OF U.F.A. & U.F.S.

SCALE 1:100 (A0)

DRAWING NO.
ET06/ICU/A/GBP-18/D

SOURCE:

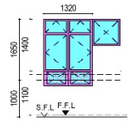
EQUNO.

HOUSING DEPARTMENT

DATE OF ISSUE: C.E. / OTHERS; E.E. / E&M; HOM/OFR / HOS/PM; C.E. / S.S.; Contractor / Architect; COPY FOR

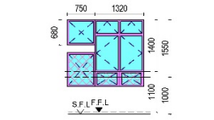
ICU Ref.: HD(ICU)_____

REFER TO DESCRIPTION 16 OF ANNEX 7



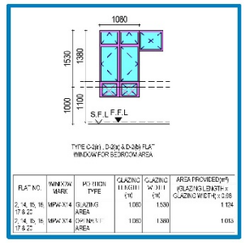
TYPE A-1(a) FLAT (PCF MODIFIED)
WINDOW FOR LIVING/DINING/BEDROOM AREA

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING H (mm)	GLAZING W (mm)	AREA PROVIDED(m²) (GLAZING LENGTH x GLAZING WIDTH) x 2.05
1	MPW-X1	GLAZING AREA	1,320	1,650	1.491
1	MPW-X1	OPENABLE AREA	1,320	1,600	1.267



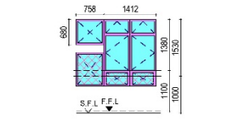
TYPE B-2(c) FLAT WINDOW
FOR LIVING/DINING/BEDROOM AREA

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING H (mm)	GLAZING W (mm)	AREA PROVIDED(m²) (GLAZING LENGTH x GLAZING WIDTH) x 2.05
3, 8 & 19	MPW-X11	GLAZING AREA	1,330	1,550	1.891
3, 8 & 19	MPW-X11	GLAZING AREA	0.500	0.680	0.347
				SUB-TOTAL	1.736
3, 8 & 19	MPW-X11	DIP/MABLE AREA	1,330	1,400	1.397
				SUB-TOTAL	1.397



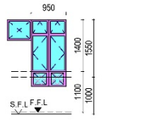
TYPE C-2(b), D-2(b) & D-2(bb) FLAT
WINDOW FOR BEDROOM AREA

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING H (mm)	GLAZING W (mm)	AREA PROVIDED(m²) (GLAZING LENGTH x GLAZING WIDTH) x 2.05
2, 14, 15, 16, 17 & 22	MPW-X14	GLAZING AREA	1,080	1,530	1.124
2, 14, 15, 16, 17 & 22	MPW-X14	OPENABLE AREA	1,080	1,360	1.003



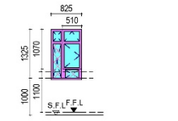
TYPE C-2(b), D-2(b) & D-2(bb) FLAT (WITH ACOUSTIC WINDOW)
WINDOW FOR LIVING/DINING/BEDROOM AREA

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING H (mm)	GLAZING W (mm)	AREA PROVIDED(m²) (GLAZING LENGTH x GLAZING WIDTH) x 0.68
2, 14, 15, 16, 17 & 22	MPW-X15	GLAZING AREA	1,412	1,530	1.469
2, 14, 15, 16, 17 & 22	MPW-X15	OPENABLE AREA	0.758	0.860	0.35
				SUB-TOTAL	1.819
2, 14, 15, 16, 17 & 20	MPW-X15	OPENABLE AREA	1,412	1,380	1.325
				SUB-TOTAL	1.325



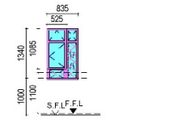
TYPE D-2(b), D-2(bb) FLAT & TYPE D-2(c) FLAT
(WITH ACOUSTIC WINDOW) WINDOW FOR KITCHEN AREA

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING H (mm)	GLAZING W (mm)	AREA PROVIDED(m²) (GLAZING LENGTH x GLAZING WIDTH) x 2.05
11, 15 & 17	MPW-X13	GLAZING AREA	0.900	1.500	1.605
11, 15 & 17	MPW-X13	CHIMNEY AREA	0.900	1.400	0.945



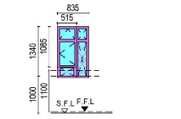
TYPE A-1(a) FLAT (PCF MODIFIED)
WINDOW FOR KITCHEN

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING H (mm)	GLAZING W (mm)	AREA PROVIDED(m²) (GLAZING LENGTH x GLAZING WIDTH) x 0.68
1, 8 & 7	MPW-X3	GLAZING AREA	0.625	1.325	0.743
1, 8 & 7	MPW-X3	CHIMNEY AREA	0.510	1.070	0.371



TYPE C-2(b) & D-2(b) FLAT
WINDOW FOR KITCHEN

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING H (mm)	GLAZING W (mm)	AREA PROVIDED(m²) (GLAZING LENGTH x GLAZING WIDTH) x 0.68
2 & 16	MPW-X6	GLAZING AREA	0.835	1.340	0.761
2 & 16	MPW-X6	CHIMNEY AREA	0.515	1.085	0.380



TYPE B, C & D FLAT EXCEPT TYPE A-1(a), A-1(b), C-2(a), D-2(a) FLAT
WINDOW FOR KITCHEN

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING H (mm)	GLAZING W (mm)	AREA PROVIDED(m²) (GLAZING LENGTH x GLAZING WIDTH) x 0.68
2, 5, 8, 14 & 17-23	MW-X5	GLAZING AREA	0.835	1.340	0.761
2, 5, 8, 14 & 17-23	MW-X5	CHIMNEY AREA	0.515	1.085	0.380

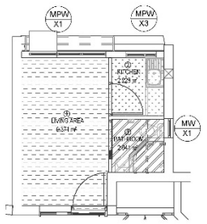
Signature of Applicant (HD / PSP) :

ICU Approved Signature :

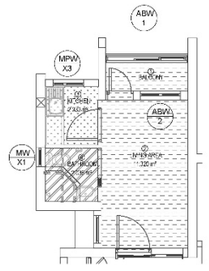
Signature for Record Plan :

NOTES:
1. UNLESS OTHERWISE STATED, LEGENDS & ABBREVIATION REFER TO DWG. NO. ET06/CU/A/GBP-C1.
2. ALL WINDOW ELEVATIONS ARE VIEWED FROM OUTSIDE.
3. THE PROVIDED WINDOW SILL LEVEL SHALL BE DEEMED TO BE AT A LEVEL OF 10th ABOVE THE LEVEL OF FLOOR OF THE ROOM, WHETHER OR NOT THERE EXISTS WINDOW SILL AT SUCH LEVEL.
4. ACCORDING TO PNAP APP-130 PARA. E, THE WIDTH OF AIR GAP IS BETWEEN 100mm TO 175mm. THE LENGTH OF AIR GAP IS NOT LESS THAN 100mm.

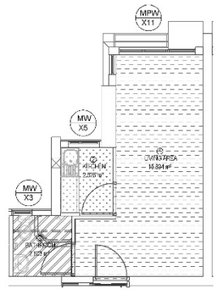
LEGENDS
- LIVING AREA / BEDROOM / BALCONY
- BATHROOM
- KITCHEN
- 6MM THK CLEAR TEMPERED GLASS
- NON ACCOUNTABLE GLAZING AREA



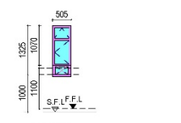
TYPE A-1(a) FLAT (PCF MODIFIED)
SCALE 1 : 50



TYPE A-1(b) FLAT (WITH ACOUSTIC BALCONY)
SCALE 1 : 50

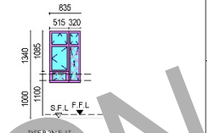


TYPE B-2(a) FLAT
SCALE 1 : 50



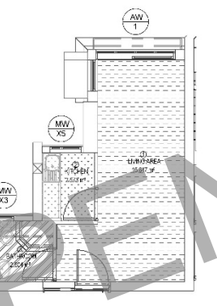
ALL FLAT TYPE
WINDOW FOR BATHROOM

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING LENGTH (m)	GLAZING WIDTH (m)	AREA PROVIDED(m²) (GLAZING LENGTH x GLAZING WIDTH) x 0.68
1,2,5,6,8,11-17 & 20	MW-X1	GLAZING AREA	0.505	1.325	0.455
1,2,5,6,8,11-17 & 20	MW-X1	OPENABLE AREA	0.505	1.000	0.343
3,4,9,10,18,19	MW-X3	GLAZING AREA	0.505	1.325	0.455
3,4,9,10,18,19	MW-X3	OPENABLE AREA	0.505	1.000	0.343

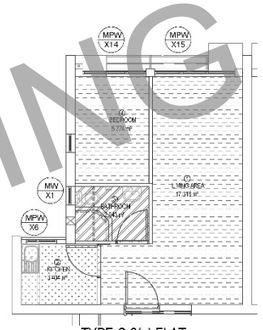


TYPE B-2(b) FLAT
WINDOW FOR KITCHEN

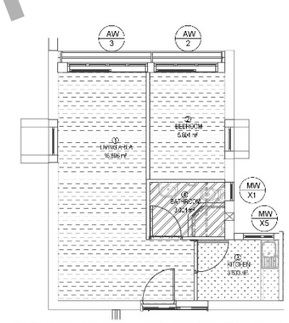
FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING LENGTH (m)	GLAZING WIDTH (m)	AREA PROVIDED(m²) (GLAZING LENGTH x GLAZING WIDTH) x 0.68
2, 5, 8, 14 & 17-23	MW-X5	GLAZING AREA	0.835	1.340	0.761
2, 5, 8, 14 & 17-23	MW-X5	CHIMNEY AREA	0.515	1.085	0.380



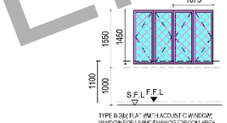
TYPE B-2(b) FLAT (WITH ACOUSTIC WINDOW)
SCALE 1 : 50



TYPE C-2(a) FLAT
SCALE 1 : 50



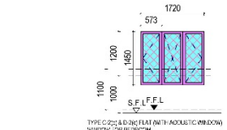
TYPE C-2(b)FLAT (WITH ACOUSTIC WINDOW)
SCALE 1 : 50



TYPE B-2(b) FLAT (WITH ACOUSTIC WINDOW)
WINDOW FOR LIVING/DINING/BEDROOM AREA

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING LENGTH (m)	GLAZING WIDTH (m)	AREA PROVIDED(m²) (GLAZING LENGTH x GLAZING WIDTH) x 2.05
4, 9, 10, 18 & 23	AW-1	GLAZING AREA	2.150	1.450	7.100
4, 9, 10, 18 & 23	AW-1	OUTER OPENABLE AREA*	1.075	1.450	1.000
4, 9, 10, 18 & 23	AW-1	CROSS SECTIONAL AREA OF THE AIR GAP	0.175	1.450	GLAZING LENGTH x GLAZING WIDTH x 0.714 0.764

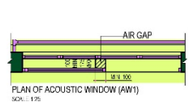
*1.000m² > CROSS SECTIONAL AREA OF THE AIR GAP COMPLY WITH REQUIREMENT AT PNAP APP-130



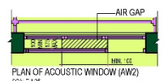
TYPE C-2(b) & D-2(b) FLAT (WITH ACOUSTIC WINDOW)
WINDOW FOR BEDROOM

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING LENGTH (m)	GLAZING WIDTH (m)	AREA PROVIDED(m²) (GLAZING LENGTH x GLAZING WIDTH) x 2.05
11 & 21	AW-2	GLAZING AREA	1.720	1.450	7.100
11 & 21	AW-2	OUTER OPENABLE AREA*	0.573	1.450	0.950
11 & 21	AW-2	CROSS SECTIONAL AREA OF THE AIR GAP	0.175	1.450	GLAZING LENGTH x GLAZING WIDTH 0.764

*0.950m² > CROSS SECTIONAL AREA OF THE AIR GAP COMPLY WITH REQUIREMENT AT PNAP APP-130

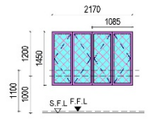


PLAN OF ACOUSTIC WINDOW (AW1)
SCALE 1:25



PLAN OF ACOUSTIC WINDOW (AW2)
SCALE 1:25

PLAN OF ACOUSTIC WINDOW (AW3)
SCALE 1:25



TYPE C-2(b) & D-2(b) FLAT (WITH ACOUSTIC WINDOW)
WINDOW FOR LIVING/DINING/BEDROOM AREA

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING LENGTH (m)	GLAZING WIDTH (m)	AREA PROVIDED(m²) (GLAZING LENGTH x GLAZING WIDTH) x 2.05
11 & 21	AW-3	GLAZING AREA	2.170	1.450	7.100
11 & 21	AW-3	OUTER OPENABLE AREA*	1.085	1.450	1.020
11 & 21	AW-3	CROSS SECTIONAL AREA OF THE AIR GAP	0.175	1.450	GLAZING LENGTH x GLAZING WIDTH 0.764

*1.190m² > CROSS SECTIONAL AREA OF THE AIR GAP COMPLY WITH REQUIREMENT AT PNAP APP-130

FLAT NOS.	WINDOW MARK	LOCATION	PORTION	FLOOR AREA (m²)	GLAZING AREA CALCULATION(m²) FACTOR REQUIRED	AREA REQUIRED (FLOOR AREA * FACTOR REQUIRED)	AREA PROVIDED	OPENABLE AREA CALCULATION(m²) FACTOR REQUIRED	AREA REQUIRED (FLOOR AREA * FACTOR REQUIRED)	AREA PROVIDED
1	MPW-X1	LIVING AREA	1	15.84	0.1	1.584	2.100	0.0625	0.990	1.250
1	MPW-X3	KITCHEN	2	2.223	0.1	0.222	0.710	0.0625	0.139	0.371
1	MW-X1	BATHROOM	3	2.54	0.1	0.254	0.495	0.0625	0.128	0.362

FLAT NOS.	WINDOW MARK	LOCATION	PORTION	FLOOR AREA (m²)	GLAZING AREA CALCULATION(m²) FACTOR REQUIRED	AREA REQUIRED (FLOOR AREA * FACTOR REQUIRED)	AREA PROVIDED	OPENABLE AREA CALCULATION(m²) FACTOR REQUIRED	AREA REQUIRED (FLOOR AREA * FACTOR REQUIRED)	AREA PROVIDED
6 & 7	MPW-X3	KITCHEN	3	2.232	0.1	0.223	0.743	0.0625	0.140	0.371
6 & 7	MW-X1	BATHROOM	4	2.281	0.1	0.264	0.495	0.0625	0.127	0.367
WINDOW OPEN INTO AC BALCONY										
6 & 7	ABW-2	LIVING AREA	182	32.32	0.1	1.132	2.321	0.0625	0.708	0.855
WINDOW OPEN INTO AC BALCONY (ROOM NO.)										
6 & 7	ABW-2	LIVING AREA	182	32.32	0.1	1.132	2.173	0.0625	0.708	1.358

FLAT NOS.	WINDOW MARK	LOCATION	PORTION	FLOOR AREA (m²)	GLAZING AREA CALCULATION(m²) FACTOR REQUIRED	AREA REQUIRED (FLOOR AREA * FACTOR REQUIRED)	AREA PROVIDED	OPENABLE AREA CALCULATION(m²) FACTOR REQUIRED	AREA REQUIRED (FLOOR AREA * FACTOR REQUIRED)	AREA PROVIDED
3, 18 & 19	MPW-X11	LIVING AREA	1	15.894	0.1	1.589	1.728	0.0625	0.743	1.250
3, 18 & 19	MW-X5	KITCHEN	2	2.578	0.1	0.258	0.797	0.0625	0.161	0.382
3, 18 & 19	MW-X3	BATHROOM	3	2.555	0.1	0.260	0.495	0.0625	0.161	0.367

FLAT NOS.	WINDOW MARK	LOCATION	PORTION	FLOOR AREA (m²)	GLAZING AREA CALCULATION(m²) FACTOR REQUIRED	AREA REQUIRED (FLOOR AREA * FACTOR REQUIRED)	AREA PROVIDED	OPENABLE AREA CALCULATION(m²) FACTOR REQUIRED	AREA REQUIRED (FLOOR AREA * FACTOR REQUIRED)	AREA PROVIDED
4, 9, 10, 22 & 23	MW-1	LIVING AREA	1	15.84	0.1	1.584	2.100	0.0625	0.990	1.250
4, 9, 10, 22 & 23	MW-X5	KITCHEN	2	2.573	0.1	0.257	0.701	0.0625	0.161	0.385
4, 9, 10, 22 & 23	MW-X3	BATHROOM	3	2.601	0.1	0.260	0.495	0.0625	0.162	0.377

FLAT NOS.	WINDOW MARK	LOCATION	PORTION	FLOOR AREA (m²)	GLAZING AREA CALCULATION(m²) FACTOR REQUIRED	AREA REQUIRED (FLOOR AREA * FACTOR REQUIRED)	AREA PROVIDED	OPENABLE AREA CALCULATION(m²) FACTOR REQUIRED	AREA REQUIRED (FLOOR AREA * FACTOR REQUIRED)	AREA PROVIDED
2 14 15&20	MPW-X15	LIVING AREA	1	17.376	0.1	1.732	1.822	0.0625	1.086	1.525
2 14 15&20	MPW-X6	KITCHEN	2	3.406	0.1	0.340	0.781	0.0625	0.213	0.367
2 14 15&20	MW-X1	BATHROOM	3	2.940	0.1	0.294	0.495	0.0625	0.184	0.367
2 14 15&20	MPW-X14	BEDROOM	4	9.774	0.1	0.977	1.124	0.0625	0.361	1.003

FLAT NOS.	WINDOW MARK	LOCATION	PORTION	FLOOR AREA (m²)	GLAZING AREA CALCULATION(m²) FACTOR REQUIRED	AREA REQUIRED (FLOOR AREA * FACTOR REQUIRED)	AREA PROVIDED	OPENABLE AREA CALCULATION(m²) FACTOR REQUIRED	AREA REQUIRED (FLOOR AREA * FACTOR REQUIRED)	AREA PROVIDED
21	AW-2	LIVING AREA	1	15.894	0.1	1.589	2.142	0.0625	0.993	1.070
21	AW-2	BEDROOM	2	9.624	0.1	0.589	1.655	0.0625	0.366	0.585
21	MW-X5	KITCHEN	3	3.859	0.1	0.303	0.701	0.0625	0.227	0.382
21	MW-X1	BATHROOM	4	3.704	0.1	0.370	0.495	0.0625	0.198	0.367

REVISIONS

NO.	DESCRIPTION AND DATE	INITIAL AND DESIGNATION		
		MRK	CKD	AUTH
A	1. CENTRE MARK OF DRAWING FRAME IS ADDED ACCORDING TO PNAP ADM-33 2. APPROVED SIGN OF DRAWING SHEET IS DELETED 3. PAPER SIZE OF A3 IS DELETED 4. FORMAT OF CALCULATION OF GLAZING AREA IS REVISED 5. VECTOR FORMAT FOR ACOUSTIC WINDOW IS ADDED 04/05/2017	*CHAN SIMSTC	STOW STOC	ADM
B	1. LEGEND IS ADDED 15/12/2017	STAV ADM	STOW STOC	ADM
C	1. BORDER LINE ERROR CORRECTED 2. AREA REVISED 28/2/2018	*CHAN SIMSTC	STOW STOC	ADM
D	1. CLEAR GLAZING AREA REVISED 11/09/2018	STAV ADM	STOW STOC	ADM

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	EDMUND CHAN SIMSTC	ORIGINAL SIGNED	31/2/2017
CHECKED	S.M. CHOI ADM	ORIGINAL SIGNED	31/2/2017
	S.K. CHAN STO/SSTC	ORIGINAL SIGNED	31/2/2017
DRAWN	JASON WONG TOW/RS	ORIGINAL SIGNED	31/2/2017

PROJECT
YUE WAN ESTATE
PHASED DEVELOPMENT -
WING TAI ROAD, CHAI WAN

DRAWING TITLE
GLAZING AREA CALCULATION
(SHEET 1 OF 3)

SCALE 1:25 & 1:50 (A3)

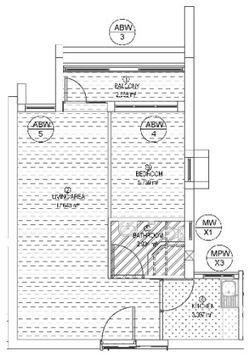
DRAWING NO.
ET06/ICU/A/GBP-19/D

SOURCE:

ICU NO.

HOUSING DEPARTMENT

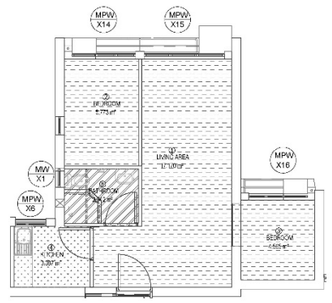
DATE OF ISSUE: E.E. / OTHERS; E.E. / LUMPSUM RESPONSIVE; E.E. / GA; CCPP / Contractor Number



TYPE C-2(c) FLAT (WITH ACOUSTIC BALCONY)

SCALE 1 : 50

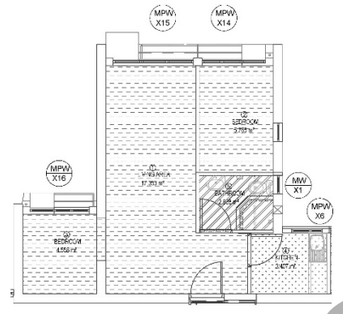
FLAT NOS.	WINDOW MARK	LOCATION	PORTION	FLOOR AREA (m²)	GLAZING AREA CALCULATION(m²) FACTOR AS REQUIRED	AREA REQUIRED (1/100 X AREA X FACTOR REQUIRED)	AREA PROVIDED	OPENABLE AREA CALCULATION(m²) FACTOR AS REQUIRED	AREA REQUIRED (1/100 X AREA X FACTOR REQUIRED)	AREA PROVIDED
5, 6, 12 & 13	ABW-4	BEDROOM	1&3	5.736	0.1	0.574	2.275	0.0625	0.359	0.541
5, 6, 12 & 13	ABW-3	BALCONY	1&3	2.668	0.1	0.267	3.536	0.0625	0.167	1.005
				SUB-TOTAL:	0.477					
5, 6, 12 & 13	ABW-5	LIVING AREA	1&3	17.623	0.1	1.762	1.762	0.0625	1.101	1.530
5, 6, 12 & 13	ABW-3	BALCONY	1&3	2.668	0.1	0.267	3.536	0.0625	0.167	1.005
				SUB-TOTAL:	20.377					
5, 6, 12 & 13	MPW-X3	KITCHEN	4	3.397	0.1	0.340	1.233	0.0625	0.212	0.546
5, 6, 12 & 13	MW-X1	BATHROOM	5	2.697	0.1	0.270	2.033	0.0625	0.169	0.540
				SUB-TOTAL:	0.537					



TYPE D-2(a) FLAT

SCALE 1 : 50

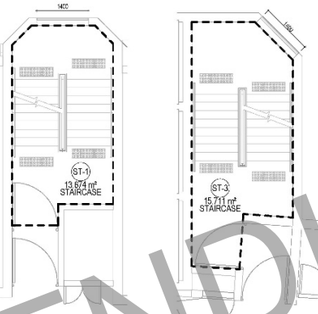
FLAT NOS.	WINDOW MARK	LOCATION	PORTION	FLOOR AREA (m²)	GLAZING AREA CALCULATION(m²) FACTOR AS REQUIRED	AREA REQUIRED (1/100 X AREA X FACTOR REQUIRED)	AREA PROVIDED	OPENABLE AREA CALCULATION(m²) FACTOR AS REQUIRED	AREA REQUIRED (1/100 X AREA X FACTOR REQUIRED)	AREA PROVIDED
16	MPW-X15	LIVING AREA	1	17.7	0.1	1.77	1.800	0.0625	1.23	2.287
16	MPW-X14	BEDROOM	2	5.773	0.1	0.577	1.134	0.0625	0.361	1.015
16	MPW-X16	BEDROOM	3	4.555	0.1	0.457	1.000	0.0625	0.285	0.904
16	MPW-X6	KITCHEN	4	3.397	0.1	0.340	0.858	0.0625	0.212	0.267
16	MW-X1	BATHROOM	5	2.542	0.1	0.254	0.455	0.0625	0.164	1.325



TYPE D-2(b) FLAT

SCALE 1 : 50

FLAT NOS.	WINDOW MARK	LOCATION	PORTION	FLOOR AREA (m²)	GLAZING AREA CALCULATION(m²) FACTOR AS REQUIRED	AREA REQUIRED (1/100 X AREA X FACTOR REQUIRED)	AREA PROVIDED	OPENABLE AREA CALCULATION(m²) FACTOR AS REQUIRED	AREA REQUIRED (1/100 X AREA X FACTOR REQUIRED)	AREA PROVIDED
17	MPW-X15	LIVING AREA	1	17.333	0.1	1.733	1.800	0.0625	1.083	2.287
17	MPW-X14	BEDROOM	2	5.760	0.1	0.576	1.134	0.0625	0.360	1.015
17	MPW-X16	BEDROOM	3	4.539	0.1	0.454	1.000	0.0625	0.283	0.904
17	MPW-X6	KITCHEN	4	3.402	0.1	0.340	0.858	0.0625	0.213	0.267
17	MW-X1	BATHROOM	5	2.538	0.1	0.254	0.455	0.0625	0.159	1.325

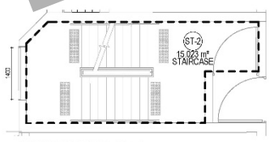


STAIRCASE NO. ST-1

SCALE 1 : 50

STAIRCASE NO. ST-3

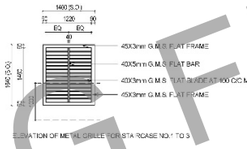
SCALE 1 : 50



STAIRCASE NO. ST-2

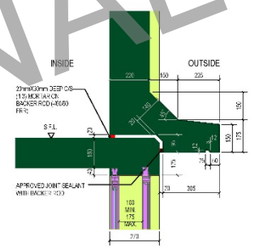
SCALE 1 : 50

STAIRCASE LOCATION	PORTION	AREA (m²)		AREA REQUIRED		OPENABLE PROVIDED
F1 TO F35	ST-1	13.674	OPENING	0.1	1.367 m²	1.652m²
F1 TO F35	ST-2	15.023	OPENING	0.1	1.502 m²	1.652m²
F1 TO F35	ST-3	15.711	OPENING	0.1	1.571 m²	1.652m²



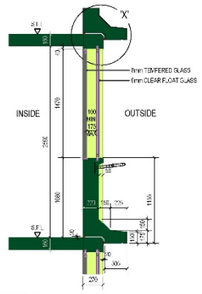
ELEVATION OF METAL GRILLE FOR STAIRCASE NO. 1 TO 3

AREA OF OPENING			
LENGTH (m)	WIDTH (m)	FACTOR	AREA (m²)
1.400	1.640	0.8	1.837



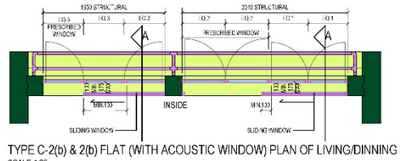
DETAIL 'X'

SCALE 1:10



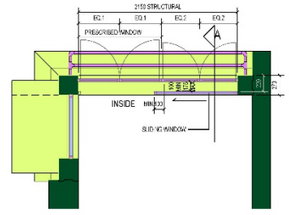
SECTION A
TYPICAL SECTION OF PRECAST FACADE (ACOUSTIC WINDOW)

SCALE 1:25



TYPE C-2(b) & 2(b) FLAT (WITH ACOUSTIC WINDOW) PLAN OF LIVING/DINNING

SCALE 1:25



TYPE B-2 FLAT (WITH ACOUSTIC WINDOW) PLAN OF LIVING/DINNING

SCALE 1:25

ICU Ref.: HD(ICU)_____

Signature of Applicant (HD / PSP) :

ICU Approved Signature :

Signature for Record Plan :

NOTES:

1. UNLESS OTHERWISE STATED, LEGENDS & ABBREVIATION IN THIS DWG NO. ESTABLISHED.
2. ALL WINDOW ELEVATIONS ARE VIEWED FROM OUTSIDE.
3. THE PRESCRIBED WINDOW SILL LEVEL IS WILL BE DEEMED TO BE A" A LEVEL OF 1.6m ABOVE THE LEVEL OF FLOOR OF THE ROOM, WHETHER OR NOT THE PARTICULAR WINDOW SILL IS AT SUCH LEVEL.
4. ACCORDING TO PNAP APP-133, PARA. 6, THE WIDTH OF AIR GAP IS BETWEEN 100mm TO 175mm THE LENGTH OF A R GAP IS NOT LESS THAN 100mm.

LEGENDS

- LIVING & DINING AREA (ONLY)
- BATHROOM
- KITCHEN

REVISIONS		INITIAL AND DESIGNATION		
NO.	DESCRIPTION AND DATE	ARN	CKD	AUTH
A	1. CENTRE MARK OF DRAWING FRAME RE-ADDED ACCORDING TO PNAP ADM 53 2. ADDED ACCESS OF DRAWING 2 LOT IS DELETED 3. PAPER SIZE OF A3 IS CLARIFIED 4. VECTOR FORMAT FOR ACOUSTIC WINDOWS IS USED 5. AREA OF CALCULATION OF GLAZING AREA IS REVISED 10/05/2017	TONG A079	STOW B110	ADM
B	1. LEGEND IS ADDED 2. SCHEDULE OF AREA OPENING FOR METAL GRILLE ADDED 15/12/2017	KTW A079	STOW B110	ADM
C	1. SPELLING ERROR CORRECTED 2. AREA REVISED 29/3/2018	KTW A079	STOW B110	ADM
D	1. GLAZING AREA REVISED 2. MAJOR AMENDMENT IS MINOR AMENDMENT 14/09/2018	KTW A079	STOW B110	ADM

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	EDMUND CHAN SIMBTC	ORIGINAL SIGNED	31/2/2017
CHECKED	S.M. CHOI AUW	ORIGINAL SIGNED	31/2/2017
	S.K. CHAN BTC/SBTC	ORIGINAL SIGNED	31/2/2017
DRAWN	JASON WONG TGD/BS	ORIGINAL SIGNED	31/2/2017

DATE OF ISSUE:

PROJECT

YUE WAN ESTATE
PHASED DEVELOPMENT -
WING TAI ROAD, CHAI WAN

DRAWING TITLE

GLAZING AREA CALCULATION (SHEET 2 OF 3)

SCALE A0 SHOWN (A0)

DRAWING NO.

ET06/ICU/A/GBP-20/D

SCRIBED

ICU NO.

HOUSING DEPARTMENT

COPY FOR: Xerox Xerox

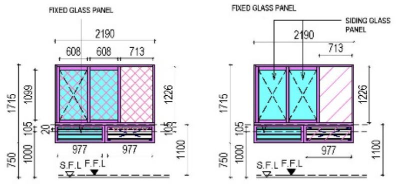
A.E. G.S.

DRAWING NO. REVISED

E.E. E.S.

C.S. OTHERS:

ICU Ref.: HD(ICU) ____________



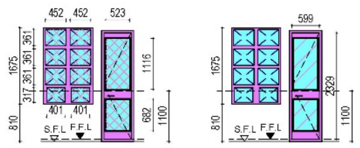
CALCULATION OF GLAZING AREA

CALCULATION OF OPENABLE AREA

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING LENGTH (m)	GLAZING WIDTH (m)	AREA PROVIDED(m²)
6 & 7	ABW-1	GRILLE AREA	0.977	0.020	0.020
6 & 7	ABW-1	GRILLE AREA	0.977	0.020	0.020
				SUB-TOTAL=	0.040
6 & 7	ABW-1	GLAZING AREA	0.713	1.226	0.874
6 & 7	ABW-1	GLAZING AREA	0.608	1.099	0.668
6 & 7	ABW-1	GLAZING AREA	0.608	1.099	0.668
6 & 7	ABW-1	GLAZING AREA	0.977	0.105	0.102
6 & 7	ABW-1	GLAZING AREA	0.977	0.105	0.102
				SUB-TOTAL=	2.414
6 & 7	ABW-1	OPENABLE AREA	0.713	1.226	0.874
6 & 7	ABW-1	OPENABLE AREA	0.977	0.105	0.102
				SUB-TOTAL=	0.976
6 & 7	ABW-1	GRILLE AREA	0.977	0.020	0.020
				SUB-TOTAL=	0.020

TOTAL OF GLAZING AREA :
GLAZING AREA - GRILLE AREA
= 2.414-0.04
= 2.374 m²

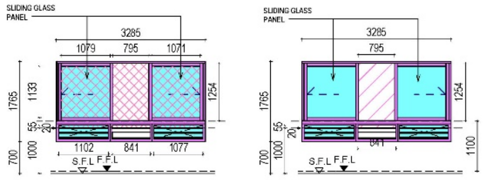
TOTAL OF OPENABLE AREA :
OPENABLE AREA - GRILLE AREA
= 0.976-0.02
= 0.956 m²



CALCULATION OF GLAZING AREA

CALCULATION OF OPENABLE AREA

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING LENGTH (m)	GLAZING WIDTH (m)	AREA PROVIDED(m²)
6 & 7	ABW-2	GLAZING AREA	0.452	0.361	0.163
6 & 7	ABW-2	GLAZING AREA	0.452	SUB-TOTAL=	0.163
6 & 7	ABW-2	GLAZING AREA	0.452	0.361	0.163
6 & 7	ABW-2	GLAZING AREA	0.452	0.361	0.163
6 & 7	ABW-2	GLAZING AREA	0.452	0.361	0.163
6 & 7	ABW-2	GLAZING AREA	0.452	0.361	0.163
6 & 7	ABW-2	GLAZING AREA	0.401	0.317	0.127
6 & 7	ABW-2	GLAZING AREA	0.401	0.317	0.127
6 & 7	ABW-2	GLAZING AREA	0.523	1.116	0.584
6 & 7	ABW-2	GLAZING AREA	0.523	0.682	0.357
					2.173
6 & 7	ABW-2	OPENABLE AREA	0.599	2.329	1.396
				SUB-TOTAL=	1.396



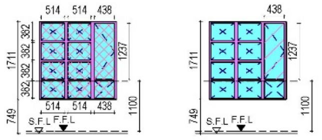
CALCULATION OF GLAZING AREA

CALCULATION OF OPENABLE AREA

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING LENGTH (m)	GLAZING WIDTH (m)	AREA PROVIDED(m²)
5, 8, 12 & 13	ABW-3	GLAZING AREA	1.079	1.133	1.222
5, 8, 12 & 13	ABW-3	GLAZING AREA	0.795	1.254	0.997
5, 8, 12 & 13	ABW-3	GLAZING AREA	1.071	1.133	1.213
5, 8, 12 & 13	ABW-3	GLAZING AREA	1.077	0.055	0.059
5, 8, 12 & 13	ABW-3	GLAZING AREA	1.102	0.055	0.060
5, 8, 12 & 13	ABW-3	GLAZING AREA	0.841	0.055	0.046
				SUB-TOTAL=	3.597
5, 8, 12 & 13	ABW-3	GRILLE AREA	1.102	0.020	0.022
5, 8, 12 & 13	ABW-3	GRILLE AREA	0.841	0.020	0.017
5, 8, 12 & 13	ABW-3	GRILLE AREA	1.077	0.020	0.022
				SUB-TOTAL=	0.061
5, 8, 12 & 13	ABW-3	OPENABLE AREA	0.795	1.254	0.997
5, 8, 12 & 13	ABW-3	OPENABLE AREA	0.841	0.055	0.046
				SUB-TOTAL=	1.043
5, 8, 12 & 13	ABW-3	GRILLE AREA	0.841	0.020	0.017
				SUB-TOTAL=	0.017

TOTAL OF GLAZING AREA :
GLAZING AREA - GRILLE AREA
= 3.597-0.061
= 3.536 m²

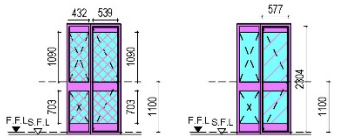
TOTAL OF OPANABLE AREA :
OPENABLE AREA - GRILLE AREA
= 1.043-0.017
= 1.026 m²



CALCULATION OF GLAZING AREA

CALCULATION OF OPENABLE AREA

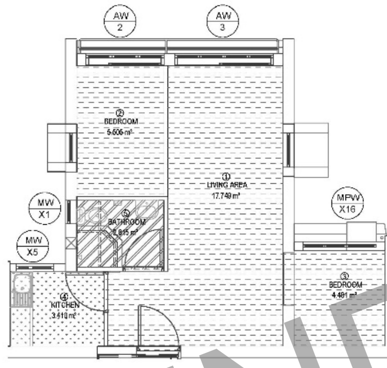
FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING LENGTH (m)	GLAZING WIDTH (m)	AREA PROVIDED(m²)
5, 8, 12 & 13	ABW-4	GLAZING AREA	0.514	0.382	0.196
5, 8, 12 & 13	ABW-4	GLAZING AREA	0.514	0.382	0.196
5, 8, 12 & 13	ABW-4	GLAZING AREA	0.514	0.382	0.196
5, 8, 12 & 13	ABW-4	GLAZING AREA	0.514	0.382	0.196
5, 8, 12 & 13	ABW-4	GLAZING AREA	0.514	0.382	0.196
5, 8, 12 & 13	ABW-4	GLAZING AREA	0.514	0.382	0.196
5, 8, 12 & 13	ABW-4	GLAZING AREA	0.514	0.382	0.196
5, 8, 12 & 13	ABW-4	GLAZING AREA	0.514	0.382	0.196
5, 8, 12 & 13	ABW-4	GLAZING AREA	0.438	1.237	0.541
5, 8, 12 & 13	ABW-4	GLAZING AREA	0.438	0.382	0.167
				SUB-TOTAL=	2.276
5, 8, 12 & 13	ABW-4	OPENABLE AREA	0.438	1.237	0.541
				SUB-TOTAL=	0.541



CALCULATION OF GLAZING AREA

CALCULATION OF OPENABLE AREA

FLAT NO.	WINDOW MARK	PORTION TYPE	GLAZING LENGTH (m)	GLAZING WIDTH (m)	AREA PROVIDED(m²)
5, 8, 12 &13	ABW-5	OPENABLE AREA	0.577	2.304	1.330
				SUB-TOTAL=	1.330
5, 8, 12 &13	ABW-5	GLAZING AREA	0.432	1.090	0.471
5, 8, 12 &13	ABW-5	GLAZING AREA	0.432	0.703	0.304
5, 8, 12 &13	ABW-5	GLAZING AREA	0.539	1.090	0.588
5, 8, 12 &13	ABW-5	GLAZING AREA	0.539	0.703	0.379
				SUB-TOTAL=	1.742



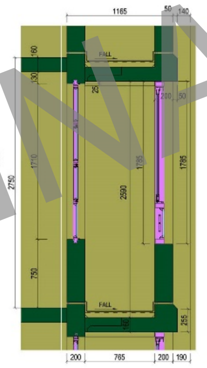
TYPE D-2(c) FLAT (WITH ACOUSTIC WINDOW)

SCALE 1 : 50

FLAT NOS.	WINDOW MARK	LOCATION	PORTION	FLOOR AREA (m²)	GLAZING AREA CALCULATION(m²)			OPENABLE AREA CALCULATION(m²)		
					FACTOR REQUIRED	AREA REQUIRED (FLOOR AREA * FACTOR REQUIRED)	AREA PROVIDED	FACTOR REQUIRED	AREA REQUIRED (FLOOR AREA * FACTOR REQUIRED)	AREA PROVIDED
11	AW-3	LIVING AREA	1	17.749	0.1	1.775	2.140	0.0625	1.109	1.070
11	AW-2	BEDROOM	2	5.506	0.1	0.551	1.696	0.0625	0.344	0.565
11	MPW-X16	BEDROOM	3	4.481	0.1	0.448	1.001	0.0625	0.280	0.904
11	MW-X5	KITCHEN	4	3.41	0.1	0.341	0.761	0.0625	0.213	0.380
11	MW-X1	BATHROOM	5	2.815	0.1	0.282	0.455	0.0625	0.176	0.367

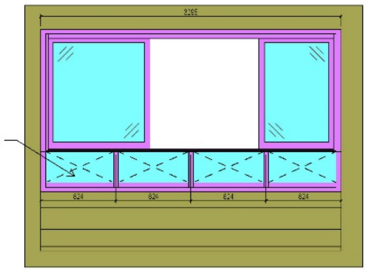
TYPICAL SECTION OF ACOUSTIC BALCONY WITH INCLINED PROJECTED PANEL

SCALE 1:25



TYPICAL SECTION OF ACOUSTIC BALCONY WITHOUT INCLINED PROJECTED PANEL

SCALE 1:25



89mm THK. GRADE 316 S.S. BUILT-UP TEE SECTION W/HAIRLINE FINISH (LAMINATED GLASS FOR INCLINED PROJECTED PANEL)

TYPICAL ELEVATION 1 OF ACOUSTIC BALCONY WITH INCLINED PROJECTED PANEL

SCALE 1:25

Signature of Applicant (HD / PSP) :

ICU Approved Signature :

Signature for Record Plan :

NOTES:

1. UNLESS OTHERWISE STATED, LEGENDS & ABBREVIATION REFER TO DWG. NO. ET06/ICU/A/GBP-01.
2. ALL WINDOW ELEVATIONS ARE VIEWED FROM OUTSIDE.
3. THE PRESCRIBED WINDOW SILL LEVEL SHALL BE DEEMED TO BE AT A LEVEL OF 1.0m ABOVE THE LEVEL OF FLOOR OF THE ROOM, WHETHER OR NOT THE PHYSICAL WINDOW SILL IS AT SUCH LEVEL.

LEGENDS

▤	LIVING AREA / BEDROOM / BALCONY
▨	BATHROOM
⁘	KITCHEN
▩	GLAZING AREA OF ACOUSTIC BALCONY
▨	OPENABLE AREA OF ACOUSTIC BALCONY

REVISIONS

NO	DESCRIPTION AND DATE	DWN	CKD	AUTH
		INITIAL AND DESIGNATION		
A	1. CENTRE MARK OF DRAWING FRAME IS ADDED ACCORDING TO PNAP ADM-10 2. APPROVED CHOP OF DRAWING SHEET IS DELETED 3. PAPER SIZE OF A0 IS CLARIFIED 4. FORMAT OF CALCULATION OF GLAZING AREA IS REVSIED 5. VECTOR FORMAT FOR ACOUSTIC BALCONY IS USED 18/09/2017	TOA/65	STO2/BTC	A/30
B	1. LEGEND IS ADDED. 2. TEXT SPELLING CORRECTED 3. COLOR OF WINDOWS ADDED 18/12/2017	CTA/A279	STO2/BTC	A/30
C	1. SPELLING ERROR CORRETED 29/3/2018	CTA/A279	STO2/BTC	A/30
D	1. GLAZING AREA REVSIED 14/09/2018	CTA/A279	STO2/BTC	A/30

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	EDMUND CHAN SM/BTC	ORIGINAL SIGNED	01/2017
CHECKED			
	S.M. CHOI A/30	ORIGINAL SIGNED	01/2017
	S.K. CHAN STO2/BTC	ORIGINAL SIGNED	01/2017
DRAWN	JASON WONG TO(A)/65	ORIGINAL SIGNED	01/2017

DATE OF ISSUE :

PROJECT
YUE WAN ESTATE
PHASED DEVELOPMENT -
WING TAI ROAD, CHAI WAN

DRAWING TITLE
GLAZING AREA CALCULATION
(SHEET 3 OF 3)

SCALE 1:25 & 1:50 (A0)

DRAWING NO.
ET06/ICU/A/GBP-21/D

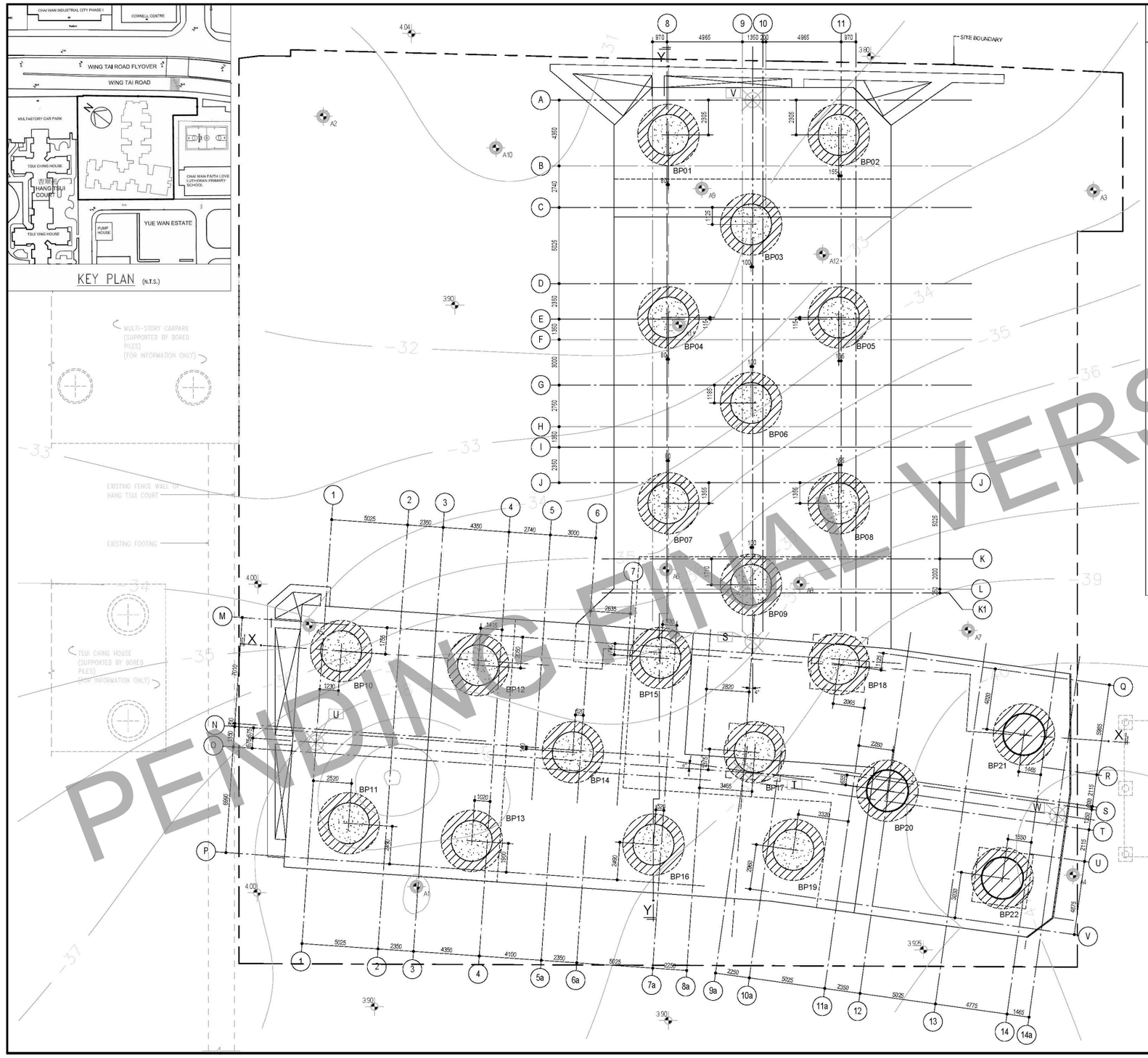
SOURCE

ICU NO.

HOUSING DEPARTMENT

COPY FOR
☐ Contractor ☐ Architect
☐ R.E. ☐ Q.S.
☐ LOW/COW ☐ FILE/OFFICE
☐ B.S.E. ☐ G.E.
☐ C.E. ☐ OTHERS: ______

KEY PLAN (N.T.S.)



ICU Ref. : HD(ICU)S 3 / ET06NR

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL AND ENGINEER'S DRAWINGS.
2. FOR GENERAL NOTES, STANDARD FIXING AND STANDARD GENERAL DETAILS FOR FOUNDATIONS, REFER TO DRAWING NO. ET06/-/FDN/S/EG-001 TO EG-004 (UNDER SEPARATE SUBMISSION).
3. FOR TYPICAL NOTES AND DETAILS OF LARGE DIAMETER BORED PILE, REFER TO DRAWING NO. ET06/-/LDBP/S/EG-001 TO EG-002.
4. FOR BORED PILE SCHEDULE, REFER TO DRAWING NO. ET06/-/BLK/S/EF-009.
5. FOR PILING SECTION X-X AND Y-Y, REFER TO DRAWING NO. ET06/-/BLK/S/EF-006 TO EF-007.
6. PILE CAP AND TIE BEAM ARE UNDER SEPARATE SUBMISSION.
7. CONTOUR LINE SHOWN IN THIS DRAWING IS THE INFERRED ROCKHEAD CONTOUR OF BEDROCK OF MATERIAL WEATHERING GRADE III OR BETTER, WITH A TOTAL CORE RECOVERY OF MORE THAN 85% OF THE GRADE IN ACCORDANCE WITH THE CATEGORY 1(c) OF TABLE 2.1 IN THE CODE OF PRACTICE FOR FOUNDATIONS. THE CONTOUR IS FOR INFORMATION ONLY.
8. ALLOWABLE DESIGN BEARING CAPACITY OF BEDROCK IS TO BE 5000kPa. (6250kPa FOR WIND CASE) [CATEGORY 1(c) ROCK AS DEFINED IN TABLE 2.1 OF THE CODE OF PRACTICE FOR FOUNDATION 2004]
9. FOR SETTING OUT CO-ORDINATES OF GRIDS AND SITE BOUNDARY, REFER TO ARCHITECTURAL DRAWINGS.
10. LEGEND:
    - BP1 — #2700 BORED PILE WITH BELL-OUT (ø4050) AT BOTTOM. PILE MARK
    - P30 — #2700 BORED PILE WITH BELL-OUT (ø4050) AT BOTTOM. SLEEVING SHALL BE PROVIDED AT TOP PORTION OF PILE (REFER TO DRAWING NO. ET06/-/LDBP/S/EG-002.) PILE MARK
    - MIN. 50mm THK. SLEEVING ALONG PILE CAP
    - 3.90 — EXISTING GROUND LEVEL IN mPD
    - A1 — EXISTING DRILLHOLE
    - -35- — INFERRED CATEGORY 1(c) ROCKHEAD CONTOUR LINE AT -35 mPD (FOR INFORMATION ONLY)
    - SETTING OUT POINT

Signature of Applicant (HD / PSP) :

ICU Approval Signature :

Signature for record Plan :

REVISIONS

NO	DESCRIPTION AND DATE	INITIAL AND DESIGNATION DWN	CKD	AUTH
A	1. CAP LEVEL AND DROP LOCATION REVISED. (03/16)	TO(S) /51 ORIG	STO(S) /38 INAL	SE /115 SIGNED
B	1. CAP LOCAL THICKEN. (03/16)	TO(S) /51 ORIG	STO(S) /38 INAL	SE /115 SIGNED
C	1. CAP DROP LOCATION REVISED (08/16)	TO(S) /51	STO(S) /38	SE /115

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	W.S.CHAU CSE/4	ORIGINAL SIGNED	03/16
CHECKED	K.W.WONG SSE/6	ORIGINAL SIGNED	03/16
	C.Y. KWAN SE/115	ORIGINAL SIGNED	03/16
	W.C. WONG STO(S)/38	ORIGINAL SIGNED	01/16
DRAWN	Y.M. WONG TO(S)/51	ORIGINAL SIGNED	01/16

PROJECT
FOUNDATION FOR PUBLIC RENTAL HOUSING DEVELOPMENT, WING TAI ROAD, CHAI WAN

DRAWING TITLE
PILING LAYOUT PLAN

SCALE 1:125

DRAWING NO.
ET06/-/BLK/S/EF-001/C

SOURCE

ICU REF.

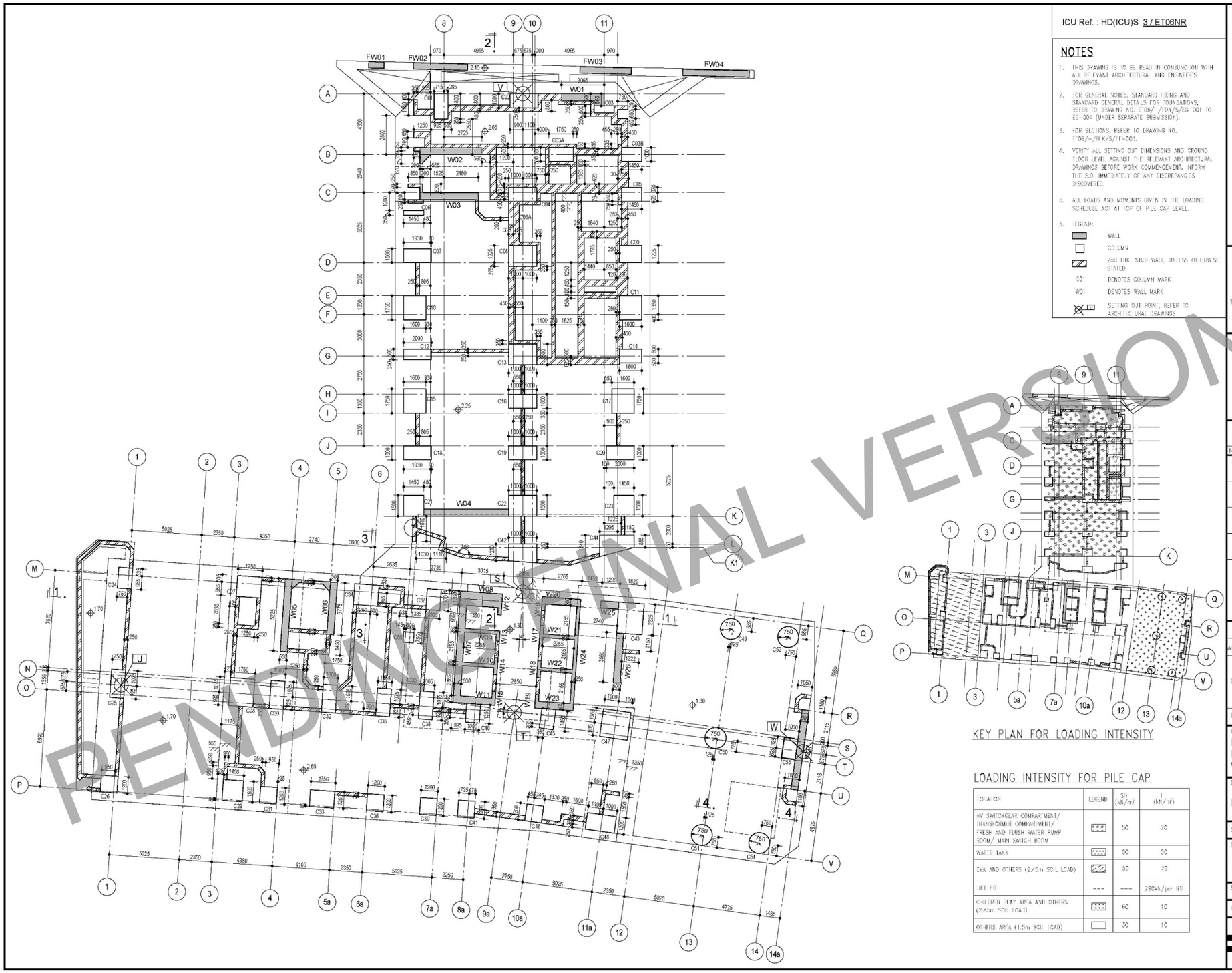
Revit 2016 A1 594 x 841

HOUSING DEPARTMENT

REF S.I. NO. SE-

DATE OF ISSUE

COPY FOR ☐ FILE/OFFICE ☐ S.E. ☐ OTHERS ☐ R.E. ☐ Q.S. ☐ CCW ☐ B.S.E. ☐ Contractor ☐ Architect



ICU Ref. : HD(ICU)S 3 / ET06NR

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL AND ENGINEER'S DRAWINGS.
2. FOR GENERAL NOTES, STANDARD FIXING AND STANDARD GENERAL DETAILS FOR FOUNDATIONS, REFER TO DRAWING NO. ET06/ /FDN/S/EG 001 TO EG-004 (UNDER SEPARATE SUBMISSION).
3. FOR SECTIONS, REFER TO DRAWING NO. ET06/-/BLK/S/FT-003.
4. VERIFY ALL SETTING OUT DIMENSIONS AND GROUND FLOOR LEVEL AGAINST THE RELEVANT ARCHITECTURAL DRAWINGS BEFORE WORK COMMENCEMENT. INFORM THE S.O. IMMEDIATELY OF ANY DISCREPANCIES DISCOVERED.
5. ALL LOADS AND MOMENTS GIVEN IN THE LOADING SCHEDULE ACT AT TOP OF PILE CAP LEVEL.
6. LEGEND:
   - WALL
   - COLUMN
   - 250 THK. STUB WALL, UNLESS OTHERWISE STATED.
   - C01 DENOTES COLUMN MARK
   - W01 DENOTES WALL MARK
   - SETTING OUT POINT, REFER TO ARCHITECTURAL DRAWINGS

LOADING INTENSITY FOR PILE CAP

LOCATION	LEGEND	S.I. (kN/m²)	I (kN/m²)
HV SWITCHGEAR COMPARTMENT/ TRANSFORMER COMPARTMENT/ FRESH AND FLUSH WATER PUMP ROOM/ MAIN SWITCH ROOM		50	20
WATER TANK		50	50
EVA AND OTHERS (2.45m SOIL LOAD)		50	20
LIFT PIT	---	---	250kN/per lift
CHILDREN PLAY AREA AND OTHERS (2.85m SOIL LOAD)		60	10
OTHERS AREA (1.5m SOIL LOAD)		30	10

Signature of Applicant (HD / PSP) :

ICU Approval Signature :

Signature for record Plan :

REVISIONS

NO	DESCRIPTION AND DATE	DWN	CKD	AUTH
A	1. ICU COMMENT INCORPORATED. (03/15)	TO(S) /51	STO(S) /38	SE /115
B	1. CAP LEVEL AND DROP LOCATION REVISED. (03/15)	TO(S) /51	STO(S) /38	SE /115
C	1. CAP LOCA. THICKEN. 2. SECTION 4 4 ADDED. (03/15)	TO(S) /51	STO(S) /38	SE /115
D	1. CAP DROP LOCATION REVISED (04/15)	TO(S) /51	STO(S) /38	SE /115

ORIGINAL SIGNED

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	W.S. CHAU CSE/4	ORIGINAL SIGNED	03/16
CHECKED	K.W. WONG SSE/6	ORIGINAL SIGNED	03/16
	C.Y. KWAN SE/115	ORIGINAL SIGNED	03/16
	W.C. WONG STO(S)/38	ORIGINAL SIGNED	01/16
DRAWN	Y.M. WONG TO(S)/51	ORIGINAL SIGNED	01/16

PROJECT
FOUNDATION FOR PUBLIC RENTAL HOUSING DEVELOPMENT, WING TAI ROAD, CHAI WAN

DRAWING TITLE
PLAN AT FOUNDATION

SCALE 1:125

DRAWING NO.
ET06/-/BLK/S/EF-002/D

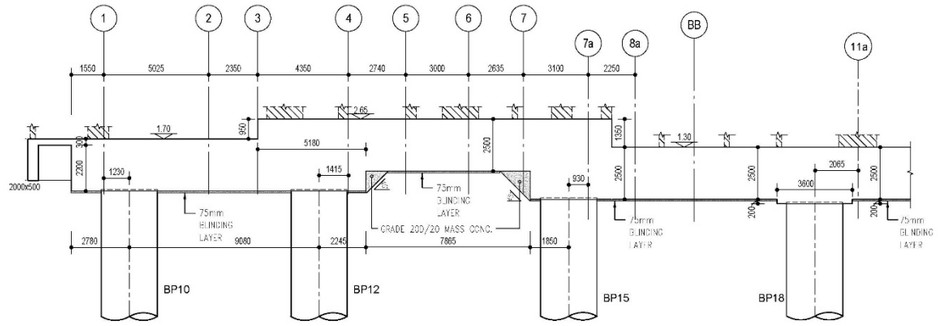
SOURCE

ICU REF.

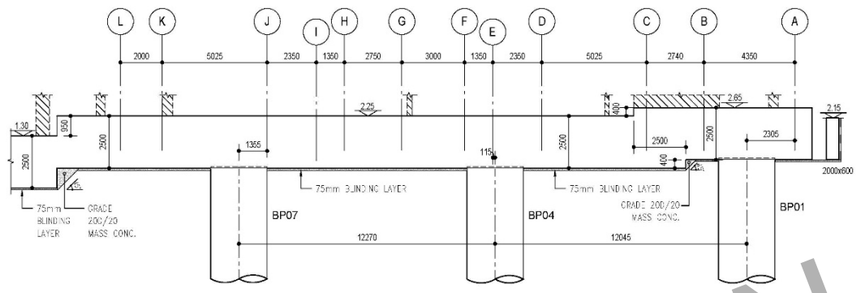
HOUSING DEPARTMENT

COPY FOR ☐ Computer ☐ Addition ☐ COVI ☐ S.S.E. ☐ P.E. ☐ U.S. ☐ FILE OFFICE ☐ S.E. ☐ OTHERS

REF. S.I. NO. SE_____ DATE OF ISSUE_____



SECTION 1–1



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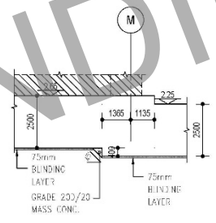
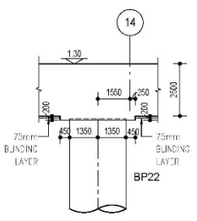


SECTION 3–3



SECTION 4–4

ICU Ref. : HD(ICU)S 3 / ET06NR

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL AND ENGINEER'S DRAWINGS.
2. FOR NOTES, REFER TO DRAWING NO. ET06/-/BLK/S/EF-001 AND EF-002.
3. FOR LOCATION OF SECTIONS, REFER TO DRAWING NO. ET06/ /BLK/S/EF 002.
4. LEGEND:
   - SUPERSTRUCTURE TO BE CONSTRUCTED BY BUILDING CONTRACTOR (UNDER SEPARATE SUBMISSION)
   - GRADE 20D/20 MASS CONC.

Signature of Applicant (HD / PSP) :

ICU Approval Signature :

Signature for record Plan :

REVISIONS

NO	DESCRIPTION AND DATE	DWN	CKD	AUTH
A	1. ICU COMMENT INCORPORATED. (03/15)	TO(S) /31	STO(S) /38	SE /115
B	1. CAP LEVEL AND DROP LOCATION REVISED. (03/15)	TO(S) /31	STO(S) /38	SE /115
C	1. SECTIONS REVISED AND ADDED. (03/15)	TO(S) /31	STO(S) /38	SE /115
D	1. CAP DROP LOCATION REVISED (08/15)	TO(S) /31	STO(S) /38	SE /115

INITIAL AND DESIGNATION

ORIGINAL SIGNED

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISE	W.S. CHAU CSE/4	ORIGINAL SIGNED	03/16
CHECKED	K.W. WONG SSE/6	ORIGINAL SIGNED	03/16
	C.Y. KWAN SEP/15	ORIGINAL SIGNED	03/16
	W.C. WONG STO(S)/58	ORIGINAL SIGNED	01/16
DRAWN	Y.M. WONG TO(S)/51	ORIGINAL SIGNED	01/16

PROJECT:
FOUNDATION FOR PUBLIC RENTAL HOUSING DEVELOPMENT, WING TAI ROAD, CHAI WAN

DRAWING TITLE:
SECTIONS

SCALE 1:125

DRAWING NO.
ET06/-/BLK/S/EF-003/D

SOURCE

ICU REF.

Revit 2016 A1 594 x 841

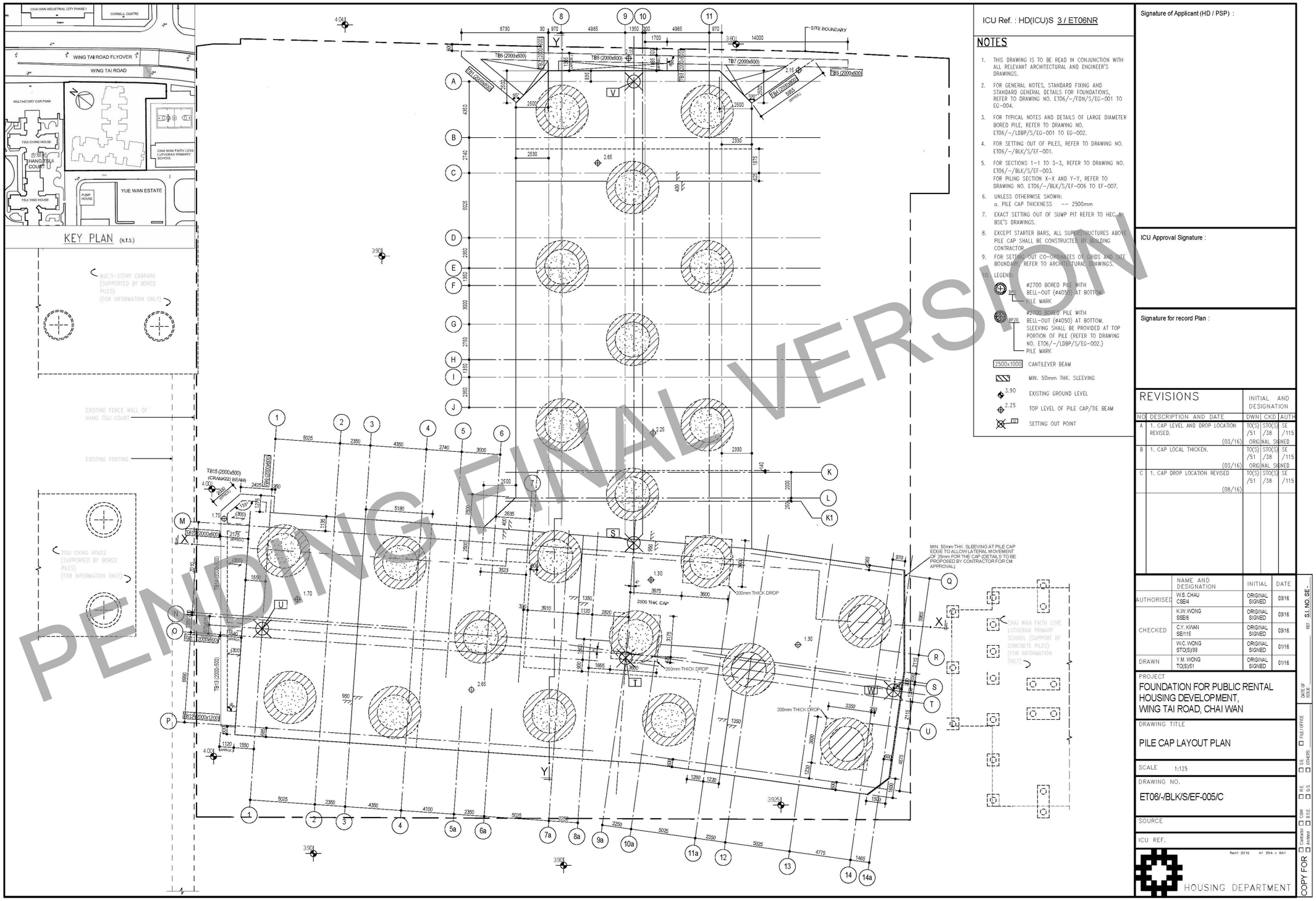
HOUSING DEPARTMENT

REF. SI_NO. SE_

DATE OF ISSUE

FILE OFFICE
S.E.
OTHERS
P.E.
U.S.
CONT
S.S.I.

COPY FOR Contractor Architect



ICU Ref. : HD(ICU)S 3 / ET06NR

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL AND ENGINEER'S DRAWINGS.
2. FOR GENERAL NOTES, STANDARD FIXING AND STANDARD GENERAL DETAILS FOR FOUNDATIONS, REFER TO DRAWING NO. ET06/-/FDN/S/EG-001 TO EG-004.
3. FOR TYPICAL NOTES AND DETAILS OF LARGE DIAMETER BORED PILE, REFER TO DRAWING NO. ET06/-/LDBP/S/EG-001 TO EG-002.
4. FOR SETTING OUT OF PILES, REFER TO DRAWING NO. ET06/-/BLK/S/EF-001.
5. FOR SECTIONS 1-1 TO 3-3, REFER TO DRAWING NO. ET06/-/BLK/S/EF-003.
   FOR PILING SECTION X-X AND Y-Y, REFER TO DRAWING NO. ET06/-/BLK/S/EF-006 TO EF-007.
6. UNLESS OTHERWISE SHOWN:
   a. PILE CAP THICKNESS -- 2500mm
7. EXACT SETTING OUT OF SUMP PIT REFER TO HEC, A BSE'S DRAWINGS.
8. EXCEPT STARTER BARS, ALL SUPERSTRUCTURES ABOVE PILE CAP SHALL BE CONSTRUCTED BY BUILDING CONTRACTOR.
9. FOR SETTING OUT CO-ORDINATES OF GRIDS AND SITE BOUNDARY, REFER TO ARCHITECTURAL DRAWINGS.
10. LEGEND:
    - BP1 — #2700 BORED PILE WITH BELL-OUT (#4050) AT BOTTOM. PILE MARK
    - BP20 — #2700 BORED PILE WITH BELL-OUT (#4050) AT BOTTOM. SLEEVING SHALL BE PROVIDED AT TOP PORTION OF PILE (REFER TO DRAWING NO. ET06/-/LDBP/S/EG-002.) PILE MARK
    - 2500x1000 — CANTILEVER BEAM
    - MIN. 50mm THK. SLEEVING
    - 3.90 — EXISTING GROUND LEVEL
    - 2.25 — TOP LEVEL OF PILE CAP/TIE BEAM
    - SETTING OUT POINT

Signature of Applicant (HD / PSP) :

ICU Approval Signature :

Signature for record Plan :

REVISIONS

NO	DESCRIPTION AND DATE	INITIAL AND DESIGNATION DWN	CKD	AUTH
A	1. CAP LEVEL AND DROP LOCATION REVISED. (03/16)	TO(S) /51 ORIGINAL	STO(S) /38 SIGNED	SE /115
B	1. CAP LOCAL THICKEN. (03/16)	TO(S) /51 ORIGINAL	STO(S) /38 SIGNED	SE /115
C	1. CAP DROP LOCATION REVISED (08/16)	TO(S) /51	STO(S) /38	SE /115

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	W.S. CHAU CSE/4	ORIGINAL SIGNED	03/16
	K.W. WONG SSE/6	ORIGINAL SIGNED	03/16
CHECKED	C.Y. KWAN SE/115	ORIGINAL SIGNED	03/16
	W.C. WONG STO(S)/38	ORIGINAL SIGNED	01/16
DRAWN	Y.M. WONG TO(S)/51	ORIGINAL SIGNED	01/16

PROJECT
FOUNDATION FOR PUBLIC RENTAL HOUSING DEVELOPMENT, WING TAI ROAD, CHAI WAN

DRAWING TITLE
PILE CAP LAYOUT PLAN

SCALE 1:125

DRAWING NO.
ET06/-/BLK/S/EF-005/C

SOURCE

ICU REF.

Revit 2016 A1 594 x 841

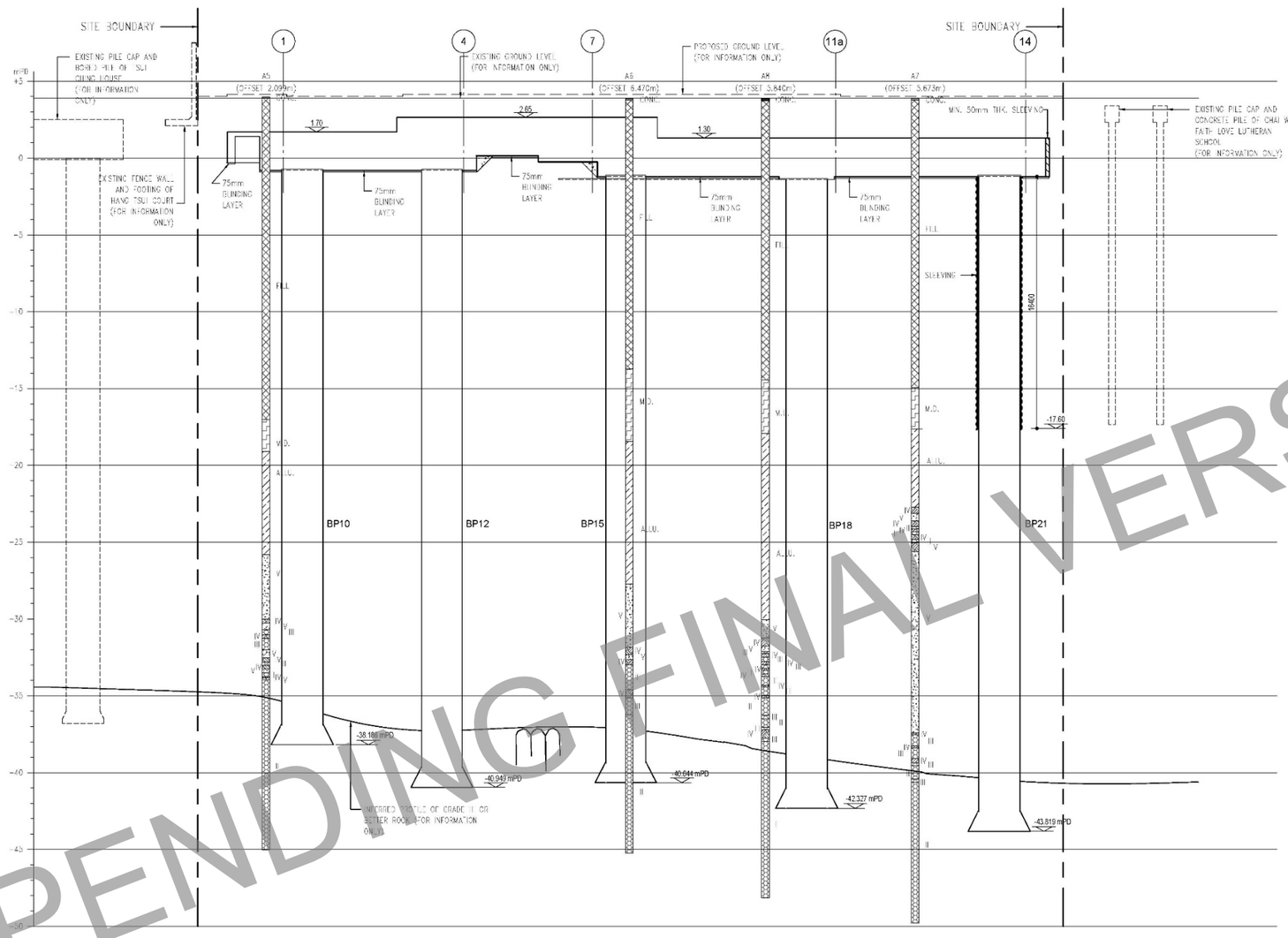
HOUSING DEPARTMENT

REF. S.I. NO. SE-

DATE OF ISSUE

FILE COPY / OTHERS: S.E. / Q.S. / R.E. / C&W BSE / Contractor / Architect

COPY FOR



SECTION X – X

ICU Ref. : HD(ICU)S 3 / ET06NR

NOTES

1. FOR NOTES, REFER TO DRAWING NO. ET06/-/BLK/S/EF-001 & EF-002.
2. LOCATIONS AND DIMENSIONS OF EXISTING STRUCTURES ARE INDICATIVE ONLY.
3. FOR LOCATION OF SECTION, REFER TO DRAWING NO. ET06/-/BLK/S/EF-001.
4. LEGEND:
   - MIN. 50mm THK. SLEEVING AT PILE CAP EDGE
   - SLEEVING PROVIDED AT TOP PORTION OF PILE
   - INFERRED PROFILE OF GRADE III OR BETTER ROCK (FOR INFORMATION ONLY)
   - CONCRETE (CONC.)
   - FILL
   - MARINE DEPOSIT (M.D.)
   - ALLUVIUM (ALLU.)
   - GRADE V ROCK
   - GRADE IV ROCK
   - GRADE III OR BETTER ROCK

Signature of Applicant (HD / PSP) :

ICU Approval Signature :

Signature for record Plan :

REVISIONS

NO	DESCRIPTION AND DATE	DWN	CKD	AUTH
A	1. ICU COMMENT INCORPORATED. (03/16)	TO(S) /31 OR	SIO(S) /38 ORIGINAL	S /115 SIGNED
B	1. CAP LEVEL AND DROP LOCATION REVISED. (03/16)	TO(S) /31 OR	SIO(S) /38 ORIGINAL	S /115 SIGNED
C	1. CAP LOCA. CHECKED. (03/16)	TO(S) /31 OR	SIO(S) /38 ORIGINAL	S /115 SIGNED
D	1. CAP DROP LOCATION REVISED (04/16)	TO(S) /31	SIO(S) /38	S /115

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISE	W.S. CHAU CSE/4	ORIGINAL SIGNED	03/16
CHECKED	K.W. WONG SSE/6	ORIGINAL SIGNED	03/16
	C.Y. KWAN SE/115	ORIGINAL SIGNED	03/16
	W.C. WONG STO(S)/08	ORIGINAL SIGNED	01/16
DRAWN	Y.M. WONG TO(S)/51	ORIGINAL SIGNED	01/16

PROJECT
FOUNDATION FOR PUBLIC RENTAL HOUSING DEVELOPMENT, WING TAI ROAD, CHAI WAN

DRAWING TITLE
PILING SECTION (SHEET 1 OF 2)

SCALE 1:130

DRAWING NO.
ET06/-/BLK/S/EF-006/D

SOURCE

ICU REF.

Revit 2016 A1 (594 x 841)

HOUSING DEPARTMENT

REF. SI / NO. SE

DATE OF ISSUE

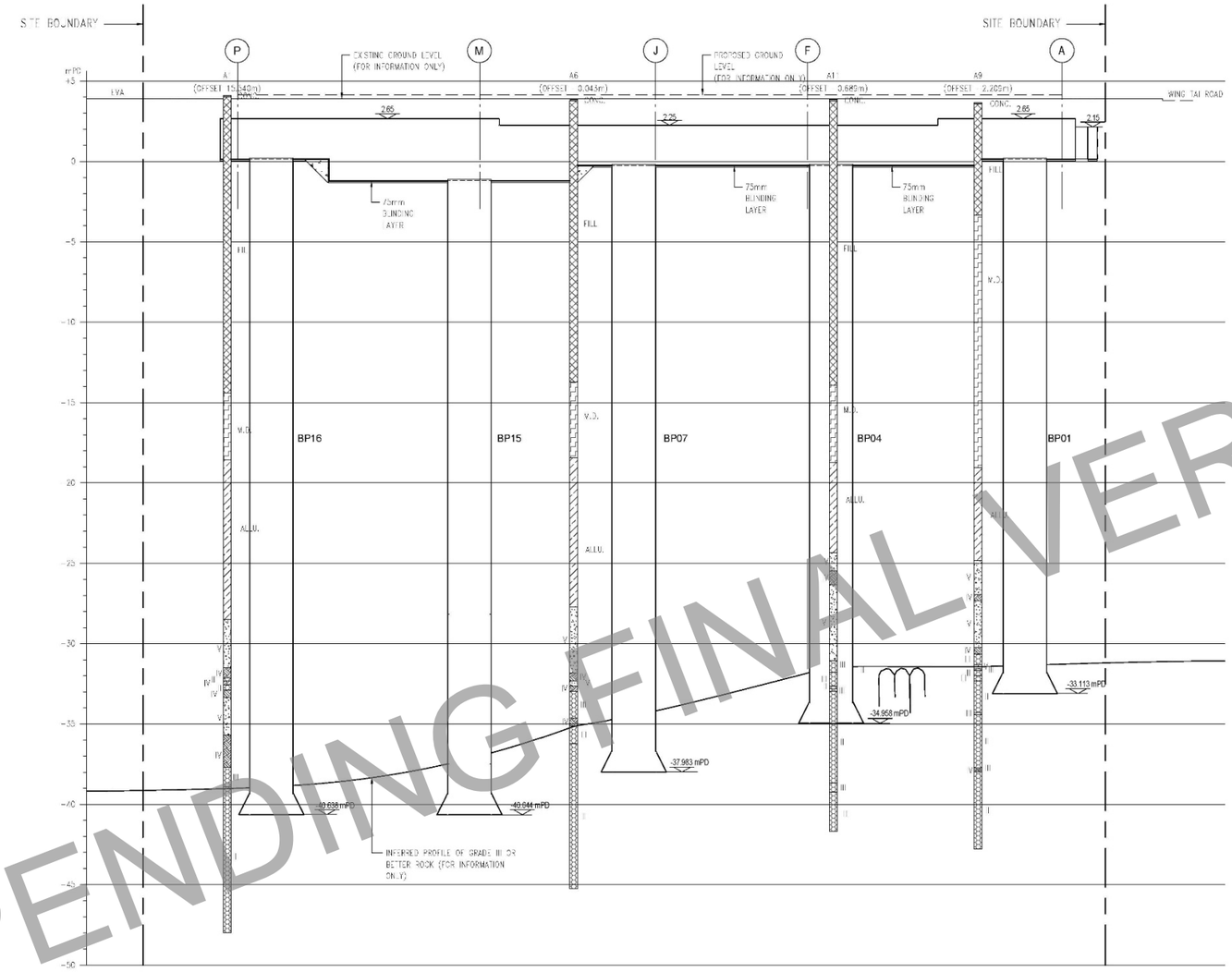
FILE / OFFICE

S.E. / PTW/BPA

P.E. / C.S.

CONT / S.S.E.

COPY FOR Contractor / Architect



SECTION Y – Y

ICU Ref. : HD(ICU)S 3 / ET06NR

NOTES

1. FOR NOTES AND LEGEND, REFER TO DRAWING NO. ET06/-/3.K/S/EF-006.
2. FOR LOCATION OF SECTION, REFER TO DRAWING NO. ET06/-/BLK/S/ET-001.

Signature of Applicant (HD / PSP) :

ICU Approval Signature :

Signature for record Plan :

REVISIONS

NO	DESCRIPTION AND DATE	INITIAL AND DESIGNATION DWN	CKD	AUTH
A	1. CAP DROP LOCATION REVISED (08/15)	TO(S) /51	STO(S) /38	SE /115

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	W.S. CHAU CSE/4	ORIGINAL SIGNED	03/16
CHECKED	K.W. WONG SSE/6	ORIGINAL SIGNED	03/16
	C.Y. KWAN SE/115	ORIGINAL SIGNED	03/16
	W.C. WONG STO(S)/38	ORIGINAL SIGNED	01/16
DRAWN	Y.M. WONG TO(S)/51	ORIGINAL SIGNED	01/16

PROJECT
FOUNDATION FOR PUBLIC RENTAL HOUSING DEVELOPMENT, WING TAI ROAD, CHAI WAN

DRAWING TITLE
PILING SECTION (SHEET 2 OF 2)

SCALE 1:150

DRAWING NO.
ET06/-/BLK/S/EF-007/A

SOURCE

ICU REF.

Revit 2016 - M ISO - A1

HOUSING DEPARTMENT

REF. S.I. NO. SE__
DATE OF ISSUE__
☐ FILE OFFICE
☐ S.E. ☐ OTHERS
☐ P.E. ☐ G.S.
☐ CONT ☐ S.S.E.
COPY FOR ☐ Contractor ☐ Architect

PILING SCHEDULE

Bored Pile Schedule

Pile Mark	Effective Shaft Diameter (mm)	Shaft Diameter in Rock Socket (mm)	Bellout Diameter (mm)	Top Level of Pile Cap (mPD)	Thickness of Pile Cap (m)	Cut off Level of Pile (mPD)	Tentative Bedrock Level at Pile Shaft (mPD)	Shaft Length in Rock Socket (SLIR) (m)*	Depth of Bellout (D)	Total Rock Socket Length (TSL) = (SLIR) + (D)	Tentative Founding Level (mPD)	Tentative Pile Length measured from Pile cut off level (m)	Bottom Level of Permanent Liner (mPD)	Critcal Load D (kN)	Critcal Load D+L (kN)	Critcal Load D+L+W (kN)	Critcal Load D-1.1U (kN)	Critcal Load D-1.5W-1.1U (kN)	Allowable End Bearing Capacity D+L (kN)	Allowable End Bearing Capacity D+L+W (kN)	Allowable Frictional Resistance of Rock Socket D+L (kN)	Allowable Frictional Resistance of Rock Socket D+L+W (kN)	Allowable Total Pile Capacity D+L (kN)	Allowable Total Pile Capacity D+L+W (kN)	Reinforcement Vertical Main Bars	Reinforcement Binders
BP01	2700	2700	4050	2.65	2.50	0.225	-31.463	0.30	1.35	1.65	-33.113	33.338	-27.78	43971	53799	69290	32265	9897	64412	80516	0	0	64412	80516	44T40	T16-125
BP02	2700	2700	4050	2.65	2.50	0.225	-32.308	0.30	1.35	1.65	-33.958	34.183	-29.58	44301	53895	69091	32502	8882	64412	80516	0	0	64412	80516	44T40	T16-125
BP03	2700	2700	4050	2.25	2.50	-0.175	-32.173	0.30	1.35	1.65	-33.823	33.648	-29.04	45713	54251	54851	33348	32448	64412	80516	0	0	64412	80516	44T40	T16-125
BP04	2700	2700	4050	2.25	2.50	-0.175	-31.808	1.80	1.35	3.15	-34.958	34.783	-25.88	43711	50747	65767	31652	9716	64412	80516	8906	11133	73319	91649	44T40	T16-125
BP05	2700	2700	4050	2.25	2.50	-0.175	-33.881	0.30	1.35	1.65	-35.531	35.356	-30.39	42575	49112	63345	30794	8872	64412	80516	0	0	64412	80516	44T40	T16-125
BP06	2700	2700	4050	2.25	2.50	-0.175	-34.205	0.30	1.35	1.65	-35.855	35.680	-28.52	42667	51272	53337	30899	27801	64412	80516	0	0	64412	80516	44T40	T16-125
BP07	2700	2700	4050	2.25	2.50	-0.175	-34.833	1.80	1.35	3.15	-37.983	37.808	-28.72	41362	52612	65561	29991	10568	64412	80516	8906	11133	73319	91649	44T40	T16-125
BP08	2700	2700	4050	2.25	2.50	-0.175	-37.213	0.30	1.35	1.65	-38.863	38.688	-29.51	41739	52606	65428	30187	10925	64412	80516	0	0	64412	80516	44T40	T16-125
BP09	2700	2700	4050	2.65	2.90	-0.175	-37.603	1.80	1.35	3.15	-40.753	40.578	-30.48	41992	60470	69878	30555	16499	64412	80516	8906	11133	73319	91649	44T40	T16-125
BP10	2700	2700	4050	1.70	2.50	-0.725	-36.536	0.30	1.35	1.65	-38.186	37.461	-27.91	36054	42075	50418	25689	12863	64412	80516	0	0	64412	80516	44T40	T16-125
BP11	2700	2700	4050	1.70	2.50	-0.725	-39.915	0.30	1.35	1.65	-41.565	40.840	-29.67	39671	46253	54935	28358	15538	64412	80516	0	0	64412	80516	44T40	T16-125
BP12	2700	2700	4050	2.65	3.45	-0.725	-37.799	1.80	1.35	3.15	-40.949	40.224	-28.77	42914	52477	60901	31159	18516	64412	80516	8906	11133	73319	91649	44T40	T16-125
BP13	2700	2700	4050	2.65	3.45	-0.725	-39.206	0.30	1.35	1.65	-40.856	40.131	-29.55	40606	47995	57118	29523	15995	64412	80516	0	0	64412	80516	44T40	T16-125
BP14	2700	2700	4050	2.65	2.50	0.225	-38.569	1.80	1.35	3.15	-41.719	41.944	-29.09	45206	58906	65211	33026	23560	64412	80516	8906	11133	73319	91649	52T40	T16-125
BP15	2700	2700	4050	2.65	3.85	-1.125	-37.494	1.80	1.35	3.15	-40.644	39.519	-29.16	43602	64874	74012	31812	18108	64412	80516	8906	11133	73319	91649	44T40	T16-125
BP16	2700	2700	4050	2.65	2.50	0.225	-38.988	0.30	1.35	1.65	-40.638	40.863	-28.81	39058	51347	62435	28553	11848	64412	80516	0	0	64412	80516	44T40	T16-125
BP17	2700	2700	4050	1.30	2.70	-1.325	-39.011	1.80	1.35	3.15	-42.161	40.836	-28.90	43630	69729	74087	31814	25274	64412	80516	8906	11133	73319	91649	52T40	T16-125
BP18	2700	2700	4050	1.30	2.70	-1.325	-39.177	1.80	1.35	3.15	-42.327	41.002	-28.96	47753	69994	78140	34680	22444	64412	80516	8906	11133	73319	91649	52T40	T16-125
BP19	2700	2700	4050	2.65	2.50	0.225	-39.517	1.80	1.35	3.15	-42.667	42.892	-28.00	40500	54292	66209	29425	11321	64412	80516	8906	11133	73319	91649	44T40	T16-125
BP20#	2700	2700	4050	1.30	2.50	-1.125	-39.983	1.80	1.35	3.15	-43.133	42.008	-27.36	43777	57933	64035	31527	22359	64412	80516	8906	11133	73319	91649	44T40	T16-125
BP21#	2700	2700	4050	1.30	2.50	-1.125	-40.669	1.80	1.35	3.15	-43.819	42.694	-26.78	52832	65551▲	81755	37821	8749	64412	80516	8906	11133	73319	91649	52T40	T16-125
BP22#	2700	2700	4050	1.30	2.70	-1.325	-41.059	1.80	1.35	3.15	-44.209	42.884	-28.48	48903	59957▲	70999	34952	13532	64412	80516	8906	11133	73319	91649	44T40	T16-125

# DENOTES PILES WITH MINIMUM 50mm SLEEVING WITH BOTTOM LEVEL AT -17.6mPD (DETAILS TO BE PROPOSED BY CONTRACTOR FOR CM APPROVAL).

* THE MINIMUM SOCKET DEPTH ALONG THE PILE DIAMETER OF 0.3m AS REQUIRED IN NOTE (3), TABLE 2 IN CODE OF PRACTICE FOR FOUNDATIONS HAS BEEN INCLUDED. CONTRIBUTION OF MINIMUM SOCKET DEPTH TO BOND OR FRICTIONAL RESISTANCE SHALL BE IGNORED.

▲ LIVE LOAD OF PILE INCLUDES ADDITIONAL VERTICAL LOAD DUE TO ADJACENT BUILDING.

ICU Ref. : HD(ICU)S 3 / ET06NR

NOTES

1. FOR NOTES, REFER TO DRAWING NO. ET06/ /BLK/S/EH 001 & EF 002.
2. FOR LOCATION OF PILES, REFER TO DRAWING NO. ET06/ -/BLK/S/EF-001.
3. DESIGN GROUND WATER LEVEL IS ASSUMED AT GROUND LEVEL FOR CONSERVATISM.
4. LEGEND FOR LOAD CASE:
   D = DEAD LOAD + SUPERIMPOSED DEAD LOAD
   D(Min.) = MINIMUM DEAD LOAD
   L = LIVE LOAD
   W = WIND LOAD
   U = BUOYANCY OF GROUND WATER AT GROUND LEVEL
5. DESIGN GROUND WATER LEVEL = 4.00 mPD

Signature of Applicant (HD / PSP) :

ICU Approval Signature :

Signature for record Plan :

REVISIONS

NO	DESCRIPTION AND DATE	INITIAL AND DESIGNATION DWN	CKD	AUTH
A	1. ICU COMMENT INCORPORATED. (C3/15)	TO(S) /51 ORIGINAL	SIO(S) /38 SIGNED	S. /115
B	1. BP13 TO 18, 20 CUT-OFF LEVEL AND LENGTH REVISED. (C3/15)	TO(S) /51 ORIGINAL	SIO(S) /38 SIGNED	S. /115
C	1. BP17, 18 & 22 CUT-OFF LEVEL AND LENGTH REVISED. (C3/15)	TO(S) /51 ORIGINAL	SIO(S) /38 SIGNED	S. /115

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	W.S. CHAU CSE/4	ORIGINAL SIGNED	03/16
CHECKED	K.W. WONG SSE/6	ORIGINAL SIGNED	03/16
	C.Y. KWAN SE/115	ORIGINAL SIGNED	03/16
	W.C. WONG STO(S)/38	ORIGINAL SIGNED	01/16
DRAWN	Y.M. WONG TO(S)/51	ORIGINAL SIGNED	01/16

PROJECT
FOUNDATION FOR PUBLIC RENTAL HOUSING DEVELOPMENT, WING TAI ROAD, CHAI WAN

DRAWING TITLE
PILING SCHEDULE

SCALE N.T.S.

DRAWING NO.
ET06/-/BLK/S/EF-009/C

SOURCE

ICU REF.

Revit 2016 A1 594 x 841

HOUSING DEPARTMENT

DATE OF ISSUE | REF. S.I. NO. SE_

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COPY FOR

GENERAL NOTES

1. THE FOLLOWING NOTES INDICATE THE MINIMUM REQUIREMENTS OF THE MONITORING WORKS FOR THE PILING WORKS. THE CONTRACTOR MAY PROPOSE ADDITIONAL MONITORING SYSTEM FOR CM'S APPROVAL, IF CONSIDERED NECESSARY, PRIOR TO THE COMMENCEMENT OF PILING WORKS. THE MONITORING MARKERS AND MONITORING WORKS WITHIN THE SITE SHALL BE INSTALLED AND CARRIED OUT WITHIN 1 MONTH UPON HANDING OVER OF THE SITE TO THE CONTRACTOR OR BEFORE COMMENCMENT OF ANY PILING WORKS WITHIN THE SITE, WHICHEVER IS THE EARLIER.
2. THE LOCATIONS OF THE MONITORING MARKERS AND DEVICES AS SHOWN ON THE MONITORING PLAN ARE INDICATIVE ONLY. THE EXACT LOCATIONS SHALL BE DETERMINED ON SITE AND AGREED WITH THE CM. THE EXACT LOCATIONS SHALL NOT CLASH WITH EXISTING/NEW HOARDING.
3. PRIOR TO COMMENCEMENT OF CONSTRUCTION,
   (a) INSPECT THE CONDITION OF ADJOINING AREAS, EXISTING SLOPES, FEATURES, STRUCTURES, HOARDINGS, UTILITIES, ROADS, PAVEMENTS AND THE LIKE. SUBMIT THE CONDITION SURVEY REPORT TO THE CM FOR RECORD;
   (b) SUBMIT THE METHOD STATEMENT FOR EVALUATION OF VIBRATION AND MOVEMENT CAUSED BY THE CONSTRUCTION WORK TO THE CM FOR APPROVAL;
   (c) SUBMIT TO THE CM FOR RECORD A SET OF INITIAL READINGS FOR ALL MONITORING POINTS / INSTRUMENTS.
   (d) THE AS-BUILT LOCATIONS OF THE MONITORING POINTS/INSTRUMENTS INCLUDING COORDINATES LEVELS AND PHOTOGRAPHS SHALL BE SUBMITTED TO THE CM FOR RECORD.
4. ALL MONITORING WORKS SHALL BE CARRIED OUT BY THE CONTRACTOR AND, IF CONSIDERED NECESSARY, SHALL BE INSPECTED JOINTLY BY THE CM'S REPRESENTATIVES.
5. ALL MONITORING MARKERS AND DEVICES (INCLUDING EXISTING PIEZOMETERS AT B4 & B16) SHALL BE MAINTAINED IN GOOD WORKING CONDITION. PLAN THE WORKS SUCH THAT NONE OF THE MONITORING MARKERS AND DEVICES WILL BE OBSTRUCTED OR DAMAGED. ANY DAMAGED OR OBSTRUCTED MARKERS AND DEVICES SHALL BE REINSTATED OR RELOCATED TO THE CM'S SATISFACTION.
6. THE MONITORING FREQUENCY SHALL BE AS FOLLOWS OR OTHERWISE AS DIRECTED OR AGREED BY THE CM:
   (a) FOR GROUND SETTLEMENT, VIBRATION AND TILTING MONITORING:
   - DAILY (DURING THE PERIOD OF PILE CONSTRUCTION AND ELS WORKS)
   - TWICE PER WEEK (OTHERWISE)

   (b) FOR UNDERGROUND WATER LEVEL MONITORING:
   - DAILY (DURING THE PERIOD OF PILE CONSTRUCTION AND ELS WORKS)
   - DAILY FOR 3 CONSECUTIVE DAYS (AFTER INTENSIVE RAINFALL LARGER THAN 100mm PER DAY)
   - WEEKLY (OTHERWISE)
7. ALL MONITORING RESULTS SHALL BE KEPT ON SITE FOR INSPECTION AND SUBMITTED TO THE CM WITHIN 3 CALENDAR DAYS AFTER TAKING MEASUREMENTS, UNLESS OTHERWISE STATED.
8. GROUND SETTLEMENT AND TILTING MONITORING

MONITORING POINT	AAA RESPONSE MAXIMUM VALUES		
	ALERT LEVEL	ALARM LEVEL	ACTION LEVEL
SETTLEMENT MARKER (SM1 TO SM6)	15mm	20mm	25mm
BUILDING TILTING MARKER (TM1 TO TM6)	1 : 1000	1 : 750	1 : 500

REFER TO THE GENERAL NOTES ON ALERT, ALARM AND ACTION LEVEL SYSTEM FOR ACTIONS TO BE IMPLEMENTED WHEN THESE TRIGGER LEVELS ARE REACHED.

(a) SHOULD THE TOTAL SETTLEMENT OF ANY SETTLEMENT MARKER BE IN EXCESS OF THE ALERT LEVEL, REVIEW THE MONITORING DATA AND CONSTRUCTION ACTIVITIES AND REPORT THE FINDING OF THE CAUSES TO THE CM IMMEDIATELY. IF UNDUE SETTLEMENT OR UNDUE TILTING IS OBSERVED, SUBJECT TO THE CM'S INSPECTION, CEASE THE CONSTRUCTION ACTIVITIES IMMEDIATELY AND SUBMIT REMEDIAL AND PRECAUTIONARY MEASURES FOR THE CM'S APPROVAL. DO NOT RESUME WORKS WITHOUT THE CM'S APPROVAL;

(b) SHOULD THE EXCESS IN SETTLEMENT ARISE FROM THE EXECUTION OF THE WORKS, REVISE THE METHOD AND/OR PROCEDURE OF CONSTRUCTION AND TAKE ALL NECESSARY STEPS TO PREVENT FURTHER SETTLEMENT;
(c) INCREASE THE FREQUENCY OF MONITORING AS AND WHEN INSTRUCTED BY THE CM;
(d) NO DEWATERING SHOULD BE ALLOWED UNLESS INSTRUCTED BY THE CM.

9. VIBRATION LIMIT (VCP1 TO VCP4)

TYPE OF STRUCTURE OR INSTALLATION	PEAK PARTICLE VELOCITY (mm/sec)
ROAD PAVEMENT	15
ROBUST AND STABLE BUILDINGS IN GENERAL	15

IF THE VIBRATION AND MOVEMENT LIMITS AS STATED ARE EXCEEDED AS A RESULT OF THE CONSTRUCTION WORKS, SUBJECT TO THE CM'S INSTRUCTION, CONSTRUCTION WORKS SHALL BE SUSPENDED IMMEDIATELY AND THE CONTRACTOR SHALL SUBMIT REMEDIAL WORK PROPOSAL TO THE CM FOR APPROVAL. NO RESUMPTION OF CONSTRUCTION WORK IS PERMITTED UNTIL THE REMEDIAL WORKS HAVE BEEN COMPLETED AND REMEDIAL MEASURES HAVE BEEN IMPLEMENTED.

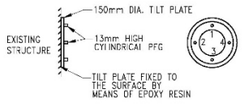
10. PIEZOMETER MONITORING

MONITORING POINT	AAA RESPONSE MAXIMUM VALUES			
	GROUNDWATER TABLE CHANGES	ALERT LEVEL	ALARM LEVEL	ACTION LEVEL
PIEZOMETER (B4, B16 AND B17)	UPPER BOUND	+3.00mPD	+3.50mPD	+4.00mPD
	LOWER BOUND*	0.5m	1.0m	1.5m

*BASED ON LOWEST OBSERVED GROUNDWATER LEVEL AS ADVISED BY CM.

REFER TO THE GENERAL NOTES ON ALERT, ALARM AND ACTION LEVEL SYSTEM FOR ACTIONS TO BE IMPLEMENTED WHEN THESE TRIGGER LEVELS ARE REACHED.

11. ADDITIONAL MONITORING MARKERS, INCLUDING SETTLEMENT MARKERS AND TILTING MARKERS, SHALL BE INSTALLED ON EXTERNAL WALL AND FENCE WALL OF ADJACENT HOUSES/BUILDINGS OUTSIDE THE SITE BOUNDARY AS INSTRUCTED BY CM. THE MONITORING FREQUENCY IS DAILY OR AS ADVISED BY CM AND THE MONITORING RECORD SHALL BE SUBMITTED TO CM WITHIN 3 DAYS FROM THE DATE OF MONITORING.



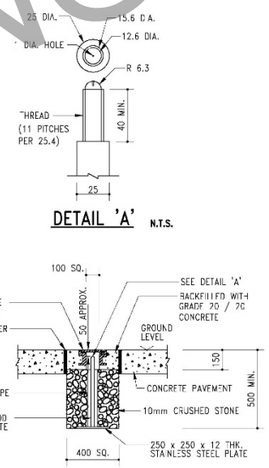
TYPICAL DETAILS OF TILTING MARKER ON EXISTING STRUCTURE
N.T.S.

GENERAL NOTES ON ALERT, ALARM AND ACTION LEVEL SYSTEM

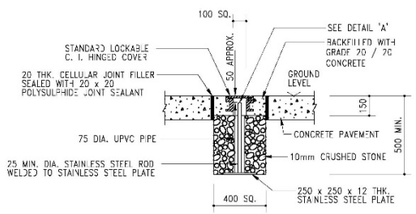
1. THE INSTRUMENT READING SHALL BE MONITORED AGAINST ALERT, ALARM AND ACTION TRIGGER LEVELS. AS DEFINED FOR THE INDIVIDUAL INSTRUMENT ON THE MONITORING SCHEDULE, ACTIONS TO BE IMPLEMENTED WHEN THESE TRIGGER LEVELS ARE REACHED ARE EXPLAINED BELOW.
2. IF AN ALERT LEVEL IS REACHED, THE FOLLOWING PROCEDURES SHALL BE FOLLOWED:
   (a) NOTIFY THE CM IMMEDIATELY;
   (b) THE CONTRACTOR SHALL SUBMIT A BRIEF REPORT DESCRIBING THE WORKS BEING UNDERTAKEN IN THE VICINITY OF THE INSTRUMENT;
   (c) THE CONTRACTOR SHALL PROPOSE AN ACTION PLAN FOR THE CM'S APPROVAL FOR ADDITION OF INSTRUMENT AND/OR INCREASE MONITORING FREQUENCY AND DESCRIBING THE MEASURES TO BE TAKEN IN THE EVENT OF AN ALARM OR ACTION TRIGGER LEVEL BEING ATTAINED.
3. IF AN ALARM LEVEL IS REACHED, THE FOLLOWING PROCEDURES SHALL BE FOLLOWED:
   (a) NOTIFY THE CM IMMEDIATELY;
   (b) CARRY OUT A JOINT INSPECTION OF THE WORKS WITH THE CM;
   (c) THE CONTRACTOR SHALL IMPLEMENT THE ALARM LEVEL TRIGGER ACTIONS AS APPROPRIATE SO THAT THE ACTION LEVEL IS NOT REACHED IN ACCORDANCE WITH THE DETAILED PLAN OF ACTION;
   (d) THE CONTRACTOR SHALL PREPARE AND SUBMIT AN EMERGENCY PLAN DESCRIBING THE MEASURES TO BE TAKEN IN THE EVENT OF AN ACTION TRIGGER LEVEL BEING ATTAINED;
   (e) IMPLEMENT AGREED ACTIONS TO UNDERTAKE ADDITIONAL MEASURES IN THE AFFECTED AREA TO AVOID REACHING THE ACTION LEVEL.
   (f) NOTIFY THE HA INDEPENDENT CHECKING UNIT (ICU) FOR ACTIONS TAKEN.
4. IF AN ACTION LEVEL IS REACHED, THE FOLLOWING PROCEDURES SHALL BE FOLLOWED.
   (a) SUSPEND ACTIVE CONSTRUCTION WORKS;
   (b) UNDERTAKE A JOINT INSPECTION OF THE WORKS WITH THE CM;
   (c) IMPLEMENT EMERGENCY TRIGGER ACTIONS BASED ON THE EMERGENCY PLAN REVIEWED WITHOUT OBJECTION OF THE CM;
   (d) WITHIN 3 DAYS, THE CONTRACTOR SHALL PROVIDE A COMPLETE REPORT TO EXAMINE THE CONSTRUCTION METHOD AND REVIEW THE DEFORMATION AND GROUND RESPONSE HISTORY AND THE TRIGGER ACTIONS ADOPTED RELATED TO THE CONSTRUCTION ACTIVITIES. THE WORKS SHALL ONLY RESUME AFTER A REMEDIAL PROPOSAL HAS BEEN SUBMITTED AND AGREED WITH THE CM.
   (e) NOTIFY THE ICU FOR ACTIONS TAKEN.
   (f) THE INVESTIGATION REPORT AND REMEDIAL PROPOSAL SHALL BE SUBMITTED TO THE ICU AND THE WORKS SHALL RESUME AFTER OBTAINING THE CM & ICU'S AGREEMENT.
5. IN ADDITION TO NOTE 1 TO 4, SHOULD DAMAGE/SIGN OF DISTRESS OF ANY EXISTING BUILDINGS/STRUCTURES/UTILITIES BE OBSERVED, SUBJECT TO THE CM'S INSPECTION, CEASE THE CONSTRUCTION ACTIVITIES IMMEDIATELY, NOTWITHSTANDING ANY OF THE PROVISION CONTAINED HEREIN WHEN ANY OF THE REQUIREMENTS STIPULATED IN THE RELEVANT STATUTORY REGULATIONS AND ORDINANCE IS VIOLATED, STOP ALL PILING OPERATIONS OR FOUNDATION WORKS OR EXCAVATION WORKS IMMEDIATELY, UNLESS OTHERWISE AGREED BY THE CM –
   a. DO NOT RECOMMENCE THE WORK SO SUSPENDED UNTIL EFFECTIVE MEANS, OR REPLACEMENT MACHINES, HAVE BEEN EMPLOYED TO REDUCE THE VIBRATION AND/OR SETTLEMENT AND/OR MOVEMENT TO WITHIN THE ACCEPTABLE LIMITS;
   b. BEAR ALL LEGAL LIABILITIES AND COST OF ANY STOPPAGE UNDER THE TERMS OF THIS CLAUSE AND COMPLETE THE WORKS WITHOUT ANY CONSEQUENTIAL EXTENSION OF TIME.
   c. SEEK CM'S APPROVAL TO RESUME WORK SO SUSPENDED.

NOTES ON EXISTING UNDERGROUND SERVICES UTILITIES AND ADJACENT PROPERTY

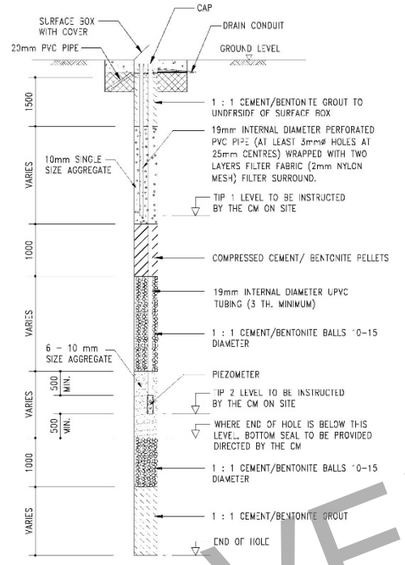
1. PRIOR TO COMMENCEMENT OF WORKS THE CONTRACTOR SHALL CARRY OUT A CONDITION SURVEY OF THE ADJACENT GROUND, STRUCTURES AND PROPERTY AND SUBMIT A SURVEY REPORT TO THE CM FOR RECORD.
2. CARRY OUT CCTV SURVEY FOR THE EXTENT OF THE PUBLIC SEWERS AND DRAINS ADJACENT TO THE SITE AS AGREED BY DSD BEFORE AND AFTER THE CONSTRUCTION WORKS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ORGANIZING ANY NECESSARY DIVERSION, PROPER PROTECTION OR MAINTAINING NORMAL FUNCTIONS OF ALL SERVICES AND UTILITIES AFFECTED BY THE WORKS BEFORE AND DURING CONSTRUCTION OPERATIONS.



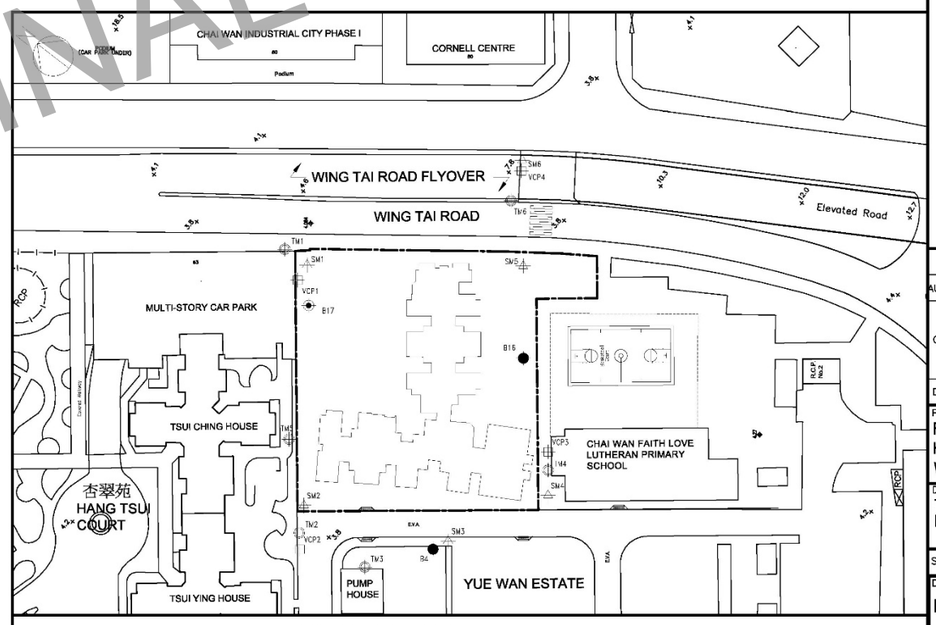
DETAIL 'A' N.T.S.



TYPICAL DETAILS OF GROUND SETTLEMENT MARKERS
N.T.S.



DETAILS OF STANDPIPE/PIEZOMETER
N.T.S.



MONITORING POINT LAYOUT (1:500)

LEGEND :

- B17 PROPOSED PIEZOMETER (B17)
- B4 EXISTING PIEZOMETER (B4 AND B16)
- SM1 PROPOSED SETTLEMENT MARKER (SM1 TO SM6)
- TM1 PROPOSED TILTING MARKER (TM1 TO TM6)
- VCP1 PROPOSED VIBRATION CHECK POINT (VCP1 TO VCP4)
- SITE BOUNDARY LINE

ICU Ref. : HD(ICU)S 3 / ET06NR

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND STRUCTURAL DRAWINGS.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.

Signature of Applicant (HD / PSP) :

ICU Approval Signature :

Signature for Record Plan :

REVISIONS

NO	DESCRIPTION AND DATE	INITIAL AND DESIGNATION DWN	CKD	AUTH

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	W.S. CHAU CSE/4	ORIGINAL SIGNED	03/16
CHECKED	K.W. WONG SSE/6	ORIGINAL SIGNED	03/16
	C.Y. KWAN SE/115	ORIGINAL SIGNED	03/16
	W.C.WONG STO(S)/38	ORIGINAL SIGNED	03/16
DRAWN	Y.M. WONG TO(S)/51	ORIGINAL SIGNED	03/16

PROJECT
FOUNDATION FOR PUBLIC RENTAL HOUSING DEVELOPMENT AT WING TAI ROAD, CHAI WAN

DRAWING TITLE
TYPICAL NOTES AND DETAILS OF MONITORING PLAN FOR PILING WORKS

SCALE N.T.S.

DRAWING NO.
ET06/-/BLK/S/EF-041

SOURCE

ICU NO.

AutoCAD 2000 A1 594 x 841

HOUSING DEPARTMENT

COUNTERCHECKED

REF. : S.I./NO. SC | DATE OF ISSUE | FILE / OFFICE | S.E. | OTHERS | R.E. | Q.S. | CO/W | B.S.E. | Contractor | Architect | COPY FOR

GENERAL NOTES AND STANDARD FIXING DETAILS

ICU Ref. : HD(ICU)S 3 / ET06NR

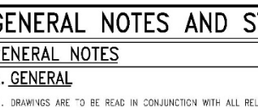
GENERAL NOTES

A. GENERAL

1. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL & STRUCTURAL DRAWINGS.
2. THE STANDARD DETAILS SHOWN ON THESE DRAWINGS ARE SUPPLEMENTARY TO THE STRUCTURAL DRAWINGS ISSUED UNDER THE CONTRACT.
3. ALL DIMENSIONS ARE IN MILLIMETRE UNLESS OTHERWISE STATED.
4. ALL LEVELS ARE STRUCTURAL LEVEL IN METRES ABOVE/BELOW PRINCIPAL DATUM OF HONG KONG.
5. ALL DETAILS SHOWN ON DRAWINGS ARE DESIGNED IN ACCORDANCE WITH RELEVANT BUILDING REGULATIONS, CODE OF PRACTICE FOR FOUNDATIONS 2004 AND CODE OF PRACTICE FOR STRUCTURAL USE OF CONCRETE 2013, CODE OF PRACTICE FOR DEAD AND IMPOSED LOADS 2011 AND CODE OF PRACTICE ON WIND EFFECTS IN HONG KONG 2004.
6. UNLESS OTHERWISE SPECIFIED, BLINDING LAYER SHALL BE PROVIDED TO UNDERSIDE OF THE FOLLOWING STRUCTURAL WORKS :-
   a. 75mm THICK GRADE 20D/20 – FOR PILE CAPS, BEAMS AND ALL OTHER FOUNDATION WORKS.
7. STRUCTURAL CONCRETE IS TO BE:
   i) PILE CAP — PFA CONCRETE* OF GRADE 40D/20 WITH MINIMUM CRUSHING STRENGTH OF 40N/mm² AT 28 DAYS.
   ii) BEAM/SLAB AT PILE CAP LEVEL — GRADE 40D/20 WITH MINIMUM CRUSHING STRENGTH OF 40N/mm² AT 28 DAYS.
   iii) WALL/COLUMN ABOVE PILE CAP — GRADE 60D/20 WITH MINIMUM CRUSHING STRENGTH OF 60N/mm² AT 28 DAYS.
   IV) MASS CONCRETE FILL — GRADE 30D/20 WITH MINIMUM CRUSHING STRENGTH OF 30N/mm² AT 28 DAYS.
   * USE OF PFA CONCRETE AT 35% PFA CONTENT (REFER TO THE SPECIFICATION) PFA SHALL COMPLY WITH PNAP APP-33.
8. UNLESS OTHERWISE SPECIFIED, ALL STRUCTURAL WALLS, COLUMNS AND MASS CONCRETE FILL EXCEPT STARTER BARS ABOVE PILE CAPS AND TIE/STRAP BEAMS ARE TO BE CONSTRUCTED BY BUILDING CONTRACTOR.

B. CONCRETE AND REINFORCEMENT

1. ALL CONCRETE SHALL COMPLY WITH HONG KONG CONSTRUCTION STANDARD CS1:2010.
2. ALL CONCRETE MATERIALS SHALL COMPLY WITH THE FOLLOWING REQUIREMENTS:
   i) CEMENT TO BS EN 197-1:2011
   ii) AGGREGATE TO CS3:2013
3. THE CONCRETE MIX SHALL COMPLY WITH PNAP APP-74 TO CATER FOR THE EFFECT OF ALKALI-AGGREGATE REACTION.
4. MAXIMUM AGGREGATE SIZE IS 20mm.
5. UNLESS OTHERWISE STATED, TESTING OF CONCRETE SHALL COMPLY WITH CS1:2010.
6. ALL REINFORCEMENT TO BE HOT ROLLED AND SHALL COMPLY WITH CS2:2012.
7. REINFORCEMENT PREFIXED 'Y' DENOTES RIBBED STEEL REINFORCING BARS WITH A CHARACTERISTIC STRENGTH OF 500N/mm². REINFORCEMENT PREFIXED 'R' DENOTES PLAIN STEEL REINFORCING BARS WITH A CHARACTERISTIC STRENGTH OF 250N/mm².
8. ALL REINFORCEMENT TO BE BENT IN ACCORDANCE WITH BS 8666:2005 EXCEPT OTHERWISE SHOWN. THE MINIMUM SCHEDULING RADIUS AND BEND ALLOWANCES SHOWN IN TABLE 3 OF BS8666:2005 ARE TO BE SUBSTITUTED BY TABLE 1 OF DRAWING NO. ET06/-/FDN/S/EG-002.
9. PRESENTATION OF REINFORCEMENT :-



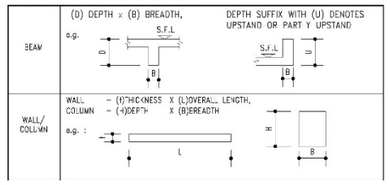
10. THE FOLLOWING SYMBOLS ARE USED AS ABBREVIATIONS AS SHOWN BELOW UNLESS OTHERWISE STATED :-

T1	TOP BARS 1st LAYER	12m	MAXIMUM LENGTH OF BAR SHALL BE 12 METRE
T2	TOP BARS 2nd LAYER	TAL	MINIMUM TENSION ANCHORAGE LENGTH
Tn	TOP BARS nth LAYER	TLL	MINIMUM TENSION LAP LENGTH
B1	BOTTOM BARS 1st LAYER	TL	BASIC TENSION LAP
B2	BOTTOM BARS 2nd LAYER	SS	SINGLE STIRRUPS
Bn	BOTTOM BARS nth LAYER	DS	DOUBLE STIRRUPS
LV	LENGTH VARIES	TS	TRIPLE STIRRUPS
A	MINIMUM END DIMENSION	TORS	TORSIONAL STIRRUPS
ø	BAR DIAMETER	HL	HOOK LINK
d	DIAMETER OF THE LARGEST VERTICAL REINFORCEMENT	ET	EACH FACE
d_L	DIAMETER OF HORIZONTAL REINFORCEMENT	NF	NEAR FACE
ds	DEPTH OF SLAB	FF	FAR FACE
VB	VERTICAL BAR	H	DEPTH OF FOUNDATION
D	DEPTH OF BEAM	HB	HORIZONTAL BAR
UB	U-BARS	r	BEND RADIUS
ALT	BARS ALTERNATELY PLACED	t	THICKNESS OF WALL
STG	BARS TO BE STAGGERED		

THE LENGTH ABBREVIATED AS TLL ARE THE TENSION LAP LENGTH REQUIRED IN THE RESPECTIVE LOCATION. THEY ARE DETERMINED BY MULTIPLYING THE BASIC TENSION LAP (ABBREVIATED BY TL) BY FACTORS 1.0, 1.4 OR 2.0 AS APPROPRIATE (IN ACCORDANCE WITH TABLE 3) AS SHOWN IN THE RESPECTIVE DETAILS OF THE STRUCTURAL MEMBER.

B. CONCRETE AND REINFORCEMENT (CONT'D)

11. MEMBER SIZES ARE INDICATED AS FOLLOWS :-



12. CONCRETE COVER IS TO BE AS FOLLOW :

MEMBER	MEASUREMENT FROM	MEASUREMENT TO FACE OF MEMBER	COVER (mm)
PILE CAP	ALL REINFORCEMENT	AT TOP	70
		AT BOTTOM	75
		OTHER FACES	50
WALL/COLUMN STARTER BAR	VERTICAL REINFORCEMENT	FACING TOWARDS LIFT SHAFT	45
		OTHER FACES	65
	HORIZONTAL REINFORCEMENT /BINDER (FOR REFERENCE)	FACING TOWARDS LIFT SHAFT	30
		OTHER FACES	50
BEAM INDICATED ON FOUNDATION PLAN	ALL REINFORCEMENT	AT BOTTOM	75
		OTHER FACES	50
SLAB	ALL REINFORCEMENT	AT TOP	70
		AT BOTTOM	75
		OTHER FACES	50

STANDARD FIXING DETAILS

A. GENERAL

1. ALL FORMWORK INDICATED ON THIS DRAWING ARE DEEMED TO BE WORKS DESIGNED BY CONTRACTOR AND THE QUANTITIES ARE NOT INCLUDED IN THE BILL OF QUANTITIES.
2. ALL SPACER BARS, SPACER U-BARS AND CHAIRS SHOWN ON THIS DRAWING ARE TO COMPLY WITH SPECIFICATIONS AND THE QUANTITIES ARE NOT INCLUDED IN THE BILL OF QUANTITIES.

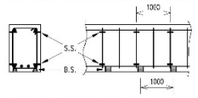
B. SECURING OF REINFORCEMENT

1. BEAM STIRRUPS :-
   a. SECURE LONGITUDINAL BARS AT CORNERS, HOOKS AND BENDS OF STIRRUPS AT ALL INTERSECTIONS.
   b. SECURE LONGITUDINAL BARS OTHER THAN (a) ABOVE AT ALTERNATE INTERSECTION WITH STIRRUPS OR CLOSER.
2. CANTILEVER STRUCTURE REINFORCEMENT :-
   a. SECURE ALL INTERSECTIONS TO AVOID STEEL REINFORCEMENT FROM BEING DISPLACED DURING CONCRETING.
3. PILE CAP REINFORCEMENT :-
   a. SECURE ALL EDGE INTERSECTIONS.
   b. FOR BARS UP TO AND INCLUDING 20mm DIAMETER, SECURE EACH BAR AT EVERY ALTERNATIVE INTERNAL INTERSECTIONS.
   c. WHERE ALL BARS ARE 25mm DIAMETER OR LARGER, SECURE EACH BAR AT SPACING NOT GREATER THAN 1000 c/c.

C. SPACERS FOR REINFORCEMENT

SPACING OF SPACERS AND BLOCKS INDICATED BELOW IS THE MINIMUM TO BE PROVIDED. SHALL THE REINFORCEMENT BE USED AS SUPPORT FOR SITE TRAFFIC, ALL EXTRA CHAIRS/SPACERS THAT ARE REQUIRED MUST BE DESIGNED BY THE CONTRACTOR FOR APPROVAL BY CONTRACT MANAGER. ALL EXTRA CHAIRS/SPACERS SHALL BE FIXED TO MAINTAIN THE REINFORCEMENT TO ITS CORRECT POSITION :-

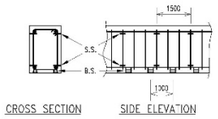
1. BEAMS :-
   a. BOTTOM AND SIDE SPACERS (FOR LARGE MAIN BARS ø ≥ 25)
      i. BOTTOM SPACERS (B.S.) – USE PLASTIC CHAIR TYPE SPACERS, 2 NOS. PER SET, 1 SET PER 1m RUN OF BEAM.
      ii. SIDE SPACERS (S.S.) – USE PLASTIC RING TYPE SPACERS, CLIPPED ON STIRRUPS, 4 NOS. PER SET, 1 SET PER 1m RUN OF BEAM.



CROSS SECTION SIDE ELEVATION

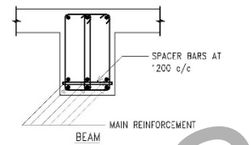
C. SPACERS FOR REINFORCEMENT (CONT'D)

1. BEAMS (CONT'D) :-
   b. BOTTOM AND SIDE SPACERS (FOR SMALL MAIN BARS ø < 25)
      i. BOTTOM SPACERS (B.S.) – USE PLASTIC CHAIR TYPE SPACERS, 2 NOS. PER SET, 1 SET PER 1m RUN OF BEAM.
      ii. SIDE SPACERS (S.S.) – USE PLASTIC RING TYPE SPACERS, CLIPPED ON STIRRUPS, 4 NOS. PER SET, 1 SET PER 1.5m RUN OF BEAM.

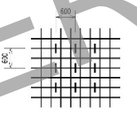


CROSS SECTION SIDE ELEVATION

   c. SPACER BARS
      i. DIAMETER OF SPACER BARS TO BE 25mm MINIMUM AND NOT LESS THAN THAT OF THE LARGEST MAIN REINFORCEMENT.

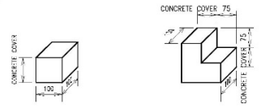


2. WALLS :-
   a. USE RING TYPE PLASTIC SPACERS, CLIPPED ON HORIZONTAL BARS.
   b. SPACING TO BE 600mm HORIZONTALLY AND VERTICALLY, FOR EACH WALL SURFACE.

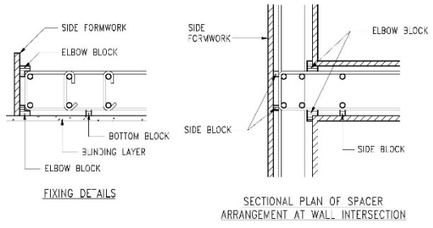


ELEVATION

3. FOUNDATION (PILE CAP) :-
   a. PRECAST CONCRETE SPACER BLOCKS SHALL BE PLACED FOR BOTTOM BARS AS SHOWN BELOW IN FOUNDATION WORKS TO ACHIEVE THE SPECIFIED CONCRETE COVER.
   b. FOR VERTICAL BARS IN WALLS AND COLUMNS REACHING THE FOUNDATION BEARING LEVEL INSIDE THE PILE CAP OR TIE/STRAP BEAM, ONE BLOCK SHALL BE USED FOR EACH BAR.
   c. FOR TOP AND BOTTOM EDGE OF PILE CAP, USE 1 PAIR OF PRECAST CONCRETE SPACER BLOCKS, PER 2m RUN OF EDGE IF APPLICABLE.

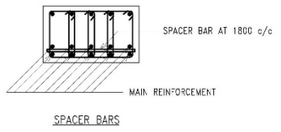


SIDE & BOTTOM BLOCK FOR (a) & (b) ELBOW BLOCK FOR (c)



FIXING DETAILS SECTIONAL PLAN OF SPACER ARRANGEMENT AT WALL INTERSECTION

   d. SPACER BARS SHALL BE OF DIAMETER 25mm MINIMUM AND NOT LESS THAN THAT OF THE LARGEST MAIN REINFORCEMENT.



SPACER BARS

Signature of Applicant (HD / PSP) :

ICU Approval Signature :

Signature for Record Plan :

REVISIONS

NO	DESCRIPTION AND DATE	INITIAL AND DESIGNATION DWN	CKD	AUTH
A	1. NOTES REVISED. (03/16)	TO(S) /51	ST'O(S)) /38	SE /115
	ORIGINAL SIGNED			
B	1. NOTES REVISED. (12/16)	TO(S) /51	ST'O(S)) /38	SE /115

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	W.S. CHAU CSE/4	ORIGINAL SIGNED	03/2016
	K.W. WONG SSE/6	ORIGINAL SIGNED	03/2016
CHECKED	C.Y. KWAN SE/115	ORIGINAL SIGNED	02/2016
	W.C. WONG STO(S)/38	ORIGINAL SIGNED	01/2016
DRAWN	Y.M. WONG TO(S)/51	ORIGINAL SIGNED	01/2016

REF : S1 NO.26

PROJECT
FOUNDATION FOR PUBLIC RENTAL HOUSING DEVELOPMENT AT WING TAI ROAD, CHAI WAN

DRAWING TITLE
GENERAL NOTES, STANDARD FIXING AND GENERAL DETAILS FOR FOUNDATION (SHEET 1 OF 4)

SCALE N.T.S.

DRAWING NO.
ET06/-/FDN/S/EG-001/B

SOURCE STD/FD/S/EG-001

ICU NO.

AutoCAD 2000 A1 594 x 841

HOUSING DEPARTMENT

DATE OF ISSUE

FILE/OFFICE COPY FOR ☐ Contractor ☐ Architect ☐ C&W ☐ S.E. ☐ R.E. ☐ B.S.E. ☐ S.E. ☐ OTHERS

COUNTERCHECKED ☐

STANDARD GENERAL DETAILS

A. BEND IN REINFORCEMENT

1. BEND AT END OF BARS :-

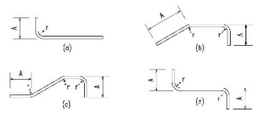


TABLE 1 : MINIMUM SCHEDULING RADIUS AND BEND ALLOWANCE

DIA. OF BARS # (mm)	PLAIN AND RIBBED STEEL REINFORCING BAR	
	r	A (mm)
10	20	130
12	24	140
16	48	150
20	80	200
25	100	255
32	128	325
40	160	400

NOTE :-

A1. FOR STIRRUPS, BINDERS AND LINKS, THE BENDING RADIUS SHALL BE THAT SHOWN IN TABLE 1 OR 5mm + DIA. OF MAIN BAR WHICHEVER IS THE GREATER.

A2. THE FOUR BEND SHAPES AS SHOWN ARE JUST BASIC SHAPES TO ILLUSTRATE THE MEASUREMENT OF THE MINIMUM END PROJECTION, A(mm). MORE STANDARD BEND SHAPES CAN BE FOUND IN TABLE 3 OF BS8666:2005.

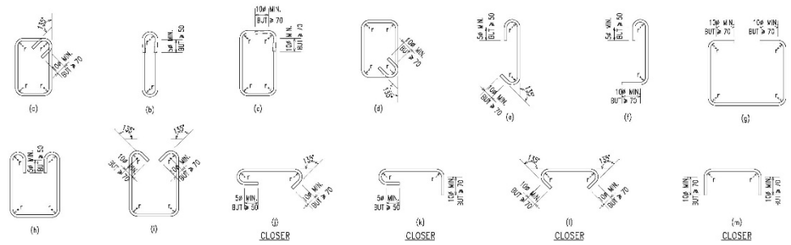
2. CRANKED BAR DETAIL :-

3. ANCHORAGE OF STIRRUPS, BINDERS AND LINKS :-

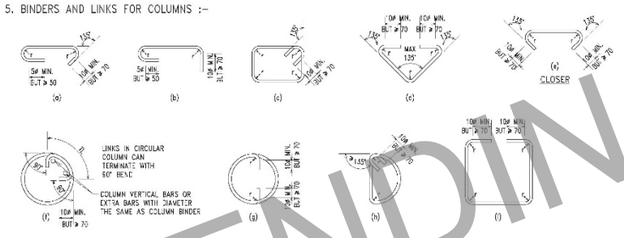
NOTE :-

A3. A LONGITUDINAL BAR OF AT LEAST THE SIZE OF THE STIRRUP/BINDER/LINK SHALL BE PROVIDED INSIDE A HOOK.

4. STIRRUPS FOR BEAMS :-



5. BINDERS AND LINKS FOR COLUMNS :-



6. SHEAR LINKS FOR PILE CAP :-

B. TENSION ANCHORAGE AND LAP LENGTH

TABLE 2 : MINIMUM TENSION ANCHORAGE LENGTH (TAL)

STEEL		RIBBED STEEL REINFORCING BARS							PLAIN STEEL REINFORCING BARS						
CONCRETE GRADE		30	35	40	45	50	55	≥ 60	30	35	40	45	50	55	≥ 60
BAR DIAMETER (mm)	10	400	400	350	350	350	300	300	400	350	350	300	300	300	300
	12	500	500	450	400	400	400	350	450	400	400	350	350	350	350
	16	650	650	600	550	500	500	450	600	550	500	500	450	450	450
	20	800	800	700	700	650	600	600	750	700	650	600	600	600	550
	25	1000	950	900	850	800	750	700	900	850	800	750	700	700	650
	32	1300	1250	1150	1100	1000	1000	900	1200	1100	1000	950	900	900	850
	40	1600	1550	1400	1350	1250	1200	1150	1450	1350	1250	1200	1150	1100	1050
FACTORS OF BAR SIZES		40	38	35	33	31	30	28	36	33	31	29	28	27	26

B. TENSION ANCHORAGE AND LAP LENGTH (CONT'D)

TABLE 3 : MINIMUM TENSION LAP LENGTH (TLL)

STEEL			RIBBED STEEL REINFORCING BARS							PLAIN STEEL REINFORCING BARS						
CONCRETE GRADE			30	35	40	45	50	55	≥ 60	30	35	40	45	50	55	≥ 60
BAR DIAMETER (mm)	10	TL	400	400	350	350	350	300	300	400	350	350	300	300	300	300
		1.4 TL	600	550	500	500	450	450	400	600	500	450	450	400	400	400
		2.0 TL	800	750	700	700	650	600	600	750	700	650	600	550	550	550
	12	TL	500	500	450	400	400	400	350	450	400	400	350	350	350	350
		1.4 TL	700	650	600	600	550	550	500	600	600	550	500	500	500	450
		2.0 TL	1000	900	850	800	750	750	700	800	800	750	700	700	700	650
	16	TL	650	650	600	550	500	500	450	600	550	500	500	450	450	450
		1.4 TL	900	850	800	800	750	700	650	800	750	700	700	650	650	600
		2.0 TL	1300	1200	1150	1100	1000	1000	900	1150	1100	1000	950	900	900	850
	20	TL	800	800	700	700	650	600	600	750	700	650	600	600	600	550
		1.4 TL	1150	1050	1000	950	900	850	800	1050	950	900	850	800	800	750
		2.0 TL	1600	1500	1400	1350	1250	1200	1150	1450	1350	1250	1200	1100	1100	1050
	25	TL	1000	950	900	850	800	750	700	900	850	800	750	700	700	650
		1.4 TL	1400	1300	1250	1200	1100	1050	1000	1250	1150	1100	1050	1000	1000	900
		2.0 TL	2000	1900	1750	1650	1550	1500	1400	1800	1650	1550	1450	1400	1400	1300
	32	TL	1300	1250	1150	1100	1000	1000	900	1200	1100	1000	950	900	900	850
		1.4 TL	1800	1700	1600	1550	1450	1350	1300	1600	1500	1400	1350	1250	1250	1200
		2.0 TL	2600	2400	2250	2150	2000	1950	1800	2300	2150	2000	1800	1800	1750	1650
	40	TL	1600	1550	1400	1350	1250	1200	1150	1450	1350	1250	1200	1150	1100	1050
		1.4 TL	2250	2100	2000	1900	1800	1700	1600	2000	1850	1750	1650	1600	1550	1450
		2.0 TL	3200	3000	2800	2650	2500	2400	2250	2850	2650	2500	2350	2200	2200	2050
FACTORS OF BAR SIZES (FOR REFERENCE)		TL	40	38	35	33	31	30	28	36	33	31	28	28	27	26
		1.4 TL	56	52	49	47	44	42	40	50	46	44	41	39	38	35
		2.0 TL	80	75	70	66	62	60	56	71	66	62	58	55	54	51

NOTES :-

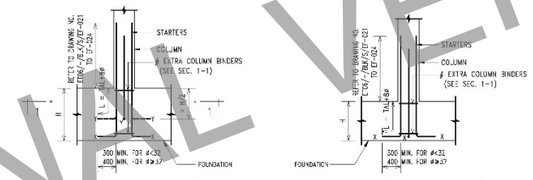
B.1. LAP LENGTHS FOR BARS OF DIFFERENT SIZE SHALL BE BASED UPON THE SMALLER BAR.

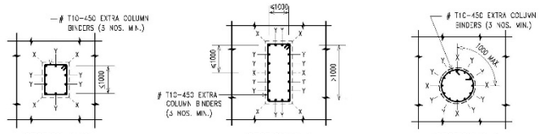
B.2. ALL FIGURES SHOWN IN TABLES 2 AND 3 ARE CALCULATED FROM THE FACTORS OF BAR SIZES AND HAVE BEEN ROUNDED UP TO THE NEXT HIGHER MULTIPLES OF 50.

B.3. REFER TO STRUCTURAL DRAWINGS FOR THE EXACT VALUES OF FACTORS FOR THE LAPPING BARS.

C. STARTER BARS

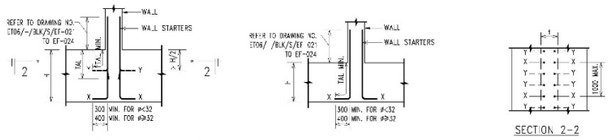
C.1. FOR COLUMNS AT FOUNDATION LEVEL :-





# DENOTES EXTRA COLUMN BINDERS INSIDE FOUNDATION. SUBJECT TO CONTRACT MANAGER'S APPROVAL, THESE BINDERS MAY BE OMITTED PROVIDED THAT THE COLUMN STARTERS ARE FIXED RIGIDLY IN POSITION AND SECURED AGAINST DISPLACEMENT.

C.2. FOR WALLS AT FOUNDATION LEVEL :-



NOTES (FOR BOTH ITEMS C.1 AND C.2) :-

C.1. FOR BARS 'Y', STRAIGHT BARS OF ENOUGH ANCHORAGE LENGTH ARE ACCEPTABLE. IF THE HORIZONTAL 90° HOOK IS USED, THE HOOK SHALL NOT BE CLOSER THAN H/2 TO THE FACE OF ENTRY.

C.2. FOR BARS 'X', THE HORIZONTAL 90° HOOK MUST BE PROVIDED.

ICU Ref. : HD(ICU)S 3 / ET06NR

1. FOR GENERAL NOTES REFER TO DRAWING NO. ET06/-/FDN/S/EG-001.

Signature of Applicant (HD / PSP) :

ICU Approval Signature :

Signature for Record Plan :

REVISIONS

NO	DESCRIPTION AND DATE	INITIAL AND DESIGNATION DWN	CKD	AUTH
A	1. DETAILS REVISED. (12/16)	TO(S) /51	S"O(S) /38	SE /115

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	W.S. CHAU CSE/4	ORIGINAL SIGNED	03/2016
CHECKED	K.W. WONG SSE/6	ORIGINAL SIGNED	03/2016
	C.Y. KWAN SE/115	ORIGINAL SIGNED	02/2016
	W.C. WONG STO(S)/38	ORIGINAL SIGNED	01/2016
DRAWN	Y.M. WONG TO(S)/51	ORIGINAL SIGNED	01/2016

PROJECT
FOUNDATION FOR PUBLIC RENTAL HOUSING DEVELOPMENT AT WING TAI ROAD, CHAI WAN

DRAWING TITLE
GENERAL NOTES, STANDARD FIXING AND GENERAL DETAILS FOR FOUNDATION (SHEET 2 OF 4)

SCALE

DRAWING NO.
ET06/-/FDN/S/EG-002/A

SOURCE STD/GD/S/EG-001, 002

ICU NO.

AutoCAD 2000 At 594 x 841

HOUSING DEPARTMENT

COPY FOR Contractor Architect C.O.W. R.S.E. R.E. Q.S. S.E. OTHERS: FILE/OFFICE DATE OF ISSUE: REF.: S.I. NO. 56

COUNTERCHECKED

STANDARD GENERAL DETAILS

ICU Ref. : HD(ICU)S 3 / ET06NR

1. FOR GENERAL NOTES REFER TO DRAWING NO. ET06/-/FDN/S/EG-001.

D. DETAILS OF MINIMUM TRANSVERSE REINFORCEMENT IN LAP ZONE

TABLE 4 : MINIMUM SIZES AND SPACING OF TRANSVERSE REINFORCEMENT IN LAP ZONE (WITHOUT STAGGERED LAP)

SMALLER SIZE OF LAPPED REINFORCEMENT	CONCRETE GRADE 30			CONCRETE GRADE 35			CONCRETE GRADE 40			CONCRETE GRADE 45		
	TL	1.4 TL	2.0 TL	TL	1.4 TL	2.0 TL	TL	1.4 TL	2.0 TL	TL	1.4 TL	2.0 TL
< 20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	7T10-130	10T10-125	13T10-130	7T10-130	10T10-115	13T10-125	7T10-115	10T10-110	13T10-115	7T10-115	10T10-105	10T10-150
25	10T10-110	13T10-115	16T10-130	10T10-105	10T10-140	16T10-125	10T10-100	10T10-135	13T10-145	7T12-140	10T10-130	13T10-135
32	10T12-140	13T12-150	19T10-140	10T12-135	13T12-140	19T10-130	10T12-125	13T12-130	16T10-150	10T12-120	13T12-125	16T10-140
40	16T12-105	16T12-150	22T12-150	16T12-100	16T12-140	22T12-140	13T16-115	16T12-130	22T12-130	10T16-150	16T12-125	19T12-145

SMALLER SIZE OF LAPPED REINFORCEMENT	CONCRETE GRADE 50			CONCRETE GRADE 55			CONCRETE GRADE ≥ 60		
	TL	1.4 TL	2.0 TL	TL	1.4 TL	2.0 TL	TL	1.4 TL	2.0 TL
< 20	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
20	7T10-105	7T10-150	10T10-135	7T10-100	7T10-140	10T10-130	7T10-100	7T10-130	10T10-125
25	7T12-130	10T10-120	13T10-125	7T12-125	10T10-115	13T10-125	7T12-115	10T10-110	13T10-115
32	10T12-110	13T12-120	16T10-130	10T12-110	10T12-150	16T10-130	10T12-100	10T12-140	13T12-150
40	10T16-135	16T12-120	19T12-135	10T16-130	16T12-110	19T12-130	10T16-125	16T12-105	17T12-135

NOTES :-

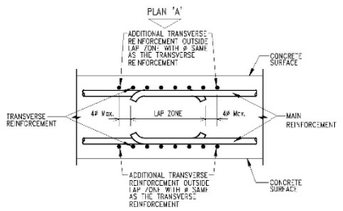
D.1. ALL TRANSVERSE REINFORCEMENT SHALL BE EVENLY DISTRIBUTED WITHIN LAP ZONE.

D.2. THE TRANSVERSE REINFORCEMENT SHALL BE PLACED PERPENDICULAR TO THE DIRECTION OF THE OUTERMOST LAPPED REINFORCEMENT AND BETWEEN THAT AND THE SURFACE OF THE CONCRETE.

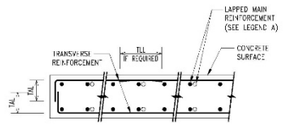
D.3. FOR TABLE 4, ALTERNATIVE BAR SIZE CAN BE PROPOSED PROVIDED THAT THE PROPOSED TRANSVERSE REINFORCEMENT HAS A TOTAL AREA NOT LESS THAN THE AREA AS REQUIRED BY TABLE 4 AND BAR SPACING ≤ 150mm .

D.4. LAP OF BARS OF DIFFERENT SIZE SHALL BE BASED UPON THE SMALLER BAR.

D.5. ADDITIONAL TRANSVERSE REINFORCEMENT SHALL BE PROVIDED OUTSIDE EACH END OF THE LAP ZONE AT A DISTANCE OF 4 DIAMETER FROM TWO ENDS OF THE LAP ZONE. (SEE PLAN 'A' BELOW)

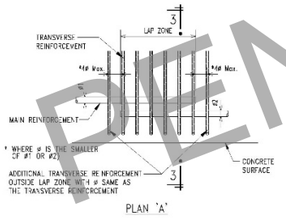


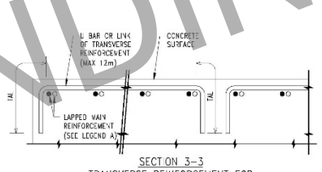
TYPICAL SECTION OF TRANSVERSE REINFORCEMENT AT LAP



SECTION 3-3
TRANSVERSE REINFORCEMENT FOR PILE CAP
(FOR ≤ 50% OF THE REINFT LAPPED AT ONE POINT)

LEGEND A :-
- HORIZONTAL BAR
- LAPPED HORIZONTAL BAR





SECTION 3-3
TRANSVERSE REINFORCEMENT FOR PILE CAP
(FOR > 50% OF THE REINFT LAPPED AT ONE POINT AND CLEAR DISTANCE BETWEEN ADJACENT LAPS AT A SECTION IS ≤ 10ø)

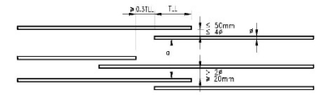
E. REQUIREMENT OF ADJACENT LAPS

THE ARRANGEMENT OF LAPPED BARS SHALL COMPLY WITH THE FIGURE BELOW:

I. THE CLEAR TRANSVERSE DISTANCE BETWEEN TWO LAPPING BARS SHALL NOT BE GREATER THAN 4ø OR 50mm, OTHERWISE THE LAP LENGTH SHALL BE INCREASED BY A LENGTH EQUAL TO THE CLEAR SPACE EXCEEDING 4ø OR 50mm ;

II. THE LONGITUDINAL DISTANCE BETWEEN TWO ADJACENT LAPS SHALL NOT BE LESS THAN 0.3 TIMES THE MINIMUM TENSION LAP LENGTH, TLL ; AND

III. IN CASE OF ADJACENT LAPS, THE CLEAR DISTANCE BETWEEN ADJACENT BARS SHALL NOT BE LESS THAN 2ø OR 20mm.

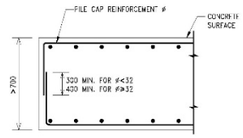


ADJACENT LAPS

ABBREVIATIONS :

a : THE CLEAR TRANSVERSE DISTANCE BETWEEN TWO LAPPING BARS.
TLL : MINIMUM TENSION LAP LENGTH
ø : BAR DIAMETER

F. FREE EDGE DETAILS FOR PILE CAP



TYPICAL SECTION OF PILE CAP EDGE

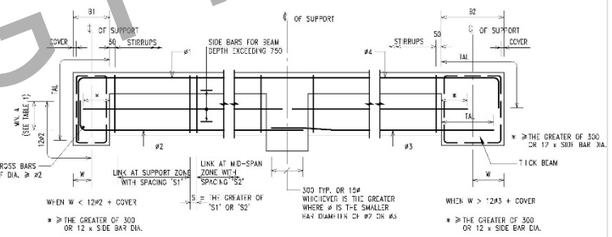
G. BEAM / SLAB / PILE CAP JUNCTION DETAILS

NOTE :-

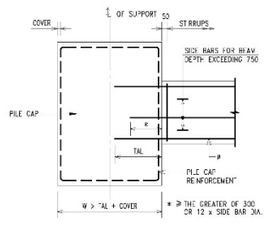
G.1. NO BEND OR HOOK SHALL BEGIN BEFORE THE CENTRE OF THE SUPPORT.

1. TYPICAL ANCHORAGE DETAILS OF BEAM

CASE (1) : END SPAN ON BEAM

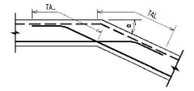


CASE (2) : END SPAN ON PILE CAP

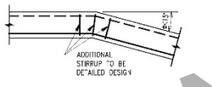


G. BEAM / SLAB / PILE CAP JUNCTION DETAILS (CONT'D)

2. TYPICAL DETAIL FOR HORIZONTAL CRANKED BEAM :-



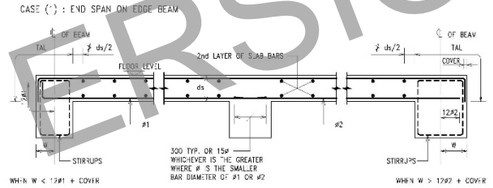
DETAIL FOR CRANKED BEAM
(ON PLAN)



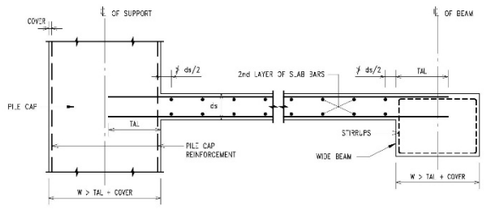
ALTERNATIVE DETAIL FOR CRANKED BEAM
(ON PLAN α < 15°)

3. TYPICAL ANCHORAGE DETAIL OF SLAB :-

CASE (1) : END SPAN ON EDGE BEAM



CASE (2) : END SPAN ON LONG SUPPORT



Signature of Applicant (HD / PSP) :

ICU Approval Signature :

Signature for Record Plan :

REVISIONS

NO	DESCRIPTION AND DATE	INITIAL AND DESIGNATION DWN	CKD	AUTH
A	1. NOTES REVISED. (12/16)	TO(S) /51	S"O(S) /38	SE /115

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	W.S. CHAU CSE/4	ORIGINAL SIGNED	03/2016
CHECKED	K.W. WONG SSE/6	ORIGINAL SIGNED	03/2016
	C.Y. KWAN SE/115	ORIGINAL SIGNED	02/2016
	W.C. WONG STO(S)/38	ORIGINAL SIGNED	01/2016
DRAWN	Y.M. WONG TO(S)/51	ORIGINAL SIGNED	01/2016

PROJECT
FOUNDATION FOR PUBLIC RENTAL HOUSING DEVELOPMENT AT WING TAI ROAD, CHAI WAN

DRAWING TITLE
GENERAL NOTES, STANDARD FIXING AND GENERAL DETAILS FOR FOUNDATION (SHEET 3 OF 4)

SCALE N.T.S.

DRAWING NO.
ET06/-/FDN/S/EG-003/A

SOURCE STD/GD/S/EG-002, 004 & 005

ICU NO.

AutoCAD 2000 A1 594 x 841

HOUSING DEPARTMENT

COUNTERCHECKED [ ]

COPY FOR [ ] Contractor [ ] Architect [ ] C&W [ ] B.S.E. [ ] R.E. [ ] O.S. [ ] S.E. [ ] OTHERS: FILE/OFFICE

DATE OF ISSUE:

REF.: S1.NO.05:

STANDARD GENERAL DETAILS

ICU Ref. : HD(ICU)S 3 / ET06NR

1. FOR GENERAL NOTES REFER TO DRAWING NO. ET06/-/FDN/S/EG-001.

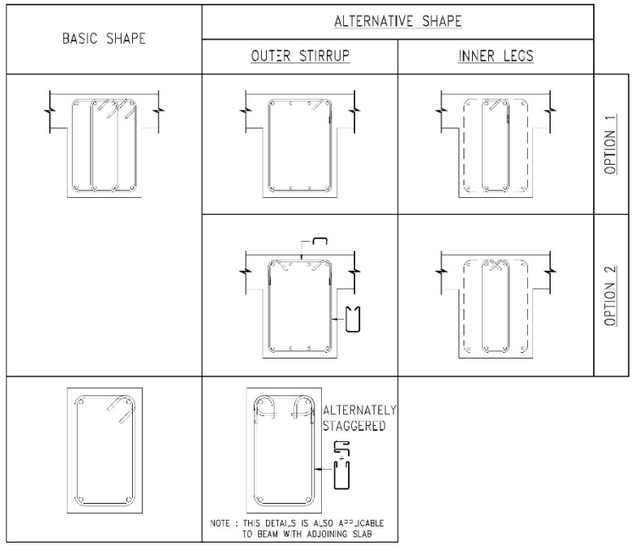
H. BASIC AND ALTERNATIVE STIRRUP DETAILS FOR BEAM

NOTES :-

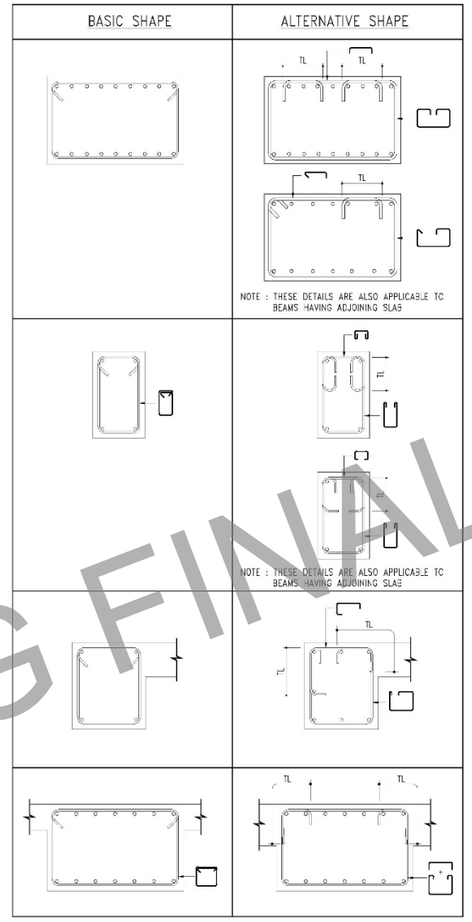
H.1 ALL SIZE OF STIRRUPS/LINKS FOR ALTERNATIVE SHAPE SHALL BE 16mm ø MAX. AND MIN. SLAB THICKNESS TO BE 160mm.

H.2 THE BEND ANGLES OF THE LINKS AT THEIR ENDS SHOWN ON THE DRAWING ARE THE MINIMUM VALUES. GREATER BEND ANGLES ARE ACCEPTABLE.

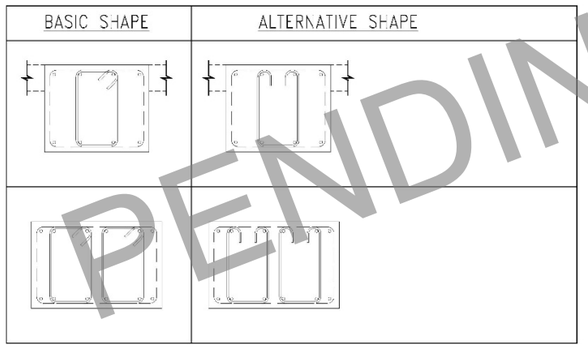
BEAM STIRRUP (NORMINAL SHEAR LINK)



BEAM OUTER STIRRUP (TORSIONAL LINK)



BEAM STIRRUP (INNER LEGS)



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	W.C. WONG STO(S)/38	ORIGINAL SIGNED	01/2016
DRAWN	Y.M. WONG TO(S)/51	ORIGINAL SIGNED	01/2016

PROJECT
FOUNDATION FOR PUBLIC RENTAL HOUSING DEVELOPMENT AT WING TAI ROAD, CHAI WAN

DRAWING TITLE
GENERAL NOTES, STANDARD FIXING AND GENERAL DETAILS FOR FOUNDATION (SHEET 4 OF 4)

SCALE N.T.S.

DRAWING NO.
ET06/-/FDN/S/EG-004/A

SOURCE STD/GD/S/EG-007

ICU NO.

AutoCAD 2000 A1 594 x 841

HOUSING DEPARTMENT

REF.: S.I. NO. 85:
DATE OF ISSUE:
FILE/OFFICE
S.E.
OTHERS:
R.E.
C.S.
COW
B.S.E.
COPY FOR Contractor Architect

COUNTERCHECKED

GENERAL NOTES

1. ALL PILING WORKS SHALL COMPLY WITH THE HONG KONG BUILDING (CONSTRUCTION) REGULATIONS, CODE OF PRACTICE FOR FOUNDATIONS, CODE OF PRACTICE FOR STRUCTURAL USE OF CONCRETE 2013, HONG KONG HOUSING AUTHORITY SPECIFICATION AND CONTRACT SPECIFICATIONS.
2. PRIOR TO COMMENCEMENT OF WORKS, THE CONTRACTOR SHALL IDENTIFY ALL NECESSARY PRE-CONSTRUCTION DIVERSION OR REMOVAL OF UTILITIES AND SERVICES, THAT WILL BE AFFECTED BY THE WORKS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL NECESSARY TEMPORARY WORKS. THE CONTRACTOR SHALL SUBMIT A PROPOSAL TO THE CONTRACT MANAGER (CM) FOR COMMENT AND APPROVAL PRIOR TO COMMENCEMENT OF THE WORKS.
4. THE CONTRACTOR SHALL OBTAIN CONSTRUCTION NOISE PERMIT REQUIRED UNDER THE NOISE CONTROL ORDINANCE WHENEVER NECESSARY.
5. UPON COMPLETION OF PILE CONSTRUCTION, AS-BUILT RECORDS AND ALL RELATED INFORMATION AND DOCUMENTS OF ALL PILES CONSTRUCTED SHALL BE SUBMITTED FOR OBTAINING THE CONSENT FOR COMMENCEMENT OF CONSTRUCTION OF PILE CAPS.
6. ALL MONITORING WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH APPROVED MONITORING PLAN(S).
7. SETTLEMENT AND VIBRATION EFFECT ON ADJACENT SLOPES, STRUCTURES AND UTILITIES DUE TO THE CONSTRUCTION OF PILES SHALL BE MONITORED IN COMPLIANCE WITH PNAP APP-137 AND APPROVED MONITORING PLAN(S).

STRUCTURAL MATERIALS

1. CONCRETE SHALL BE GRADE 45/20D WITH 175mm SLUMP EXCEPT WHERE SHOWN OTHERWISE.
2. THE CONCRETE STRENGTH SHALL BE REDUCED BY 20% FOR PLACING OF CONCRETE UNDER WATER (TREMIE METHOD).
3. PFA SHALL BE 35% BY MASS OF THE CEMENTITIOUS CONTENT OF THE CONCRETE.
4. THE REACTIVE ALKALI CONTENT OF CONCRETE EXPRESSED AS THE EQUIVALENT SODIUM OXIDE PER CUBIC METRE OF CONCRETE SHALL NOT EXCEED 3.0 kg WHEN DETERMINED IN ACCORDANCE WITH APPENDIX A OF PNAP APP-74.
5. ALL CONCRETE TESTING SHALL COMPLY WITH CS1:2010.
6. ALL REINFORCEMENT BARS SHALL COMPLY WITH CS2:2012.
7. 'T' DENOTES RIBBED STEEL REINFORCING BARS WITH A CHARACTERISTIC STRENGTH OF 500 N/mm^2. 'R' DENOTES PLAIN STEEL REINFORCING BARS WITH A CHARACTERISTIC STRENGTH OF 250 N/mm^2.
8. THE TENSION ANCHORAGE LENGTH SPECIFIED IN THE RESPECTIVE LOCATION SHALL BE DETERMINED IN ACCORDANCE WITH THE TABLE 8.4 OF THE CODE OF PRACTICE FOR STRUCTURAL USE OF CONCRETE 2013.
9. THE TENSION LAP LENGTH SPECIFIED IN THE RESPECTIVE LOCATION SHALL BE DETERMINED BY MULTIPLYING THE BASIC TENSION LAP LENGTH BY 1.0 , 1.4 OR 2.0 AS APPROPRIATE IN ACCORDANCE WITH THE TABLE 8.5 OF THE CODE OF PRACTICE FOR STRUCTURAL USE OF CONCRETE 2013.
   THE APPROPRIATE MULTIPLYING FACTORS ARE DETERMINED BY :
   - WHERE A LAP OCCURS AT THE TOP OF A SECTION AS CAST AND THE MINIMUM COVER IS LESS THAN TWICE THE DIAMETER OF THE LAPPED REINFORCEMENT, THE LAP LENGTH SHOULD BE INCREASED BY A FACTOR OF 1.4;
   - WHERE A LAP OCCURS AT A CORNER OF A SECTION AND THE MINIMUM COVER TO EITHER FACE IS LESS THAN TWICE THE DIAMETER OF THE LAPPED REINFORCEMENT OR, WHERE THE CLEAR DISTANCE BETWEEN ADJACENT LAPS IS LESS THAN 75mm OR 6 TIMES THE SIZE OF THE LAPPED REINFORCEMENT, WHICHEVER IS THE GREATER, THE LAP LENGTH SHOULD BE INCREASED BY A FACTOR OF 1.4; AND
   - WHERE BOTH CONDITIONS ABOVE APPLY, THE LAP LENGTH SHOULD BE INCREASED BY A FACTOR OF 2.0.
10. MINIMUM COVER TO ALL REINFORCEMENT SHALL BE 75mm UNLESS OTHERWISE STATED.
11. WELDING OF REINFORCEMENT IS NOT PERMITTED UNLESS OTHERWISE APPROVED.

FOUNDING CRITERIA

1. ALL BORED PILES SHALL BE FOUNDED ON SLIGHTLY TO MODERATELY DECOMPOSED MODERATELY STRONG ROCK OF MATERIAL WEATHERING GRADE III OR BETTER, WITH A TOTAL CORE RECOVERY OF MORE THAN 85% OF THE GRADE AND MINIMUM UNIAXIAL COMPRESSIVE STRENGTH OF ROCK MATERIAL (UCS) NOT LESS THAN 25 MPa (EQUIVALENT POINT LOAD INDEX STRENGTH $Is_{(50)}$ NOT LESS THAN 1 MPa). THE ALLOWABLE BEARING CAPACITY SHALL BE 5000 KN/m^2 (6250 KN/m^2 UNDER WIND CONDITION) EXCEPT OTHERWISE STATED. THE FOUNDING ROCK IS IN ACCORDANCE WITH THE CATEGORY 1(c) OF TABLE 2.1 IN THE CODE OF PRACTICE FOR FOUNDATIONS.
2. MINIMUM SOCKET LENGTH OF ALL BORED PILES SHALL BE 0.3m OR AS SHOWN OTHERWISE.
3. ALL PILES SHALL HAVE AT LEAST ONE PRE-DRILLING HOLE TO DETERMINE THE TENTATIVE FOUNDING LEVEL BEFORE COMMENCEMENT OF EXCAVATION FOR THE PILE. PRE-DRILLING HOLE SHALL BE SUNK AT LEAST 5m INTO BEDROCK OF THE SPECIFIED GRADE.
4. THE UNIAXIAL COMPRESSIVE STRENGTH (UCS) OR EQUIVALENT POINT LOAD INDEX STRENGTH ($Is_{(50)}$) OF THE FOUNDING MATERIAL FOR PILES FOUNDED ON CATEGORY 1(c) OR BETTER ROCK SHALL BE CARRIED OUT FOR TEST ON BEARING STRATA. A MINIMUM OF 1 NUMBER OF SUCH TEST SHALL BE PREFORMED ON ROCK SPECIMEN OBTAINED AT THE LOCATION OF EACH INSTALLED PILE.
5. NOTWITHSTANDING THE DEFINITION OF THE BEDROCK, INFERRED BEDROCK LEVEL FOR A PILE SHALL BE DEFINED AS THE LOWEST ROCKHEAD LEVEL WITHIN THE FOOTPRINT OF INDIVIDUAL PILE BASE AFTER INTERPOLATING THE RESULTS OF THE SURROUNDING PRE-DRILLINGS AND GROUND INVESTIGATION BORED HOLES. ROCK SOCKET LENGTH AND THE FOUNDING LEVEL OF THE PILE SHALL BE DEDUCED FROM SUCH LOWEST ROCKHEAD LEVEL.
6. THE FOUNDING LEVEL SHOWN ON DRAWINGS ARE TENTATIVE AND THE ACTUAL FOUNDING LEVEL FOR EACH PILE SHALL BE VERIFIED BY THE CM's REPRESENTATIVE ON SITE.

NOTES ON PILE INSTALLATION

1. THE FOLLOWING NOTES INDICATE ONLY THE MAJOR ACTIVITIES OF BORED PILE CONSTRUCTION. THE CONTRACTOR SHALL SUBMIT THE INSTALLATION SYSTEM AND A DETAILED METHOD STATEMENT FOR CM'S APPROVAL PRIOR TO THE COMMENCEMENT OF PILING WORK.
2. ALL PILES SHALL BE SET OUT IN ACCORDANCE WITH APPROVED PILING LAYOUT PLAN.
3. THE BORING WORKS OF THE PILES SHALL BE CARRIED OUT BY A SUITABLE HAMMER GRAB AND/OR REVERSE CIRCULATION DRILL (RCD) MACHINE UNDER WATER. NO DEWATERING OF THE BORED HOLE SHALL BE PERMITTED.
4. TEMPORARY CASING SHALL BE PROVIDED FOR THE ENTIRE LENGTH OF THE PILE SHAFT DOWN TO THE INFERRED ROCK-HEAD LEVEL OF BEDROCK, OR SUCH OTHER DEPTHS ACCEPTABLE TO THE CM SO AS TO PREVENT COLLAPSE OF SOIL INTO THE UNLINED SHAFT AND OF SUFFICIENT STRENGTH TO WITHSTAND WATER AND EARTH PRESSURE. THE TEMPORARY CASING SHALL BE DRIVEN INTO THE GROUND AHEAD OF THE SOIL EXCAVATION BY AT LEAST 1m.
5. VIBRATOR SHALL NOT BE USED FOR THE INSTALLATION AND EXTRACTION OF TEMPORARY STEEL CASING UNLESS OTHERWISE APPROVED BY THE CM.
6. FORM ROCK SOCKETS BY REVERSE CIRCULATION DRILLING, OR OTHER METHOD APPROVED BY THE CM.
7. FORM BELL-OUT USING AN EXPANDABLE DRILL BIT MOUNTED ONTO A REVERSE CIRCULATION DRILLING RIG OR OTHER MEANS APPROVED BY THE CM. THE SIZE OF THE BELL-OUT TOOLS SHALL BE CHECKED AND CALIBRATED ON GROUND IN THE PRESENCE OF THE CM OR HIS REPRESENTATIVES BEFORE USE.
8. FLUSH OUT FINE GRAINS AND DEBRIS THAT MAY REMAIN AT THE BASE OF EXCAVATION. NO PILE SHALL BE CONCRETED BEFORE THE PILE AND PILE BASE CLEANING WORKS BY AIR LIFTING OR OTHER APPROVED METHOD HAVE BEEN COMPLETED.
9. CONDUCT ULTRASONIC ECHO SOUNDER TEST OR OTHER APPROVED TESTS TO CHECK CORRECTNESS OF PILE SHAFT AND BELL-OUT DIMENSIONS BEFORE INSTALLATION OF PERMANENT STEEL LINING AND STEEL REINFORCEMENT FOR EACH PILE.
10. FOR PILE ENTIRELY BELOW GROUND,
    (a) CARRY OUT CONCRETING WORKS CONTINUOUSLY IN ONE OPERATION BY TREMIE METHOD;
    (b) TEMPORARY CASING SHALL BE WITHDRAWN SLOWLY TO ENSURE NO NECKING OF PILE AT ANY LEVEL;
    (c) AT ALL TIMES DURING CONCRETING WORKS, THE SURFACE OF THE CONCRETE SHALL BE MAINTAINED AT LEAST 3m ABOVE THE BOTTOM OF BOTH THE TEMPORARY CASING AND TREMIE PIPE; AND
    (d) MAINTAIN POSITIVE HEAD OF WATER AT ALL TIMES DURING THE CONCRETE OPERATION.
11. THE FINISHED CONCRETE TOP LEVEL SHALL BE AT LEAST 750mm ABOVE THE CUT-OFF LEVEL.
12. IMMEDIATELY AFTER EXTRACTION OF THE TEMPORARY CASING, BACKFILL THE GAP BETWEEN THE PERMANENT LINER, IF ANY, AND THE SOIL FACE WITH APPROVED MATERIAL.
13. BACKFILL THE VOID ABOVE THE CONCRETE PILE HEAD WITH APPROVED GRANULAR MATERIALS TO THE EXISTING GROUND LEVEL AFTER THE CONCRETE HAS ACHIEVED INITIAL SET.
14. NO PILE EXCAVATION SHALL BE CARRIED OUT WITHIN A DISTANCE OF 5 TIMES THE BORED PILE SHAFT DIAMETER OR 10M (CENTRE TO CENTRE), WHICHEVER IS THE GREATER, FROM A PILE WHICH HAS BEEN CONCRETED LESS THAN 48 HOURS PREVIOUSLY, UNLESS OTHERWISE APPROVED BY THE CM.

NOTES ON CONTROLLING AND MONITORING VERTICALITY AND ALIGNMENT OF PILES DURING INSTALLATION

1. A DETAILED METHOD STATEMENT AND PROCEDURES FOR CONTROLLING AND MONITORING THE VERTICALITY AND ALIGNMENT OF PILES DURING INSTALLATION SHALL BE PROPOSED BY THE CONTRACTOR FOR THE CM'S APPROVAL BEFORE COMMENCEMENT OF PILE EXCAVATION WORKS.
2. DURING PILE EXCAVATION, ALIGNMENT AND VERTICALITY OF EACH BORED PILE SHALL BE FREQUENTLY CHECKED. IN THE EVENT OF THE DEVIATION OF ALIGNMENT OR VERTICALITY EXCEEDING THE ALLOWABLE TOLERANCE, THE CONTRACTOR SHALL PROPOSE A METHOD OF RECTIFICATION TO THE CM FOR AGREEMENT PRIOR TO FURTHER EXCAVATION.
3. THE MAXIMUM PERMISSIBLE DEVIATION OF PILE CENTRE AT CUT-OFF LEVEL OF THE COMPLETED PILE SHALL BE 75mm IN ANY DIRECTION FROM THE DESIGN PILE CENTRE. THE MAXIMUM PERMISSIBLE DEVIATION FROM THE VERTICAL AT ANY LEVEL OF A FINISHED PILE SHALL BE 1%.
4. IF THE DEVIATION EXCEEDS THE TOLERANCE AS SPECIFIED, REMEDIAL PROPOSAL SHALL BE SUBMITTED BY THE CONTRACTOR.

NOTES ON OVERCOMING UNDERGROUND OBSTRUCTIONS

1. A METHOD STATEMENT TO EFFECTIVELY REMOVE OR PENETRATE EACH TYPE OF OBSTRUCTIONS SHALL BE PROPOSED BY THE CONTRACTOR FOR THE CM'S APPROVAL PRIOR TO THE COMMENCEMENT OF BORED PILING WORKS.
2. ALL UNDERGROUND OBSTRUCTIONS, WHETHER NATURALLY OCCURRING OR OTHERWISE, ENCOUNTERED DURING THE COURSE OF PILE EXCAVATION, SHALL BE REMOVED OR PENETRATED THROUGH BY THE FOLLOWING MEANS SUBJECT TO THE APPROVAL OF THE CM OR BY ANY OTHER METHODS APPROVED BY THE CM:
   2.1 IF THE UNDERGROUND OBSTRUCTION IS FOUND AT SHALLOW DEPTH, IT SHALL BE EXCAVATED AWAY WITH HAND-HELD MACHINE OR BACKHOE AND THE CAVITY LEFT SHALL BE BACKFILLED WITH SUITABLE COMPACTED MATERIALS PRIOR TO PITCHING OF THE TEMPORARY CASING.
   2.2 IN THE EVENT OF THE UNDERGROUND OBSTRUCTION IS FOUND AT DEPTH, CHISELLING BY ROCK CHISELS, UNDER-RIMMING METHOD OR REVERSE CIRCULATION DRILLING METHOD WITH OVERSIZE CASING (TELESCOPIC METHOD) SHALL BE ADOPTED.
3. NOTWITHSTANDING THE CM'S APPROVAL, THE CONTRACTOR'S EXECUTION OF THE WORKS SHALL IN NO CASE HAVE ANY ADVERSE EFFECT TO THE SAFETY OF ANY LAND, STREET, STRUCTURE, BUILDING OR UTILITIES.
4. CHISELLING IS NOT ALLOWED IN THIS CONTRACT UNLESS AGREED BY THE CM.

NOTES ON SONIC ACCESS TUBES INSIDE BORED PILE

1. ALL SONIC ACCESS TUBES ARE TO BE EVENLY SPACED, PLACED VERTICALLY AND ADEQUATELY SECURED AGAINST DISPLACEMENT.
2. ALL SONIC ACCESS TUBES ARE TO BE MILD STEEL TUBE WITH INTERNAL DIAMETER AS SHOWN AND THEIR INTERNAL SURFACE ARE SUFFICIENTLY REGULAR AND FREE FROM DEFECTS TO ALLOW THE FREE AND UNOBSTRUCTED PASSAGE OF THE PROBES EMPLOYED.
3. ALL SONIC ACCESS TUBES INCLUDING JOINTS ARE TO BE WATERTIGHT AND FIRMLY FITTED TOGETHER WITH SCREW ON WATERTIGHT SHOES OR BY ANY OTHER APPROVED MEANS AT BOTH ENDS.
4. THE CLEAR SPACE BETWEEN THE FACE OF THE SONIC TUBE AND THE INTERIOR FACE OF THE NEAREST REINFORCEMENT LAYER SHOULD NOT EXCEED 75mm.
5. ALL SONIC ACCESS TUBES CAN BE FIXED TO THE REINFORCEMENT CAGE.
6. THE SONIC ACCESS TUBES SHALL BE PROJECTED APPROXIMATELY 300mm ABOVE THE FINISHED PILE TOP LEVEL.
7. CAP THE SONIC ACCESS TUBES BY PLASTIC CAP OR EQUIVALENT MATERIAL PRIOR TO CONCRETING OF THE LDBP.
8. TAKE CARE NOT TO DAMAGE THE TUBES DURING CONCRETING OF THE LDBP OR CUTTING BACK CONCRETE FILL.
9. ALL SONIC ACCESS TUBES ARE TO BE FREE FOR ACCESS DURING TESTING.
10. FILL UP THE SONIC ACCESS TUBES WITH WATER PRIOR TO CONCRETING AND DURING TESTING.
11. CUT OFF ALL TUBES FLUSH WITH THE CONCRETE AND FILL UP THE TUBES BY TREMIE METHOD WITH NON-SHRINKAGE GROUT OF AT LEAST THE SAME CRUSHING STRENGTH AS THE CONCRETE STRENGTH OF THE PILE UPON COMPLETION OF ALL TESTING.

NOTES ON CONFIRMATORY CORE TESTING

1. CONFIRMATORY CORE TEST SHALL BE CARRIED OUT AT THE CONCRETE-ROCK INTERFACE FOR EACH BORED PILE THROUGH ONE OF THE SONIC ACCESS TUBES AT THE DIRECTION OF THE CM.
2. THE CORE TAKEN SHALL INCLUDE 1m OF CONCRETE ABOVE THE CONCRETE-ROCK INTERFACE AND 1m OF ROCK BELOW THE INTERFACE.
3. UNIAXIAL COMPRESSIVE STRENGTH TESTS AND/OR FIELD POINT LOAD TESTS ON CORE SPECIMENS TO DETERMINE THE CONCRETE AND/OR ROCK STRENGTH SHALL BE CARRIED OUT IF NECESSARY.

NOTES ON PROOF TEST (CORE TEST)

1. UPON THE COMPLETION OF PILING WORKS, PILE(S) SHALL BE SELECTED FOR PROOF TEST(S).
2. THE CORE-DRILLING SHALL BE TAKEN THROUGH THE FULL DEPTH OF THE PILE WITH CONCRETE CORE SPECIMENS OF MINIMUM 100mm DIAMETER AND TAKE CORE OF MINIMUM NX SIZE DOWN TO AT LEAST ONE HALF IN DIAMETER OF THE PILE AT FOUNDING LEVEL, OR 600mm, WHICHEVER IS LARGER, INTO THE ROCK BELOW THE PILE BASE.
3. MINIMUM 3 CORE SAMPLES SHALL BE SELECTED FROM THE FULL-LENGTH CONCRETE CORE OF EACH CORE TESTS FOR LABORATORY COMPRESSION TESTS.
4. WHENEVER DOUBT EXISTS AS TO THE DESIGN ASSUMPTION OR LOAD CARRYING CAPACITY OF ANY PILE FOUNDATION, FURTHER ON SITE TESTS MAY BE REQUIRED.
5. FILL UP ALL DRILL HOLES BY TREMIE METHOD WITH NON-SHRINKED GROUT OF AT LEAST THE SAME SPECIFIED CONCRETE STRENGTH OF THE BORED PILE UPON COMPLETION OF ALL TESTING.

NOTES ON REMEDIAL WORKS FOR THIN LAYER OF SEDIMENT (SEGREGATION) AT THE CONCRETE-ROCK INTERFACE

1. A DETAILED METHOD STATEMENT FOR ANY REMEDIAL WORKS SHALL BE PROPOSED BY THE CONTRACTOR FOR THE CM'S ACCEPTANCE BEFORE COMMENCEMENT OF THE REMEDIAL WORKS. ALL RELEVANT RECORDS SHALL BE KEPT ON SITE FOR INSPECTION.
2. UPON COMPLETION OF THE REMEDIAL WORKS, FULL DETAILS OF THE REMEDIAL GROUTING WORKS INCLUDING IDENTIFICATION OF THE PILES FOR GROUTING, NATURE AND THICKNESS OF THE SEDIMENT OR SEGREGATION DISCOVERED, EFFECTIVENESS OF FLUSHING AND GROUTING WORKS, GROUTING RECORDS AND GROUT CUBE TEST REPORTS SHALL BE INCORPORATED IN THE PILING REPORTS.
3. FOR ANY SEDIMENT OR SEGREGATION NOT EXCEEDING 100mm (50mm FOR PILE LENGTH LESS THAN 30m) THICK FOUND AT CONCRETE-ROCK INTERFACE OF BORED PILES. REMEDIAL WORKS BY MEANS OF PRESSURE GROUTING IS TO BE USED.
4. MINIMUM NUMBER OF 100mm DIAMETER OR OTHER SUITABLE SIZE GROUT HOLES SHALL BE SUNK TO THE INTERFACE OF THE DEFECTIVE AREA IN ACCORDANCE WITH THE FOLLOWING TABLE :

SHAFT DIAMETER OF BORED PILE (mm)	MINIMUM NUMBER OF GROUT HOLES
<=3000	3
>3000 AND <=3500	4
>3500 AND <=4500	5
>4500	6

5. THE SEDIMENT OR DEFECTIVE CONCRETE SHALL BE CLEANED BY HIGH PRESSURE WATER JETTING WITH MINIMUM JET PRESSURE OF 200 BARS PRIOR TO PRESSURE GROUTING.
6. THE GROUT SHALL BE NON-SHRINKED CEMENT GROUT. THE CRUSHING STRENGTH OF THE GROUT SHALL BE AT LEAST THE SAME AS THE SPECIFIED CONCRETE STRENGTH OF THE BORED PILES.
7. THE GROUT PRESSURE SHALL NOT BE LESS THAN 25 BARS AND SHALL BE MAINTAINED FOR AT LEAST 5 MINUTES UNTIL NO SIGNIFICANT GROUT INTAKE IS NOTED.
8. IF THE SEDIMENT OR SEGREGATION FOUND AT THE PILE BASE EXCEEDS THE AMOUNT STATED IN ITEM 3 ABOVE OR OTHER TYPES OF ANOMALIES ARE OBSERVED, AN ASSESSMENT REPORT TOGETHER WITH APPROPRIATE REMEDIAL PROPOSALS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO COMMENCEMENT OF THE REMEDIAL WORKS.

ICU Ref. : HD(ICU)S 3 / ET06NR

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWINGS FOR FOUNDATIONS.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED. ALL LEVELS ARE IN METERS REFERRED TO PRINCIPAL DATUM.
3. THE METHOD STATEMENT DESCRIBED IN THIS DRAWING IS INDICATIVE ONLY AND SHALL IN NO WAY RESTRICT THE CONTRACTOR FROM USING OTHER METHODS OF CONSTRUCTION ALLOWED IN THE CONTRACT NOR BE RELIED UPON BY THE CONTRACTOR TO VOID ANY LIABILITY OR OBLIGATION IMPOSED ON HIM BY THE CONTRACT.

Signature of Applicant (HD / PSP) :

ICU Approval Signature :

Signature for Record Plan :

REVISIONS

NO	DESCRIPTION AND DATE	INITIAL AND DESIGNATION DWN	CKD	AUTH

	NAME AND DESIGNATION	INITIAL	DATE
AUTHORISED	W.S. CHAU CSE/4	ORIGINAL SIGNED	03/16
CHECKED	K.W.WONG SSE/8	ORIGINAL SIGNED	03/16
	C.Y. KWAN SE/115	ORIGINAL SIGNED	03/16
	W.C.WONG STO(S)/38	ORIGINAL SIGNED	01/16
DRAWN	Y.M. WONG TO(S)/51	ORIGINAL SIGNED	01/16

PROJECT
FOUNDATION FOR PUBLIC RENTAL HOUSING DEVELOPMENT AT WING TAI ROAD, CHAI WAN

DRAWING TITLE
TYPICAL NOTES AND DETAILS FOR LARGE DIAMETER BORED PILE
(SHEET 1 OF 2)

SCALE N.T.S.

DRAWING NO.
ET06/-/LDBP/S/EG-001

SOURCE STD/LDBP/S/EG-001/A

ICU NO.

AutoCAD 2000 A1 594 x 841

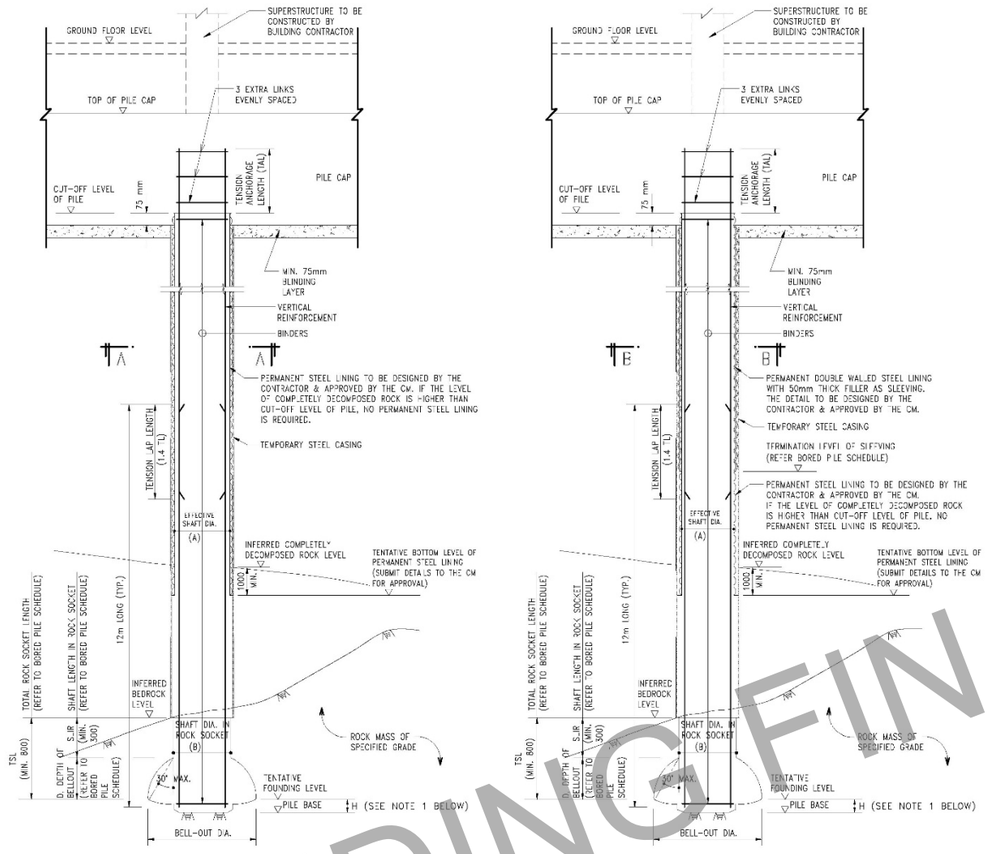
HOUSING DEPARTMENT

COUNTERCHECKED

COPY FOR ☐ Contractor ☐ Architect ☐ COW ☐ S.E. ☐ G.S. ☐ S.E. ☐ OTHERS ☐ FILE/OFFICE

DATE OF ISSUE

REF : S1 NO. SE

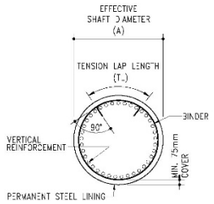


TYPICAL DETAILS OF BORED PILE (UNSLEEVED) (N.T.S.)

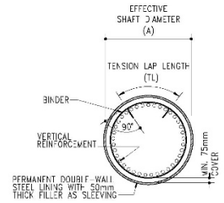
NOTE : 1. DEPTH "H" IS BELL-OUT TOOL DEPENDENT. THE EXACT VALUE OF 'H' TO BE USED SHALL BE CALIBRATED AND AGREED ON SITE.
2. MINIMUM SOCKET DEPTH ALONG PILE PERIMETER SHALL COMPLY WITH NOTE(3) OF TABLE 2.1 OF CODE OF PRACTICE FOR FOUNDATIONS. CONTRIBUTION OF MINIMUM SOCKET DEPTH TO BOND OR FRICTIONAL RESISTANCE SHALL BE IGNORED.

TYPICAL DETAILS OF BORED PILE (SLEEVED) (N.T.S.)

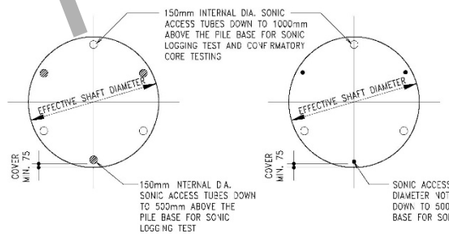
NOTE : 1. DEPTH "H" S BELL-OUT TOOL DEPENDENT. THE EXACT VALUE OF 'H' TO BE USED SHALL BE CALIBRATED AND AGREED ON SITE.
2. MINIMUM SOCKET DEPTH ALONG PILE PERIMETER SHALL COMPLY WITH NOTE(3) OF TABLE 2.1 OF CODE OF PRACTICE FOR FOUNDATION. CONTRIBUTION OF MINIMUM SOCKET DEPTH TO BOND OR FRICTIONAL RESISTANCE SHAL. BE IGNORED.



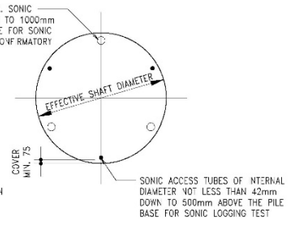
SECTION A-A



SECTION B-B



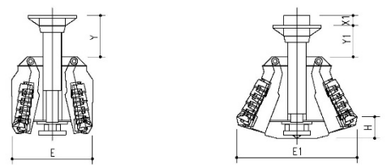
FOR L ≥ 50m AND A ≥ 2m



FOR L < 50m AND A ≥ 2m

LAYOUT OF SONIC ACCESS TUBES INSIDE BORED PILE

L = LENGTH OF BORED PILE MEASURED FROM CUT OFF LEVEL TO FOUNDING LEVEL
A = EFFECTIVE SHAFT DIAMETER



BELL-CUT TOOL

(EXACT VALUES OF Y, Y1, X1, E, E1 AND H TO BE DETERMINED ON SITE)

NOTE : 1. THE INFORMATION SHOWN ABOVE S INDICATIVE ONLY FOR CONTRACTOR'S REFERENCE.
2. FOR CALIBRATING BELL-OUT TOOL ON SITE, THE METHOD STATEMENT SHALL BE SUBMITTED BY CONTRACTOR.

ICU Ref. : HD(ICU)S 3 / ET06NR

NOTES

2. FOR GENERAL NOTES SEE DRAWING NO. ET06/-/LDBP/S/EG-001.

Signature of Applicant (HD / PSP) :

ICU Approval Signature :

Signature for Record Plan :

REVISIONS

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PROJECT
FOUNDATION FOR PUBLIC RENTAL HOUSING DEVELOPMENT AT WING TAI ROAD, CHAI WAN

DRAWING TITLE
TYPICAL NOTES AND DETAILS FOR LARGE DIAMETER BORED PILE
(SHEET 2 OF 2)

SCALE N.T.S.

DRAWING NO.
ET06/-/LDBP/S/EG-002

SOURCE STD/LDBP/S/EG-002/A

ICU NO.

AutoCAD 2000 A1 594 x 841

HOUSING DEPARTMENT

COUNTERCHECKED ☐

REF : S1 NO. SE

DATE OF ISSUE

FILE / OFFICE ☐ S.E. ☐ OTHERS

R.E. ☐ Q.S. ☐ CON ☐ B.S.E. ☐ Contractor ☐ Architect

COPY FOR

8 Corresponding Studies (to be supplemented by the HA)

9 Resources

9.1 Hardware

Hardware shall refer to the latest HA hardware specifications and as per contract conditions.

Hardware requirements vary according to the number of participants, various building stages and complexity of projects. As a reference, for large multidisciplinary projects, the following hardware specifications are preferred for efficiency.

CPU type	Multi-core Intel® Xeon®, or i-Series processor or AMD® equivalent with SSE2 technology. Highest affordable CPU speed rating recommended. Revit productions will use multiple cores for many tasks, using up to 16 cores for near-photorealistic rendering operations. It should be noted, however, that up to Revit 2018 version, still only single core is being utilized for Revit operations.
Memory	Min 16GB RAM - As a general rule of thumb, RAM = 20 x Total File Size (Including Link Files) - This estimate is based on internal testing and customer reports. Individual models will vary in their use of computer resources and performance characteristics. - Models created in previous versions of Revit may require more available memory for the one-time upgrade process. - As projects progress, the amount of information and RAM used will increase through time. More RAM such as 32GB or 64GB may be needed to ensure the practicality of the models. Performance tests on RAM is being carried out at the time of this publication Nov 2017 and may be subject to review.
Video display	1920x1200 or higher with true colour, dual monitors
Video adapter	DirectX® 11 capable graphic card with Shader Model 3 as recommended by Autodesk at http://www.autodesk.com/revit-graphicshardware
Disk space	- 5GB free disk space - 10,000+ RPM (for Point cloud interactions) or Solid State Drive
Media	Download or installation from DVD9 or USB key
Ponting device	MS-Mouse or 3Dconnexion® compliant device
Browser	Microsoft® Internet Explorer® 11.0 (or later)
Connectivity	Internet connection for license registration and prerequisite component download

9.2 Operating System

Operating system	• Microsoft® Windows® 7 or later version, 64 bit for maximising memory utilization

9.3 Software

- It should be aware that BIM software is NOT backward compatible, i.e. cannot be saved as an earlier version. Once an older version file is read by later version software and saved, it will no longer be compatible with the older version software. The whole team has to upgrade to that later version software. Do discuss with whole project team before any software upgrade is launched.
- A strategy should be established among the project team on the software upgrades.
- For drawing production or analysis purposes, it is suggested that a consistent software platform should be adopted for the collaboration of BIM projects.
- If 3rd party applications are used, originators should ensure the all file versions are compatible.

• Major software and files types:

Software	Major function	File produce	File Type (could be adopt)
Revit	• Modelling • Drawing production • Simple walkthrough video • Rendering perspective • Quantity take off	• CAD formats • DWF • NWC (Navisworks) • ADSK • IFC • gbXML • TXT(schedule)	• Revit files • CAD files • Sketchup files • ACIS *.sat file • IFC • gbXML • FBX
Navisworks	• Quantity take off • Construction simulation • Animation	• Revit files • Most of 3D file formats	• Navisworks format
Design Review	• DWF drawing review • DWF drawing comparison and comment	• DWF	• DWF

9.4 Network

Giga bit Network is preferred, especially when the team is working in a worksharing mode as there are live monitoring of every user's activity by the central file.