

**S12A AMENDMENT OF PLAN APPLICATION  
APPROVED NGAU TAM MEI  
OUTLINE ZONING PLAN NO. S/YL-NTM/12**

**PROPOSED REZONING FROM "R(C)" TO "G/IC"  
FOR A PROPOSED "SOCIAL WELFARE FACILITIES"  
(RESIDENTIAL CARE HOMES FOR THE ELDERLY)  
(RCHE)**

**AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,  
SAN TIN, N.T.**

**FURTHER INFORMATION  
OCT 2022**

## CONTENTS

Response-to-Comment - SWD

Response-to-Comment - HyD

Response-to-Comment - DSD

Response-to-Comment - CEDD

Response-to-Comment - EPD

Response-to-Comment - EMSD

Response-to-Comment – PlanD

Revised RCHE Design

Revised Visual Impact Assessment

Revised Master Layout Plan

Design Calculation for Sewage Treatment Plant (MBR)

Geotechnical Planning Review Report for Planning Application

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RESPONSE-TO-COMMENT - SWD

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Lot 4823 in D.D.104, 81 San Tam Road, San Tin, N.T.  
S12A Application for Planning Application No. Y/YL-NTM/9  
Response-to-Comment – SWD  
(dated to 27 SEPTEMBER 2022)**

Comments	Response
<p>Refer to the subject application received by the Town Planning Board (TPB) on 10.8.2022 and attached the comments of Director of Social Welfare, Social Welfare Department (DSW, SWD) :</p> <p>1.1 Comments from RCHE licensing perspective</p> <p>(i) The premises shall be constructed and maintained in accordance with the provisions of Buildings Ordinance, its allied regulations and the Code of Practice for Fire Safety in Building 2011 issued by Buildings Department.</p> <p>(ii) Compliance with the Building (Planning) Regulation 72 and the "Design Manual: Barrier Free Access 2008" on the provision of access and facilities for persons with disabilities from the lot boundary to the proposed RCHE should be demonstrated.</p> <p>(iii) Adequate natural lighting and natural ventilation to the habitable area, office and kitchen should be provided in compliance with the Building (Planning) Regulation 30 &amp; 31 and demonstrated by window elevations and calculations. Exemption may be considered if adequate artificial lighting and mechanical ventilation for the office and kitchen is provided and these should be marked on the plans by showing both the exhaust and supply air ventilation ducts. Demonstration by calculation of 5 and 20 air changes per hour respectively is required separately.</p>	<p>Noted. The detail GBP will be submitted to BD for approval in due course.</p> <p>Noted. The detail GBP will be submitted to BD for approval in due course.</p> <p>Noted. The detail GBP will be submitted to BD for approval in due course.</p>

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<p>(iv) No part of the area used for habitation shall be more than 9 m measured within the habitable area from a prescribed window as stipulated in Building (Planning) Regulation 32.</p> <p>(v) Adequate natural lighting and natural ventilation to the toilets should be provided in accordance with the Building (Planning) Regulation 36 and demonstrated by window elevations and calculations. Exemption may be considered if adequate artificial lighting and mechanical ventilation for the toilets are provided, and these should be marked on plans by showing both the exhaust and supply air ventilation ducts. Demonstration by calculation of 10 air changes per hour is required separately.</p> <p>(vi) The clear width of the door opening for each dormitory and the toilet should have a width not less than 800 mm. The door should also be readily opened from inside without the use of a key.</p> <p>(vii) The ceiling (the ceiling structure or suspended false ceiling) of the RCHE must be situated at a height not less than 2.5 m measuring vertically from the floor or not less than 2.3m measuring vertically from the floor to the underside of any beam.</p>	<p>Noted. The detail GBP will be submitted to BD for approval in due course.</p> <p>Noted. The detail GBP will be submitted to BD for approval in due course.</p> <p>Noted. The detail GBP will be submitted to BD for approval in due course.</p> <p>Noted. The detail GBP will be submitted to BD for approval in due course.</p> <p>Noted. The detail GBP will be submitted to BD for approval in due course.</p>

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<b>Comments</b>	<b>Response</b>
<p>(viii) The dead-end travel distance in every part of the proposed RCHE should not be more than 12 m to the protected exit or to a point, from which travel in different directions to 2 or more protected exits is available.</p> <p>(ix) Net floor area should be demonstrated by area calculation diagram.</p> <p>(x) A designated isolation room shall be provided for every 50 beds.</p> <p>(xi) The captioned premises should be of free of unauthorized building works.</p> <p>(xii) Any building works which fall within Minor Work under Building (Minor Works) Regulation (B(MW)R), should fully comply with the requirements of the regulation. Details of the MWCS can be found at the Buildings Department website (<a href="http://www.bd.gov.hk">www. bd.gov.hk</a>).</p>	<p>Noted. The detail GBP will be submitted to BD for approval in due course.</p> <p>Noted. The detail GBP will be submitted to BD for approval in due course.</p> <p>3 isolation rooms are provided on 3/F as shown on revised G-06 Rev B.</p> <p>No UBW exists in the captioned premises.</p> <p>Noted</p>

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<b>Comments</b>	<b>Response</b>
<p>(xiii) Under section 20 of the Residential Care Homes (Elderly Persons) Regulation, unless otherwise with Director of Social Welfare (DSW)'s notice in writing, no part of an RCHE shall be situated at a height more than 24 m above the ground floor, measuring vertically from the ground of the building to the floor of the premises in which the RCHE is to be situated. If an RCHE operator can prove that the RCHE possesses facilities for fire safety, evacuation and rescue, and appropriate evacuation, contingency and fire drill plans to the satisfaction of the DSW, the DSW may approve the ancillary facilities of the RCHE to which the residents normally do not have access (e.g. kitchen, laundry room, office, staff resting room) to be situated at a height more than 24 m above the ground.</p>	<p>Noted. Our proposed highest floor of the dormitory on 8/F is within 24 m from ground. One additional floor above the dormitory above 24 m is solely for administrative staff. A similar design is also observed in “Forward Living”, which is a RCHE at No.9 Fu Tei Road, Tuen Mun, the highest floor of dorms is 8/F and its floor slab is within 24 m from the street level.</p>

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Comments	Response
<p>1.2 Comments from RCHE services perspective</p> <p><b>A) Salient points on design of RCHE</b></p> <p>i) Boundary/ extent of the RCHE</p> <ul style="list-style-type: none"> <li>● The boundary/ extent of the proposed RCHE appear not well defined in the applicant's submission.</li> <li>● From the table 3.1.7 of "Supporting Planning Statement" (P.13), "RCHE" is indicated to spread from 2/F to 7/F whereas other facilities including "Entrance &amp; Carpark", "Multi-purpose rooms", "Wellness Centre + Sky Garden" and "Administrative office + Staff Quarter" are placed on upper and lower floors of the same 10-storey building.</li> <li>● The applicant should clarify the boundary/ extent and the total GFA of the intended RCHE for our consideration.</li> </ul>	<p>The whole development is designed as RCHE, which includes other facilities such as Entrance, Carpark, Multi-purpose Room, Wellness Centre, Sky Garden, Administrative Office and Staff Quarter. The site boundary is indicated by red-dashed line in all revised drawings.</p>



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<b>Comments</b>	<b>Response</b>
<p>ii) 24m height restriction of RCHE</p> <ul style="list-style-type: none"> <li>● While the proposed RCHE are located on a 10-storey block with building height of 29.6m, the 24m height restriction of RCHE is one of the concerns.</li> <li>● According to para 5.3 of Code of Practice for Residential Care Homes (Elderly Persons) January 2020 (Revised Edition) (CoP), "no part of the RCHE shall be situated at a height more than 24 metres above the ground floor, measuring vertically from the ground of the building to the floor of the premises in which the RCHE is to be situated.... If an RCHE is located in a building served by 2 streets/ roads at different levels, the height of the RCHE is to be measured from the level of the lower street/road".</li> <li>● In view of above, would the applicant please ensure the height of the proposed RCHE is in full compliance with the prevailing licensing and statutory height requirements.</li> </ul>	<p>Noted. Our proposed highest floor of the dormitory on 8/F is within 24 m from ground. One additional floor above the dormitory above 24 m is solely for administrative staff. A similar design is also observed in “Forward Living”, which is a RCHE at No.9 Fu Tei Road, Tuen Mun, the highest floor of dorms is 8/F and its floor slab is within 24 m from the sheet level.</p> <p>Our proposed RCHE adjoin a run-in out of level 7.33 mPd at San Tin Road only. Therefore, +7.33 mPd should be the ground level of the RCHE.</p>

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<b>Comments</b>	<b>Response</b>
<p>iii) Isolation measures</p> <ul style="list-style-type: none"> <li>● As shown from the Proposed RCHE Design of "Drawing &amp; Plans - Supporting Planning Statement" (P.9-17), the essential facility of isolation room is found missing in the proposed RCHE.</li> <li>● As set out in para 12.4 of CoP, "RCHEs shall be provided with proper isolation facilities, and a designated isolation room shall be provided for every 50 beds... In addition, the RCHE should ensure that the designated isolation room(s) is always ready to be used as an infection control measures."</li> <li>● Hence, the applicant should provide relevant isolation rooms/ facilities for the proposed RCHE to meet the infection control purpose in accordance with licensing requirement.</li> </ul>	<p>3 nos. of Isolation Rooms are provided on 3/F as shown on revised G-06 Rev. B.</p>

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<b>Comments</b>	<b>Response</b>
<p><b>B) Views on the Applicant’s intention for joining the Premium Concession Scheme</b></p> <ul style="list-style-type: none"> <li>● Should the application wish to apply for the "Scheme to Encourage Provision of Residential Care Home for the Elderly Premises in New Private Developments" (Premium Concession Scheme) for the RCHE to be developed, please submit a formal application to District Lands Office, Yuen Long, LandsD. We stand ready to tender our comments on details of layout design of the proposed RCHE and to assess its support-worthiness for joining the Premium Concession Scheme upon receipt of the LandsD’s referral.</li> <li>● Subject to comments from other government bureaux/ departments, please be advised we shall only support the setting up of a RCHE and consider recommending Premium Concession for the proposed RCHE on conditions that – <ul style="list-style-type: none"> <li>a) the proposed RCHE should be a satisfactory design as agreed by the Social Welfare Department;</li> <li>b) there shall be no financial implications, both capital and recurrent, to the Government;</li> <li>c) the design and construction of the RCHE should be in full compliance with the statutory and licensing requirements including but not limited to those stipulated in the Residential Care Home (Elderly Persons) Ordinance, Cap. 459 and its subsidiary legislation, as well as the latest version of the Code of Practice for Residential Care Homes (Elderly Persons);</li> </ul> </li> </ul> <p>and</p>	<p>We intend to apply to join the Premium Concession Scheme upon TPB approval of the subject site.</p>

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<p>d) all the requirement of the Premium Concession Scheme as set out in Lands Department (LandsD)’s Practice Note No. 4/2003, together with any other requirements imposed by LandsD in the lease exchange, if applicable, shall be complied with.</p> <ul style="list-style-type: none"> <li>● With a view to meeting the objective of providing a quality RCHE, the applicant should refer to the following attached – i) Guidance Note of Premium Concession Scheme; ii) Best Practices in Design and Operation of RCHE; iii) Best Practices Guideline – Basic Provision Schedule Specific Requirements for RCHE when Designing and Planning for The Proposed RCHE; and iv) A Supplement on Ventilation - Guidelines on Prevention of Communicable Diseases in RCHEs/ Residential Care Homes for Persons with Disabilities.</li> <li>● While 5,400 sq.m is the maximum GFA for a RCHE built under the Premium Concession Scheme, the applicant should ensure the size of the GFA of the intended RCHE should not exceed this cap should he would like to apply for Premium Concession Scheme.</li> </ul>	

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<b>Comments</b>	<b>Response</b>
<ul style="list-style-type: none"> <li>● In addition, it is noted that some non-standard facilities of RCHE including the Sky Garden, Wellness Centre and Hydrotherapy Room (on 1/F), Staff Quarter involving 8 no. of staff rooms (on 8/F), Roof Garden and farming areas (on R/F) are proposed on the 10-storey building. If the applicant intends to include the above-mentioned facilities as part of the RCHE to be applied for Premium Concession Scheme, we would like to seek the applicant's confirmation if those facilities are for the exclusive use of the residents and the staff of the RCHE, and should not be opened to the use of public. Besides, the applicant should also provide the estimated area and detailed justification for incorporation of those non-standard facilities for our consideration.</li> </ul>	<p>Noted. The mentioned facilities are for the exclusive use of RCHE and should not be opened to the use of public.</p>

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RESPONSE-TO-COMMENT - HyD

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Comments	Response
<p>2. Comments of the Chief Highway Engineer/New Territories West, Highways Department (HyD) as follow:</p> <p>2.1 If the vehicular access at San Tam Road is agreed by TD, the applicant should design and construct the vehicular access in accordance with the latest Transport Planning and Design Manual of Transport Department (TD) and relevant HyD’s standard drawings, and to the satisfaction of TD and HyD.</p> <p>2.2 Adequate drainage measures should be provided at the site access to prevent surface water flowing from the site to nearby public roads or exclusive road drains.</p>	<p>Noted.</p> <p>Noted.</p>

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RESPONSE-TO-COMMENT - DSD

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Comments	Response
<p>3. Comments of the Chief Engineer/Mainland North, Drainage Services Department (CE/MN, DSD) as follow:</p> <p>3.1 As the site is not covered by the previous application, this application would be processed as a new case. In this aspect, the applicant shall submit a drainage submission to demonstrate how he will collect, convey and discharge rain water falling onto or flowing to his site. A clear drainage plan showing full details of the existing drains &amp; the proposed drains (e.g. cover &amp; invert levels of pipes/catchpits outfalls and ground levels justifying waterfall etc.) with supporting design calculations &amp; charts should be included. (For preparation of the drainage proposal, the Guideline on preparation of the drainage proposal is available in DSD homepage at <a href="http://www.dsd.gov.hk/EN/Files/technical_Manual/dsd_guideline/Drainage_Submission.pdf">http://www.dsd.gov.hk/EN/Files/technical_Manual/dsd_guideline/Drainage_Submission.pdf</a> for reference). The applicant is reminded that approval of the drainage proposal must be sought prior to the implementation of drainage works on site.</p>	<p>Noted. The related submission would seek DSD approval through separate submission upon TBP approval of the subject site.</p>

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<b>Comments</b>	<b>Response</b>
<p>3.2 After completion of the required drainage works, the applicant shall provide DSD for reference a set of record photographs showing the completed drainage works with corresponding photograph locations marked clearly on the approved drainage plan. DSD will inspect the completed drainage works jointly with the applicant with reference to the set of photographs.</p>	<p>Noted. The related submission would seek DSD approval through separate submission upon TBP approval of the subject site.</p>

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<b>Comments</b>	<b>Response</b>
3.3 The applicant shall ascertain that all existing flow paths would be properly intercepted and maintained without increasing the flooding risk of the adjacent areas.	Noted. The related submission would seek DSD approval through separate submission upon TBP approval of the subject site.
3.4 The applicant is reminded that the proposed drainage proposal / works as well as the site boundary should not cause encroachment upon area outside his jurisdiction.	Noted. The related submission would seek DSD approval through separate submission upon TBP approval of the subject site.
3.5 No public sewerage maintained by DSD is currently available for connection. No sewerage collected from the site should be discharged to the drainage system. For sewerage disposal and treatment, agreement from DEP shall be obtained.	Noted. The related submission would seek DSD approval through separate submission upon TBP approval of the subject site.
3.6 The applicant should consult DLO/YL regarding all the proposed drainage works outside the lot boundary in order to ensure the unobstructed discharge from the application suite in future.	Noted. The related submission would seek DSD approval through separate submission upon TBP approval of the subject site.
3.7 All the proposed drainage facilities should be constructed and maintained by the applicant at his own cost. The applicant should ensure and keep all drainage works on site under proper maintenance at all times.	Noted. The related submission would seek DSD approval through separate submission upon TBP approval of the subject site.

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<b>Comments</b>	<b>Response</b>
<p>4. Comments of the Head of Geotechnical Engineering Office, Civil Engineering and Development Department (H(GEO), CEDD) as follow:</p> <p>4.1 Several man-made slope features, which may affect or be affected by the proposed development, are present within and/or in the vicinity of the application site. The applicant is required to submit a Geotechnical Planning Review Report (GPRR) in support of the planning application. The essential contents of a GPRR are given in the attached GEO Advice Note.</p>	<p>A Geotechnical Planning Review Report is attached herewith.</p>

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Comments	Response
<p>5. Comments of the Director of Environmental Protection (DEP) as follow:</p> <p>5.1 Comments on ER of the supporting planning statement:</p> <p><u>5.1.1 Comments on air quality assessment</u></p> <p>1. Section 2.1.1 and 2.3.1: Please be reminded that it should be the responsibility of the applicant and their consultants to ensure the validity of the chimney data by their own site surveys. Should the information of industrial chimneys be subsequently found to be incorrect, the assessment result as presented in the planning application would be invalidated.</p> <p>2. Table 2: Please review the latest 5 years (2017 -2021) of air quality (for both long term and short term AQOs) at Yuen Long Monitoring Station and describe the baseline air quality condition in the Yuen Long area.</p> <p>3. Section 2.2.1: Please combine the 1st and 2nd bullets point to read “No air-sensitive uses including openable window, fresh air intake and active recreational uses in open space shall be allowed within buffer zones.”</p>	<p>Await replies from our Environmental Consultant.</p> <p>Await replies from our Environmental Consultant.</p> <p>Await replies from our Environmental Consultant.</p> <p>Await replies from our Environmental Consultant.</p>

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<p>4. Section 2.3.1: Please clarify if there is any air and odour emission sources (e.g. any emissions from nearby nullah, warehouses and workshops) within 200 m from the site boundary and address their potential impacts on the proposed development (if any) in this section.</p> <p>5. Section 2.4.1: It is recommended that electric power supply shall be provided for on-site machinery as far as practicable to minimize aerial emissions. Please supplement.</p>	<p>Await replies from our Environmental Consultant.</p> <p>Await replies from our Environmental Consultant.</p>

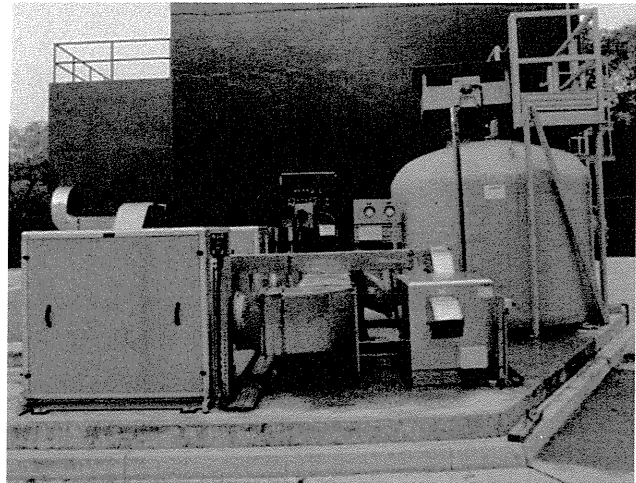


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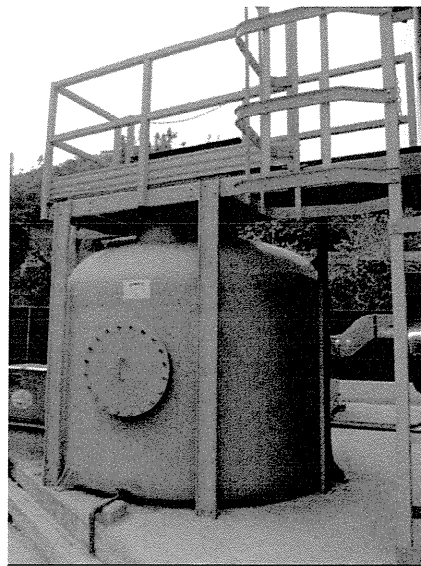
<b>Comments</b>	<b>Response</b>
<p>6. Odour impact from the proposed on-site STP (as shown in Figure 3.2.1):</p> <p>(a) The consultant should address the odour impact arising from the proposed on-site STP on the nearby ASRs including the existing ones and the proposed development in the report. Please indicate the location of the exhaust of the proposed STP in a location map with the nearest ASRs and provide their separation distances. Please also specify the odour removal efficiency of the deodorizer in the report.</p> <p>(b) The applicant should observe and follow EPD's Guidelines for the Design of Small Sewage Treatment Plants for minimization of the odour impact from the proposed STP while the exhaust outlet of the proposed STP should be located away from all nearby ASRs as far as possible.</p> <p>(c) Please clarify how the sewage and sludge generated from the STP will be discharged and whether there is any odour issues related to disposal.</p>	<p>(a) &amp;(b): A deodorization adsorption system is proposed to install for removal of odor from generated sources, which includes a FRP vessel with activated carbon media, pre-filter, post-filter and dehumidifier, please refer to attached brochure. The deodorization adsorption system will have minimum odor removal efficiency of 99.5% at 5 ppm H2S concentration. The deodorization adsorption system will have minimum service life for 12 months continuous operation for 5ppm H2S loading. Sufficient adsorption capacity of activated carbon will be installed. The odor removal air from the outlet of deodorization adsorption system will be exhausted through the air duct to high level.</p> <p>(c): A wet sludge transfer pipe will be installed to draw wet sludge from the sludge holding tank at sewage treatment plant to the collection point adjacent to the entrance of development in fully close system for tanker collection of wasting wet sludge to dispose to Government sewage treatment plant. It will be eliminated odor release during wasting wet sludge disposal service.</p>



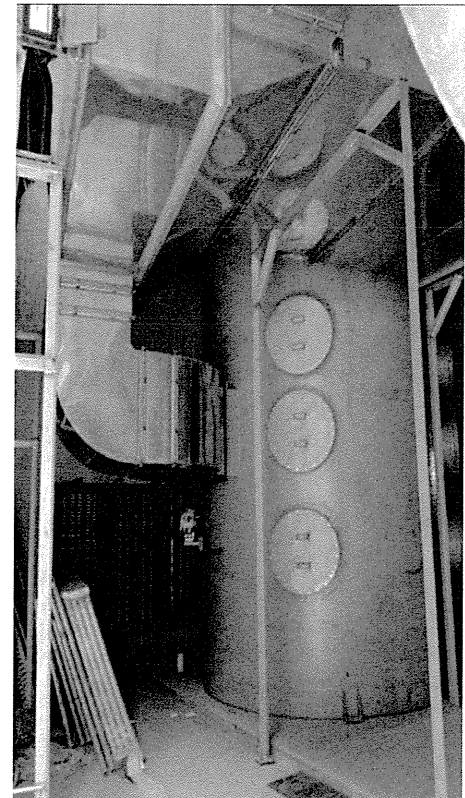
**Rage** Activated carbon adsorption tower is designed for industrial and municipal odour control. Activated carbon is the most widely used media for pollutant adsorption in gas phase. The carbon pellet has a very porous structure with a high surface-to-volume ratio, and enables the odorous compounds being captured when the foul gases passing through the carbon bed through the duty extraction fan.



The adsorption tower can be a single bed or dual bed design depends on the air volume and made from Fiberglass Reinforced Plastic (FRP), steel or stainless steel as per the specification.



*A single bed construction activated carbon filter system with cat ladder and working platform*



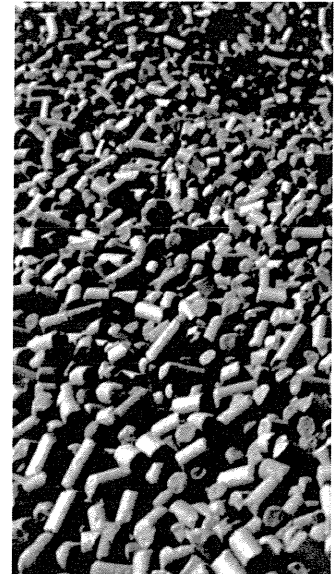
*A dual bed construction system with air duct connection*



*Two dual bed construction filter houses on a 12m length trailer delivered to site*

A wide range of activated carbon manufactured from both bituminous coal and coconut shell and impregnated specific chemicals available for various odorous compound removal. Sometimes, beds of carbon with different chemical impregnated are packed in the single house for capture and chemically destroy different type of odourous composition. Typically, KOH or KMNO<sub>4</sub> for breaking down Hydrogen Sulphide. The disadvantage of the addition of caustics lowers the ignition temperature and shall be considered as hazardous, and higher production cost.

Recently, regenerate type activated carbon is available, which is unimpregnated carbon that regain some absorption capacity after washing. However, cost will be higher.



#### **Benefits**

- Simple in construction & maintenance
- Capable to handle a number of odourous gases.

**Proposed Rezoning From “R(C)” To “G/IC” for  
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Lot 4823 in D.D.104, 81 San Tam Road, San Tin, N.T.  
S12A Application for Planning Application No. Y/YL-NTM/9  
Response-to-Comment – EPD  
(dated to 27 SEPTEMBER 2022)**

Comments	Response
<p>7. Air quality impact from the proposed kitchen of the proposed development: Please address if there are any oily fumes from the proposed kitchen and any mitigation measures will be in place to alleviate the potential air quality impact on the nearby ASRs in the report.</p> <p>8. Figure 2.1.1: Please provide a remark in the figure to state clearly that no air-sensitive uses including openable window, fresh air intake and active recreational uses in the open space is allowed within the buffer zone.</p>	<p>A grease filter would be applied to remove oily fume. The Catalogue is attached for your information. Routing is shown on the revised G-03 Rev.B.</p> <p>Await reply from our Environmental Consultant.</p>

ALL STAINLESS GREASE FILTER

# PLUS ONE & PLUS ONE SUPER

除油率  
Oil removal  
89.27%



加一、  
超級加一

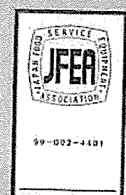
使用不銹鋼製的廚房油煙網  
使廚房更安全、更舒適

- Good Ventilation 通風性良好
- Powerful Retention of Fumes 除垢力強煙異味
- Light-Weight Filter 耐用全不銹鋼製
- Not Easily Clogged 過濾網不易阻塞
- Save Maintenance Fee 少維修掙錢省時

## KAWASHO

日本廚房工業會  
的認定品。  
適合總務省消防  
裝置有關除去油  
煙的準則、日本  
廚房工業會認可  
商標，請以放心  
使用。

JAPAN FOOD SERVICE  
EQUIPMENT ASSOCIATION

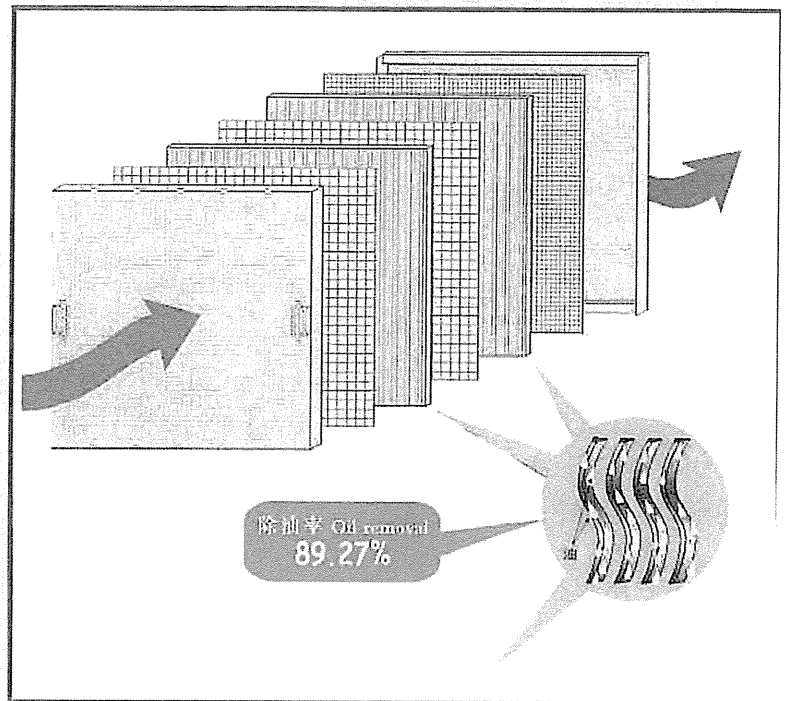


## 「超級加一」及「加一」的油濾光片

- 「超級加一」及「加一」的優點是通氣性，確實有效地除去油塵的 Long Life 油濾光片。
- 具有通風性和除去油塵的2種性能均能做到兩方平衡的優質 Grease Filter。

由於油濾光片上下方面均是特殊耐熱，加上使用不銹鋼纖維組成，故此在排氣中同時可將油塵捉住及除去。所以當油濾光片累積的油塵減少，相對性便可維持長時間性能效用。

(特許取得 第3141063號)



## 「超級加一」及「加一」的6個特性優秀點

- 1) 優質的通風性  
由於擁有優質的良好的換氣能力，故此能夠控制廚房內的溫度上升及可以將廚房的舒通環境得以維持。
- 2) 卓越的除油性能  
因為長方形斷面上已佈滿特殊耐熱性及不銹鋼纖維，故能夠容易將油塵捉住。
- 3) 維持更長的高性能  
由於利用編設方法而成的特殊耐熱性及不銹鋼纖維的油濾光片，不但可減少油塵的成份滯留，同時也可以使通風的效能更暢順，更甚者是能夠將除去油塵的性能得以長期性的維持。
- 4) 全是不銹鋼製的產品，長期使用更加經濟  
因為擁有優良的耐蝕性、耐熱性、耐衝擊性、以及藥品性的抵擋。由於以不銹鋼製成的油濾光片非常堅硬，因此外貌美觀得以更長持久。
- 5) 節省經費  
擁有優良的通風性和除去性能的不銹鋼纖維，能減輕換風氣用的摩打負擔及減少機器裏污物的積聚，當然亦可省下更多不必要的電費和減少清掃的費用。
- 6) 優良的洗淨法  
油塵分子的滯留相繼減少，故可將裏面的油塵更容易洗淨。

# **WE GUARANTEE HYGIENIC KITCHENS 'NO GREASE, AND NO SMELLY ODOR'**

**This Specially-Designed Cooked Hood Serves the Kitchen Requirements of Business Establishments.**

## **Specification :-**

1. Good Ventilation - maintains a pleasant environment and does not strain the suction-fan.
2. Powerful Retention of Fumes - more efficient than other cooker hoods.
3. Light-Weight Filter - unique stainless steel which is very light.
4. Not Easily Clogged - fast, powerful and efficient suction and retention of fumes.
5. Annual maintenance fees are kept to the minimum.

## **KITCHEN HAZARDS : HOW TO OVERCOME THEM**

Present-day kitchen environment and conditions which are greasy smoky and sticky may lead to fire hazards. In addition, the fumes which are trapped due to poor ventilation and improper kitchen maintenance may also cause fires.

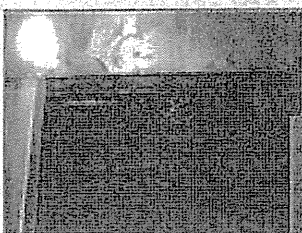
## **GUIDELINES ON FIRE PREVENTION**

The Japanese Fire Department makes it mandatory for all Japanese kitchens to install grease filters and to clean the ducts once a month. This maintenance work is very costly. In spite of these measures, fire still occurs in kitchens.

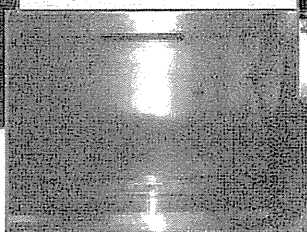
## **INEFFICIENT SUCTION AND RETENTION OF OIL IN THE FUMES**

There is a slow build-up of grease and oil in the filter owing to non-optimum performance of the filter system. This leads to a hazardous situation likely to cause fires in the kitchen! The buffalo-shaped filter does not efficiently retain the oil in the fumes and the sub-standard and unhygienic ventilation system. The factors are the main causes of the high incidence of kitchen fires.

Due to the poor retention of oil by the filter, the filter clogs easily, causing Oxidation. To overcome all the above problems, our company, the Totaru Plan (M) Sdn. Bhd, has invented the latest state-of-the-art cooker hood. It is super efficient in oil retention and provides the highest standard in ventilation. It is hardy, durable and a boon to all consumers!



• Before Installation  
未安裝 Kawasho 隔油煙網前



• Cleaned air duct and hood with  
Kawasho grease filter installed  
清潔煙罩風槽後及安裝 Kawasho 隔油煙網

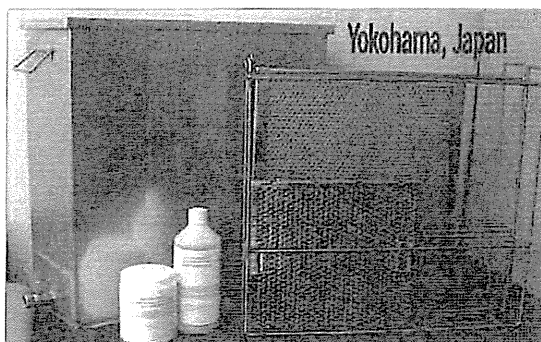
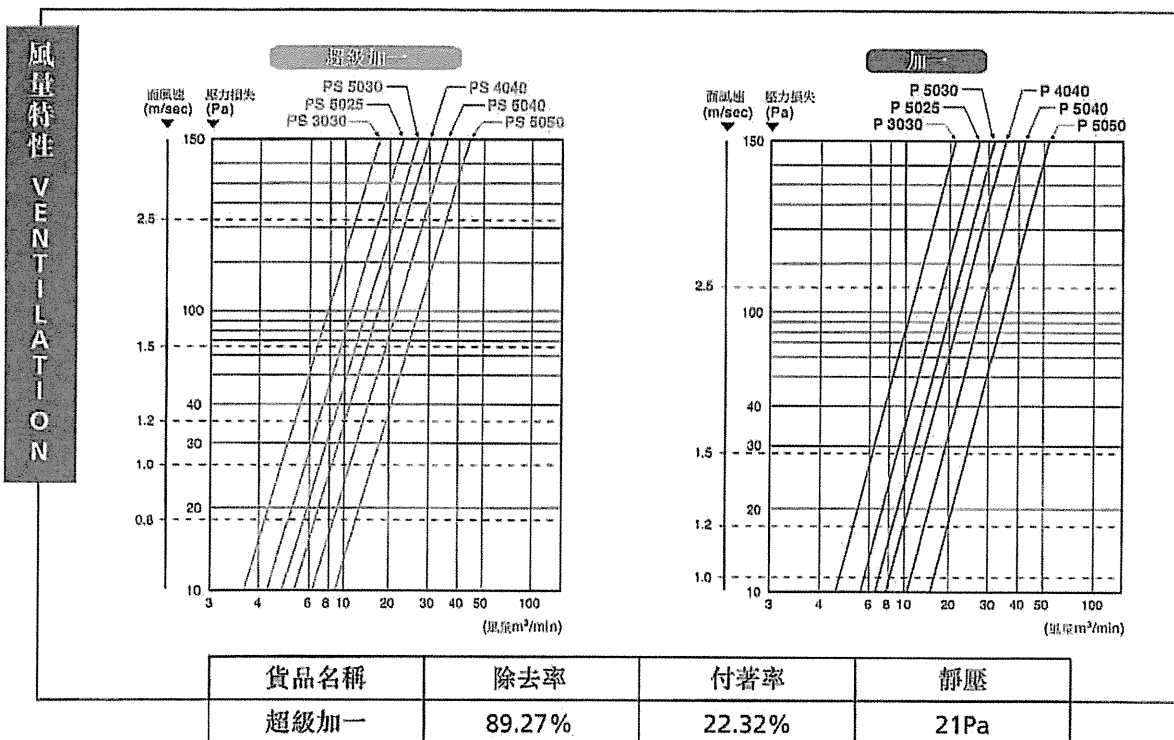


• Air duct and hood are still in  
clean condition  
風槽及煙罩內能仍然保持清潔



• Front and rear of Filter  
隔油網的前後面

型號尺寸 SIZE CHART	超級加一	加一	幅 (W)	高 (H)	厚 (t)
	PS 5050	PS 5050	500	500	25
	PS 5050S	PS 5050S	495	500	25
	PS 5040	PS 5040	500	400	25
	PS 5040S	PS 5040S	495	400	25
	PS 5030	PS 5030	500	300	25
	PS 5030S	PS 5030S	495	300	25
	PS 5025	PS 5025	500	250	25
	PS 5025S	PS 5025S	495	250	25
	PS 4040	PS 4040	400	400	25
PS 3030	PS 3030	300	300	25	



規格 SPECIFICATIONS	
桶子型號 Bucket Type	G. F. 5
桶子尺碼 Bucket Size	600(高)Hx540(長)Lx220(闊)W
裝置水容量 Capacity	70 (公升)Litres
隔油網容量 Filter Holding Capacity	5 (塊)Pieces
不銹鋼架尺寸 Dimension of Stainless Steel Rack	(Grease Filter) 560(高)H x 520(長)L x 120(闊)W 3(塊用)Pieces 560(高)H x 520(長)L x 80(闊)W 2(塊用)Pieces

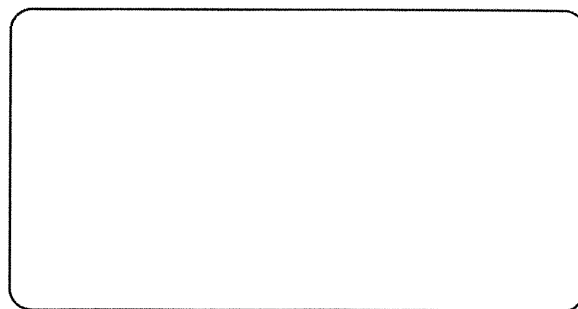
生產商  
川鐵商事株式会社  
Tel : 03-5203-5141

總部  
株式会社  
Tel : 045-471-8800

海外營業部  
多德來(香港)有限公司  
Tel : 852-2191-7686

TOTARU PLAN (JAPAN)  
Web-site : www.totaru.com

TOTARU PLAN (H.K.) LTD.  
Web-site : www.totaru.com.hk





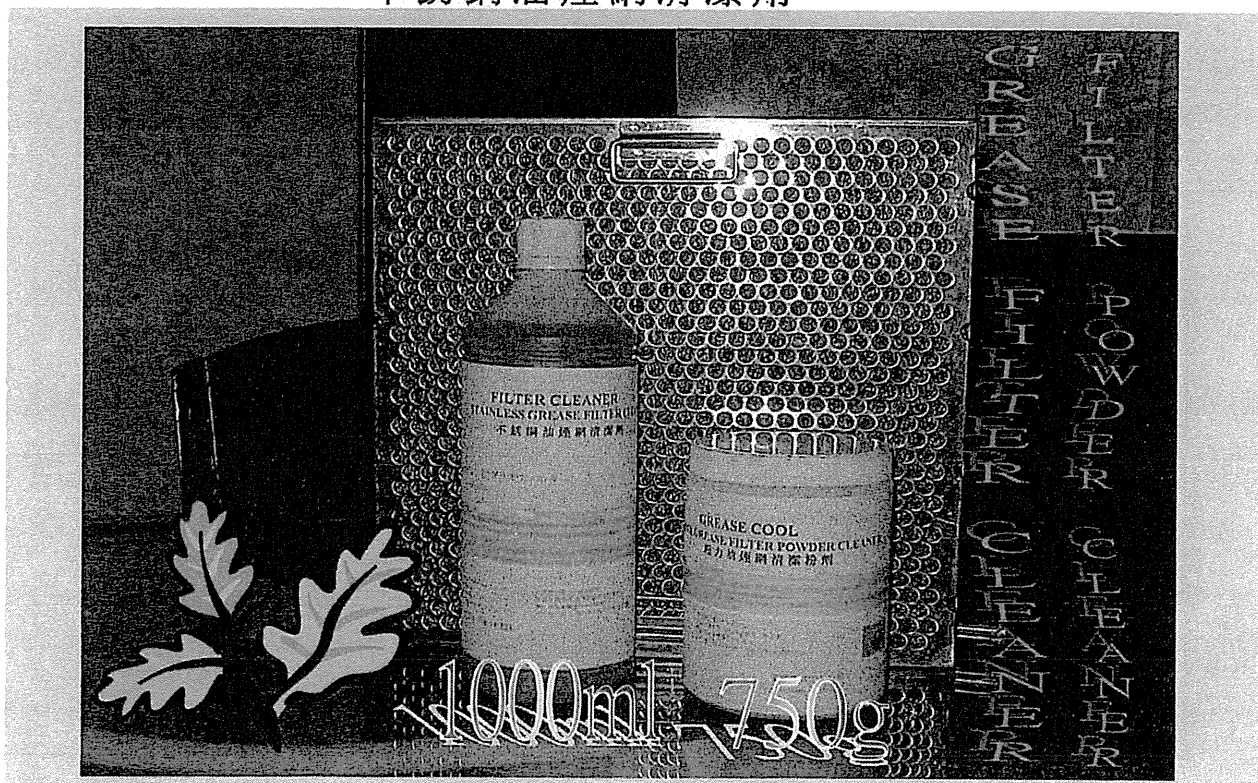
# GREASE COOL & FILTER CLEANER

SUPER GREASE FILTER POWDER CLEANER

STAINLESS GREASE FILTER CLEANER

超力油煙網清潔粉劑

不銹鋼油煙網清潔劑



業務用ステンレ製グリスフィルター

Yokohama, Japan

## DIRECTIONS FOR USE 使用方法

Input 750g of Grease Removal Power with water (hot or cool) into TOTARU STAINLESS BUCKET, and then input 1000ml of Grease Removal Cleaner into bucket, after wipe off with dirty filter 8hrs to 48hrs, rinse with clean of water

首先將750克除油粉放入多德來不銹鋼桶內，然後再加入清水(冷熱皆可)，再將1000毫升除油劑放入桶內及攪和後便可將污垢的隔油煙網放至水中，待浸8至48小時後再用清水徹底洗淨便可

TOTARU PLAN (HK) LTD.

# TOTARU G.F.BOX

Stainless Steel Grease Filter Cleaning Box

不銹鋼隔油網清潔箱



## 業務用ステンレ製箱

Yokohama, Japan



STAINLESS STEEL BOX

### 規格 SPECIFICATIONS

桶子型號 Bucket Type	G.F.5
桶子尺碼 Bucket Size	600 (高)H x 540 (長)L x 220 (闊)W
裝置水容量 Capacity	70 (公升) Litres
隔油網容量 Filter Holding Capacity	5 (塊) Pieces
不銹鋼架 Stainless Steel Rack	(Grease Filter) 560 (高)H x 520 (長)L x 120 (闊)W 3(塊用)Pieces
	560 (高)H x 520 (長)L x 80 (闊)W 2(塊用)Pieces

**Proposed Rezoning From “R(C)” To “G/AC” for  
a Proposed “Social Welfare Facilities” (Residential Care Homes for The Elderly) (RCHE)  
Lot 4823 in D.D.104, 81 San Tam Road, San Tin, N.T.  
S12A Application for Planning Application No. Y/YL-NTM/9  
Response-to-Comment – EPD  
(dated to 27 SEPTEMBER 2022)**

Comments	Response
<p><u>5.1.2 Comments on Noise Impact Assessment</u></p> <p>Traffic noise</p> <p>1. Sections 3.1.2, 3.2.1 and 3.3.1: Please clarify if any diagnostic rooms/wards in the proposed RCHE development will rely on the operable window for ventilation. If yes, the road traffic noise criteria should be 55 dB(A). Please also clarify the nature and use of the Multi-Function Area, and whether there would be any operable window for ventilation.</p> <p>2. Section 3.2.2: Please review if ASR “B” would be more appropriate for representative NSRs (i.e. W07 to W13) facing away from San Tin Highway.</p> <p>3. Section 3.3.2: Please document TD’s agreement on the traffic forecast data in the report once available. In case TD has no comment on the methodology for traffic forecast only, the consultant should provide written confirmation from the respective competent party (e.g. traffic consultant) that TD’s endorsed methodology has been strictly adopted in preparing the traffic forecast data, and hence the validity of traffic data can be confirmed.</p> <p>4. Section 3.3.5: The consultant proposed vertical architectural fins at the northern, eastern and southern facade of the proposed RCHE to mitigate the traffic noise impact. Please note that the proposed architectural fin may bring a maximum of 3 dB(A) of additional noise reduction. Please review and propose noise mitigation measures such as INMD to mitigate traffic noise impact if necessary.</p>	<p>No diagnostic rooms/wards is provided in the development. The Multi-function Area is for dining and rest purpose. Since the area is air-conditioned by AC unit, openable window would not be provided.</p>

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Response-to-Comment – EPD  
(dated to 27 SEPTEMBER 2022)**

Comments	Response
<p>Noise model</p> <p>5. The search radius in the configuration should be set to 300m. Please review.</p> <p>6. The traffic data for Road I to R are missing. Please supplement.</p> <p>7. The traffic flow of Road C1 appeared to be inconsistent with Table 3-3. Please review and rectify.</p> <p>Fixed noise</p> <p>8. Section 3.4.4 and Table 3-7: Please provide a figure with the location of representative NSRs (i.e. NSR N01 to NSR N03) relative to the proposed fixed plant noise sources.</p> <p>9. Based on our desktop review, open storage was located approximately 100m to the west of the site, and a mobile forklift and crane were found in the open storage site. Please double-check the potential fixed noise sources in the vicinity that should be included in the fixed noise impact assessment. The fixed noise impact assessment from surrounding existing sources to the proposed development is found missing in the planning application.</p> <p>10. Figure 3.2.4: Please assign the NSRs mentioned in Table 3-7 in CadnaA for fixed noise impact assessment. Please be reminded that the cumulative fixed noise impact should be included in the fixed noise impact assessment.</p>	<p>5-7 : Await reply from our Environmental Consultant</p> <p>8-10: Await reply from our Environmental Consultant</p>

**Proposed Rezoning From “R(C)” To “G/AC” for  
a Proposed “Social Welfare Facilities” (Residential Care Homes for The Elderly) (RCHE)  
Lot 4823 in D.D.104, 81 San Tam Road, San Tin, N.T.  
S12A Application for Planning Application No. Y/YL-NTM/9  
Response-to-Comment – EPD  
(dated to 27 SEPTEMBER 2022)**

Comments	Response
<p><u>5.1.3 Comments on water quality impact</u></p> <p>1. Please provide relevant baseline condition of nearby waterbodies and confirm whether the development would have adverse water quality impact on WQO.</p> <p>2. Section 4.5: Please provide more information on the sewage generation during operation, including the amount of sewage flow generated per day (from residents, staff, facilities, etc.), the size of the STP, mitigation measures to prevent discharge/ overflow of untreated raw sewage, etc. to demonstrate there would be no adverse water quality impact.</p> <p>3. Section 4.3: Please list and provide a figure to identify the WSRs within 500m area. Please also indicates the discharge route of the proposed STP. Please also elaborate whether WSRs within 500m would be affected by the proposed development during construction and operation phase.</p> <p>4. Section 4.5: Design of the STP shall follow Guidelines for the Design of Small Sewage Treatment Plants by EPD.</p>	<p>1 &amp; 3: Please refer to the Appendix 1.</p> <p>2 &amp; 4: The Design Calculation is attached for your information. It provides the calculation of the daily flow generated from resident and staff, the applied discharge standard and design treatment tank to fulfill the effluent quality of discharge standard of EPD.</p>

**Proposed Rezoning From “R(C)” To “G/IC” for  
a Proposed “Social Welfare Facilities” (Residential Care Homes for The Elderly) (RCHE)  
Lot 4823 in D.D.104, 81 San Tam Road, San Tin, N.T.  
S12A Application for Planning Application No. Y/YL-NTM/9  
Response-to-Comment – EPD  
(dated to 27 SEPTEMBER 2022)**

Comments	Response														
<p>5. Section 4.5: The subject site falls within Deep Bay catchment area with limited assimilative capacity. We understand that there is no public sewerage system available in the vicinity of the site. Subject to confirmation that connection to public sewerage is not feasible, the development shall be equipped with on-site tertiary sewage treatment facility. A typical tertiary treatment standard is attached below for reference.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Parameter</th> <th style="width: 80%;">Tertiary Effluent Standards (Upper Limit) *</th> </tr> </thead> <tbody> <tr> <td>BOD5</td> <td>10 mg/L</td> </tr> <tr> <td>TSS</td> <td>10 mg/L</td> </tr> <tr> <td>TN</td> <td>20 mg/L</td> </tr> <tr> <td>TP</td> <td>2 mg/L</td> </tr> <tr> <td>Ammonia-N</td> <td>5 mg/L</td> </tr> <tr> <td>E. coli</td> <td>100units/100mL</td> </tr> </tbody> </table> <p>*Depending on the water body receiving the discharge, the more stringent set of the effluent standards (those listed in the table or the WPCO TM) should be adopted as appropriate.</p>	Parameter	Tertiary Effluent Standards (Upper Limit) *	BOD5	10 mg/L	TSS	10 mg/L	TN	20 mg/L	TP	2 mg/L	Ammonia-N	5 mg/L	E. coli	100units/100mL	<p>The Design Calculation is attached for your information. It provides the calculation of the daily flow generated from resident and staff, the applied discharge standard and design treatment tank to fulfill the effluent quality of discharge standard of EPD.</p>
Parameter	Tertiary Effluent Standards (Upper Limit) *														
BOD5	10 mg/L														
TSS	10 mg/L														
TN	20 mg/L														
TP	2 mg/L														
Ammonia-N	5 mg/L														
E. coli	100units/100mL														

**Proposed Rezoning From “R(C)” To “G/IC” for  
a Proposed “Social Welfare Facilities” (Residential Care Homes for The Elderly) (RCHE)  
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S12A Application for Planning Application No. Y/YL-NTM/9  
Response-to-Comment – EPD  
(dated to 27 SEPTEMBER 2022)**

Comments	Response
<p><u>5.1.4 Comments on waste management</u></p> <p>1. Please confirm whether there is any potential land contamination issue due to the historical and current land uses at the subject site.</p> <p><u>5.1.5 Comments on landfill gas hazard impact</u></p> <p>1. As the application site falls within 250m consultation zone of the restored Ngau Tam Mei Landfill, please address potential landfill gas hazard impacts during construction and operation phase of the proposed development and propose mitigation measures, if necessary.</p>	<p>Await reply from our Environmental Consultant</p> <p>A Landfill Gas Hazard Assessment Report for the existing house was submitted on 04/2016 and be approved by EPD. A revised assessment could be carried out at later stage if necessary.</p>

**S12A AMENDMENT OF PLAN APPLICATION  
APPROVED NGAU TAM MEI  
OUTLINE ZONING PLAN NO. S/YL-NTM/12**

**PROPOSED REZONING FROM "R(C)" TO "G/IC"  
FOR A PROPOSED "SOCIAL WELFARE FACILITIES"  
(RESIDENTIAL CARE HOMES FOR THE ELDERLY)  
(RCHE)**

**AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,  
SAN TIN, N.T.**

APPENDIX 1

RESPONSE-TO-COMMENT - EPD

5.1.3 WATER QUALITY IMPACT (COMMENT 1&3)



**Please provide relevant baseline condition of nearby waterbodies and confirm whether the development would have adverse water quality impact on WQO.**

For the marine environment, the nearest EPD Water Quality Monitoring Station (WQMS) to 81 San Tam Road is DM1. The latest summary of baseline condition of subject WQMS in 2020 is extracted, reference from "Marine Water Quality in Hong Kong in 2020" by EPD.

In 2020, the overall WQO compliance rate for Deep Bay WCZ was 67%, as compared with a ten year average of 47% in 2009-2018. Overall, with the measures under the Deep Bay Water Pollution Control Joint Implementation Plan taken progressively by Hong Kong and Shenzhen, there have been significant water quality improvements in Deep Bay. In particular, there have been full compliance of the DO WQO in the past two years and NH<sub>3</sub>-N WQOs in the past five years. Although Deep Bay, as compared with other WCZs, had higher nutrient levels with annual depth averaged TIN levels exceeding the respective TIN WQOs, a noticeable long-term decrease in TIN levels since mid-2000s has been seen.

Sewage will be treated by the onsite STP before discharge. The disposal of the treated effluent shall comply with relevant statutory requirements and guidelines such as Water Pollution Control Ordinance (Cap. 358), etc. All discharges during the operation phase of the proposed development are required to comply with the Technical Memorandum for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM-DSS) issued under Section 21 of the Water Pollution Control Ordinance (WPCO). The TM-DSS defines acceptable discharge limits to different types of receiving waters. Under the TM-DSS, effluents discharged into the drainage and sewerage systems, inland and coastal waters of the Water Control Zones (WCZs) are subject to pollutant concentration standards for specified discharge volumes. These are defined by the Environmental Protection Department (EPD) and are specified in licence conditions for any new discharge within a WCZ. Therefore, no adverse water quality impact on WQO is anticipated.

## Summary of water quality statistics for the Deep Bay WCZ in 2020

Parameter	Inner Deep Bay			Outer Deep Bay	
	DM1	DM2	DM3	DM4	DM5
<b>Number of samples</b>	<b>8</b>	<b>8</b>	<b>12</b>	<b>8</b>	<b>8</b>
Temperature (°C)	26.5 (20.8-31.2)	26.6 (21.1-30.9)	26.4 (20.2-30.6)	26.1 (21.1-29.8)	26.7 (20.9-28.9)
Salinity	14.6 (1.6-22.6)	16.6 (3.0-25.5)	21.5 (4.4-29.3)	20.9 (9.8-30.7)	23.7 (8.9-31.6)
Dissolved Oxygen (mg/L)	5.9 (4.4-7.5)	6.1 (4.8-7.3)	6.0 (4.3-7.1)	5.8 (5.2-6.6)	5.8 (4.4-6.9)
<b>Bottom</b>	N/A	N/A	N/A	5.4	5.5
Dissolved Oxygen (% Saturation)	79 (62-105)	83 (69-94)	89 (66-97)	80 (70-94)	81 (69-98)
<b>Bottom</b>	N/A	N/A	N/A	75	77
pH	7.4 (7.1-7.8)	7.6 (7.2-8.0)	7.8 (7.4-8.2)	7.7 (7.3-8.1)	7.8 (7.5-8.1)
Secchi Disc Depth (m)	1.1 (0.8-1.2)	1.1 (0.8-1.3)	1.4 (1.1-1.9)	1.5 (1.0-2.0)	1.6 (1.0-2.1)
Turbidity (NTU)	21.7 (13.3-41.4)	29.3 (13.9-42.7)	9.5 (5.9-14.2)	9.0 (5.1-17.4)	9.1 (4.5-21.0)
Suspended Solids (mg/L)	37.0 (19.0-59.0)	47.4 (24.0-80.0)	15.3 (6.5-30.0)	14.5 (6.3-21.5)	14.7 (6.9-27.3)
5-day Biochemical Oxygen Demand (mg/L)	1.6 (0.3-3.1)	1.8 (0.7-4.9)	1.0 (0.3-4.3)	0.6 (0.2-0.9)	0.6 (0.3-1.0)
Ammonia Nitrogen (mg/L)	0.465 (0.190-0.970)	0.331 (0.075-0.900)	0.134 (0.029-0.320)	0.102 (0.018-0.180)	0.099 (0.011-0.170)
Unionised Ammonia (mg/L)	0.007 (0.002-0.014)	0.006 (0.002-0.019)	0.004 (0.001-0.009)	0.003 (0.001-0.007)	0.003 (0.001-0.007)
Nitrite Nitrogen (mg/L)	0.131 (0.026-0.310)	0.105 (0.040-0.310)	0.081 (0.014-0.170)	0.067 (0.026-0.165)	0.052 (0.024-0.130)
Nitrate Nitrogen (mg/L)	1.300 (0.900-1.600)	1.060 (0.600-1.500)	0.753 (0.370-1.500)	0.711 (0.265-1.400)	0.605 (0.137-1.330)
Total Inorganic Nitrogen (mg/L)	1.89 (1.39-2.32)	1.52 (1.02-2.34)	0.95 (0.43-1.78)	0.88 (0.37-1.52)	0.75 (0.23-1.41)
Total Kjeldahl Nitrogen (mg/L)	0.90 (0.59-1.70)	0.79 (0.46-1.60)	0.39 (0.22-0.67)	0.34 (0.14-0.49)	0.43 (0.09-0.97)
Total Nitrogen (mg/L)	2.33 (1.81-2.91)	1.98 (1.52-3.01)	1.21 (0.77-2.11)	1.12 (0.76-1.81)	1.09 (0.73-1.72)
Orthophosphate Phosphorus (mg/L)	0.151 (0.120-0.223)	0.123 (0.066-0.180)	0.061 (0.010-0.082)	0.035 (0.017-0.053)	0.025 (0.011-0.037)
Total Phosphorus (mg/L)	0.24 (0.19-0.34)	0.21 (0.15-0.27)	0.10 (0.05-0.14)	0.07 (0.05-0.10)	0.06 (0.04-0.09)
Silica (as SiO <sub>2</sub> ) (mg/L)	5.88 (3.10-10.00)	5.15 (1.90-10.00)	3.70 (0.47-8.90)	3.89 (0.39-9.00)	3.60 (0.34-8.97)
Chlorophyll-a (µg/L)	63 (2.5-8.9)	84 (2.6-15.0)	28 (1.0-11.0)	19 (0.5-4.0)	19 (0.6-3.6)
<i>E. coli</i> (count/100mL)	200 (12-1600)	160 (17-8100)	22 (1-1100)	63 (4-890)	75 (9-1600)
Faecal Coliforms (count/100mL)	530 (5-2800)	340 (24-9600)	66 (3-3900)	170 (11-3000)	190 (26-4600)

Note: 1. Unless otherwise specified, data presented are depth-averaged (A) values calculated by taking the means of three depths: Surface (S), Mid-depth (M), Bottom (B).

2. Data presented are annual arithmetic means of the depth-averaged results except for *E. coli* and Faecal coliforms which are annual geometric means.

3. Data in brackets indicate the ranges.

4. N/A (Not Applicable) indicates the measurement was not made due to shallow water.

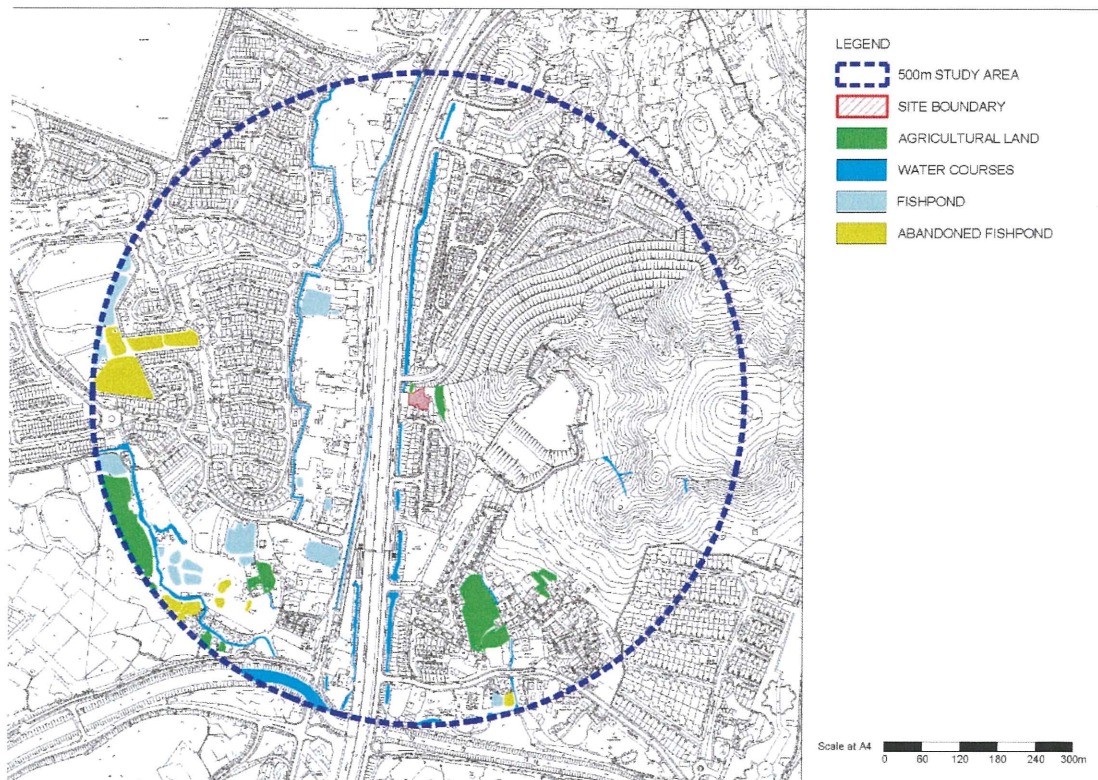
5. During the periods of the special work arrangement under the COVID-19 pandemic in 2020, marine water quality monitoring frequency was adjusted and sampling at representative monitoring stations were maintained.

Full scale monitoring was conducted in the periods of January, May to June and September to November 2020.

Please list and provide a figure to identify the WSRs within 500m area. Please also indicates the discharge route of the proposed STP. Please also elaborate whether WSRs within 500m would be affected by the proposed development during construction and operation phase.

Water Sensitive Receivers (WSRs) are defined as those users of the aquatic/marine environment whose use of the environment could be impaired as a result of the proposed project. When WSRs that are potentially affected by the construction and operation of the Project are identified, further study will be conducted.

Representative Water Sensitive Receivers (WSRs) identified within 500m of the Project boundary that may potentially be affected are shown in Figure below.



### **Construction Site Runoff**

The surface runoff from construction works areas may contain increased loads of suspended solids (SS) and contaminants. Potential sources of pollution from construction site drainage include:

- Runoff and erosion from site surfaces, drainage channels, demolition works, earth working areas and stockpiles;
- Release of any bentonite slurries, concrete washings and other grouting activities;
- Wash water from dust suppression spray facilities; and
- Fuel, oil, solvents and lubricants from maintenance of mechanical equipment.

Sediment laden runoff particularly from works areas subjected to excavation or earthworks, if uncontrolled, may cause increased levels of suspended solids and pollutants entering the stormwater drainage system and into the marine environment.

Mitigation measures and good site practices outlined in ProPECC PN1/94 should be implemented to control construction site runoff and drainage from the works area. The Contractor would also be required to apply for a discharge license under the WPCO. With implementation of the recommended mitigation measures along with compliance of the effluent standards set under TM-DSS, construction site runoff can be effectively controlled, and adverse impacts to storm drains or the marine environment is not anticipated.

### **General Construction Activities**

On-site construction activities may result in water pollution from uncontrolled discharge of debris and rubbish such as packaging, construction materials, chemicals and refuse. Best Management Practices (BMPs) should be implemented at the construction site, including proper handling, sorting and storage of construction solid waste, debris and refuse generated on-site prior to disposal. General refuse and recyclable materials should be collected separately and stored in appropriately labelled bins and removed regularly to minimise the risk of windblown waste / debris discharging into the harbour.

With proper implementation of the good construction and site management practices mentioned above, water pollution arising from the general on-site construction activities can be prevented, and water quality impacts would not be anticipated.

### **Accidental Spillage of Chemicals**

A large variety of chemicals may be used during construction activities. These may include petroleum products, surplus adhesives, spent lubrication oil, grease and mineral oil, spent acid and alkaline solutions/solvent and other chemicals. The use of these chemicals and their storage as waste materials has the potential to create impacts on the water quality of adjacent watercourses or storm drains if spillage occurs. Waste oil may infiltrate into the surface soil layer, or runoff into local watercourses, increasing hydrocarbon levels. The potential impact could however be mitigated by practical mitigation measures and good site practices as given in Waste Disposal Ordinance (Cap. 354), its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation and The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

### **Sewage Effluent from the Construction Workforce**

During the construction of the Project, the workforce on site will generate sewage effluents, which are characterised by high levels of BOD, ammonia and E.coli counts. Potential water quality impacts upon the local drainage and freshwater system may arise from these sewage effluents, if uncontrolled.

The construction sewage should be handled by interim sewage treatment facilities, such as portable chemical toilets. Appropriate numbers of portable toilets should be provided by a licensed contractor to serve the large number of construction workers over the construction site. Provided that sewage is not discharged directly into the storm drains or watercourses adjacent to the construction site, and temporary sanitary facilities are used and properly maintained, it is unlikely that sewage generated from the site would have a significant water quality impact.

### **Sewage generated from the Development Operation**

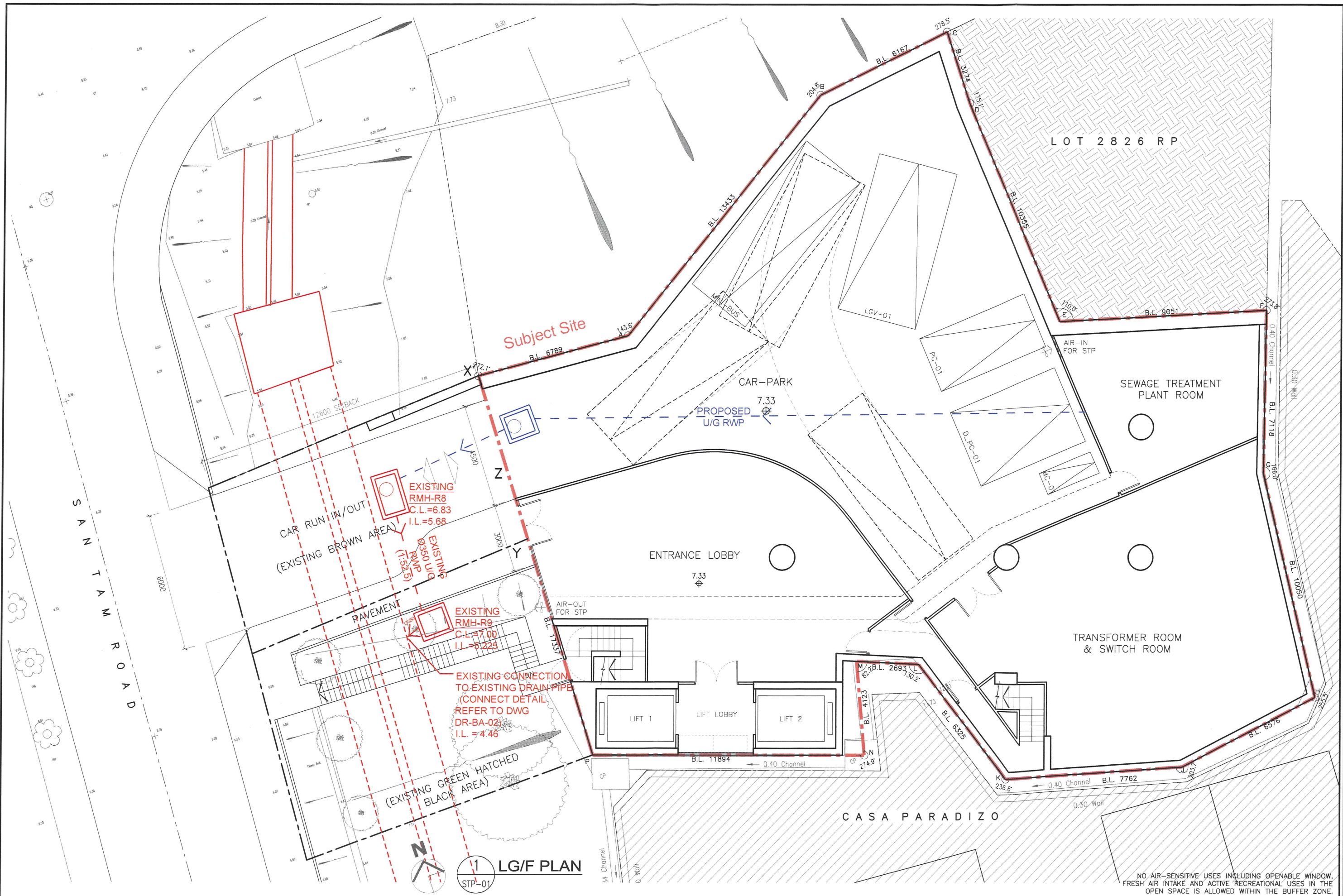
Sewage discharge will be the major water pollution source throughout the operation phase of the proposed Development. The sewage generated from the proposed Development will be collected and conveyed to the nearest public sewerage system via proper connections. No sewage will be released to the environment without treatment.

### **Runoff from road surfaces and paved areas**

During operation phase, stormwater runoff from paved surfaces within the Project Sites will be directed to a managed stormwater drainage system. Runoff from the roofs of buildings and road surfaces within the Sites may carry suspended solids and other pollutants such as fuel, oils and heavy metals that could enter nearby surface water bodies or storm drains if uncontrolled. With implementation of stormwater best management practices including provision of trapped gullies and catch-pits, adverse impacts to the water quality is not anticipated.

### **Discharge route of the proposed STP**

The discharge route is shown as per STP-01 attached.



2202  
 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY  
 at 81 SAN TAM ROAD,  
 YUEN LONG, N.T.

LG/F PLAN  
 DISCHARGE ROUTE OF THE STP

STP-01 1:150 (A3) - OCT. 2022

Do not scale drawing.  
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**RLEE**

**S12A AMENDMENT OF PLAN APPLICATION  
APPROVED NGAU TAM MEI  
OUTLINE ZONING PLAN NO. S/YL-NTM/12**

RESPONSE-TO-COMMENT - EMSD

**PROPOSED REZONING FROM "R(C)" TO "G/IC"  
FOR A PROPOSED "SOCIAL WELFARE FACILITIES"  
(RESIDENTIAL CARE HOMES FOR THE ELDERLY)  
(RCHE)**

**AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,  
SAN TIN, N.T.**

**Proposed Rezoning From “R(C)” To “G/IC” for  
a Proposed “Social Welfare Facilities” (Residential Care Homes for The Elderly) (RCHE)  
Lot 4823 in D.D.104, 81 San Tam Road, San Tin, N.T.  
S12A Application for Planning Application No. Y/YL-NTM/9  
Response-to-Comment – EMSD  
(dated to 27 SEPTEMBER 2022)**

Comments	Response
<p>6. Comments of the Director of Electrical and Mechanical Services (DEMS) as follow:</p> <p>Town Gas Safety</p> <p>6.1 Please note that there is a high pressure town gas pipeline (HP pipeline) running along San Tam Road in close vicinity of the subject site.</p> <p>6.2 A Quantitative Risk Assessment (QRA) conducted by the project proponent is required to assess the potential risks associated with the HP pipeline, having considered the proposed development and implement mitigation measures if necessary for compliance with the risk guidelines of the Hong Kong Planning Standards and Guidelines.</p> <p>6.3 The project proponent is required to observe the requirements of the Electrical and Mechanical Services Department’s “Guidance Note on Quantitative Risk Assessment Study for High Pressure Town Gas Installations in Hong Kong” for carrying out the QRA. The guidance note can be downloaded via the following web-link:- <a href="https://www.emsd.gov.hk/en/gas_safety/publications/guidance_notes/index.html">https://www.emsd.gov.hk/en/gas_safety/publications/guidance_notes/index.html</a></p> <p>6.4 The project proponent should liaise with The Hong Kong and China Gas Company Limited in respect of the exact locations of existing and planned gas pipes/gas installations in the vicinity to the site and any required minimum set back distance away from them during the planning design and construction stages of the proposed development.</p>	<p>Noted</p> <p>QRA would be carried out if necessary.</p> <p>Noted</p> <p>Noted</p>



**S12A AMENDMENT OF PLAN APPLICATION  
APPROVED NGAU TAM MEI  
OUTLINE ZONING PLAN NO. S/YL-NTM/12**

**PROPOSED REZONING FROM "R(C)" TO "G/IC"  
FOR A PROPOSED "SOCIAL WELFARE FACILITIES"  
(RESIDENTIAL CARE HOMES FOR THE ELDERLY)  
(RCHE)**

**AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,  
SAN TIN, N.T.**

RESPONSE-TO-COMMENT - PlanD

**Proposed Rezoning From “R(C)” To “G/IC” for  
a Proposed “Social Welfare Facilities” (Residential Care Homes for The Elderly) (RCHE)  
Lot 4823 in D.D.104, 81 San Tam Road, San Tin, N.T.  
S12A Application for Planning Application No. Y/YL-NTM/9  
Response-to-Comment – PlanD  
(dated to 27 SEPTEMBER 2022)**

Comments	Response
<p><b>7. Comments of the Chief Town Planner/ Urban Design and Landscape Section, Planning Department as follow:</b></p> <p>7.1 The visual sensitivity of VP6 as stated in paragraphs 5.1 and 3.3.6 are different. Please check.</p>	Revised
<p><b>8. Comments of the Chief Town Planner/ Urban Design and Landscape Section, Planning Department as follow:</b></p> <p>8.1 Comments on Appendix 4 – Landscape Master Plan</p> <p>(i) The application site boundary should be clearly indicated on all figures.</p> <p>(ii) Paragraphs 2.3 &amp; 2.4, the applicant should clarify whether the “Green Hatched Black Area” and “Brown Area” are outside the application site boundary.</p> <p>(iii) Para 8.14 states that “mini flower planter at 3/F &amp; 4/F...” but the concerned planters are shown on 2/F and 3/F on Figure 5 and 6 respectively.</p> <p>(iv) Figure 2 to Figure 16, drawing scale should be indicated.</p> <p>(v) Figure 3, “Landscape Master Plan”, new trees and existing trees to be retained and proposed landscape design on different levels should be clearly indicated.</p>	<p>Revised as per on Figure 2-10 Rev. B, 14-16 Rev. B.</p> <p>Revised</p> <p>Para 8.14 revised as “mini flower planter at 2/F &amp; 3/F”.</p> <p>Revised as per Figure 2 Rev. B to Figure 16 Rev. B.</p> <p>Revised as per Figure 2 Rev. B.</p>

**Proposed Rezoning From “R(C)” To “G/IC” for  
a Proposed “Social Welfare Facilities” (Residential Care Homes for The Elderly) (RCHE)  
Lot 4823 in D.D.104, 81 San Tam Road, San Tin, N.T.  
S12A Application for Planning Application No. Y/YL-NTM/9  
Response-to-Comment – PlanD  
(dated to 27 SEPTEMBER 2022)**

<b>Comments</b>	<b>Response</b>
<p>(vi) Figure 4 “1/F Landscape”, about half of proposed plantings are under cover and facing north and west while the floor headroom is less than 2.8m. The applicant is advised to review whether the proposed planting environment is favorable to the growth of plants and suitable species should be selected.</p> <p>(vii) Figure 5 and 6, the design of planters on 2/F and 3/F should take into consideration the needs of maintenance and replacement of plants.</p> <p>(viii) Figure 9 “Section AA Diagram”</p> <ul style="list-style-type: none"> <li>● It should be clearly indicated if the Green Hatch Black Area is not covered by the application.</li> <li>● Broken line indicating the omission of 3/F to 7/F should be marked.</li> </ul> <p>(ix) Figure 10 “Section BB Diagram”</p> <ul style="list-style-type: none"> <li>● The direction of cut-line on the key plan is different from that on Figure 2 and should be rectified.</li> <li>● The layout of planters at the western side on roof garden does not tally with the layout on plan and should be rectified.</li> <li>● Proposed tall plantings on 1/F will black the light and views of users on upper floors.</li> <li>● Broken line indicating the omission of 3/F to 7/F should be marked.</li> </ul>	<p>For the covered part, artificial turf will be applied instead of plants. Those has been revised as per Figure 4 Rev. B.</p> <p>Planters on 2/F, 3/F and Vertical Greenery on San Tam Road Façade are accessed by Gondola.</p> <p>Revised as per Figure 9 Rev. B.</p> <p>Revised as per Figure 10 Rev. B.</p>

**Proposed Rezoning From “R(C)” To “G/IC” for  
a Proposed “Social Welfare Facilities” (Residential Care Homes for The Elderly) (RCHE)  
Lot 4823 in D.D.104, 81 San Tam Road, San Tin, N.T.  
S12A Application for Planning Application No. Y/YL-NTM/9  
Response-to-Comment – PlanD  
(dated to 27 SEPTEMBER 2022)**

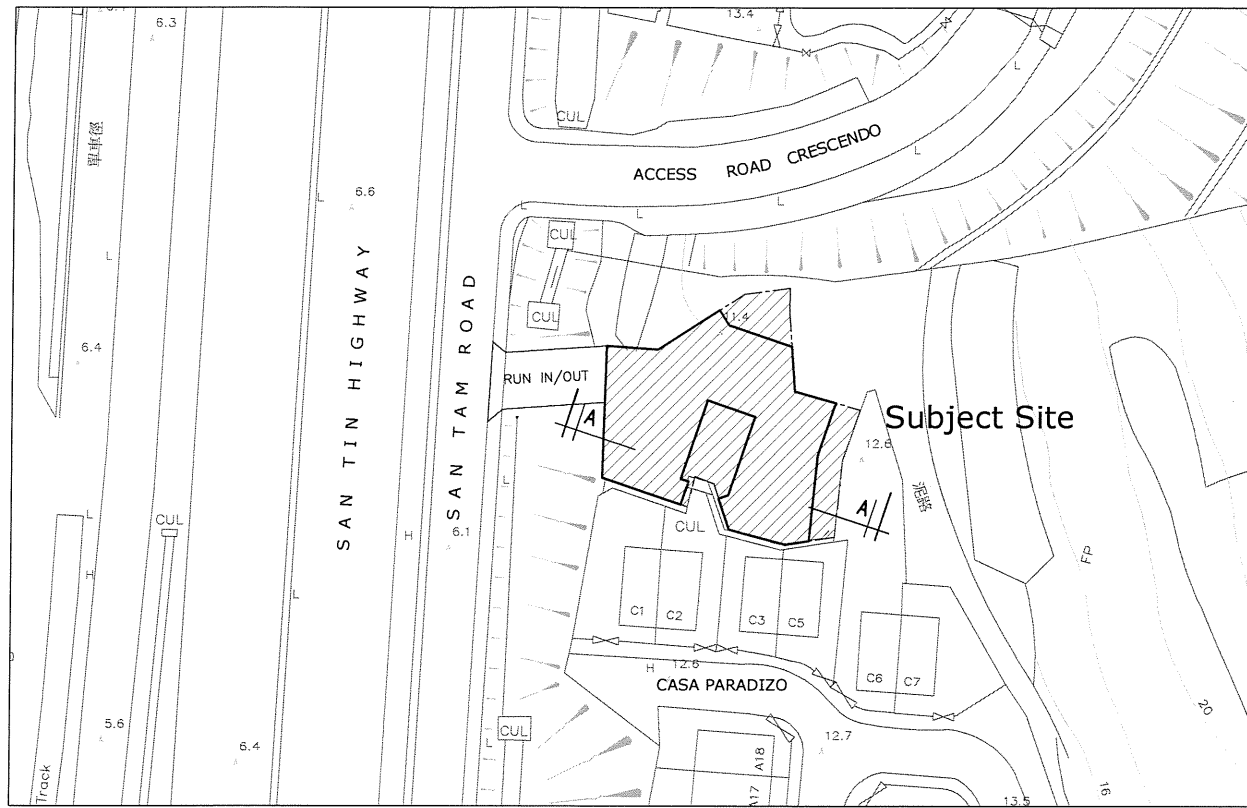
Comments	Response
(x) Figure 14 “Green Coverage Calculation” <ul style="list-style-type: none"> <li>● The provision of greenery coverage has not been indicated on this figure.</li> </ul>	Revised as per Figure 14 Rev. B.

**S12A AMENDMENT OF PLAN APPLICATION  
APPROVED NGAU TAM MEI  
OUTLINE ZONING PLAN NO. S/YL-NTM/12**

REVISED RCHE DESIGN

**PROPOSED REZONING FROM "R(C)" TO "G/IC"  
FOR A PROPOSED "SOCIAL WELFARE FACILITIES"  
(RESIDENTIAL CARE HOMES FOR THE ELDERLY)  
(RCHE)**

**AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,  
SAN TIN, N.T.**



**BLOCK PLAN**

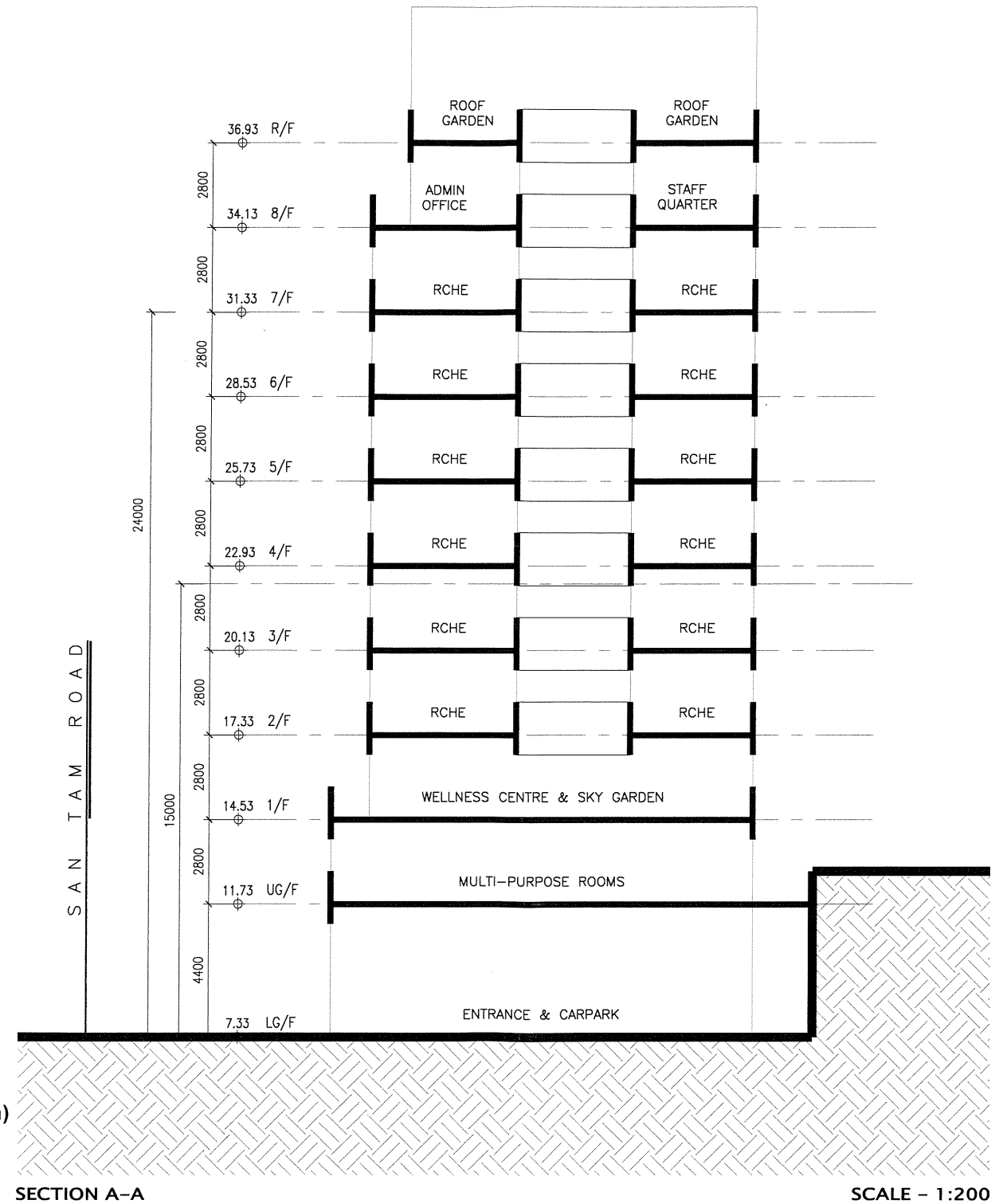
SCALE - 1:1000

**DEVELOPMENT SCHEDULE:**

Site Area	:	736.3 m <sup>2</sup>	(7926 ft <sup>2</sup> )
Class of Site	:	A	
Proposed Plot Ratio For Non-Domestic	:	7.33	
Proposed Site Coverage above For Non-Domestic (Above 15m)	:	75.558%	
Maximum Gross Floor Area	:	5400 m <sup>2</sup>	(58125.6 ft <sup>2</sup> )
Proposed Building Height	:	36.93 mPD	
Absolute Height	:	29.6 m	
Proposed No. Of Storeys	:	10 STOREYS	
Proposed Gross Floor Area	:		
LG/F (ENTRANCE & CARPARK)	:	352.479 m <sup>2</sup>	
UG/F (MULTI-PURPOSE ROOMS)	:	617.819 m <sup>2</sup>	
1/F (WELLNESS CENTRE + SKY GARDEN)	:	626.160 m <sup>2</sup>	
2/F (RCHE)	:	595.090 m <sup>2</sup>	( 45 nos. of bed )
3/F (RCHE)	:	556.330 m <sup>2</sup>	( 17 nos. of bed + 3 nos. of isolation room )
4/F - 7/F (RCHE)	:	556.330 m <sup>2</sup> x 4 storeys	
	:	= 2225.32 m <sup>2</sup>	(20 nos. of bed x 4 storeys)
8/F (ADMIN OFFIC + STAFF QUARTER)	:	426.802 m <sup>2</sup>	
<b>TOTAL</b>	:	<b>5400.000 m<sup>2</sup></b>	<b>( 142 nos. of bed + 3 nos. of isolation room)</b>

**Parking Spaces :**

No. of LGV	:	1 Nos.
No. of Minibus	:	1 Nos.
No. of Private Car Parking	:	1 Nos. + 1 Nos. (Accessible Car Parking)
No. of Motorcycle Parking	:	1 Nos.



**SECTION A-A**

SCALE - 1:200

NO AIR-SENSITIVE USES INCLUDING OPENABLE WINDOW, FRESH AIR INTAKE AND ACTIVE RECREATIONAL USES IN THE OPEN SPACE IS ALLOWED WITHIN THE BUFFER ZONE.

2202  
PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY  
at 81 SAN TAM ROAD,  
YUEN LONG, N.T.

**DEVELOPMENT SCHEDULE & SECTION**

G-01

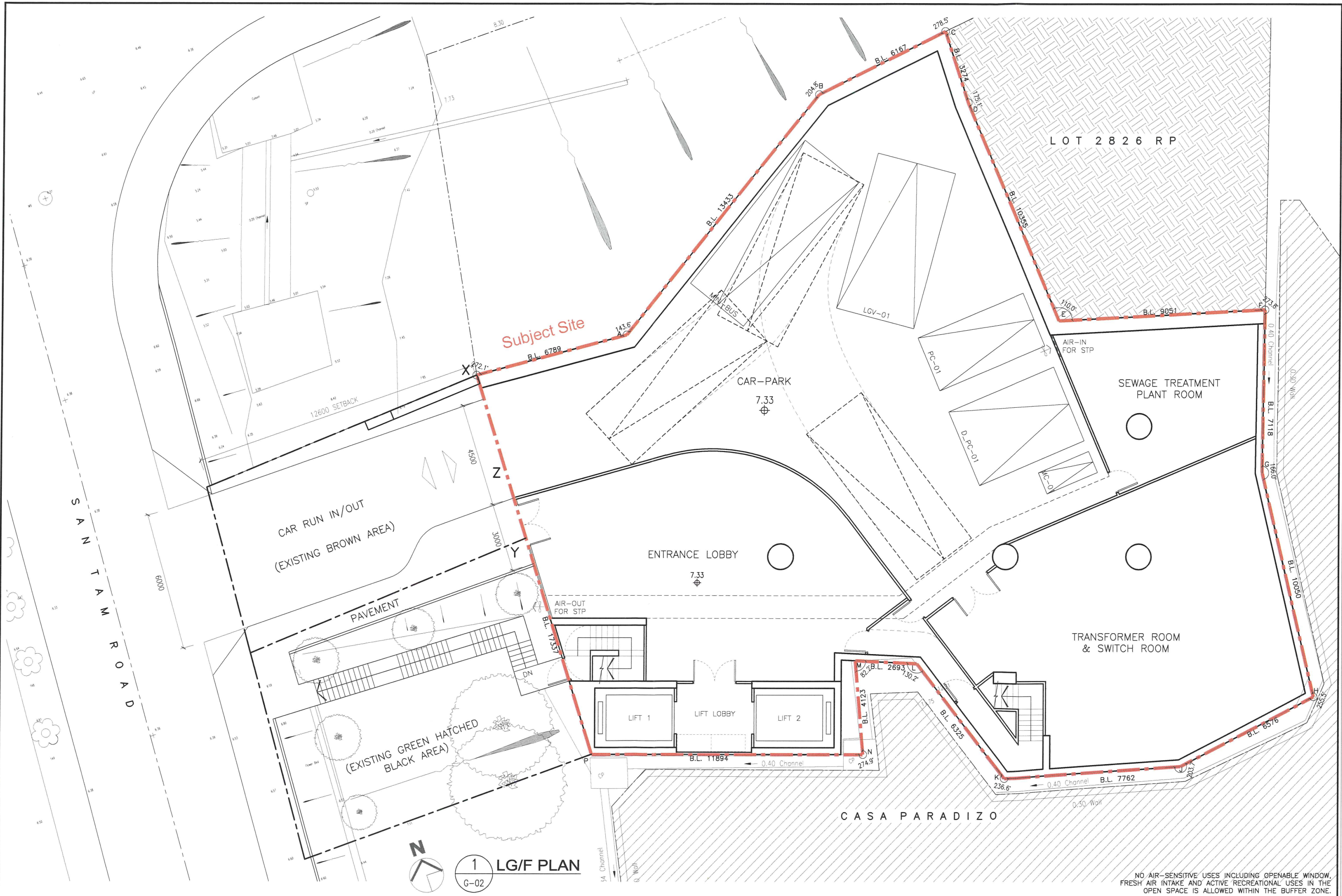
N.T.S. (A3)

B  
A

OCT. 2022  
JULY. 2022

*Do not scale drawing.  
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Subject Site

LOT 2826 RP

SAN TAM ROAD

CAR RUN IN/OUT  
(EXISTING BROWN AREA)

(EXISTING GREEN HATCHED  
BLACK AREA)

N  
1 LG/F PLAN  
G-02

2202  
PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY  
at 81 SAN TAM ROAD,  
YUEN LONG, N.T.

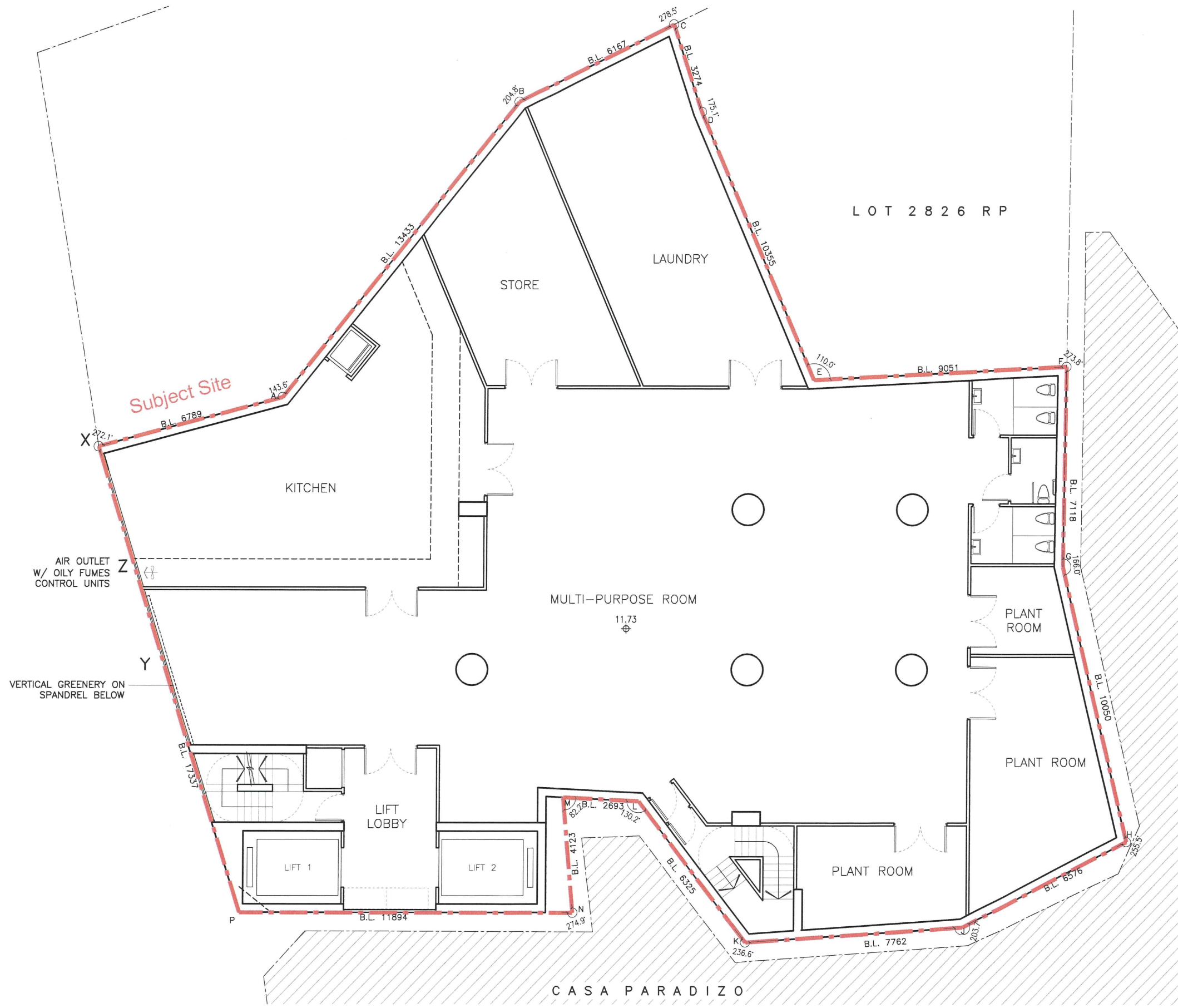
LG/F PLAN  
ENTRANCE & CARPARK

G-02 1:150 (A3) B A OCT. 2022 JULY. 2022

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NO AIR-SENSITIVE USES INCLUDING OPENABLE WINDOW,  
FRESH AIR INTAKE AND ACTIVE RECREATIONAL USES IN THE  
OPEN SPACE IS ALLOWED WITHIN THE BUFFER ZONE.

RLEE



**1** UG/F PLAN  
G-03

2202  
 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY  
 at 81 SAN TAM ROAD,  
 YUEN LONG, N.T.

**UG/F PLAN**  
**MULTI-PURPOSE ROOMS**

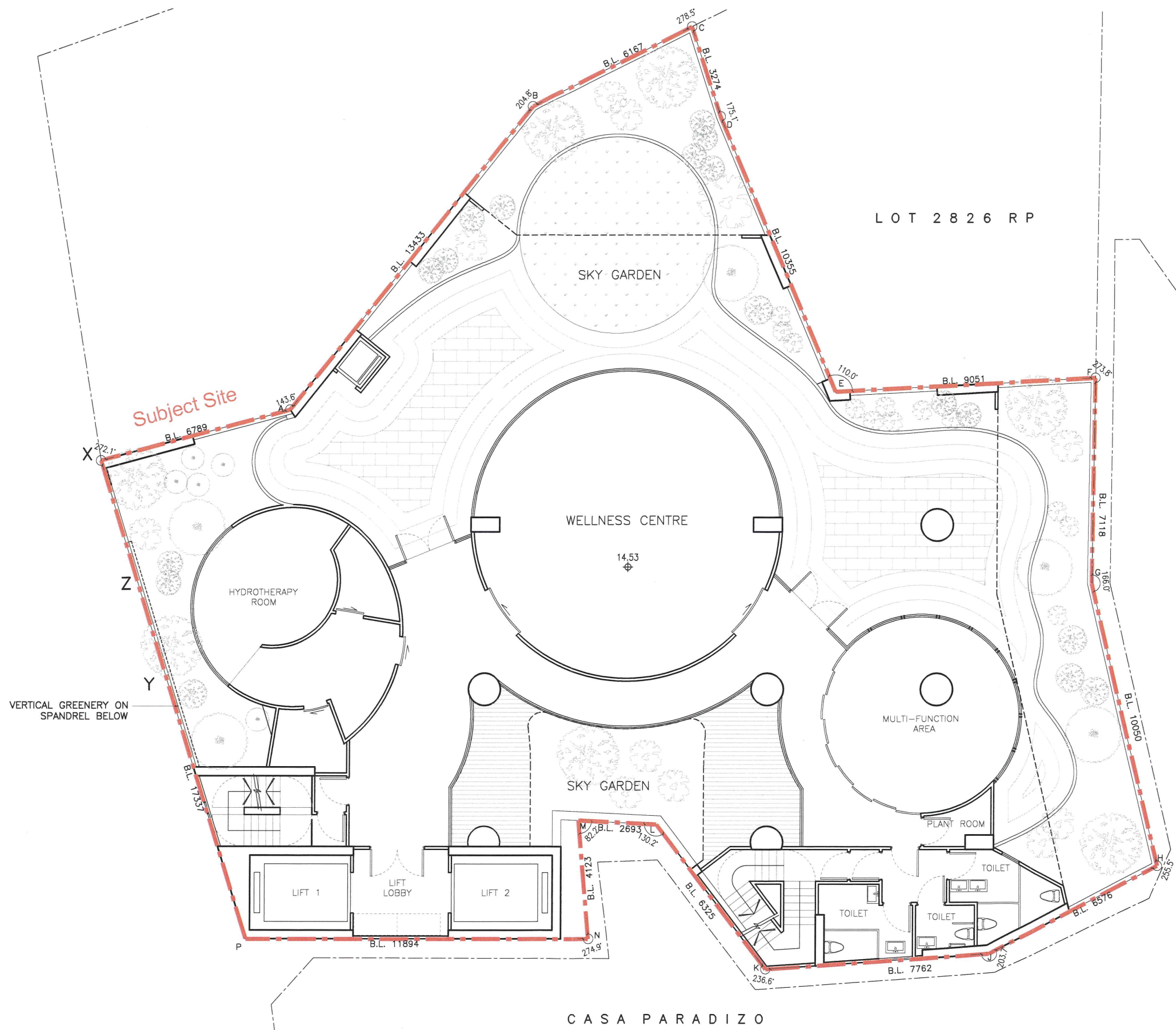
G-03 1:150 (A3) B A OCT. 2022 JULY. 2022

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**1**  
G-04  
**1/F PLAN**

**1/F PLAN  
WELLNESS CENTRE & SKY GARDEN**

G-04

1:150 (A3)

B  
A

OCT. 2022  
JULY. 2022

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2202  
PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY  
at 81 SAN TAM ROAD,  
YUEN LONG, N.T.



N  
 1 2/F PLAN  
 G-05

NO AIR-SENSITIVE USES INCLUDING OPENABLE WINDOW, FRESH AIR INTAKE AND ACTIVE RECREATIONAL USES IN THE OPEN SPACE IS ALLOWED WITHIN THE BUFFER ZONE.

2202  
 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY  
 at 81 SAN TAM ROAD,  
 YUEN LONG, N.T.

2/F PLAN  
 RCHE

G-05 1:150 (A3) B A OCT. 2022 JULY. 2022

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N  
 1 3/F PLAN  
 G-06

2202  
 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY  
 at 81 SAN TAM ROAD,  
 YUEN LONG, N.T.

3/F PLAN  
 RCHE

G-06 1:150 (A3) B A OCT. 2022 JULY. 2022

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1 TYPICAL FLOOR PLAN PLAN  
G-07

NO AIR-SENSITIVE USES INCLUDING OPENABLE WINDOW, FRESH AIR INTAKE AND ACTIVE RECREATIONAL USES IN THE OPEN SPACE IS ALLOWED WITHIN THE BUFFER ZONE.

2202  
 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY  
 at 81 SAN TAM ROAD,  
 YUEN LONG, N.T.

TYPICAL FLOOR PLAN PLAN  
 RCHE

G-07 1:150 (A3) B A OCT. 2022 JULY. 2022

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1 8/F PLAN  
G-08

**8/F PLAN  
ADMIN OFFICE & STAFF QUARTER**

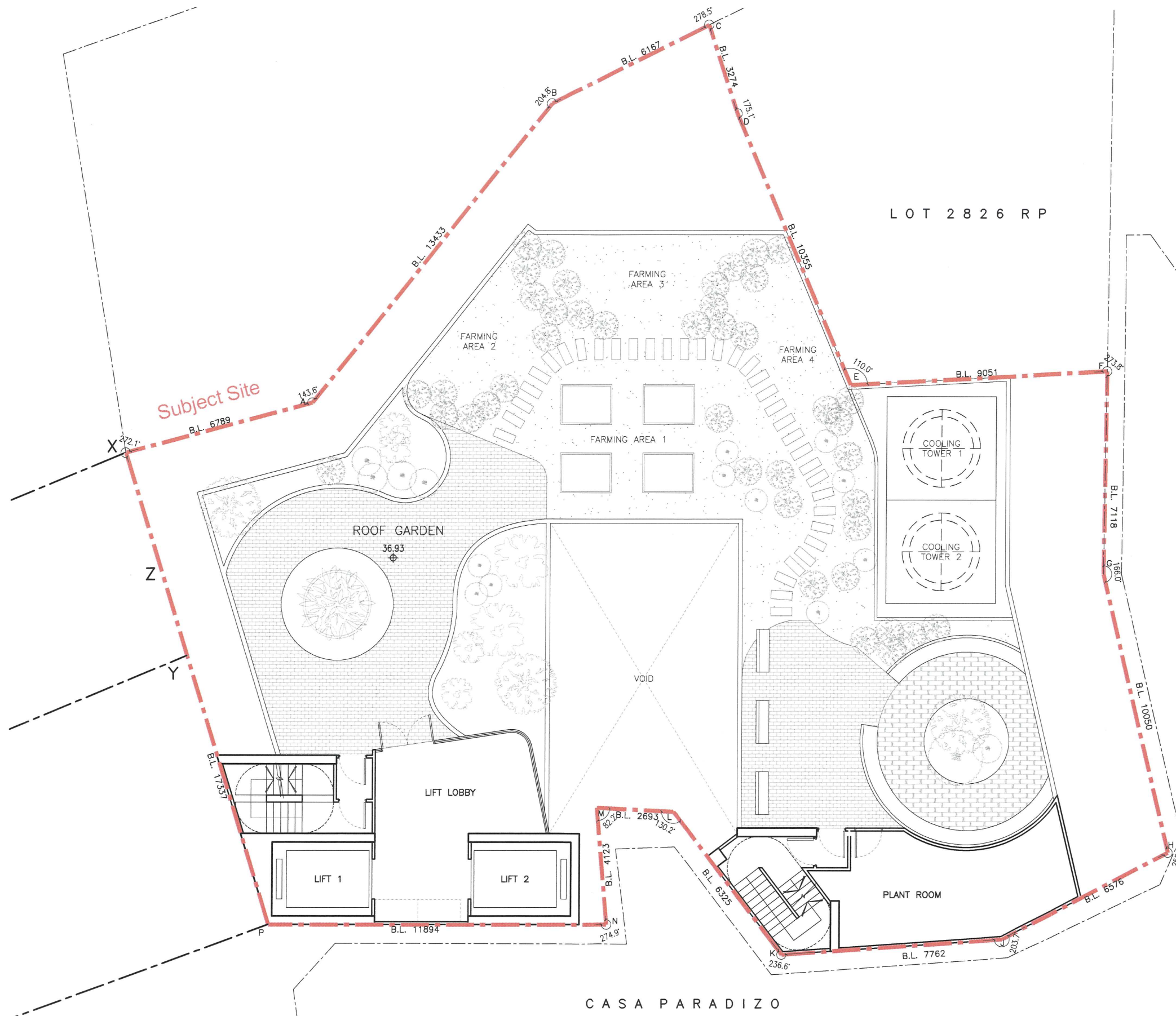
G-08 1:150 (A3) B A OCT. 2022 JULY. 2022

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**RLEE**

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**1** ROOF GARDEN PLAN  
G-09

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ROOF GARDEN PLAN

G-09 1:150 (A3)

B A OCT. 2022  
JULY. 2022

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**S12A AMENDMENT OF PLAN APPLICATION  
APPROVED NGAU TAM MEI  
OUTLINE ZONING PLAN NO. S/YL-NTM/12**

**PROPOSED REZONING FROM "R(C)" TO "G/IC"  
FOR A PROPOSED "SOCIAL WELFARE FACILITIES"  
(RESIDENTIAL CARE HOMES FOR THE ELDERLY)  
(RCHE)**

**AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,  
SAN TIN, N.T.**

REVISED VISUAL IMPACT ASSESSMENT

## 5.0 Conclusion

5.1 The Below Table summarize the Visual Impact of Scheme A (Proposed Development with permissible PR) compared to Scheme B (Proposed Development with minor relaxation) in the six VPs: -

V.P.	Visual Sensitivity	Visual Impact	Conclusion
VP1: Castle Peak Road – Mai Po near Ko Hang towards East	Medium	Slightly adversed	Slightly adversed
VP2: Castle Peak Road – Mai Po towards South-East	Medium	Slightly adversed	Slightly adversed
VP3: Castle Peak Road – Mai Po towards North-East	Medium	Slightly adversed	Slightly adversed
VP4: San Tam Road towards South-East	Medium	Slightly adversed	Slightly adversed
VP5: Footbridge above San Tin Highway towards South	Medium	Negligible	Negligible
VP6: Footbridge above San Tin Highway towards North	Medium	Negligible	Negligible



**S12A AMENDMENT OF PLAN APPLICATION  
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(RESIDENTIAL CARE HOMES FOR THE ELDERLY)  
(RCHE)**

**AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,  
SAN TIN, N.T.**

REVISED LANDSCAPE MASTER PLAN



## 1. Introduction

- 1.1 The Landscape Master Plan is prepared and submitted in support of the S12A application for a proposed amendment to the approved Ngau Tam Mei Outline Zoning Plan ("the approved OZP") No. S/YL-NTM/12. The proposed amendment is to rezone a Site from "R(C)" zone to "G/IC" zone to facilitate the development of a proposed RCHE at No.81 San Tam Road, Lot No. 4823 in D.D. 104.
- 1.2 The Indicative Landscape Master Plan is presented in *Figure 2* to *Figure 8*, two Sections in *Figures 9 & 10*, and Diagrams in *Figures 14 & 15*.

## 2. Existing Site Condition

- 2.1 The application site with an area of Approx. 736.3m<sup>2</sup> and is accessible from San Tam Road at level +7.33 mPD by the West. It adjoins an access road to "Crescendo" to the North and a low-rise residential development "Casa Paradiso" to the South. To the East is a small mountain full of Greenery.
- 2.2 By situating in R(C) zone, the surroundings are predominately low-rise, low-density development. However, the situation may undergo rapid change since a number of adjoining Planning Applications are underway.
- 2.3 In this rezoning, the gentle slope and greenery on the existing Green Hatched Black Area **outside boundary** would be generally maintained except with the addition of a concrete path with steps to facilitate a staircase discharge from the building.

2.4 All the trees in the Green Hatched Black Area **outside boundary** will be retained in the same location (Table 1), which includes a Cinamomum Camphora, a Celtis Sinensis retained and Five Gracina Spicata as compensatory planting proposed in the Tree Felling Application for the existing house development and was approved by DLO on 15/06/2016 (Ref No. (25) in DLOYL 515/YLT/2012D). **Figure 16** shows the details of that Tree Felling Proposal.

Tree	Species			Measurement			
Quantity	Botanical Name	Chinese Name	Location	Height	Spread	DBH	remarks
5	Garcinia Spicata	福木	Green Hatched Black Area	3000	1500	100	Straight trunk & Balance form
1	Cinnamomum Camphora	樟	Green Hatched Black Area	12000	8000	600	
1	Celtis Sinensis	朴樹	Green Hatched Black Area	12000	600	650	

Table 1 : Existing Tree in Brown Area and Green Hatched Black Area.  
(As approved by DLO on 15/06/2016, (Ref No. (25) in DLOYL 515/YLT/2012D))

2.5 There is NO additional compensatory planting required for the proposed development as there is NO tree exists on Site.

#### Flower Planter on 2/F & 3/F

- 8.14 Mini Flower Planter located at 2/F & 3/F intends to soften the building form in low-level and provide views for the Dorm resident. Flower aims to reduce the anxiety of the resident when they require to stay in the Dorm alone. All the vegetation planted in the flower planter are designed to be slightly higher than the parapet of the dorm to ensure the user can easily notice the greenery through the window in the same level. *Figure 5 & 6* shows the flower planter location.

#### Staff Quarter Flat Roof on 8/F

- 8.15 In emergency conditions, the staff may require to work in closed-loop management and stay in the building for a longer period. The Staff Quarter Flat Roof provides a staff-only outdoor place that can efficiently improve staff accommodation quality and provide private space for the off-duty staff. Staff may feel anxiety during closed-loop management as they work and rest in the same place. The Flat Roof defines the boundary of working space and resting space for the staff to reduce the negative mental issues. *Figure 7* shows the location of the Staff Quarter Flat Roof and the proposed planter on the Flat Roof.

#### Roof Garden on R/F

- 8.16 The Roof Garden is a large outdoor area for user entertainment and space for events & activities. Being on the topmost floor, the Roof Garden maintain great advantages of non-distractive sight view and fresh air ventilation. Users can enjoy high-quality views and the equipment in their accommodation experience. *Figure 8* shows the layout plan of the Roof Garden accommodated every section location mentioned below.

#### Observatory Garden

- 8.17 Located on the Western Side of the Roof Garden, residents are able to have the view of Mai Po Nature Reserve and Wetland Area and observe the skyline without distraction. Seats are provided in the garden for users to relax and rest here.



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LANDSCAPE MASTER PLAN

FIGURE 2 1:150

B

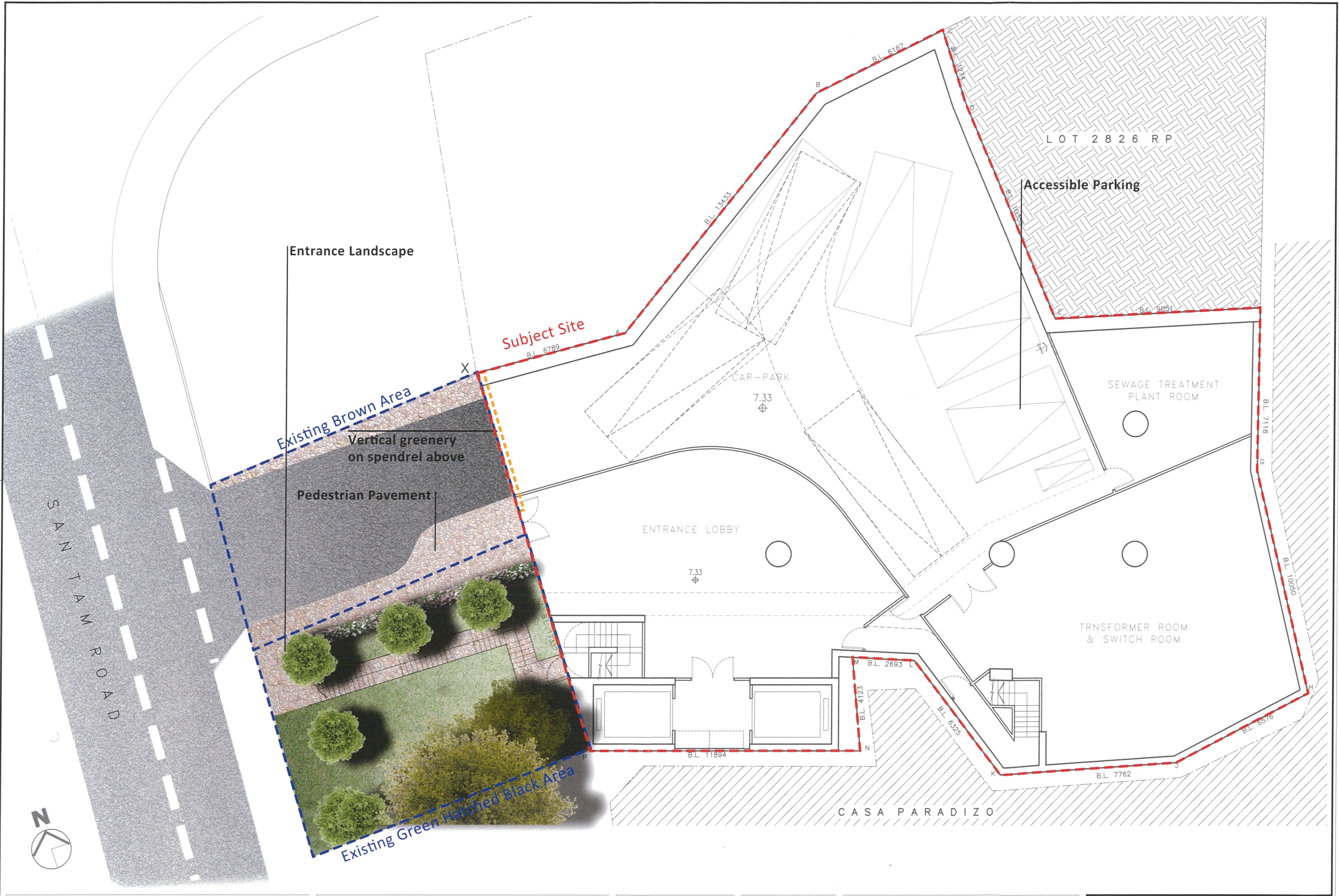
A

-

OCT 2022  
 JUL 2022  
 MAY 2022

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RLEE



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 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY  
 at 81 SAN TAM ROAD,  
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LG/F LANDSCAPE

FIGURE 3 1:150

B  
 A  
 -  
 OCT 2022  
 JUL 2022  
 MAY 2022

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 YUEN LONG, N.T.

1/F LANDSCAPE

FIGURE 4

1:150

B

A

-

OCT 2022  
 JUL 2022  
 MAY 2022

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R.L.E.E.



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2/F LANDSCAPE

FIGURE 5 1:150

B  
 A  
 -

OCT. 2022  
 JUL. 2022  
 MAY. 2022

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Vertical greenery  
on spandrel above  
& below



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PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY  
at 81 SAN TAM ROAD,  
YUEN LONG, N.T.

3/F LANDSCAPE

FIGURE 6 1:150

B  
A  
-  
OCT 2022  
JUL 2022  
MAY 2022

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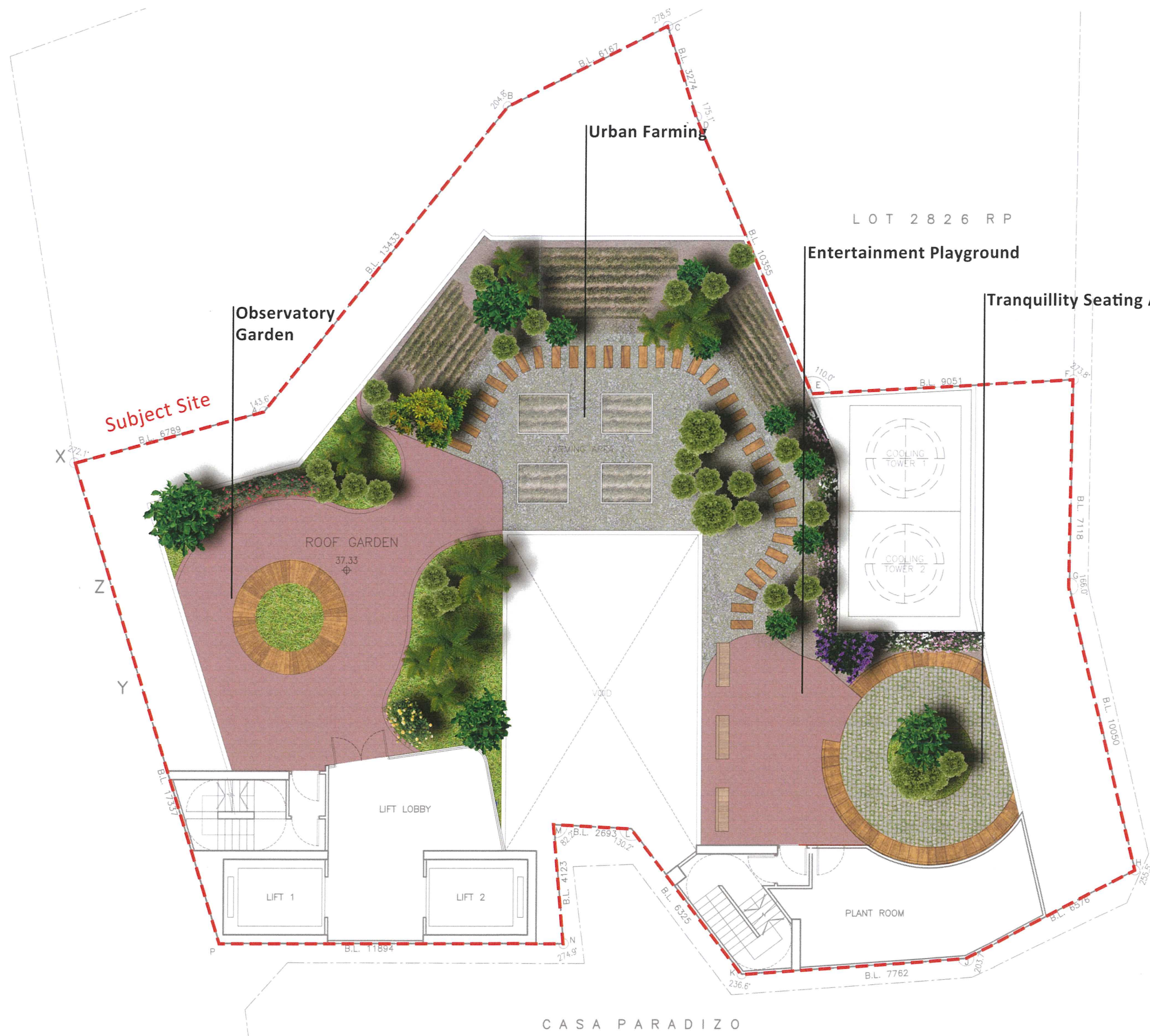
8/F LANDSCAPE

FIGURE 7 1:150

B  
 A  
 -  
 OCT. 2022  
 JUL. 2022  
 MAY. 2022

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CASA PARADIZO

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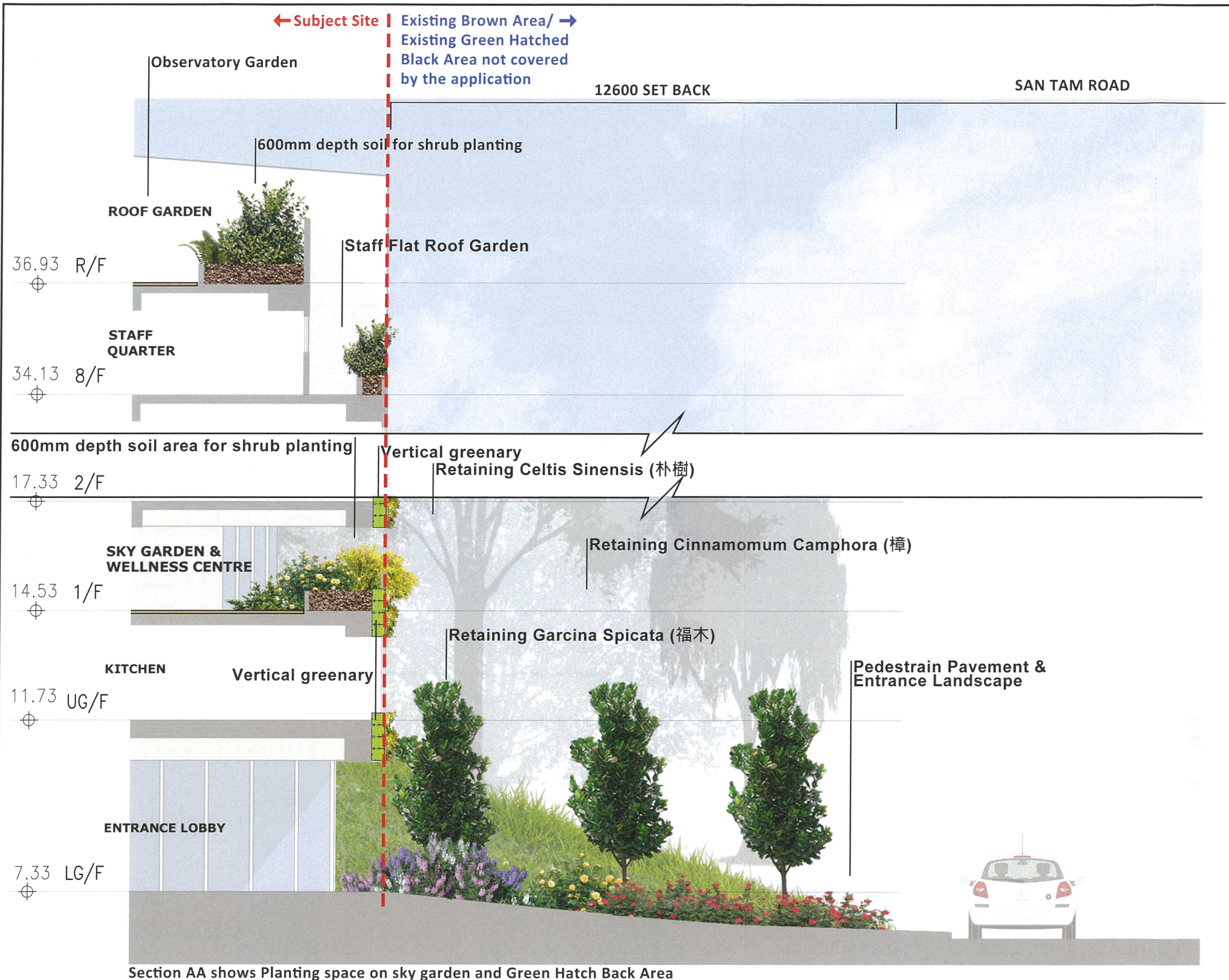
R/F LANDSCAPE

FIGURE 8 1:150

B  
 A  
 -  
 OCT 2022  
 JUL 2022  
 MAY 2022

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- || A — A || Section Line
- — — Boundary Line
- — — Building Outline
- ⊕ Level Mark
- █ Planting Soil
- █ Concrete Structure

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 at 81 SAN TAM ROAD,  
 YUEN LONG, N.T.

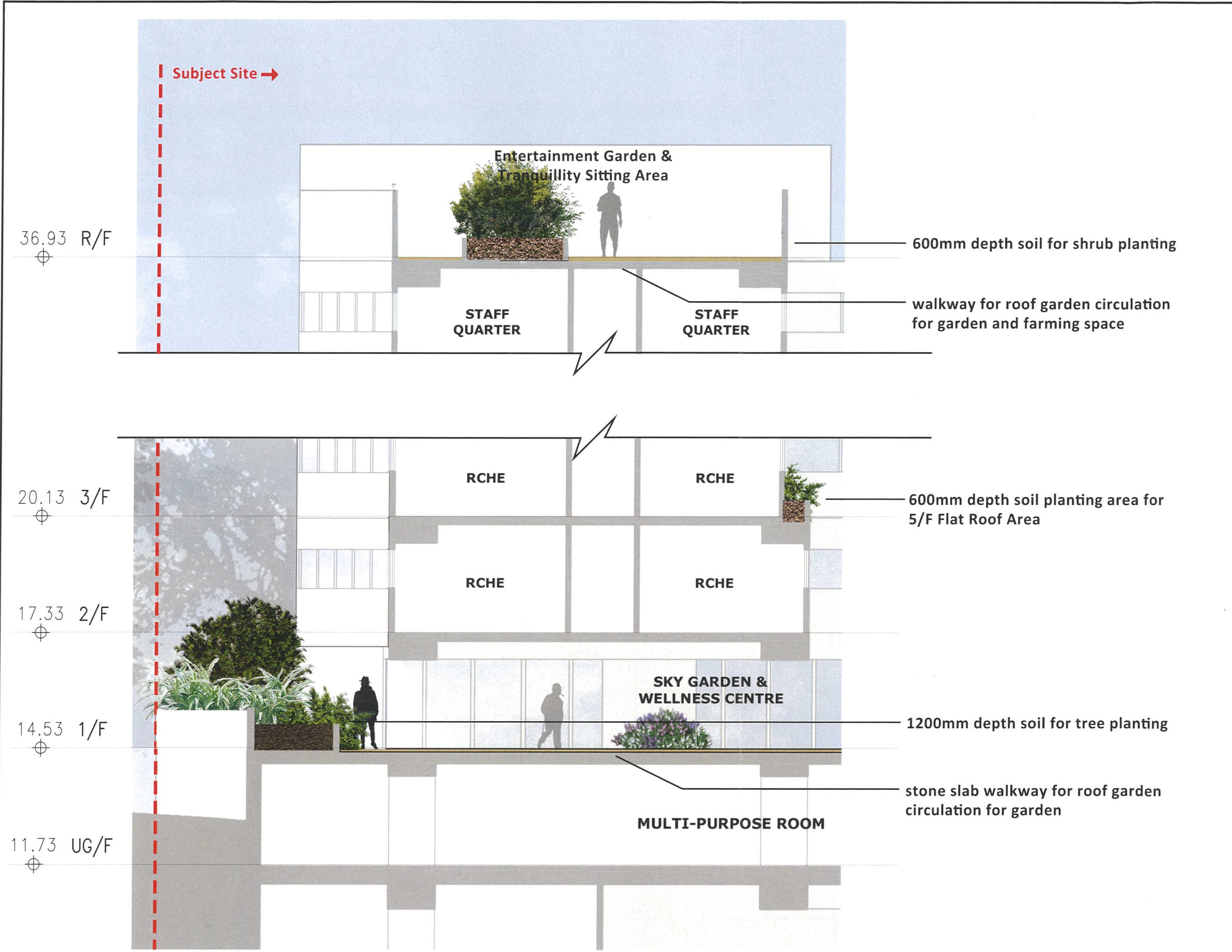
SECTION AA DIAGRAM

FIGURE 9 1:100

B  
 A  
 -  
 OCT 2022  
 JUL 2022  
 MAY 2022

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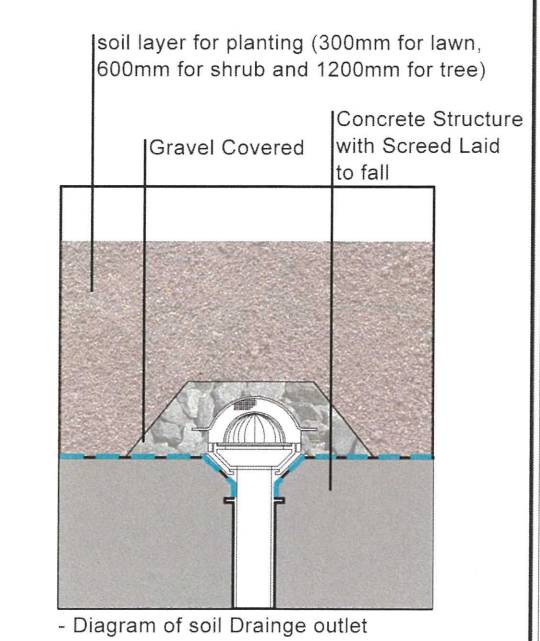


Section BB shows Planting space on sky garden



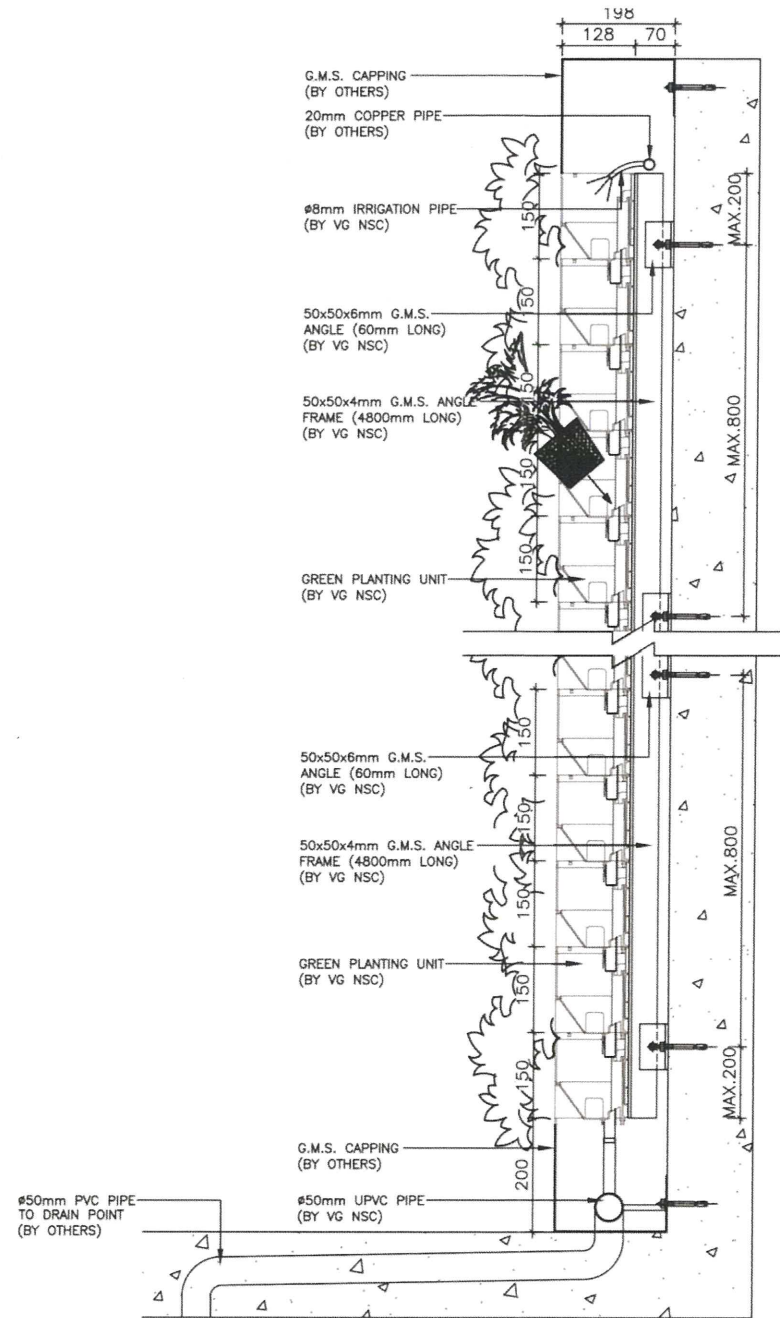
- Section Line
- Boundary Line
- Building Outline
- Level Mark
- Planting Soil
- Concrete Structure

**Note:**  
 - All soil depths stated exclude drainage layer.  
 - Yellow Granite finished for the planter walls and coping

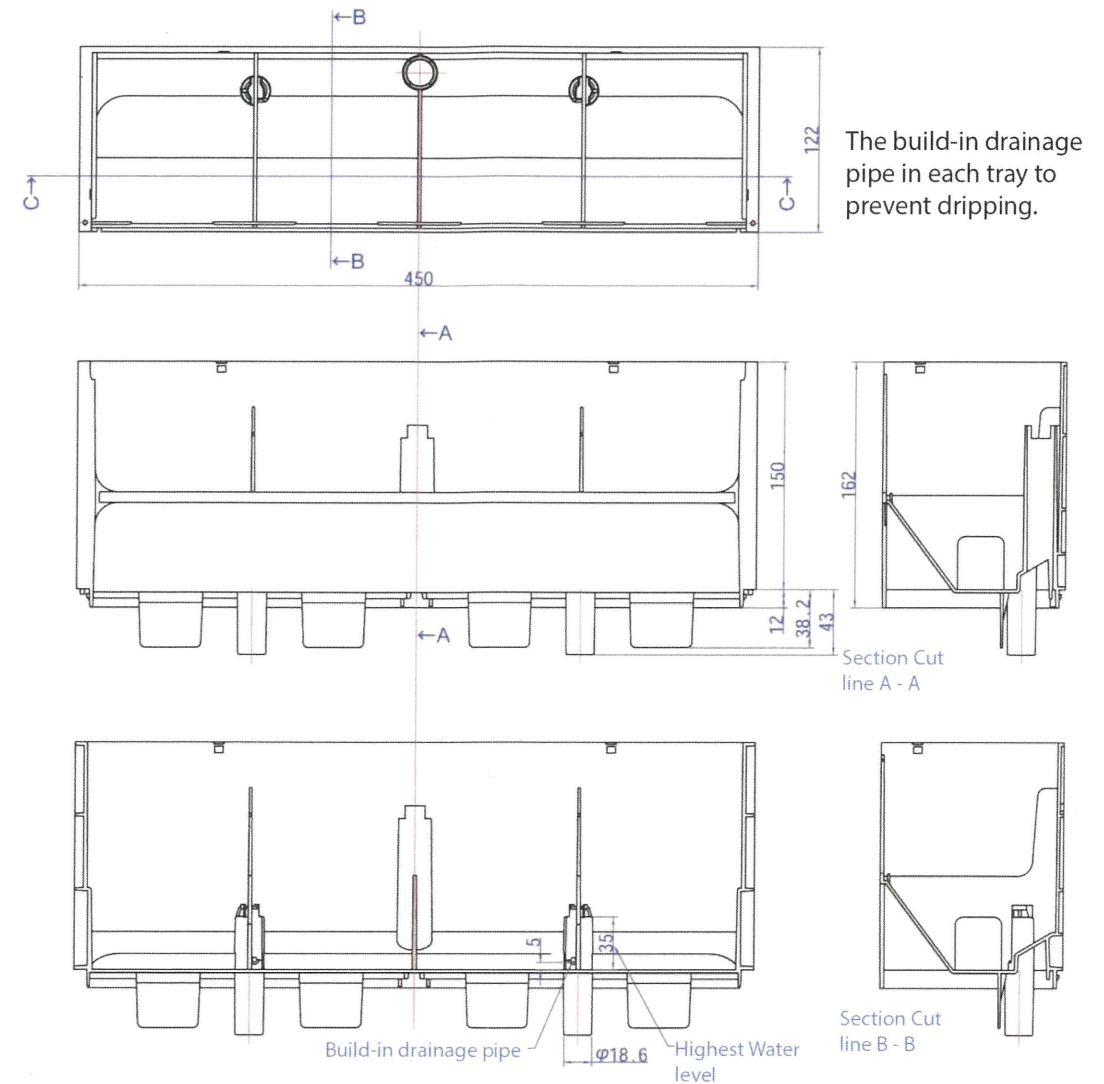




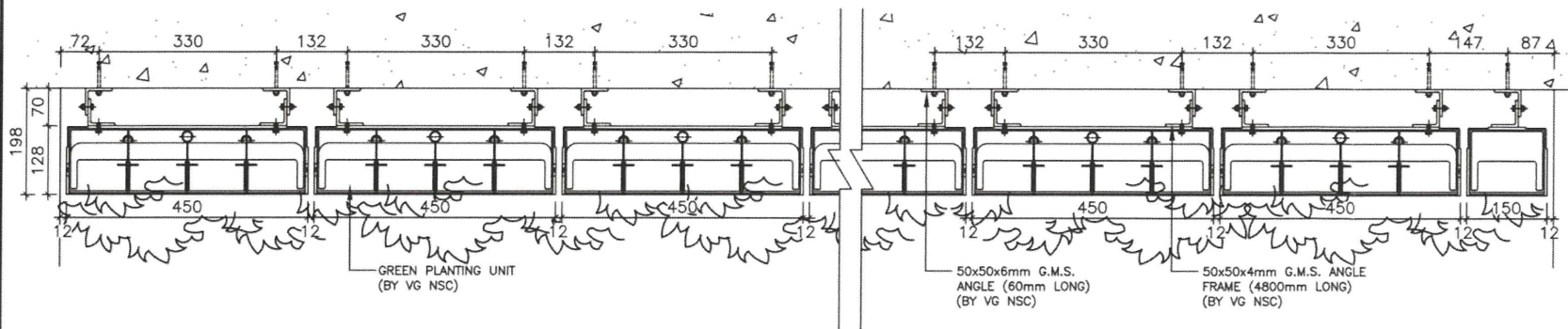
Example of Vertical Greenery



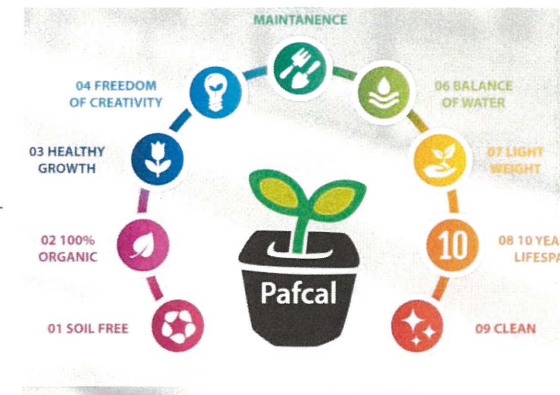
Section detail - 1:65



Modular design - 1:5



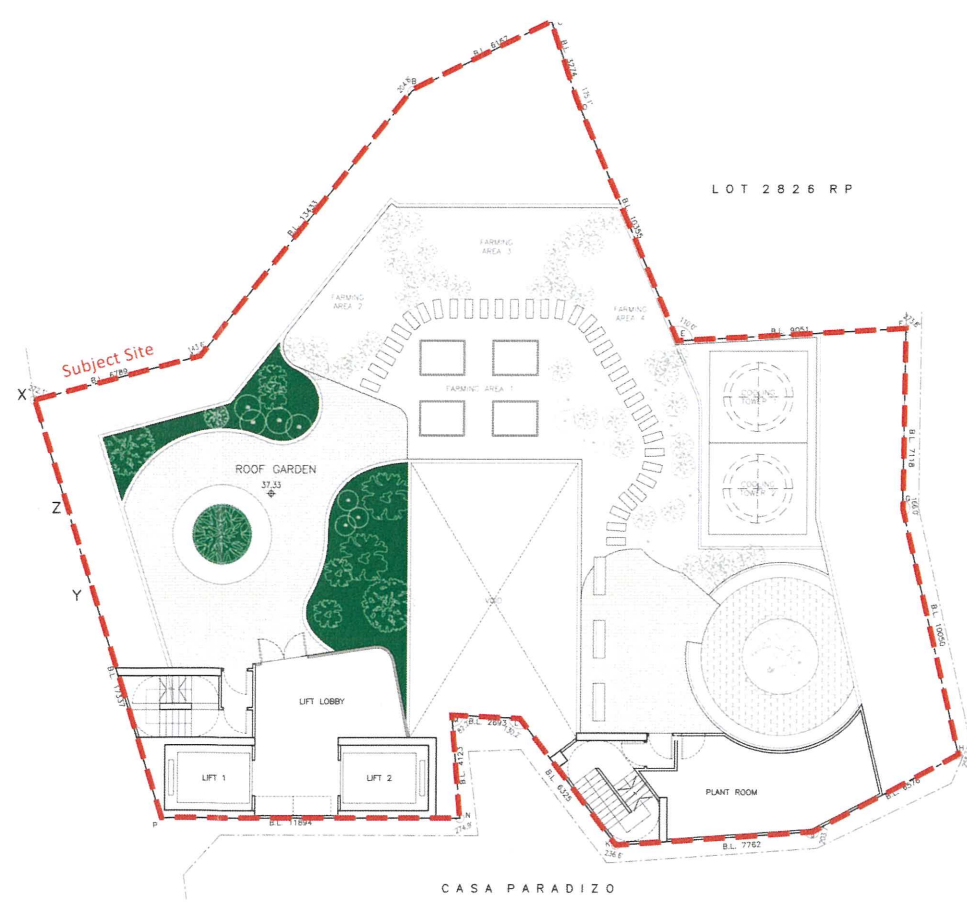
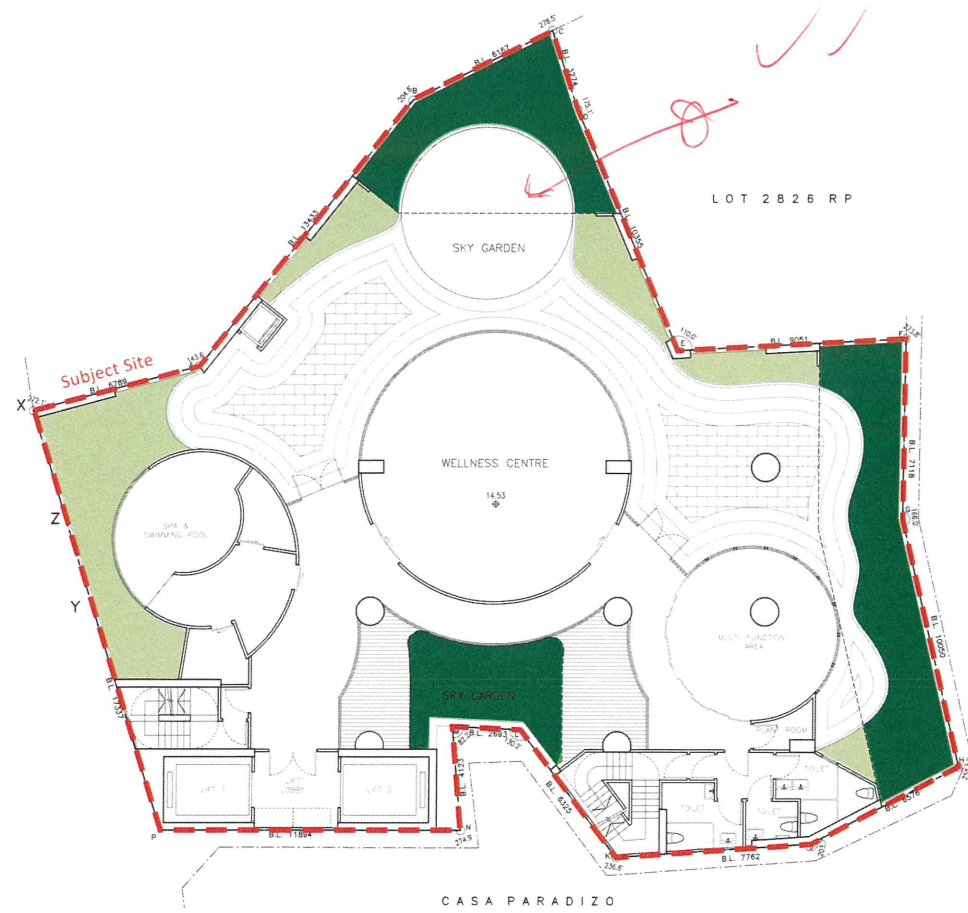
Detail plans - 1:12.5



Filling material

PA = F = CAL	Natural Soil Mix
Black urethane-based spongy	Soil Replenishment
Low maintenance	Regular Monitoring
No bacteria & do not attract bugs	Contains Bacteria & Bugs
Perfect Balance of water & air	Poor Water Retention
Easy outflow of water	Water logged caused mold to grow
Lightweight	Soil is heavy & dense
Minimal fertilizer	Fertilizer application
Easily Replace	Difficult to handle
Fuss-Free	Need to trim
Clean and Eco-friendly	Messy & caused spill out

Covered green Area  
 Uncovered green Area



Green Coverage:  
Primary Zone (15m above mean street level):

1/F uncovered area: 96.655m<sup>2</sup>  
covered area: 57.266m<sup>2</sup>

2/F uncovered area: 6.844m<sup>2</sup>

3/F uncovered area: 2.883m<sup>2</sup>

Total: 96.655 + 6.844 + 2.883 = 106.382m<sup>2</sup>  
(14.442% > 10%)

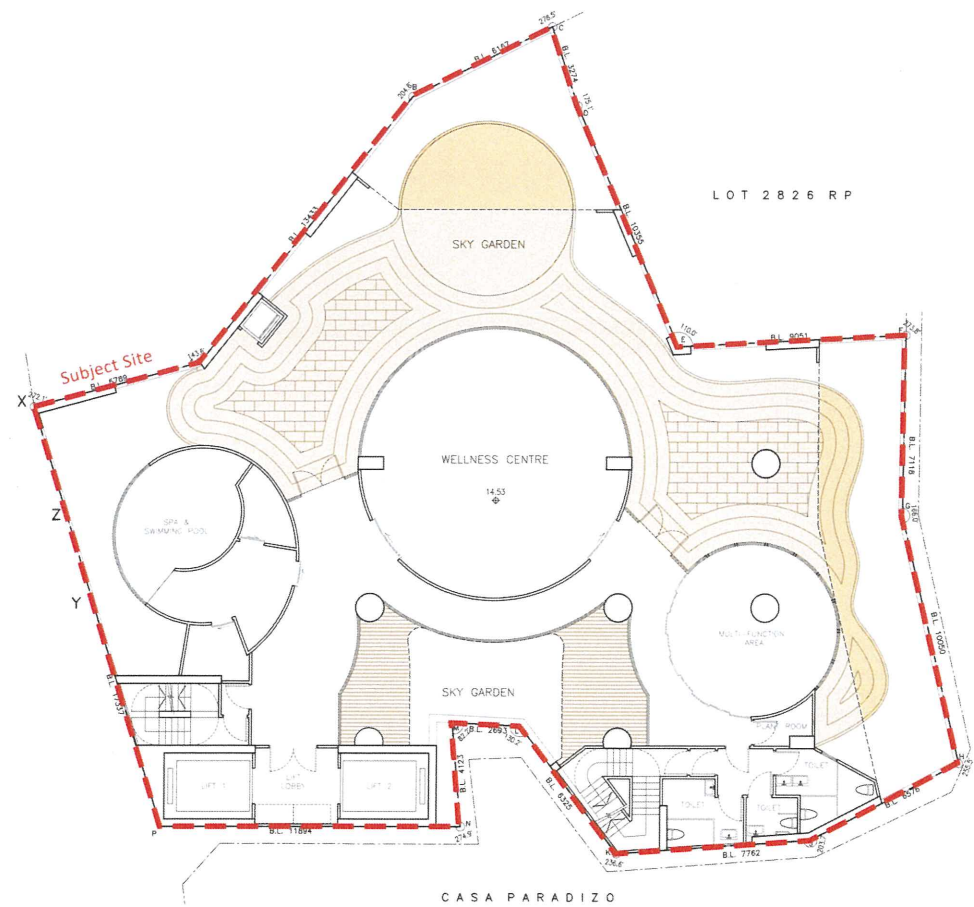
Non-primary Zone:

R/F uncovered area: 42.062m<sup>2</sup>

Total: 42.062m<sup>2</sup> (5.713%)

Total Green Coverage:

106.382 + 42.062  
= 148.444m<sup>2</sup> (20.161% > 20%)



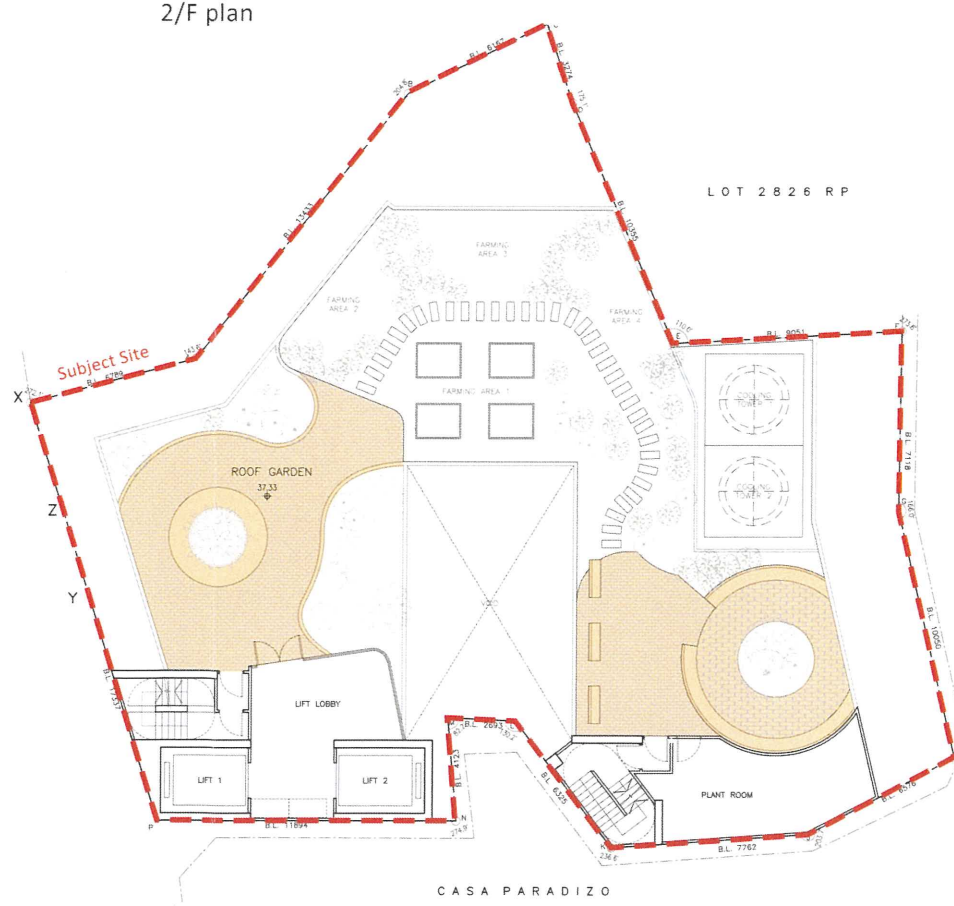
1/F plan



2/F plan



3/F plan



R/F plan

Open Space:

1/F uncovered area: 35.467m<sup>2</sup>  
covered area: 157.516m<sup>2</sup>

R/F uncovered area: 148.153m<sup>2</sup>

Total: uncovered area: 35.467 + 148.153 = 183.620m<sup>2</sup>  
covered area: 157.516m<sup>2</sup>

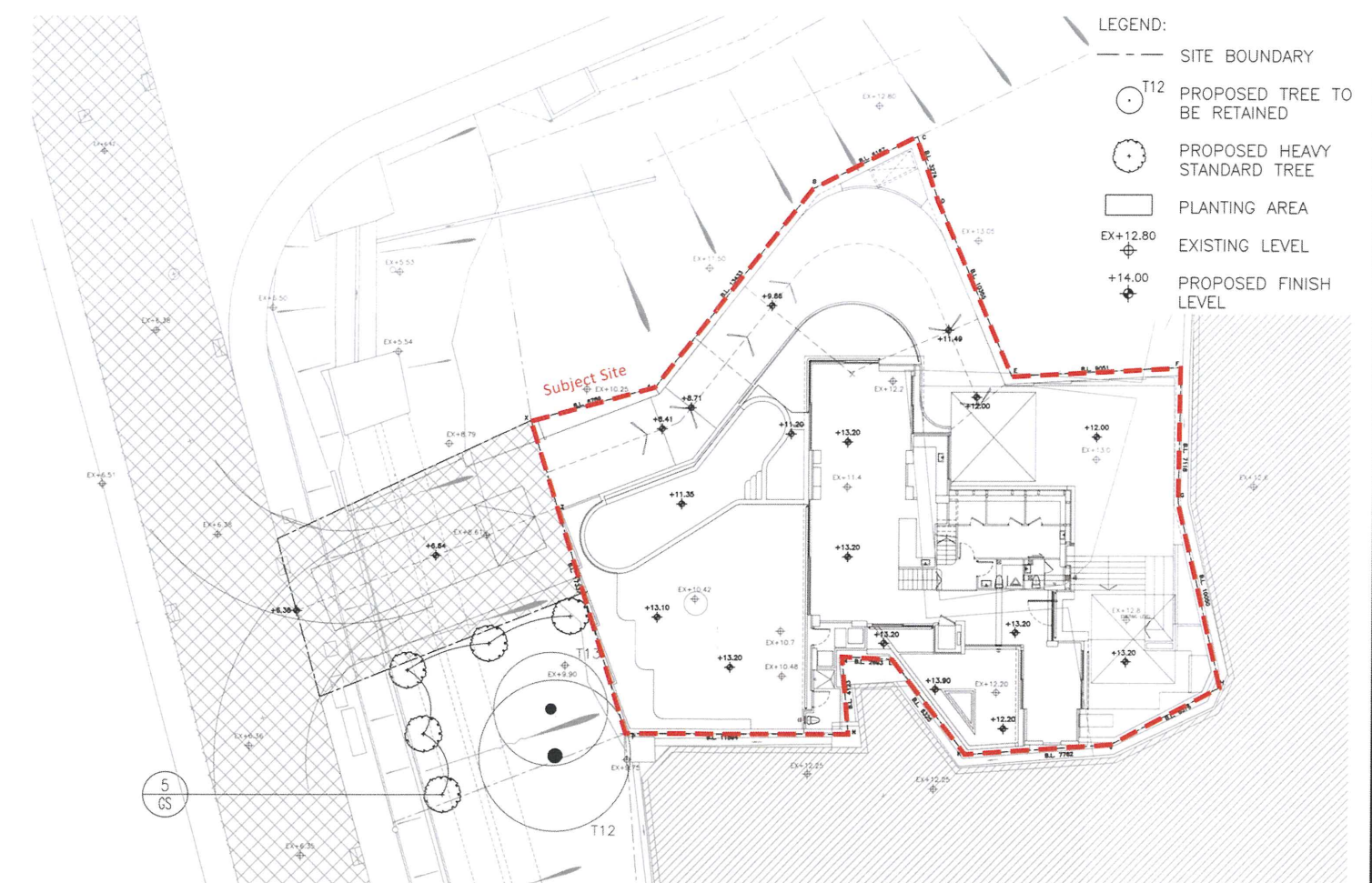
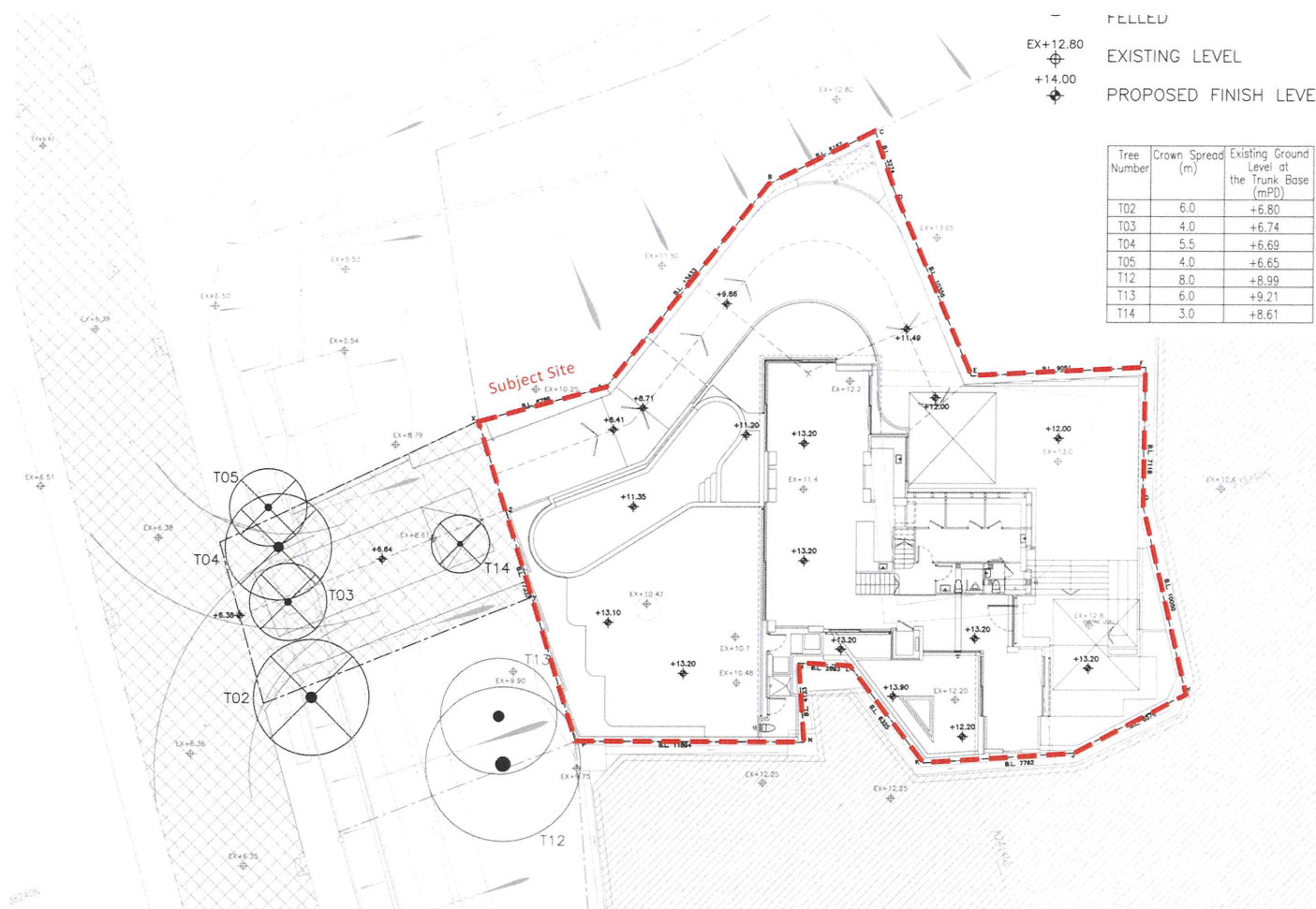
Total Open Space Area: 183.620 + 157.516 = 341.136m<sup>2</sup>



Tree Assessment Schedule at  
 PROPOSED RESIDENTIAL DEVELOPMENT AT LOT NO. 4823 IN D.D.104, YUEN LONG, NEW TERRITORIES  
 Prepared by Ted Lam (R.L.A. NO. R-073) on 18 FEBRUARY 2014  
 To be read in conjunction with drawing nos. C1418/TS01

Tree No.	Species		Measurements			Amenity value	Form	Health condition	Structural Condition	Suitability for transplanting	Remarks	OVT or Important Tree (IM)	Conservation status (**)	Recommendation (retain/transplant/fell)	Department to provide expert advice to LandsD (HyD, AFCD, LCSD, LandsD)	Justification for Tree Felling
	Scientific name	Chinese name	Height (m)	DBH (mm)	Crown Spread (m)											
T02	<i>Ficus microcarpa</i>	細葉榕	8.0	0.45	6.0	Low	Poor	Poor	Poor	Low	codominant trunk, unbalanced form	-	-	Fell	LCSD	1.2,7
T03	<i>Bombax ceiba</i>	木棉	8.0	0.15	4.0	Med	Fair	Poor	Fair	Low	Root embedded by concrete	-	-	Fell	LCSD	1.2
T04	<i>Bombax ceiba</i>	木棉	10.0	0.23	5.5	Med	Fair	Poor	Fair	Low	Root embedded by concrete	-	-	Fell	LCSD	1.2
T05	<i>Bombax ceiba</i>	木棉	8.0	0.16	4.0	Med	Fair	Poor	Fair	Low	Root embedded by concrete	-	-	Fell	LCSD	1.2
T12	<i>Cinnamomum camphora</i>	樟	12.0	0.60	8.0	Med	Fair	Fair	Fair	Low	-	-	-	Retain	LCSD	-
T13	<i>Celtis sinensis</i>	朴樹	12.0	0.65	6.0	Med	Fair	Fair	Fair	Low	-	-	-	Retain	LCSD	-
T14	Dead Tree	死樹	4.0	0.18	3.0	-	-	Dead	Poor	-	Wilted branches and unbalanced form	-	-	Fell	LCSD	-

Tree Assessment before the Existing House development at Lot No. 4823 in 2014



Tree Survey Plan before Existing House Development

Tree Compensatory Plan for the Existing House Development

Quantity	Code	Chinese Name	Botanical Name	Location	Height (mm)	Spread (mm)	DBH (mm)	Spacing (mm)	Remark
TREE									
5	GS	福木	<i>Garcinia spicata</i>	Green Hatched Black Area	3000	1500	100	4000	straight trunk and balanced form

Compensatory Planting for Existing House Development

**S12A AMENDMENT OF PLAN APPLICATION  
APPROVED NGAU TAM MEI  
OUTLINE ZONING PLAN NO. S/YL-NTM/12**

**PROPOSED REZONING FROM "R(C)" TO "G/IC"  
FOR A PROPOSED "SOCIAL WELFARE FACILITIES"  
(RESIDENTIAL CARE HOMES FOR THE ELDERLY)  
(RCHE)**

**AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,  
SAN TIN, N.T.**

DESIGN CALCULATION FOR  
SEWAGE TREATMENT PLANT (MBR)

## CONTENTS

	Page
I. Basic of Design	4
II. Process Description	7
III. Treatment Process Flow Diagram	10
IV. Design Calculation	12
A. Automatic Coarse Bar Screen	12
B. Equalization Tank	12
C. Automatic Fine Bar Screen	13
D. Membrane Bioreactor Tank (MBR Tank)	13
E. UV Sterilization	16
F. Sludge Holding Tank	17
V. Major Equipment List	20

# **BASIS OF DESIGN**

## I. BASIC OF DESIGN

### Hydraulic Loading and Organic Loading

#### A) From Residents

No. of Residents	:	200 head/Day
Unit Flow	:	0.37m <sup>3</sup> /head/day
BOD <sub>5</sub> Loading for Residents	:	0.055 kg/head/day
SS Loading for Residents	:	0.055 kg/head/day

Daily Flow from Residents  
= 200 head x 0.37 m<sup>3</sup>/head/day  
= 74 m<sup>3</sup>/day

BOD<sub>5</sub> Loading from Residents  
= 200 head x 0.055 kg/head/day  
= 11 kg/day

SS Loading from Residents  
= 200 head x 0.055 kg/head/day  
= 11 kg/day

#### B) From Staff

No. of Staff	:	50 head/Day
Unit Flow	:	0.07m <sup>3</sup> /head/day
BOD <sub>5</sub> Loading for User	:	0.023 kg/head/day
SS Loading for User	:	0.023 kg/head/day

Daily Flow from Staff  
= 50 head x 0.07 m<sup>3</sup>/head/day  
= 3.5 m<sup>3</sup>/day

BOD<sub>5</sub> Loading from Staff  
= 50 head x 0.023 kg/head/day  
= 1.15 kg/day

SS Loading from Staff  
= 50 head x 0.023 kg/head/day  
= 1.15 kg/day

### **Influent Condition**

Total Daily Flow  
= (74+3.5) m<sup>3</sup>/day  
= 77.5 m<sup>3</sup>/day

Average Hourly Flow (DWF)  
=  $\frac{77.5 \text{ m}^3/\text{day}}{24\text{hr}/\text{day}}$   
= 3.23 m<sup>3</sup>/hr

Peak Hourly (6 DWF)  
= 3.23 m<sup>3</sup>/hr x 6  
= 19.38 m<sup>3</sup>/hr

Design Flow (3DWF)  
= 3.23 m<sup>3</sup>/hr x 3  
= 9.69 m<sup>3</sup>/hr

Total BOD<sub>5</sub> Loading  
= (11+1.15) kg/day  
= 12.15 kg/day (156.774 mg/l)

Total SS Loading  
= (11+1.15) kg/day  
= 12.15 kg/day (156.774 mg/l)

### **Required Standard of Treated Water**

BOD <sub>5</sub>	:	≤	20 mg/L
SS	:	≤	20 mg/L
E. coli	:	≤	1000 count/100ml
Amonia Nitrogen	:	≤	2mg/l

Extracted from Table 5 Standard for effluents discharged into **Group C inland waters** at Chapter 358AK “Technical Memorandum of Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Costal Waters”

# **PROCESS DESCRIPTION**

## **II. PROCESS DESCRIPTION**

Sewage arising from development will be collected by the sewerage collection network to the Equalization Tank for the treatment process via the automatic coarse bar screen of bar spacing 20mm (one auto duty and one manual standby).

### **a) Equalization Tank**

Primary screened sewage then flows by gravity into the Equalization Tank. The Equalization Tank acts to equalize the flow in terms of both hydraulic and organic loading. Aeration and mixing in the Equalization Tank is provided by two submersible air ejector (one duty) to prevent sewage from becoming septic and to prevent solids from settling. Two sewage transfer pumps (one duty and one standby) are provided to transfer equalized sewage from the Equalization Tank to automatic fine bar screen of bar spacing 2mm (one auto duty and one manual standby) to flows by gravity into the MBR Tank.

### **b) MBR Tank**

Equalized and screened sewage transfers to the Membrane Bioreactor (MBR) Tank and then mixed & aerated together with the Mixed Liquor Suspended Solids (MLSS) for the removal of organic pollutants such as BOD. The MBR system is a suspended growth activated sludge system followed by micro-filtration for sludge-liquid separation by the membrane modules. Submerged, outside-in, flat sheet type membrane module (four duty) will be installed in the MBR Tank.

This membrane will separate treated effluent from MLSS (pore size smaller than 0.08  $\mu\text{m}$ ) and no further secondary sedimentation is required. The effective retention of MLSS provided the long Sludge Retention Time (SRT) and short Hydraulic Retention Time (HRT) for the treatment process. In-built bubble diffusers of MBR module and diffusers in MBR tank will provide aeration in the MBR System. Scrubbing of the membrane will effectively be achieved by the continuous aeration. Compressed air will be supplied by positive displacement blowers (one duty and one standby).

Pressure Transmitter (one duty) across the membrane and pump will be provided indicate the running pressure of permeate pumps (two duty and one standby). The dissolved oxygen monitor is provided to monitor the dissolved oxygen content in MBR tank which indicate the aeration condition inside the tank.



Two submersible de-sludge pumps (one duty and one standby) will be provided in MBR Tank. Duty de-sludge pump transfers surplus activated sludge to the Sludge Holding Tank for further treatment. The operation of de-sludge depends on the real situation of MBR tank such as the thickness of active sludge bed or the concentration of MLSS. At the early stage, the operation of de-sludge pump shall be manual and would switch to timer control once the system is deemed as mature.

**c) Disinfection and Effluent Discharge**

MBR treatment system can provide highly efficient suspended solids removal by physical separation. Three permeate pumps (two duty and one standby) will operate by level controller to draw the effluent through the membrane filter to UV disinfection system (one duty and one standby) for elimination of growth of E.Coli.

This UV sterilizer equipped with advanced automatic wiping system. The unfiltered solid may coat on the UV quartz sleeve and reduce transmittance strength. The wipe ring which surrounded the UV quartz sleeve will automatically wipe out the solid coated on the sleeve surface under the factory pre-set timer.

Electromagnetic flowmeter (one duty) is provided at the discharge pipe after UV sterilizer for effluent monitoring purpose.

**d) Sludge Holding Tank**

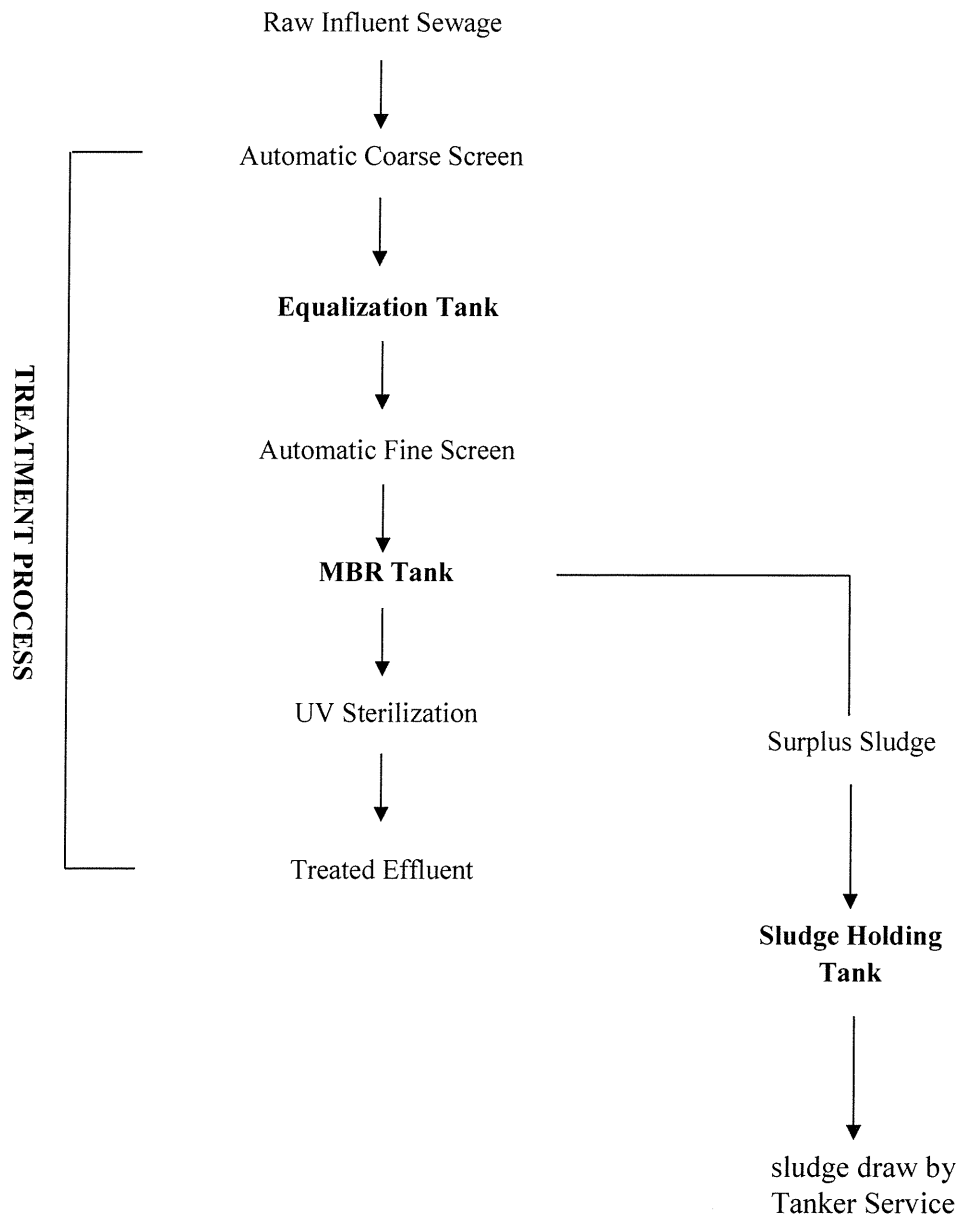
Waste sludge is an end product of all aerobic processes. It may be allowed to build up in the MBR Tank to a certain extent as an increase in mixed-liquor solids, or in the Sludge Holding Tank.

Surplus activated sludge of approximately 1% solids content is wasted from the MBR Tank to the Sludge Holding Tank by the de-sludge pump. This sludge wasting is regulated on a time basis according to sludge growth rate as measured by the rate of increase in mixed liquor suspended solids (MLSS). The sludge in the Sludge Holding Tank will be further digested aerobically by aeration through the submersible air ejector (one duty).

Aeration in sludge holding tank will be stopped regularly for gravity thickening of the sludge. The Sludge Holding Tank is designed to hold wasted sludge for a minimum of twenty (20) days. Digested sludge will be disposed by sludge dewatering system frequently.

# **TREATMENT PROCESS SCHEMATIC**

### III. TREATMENT PROCESS FLOW DIAGRAM



# **DESIGN CALCULATION**

## IV. DESIGN CALCULATION

### A. Automatic Coarse Bar Screen

An automatic coarse bar screen is installed before Equalization Tank to removal debris from entering raw sewage.

Bar Spacing: 20mm

Flow capability = 70 m<sup>3</sup>/hr > Peak hourly flow 19.38 m<sup>3</sup>/hr

### B. Equalization Tank

The minimum retention time of Equalization Tank should be 2 hours of peak hourly Flow.

#### (i) *Size of Tank*

The minimum effective value = 2 hr x (Peak hourly flow – Design hourly flow)

$$\begin{aligned} &= 2 \text{ hr} \times (19.38 - 9.69) \text{ m}^3/\text{hr} \\ &= 19.38 \text{ m}^3 \end{aligned}$$

Tank size = 3.5 m (L) x 3 m (W)

Tank Height = 3 m

Top water level (TWL) = +2.7

Bottom water level (BWL) = +0.0

Water depth (WD) = 2.7 m

Effective water level = 2.1 m

Effective volume = 3.5 m(L) x 3 m(W) x 2.1 m (H)  
= 22.05 m<sup>3</sup>

$$(ii) \text{ Retention time} = \frac{22.05 \text{ m}^3}{(19.38 - 9.69) \text{ m}^3/\text{hr}} = 2.28 \text{ hrs} > 2 \text{ hrs, OK}$$

#### (iii) *Check pump Start/stop frequency*

Pump stop level = +0.6

Pump start level = +0.8

Pump start/stop volume = 3.5 m (L) x 3 m (W) x 0.2 m  
= 2.1 m<sup>3</sup>

$$\begin{aligned} \text{Pump start/stop frequency} &= \frac{15 \times 9.69 \text{ m}^3/\text{hr} \div 60 \text{ min/hr}}{2.1} \\ &= 1.15 \text{ time/hr} < 10 \text{ times/hr, OK} \end{aligned}$$

(iv) Air requirement for mixing =  $20\text{m}^3/\text{min}$  per  $1000\text{m}^3$  of tank volume

$$= 20\text{ m}^3/\text{min} \times \frac{3.5\text{ m} \times 3\text{ m} \times 2.7\text{ m}}{1000\text{m}^3}$$

$$= 0.567\text{ m}^3/\text{min}$$

$$= 34.02\text{ m}^3/\text{hr}$$

Provide two submersible pumps, (one duty and one standby) in the Equalization Tank to transfer sewage with equalized flow of  $19.5\text{ m}^3/\text{hr}$  at 5 m head to MBR Tank.

Provide one sets of submersible ejector at air capacity  $45\text{ m}^3/\text{hr}$  in 3mAq.

### C. Automatic Fine Bar Screen

An automatic fine bar screen is installed before Equalization Tank to removal fine debris from entering raw sewage.

Bar Spacing: 2mm

Flow capability =  $26\text{ m}^3/\text{hr}$  > Peak hourly flow  $9.69\text{ m}^3/\text{hr}$

### D. Membrane Bioreactor Tank (MBR Tank)

Pre-treated sewage will be pumped at a constant rate, from Equalization Tank to MBR Tank. Air is provided for biological treatment.

(i) *Size of Tank*

Tank Size = 3.5 m (L) x 3.7 m (W)

Tank Height = 3 m

Top water level = +2.7

Bottom water level = +0.0

Water Depth = 2.7 m

Tank capacity

= 3.5 m (L) x 3.7 m (W) x 2.7 m (WD)

=  $34.97\text{ m}^3$

$$(ii) \text{ Retention time} = \frac{36.97\text{ m}^3}{9.69\text{ m}^3/\text{hr}}$$

$$= 3.6\text{ hrs} > 3\text{hrs, OK}$$

(iii) *Calculation of F/M ratio of MBR Tank*

After passing through the Bar Screen, the BOD loading before entering the MBR tank will be removed by 7.5%

Influent BOD loading = 12.15 Kg/day

BOD loading before entering the MBR Tank

$$= 12.15 \text{ kg/day} \times 0.925$$

$$= 11.24 \text{ kg/day (145.02 mg/l)}$$

Assume MLSS = 5000 mg/l,

F/M ratio

$$= 11.24 \text{ kg/day} / (5000 \text{ mg/l} \times 10^{-6} \text{ kg/mg} \times 10^3 \text{ l/m}^3 \times 47.25 \text{ m}^3)$$

$$= 0.064 \text{ Kg BOD/ Kg MLSS -day}$$

(iv) *Nos. of Membrane module required*

Design flux rate of membrane sheet = 35 litre/m<sup>2</sup>-hr

Minimum filtration area required:

$$= (9.69 \text{ m}^3/\text{hr} \times 1000 \text{ l/m}^3) / 35 \text{ litre/m}^2\text{-hr}$$

$$= 277 \text{ m}^2$$

Three sets of “Toray” NHP210-150S membrane module is adopted , each of membrane filtration area of 105 m<sup>2</sup> to provide total filtration area of 315m<sup>2</sup> for this tank.

(v) *Calculation of Volumetric BOD Loading*

After passing through the Bar Screen, the BOD loading before entering the MBR tank will be removed by 7.5%

After passing through the Bar Screen BOD loading = 11.24 kg/day (145.02 mg/l)

$$\frac{Q \text{ m}^3/\text{day} \times 10^{-3} \times S \text{ mg/l}}{V \text{ m}^3 \times 10^{-3}}$$

$$= (77.5 \text{ m}^3/\text{day} \times 145.02 \text{ mg/l}) / 34.97 \text{ m}^3$$

$$= 321.43 \text{ mg/l-day}$$

$$= 0.321 \text{ Kg BOD/ m}^3 \text{ -day}$$

(vi) *Ammonia Nitrogen removal*

Assume Ammonia Nitrogen = 20mg/l

$$\begin{aligned}
\text{Ammonia Nitrogen of influent sewage} &: \text{Total flow} \times 20\text{mg/l} \\
&= 77.5\text{m}^3/\text{day} \times 20\text{mg/l} \\
&= 1550 \text{ g/day} \\
&= 1.55 \text{ kg/day}
\end{aligned}$$

*(vii) Calculation of oxygen requirement*

(a) Air requirement for BOD removal:  
 Recommended by manufacturer is 110 m<sup>3</sup> air /kg - BOD removed.

$$\begin{aligned}
&\text{Minimum air requirement for BOD removal} \\
&= (145 - 20) \text{ mg/l} \times 77.5 \text{ m}^3/\text{day} \times 110 \text{ m}^3/\text{kg} \times 10^{-6} \text{ kg/mg} \times 10^3 \text{ l/m}^3 \\
&= 1065.76 \text{ m}^3/\text{day} \\
&= 44.4 \text{ m}^3/\text{hr} (0.74 \text{ m}^3/\text{min})
\end{aligned}$$

(b) Air requirement for air scour of membrane module  
 From manufacturer design, 1 m<sup>3</sup>/min air is required for air scour of one membrane module.

$$\begin{aligned}
&\text{Total air required for air scour of membrane modules} \\
&= 1 \text{ m}^3/\text{min} \times 60 \text{ min} \times 3 \text{ modules} \\
&= 180 \text{ m}^3/\text{hr} (3 \text{ m}^3/\text{min})
\end{aligned}$$

(c) Air requirement for Ammonia Nitrogen removal:  
 Recommended by manufacturer is 380 m<sup>3</sup> air /kg - BOD removed.

$$\begin{aligned}
&\text{Minimum air requirement for Ammonia Nitrogen removal} \\
&= (20 - 2) \text{ mg/l} \times 77.5 \text{ m}^3/\text{day} \times 380 \text{ m}^3/\text{kg} \times 10^{-6} \text{ kg/mg} \times 10^3 \text{ l/m}^3 \\
&= 530.1 \text{ m}^3/\text{day} \\
&= 22.1 \text{ m}^3/\text{hr} (0.368 \text{ m}^3/\text{min})
\end{aligned}$$

$$\begin{aligned}
&\text{Total minimum air required for air blower} \\
&= (44.4 + 180 + 22.1) \text{ m}^3/\text{hr} \\
&= 246.5 \text{ m}^3/\text{hr} (4.1 \text{ m}^3/\text{min})
\end{aligned}$$

Provide two air blowers (one duty and one standby) with airflow of 4.74m<sup>3</sup>/min (284.4m<sup>3</sup>/hr) at 3.0mAq.

*(viii) Check pump Start/stop frequency*



Pump stop level = +1.5

Pump start level = +1.7

Pump start/stop volume = 3.5 m (L) x 3.7 m (W) x 0.2m  
= 2.59 m<sup>3</sup>

Pump start/stop frequency =  $\frac{15 \times 9.69 \text{ m}^3/\text{hr} + 60 \text{ min}/\text{hr}}{2.59}$   
= 0.94 time/hr < 10 times/hr, OK

### **E. UV Sterilization**

UV Sterilizer is selected with nominal flow capacity of 24 m<sup>3</sup>/hr to disinfect filtered effluent of design flow capacity (9.69 m<sup>3</sup>/hr).

Dose requirement = 30000 μW/cm<sup>2</sup> for achieve 99.99% E. Coli removal

UV Chamber inner diameter = 150mm (15cm)

Quartz sleeve outer diameter = 28mm (2.8cm)

Total watt of UV lamp = 200W (200 x 10<sup>6</sup> μW)

UV lamp arch length = 1000mm (100cm)

Liquid transmission over 1cm = 1.0

Quartz sleeve transmission loss = 10% (assume)

UV output loss = 20% (assume)

UV chamber effective volume

= Water flow through UV chamber area x Lamp arch length

=  $[(15/2)^2 - (2.8/2)^2] \times \pi \times 100 \text{ cm}$

= 17055 cm<sup>3</sup>

= 17.055 L

Retention Time

= Volume / flow rate

= 17.055 L / (9.69m<sup>3</sup>/hr x 1000L / 3600sec)L/s

= 6.34 sec.

UV intensity at Chamber wall

= [Watt of UV lamp / (π x Chamber inner diameter x Lamp arch length)] x Liquid transmission x Quartz sleeve transmission loss x UV output loss

=  $[200 \times 10^6 \mu\text{W} / (\pi \times 15\text{cm} \times 100\text{cm})] \times 1 \times 0.9 \times 0.8$

= 42441 x 1 x 0.9 x 0.8

= 30558 μW/cm<sup>2</sup>

$$\begin{aligned}
& \text{UV Dose at Chamber wall} \\
& = \text{Retention time} \times \text{UV intensity at Chamber wall} \\
& = 6.34 \text{ sec.} \times 30558 \mu\text{W}/\text{cm}^2 \\
& = 193737 \mu\text{Ws}/\text{cm}^2 (>30000 \mu\text{Ws}/\text{cm}^2, \text{OK})
\end{aligned}$$

#### **F. Sludge Holding Tank**

A Sludge Holding Tank for holding primary sludge and secondary sludge for 60 days. Wet sludge will be disposed by tankers regular. Submersible ejector is installed in the tank to prevent stagnant condition and remove odor of the wastewater. The submersible ejector will be controlled by timer and only operated at certain time interval which does not affect the settling efficiency.

##### *(i) Size of Tank (Holding time)*

A Sludge Holding Tank for holding the secondary sludge for 60 days. The sludge holding time is calculated as follows:

$$\text{Tank Size} = 2.9 \text{ m (L)} \times 3.7 \text{ m (W)}$$

$$\text{Tank Height} = 3 \text{ m}$$

$$\text{Top water level} = +2.7$$

$$\text{Bottom water level} = +0.0$$

$$\text{Water Depth} = 2.7 \text{ m}$$

$$\begin{aligned}
\text{Tank capacity} &= 2.9 \text{ m (L)} \times 3.7 \text{ m (W)} \times 2.7 \text{ m (WD)} \\
&= 28.97 \text{ m}^3
\end{aligned}$$

With 7.5% BOD removed after fine bar screen

$$\begin{aligned}
& \text{BOD loading for biological treatment} \\
& = 11.24 \text{ kg/day}
\end{aligned}$$

$$\begin{aligned}
& \text{BOD removal rate} \\
& = 77.5 \text{ m}^3/\text{day} \times 1000 \text{ litre}/\text{m}^3 \times (145 - 20) \text{ mg}/\text{liter} \times 10^{-6} \text{ kg}/\text{day} \\
& = 9.69 \text{ kg/day}
\end{aligned}$$

Sludge yield from biological processes is taken as 1 kg solid/1 kg BOD removed. Therefore sludge production rate is calculated as follows:

$$\begin{aligned}
\text{Sludge production rate} &= 9.69 \text{ kg/day} \times 1.0 \text{ kg}/\text{kg BOD removal} \\
&= 9.69 \text{ kg/day}
\end{aligned}$$

Assuming that the wet sludge solid content is 2% and specific gravity of 1.01

$$\begin{aligned}\text{Volume of wet sludge produced} &= \frac{9.69 \text{ kg/day}}{0.02 \times 1.01 \times 1000 \text{ kg/m}^3} \\ &= 0.48 \text{ m}^3/\text{day}\end{aligned}$$

$$\begin{aligned}\text{Storage time} &= \left( \frac{28.97 \text{ m}^3}{0.48 \text{ m}^3/\text{day}} \right) \\ &= 60.4 \text{ days} > 60 \text{ days, OK}\end{aligned}$$

*(ii) Air requirement for aeration and mixing*

$$\begin{aligned}&= 30 \text{ m}^3/\text{min per } 1000 \text{ m}^3 \text{ x tank volume} \\ &= (30 \text{ m}^3/\text{min} \times 28.975 \text{ m}^3) / 1000 \text{ m}^3 \\ &= 0.87 \text{ m}^3/\text{min} \\ &= 52.15 \text{ m}^3/\text{hr}\end{aligned}$$

Provide a submersible ejector with air flow of 80 m<sup>3</sup>/hr at 3 mAq.

# **MAJOR EQUIPMENT LIST**

## V. MAJOR EQUIPMENT LIST

### 1. Automatic Coarse Bar Screen

1set – ‘Tsurumi’ model KS-200S-20mm with bar opening of 20mm and flow capacity of 70 m<sup>3</sup>/hr

1set – Manual Bar Screen with bar opening of 20mm

### 2. Equalization Tank

2sets – ‘Tsurumi’ model TOS-50B2.75 submersible pump, one duty and one standby , each of flow capacity of 19.4m<sup>3</sup>/hr vs 5m c/w 0.75 kw motor (3ph/50Hz/380V), w/SS316 lifting chain

1set – ‘Tsurumi’ model TOS-22BER5 submersible ejector, in 45m<sup>3</sup>/hr vs 3mAq c/w 2.2 kw motor (3ph/50Hz/380V), w/ SS316 lifting chain

1set – Level switches for the above pumps

### 3. Automatic Fine Bar Screen

1set – ‘Tsurumi’ model KE-200S-2mm with bar opening of 2mm and flow capacity of 26 m<sup>3</sup>/hr

1set – Manual Bar Screen with bar opening of 2mm

### 4. MBR Tank

4sets –‘Toray’ model NHP210-150S flat-sheet type membrane module provided individually 315 m<sup>2</sup> area of membrane plat at pore size of 0.08 micron with flux rate of 35 litre/m<sup>2</sup>/hr.

3sets –‘Liverani’ model EP 40”-M TF non-submersible permeate pump, two duty and one standby, in flow capacity of 4.8 m<sup>3</sup>/hr(21.1gpm) vs 12.5m head c/w 1.1 kw motor (3ph/50Hz/380V)

2sets –‘Tsurumi’ model TOK-50UT2.4 submersible pump, one duty and one standby , each of flow capacity of 12m<sup>3</sup>/hr vs 5m c/w 0.4 kw motor (3ph/50Hz/380V), w/SS316 lifting chain

2sets –‘Tsurumi’ model RSR-80 air blowers, one duty and one standby, in 284.4m<sup>3</sup>/hr vs 3mAq c/w 5.5 kw motor (3ph/50Hz/380V)

1set – Level switches for the above pumps

5. Sludge Holding Tank

1set – ‘Tsurumi’ model 50UT2.4 submersible pump, one duty of flow capacity of 12m<sup>3</sup>/hr vs 5m c/w 0.4 kw motor (3ph/50Hz/380V), w/SS316 lifting chain

1set – ‘Tsurumi’ model TOS-37BER5 submersible ejector, in 80m<sup>3</sup>/hr vs 3mAq c/w 3.7 kw motor (3ph/50Hz/380V), w/ SS316 lifting chain

6. UV Sterilizer

2sets – “Triogen” model SLP150-50-1 UV Sterilizer, one duty and one standby, each of flow capacity of 24m<sup>3</sup>/hr c/w 0.2 kw motor (3ph/50Hz/380V)

7. One set of pressure transmitter, dissolved oxygen monitor, MLSS monitor and electromagnetic flow meter indicating the suction pressure dissolved oxygen sensor and MLSS sensor in MBR tank and the final discharge flow.
8. Centralized PLC Control panel for above sewage treatment system
9. Interconnecting pipe, valves and fittings for above sewage treatment system
10. Interconnecting cable, conduit and fitting for above sewage treatment system



**S12A AMENDMENT OF PLAN APPLICATION  
APPROVED NGAU TAM MEI  
OUTLINE ZONING PLAN NO. S/YL-NTM/12**

**PROPOSED REZONING FROM "R(C)" TO "G/IC"  
FOR A PROPOSED "SOCIAL WELFARE FACILITIES"  
(RESIDENTIAL CARE HOMES FOR THE ELDERLY)  
(RCHE)**

**AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,  
SAN TIN, N.T.**

Geotechnical Planning Review Report  
For Planning Application

OCT 2022



## CONTENTS

1.0	Introduction
2.0	The Site
3.0	Existing and Proposed Design
4.0	Existing Geotechnical Features
5.0	Desk Study and Background Information Search
6.0	Geotechnical Investigation Work
7.0	Proposed Sequence of Construction
8.0	Conclusion
Appendices	
Appendix 1	Slope Information Record of Features
Appendix 2	Existing Ground Investigation Works Data

## 1.0 INTRODUCTION

This report is to present geotechnical assessments to support the planning application for a proposed rezoning from "R(C)" to G/IC" for a proposed "Social Welfare Facilities" (Residential Care Homes for the Elderly) (RCHE)

The following geotechnical aspects are covered on this appraisal report:

1. Desk study and background information search of existing structures and geotechnical features located in the vicinity of the site.
2. A review of the site conditions and findings of the geotechnical investigation.
3. Brief assessment of the geotechnical feasibility of this planning application.
4. A proposed sequence of construction and / or mitigation measures which are likely to be carried out in connection with this planning application.

## 2.0 THE SITE

The Application Site locates at **No.81 San Tam Road, Lot no. 4823 in D.D. 104**, with a site area of about 736.3 m<sup>2</sup>. The Site is accessible from San Tam Road at level +7.33 mPd from the West. It adjoins an access road to "Crescendo" to the North and a low-rise residential development "Casa Paradiso" to the South. To the East is a small mountain full of greenery.

Please refer to *Figure 1* for the Location Plan of the Application Site.

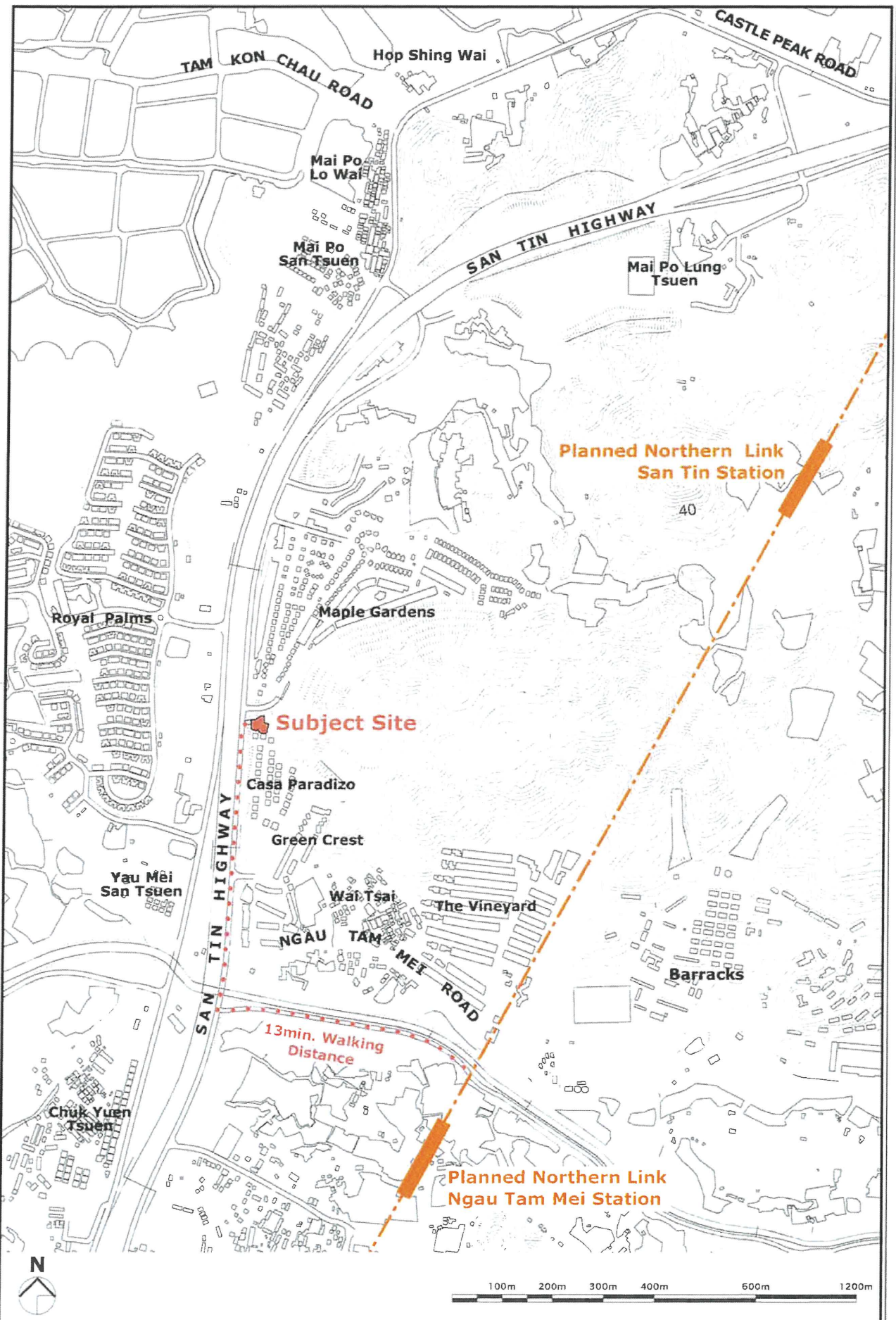
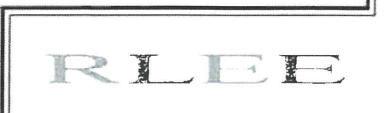


FIGURE NO.  
1

TITLE  
LOCATION PLAN

SCALE  
1:10000  
DATE  
MAY 2022



### 3.0 EXISTING & PROPOSED DESIGN

There is an existing House of 3 storeys high from carpark, the main roof level is +21.00 mPd. It situates on a platform of level +12.0 mPd with a car ramp leading from the existing Brown area of level +7.33 mPd, which gain access from San Tam Road to the West.

The existing House is proposed to be demolished and re-developed into a RCHE by first of all, lowering of the access point to a level of +7.33 mPd, then follow up a 10-storeys building with main roof at level of + 36.93 mPd.

### 4.0 EXISTING GEOTECHNICAL FEATURES

According to the information obtained from the Hong Kong Slope Safety (HKSS) website, there are three registered features of 2SE – C/F 94, 2SE – C/R 113 and 2SE – C/R 114 located in the vicinity of the proposed application site.

For ease of reference, the registered slope plan downloaded from HKSS website is shown in Figure 2.

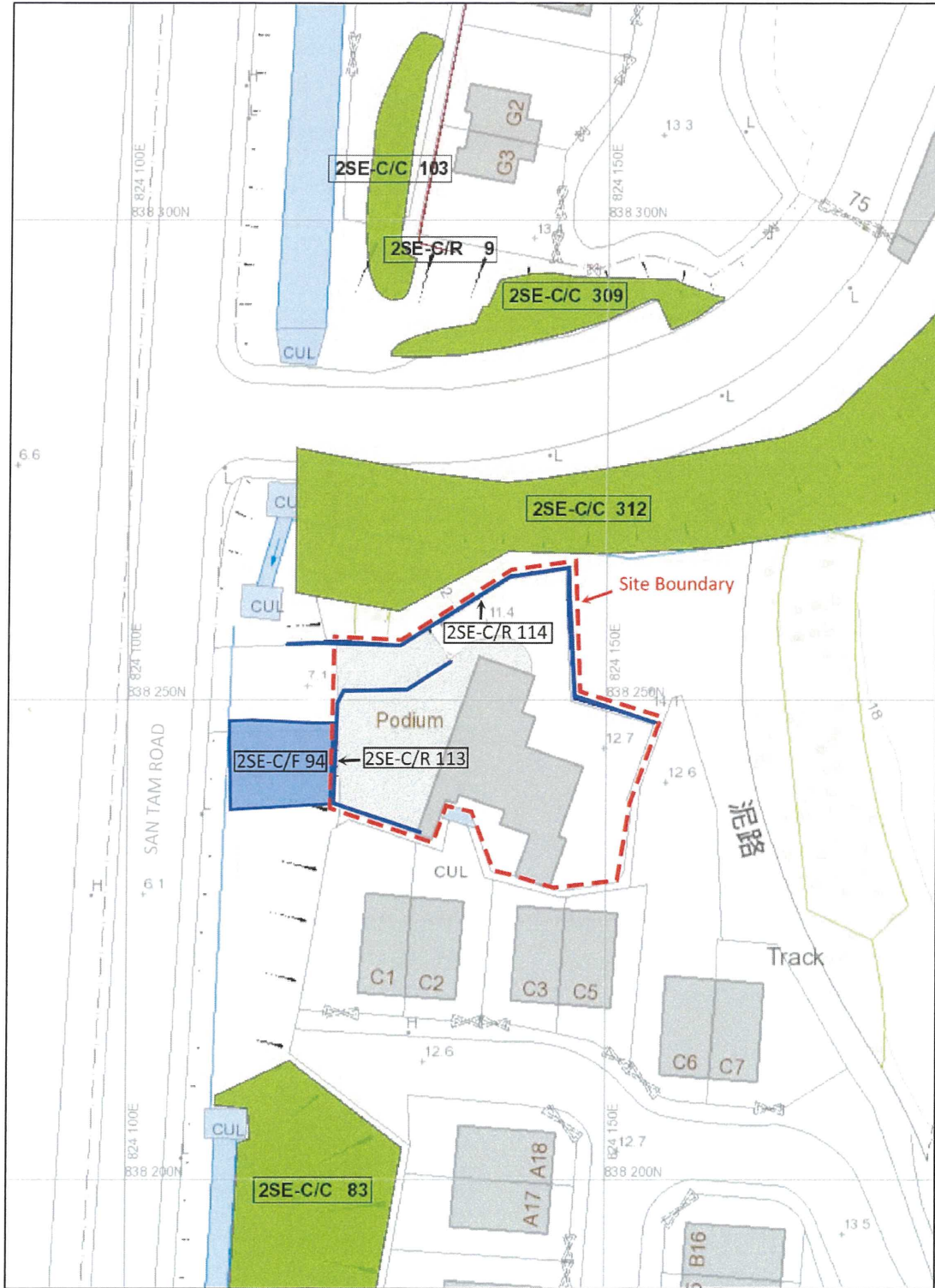


Figure 2

A brief description on these geotechnical features is given below and the detail information is attached in Appendix 1.

Feature No. 2SE – C/F 94

Feature No. 2SE – C/F 94 adjoins the proposed site at the West. The feature consists of a slope of Max. 3.5 m high, 9m long and with an average angle of 20 deg. There is an existing 225 mm surface channel located at the toe of the feature. The consequence-to-life category is 1, according to HKSS website of the GEO. The maintenance at responsibility of the feature belongs to Lot 4823 in DD 104.

Feature No. 2SE – C/R 113

Feature No. 2SE – C/R 113 is a R.C. Retaining Wall to the West & North of the site. It is app. 6.2 m high, 34.5m long and with a face angle of 90 deg. The consequence-to-life category is 1, according to HKSS website of the GEO. The maintenance at responsibility of the feature belongs to Lot 4823 in DD 104.

Feature No. 2SE – C/R 114

Feature No. 2SE – C/R 114 is a R.C. Retaining Wall to the North of the site. It is app. 2.2 m high, 53.5 m long and with a face angle of 90 deg. The consequence-to-life category is 1, according to HKSS website of the GEO. The maintenance at responsibility of the feature belongs to Lot 4823 in DD 104.

## 5.0 DESK STUDY AND BACKGROUND INFORMATION SEARCH

We have searched record files in the Buildings Department & the Geotechnical Engineering Office concerning this site and there are corresponding records for the existing House on the site. The information would be helpful and be utilized in the Detail Design of the new RCHE Development.

## 6.0 GEOTECHNICAL INVESTIGATION WORK

### 6.1 Outline of Site Geology

According to the Geological Map of San Tin (Sheet 2), the site is generally underlain by coarse ash crystal TUFF, which is consistent with the findings from the completed boreholes of the adjacent lot.

### 6.2 Information Retrieval

According to record, the site has carried out Geotechnical Investigation Works in year 2013. The works consist of 5 boreholes and a number of trial pits within the site.

The borehole records are shown in Appendix 2. The information would be utilized in the Detail Design of the new RCHE Development.

## 7.0 PROPOSED SEQUENCE OF CONSTRUCTION

In order to suit the new RCHE design, The Soldier Pile Retaining Wall (2SE – C/R 114) would be abandoned while the R.C. Retaining Wall (2SE – C/R 113) would be removed during construction. The slope (2SE – C/F 94) would be undisturbed. The sequence of construction involves basically the following steps:

1. After existing buildings are demolished, install the foundation piles.
2. Install the pipe pile/sheet pile cofferdam (and, if necessary, the associated grout curtain) along the perimeter of the proposed site.
3. Carry out the excavation and lateral support works sequentially down to the final excavation level.
4. Construct the pile caps and then the basement structures up to ground floor levels.
5. After the as-built basement structures have achieved adequate strength, carry out ELS works at the remaining parts of the site down to the final excavation level. In that process, the basement structures completed in step 4 are employed as stiff and monolithic reaction blocks to provide the required lateral support to the struts and to limit the settlement/movements of the adjacent land and structures.
6. Construct the pile caps at the remaining parts of the site.
7. Afterwards, the construction of the superstructure may proceed in the usual manner.

## 8.0 CONCLUSION

A review of the site conditions and the geotechnical works likely to be carried out for the proposed planning application has been carried out and the following conclusion can be made.

1. It is envisaged that the proposed planning application is geotechnically feasible. Since the existing retaining walls (2SE – C/R 113 & 2SE – C/R 114) would be modified & be buttressed by the new permanent basement structures. While the existing gentle slope (2SE – C/F 94) in front would remain unchanged. No additional adverse effect will be induced on the adjacent ground and geotechnical features.
2. A detailed investigation and assessment of all existing slopes located in the vicinity to the site such as 2SE – C/F 94, 2SE – C/R 113 and 2SE – C/R 114 will be carried out to ensure that the stability of the existing geotechnical features is complying with current geotechnical standards and will not induce any adverse effect on the proposed development. If necessary, appropriate measures including recommendation and implementation of any stabilization / upgrading / preventive works in order to acquire a safe geotechnical environment will be employed in detail in future studies.



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(RESIDENTIAL CARE HOMES FOR THE ELDERLY)  
(RCHE)**

**AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,  
SAN TIN, N.T.**

APPENDIX 1

Slope Information Record of Features

## BASIC INFORMATION

Location: Lot No. 4823 in DD104, Yuen Long, New Territories

Date of Formation: post-1977

Date of Construction/  
Modification: 30-06-2017

Approximate Coordinates: Easting : 824116 Northing : 838243

## CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Residential building

Distance of Facility from Crest (m): 0

Facility at Toe: Road/footpath with moderate traffic density

Distance of Facility from Toe (m): 2

Consequence-to-life Category: 1

Remarks: N/A

## SLOPE PART

(1) Max. Height (m): 3.5 Length (m): 9 Average Angle (deg): 20

## WALL PART

N/A



## MAINTENANCE RESPONSIBILITY

Private Feature Party: DD104 LOT 4823 Agent: N/A

## DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 16-01-2018  
Data Source: AP  
Slope Part Drainage: (1) Position: Toe Size(mm): 225

Wall Part Drainage: N/A

## SLOPE PART

Slope Part (1)

Surface Protection (%): Bare: 0 Vegetated: 100 Chunam: 0 Shotcrete: 0 Other Cover: 0

Material Description: Material type: Soil Geology: N/A

Berm: No. of Berms: N/A Min. Berm Width (m): N/A

Weepholes: Size (mm): N/A Spacing (m): N/A



**WALL PART**

N/A

**SERVICES**

(1) Utilities Type: Water Main    Size(mm): 1500    Location: Crest    Remark: N/A

## STAGE 1 STUDY REPORT

Inspected On:

Weather:

District: N/A

Section No: 1-1

Height(m):

Type of Toe Facility: Road/footpath with moderate traffic density

Distance from Toe(m): 2

Type of Crest Facility: Residential building

Distance from Crest(m): 0

Consequence Category:

Engineering Judgement:

Section No: 2-2

Type of Toe Facility:

Distance from Toe(m):

Type of Crest Facility:

Distance from Crest(m):

Consequence Category:

Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

### ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

### OTHER EXTERNAL ACTION

Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

PHOTO





**BASIC INFORMATION**

Location: Lot No. 4823 in DD104, Yuen Long, New Territories

Date of Formation: post-1977

Date of Construction/  
Modification: 30-06-2017

Approximate Coordinates: Easting : 824125 Northing : 838238

**CONSEQUENCE-TO-LIFE CATEGORY**

Facility at Crest: Residential building

Distance of Facility from Crest (m): 0

Facility at Toe: Road/footpath with moderate traffic density

Distance of Facility from Toe (m): 2

Consequence-to-life Category: 1

Remarks: N/A

**SLOPE PART**

N/A

**WALL PART**

(1) Max. Height (m): 6.2 Length (m): 34.5 Face Angle (deg): 90





## MAINTENANCE RESPONSIBILITY

Private Feature    Party: DD104 LOT 4823    Agent: N/A

## DETAILS OF SLOPE / RETAINING WALL

Date of Inspection:    16-01-2018  
Data Source:            AP  
Slope Part Drainage:    N/A

Wall Part Drainage:    N/A

## SLOPE PART

N/A



## WALL PART

Wall Part (1)

Type of Wall: Wall Material: Concrete Wall Location: Retaining wall with level platform

Berm: No. of Berms: N/A Min. Berm Width (m): N/A

Weepholes: Size (mm): 75 Spacing (m): 2

## SERVICES

N/A



**STAGE 1 STUDY REPORT**

Inspected On:  
Weather:  
District: N/A

Section No: 1-1  
Height(m):  
Type of Toe Facility: Road/footpath with moderate traffic density  
  
Distance from Toe(m): 2  
Type of Crest Facility: Residential building  
  
Distance from Crest(m): 0  
Consequence Category:  
Engineering Judgement:

Section No: 2-2  
Type of Toe Facility:  
  
Distance from Toe(m):  
Type of Crest Facility:  
  
Distance from Crest(m):  
Consequence Category:  
Engineering Judgement:



Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

### ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

### OTHER EXTERNAL ACTION

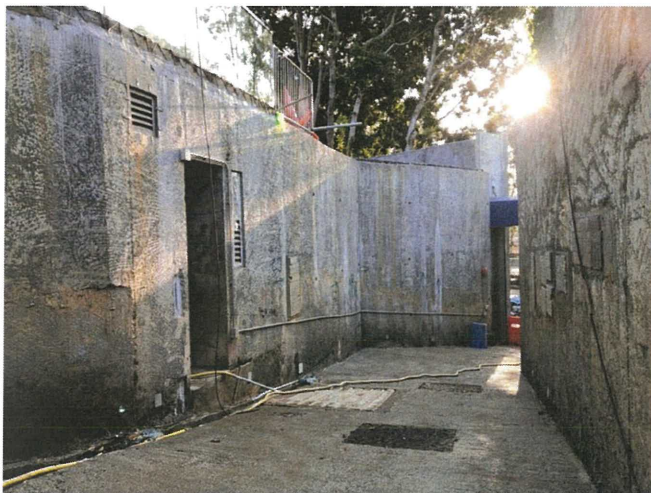
Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

**PHOTO**



## BASIC INFORMATION

Location: Lot No. 4823 in DD104, Yuen Long, New Territories

Date of Formation: post-1977

Date of Construction/  
Modification: 30-06-2017

Approximate Coordinates: Easting : 824136 Northing : 838260

## CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Residential building

Distance of Facility from Crest (m): 0

Facility at Toe: Road/footpath with moderate traffic density

Distance of Facility from Toe (m): 2

Consequence-to-life Category: 1

Remarks: N/A

## SLOPE PART

N/A

## WALL PART

(1) Max. Height (m): 2.2 Length (m): 53.5 Face Angle (deg): 90



## MAINTENANCE RESPONSIBILITY

Private Feature Party: DD104 LOT 4823 Agent: N/A

## DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 09-05-2019  
Data Source: AP  
Slope Part Drainage: N/A

Wall Part Drainage: N/A

## SLOPE PART

N/A



## WALL PART

Wall Part (1)

Type of Wall: Wall Material: Concrete Wall Location: Wall at toe  
Berm: No. of Berms: N/A Min. Berm Width (m): N/A  
Weepholes: Size (mm): N/A Spacing (m): N/A

## SERVICES

N/A





## STAGE 1 STUDY REPORT

Inspected On:

Weather:

District: N/A

Section No: 1-1

Height(m):

Type of Toe Facility: Road/footpath with moderate traffic density

Distance from Toe(m): 2

Type of Crest Facility: Residential building

Distance from Crest(m): 0

Consequence Category:

Engineering Judgement:

Section No: 2-2

Type of Toe Facility:

Distance from Toe(m):

Type of Crest Facility:

Distance from Crest(m):

Consequence Category:

Engineering Judgement:

Sign of Seepage:

Criterion A satisfied:

Sign of Distress:

Criterion D satisfied:

Non-routine maintenance required:

Note:

Masonry wall/Masonry facing:

Note:

Consequence category (for critical section):

Observations: N/A

Emergency Action Required:

Action By: N/A

### ACTION TO INITIATE PREVENTIVE WORKS

Criterion A/Criterion D: N/A

Action By: N/A

Further Study:

Action By: N/A

### OTHER EXTERNAL ACTION

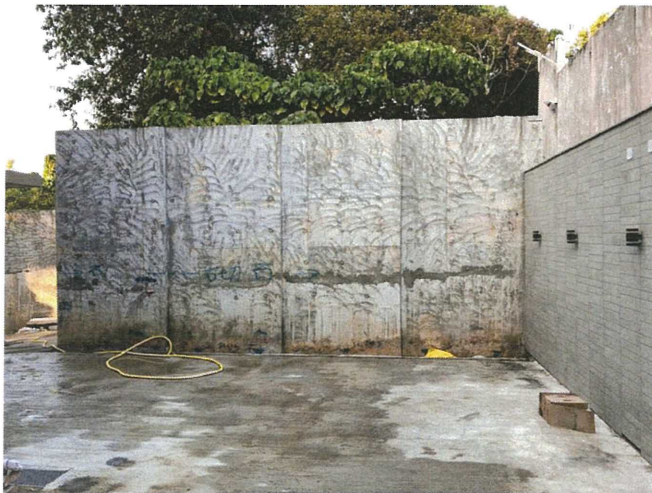
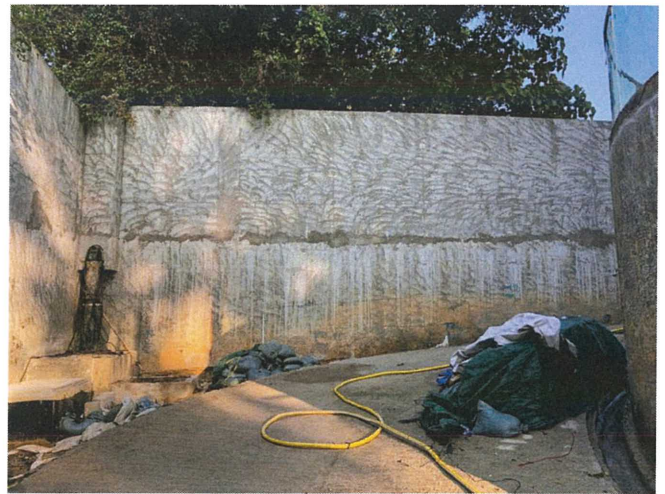
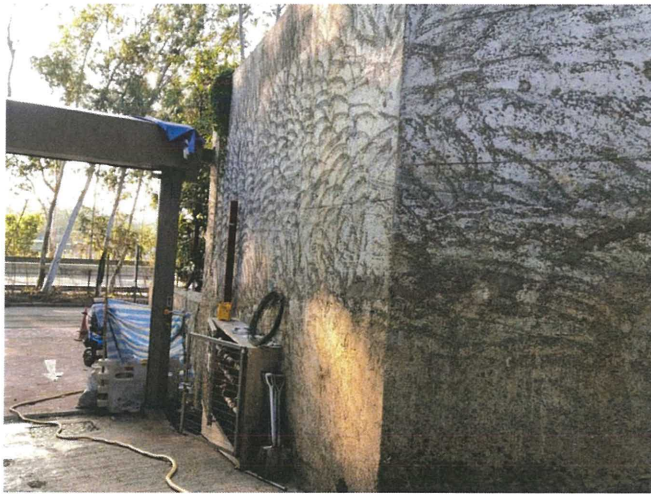
Check / repair Services:

Action By: N/A

Non-routine Maintenance:

Action By: N/A

**PHOTO**



**S12A AMENDMENT OF PLAN APPLICATION  
APPROVED NGAU TAM MEI  
OUTLINE ZONING PLAN NO. S/YL-NTM/12**

**PROPOSED REZONING FROM "R(C)" TO "G/IC"  
FOR A PROPOSED "SOCIAL WELFARE FACILITIES"  
(RESIDENTIAL CARE HOMES FOR THE ELDERLY)  
(RCHE)**

**AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,  
SAN TIN, N.T.**

APPENDIX 2

Existing Ground Investigation Works Data

AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD					HOLE NO. BH 1						
CONTRACT NO.					SHEET 1 of 4								
PROJECT Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories													
METHOD RC			CO-ORDINATES			W.O. No							
MACHINE & No. XY2B			E 824,144.44 N 838,262.20			DATE: 18/01/2013 to 21/01/2013							
FLUSHING MEDIUM WATER			ORIENTATION VERTICAL			GROUND LEVEL +12.02 mPD							
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R.(%)	S.C.R.(%)	R.Q.D.(%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
16.1.13	HX							A					Firm, greyish yellow, sandy SILT with some gravels and roots. (FILL)
1			100				(1, 1, 2, 2, 3, 5) N = 12	B 1 2 3 4	+11.02	1.00			Firm, yellowish brown, fine sandy SILT. (COLLUVIUM)
2								5					
3			100				(1, 3, 3, 3, 4, 4) N = 14	6 7 8					
4								9					
5			100				(2, 3, 3, 4, 6, 8) N = 21	10 11 12	+5.02	7.00			Firm to stiff, yellowish brown with reddish brown, fine sandy SILT. (RESIDUAL SOIL)
6								13					
7			63				(3, 4, 4, 5, 7, 7) N = 23	14 15 16					
8		7.30m at 18:00						17	+3.02	9.00		V	Extremely weak, yellowish grey, completely decomposed fine ash TUFF. (Stiff, fine sandy SILT)
9 18.1.13 19.1.13		8.00m at 08:00	80					18	+2.02	10.00			
10													

<ul style="list-style-type: none"> <li>● Small Disturbed Sample</li> <li>▣ Piston Sample</li> <li>▨ U76 Undisturbed Sample</li> <li>▩ U100 Undisturbed Sample</li> <li>▭ Mazier Sample</li> <li>▮ SPT Liner Sample</li> <li>△ Water Sample</li> </ul>	<ul style="list-style-type: none"> <li>↓ Standard Penetration Test</li> <li>∇ In-situ Vane Shear Test</li> <li>⊥ Permeability Test</li> <li>⊞ Impression Packer Test</li> <li>⊠ Packer Test</li> <li>▲ Piezometer Tip</li> <li>◻ Standpipe Tip</li> </ul>	<p>LOGGED <u>P.S. Wong</u></p> <p>DATE <u>22/01/2013</u></p> <p>CHECKED <u>K.M. Lam</u></p> <p>DATE <u>23/01/2013</u></p>	<p>REMARKS</p> <p>1. Prior to drilling an inspection pit was excavated by hand to 1.00m depth.</p> <p>2. Constant head permeability tests were carried out at 6.00-7.00m and 8.00-9.00m depth.</p>
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AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD					HOLE NO. <b>BH 1</b>							
PROJECT Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories					CONTRACT NO.		SHEET <b>2</b> of <b>4</b>							
METHOD RC			CO-ORDINATES			W.O. No								
MACHINE & No. XY2B			E 824,144.44 N 838,262.20			DATE: 18/01/2013 to 21/01/2013								
FLUSHING MEDIUM WATER			ORIENTATION VERTICAL			GROUND LEVEL +12.02 mPD								
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R.(%)	S.C.R.(%)	R.Q.D.(%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description	
11			73				(3, 3, 4, 4, 6, 7, 8) N = 25	19 10.20 20 10.50 10.55				V	As sheet 1 of 4.	
12							(3, 4, 5, 6, 9, 12) N = 32	21 11.00 22 12.00 23 12.10 24 12.50 12.55						
13			85				(2, 6, 6, 9, 13, 15) N = 43	25 13.00 26 14.00 27 14.10 28 14.50 14.55						
14							(3, 4, 9, 9, 15, 20) N = 53	29 15.00 30 16.00 31 16.10 32 16.50 16.55						
15		7.80m at 18:00	100				(4, 7, 7, 9, 9, 14) N = 39	33 17.00 34 18.00 35 18.10 36 18.50 18.55						
16														
17		8.00m at 08:00	100											
18														
19			0									V/IV		Extremely weak to very weak, brownish grey, completely to highly decomposed fine ash TUFF. (Hard to stiff, sandy silty GRAVEL sized rock fragments)
20														

- Small Disturbed Sample
- ▣ Piston Sample
- ▨ U76 Undisturbed Sample
- ▩ U100 Undisturbed Sample
- ▤ Mazzer Sample
- ▧ SPT Liner Sample
- △ Water Sample
- ↓ Standard Penetration Test
- ∇ In-situ Vane Shear Test
- ⊥ Permeability Test
- ⊓ Impression Packer Test
- ⊔ Packer Test
- ⊕ Piezometer Tip
- ⊖ Standpipe Tip

LOGGED P.S. Wong  
 DATE 22/01/2013  
 CHECKED K.M. Lam  
 DATE 23/01/2013

REMARKS

AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD				HOLE NO. BH 1							
				CONTRACT NO.		SHEET 3 of 4							
PROJECT Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories													
METHOD RC				CO-ORDINATES		W.O. No							
MACHINE & No. XY2B				E 824,144.44 N 838,262.20		DATE: 18/01/2013 to 21/01/2013							
FLUSHING MEDIUM WATER				ORIENTATION VERTICAL		GROUND LEVEL +12.02 mPD							
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R. (%)	S.C.R. (%)	R.Q.D. (%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
21			95				1 50/40mm 200/40mm	38 28.19 20.18				V/IV	As sheet 2 of 4.
22							(5, 7, 12, 14, 20, 24) N = 70	39 20.50 40 21.50 21.60 21.70					
23			70					41 22.00 22.05					
24							(3, 6, 21, 20, 30, 34) N = 105	42 22.50 43 23.50 23.60 23.70					
25			100					44 24.00 24.05					
26							(3, 6, 19, 22, 25, 37) N = 103	45 24.50 46 25.50 25.60 25.70					
27			47					47 26.00 26.05					
28			95	0	0	NI		48 26.50 27.50	-15.73	-27.75		III	Moderately strong, greyish yellow, moderately decomposed fine ash TUFF with closely spaced joints and iron stained.
29			100	67	46	7.5		49 27.67 27.72					
30			100	24	24	NI		T2-101 28.95 T2-101 29.49	-17.47	-29.49		V/IV	Extremely weak to very weak, greyish brown, completely to highly decomposed fine ash TUFF. (Very dense, silty sandy)

- Small Disturbed Sample
- Piston Sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- SPT Liner Sample
- Water Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Impression Packer Test
- Packer Test
- Piezometer Tip
- Standpipe Tip

LOGGED P.S. Wong  
DATE 22/01/2013  
CHECKED K.M. Lam  
DATE 23/01/2013

REMARKS

AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD				HOLE NO. BH 1							
				CONTRACT NO.		SHEET 4 of 4							
PROJECT Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories													
METHOD RC				CO-ORDINATES		W.O. No							
MACHINE & No. XY2B				E 824,144.44 N 838,262.20		DATE: 18/01/2013 to 21/01/2013							
FLUSHING MEDIUM WATER				ORIENTATION VERTICAL		GROUND LEVEL +12.02 mPD							
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R. (%)	S.C.R. (%)	R.Q.D. (%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
30			0									V/IV	coarse GRAVEL sized rock fragments)
31			0				53/40mm 200/40mm 54	30.50 30.60 30.63 30.68 31.00					
32			0				55/30mm 200/30mm 56	32.00 32.10 32.16 32.50					
33			0				57/20mm 200/20mm 58	33.50 33.60 33.64 34.00					
34			0										
35			0				59/30mm 200/10mm 60	35.00 35.10 35.13 35.50					
36	HX 21.1,13 36.65		0				61/30mm 200/20mm 62	36.50 36.60 36.63	-24.63	36.65			
37													End of Investigation hole at 36.65m.
38													
39													
40													

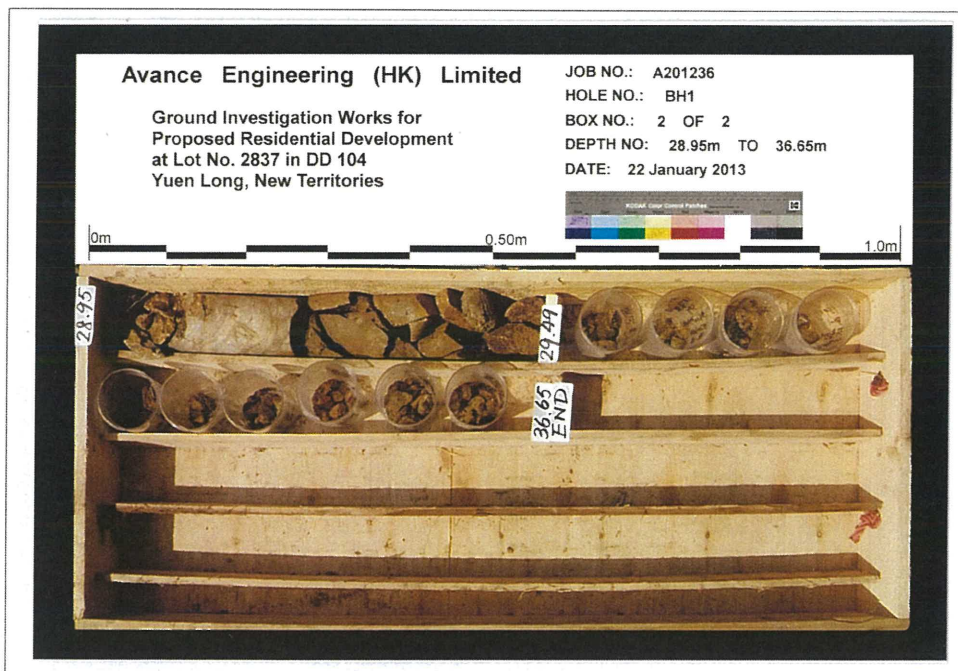
  

<ul style="list-style-type: none"> <li> Small Disturbed Sample</li> <li> Piston Sample</li> <li> U76 Undisturbed Sample</li> <li> U100 Undisturbed Sample</li> <li> Mazier Sample</li> <li> SPT Liner Sample</li> <li> Water Sample</li> </ul>	<ul style="list-style-type: none"> <li> Standard Penetration Test</li> <li> In-situ Vane Shear Test</li> <li> Permeability Test</li> <li> Impression Packer Test</li> <li> Packer Test</li> <li> Piezometer Tip</li> <li> Standpipe Tip</li> </ul>	LOGGED <u>P.S. Wong</u> DATE <u>22/01/2013</u> CHECKED <u>K.M. Lam</u> DATE <u>23/01/2013</u>	REMARKS
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**BH1 – 1 OF 2**



**BH1 – 2 OF 2**

AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD				HOLE NO. BH 2							
PROJECT Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories				CONTRACT NO.		SHEET 1 of 4							
METHOD RC		CO-ORDINATES		W.O. No									
MACHINE & No. XY2B		E 824,124.52 N 838,244.82		DATE: 10/01/2013 to 12/01/2013									
FLUSHING MEDIUM WATER		ORIENTATION VERTICAL		GROUND LEVEL +10.32 mPD									
e-Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R. (%)	S.C.R. (%)	R.Q.D. (%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
10.1.13 1	HX		100				(1, 1, 2, 2, 3, 3) N=10	A 0.50 B 1.00 1 1.00 2 2.00 3 2.10 4 2.50 5 2.55	+7.32	3.00	(Diagonal lines)		Soft, greyish brown, sandy SILT with roots. (FILL)
2			100				(1, 2, 2, 3, 4, 6) N=15	6 4.00 7 4.10 8 4.20 9 4.50 10 4.55	+5.32	5.00	(Vertical dashes)		Firm, greyish brown, slightly fine sandy SILT. (COLLUVIUM)
3			100				(2, 5, 7, 13, 13, 15) N=48	11 6.00 12 6.10 13 6.20 14 6.50 15 6.55	+3.32	7.00	(Vertical dashes)		Stiff, reddish brown, slightly sandy SILT. (RESIDUAL SOIL)
4			0				50/10mm 200/10mm	13 8.00 14 8.10 15 8.12 16 8.20	+2.12	8.20	(Vertical dashes)	V/IV	Extremely weak to weak, greyish brown with greyish yellow, completely to highly decomposed fine ash TUFF. (Hard, sandy SILT with some gravel sized rock fragments)
5		5.70m at 18:00	50				T2-101	13 8.00 14 8.10 15 8.12 16 8.20	+0.82	9.50	(Vertical dashes)	IV/III	Weak to moderately strong, dark brown, highly to moderately decomposed fine ash TUFF with fractured. (CORESTONE)
6		8.00m at 08:00						15 9.50	+0.32	10.00	(Vertical dashes)	V	Extremely weak, brownish grey, completely decomposed fine ash TUFF. (Hard, slightly fine sandy SILT)
10.1.13 11.1.13													

● Small Disturbed Sample	↓ Standard Penetration Test
▣ Piston Sample	∇ In-situ Vane Shear Test
▨ U76 Undisturbed Sample	⊥ Permeability Test
▩ U100 Undisturbed Sample	⊕ Impression Packer Test
▧ Mazier Sample	⊞ Packer Test
▤ SPT Liner Sample	⊡ Piezometer Tip
△ Water Sample	⊠ Standpipe Tip

LOGGED	<u>P.S. Wong</u>
DATE	<u>17/01/2013</u>
CHECKED	<u>K.M. Lam</u>
DATE	<u>18/01/2013</u>

REMARKS
1. Prior to drilling an inspection pit was excavated by hand to 1.00m depth.
2. A standpipe installed to 10.00m depth.
3. Constant head permeability tests were carried out at 3.00-4.00m and 7.00-8.00m depth.

AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD				HOLE NO. BH 2							
				CONTRACT NO.		SHEET 2 of 4							
PROJECT Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories													
METHOD RC				CO-ORDINATES		W.O. No							
MACHINE & No. XY2B				E 824,124.52 N 838,244.82		DATE: 10/01/2013 to 12/01/2013							
FLUSHING MEDIUM WATER				ORIENTATION VERTICAL		GROUND LEVEL +10.32 mPD							
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R. (%)	S.C.R. (%)	R.Q.D. (%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
10			100									V	As Sheet 1 of 4.
11							9.26 65,135 200/150mm	16 17 18	11.00 11.10 11.35	-1.18	11.50		
12			100					T2-101				IV/III	Weak to moderately strong, dark brown, highly to moderately decomposed fine ash TUFF with fractured. (CORESTONE)
13			100					19	13.00	-2.68	13.00	V	Extremely weak, greyish brown, completely decomposed fine ash TUFF. (Hard, fine sandy SILT)
14								20	14.00 14.10	-3.78 -3.98	14.10 14.30		
15			80					T2-101		-4.38	14.70	IV/III	Weak to moderately strong, greyish brown, highly to moderately decomposed fine ash TUFF. (CORESTONE) From 14.30-14.70m : Quartz vein.
16		5.80m at 18:00	87					T2-101		-4.93	15.25		
17		8.00m at 08:00	0					21 22	16.10 17.10 17.20	-5.28	15.60		
18			100				(27, 57, 100, 100) N = 200	23 24	17.45 17.60				
19							(4, 4, 8, 10, 11, 19) N = 48	25 26 27	18.50 18.60 18.70 19.00 19.05			V	Extremely weak, greyish brown, completely decomposed fine ash TUFF. (Stiff to very stiff, fine sandy SILT)
20										-9.68	20.00		

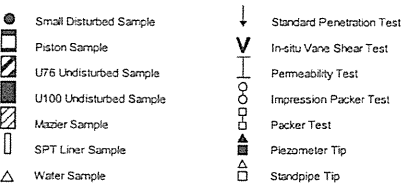
  

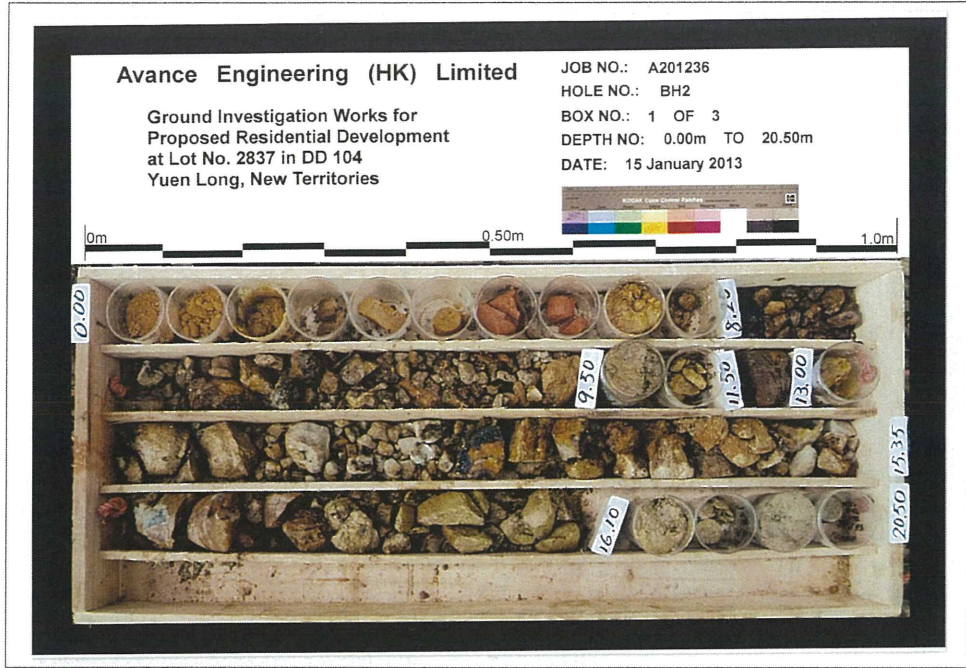
<ul style="list-style-type: none"> <li>● Small Disturbed Sample</li> <li>▣ Piston Sample</li> <li>▨ U76 Undisturbed Sample</li> <li>▩ U100 Undisturbed Sample</li> <li>▧ Mazier Sample</li> <li>▭ SPT Liner Sample</li> <li>△ Water Sample</li> </ul>	<ul style="list-style-type: none"> <li>↓ Standard Penetration Test</li> <li>∇ In-situ Vane Shear Test</li> <li>⊥ Permeability Test</li> <li>⊏ Impression Packer Test</li> <li>⊓ Packer Test</li> <li>⊕ Piezometer Tip</li> <li>⊔ Standpipe Tip</li> </ul>	LOGGED <u>P.S. Wong</u> DATE <u>17/01/2013</u> CHECKED <u>K.M. Lam</u> DATE <u>18/01/2013</u>	REMARKS
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AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD				HOLE NO. <b>BH 2</b>							
CONTRACT NO.				SHEET <b>3</b> of <b>4</b>									
PROJECT <b>Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories</b>													
METHOD <b>RC</b>			CO-ORDINATES			W.O. No							
MACHINE & No. <b>XY2B</b>			<b>E 824,124.52</b> <b>N 838,244.82</b>			DATE: <b>10/01/2013</b> to <b>12/01/2013</b>							
FLUSHING MEDIUM <b>WATER</b>			ORIENTATION <b>VERTICAL</b>		GROUND LEVEL <b>+10.32</b> mPD								
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R. (%)	S.C.R. (%)	R.Q.D. (%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
20												V	As Sheet 2 of 4.
21			100				(3, 5, 9, 13, 14, 19) N = 55	28 20.50 29 21.50 30 21.60 31 21.70					
22													
23													
24			100				(11, 13, 22, 31, 50, 100) N = 203	32 23.50 33 24.50 34 24.60 35 24.70					
25													
26			70					36 25.50					
27	HX 27.00						30.46 100, 100, 5mm 200, 5mm	37 26.50 38 26.60 39 26.78 27.00	-16.68	27.00			
28			100	12	12	9.1		T2-101 28.10				III	Moderately strong, yellowish grey, moderately decomposed fine ash TUFF. Joints are closely and very closely spaced, smooth planar and undulating, iron stained, dipping at 25°, 40°, 60° and 75°.
29			83	38	33	8.6		T2-101 29.30					
30			100	18	0	11.4		T2-101	-19.68	30.00			

<ul style="list-style-type: none"> <li>● Small Disturbed Sample</li> <li>▣ Piston Sample</li> <li>▨ U76 Undisturbed Sample</li> <li>▩ U100 Undisturbed Sample</li> <li>▧ Mazer Sample</li> <li>▭ SPT Liner Sample</li> <li>△ Water Sample</li> </ul>	<ul style="list-style-type: none"> <li>↓ Standard Penetration Test</li> <li>∇ In-situ Vane Shear Test</li> <li>⊥ Permeability Test</li> <li>⊓ Impression Packer Test</li> <li>⊔ Packer Test</li> <li>▲ Piezometer Tip</li> <li>□ Standpipe Tip</li> </ul>	LOGGED <u>P.S. Wong</u> DATE <u>17/01/2013</u> CHECKED <u>K.M. Lam</u> DATE <u>18/01/2013</u>	REMARKS
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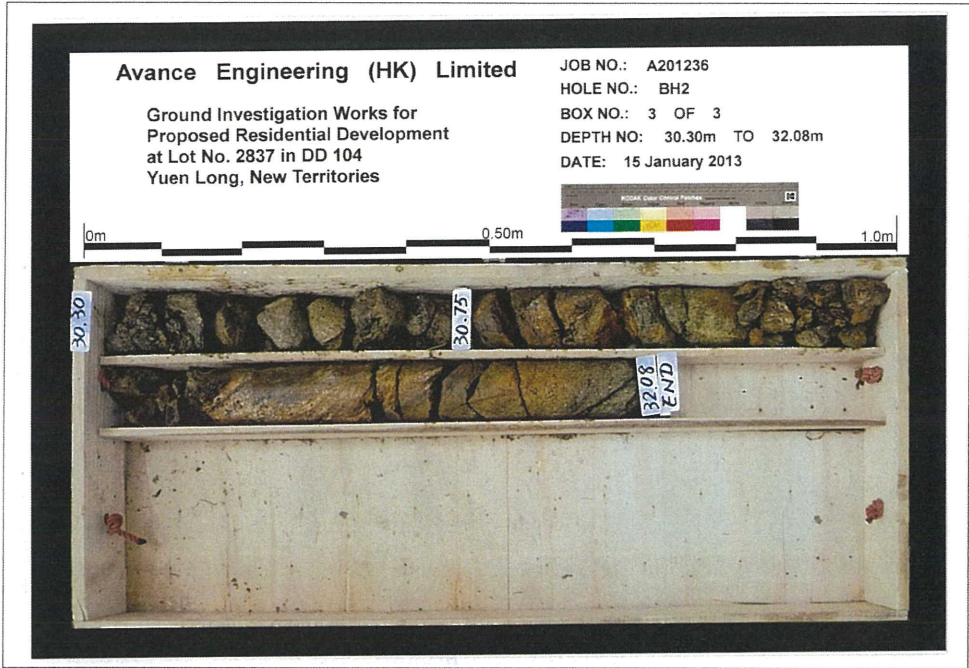
<b>AVANCE ENGINEERING (HK) LIMITED</b>		DRILLHOLE RECORD				HOLE NO. <b>BH 2</b>							
		CONTRACT NO.				SHEET <b>4</b> of <b>4</b>							
PROJECT <b>Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories</b>													
METHOD <b>RC</b>				CO-ORDINATES <b>E 824,124.52</b> <b>N 838,244.82</b>		W.O. No							
MACHINE & No. <b>XY2B</b>						DATE: <b>10/01/2013</b> to <b>12/01/2013</b>							
FLUSHING MEDIUM <b>WATER</b>				ORIENTATION <b>VERTICAL</b>		GROUND LEVEL <b>+10.32</b> mPD							
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R. (%)	S.C.R. (%)	R.Q.D. (%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
30			100	18	0	11.4		T2-101 30.30			▽	III	As Sheet 3 of 4.
31			100	0	0	NI		T2-101 30.75			▽		
32			98	38	17	20.0 NI		T2-101			▽		
32 <small>12.1.13</small>						9.5		32.08	-21.76	32.08	▽		
33													
34													
35													
36													
37													
38													
39													
40													
								LOGGED <u>P.S. Wong</u>		REMARKS			
								DATE <u>17/01/2013</u>					
								CHECKED <u>K.M. Lam</u>					
								DATE <u>18/01/2013</u>					



BH2 - 1 OF 3



BH2 - 2 OF 3



**BH2 – 3 OF 3**

AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD				HOLE NO. BH 3							
		CONTRACT NO.				SHEET 1 of 4							
PROJECT Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories													
METHOD RC				CO-ORDINATES		W.O. No							
MACHINE & No. XY2B				E 824,136.08 N 838,247.23		DATE: 16/01/2013 to 18/01/2013							
FLUSHING MEDIUM WATER				ORIENTATION VERTICAL		GROUND LEVEL +11.15 mPD							
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R.(%)	S.C.R.(%)	R.Q.D.(%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
16.1,13	PX												Firm, greyish brown, very sandy gravelly SILT with roots. (FILL)
1	PX 1.00 HX		100				(2, 2, 3, 3, 3, 4) N=13	A I.P. 0.50 B 1.00	+10.15	1.00			Firm, yellowish brown, sandy SILT with some gravels. (COLLUVIUM)
2			100					2 2.00 2.10 2.20					
3			100					3 2.50 2.55					
4			100					4 3.00					
5			100				(3, 4, 4, 4, 5, 5) N=19	5 4.00 4.10 4.20	+6.15	5.00		VI	Stiff, reddish brown with white, fine sandy SILT. (RESIDUAL SOIL)
6			100					6 4.50 4.55					
7			100				(5, 5, 7, 9, 13, 13) N=42	7 5.00	+4.15	7.00		V	Extremely weak, yellowish grey, completely decomposed fine ash TUFF. (Stiff, fine sandy SILT)
8			100					8 6.00 6.10 6.20					
9			100					9 6.50 6.55					
10			100				(7, 7, 9, 11, 14, 17) N=51	10 7.00					
			100					11 8.00 8.10 8.20					
			100					12 8.50 8.55					
			100					13 9.00					
			100					14 8.00 8.10 8.20					
			100					15 8.50 8.55					
			100					16 8.50 8.55					
			100					17 9.00					
			100					18 10.00	+1.15	10.00			

<ul style="list-style-type: none"> <li> Small Disturbed Sample</li> <li> Piston Sample</li> <li> U76 Undisturbed Sample</li> <li> U100 Undisturbed Sample</li> <li> Mazier Sample</li> <li> SPT Liner Sample</li> <li> Water Sample</li> </ul>	<ul style="list-style-type: none"> <li> Standard Penetration Test</li> <li> In-situ Vane Shear Test</li> <li> Permeability Test</li> <li> Impression Packer Test</li> <li> Packer Test</li> <li> Piezometer Tip</li> <li> Standpipe Tip</li> </ul>	LOGGED <u>P.S. Wong</u> DATE <u>19/01/2013</u> CHECKED <u>K.M. Lam</u> DATE <u>21/01/2013</u>	<b>REMARKS</b> 1. Prior to drilling an inspection pit was excavated by hand to 1.00m depth. 2. A standpipe installed to 10.00m depth.
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AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD				HOLE NO. <b>BH 3</b>							
		CONTRACT NO.				SHEET <b>2</b> of <b>4</b>							
PROJECT <b>Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories</b>													
METHOD <b>RC</b>				CO-ORDINATES		W.O. No							
MACHINE & No. <b>XY2B</b>				<b>E 824,136.08</b> <b>N 838,247.23</b>		DATE: <b>16/01/2013</b> to <b>18/01/2013</b>							
FLUSHING MEDIUM <b>WATER</b>				ORIENTATION <b>VERTICAL</b>		GROUND LEVEL <b>+11.15</b> mPD							
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R. (%)	S.C.R. (%)	R.Q.D. (%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
10												V	As sheet 1 of 4.
11			100				(5, 7, 11, 11, 13, 15) N=50	19 18.20 20 10.50 10.55					
12			100				(5, 8, 11, 12, 16, 25) N=64	21 11.00 22 12.00 12.10 12.20					
13		6.30m at 08:00	100				(6, 13, 15, 15, 22, 29) N=81	23 12.50 12.55 24 12.50 12.55					
14			100				(7, 11, 14, 15, 21, 27) N=77	25 13.00 26 14.00 14.10 14.20					
15			80				(6, 7, 11, 16, 19, 25) N=71	27 14.50 14.55 28 14.50 14.55					
16			100					29 15.00 30 16.00 16.10 16.20					
17			100					31 16.50 16.55 32 16.50 16.55					
18			90					33 17.00 34 18.00 18.10 18.20					
19			90					35 18.50 18.55 36 18.50 18.55					
20								37 19.00 38 20.00	-8.85	20.00			

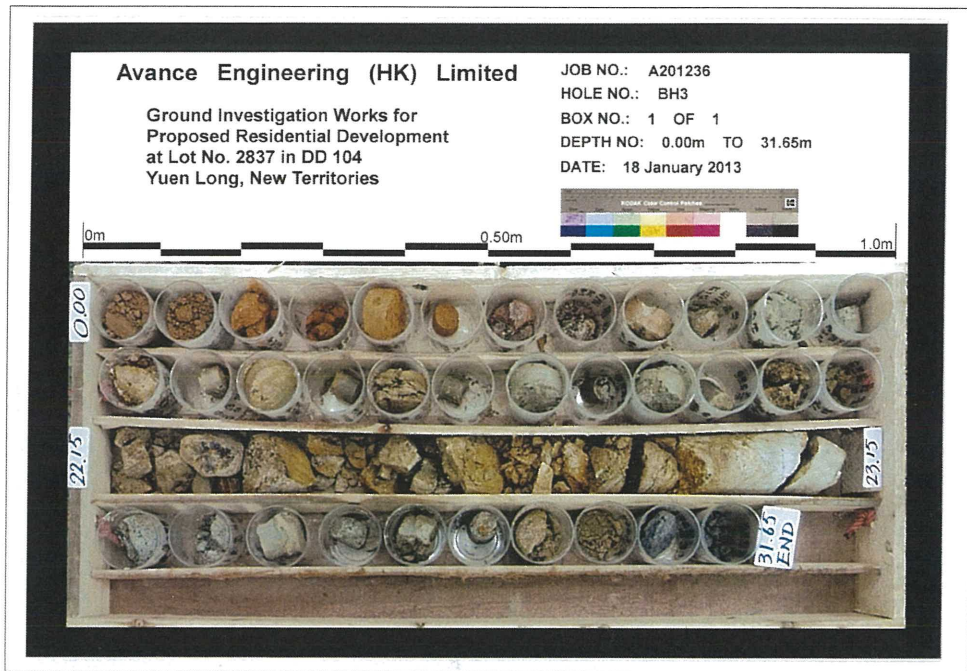
<ul style="list-style-type: none"> <li> Small Disturbed Sample</li> <li> Piston Sample</li> <li> U76 Undisturbed Sample</li> <li> U100 Undisturbed Sample</li> <li> Mazer Sample</li> <li> SPT Liner Sample</li> <li> Water Sample</li> </ul>	<ul style="list-style-type: none"> <li> Standard Penetration Test</li> <li> In-situ Vane Shear Test</li> <li> Permeability Test</li> <li> Impression Packer Test</li> <li> Packer Test</li> <li> Piezometer Tip</li> <li> Standpipe Tip</li> </ul>	LOGGED <u>P.S. Wong</u> DATE <u>19/01/2013</u> CHECKED <u>K.M. Lam</u> DATE <u>21/01/2013</u>	REMARKS
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AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD				HOLE NO. <b>BH 3</b>							
CONTRACT NO.				SHEET <b>3</b> of <b>4</b>									
PROJECT Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories													
METHOD RC			CO-ORDINATES			W.O. No							
MACHINE & No. XY2B			E 824,136.08 N 838,247.23			DATE: 16/01/2013 to 18/01/2013							
FLUSHING MEDIUM WATER			ORIENTATION VERTICAL			GROUND LEVEL +11.15 mPD							
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R.(%)	S.C.R.(%)	R.Q.D.(%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
20							11.21 150.55mm 200/50mm	39 20.10 40 20.28 20.33				V	As sheet 1 of 4.
21			100					41 21.00	-9.85	21.00		IV	Very weak, brownish grey, highly decomposed fine ash TUFF.
22							50/10mm 200/50mm	42 22.00 43 22.18 22.13	-11.00	22.15		III	Moderately strong, brownish grey, moderately decomposed fine ash TUFF. (CORESTONE)
23			93	13	13	NI	T2-101	23.15	-12.00	23.15		V/IV	Extremely weak to very weak, yellowish grey and grey, completely to highly decomposed fine ash TUFF. (Stiff to hard, fine sandy SILT with gravel sized rock fragments)
24			100					44 23.50					
25							50/20mm 200/10mm	45 24.50 46 24.60 24.64					
26			0					47 25.00					
27							50/40mm 200/10mm	48 26.00 26.10 26.15					
28								49 26.50					
29							50/20mm 200/10mm	50 27.50 27.60 27.63					
30		6.50m at 08:00	100					51 28.00					
							50/20mm 200/10mm	52 29.00 53 29.10 29.13	-18.85	30.00			

<ul style="list-style-type: none"> <li> Small Disturbed Sample</li> <li> Piston Sample</li> <li> U76 Undisturbed Sample</li> <li> U100 Undisturbed Sample</li> <li> Mazer Sample</li> <li> SPT Liner Sample</li> <li> Water Sample</li> </ul>	<ul style="list-style-type: none"> <li> Standard Penetration Test</li> <li> In-situ Vane Shear Test</li> <li> Permeability Test</li> <li> Impression Packer Test</li> <li> Packer Test</li> <li> Piezometer Tip</li> <li> Standpipe Tip</li> </ul>	LOGGED <u>P.S. Wong</u> DATE <u>19/01/2013</u> CHECKED <u>K.M. Lam</u> DATE <u>21/01/2013</u>	REMARKS
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AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD					HOLE NO. <b>BH 3</b>						
		CONTRACT NO.					SHEET <b>4</b> of <b>4</b>						
PROJECT Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories													
METHOD RC			CO-ORDINATES			W.O. No							
MACHINE & No. XY2B			E 824,136.08 N 838,247.23			DATE: 16/01/2013 to 18/01/2013							
FLUSHING MEDIUM WATER			ORIENTATION VERTICAL			GROUND LEVEL +11.15 mPD							
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R.(%)	S.C.R.(%)	R.Q.D.(%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
30 16.1.13	HX 31.65		100						-20.50	31.65		V/IV	As sheet 3 of 4.
31													End of Investigation hole at 31.65m.
32													
33													
34													
35													
36													
37													
38													
39													
40													
								LOGGED <u>P.S. Wong</u> DATE <u>19/01/2013</u> CHECKED <u>K.M. Lam</u> DATE <u>21/01/2013</u>		REMARKS			



**BH3 – 1 OF 1**

AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD				HOLE NO. BH 4							
CONTRACT NO.				SHEET 1 of 4									
PROJECT Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories													
METHOD RC		CO-ORDINATES			W.O. No								
MACHINE & No. XY2B		E 824,153.27 N 838,247.14			DATE: 12/01/2013 to 16/01/2013								
FLUSHING MEDIUM WATER		ORIENTATION VERTICAL		GROUND LEVEL +13.16 mPD									
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R. (%)	S.C.R. (%)	R.Q.D. (%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
12.1.13	HX							A 0.50 I.P.					Firm, yellowish brown, sandy SILT with gravel and concrete fragments. (FILL)
1			100					B 1.00 1	+12.16	1.00			Firm to stiff, yellowish brown, fine sandy SILT with gravels. (COLLUVIUM)
2							(1, 1, 3, 3, 3, 3) N=12	2 2.00 3 2.10 4 2.20					
3			100					5 3.00					
4							(2, 3, 3, 4, 4, 4, 4) N=19	6 4.00 7 4.10 8 4.20					
5			100					9 5.00	+8.16	5.00		VI	Stiff, yellowish brown and brownish yellow, fine sandy SILT. (RESIDUAL SOIL)
6								10 6.00 11 6.10 12 6.20					
7			100				(1, 3, 3, 3, 3, 3) N=17	13 7.00					
8								14 8.00 15 8.10 16 8.20					
9			100				(2, 3, 5, 6, 8, 10) N=29	17 9.00	+4.16	9.00		V	Extremely weak, yellowish grey, completely decomposed fine ash TUFF. (Stiff, fine sandy SILT)
10								18 10.00	+3.16	10.00			

<ul style="list-style-type: none"> <li>● Small Disturbed Sample</li> <li>▣ Piston Sample</li> <li>▨ U76 Undisturbed Sample</li> <li>▩ U100 Undisturbed Sample</li> <li>▧ Mazier Sample</li> <li>▭ SPT Liner Sample</li> <li>◻ Water Sample</li> </ul>	<ul style="list-style-type: none"> <li>↓ Standard Penetration Test</li> <li>∇ In-situ Vane Shear Test</li> <li>○ Permeability Test</li> <li>⊖ Impression Packer Test</li> <li>⊕ Packer Test</li> <li>▲ Piezometer Tip</li> <li>◻ Standpipe Tip</li> </ul>	LOGGED <u>P.S. Wong</u> DATE <u>17/01/2013</u> CHECKED <u>K.M. Lam</u> DATE <u>18/01/2013</u>	<b>REMARKS</b> 1. Prior to drilling an inspection pit was excavated by hand to 1.00m depth. 2. A standpipe installed to 15.00m depth. 3. Constant head permeability tests were carried out at 4.00-5.00m and 9.00-10.00m depth.
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AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD				HOLE NO. <b>BH 4</b>							
		CONTRACT NO.				SHEET <b>2</b> of <b>4</b>							
PROJECT <b>Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories</b>													
METHOD <b>RC</b>			CO-ORDINATES			W.O. No							
MACHINE & No. <b>XY2B</b>			<b>E 824,153.27</b> <b>N 838,247.14</b>			DATE: <b>12/01/2013</b> to <b>16/01/2013</b>							
FLUSHING MEDIUM <b>WATER</b>			ORIENTATION <b>VERTICAL</b>			GROUND LEVEL <b>+13.16</b> mPD							
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R. (%)	S.C.R. (%)	R.Q.D. (%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
10							(3, 7, 7, 8, 10, 12) N = 37	19 10.30 20 10.50 10.55				V	As sheet 1 of 4.
11			100					21 11.00					
12							(1, 10, 12, 14, 14, 16) N = 56	22 12.00 23 12.10 12.20					
13			95					24 12.50 12.55					
14							(1, 11, 20, 24, 32, 34) N = 110	25 13.00					
15			100					26 14.00 27 14.10 14.20					
16							(10, 15, 24, 39, 56, 59) N = 178	28 14.50 14.55					
17		9.40m at 18:00						29 15.00					
17:2:13		8.00m at 08:00	100					30 16.00 31 16.10 16.20					
18							(12, 20, 25, 40, 53, 58) N = 176	32 16.50 16.55					
19			100					33 17.00					
20								34 18.00 35 18.10 18.20					
								36 18.50 18.55					
								37 19.00					
								38 20.00	-6.84	20.00			

<ul style="list-style-type: none"> <li>● Small Disturbed Sample</li> <li>▣ Piston Sample</li> <li>▨ U76 Undisturbed Sample</li> <li>▩ U100 Undisturbed Sample</li> <li>▧ Mazer Sample</li> <li>▭ SPT Liner Sample</li> <li>▬ Water Sample</li> </ul>	<ul style="list-style-type: none"> <li>↓ Standard Penetration Test</li> <li>∇ In-situ Vane Shear Test</li> <li>⊥ Permeability Test</li> <li>⊞ Impression Packer Test</li> <li>⊞ Packer Test</li> <li>▲ Piezometer Tip</li> <li>□ Standpipe Tip</li> </ul>	LOGGED <u>P.S. Wong</u> DATE <u>17/01/2013</u> CHECKED <u>K.M. Lam</u> DATE <u>18/01/2013</u>	REMARKS
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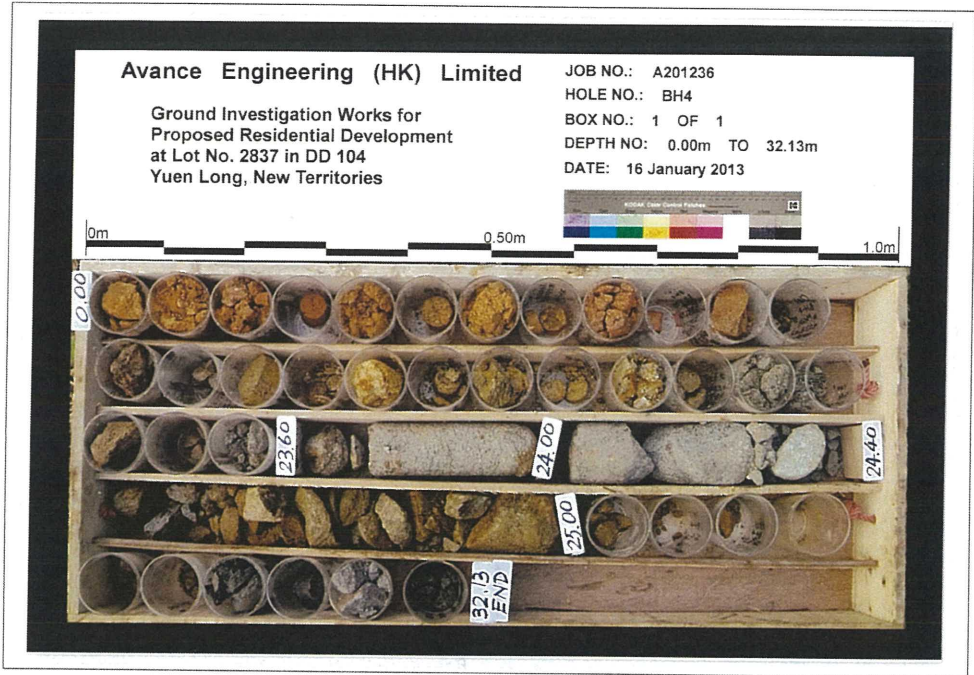
AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD				HOLE NO. <b>BH 4</b>							
		CONTRACT NO.				SHEET <b>3</b> of <b>4</b>							
PROJECT <b>Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories</b>													
METHOD <b>RC</b>			CO-ORDINATES			W.O. No							
MACHINE & No. <b>XY2B</b>			<b>E 824,153.27</b> <b>N 838,247.14</b>			DATE: <b>12/01/2013</b> to <b>16/01/2013</b>							
FLUSHING MEDIUM <b>WATER</b>			ORIENTATION <b>VERTICAL</b>			GROUND LEVEL <b>+13.16</b> mPD							
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R. (%)	S.C.R. (%)	R.Q.D. (%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
21 14.13 15.13	9.23m at 18:00		100				(10, 12, 15, 17, 22, 26) N = 80	39 20.10 20.20 40 20.50 20.55				V	As sheet 1 of 4.
22			100					41 21.00 42 22.00 22.10 43 22.21 22.26 44 22.26					
23 15.13 16.13	9.30m at 18:00		93				40, 10.5mm 150, 50.5mm 200, 50mm	45 23.26 23.35 23.48 23.50 46 23.48 23.50	-10.44	23.60		III	Moderately strong, brownish grey, moderately decomposed fine ash TUFF. (CORESTONE)
24			97				T2-101 T2-101	24.00					
25			0					25.00	-11.84	25.00		V/IV	Extremely weak to very weak, brownish grey, completely to highly decomposed fine ash TUFF. (Hard, sandy SILT with some gravel sized rock fragments)
26			0				50, 50mm 200, 20mm	47 26.00 26.10 26.11 26.16 48 26.50					
27			0					49 27.50 27.60 27.65 50 27.65					
28			0				50, 20mm 200, 20mm	51 28.00 52 29.10 29.14 53 29.50					
29													
30									-16.84	30.00			

<ul style="list-style-type: none"> <li> Small Disturbed Sample</li> <li> Piston Sample</li> <li> U76 Undisturbed Sample</li> <li> U100 Undisturbed Sample</li> <li> Mazer Sample</li> <li> SPT Liner Sample</li> <li> Water Sample</li> </ul>	<ul style="list-style-type: none"> <li> Standard Penetration Test</li> <li> In-situ Vane Shear Test</li> <li> Permeability Test</li> <li> Impression Packer Test</li> <li> Packer Test</li> <li> Piezometer Tip</li> <li> Standpipe Tip</li> </ul>	LOGGED <u>P.S. Wong</u> DATE <u>17/01/2013</u> CHECKED <u>K.M. Lam</u> DATE <u>18/01/2013</u>	REMARKS
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AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD					HOLE NO. <b>BH 4</b>						
		CONTRACT NO.					SHEET <b>4</b> of <b>4</b>						
PROJECT Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories													
METHOD <b>RC</b>			CO-ORDINATES			W.O. No							
MACHINE & No. <b>XY2B</b>			<b>E 824,153.27</b> <b>N 838,247.14</b>			DATE: <b>12/01/2013</b> to <b>16/01/2013</b>							
FLUSHING MEDIUM <b>WATER</b>			ORIENTATION <b>VERTICAL</b>			GROUND LEVEL <b>+13.16</b> mPD							
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R. (%)	S.C.R. (%)	R.Q.D. (%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
31			95					      				V/IV	As sheet 3 of 4.
32	HX 32.13		95						-18.97	32.13			End of Investigation hole at 32.13m.
33													
34													
35													
36													
37													
38													
39													
40													
												LOGGED <u>P.S. Wong</u> DATE <u>17/01/2013</u> CHECKED <u>K.M. Lam</u> DATE <u>18/01/2013</u>	REMARKS





BH4 - 1 OF 1

AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD					HOLE NO. <b>BH 5</b>						
							CONTRACT NO.		SHEET <b>1</b> of <b>3</b>				
PROJECT Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories													
METHOD <b>RC</b>			CO-ORDINATES			W.O. No							
MACHINE & No. <b>XY2B</b>			<b>E 824,143.98</b> <b>N 838,236.29</b>			DATE: <b>10/01/2013</b> to <b>12/01/2013</b>							
FLUSHING MEDIUM <b>WATER</b>			ORIENTATION <b>VERTICAL</b>			GROUND LEVEL <b>+12.24</b> mPD							
eDrilling Progress	Casing size	Water level (m) Shift start/end	T.C.R.(%)	S.C.R.(%)	R.Q.D.(%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
10.1.13	PX							A 0.50					Firm, brownish grey, fine sandy SILT with gravels. (FILL)
1	PX 1.00 HX		100				(23, 3, 4, 6, 8, 10) N = 28	B 1 1.00	+11.24	1.00			Firm to stiff, yellowish brown, slightly fine sandy SILT. (COLLUVIUM)
2								2 2.00 3 2.10 4 2.20					
3			100					5 3.00					
4							(3, 4, 6, 8, 10, 12) N = 36	6 4.00 7 4.10 8 4.20					
5			100					9 5.00	+7.24	5.00		VI	Stiff, yellowish brown and reddish brown, fine sandy SILT with gravel. (RESIDUAL SOIL)
6							(4, 6, 8, 10, 12, 13) N = 43	10 6.00 11 6.10 12 6.20					
7			95					13 7.00	+5.24	7.00		V	Extremely weak, greyish yellow, completely decomposed fine ash TUFF. (Stiff to hard, slightly sandy SILT)
8							(3, 5, 7, 9, 11, 13) N = 40	14 8.00 15 8.10 16 8.20					
9		7.20m at 18:00						17 9.00					
10.1.13		8.00m at 08:00	100					18 10.00	+2.24	10.00			
11.1.13													

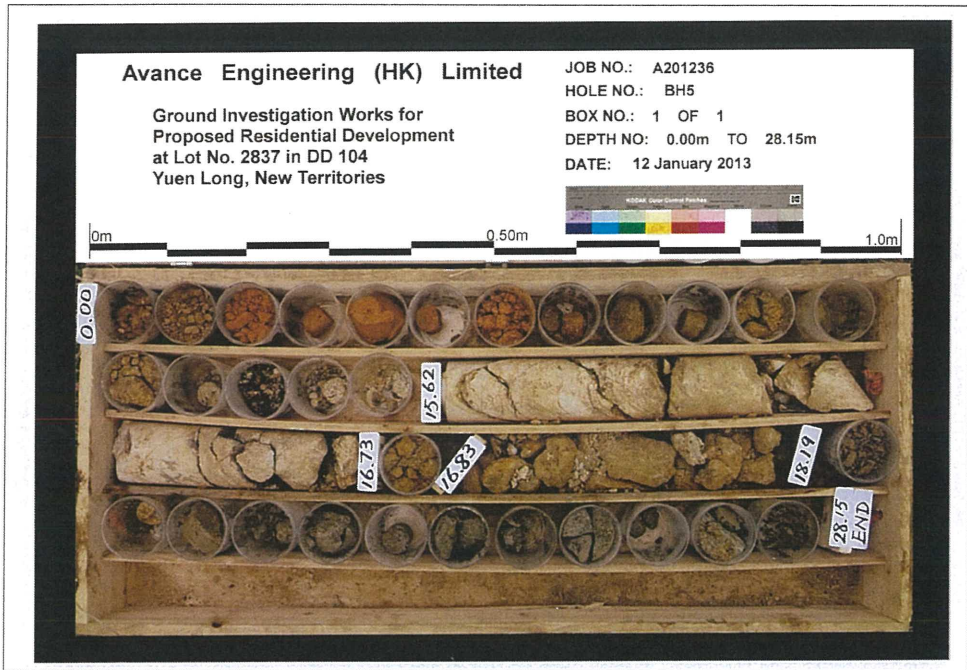
<ul style="list-style-type: none"> <li> Small Disturbed Sample</li> <li> Piston Sample</li> <li> U76 Undisturbed Sample</li> <li> U100 Undisturbed Sample</li> <li> Mazer Sample</li> <li> SPT Liner Sample</li> <li> Water Sample</li> </ul>	<ul style="list-style-type: none"> <li> Standard Penetration Test</li> <li> In-situ Vane Shear Test</li> <li> Permeability Test</li> <li> Impression Packer Test</li> <li> Packer Test</li> <li> Piezometer Tip</li> <li> Standpipe Tip</li> </ul>	LOGGED <u>P.S. Wong</u> DATE <u>15/01/2013</u> CHECKED <u>K.M. Lam</u> DATE <u>16/01/2013</u>	REMARKS 1. Prior to drilling an inspection pit was excavated by hand to 1.00m depth.
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AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD				HOLE NO. <b>BH 5</b>							
		CONTRACT NO.				SHEET <b>2</b> of <b>3</b>							
PROJECT Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories													
METHOD <b>RC</b>			CO-ORDINATES			W.O. No							
MACHINE & No. <b>XY2B</b>			<b>E 824,143.98</b> <b>N 838,236.29</b>			DATE: <b>10/01/2013</b> to <b>12/01/2013</b>							
FLUSHING MEDIUM <b>WATER</b>			ORIENTATION <b>VERTICAL</b>			GROUND LEVEL <b>+12.24</b> mPD							
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R. (%)	S.C.R. (%)	R.Q.D. (%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description
11							(5, 6, 8, 10, 12, 14) N = 44	19 18.28 20 10.50 10.55				V	As sheet 1 of 3.
12			100				(7, 14, 16, 26, 28, 30) N = 100	21 11.00 22 12.00 12.10 12.20 23 12.50 12.55 24	+1.24	11.00		V/IV	Extremely weak to weak, greyish yellow, completely to highly decomposed fine ash TUFF. (Hard, sandy SILT with some gravel sized rock fragments)
13			95				(10, 15, 21, 25, 29, 33) N = 108	25 13.00 26 14.00 14.10 14.20 27 14.50 14.55 28					
14							(11, 17, 22, 28, 45, 48) N = 143	29 15.10 30 15.40 15.45 15.62	-3.38	15.62		III	Moderately strong, greyish yellow, moderately decomposed fine ash TUFF. (CORESTONE)
15			70	29	18	7.2		T2-101					
16								31 16.73 16.83	-4.49	16.73		V	Extremely weak to weak, yellowish grey, completely to highly decomposed fine ash TUFF. (Hard, sandy SILT with some gravel sized rock fragments)
17		7.50m at 18:00	25	0	0	NI		T2-101	-4.59	16.83		IV/III	Moderately weak to weak, greyish brown, highly to moderately decomposed fine ash TUFF with fractured. (CORESTONE)
18		8.00m at 08:00	95					32 18.19	-5.95	18.19		V	Extremely weak, greyish yellow, completely decomposed fine ash TUFF. (Hard to stiff, fine sandy SILT)
19							(6, 8, 15, 40, 48, 59) N = 162	33 19.19 19.29 19.39 34 19.69 19.74 35					
20								36 20.00	-7.76	20.00			
								LOGGED <u>P.S. Wong</u>		REMARKS			
								DATE <u>15/01/2013</u>					
								CHECKED <u>K.M. Lam</u>					
								DATE <u>16/01/2013</u>					

AVANCE ENGINEERING (HK) LIMITED		DRILLHOLE RECORD				HOLE NO. BH 5								
		CONTRACT NO.				SHEET 3 of 3								
PROJECT Ground Investigation Works for Proposed Residential Development at Lot No. 2837 in DD 104, Yuen Long, New Territories														
METHOD RC				CO-ORDINATES		W.O. No								
MACHINE & No. XY2B				E 824,143.98 N 838,236.29		DATE: 10/01/2013 to 12/01/2013								
FLUSHING MEDIUM WATER				ORIENTATION VERTICAL		GROUND LEVEL +12.24 mPD								
Drilling Progress	Casing size	Water level (m) Shift start/end	T.C.R.(%)	S.C.R.(%)	R.Q.D.(%)	F.I.	Tests	Samples	Reduced Level	Depth (m)	Legend	Grade	Description	
21			100					37 21.00 38 21.10 21.20 39 21.50 21.55				V/IV	Extremely weak to very weak, yellowish grey, completely to highly decomposed fine ash TUFF. (Hard, fine sandy SILT with gravel sized rock fragments)As sheet 2 of 3.	
22			100				(25, 35, 43, 48, 50, 59) N = 200	40 22.00						
23							(27, 29, 40, 48, 52, 60) N = 200	41 23.00 42 23.10 23.20 43 23.50 23.68						
24			100					44						
25							(15, 33, 38, 46, 58, 64) N = 206	45 24.60 46 24.70 24.80 47 25.10 25.15						
26			100					48						
27							(22, 50, 42, 48, 51, 59) N = 200	49 26.15 26.25 26.35 50 26.25 26.35 51 26.65 26.70 52 26.70						
28	HX 12.1.13 28.15						50/10mm 200/20mm	53 27.70 27.80 54 27.83	-15.91	28.15				
29														End of Investigation hole at 28.15m.
30														

<ul style="list-style-type: none"> <li> Small Disturbed Sample</li> <li> Piston Sample</li> <li> U76 Undisturbed Sample</li> <li> U106 Undisturbed Sample</li> <li> Mazier Sample</li> <li> SPT Liner Sample</li> <li> Water Sample</li> </ul>	<ul style="list-style-type: none"> <li> Standard Penetration Test</li> <li> In-situ Vane Shear Test</li> <li> Permeability Test</li> <li> Impression Packer Test</li> <li> Packer Test</li> <li> Piezometer Tip</li> <li> Standpipe Tip</li> </ul>	LOGGED <u>P.S. Wong</u> DATE <u>15/01/2013</u> CHECKED <u>K.M. Lam</u> DATE <u>16/01/2013</u>	REMARKS
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BH5 - 1 OF 1