Y/YL-NTM/9

Form No. S12A
表格第 S12A 號

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A OF THE TOWN PLANNING ORDINANCE (CAP.131)

根據《城市規劃條例》(第131章)第12A條遞交的修訂圖則申請

Applicant who would like to publish the notice of application in local newspapers to meet one of the Town Planning Board's requirements of taking reasonable steps to obtain consent of or give notification to the current land owner, please refer to the following link regarding publishing the notice in the designated newspapers: https://www.info.gov.hk/tpb/en/plan_application/apply.html

申請人如欲在本地報章刊登申請通知，以採取城市規劃委員會就取得現行土地擁有人的同意或通知現行土地擁有人所指定的其中一項合理步驟，請瀏覽以下網址有關在指定的報章刊登通知：https://www.info.gov.hk/tpb/tc/plan_application/apply.html

此文件在 2022年 08月 10日 收到。城市規劃委員會只會在收到所有必要的資料及文件後才正式確認收到申請的日期。

This document is received on 10 AUG 2022
The Town Planning Board will formally acknowledge the date of receipt of the application only upon receipt of all the required information and documents.

General Note and Annotation for the Form
填寫表格的一般指引及註解

\# "Current land owner" means any person whose name is registered in the Land Registry as that of an owner of the land to which the application relates, as at 6 weeks before the application is made
「現行土地擁有人」指在提出申請前六星期，其姓名或名稱已在土地註冊處註冊為該申請所關乎的土地的擁有人的人

& Please attach documentary proof 請夾附證明文件

^ Please insert number where appropriate 請在適當地方註明編號

Please fill "NA" for inapplicable item 請在不適用的項目填寫「不適用」

Please use separate sheets if the space provided is insufficient 如所提供的空間不足，請另頁說明

Please insert a「✔」at the appropriate box 請在適當的方格內上加上「✔」號

For Official Use Only 請勿填寫此欄	Application No. 申請編號	Y/YL-NTM/9
	Date Received 收到日期	10 AUG 2022

1. The completed form and supporting documents (if any) should be sent to the Secretary, Town Planning Board (the Board), 15/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong.
申請人須把填妥的申請表格及其他支持申請的文件 (倘有)，送交香港北角渣華道 333 號北角政府合署 15 樓城市規劃委員會(下稱「委員會」)秘書收。

2. Please read the "Guidance Notes" carefully before you fill in this form. The document can be downloaded from the Board's website at http://www.info.gov.hk/tpb/. It can also be obtained from the Secretariat of the Board at 15/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong (Tel: 2231 4810 or 2231 4835), and the Planning Enquiry Counters of the Planning Department (Hotline: 2231 5000) (17/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong and 14/F, Sha Tin Government Offices, 1 Sheung Wo Che Road, Sha Tin, New Territories).
請先細閱《申請須知》的資料單張，然後填寫此表格。該份文件可從委員會的網頁下載 (網址：http://www.info.gov.hk/tpb/)，亦可向委員會秘書處 (香港北角渣華道 333 號北角政府合署 15 樓 – 電話：2231 4810 或 2231 4835)及規劃署的規劃資料查詢處(熱線：2231 5000) (香港北角渣華道 333 號北角政府合署 17 樓及新界沙田上禾輋路 1 號沙田政府合署 14 樓)索取。

3. This form can be downloaded from the Board's website, and obtained from the Secretariat of the Board and the Planning Enquiry Counters of the Planning Department. The form should be typed or completed in block letters. The processing of the application may be refused if the required information or the required copies are incomplete.
此表格可從委員會的網頁下載，亦可向委員會秘書處及規劃署的規劃資料查詢處索取。申請人須以打印方式或以正楷填寫表格。如果申請人所提交的資料或文件副本不齊全，委員會可拒絕處理有關申請。

1. Name of Applicant 申請人姓名/名稱

(☐ Mr. 先生 / ☐ Mrs. 夫人 / ☐ Miss 小姐 / ☐ Ms. 女士 / ☑ Company 公司 / ☐ Organisation 機構)

WONDER PACIFIC DEVELOPMENT LIMITED

2. Name of Authorised Agent (if applicable) 獲授權代理人姓名/名稱（如適用）

(☐ Mr. 先生 / ☐ Mrs. 夫人 / ☐ Miss 小姐 / ☐ Ms. 女士 / ☑ Company 公司 / ☐ Organisation 機構)

R LEE ARCHITECTS (HK) LTD

3. Application Site 申請地點

(a)	Whether the application directly relates to any specific site? 申請是否直接與某地點有關？	Yes 是 ☑ No 否 ☐ (Please proceed to Part 6 請繼續填寫第 6 部分)
(b)	Full address/ location/ demarcation district and lot number (if applicable) 詳細地址／地點／丈量約份及地段號碼（如適用）	No. 81, SAN TAM ROAD LOT 4823 IN DD 104
(c)	Site Area 申請地點面積	736.3 sq.m 平方米 ☐ About 約

(d) Area of Government land included (if any) 所包括的政府土地面積 (倘有)	.....sq.m 平方米 ☐ About 約
(e) Current use(s) 現時用途	HOUSE (If there are any Government, institution or community facilities, please illustrate on plan and specify the use and gross floor area) (如有任何政府、機構或社區設施，請在圖則上顯示，並註明用途及總樓面面積)

4. "Current Land Owner" of Application Site 申請地點的「現行土地擁有人」

The applicant 申請人 –

☑ is the sole "current land owner"#& (please proceed to Part 6 and attach documentary proof of ownership).
是唯一的「現行土地擁有人」#& (請繼續填寫第 6 部分，並夾附業權證明文件)。

☐ is one of the "current land owners"#& (please attach documentary proof of ownership).
是其中一名「現行土地擁有人」#& (請夾附業權證明文件)。

☐ is not a "current land owner"#.
並不是「現行土地擁有人」#。

☐ The application site is entirely on Government land (please proceed to Part 6).
申請地點完全位於政府土地上（請繼續填寫第 6 部分）。

5. Statement on Owner's Consent/Notification
就土地擁有人的同意/通知土地擁有人的陳述

(a) According to the record(s) of the Land Registry as at ..... (DD/MM/YYYY), this application involves a total of ..... "current land owner(s) "#.
根據土地註冊處截至 ..... 年 ..... 月 ..... 日的記錄，這宗申請共牽涉 ..... 名「現行土地擁有人」#。

(b) The applicant 申請人 –

☐ has obtained consent(s) of ..... "current land owner(s)"#.
已取得 ..... 名「現行土地擁有人」#的同意。

Details of consent of "current land owner(s)"# obtained 取得「現行土地擁有人」#同意的詳情		
No. of 'Current Land Owner(s)' 「現行土地擁有人」數目	Lot number/address of premises as shown in the record of the Land Registry where consent(s) has/have been obtained 根據土地註冊處記錄已獲得同意的地段號碼／處所地址	Date of consent obtained (DD/MM/YYYY) 取得同意的日期 (日/月/年)

(Please use separate sheets if the space of any box above is insufficient. 如上列任何方格的空間不足，請另頁說明)

☐ has notified ..... "current land owner(s)"#
已通知 ..... 名「現行土地擁有人」#。

Details of the "current land owner(s)"# notified 已獲通知「現行土地擁有人」#的詳細資料		
No. of 'Current Land Owner(s)' 「現行土地擁有人」數目	Lot number/address of premises as shown in the record of the Land Registry where notification(s) has/have been given 根據土地註冊處記錄已發出通知的地段號碼／處所地址	Date of notification given (DD/MM/YYYY) 通知日期(日/月/年)

(Please use separate sheets if the space of any box above is insufficient. 如上列任何方格的空間不足，請另頁說明)

☐ has taken reasonable steps to obtain consent of or give notification to owner(s):
已採取合理步驟以取得土地擁有人的同意或向該人發給通知。詳情如下：

Reasonable Steps to Obtain Consent of Owner(s) 取得土地擁有人的同意所採取的合理步驟

☐ sent request for consent to the "current land owner(s)"#& on _____ (DD/MM/YYYY)
於_____(日/月/年)向每一名「現行土地擁有人」#郵遞要求同意書&

Reasonable Steps to Give Notification to Owner(s) 向土地擁有人發出通知所採取的合理步驟

☐ published notices in local newspapers& on _____ (DD/MM/YYYY)
於_____(日/月/年)在指定報章就申請刊登一次通知&

☐ posted notice in a prominent position on or near application site/premises& on
_____ (DD/MM/YYYY)
於_____(日/月/年)在申請地點／申請處所或附近的顯明位置貼出關於該申請的通知&

☐ sent notice to relevant owners' corporation(s)/owners' committee(s)/mutual aid committee(s)/management office(s) or rural committee& on _____ (DD/MM/YYYY)
於_____(日/月/年)把通知寄往相關的業主立案法團/業主委員會/互助委員會或管理處，或有關的鄉事委員會&

Others 其他

☐ others (please specify)
其他（請指明）

_____
_____
_____
_____

Note: May insert more than one「✔」.
Information should be provided on the basis of each and every lot (if applicable) and premises (if any) in respect of the application.
註: 可在多於一個方格內加上「✔」號
申請人須就申請涉及的每一地段（倘適用）及處所（倘有）分別提供資料

6. Plan Proposed to be Amended 擬議修訂的圖則

(a) Name and number of the related statutory plan(s) 有關法定圖則的名稱及編號	APPROVED NGAU TAM MEI OUTLINE ZONING PLAN S/YL-NTM/12
(b) Land use zone(s) involved (if applicable) 涉及的土地用途地帶(如適用)	"R(C)"

7. Proposed Amendments 擬議修訂

(a) Propose to rezone the application site to the following zone(s)/use(s)
(May insert more than one 「✔」) (Please illustrate the details on plan)
建議將申請地點的用途地帶改劃作下列地帶 / 用途
(可在多於一個方格內加上「✔」號) (請在圖則顯示詳情)

☐ Comprehensive Development Area [ ]
綜合發展區 [ ]

☐ Residential (Group ☐A/☐B/☐C/☐D/☐E) [ ]
住宅 (☐甲類 / ☐乙類 / ☐丙類 / ☐丁類 / ☐戊類) [ ]

☐ Agriculture [ ] 農業 [ ]

☐ Industrial (Group D) [ ] 工業 (丁類) [ ]

☑ Government, Institution or Community [ ]
政府、機構或社區 [ ]

☐ Recreation [ ] 康樂 [ ]

☐ Country Park [ ] 郊野公園 [ ]

☐ Conservation Area [ ] 自然保育區 [ ]

☐ Commercial [ ] 商業 [ ]

☐ Village Type Development [ ]
鄉村式發展 [ ]

☐ Industrial [ ] 工業 [ ]

☐ Open Storage [ ] 露天貯物 [ ]

☐ Open Space [ ] 休憩用地 [ ]

☐ Green Belt [ ] 綠化地帶 [ ]

☐ Coastal Protection Area [ ]
海岸保護區 [ ]

☐ Site of Special Scientific Interest [ ]
具特殊科學價值地點 [ ]

☐ Other Specified Uses (☐Business/☐Industrial Estate/☐Mixed Use/☐Rural Use/☐Petrol Filling Station/☐Others (please specify_____)) [ ]
其他指定用途 (☐商貿 / ☐工業邨 / ☐混合用途 / ☐鄉郊用途 / ☐加油站 / ☐ 其他 (請註明：_____)) [ ]

☐ Road 道路

☐ Others (please specify_____)
其他 (請註明：_____)

Please insert subzone in [ ] as appropriate.
請於[ ]內註明支區，如適用。

(b) Propose to amend the Notes of the Plan(s) 建議修訂圖則的《註釋》

☐ Covering Notes 《註釋》說明頁

☐ Notes of the zone applicable to the Site 適用於申請地點土地用途地帶的《註釋》

Details of the proposed amendment(s) to the Notes of the Plan, where appropriate, are as follows:
(Please use separate sheets if the space below is insufficient)
建議修訂圖則的《註釋》的詳情，如適用：
(如下列空間不足，請另頁說明)

.....

.....

.....

.....

.....

.....

.....

.....

☐ Proposed Notes of Schedule of Uses of the zone attached
夾附對《 註釋 》的擬議修訂

8. Details of Proposed Amendment (if any) 擬議修訂詳情 (倘有)

☑ Particulars of development are included in the **Appendix**.
附錄包括一個擬議發展的細節。

☐ No specific development proposal is included in this application.
這宗申請並不包括任何指定的擬議發展計劃。

9. Justifications 理由

The applicant is invited to provide justifications in support of the application. Use separate sheets if necessary.
現請申請人提供申請理由及支持其申請的資料。如有需要請另頁說明。

.....

Please see the Planning Statement attached

.....

.....

.....

.....

.....

.....

.....

10. Declaration 聲明

I hereby declare that the particulars given in this application are correct and true to the best of my knowledge and belief.
本人謹此聲明，本人就這宗申請提交的資料，據本人所知及所信，均屬真實無誤。

I hereby grant a permission to the Board to copy all the materials submitted in this application and/or to upload such materials to the Board's website for browsing and downloading by the public free-of-charge at the Board's discretion.
本人現准許委員會酌情將本人就此申請所提交的所有資料複製及/或上載至委員會網站，供公眾免費瀏覽或下載。

Signature 簽署 ..... ☐ Applicant 申請人 / ☑ Authorised Agent 獲授權代理人

LEE YING KIT
Name in Block Letters 姓名（請以正楷填寫）

DIRECTOR
Position (if applicable) 職位 （如適用）

Professional Qualification(s) 專業資格
☐ Member 會員 / ☐ Fellow of 資深會員
☐ HKIP 香港規劃師學會 / ☑ HKIA 香港建築師學會 /
☐ HKIS 香港測量師學會 / ☐ HKIE 香港工程師學會 /
☐ HKILA 香港園境師學會/ ☐ HKIUD 香港城市設計學會
☐ RPP 註冊專業規劃師
Others 其他 .....

on behalf of 代表 R LEE ARCHITECTS (HK) LTD

☑ Company 公司 / ☐ Organisation Name and Chop (if applicable) 機構名稱及蓋章（如適用）

Date 日期 15/07/2022 (DD/MM/YYYY 日/月/年)

Remark 備註

The materials submitted in this application and the Board's decision on the application would be disclosed to the public. Such materials would also be uploaded to the Board's website for browsing and free downloading by the public where the Board considers appropriate.
委員會會向公眾披露申請人所遞交的申請資料和委員會對申請所作的決定。在委員會認為合適的情況下，有關申請資料亦會上載至委員會網頁供公眾免費瀏覽及下載。

Warning 警告

Any person who knowingly or wilfully makes any statement or furnish any information in connection with this application, which is false in any material particular, shall be liable to an offence under the Crimes Ordinance.
任何人在明知或故意的情況下，就這宗申請提出在任何要項上是虛假的陳述或資料，即屬違反《刑事罪行條例》。

Statement on Personal Data 個人資料的聲明

1. The personal data submitted to the Board in this application will be used by the Secretary of the Board and Government departments for the following purposes:
委員會就這宗申請所收到的個人資料會交給委員會秘書及政府部門，以根據《城市規劃條例》及相關的城市規劃委員會規劃指引的規定作以下用途：

   (a) the processing of this application which includes making available the name of the applicant for public inspection when making available this application for public inspection; and
   處理這宗申請，包括公布這宗申請供公眾查閱，同時公布申請人的姓名供公眾查閱；以及
   (b) facilitating communication between the applicant and the Secretary of the Board/Government departments.
   方便申請人與委員會秘書及政府部門之間進行聯絡。

2. The personal data provided by the applicant in this application may also be disclosed to other persons for the purposes mentioned in paragraph 1 above.
申請人就這宗申請提供的個人資料，或亦會向其他人士披露，以作上述第 1 段提及的用途。

3. An applicant has a right of access and correction with respect to his/her personal data as provided under the Personal Data (Privacy) Ordinance (Cap. 486). Request for personal data access and correction should be addressed to the Secretary of the Board at 15/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong.
根據《個人資料(私隱)條例》(第 486 章)的規定，申請人有權查閱及更正其個人資料。如欲查閱及更正個人資料，應向委員會秘書提出有關要求，其地址為香港北角渣華道 333 號北角政府合署 15 樓。

APPLICATION FOR AMENDMENT OF PLAN UNDER SECTION 12A OF THE TOWN PLANNING ORDINANCE (CAP. 131)
根據城市規劃條例(第 131 章)第 12A 條遞交的修訂圖則申請

Development Proposal (only for indicative purpose)
擬議發展的發展計劃（只作指示用途）

1. Development Proposal 擬議發展計劃

☑ Proposed Gross floor area (GFA) 擬議總樓面面積	5,400 sq.m. 平方米	☑ About 約
☑ Proposed plot ratio 擬議地積比率	7.33	☑ About 約
☑ Proposed site coverage 擬議上蓋面積	75.558 %	☑ About 約
☑ Proposed number of blocks 擬議座數	1	
☑ Proposed number of storeys of each block 每座建築物的擬議層數	10 storeys 層 ☐ include 包括 ____ storeys of basements 層地庫 ☐ exclude 不包括 ____ storeys of basements 層地庫	
☑ Proposed building height of each block 每座建築物的擬議高度	29.6 m 米	☑ About 約
	36.93 mPD 米(主水平基準上)	☑ About 約
☐ Domestic part 住用部分		
GFA 總樓面面積	sq.m. 平方米	☐ About 約
number of units 單位數目		
average unit size 單位平均面積	sq.m. 平方米	☐ About 約
estimated number of residents 估計住客數目		
	GFA 總樓面面積	
☑ Non-domestic part 非住用部分	sq.m.平方米	☐ About 約
☐ hotel 酒店	sq.m.平方米	☐ About 約
	(please specify the number of rooms 請註明房間數目:)	
☑ office 辦公室	426.802 sq.m.平方米	☐ About 約
☐ shop and services/eating place 商店及服務行業/食肆	sq.m.平方米	☐ About 約
☑ Government, institution or community facilities 政府、機構或社區設施	(please specify the use(s) and concerned land area(s)/GFA(s)) (請註明用途及有關的地面面積/總樓面面積)	
	RCHE 4,973.198 m² About	
☐ other(s)其他	(please specify the use(s) and concerned land area(s)/GFA(s)) (請註明用途及有關的地面面積/總樓面面積)	
☑ Open space 休憩用地	(please specify land area(s)) (請註明面積)	
☑ private open space 私人休憩用地	183.620 sq.m.平方米	☑ Not less than 不少於
☐ public open space 公共休憩用地	sq.m.平方米	☐ Not less than 不少於

☐ Transport-related facilities 與運輸有關的設施

☐ parking spaces 停車位 (please specify type(s) and number(s)) (請註明種類及數目)

Private Car Parking Spaces 私家車車位	2 (including 1 Accessible Car Parking)
Motorcycle Parking Spaces 電單車車位	1
Light Goods Vehicle Parking Spaces 輕型貨車泊車位	
Medium Goods Vehicle Parking Spaces 中型貨車泊車位	
Heavy Goods Vehicle Parking Spaces 重型貨車泊車位	
Others (Please Specify) 其他 (請列明)	

☑ loading/unloading spaces 上落客貨車位 (please specify type(s) and number(s)) (請註明種類及數目)

Taxi Spaces 的士車位	
Coach Spaces 旅遊巴車位	1 MINIBUS
Light Goods Vehicle Spaces 輕型貨車車位	1
Medium Goods Vehicle Spaces 中型貨車車位	
Heavy Goods Vehicle Spaces 重型貨車車位	
Others (Please Specify) 其他 (請列明)	

☐ other transport-related facilities 其他與運輸有關的設施 (please specify type(s) and number(s)) (請註明種類及數目)

Use(s) of different floors (if applicable) 各樓層的用途(如適用)

[Block number] [座數]	[Floor(s)] [層數]	[Proposed use(s)] [擬議用途]
1	LG1F	ENTRANCE LOBBY & CAR PARK
	UG/F	MULTI-PURPOSE ROOM, LAUNDRY & KITCHEN
	1/F	SKYGARDEN & WELLNESS CENTRE
	2/F - 7/F	RCHE
	8/F	ADMIN OFFICE & STAFF QUARTER

Proposed use(s) of uncovered area (if any) 露天地方(倘有)的擬議用途

R/F ROOF GARDEN
2/F SKY GARDEN

Any vehicular access to the site? 是否有車路通往地盤?

Yes 是 ☑ There is an existing access. (please indicate the street name, where appropriate) 有一條現有車路。(請註明道路名稱(如適用))
SAN TAM ROAD

☐ There is a proposed access. (please illustrate on plan and specify the width) 有一條擬議車路。(請在圖則顯示，並註明車路的闊度)

No 否 ☐

For Development involving columbarium use, please complete the table in the Annex to this Appendix.
如發展涉及靈灰安置所用途，請填妥於此附件後附錄的表格。

2. Impacts of Development Proposal 擬議發展計劃的影響

If necessary, please use separate sheets to indicate the proposed measures to minimise possible adverse impacts or give justifications/reasons for not providing such measures
如需要的話，請另頁註明可盡量減少可能出現不良影響的措施，否則請提供理據/理由。

Does the development proposal involve alteration of existing building? 擬議發展計劃是否包括現有建築物的改動?	Yes 是	☑ Please provide details 請提供詳情 The existing building would be demolished for re-development
	No 否	☐
Does the development proposal involve the operation on the right? 擬議發展是否涉及右列的工程?	Yes 是	☐ (Please indicate on site plan the boundary of concerned land/pond(s), and particulars of stream diversion, the extent of filling of land/pond(s) and/or excavation of land) (請用地盤平面圖顯示有關土地／池塘界線，以及河道改道、填塘、填土及／或挖土的細節及/或範圍) ☐ Diversion of stream 河道改道 ☐ Filling of pond 填塘 Area of filling 填塘面積 ..... sq.m 平方米 ☐About 約 Depth of filling 填塘深度 ..... m 米 ☐About 約 ☐ Filling of land 填土 Area of filling 填土面積 ..... sq.m 平方米 ☐About 約 Depth of filling 填土厚度 ..... m 米 ☐About 約 ☐ Excavation of land 挖土 Area of excavation 挖土面積..... sq.m 平方米 ☐About 約 Depth of excavation 挖土深度 .....m 米 ☐About 約
	No 否	☑

Would the development proposal cause any adverse impacts?
擬議發展計劃會否造成不良影響？

On environment 對環境	Yes 會 ☐	No 不會 ☑
On traffic 對交通	Yes 會 ☐	No 不會 ☑
On water supply 對供水	Yes 會 ☐	No 不會 ☑
On drainage 對排水	Yes 會 ☐	No 不會 ☑
On slopes 對斜坡	Yes 會 ☐	No 不會 ☑
Affected by slopes 受斜坡影響	Yes 會 ☐	No 不會 ☑
Landscape Impact 構成景觀影響	Yes 會 ☐	No 不會 ☑
Tree Felling 砍伐樹木	Yes 會 ☐	No 不會 ☑
Visual Impact 構成視覺影響	Yes 會 ☐	No 不會 ☑
Others (Please Specify) 其他 (請列明)	Yes 會 ☐	No 不會 ☐

Please state measure(s) to minimise the impact(s). For tree felling, please state the number, diameter at breast height and species of the affected trees (if possible)
請註明盡量減少影響的措施。如涉及砍伐樹木，請說明受影響樹木的數目、及胸高度的樹幹直徑及品種(倘可)

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For Developments involving Columbarium Use, please also complete the following:
如發展涉及靈灰安置所用途，請另外填妥以下資料

Ash interment capacity 骨灰安放容量@

Maximum number of sets of ashes that may be interred in the niches
在龕位內最多可安放骨灰的數量 _____

Maximum number of sets of ashes that may be interred other than in niches
在非龕位的範圍內最多可安放骨灰的數量 _____

Total number of niches 龕位總數 _____

Total number of single niches
單人龕位總數 _____

Number of single niches (sold and occupied)
單人龕位數目 (已售並佔用) _____

Number of single niches (sold but unoccupied)
單人龕位數目 (已售但未佔用) _____

Number of single niches (residual for sale)
單人龕位數目 (待售) _____

Total number of double niches
雙人龕位總數 _____

Number of double niches (sold and fully occupied)
雙人龕位數目 (已售並全部佔用) _____

Number of double niches (sold and partially occupied)
雙人龕位數目 (已售並部分佔用) _____

Number of double niches (sold but unoccupied)
雙人龕位數目 (已售但未佔用) _____

Number of double niches (residual for sale)
雙人龕位數目 (待售) _____

Total no. of niches other than single or double niches (please specify type)
除單人及雙人龕位外的其他龕位總數 (請列明類別) _____

Number. of niches (sold and fully occupied)
龕位數目 (已售並全部佔用) _____

Number of niches (sold and partially occupied)
龕位數目 (已售並部分佔用) _____

Number of niches (sold but unoccupied)
龕位數目 (已售但未佔用) _____

Number of niches (residual for sale)
龕位數目 (待售) _____

Proposed operating hours 擬議營運時間 _____

_____

@ Ash interment capacity in relation to a columbarium means –
就靈灰安置所而言，骨灰安放容量指：
- the maximum number of containers of ashes that may be interred in each niche in the columbarium;
每個龕位內可安放的骨灰容器的最高數目；
- the maximum number of sets of ashes that may be interred other than in niches in any area in the columbarium; and
在該靈灰安置所並非龕位的範圍內，總共最多可安放多少份骨灰；以及
- the total number of sets of ashes that may be interred in the columbarium.
在該骨灰安置所內，總共最多可安放多少份骨灰。

Gist of Application 申請摘要

(Please provide details in both English and Chinese as far as possible. This part will be circulated to relevant consultees, uploaded to the Town Planning Board's Website for browsing and free downloading by the public and available at the Planning Enquiry Counters of the Planning Department for general information.)
(請盡量以英文及中文填寫。此部分將會發送予相關諮詢人士、上載至城市規劃委員會網頁供公眾免費瀏覽及下載及於規劃署規劃資料查詢處供一般參閱。)

Application No. 申請編號	(For Official Use Only) (請勿填寫此欄)
Location/address 位置／地址	NO. 81, SAN TAM ROAD, SAN TIN LOT 4823 IN DD 104
Site area 地盤面積	736.3 sq. m 平方米 ☑ About 約 (includes Government land of 包括政府土地 sq. m 平方米 ☐ About 約)
Plan 圖則	S/YL-NTM/12
Zoning 地帶	"R(C)"
Proposed Amendment(s) 擬議修訂	☐ Amend the Covering Notes of the Plan 修訂圖則《註釋》的說明頁 ☐ Amend the Notes of the zone applicable to the site 修訂適用於申請地點土地用途地帶的《註釋》 ☑ Rezone the application site from R(C) to G/IC 把申請地點由_____地帶改劃為_____

Development Parameters (for indicative purpose only) 發展參數(只作指示用途)

			sq.m 平方米	Plot Ratio 地積比率
(i)	Gross floor area and/or plot ratio 總樓面面積及／或地積比率	Domestic 住用	☐ About 約 ☐ Not more than 不多於	☐About 約 ☐Not more than 不多於
		Non-domestic 非住用	☑ About 約 ☐ Not more than 不多於 5,400	☑About 約 ☐Not more than 不多於 7.33
(ii)	No. of block 幢數	Domestic 住用		
		Non-domestic 非住用		
		Composite 綜合用途	1	

(iii)	Building height/No. of storeys 建築物高度／層數	Domestic 住用	m 米 ☐ (Not more than 不多於)
			mPD 米(主水平基準上) ☐ (Not more than 不多於)
			Storeys(s) 層 ☐ (Not more than 不多於) (☐*Include 包括*/☐ *Exclude 不包括* ☐ *Carport 停車間* ☐ *Basement 地庫* ☐ *Refuge Floor 防火層* ☐ *Podium 平台*)
		Non-domestic 非住用	m 米 ☐ (Not more than 不多於)
			mPD 米(主水平基準上) ☐ (Not more than 不多於)
			Storeys(s) 層 ☐ (Not more than 不多於) (☐*Include 包括*/☐ *Exclude 不包括* ☐ *Carport 停車間* ☐ *Basement 地庫* ☐ *Refuge Floor 防火層* ☐ *Podium 平台*)
		Composite 綜合用途	29.6 m 米 ☑ (Not more than 不多於)
			36.93 mPD 米(主水平基準上) ☑ (Not more than 不多於)
			10 Storeys(s) 層 ☑ (Not more than 不多於) (☑*Include 包括*/☐ *Exclude 不包括* ☑ *Carport 停車間* ☐ *Basement 地庫* ☐ *Refuge Floor 防火層* ☐ *Podium 平台*)
(iv)	Site coverage 上蓋面積	100% (below 15 m) 75.558% (above 15 m) %	☐ About 約
(v)	No. of units 單位數目	142 (nos. of bed)	
(vi)	Open space 休憩用地	Private 私人	183.620 sq.m 平方米 ☑ Not less than 不少於
		Public 公眾	sq.m 平方米 ☐ Not less than 不少於

(vii) No. of parking spaces and loading / unloading spaces 停車位及上落客貨車位數目	Total no. of vehicle parking spaces 停車位總數 Private Car Parking Spaces 私家車車位 Motorcycle Parking Spaces 電單車車位 Light Goods Vehicle Parking Spaces 輕型貨車泊車位 Medium Goods Vehicle Parking Spaces 中型貨車泊車位 Heavy Goods Vehicle Parking Spaces 重型貨車泊車位 Others (Please Specify) 其他 (請列明) _____ _____	3 2 1
	Total no. of vehicle loading/unloading bays/lay-bys 上落客貨車位／停車處總數 Taxi Spaces 的士車位 Coach Spaces 旅遊巴車位 Light Goods Vehicle Spaces 輕型貨車車位 Medium Goods Vehicle Spaces 中型貨車位 Heavy Goods Vehicle Spaces 重型貨車車位 Others (Please Specify) 其他 (請列明) _____ _____	2 1 1

Submitted Plans, Drawings and Documents 提交的圖則、繪圖及文件

	Chinese 中文	English 英文
Plans and Drawings 圖則及繪圖		
Master layout plan(s)/Layout plan(s) 總綱發展藍圖／布局設計圖	☐	☑
Block plan(s) 樓宇位置圖	☐	☑
Floor plan(s) 樓宇平面圖	☐	☑
Sectional plan(s) 截視圖	☐	☑
Elevation(s) 立視圖	☐	☐
Photomontage(s) showing the proposed development 顯示擬議發展的合成照片	☐	☑
Master landscape plan(s)/Landscape plan(s) 園境設計總圖／園境設計圖	☐	☑
Others (please specify) 其他（請註明）	☐	☐
_____		
_____		
Reports 報告書		
Planning Statement/Justifications 規劃綱領/理據	☐	☑
Environmental assessment (noise, air and/or water pollutions) 環境評估（噪音、空氣及／或水的污染）	☐	☑
Traffic impact assessment (on vehicles) 就車輛的交通影響評估	☐	☑
Traffic impact assessment (on pedestrians) 就行人的交通影響評估	☐	☑
Visual impact assessment 視覺影響評估	☐	☑
Landscape impact assessment 景觀影響評估	☐	☑
Tree Survey 樹木調查	☐	☐
Geotechnical impact assessment 土力影響評估	☐	☐
Drainage impact assessment 排水影響評估	☐	☑
Sewerage impact assessment 排污影響評估	☐	☑
Risk Assessment 風險評估	☐	☐
Others (please specify) 其他（請註明）	☐	☐
_____		
_____		

Note: May insert more than one「✔」. 註：可在多於一個方格內加上「✔」號

Note: The information in the Gist of Application above is provided by the applicant for easy reference of the general public. Under no circumstances will the Town Planning Board accept any liabilities for the use of the information nor any inaccuracies or discrepancies of the information provided. In case of doubt, reference should always be made to the submission of the applicant.

註： 上述申請摘要的資料是由申請人提供以方便市民大眾參考。對於所載資料在使用上的問題及文義上的歧異，城市規劃委員會概不負責。若有任何疑問，應查閱申請人提交的文件。

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.

Consolidated Planning Statement

(Vol. 1)

RLEE

RLEE Architects (HK) Ltd

CONTENTS

Chapter 1 – Response-to-Comments

Chapter 2 – Supporting Planning Statement

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

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

Chapter 1

Response-to-Comments

CONTENTS

Response-to-Comment
- SWD
- HyD
- DSD
- CEDD
- EPD
- EMSD
- PlanD
- TD

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 - SWD

RLEE

RLEE Architects (HK) Ltd

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 – SWD
(dated to 27 SEPTEMBER 2022)

Comments	Response
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) :	
1.1 Comments from RCHE licensing perspective (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.	Noted. The detail GBP will be submitted to BD for approval in due course.
(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.	Noted. The detail GBP will be submitted to BD for approval in due course.
(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 & 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.	Noted. The detail GBP will be submitted to BD for approval in due course.

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.
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Response-to-Comment – SWD
(dated to 27 SEPTEMBER 2022)

Comments	Response
(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.	Noted. The detail GBP will be submitted to BD for approval in due course.
(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.	Noted. The detail GBP will be submitted to BD for approval in due course.
(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.	Noted. The detail GBP will be submitted to BD for approval in due course.
(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.	Noted. The detail GBP will be submitted to BD for approval in due course.
	Noted. The detail GBP will be submitted to BD for approval in due course.

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Comments	Response
(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.	Noted. The detail GBP will be submitted to BD for approval in due course.
(ix) Net floor area should be demonstrated by area calculation diagram.	Noted. The detail GBP will be submitted to BD for approval in due course.
(x) A designated isolation room shall be provided for every 50 beds.	3 isolation rooms are provided on 3/F as shown on revised G-06 Rev B.
(xi) The captioned premises should be of free of unauthorized building works.	No UBW exists in the captioned premises.
(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 (www. bd.gov.hk).	Noted

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(dated to 27 SEPTEMBER 2022)

Comments	Response
(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.	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.

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Response-to-Comment – SWD
(dated to 27 SEPTEMBER 2022)

Comments	Response
1.2 Comments from RCHE services perspective **A) Salient points on design of RCHE** i) Boundary/ extent of the RCHE ● The boundary/ extent of the proposed RCHE appear not well defined in the applicant's submission. ● 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 & 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. ● The applicant should clarify the boundary/ extent and the total GFA of the intended RCHE for our consideration.	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.

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(dated to 27 SEPTEMBER 2022)

Comments	Response
ii) 24m height restriction of RCHE ● 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.	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.
● 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".	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.
● 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.	

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Comments	Response
iii) Isolation measures • As shown from the Proposed RCHE Design of "Drawing & Plans - Supporting Planning Statement" (P.9-17), the essential facility of isolation room is found missing in the proposed RCHE. • 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." • Hence, the applicant should provide relevant isolation rooms/ facilities for the proposed RCHE to meet the infection control purpose in accordance with licensing requirement.	3 nos. of Isolation Rooms are provided on 3/F as shown on revised G-06 Rev. B.

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(dated to 27 SEPTEMBER 2022)

Comments	Response
B) Views on the Applicant's intention for joining the Premium Concession Scheme ● 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. ● 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 – a) the proposed RCHE should be a satisfactory design as agreed by the Social Welfare Department; b) there shall be no financial implications, both capital and recurrent, to the Government; 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); and	We intend to apply to join the Premium Concession Scheme upon TPB approval of the subject site.

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 – SWD
(dated to 27 SEPTEMBER 2022)

Comments	Response
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. • 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. • 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.	

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 – SWD
(dated to 27 SEPTEMBER 2022)

Comments	Response
• 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.	Noted. The mentioned facilities are for the exclusive use of RCHE and should not be opened to the use of public.

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 – SWD
(dated 13 DECEMBER 2022)

Comments	Response
1.1 Comments from RCHE licensing perspective	
(i) In assessing a licence application, the applicant is required to comply with the requirements stipulated in the Residential Care Homes (Elderly Persons) Ordinance (Cap. 459), its subsidiary legislation and the latest version of the Code of Practice for Residential Care Homes (Elderly Persons)(CoP).	Noted
(ii) As noted from the submitted R-to-C in respect of the building height, it is mentioned that the proposed highest floor of the dormitory is on 8/F and within 24 m from ground. However, as shown on the section plan, the height of 8/F is exceeding 24 m measuring from the San Tam Road and it is proposed to be used for administrative office and staff quarter. The applicant is thus required to clarify the proposed usage of 8/F and ensure that all dormitories are located within 24 m measuring vertically from the ground of the building as required under section 20 of the Residential Care Homes (Elderly Persons) Regulation.	It is a typo-error of the previously submitted R-to-C. It should be "The proposed highest floor of the dormitory is on 7/F and within 24 m from ground. One additional floor above the dormitory above 24m 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 7/F and its floor slab is within 24 m from the street level."
(iii) For those ancillary facilities of the RCHE to which the resident normally do not have access (e.g. kitchen, laundry room, office, staff resting room) and proposed to to be situated at a height more than 24 m above the ground, the applicant's attention is drawn to the previous comments lastly provided and recapped as follows :	Noted

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 – SWD
(dated 13 DECEMBER 2022)

Comments	Response
(iv) "Under section 20 of the Residential Care Homes (Elderly Persons) Regulation, 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 the operator of the proposed RCHE can prove that the proposed 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 resident 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 ".	Noted. Detail design would be provided on next step.

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 – SWD
(dated 13 DECEMBER 2022)

Comments	Response
1.2 Comments from RCHE services perspective (I) Applicant's R-to-C A) Salient points on design of RCHE i) Boundary/ extent of the RCHE	
• The applicant should clarify the boundary/ extent and the total GFA of the intended RCHE for our consideration. As per our last comments, the applicant clarified that 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 boundary/extent included other facilities such as Entrance, Carpark, Multi-purpose Room, Wellness Centre, Sky Garden, Administrative Office and Staff Quarter has been submitted as per last R-to-C. The total GFA of the intended RCHE is 5,400 sq.m.
• While the site boundary is indicated by red-dashed line in all revised drawings, we have no further comments on extent of the RCHE at this stage.	
ii) 24m height restriction of RCHE	
• The applicant replied that the 24m height restriction of RCHE was noted. While it is indicated "our proposed highest floor of the dormitory on 8/F is within 24m from ground" and "one additional floor above the dormitory above 24m is soley for the administrative staff", we would like to defer to LORCHE for comments should the proposed location of the RCHE is in full compliance of the 24m height requirements in accordance with the licensing standard.	Noted. It is a typo-error of the previously submitted R-to-C. It should be "The proposed highest floor of the dormitory is on 7/F and within 24 m from ground. One additional floor above the dormitory above 24m 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 7/F and its floor slab is within 24 m from the street level."

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 – SWD
(dated 13 DECEMBER 2022)

Comments	Response
iii) Isolation measures ● As per our last comments, 3 no. of Isolation Rooms are added on 3/F as shown on the revised layout plan for the fulfilment of licensing requirements. ● Subject to design feasibility, the applicant may consider providing a protected lobby, say 2 sq.m in area, at the entrance of each Isolation Room for infection control purpose.	Protected lobbies to the 3 nos. isolation rooms of area not less than 2 sq.m are added as shown on G-06 Rev.C.

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 – SWD
(dated 13 DECEMBER 2022)

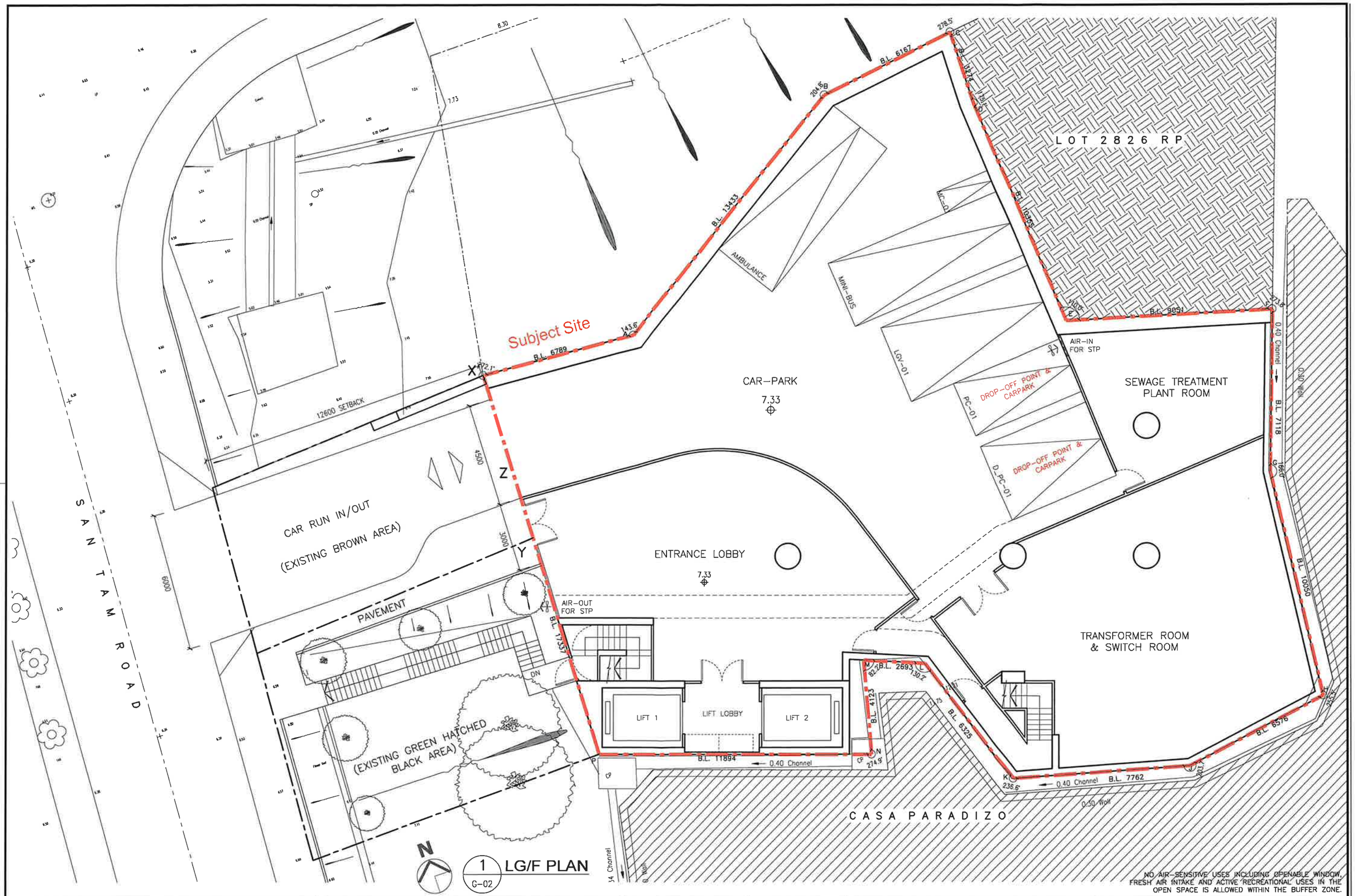
Comments	Response
B) Comments on the Applicant's intention for joining the Premium Concession Scheme	
• While the applicant indicated an intention for joining the Premium Concession Scheme upon TPB's approval of the subject site, please note that our previous comments with regard to the application for joining this Scheme remains valid.	Noted
• It is noted that some non-standard facilities of RCHE, including the Sky Garden, Wellness Centre and Hydrotherapy (on 1/F) and Staff Quarter involving 8 no. of staff rooms (8/F) and Roof Garden and Farming Areas (on Roof/F) are provided for the RCHE. While the applicant stated that the mentioned facilities are for exclusive use of the RCHE and should not be opened for the public use, would the applicant please provide more information on the usage of these functional rooms/areas and the justifications for such provision for our consideration.	Wellness Centre and Hydrotherapy are for rehabilitation use. The Sky Garden and Roof Garden and Farming Areas are for the residents to have outdoor exercises. The staff rooms of Staff Quarter are for the overnight staffs to rest. Also, it can provide spaces for the staffs during the close-loop management if necessary.
• With a view to providing a quality RCHE for service users, the applicant is further reminded to make reference to the attached documents (i) to (iv) in the design of the RCHE – (i) Guidance Note: Guidance_Note_(Eng)_Jan_2022.pdf (ii) Best Practices in Design and Operation of RCHE: Best Practices in Design and Operation (Jan 2015).pdf	Noted

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 – SWD
(dated 13 DECEMBER 2022)

Comments	Response
(iii) Best Practices Guideline - Basic Provision Schedule Specific Requirements for RCHE: Best_Practices_Guideline_RCHE_March_2020.pdf (iv) A Supplement on Ventilation - Guidelines on Prevention of Communicable Diseases in RCHEs/ Residential Care Homes for Persons with Disabilities: a_supplement_on_ventilation.pdf	Noted
(II) Revised RCHE Design	
• It is noted that most of the beds have either of the lateral sides leaning directly against the wall. To facilitate the caring of the elderly from both sides of the bed, would the applicant please review the design and position the beds with adequate spaces on both sides.	Noted
• While two lifts are provided for the RCHE, to facilitate the escort of the elderly in the event of medical emergency, would the applicant ensure that the capacity of one of the lifts is able to accommodate a stretcher bed measuring 2050mm x 560mm.	We would provide the lifts with bare size: 2900 mm x 2000 mm. Both lifts are able to accommodate a stretcher bed of size 2050mm x 560mm.
• Car parking spaces are located on LG/F. To enhance safety in escorting the elderly during adverse weather, would the applicant please ensure the walkpath from the drop-off point to the entrance of the RCHE be provided with cover and convenient for access.	Two drop-off points inside covered carparks are provided as shown on G-02 Rev.C.

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 – SWD
(dated 13 DECEMBER 2022)

Comments	Response
• It is noted that the design of the proposed RCHE is at a preliminary stage. If the applicant would like to apply for joining the Premium Concession Scheme for the RCHE development, the design of the RCHE should be satisfactory and agreed by SWD. In this regard, we stand ready to provide further comments at a later stage on the revised layout plan including but not limited to the number of beds to be provided.	Noted



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.

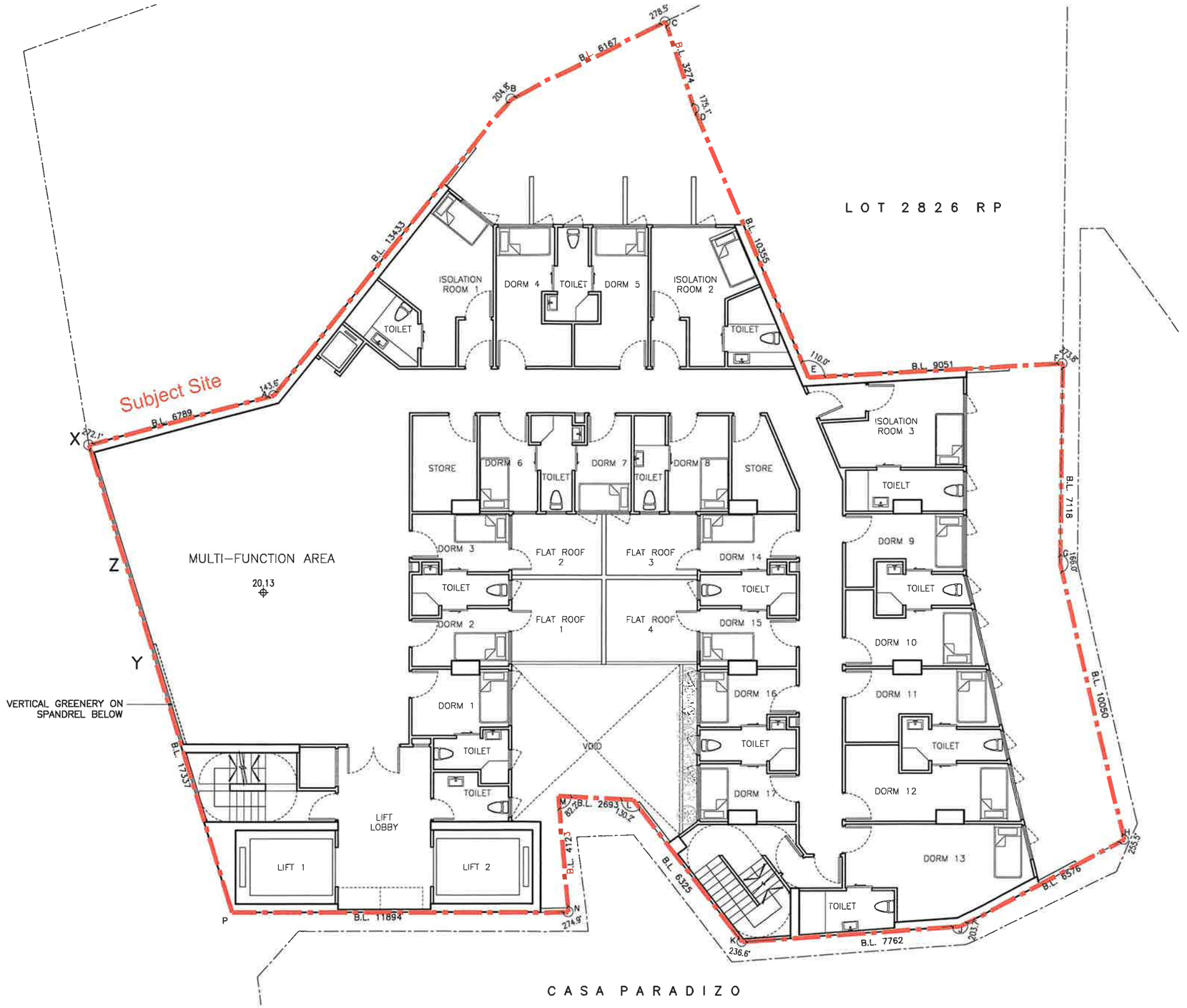
LG/F PLAN
ENTRANCE & CARPARK

G–02 1:150 (A3) 1:225 (A4)

C	DEC. 2022
B	OCT. 2022
A	JULY. 2022

Do not scale drawing.
Contractors are required to verify exact dimensions on site.
The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate.
The design remains to be the property of "Rlee Architects (HK) Ltd" unless otherwise specified.
This drawing is not for construction purposes unless expressedly certified.

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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) 1:225 (A4)

C	DEC. 2022	
B	OCT. 2022	
A	JULY. 2022	

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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 – SWD
(updated 13 April 2023)

Comments	Response
2. Comments of the Director of Social Welfare, Social Welfare Department (DSW, SWD) as follows:	
RCHE Services Perspective	
(A) Applicant's R-to-C	
(i) Boundary/ Extent of the RCHE	
• Given the applicant has clarified the boundary of RCHE and the total GFA of the intended RCHE is 5400 sqm which is maximum GFA for fulfilling the eligibility for "Scheme to Encourage Provision of Residential Care Home for the Elderly Premises in New Private Developments", we have no further comments on it.	Noted.
(ii) 24 height restriction of RCHE	
• As clarified by the applicant, the proposed highest floor of the dormitory is on 7/F which is within 24m from the ground level and an additional floor above the dormitory, located at above 24m, is solely for administrative staff. While some ancillary facilities are proposed to be situated at a height over 24m, we would like to defer to the comments of LORCHE should the location of the RCHE is in full compliance of the 24m height requirements in accordance with the licensing standard.	According to S20 of Residential Care Homes (Elderly Persons) Regulation, we would seek the approval from Director of Social Welfare Department on the part of RCHE which exceed a height of 24m from Ground Floor, during the Licensing application process.
(iii) Isolation Measures	
• As per our advice, protected lobbies to the 3 no. isolation rooms of area at not more	Noted.

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 – SWD
(updated 13 April 2023)

Comments	Response
than 2 sqm are added. While the installation of protected lobbies are desirable for the purpose of infection control, the provision is supported from service perspective.	
(B) Revised RCHE Layout Plan	
(i) Bed spacing requirement	
• While the applicant replied to have taken note of our advice for providing adequate spaces on both sides of beds to facilitate the caring the elderly, we still observe that some of notional beds in the partial layout drawing of RCHE are having either one side leaning directly against the wall. Hence, the applicant may need to review and make appropriate revision on bed disposition in accordance to the bed spacing requirement.	Bed spacing revised as per your comment. Please refer to G-05 rev. D to G-07 rev. D.
(ii) Dimension of lifts	
• As the applicant responded that the bare size of both lifts is at 2900mm x 2000mm and are able to accommodate a stretcher bed of 2050mm x 560mm, we have no further comments on the dimension of the lifts.	Noted.
(iii) Location of car parking spaces	
• Given the applicant has confirmed that the two drop-off points inside covered carparks are provided on LG/F, we have no further comments on it.	Noted.
(iv) Usages of non-standard facilities of RCHE, including Wellness Centre, Hydrotherapy, Sky Garden, Roof Garden, Farming Areas and Staff Quarter	

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 – SWD
(updated 13 April 2023)

Comments	Response
• As per our last enquiry, the applicant clarified that the Wellness Centre and Hydrotherapy are for rehabilitation use; the Sky Garden, Roof Garden and Farming Areas are for residents to have outdoor exercises; and the staff rooms of staff Quarter are for overnight staff to take rest. Also, it can provide spaces for staff during the close-loop management if necessary.	
• On the understanding that these functional areas are for the benefit to the caring/ rehabilitation of the elderly residents and operational need of the intended RCHE, we have no further comments on them at this stage. We would provide further comments upon the applicant's submission of a detailed layout plan.	Noted.
(C) Views on the Applicant's Intention for Joining the Premium Concession Scheme	
• Should the applicant 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, would the applicant please submit a formal application to the concerned District Lands Office of LandsD. We stand ready to provide our comments on the latest layout design of the proposed RCHE and to assess its support-worthiness for joining the Premium Concession Scheme upon receipt of LandsD's referral.	
• Subject to comments from other government bureau/ departments, please be advised	Noted. We will submit the application and comply with the conditions and all relative

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 – SWD
(updated 13 April 2023)

Comments	Response
that we shall only support the setting up of a RCHE and consider recommending Premium Concession for the proposed RCHE on the conditions that – (a) the proposed RCHE should be a satisfactory design as agreed by the Social Welfare Department (SWD); (b) there shall be no financial implications, both capital and recurrent, to the Government; (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); and (d) all the requirement of Premium Concession Scheme as set out in Lands Department (LandsD)'s Practice Note No. 4/2003 as attached, together with any other requirements imposed by LandsD in the lease exchange, if applicable, shall be complied with.	guidelines.
• As mentioned in previous comments, the applicant has been advised to refer to the following attachments in the design of the RCHE, including (i) Guidance Note of Premium Concession Scheme; (ii) Best Practices in Design and Operation of RCHE;	

Proposed Rezoning From "R(C)" To "G/IC" for
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S12A Application for Planning Application No. Y/YL-NTM/9
Response-to-Comment – SWD
(updated 13 April 2023)

Comments	Response
(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. With a view to meeting the objective of proving a quality RCHE, the applicant should study the references in details for the design/ planning of the RCHE.	
RCHE Licensing Perspective	
It is noted that the applicant has clarified that the proposed highest floor of the dormitory is on 7/F which is within 24m from the ground level and an additional floor above the dormitory, located at above 24m, is solely for administrative staff. Our previous comments on those ancillary facilities of the RCHE to which the resident normally do not have access (e.g. kitchen, laundry room, office, staff resting room) and proposed to be situated at a height more than 24m above the ground is still applicable and recapped.	According to S20 of Residential Care Homes (Elderly Persons) Regulation, we would seek the approval from Director of Social Welfare Department on the part of RCHE were exceed a height of 24m from Ground Floor during the Licensing application process.
"Under section 20 of the Residential Care Homes (Elderly Persons) Regulation, no part of an RCHE shall be situated at a height more than 24m 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 the operator of the proposed RCHE can prove that the proposed RCHE possesses	

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 – SWD
(updated 13 April 2023)

Comments	Response
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 resident normally do not have access (e.g. kitchen, laundry room, office, staff resting room) to be situated at a height more than 24m above the ground".	



1 / G-05 2/F PLAN

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) 1:225 (A4)	D MAY. 2023 C APR. 2023 B OCT. 2022 A JULY. 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

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N

1 / G-06 3/F PLAN

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2202

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

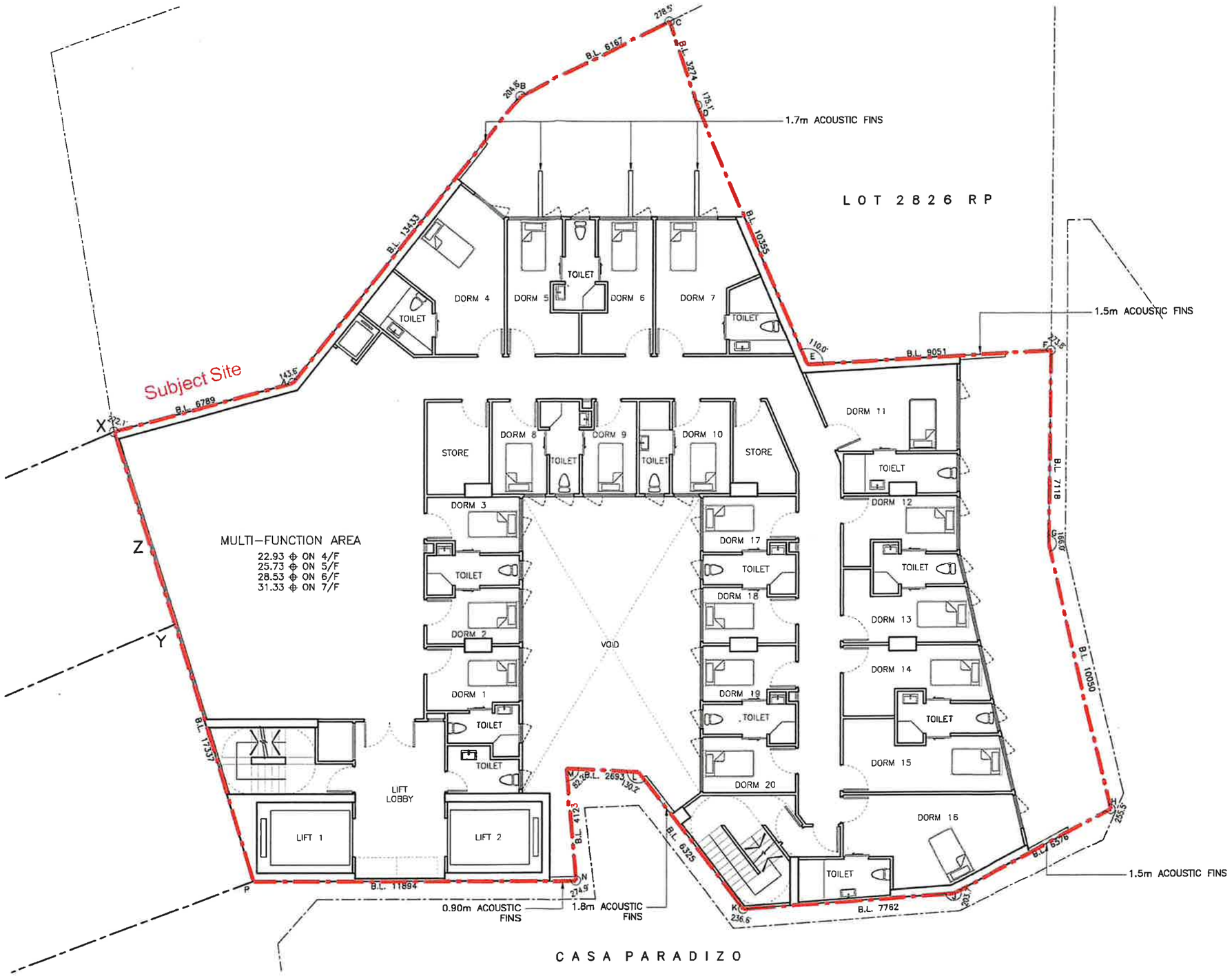
3/F PLAN
RCHE

G-06 1:150 (A3) 1:225 (A4)

D	MAY. 2023	
C	APR. 2023	
B	OCT. 2022	
A	JULY. 2022	

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R-LEE



N

1 / G-07 TYPICAL FLOOR PLAN PLAN

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) 1:225 (A4)

D	MAY. 2023	
C	APR. 2023	
B	OCT. 2022	
A	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.

RESPONSE-TO-COMMENT - HyD

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RLEE Architects (HK) Ltd

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 – HyD
(dated to 27 SEPTEMBER 2022)

Comments	Response
2. Comments of the Chief Highway Engineer/New Territories West, Highways Department (HyD) as follow:	
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.	Noted.
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.	Noted.

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 - DSD

RLEE

RLEE Architects (HK) Ltd

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 – DSD
(dated to 27 SEPTEMBER 2022)

Comments	Response
3. Comments of the Chief Engineer/Mainland North, Drainage Services Department (CE/MN, DSD) as follow:	
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 & the proposed drains (e.g. cover & invert levels of pipes/catchpits outfalls and ground levels justifying waterflow etc.) with supporting design calculations & charts should be included. (For preparation of the drainage proposal, the Guideline on preparation of the drainage proposal is available in DSD homepage at http://www.dsd.gov.hk/EN/Files?technical_Manual/dsd_guideline/Drainage_Submission.pdf for reference). The applicant is reminded that approval of the drainage proposal must be sought prior to the implementation of drainage works on site.	Noted. The related submission would seek DSD approval through separate submission upon TBP approval of the subject site.

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Response-to-Comment – DSD
(dated to 27 SEPTEMBER 2022)

Comments	Response
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.	Noted. The related submission would seek DSD approval through separate submission upon TBP approval of the subject site.

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Response-to-Comment – DSD
(dated to 27 SEPTEMBER 2022)

Comments	Response
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 sewage 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.

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 - CEDD

RLEE

RLEE Architects (HK) Ltd

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 – CEDD
(dated to 27 SEPTEMBER 2022)

Comments	Response
4. Comments of the Head of Geotechnical Engineering Office, Civil Engineering and Development Department (H(GEO), CEDD) as follow:	
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.	A Geotechnical Planning Review Report is attached herewith.

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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 – CEDD
(dated 13 DECEMBER 2022)

Comments	Response
2. Comments of the Head of Geotechnical Engineering Office, Civil Engineering and Development Department (H(GEO), CEDD) as follow:	
2. Section 4. As shown in Figure 2, it is noted that there are four registered man-made slopes (i.e. Features No. 2SE-C/C312, 2SE-C/F94, 2SE-C/R113 and 2SE-C/R114) within and adjacent to the application site. The applicant should provide cross-sections with the proposed construction works (including excavation & lateral support, foundation and site formation, if any) across the application site showing the aforementioned registered man-made geotechnical features.	The replacement and additional pages for Geotechnical Planning Review Report attached has included four registered man-made features (2SE-C/C312, 2SE-C/F94, 2SE-C/R113 and 2SE-C/R114). Cross-sections across the application site has also been included.
3. Section 3, 7 and 8(1). As mentioned in the GPRR, the existing 3-storey house with a car ramp will be demolished and re-developed into a 10-storey building with an approximate height of 29.6 m, together with the access point at ground level of the building lowered from +12 mPD to +7.33 mPD. In view of the proposed building and site formation works would be carried out immediately adjacent to man-made geotechnical features no. 2SE-C/C312 and 2SE-C/F94, please request the applicant to double check on the validity of the slope (2SE-C/F94) would be undisturbed" (section7) and, "...existing gentle slope (2SE-C/F94) in front would remain unchanged." (Section 8). The applicant should clearly state whether any necessary slope upgrading works and slope stability assessment of the concerned slope should be carried out prior to commencement of works.	The replacement and additional pages for Geotechnical Planning Review Report attached has included the necessary slope upgrading works and slope stability assessment of the concerned slope 2SE-C/C 312 and 2SE-C/F94.

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Response-to-Comment – CEDD
(dated 13 DECEMBER 2022)

Comments	Response
4. Further to para. 3 above, the applicant is advised that they should clarify with LandsD on whether necessary land allocation would be required for any slope upgrading works.	Noted. All slope upgrading works would be carried out within our site boundary. Therefore, no land allocation by LandsD is required.
5. Section 8(2). We note that the applicant would carry out a detailed investigation and assessment on the three existing man-made slope features no. 2SE-C/C312, 2SE-C/F94, 2SE-C/R113 and 2SE-C/R114 that may affect or be affected by the proposed development, and to carry out slope upgrading works if found necessary. Please remind the applicant to include slope feature no. 2SE-C/C312 in their future assessment with consideration of our comments in para.2 above.	The replacement and additional pages for Geotechnical Planning Review Report attached has included the necessary slope upgrading works and slope stability assessment of all features.

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"
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(RCHE)

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

RESPONSE-TO-COMMENT - EPD

RLEE

RLEE Architects (HK) Ltd

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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
5. Comments of the Director of Environmental Protection (DEP) as follow:	
5.1 Comments on ER of the supporting planning statement:	
5.1.1 Comments on air quality assessment	
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.	Await replies from our Environmental Consultant.
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.	Await replies from our Environmental Consultant.
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."	Await replies from our Environmental Consultant.

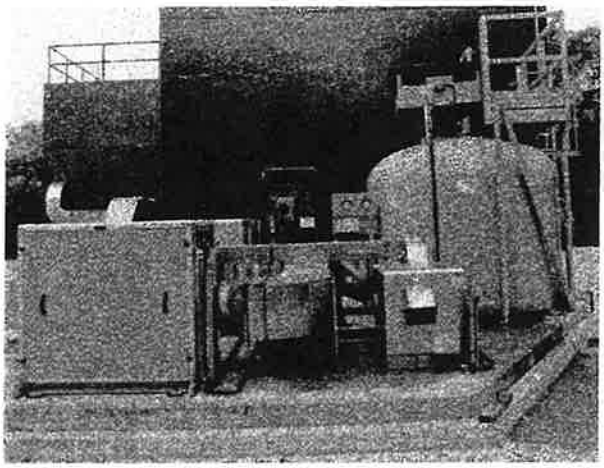
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Response-to-Comment – EPD
(dated to 27 SEPTEMBER 2022)

Comments	Response
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.	Await replies from our Environmental Consultant.
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.	Await replies from our Environmental Consultant.

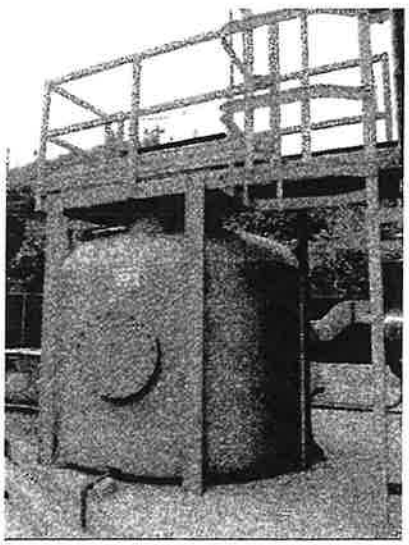
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Comments	Response
6. Odour impact from the proposed on-site STP (as shown in Figure 3.2.1): (a) The consultant should address the odour impact arising from the proposed on-site STP on the nearby ASRs including the existing ones and the proposed development 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. (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. (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.	(a) &(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. (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.

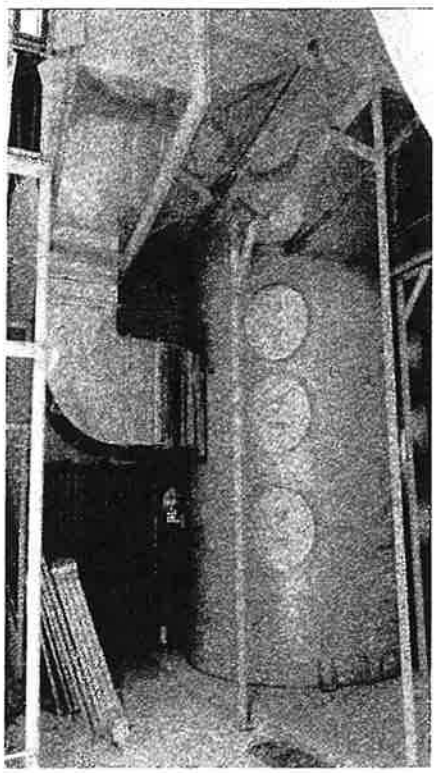
Rage Activated carbon adsorption tower is designed for industrial and municipal odour control. Activated carbon is the most widely used media for pollutant adsorption in gas phase. The carbon pellet has a very porous structure with a high surface-to-volume ratio, and enables the odorous compounds being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



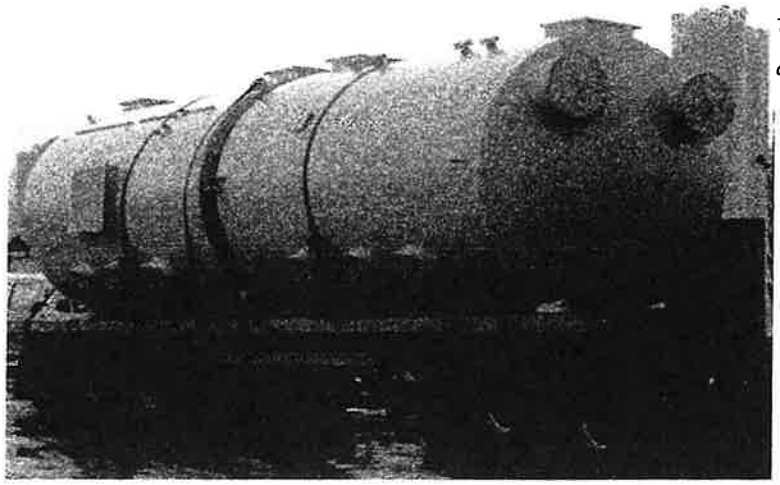
The adsorption tower can be a single bed or dual bed design depends on the air volume and made from Fiberglass Reinforced Plastic (FRP), steel or stainless steel as per the specification.



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 $KMNO_4$ 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

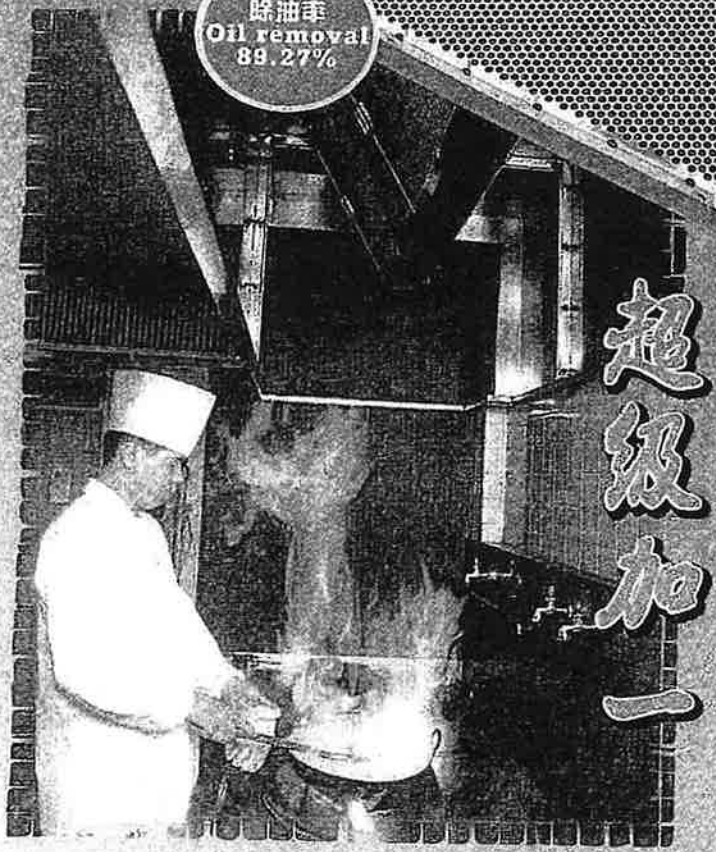
- Simple in construction & maintenance
- Capable to handle a number of odourous gases.

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Comments	Response
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.	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.
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.	Await reply from our Environmental Consultant.

All STAINLESS GREASE FILTER

PLUS ONE & PLUS ONE SUPER



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 除污力強除異味
- Light-Weight Filter 耐用全不銹鋼製
- Not Easily Clogged 過濾網不易阻塞
- Save Maintenenance Fee 少維修壓錢省時

日本厨房工業會的認定品，適合總務省消防裝置有關除去油煙的準則，日本厨房工業會認可商標，請以放心使用。

JAPAN FOOD SERVICE EQUIPMENT ASSOCIATION

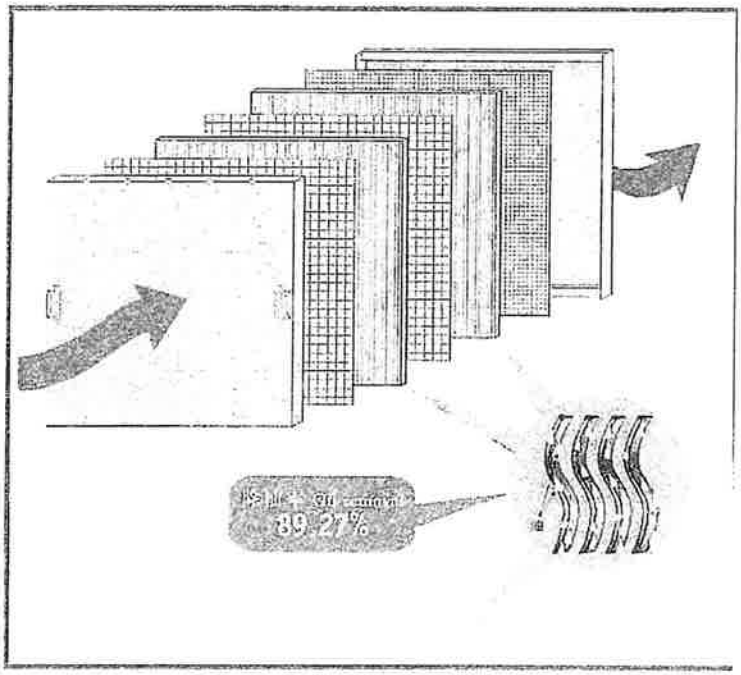
JFEA

JFEA

KAWASHO

「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 Businrss 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-say 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 casue fires.

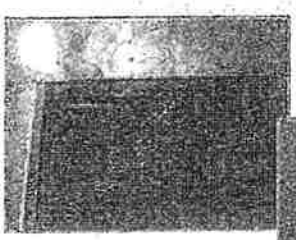
GUIDELINES ON FIRE PREVENTION

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 occur in kitchens.

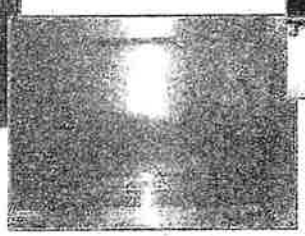
INEFFICIENT SUCTION AND RETENTION OF OIL IN THE FUMES

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 unhygenic ventilation system. The factors are the main causes of the high incidence of kitchen fires.

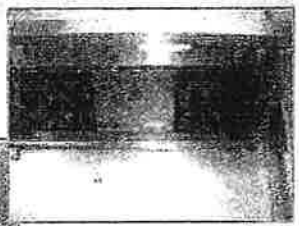
Due to the poor retention of oil by the filter, the filter clogs easily, Causing Oxidation. To overcome all the above problem, our company, the Totaru Plan (m) Sdn. Bhd, has invented the latest state-of-the art cooker hood. It is super efficient in oil retention and provides the highest standard in ventilation.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



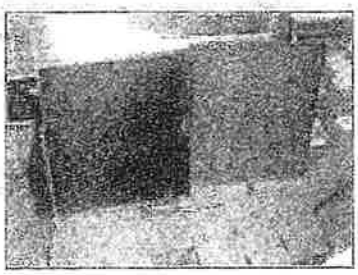
• Before Installation
未安裝 Kawasho 隔油烟網前



• Cleaned air duct and hood with Kawasho grease filter installed
清潔烟罩風槽後及安裝 Kawasho 隔油烟網



• Air duct and hood are still in clean condition
風槽及烟罩內籠仍然保持清潔

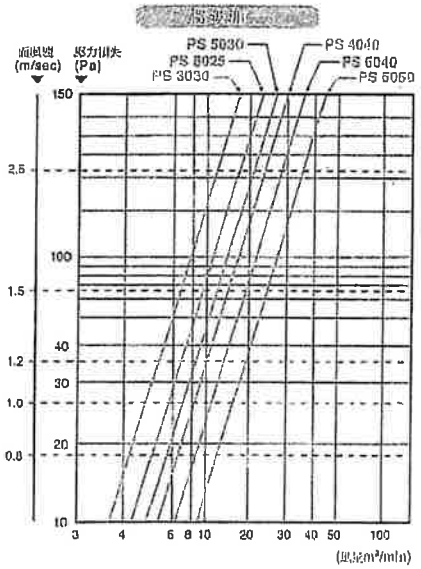


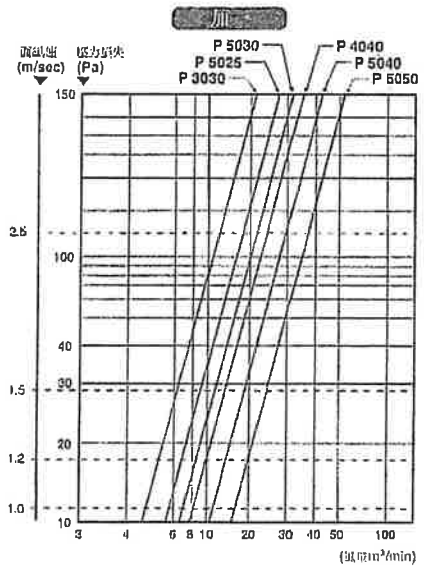
• Front and rear of Filter
隔油網的前後面

型號尺寸 SIZE CHART

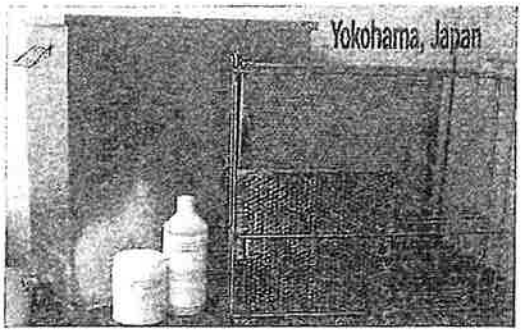
超級加一	加一	高 (H)	長 (L)	闊 (W)
PS 5050	PS 5050	500	500	25
PS 5050S	PS 5050S	495	500	25
PS 5040	PS 5040	500	400	25
PS 5040S	PS 5040S	495	400	25
PS 5030	PS 5030	500	300	25
PS 5030S	PS 5030S	495	300	25
PS 5025	PS 5025	500	250	25
PS 5025S	PS 5025S	495	250	25
PS 4040	PS 4040	400	400	25
PS 3030	PS 3030	300	300	25

風量特性 VENTILATION





貨品名稱	除去率	付著率	靜壓
超級加一	89.27%	22.32%	21Pa



規格 SPECIFICATIONS	
桶子型號 Bucket Type	G. F. 5
桶子尺碼 Bucket Size	600(高)Hx540(長)Lx220(濶)W
裝渥水容量 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(塗冊)Pieces 560(高)H x 520(長)L x 80(闊)W 2(格冊)Pieces

生產商
川鉄商事株式会社
Tel : 03-5203-5141

總部
株式会社
Tel : 045-471-8800

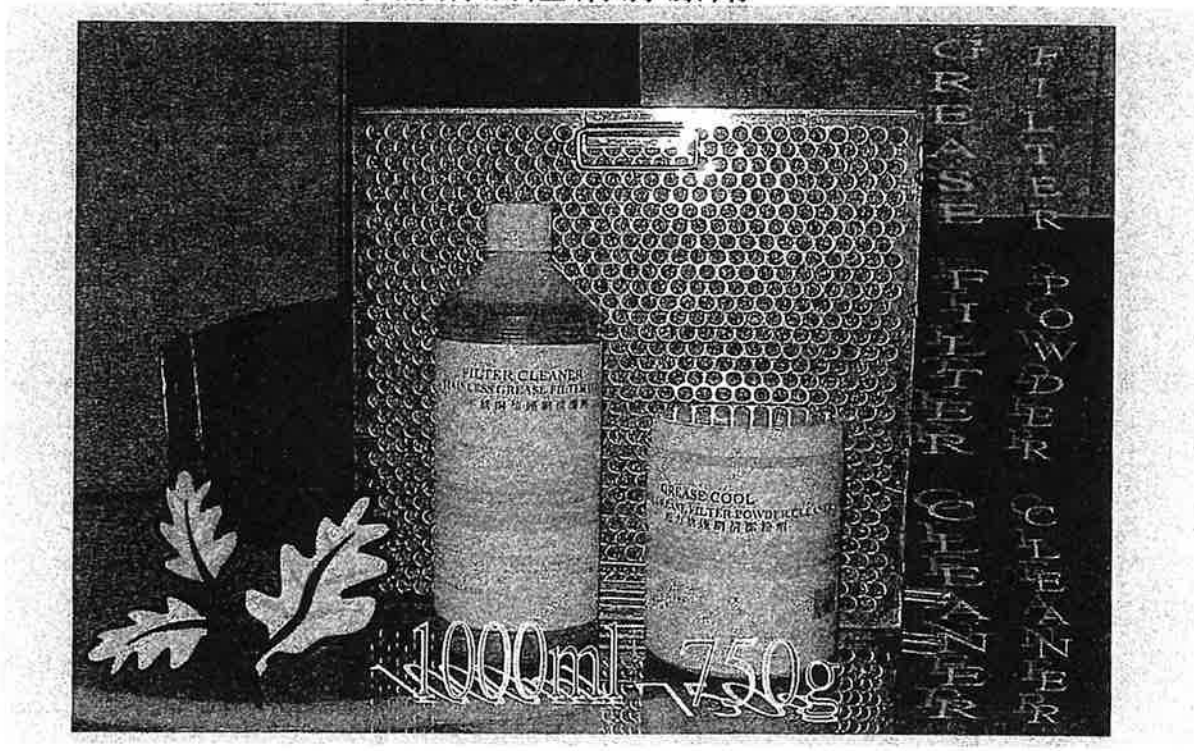
TOTARU PLAN (JAPAN)
Web-site : www.totaru.com

海外營業部
多德來(香港)有限公司
Tel : 852-2191-7686

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



業務用ステンレス製グリスフィルター

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



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

TOTARU PLAN (HK) LTD.

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
5.1.2 Comments on Noise Impact Assessment Traffic noise 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 openable window for ventilation. 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. 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. 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.	No diagnostic rooms/wards is provided in the development. The Multi-function Area is for dinning and rest purpose. Since the area is air-conditioned by AC unit, openable window would not be provided.

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Comments	Response
Noise model 5. The search radius in the configuration should be set to 300m. Please review. 6. The traffic data for Road I to R are missing. Please supplement. 7. The traffic flow of Road C1 appeared to be inconsistent with Table 3-3. Please review and rectify.	5-7 : Await reply from our Environmental Consultant
Fixed noise 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. 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. 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.	8-10: Await reply from our Environmental Consultant

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Comments	Response
5.1.3 Comments on water quality impact 1. Please provide relevant baseline condition of nearby waterbodies and confirm whether the development would have adverse water quality impact on WQO. 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. 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. 4. Section 4.5: Design of the STP shall follow Guidelines for the Design of Small Sewage Treatment Plants by EPD.	1 & 3: Please refer to the Appendix 1. 2 & 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.

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<table>
<tr><th>Comments</th><th>Response</th></tr>
<tr><td>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.
<table>
<tr><td>Parameter</td><td>Tertiary Effluent Standards (Upper Limit) *</td></tr>
<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>100unts/100mL</td></tr>
</table>
*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.</td><td>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.</td></tr>
</table>

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Comments	Response
5.1.4 Comments on waste management 1. Please confirm whether there is any potential land contamination issue due to the historical and current land uses at the subject site.	Await reply from our Environmental Consultant
5.1.5 Comments on landfill gas hazard impact 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.	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.

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 NH3-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.

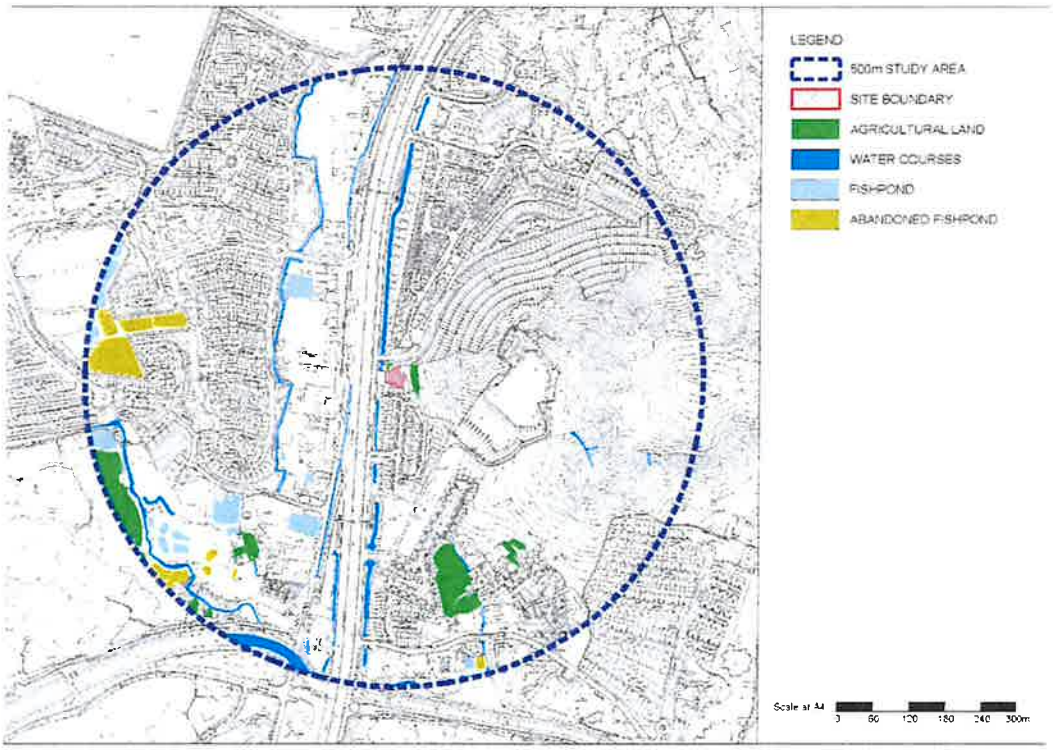
Summary of water quality statistics for the Deep Bay WCZ in 2020

Parameter		DM1	Inner Deep Bay DM2	DM3	Outer Deep Bay DM4	DM5
Number of samples		8	8	12	8	8
Temperature (°C)		25.1 (20.9 - 31.2)	25.5 (21.1 - 30.9)	25.4 (20.2 - 30.6)	25.1 (21.1 - 29.8)	25.7 (20.9 - 29.9)
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 (9.2 - 31.6)
Dissolved Oxygen (mg/L)		5.9 (4.4 - 7.6)	6.1 (4.6 - 7.9)	6.0 (4.3 - 7.1)	5.8 (5.2 - 6.6)	5.9 (4.1 - 6.3)
	Bottom	N/A N/A	N/A N/A	N/A N/A	5.4 (4.8 - 6.6)	5.5 (4.8 - 7.1)
Dissolved Oxygen (% Saturation)		79 (62 - 102)	85 (60 - 94)	80 (58 - 97)	80 (70 - 94)	81 (65 - 96)
	Bottom	N/A N/A	N/A N/A	N/A N/A	75 (61 - 94)	77 (66 - 100)
pH		7.4 (7.1 - 7.8)	7.6 (7.2 - 8.0)	7.8 (7.1 - 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 - 1.8)	1.5 (1.0 - 2.0)	1.8 (1.0 - 2.1)
Turbidity (NTU)		21.7 (13.3 - 41.8)	29.2 (12.5 - 62.7)	9.5 (5.5 - 14.2)	9.1 (5.1 - 17.4)	9.1 (5.5 - 21.6)
Suspended Solids (mg/L)		37.0 (19.0 - 59.0)	47.4 (24.0 - 80.0)	16.3 (6.5 - 30.0)	14.5 (6.3 - 21.5)	14.7 (8.8 - 27.3)
5-day Biochemical Oxygen Demand (mg/L)		1.6 (0.9 - 3.1)	1.9 (0.7 - 4.0)	1.8 (0.3 - 4.5)	2.6 (0.2 - 5.8)	2.6 (0.3 - 5.0)
Ammonia Nitrogen (mg/L)		0.455 (0.190 - 0.670)	0.331 (0.075 - 0.930)	0.134 (0.029 - 0.320)	0.102 (0.018 - 0.180)	0.089 (0.011 - 0.170)
Unionised Ammonia (mg/L)		0.005 (0.002 - 0.011)	0.005 (0.002 - 0.015)	0.004 (0.001 - 0.009)	0.003 (<0.001 - 0.007)	0.003 (<0.001 - 0.007)
Nitrite Nitrogen (mg/L)		0.191 (0.025 - 0.310)	0.105 (0.040 - 0.310)	0.061 (0.014 - 0.170)	0.067 (0.026 - 0.165)	0.052 (0.024 - 0.130)
Nitrate Nitrogen (mg/L)		1.301 (0.100 - 1.900)	1.061 (0.450 - 1.500)	0.753 (0.320 - 1.501)	0.711 (0.265 - 1.400)	0.696 (0.137 - 1.100)
Total Inorganic Nitrogen (mg/L)		1.99 (0.59 - 2.32)	1.52 (1.02 - 2.34)	0.95 (0.43 - 1.78)	0.68 (0.37 - 1.52)	0.76 (0.33 - 1.41)
Total Kjeldahl Nitrogen (mg/L)		0.70 (0.58 - 1.17)	0.73 (0.48 - 1.40)	1.00 (0.22 - 3.51)	0.82 (0.14 - 2.43)	0.83 (0.06 - 2.07)
Total Nitrogen (mg/L)		2.69 (1.81 - 2.91)	1.99 (1.52 - 3.01)	1.21 (0.77 - 2.11)	1.12 (0.78 - 1.81)	1.09 (0.73 - 1.72)
Orthophosphate Phosphorus (mg/L)		0.151 (0.120 - 0.220)	0.123 (0.067 - 0.180)	0.061 (0.016 - 0.088)	0.035 (0.007 - 0.063)	0.025 (0.011 - 0.037)
Total Phosphorus (mg/L)		0.24 (0.19 - 0.34)	0.21 (0.15 - 0.27)	0.10 (0.06 - 0.14)	0.07 (0.05 - 0.10)	0.06 (0.04 - 0.09)
Silica (as SiO_2) (mg/L)		5.89 (3.13 - 10.00)	5.15 (1.39 - 10.00)	3.70 (0.47 - 8.50)	3.59 (0.39 - 9.00)	3.50 (0.34 - 9.37)
Chlorophyll-a (µg/L)		9.3 (2.5 - 8.9)	9.4 (2.6 - 15.0)	2.9 (1.0 - 11.0)	1.9 (0.5 - 4.0)	1.9 (0.5 - 3.6)
E.coli (count/100mL)		200 (12 - 1500)	160 (17 - 810)	22 (1 - 180)	61 (1 - 435)	75 (1 - 520)
Faecal Coliforms (count/100mL)		530 (55 - 2900)	340 (24 - 2600)	66 (3 - 360)	170 (11 - 1000)	190 (26 - 4600)

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

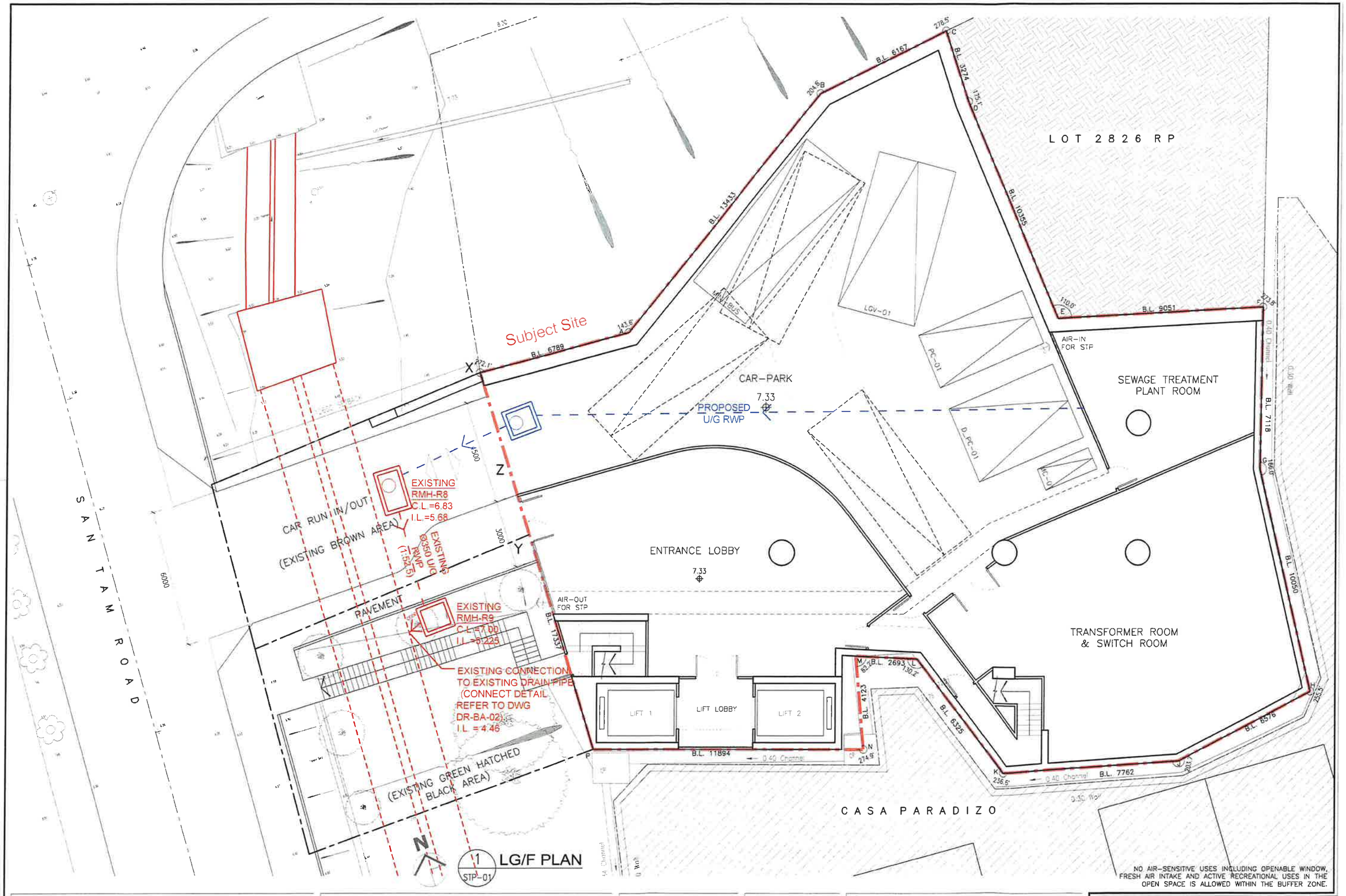
Sewage discharge will be the major water pollution source throughout the operation phase of the proposed Development. The sewage generated from the proposed Development will be collected and conveyed to the nearest public sewerage system via proper connections. No sewage will be released to the environment 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.
Contractors are required to verify exact dimensions on site.
The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate.
The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified.
This drawing is not for construction purposes unless expressedly certified.

RLEE

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(updated 05 JANUARY 2023)

Comments	Response
5. Comments of the Director of Environmental Protection (DEP) as follow:	
5.1 Comments on ER of the supporting planning statement:	
5.1.1 Comments on air quality assessment	
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.	Please refer to 2.1.1 para.1
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.	Please refer to 2.1.1 para. 2 & Table 2
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."	Please refer to 2.2.1

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Comments	Response
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.	Please refer to 2.3.1
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.	Please refer to 2.4.1 last bullet point

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Comments	Response
6. Odour impact from the proposed on-site STP (as shown in Figure 3.2.1): (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. (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. (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.	(a) &(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. (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.

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 27 SEPTEMBER 2022)
(updated 05 JANUARY 2023)

Comments	Response
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.	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.
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.	Figure attached to Appendix 2.1

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 27 SEPTEMBER 2022)
(updated 05 JANUARY 2023)

Comments	Response
5.1.2 Comments on Noise Impact Assessment	
Traffic noise	
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 openable window for ventilation.	No diagnostic rooms/wards is provided in the development. The Multi-function Area is for dinning and rest purpose. Since the area is air-conditioned by AC unit, openable window would not be provided.
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.	Please refer to 3.2.2 para. 2
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.	TIA under process by TD. Would await TD's confirmation on methodology in due course.
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.	3.3.5 para. 1, bullet point 4 & subsequent analysis.

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 27 SEPTEMBER 2022)
(updated 05 JANUARY 2023)

Comments	Response
Noise model	
5. The search radius in the configuration should be set to 300m. Please review.	5-7 : Please refer to the attached revised traffic noise model attached in email to PlanD.
6. The traffic data for Road I to R are missing. Please supplement.	
7. The traffic flow of Road C1 appeared to be inconsistent with Table 3-3. Please review and rectify.	
Fixed noise	
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.	Please refer to Appendix 3.2
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.	Please refer to 3.4.2 para. 2 & 3.4.6.
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.	Updated in Table 3-8

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 27 SEPTEMBER 2022)
(updated 05 JANUARY 2023)

Comments	Response
5.1.3 Comments on water quality impact	
1. Please provide relevant baseline condition of nearby waterbodies and confirm whether the development would have adverse water quality impact on WQO.	Please refer to 4.3 para. 5
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.	2 & 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.
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.	Please refer to 4.3 para. 6
4. Section 4.5: Design of the STP shall follow Guidelines for the Design of Small Sewage Treatment Plants by EPD.	Noted

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 27 SEPTEMBER 2022)
(updated 05 JANUARY 2023)

<table>
<tr><th>Comments</th><th>Response</th></tr>
<tr><td>
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.
<table>
<tr><td>Parameter</td><td>Tertiary Effluent Standards (Upper Limit) *</td></tr>
<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>100unts/100mL</td></tr>
</table>
*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.
</td><td>
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.
</td></tr>
</table>

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 27 SEPTEMBER 2022)
(updated 05 JANUARY 2023)

Comments	Response
5.1.4 Comments on waste management 1. Please confirm whether there is any potential land contamination issue due to the historical and current land uses at the subject site.	Refer to enclosed FSD's letter dated 6 December 2022, neither records of dangerous goods license, nor incidents of spillage / leakage of dangerous goods were found for the captioned lots, land contamination from spillage / leakage of dangerous goods is not anticipated.
5.1.5 Comments on landfill gas hazard impact 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.	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.

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 27 SEPTEMBER 2022)
(updated 20 FEBRUARY 2023)

Comments	Response
5.1.2 Comments on Noise Impact Assessment	
Traffic noise	
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 openable window for ventilation.	No diagnostic rooms/wards is provided in the development. The Multi-function Area is for dinning and rest purpose. Since the area is air-conditioned by AC unit, openable window would not be provided.
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.	Please refer to 3.2.2 para. 2
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.	TD has no comment on the methodology. "Technical Note of Methodology on Year 2042 Traffic Forecasts for Traffic Noise Impact Assessment (TNIA)" proposed by the Traffic Consultant is attached herewith. A Revised Environmental Assessment Report is attached herewith.
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.	3.3.5 para. 1, bullet point 4 & subsequent analysis.

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
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Comments	Response
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5.1.5 Comments on landfill gas hazard impact 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.	A Landfill Gas Hazard Assessment Report is submitted as attached.

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
(updated 13 April 2023)

Comments	Response
1. Comments of the Director of Environmental Protection (DEP) as follows:	
EPD's Comments on the revised EA (FI-2)	
Comments on air quality assessment	
1. Sections 2.1.1 and 2.3.1: Please revise the text to confirm that there is no chimney within 200m from the site boundary of the proposed development instead of no chimney near the site.	It is confirmed that no chimneys were observed within 200m from the Site boundary. Section 2.1.1 and 2.3.1 have been revised accordingly.
2. Table 2 (a) Please revise "2021-2022" as "2017-2021" in the title. (b) We noted that the values of 10th highest 24-hr PM2.5 instead of 34th highest 24-hr PM2.5 were presented in the table. Please note that the values of 36th highest 24-hr PM2.5 should be presented in the table instead of 10th/34th highest 24-hr PM2.5 when comparison with the new AQOs is made. Please revise the table accordingly. (c) The remark for 1-hr NO2 should be 19th highest instead of 18th highest. Please correct the typo accordingly. Please delete the last row (Lead) of the Table and "in Red" in Note [1].	Revised accordingly.
3. Section 2.2.1 (a) Please note that 2021 Traffic Census is available now and please update the text accordingly.	(a) Updated.

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
(updated 13 April 2023)

Comments	Response
(b) Please delete "active" in the 1st bullet point.	(b) The 1st bullet point has been revised.
4. Section 2.4	
(a) Please identify the nearest ASRs in the vicinity of the proposed development and provide their separation distance from the subject boundary.	(a) The nearest ASRs would be located.
(b) Please also provide the size of site formation/ excavation area, amount of excavated materials to be handled and no. of dump trucks at a time to justify that the dust impact will not be significant with mitigation measures in place.	(b) The Project Site Area is only about 736m^2 which is a very small footprint. Considering the size of site formation and excavation is in a small scale, the amount of excavated material and number of dump trunk would be limited. No significant dust impact from the construction works is anticipated. With implementation of the good site practice, no adverse air quality impact during the construction is anticipated. Nevertheless, it is also suggested that the contractor should set up a communication channel (e.g. regular meeting) with the management office of Casa Paradizo to have a better dust control management, if necessary.
(c) Please clarify whether there are any concurrent projects in the surrounding area and their cumulative air quality impact shall be assessed.	(c) No concurrent project in the surrounding area. In addition, as no adverse air quality impact during the construction are anticipated, no cumulative air quality impact would be anticipated due to the project
5. Other than the constructional dust impact, a new Section should be added to address the operational phase air quality impact arising from the proposed development as follows in the report:	
<u>Operational air quality impacts</u>	
(a) **Odour impact from the proposed on-site STP:** Please incorporate R-t-C #6(a), (b) and (c) in this section. As mentioned in R-t-C #6(a),	Noted. R-t-C #6(a), (b) and (c) have been incorporated.

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
(updated 13 April 2023)

Comments	Response
(i) please indicate the location of the exhaust of the proposed STP in a location map with the nearest ASRs (including the existing ones and the proposed development) and provide their separation distances for evaluation of the odour impact. Please be reminded that the exhaust outlet of the proposed on-site STP should be designed properly and located away from all nearby ASRs (including the air sensitive use of the proposed development such as the residential units on top of the STP) as far as possible to avoid causing any odour impact. (ii) Please also list out the sewage treatment capacity of the proposed on-site STP and state clearly if the design of the proposed on-site STP would observe and follow the Environmental Consideration specified in EPD Guidelines for the Design of Small Sewage Treatment Plants for minimization of the odour impact from the proposed STP during operation phase.	The STP will serve less than 2000 population, hence the Environmental Consideration specified in EPD Guidelines for the Design of Small Sewage Treatment Plants have been incorporated. The location of the exhaust of the proposed STP has been indicated in Figure 2.1.2. The location of the exhaust has been designed as far as possible all nearby ASRs. Considering that at source mitigation measures would be applied, no adverse odour impact from the proposed on-stie STP is anticipated
(b) **Cooking Fume/ odour from the proposed kitchen:** Please observe and follow the guidelines recommended by EPD's Control of Oily Fume and Cooking Odour from Restaurants and Food Business to avoid causing air and odour nuisance. In particular, the exhaust vent of the kitchen should be positioned away from nearby ASRs as far as possible. Please supplement. Please also incorporate R-t-C #7 in this section.	The recommendations on EPD's Control of Oily Fume and Cooking Odour from Restaurants and Food Business have been incorporated. R-t-C#7 have also been incorporated.
6. Section 6: Please clarify if there is any adverse air quality/ odour impact arising from	The tentative location of the STP/Kitchen exhaust has been designed as far as possible all

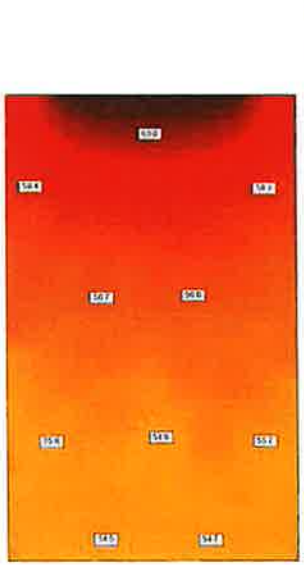
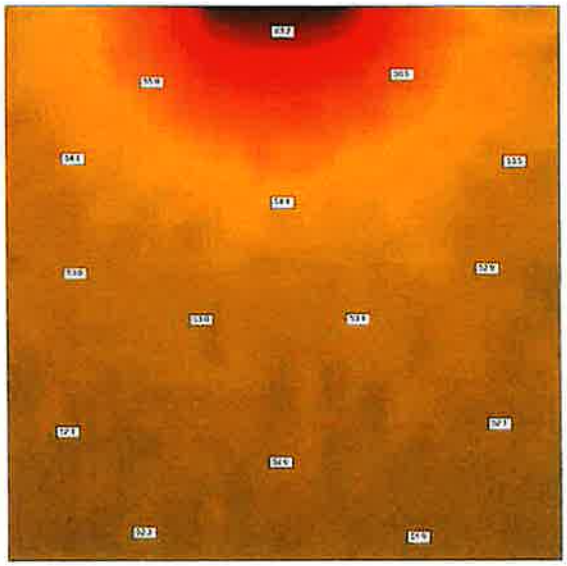
Proposed Rezoning From "R(C)" To "G/IC" for
a Proposed "Social Welfare Facilities" (Residential Care Homes for The Elderly) (RCHE)
Lot 4823 in D.D.104, 81 San Tam Road, San Tin, N.T.
S12A Application for Planning Application No. Y/YL-NTM/9
Response-to-Comment – EPD
(updated 13 April 2023)

Comments	Response
the proposed on-site STP and kitchen under "Air Quality" section.	nearby ASRs. Considering that at source mitigation measures (e.g. deodorization adsorption system/grease filter) would be applied, no adverse odour impact from the proposed on-stie STP/Kitchen is anticipated.
7. Figure 2.1.1: Please delete "active" in the remark.	Revised.
8. R-t-C 6(a): The brochure of the deodorization adsorption system could not be found in the report. Please supplement.	Added at Appendix 2.2.
9. R-t-C 7: The catalogue of the grease filter could not be found in the report. Please supplement.	Added at Appendix 2.3.
10. Please highlight all the changes/ amendments in the next submission for review.	Noted.
<u>Comments on Noise Impact Assessment</u>	
1. Please provide more information of the proposed RCHE, such as the room size of dormitories, the spreadsheet of traffic noise and fixed noise impact assessment, for checking.	Layout plan and room size of the dormitories are attached. Calculation spreadsheet in excel file is attached. Due to extensive number of segments, receiver points and huge file size, only the sample calculation spreadsheet for traffic noise is attached for reference. The calculation spreadsheet for all receiver points and assessment scenarios can be directly viewed from the submitted noise model file, by selecting Calculation → Protocol → Write Protocol checkbox → export the calculation files.
2. Section 3.3.5 (i) Architectural fins with acoustic windows were proposed to mitigate the traffic noise impact. Please note that the noise reduction performance of combined noise	Due considerations have been given to the building layout planning and window façade orientations. No window openings are directly facing the San Tin Highway. The windows

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
(updated 13 April 2023)

Comments	Response
mitigation measures for traffic noise impact will need to be further substantiated; mock-up test maybe required to demonstrate that adequate noise reduction can be achieved.	are tilted to at least 90 deg to the dominant road traffic line source. Under the proposed arrangement, the architectural fin on the sides would screen out the nearest road segments thus provide very significant screening effect to the dominant line source. The screening effect of architectural fins has been calculated based on the CRTN protocol taking into account all major vertical and lateral diffraction paths. The combined noise reduction performance of architectural fin with acoustic window was referred to the Practice Note on Application of INMD in Planning Private Residential Developments against Road Traffic Noise Impact.
(ii) We noted the large room size of dormitories at 2/F and 2 to 3 acoustic windows were proposed to mitigate traffic noise, the noise reduction performance of proposed acoustic windows will need to be further substantiated by making reference to other precedent cases or otherwise, mock-up test maybe required to demonstrate that adequate noise reduction can be achieved.	We have no precedent case on the performance of acoustic window in large dormitory of similar size. However based on acoustic principle, the large room size shall not have adverse acoustic impact, since the incident sound energy from window glazing would be distributed over a larger room volume. A sensitivity analysis has been conducted based on two different room sizes with other settings remain the same (incident sound energy, window size, extent of interior furnishing). In general, the diffuse field noise level in the larger room would be smaller as the noise radiates further into interior space. The CadnaA software, combined with CadnaB and CadnaR, is capable of simulating the road traffic noise impact (using CRTN) into interior space (in combination with ray tracing).

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
(updated 13 April 2023)

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	Physical mock up test for such large size dormitories would be difficult in practice, where appropriate, we can construct the full scale noise model (from exterior to interior) to evaluate the interior noise reduction and compare the effect on room size based on the actual room settings.  Interior noise distribution In small room 2.5 x 4m  Interior noise distribution in large room 6 x 6m

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
(updated 13 April 2023)

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	Anyhow, in para. 3.3.5 of the EA, we have stated that in detail design stage, mock-up test will be conducted to demonstrate that adequate noise reduction will be achieved.
(iii) To minimize the potential reverberation noise created in the re-entrant, please consider adding SAM/ MPA and/ or other treatment on the external facade as far as practicable.	Sound absorption material is proposed on the back side of architectural fin. Additional SAM are proposed at the entrance to the void area, as indicated in Figure 3.1.6 and 3.1.7. The proposed SAM would be in the form of 50mm thick rockwool covered in waterproof acoustic transparent member and perforated panel. To ascertain the noise compliance, an alternative noise model has been conducted with multiple reflection effect switched on (instead of using max 1.5dB reflection from opposite buildings, +2.5dB from facade strictly according to CRTN). The proposed SAM would be sufficient to suppress the multiple reflection effect. Anyhow, sound absorption material is proposed to be added to the architectural feature and the void area as per EA para. 3.3.5.
3. Section 3.4.2: It was identified that there were potential fixed noise sources (i.e. ID S1 and S2) to the west of the site. Please add the locations of these fixed noise sources in the drawing. Please also justify the locations of these fixed noise sources adopted in the noise model.	Section 3.4.2 and Figure 3.2.4 Updated accordingly.

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
(updated 13 April 2023)

Comments	Response
Comments on water quality impact	
1. Para.5 under section 4.3: Marine Water Quality in Hong Kong in 2021 has been issued, please update the data and text.	Noted and revised.
2. Figure B-14: Please prepare a table to list out all the parameters on the water quality monitoring station rather citing the appendix from the Marine Water Quality in Hong Kong in 2020, and please note the report in 2021 has been issued.	Noted and revised.
3. Para.6 under section 4.3: Please provide a table listing out representative WSRs, if any, within 500m of the project boundary.	The WSRs shown in Figure has been listed out for ease reference.
4. Para.5 under section 4.4: Please confirm if demolition works of existing House will be involved.	Will be involved. The relevant text has been added.
5. Section 4.5: Previous comment has not been addressed, please provide the amount of sewage flow generated, size of STP, etc.	The major parameter has been listed and details were shown in Appendix 4.1.
6. Para.4 under section 4.5: Please confirm the sewage treatment level, and incorporate the tertiary treatment standard requirement (provided in our previous comments and below table refers) in the main text and hence to revise "… an onsite **tertiary** sewage treatment plant (STP)…" in the relevant parts. development shall be equipped with on-site tertiary sewage treatment facility. A typical tertiary treatment standard is attached below for reference.	Noted. The word of "tertiary" has been added in the sentence. The following STP represents the "tertiary STP". In addition, the standard of a tertiary STP has been included.

Proposed Rezoning From "R(C)" To "G/IC" for
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(updated 13 April 2023)

Comments	Response
<table><tr><td>Parameter</td><td>Tertiary Effluent Standards (Upper Limit) *</td></tr><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>100unts/100mL</td></tr></table> *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. <u>Comments on waste management</u> R-to-C to s. 5.1.4: FSD's reply was not attached. Besides, no information was provided on the "historical and current land uses" at the subject site in order to confirm that there is no potential land contamination issue.	FSD's reply dated 6 December 2022, neither records of dangerous license, nor incidents of spillage/ leakage of dangerous goods were found. Also, EPD has no record of any reported chemical spillage/ leakage incident at the captioned locations as shown in Appendix 5.1. There was no record of chemical waste producers' registration found as per record inspection at EPD Territory Control Office dated 5 July 2022. Considering the historical land use of the site, it is confirmed that land contamination assessment was not required.

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
(updated 13 April 2023)

Comments	Response
Comments on landfill gas hazard assessment Landfill gas hazard assessment has to be carried out for the proposed development as the site concerned is within the consultation zone of the restored Ngau Tam Mei Landfill. Our previous comment as stated in 5.1.5 of the R-to-C is still valid.	Landfill gas hazard assessment was submitted in previous FI dated Feb 2023. The same has been supplemented again in this FI.

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
(Updated 27 July 2023)

Comments	Response
1. Comments of the Director of Environmental Protection (DEP) as follows:	
EPD's Comments on the revised EA (FI-4)	
Comments on air quality assessment	
1. Sections 2.1.1 and 2.3.1: Please conduct an updated site survey since the site survey was conducted about a year ago.	Recent site visit on 24th July 2023 has been conducted. The observation is the same as 22nd June 2022. Date of recent site visit has been added to Section 2.1.1 and 2.3.1.
2. Section 2.1.1 2nd bullet point and Table 2: Please note that the air quality monitoring data In Year 2022 are available now and please update the text and table.	Noted Section 2.1.1 2nd bullet point has been updated and the monitoring data of Year 2022 has been added in Table 2.
3. Section 2.1.1: Please revise the 2nd bullet point as "No air-sensitive uses including openable window, fresh air intake and recreational use in the open space is allowed within the buffer zone". Similar amendment shall be applied to the legend in Figure 2.1.1.	Figure 2.1.1. and Bullet point of Section 2.2.1 has been revised.
4. Section 2.4.1: Please delete "short-term" in lines 4-5.	Noted and deleted accordingly.
5. Section 2.4.1, last bullet point: Please revise to "No concurrent project in the surrounding area and hence adverse cumulative air quality impact during the construction stage is not anticipated."	Noted and amend accordingly.
6. Section 2.5.1	
(a) Please delete the 2nd bullet point since it is not related to air quality impact during operation stage.	(a) Deleted accordingly.
(b) 3rd bullet point, please provide the sewage treatment capacity of the on-site STP or other justifications (e.g. no. of bed spaces provided in the proposed RCHE) to further	(b) The Proposed Development only have a total 142 bed spaces (far below than 2000 population). The justification is stated in 2nd bullet point of Section 2.5.1. In addition, according to the STP

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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
(Updated 27 July 2023)

Comments	Response
justify the scale of the on-site STP is small.	design calculation in Appendix 4.3, the treatment capacity of the on-site STP is 77.5 cu.m/day and serving 250 head/day.
(c) 4th bullet point, please revise "or" to "and".	(c) Revised
(d) 5th bullet point, please delete ", or else odour treatment or masking facilities may be required".	(d) Revised
(e) 6th bullet point, the specification of the deodorization unit including odour removal efficiency and the life time of the deodorization system could not be found in Appendix 2.2. Please supplement. If such information is not available, the consultant may consider to remove Appendix 2.2 and revise this bullet point by specifying the targeted odour removal efficiency (i.e. 99.5%) and provide source of reference (e.g. make reference to other STP with similar scale and odour removal efficiency from approved EIA reports/ AQIA, etc.) to support the targeted odour removal efficiency is achievable. Please also address if replacement of the deodorizer will be taken place annually since it is claimed that its service life is only 12 months.	(e) The spec of deodorization unit is attached in Appendix 2.2. It is supplemented that replacement Of the deodorizing filter will be taken place annually.
(f) Instead of providing the serving population size, please provide the sewage handling capacity of the on-site STP.	(f) The handling capacity is 77.5 cu.m/day as per calculation in Appendix 4.3.
<u>Comments on Noise Impact Assessment</u>	
1. The applicant will be required for submission of a detailed Noise Impact Assessment (NIA) report for the latest master layout plans (to demonstrate 100% compliance with	Noted.

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
(Updated 27 July 2023)

Comments	Response
the noise criteria under HKPSG) and the implementation of mitigation measure identified therein, to the satisfaction of the DEP/ LandsD under land lease mechanism.	
2. 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.	Noted. Please refer to Appendix 7.1
Comments on water quality impact	
1. Sections 4.2: The construction works are in close proximity to the watercourse, relevant mitigation measure from the ETWB TC (Works) No. 5/2005 shall be incorporated.	Noted and supplemented.
2. Section 4.3	
(a) Please provide a high-resolution figure with indicating the WSRs in Appendix.	(a) Noted and provided in Appendix 4.2.
(b) Various fishponds and watercourses are sited within the 500m assessment area, please specify rather identifying them by general nature.	(b) ID from the fishponds have been provided. Also, with reference to the Geoinfo map or basemap, drainage channel and nullah have been also identified. Others are considered as water course. Given that our project scale is small and the major WSRs have been identified, we considered the levels of details are sufficient for current planning stage.
3. Sections 4.4 and 4.5:	
(a) For better presentation, please indicate the potential source of water quality impact and respective mitigation measures during construction and operation phases in separate sections.	(a) The headline of potential source and mitigation measures have been added for better presentation. Section 4.4 and 4.5 have been revised accordingly.

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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
(Updated 27 July 2023)

Comments	Response
(b) Please elaborate on the mitigation measures to be implemented rather citing the ProPRECC notes only or selectively quote certain measures.	(b) Noted and elaborated in Section 4.4.
4. RtC comment 5	
(a) Appendix 4.1 is missing.	(a) Appendix 4.1 has been attached.
(b) Please indicate the estimated population and staff, and the unit load factor.	(b) The estimated population staff and the unit load factor has been shown in Appendix 4.1 and 4.3.
5. Sections 4.5 (last bullet point on page 26): Please elaborate the mitigation measures.	The regular cleaning and sweeping open paved road reduce the suspended solid or other unwanted pollutants or waste fall into the stormwater drain. The relevant bullet point of Section 4.5 has been revised.
6. On-site Tertiary STP	
(a) Please indicate the discharge point of the treated effluent.	(a) The proposed discharge point is shown in Appendix 4.3.
(b) The treated effluent discharge from construction and operational stages should be sited away from natural water course.	(b) Noted. The proposed discharge point is the drainage channel. In addition, statement of "The treated effluent discharge from construction and operational stages should be sited away from natural water course" has been supplemented in Section 4.5.
<u>Comments on landfill gas hazard assessment</u>	
1. Table 4.3 of Section 4.2.1.2 of the LGHA report stated that landfill gas monitoring data in Ngau Tam Mei Landfill is from "October 2013 to September 2015", and the source analysis was conducted based on the subject data as stated in Section 4.2.1.3. It is contrary to ".....Recent gas monitoring data from July 2020 to June 2022 provided by	Relevant content has been revised to from "July 2020 to June 2022".

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
(Updated 27 July 2023)

Comments	Response
EPD are attached in Appendix B" as stated in Section 3.4.1.1. Please review and correct inconsistency.	
2. Landfill gas hazard assessment report was found in the F1-4 but not include in the revised EA report. Please consider if it is more appropriate to include the LFGH as a section in the EA report.	Noted. Landfill gas hazard assessment is included following Section 5 of the EA report.

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
(Updated 13 October 2023)

Comments	Response
1. Comments of the Director of Environmental Protection (DEP) as follows:	
EPD's Comments on the revised EA (FI-5)	
Comments on air quality assessment	
1. Sections 2.2.1: Please note that there is no recommended buffer distance for rural road in HKPSG and it shall be considered as either DD or LD. As a conservative approach, a 10m buffer distance shall be allowed for rural road unless justification distance from San Tam Road, it should not be a concern but please revise the text accordingly.	Noted. Section 2.2.1 revised as "… a separation distance of more than 20m and more than 10m between the sensitive uses of this Project and from the road kerb of the San Tin Highway and San Tam Road, respectively …".
2. Section 2.4.1, 1st paragraph: Please revise the last sentence to "The constructional works of the proposed project will impose potential air quality impacts on the nearby ASRs during the constructional stage (Figure 2.1.2 refers)."	Noted and revised.
3. Section 2.5.1, Odour Impact from the proposed on-site STP. Under 5th paragraph:	
(a) According to Appendix 2.2(page 157), it is noted that the odour removal efficiency is 90% instead of 99.5% for the deodorizer to be used as the one for Kwu Tung Sewage Pump Room. Please rectify the discrepancy. The consultant may review if the proposed STP will impose any adverse odour impact on the nearby ASRs by making reference to the assessment results of other STPs/ STWs with similar control	Noted. In order to achieve the removal efficiency to 99.5%, another deodorizer system is proposed. Another Project reference in "Ma Wan Lot No. 739, Ma Wan Village" with a removal efficiency up to 99.5% is replaced. The new catalogue has been attached in Appendix 2.2.

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
(Updated 13 October 2023)

Comments	Response
measures (i.e. using activated carbon filters) and H2S removal efficiency. Please revise this paragraph as appropriate.	
(b) It is suggested to revise the last sentence to read as "No odour will be released during the wet sludge disposal process."	Noted and revised.
Under 6th paragraph:	
(c) Please revise lines 1-2 to read as "The tentative location of the STP exhaust has been designed as far away as possible from all nearby ASRs. Considering that the scale of the proposed STP is small and at source mitigation measures...".	Noted and revised..
4. Figure 2.1.1: The figure is illegible and please add the roads and other layout details to the figure.	Noted and revised.
5. Figure 2.1.2: Please clarify if the exhaust of STP and kitchen will be at the same location.	It is clarified that the exhaust of STP and kitchen will be at same location with different connected ducts.
Comments on water quality impact	
1. Section 4.3	
(a) Marine Water Quality in Hong Kong in 2022 has been issued, please update.	Noted and updated accordingly.
(b) The project boundary map should read as "Appendix ~~4.1~~ 4.2"	Noted and revised in page 23.
(c) The WSR ID should be indicated in the map / legend box.	Noted and added in legend box accordingly in Appendix 4.2.

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
(Updated 13 October 2023)

Comments	Response
Comments on landfill gas hazard assessment 1. Table 4.3 of Section 4.2.1.2: The data presented in the Table 4.3 and used for Source Analysis in Section 4.2.1.3 are exactly the same as the report submitted in 2016. Please update the data and review the Source Analysis, the overall risk level and the recommendations and protection measures accordingly.	Noted and revised on Table 4.3 of Section 4.2.1.2, Section 4.2.1.3 and Table 4.4 of Section 4.5.1.1.

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
(Updated 06 November 2023)

Comments	Response
1. Comments of the Director of Environmental Protection (DEP) as follows:	
EPD's Comments on the revised EA (FI-5)	
Comments on air quality assessment	
1. Sections 2.2.1:	
(a) Please note that Traffic Census in 2022 is now available and please use the latest TC for reference.	Noted and revised accordingly.
(b) Please state clearly in this section that a 10m buffer distance is allowed between the air-sensitive uses of the proposed development and San Tam Road by considering Rural Road as District Distributor.	Noted. There is no specific requirement on rural road under HKPSG. Considering the San Tam Road is similar to a local distributor, 10m buffer distance thus be recommended as reference to HKPSG.
2. Section 2.4.1 and Figure 2.1.2:	
(a) The separation distances given in Section 2.4.1 and Figure 2.1.2 for Casa Paradizo and Maple Garden are not the closest distances. It should be measured from the site boundary of the proposed development and these ASRs. Please show their shortest separation distances in Figure 2.1.2 and revise the text.	Noted. The separation distances from the Site to Casa Paradizo Block C1-C7 and Maple Gardens Block G2&3 have been shown in Figure 2.1.2. Section 2.4.1 also revised accordingly
(b) Based on Figure 2.1.1, Block C2 and C3 of Casa Paradizo are found to be in close proximity of the site boundary (<10m), additional mitigation measures such as erection of higher hoarding (not less than 3m) close to these ASRs shall be considered. Please supplement.	Block C1 to C7 of Casa Paradizo are within 10m of the Site Boundary. Site hoarding at least 3m at the side of Casa Paradizo is proposed as the mitigation measures and shown in Figure 2.1.2

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
(Updated 06 November 2023)

Comments	Response
3. Section 2.5.1 (a) The STP design calculation is provided in Appendix 4.3 instead of Appendix 2.2. Please check and revise. As mentioned in our previous comment, please provide the closest separation distance of the ASRs from the exhaust of the deodorization system for the on-site STP and make use of the assessment results of other STPs with similar capacity and odour removal efficiency to justify the nearby ASRs will not be subject to adverse odour impact. Please supplement.	With reference to the EIA Report of Expansion of Sha Tau Kok Sewage Treatment Works (STKSTW), the treatment capacity is about 10,000m3/day at ADWF with 99.5% removal efficiency, the nearest ASR (20m from the boundary of STKSTW) is 0.13 OU/m3. Given that the capacity of the Project is far below than the STKSTW, it is anticipated that the odour impact generated from the Project would not greater than the SKTSTW with same odour removal efficiency of 99.5%. With reference to contour map of averaged odour concentration (Figure 3.2 – 3.5) of the said EIA Report, no average odour concentration is found >5 OU/m3. Therefore, it is anticipated that no adverse impact from the Project is anticipated.
(b) Page 7, 3rd last paragraph – Please rectify the typo "washing sludge" in 2nd last line. Suggest to remove 3rd and 4th sentences since it is an engineering design, which depends on the performance of the deodorizer.	Noted and revised.
4. Appendix 2.2 (P. 117) (a) It is noted that the deodorizer has a H_2S removal efficiency of 99.5% for 5ppm H_2S. Please clarify if the concentration of H_2S in the proposed on-site STP will not be higher than 5ppm so that the removal efficiency is achievable.	Hydrogen sulphide by volume. With reference to the EPD website, the 1 odour unit is 0.00047 ppm by volume. 5 OU is equivalent to 0.00235 ppm. As such, 5ppm is equal to 5/0.00047 = 10638 OU. It is reasonable to assume that the small size on-site STP would not generate the odour unit higher than 5ppm.

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
(Updated 06 November 2023)

Comments	Response
(b) Please note that it is not within EPD's purview to comment on the calculations of the design capacity of the deodorizer. The applicant/ design engineer shall ensure that the performance of the deodorizer can achieve the target odour removal efficiency of 99.5% at all time.	Noted. Those are added in Appendix 2.2 (page 117 and 118).

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
(Updated 15 November 2023)

Comments	Response
1. Comments of the Director of Environmental Protection (DEP) as follows:	
EPD's Comments on the revised EA (FI-5)	
Comments on air quality assessment	
1. Sections 2.2.1:	
Please revise the 5th sentence as "As a conservative approach, San Tam Road is assumed as District Distributor and hence a 10m buffer distance shall be provided in accordance with the HKPSG's requirement".	Noted and revised as per P.5.
2. Section 2.5.1:	
Please check if "Figure 3.2 – 3.5" should be revised as "Figures 3.4 - 3.5" since the reference contour plots for the STKSTW were presented in Figures 3.4 and 3.5 of the approved EIA study (AEIAR-207/2017 - Expansion of STKSTW).	Noted and revised as per P.8.
3. Section 2.5.1 and R-t-C 4:	
Since no detailed calculations could be provided to justify that the H2S at the inlet of deodorizer is less 5ppm (or 10638OU/m3), please revise "at 5ppm H2S concentrations" to "for H2S" in line 4 of 5th paragraph to ensure the performance of the deodorizer can achieve the target H2S removal efficiency of 99.5% at all the time for any H2S concentrations.	Noted and revised as per P.7

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 - EMSD

RLEE

RLEE Architects (HK) Ltd

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
6. Comments of the Director of Electrical and Mechanical Services (DEMS) as follow:	
Town Gas Safety	
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.	Noted
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.	QRA would be carried out if necessary.
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:- https://www.emsd.gov.hk/en/gas_safety/publications/guidance_notes/index.html	Noted
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.	Noted

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 – EMSD
(dated to 27 SEPTEMBER 2022)
(updated to 20 FEBRUARY 2023)

Comments	Response
6. Comments of the Director of Electrical and Mechanical Services (DEMS) as follow:	
Town Gas Safety	
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.	Noted
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.	QRA Report is submitted as attached.
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:- https://www.emsd.gov.hk/en/gas_safety/publications/guidance_notes/index.html	Noted
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.	Noted

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

RLEE

RLEE Architects (HK) Ltd

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 – PlanD
(dated to 27 SEPTEMBER 2022)

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

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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 – PlanD
(dated to 27 SEPTEMBER 2022)

Comments	Response
(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.	For the covered part, artificial turf will be applied instead of plants. Those has been revised as per Figure 4 Rev. B.
(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.	Planters on 2/F, 3/F and Vertical Greenery on San Tam Road Façade are accessed by Gondola.
(viii) Figure 9 "Section AA Diagram" • It should be clearly indicated if the Green Hatch Black Area is not covered by the application. • Broken line indicating the omission of 3/F to 7/F should be marked.	Revised as per Figure 9 Rev. B.
(ix) Figure 10 "Section BB Diagram" • The direction of cut-line on the key plan is different from that on Figure 2 and should be rectified. • The layout of planters at the western side on roof garden does not tally with the layout on plan and should be rectified. • Proposed tall plantings on 1/F will black the light and views of users on upper floors. • Broken line indicating the omission of 3/F to 7/F should be marked.	Revised as per Figure 10 Rev. B.

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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 – PlanD
(dated to 27 SEPTEMBER 2022)

Comments	Response
(x) Figure 14 "Green Coverage Calculation" • The provision of greenery coverage has not been indicated on this figure.	Revised as per Figure 14 Rev. B.

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
(Updated 24 November 2023)

Comments	Response
1. Comments of the Chief Town Planner/ Urban Design and Landscape Section, Planning Department as follows:	
1. Please confirm whether the completion year is 2027 as indicated in the TIA report.	Confirmed. The completion year is 2027.
2. Please note that 'no vehicle is allowed to queue back to or reverse onto/from public roads at any time'.	Confirmed.

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 - TD

RLEE

RLEE Architects (HK) Ltd

Summary Table of 'Responses to Comments'

Comments of TD on 2022.12.02	
Comments	**Responses**
a) Please review the location of proposed ingress/ egress for vehicular access in order to improve sight line.	Please find attached Drawing in Appendix I which shows the Subject Lot (i.e. Lot 4823 in DD104) is sandwiched by Lot 2086 in DD 105 to the North and Lot 4764 in DD 104 to the South. Please note that the Brown Area for the Subject Lot has been designated under the Lease and the vehicular access (X, Y through Z) location at San Tam Road is also designated under the Lease. Due to the land issue, the location of the proposed vehicular access point will be maintained. It is noted that trees and shrubs along San Tam Road are regularly maintained and trimmed by LCSD to improve sight line. In addition, similar vehicular access of other developments along San Tam Road are observed and no major Traffic Accidents has been noted so far. The Applicant would also install safety measures such as traffic signs to alert drivers drive slowly and be aware of long vehicles ahead, if necessary.
b) Please indicate the location of pedestrian entrance(s) for the concerned development.	Please find attached **Figure 2.1 (Rev.A)** in the revised TIA report showing the location of pedestrian entrance for the proposed development for your information.
c) Based on the design year of 2030, a set of planning assumptions should be agreed with PlanD given that there are various on-going developments under planning application stage in the vicinity.	PlanD's agreement on the latest planning data in the vicinity has been sought. Please find PlanD's email dated 23 December 2022 attached in Appendix II for your information. Please refer to Section 4.3 and **Figure 4.1 (Rev.A)** for the planned developments considered in the assessment for your reference.

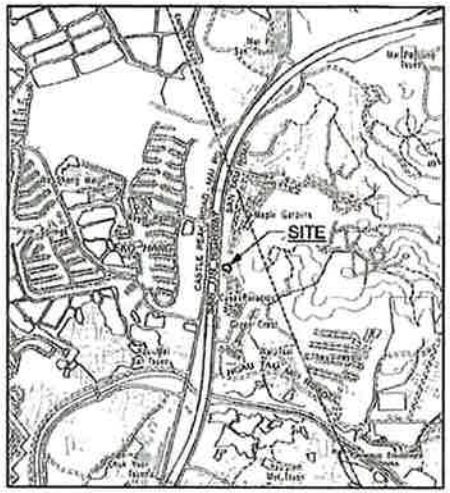
Comments of TD on 2022.12.02	
Comments	**Responses**
d) Swept path analysis should be carried out at critical turning location(s) at ingress/ egress, parking spaces and loading/ unloading areas to demonstrate sufficient space for vehicles manoeuvring of the types of vehicle allowed within the subject site.	Please find attached **Figure SP-01** to **SP-02** in Appendix III showing the swept path at ingress/ egress, parking spaces and loading/ unloading areas.
e) Table 2.3 – • Please specify the headroom of the of the types of vehicle in the table • Please include the picking up and setting down point for ambulance	Please find the revised Table 2.3 with information of headroom of the types of vehicle in the table for your information. Please refer to **Figure 2.1 (Rev.A)** for the proposed picking-up/setting down point for ambulance, and **Figure SP-03** showing the swept path of ambulance ingressing and egressing the site.
f) Table 3.1 – Please include Fairview Peak Interchange in the table and subsequent assessment.	Junction assessment of Fairview Park Interchange is included in the revised TIA report.
g) Section 3.2.2 – To ensure the traffic flow would not be underestimated during COVID epidemic situations, suitable rectifying factors shall be applied to the existing traffic flow to pro-rata the normal traffic condition for subsequent assessment in Year 2030.	Noted. Covid-19 factor is now applied to the existing traffic flows of the revised TIA report. Please refer to Section 3.2.3 to 3.2.4 for the derivation of Covid-19 factor.
h) Figure 2.1 – Please specify the clear width of proposed ingress/ egress, driveway and footpath.	Please find the **Figure 2.1 (Rev.A)** with marked width of proposed ingress/ egress, driveway and footpath for your information.
i) Adequate headroom should be allowed for the type(s) of vehicle to access.	Noted.

Comments of TD on 2022.12.02	
Comments	**Responses**
j) Please ensure vehicles would not encroach to the opposite lane of San Tam Road when entering/ leaving the subject site.	Please find attached drawing **Figure SP-01** to **SP-03** in Appendix III showing the swept path of vehicles for your kind information and consideration. Swept path analysis of ambulance is illustrated diagrammatically in **Figure SP-03** in Appendix III. Although the swept path of ambulance will encroach slightly onto the opposite traffic lane when egressing from the proposed development and making a left-turn, it is envisaged that the time required for encroachment will be very short. Also, the alignment of section of Sam Tam Road outside the proposed development is straight and clear sightline could be provided for the proposed run-in/out of the proposed development. Hence, for emergency purpose, it is considered that the arrangement is acceptable from traffic engineering point of view. Other than that, please note that 8m vehicle will encroach to the opposite lane of San Tam Road when egressing the subject site. Therefore, mitigation measure such as traffic sign will be installed inside the proposed development to ban left turn of vehicle longer than 7m when leaving the site in order to ease the problem.
k) No vehicle is allowed to queue back to or reverse onto/from public road at any time during the planning approval period.	Noted.

Appendix I

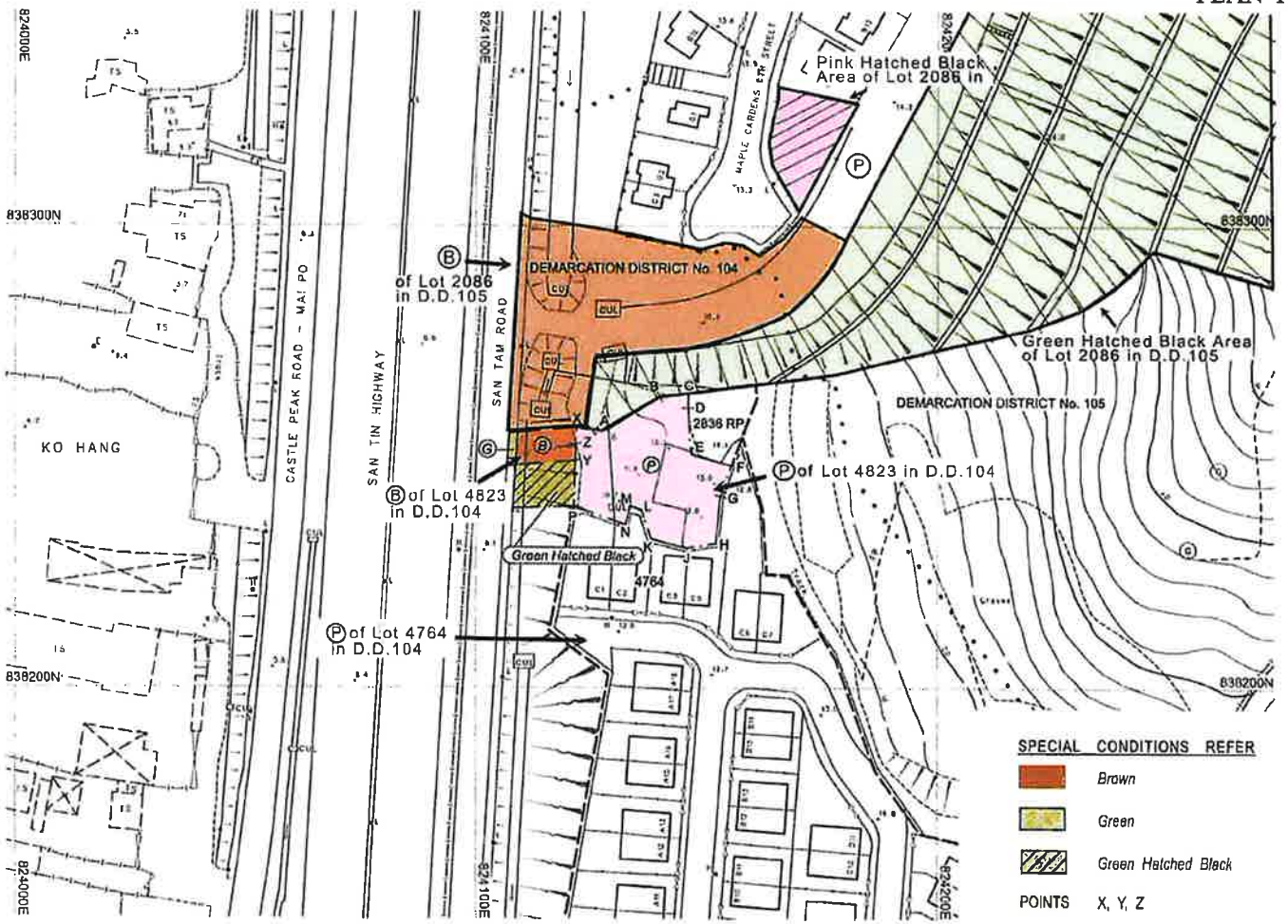
PLAN I

LOCATION



SCALE 1:20000

SIDE	DISTANCE IN METRES	BEARING ° ' "	PL.	CORNER MARKED BY
X A	8.789	93 53 38		
A B	13.433	57 27 48		
B C	6.167	82 18 08		
C D	3.274	180 47 15		
D E	10.355	175 51 27		
E F	9.051	105 50 37		
F G	7.118	109 40 20		
G H	10.050	185 42 40		
H J	6.576	261 15 10		
J K	7.762	284 55 50		
K L	6.325	341 33 50		
L M	2.693	291 48 10		
M N	4.123	194 02 10		
N P	11.894	288 55 00		
P X	17.330	1 44 54		



COLOURED PINK AREA 736.3 SQUARE METRES (ABOUT)

SCALE 1:1 000

metres 20 0 20 40 60 80 100 metres

DRAFT

District Lands Office, Yuen Long
Lands Department

Plan Prepared by District Survey Office, Yuen Long

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LOT No. 4823 IN DEMARCATION DISTRICT No. 104

File No. DLOYL516/YLT/2012C, DSO/YL/W/794/2012
Survey Sheet No. 2-SE-17A
Layout Plan No. ------
Reference Plan No. ------
ALS Plan No. ------

PLAN No. YL14882-DIb

Date : 13/03/2014

Appendix II

寄件者: gtllam@pland.gov.hk
傳送時間: 2022 年 12 月 23 日 18:09
收件者: Agnes Lee
副本: evonneli@ctaconsultants.com; 'Horace Mak'
主旨: Re: S12A amendment of OZP no. S/YL-NTM/12 - Proposed RCHE at 81 San TamRoad, San Tin, NT

Dear Agnes,

My comments on the draft list of planned development is enclosed for your follow-up.

Regards,

Gary Lam
TP/YLE1
FS&YLE District Planning Office, PlanD
Tel: 3168 4043

From: "Agnes Lee" <agneslee@ctaconsultants.com>
To: <gtllam@pland.gov.hk>
Cc: '"Horace Mak"' <horacemak@ctaconsultants.com>, <evonneli@ctaconsultants.com>
Date: 08/12/2022 11:48
Subject: S12A amendment of OZP no. S/YL-NTM/12 - Proposed RCHE at 81 San Tam Road, San Tin, NT

Dear Gary,

I refer to the TD's Comment item (c) (Annex I refers) on the Application No. Y/YL-NTM/9 that "**Based on the design year of 2030, a set of planning assumptions should be agreed with PlanD given that there are various on-going developments under planning application stage in the vicinity.**"

Attached please find the list of planned developments in the vicinity obtained from OZP portal for your information and agreement. The site location of the proposed development has also been attached for your easy reference. Kindly please confirm the planning data in the table as requested by TD. Thank you.

Best regards,
Agnes Lee

CTA Consultants Limited
Unit 2108, 21/F, Westlands Centre, 20 Westlands Road, Quarry Bay, H. K.
Tel: (852) 2214 0849 Fax: (852) 2214 0817
Email : cta@ctaconsultants.com
[attachment "Annex I.pdf" deleted by Gary Tat Leung LAM/PLAND/HKSARG] [attachment "Planned developments in the vicinity.pdf" deleted by Gary Tat Leung LAM/PLAND/HKSARG] [attachment "FIG_1.1 SITE LOCATION PLAN.pdf" deleted by Gary Tat Leung LAM/PLAND/HKSARG]

Planned Developments in the Vicinity

Application No.	Type	Key Development Parameters
Ongoing S12A Applications in the Vicinity		
Y/YL-NTM/5	Residential	1,980 residential units
Y/YL-NTM/6	Residential	1,990 residential units + 6,485m² GFA for commercial
Y/YL-MP/6	Residential	• 3,090 residential units • 2,363m² retail GFA • 6-classroom kindergarten • 100-place RCHE • Neighbourhood Elderly Centre (NEC)
Y/YL-ST/1	Residential	• 2,075m² Retail GFA • 4,176 residential units • 100-place child care centre • 6-classroom kindergarten
Y/YL-NSW/7	Residential	• 900m² Retail GFA • 1,997 residential units • 6 ~~4~~-classroom kindergarten • 100-place child care centre
Y/YL-NTM/8	Residential	• 6,276 residential units • 67,000m² GFA for GIC facilities
Y/YL-MP/6	Residential	3,090 residential units
Y/YL-MP/7	Residential	1,228 residential units
Y/YL-MP/8	Residential	1,249 residential units
Y/YL-NSW/8	Residential	• 6,825 residential units • 750m² retail GFA • 4 nos. of GIC facilities — NEC, 100-place CCC, 100-place RCHE, 80-place Day Care Cntre for Elderly
Y/YL-NSW/9	Residential	• 3,115 residential units • ~~3,000~~ 6,000m² Retail GFA • 1 Primary school • ~~3 Kindergartens~~ • 1 relocated soy sauce factory
~~Y/YL-NSW/6~~	~~Residential~~	• ~~4,329 private housing~~ • ~~640 public housing~~
Approved S16 Applications in the Vicinity		
A/YL-MP/247	Residential	Domestic GFA about 16,200m² for 105 houses
A/YL-MP/287	Residential	Domestic GFA about 7,540m² for 65 houses
A/YL-NSW/274	Residential	Domestic GFA about 70,328m² for ~~1,955~~ 1,518 flats
A/YL-NTM/178 -2	Residential	Domestic GFA about ~~46,365m² for 322 houses~~ 45,197m² for 320 houses
~~A/YL-NTM/432~~	~~Residential~~	~~Domestic GFA about 28,840m² for 1,208 flats~~
A/YL-MP/291	Residential	268 houses
A/YL-NSW/241	Retail	37,171 m² retail GFA

Y/YL-NTM/7
- 12,575m² GFA for commercial
- 39,215m² for commercial
- NEC
- CCC

Appendix III



FIGURE NO.: SP-01	PROJECT TITLE: 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 DD 104, 81 San Tam Road, San Tin, N.T.	
PROJECT NO.: 22069HK	DRAWING TITLE: SWEPT PATH ANALYSIS OF 8M VEHICLE	CTA Consultants Limited 志達顧問有限公司
SCALE: 1 : 350 @A4 / DATE: 03 JAN 2023		



FIGURE NO.: SP-02	PROJECT TITLE: 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 DD 104, 81 San Tam Road, San Tin, N.T.
PROJECT NO.: 22069HK	DRAWING TITLE: SWEPT PATH ANALYSIS OF 7M VEHICLE
SCALE: 1 : 350 @A4	DATE: 03 JAN 2023

CTA Consultants Limited
志達顧問有限公司

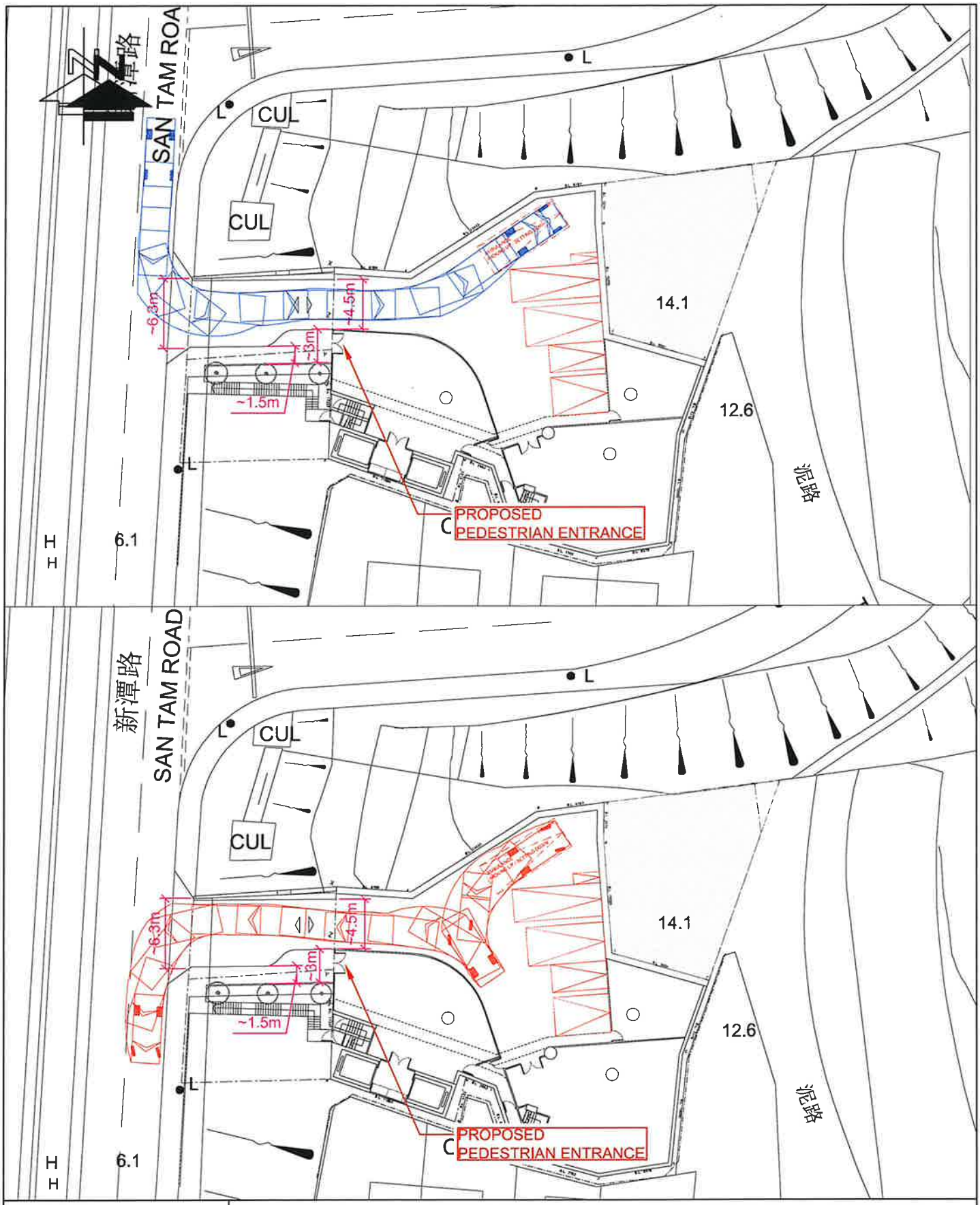


FIGURE NO.: SP-03	PROJECT TITLE: S12A Amendment of Plan Application, Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12 Proposed Rezoning from "R(C)" to "G/IC" for a Proposed "Social Welfare Facilities" (Residential Care Homes for the Elderly) (RCHE) At Lot 4823 in DD 104, 81 San Tam Road, San Tin, N.T.
PROJECT NO.: 22069HK	DRAWING TITLE: SWEPT PATH ANALYSIS OF AMBULANCE
SCALE: 1 : 400 @A4 / DATE: 03 JAN 2023	CTA Consultants Limited 志達顧問有限公司

Summary Table of 'Responses to Comments'

Comments of TD on 2023.1.4	
Comments	**Responses**
1. Please provide the approved plan regarding the land lease instead of the "Draft" version.	Please find attached the approved Lease in Appendix I for your reference and information.
2. It was noted the XYZ points are inside the site instead of immediately adjacent to the existing footpath. Please review the location of proposed run-in/out for improving the sight line.	Please refer to Cl. 9 of the Special Conditions of the Lease (Appendix I p.10 refers) which specify the purpose of Brown Area as a Right-of-way.
3. Please advise the use of "Green Hatched Black" Area according to the land lease to see if there is flexibility to further adjust the location of proposed run-in/out.	Please refer to Cl. 27 of the Special Conditions in the Lease (Appendix I p.17 and 18 refers) which specify the purpose of Green Hatched Black Area is for slope maintenance and stabilization only. Moreover, the Green Hatched Black Area is occupied by a slope at the moment and therefore, no access to the Lot is possible. Please refer to the drawing in Appendix II illustrating the current condition of the Green Hatched Black Area for your information and consideration.

Appendix I

COPY

地政總署
法律諮詢及田土轉易處
LEGAL ADVISORY AND CONVEYANCING OFFICE
LANDS DEPARTMENT

我們矢志努力不懈，提供盡善盡美的土地行政服務。
We strive to achieve excellence in land administration.
網址 Website : www.landsd.gov.hk

(YUEN LONG AND TUEN MUN)
12/F.,Yuen Long Government Offices,
No. 2 Kiu Lok Square,
Yuen Long, New Territories

電　話 Tel: 2443 1105
圖文傳真 Fax: 2473 3058
電郵地址 Email:

本署檔號 Our Ref: (39) in LD/LACO/YL 74/582/2012 Pt.2
來函檔號 Your Ref: LAS/CHC/TT/pl /14-14074

來函請註明本署檔號
Please quote our reference in your reply

12 January 2016

BY FAX & BY COLLECTION
(Fax No. 2840 0600)

Wonder Pacific Development Limited
c/o Knight Frank Petty Limited
4/F, Shui On Centre,
6-8 Habour Road, Wanchai,
Hong Kong

Dear Sirs,

Land Exchange
Lot No.4823 in D.D. 104

With reference to the above matter, I return herewith the original Conditions of Exchange with plan annexed thereto ("the Conditions") which was duly registered in the Land Registry by New Grant No. 22253.

Please send a representative who should bring with him/her your company chop to this office at the above address to collect the Conditions. For enquires, please contact Mr. LUK at Telephone No.2475 6317.

Yours faithfully,

(Miss Miranda LEUNG)
Land Conveyancing Officer II
for Senior Solicitor
Lands Department

Encl.
c.c. District Lands Officer/ Yuen Long) w/o encl
(Ref. DLO/YL 515/YLT/2012 Pt.2)

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準時繳納地稅 - 以免業權受損
Don't put your property at risk – make sure the Government rent is paid !

PARTICULARS AND CONDITIONS OF EXCHANGE

PARTICULARS AND CONDITIONS FOR THE GRANT by the Government of the Hong Kong Special Administrative Region (hereinafter referred to as "the Government") of the lot of land described in the First Schedule hereunder and shown coloured pink on PLAN I annexed hereto for a term of fifty years commencing from the date of the Memorandum of Agreement annexed hereto at the rent specified in the First Schedule hereunder and subject to the General and Special Conditions hereunder in exchange for the surrender of the OLD LOT described in the Second Schedule hereunder and shown coloured blue on PLAN II annexed hereto.

First Schedule

PARTICULARS OF THE LOT

Registry No.	Location	Site	Area in square metres	Rent	Premium
Lot No. 4823 in Demarcation District No. 104	San Tam Road, San Tin, Yuen Long, New Territories	As delineated and shown coloured pink on PLAN I annexed hereto	736.3 (about)	An annual rent of an amount equal to 3% of the rateable value from time to time of the lot, subject to General Condition No. 1 hereof	$30,540,000.00

Second Schedule

OLD LOT TO BE SURRENDERED

Registry No.	Location	Area in square metres
Lot No. 2837 in Demarcation District No. 104	San Tam Road, San Tin, Yuen Long, New Territories	607 (about)

GENERAL CONDITIONS

Rent

1. Rent as specified in the Particulars of the Lot shall commence and be payable from the date of this Agreement and until the expiry of the term hereby agreed to be granted, and shall be governed by the provisions of the Government Rent (Assessment and Collection) Ordinance, any regulations made thereunder and any amending legislation and also subject to a minimum rent of $1 per annum (if demanded).

Acknowledgement by Grantee

2. The Grantee hereby expressly acknowledges :

(a) that the Government shall be under no liability whatsoever to the Grantee (which expression shall for the purpose of this General Condition only include his successors, assigns, mortgagees, tenants or other occupiers of the lot whether lawful or otherwise) for any loss or damage howsoever arising in connection with or as a consequence of his grant of the lot and its subsequent development;

(b) that he has acquired the lot based on his site investigation (if any) or upon his own evaluation of land records and available geotechnical information whether obtained from Government sources or otherwise and has satisfied himself as to the state and condition of the lot in relation to the purposes for which the lot is to be developed or redeveloped;

(c) that he takes the lot, whether on, above or below the surface of the ground, in the state and condition as it exists on the date on which possession of the lot is deemed to be given in accordance with Special Condition No. (4) of these Conditions; and

(d) that he shall not be entitled to revoke, withdraw, cancel or resile in any way whatsoever from this Agreement nor be entitled in any way whatsoever to compensation or a reduction in the premium or any other compromise whatsoever should he subsequently determine that the lot is not fit for the purposes for which he acquired the lot.

Exclusion of warranty

3. (a) The Government has given no warranty, express or implied, as to the suitability or fitness of the lot or any part thereof for development whether in accordance with these Conditions or otherwise. The Grantee for himself, his successors or assigns undertakes not to make any claim against the Government for any loss or damage whatsoever which he may suffer as a result of or arising from the state and condition of the lot making it either unfit for the purpose for which he acquired the lot or rendering it impossible to achieve the scale of development originally intended.

(b) The Government in no way warrants the accuracy or correctness in any way whatsoever of any information made available or obtained, and in particular does not warrant that the lot is fit and suitable

for any particular purpose.

Indemnity by Grantee

4. The Grantee hereby indemnifies and shall keep indemnified the Government against all actions, proceedings, liabilities, demands, costs, expenses, losses (whether financial or otherwise) and claims whatsoever and howsoever arising from any breach of these Conditions or any damage or soil and groundwater contamination caused to adjacent or adjoining land or to the lot where such damage or soil and groundwater contamination has, in the opinion of the Director of Lands (hereinafter referred to as "the Director", and whose opinion shall be final and binding upon the Grantee), arisen out of any use of the lot, or any development or redevelopment of the lot or part thereof or out of any activities carried out on the lot or out of any other works carried out thereon by the Grantee whether or not such use, development or redevelopment, activities or works are in compliance with these Conditions or in breach thereof.

Setting out

5. (a) The Director shall, at such time as he thinks fit or upon the application of the Grantee, set out the lot on the ground and the Grantee or his authorized representative after such setting out when called upon by the Director will attend at the lot to inspect the survey marks delineating the lot on the ground and will be given a plan showing the positions and descriptions of each such mark. The Grantee shall not commence any operations for building on the lot until it shall have been so set out by the Director. The Grantee shall take or cause to be taken all proper care and precautions to safeguard the said survey marks from disturbance or removal. If, before commencing any operations for building on the lot, any of the said survey marks are disturbed or removed, the Grantee shall apply in writing to the Director for replacement by survey and shall pay on demand to the Government in advance the prescribed fee therefor.

Encroachment upon Government land

(b) In the event that the Grantee is found to have encroached upon and to be occupying Government land the Director may in his absolute discretion either require the Grantee to demolish any building or part of any building standing on such Government land, to reinstate such Government land to his satisfaction and deliver vacant possession of the same to the Government or pay to the Government such sum as the Director in his absolute discretion shall determine as the premium in respect of such Government land. A certificate under the hand of the Director shall be conclusive as to the extent of any such encroachment and as to the amount of the premium payable in respect thereof. If the Grantee fails to demolish any building as required by the Director as above it shall be lawful for the Director to demolish such building and the Grantee shall pay on demand to the Government the amount certified by the Director as the cost of such demolition. In the event that the Director exercises his discretion to require the payment of premium as aforesaid, upon the payment of such premium the area of Government land encroached upon shall be deemed in all respects to be part of the lot and shall be included in the lease of the lot when issued.

Maintenance

6. (a) The Grantee shall throughout the tenancy having built or rebuilt (which word refers to redevelopment as contemplated in sub-clause (b) of this General Condition) in accordance with these Conditions :

(i) maintain all buildings in accordance with the approved design, disposition or height and any approved building plans without variation or modification thereto; and

(ii) maintain all buildings erected or which may hereafter be erected in accordance with these Conditions or any subsequent contractual variation of them, in good and substantial repair and condition and in such repair and condition deliver up the same at the expiration or sooner determination of the tenancy.

(b) In the event of the demolition at any time during the tenancy of any building then standing on the lot or any part thereof the Grantee shall replace the same either by sound and substantial building or buildings of the same type and of no less gross floor area or by building or buildings of such type and value as shall be approved by the Director. In the event of demolition as aforesaid the Grantee shall within one calendar month of such demolition apply to the Director for consent to carry out building works for the redevelopment of the lot and upon receiving such consent shall within three calendar months thereof commence the necessary works of redevelopment and shall complete the same to the satisfaction of and within such time limit as is laid down by the Director.

Boundary stones

7. The Grantee shall permit boundary stones properly cut and marked with the number of the lot to be fixed at each angle thereof and either in or on the land itself or in or on any building erected thereon as may be required by the Director and shall pay the fees prescribed by him therefor as well as the prescribed fees for the refixing of such boundary stones which, through being lost, damaged or removed, need replacing.

Private streets, roads and lanes

8. Any private streets, roads and lanes which by these Conditions are required to be formed shall be sited to the satisfaction of the Director and included in or excluded from the area to be leased as may be determined by him and in either case shall be surrendered to the Government free of cost if so required. If the said streets, roads and lanes are surrendered to the Government, the surfacing, kerbing, draining (both foul and storm water sewers), channelling and road lighting thereof shall be carried out by the Government at the expense of the Grantee and thereafter they shall be maintained at public expense. If the said private streets, roads and lanes remain part of the area to be leased, they shall be lighted, surfaced, kerbed, drained, channelled and maintained by and at the expense of the Grantee in all respects to the satisfaction of the Director and the Director may carry out or cause to be carried out the installation and maintenance of road lighting for the sake of public interest as required. The Grantee shall bear the capital cost of installation of road lighting and allow free ingress and egress to and from the area to be leased to workmen and vehicles for the purpose of installation and maintenance of the road lighting.

Right to inspect

9. (a) The Grantee shall throughout the tenancy, at all reasonable times, permit the Director or his authorized representatives, with or

without having given notice, to enter in or upon the lot or any part thereof or any building or part of any building erected on the lot for the purpose of inspecting the same so as to ascertain that there is no breach of or failure to observe any of these Conditions.

Right to inspect for assessing contamination

(b) The Grantee shall throughout the tenancy, at all reasonable times, permit the Director and the Director of Environmental Protection or his or their authorized representatives, upon serving reasonable verbal or written notice on the Grantee, to enter into or upon the lot or any part thereof or any building or part of any building erected on the lot for the purpose of carrying out site investigation works to assess the extent of contamination within the lot, which works shall include but not be limited to conducting site inspections, taking soil and water samples and any other works and operations relating or ancillary to such contamination assessment.

Breach of lease conditions

(c) The fulfilment by the Grantee of his obligations under these Conditions shall be a condition precedent to the grant or continuance of the tenancy, and in the event of any default by the Grantee in complying therewith such default shall be deemed to be a continuing breach and the subsequent acceptance by or on behalf of the Government of any rent or rates or other payment whatsoever shall not (except where the Government has notice of such breach and has expressly acquiesced therein) be deemed to constitute any waiver or relinquishment or otherwise prejudice the enforcement of the Government's right of re-entry for or on account of such default or any other rights, remedies or claims of the Government in respect thereof under these Conditions which shall continue in force and shall apply also in respect of default by the Grantee in the fulfilment of his obligations under these Conditions within any extended or substituted period as if it had been the period originally provided.

Re-entry

10. (a) Upon any failure or neglect by the Grantee to perform, observe or comply with any of these Conditions the Government shall be entitled to re-enter upon and take back possession of the lot or any part thereof and all or any buildings, erections and works erected or to be erected on the lot or any such part thereof or any part of such buildings, erections or works and thereupon this Agreement and the rights of the Grantee hereunder shall absolutely cease and determine (in respect of such part if the re-entry is upon a part only) but without prejudice nevertheless to the rights, remedies and claims of the Government in respect of any breach, non-observance or non-performance of the terms and conditions hereof.

No refund of premium on re-entry

(b) In the event of re-entry by the Government for or in respect of or arising out of the breach, non-observance or non-performance by the Grantee of the provisions of these Conditions, the Grantee shall not be entitled to any refund of the premium paid by him or any part thereof or to any payment or compensation whatsoever whether in respect of the value of the land or any part thereof or any building or buildings erected or to be erected on the land or any part thereof or part of any such building or buildings or any amount expended by the Grantee in the preparation, formation or development of the lot or any part thereof or otherwise.

Lease

11. (a) When these Conditions have been complied with to the satisfaction of the Director, the Grantee shall subject to approval of his title by the Director be entitled to a lease of the lot for the term stated in the preamble to these Conditions.

(b) The Grantee shall execute and take up the lease of the lot when called upon to do so by the Director and shall pay the prescribed fees therefor. In the event of more than one building being erected on the lot the Grantee may be required to take up a separate lease for the site of each separate building and shall pay the prescribed fees for every additional lease so required to be taken up.

(c) Pending the issue of the lease the tenancy of the lot shall be deemed to be upon and subject to, and such lease, when issued, shall be subject to and contain all exceptions, reservations, covenants, clauses, conditions and provisos as are now inserted in the leases issued by the Government of similar lots in the Hong Kong Special Administrative Region (hereinafter referred to as "Hong Kong") as varied, modified or extended by these Conditions.

Definitions

12. (a) The expression "Grantee" shall in these Conditions include the person entering into and executing this Agreement and where the context so admits or requires his executors, administrators and assigns and in the case of a corporation its successors and assigns and the expression "lot", except where the context otherwise requires, means the lot stated in the First Schedule hereto. Where the context so admits or requires, words importing the masculine gender shall be deemed to include females and corporations, and words in the singular shall be deemed to include the plural and vice versa.

(b) The foregoing General Conditions shall be read and construed as varied or modified by the Special Conditions hereinafter contained, and the expression "these Conditions" whenever used shall mean and include the General and Special Conditions.

Marginal notes

13. The marginal notes to these Conditions shall not be deemed to be part of these Conditions and shall not affect the interpretation or construction thereof.

SPECIAL CONDITIONS

Surrender

(1) The Grantee shall at his own expense surrender to the Government free of cost the old lot described in the Second Schedule hereto to the satisfaction of the Director contemporaneously with the execution of this Agreement.

Indemnify Government against structures

(2) The Grantee acknowledges that there are some buildings and structures existing on the old lot and undertakes to remove at his own expense the said buildings and structures from the old lot. The Government will accept no responsibility or liability for any damage, nuisance or disturbance caused to or suffered by the Grantee by reason of the presence of the said buildings and structures and the Grantee hereby indemnifies and shall keep indemnified the Government from and against all liabilities, claims, costs, demands, actions or other proceedings whatsoever arising whether directly or indirectly out of or in connection with the presence and subsequent demolition of the said buildings and structures.

Premium

(3) Having paid the deposit equal to 10% of the premium specified in the First Schedule hereto, the Grantee shall pay to the Government upon the execution of this Agreement by the Grantee the balance of the premium.

Possession

(4) (a) Subject to compliance with Special Condition No. (1) hereof and to the payment of the balance of the premium in accordance with Special Condition No. (3) hereof, possession of the lot shall be deemed to be given to and taken by the Grantee on the date of this Agreement.

(b) The lot is granted subject to all and any rights, claims, actions, proceedings and liabilities whether arising by way of adverse possession or otherwise as existing on the date of this Agreement in relation to the lot or any part thereof hereby agreed to be granted.

Formation of the Green Area (time limit, manner and purpose)

(5) (a) The Grantee shall :

(i) on or before the 30th day of June, 2019 (or such other extended period as may be approved by the Director), at his own expense, in such manner with such materials and to such standards, levels, alignment and design as the Director shall approve and in all respects to the satisfaction of the Director:

(I) lay and form that portion of future public road shown coloured green on PLAN I annexed hereto (hereinafter referred to as "the Green Area"); and

(II) provide and construct such bridges, tunnels, over-passes, under-passes, culverts, viaducts, flyovers, pavements, roads or such other structures as the Director in his sole discretion may require (hereinafter collectively referred

to as "the Structures")

so that building, vehicular and pedestrian traffic may be carried on the Green Area;

(ii) on or before the 30th day of June, 2019 (or such other extended period as may be approved by the Director), at his own expense and to the satisfaction of the Director, surface, kerb and channel the Green Area and provide the same with such gullies, sewers, drains, fire hydrants with pipes connected to water mains, street lights, traffic signs, street furniture and road markings as the Director may require; and

(iii) maintain at his own expense the Green Area together with the Structures and all structures, surfaces, gullies, sewers, drains, fire hydrants, services, street lights, traffic signs, street furniture, road markings and plant constructed, installed and provided thereon or therein to the satisfaction of the Director until such time as possession of the Green Area has been delivered in accordance with Special Condition No. (6) hereof.

Formation of the Green Area (non-fulfilment)

(b) In the event of the non-fulfilment of the Grantee's obligations under sub-clause (a) of this Special Condition within the prescribed period stated therein, the Government may carry out the necessary works at the cost of the Grantee who shall pay to the Government on demand a sum equal to the cost thereof, such sum to be determined by the Director whose determination shall be final and shall be binding upon the Grantee.

No claim on works on the Green Area

(c) The Government shall have no liability in respect of any loss, damage, nuisance or disturbance whatsoever caused to or suffered by the Grantee or any other person whether arising out of or incidental to the fulfilment of the Grantee's obligations under sub-clause (a) of this Special Condition or the exercise of the rights by the Government under sub-clause (b) of this Special Condition or otherwise, and no claim whatsoever shall be made against the Government by the Grantee in respect of any such loss, damage, nuisance or disturbance.

Possession of the Green Area

(6) For the purpose only of carrying out the necessary works specified in Special Condition No. (5) hereof, the Grantee shall on the date of this Agreement be granted possession of the Green Area. The Green Area shall be re-delivered to the Government on demand and in any event shall be deemed to have been re-delivered to the Government by the Grantee on the date of a letter from the Director indicating that these Conditions have been complied with to his satisfaction. The Grantee shall at all reasonable times while he is in possession of the Green Area allow free access over and along the Green Area for all Government and public vehicular and pedestrian traffic and shall ensure that such access shall not be interfered with or obstructed by the carrying out of the works whether under Special Condition No. (5) hereof or otherwise.

Restriction on use of the Green Area

(7) The Grantee shall not without the prior written consent of the Director use the Green Area for the purpose of storage or for the erection of any temporary structure or for any purposes other than the carrying out of the works specified in Special Condition No. (5) hereof.

Access to the Green Area for inspection

(8) (a) The Grantee shall at all reasonable times while he is in the possession of the Green Area:

(i) permit the Government, the Director and his officers, contractors and agents and any persons authorized by the Director, the right of ingress, egress and regress to, from and through the lot and the Green Area for the purpose of inspecting, checking and supervising any works to be carried out in compliance with Special Condition No. (5)(a) hereof and the carrying out, inspecting, checking and supervising of the works under Special Condition No. (5)(b) hereof and any other works which the Director may consider necessary in the Green Area;

(ii) permit the Government and the relevant public utility companies authorized by the Government the right of ingress, egress and regress to, from and through the lot and the Green Area as the Government or the relevant public utility companies may require for the purpose of any works to be carried out in, upon or under the Green Area or any adjoining land including but not limited to the laying and subsequent maintenance of all pipes, wire, conduits, cable-ducts and other conducting media and ancillary equipment necessary for the provision of telephone, electricity, gas (if any) and other services intended to serve the lot or any adjoining or neighbouring land or premises, and the Grantee shall co-operate fully with the Government and also with the relevant public utility companies duly authorized by the Government on all matters relating to any of the aforesaid works to be carried out within the Green Area; and

(iii) permit the officers of the Water Authority and such other persons as may be authorized by them the right of ingress, egress and regress to, from and through the lot and the Green Area as the officers of the Water Authority or such authorized persons may require for the purpose of carrying out any works in relation to the operation, maintenance, repairing, replacement and alteration of any other waterworks installations within the Green Area.

(b) The Government, the Director and his officers, contractors and agents and any persons or public utility companies duly authorized under sub-clause (a) of this Special Condition shall have no liability in respect of any loss, damage, nuisance or disturbance whatsoever caused to or suffered by the Grantee or any person arising out of or incidental to the

exercise of the rights by the Government, the Director and his officers, contractors and agents and any persons or public utility companies duly authorized under sub-clause (a) of this Special Condition.

Right-of-way over Government land (Brown Area)

(9) (a) The lot is granted together with a right for the Grantee and his servants, visitors, workmen and other persons authorized by him in that behalf from time to time and at all times during the term hereby agreed to be granted for all purposes connected with the proper use and enjoyment of the lot to pass and repass on, along, over, by and through the area shown coloured brown on PLAN I annexed hereto (hereinafter referred to as "the Brown Area") at such levels as may be approved by the Director.

(b) The Grantee shall, on or before the 30th day of June, 2019 (or such other extended period as may be approved by the Director), at his own expense, in such manner, with such materials and to such standards as the Director shall require or approve, construct a paved way with such associated street furniture, traffic aids, street lighting, sewers, drains, channels, catchpits, culverts and other structures as the Director may consider necessary on the Brown Area over and along which a right of way referred to in sub-clause (a) of this Special Condition is given with minimum disturbance to the owners of any other lots in the vicinity to whom rights of way over the whole or any portion of the Brown Area may have been granted.

(c) The Grantee shall at his own expense uphold, maintain, repair and manage the Brown Area and everything forming a portion of or pertaining to it, all to be done to the satisfaction of the Director and the Grantee shall be responsible for the whole as if he were the absolute owner thereof.

(d) Any alteration to any public road absorbing a portion of the Brown Area over and along which a right of way is given or affecting the gradient thereof, shall not give rise to any claim by the Grantee who shall at his own expense carry out all consequent alterations to the paved way constructed by him to the satisfaction of the Director.

(e) The grant of the right of way referred to in sub-clause (a) of this Special Condition shall not give the Grantee the exclusive right over the Brown Area or any part thereof. The Government shall have the right to grant rights of way over the Brown Area or any part thereof to the owners of any other lots in the vicinity now or at any time in the future, or to take over the whole or any portion of the Brown Area for the purposes of a public street without payment of any compensation to the Grantee or to other owners to whom rights of way over the whole or any portion of the Brown Area may have been granted.

(f) In the event of the non-fulfilment of the Grantee's obligations under sub-clauses (b), (c) or (d) of this Special Condition, the Government may carry out the necessary construction, maintenance, repair or alteration works at the cost of the Grantee who shall pay to the Government on demand a sum equal to the costs thereof, such sum to be determined by the Director whose determination shall be final and shall be binding upon the Grantee.

(g) Notwithstanding the grant of the right of way referred to in sub-clause (a) of this Special Condition, the Government shall have the full right and power, upon giving to the Grantee, not less than fourteen days' written notice (save in case of emergency) to lay, install, relay, divert, remove, reprovision, replace, inspect, operate, repair, maintain and renew any Government or other drain, channel, catchpit, culvert, waterway or watercourse, sewer, nullah, water main, pipe, cable, wire, line, utility service or other works or installations (all together hereinafter referred to as "the Brown Area Services") which are now or may hereafter be upon, over, under or adjacent to the Brown Area as the Director may in his absolute discretion deem fit, making good any and all damage caused thereby, and the Director, his officers, contractors and any other persons authorized by him, his or their workmen with or without tools, equipment, plant, machinery or motor vehicles shall have the right of free ingress, egress and regress at all times to and from the Brown Area for the purposes aforesaid. The Grantee shall not disturb or allow anybody to disturb the Brown Area Services without the prior written approval from the Director. Save in respect of making good any and all damage caused by any exercise of the aforesaid rights and powers, the Government, the Director, his officers, contractors and any other persons authorized by him, his or their workmen shall have no liability in respect of any loss, damage, nuisance or disturbance whatsoever caused to or suffered by the Grantee arising out of or incidental to the exercise of the rights conferred under this sub-clause, and no claim nor objection shall be made against him or them by the Grantee.

Building covenant

(10) The Grantee shall develop the lot by the erection thereon of a building or buildings complying in all respects with these Conditions and all Ordinances, bye-laws and regulations relating to building, sanitation and planning which are or may at any time be in force in Hong Kong, such building or buildings to be completed and made fit for occupation on or before the 30th day of June, 2019.

User

(11) (a) Subject to sub-clause (b) of this Special Condition, the lot or any part thereof or any building or part of any building erected or to be erected thereon shall not be used for any purpose other than for private residential purposes.

(b) The lot shall be developed for use as a single family residence provided that the decision of the Director as to whether the lot is developed for use as a single family residence shall be final and binding on the Grantee.

Development conditions

(12) Subject to these Conditions, upon development or redevelopment (which term refers solely to redevelopment contemplated in General Condition No. 6 hereof) of the lot or any part thereof:

Compliance with Buildings Ordinance

(a) any building or buildings erected or to be erected on the lot shall in all respects comply with the Buildings Ordinance, any regulations made thereunder and any amending legislation;

Compliance with Town Planning Ordinance

(b) no building or buildings may be erected on the lot or any part thereof or upon any area or areas outside the lot specified in these Conditions, nor may any development or use of the lot or any part thereof, or of any area or areas outside the lot specified in these Conditions take place, which does not in all respects comply with the requirements of the Town Planning Ordinance, any regulations made thereunder and any amending legislation;

Total gross floor area

(c) the total gross floor area of any building or buildings erected or to be erected on the lot shall not be less than 176.7 square metres and shall not exceed 294.5 square metres;

Height

(d) no part of any building or other structure erected or to be erected on the lot together with any addition or fitting (if any) to such building or structure may in the aggregate exceed a height of 21 metres above the Hong Kong Principal Datum, or such other height limit as the Director at his sole discretion may, subject to the payment by the Grantee of any premium and administrative fee as shall be determined by the Director, approve, provided that:

(i) machine rooms, air-conditioning units, water tanks, stairhoods and similar roof-top structures may be erected or placed on the roof of the building so as to exceed the above height limit on condition that the design, size and disposition of the said roof-top structures are to the satisfaction of the Director; and

(ii) the Director at his sole discretion may in calculating the height of a building or structure exclude any structure or floor space referred to in Special Condition No. (34) (b)(i)(II) hereof;

Maximum number of storeys

(e) any building or buildings erected or to be erected on the lot shall not exceed 3 storeys including any floor or space below the level of the ground and any floor or space used for the parking of motor vehicles licensed under the Road Traffic Ordinance, any regulations made thereunder and any amending legislation provided that the Director at his sole discretion may in calculating the number of storeys referred to in this sub-clause (e) exclude:

(i) any floor or space that he is satisfied is constructed or intended to be occupied solely by machinery or equipment for any lift, air-conditioning or heating system or any similar service; and

(ii) any structure or floor space referred to in Special Condition No. (34)(b)(i)(II) hereof; and

Design and disposition

(f) the design and disposition of any building or buildings erected or to be erected on the lot shall be subject to the

approval in writing of the Director and no building works (other than site formation works and the demolition works referred to in Special Condition No. (2) hereof) shall be commenced on the lot until such approval shall have been obtained and for the purpose of these Conditions, "building works" and "site formation works" shall be as defined in the Buildings Ordinance, any regulations made thereunder and any amending legislation.

Preservation of trees

(13) No tree growing on the lot or adjacent thereto shall be removed or interfered with without the prior written consent of the Director who may, in granting consent, impose such conditions as to transplanting, compensatory landscaping or replanting as he may deem appropriate.

Landscaping

(14) The Grantee shall at his own expense landscape and plant with trees and shrubs any portion of the lot and podium (if any) not built upon and thereafter maintain and keep the same in a safe, clean, neat, tidy and healthy condition all to the satisfaction of the Director.

No exempt building

(15) No building shall be erected on the lot of a type which by virtue of the Buildings Ordinance (Application to the New Territories) Ordinance, any regulations made thereunder and any amending legislation is exempted from the provisions of the Buildings Ordinance, any regulations made thereunder and any amending legislation.

One assignment

(16) Notwithstanding anything to the contrary herein contained, the Grantee (which expression shall, for the purpose of this Special Condition only, exclude his executors, administrators and assigns) may, after he has complied with Special Condition Nos. (1) and (3) hereof but before he has in all respects observed and complied with and fulfilled all of his obligations under these Conditions to the satisfaction of the Director, assign the whole of the lot, but not a part thereof, absolutely.

Restriction on alienation except as a whole

(17) Throughout the term hereby agreed to be granted, the Grantee shall not assign, mortgage, charge, underlet, part with possession of or otherwise dispose of:

(a) subject to sub-clause (b) of this Special Condition, any interest in the lot (including but not limited to any undivided shares therein) or any building or part of any building thereon;

(b) the lot except as a whole provided that any assignment, mortgage, charge, underletting, parting with possession or other disposal of the lot as a whole prior to compliance with these Conditions by the Grantee shall be subject to Special Condition No. (18) hereof;

or enter into any agreement so to do.

Restriction on alienation before compliance

(18) Prior to compliance with these Conditions in all respects to the satisfaction of the Director, the Grantee shall not:

(a) assign, part with possession of or otherwise dispose of the lot (whether by way of direct or indirect reservation, the grant of any right of first refusal, option or power of attorney, or any other method, arrangement or document of any description) or enter into any agreement so to do;

(b) solicit or accept, whether directly or indirectly or through a solicitor, agent, contractor or trustee or through a company in which the Grantee or its nominee is directly or indirectly the owner of shares or which is the owner of shares in the Grantee or otherwise, any money, money's worth or other valuable consideration of any description pursuant to any transaction, present or future, conditional or unconditional whereby the lot is or may be sold, assigned or otherwise disposed of or affected, or enter into any agreement so to do;

(c) underlet the lot or enter into any agreement so to do unless the tenancy or lease of the lot complies with the following terms and conditions:

(i) the term of the tenancy or lease shall not exceed 10 years in the aggregate including any right of renewal;

(ii) the tenancy or lease shall not commence until after the issue by the Building Authority of an occupation permit or a temporary occupation permit under the Buildings Ordinance, any regulations made thereunder and any amending legislation;

(iii) no premium shall be paid by the tenant;

(iv) the rent payable shall not exceed a rack rent;

(v) no rent shall be payable in advance for a period greater than 12 calendar months;

(vi) the user permitted in the tenancy agreement or lease or agreement for tenancy or lease shall comply with these Conditions;

(vii) none of the terms and conditions in the tenancy agreement or lease or agreement for tenancy or lease shall contravene these Conditions; or

(d) mortgage or charge the lot except for the purpose of the development thereof in accordance with these Conditions and then only by way of a building mortgage of the lot, it being agreed that for this purpose a building mortgage shall be one:

(i) whereby the lot is mortgaged or charged in favour of a licensed bank or a registered deposit-taking company authorized under section 16 of the Banking

Ordinance to secure monies (and interest thereon) advanced or to be advanced to the Grantee for the purpose only of developing the lot in accordance with these Conditions and for the payment of legal and other professional fees in connection with such development and the mortgage (provided that such fees do not, in the aggregate, exceed 5% of the total amount secured by the mortgage), and for no other purpose; and

(ii) under which such advances (in the case of work done) are to be made to the Grantee only in amounts to be certified from time to time by the authorized person (appointed by the Grantee under the Buildings Ordinance, any regulations made thereunder and any amending legislation for the development of the lot) as having been incurred by the Grantee for the development of the lot.

Registration

(19) Every assignment, mortgage, charge, underletting for more than three years or other alienation of the lot or any part thereof or any interest therein shall be registered at the Land Registry.

Restriction on partitioning

(20) The Grantee shall not partition (whether by way of assignment or other disposal or by any other means) the lot.

Residential Parking Spaces

(21) (a) Two spaces shall be provided within the lot to the satisfaction of the Director for the parking of motor vehicles licensed under the Road Traffic Ordinance, any regulations made thereunder and any amending legislation, and belonging to the residents of the building or buildings erected or to be erected on the lot and their bona fide guests, visitors or invitees (hereinafter referred to as "the Residential Parking Spaces").

Dimensions of parking spaces

(b) The Residential Parking Spaces shall each measure 2.5 metres in width and 5.0 metres in length with a minimum headroom of 2.4 metres.

(c) The Residential Parking Spaces shall not be used for any purpose other than for the purpose set out in sub-clause (a) of this Special Condition and in particular the said spaces shall not be used for the storage, display or exhibiting of motor vehicles for sale or otherwise or for the provision of car cleaning and beauty services.

Parking spaces etc. excluded from gross floor area calculation

(22) For the purpose of calculating the total gross floor area referred to in Special Condition No. (12)(c) hereof, there shall not be taken into account the spaces provided in accordance with Special Condition No. (21) hereof.

Vehicular access

(23) The Grantee shall have no right of ingress or egress to or from the lot for the passage of motor vehicles except between the points X and Y through Z shown and marked on PLAN I annexed hereto or at such other points as may be approved in writing by the Director. Upon

development or redevelopment of the lot, a temporary access for construction vehicles into the lot may be permitted in such position and subject to such conditions as may be imposed by the Director. Upon completion of the development or redevelopment, the Grantee shall at his own expense within the time limit specified by the Director and in all respects to the satisfaction of the Director, reinstate the area or areas upon which the temporary access was constructed.

Set back

(24) The Grantee shall not cut away, remove or set back any Government land adjacent to or adjoining the lot or carry out any building-up, filling-in or any slope treatment works of any kind whatsoever on any Government land except with the prior written consent of the Director who may, at his sole discretion, give his consent subject to such terms and conditions as he sees fit, including the grant of additional Government land as an extension to the lot at such premium as he may determine.

Cutting away

(25) (a) Where there is or has been any cutting away, removal or setting back of any land, or any building-up or filling-in or any slope treatment works of any kind whatsoever, whether with or without the prior written consent of the Director, either within the lot or on any Government land, which is or was done for the purpose of or in connection with the formation, levelling or development of the lot or any part thereof or any other works required to be done by the Grantee under these Conditions, or for any other purpose, the Grantee shall at his own expense carry out and construct such slope treatment works, retaining walls or other support, protection, drainage or ancillary or other works as shall or may then or at any time thereafter be necessary to protect and support such land within the lot and also any adjacent or adjoining Government or leased land and to obviate and prevent any falling away, landslip or subsidence occurring thereafter. The Grantee shall at all times during the term hereby agreed to be granted maintain at his own expense the said land, slope treatment works, retaining walls or other support, protection, drainage or ancillary or other works in good and substantial repair and condition to the satisfaction of the Director.

(b) Nothing in sub-clause (a) of this Special Condition shall prejudice the Government's rights under these Conditions, in particular Special Condition No. (24) hereof.

(c) In the event that as a result of or arising out of any formation, levelling, development or other works done by the Grantee or owing to any other reason, any falling away, landslip or subsidence occurs at any time, whether in or from any land, within the lot or from any adjacent or adjoining Government or leased land, the Grantee shall at his own expense reinstate and make good the same to the satisfaction of the Director and shall indemnify the Government, its agents and contractors from and against all costs, charges, damages, demands and claims whatsoever which shall or may be made, suffered or incurred through or by reason of such falling away, landslip or subsidence.

(d) In addition to any other rights or remedies herein provided for breach of any of these Conditions, the Director shall be entitled by notice in writing to call upon the Grantee to carry out, construct and

maintain the said land, slope treatment works, retaining walls, or other support, protection, and drainage or ancillary or other works or to reinstate and make good any falling away, landslip or subsidence, and if the Grantee shall neglect or fail to comply with the notice to the satisfaction of the Director within the period specified therein, the Director may forthwith execute and carry out any necessary works and the Grantee shall on demand repay to the Government the cost thereof, together with any administrative or professional fees and charges.

Anchor maintenance

(26) Where prestressed ground anchors have been installed, upon development or redevelopment of the lot or any part thereof, the Grantee shall at his own expense carry out regular maintenance and regular monitoring of the prestressed ground anchors throughout their service life to the satisfaction of the Director and shall supply to the Director such reports and information on all such monitoring works as the Director may from time to time in his absolute discretion require. If the Grantee shall neglect or fail to carry out the required monitoring works, the Director may forthwith execute and carry out the monitoring works and the Grantee shall on demand repay to the Government the cost thereof.

Slopes maintenance (Green Hatched Black Area)

(27) (a) The Grantee shall at his own expense carry out and complete to the satisfaction of the Director such geotechnical investigations and such slope treatment, landslide preventive, mitigation and remedial works on the area shown coloured green hatched black on PLAN I annexed hereto (hereinafter referred to as "the Green Hatched Black Area") as the Director in his absolute discretion may require and shall, at all times during the term hereby agreed to be granted, at his own expense, maintain in good and substantial repair and condition to the satisfaction of the Director the Green Hatched Black Area including all land, slope treatment works, earth-retaining structures, drainage and any other works therein and thereon. In the event that any landslip, subsidence or falling away occurs within the Green Hatched Black Area at any time during the term hereby agreed to be granted, the Grantee shall at his own expense reinstate and make good the same to the satisfaction of the Director together with any adjacent or adjoining areas which, in the opinion of the Director (whose decision shall be final and binding on the Grantee), have also been affected. The Grantee shall indemnify the Government, its agents and contractors against all claims, proceedings, costs, damages and expenses whatsoever incurred by reason of such landslip, subsidence or falling away. The Grantee shall ensure at all times that there shall be no illegal excavation or dumping on the Green Hatched Black Area and, subject to the prior written approval of the Director, the Grantee may erect fences or other barriers for the prevention of such illegal excavation or dumping. In addition to any other rights or remedies the Director may have in respect of any breach of these Conditions, the Director may at any time by notice in writing call upon the Grantee to carry out such geotechnical investigations, slope treatment, landslip preventive, mitigation and remedial works and to maintain, reinstate and make good any land, structure or works affected by such landslip, subsidence or falling away, and if the Grantee shall neglect or fail to comply with such notice to the satisfaction of the Director within the period specified therein, the Director may, after the expiry of such period, execute and carry out the

required works and the Grantee shall on demand repay to the Government the cost thereof.

(b) Notwithstanding sub-clause (a) of this Special Condition, the obligations and rights of the Grantee in respect of the Green Hatched Black Area or any part thereof under this Special Condition shall absolutely determine upon the Government giving to the Grantee notice to that effect, and no claim for compensation shall be made against the Government or the Director or his authorized officer by the Grantee in respect of any loss, damage or disturbance suffered or any expense incurred as a result of such determination. However, such determination shall be without prejudice to any rights or remedies of the Government in respect of any antecedent breach, non-performance or non-observance of the said sub-clause (a).

Spoil or debris

(28) (a) In the event of earth, spoil, debris, construction waste or building materials (hereinafter referred to as "the waste") from the lot, or from other areas affected by any development of the lot being eroded, washed down or dumped onto public lanes or roads or into or onto road-culverts, foreshore or seabed, sewers, storm-water drains or nullahs or other Government properties (hereinafter referred to as "the Government properties"), the Grantee shall at his own expense remove the waste from and make good any damage done to the Government properties. The Grantee shall indemnify the Government against all actions, claims and demands arising out of any damage or nuisance to private property caused by such erosion, washing down or dumping.

(b) Notwithstanding sub-clause (a) of this Special Condition, the Director may (but is not obliged to), at the request of the Grantee, remove the waste from and make good any damage done to the Government properties and the Grantee shall pay to the Government on demand the cost thereof.

Damage to Services

(29) The Grantee shall take or cause to be taken all proper and adequate care, skill and precautions at all times, and particularly when carrying out construction, maintenance, renewal or repair work (hereinafter referred to as "the Works"), to avoid causing any damage, disturbance or obstruction to any Government or other existing drain, waterway or watercourse, water main, road, footpath, street furniture, sewer, nullah, pipe, cable, wire, utility service or any other works or installations being or running upon, over, under or adjacent to the lot or any part thereof or the Green Area or the Brown Area or the Green Hatched Black Area or any combination of any of them (hereinafter collectively referred to as "the Services"). The Grantee shall prior to carrying out any of the Works make or cause to be made such proper search and enquiry as may be necessary to ascertain the present position and levels of the Services, and shall submit his proposals for dealing with any of the Services which may be affected by the Works in writing to the Director for his approval in all respects, and shall not carry out any work whatsoever until the Director shall have given his written approval to the Works and to such aforesaid proposals. The Grantee shall comply with and at his own expense meet any requirements which may be imposed by the Director in respect of the Services in granting the aforesaid approval, including the cost of any necessary diversion, relaying or reinstatement.

The Grantee shall at his own expense in all respects repair, make good and reinstate to the satisfaction of the Director any damage, disturbance or obstruction caused to the lot or any part thereof or the Green Area or the Brown Area or the Green Hatched Black Area or any combination of any of them or any of the Services in any manner arising out of the Works (except for nullah, sewer, storm-water drain or water main, the making good of which shall be carried out by the Director, unless the Director elects otherwise, and the Grantee shall pay to the Government on demand the cost of such works). If the Grantee fails to carry out any such necessary diversion, relaying, repairing, making good and reinstatement of the lot or any part thereof or the Green Area or the Brown Area or the Green Hatched Black Area or any combination of any of them or of any of the Services to the satisfaction of the Director, the Director may carry out any such diversion, relaying, repairing, making good or reinstatement as he considers necessary and the Grantee shall pay to the Government on demand the cost of such works.

Construction of drains and channels

(30) (a) The Grantee shall construct and maintain at his own expense and to the satisfaction of the Director such drains and channels, whether within the boundaries of the lot or on Government land, as the Director may consider necessary to intercept and convey into the nearest stream-course, catchpit, channel or Government storm-water drain all storm-water or rain-water falling or flowing on to the lot, and the Grantee shall be solely liable for and shall indemnify the Government and its officers from and against all actions, claims and demands arising out of any damage or nuisance caused by such storm-water or rain-water.

Connecting drains and sewers

(b) The works of connecting any drains and sewers from the lot to the Government storm-water drains and sewers, when laid and commissioned, may be carried out by the Director who shall not be liable to the Grantee for any loss or damage thereby occasioned and the Grantee shall pay to the Government on demand the cost of such connection works. Alternatively, the said connection works may be carried out by the Grantee at his own expense to the satisfaction of the Director and in such case any section of the said connection works which is constructed within Government land shall be maintained by the Grantee at his own cost and upon demand be handed over by the Grantee to the Government for future maintenance thereof at the expense of the Government and the Grantee shall pay to the Government on demand the cost of the technical audit in respect of the said connection works. The Director may, upon failure of the Grantee to maintain any section of the said connection works which is constructed within Government land, carry out such maintenance works as he considers necessary and the Grantee shall pay to the Government on demand the cost of such works.

Drainage impact assessment

(31) (a) The Grantee shall within 6 calendar months from the date of this Agreement (or such other extended period as may be approved by the Director), at his own expense and in all respects to the satisfaction of the Director, submit or cause to be submitted to the Director for his written approval a drainage impact assessment (hereinafter referred to as "the Assessment") for all proposed works in connection with the development of the lot.

(b) The technical aspects of the Assessment shall be undertaken by a chartered civil engineer or a member of the Hong Kong Institution of Engineers with civil engineering as the specialist discipline.

(c) The Assessment shall identify all adverse drainage impact resulting from the development of the lot and the Grantee shall at his own expense carry out appropriate mitigation works in all respects to the satisfaction of the Director within such time limit as the Director may require.

(d) No building or any other works (including but not limited to site formation works and the demolition works referred to in Special Condition No. (2) hereof) shall be commenced on the lot or any part thereof until the Assessment has been approved in writing by the Director.

Qualitative Landfill Gas Hazard Assessment

(32) (a) The Grantee acknowledges that the lot falls within the 250 metres consultation zone of the restored Ngau Tam Mei Landfill (hereinafter referred to as "the Landfill").

(b) The Grantee shall within 12 calendar months from the date of this Agreement (or such other extended period as may be approved by the Director) at his own expense submit or cause to be submitted to the Director of Environmental Protection for his written approval a qualitative landfill gas hazard assessment report in respect of the Landfill (hereinafter referred to as "the Report") identifying all potential landfill gas problems or hazards and proposing all precautionary and protection measures to mitigate the potential landfill gas problems or hazards so identified and such other problems or hazards as may be identified by the Director of Environmental Protection (hereinafter referred to as "the Mitigation Measures"). The Report shall be prepared by a competent professional person in accordance with Landfill Gas Hazard Assessment Guidance Note and Professional Persons Environmental Consultative Committee Practice Note No. 3/96 (both issued by the Environmental Protection Department).

(c) The Grantee shall at his own expense implement the Mitigation Measures approved in accordance with sub-clause (b) of this Special Condition in all respects to the satisfaction of the Director of Environmental Protection. Upon completion of the Mitigation Measures, a competent professional person representing the Grantee shall confirm in writing to the Director of Environmental Protection that all the Mitigation Measures have been properly implemented.

(d) No building or any other works (including but not limited to site formation works and the demolition works referred to in Special Condition No. (2) hereof) shall be commenced on the lot or any part thereof until the Report has been approved in writing by the Director of Environmental Protection.

(e) The Government shall have no liability in respect of any loss, damage, nuisance or disturbance whatsoever caused to or suffered

by the Grantee whether arising out of or incidental to the Landfill or otherwise, and no claim whatsoever shall be made against the Government by the Grantee in respect of any such loss, damage, nuisance or disturbance.

(33) Wherever in these Conditions it is provided that:

Supervisory and overhead charges

(a) the Government or its duly authorized officers shall or may carry out works of any description on the lot or any part thereof or outside the lot (whether on behalf of the Grantee or on the failure of the Grantee to carry out such works or otherwise) at the cost of the Grantee or that the Grantee shall pay or repay to the Government or to its duly authorized officers on demand the cost of such works, such cost shall include such supervisory and overhead charges as may be fixed by the Government or by its duly authorized officers; or

Prior approval or consent

(b) the prior approval or consent of the Government or its duly authorized officers is required, they may give the approval or consent on such terms and conditions as they see fit or refuse it at their absolute discretion.

Definition of gross floor area

(34) (a) For the purposes of these Conditions, the expression "gross floor area" means the area contained within the external faces of the external walls (or in the absence of such walls the external perimeters) of any building or buildings erected or to be erected on the lot measured at each floor level (including any floor below the level of the ground), together with the area of each balcony in such building or buildings, which shall be calculated from the overall dimensions of the balcony (including the thickness of the sides thereof).

(b) Notwithstanding sub-clause (a) of this Special Condition, the Director at his sole discretion may:

(i) in calculating the gross floor area of any building or buildings erected or to be erected on the lot (in addition to any floor space which may be excluded by Special Condition No. (22) hereof), subject to sub-clause (c) of this Special Condition, exclude:

(I) any sunshade, reflector, any floor space that he is satisfied is constructed or intended to be used solely for the parking of motor vehicles or occupied solely by machinery or equipment for any lift, air-conditioning or heating system or any similar service and any space for refuse disposal;

(II) subject to the payment by the Grantee of any premium and administrative fee as shall be determined by the Director:

(A) any structure or floor space, including, but not limited to, any balcony, utility platform, corridor, lift lobby, communal sky garden, acoustic fin, noise barrier, wing wall, wind catcher or funnel, non-structural prefabricated external wall the thickness of which does not exceed 150 millimetres, or any part thereof (all hereinafter referred to as "environmentally friendly or innovative features") and any other structure or floor space which in the opinion of the Building Authority is an environmentally friendly or innovative feature (as to which the opinion of the Building Authority shall be conclusive) and which, for that reason, has been excluded by the Building Authority from the calculation of gross floor area under the Buildings Ordinance, any regulations made thereunder and any amending legislation; and

(B) any floor space or structure which has been excluded by the Building Authority from the calculation of gross floor area under the Buildings Ordinance, any regulations made thereunder and any amending legislation;

Calculation of gross floor area in buildings with curtain wall system forming external face of building

(ii) accept, for the purpose of calculating the gross floor area, the outer face of the structural elements of the building or buildings erected or to be erected on the lot as the external wall where a curtain wall system forms the external face of any building or buildings erected or to be erected on the lot provided that the outer face of the curtain wall system shall project no more than 200 millimetres from the outer face of the structural elements and provided also that the Director shall have the sole discretion in deciding what comprises a structural element of any building or buildings erected or to be erected on the lot.

Cap on concession

(c) (i) The floor spaces of the features listed below which may in accordance with these Conditions be excluded from the calculation of the total gross floor area stipulated in Special Condition No. (12)(c) hereof shall not in the aggregate exceed 10% of the total gross floor area of the building or buildings erected or to be erected on the lot:

(I) plant room which has been decided by the Building Authority as non-mandatory or non-essential plant room including but not limited to boiler room, room occupied by machinery or equipment for air-conditioning or heating system, SMATV room (as to which the decision of the Building Authority shall be final and binding on the Grantee), and pipe duct and air duct connected to such plant room;

(II) chimney shaft;

(III) portion of lift shaft which has been decided by the Building Authority as larger lift shaft (as to which the decision of the Building Authority shall be final and binding on the Grantee);

(IV) covered walkway, trellis and horizontal screen not landscaped to the satisfaction of the Building Authority (as to which the decision of the Building Authority shall be final and binding on the Grantee);

(V) corridor, lift lobby, balcony, utility platform, and non-structural prefabricated external wall the thickness of which does not exceed 150 millimetres;

(VI) void in duplex unit in the building or buildings erected or to be erected on the lot, and void in detached, semi-detached or terraced house erected or to be erected on the lot which is intended for use as a single family residence, and the decision of the Director as to what constitutes a detached, semi-detached or terraced house and whether such house is intended for use as a single family residence shall be final and binding on the Grantee; and

(VII) projection which projects more than 750 millimetres from the external wall of the building or buildings erected or to be erected on the lot.

(ii) In calculating the total gross floor area of the building or buildings erected or to be erected on the lot referred to in sub-clause (c)(i) of this Special Condition, there shall not be taken into account the floor spaces which are excluded from the calculation of the gross floor area of the building or buildings erected or to be erected on the lot in

accordance with these Conditions as to which the decision of the Director shall be final and binding on the Grantee.

No grave or columbarium permitted

(35) No grave or columbarium shall be erected or made on the lot, nor shall any human remains or animal remains whether in earthenware jars, cinerary urns or otherwise be interred therein or deposited thereon.

LOT NUMBER
LOTID : LOT103 DD104 4823
LOTNO 4823213
LOTALPH
SECTION

Point	Hong Kong 1980 Grid Coordinates	
	N (m)	E (m)
X	838256.186	824121.777
A	838255.725	824128.550
B	838262.950	824139.875
C	838263.776	824145.986
D	838260.502	824145.941
E	838250.174	824146.689
F	838247.703	824155.396
G	838241.000	824153.000
H	838231.000	824152.000
J	838230.000	824145.500
K	838232.000	824138.000
L	838238.000	824136.000
M	838239.000	824133.500
N	838235.000	824132.500
P	838238.856	824121.248

I, AU Chi-ho, *Land Surveyor/ Yuen Long / ~~*an Authorized Land Surveyor registered under the Land Survey Ordinance (Cap. 473)~~, hereby certify that this land boundary plan has been prepared from land boundary surveys that were carried out by me or under my direct supervision in conformity with the *Land Boundary Survey Regulations / ~~*Code of Practice approved by the Land Survey Authority under the above Ordinance~~, and that this plan correctly represents that survey completed on the 7th day of Nov 2013

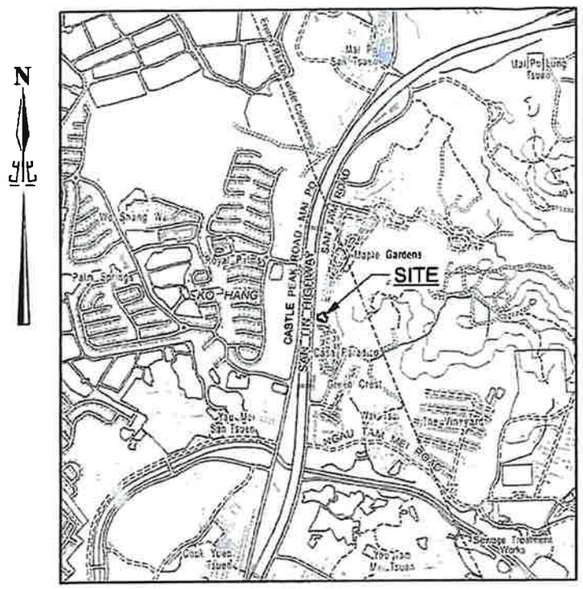
Dated this 13th day of Mar 2014

*Land Surveyor/Yuen Long
~~*Authorized Land Surveyor~~

Remarks:
(1) * - Delete as appropriate.
(2) The practice requirements laid down in the Land Boundary Survey Regulations of the Lands Department are the same as those in the Code of Practice approved by the Land Survey Authority under the Land Survey Ordinance.

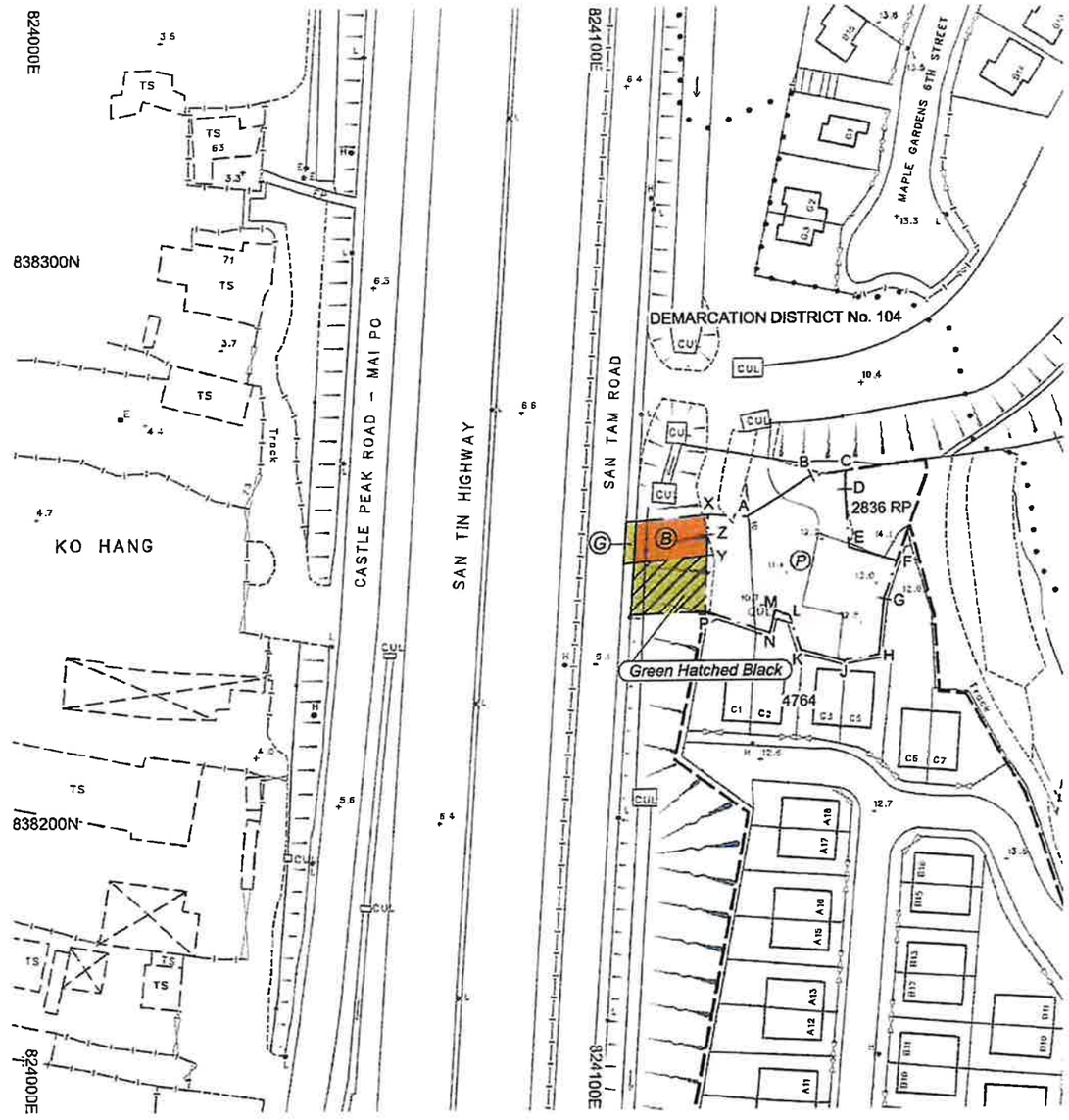
	DI	Dla	Dla	Dlb
Field Book	D202251-2	D202251-2	D202251-2	D202251-2
Comp. Folder	YL14882	YL14882	YL14882	YL14882
Svy. Officer	H.Y.LAM	H.Y.LAM	H.Y.LAM	H.Y.LAM
Tech. Officer	K.F.LIU	K.F.LIU	K.F.LIU	K.F.LIU
Date	14/11/2013	03/01/2014	03/03/2014	13/03/2014
ALS Plan No.	—	—	—	—
Plan No.	YL14882-DI	YL14882-Dla	YL14882-Dla	YL14882-Dlb

LOCATION



SCALE 1:20000

SIDE	DISTANCE IN METRES	BEARING ° ' "	Pt.	CORNER MARKED BY
X A	6.789	93 53 38		
A B	13.433	57 27 48		
B C	6.167	82 18 08		
C D	3.274	180 47 15		
D E	10.355	175 51 27		
E F	9.051	105 50 37		
F G	7.118	199 40 20		
G H	10.050	185 42 40		
H J	6.576	261 15 10		
J K	7.762	284 55 50		
K L	6.325	341 33 50		
L M	2.693	291 48 10		
M N	4.123	194 02 10		
N P	11.894	288 55 00		
P X	17.338	1 44 54		



COLOURED PINK AREA 736.3 SQUARE METRES (ABOUT)

SCALE 1:1 000

metres 20 0 20 40 60 80 100 metres

District Lands Office, Yuen Long
Lands Department

Plan Prepared by District Survey Office, Yuen Long

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LOT No. 4823 IN DEMARCATION DISTRICT No. 104

PLAN I



SPECIAL CONDITIONS REFER

	Brown
	Green
	Green Hatched Black
POINTS	X, Y, Z

COLOURED PINK AREA 736.3 SQUARE METRES (ABOUT)

SCALE 1:1 000

metres 20 0 20 40 60 80 100 metres

LOT No. 4823 IN DEMARCATION DISTRICT No. 104

File No.	DLOYL515/YLT/2012C, DSO/YL/W/794/2012
Survey Sheet No.	2-SE-17A
Layout Plan No.	------
Reference Plan No.	------
ALS Plan No.	------
PLAN No.	YL14882-DIb

Date : 13/03/2014

DISTRICT LANDS OFFICE

YUEN LONG

LANDS DEPARTMENT

Lee Yuen Kit

Execution by the Grantee,
Wonder Pacific Development Limited

(Name: Chan Tak Yan)

Witness to the Execution by the Grantee,
Wonder Pacific Development Limited

(Name: Ms. L.L. CHIU)

District Lands Officer, Yuen Long

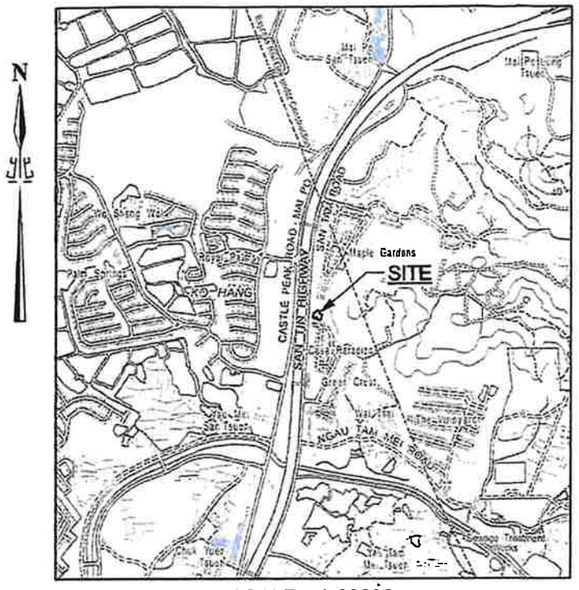
(Name: FUNG LAI FOON)

Witness to the Signature of
District Lands Officer, Yuen Long
Civil Servant,
Lands Department

9th December 2015

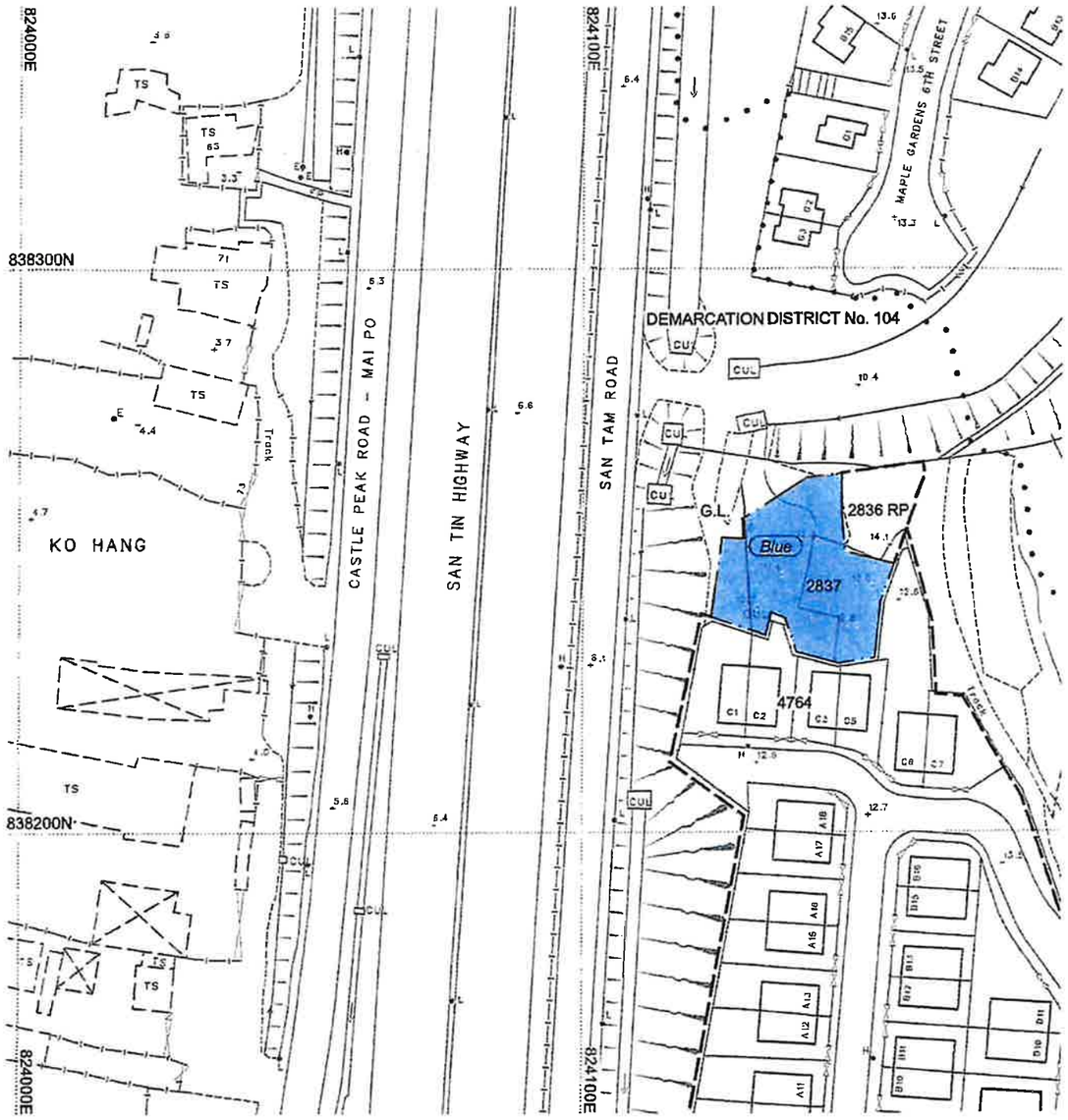
Date

LOCATION



SCALE 1:20000

Blue	AREA TO BE SURRENDERED
DEMARCATION DISTRICT No. 104 LOT No.	SQUARE METRES (ABOUT)
2837	607



SCALE 1:1 000

metres 20 0 20 40 60 80 100 metres

	II	IIa	IIb	
Field Book	—	—	—	
Comp. Folder	—	—	—	
Svy. Officer	—	—	—	
Tech. Officer	K.F.LIU	K.F.LIU	K.F.LIU	
Date	14/11/2013	03/01/2014	13/03/2014	
ALS Plan No.	—	—	—	
Plan No.	YL14882-II	YL14882-IIa	YL14882-IIb	

FOR IDENTIFICATION PURPOSES ONLY

District Lands Office, Yuen Long
Lands Department

Plan Prepared by District Survey Office, Yuen Long

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SURRENDER PLAN
DEMARCATION DISTRICT No. 104

PLAN II



SCALE 1:1 000

metres 20 0 20 40 60 80 100 metres

SURRENDER PLAN
DEMARCATION DISTRICT No. 104

File No.	DLOYL515/YLT/2012C, DSO/YL/W/794/2012
Survey Sheet No.	2-SE-17A
Layout Plan No.	------
Reference Plan No.	-----
ALS Plan No.	------
PLAN No.	**YL14882-IIb**

Date : 13/03/2014

DISTRICT LANDS OFFICE

YUEN LONG

LANDS DEPARTMENT

LEE Yung Kit

Execution by the Grantee,
Wonder Pacific Development Limited

(Name: Chan Tak Yan)

Witness to the Execution by the Grantee,
Wonder Pacific Development Limited

(Name: Ms. L.L. CHIU)

District Lands Officer, Yuen Long

(Name: FUNG LAI FOON)

Witness to the Signature of
District Lands Officer, Yuen Long
Civil Servant,
Lands Department

9th December 2015

Date

MEMORANDUM OF AGREEMENT

Memorandum that Wonder Pacific Development Limited 成暉發展有限公司 whose registered office is situate at Unit 1601, 16/F, Stelux House, 698 Prince Edward Road East, San Po Kong, Kowloon, Hong Kong, has this day agreed to carry out the terms and conditions of the foregoing Conditions of Exchange and the Grantee hereby agrees fully to observe and perform the said Conditions and to be bound thereby and the District Lands Officer, Yuen Long on behalf of the Chief Executive of the Hong Kong Special Administrative Region hereby ratifies and confirms the said Exchange on the above Conditions.

Dated this 9th day of December 2015

Chan Tak Yan

Witness to the execution by the Grantee, Wonder Pacific Development Limited

Address Unit 1601, 16/F, Stelux House, 698 Prince Edward Road East, San Po Kong, Kowloon

LEE YING KIT

Execution by the Grantee, Wonder Pacific Development Limited

Witness to the signature of District Lands Officer, Yuen Long

FUNG LAI FOON
Civil Servant,
Lands Department

Ms. L.L. CHIU
District Lands Officer, Yuen Long

NEW GRANT NO. 22253

Dated 9th day of December 2015

AGREEMENT

AND

CONDITIONS OF EXCHANGE

of

Lot No. 4823 in Demarcation District No. 104

Grantee : Wonder Pacific Development Limited
成暉發展有限公司

Rent : As specified in General Condition No. 1

Term : Fifty years from the date of the Memorandum of Agreement

Lands Department

Appendix II



2202

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

FRONT VIEW SHOWING GREENERY

Figure 13 NTS (A3)

A JUL. 2022
- MAY. 2022

Do not scale drawing.
Contractors are required to verify exact dimensions on site.
The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate.
The design remains to be the property of "R.Lee Architects (HK) Ltd" unless otherwise specified.
This drawing is not for construction purposes unless expressedly certified.

R.LEE

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.

TECHNICAL NOTE OF METHODOLOGY ON YEAR 2042 TRAFFIC FORECASTS FOR TRAFFIC NOISE IMPACT ASSESSMENT (TNIA)

RLEE

RLEE Architects (HK) Ltd

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 DD 104, 81 San Tam Road, San Tin, N.T.
Technical Note of Methodology on Year 2042 Traffic Forecasts for
Traffic Forecasts for Traffic Noise Impact Assessment (TNIA)

1. Objective

1.1 This technical note summarizes the methodology and results of the traffic forecasts in support of the Traffic Noise Impact Assessment (TNIA) for the 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 DD 104, 81 San Tam Road, San Tin, N.T..

2. Approach

2.1 The Annual Growth Rate Method has been adopted.

3. Methodology

3.1 The proposed Residential Care Home for the Elderly (RCHE) is planned to be completed by year 2027 tentatively and hence year 2042 traffic forecasts (i.e. year 2027 +15 years) for the roads within the 300m catchment area are required and summarized in **Appendix A**.

COVID-19 Factor

3.2 Due to effect of COVID-19, the surveyed traffic flows may be much less than that of the normal conditions. The COVID-19 factor has been derived by comparing the selected ATC core station with the ATC 2015-2019 record flow as shown in **Table 3.1**. A percentage of 1.33% per annum is found and applied to ATC 2019 record flows to generate a year 2021 reference flows as shown in **Table 3.2**.

Table 3.1 Historical Traffic Data from the ATC

Core Stn.	Road Name	2015	2016	2017	2018	2019	2015 to 2019
5016	San Tin Highway, Castle Peak Road & San Tam Road	86,180	92,230	90,650	86,230	90,860	1.33%

Table 3.2 Comparison of 2021 Reference Flows and ATC 2021 Record Flow

Core Stn.	Road Name	ATC 2019 Record Flow	2021 Reference Flows (2019ATC Record Flow x 1.33%)	ATC 2021 Record Flow
5016	San Tin Highway, Castle Peak Road & San Tam Road	90,860	93,295	86,620

3.3 To compare with 2021 reference flows with ATC 2021 record flows and hence the COVID-19 factor of 1.08 is adopted and applied to 2022 existing traffic flows, e.g.:

COVID-19 factor:
2019 ATC record flow x adopted growth factor from 2015-2019 ATC record flow /2021 ATC record flow =1.08

Annual Growth Rate

3.4 In order to assess the impact of the proposed development related traffic on the road links required, reference is made to the growth factor in Annual Traffic Census (ATC) which is summarized in below **Table 3.3**.

Table 3.3 Historical Traffic Data from Annual Traffic Census (ATC)

ATC Stn.	Road Name	Annual Average Daily Traffic (AADT)						Avg. Annual Growth Rate (2015-2019)
		2015	2016	2017	2018	2019	2020	
5016	San Tin Highway, Castle Peak Rd & San Tam Rd (From Kam Tin Road to Fairview Park Boulevard)	86,180	92,230	90,650	86,230	90,860	81,870	1.33%

5257	Castle Peak Rd - Tam Mi,Mai Po & San Tin (From Fairview Paark Boulevard to Lok Ma Chau Road)	10,510 *	10,940 *	10,770 *	11,980	11,910	11,420 *	3.18%
5297	San Tam Rd (From Castle Peak Road - Mai Po to Fairview Park Boulevard RA)	6,140 *	6,400 *	6,300 *	8,540	7,530	7,220 *	5.23%
5505	San Tam Road (From Fairview Park Boulevard RA to End)	12,090	12,590*	12,390*	12,700*	13,330	13,420	2.47%
5508	San Tin Highway (From Fairview Park Boulevard to Lok Ma Chau Road)	85,910	90760*	90,110*	92,980*	80,460	82,010	-1.63%
Total		**200,830**	**212,920**	**210,220**	**212,430**	**204,090**	**195,940**	**0.40%**

Notes:
1. *AADT estimated by Growth factor
2. Due to Covid-19, the data for 2020 are considered not accurate and not included.

Planning Data

3.5 Reference has also been made to the "Projections of Population Distribution 2021-2029" published by Planning Department on Population Distribution Projections. The annual growth rates of the Tertiary Planning Units in the vicinity are summarized in **Table 3.4**.

Table 3.4 Projected Populations of Selected Tertiary Planning Units

Tertiary Planning Units (TPU)	Projected Population		Annual Average Growth Rate (2019-2025)
	2019	2025	
543&546	4,300	5,000	2.55%
544	3,000	3,000	0.00%
541	19,400	18,200	-1.60%
542	13,800	14,100	0.36%
525	1,400	1,600	2.25%
526	11,200	12,400	1.71%
Total	**53,100**	**54,300**	**0.37%**

3.6 Reference has also been made to the latest 2019-Based Territorial Population Employment Data Matrices (TPEDM) planning data published by the Planning Department for projection of population and employment within the study district. The average annual growth rates in terms of population and employment from 2019 to 2031 are tabulated in **Table 3.5**.

Table 3.5 2019-Based Planning Data from 2019 to 2031

Yuen Long				
Data	**Year**			**Average Annual Growth Rate (2019-2031)**
	2019	**2026**	**2031**	
Population	175,150	172,350	159,850	-0.76%
Employment	68,100	70,700	70,250	0.26%
Total	**243,250**	**243,050**	**230,100**	**-0.46%**

Adopted Growth Rate

3.7 A.A.D.T. of ATC indicates that the traffic flow of the local road network has an average annual growth rate of **+0.40%** from year 2015 to year 2019.

3.8 The population projections of selected Tertiary Planning Units show that an annual growth rate of **+0.37%** is expected in the study area.

3.9 Whilst, the planning data indicates that the population and employment of the study area are expected to grow with an average annual growth rate of **-0.46%**.

3.10 As a conservative approach, annual growth rate **+1% p.a.** is adopted for the traffic forecast from 2022 to 2042. It is deemed sufficient to allow for any unexpected future growth as a result of some changes in land use or development in the study area.

Proposed Development

3.11 The proposed development parameters for the proposed use are summarized in **Table 3.6**.

Table 3.6 Proposed Development Parameters

Site Location	**Lot 4823 in DD 104, 81 San Tam Road, San Tin, N.T.**
Proposed Use	Residential Care Home for the Elderly (RCHE)
Site Area	About 736.3 m^2
Total Accountable GFA	About 5,400 m^2
No. of Storeys	10
No. of Beds	142

3.12 It is noted that traffic rates of both generation and attraction for proposed Residential Care Home for the Elderly (RCHE) are not specified in the latest Transport Planning & Design Manual (T.P.D.M.).

3.13 The estimation of traffic trips due to the proposed development is based on in-house surveys carried out at Tung Wah Group of Hospitals - Wong Cho Tong Social Service Building with total 278 beds in the building. The traffic trips and the estimated trip rates are summarized in **Table 3.7** and **Table 3.8**.

Table 3.7 In-house Traffic Trips of Reference Building

Use	Units	AM Peak		PM Peak	
		Gen.	Att.	Gen.	Att.
Surveyed Traffic Trips					
TWGHs Wong Cho Tong Social Service Building -IN/OUT of Building	(pcu/hr)	14	11	14	11
TWGHs Wong Cho Tong Social Service Building - Loading/Unloading activities of Building	(pcu/hr)	10	8	10	8
Total Traffic Trip	**(pcu/hr)**	**24**	**19**	**24**	**19**

Table 3.8 Estimated Traffic Trip Rates of Reference Building

Use	Units	AM Peak		PM Peak	
		Gen.	Att.	Gen.	Att.
Total Traffic Trip	(pcu/hr)	24(1)	19(1)	24(1)	19(1)
Estimated Traffic Trip Rates (278 beds)					
TWGHs Wong Cho Tong Social Service Building	(pcu/hr/bed)	0.0863	0.0684	0.0432	0.0576

Note:

(1) Based on traffic trips in **Table 3.7**.

3.14 Based on the in-house traffic trip rates related to the proposed development, the adopted traffic trips of the proposed development are calculated and shown in below **Table 3.9**.

Table 3.9 Traffic Trips of the Proposed Development

Proposed Development	Unit/ Parameter	Trip Generation (pcu/hr)			
		AM Peak		PM Peak	
		Gen.	Att.	Gen.	Att.
Adopted Traffic Trip Rates					
Proposed RCHE	(pcu/hr/bed)	0.0863(1)	0.0684(1)	0.0432(1)	0.0576(1)
Adopted Traffic Trips Generation					
Proposed RCHE	142 beds	12	10	6	8

Note:

(1) Based on traffic trip rates in **Table 3.8**.

Adjacent Developments

3.15 To fully reflect the traffic growth that would contribute to the adjacent road network, latest planning data has been obtained from Planning Department. The future planned developments in the vicinity provided and agreed by Planning Department are summarized in below **Table 3.9**.

Table 3.9 Planned Developments in the Vicinity

Application No.	Type	Key Development Parameters(1)
Ongoing S12A Applications in the Vicinity(1)		
Y/YL-NTM/5	Residential	1,980 residential units
Y/YL-NTM/6	Residential	• 1,990 residential units • 6,485m² commercial GFA
Y/YL-NTM/7	Residential	• 12,575 residential units • 39,265m² commercial GFA • Neighbourhood Elderly Centre (NEC) • Child Care Centre (CCC)
Y/YL-MP/6	Residential	• 3,090 residential units • 2,363m² retail GFA • 6-classroom kindergarten • 100-place RCHE • Neighbourhood Elderly Centre (NEC)
Y/YL-ST/1	Residential	• 2,075m² Retail GFA • 4,176 residential units • 100-place child care centre • 6-classroom kindergarten

Y/YL-NSW/7	Residential	• 900m^2 Retail GFA • 1,997 residential units • 4-classroom kindergarten • 100-place child care centre
Y/YL-NTM/8	Residential	• 6,276 residential units • 67,000m^2 GFA for GIC facilities
Y/YL-MP/6	Residential	3,090 residential units
Y/YL-MP/7	Residential	1,228 residential units
Y/YL-MP/8	Residential	1,249 residential units
Y/YL-NSW/8	Residential	• 6,825 residential units • 750m^2 retail GFA • 4 nos. of GIC facilities - 1 no. of NEC - 100-place CCC - 100-place RCHE - 80-place Day Care Centre for Elderly
Y/YL-NSW/9	Residential	• 3,115 residential units • 6,000m^2 Retail GFA • 1 Primary school • 3 Kindergartens • 1 relocated soy sauce factory
Approved S16 Applications in the Vicinity(1)		
A/YL-MP/247	Residential	Domestic GFA about 16,200m^2 for 105 houses
A/YL-MP/287	Residential	Domestic GFA about 7,540m^2 for 65 houses
A/YL-NSW/274	Residential	Domestic GFA about 70,328m^2 for 1,518 flats
A/YL-NTM/178-2	Residential	Domestic GFA about 45,197m^2 for 300 houses
A/YL-MP/291	Residential	268 houses
A/YL-NSW/241	Retail	37,171 m^2 retail GFA

Note:
(1) Information provided and agreed by Planning Department.

3.16 The traffic generations and attractions of the adjacent development are summarized in **Table 3.10**.

Table 3.10 Estimated Traffic Generations & Attractions of the Adjacent Developments in Vicinity

Application No.	Type	Estimated Trip Generation (pcu/hr)			
		AM Peak		PM Peak	
		Gen.	Att.	Gen.	Att.
Y/YL-NTM/5	Residential	143(1)	85(1)	57(1)	74(1)
Y/YL-NTM/6	Residential	60(1)	60(1)	45(1)	55(1)
Y/YL-NTM/7	Residential	1,013(2)	651(2)	502(2)	626(2)
Y/YL-MP/6	Residential	301(1)	219(1)	133(1)	155(1)
Y/YL-ST/1	Residential	350(1)	229(1)	164(1)	200(1)
Y/YL-NSW/7	Residential	209(1)	150(1)	90(1)	107(1)
Y/YL-NTM/8	Residential	721(1)	518(1)	453(1)	537(1)
Y/YL-MP/6	Residential	301(1)	219(1)	133(1)	155(1)
Y/YL-MP/7	Residential	211(1)	150(1)	86(1)	99(1)
Y/YL-MP/8	Residential	211(1)	150(1)	86(1)	99(1)
Y/YL-NSW/8	Residential	427(1)	222(1)	103(1)	143(1)
Y/YL-NSW/9	Residential	120(1)	51(1)	-92(1)	-117(1)
A/YL-MP/247	Residential	29(2)	19(2)	17(2)	25(2)
A/YL-MP/287	Residential	15(2)	8(2)	7(2)	10(2)
A/YL-NSW/274	Residential	95(2)	65(2)	46(2)	61(2)
A/YL-NTM/178-2	Residential	84(2)	54(2)	50(2)	72(2)
A/YL-MP/291	Residential	87(1)	70(1)	76(1)	109(1)
A/YL-NSW/241	Residential	86(1)	91(1)	116(1)	133(1)

Notes:
(1) Information as obtained from submitted TIA reports.
(2) Traffic Trips have been estimated by the trip generation and attraction rates as stipulated in Volume 1 Chapter 3 Annex C Table 1 of the latest T.P.D.M. and internal trip rates.

Formulation

3.17 Therefore, the traffic forecasts for design year 2042 can be derived based on the following formula with data as shown in **Tables 3.1** to **Table 3.10**:

$$\textbf{Year 2042 Traffic Flow} = \textbf{Year 2022 Observed Traffic Flow} \times \textbf{Adopted COVID-19 Factor 1.08} \times (1+1\%)^{20} + \textbf{Adjacent Developments} + \textbf{Proposed Development}$$

3.18 As a result, the traffic forecasts for design year 2042 have been estimated and summarized in **Appendix A**.

Appendix A

Year 2042 Traffic Forecasts for TNIA

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 DD 104, 81 San Tam Road, San Tin, N.T.

2042 Traffic Forecasts for Traffic Noise Impact Assessment (TNIA)

Road Link	Road Name	Direction	Road Type	Road Speed	2042 AM Peak		2042 PM Peak	
					Peak Hour Traffic Flows (in veh/hr)	% of HV(1)	Peak Hour Traffic Flows (in veh/hr)	% of HV(1)
A	Geranium Path	Two-way	Local Road	50	30	10%	30	10%
B	Royal Palms Boulevard	Two-way	Local Road	50	580	10%	565	10%
C1	Castle Peak Road - Mai Po	NB	Rural Road	50	770	34%	690	30%
C2	Castle Peak Road - Mai Po	SB	Rural Road	50	1,185	34%	640	23%
D1	Castle Peak Road - Mai Po	NB	Rural Road	50	940	25%	900	19%
D2	Castle Peak Road - Mai Po	SB	Rural Road	50	1,490	20%	790	18%
E1	Castle Peak Road - Mai Po	NB	Rural Road	50	915	23%	870	17%
E2	Castle Peak Road - Mai Po	SB	Rural Road	50	1,515	21%	815	20%
F1	San Tin Highway	NB	Expressway	100	4,700	26%	4,030	25%
F2	San Tin Highway	SB	Expressway	100	4,815	30%	5,025	20%
G1	San Tam Road	NB	Rural Road	50	740	17%	595	10%
G2	San Tam Road	SB	Rural Road	50	950	22%	650	20%
H1	San Tam Road	NB	Rural Road	50	700	15%	670	10%
H2	San Tam Road	SB	Rural Road	50	1,005	20%	585	20%
I1	San Tam Road	NB	Rural Road	50	685	15%	665	10%
I2	San Tam Road	SB	Rural Road	50	1,005	20%	585	20%
J	Access Road	Two-way	Local Road	50	25	10%	30	10%
K	Maple Gardens 5th Street	Two-way	Local Road	50	30	10%	30	10%
L	Maple Gardens 4th Street	Two-way	Local Road	50	30	10%	30	10%
M	Maple Gardens 6th Street	Two-way	Local Road	50	30	10%	30	10%
N	Maple Gardens 6th Street	Two-way	Local Road	50	30	10%	30	10%
O	Maple Gardens 6th Street	Two-way	Local Road	50	30	10%	30	10%
P	Maple Gardens 5th Street	One-way	Local Road	8	30	10%	30	10%
Q	Access Road	Two-way	Local Road	50	55	10%	55	10%
R	Access Road	Two-way	Local Road	50	55	10%	55	10%

Note:

(1) HV includes Light Van, Public Light Bus, Light Goods Vehicle, Medium Goods Vehicle, Heavy Goods Vehicle and Container/Tractor, Coach and Bus.

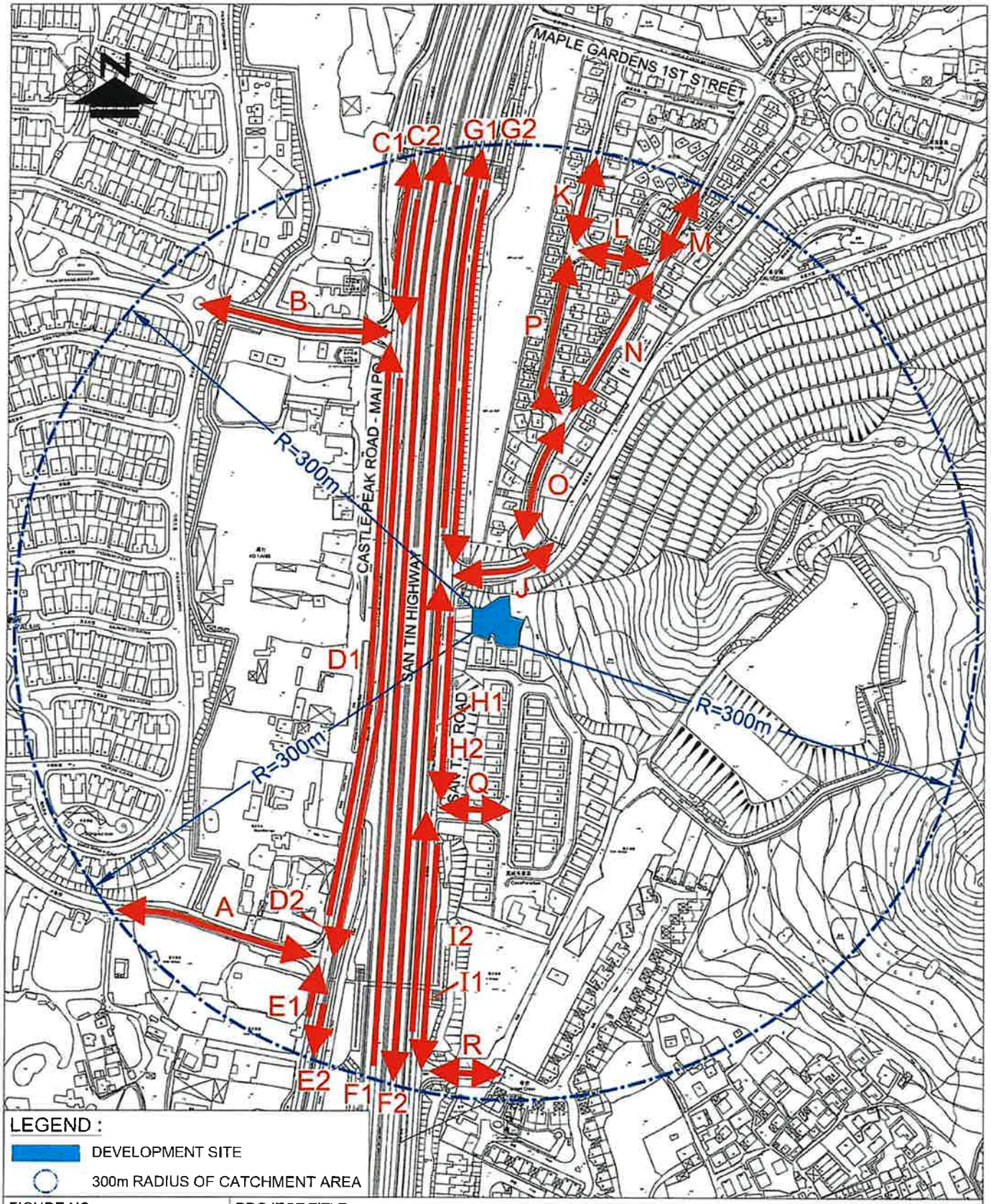


FIGURE NO.: 1	PROJECT TITLE: Proposed Rezoning for Proposed RCHE at 81 San Tam Road, San Tin
PROJECT NO.: 22069HK	DRAWING TITLE: INDEX PLAN
SCALE: 1 : 3250 @A4 / DATE: 17 JUN 2022	CTA Consultants Limited 志達顧問有限公司

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.

Chapter 2

Supporting Planning Statement

RLEE

RLEE Architects (HK) Ltd

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.

SUPPORTING PLANNING STATEMENT
JULY 2022

RLEE

RLEE Architects (HK) Ltd

CONTENTS

		Page
	Executive Summary	4-5
	行政摘要	6
1.0	**Introduction**	7
1.1	Background	7
2.0	**Site and Surroundings**	8
2.1	Location	8
2.2	Land Status	8
2.3	Existing and Proposed Design	9
2.4	Accessibility	10
3.0	**Proposed Development**	11
3.1	Proposed RCHE Development	11-12
3.2	Design Concepts	13-14
3.3	Comparison of Design to a Newly Completed RCHE	15
3.4	Visual Impact Assessment	16
3.5	Traffic Impact Assessment	16
3.6	Environmental Impact Assessment	16
3.7	Landscape Master Planning	16

		Page
4.0	**Planning and Development Context**	17
4.1	Surrounding Land Uses Pattern	17
4.2	The Proposed Rezoning	17
4.3	Similar Approved and Proceeding Planning Application	17
4.4	Similar Approved S16 Planning Application	17
5.0	**Planning Justification**	18
5.1	Restrictions on Plot Ratio & No. of Storeys in "G/IC" zone	18
5.2	Comparison of Building Height for RCHEs / "G/IC" Developments to adjoining Low-density Developments.	19
5.3	Increase in Population nearby.	20-21
5.4	Long Term Demand for RCHEs and Related Policies	22-23
5.5	Scarce Standalone RCHEs	23
5.6	Consideration of Green Building Design and Sustainable Building Design Guidelines (SBDG)	24
6.0	**Conclusion**	25-26

Figure 1	–	Location Plan
Figure 2	–	Existing House Design
Figure 3	–	Proposed RCHE Design
Figure 4A & 4B	–	Design Concept (1) & (2)
Figure 4C	–	Perspective View through Sky Garden
Figure 5	–	Comparison Of Design to A Newly Completed RCHE "Forward Living" at No.9, Fu Tei Road, Tuen Mun
Figure 6	–	The Outline Zoning Plan No. S/YL-NTM/12
Figure 6A	–	The Proposed Rezoning
Figure 7	–	Nearby Planning Application Cases
Figure 8	–	Similar Approved & Proceeding S12A Planning Applications
Figure 9	–	Similar Approved S16 Planning Applications
Figure 10A-10D	–	Comparison of Building Height for RCHE / "G/IC" Development adjoining Low-density Development
Figure 11	–	Initial Land Use for San Tin & Lok Ma Chau Development
Figure 12	–	Proposed MTR Northern Link
Appendix 1	–	Visual Impact Assessment
Appendix 2	–	Traffic Impact Assessment
Appendix 3	–	Environmental Impact Assessment
Appendix 4	–	Landscape Master Plan

Appendix 5 – Geotechnical Planning Review Report For Planning Application

Appendix 6 – Quantitative Risk Assessment Report For High Pressure Town Gas Pipeline

Executive Summary

This Planning Application is prepared and submitted on behalf of Wonder Pacific Development Limited ("the Applicant") to seek approval from the Town Planning Board ("TPB" / the Board") under section 12A of the Town Planning Ordinance 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)" to "G/IC" to allow the development of a RCHE.

The proposed development is a 10-storey RCHE comprising about 142 bedspaces. The Application Site is proximate to the planned Northern Link Ngau Tam Mei Station and the Northern Metropolis Development. The proposed development would make optimal use of scarce land resources to address the demand for elderly home care services in the vicinity. As detailed in the Planning Statement, the proposed development is fully justified to the following reasons:

- The proposed development is in line with the Government's recent Policy Direction to increase RCHEs bedspace supply and would alleviate the shortfall of RCHEs in Ngau Tam Mei and the Northern Metropolis Development which plan to house another 2.5 million people.

- Since the launch of Encouragement Scheme by the Social Welfare Department in 2003, only one RCHE complying the standard completed in 2019. The approval of this S12A application would aid in speeding up the supply further.

- The GFA of 5,400 sm of the proposed development comply with the Conditions to encourage provision of RCHEs premises in new private development and is eligible for exemption from assessment of premium which could provide timely elderly home care services in the Ngau Tam Mei Area.

- The Lot is under the Applicant's sole ownership and could speedily redeveloped upon TPB approval.

- The proposed RCHE, although bearing higher Plot Ratio and no. of storeys than the original "R(C)" zoning, is justified by comparison to similar "G/IC" zones adjoining low-density developments.

- Technical assessments demonstrated that the proposed development would not result in insurmountable visual, traffic, environmental, sewerage and drainage impacts on the surrounding areas.

In view of the above and the list of detailed planning justifications in this Planning Statement, the Board is respectfully requested to consider the current planning application favourably.

行政摘要
(以英文版本為準)

此規劃申請是代表申請人 "成暉發展有限公司" (下稱「申請人」) 根據城市規劃條例第 12A 條，向城市規劃委員會(下稱城規會) 遞交規劃申請，擬議對牛潭尾新潭路 81 號計劃大綱核准圖編號 No. S/YL-NTM/12 作出修訂。是次申請擬議就"住宅(丙)類" 地帶更改為"政府、機構或社區"地帶。

擬議發展將於申請地點內興建一座樓高 10 層包括大概 142 張床位的社會福利設施(安老院舍)。申請地點鄰近擬建之北環線牛潭尾站及北部都會區發展。該發展將有效充分利用短缺的土地資源以回應政府對解決長者護理服務設施需求。申請人提出是次規劃申請是基於以下理據：

- 擬議發展符合政府最新的政策方向以適時回應社會對安老院舍的需求，同時亦針對未來牛潭尾及即將帶來額外二百五十萬人口之北部都會區計劃。

- 自 2003 年社會福利署推行私人土地發展安老院舍鼓勵計劃以來, 只有一所安老院舍符合標準並於 2019 年落成。若此申請獲批，將可增加安老院舍的供應。

- 擬議發展提供一個整體樓面積 5,400 平方米的安老院舍，符合「鼓勵在新私人發展物業內提供安老院舍院址計劃」的指引，即合資格獲豁免繳付地價，為建立安老院舍提供誘因。

- 申請人屬申請地點內的私人土地的唯一土地擁有人。若是次規劃申請獲得城規會同意，可迅速作出重建。

- 雖則擬議中之安老院之地積比及層數較現時之 "住宅(丙)類" 為高，但該等增加跟一般低密度發展毗鄰之 "政府、機構或社區"地帶之差距相若。

- 多個技術評估均證明是次發展計劃不會對附近地區造成不可逾越的視覺、交通、環境、排污及排水影響。

根據以上各點，申請人希望是次規劃申請能在規劃及技術層面獲城規會支持。

1.1 Background

1.1.1 This planning application is submitted to seek permission from the Town Planning Board (the Board) in support of a proposed S12A Amendment to the Approved Ngau Tam Mei Outline Zoning Plan S/YL-NTM/12 to rezone a site from "R(C)" to "G/IC" in order to allow the re-development of a House to a RCHE.

1.1.2 The location of the subject Lot is Lot 4823 in D.D.104, 81 San Tam Road, San Tin, N.T. It locates within the R(C) zone of the OZP.

1.1.3 There is an existing House of GFA 294.258 sm and a Plot Ratio 0.4. It got the O.P. on 28/07/2017.

1.1.4 The proposed amendment would replace the existing small House and would be re-developed into a RCHE of GFA of 5,400 sm, equivalent to a P.R. of 7.33 and a height of 29.6 m. The proposal is solely based on public interest to provide enough G/IC / RCHEs facilities to serve foreseeable significant increase in population for the Northern Metropolis Development (NMD). It also responds to better utilisation of the scare land resources.

1.1.5 The site is surrounded by abundant greenery and could effectively shield off the increase in building bulk. The effect would be demonstrated by the Visual Impact Analysis as per attached

1.1.6 This Planning Statement consists of the following sections in support of the Proposed Development:

Section 2: Site and Surroundings
Section 3: Proposed Development
Section 4: Planning and Development Context
Section 5: Planning Justifications
Section 6: Conclusion

2.0 SITE AND SURROUNDINGS

2.1 Location

2.1.1 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^2. 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.

2.1.2 The Site is of close proximity to the "Northern Metropolis Development" (NMD) zone and is within 10 minutes walking distance from the "Planned Northern Link Ngau Tam Mei Station".

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

2.2 Land Status

2.2.1 The Application Site is held under single ownership, under Conditions of Exchange for Lot 4823 in D.D. 104. The existing Leases are of restrictions on the Plot Ratio and Building Height, etc for R(C) development.

2.2.2 Upon TPB approval, Lease Modification is required. Subject to Guidance Notes issued by the Social Welfare Department, the Lot having a GFA of 5,400 sm would be exempted from payment of premium.

2.3 Existing and Proposed Design

2.3.1 There is an existing House of GFA 294.258 sm, with a Plot Ratio 0.4, and is 3 storeys high from carpark, the main roof level is +21.00 mPd.

2.3.2 It is situated on a platform of level +12.0 m with a car ramp leading from the existing Brown area of level +7.33 m, which gain access from San Tam Road to the West.

2.3.3 There is an existing Green Hatched Black Area adjoining the Brown area to the South-West, which is a gentle slope formed and landscaped to all Government Departments' satisfaction when the House was built in 2017.

Please refer to ***Figure 2*** for the existing House design.

2.3.4 The gentle slope and greenery on the existing Green Hatched Black Area would be generally maintained except with the addition of a concrete path with steps to facilitate a staircase discharge from the building.

2.3.5 The proposed Brown Area would undergo slight change to provide a pavement while the access road would be reduced to 4.5 m wide which is still good enough to serve 2 nos. of private car parks and 2 loading / unloading bays inside.

2.3.6 The existing boundary of the site already set back from San Tam Road for a distance of 12.6 m. It is considered the existing set back would be adequate to ensure no visual encroachment onto San Tam Road.

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

2.3.8 Please refer to ***Figure 3*** for the proposed RCHE Design, the Detail Design of the proposed Development would be outlined in Section 3.0.

2.4 Accessibility

2.4.1 The Application Site is easily accessible within 10 minutes walking distance from the Planned Northern Link Ngau Tam Mei Station. It is also served by existing minibus and bus route per the followings:

Future Planned Northern Link Ngau Tam Mei Station:	
13 minutes walking distance	
Minibus:	
37	Yuen Long (Fook Hong Street) ↔ Yau Tam Mei
76	Yuen Long (Fook Hong Street) ↔ Siu Hum Tsuen
78	Yuen Long (Fook Hong Street) ↔ Yau Tam Mei
Bus:	
76K	Yueng Long (Long Ping) ↔ Sheung Shui (Ching Ho)

2.4.2 Vehicular access is currently through the San Tam Road which provides convenient access to the East towards Sheung Shui and to the West toward Yuen Long through the San Tin Highway.

3.0 PROPOSED DEVELOPMENT

3.1 Proposed RCHE Development

3.1.1 The Development would gain access from San Tam Road at +7.33 m on LG/F. Two private Car Parks, a light Goods Vehicle Loading / Unloading Bay and a Mini-bus Parking locate beside the Entrance Lobby. Transformer Room and Sewerage Treatment Plant are located beside.

3.1.2 UG/F would be the supporting facilities like Multi-Purpose Rooms, Kitchen, Laundry, Store and Plant Room etc.

3.1.3 1/F is designed as a Wellness Centre with health facilities like hydrotherapy, yoga and gymnasium. It adjoins an outdoor Covered Sky Garden to provide covered and open leisure spaces, completed with landscaping and health equipment etc.

3.1.4 2/F to 7/F (total 6 storeys) are RCHE which provide a big spectrum of Dormitory Rooms combination ranging from Shared to Individual Rooms. A total of 142 bedspaces are assumed for the development.

3.1.5 8/F is a specially designed floor for the Staff and General Administration. Not only do it include Standard Office and Administrative space, 8 nos. of Staff Quarters are deliberately provided to facilitate the after-hour emergency services and the needs for "Epidemic closed-loop management", in case necessary.

3.1.6 The Roof Garden on level +36.93 provides outdoor Sun Shine spaces and individual Farming Areas for cultivation and hobbies.

3.1.7 The GFA allocation is tabulated as below:

Site Area		: 736.3 m^2	7926 ft^2
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^2	58125.6 ft^2
Proposed Building Height		: 36.93 mPD	
Absolute Height		: 29.6 m	
Proposed No. of Storey		: 10 STOREYS	
Proposed Gross Floor Area			
LG/F	ENTRANCE & CARPARK	: 352.479 m^2	
UG/F	MULTI-PURPOSE ROOMS	: 617.819 m^2	
1/F	WELLNESS CENTRE + SKY GARDEN	: 626.160 m^2	
2/F	RCHE	: 595.090 m^2	45 nos. of bed
3/F	RCHE	: 556.330 m^2	17 nos. of bed
4/F – 7/F	RCHE	: 556.330 m^2 x 4 storeys = 2225.32 m^2	20 nos. of bed x 4 storeys
8/F	ADMIN OFFICE + STAFF QUARTER	: 426.802 m^2	
TOTAL		**: 5400.000 m^2**	**142 nos. of bed**
Parking Spaces : (Loading / Unloading)			
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.	

Please refer to ***Figure 3*** for the Proposed Development

3.2 Design Concept

Concept Design (1) and (2) are described in ***Figure 4A & 4B*** should be read in conjunction to illustrate the following Design Concepts.

3.2.1 ①- The closest Noise Sources would be Traffic Noise generated from San Tin Highway nearby. Innovative Floor Plan is created by abutting non-domestic spaces like Multi-Function Area to the West while Noise Sensitive Dormitory Rooms are facing the other sides.

3.2.2 ②- Orientation of the Noise Sensitive Dormitory Rooms towards the N-E and S-E sides. Those Rooms could therefore enjoy quiet greenery view and at the same time, there would be no blockage of view to the neighbourhood. Acoustic Fins to combat noise are also included which would be further discussed in the Environmental Impact Assessment enclosed.

3.2.3 ③- A partially covered sky garden is formed on 1/F, together with a list of Indoor Facilities like hydrotherapy, gymnasium, yoga and multi-purpose rooms. It provides leisure activities to the Elderly. A covered sky garden would be best for the Elderly to escape from the extreme sun shine and glare, together with the heavy rainfall during Summer season. The covered sky garden also promotes ventilation and breeze through the building and would benefit the neighbourhood. A perspective view showing the proposed covered sky garden is shown on ***Figure 4C***.

3.2.4 ④- A number of Dormitory Rooms face into a light well which, by means of Stack Effect created, would promote ventilation of Individual Rooms.

3.2.5 ⑤- The existing site is setback from San Tam Road for a distance of 12.6 m. It is considered adequate to provide visual comfort for the General Public.

3.2.6 ⑥- The existing Green Hatched Black Area, which is a gentle slope with Trees and Shrubs, would be maintained to soften the Building and to signify the Entrance.

3.2.7 ⑦- A Floor for General Administration locates above the Dormitory Rooms on the upper most floor. Setback is provided along the North and West side so as to minimize the Building Bulk effect.

In addition to general administration need, it provides 8 Staff Quarters, which may benefit the Elderly for after-hours emergency services and consideration is also given to the flexibility to employ "Epidemic Close Circuit Management" in case needed.

3.2.8 ⑧- A roof garden consists of outdoor Leisure Spaces, Equipment and Individual Farming Areas for interest and hobby is provided on Roof Floor.

3.3 Comparison of Design to a Newly Completed RCHE

3.3.1 There is only one successful RCHE built since the launching of Encouragement Scheme by SWD in 2003. The RCHE, named "Forward Living", completed in 2019, located at No. 9, Fu Tei Road, Tuen Mun, is within a G/IC zone in OZP Drawing No. S/TM/35. There being no restriction on Plot Ratio but a restriction of 10 storeys height.

3.3.2 The Site Particulars, Design and Height is summarized as per ***Figure 6***.

3.3.3 The "Forward Living" represent a typical RCHE design which take into account to limit of 24m from street level for the Dormitories, while Administrative Office and Supporting function are put on top. The Height measured from street level to top of the Administrative Office is 31.15m

3.3.4 Our proposed design are similar to "Forward Living" in terms of GFA (both 5,400 sm) and less in height (our proposed design: 29.6 m ; "Forward Living" 31.15 m)

3.4 Visual Impact Assessment

A Report of the Visual Impact Assessment of the Development prepared by RLEE Architects (HK) Ltd is enclosed as per Appendix 1. It presents the Findings and Surveys conducted and summarized that NO adverse Impact to the Visual Aspect is created due to the increased in Plot Ratio and Height.

3.5 Traffic Impact Assessment

A Report of the Traffic Impact Assessment of the Development prepared by CTA Consultants Limited is enclosed as per Appendix 2. It presents the Findings and Surveys conducted and summarized that NO adverse Impact to the Traffic Aspect is created due to the increased in Plot Ratio.

3.6 Environmental Impact Assessment

A Report of the Environmental Impact Assessment of the Development prepared by Novox Limited is enclosed as per Appendix 3. It presents the Findings and Surveys conducted and summarized that NO adverse Impact to the Environmental Aspect is created due to the increased in Plot Ratio.

3.7 Landscape Master Planning

A Report of the Landscape Master Planning of the Development prepared by R LEE Architects (HK) Limited is enclosed as per Appendix 4. The Landscaping design could benefit the surroundings by improving the visual, Air Purification and Micro-Climate aspects.

4.0 PLANNING AND DEVELOPMENT CONTEXT

4.1 Surrounding Land Uses Pattern

4.1.1 Please refer to ***Figure 6*** for the extracted OZP No. S/YL – NTM/12. By situating in a 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.

Figure 7 shows the Planning Application Cases Submission for higher density residential developments nearby. Should all the Planning Applications be approved, the total increase in no. of residential units is expected to be around 33,857 units which represent an increase in population of around 101,571 people.

Besides, it is the Government's intention to plan to house another 2.5 million in the whole NMD development. There would be definitely a shortage of RCHEs and similar G/IC facilities in the future.

4.2 Similar Approved and Proceeding S12A Planning Applications

4.2.1 There is one approved S12A rezoning case in 8-12 Hi Yip Street (Application No. Y/YL/6) on 20/04/2012. ***Figure 8*** summarises one Approved and one Proceeding S12A Planning Application cases related to "RCHEs".

4.3 Similar Approved S16 Planning Applications

4.3.1 ***Figure 9*** summarized the Approved S16 Planning Applications. It is worth noting that First 5 Applications adjoin low-density "V" zoning. Those would undoubtedly create a difference in Height with its surroundings. The comparison on Building Bulk would be carried out in Section 5.2.

5.1 Restrictions on Plot Ratio & No. of Storeys in "G/IC" Zone

5.1.1 "G/IC" zone is designated for Government, Institution and Community uses. Those should be built according to their needs for individual merit and their bulks are usually governed by relevant Regulations. Normally, the Plot Ratio are not restricted but some restrictions may apply to the No. of Storeys on Building Height.

5.1.2 Similar decision on relaxation of no. of storeys restriction can be noted from the Town Planning Board Meeting on 17.9.2021 on Proposed Amendments to the Draft Yau Ma Tei Outline Zoning Plan No. S/K2/22 (TPB Paper No. 10773), the Town Planning Board Chairman and the Planning Department were of the view that in the absence of concrete redevelopment proposals, it was difficult to predetermine any appropriate BHR for the "G/IC" sites. Plan D would, with the benefit of the redevelopment proposal(s) so put forward, review the BHRs of those sites and make suitable amendments to the OZP. The same principle of "case-by-case" should be applied to other similar "G/IC" sites in Hong Kong as well, where the BHR should be imposed based on individual proposals, subject to no significant adverse impact from planning and technical points of view.

5.1.3 As revealed from the Design of the proposed development and Building Bulk Study as per the Visual Impact Assessment. The proposed Plot Ratio of 7.33 and the Height of 29.6 m for this Planning Application is justified.

5.2 Comparison of Building Height for RCHEs / "G/IC" Developments to adjoining Low-density Developments.

5.2.1 Whenever a RCHE or a "G/IC" Development exist adjoining a low-density development, there is inevitably difference in Height. Study of Four established or approved cases are presented in ***Figure 10A*** to ***10D*** are summarised below:

Figure	OZP	Description	Difference in Height
10A	S/YL-TT/18	Existing "G/IC" Building (Yuen Long Government Primary School) to adjoining "V" zone (Yeung Uk Tsuen).	17.48 m
10B	S/YL-TT/18	Existing "G/IC" Building (TWGHs C.Y. Ma Memorial College) to adjoining "R(C)" zone (Harmonic Villa).	17.7 m
10C	S/YL/25	Approved RCHE (No. A/YL/256) to adjoining "V" zone.	13.92 m
10C	S/YL/25	Approved RCHE (No. A/YL/263) to adjoining "V" zone.	14.77 m
10D	S/YL-NTM/12	Proposed RCHE at 81 San Tam Road to adjoining "R(C)" zone (Casa Paradizo)	**15.38 m**

5.2.2 As revealed from above comparisons, our proposed RCHE (***Figure 10D***) bear a Height Difference of **15.38 m** to its immediate neighbourhood, which is slightly higher than the two approved RCHEs adjoining "V" zone (14.77 m & 13.92 m respectively as shown in ***Figure10C***). However, the Height Difference is less than the two cases of existing "G/IC" Buildings adjoining "V" zone (17.48 m in ***Figure 10A*** & 17.7 m in ***Figure 10B***). Therefore, the difference in height between our proposed RCHE to its surrounding "R(C)" zone is fully justified.

5.3 Increase in Population nearby

5.3.1 The "NMD" Development

The Chief Executive unveiled the Northern Metropolis plan which aims to transform the northern part of Hong Kong into a lively, attractive area.

The proposed Northern Metropolis covers the Shenzhen-Hong Kong Boundary Control Points Economic Belt, Yuen Long and North districts, with a total land area of about 300 sq km.

It encompasses mature new towns in the area and their neighbouring rural areas, as well as six new development areas and development nodes in different planning and development stages.

It will be a transport infrastructure-led development with railways as its backbone, involving projects such as the Hong Kong Shenzhen Western Railway linking up Hung Shui Kiu/Ha Tsuen and Qianhai of Shenzhen, extension of the Northern Link and the East Rail Line. An automated people mover system from Tsim Bei Tsui to Pai Nai will also be explored.

There would be an extra 600 hectares of land could be developed within the Northern Metropolis for residential and industry purposes, providing up to 186.000 flats. When fully developed, the Northern Metropolis will offer a total of up to 926,000 flats – including those existing ones in Yuen Long and North districts, capable of housing a population of about 2.5 million.

It is envisaged the increase in population would lead to an increase in Elderly Population and thus the need for RCHEs in the long run.

Figure 11 illustrates the initial land use for San Tin and Lok Ma Chau Development and the relationship to the subject site.

5.3.2 The Planned Northern Link

The Northern Link (NOL) is an important railway project which will connect the existing Kam Sheung Road MTR Station at the Tuen Ma Line, the planned Kwu Tung Station at the Lok Ma Chau Spur Line and hence other stations at the East Rail to form / complete a strategic rail "loop". It plans to connect the "East" and "West" together. Above all, the interchange at Kwu Tung Station with the Lok Ma Chau Spur Line will provide mass transit connecting the Northwest New Territories with Shenzhen. The detailed planning and design of this railway has already commenced in late 2020 and the construction will commence in 2025.

Figure 12 shows the proposed Route and Stations of the Planned Northern Link.

5.4 Long Term Demand for RCHEs and Related Policies

5.4.1 Hong Kong has the highest life expectancy in the world – 81.7 for men and 87.66 for women. In 2016, about 8 percent of the population aged 65 or above (i.e. 93,600 nos.) lived in RCHEs.

As per information from Social Welfare Department there are 31,080 waitlistees on the central waiting list applying for various types of residential care services places as at 31.10.2021, with an average waiting time for care-and-attention places and nursing home places at 19 months and 22 months respectively.

5.4.2 In order to encourage developers to provide RCHEs in new private developments, in July 2003, the Government launched the "Scheme to Encourage Provision of RCHEs Premises in New Private Development", under which eligible premises would be exempted from assessment of premium for various types of land transactions, subject to meeting certain conditions for delivery of the RCHEs premises, including the conditions that "only one RCHEs premises per development will be eligible for the scheme" and "the size of the RCHEs premises will be subject to a maximum limit of a total GFA of 5,400 m2 ".

Since Launching of the Scheme in 2003, there is only one successful case completed in 2019, named "Forward Living" in Fu Tei, Tuen Mun.

5.4.3 Enhanced Bought Place Scheme

In Policy Address 2018, the Chief Executive stated that the SWD introduced a special measure from February to September this year (2018) to purchase about 250 additional residential places from private RCHEs participating in the Enhanced Bought Place Scheme (EBPS)", and "the Government plans to regularise the measure in 2019-20 to provide designated residential respite places in private RCHEs participating in the EBPS, as to relieve the stress of cares". To add on, it is also stated that "**the Government will purchase an additional 5000 EA1 places under EBPS in the next five years** to increase the supply of subsidised residential care places for the elderly and enhance the overall service quality of private RCHES."

5.4.4 Recent Proposal on Increasing the Minimum Area Per Resident for RCHEs

The residential care services for the elderlies in Hong Kong in general have long been criticized for their low living standards as compared to the major cities internationally, especially with regards to the amount of living space. There have been persistent discussions among the society about increasing the inimum area per resident for RCHEs. In the Report of "Working Group on the Review of Ordinances and Codes of Practice for Residential Care Homes" ("the Working Group") dated May 2019, it is proposed to increase the minimum area per resident for "Care-and-Attention Home" RCHEs from 6.5 sq.m to 9.5 sq.m. The proposal will be submitted to the Legislative Council for the procedures of amendment of the Regulation.7

5.5 Scarce Standalone RCHEs

In view of the scarce land resources and dense population, majority of the existing RCHEs are transformed from existing Residential and Commercial Mixed Uses Developments. Not only do it create the problem of circulation needs for Lift Usage, it also induces certain nuisance like noise and hygiene problem to the residents in daily operation.

Standalone RCHEs might be a way out for the problem. The subject Standalone application with its independent Vehicles, Pedestrian and Services Access, would create no inconvenience to the surroundings and the general public. In addition, this purpose built RCHEs would fully utilize its Developmental Potential through necessary relaxation in no. of storeys and Plot Ratio.

5.6 Consideration of Green Building Design and Sustainable Building Design Guidelines (SBDG)

5.6.1 Green Building Design

A List of Green Building Design including Covered Sky Garden and Open Roof Garden are elaborated in Section 3.2.

5.6.2 Sustainable Building Design Guideline

The Site area of the Development is below 2,000m², of which SBDG (PNAP) APP-152 would not be applicable. However, every effort is made to comply with the Guideline as much as possible in order to contribute to improve the overall Built Environment. Those are summarized as Follows:

5.6.2.1 Building Length

The projected facade length of the proposed building abutting the street is below 60m which is below the stipulation under the SBDG.

5.6.2.2 Building Setback

In the Proposed Development, no part of building is built up within 7.5m from the centreline of San Tam Road. The ventilation corridor would be well maintained. Thus, the building setback requirement has been complied with in accordance with SBDG.

5.6.2.3 Greenery

In order to improve the environmental quality of the urban space, particularly of the pedestrian level to mitigate the heat island effect, Greenery is proposed on various locations to satisfy that required under SBDG. The details are summarized in a LMP report as attached in Appendix 6.

6.0 CONCLUSION

6.1 This supporting Planning Statement is submitted under Section 12A of the TPO to seek approval for the rezoning of the subject site from "R(C)" to "G/IC", for the proposed RCHE.

6.2 The proposed RCHE with a focus on Public Interest based on the followings:

6.2.1 In view of the future growth in Population nearby, there is a strong demand of RCHEs in Yuen Long in the long run.

6.2.2 In consideration of the scarce land resources, the replacement of the existing low-rise development by a RCHE of higher Plot Ratio is justified.

6.2.3 The Applicant has located a number of potential experienced RCHEs Operators and would assign one of them as the Operators in future.

6.2.4 It is a sizable standalone RCHEs development would comply with the Encouragement Scheme of the Social Welfare Development. Since the launching of the Scheme in 2003, there is only one successful RCHE built in 2019. The approval on this S12A application would aid to speed up more RCHE developments.

6.2.5 The design of the proposed RCHEs is governed by relevant regulations to limit its height. The difference in Height to the surrounding is justified. The site is also surrounded by abundant Greenery and the increase in Building Bulk is adequately shield off.

6.2.6 The site is under single ownership, it could be readily re-developed to aid to solve the RCHEs demand in short term.

6.3 In addition to the planning and design merits, it is also demonstrated by technical assessments on the Environmental Impact, Traffic and Landscape aspects that the Proposed Development will NOT generate adverse impacts to the Application Site and its surroundings.

6.4 In the light of the planning merits and justifications put forward in this Supporting Planning Statement, we sincerely seek for the favourable consideration from the TPB to give support to this Application.

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.

FIGURE 1

LOCATION PLAN

RLEE

RLEE Architects (HK) Ltd

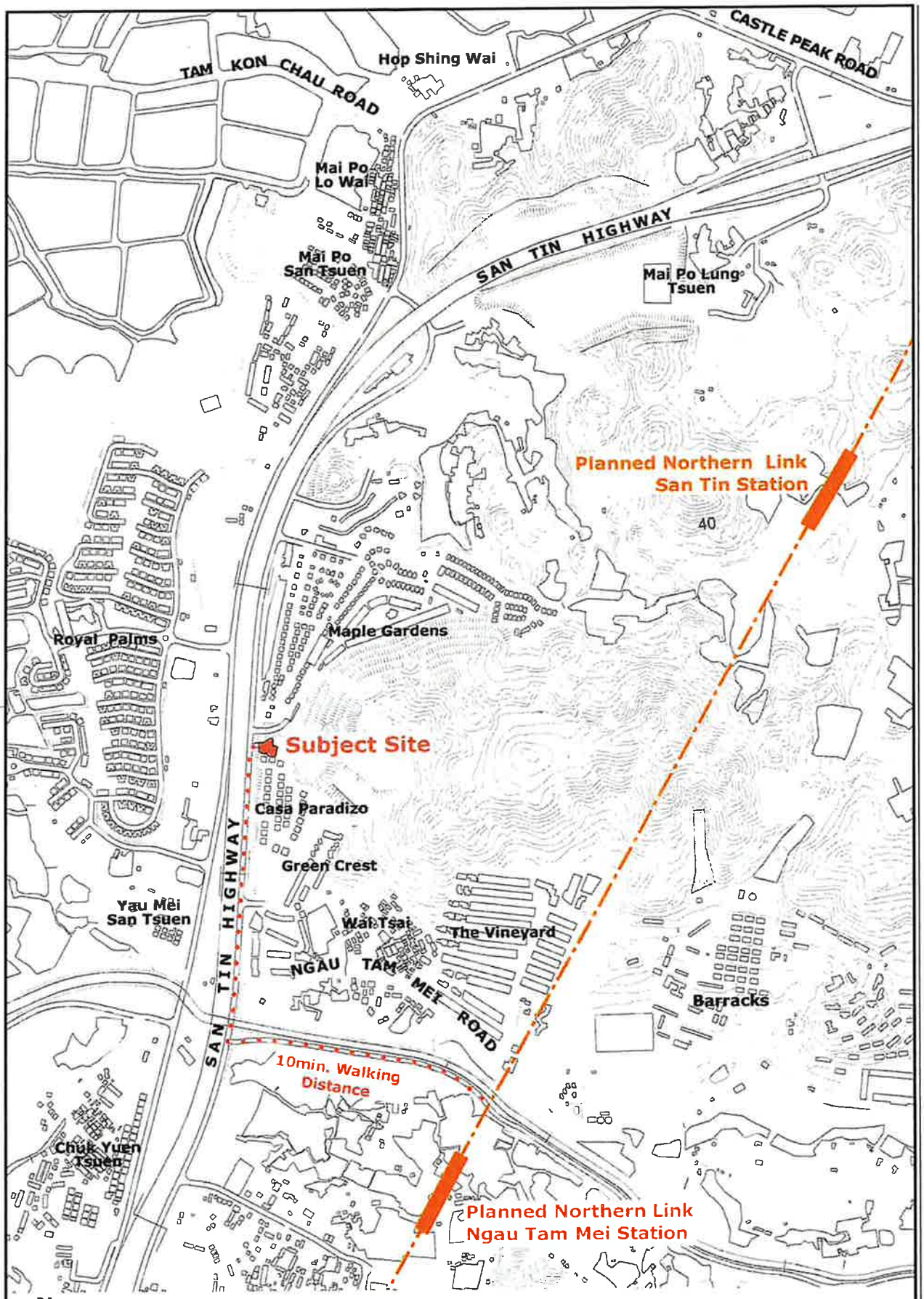
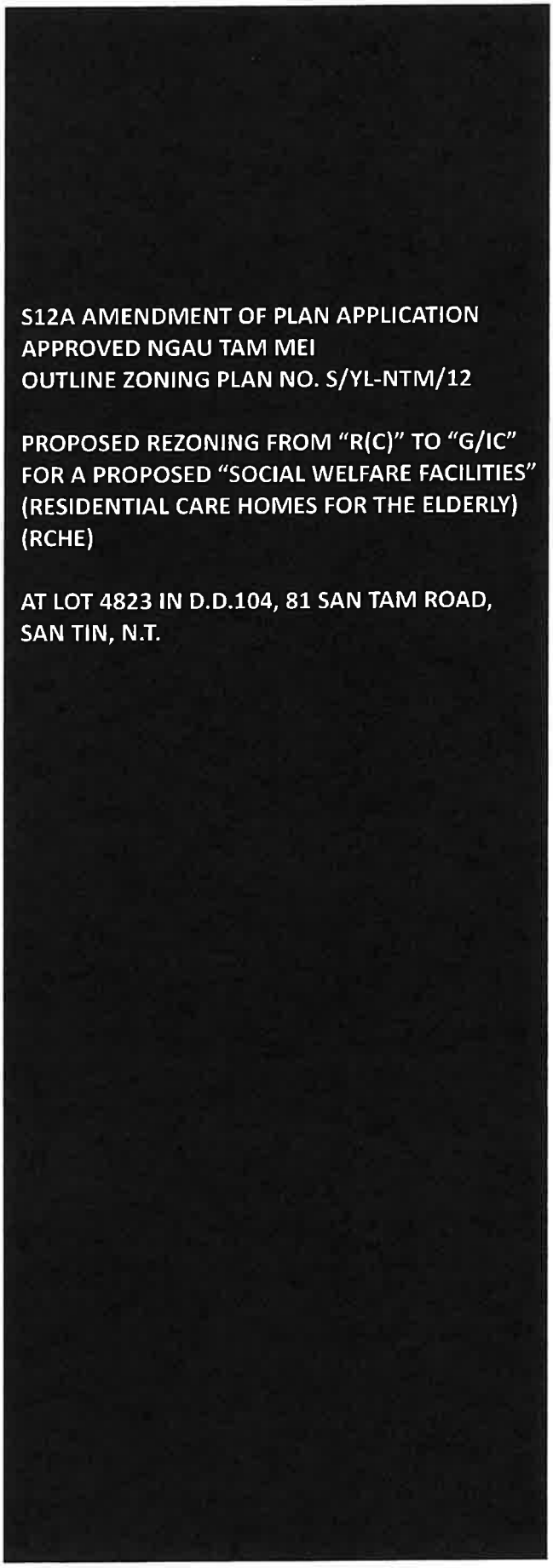


FIGURE NO.	TITLE	SCALE	
1	LOCATION PLAN	1:10000	
		DATE	JUL 2022

RLEE



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.

FIGURE 2

EXISTING HOUSE DESIGN

RLEE

RLEE Architects (HK) Ltd

GENERAL NOTES:

1. ALL BRICK WORKS AND MASONRY SHALL BE BUILT IN 1:3 CEMENT MORTAR
2. NON STRUCTURAL CONCRETE TO BE 1:2:4 MIXTURE
3. ALL R.C. DETAILS AND CALCULATIONS SHALL BE SUBMITTED SEPARATELY
4. DRAINAGE PLANS AND TYPICAL DETAILS SHALL BE SUBMITTED SEPARATELY
5. ALL PARAPETS SHALL BE 1100mm HIGH MIN. ABOVE FINISHED FLOOR LEVEL.
6. ALL RISERS OF STAIRCASE SHALL NOT MORE THAN 175mm, TREADS NOT LESS THAN 225mm
7. ALL DIMENSIONS SHOWN ON ALL DRAWINGS ARE STRUCTURAL
8. LANDSCAPE DETAILS TO BE SUBMITTED LATER
9. ALL FLAT ROOF TO BE PROVIDED MOVEABLE CAT-LADDER.
10. ALL FOUNDATIONS TO BE CARRIED DOWN ON SOLID GROUND OR PILES IF NECESSARY.
11. CLEAR HEIGHT BETWEEN FLOOR LEVEL TO BEAM SOFFIT SHALL BE 2300mm.
12. CLEAR HEIGHT BETWEEN FLOOR LEVEL TO SOFFIT TO BE 2500mm MIN. UNLESS OTHERWISE DENOTED.
13. CLEAR HEIGHT BETWEEN FINISHED FLOOR LEVEL TO BEAM SOFFIT OF STAIRCASE TO BE 2000mm MINIMUM.
14. THE GENERAL BUILDING PLAN WILL BE COMPLIED WITH CODE OF PRACTICE FOR FIRE SAFETY IN BUILDINGS 2011,
    EXCEPT PART B – MEANS OF ESCAPE SINCE:
    (a) DOMESTIC BUILDING HAVING NOT MORE THAN THREE MAIN DOMESTIC STOREYS
    (b) THE LEVEL OF THE HIGHEST FLOOR OF WHICH IS NOT MORE THAN 1.3m ABOVE THE GROUND LEVEL; AND
    (c) USED OR INTENDED TO BE USED FOR OCCUPATION BY A SINGLE FAMILY.
15. THE INTERNAL SURFACE OF KITCHEN TO HAVE A HEIGHT OF AT LEAST 1.2m FROM FLOOR SHALL BE RENDERED IN CEMENT MORTAR, NOT LESS THAN 12.5mm IN THICKNESS, OR OTHER NON-ABSORBENT MATERIAL.
16. THE FOLLOWING MODIFICATIONS AND/OR EXEMPTIONS ARE GRANTED BY THE BUILDING AUTHORITY (REFER TO TABLE A)
17. BUILDING (CONSTRUCTION) REGULATION 8, REGARDING "CHANGE IN LEVEL" DO NOT APPLY TO THIS PROJECT SINCE IT IS SPACE WITHIN DOMESTIC PREMISES FOR OCCUPATION BY ONE FAMILY.

SIDE	DISTANCE IN METERS	BEARING ° ' "	PL	CORNER MARKED BY
X A	6.789	83 53 38		
A B	13.433	57 27 48		
B C	6.167	82 18 08		
C D	3.574	180 47 15		
D E	10.355	175 31 27		
E F	9.051	105 50 37		
F G	7.118	199 40 20		
G H	10.050	185 42 40		
H J	6.576	261 13 10		
J K	7.762	284 55 50		
K L	6.325	341 33 50		
L M	2.693	291 48 10		
M N	6.123	194 02 10		
N P	11.894	288 55 00		
P X	17.338	1 44 54		

F.S. NOTES :

1. PORTABLE FIRE EXTINGUISHER

(a) PORTABLE FIRE EXTINGUISHERS WITH TYPE-SPECIFIED SHALL BE PROVIDED AS INDICATED ON PLAN IN ACCORDANCE WITH CURRENT F.S.D. CIRCULAR LETTERS NO. 4/96.

2. HOSE REEL SYSTEMS

(a) A HOSE REEL SYSTEM SHALL BE PROVIDED FOR THE ENTIRE BUILDING, SINCE THE HORIZONTAL DISTANCE BETWEEN THE EVA AND THE BUILDING FACADE EXCEEDS 10m BUT WITHIN 30m. A $2m^3$ F.S. WATER TANK FED BY THE CITY WATER TOWN MAIN SHALL BE PROVIDED AT THE LOCAL AS SHOWN ON PLAN.

(b) THE HR SYSTEM CONSISTS OF HOSE REELS THAT ARE POSITIONED AND SHOWN ON PLAN SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT H.K. F.S.D. CODE OF PRACTICE. ONE MANUAL ACTUATING POINT AND ONE AUDIO WARNING DEVICE SHALL BE PROVIDE FOR EACH HOSE REEL POINT THIS MANUAL ACTUATING POINT FACILITATES THE FIRE PUMP ACTUATION AND AUDIO WARNING ALARM INITIATION.

(c) A HOSE REEL WITH HOSE REEL TUBING OF NO MORE THAN 30 METRES IN LENGTH SHALL BE PROVIDED AT THE LOCATIONS AS SHOWN ON PLAN TO ENSURE THAT ALL AREAS ARE COVERED BY THE HOSE REEL SYSTEM.

(d) THE FIXED FIRE PUMPS AS SHOWN ON PLAN.

3. OTHERS

(a) ALL LININGS FOR ACOUSTIC AND THERMAL INSULATION PURPOSES IN DUCTING AND CONCEALED LOCATIONS SHALL BE OF CLASS 1 OR 2 RATE OF SURFACE SPREAD OF FLAME AS PER BRITISH STANDARD 476: PART 7 OR ITS INTERNATIONAL EQUIVALENT, OR BE BROUGHT UP TO THAT STANDARD BY THE USE OF APPROVED FIRE RETARDANT PRODUCT.

(b) ALL LININGS FOR ACOUSTIC, THERMAL INSULATION AND DECORATIVE PURPOSES WITHIN PROTECTED MEANS OF ESCAPE SHALL BE OF CLASS 1 OR 2 RATE OF SURFACE SPREAD OF FLAME AS PER BRITISH STANDARD 476 : PART 7 OR ITS INTERNATIONAL EQUIVALENT, OR BE BROUGHT UP TO THAT STANDARD BY USE OF AN APPROVED FIRE RETARDANT PRODUCT.

(c) ANY INTENDED STORAGE OR USE OF DANGEROUS GOODS AS DEFINED IN CHAPTER 295 OF THE LAWS OF HONG KONG SHOULD BE NOTIFIED TO THE DIRECTOR OF FIRE SERVICES.

4. SECONDARY POWER SUPPLY

(a) THE SECONDARY ELECTRICITY SUPPLY TO BE TEE-OFF BEFORE THE INCOMING MAIN SWITCH FOR THE ESSENTIAL FSI SERVICE.

PLOT RATIO & SITE COVERAGE CALCULATIONS

(UNDER OUTLINE ZONING PLAN)

SITE AREA	=	736.3 sq.m.
CLASS OF SITE	=	A
ZONE	=	RESIDENTIAL (GROUP C)
MAXIMUM PLOT RATIO	=	0.4
PERMITTED NO. OF STOREYS	=	3 STROEYS (9m) INCLUDING CARPARK
TOTAL ACTUAL DOMESTIC G.F.A. :	=	294.258 sq.m. < 294.500 sq.m.
ACTUAL PLOT RATIO FOR DOMESTIC	=	294.258 / 736.300
	=	0.39964 < 0.4 (O.K.)
ACTUAL DOMESTIC G.F.A.		
G/F :	=	157.997 sq.m.
1/F :	=	136.261 sq.m.
TOTAL G.F.A	=	294.258 sq.m.

PLOT RATIO & SITE COVERAGE CALCULATIONS

(UNDER BUILDING REGULATIONS)

SITE AREA	=	736.3 sq.m.
CLASS OF SITE	=	A
HEIGHT OF BUILDING	=	NOT EXCEEDING 15m
MAXIMUM PLOT RATIO	=	3.3
MAXIMUM PERCENTAGE SITE COVERAGE (NOT EXCEEDING 15m)	=	66.6%
TOTAL ACTUAL DOMESTIC G.F.A. :	=	294.258 sq.m. < 294.500 sq.m.
ACTUAL PLOT RATIO FOR DOMESTIC	=	294.258 / 736.300
	=	0.39964 < 0.4 (O.K.)
ACTUAL SITE COVERAGE FOR DOMESTIC (NOT EXCEEDING 15m)	=	189.832 / 736.300 x 100 %
	=	25.782 % < 66.6% (O.K.)
ACTUAL DOMESTIC G.F.A.		
G/F :	=	157.997 sq.m.
1/F :	=	136.261 sq.m.
TOTAL G.F.A	=	294.258 sq.m.

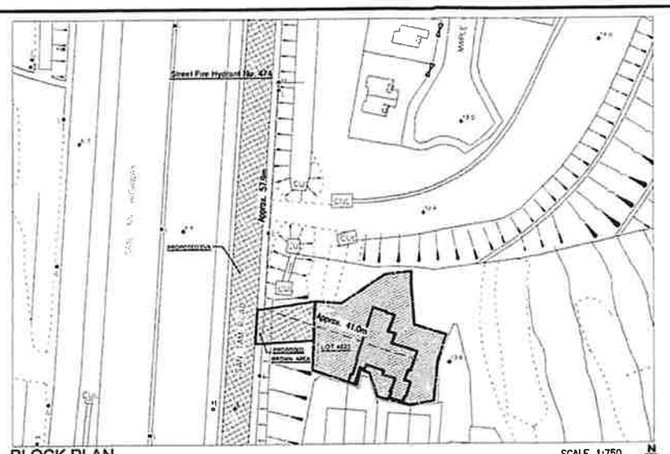
CAR PARKING SPACES CALCULATIONS

STANDARD OF PARKING SPACES REQUIRED UNDER HKPSG :

PROPOSED DEVELOPMENT :		RESIDENTIAL DEVELOPMENTS (PRIVATE HOUSING)
TOTAL GFA	=	294.258 sq.m.
CPS	=	1/6
R1	=	9
R2	=	1
NO. OF PRIVATE CAR PARKING	=	CPS X R1 X R2 = 2 NOS.

ACTUAL NO. OF PARKING SPACE/LOADING & UNLOADING SPACE PROVIDED :

PRIVATE CAR (2.5m x 5m x 2.4m H.) = 2 NOS.



BLOCK PLAN SCALE 1:750

SCHEDULE OF SANITARY FITMENT

LOCATION	USE	CAPACITY (TAKE MAX.)	NO. OF SANITARY FITMENT REQUIRED				NO. OF SANITARY FITMENT PROVIDED			
			W.C.	BASIN	URINAL	BATH / SHOWER	W.C.	BASIN	URINAL	BATH / SHOWER
G/F-1/F	RESIDENTIAL	256.619 / 9 = 29	3	3	-	3	7	7	1	7

NOTES:

FIRE RESISTANCE REQUIREMENTS FOR ELEMENTS OF CONSTRUCTION

LOCATION	USE	CLASS	COMPARTMENT AREA (m^2) COMPARTMENT VOLUME (m^3) (TAKE MAX.)	F.R.R.	MIN. DIMENSION OF ELEMENTS OF CONSTRUCTION (mm)							
					SOLID CONC. BLOCK WALL	R.C. WALL		R.C. FLOOR		R.C. COLUMNS		R.C. BEAMS	
					MIN. SIZE	MIN. SIZE	MIN. CONC. COVER	MIN. SIZE	MIN. CONC. COVER	MIN. SIZE	MIN. CONC. COVER	MIN. SIZE	MIN. CONC. COVER
G/F	CARPARK	7	$34.827m^2 \times 2.8 = 97.516m^3$	-/60/60	100	75	15	100	20	200	25	200	30
G/F	RESIDENTIAL	1	$144.742m^2 \times 4.425 = 640.483m^3$										
1/F	RESIDENTIAL	1	$111.877m^2 \times 3.375 = 377.589m^3$										
G/F - 1/F	RESIDENTIAL		TOTAL = $1115.588m^3$										
ALL FLOORS	ALL E/M ROOMS	SPECIAL HAZARDS	-	-/120/120	225	100	25	125	35	300	35	200	50

NOTES: -/120/120 F.R.R. TO BE PROVIDED FOR SEPARATION BETWEEN DIFFERENT USES.

COLOR LEGEND:

- R.C. WORKS
- SOLID BLOCKS WALL (WITH F.R.R.)
- CONC. WORKS
- GLASS
- METAL WORKS
- TIMBER WORKS
- FLOOR RENDERING
- WALL FINISH
- SANITARY FITMENTS
- SOLID BLOCK WALL (WITHOUT F.R.R.)
- 900mm(H) SOLID BLOCK WALL (WITHOUT F.R.R.
- SOIL

INDICATION SCHEDULE :

MARK	INDICATION
O FH	FIRE HYDRANT
EXIT	EXIT SIGN
H.R.	HOSE REEL
F.E.	4.5kg CO_2 FIRE EXTINGUISHER
	STRUCTURE LEVEL
	FINISH LEVEL
	-/30/30 F.R.R. SELF-CLOSING DOOR WITH UPPER VISION PANEL AND SMOKE SEAL
	-/60/60 F.R.R. SELF-CLOSING DOOR WITH UPPER VISION PANEL AND SMOKE SEAL
	-/120/120 F.R.R. SELF-CLOSING DOOR WITH UPPER VISION PANEL AND SMOKE SEAL
	-/30/30 F.R.R. SELF-CLOSING DOOR WITH SMOKE SEAL
	-/60/60 F.R.R. SELF-CLOSING GLASS DOOR WITH SMOKE SEAL
	-/120/120 F.R.R. SELF-CLOSING DOOR WITH SMOKE SEAL
	DOOR WITH PANIC BOLT WITH SMOKE SEAL
MV/AL	MECHANICAL VENTILATION AND ARTIFICIAL LIGHTING TO BE PROVIDED TO THE SATISFACTION OF BD
AL	ARTIFICIAL LIGHTING TO BE PROVIDED TO THE SATISFACTION OF BD
M.L.	METAL LOUVRE
H/L	HIGH LEVEL
L/L	LOW LEVEL
	LEVEL DIFFERENCE
(D)	ACCESSIBLE LIFT
(A)	FIREMAN'S LIFT
O SB	SAND BUCKET
F/B	FROM BELOW
T/A	TO ABOVE

TABLE A

MODIFICATIONS / EXEMPTIONS NT 591/2013(MOD) GRANTED on 13 DECEMBER 2013 and AMENDMENT TO LOCATION (if any) IN THE CURRENT SUBMISSION

Description	Condition	Location with Modification/ Exemption Granted	Date of Approval	Qty.	1/3	2/3	3/3	4/3	5/3	6/3	7/3	8/3	9/3	10/3	11/3	12/3
				Domestic	1/3	2/3	3/3	4/3	5/3	6/3	7/3	8/3	9/3	10/3	11/3	12/3
				Total	1/3	2/3	3/3	4/3	5/3	6/3	7/3	8/3	9/3	10/3	11/3	12/3
				Rem.	G	B	E	F	H	J	K	L	M	N	P	X
(A) Building (Planning) Regulation 28 to permit the non provision of service lane.	Site Permit is granted subject to the following conditions:- (a) The said works are to be carried out in accordance with the plans approved on 12 December 2013 under our Ref. No. BD 2/9233/12	All area from G/F to UR/F															
(B) Building (Planning) Regulation 36 to permit omission of natural lighting and ventilation in the internal lavatories and internal bathrooms as shown on the plans.	(b) Regarding item (B) above: (i) Compliance with the requirements and conditions as laid down in PNAP APP-96.																
(C) Building (Planning) Regulation 35 to permit the level of internal floors to be less than 150mm above the level of the external ground at locations as shown on the plans.	(c) Regarding item (C) above:- (i) Provision of additional drainage channels, each with at least 2 no. of drainage outlets; and (ii) Provision of a kerb, not less than 1.80, on the flat roof or external ground sloping away from the adjoining internal/ usable floor area.																
(D) Building (Planning) Regulation 26A to permit the non-provision of gas flue aperture in the bathrooms as shown on plans.	(d) Regarding items (D) above:- (i) Shared hot water heater with other room(s) should be provided and the hot water pipe should comply with the Waterworks Regulation 19 (Cap 102).																
(E) Building (Planning) Regulation 41D to permit the horizontal distance between the EVA and the major facade of the house to exceed 10m subject to enhanced FSI to satisfaction of FSD.#	(e) The conditions (b) to (d) imposed in this paragraph are to be incorporated in the subsequent amendment plans for approval prior to the submission of Form BA13 upon completion.																
	(f) A checklist of valid Forms BD10B is to be submitted at the time of the application for an occupation permit .																
	(g) This permit will expire on December 2015 if the consent to commence the above works is not obtained on or before the specified date or where such consent has been obtained but is deemed to be revoked under section 20(1) of the buildings Ordinance after the specified date.																

MODIFICATIONS / EXEMPTIONS NT 354/2016(MOD) GRANTED on 10 JUNE 2016 and AMENDMENT TO LOCATION (if any) IN THE CURRENT SUBMISSION

Description	Condition	Location with Modification/ Exemption Granted	Date of Approval	Qty.	1/3	2/3	3/3	4/3	5/3	6/3	7/3	8/3	9/3	10/3	11/3	12/3
				Domestic	1/3	2/3	3/3	4/3	5/3	6/3	7/3	8/3	9/3	10/3	11/3	12/3
				Total	1/3	2/3	3/3	4/3	5/3	6/3	7/3	8/3	9/3	10/3	11/3	12/3
				Rem.	G	B	E	F	H	J	K	L	M	N	P	X
(A) Building (Planning) Regulation 28 (1)(b) to permit the non provision of service lane.	Site Permit is granted subject to the following conditions:- (a) The said works are to be carried out in accordance with the plans approved on 10 June 2016 under our Ref. No. BD 2/9233/12	All area from G/F to UR/F															
(B) Building (Planning) Regulation 35A to permit the non-provision of gas flue aperture in the bathrooms as shown on plans.	(b) The conditions imposed in this paragraph are to be incorporated in the subsequent amendment plans for approval before the application permit is submitted.																
(C) Building (Planning) Regulation 36 to permit omission of natural lighting and ventilation in the internal lavatories and internal bathrooms as shown on the plans.	(c) A checklist of valid Forms BD10B is to be submitted at the time of the application for an occupation permit .																
(D) Building (Planning) Regulation 41D to permit the horizontal distance between the EVA and the major facade of the house to exceed 10m subject to enhanced FSI to satisfaction of FSD.	(d) Regarding item (B) above:- The provision of shared hot water heater with other room and the length of the hot water pipe from the said water heater comply with the requirements of Waterworks Regulation 19 (Cap 102).																
(E) Building (Planning) Regulation 35 to permit the internal floors to be less than 150mm above the level of the external ground at locations as shown on the plans.	(e) Regarding item (C) above: Subject to the compliance with the requirements and conditions as laid down in PNAP APP-96.																
	(f) Regarding item (D) above: Enhanced fire service installations are to be provided to satisfaction of the Director of Fire Services.																
	(g) Regarding item (E) above:- (i) Provision of additional drainage channels, each with at least 2 no. of drainage outlets; and (ii) Provision of a kerb, not less than 1.80, on the flat roof or external ground sloping away from the adjoining internal/ usable floor area.																
	(g) This permit will expire on 9 June 2018 if the consent to commence the above works is not obtained on or before the specified date or where such consent has been obtained but is deemed to be revoked under section 20(1) of the buildings Ordinance after the specified date.																

2202

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

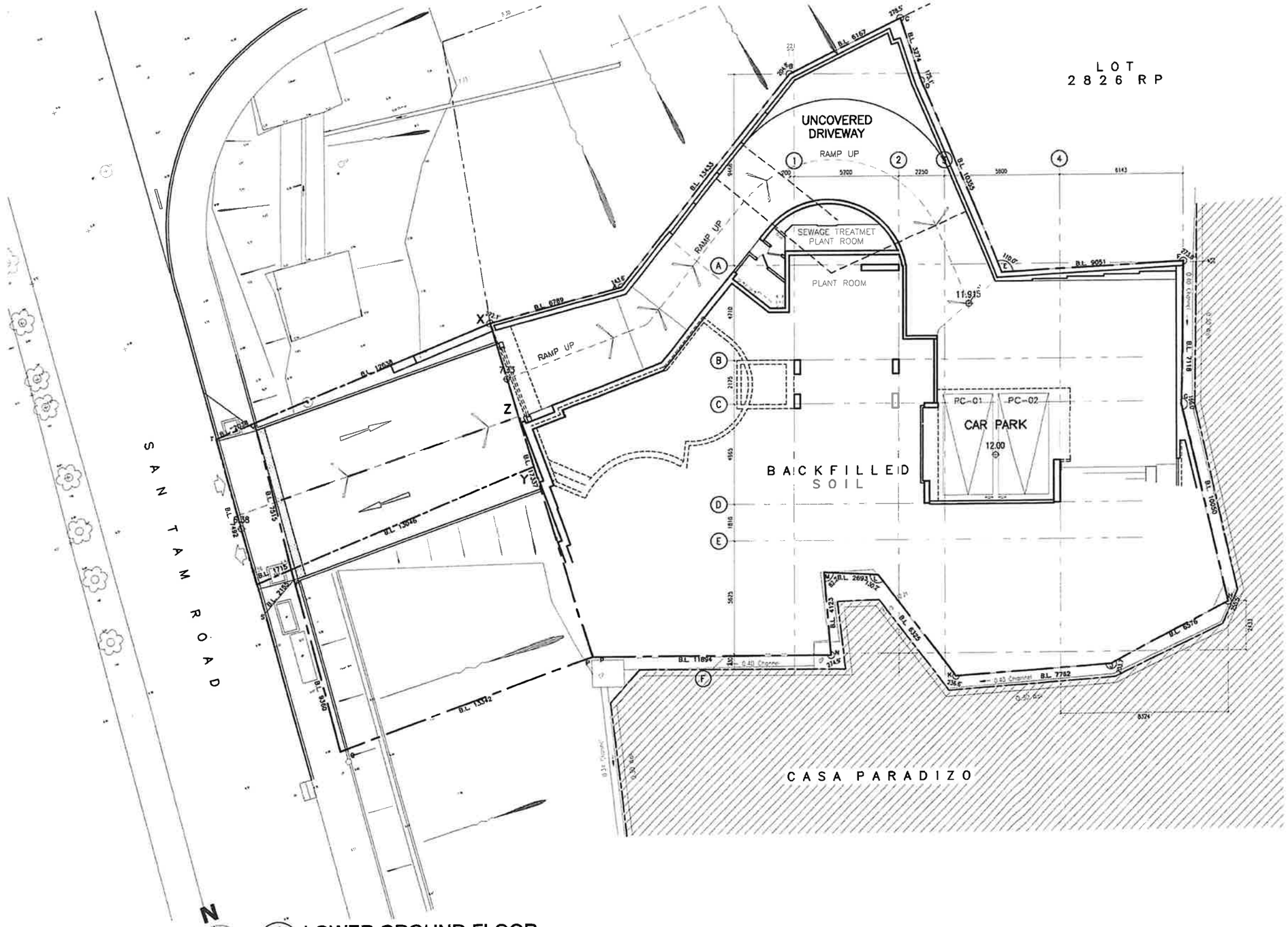
28/07/2017 – APPROVED PLAN
NOTES, SCHEDULE, LEGEND,
CALCULATION & LOCATION PLAN

AP-01 NTS (A3)

- JUN. 2022

Do not scale drawing.
Contractors are required to verify exact dimensions on site.
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This drawing is not for construction purposes unless expressedly certified.

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

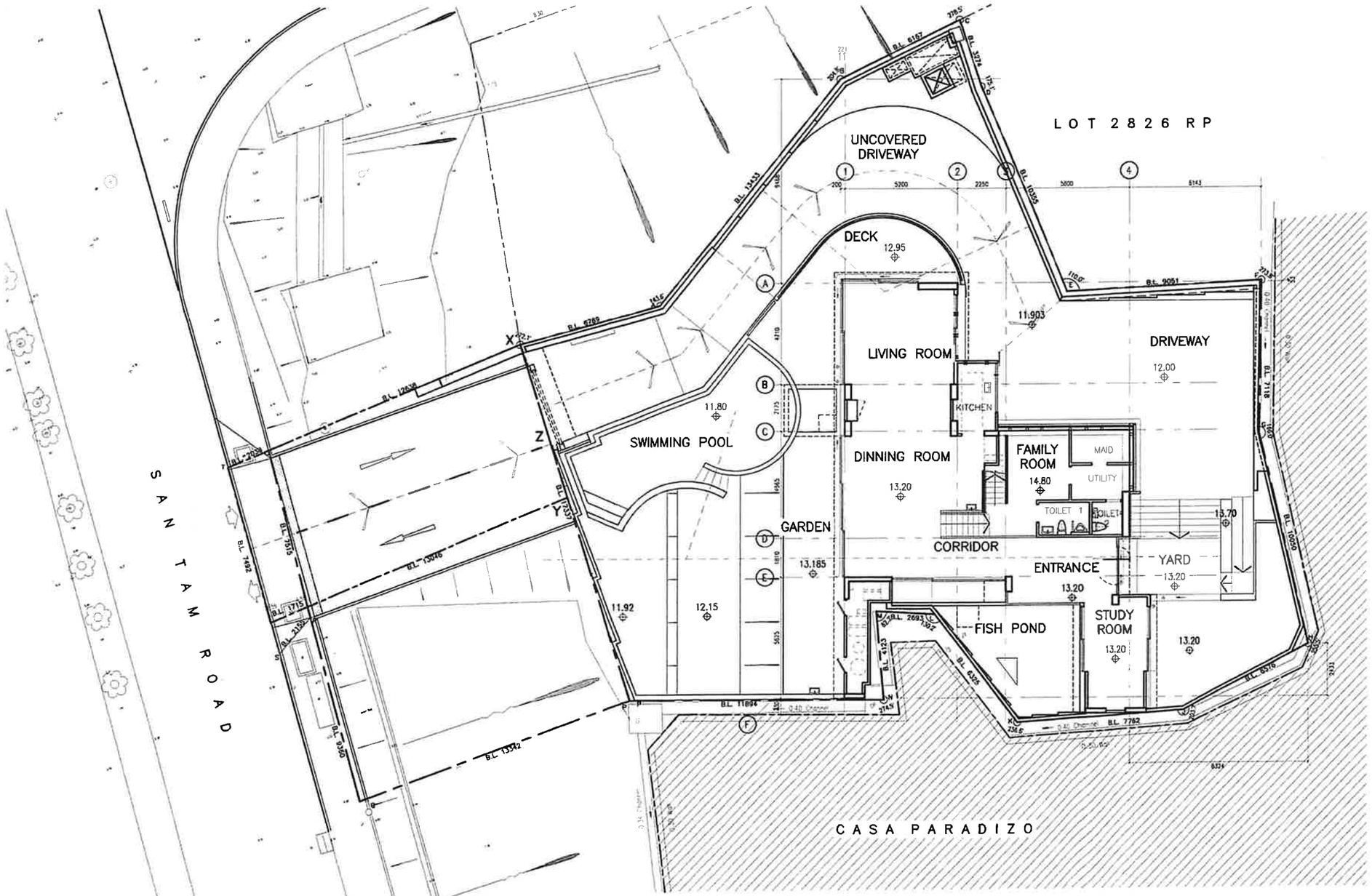
28/07/2017 – APPROVED PLAN
LOWER GROUND FLOOR

AP-02 1:200 (A3)

\- JUN. 2022

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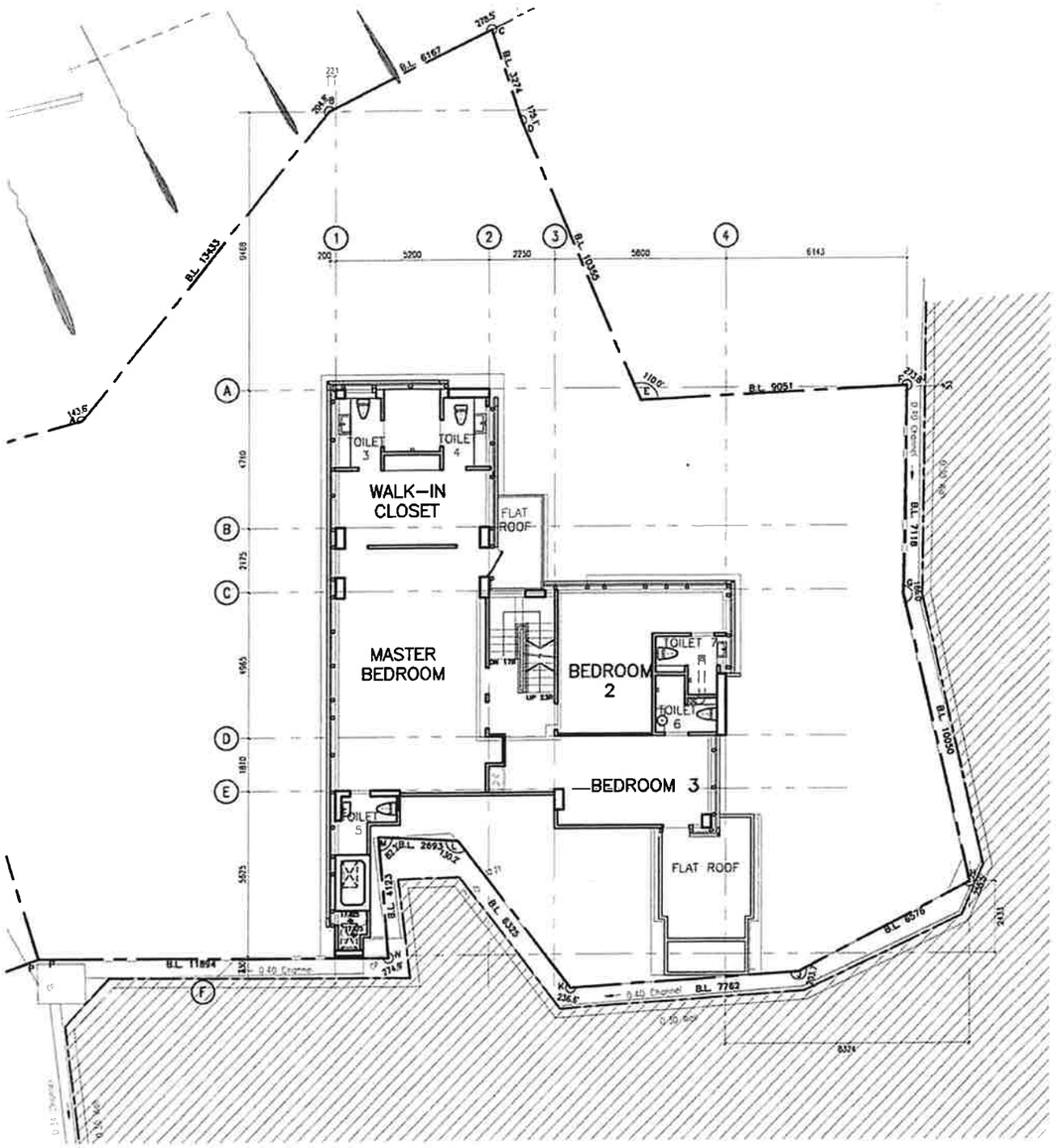
RLEE



1 G/F PLAN
AP-03

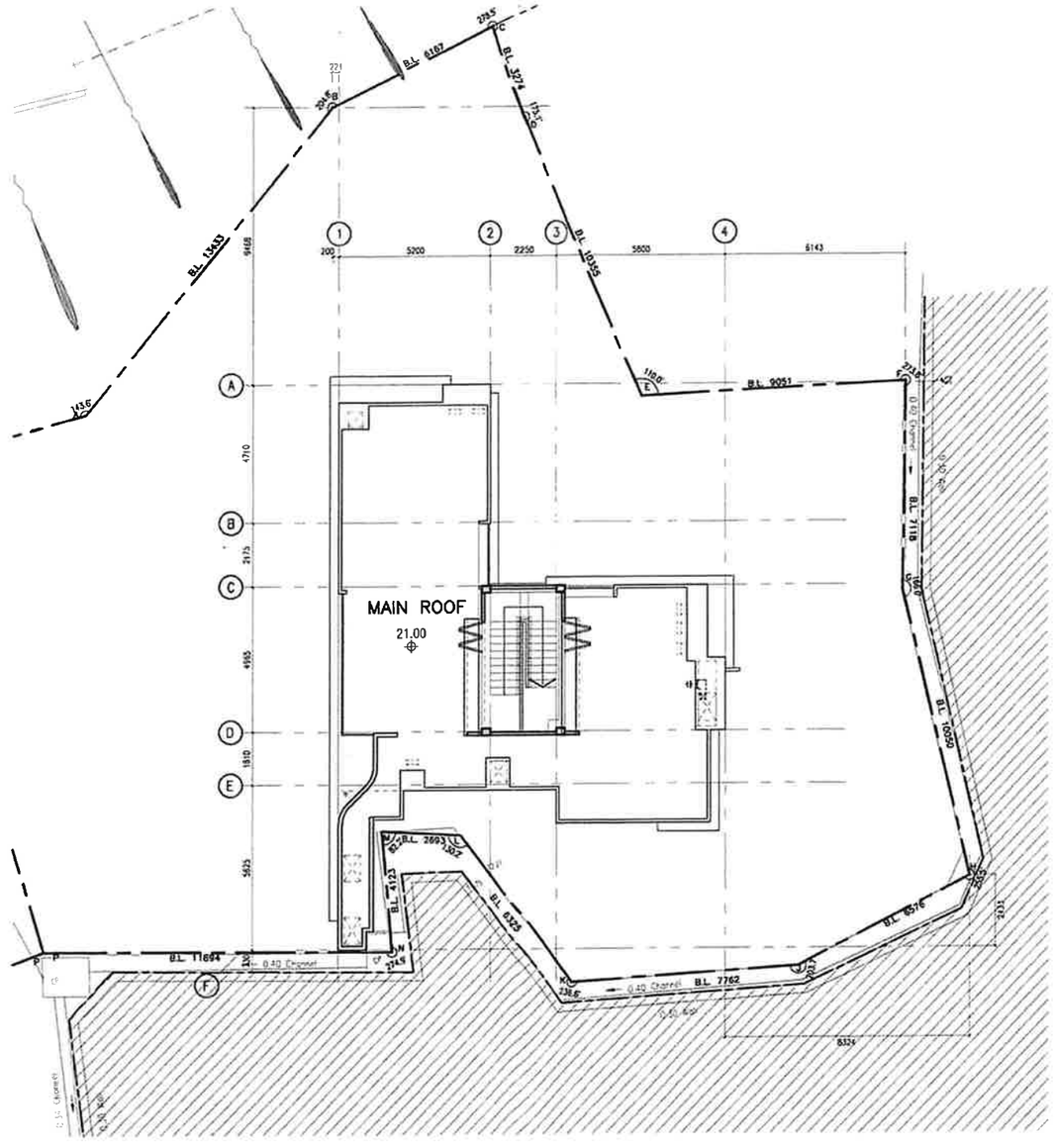
2202 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.	28/07/2017 – APPROVED PLAN G/F	AP-03 1:200 (A3)		Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "R.Lee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

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N

1 AP-04 1/F PLAN



N

2 AP-04 ROOF PLAN

2202

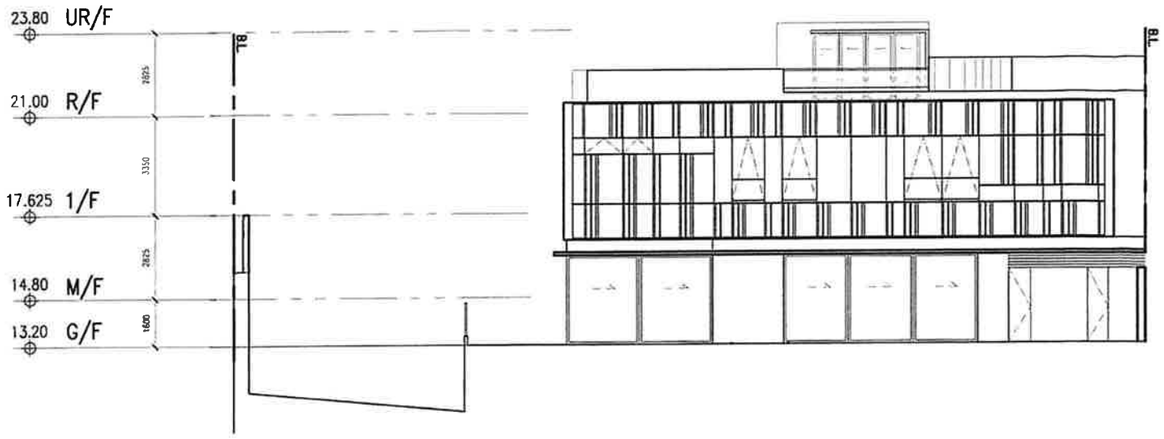
PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY
at 81 SAN TAM ROAD,
YUEN LONG, N.T.

28/07/2017 – APPROVED PLAN
1/F & ROOF

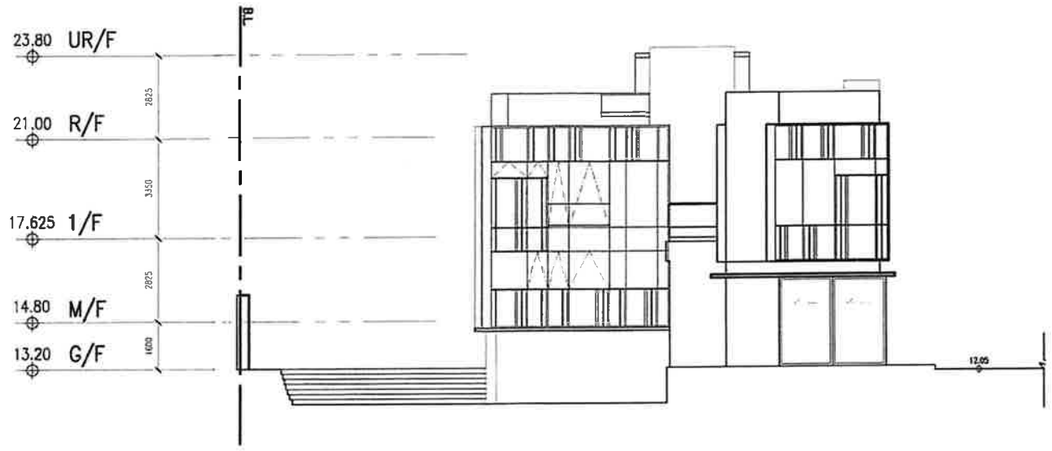
AP-04 1:200 (A3)

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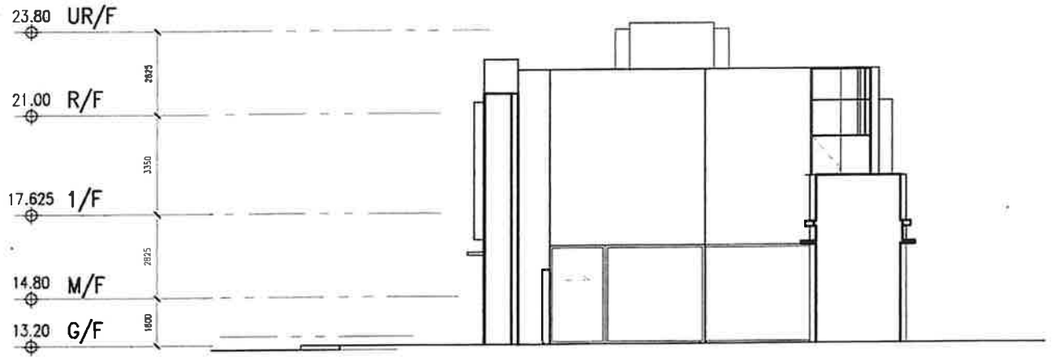
1 / AP-05 **ELEVATION A**



1 / AP-05 **ELEVATION B**



3 / AP-05 **ELEVATION C**



4 / AP-05 **ELEVATION D**

2202

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

28/07/2017 – APPROVED PLAN
ELEVATIONS

AP-05 1:200 (A3)

Do not scale drawing.
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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)

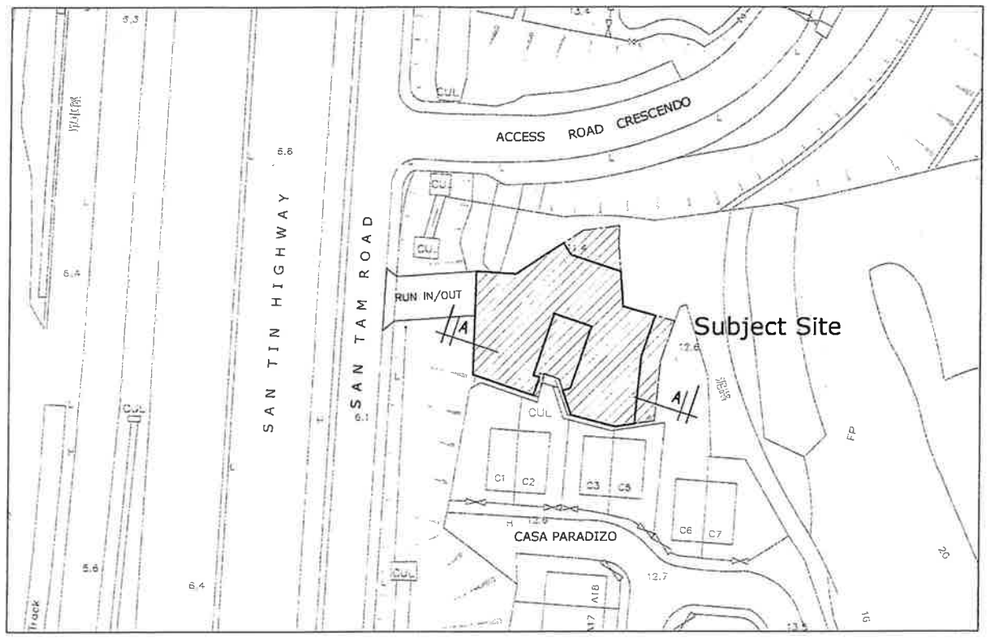
AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,
SAN TIN, N.T.

FIGURE 3

PROPOSED RCHE DESIGN

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RLEE Architects (HK) Ltd



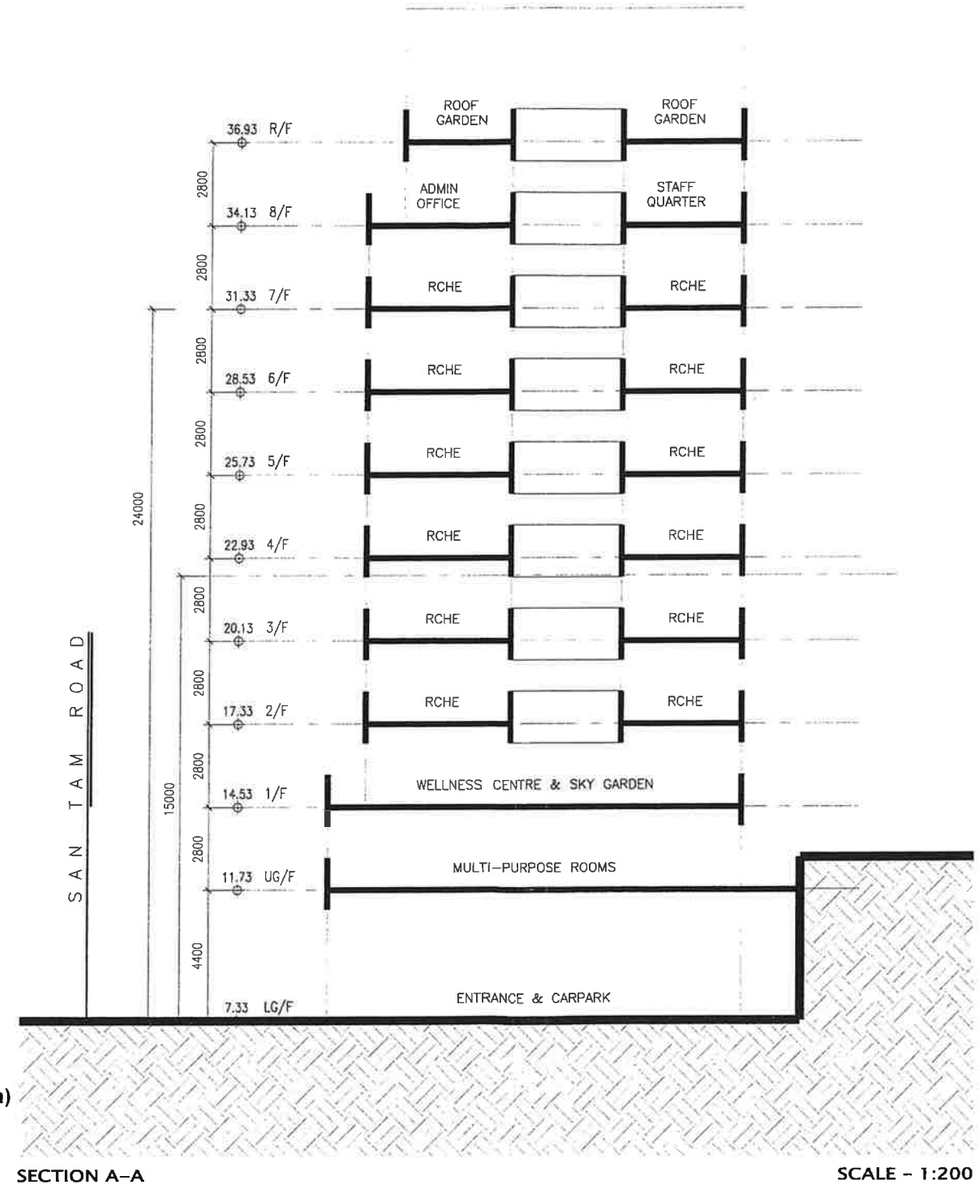
BLOCK PLAN **SCALE – 1:1000**

DEVELOPMENT SCHEDULE:

Site Area	:	736.3 m² (7926 ft²)
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 m² (58125.6 ft²)
Proposed Building Height	:	36.93 mPD
Absolute Height	:	29.6 m
Proposed No. Of Storey	:	10 STOREYS
Proposed Gross Floor Area		
LG/F (ENTRANCE & CARPARK)	:	352.479 m²
UG/F (MULTI-PURPOSE ROOMS)	:	617.819 m²
1/F (WELLNESS CENTRE + SKY GARDEN)	:	626.160 m²
2/F (RCHE)	:	595.090 m² (45 nos. of bed)
3/F (RCHE)	:	556.330 m² (17 nos. of bed + 3 nos. of isolation room)
4/F - 7/F (RCHE)	:	556.330 m² x 4 storeys = 2225.32 m² (20 nos. of bed x 4 storeys)
8/F (ADMIN OFFIC + STAFF QUARTER)	:	426.802 m²
TOTAL	:	**5400.000 m² (142 nos. of bed + 3 nos. of isolation room)**

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.

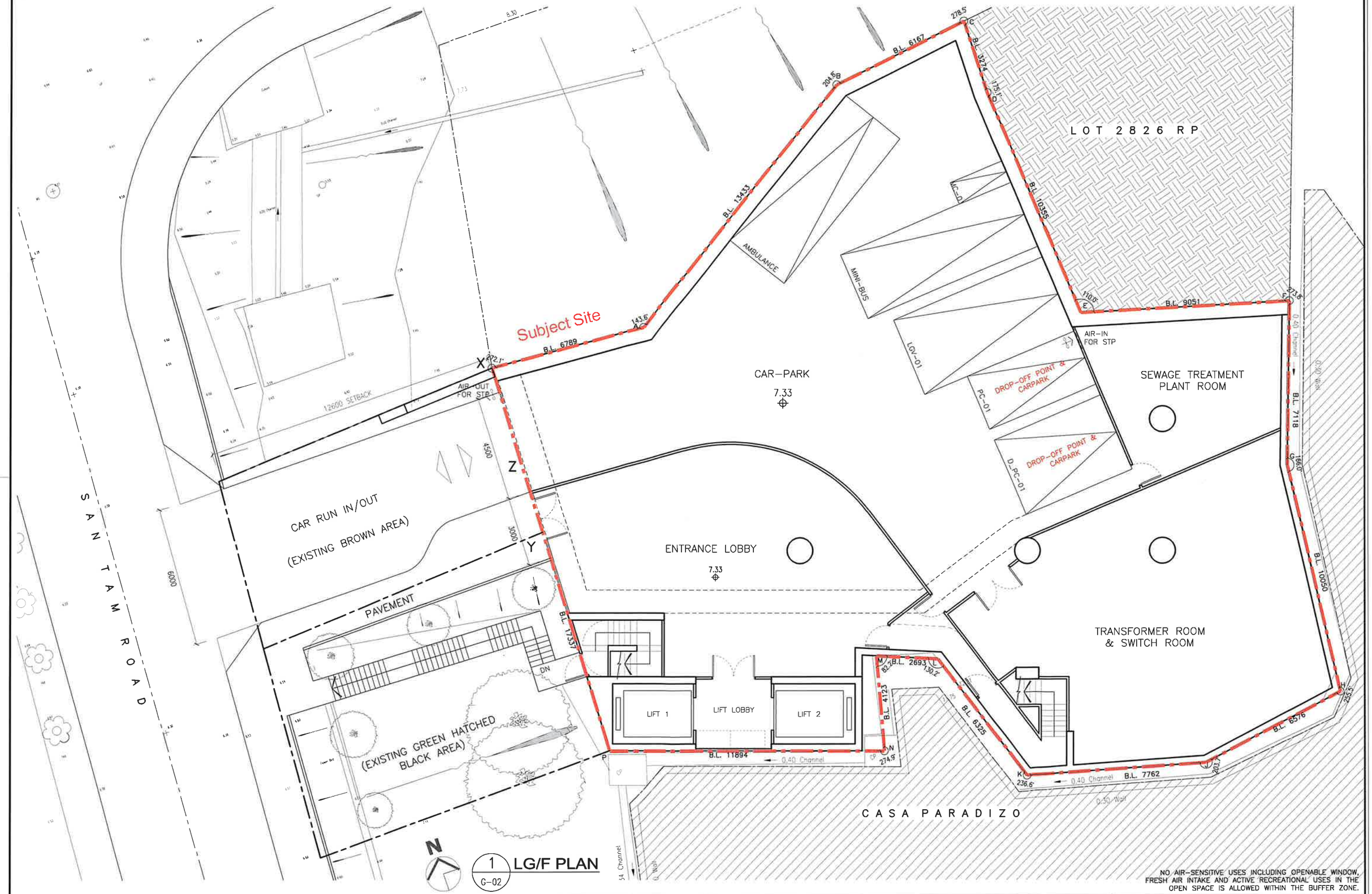
DEVELOPMENT SCHEDULE & SECTION

G–01 N.T.S. (A3)

B	OCT. 2022
A	JULY. 2022

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R LEE



2202

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

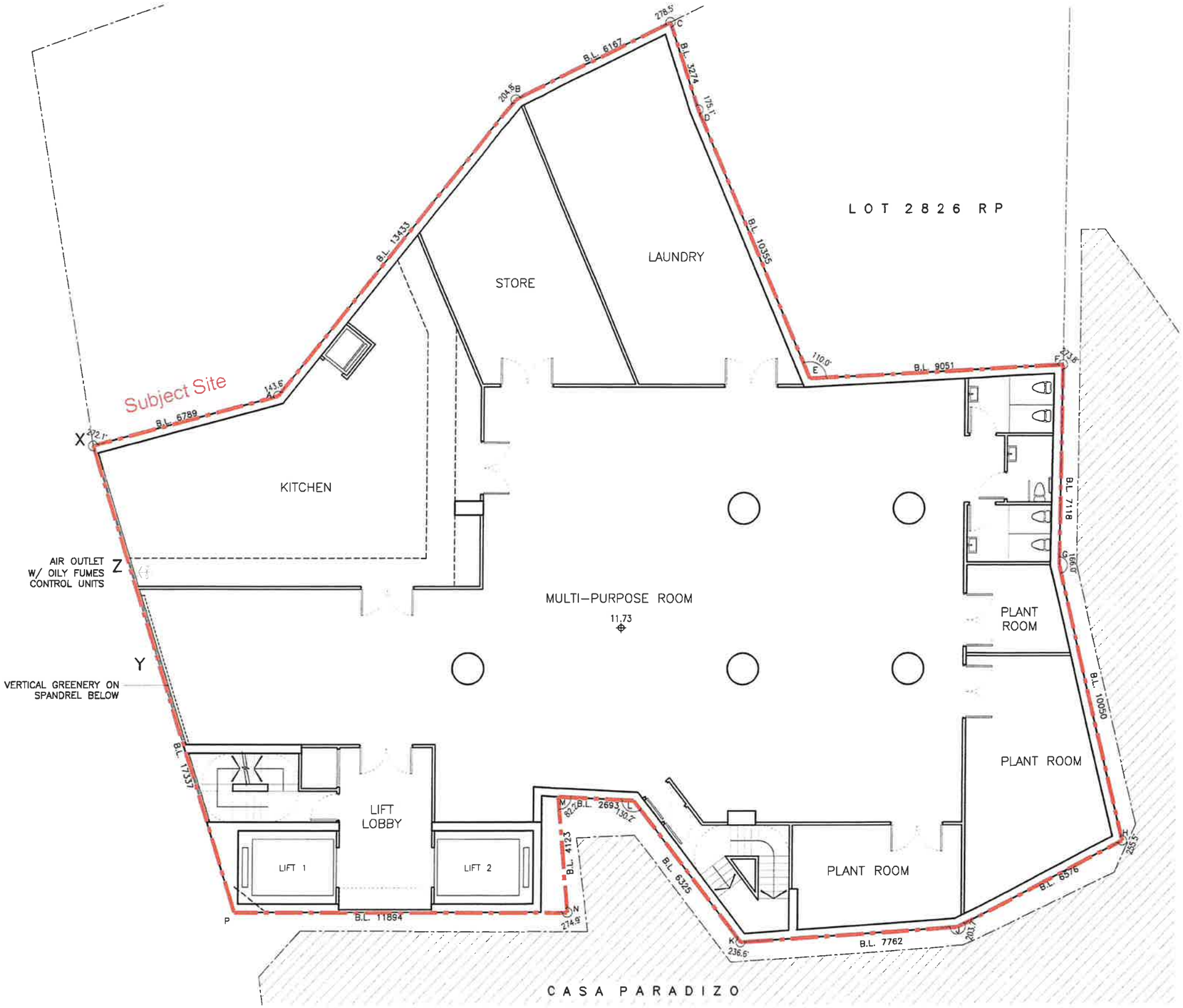
LG/F PLAN
ENTRANCE & CARPARK

G–02 1:150 (A3) 1:225 (A4)

C	APR. 2023
B	OCT. 2022
A	JULY. 2022

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N

1 UG/F PLAN
G-03

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.

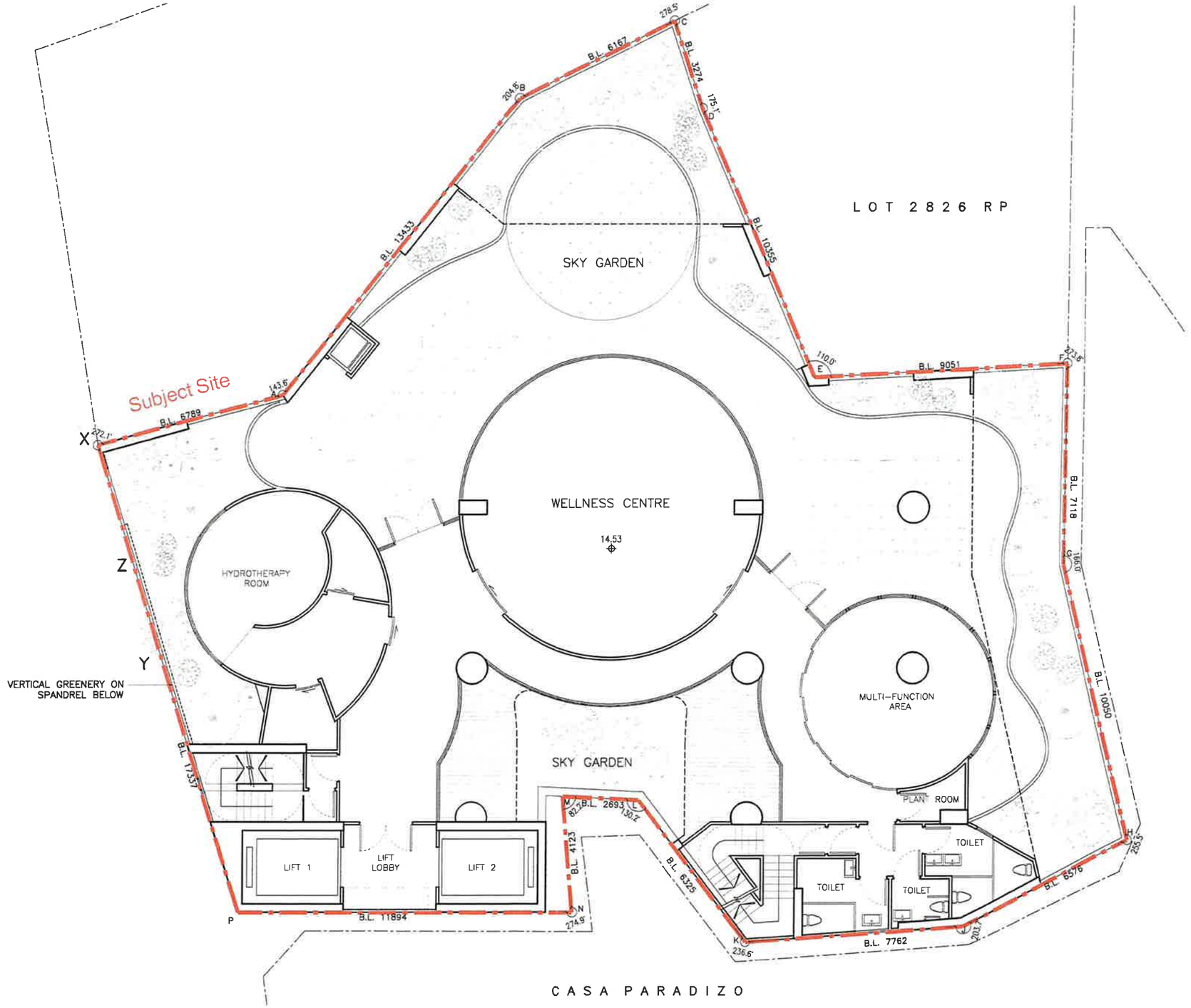
UG/F PLAN
MULTI–PURPOSE ROOMS

G-03 1:150 (A3)

B	OCT. 2022	
A	JULY. 2022	

Do not scale drawing.
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This drawing is not for construction purposes unless expressedly certified.

RLEE



CASA PARADIZO

N

1 / G-04 1/F PLAN

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.

1/F PLAN
WELLNESS CENTRE & SKY GARDEN

G-04 1:150 (A3)

B	OCT. 2022
A	JULY. 2022

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RLEE



N

1 G-05 2/F PLAN

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) 1:225 (A4)	D MAY. 2023 C APR. 2023 B OCT. 2022 A JULY. 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

RLEE



N

1 / G-06 3/F PLAN

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.

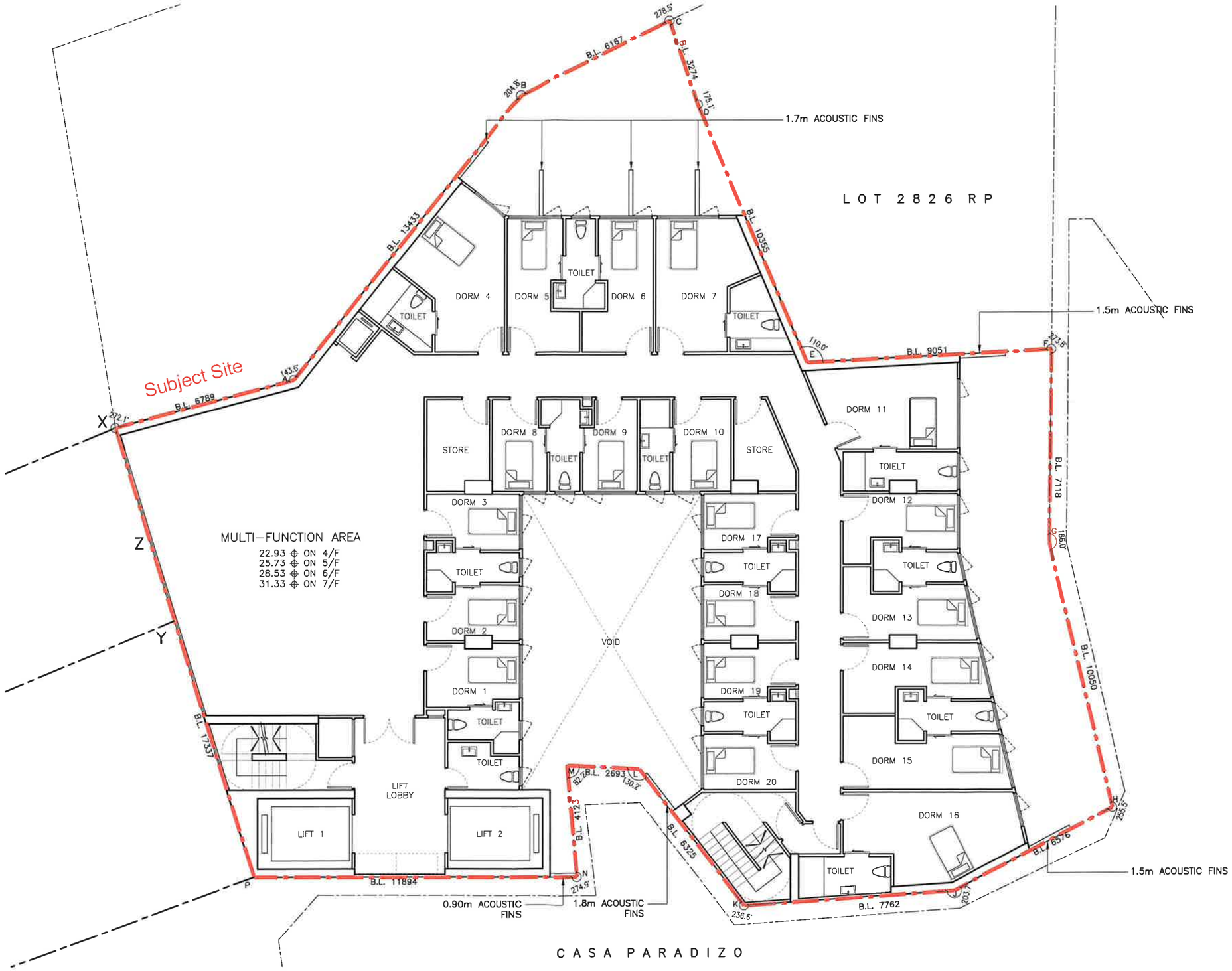
3/F PLAN
RCHE

G-06 1:150 (A3) 1:225 (A4)

D	MAY. 2023	
C	APR. 2023	
B	OCT. 2022	
A	JULY. 2022	

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RLEE



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) 1:225 (A4)

D	MAY. 2023
C	APR. 2023
B	OCT. 2022
A	JULY. 2022

Do not scale drawing.
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RLEE



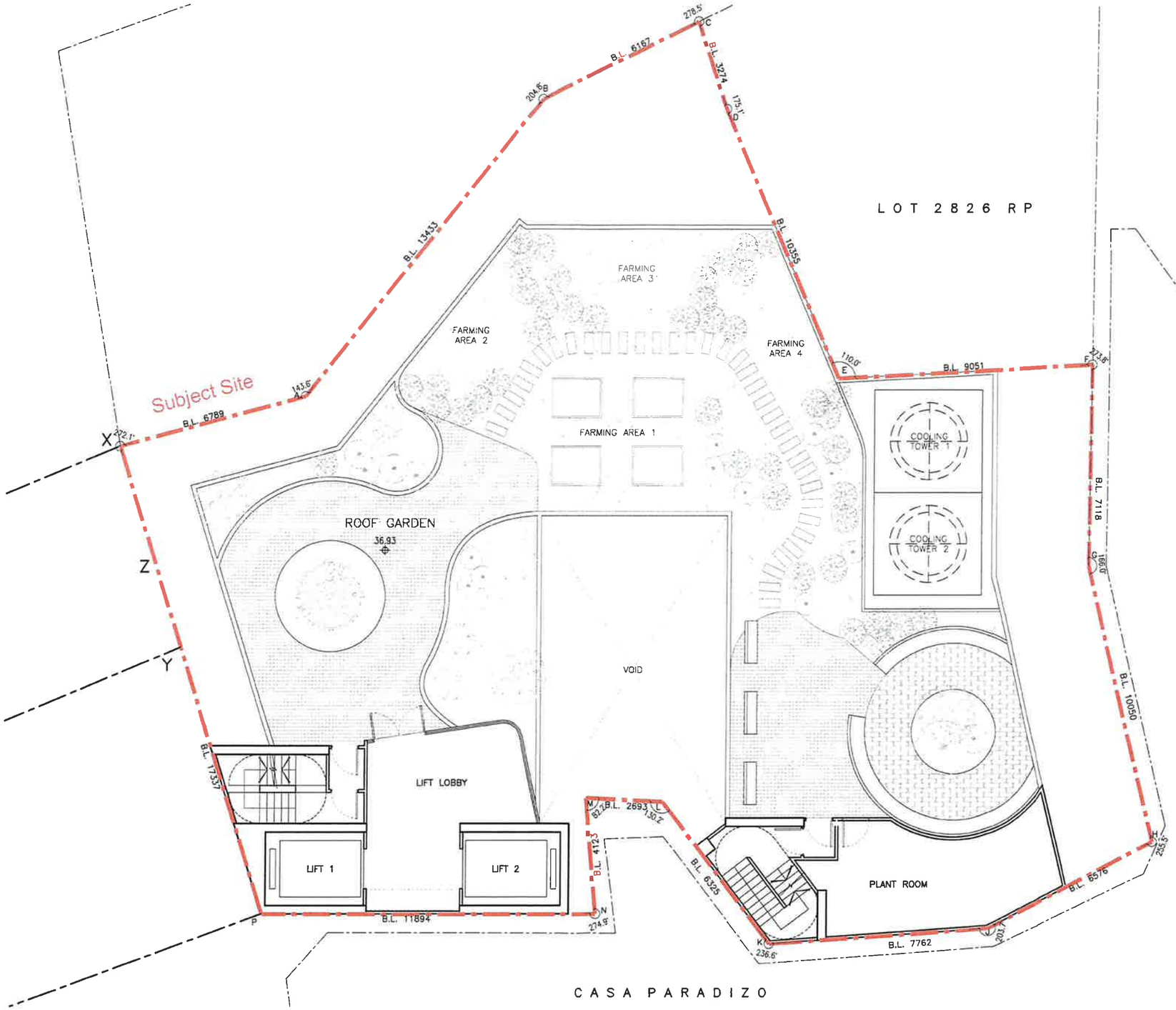
N

1 / G-08 8/F PLAN

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.	8/F PLAN ADMIN OFFICE & STAFF QUARTER	G-08	1:150 (A3)	B OCT. 2022 A JULY. 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

RLEE



N

1 G-09 ROOF GARDEN PLAN

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.

ROOF GARDEN PLAN

G-09 1:150 (A3)

B	OCT. 2022
A	JULY. 2022

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RLEE

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)

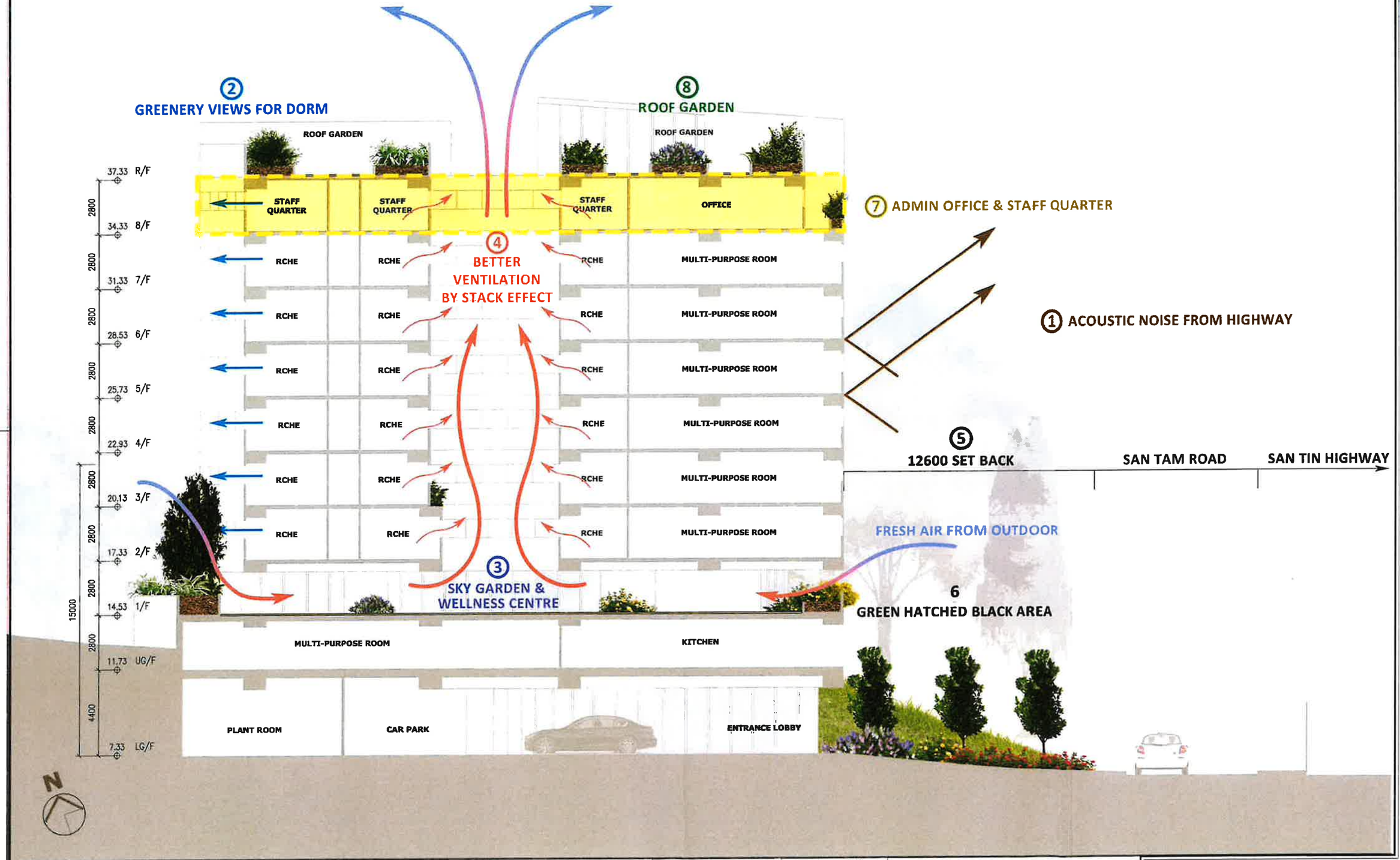
AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,
SAN TIN, N.T.

FIGURE 4A & 4B

DESIGN CONCEPT (1) & (2)

RLEE

RLEE Architects (HK) Ltd



2202

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

CONCEPT DIAGRAM (1)

FIGURE 4a

-

MAY,2022

Do not scale drawing.
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ACCESS ROAD TO CRESCENDO

LOT 2826 RP

① ACOUSTIC NOISE FROM HIGHWAY

② GREENERY VIEWS FOR DORM

③ 12600 SET BACK

④ BETTER VENTILATION FOR INDOOR

⑤ Multi-Purpose Room

⑥ GREEN HATCHED BLACK AREA

CASA PARADIZO

SAN TIN HIGHWAY

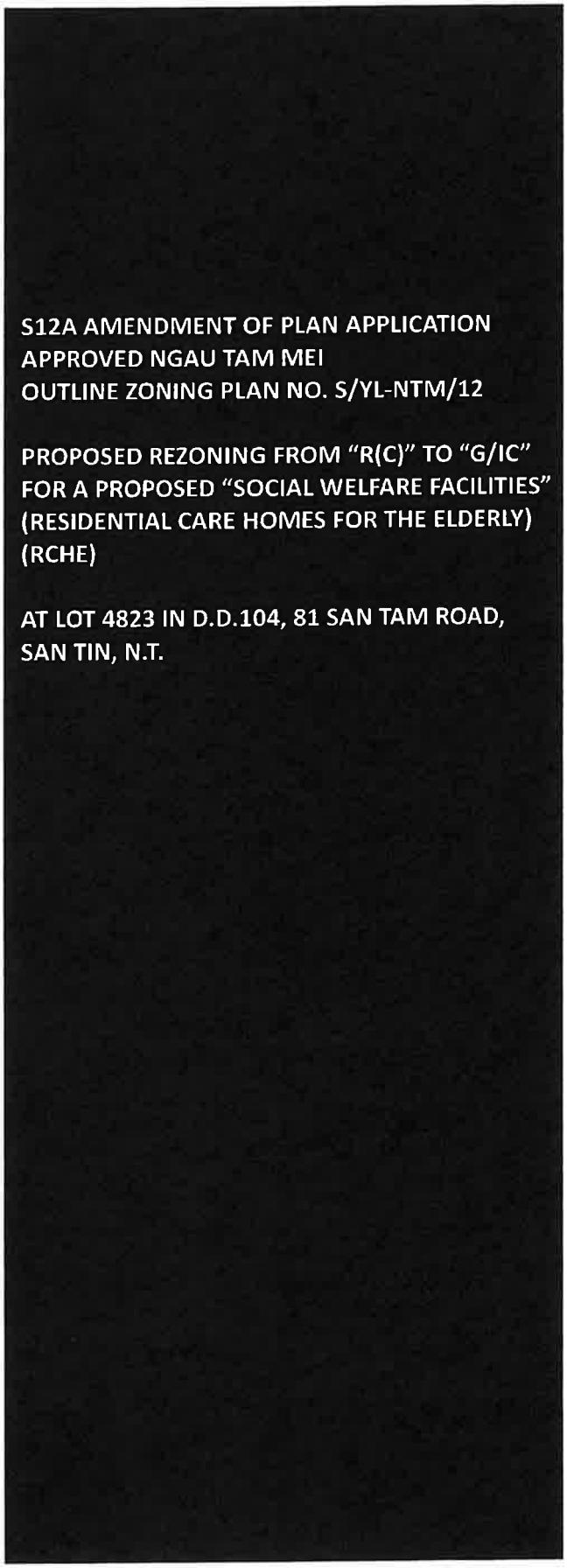
SAN TAM ROAD

N

2202 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.	CONCEPT DIAGRAM (2)	FIGURE 4b	-	MAY.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.

FIGURE 4C

PERSPECTIVE VIEW THROUGH SKY GARDEN

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

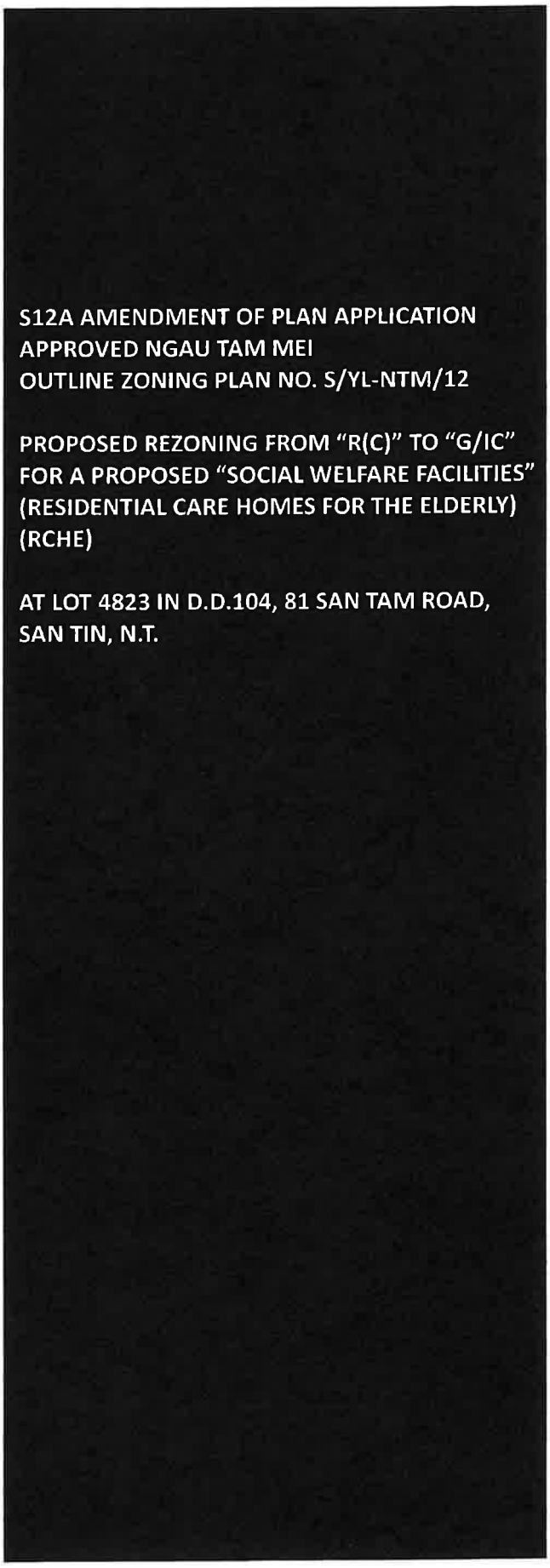
PERSPECTIVE VIEW THROUGH SKYGARDEN

Figure 4C NTS (A3)

A	JUL. 2022
-	MAY. 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)

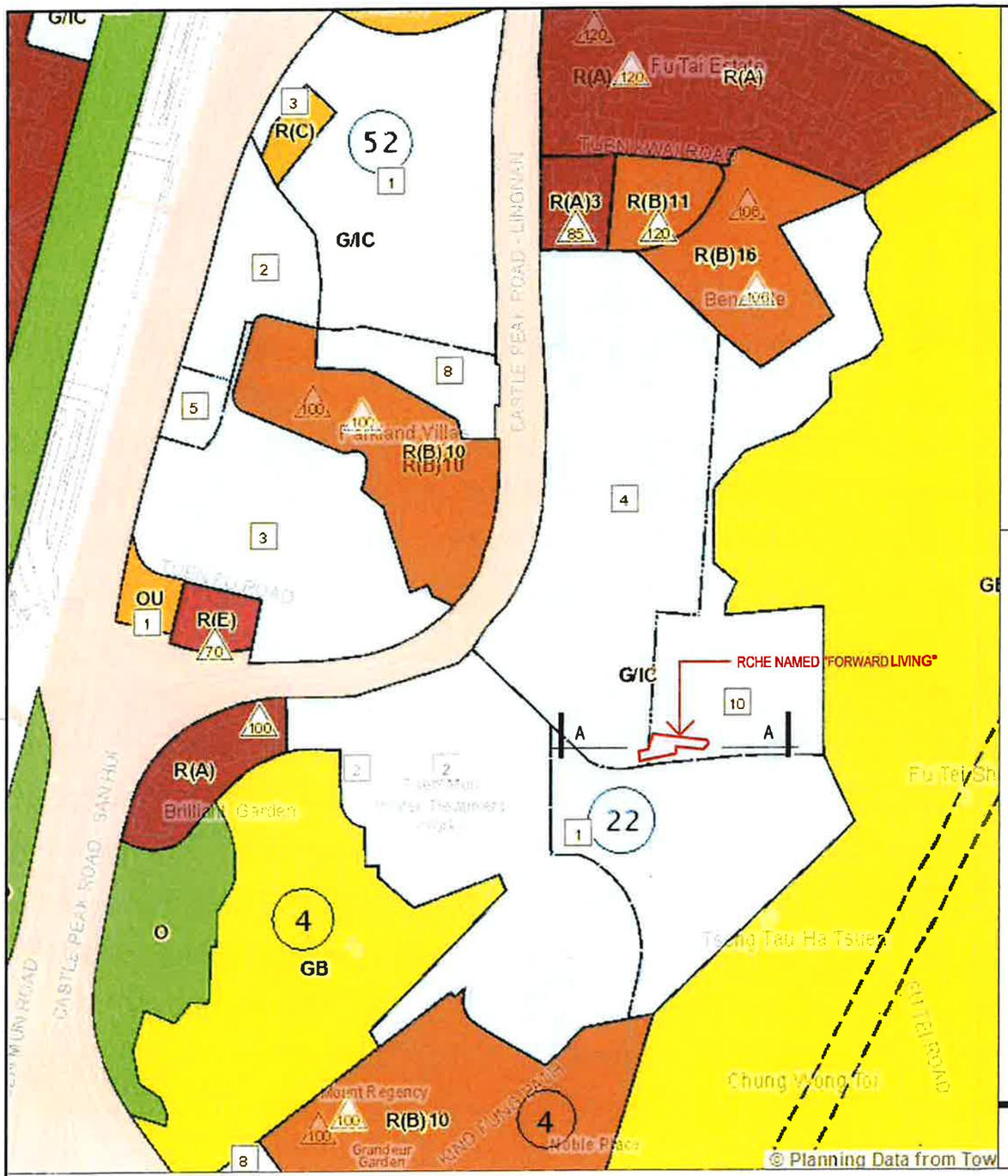
AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD, SAN TIN, N.T.

FIGURE 5

COMPARISON OF DESIGN TO A NEWLY COMPLETED RCHE "FORWARD LIVING" AT NO.9, FU TEI ROAD, TUEN MUN

RLEE

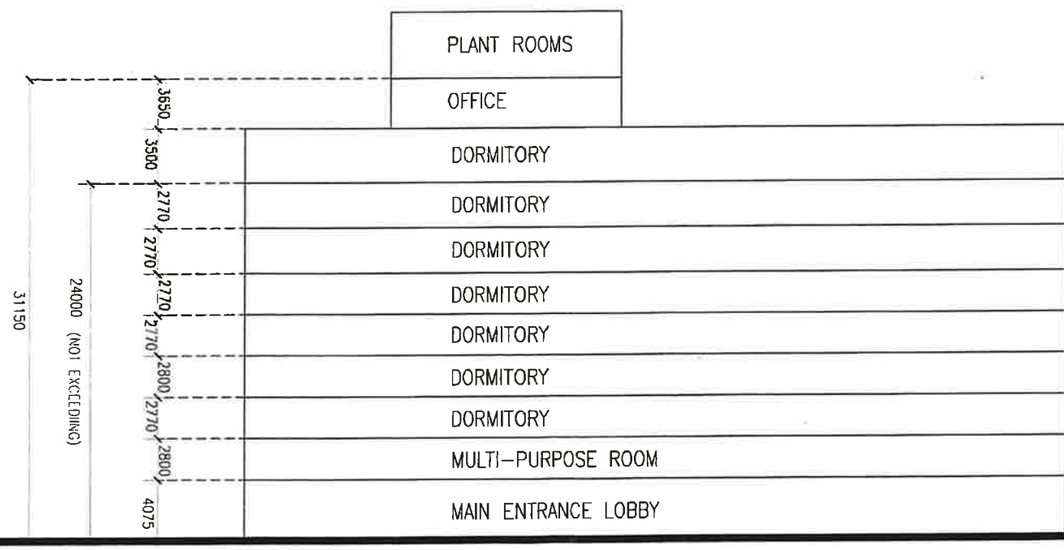
RLEE Architects (HK) Ltd



1/6 OZP no. S/TM/35
SCALE : N.T.S.

DETAIL INFORMATION OF "FORWARD LIVING"

ADDRESS: NO. 9, FU TEI ROAD, TUEN MUN	
SITE AREA	1,122 S.M.
PERMITTED G.F.A.	5,400 S.M.
BUILDING HEIGHT	31.15m UP TO TOP OF ADMIN OFFICE
PLOT RATIO	4.81
NO. OF STOREY	10



2/6 SECTION A-A
SCALE : 1:500

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

COMPARISON OF DESIGN TO A NEWLY COMPLETED RCHE "FORWARD LIVING" AT NO. 9, FU TEI ROAD, TUEN MUN

FIGURE 5 (A3)

JULY. 2022

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RLEE

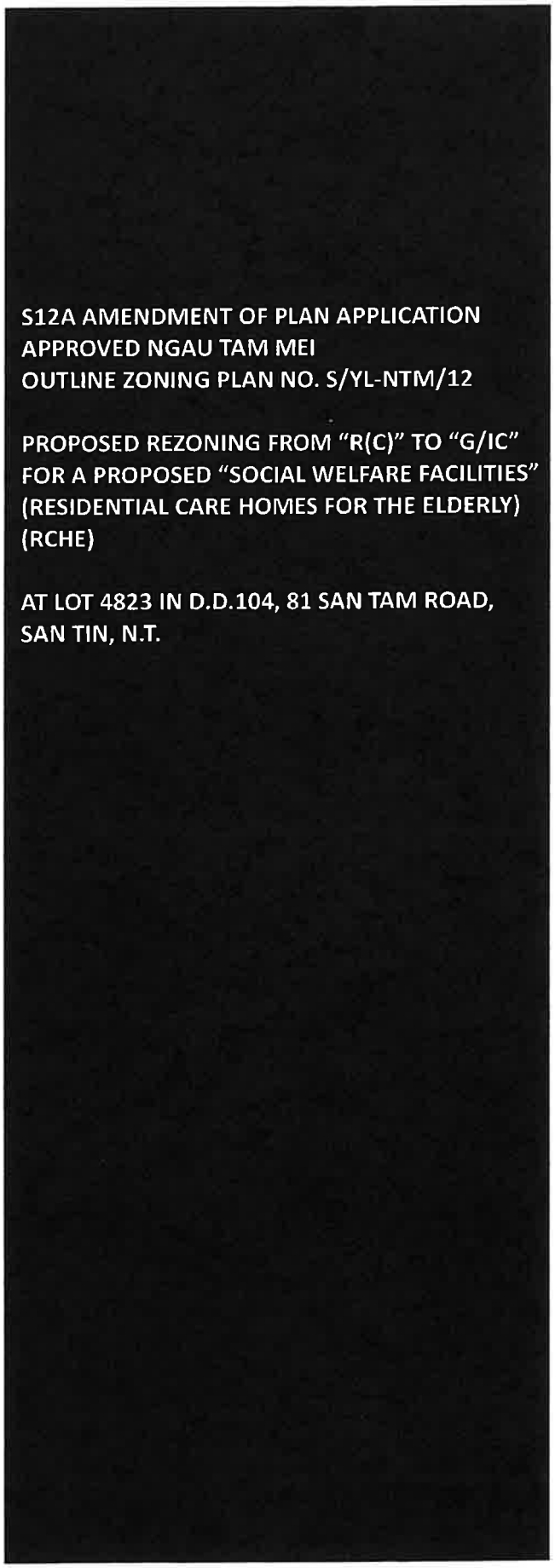


FIGURE 6

THE OUTLINE ZONING PLAN NO. S/YL – NTM/12

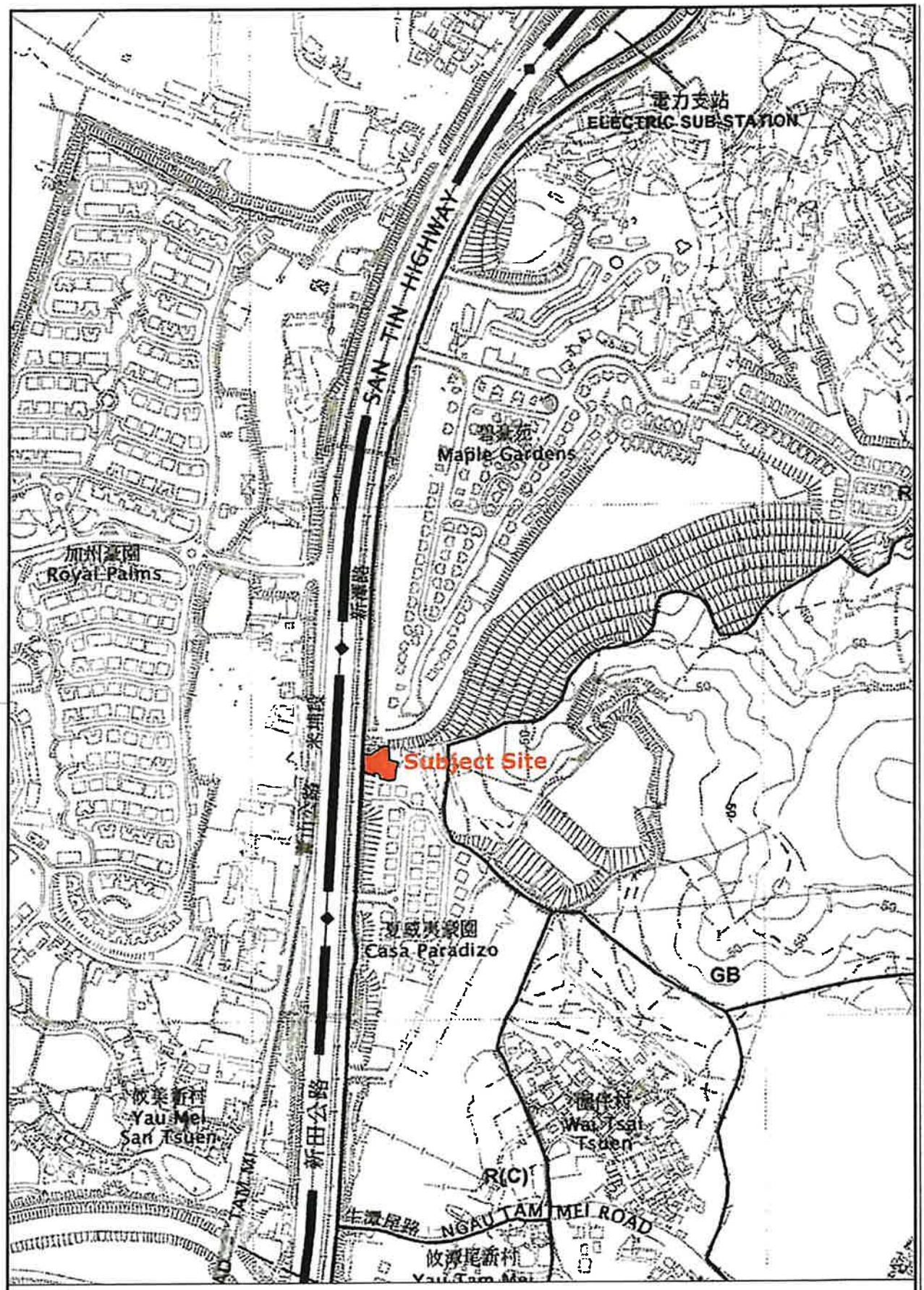


FIGURE NO.	TITLE	SCALE	
6	**OUTLINE ZONING PLAN NO. S/YL-NTM/12**	1:5000	
		DATE	JUL 2022

RLEP

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.

FIGURE 6A

THE PORPOSED REZONING

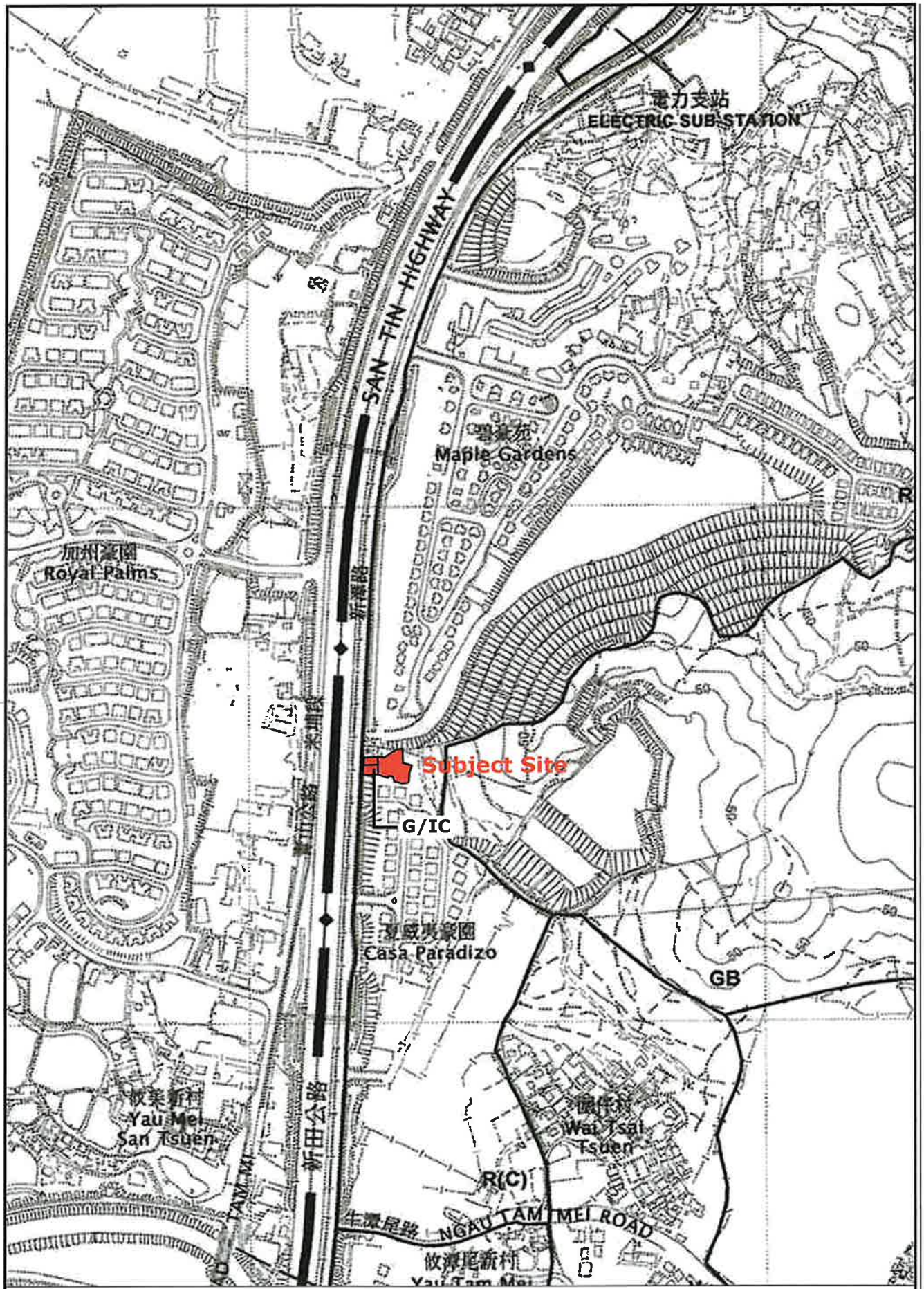


FIGURE NO.	TITLE	SCALE	
6A	THE PROPOSED REZONING	1:5000	
		DATE	JUL 2022

RLEE

GOVERNMENT, INSTITUTION OR COMMUNITY

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Ambulance Depot	Animal Boarding Establishment
Animal Quarantine Centre (in Government building only)	Animal Quarantine Centre (not elsewhere specified)
Broadcasting, Television and/or Film Studio	Columbarium
Eating Place (Canteen, Cooked Food Centre only)	Correctional Institution
Educational Institution	Crematorium
Exhibition or Convention Hall	Driving School
Field Study/Education/Visitor Centre	Eating Place (not elsewhere specified)
Government Refuse Collection Point	Firing Range
Government Use (not elsewhere specified)	Flat
Hospital	Funeral Facility
Institutional Use (not elsewhere specified)	Helicopter Fuelling Station
Library	Helicopter Landing Pad
Market	Holiday Camp
Place of Recreation, Sports or Culture	Hotel
Public Clinic	House (other than rebuilding of New Territories Exempted House or replacement of existing domestic building by New Territories Exempted House permitted under the covering Notes)
Public Convenience	Off-course Betting Centre
Public Transport Terminus or Station	Office
Public Utility Installation	Petrol Filling Station
Public Vehicle Park (excluding container vehicle)	Place of Entertainment
Recyclable Collection Centre	Private Club
Religious Institution	Radar, Telecommunications Electronic Microwave Repeater, Television and/or Radio Transmitter Installation
Research, Design and Development Centre	Refuse Disposal Installation (Refuse Transfer Station only)
Rural Committee/Village Office	Residential Institution
School	Sewage Treatment/Screening Plant
Service Reservoir	Shop and Services
Social Welfare Facility	Utility Installation for Private Project
Training Centre	Zoo
Wholesale Trade	

Planning Intention

This zone is intended primarily for the provision of Government, institution or community facilities serving the needs of the local residents and/or a wider district, region or the territory. It is also intended to provide land for uses directly related to or in support of the work of the Government, organizations providing social services to meet community needs, and other institutional establishments.

FIGURE NO.	TITLE	SCALE	
6A	EXTRACTED NOTE OF G/IC ZONE ATTACHED TO OZP	N.T.S.	RLEE
		DATE	JUL 2022

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.

FIGURE 7

NEARBY PLANNING APPLICATION CASES

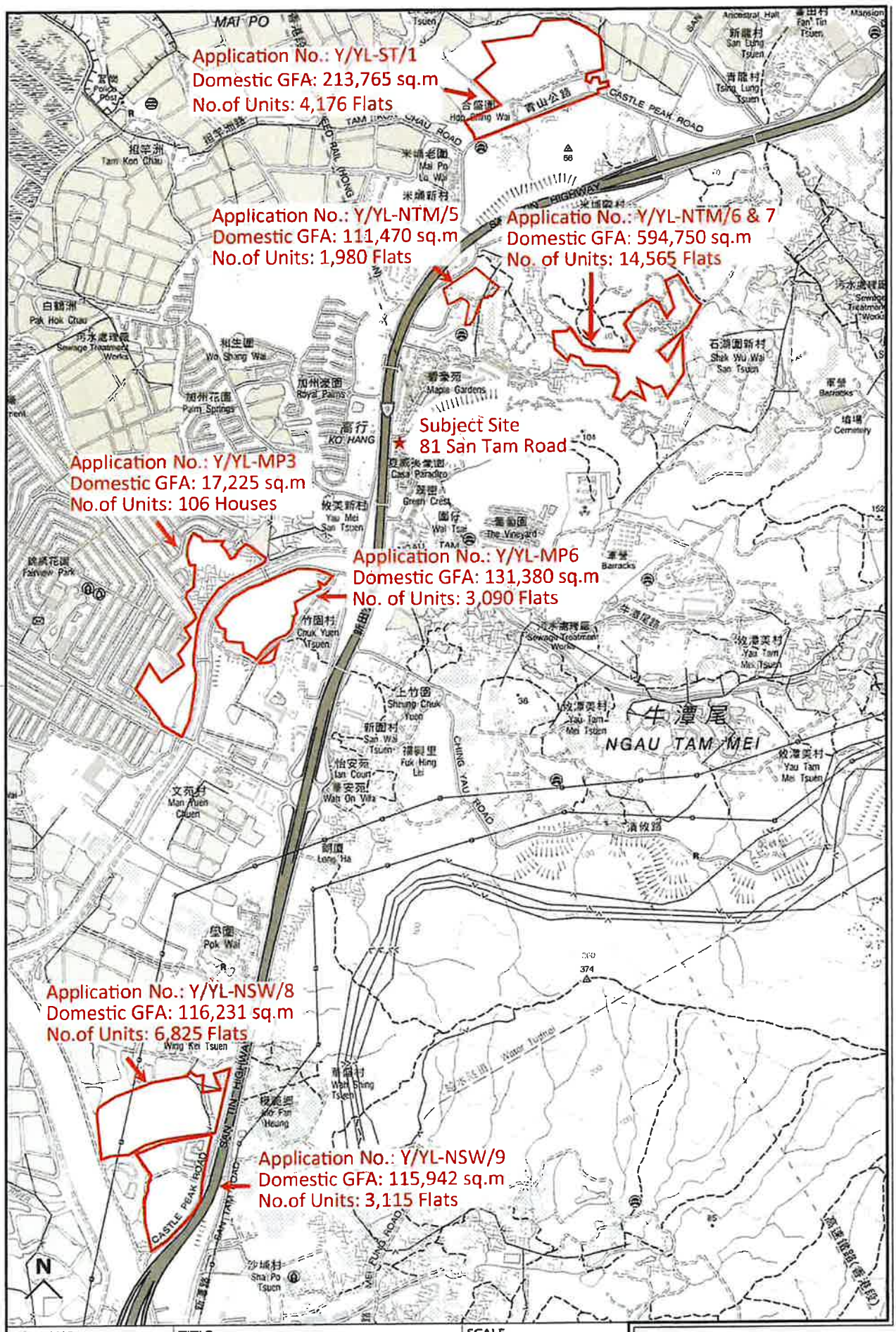
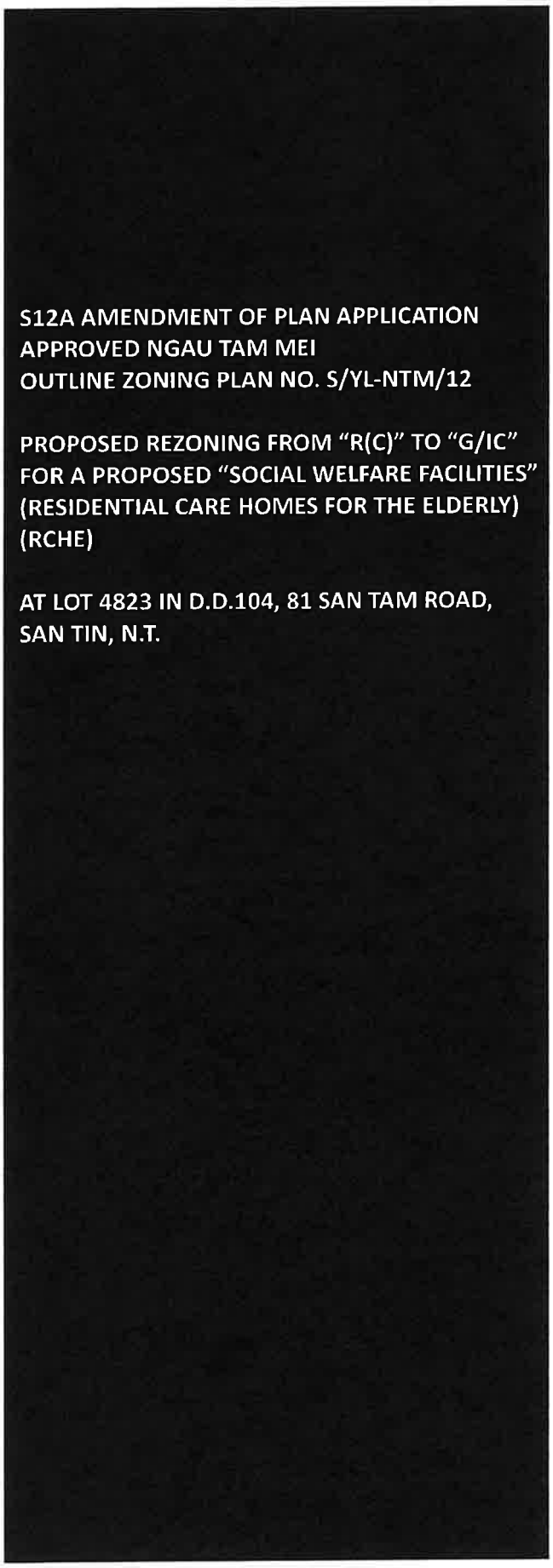


FIGURE NO.	TITLE	SCALE	
7	NEARBY PLANNING APPLICATION CASES	DATE	JUL 2022

RLE



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.

FIGURE 8

SIMILAR APPROVED & PROCEEDING
S12A PLANNING APPLICATIONS

RLEE

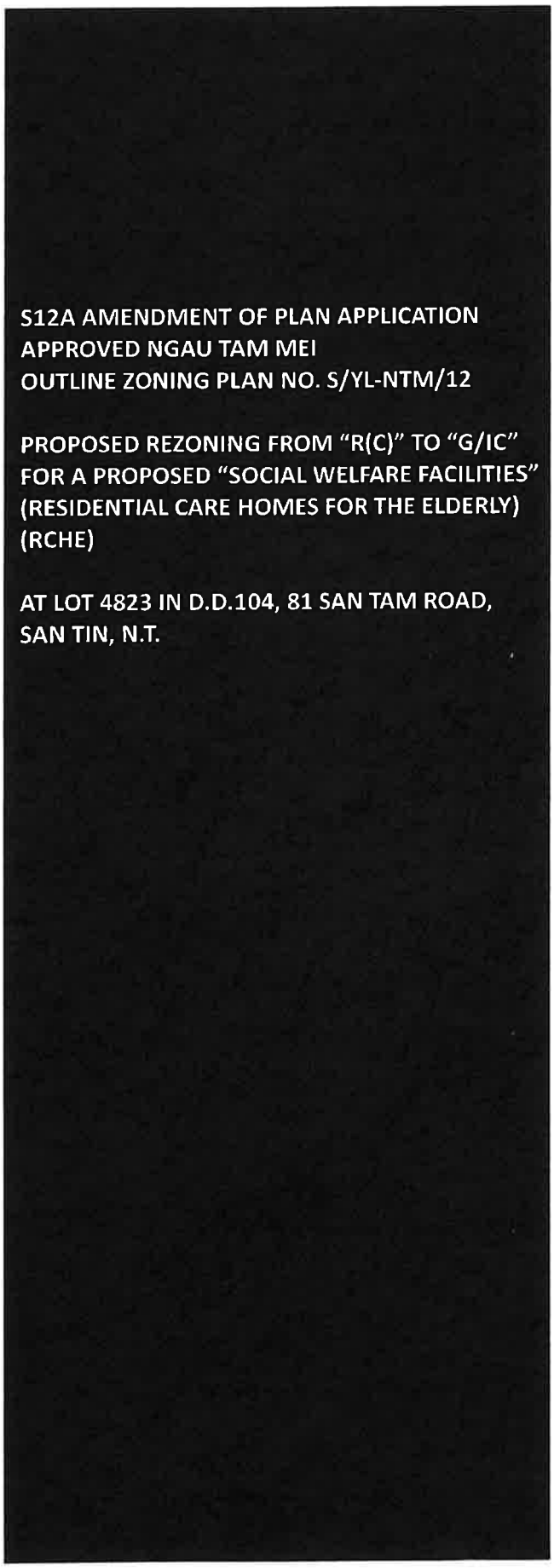
RLEE Architects (HK) Ltd

Summary of S12A Planning Application of RCHE

Existing Zoning	Amended Zoning	Location	Application No.	Status
OU (B)	GIC	No. 8-12 Hi Yip Street, Yuen Long, New Territories (Yuen Long Town Lot No. 361)	Y/YL/6	Approved 20/04/2012
REC	GIC	Lot No. 953 RP (Part) in D.D. 92 and adjoining Government Land, Kam Hang Road, Kwu Tung South, New Territories	Y/NE-KTS/16	In Progress

FIGURE NO.	TITLE	SCALE
8	SIMILAR APPROVED & PROCEEDING S12A PLANNING APPLICATIONS	-
		DATE JUL 2022

RLEE



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.

FIGURE 9

SIMILAR APPROVED S16 PLANNING APPLICATIONS

Summary of S16 Planning Application of RCHE

Existing Zoning	Amended Zoning	Location	Application No.	Status
GIC	N/A	Lots 1695 S.E ss.1 RP, 1695 S.F ss.1 and 1695 S.H RP (Part) in D.D. 120, Tai Kei Leng, Yuen Long, New Territories	A/YL/256	Approved 20/03/2020
V / R(C)	N/A	Lot 1689 S.A and Adjoining Government Land in D.D. 109, Yuen Long	A/YL-KTS/838-6	Approved 07/03/2022
V	N/A	Lots 1695 S.D RP, 1741 RP(Part) and 1394 S.B RP (Part) in D.D. 120 and adjoining Government Land, Tai Kei Leng, Yuen Long, New Territories	A/YL/263	Approved 05/02/2021
V	N/A	Lots 834 and 838 RP in D.D. 52 and adjoining Government Land, Tin Ping Road, Sheung Shui, New Territories	A/FSS/279	Approved 29/10/2021
V	N/A	Various Lots in D.D. 51, Fanling, New Territories	A/FSS/276	Approved 06/11/2020
RE1	N/A	1 Hong Ting Road, Sai Kung, New Territories	A/SK-SKT/29	Approved 26/11/2021
RE1	N/A	2 Hong Ting Road, Sai Kung, New Territories	A/SK-SKT/30	Approved 26/11/2021
RE1	N/A	6 Hong Ting Road, Sai Kung, New Territories	A/SK-SKT/31	Approved 26/11/2021
RE1	N/A	7 Hong Ting Road, Sai Kung, New Territories	A/SK-SKT/32	Approved 26/11/2021
RE1	N/A	7 (Part) and 9 Hong Ting Road, Sai Kung, New Territories	A/SK-SKT/33	Approved 26/11/2021

FIGURE NO.	TITLE	SCALE	
9	SIMILAR APPROVED & PROCEEDING S16 PLANNING APPLICATIONS	DATE	JUL 2022

RLEE

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"
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(RCHE)

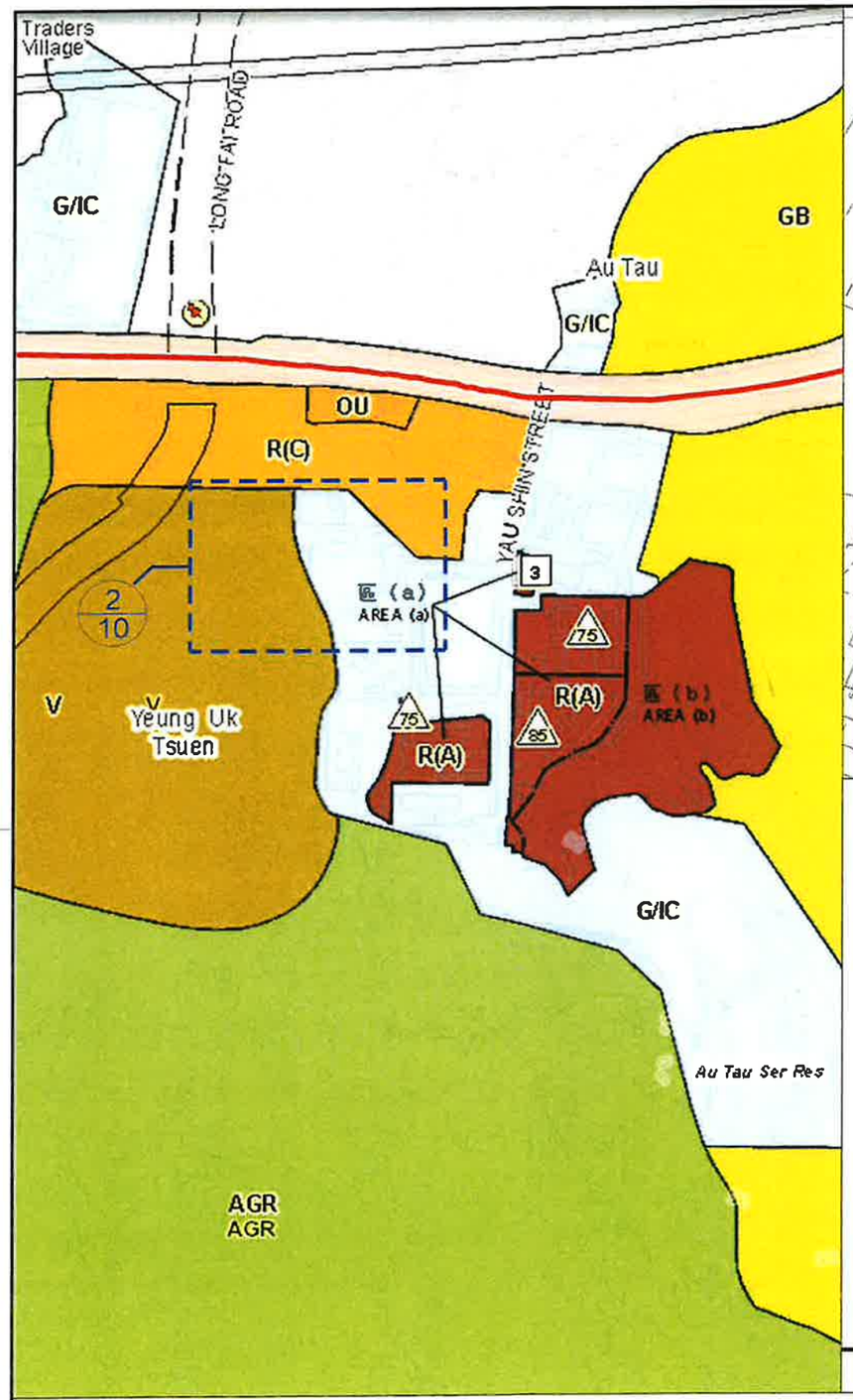
AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,
SAN TIN, N.T.

FIGURE 10A – 10D

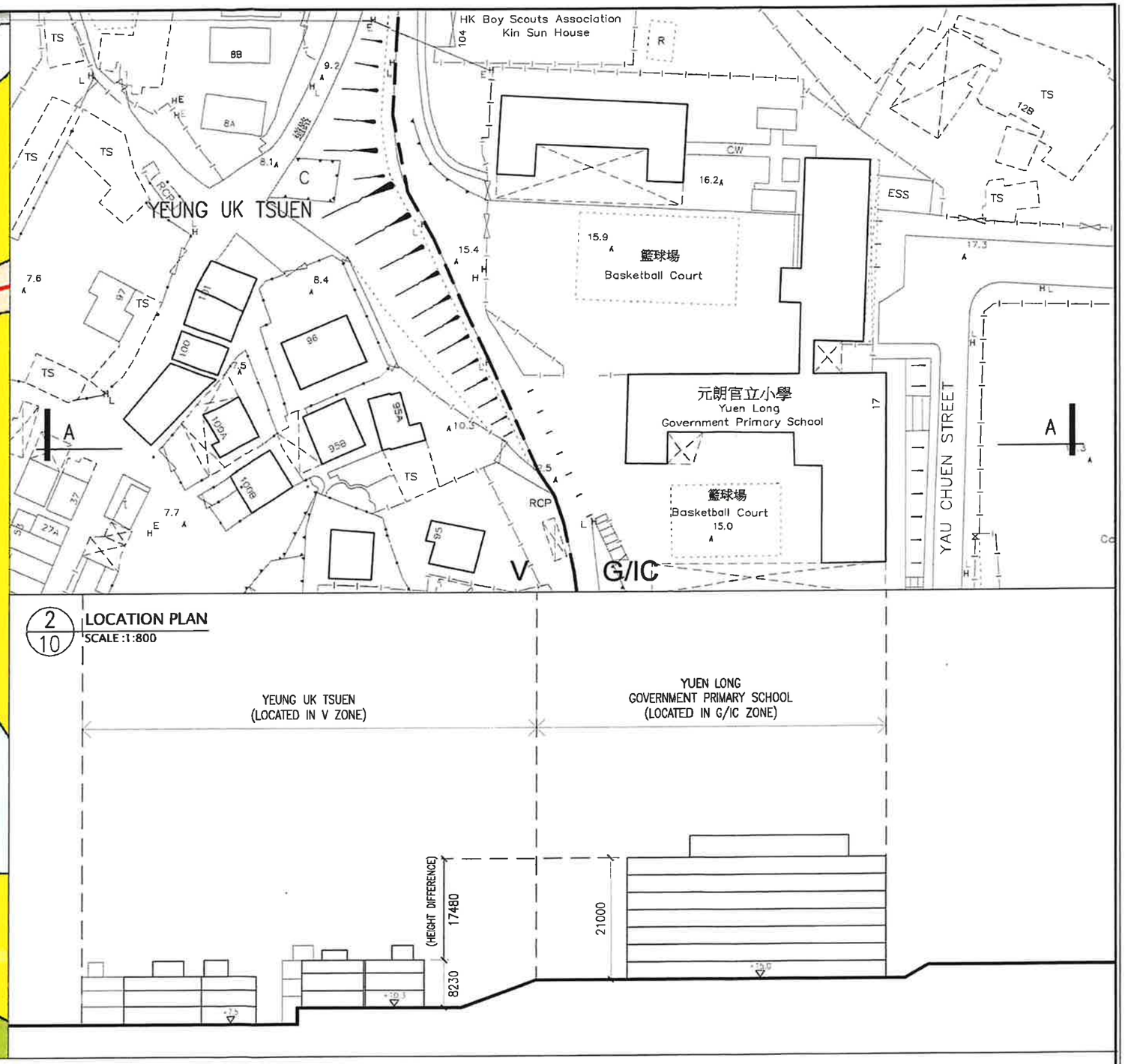
COMPARISON OF BUILDING HEIGHT FOR
RCHE / "G/IC" DEVELOPMENT ADJOINING
LOW-DENSITY DEVELOPMENT

RLEE

RLEE Architects (HK) Ltd



1/10A OZP no. S/YL-TT/18
SCALE :N.T.S.



2/10 LOCATION PLAN
SCALE :1:800

3/10A SECTION A-A
SCALE :1:800

10m 20m 30m 60m

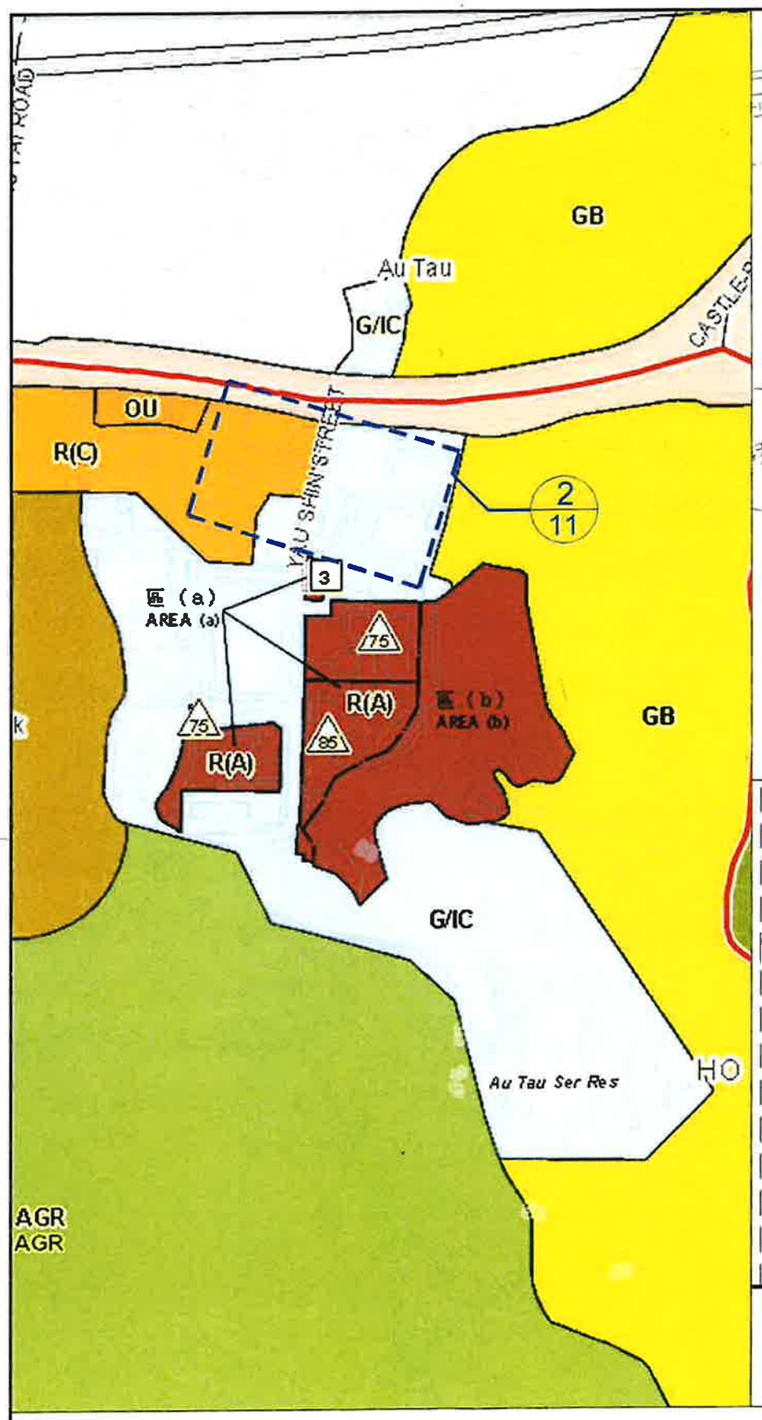
2202
PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY
at 81 SAN TAM ROAD,
YUEN LONG, N.T.

COMPARISON OF BUILDING HEIGHT FOR RCHE/"G/IC" DEVELOPMENT ADJOINING LOW DENSITY DEVELOPMENTS

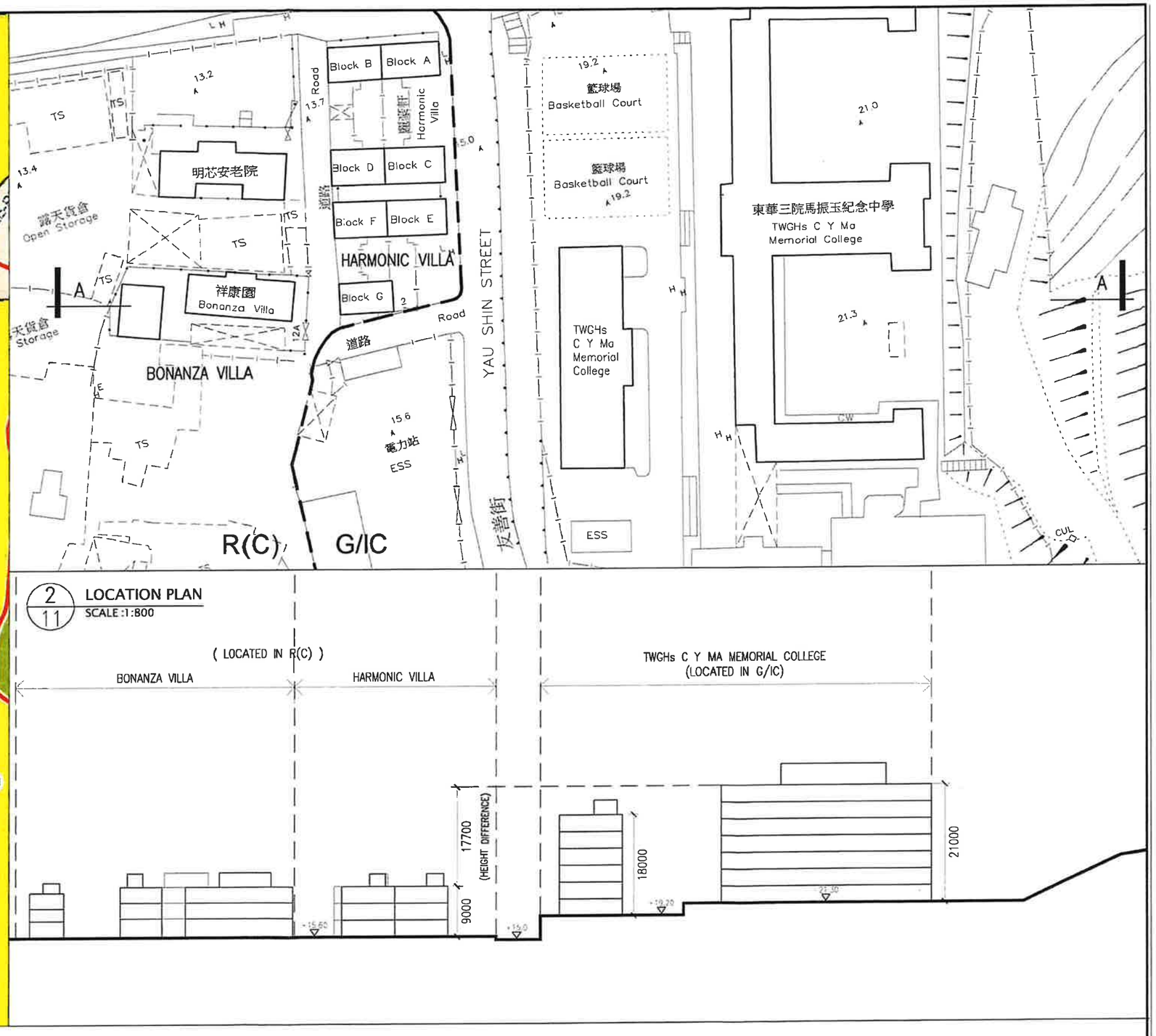
Figure 10A - (A3) - JULY. 2022

Do not scale drawing.
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1 / 10B OZP no. S/YL-TT/18
SCALE :N.T.S.



2 / 11 LOCATION PLAN
SCALE :1:800

3 / 10B SECTION A-A
SCALE :1:800

10m 20m 30m 60m

2202

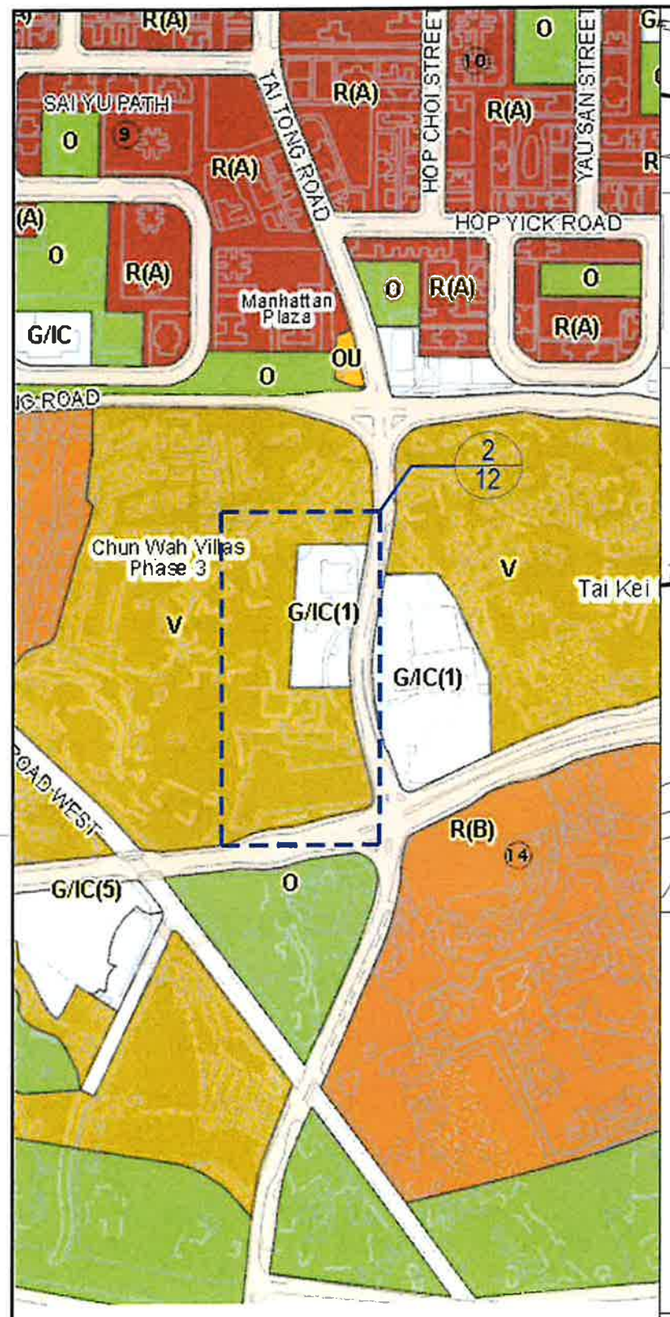
PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY
at 81 SAN TAM ROAD,
YUEN LONG, N.T.

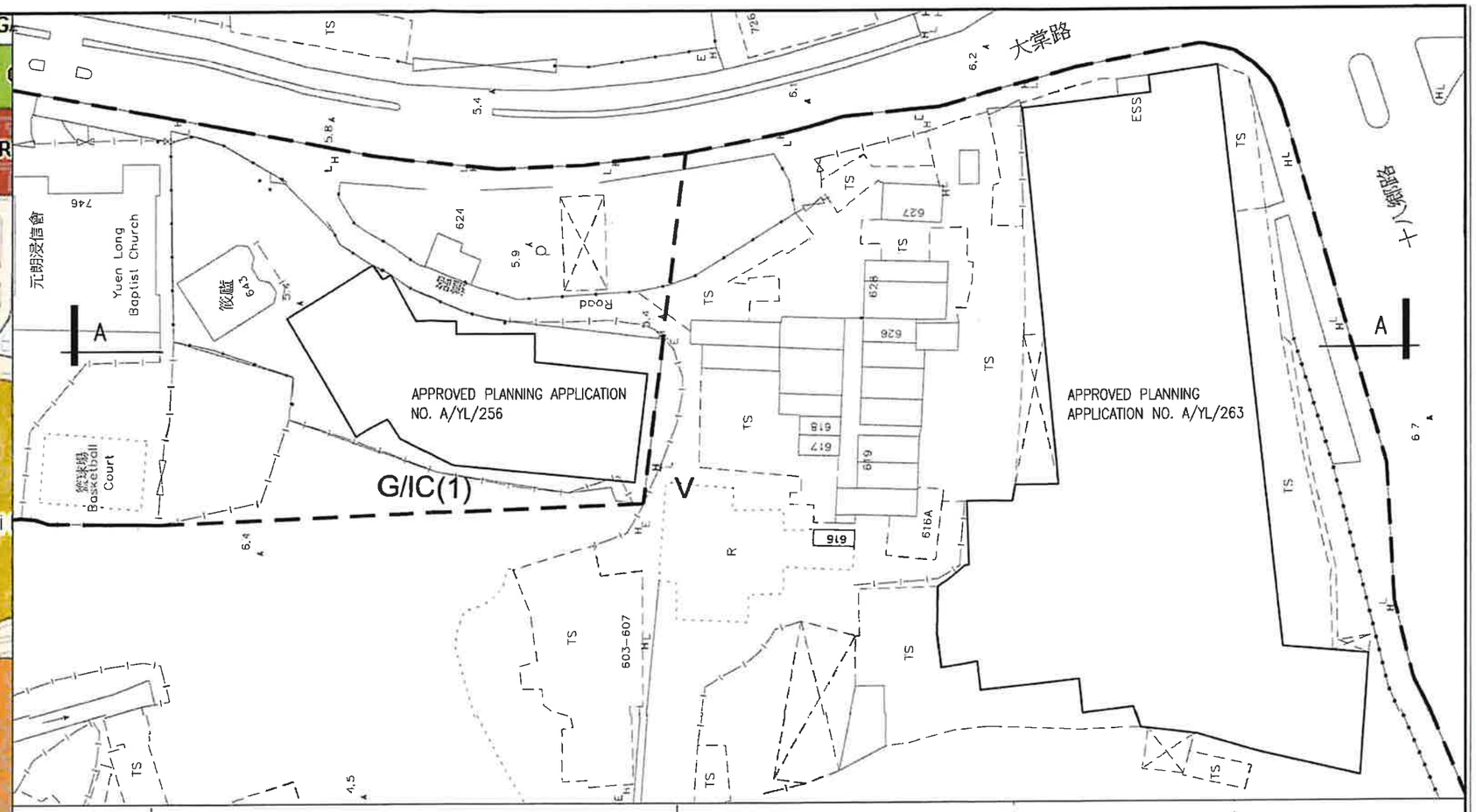
COMPARISON OF BUILDING HEIGHT FOR RCHE/"G/IC" DEVELOPMENT ADJOINING LOW DENSITY DEVELOPMENTS

Figure 10B – (A3) | - | JULY. 2022

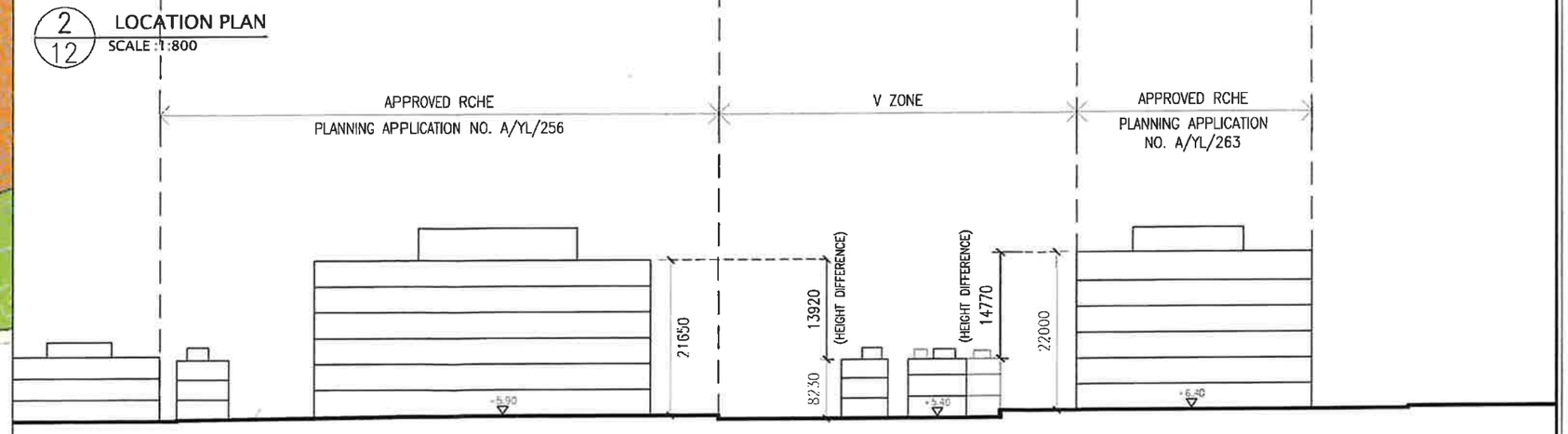
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2/12 LOCATION PLAN
SCALE :1:800



1/10C OZP no. S/YL/25
SCALE :N.T.S.

3/10C SECTION A-A
SCALE :1:800

10m 20m 30m 60m

2202

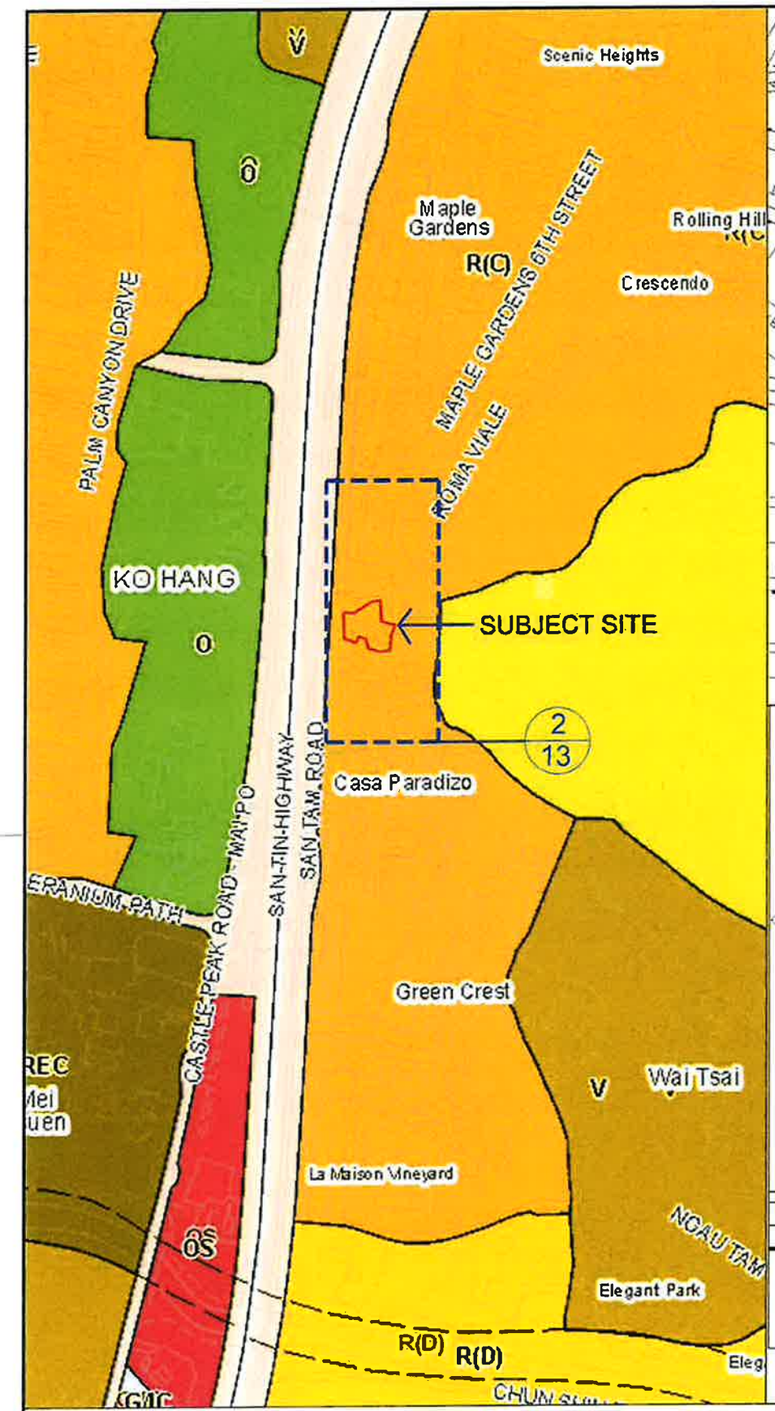
PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY
at 81 SAN TAM ROAD,
YUEN LONG, N.T.

COMPARISON OF BUILDING HEIGHT FOR RCHE/"G/IC" DEVELOPMENT ADJOINING LOW DENSITY DEVELOPMENTS

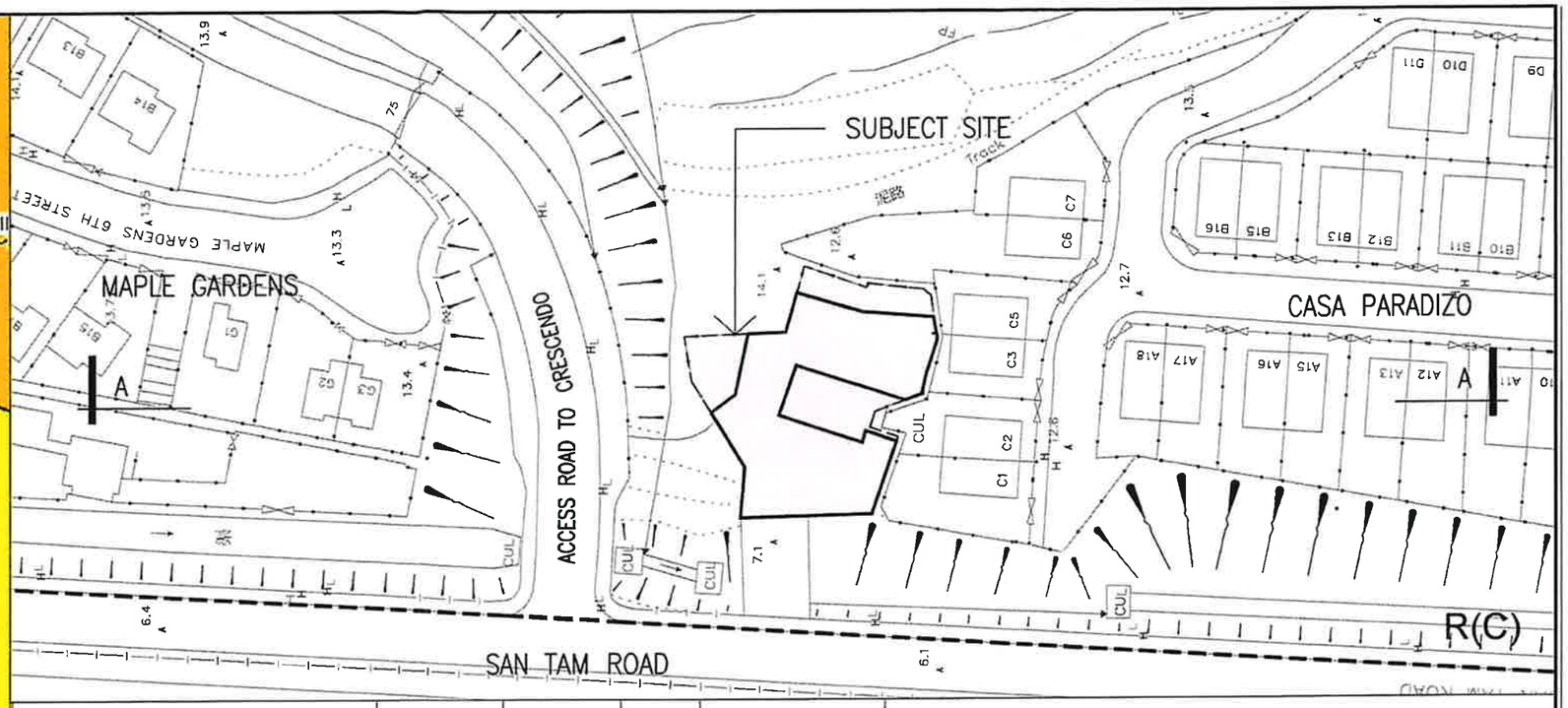
Figure 10C – (A3) – JULY. 2022

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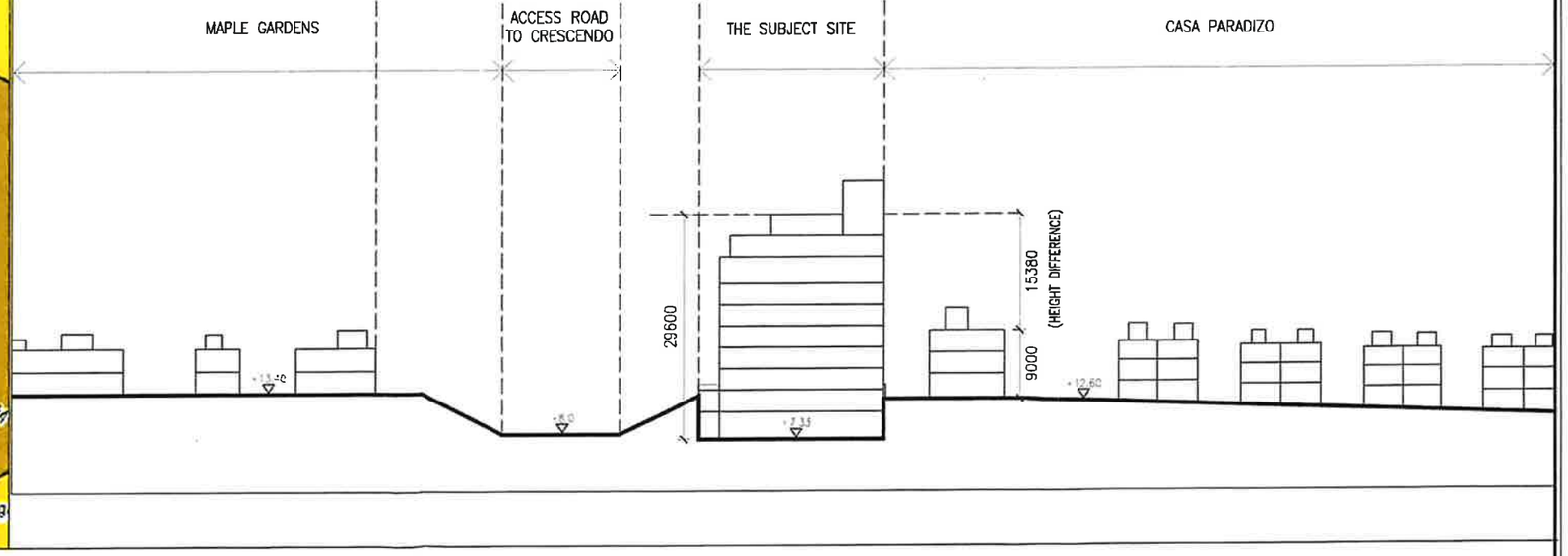
RLEE



1/10D OZP of S/YL-NTM/12
SCALE :N.T.S.



2/13 LOCATION PLAN
SCALE :1:800



3/10D SECTION A-A
SCALE :1:800

10m 20m 30m 60m

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

COMPARISON OF BUILDING HEIGHT FOR RCHE/"G/IC" DEVELOPMENT ADJOINING LOW DENSITY DEVELOPMENTS

Figure 10D – (A3) - JULY. 2022

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RLEE

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.

FIGURE 11

INITIAL LAND USE FOR SAN TIN & LOK MA CHAU
DEVELOPMENT

土地用途預算 LAND USE BUDGET		面積 (公頃) (約) AREA (HA (ABOUT))	%
混合用途 MIXED USE	地積比率 7 PR 7	10	3%
住宅 RESIDENTIAL	地積比率 3.6 - 7 PR 3.6 - 7	33	10%
經濟及就業用途 ECONOMIC & EMPLOYMENT USES	企業及科技園 – 地積比率 5 ENTERPRISE AND TECHNOLOGY PARK - PR 5	57	18%
	零售、餐飲及娛樂設施 – 地積比率 4 RETAIL, DINING AND ENTERTAINMENT - PR 4	5	2%
	物流、貯物及工場用途 – 地積比率 5 LOGISTICS, STORAGE AND WORKSHOP - PR 5	8	2%
政府、機構或社區設施 GOVERNMENT, INSTITUTION OR COMMUNITY		37	11%
休憩用地 OPEN SPACE		56	18%
道路 (包括美化市容地帶/可能的道路預留土地) ROAD (Incl. Amenity / Possible Road Reserve)		67	21%
總發展面積 TOTAL DEVELOPMENT AREA		273	85%
以下地帶反映現有用途 THE LAND USES BELOW ARE REFLECTING EXISTING USE			
鄉村式發展 VILLAGE TYPE DEVELOPMENT		6	2%
農業 AGRICULTURE		7	2%
綠化地帶 GREEN BELT		34	11%
共計 TOTAL		320	100%

深圳福田
Futian, Shenzhen

落馬洲河套地區
Lok Ma Chau Loop

落馬洲站
Lok Ma Chau Station

落馬洲村
Lok Ma Chau Tsuen

有待研究
Subject to study

往落馬洲站
To LMC Station

往落馬洲河套地區
To LMC Loop

蓮屋村
Poon Uk Tsuen

洲頭村
Chau Tau

古洞北新發展區
Kwu Tung North
New Development Area

擬議古洞站
Proposed Kwu Tung Station

往擬議古洞站
To Proposed Kwu Tung Station

現有洲頭通風大樓
Existing Chau Tau Ventilation Building

麒麟山
Hadden Hill
(Ki Lun Shan)

東涌圍
Tung Chan Wai

仁壽圍
Yan Sau Wai

安窰村
On Loong Tsuen

永平村
Wing Ping Tsuen

新圍村
San Loong Tsuen

蕃田村
Fan Tin Tsuen

青龍村
Tsing Lung Tsuen

合益圍
Hop Shing Wai

已規劃新田靈灰安置所
Planned San Tin Columbarium

米埔新村
Mai Po San Tsuen

米埔
Mai Po

加州花園
Palm Springs

★ Subject Site

新田軍營
San Tin Barracks

譚尾軍營
Tam Mei Barracks

林村郊野公園
To Lam Tsuen Country Park

牛潭山
Ngau Tam Shan

0 250 500 750 1,000 Meters 米

圖例 LEGEND

- 新田/落馬洲發展框架 San Tin / Lok Ma Chau Development Node
- 擬議北環線的指示走線 Indicative Alignment of the Proposed Northern Link
- 擬議新田站 Proposed San Tin Station
- 擬議古洞站 Proposed Kwu Tung Station
- 東鐵線(落馬洲支線) East Rail Line (Lok Ma Chau Spur Line)
- 現有的落馬洲站 Existing Lok Ma Chau Station
- 擬議標誌性綠化天橋 Proposed Iconic Green Bridge
- 普通科診所 General Clinic
- 消防局暨救護站 Fire Station cum Ambulance Depot
- 小學 Primary School
- 中學 Secondary School
- 圖書館 Library
- 體育中心 Sports Centre
- 公共運輸交匯處 Public Transport Interchange
- 單車停泊處 Cycle Parking Areas
- RL 蓄洪湖 Retention Lake

水體 WATER RESOURCES

- 河溪/明渠改善工程 Potential Watercourses/Nullah Upgrade
- 鄰近新田/落馬洲發展框架的河溪 Watercourses around STLMC DN
- 現時落馬洲邊境管制站土地的概略位置 Broad Location of the Land of Existing Lok Ma Chau Boundary Control Point

土地用途 LAND USE

- R(A) 混合用途 MIXED USE
- R 住宅 RESIDENTIAL
- E&T 企業及科技園 ENTERPRISE AND TECHNOLOGY PARK
- RDE 零售、餐飲及娛樂設施 RETAIL, DINING AND ENTERTAINMENT
- LSW 物流、貯物及工場用途 LOGISTICS, STORAGE AND WORKSHOP
- ECOHUB 環保樞紐 ECOHUB
- VENTILATION BUILDING 通風大樓 VENTILATION BUILDING
- G/IC 政府、機構或社區設施/政府用地(儲備) GOVERNMENT / GOVERNMENT RESERVE
- E 教育 EDUCATION
- O 休憩用地 OPEN SPACE
- A 美化市容地帶 (可能的道路預留土地) AMENITY (POSSIBLE ROAD RESERVE)
- 道路 ROAD

以下地帶反映現有用途 THE LAND USES BELOW ARE REFLECTING EXISTING USE

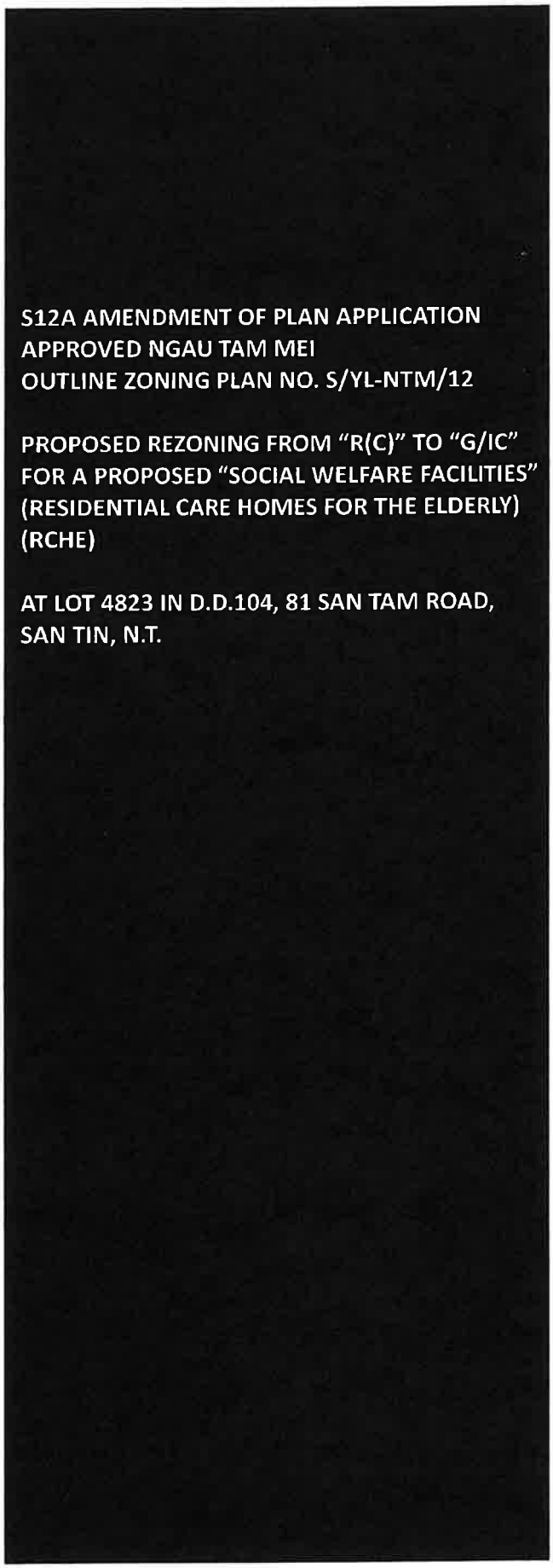
- V 鄉村式發展 VILLAGE TYPE DEVELOPMENT
- AGR 農業 AGRICULTURE
- GB 綠化地帶 GREEN BELT
- * 認可墳場區 PERMITTED BURIAL GROUND

初步土地用途
(未包括落馬洲邊境管制站土地)
INITIAL LAND USE PLAN
(Not yet included the land at Lok Ma Chau Boundary Control Point)

附註：需作進一步研究及修訂
Remarks: Subject to further study and amendments

2202 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.	INITIAL LAND USE FOR SAN TIN & LOK MA CHOU DEVELOPMENT	FIGURE 11	-	A -	JUL 2022 MAY 2022

Do not scale drawing.
Contractors are required to verify exact dimensions on site.
The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate.
The design remains to be the property of "Rl-oo Architects (HK) Ltd" unless otherwise specified.
This drawing is not for construction purposes unless expressedly certified.



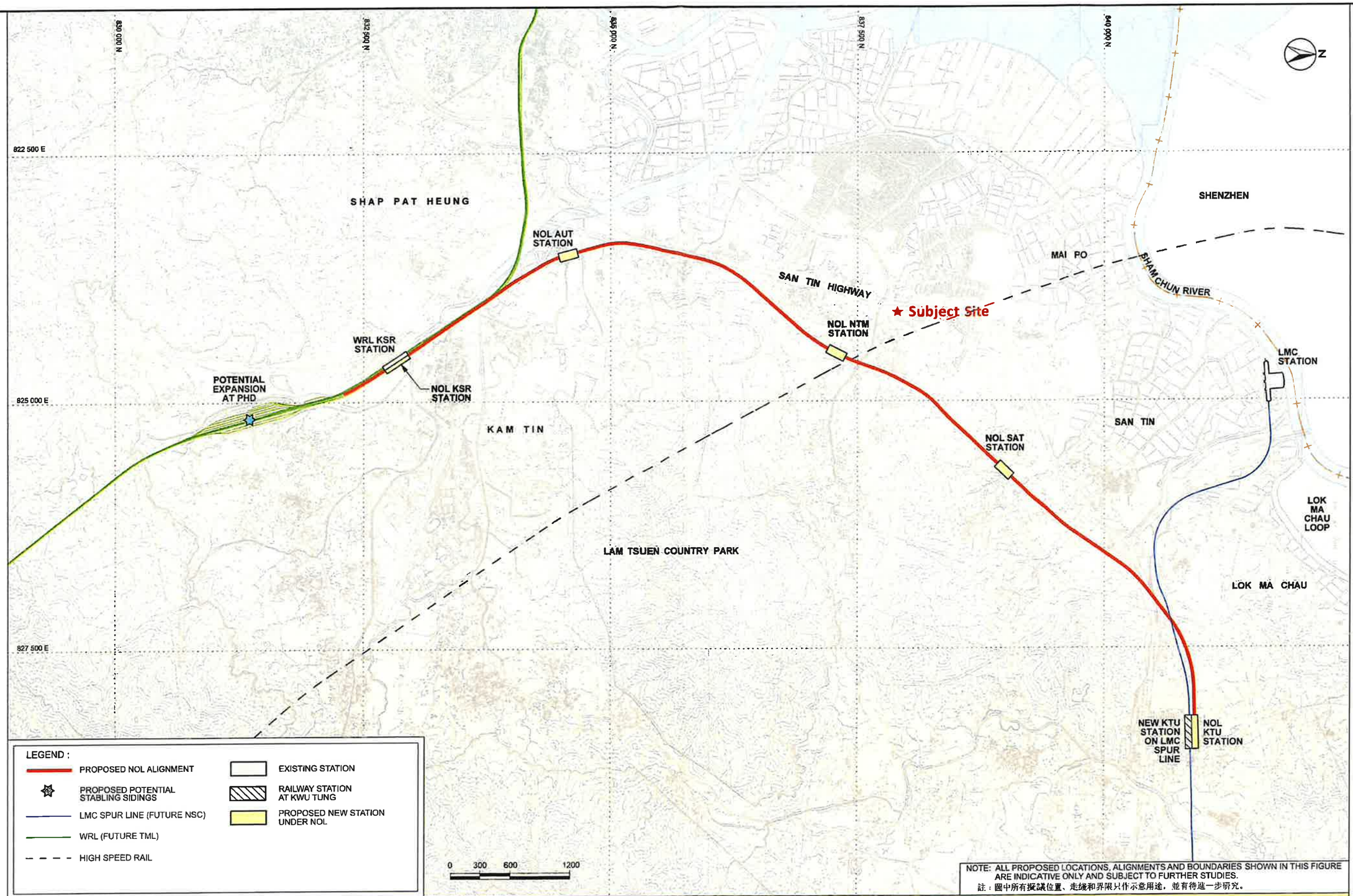
S12A AMENDMENT OF PLAN APPLICATION
APPROVED NGAU TAM MEI
OUTLINE ZONING PLAN NO. S/YL-NTM/12

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.

FIGURE 12

PROPOSED MTR NORTHERN LINK



MTR

NORTHERN LINK
北環綫

Figure 1
圖1

2202 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.	PROPOSED MTR NORTHERN LINK	FIGURE 12	-	MAY.2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "Rlee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

RLEE

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"
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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

VISUAL IMPACT ASSESSMENT

RLEE

RLEE Architects (HK) Ltd

1.0 INTRODUCTION

1.1.1 This Visual Impact Assessment (VIA) is prepared in support of the S12A Planning Application for the proposed amendment to the Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12. The objective is to rezone a site from "R(C)" to "G/IC" for a proposed social welfare facility (Residential Care Home for the Elderly).

1.1.2 Currently, the Application Site is designated as "R(C)" zone on the Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12 "(the OZP"). There is a restriction on Plot Ratio of 0.4, 3 storeys high and a height limit of 9m from Car Park. By rezoning the site into "G/IC", the restriction on Plot Ratio is proposed to waive, while the height of the RCHE is governed by regulation and is proposed to be 29.6 m for the time being.

1.1.3 According to the Point (e) of Para. 2.3 of the Town Planning Board Guidelines (TPB PG) no. 41, a VIA is required to the proposals that "involves, modification of development parameters of a site to deviate from the statutory planning restrictions applicable to the site or the neighbourhood, and the modification will amount to pronounced increase in development scale and intensity and visual changes from key public viewing points". The visual impacts of the Proposed Scheme are evaluated against the existing condition, surrounding building(s) in order to ensure compatibility of the Proposed Scheme.

1.1.4 The VIA evaluates the visual compatibility and degree of anticipated visual impacts of the Proposed Scheme on the Visually Sensitive Receivers relevant to the Application Site. Based on the evaluation, the VIA comments on the visual acceptability of the Proposed Scheme.

1.1.5 The outline for the VIA is set out below:

- Section 2 outlines Proposed Development Particulars
- Section 3 identifies the Assessment Area and provides analysis of the viewing points;
- Section 4 assesses the visual impacts; and
- Section 5 concludes the VIA

2.0 PROPOSED RCHE DEVELOPMENT PARTICULARS

2.1 Local Context

2.1.1 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^2 ***(Figure 1)***. 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.

2.1.2 The Site is of close proximately to the "Northern Metropolis Development" (NMD) zone and is within 10 minutes walking distance from the "Planned Northern Link Ngau Tam Mei Station".

2.2 Existing House Design

2.2.1 There is an existing House of GFA 294.258 sm, with a Plot Ratio 0.4, and is 3 storeys high from carpark, the main roof level is +21.00 mPd.

2.2.2 It is situated on a platform of level +12.0 m with a car ramp leading from the existing Brown area of level +7.33 m, which gain access from San Tam Road to the West.

2.2.3 There is an existing Green Hatched Black Area adjoining the Brown area to the South-West, which is a gentle slope formed and landscaped to all Government Departments' satisfaction when the House was built in 2017.

Please refer to ***Figure 2*** for the existing House design.

2.3 Proposed RCHE Development Parameters

2.3.1 The Development would gain access from San Tam Road at +7.33 m on LG/F. Two private Car Parks, a light Goods Vehicle Loading / Unloading Bay and a Mini-bus Parking locate beside the Entrance Lobby. Transformer Room and Sewerage Treatment Plant are located beside.

2.3.2 UG/F would be the supporting facilities like Multi-Purpose Rooms, Kitchen, Laundry, Store and Plant Room etc.

2.3.3 1/F is designed as a Wellness Centre with health facilities like hydrotherapy, yoga and gymnasium. It adjoins an outdoor Covered Sky Garden to provide covered and open leisure spaces, completed with landscaping and health equipment etc.

2.3.4 2/F to 7/F (total 6 storeys) are RCHE which provide a big spectrum of Dormitory Rooms combination ranging from Shared to Individual Rooms. A total of 142 bedspaces are assumed for the development.

2.3.5 8/F is a specially designed floor for the Staff and General Administration. Not only do it include Standard Office and Administrative space, 8 nos. of Staff Quarters are deliberately provided to facilitate the after-hour emergency services and the needs for "Epidemic closed-loop management", in case necessary.

2.3.6 The Roof Garden on level +36.93 provides outdoor Sun Shine spaces and individual Farming Areas for cultivation and hobbies.

2.3.7 The GFA allocation is tabulated as below:

Site Area		: 736.3 m^2	7926 ft^2
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^2	58125.6 ft^2
Proposed Building Height		: 36.93 mPD	
Absolute Height		: 29.6 m	
Proposed No. of Storey		: 10 STOREYS	
Proposed Gross Floor Area			
LG/F	ENTRANCE & CARPARK	: 352.479 m^2	
UG/F	MULTI-PURPOSE ROOMS	: 617.819 m^2	
1/F	WELLNESS CENTRE + SKY GARDEN	: 626.160 m^2	
2/F	RCHE	: 595.090 m^2	45 nos. of bed
3/F	RCHE	: 556.330 m^2	17 nos. of bed
4/F – 7/F	RCHE	: 556.330 m^2 x 4 storeys = 2225.32 m^2	20 nos. of bed x 4 storeys
8/F	ADMIN OFFICE + STAFF QUARTER	: 426.802 m^2	
TOTAL		**: 5400.000 m^2**	**142 nos. of bed**
Parking Spaces : (Loading / Unloading)			
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.	

Please refer to ***Figure 3*** for the Proposed Development.

3.0 ASSESSMENT AREA & SELECTION OF VIEWING POINTS

3.1 According to the TPB PG No. 41, the Assessment Area is defined by approximately 350 m from the boundary of the Application Site and is selected for assessment purpose accordingly (***Figure 4*** refers).

The visual assessment will be conducted by comparing the conditions before the rezoning (i.e. 0.4 PR Houses) (Scheme A) and after the rezoning (i.e. the RCHE) (Scheme B).

Scheme A would be the Existing House Design of Plot Ratio of 0.4, 3 storeys and 9 m high from the Carpark. A driveway leading from +7.33 from a Brown Area adjoining San Tam Road, to a platform for Carpark at +12.00. The Main Roof of the Existing House is at +21.00. (***Figure 2*** refers)

Scheme B would be a RCHE of 10 storeys high, with the Vehicular and Pedestrian Entrance at +7.33 and the Main Roof of the RCHE is at +36.93. The absolute height is 29.6 m. (***Figure 3*** refers)

3.2 When assessing the potential visual impacts of the Proposed Schemes, the clarification of VPs is categorized as follows:

Table 3.1 Classification of Visual Sensitivity

Receivers	Main Activities	Sensitivity
Recreational	Those viewers who would view the Application Site while engaging in recreational activities	High
Travellers	Those viewers who would view the Application Site from vehicles or on foot	Medium
Occupational	Those viewers who would view the Application Site from their workplaces.	High

3.3 Six VPs including short and long ranges are considered to be the most affected by any development on the Application Site (Figure **4** refers).

3.3.1 **VP1** : Castle Peak Road – Mai Po near Ko Hang towards East (***Figure 5***)

This VP is located West and is about 100 m away from the Application Site. It is surrounded by low-rise developments and "Royal Palms" to its South-West to North-West.

This VP is set to evaluate the Medium-Range visual impacts of the Travellers. It should be considered as **Medium** Visual Sensitivity.

3.3.2 **VP2** : Castle Peak Road – Mai Po towards South-East (***Figure 6***)

This VP is located North-West and is about 100 m away from the Application Site. It is surrounded by low-rise developments.

This VP is set to evaluate the Medium-Range visual impacts of the Travellers. It should be considered as **Medium** Visual Sensitivity.

3.3.3 **VP3** : Castle Peak Road – Mai Po towards North-East (***Figure 7***)

This VP is located South-West is about 100 m away from the Application Site. It is surrounded by low-rise developments.

This VP is set to evaluate the Medium-Range visual impacts of the Travellers. It should be considered as **Medium** Visual Sensitivity.

3.3.4 **VP4** : San Tam Road towards South-East (***Figure 8***)

This VP is located North-West and is about 50 m away from the Application Site. It is close to a junction and a driveway leading to "Crescendo".

This VP is set to evaluate the Short-Range visual impact of the Travellers. It should be considered as **Medium** Visual Sensitivity.

3.3.5 **VP5 :** Footbridge above San Tin Highway towards South (***Figure 9***)

This VP is located North and is about 300 m away from the Application Site. It is on a Footbridge above San Tin Highway.

This VP is set to evaluate the Long-Range visual impact of the Travellers. It should be considered as **Medium** Visual Sensitivity.

3.3.6 **VP6 :** Footbridge above San Tin Highway towards North (***Figure 10***)

This VP is located South and is about 300 m away from the Application Site. It is on a Footbridge above San Tin Highway.

This VP is set to evaluate the Long-Range visual impact of the Travellers. It should be considered as **Medium** Visual Sensitivity.

4.0 ASSESSMENT OF VISUAL IMPACT

This Section evaluate the Visual Impact of the "Existing House" (Scheme A) to the "Proposed RCHE" (Scheme B).

The overall visual resultant impact of the Proposed Schemes are appraised based on the classifications of visual impact as set in the TPB PG No.41, which include 'enhanced', 'party enhanced/party adverse', 'negligible', 'slightly adverse, 'moderately adverse' and 'significantly adverse'.

4.1 **VP1 :** Castle Peak Road – Mai Po near Ko Hang towards East ***(Figure 5)***

4.1.1 This Medium Range VP1 located right opposite to the West of the Site across the San Tin Highway. It represents the View received by Travellers on foot and by vehicles. Therefore, the visual sensitivity is considered Medium. Both Proposed Schemes are visible at the VP.

The Visual Composition comprise Greenery on both sides with San Tin Highway and Castle Peak Road – Mai Po in the front. Rows of tree are present along both sides of the San Tin Highway which partly shield off the Visual Effect.

Scheme B would create comparatively bigger Building Bulk than Scheme A. However, the effect is somehow shield off and soften by the Greenery around. The effect would be further minimized by rows of Tree along San Tin Highway as Travellers move across.

4.1.2 Conclusion :

As a conclusion, the Visual Impact of Scheme B compared to Scheme A would be **slightly adverse.**

4.2 **VP2 :** Castle Peak Road – Mai Po towards South-East (***Figure 6***)

4.2.1 This Medium Range VP2 located to the North-West of the Site across the San Tin Highway. It represents the View received by Travellers on foot and by vehicles. Therefore, the visual sensitivity is considered Medium. Both Proposed Schemes are visible at the VP.

The Visual Composition comprise Greenery on both sides with San Tin Highway and Castle Peak Road – Mai Po in the front. Rows of tree are present along both sides of the San Tin Highway which partly shield off the Visual Effect.

Scheme B would create comparatively bigger Building Bulk than Scheme A. However, the effect is somehow shield off and soften by the Greenery around. The effect would be further minimized by rows of Tree along San Tin Highway as Travellers move across.

4.2.2 Conclusion :

As a conclusion, the Visual Impact of Scheme B compared to Scheme A would be **slightly adverse.**

4.3 **VP3 :** Castle Peak Road – Mai Po towards North-East (***Figure 7***)

4.3.1 This Medium Range VP3 located to the South-West of the Site across the San Tin Highway. It represents the View received by Travellers on foot and by vehicles. Therefore, the visual sensitivity is considered Medium. Both Proposed Schemes are visible at the VP.

The Visual Composition comprise Greenery on both sides with San Tin Highway and Castle Peak Road – Mai Po in the front. Rows of tree are present along both sides of the San Tin Highway which partly shield off the Visual Effect.

Scheme B would create comparatively bigger Building Bulk than Scheme A. However, the effect is somehow shield off and soften by the Greenery around. The effect would be further minimized by rows of Tree along San Tin Highway as Travellers move across.

4.3.2 Conclusion :

As a conclusion, the Visual Impact of Scheme B compared to Scheme A would be **slightly adverse**.

4.4 **VP4** : San Tam Road towards South-East (***Figure 8***)

4.4.1 This Short Range VP4 located North-West and is about 50 m away from the Application Site. It is right at the road junction between San Tam Road and an Access Road leading to a low-density Residential Development named "Crescendo". It represents the view received by Travellers on foot and by vehicles. Therefore, the visual sensitivity is considered Medium. Both the Proposed Schemes are visible at the VP.

The Visual Composition comprise a slope full of Greenery surrounding the Application Site in front, which a low-density Residential Development named "Casa Paradiso" to the back.

Scheme B would create comparatively bigger Building Bulk than Scheme A. However, the effect is somehow shield off and soften by the Greenery around.

4.4.2 Conclusion :

As a conclusion, the Visual Impact of Scheme B compared to Scheme A would be **slightly adverse.**

4.5 **VP5 :** Footbridge above San Tin Highway towards South (***Figure 9***)

4.5.1 This Long Range VP5 located on a Footbridge across the San Tin Highway to the North about 300 m away from the Application Site. It represents the View received by Travellers travel back and forth from San Tam Road to Castle Peak Road – Mai Po. The visual sensitivity is considered Medium.

The Visual Composition comprise San Tin Highway in the middle with rows of tree bounding on San Tam Road and Castle Peak Road – Mai Po.

Both Scheme A and Scheme B are hardly visible in this Viewpoint and are completely shield off by rows of tree.

4.5.2 Conclusion :

As a conclusion, the Visual Impact of Scheme B compared to Scheme A would be **negligible**.

4.6 **VP6** : Footbridge above San Tin Highway towards North (***Figure 10***)

4.6.1 This Long Range VP6 located on a Footbridge across the San Tin Highway to the North about 300 m away from the Application Site. It represents the View received by Travellers travel back and forth from San Tam Road to Castle Peak Road – Mai Po. The visual sensitivity is considered Medium.

The Visual Composition comprise San Tin Highway in the middle with rows of tree bounding on San Tam Road and Castle Peak Road – Mai Po.

Both Scheme A and Scheme B are hardly visible in this Viewpoint and are completely shield off by rows of tree.

4.6.2 Conclusion :

As a conclusion, the Visual Impact of Scheme B compared to Scheme A would be **negligible.**

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: -

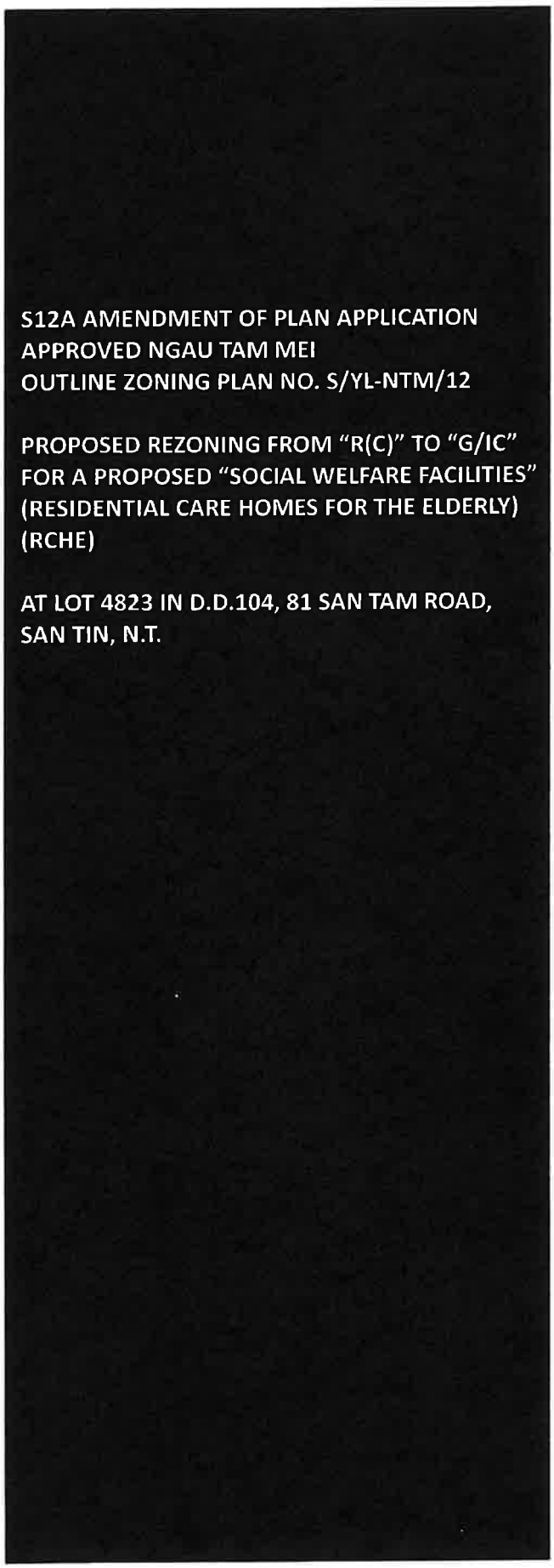
V.P.	Visual Sensitivity	Visual Impact	Conclusion
VP1: Castle Peak Road – Mai Po near Ko Hang towards East	Medium	Slightly adversed	Slightly adversed
VP2: Castle Peak Road – Mai Po towards South-East	Medium	Slightly adversed	Slightly adversed
VP3: Castle Peak Road – Mai Po towards North-East	Medium	Slightly 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

5.2 A total of six VPs (including short and medium range VPs) were assessed in this Visual Impact Assessment, covering VPs in medium visual sensitivity.

With the provision of numerous planning and design merits in our Proposed Scheme, four VPs are identified with **slightly adversed** visual impact, while the remaining two VPs are identified with **negligible** visual impact.

5.3 The Site already set back from San Tam Road by 12.6 m. It is considered adequate for not creating adverse visual impact.

5.4 Based on the above, the Proposed Scheme is considered to be fully acceptable in terms of visual impact.



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.

FIGURE 1
LOCATION PLAN

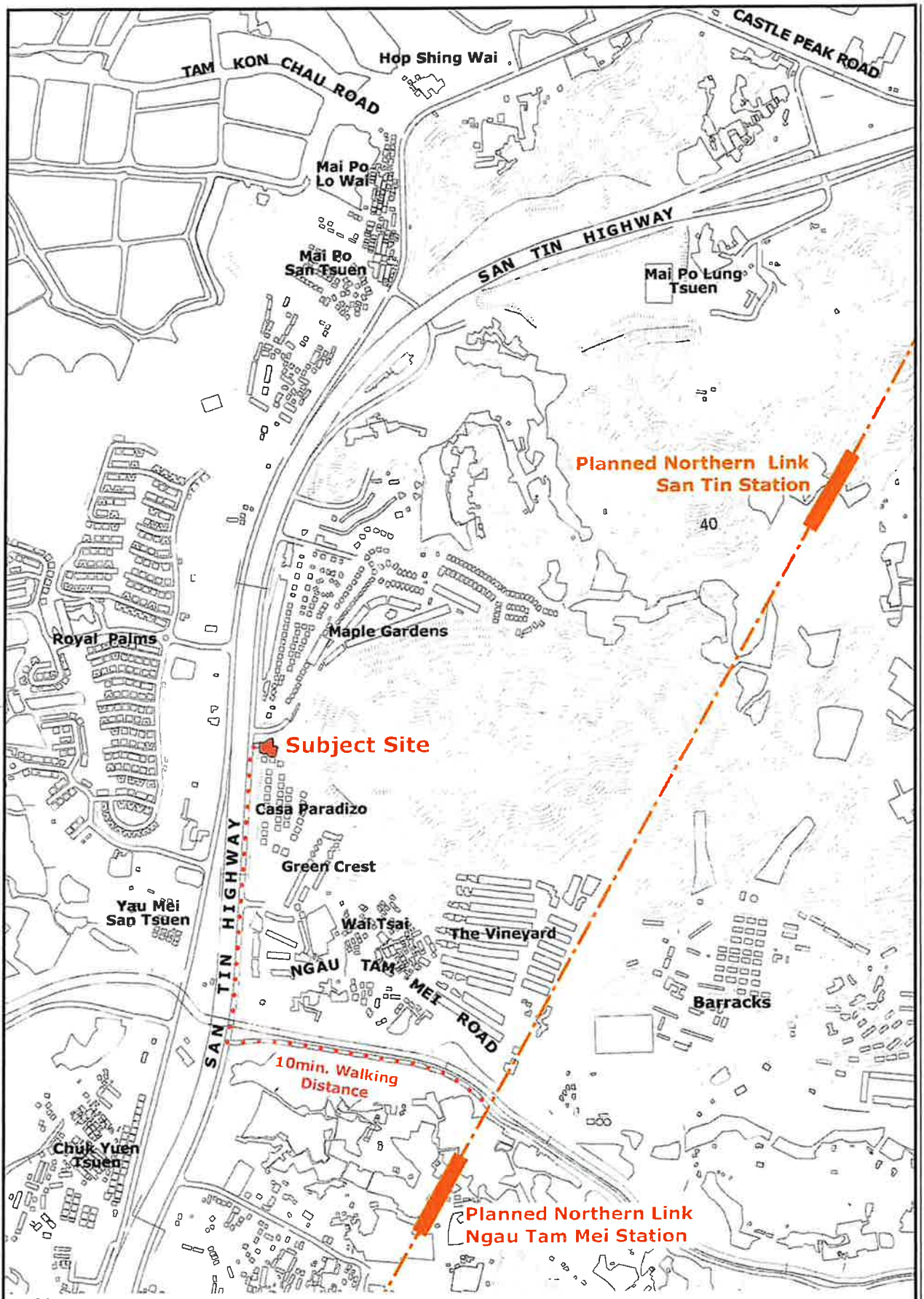
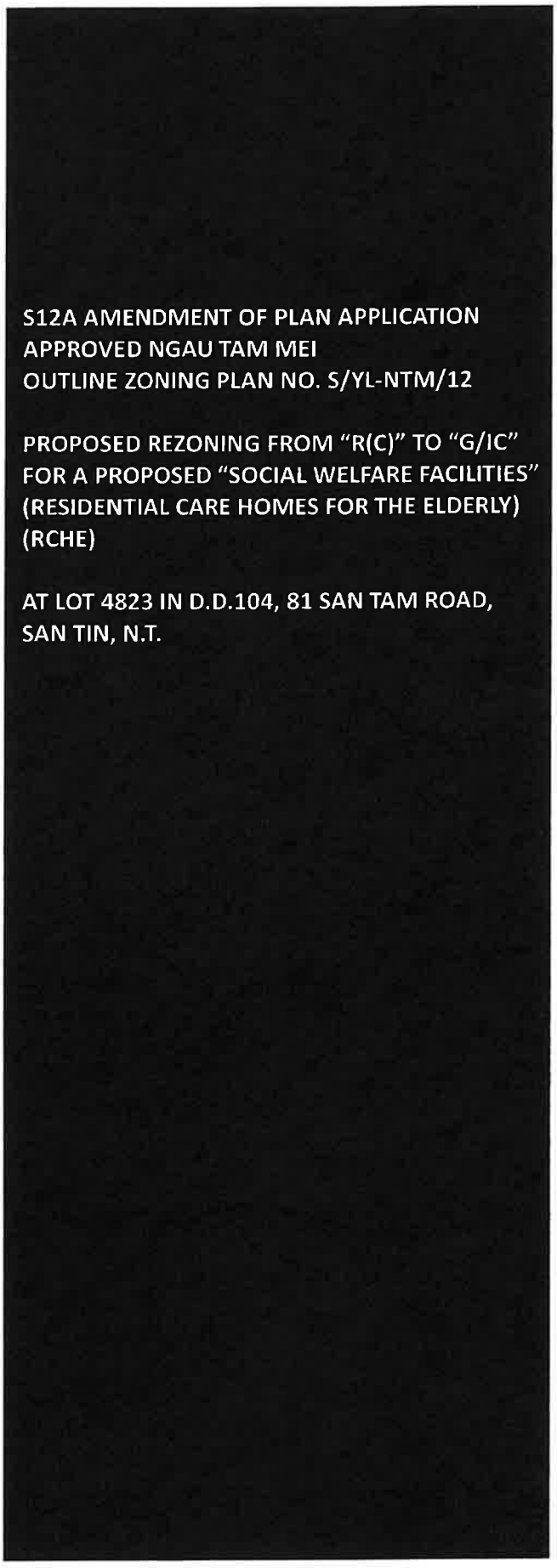


FIGURE NO.	TITLE	SCALE	
1	LOCATION PLAN	1:10000	
		DATE	JUL 2022



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AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,
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FIGURE 2

EXISTING HOUSE DESIGN

GENERAL NOTES:

LAND WORK WORKS AND MASONRY SHALL BE BUILT IN 1:3 CEMENT MORTAR

2. ALL STRUCTURAL CONCRETE TO BE 1:2:4 MIXTURE

3. ALL R.C. DETAILS AND CALCULATIONS SHALL BE SUBMITTED SEPARATELY

4. DRAINAGE PLANS AND TYPICAL DETAILS SHALL BE SUBMITTED SEPARATELY

5. ALL MANHOLES (SHALL BE 1150mm MIN. DEEP) FINISHED FLOOR LEVEL

6. ALL RISERS OF STAIRCASE SHALL NOT MORE THAN 175mm, TREADS NOT LESS THAN 220mm

7. ALL DIMENSIONS SHOWN ON ALL DRAWINGS ARE STRUCTURAL

8. LANDSCAPE DETAILS TO BE SUBMITTED LATER

9. ALL FLAT ROOF TO BE PROVIDED WATERPROOFING AND INSULATION

10. ALL FOUNDATIONS TO BE CARRIED DOWN ON SOLID GROUND OR PILES IF NECESSARY.

11. CLEAR HEIGHT BETWEEN FLOOR LEVEL TO BEAM SOFFIT SHALL BE 2300mm.

12. CLEAR HEIGHT BETWEEN FLOOR LEVEL TO SOFFIT TO BE 2300mm MIN. UNLESS OTHERWISE DENOTED.

13. CLEAR HEIGHT BETWEEN FINISHED FLOOR LEVEL TO BEAM SOFFIT OF STAIRCASE TO BE 2000mm MINIMUM.

14. THE GENERAL BUILDING PLAN WILL BE COMPLIED WITH CODE OF PRACTICE FOR FIRE SAFETY IN BUILDINGS 2011,
EXCEPT PART B – MEANS OF ESCAPE SINCE:
(a) DOMESTIC BUILDING PARAG NOT MORE THAN THREE MAIN DOMESTIC STOREYS
(b) THE LEVEL OF THE HIGHEST FLOOR OF WHICH IS NOT MORE THAN 15m ABOVE THE OPENING LEVEL; AND
(c) USED OR INTENDED TO BE USED FOR OCCUPATION BY A SINGLE FAMILY.

15. THE INTERNAL SURFACE OF SECTION TO HAVE A HEIGHT OF AT LEAST 1.2m FROM FLOOR SHALL BE REMOVED IN CEMENT MORTAR, NOT LESS THAN 12.5mm IN THICKNESS, OR OTHER NON-RESIDENT MATERIAL.

16. THE FOLLOWING MODIFICATIONS AND/OR EXEMPTIONS ARE GRANTED BY THE BUILDING AUTHORITY (REFER TO TABLE A)

17. BUILDING (CONSTRUCTION) REGULATION 8 REFERRING "CHANGE IN USE)" DO NOT APPLY TO THIS PROJECT SINCE IT IS SPACE WITHIN DOMESTIC PREMISES FOR OCCUPATION BY ONE FAMILY.

SIDE	DISTANCE IN METRES	BEARING °	'	"	PL	CORNER (WHERE) ET
A-B	8.788	93	53	30		
B-C	13.413	87	27	45		
C-D	8.197	92	42	30		
D-E	3.274	180	07	15		
E-F	10.385	179	51	27		
F-G	5.861	180	39	57		
G-H	7.119	180	00	00		
H-I	13.052	180	42	45		
I-J	8.575	180	15	15		
J-K	7.752	179	55	30		
K-L	6.625	269	20	30		
L-M	3.263	269	42	15		
M-N	6.117	179	02	45		
N-O	11.084	269	26	30		
O-A	17.328	°	"	"		

PLOT RATIO & SITE COVERAGE CALCULATIONS
(UNDER OUTLINE ZONING PLAN)

SITE AREA	=	734.3 sq.m.
CLASS OF SITE	=	A
ZONE	=	RESIDENTIAL (GROUP C)
MAXIMUM PLOT RATIO	=	0.4
PERMITTED NO. OF STOREYS	=	2 STOREYS (3m) INCLUDING CARPARK
MAX. ACTUAL DOMESTIC G.F.A. :	=	294.520 sq.m. < 294.520 sq.m.
ACTUAL PLOT RATIO FOR DOMESTIC	=	294.258 / 736.300
	=	0.39944 < 0.4 (O.K.)
ACTUAL DOMESTIC G.F.A.		
G/F :	=	157.057 sq.m.
1/F :	=	137.201 sq.m.
TOTAL G.F.A	=	294.258 sq.m.

PLOT RATIO & SITE COVERAGE CALCULATIONS
(UNDER BUILDING REGULATIONS)

SITE AREA	=	734.3 sq.m.
CLASS OF SITE	=	A
HEIGHT OF BUILDING	=	NOT EXCEEDING 15m
MAXIMUM PLOT RATIO	=	3.3
MAXIMUM PERMISSIBLE SITE COVERAGE (NOT EXCEEDING 1/3rd)	=	84.65%
TOTAL ACTUAL DOMESTIC G.F.A :	=	294.258 sq.m. < 294.520 sq.m.
ACTUAL PLOT RATIO FOR DOMESTIC	=	294.258 / 736.300
	=	0.39994 < 0.4 (O.K.)
ACTUAL SITE COVERAGE FOR DOMESTIC (NOT EXCEEDING 1/3rd)	=	138.622 / 736.300 x 100 %
	=	25.783 % < 66.65 (O.K.)
ACTUAL DOMESTIC G.F.A.		
G/F :	=	157.057 sq.m.
1/F :	=	137.201 sq.m.
TOTAL G.F.A	=	294.258 sq.m.

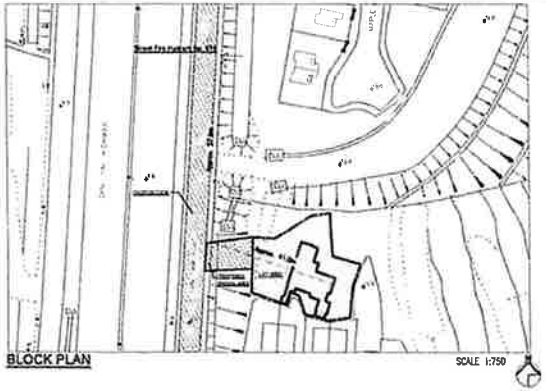
CAR PARKING SPACES CALCULATIONS

NUMBER OF PARKING SPACES REQUIRED UNDER HOKLE :

PROPOSED DEVELOPMENT :		RESIDENTIAL INSTITUTION (PRIVATE HOUSING)
AREAS, GFA	=	294.258 sq.m.
CFA	=	1/3
R1	=	0
R2	=	1
NO. OF PRIVATE CAR PARKING	=	CFA X R1 X R2 = 0 NOS.

ACTUAL NO. OF PARKING SPACES (USING A LARGER SPACE PROVIDED) :

PRIVATE CAR (2.5m x 5m = 2.4m 2) = 2 NOS.



COLOR LEGEND:

- R.C. WORKS
- SOLID BLOCKS WALL (WITH F.R.R.)
- CONC. WORKS
- GLASS
- METAL WORKS
- TIMBER WORKS
- FLOOR RENDERING
- WALL FINISH
- SANITARY FITMENTS
- SOLID BLOCK WALL (WITHOUT F.R.R.)
- 900mm(w) SOLID BLOCK WALL (WITHOUT F.R.R.)
- SOIL

INDICATION SCHEDULE :

MARK	INDICATION
F.H.	FIRE HYDRANT
EXIT	EXIT SIGN
H.R.	HOSE REEL
F.E.	4.5kg CO2 FIRE EXTINGUISHER
	STAIRCASE LEVEL
	FINISH LEVEL
	–/30/30 F.R.R. SELF-CLOSING DOOR WITH UPPER VISION PANEL AND SMOKE SEAL
	–/60/60 F.R.R. SELF-CLOSING DOOR WITH UPPER VISION PANEL AND SMOKE SEAL
	–/120/120 F.R.R. SELF-CLOSING DOOR WITH UPPER VISION PANEL AND SMOKE SEAL
	–/30/30 F.R.R. SELF-CLOSING DOOR WITH SMOKE SEAL
	–/60/60 F.R.R. SELF-CLOSING GLASS DOOR WITH SMOKE SEAL
	–/120/120 F.R.R. SELF-CLOSING DOOR WITH SMOKE SEAL
	DOOR WITH PANIC BOLT WITH SMOKE SEAL
W/P.H.	WEATHERPROOF HORIZONTAL AND VERTICAL LIGHTING TO BE PROVIDED TO THE SATISFACTION OF FSD
A.	ARTIFICIAL LIGHTING TO BE PROVIDED TO THE SATISFACTION OF FSD
M.H.	MEDIAL LEVANGE
H/A.	HIGH LEVEL
L/L.	LOW LEVEL
	LEVEL DIFFERENCE
D	ACCESSIBLE LIFT
A	FIREMAN'S LIFT
S.B.	SAND BUCKET
F/B	FINISH BELOW
T/A	TO ABOVE

SCHEDULE OF SANITARY FITMENT

LOCATION	USE	CAPACITY (DWE MAX.)	NO. OF SANITARY FITMENT REQUIRED				NO. OF SANITARY FITMENT PROVIDED			
			W.C.	BASIN	URINAL	BATH / SHOWER	W.C.	BASIN	URINAL	BATH / SHOWER
G/F–1/F	RESIDENTIAL	258.818 / 8 = 35	3	3	-	3	7	7	1	7
NOTES:										

FIRE RESISTANCE REQUIREMENTS FOR ELEMENTS OF CONSTRUCTION

LOCATION	USE	CLASS	COMPARTMENT AREA (m^2) COMPARTMENT VOLUME (m^3) (TAKE MAX.)	F.R.P.	MIN. DIMENSION OF ELEMENTS OF CONSTRUCTION (mm)							
					SOLID CONC. BLOCK WALL	R.C. WALL		R.C. FLOOR		R.C. COLUMNS		R.C. BEAMS
G/F	CARPARK	7	34.827m² x 2.8 = 97.518m³	–/60/60	120	75	15	100	20	200	25	200	20
1/F	RESIDENTIAL	1	196.750m² x 4.425 = 870.469m³									
1/F	RESIDENTIAL	1	111.672m² x 3.225 = 360.158m³									
G/F – 1/F	RESIDENTIAL		TOTAL = 1230.627m³									
ALL FLOORS	ALL E/W HOSE	SPECIAL PROVISION	-	–/120/120	225	150	25	125	25	300	30	300	30
NOTES: –/120/120 F.R.R. TO BE PROVIDED FOR SEPARATION BETWEEN DIFFERENT USES.													

TABLE A

MODIFICATIONS / EXEMPTIONS VIS-A-VIS (SUCH WAIVER) GRANTED ON 1/F PURSUANT TO APPLICATION NO. WITH FIRE ENDORSEMENT TO LOCATION OF WORK IN THE CURRENT SUBMISSION

Description	Condition	Location with Modification / Exemption Granted	W.B.I. Sec.	Fire Resisting Construction	Means of Escape	Fire Service Installations	Ventilation	Provision for Special Hazards
(a) Building (Planning) Regulation 20 to permit the non-provision of service lane.	This Permit is granted subject to the following conditions:– (a) The said works are to be carried out in accordance with the plans approved on 11 December 2015 under our Ref. No. BD 2/4933/15	All areas from G/F to 1/F						
(b) Building (Planning) Regulation 20 to permit provision of natural lighting and ventilation to the internal lavatories and internal bathrooms as shown on the plans.	(b) Regarding Item (b) above:– (i) Compliance with the requirements and conditions as laid down in PNAP APP–28.							
(c) Building (Planning) Regulation 20 to permit the level of internal floors to be less than 150mm above the level of the external ground at locations as shown on the plans.	(c) Regarding Item (c) above:– (i) Provision of sufficient drainage channels, each with at least 2 no. of drainage outlets; and (ii) Provision of a 1m, not less than 1:40, on the flat roof or external ground sloping away from the adjoining internal/ outside floor area.							
(d) Building (Planning) Regulation 20A to permit the non-provision of open free spaces to the bathrooms as shown on plans.	(d) Regarding Item (d) above:– (i) Covered but water tanker with other means and the length of the fall water pipe from the said water tanker comply with the requirements of Waterworks Regulation 18 (Cap 102)							
(e) Building (Planning) Regulation 31(3) to permit the non-provision of open free spaces to the bathrooms as shown on plans.	(e) Regarding Item (e) above:– Subject to the compliance with the requirements and conditions as laid down in PNAP APP–96.							
(f) Building (Planning) Regulation 31(3) to permit the internal layout to be less than 150mm above the level of the external ground at locations as shown on the plans.	(f) Regarding Item (f) above:– Enhanced fire service installations are to be provided in substitution of the Director of Fire Services.							
	(g) Regarding Item (g) above:– (i) Provision of sufficient drainage channels, each with at least 2 no. of drainage outlets; and (ii) Provision of a 1m, not less than 1:40, on the flat roof or external ground sloping away from the adjoining internal/ outside floor area.							
	(h) This permit will expire on 9 June 2018 if the covered by concerned the above works is not completed on or before the specified date or where such consents have been obtained but is deemed to be revoked under section 31(1) of the Buildings Ordinance after the specified date.							

MODIFICATIONS / EXEMPTIONS VIS-A-VIS (SUCH WAIVER) GRANTED ON 1/F PURSUANT TO APPLICATION NO. WITH FIRE ENDORSEMENT TO LOCATION OF WORK IN THE CURRENT SUBMISSION

Description	Condition	Location with Modification / Exemption Granted	W.B.I. Sec.	Fire Resisting Construction	Means of Escape	Fire Service Installations	Ventilation	Provision for Special Hazards
(a) Building (Planning) Regulation 20 (1)(b) to permit the non-provision of service lane.	This Permit is granted subject to the following conditions:– (a) The said works are to be carried out in accordance with the plans approved on 16 June 2016 under our Ref. No. BD 2/4933/15	All areas from G/F to 1/F						
(b) Building (Planning) Regulation 20A to permit the non-provision of open free spaces to the bathrooms as shown on plans.	(b) The conditions imposed in this paragraph are to be incorporated in the submitted amendment plans for approval before the application permit is issued.							
(c) Building (Planning) Regulation 20 to permit provision of natural lighting and ventilation to the internal lavatories and internal bathrooms as shown on the plans.	(c) A checklist of valid Forms ID1018 is to be submitted at the time of the application for an occupation permit .							
(d) Building (Planning) Regulation 41D to permit the horizontal distance between the fresh air intake of the mechanical ventilation system and the exhaust outlet of the kitchen of the house to exceed 10m subject to enhanced FSI to satisfaction of FSD.	(d) Regarding Item (c) above:– (i) Covered but water tanker with other means and the length of the fall water pipe from the said water tanker comply with the requirements of Waterworks Regulation 18 (Cap 102)							
(e) Building (Planning) Regulation 31(3) to permit the internal layout to be less than 150mm above the level of the external ground at locations as shown on the plans.	(e) Regarding Item (d) above:– Subject to the compliance with the requirements and conditions as laid down in PNAP APP–96.							
	(f) Regarding Item (e) above:– Enhanced fire service installations are to be provided in substitution of the Director of Fire Services.							
	(g) Regarding Item (f) above:– (i) Provision of sufficient drainage channels, each with at least 2 no. of drainage outlets; and (ii) Provision of a 1m, not less than 1:40, on the flat roof or external ground sloping away from the adjoining internal/ outside floor area.							
	(h) This permit will expire on 9 June 2018 if the covered by concerned the above works is not completed on or before the specified date or where such consents have been obtained but is deemed to be revoked under section 31(1) of the Buildings Ordinance after the specified date.							

F.S. NOTES :

1. PORTABLE FIRE EXTINGUISHER

(a) PORTABLE FIRE EXTINGUISHERS WITH TYPE-SPECIFIED SHALL BE PROVIDED AS INDICATED ON PLAN IN ACCORDANCE WITH CURRENT F.S.D. CIRCULAR LETTERS NO. 4/96.

2. HOSE REEL SYSTEMS

(a) A HOSE REEL SYSTEM SHALL BE PROVIDED FOR THE DOMESTIC BUILDING, SINCE THE HORIZONTAL DISTANCE BETWEEN THE EXIT AND THE BUILDING ENTRANCE EXCEEDS 30m. A 2m² O.S. WATER TANK FED BY THE CITY WATER MAIN MAIN SHALL BE PROVIDED AT THE ROOF, AS SHOWN ON PLAN.

(b) THE HR SYSTEM CONSISTS OF HOSE REELS THAT ARE POSITIONED AND SHOWN ON PLAN SHALL BE INSTALLED IN ACCORDANCE WITH THE CURRENT H.R. F.S.D. CODE OF PRACTICE. ONE MANUAL ACTUATING POINT AND ONE AUDIO WARNING DEVICE SHALL BE PROVIDE FOR EACH HOSE REEL POINT THIS MANUAL ACTUATING POINT FACILITATES THE FIRE PUMP ACTUATION AND AUDIO WARNING ALARM BETWEEN.

(c) A HOSE REEL WITH HOSE REEL TUBING OF NO MORE THAN 30 METRES IN LENGTH SHALL BE PROVIDED AT THE LOCATIONS AS SHOWN ON PLAN TO
ENSURE THAT ALL AREAS ARE REACHED BY ONE HOSE REEL SYSTEM.

(d) THE FIXED FIRE PUMPS AS SHOWN ON PLAN.

3. GENERAL

(a) ALL LINING FOR ACCESS AND PATROL, INSULATION PURPOSES IN ENCLOSE AND CONCEALED LOCATIONS SHALL BE OF CLASS 1 (ZF) 2 SURF OF SURFACE SPREAD OF FLAME AS PER BRITISH STANDARD 476, PART 7 OR ITS INTERNATIONAL EQUIVALENT, OR BE ENCLOSE UP TO THAT STANDARD BY
THE USE OF APPROVED FIRE RETARDANT PAINTING.

(b) ALL LINING FOR ACCESSORY, THERMAL INSULATION AND DECORATIVE PURPOSES WHERE PROTECTED MEANS OF ESCAPE SHALL BE OF CLASS 1 OR 2 RATE OF SPREADING SPREAD OF FLAME AS PER BRITISH STANDARD 476 : PART 7 OR US INTERNATIONAL EQUIVALENT, OR BE ENCLOSE UP TO THAT STANDARD BY USE OF AN APPROVED FIRE RETARDANT PAINTING.

(c) ANY APPROVED STORAGE OR USE OF DANGEROUS GOODS AS DEFINED IN CHAPTER 295 OF THE LAWS OF HONG KONG SHALL BE MONITORED TO THE DIRECTION OF FIRE SERVICES.

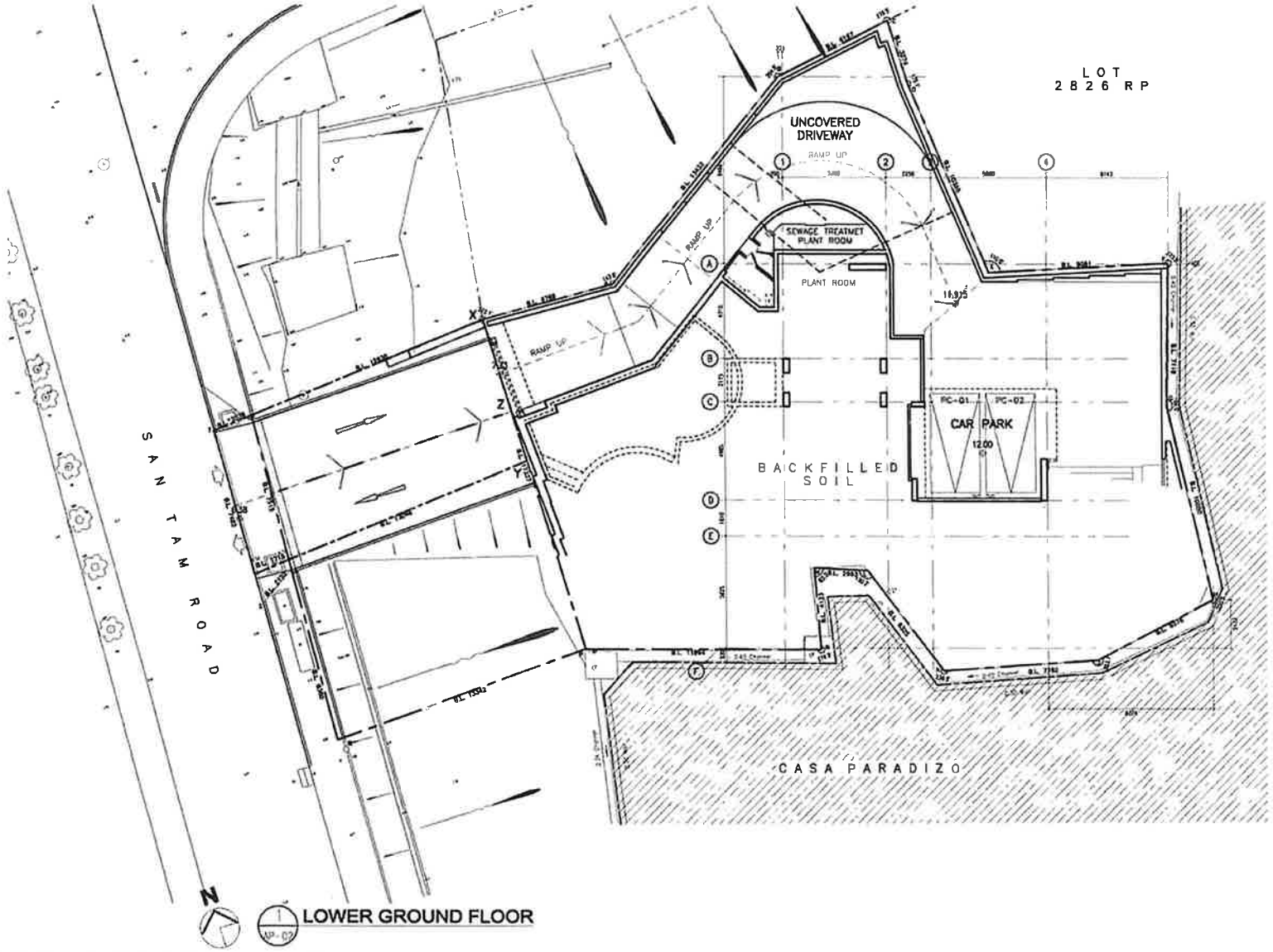
4. SECONDARY POWER SUPPLY

(a) THE SECONDARY ELECTRICITY SUPPLY TO BE TICK-OFF ENSURE THE INCOMING MAIN SWITCH FOR THE EXTERNAL FIRE SERVICE.

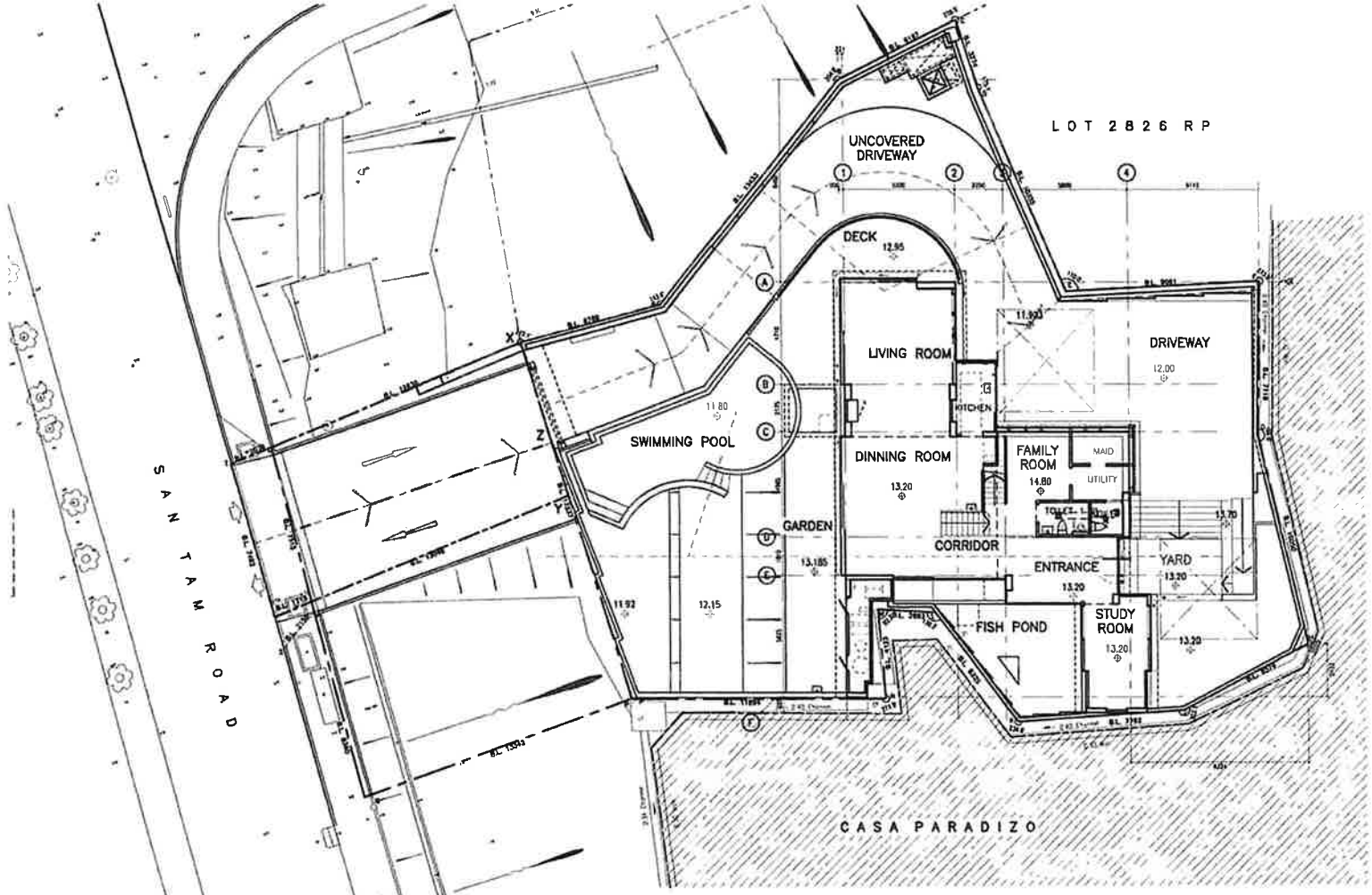
2202 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.	28/07/2017 – APPROVED PLAN NOTES, SCHEDULE, LEGEND, CALCULATION & LOCATION PLAN	AP-01	NTS (A3)	JUN. 2022

Do not scale drawing.
Contractors are required to verify exact dimensions on site.
The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate.
The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified.
This drawing is not for construction purposes unless expressedly certified.

RLEE



2202 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.	28/07/2017 – APPROVED PLAN LOWER GROUND FLOOR	AP-02 1:200 (A3)	JUN 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless countersigned certified.



1 G/F PLAN
AP-02

2202

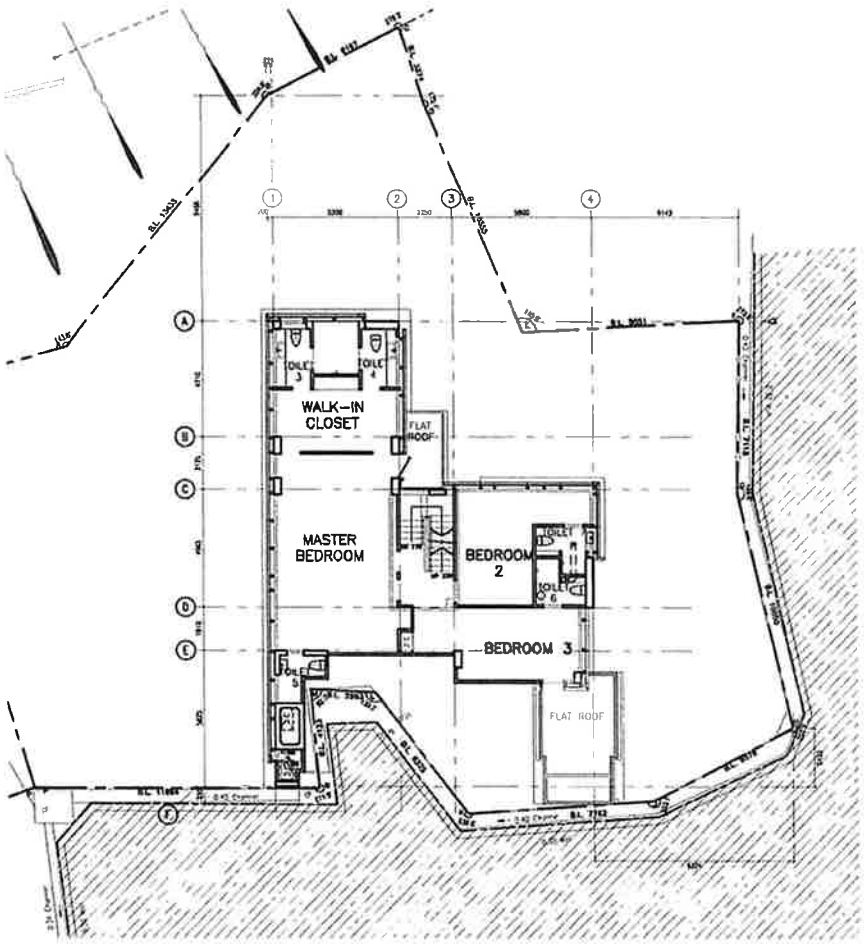
PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY
at 81 SAN TAM ROAD,
YUEN LONG, N.T.

28/07/2017 – APPROVED PLAN
G/F

AP-03 1:200 (A3)

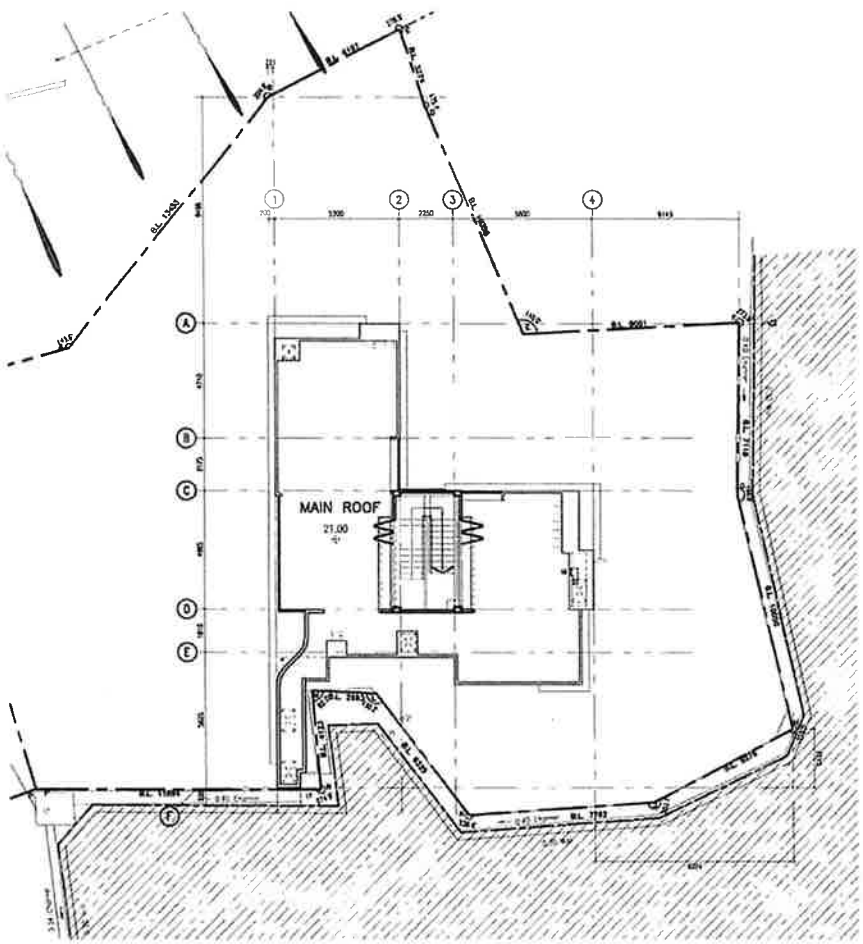
Do not scale drawing.
Contractors are required to verify exact dimensions on site.
The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate.
The design remains to be the property of "RLab Architects (HK) Ltd" unless otherwise specified.
This drawing is not for construction purposes unless expressedly certified.

RLAB



N

1/F PLAN

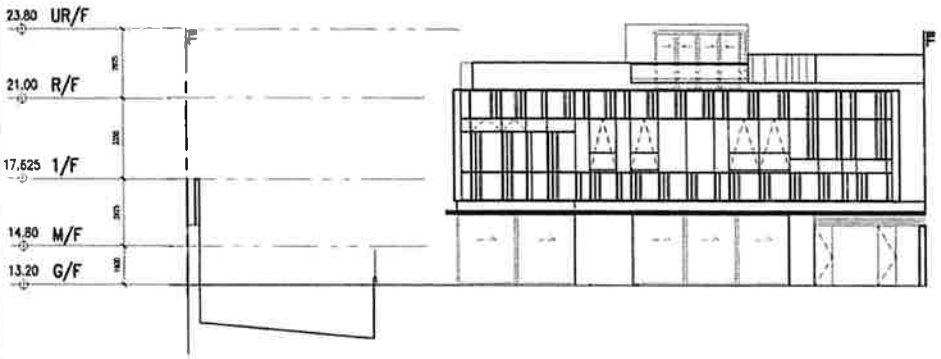


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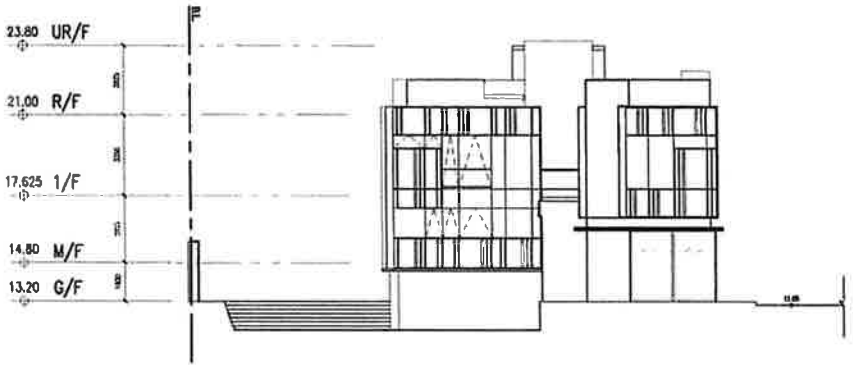
ROOF PLAN

2202 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.	28/07/2017 – APPROVED PLAN 1/F & ROOF	AP-04 1:200 (A3)	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "R.Lee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

R.LEE



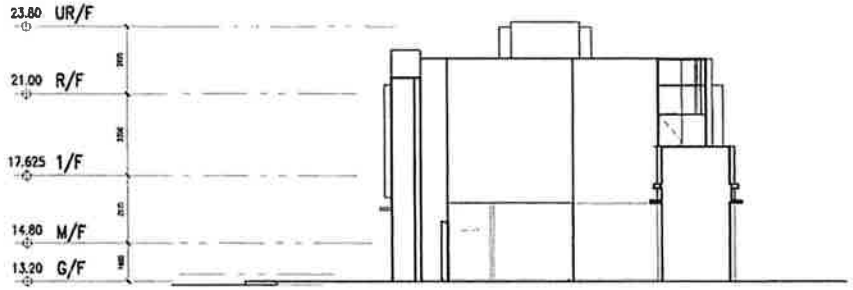
1 AP-04 ELEVATION A



1 AP-04 ELEVATION B



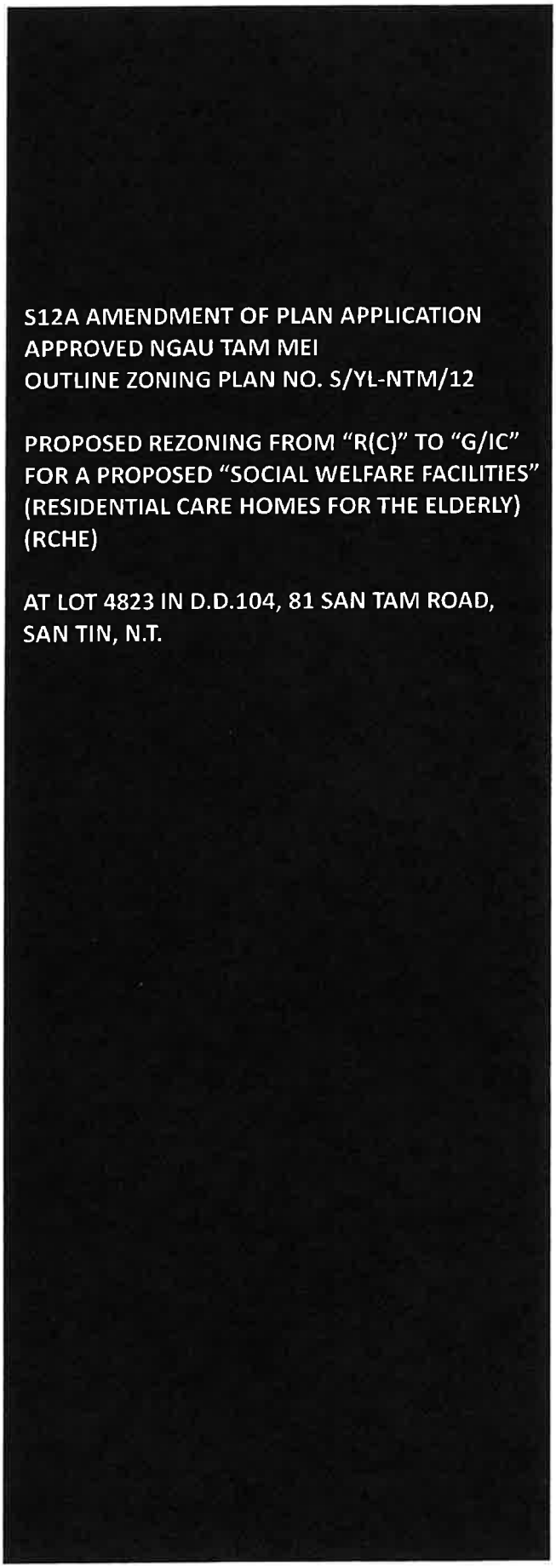
3 AP-05 ELEVATION C



4 AP-05 ELEVATION D

2202 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.	28/07/2017 – APPROVED PLAN ELEVATIONS	AP-05 1:200 (A3)	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The drawings remains to be the property of "RLab Architects CHK) Ltd" unless otherwise specified. The drawings is not for construction purposes unless expressedly certified.

RLAB

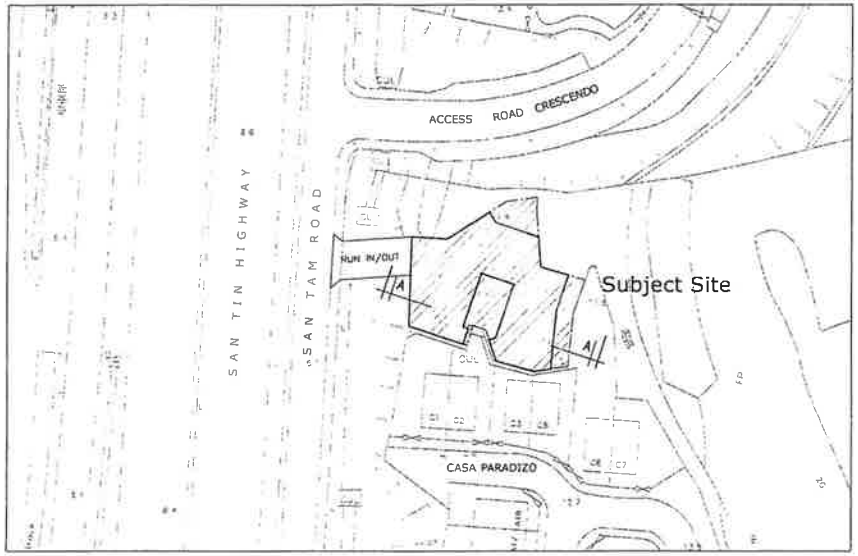


S12A AMENDMENT OF PLAN APPLICATION
APPROVED NGAU TAM MEI
OUTLINE ZONING PLAN NO. S/YL-NTM/12

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.

FIGURE 3
PROPOSED RCHE DESIGN



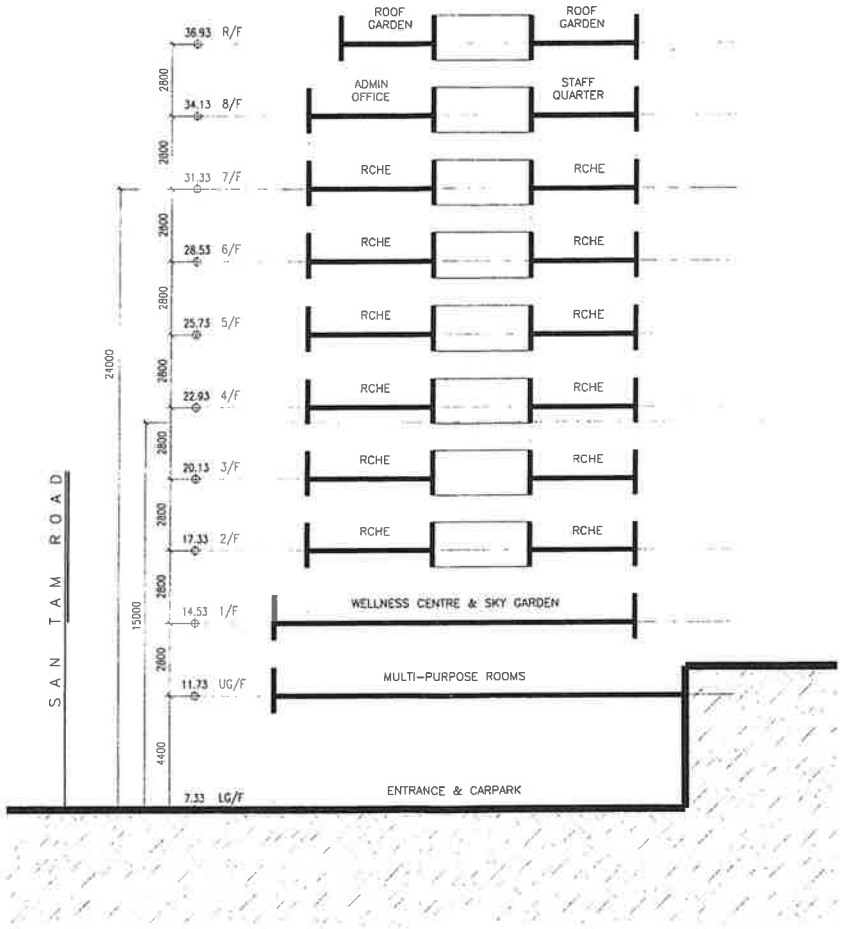
BLOCK PLAN SCALE - 1:1000

DEVELOPMENT SCHEDULE:

Site Area	:	736.3 m² (7926 ft²)
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 m² (58125.6 ft²)
Proposed Building Height	:	36.93 mPD
Absolute Height	:	29.6 m
Proposed No. Of Storey	:	10 STOREYS

Proposed Gross Floor Area

LG/F (ENTRANCE & CARPARK)	:	352.479 m²
UG/F (MULTI-PURPOSE ROOMS)	:	617.819 m²
1/F (WELLNESS CENTRE + SKY GARDEN)	:	626.160 m²
2/F (RCHE)	:	595.090 m² (45 nos. of bed)
3/F (RCHE)	:	556.330 m² (17 nos. of bed + 3 nos. of isolation room)
4/F - 7/F (RCHE)	:	556.330 m² x 4 storeys = 2225.32 m² (20 nos. of bed x 4 storeys)
8/F (ADMIN OFFIC + STAFF QUARTER)	:	426.802 m²
TOTAL	:	**5400.000 m² (142 nos. of bed + 3 nos. of isolation room)**



SECTION A-A SCALE - 1:200

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.

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.

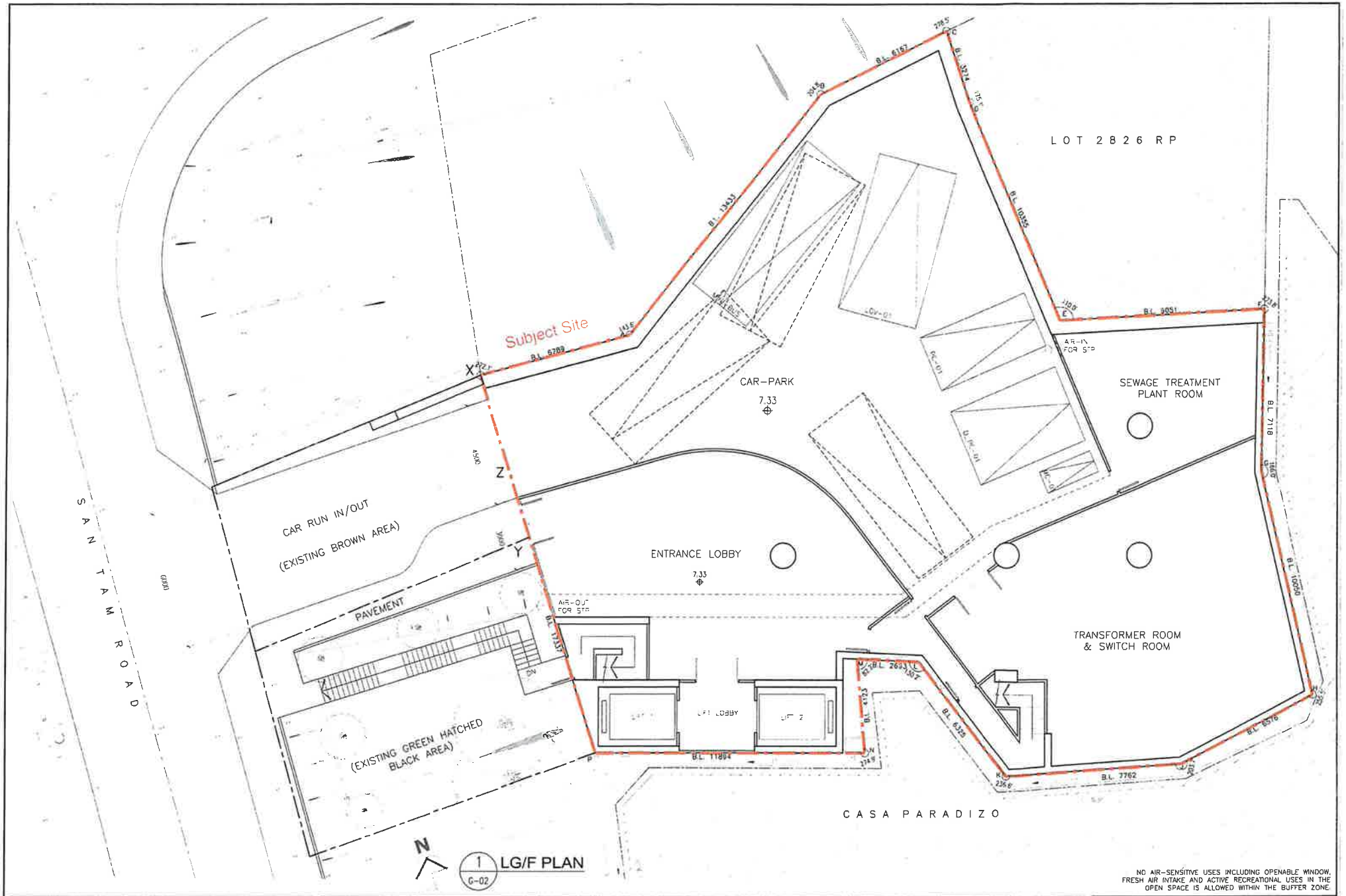
DEVELOPMENT SCHEDULE & SECTION

G-01 N.T.S. (A3)

B OCT. 2022
A JULY. 2022

Do not scale drawing.
Contractors are required to verify exact dimensions on site.
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The design remains to be the property of "Rlee Architects (HK) Ltd" unless otherwise specified
This drawing is not for construction purposes unless expressedly certified.

RLEE



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.

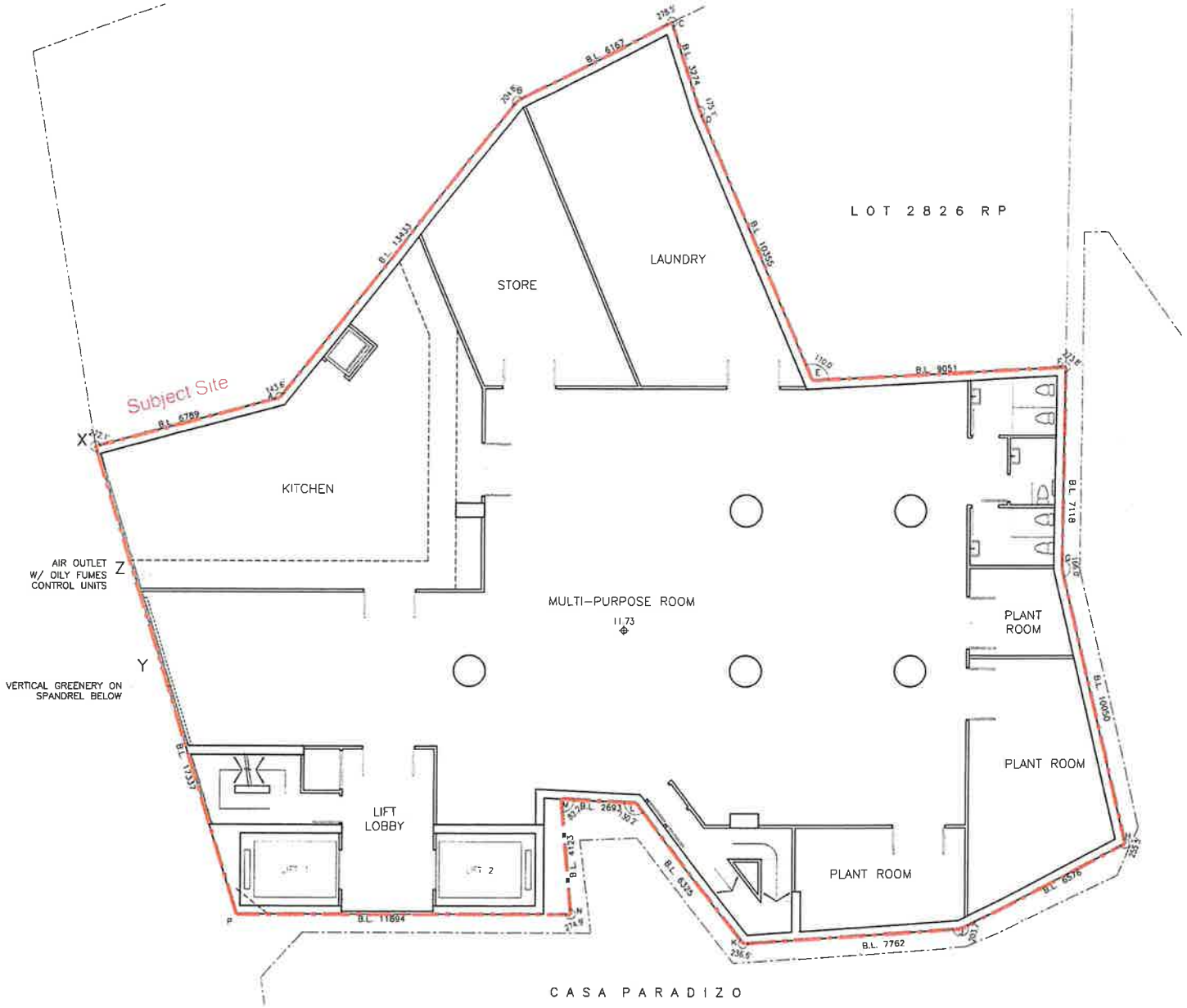
LG/F PLAN
ENTRANCE & CARPARK

G-02 1:150 (A3)

B	OCT. 2022	
A	JULY 2022	

Do not scale drawing.
Contractors are required to verify exact dimensions on site.
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The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified.
This drawing is not for construction purposes unless expressedly certified.

RLEE



N

1 / G-03 UG/F PLAN

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.

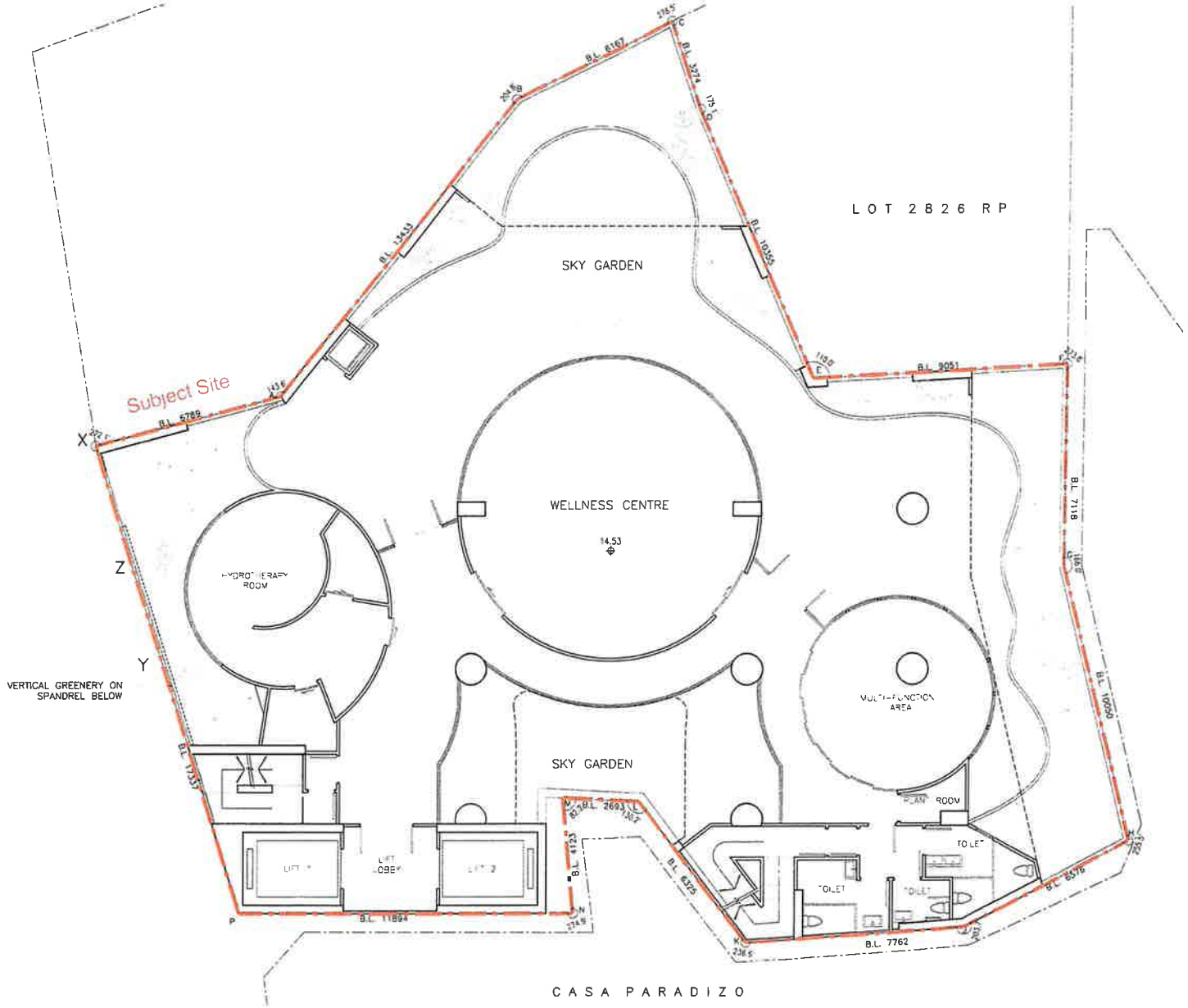
UG/F PLAN
MULTI-PURPOSE ROOMS

G-03 1:150 (A3)

B	OCT. 2022
A	JULY 2022

Do not scale drawing.
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1/F PLAN

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

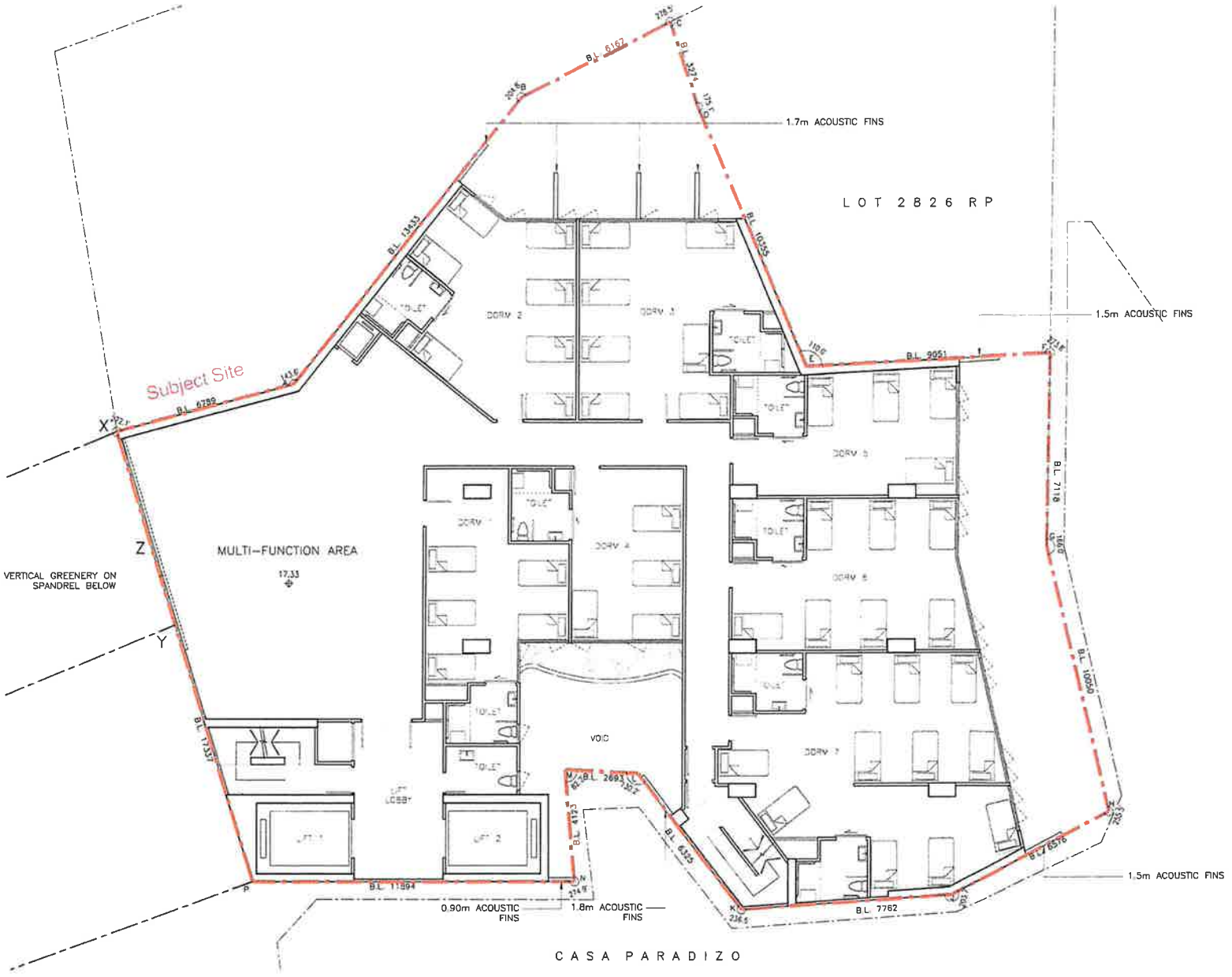
PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY
at 81 SAN TAM ROAD,
YUEN LONG, N.T.

1/F PLAN
WELLNESS CENTRE & SKY GARDEN

G-04 | 1:150 (A3) | B OCT. 2022 | A JULY. 2022

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1/G-05 2/F PLAN

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

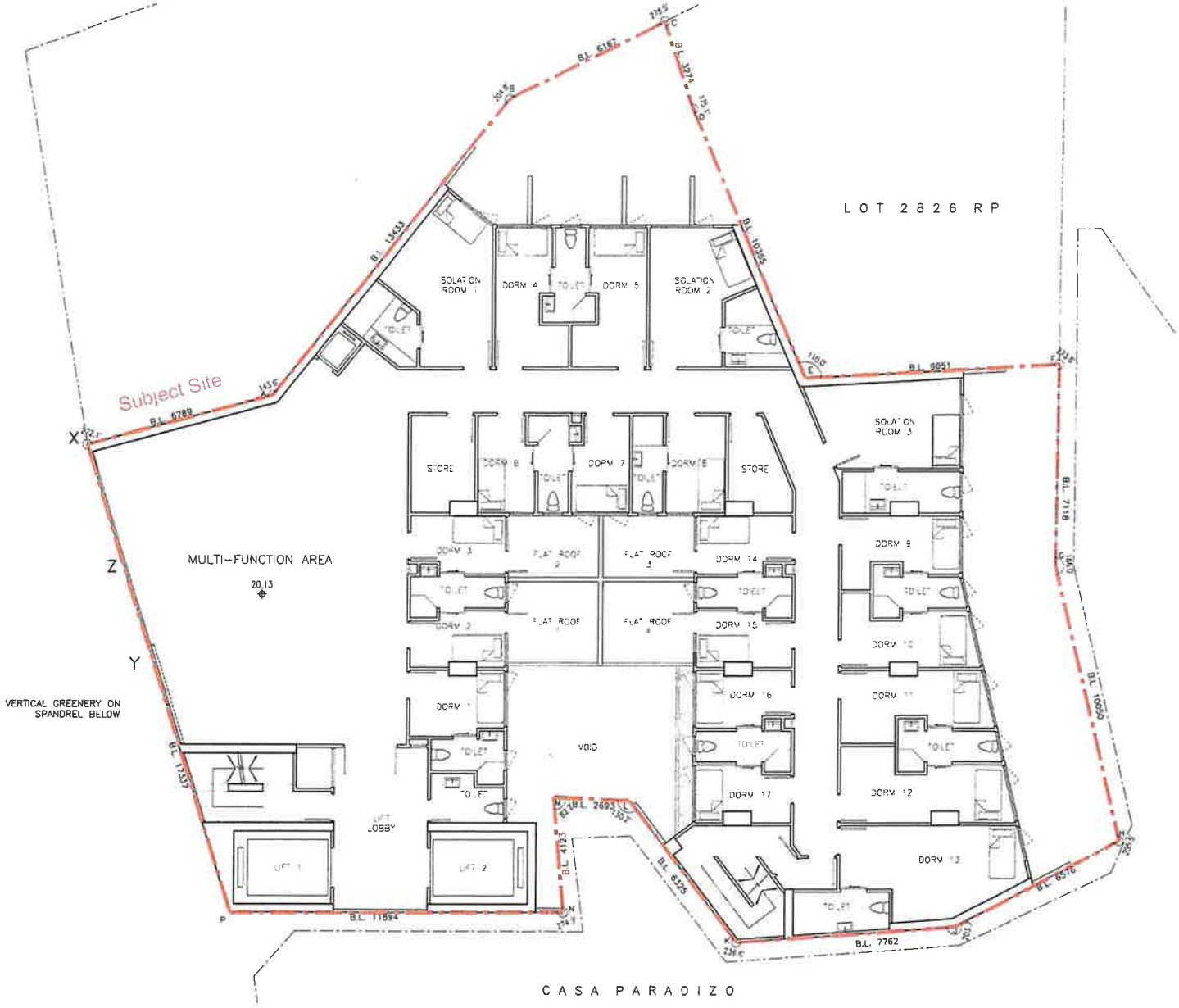
2/F PLAN
RCHE

G-05 1:150 (A3)

B	OCT 2022	
A	JULY 2022	

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N

1 / G-06 3/F PLAN

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

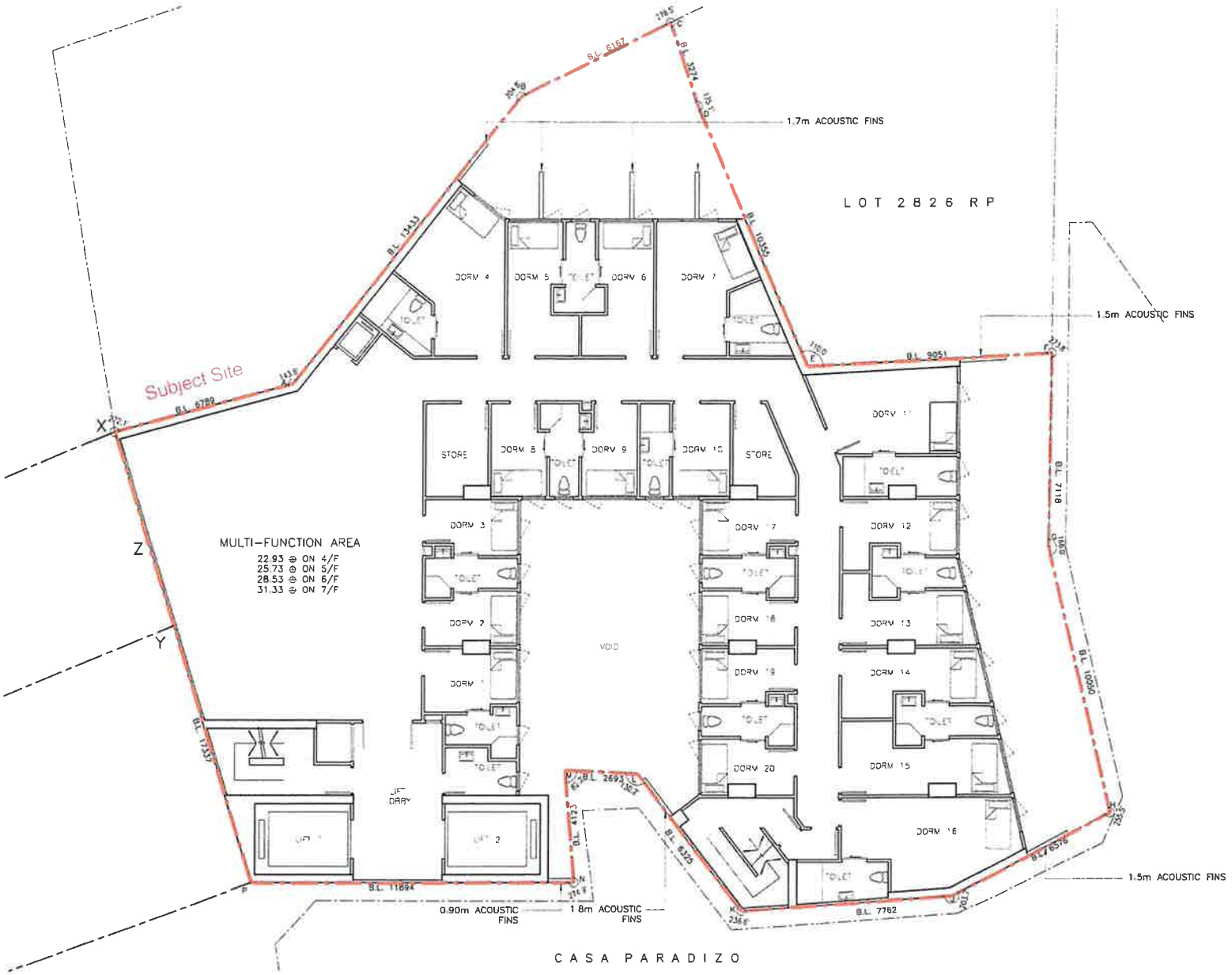
3/F PLAN
RCHE

G-06 1:150 (A3)

B OCT 2022
A JULY 2022

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R-LEE

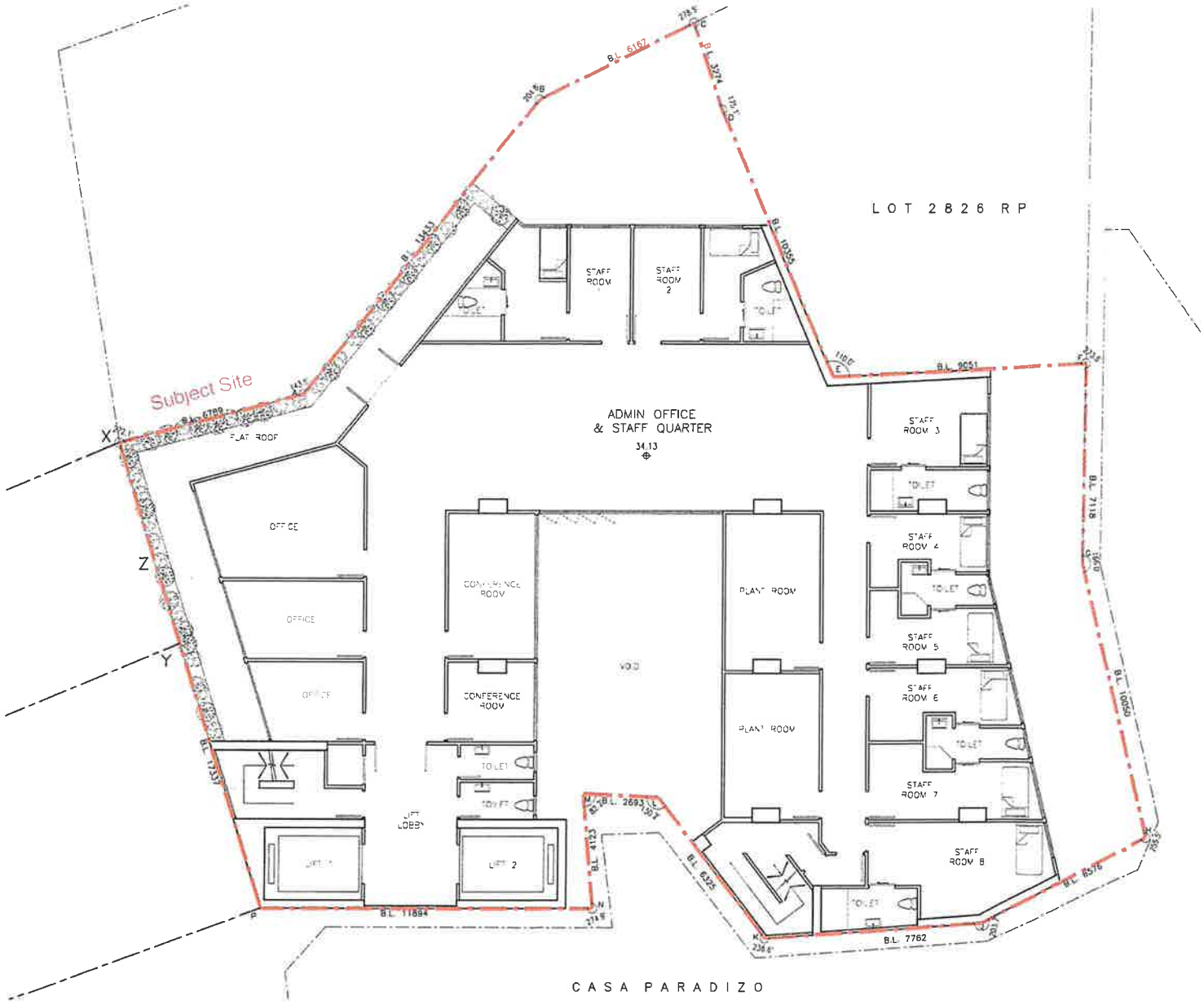


1 G-07 TYPICAL FLOOR PLAN PLAN

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 OCT. 2022 A JULY 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified This drawing is not for construction purposes unless expressedly certified

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1 / G-08 8/F PLAN

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

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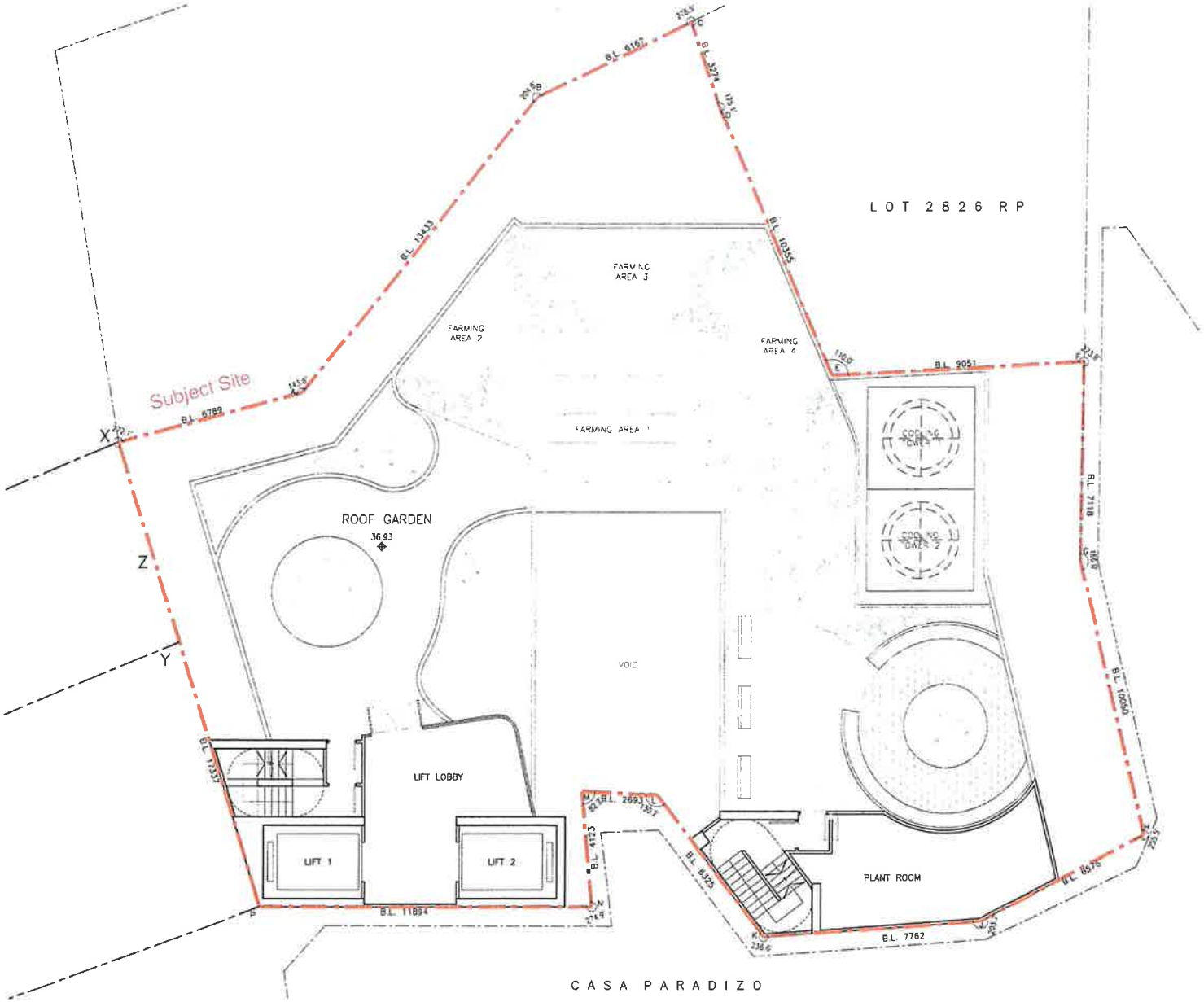
PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY
at 81 SAN TAM ROAD,
YUEN LONG, N.T.

8/F PLAN
ADMIN OFFICE & STAFF QUARTER

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

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N

1 / G-09 ROOF GARDEN PLAN

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.

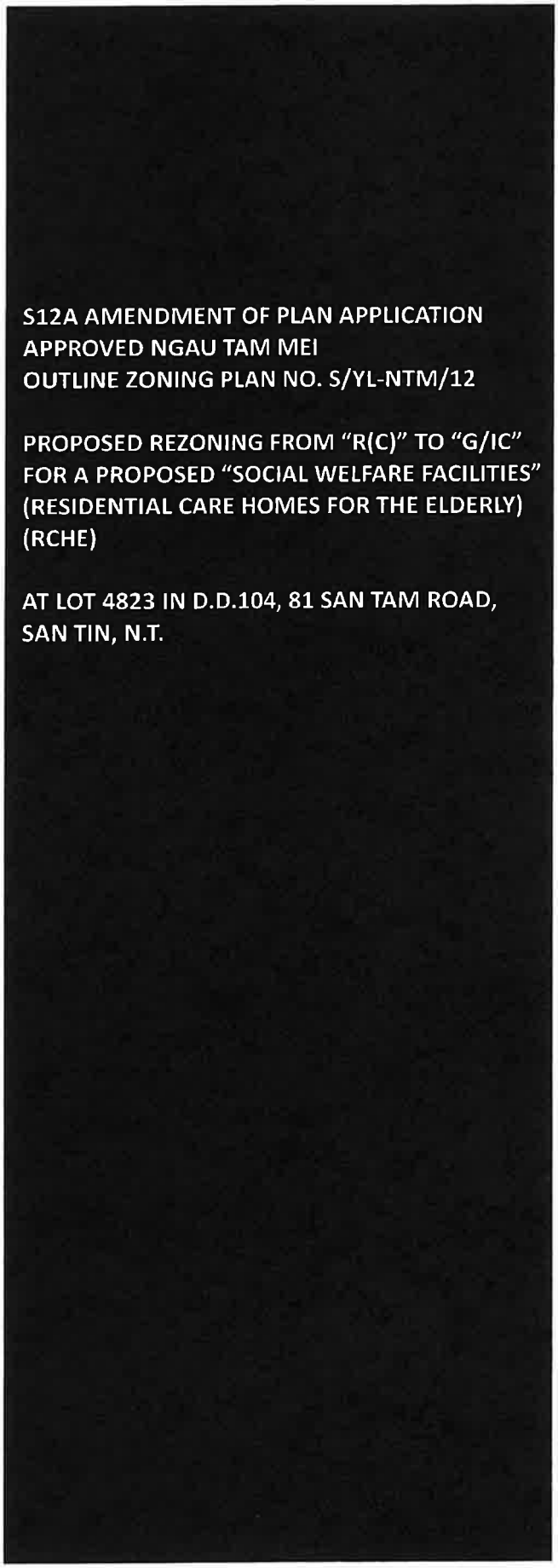
ROOF GARDEN PLAN

G-09 1:150 (A3)

B OCT 2022
A 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.

FIGURE 4
LOCATION OF VIEWPOINTS

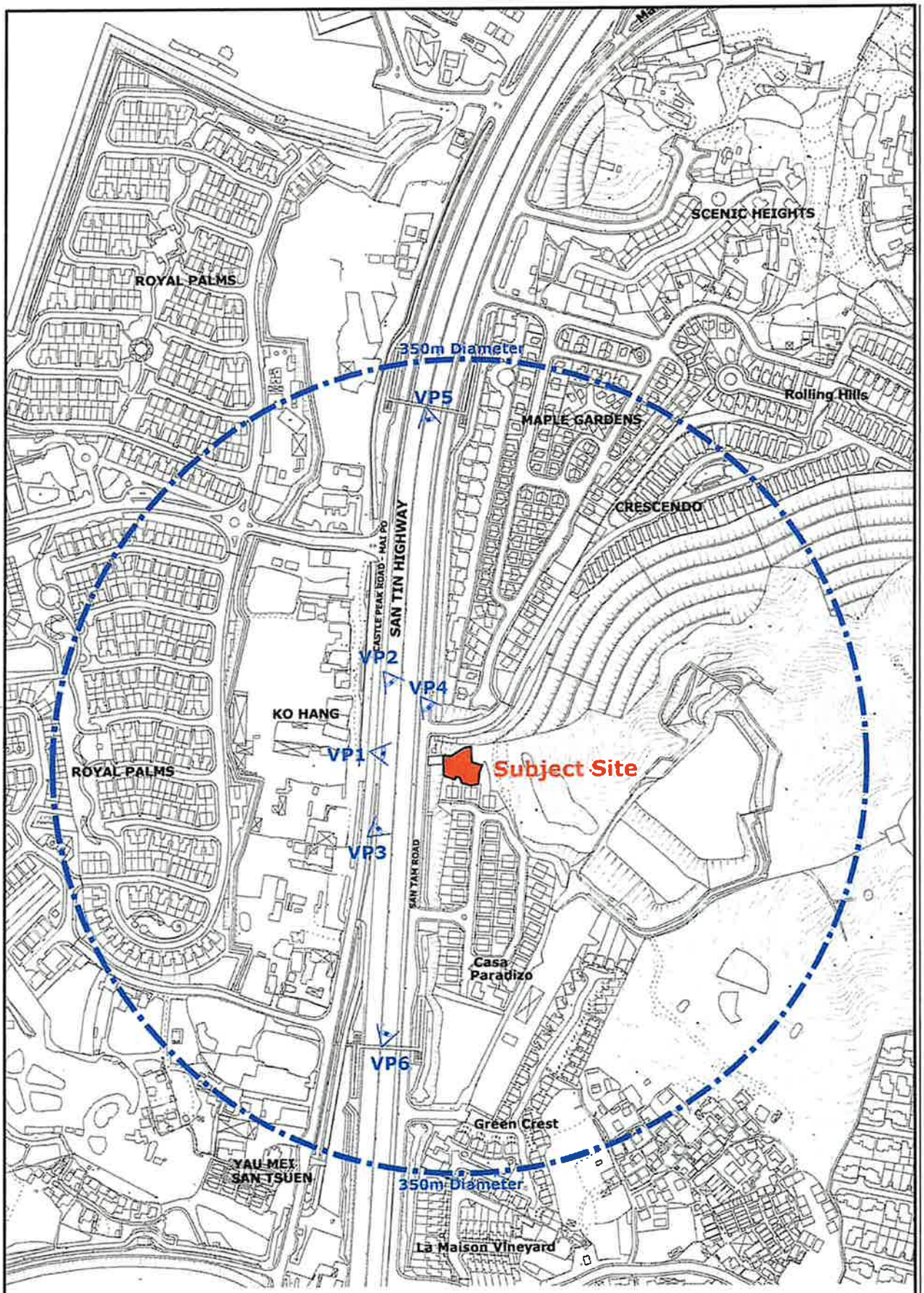
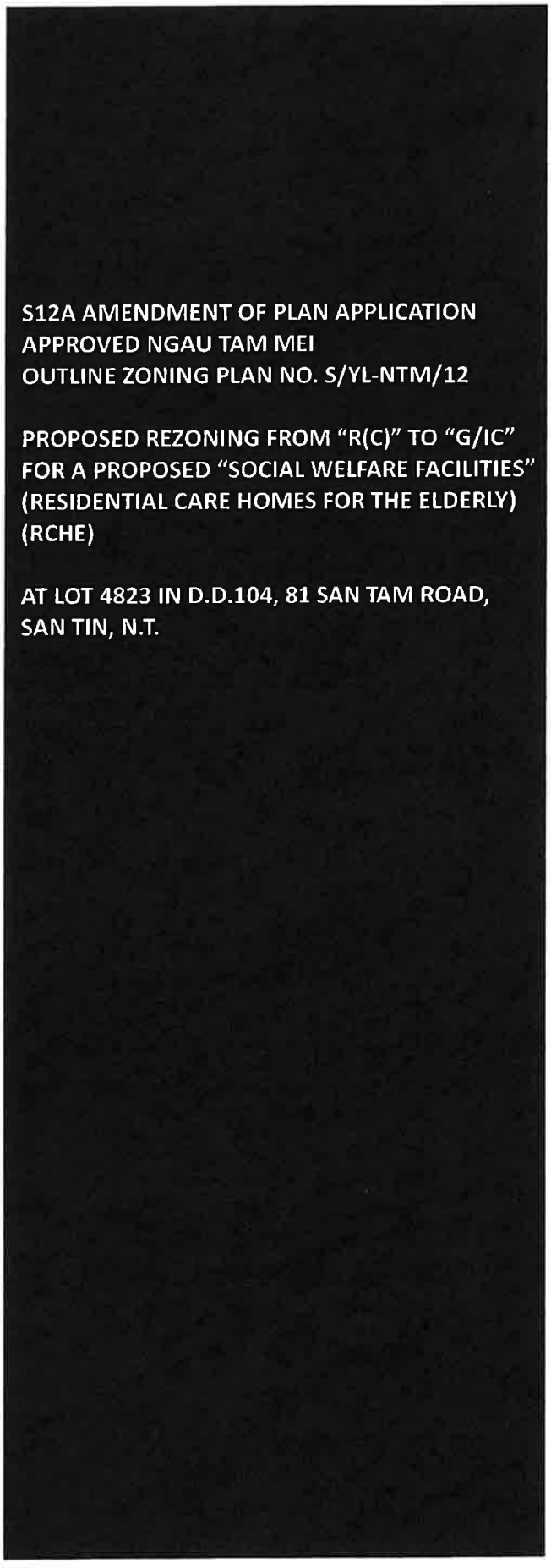


FIGURE NO.	TITLE	SCALE	
4	LOCATION OF VIEWPOINTS	1:4500	
		DATE	JUL 2022

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

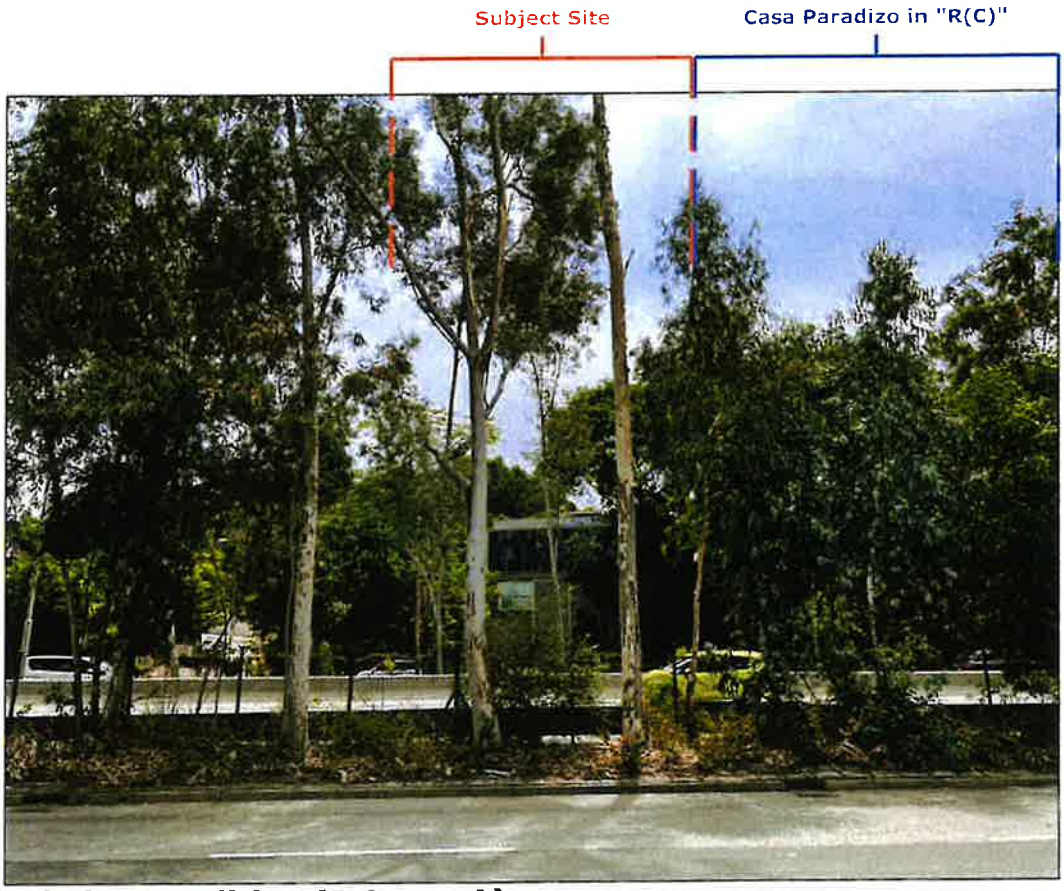
PROPOSED REZONING FROM "R(C)" TO "G/IC"
FOR A PROPOSED "SOCIAL WELFARE FACILITIES"
(RESIDENTIAL CARE HOMES FOR THE ELDERLY)
(RCHE)

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

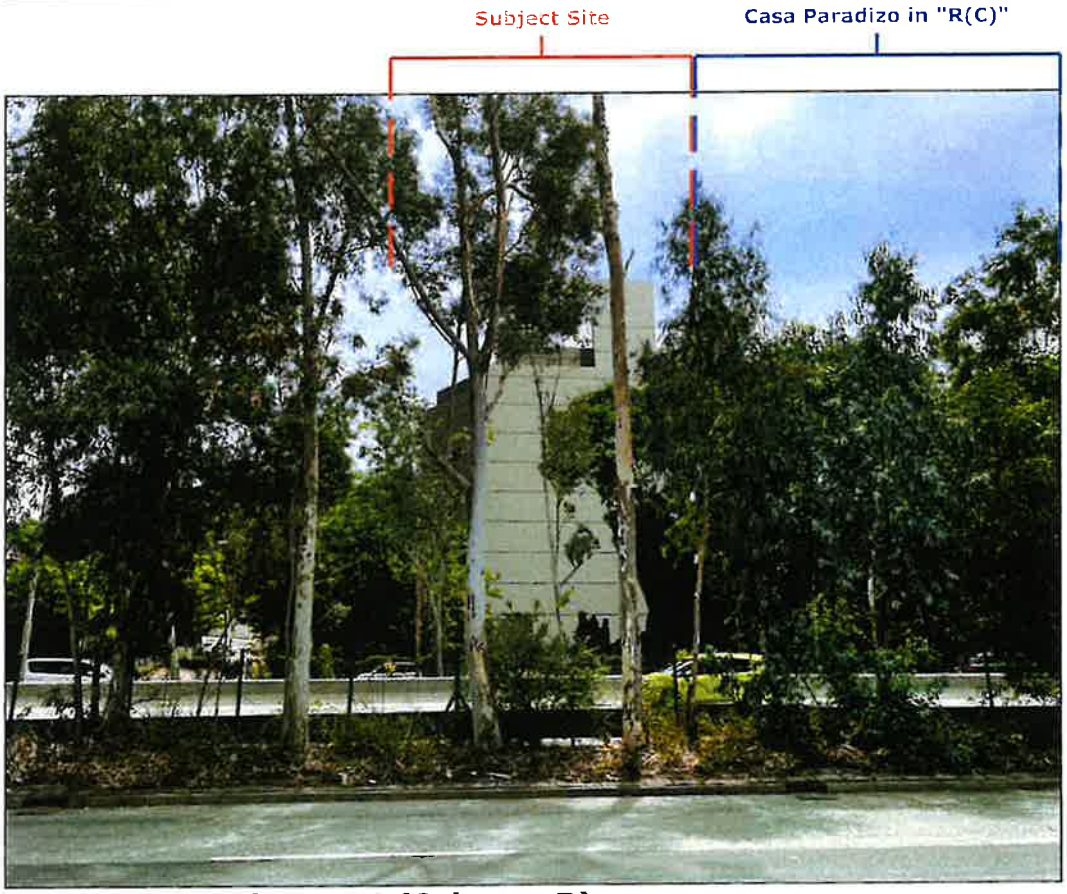
FIGURE 5 to FIGURE 10
VIEWPOINT 1 TO VIEWPOINT 6

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Existing condition (Scheme A)



Proposed development (Scheme B)

FIGURE NO.	TITLE	SCALE	
5	VIEWPOINT 1	N.T.S.	
		DATE	JUL 2022

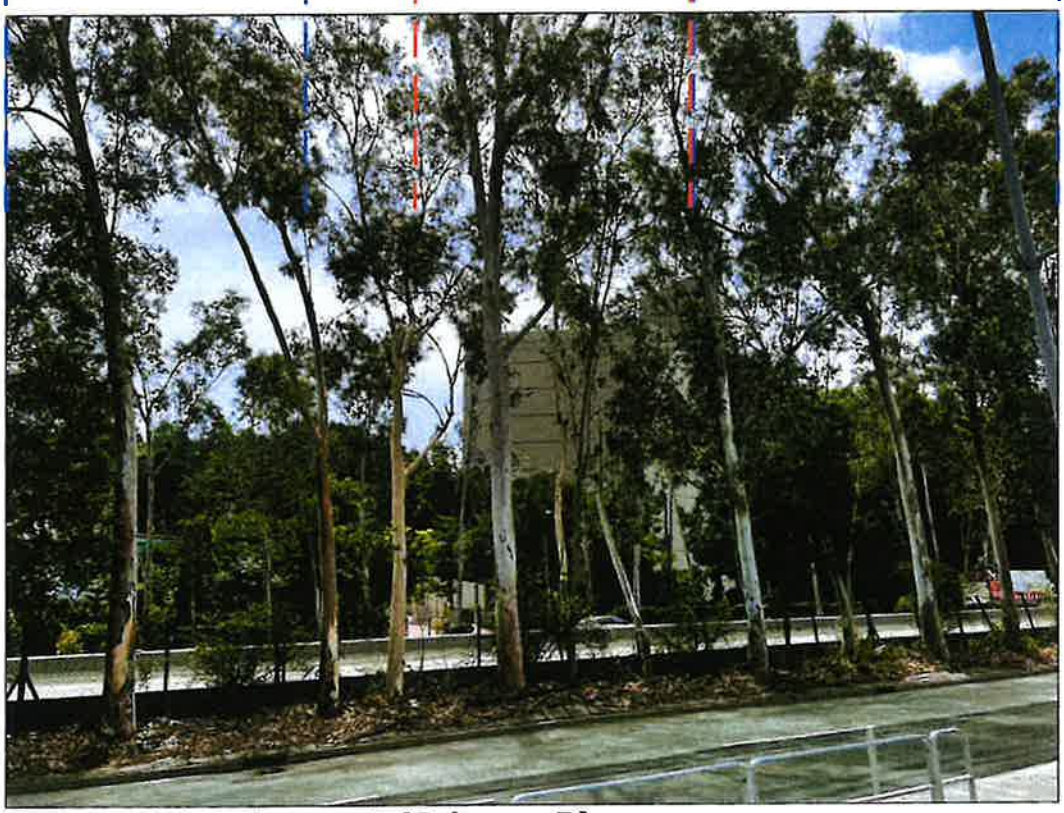
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Maple Garden in "R(C)" | Subject Site | Casa Paradizo in "R(C)"



Existing condition (Scheme A)

Maple Garden in "R(C)" | Subject Site | Casa Paradizo in "R(C)"



Proposed development (Scheme B)

FIGURE NO.	TITLE	SCALE	
6	VIEWPOINT 2	N.T.S.	
		DATE	JUL 2022

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Maple Garden in "R(C)" | Subject Site | Casa Paradizo in "R(C)"



Existing condition (Scheme A)

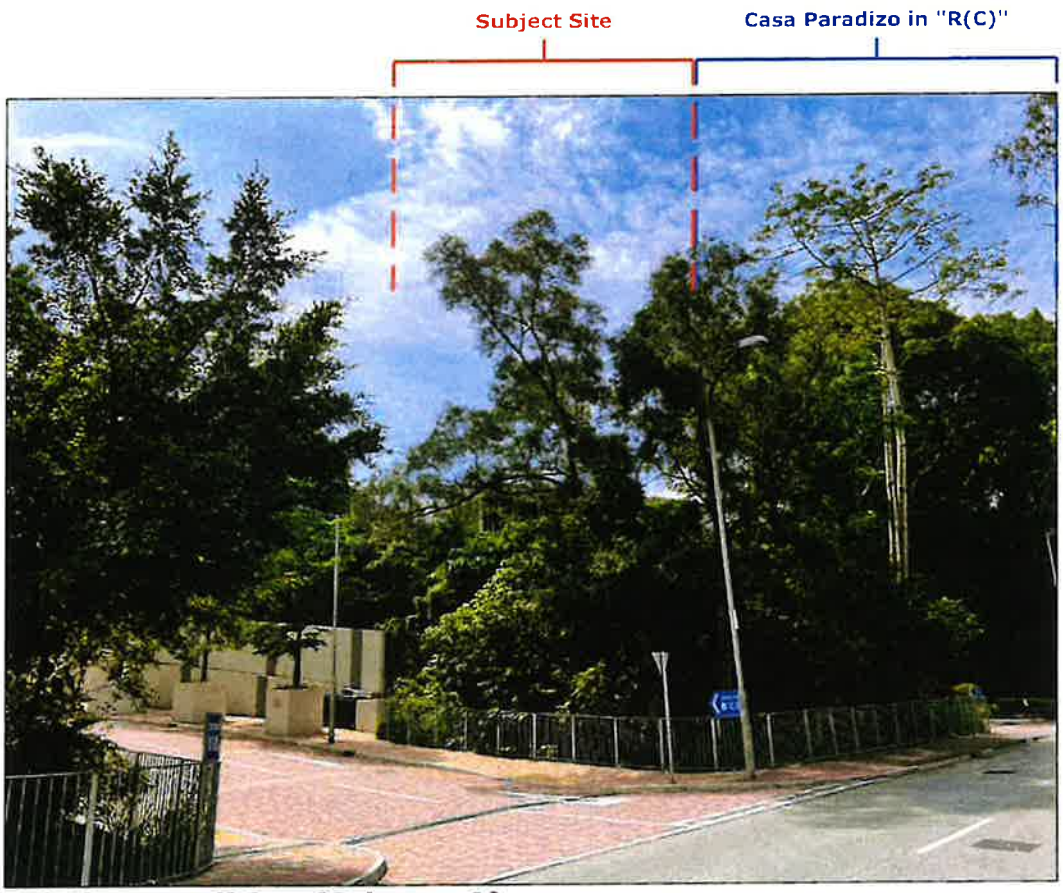
Maple Garden in "R(C)" | Subject Site | Casa Paradizo in "R(C)"



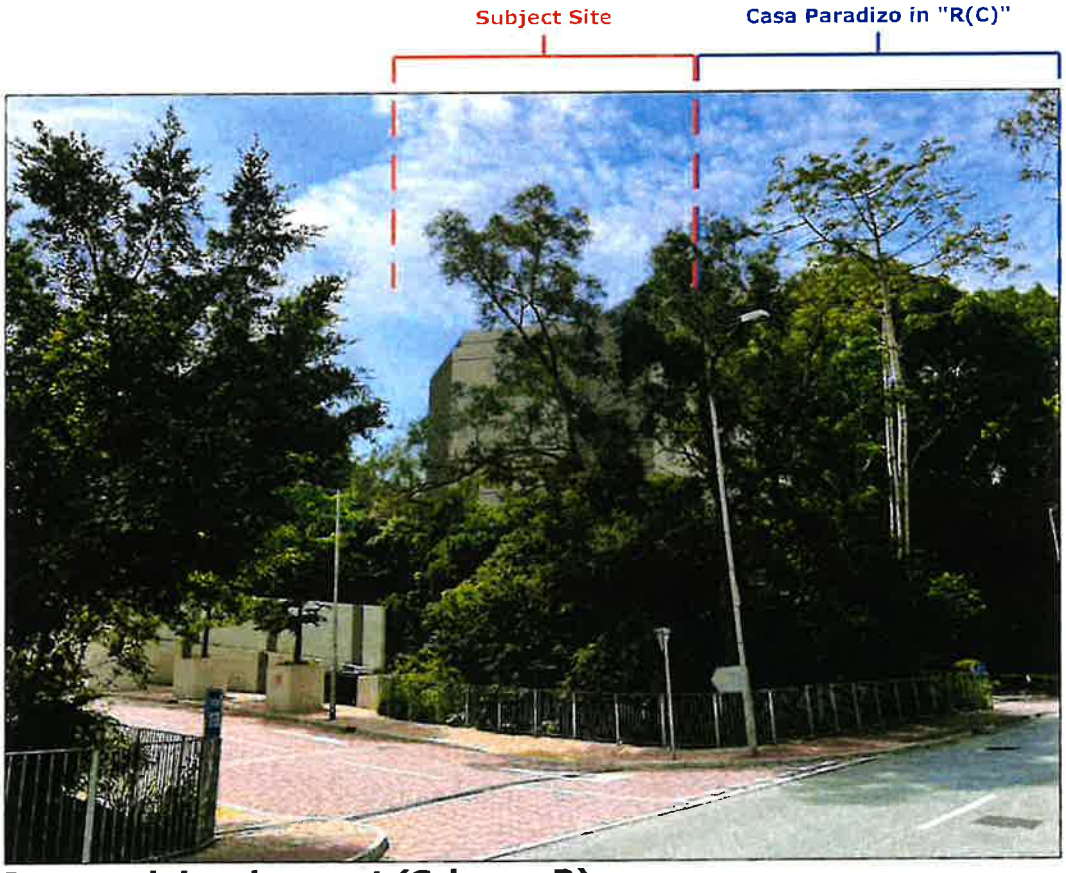
Proposed development (Scheme B)

FIGURE NO.	TITLE	SCALE	
7	VIEWPOINT 3	N.T.S.	
		DATE	JUL 2022

RLEE



Existing condition (Scheme A)



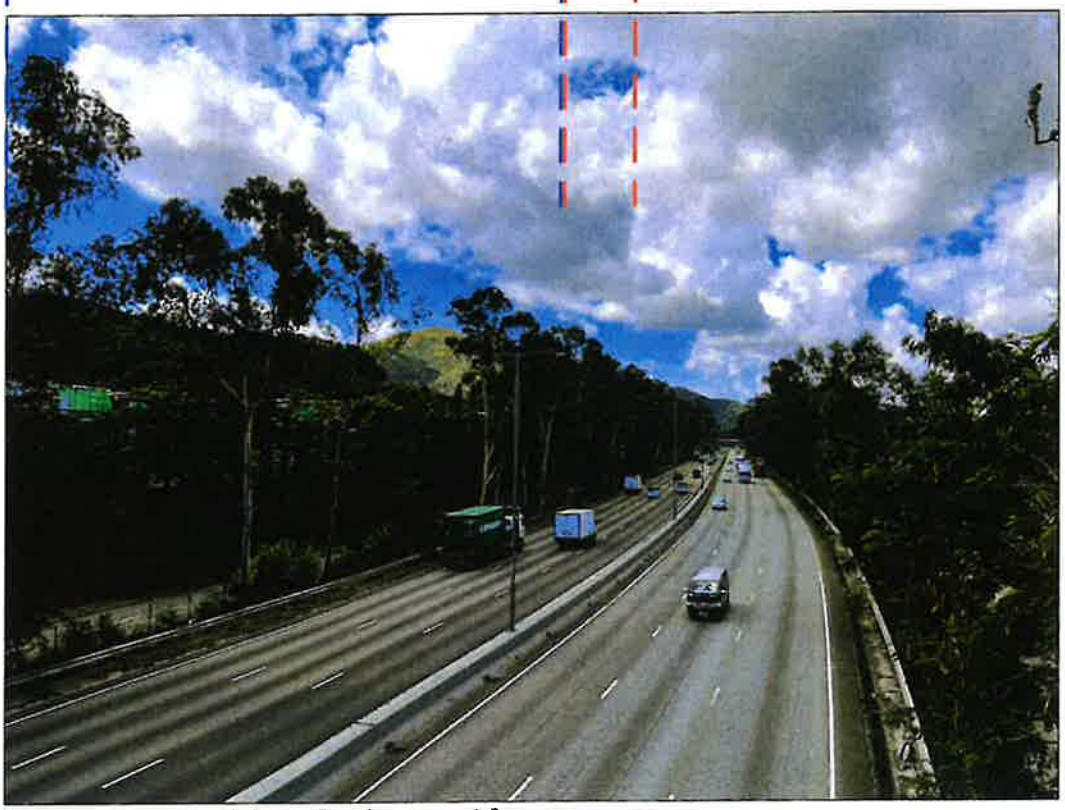
Proposed development (Scheme B)

FIGURE NO.	TITLE	SCALE	
8	VIEWPOINT 4		N.T.S.
		DATE	JUL 2022

RIDE

Maple Garden in "R(C)"

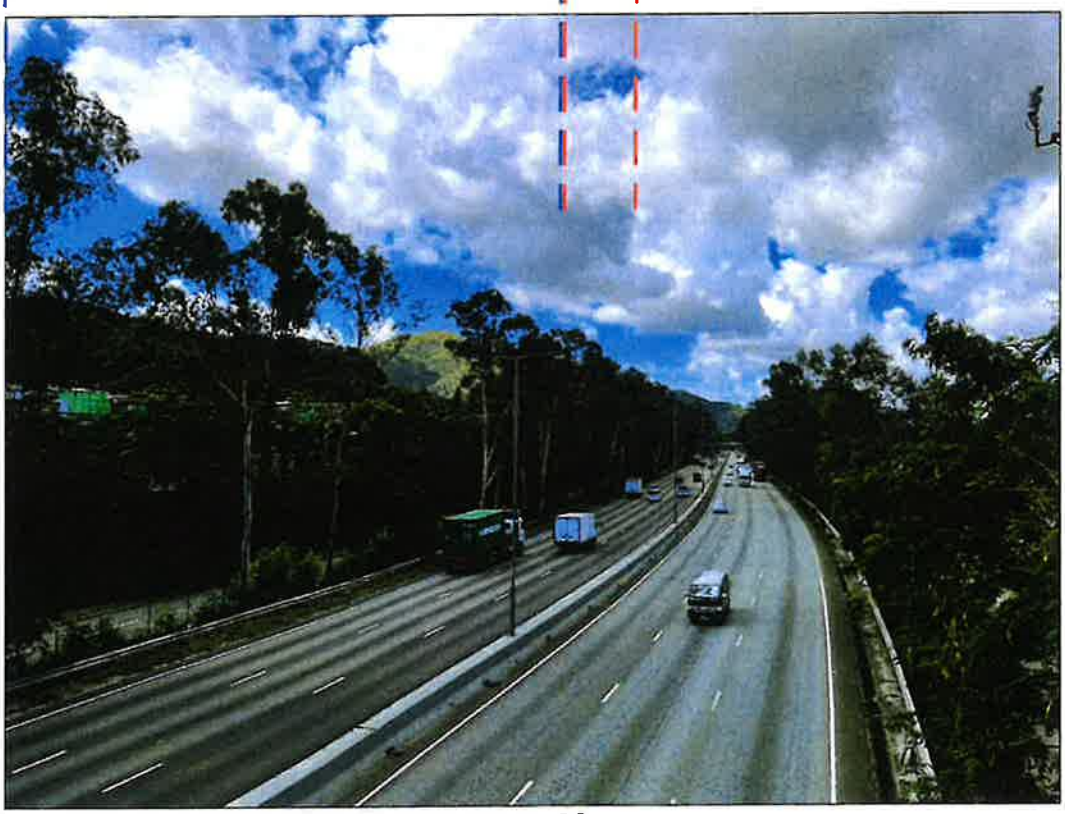
Subject Site



Existing condition (Scheme A)

Maple Garden in "R(C)"

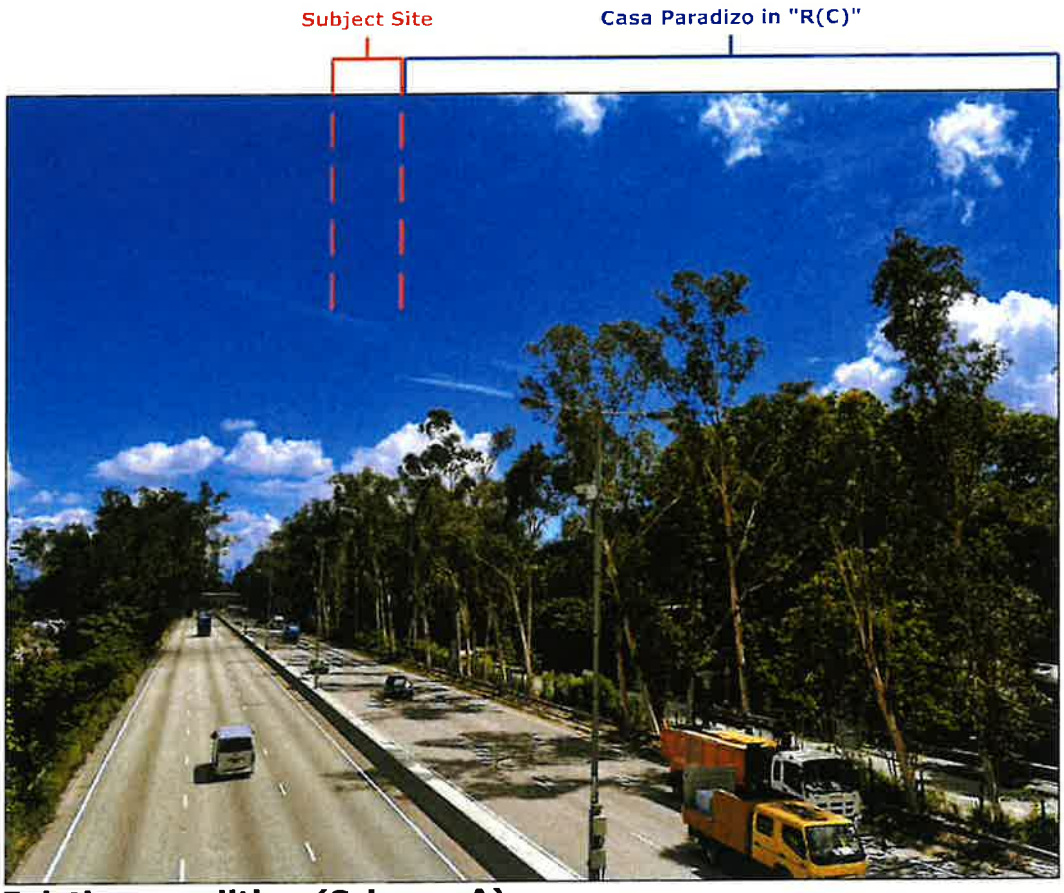
Subject Site



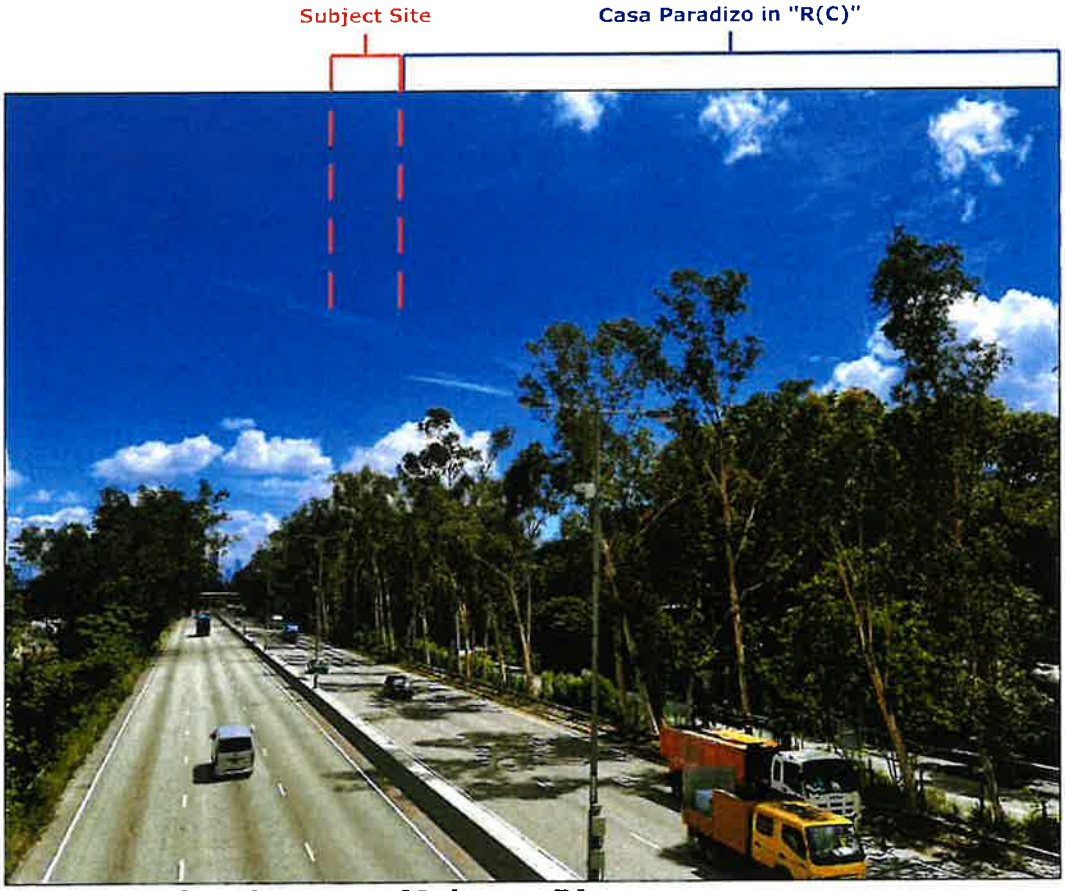
Proposed development (Scheme B)

FIGURE NO.	TITLE	SCALE	
9	VIEWPOINT 5	N.T.S.	
		DATE	JUL 2022

RLE



Existing condition (Scheme A)



Proposed development (Scheme B)

FIGURE NO.	TITLE	SCALE	
10	VIEWPOINT 6	N.T.S.	
		DATE	JUL 2022

RLCE

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

TRAFFIC IMPACT ASSESSMENT

RLEE

RLEE Architects (HK) Ltd

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 DD 104, 81 San Tam Road, San Tin, N.T.

Traffic Impact Assessment

January 2023

CTA Consultants Limited
志達顧問有限公司

LIST OF CONTENTS

1. INTRODUCTION 1
1.1 Background 1
1.2 Study Objectives 1

2. THE PROPOSED DEVELOPMENT 2
2.1 Site Location 2
2.2 Development Proposal 2
2.3 Provision of Internal Transport Facilities 2
2.4 Public Transport Services in the Vicinity 5

3. EXISTING TRAFFIC CONDITION 6
3.1 Existing Road Network 6
3.2 Critical Junctions 6
3.3 Road Link Assessment 8

4. FUTURE TRAFFIC CONDITION & TRAFFIC IMPACT ASSESSMENT 10
4.1 Design Year 10
4.2 Traffic Forecast 10
4.3 Reference Traffic Flow in Year 2030 13
4.4 Traffic Trips of the Proposed Development 16
4.5 Traffic Forecast for Design Year 2030 17
4.6 Operational Assessment 17

5. SUMMARY AND CONCLUSION 21
5.1 Summary 21
5.2 Conclusion 22

Appendix 1 – Junction Calculation Sheets

LIST OF TABLES

Table 2.1	Parameters of the Proposed Development
Table 2.2	Examples of Existing RCHE
Table 2.3	Proposed Provisions of Internal Transport Facilities
Table 2.4	Public Transport Services in the Vicinity
Table 3.1	Identified Critical Junctions
Table 3.3	Operational Performances of Critical Junctions in 2022
Table 3.4	Road Link Assessment in Observed Year 2022
Table 4.1	Historical Traffic Data from Annual Traffic Census (ATC)
Table 4.2	Projected Populations of Selected Tertiary Planning Units
Table 4.3	2019-Based Planning Data from 2019 to 2031
Table 4.4	Planned Development in the Vicinity
Table 4.5	Selected Future Planned Developments for Assessment
Table 4.6	Estimated Traffic Generations & Attractions of the Selected Developments in Vicinity
Table 4.7	In-house Traffic Trip Rates of Proposed Development
Table 4.8	Traffic Trips of the Proposed Development
Table 4.9	Operational Performance of Critical Junctions in Year 2030
Table 4.10	Road Link Assessment in Reference Year 2030
Table 4.11	Road Link Assessment in Design Year 2030
Table 4.12	Operational Performance in 2030 Reference Case ("Without" the Proposed Development) and Design Case – ("With" the Proposed Development) for the Improvement Proposal for Junction F

LIST OF FIGURES

Figure 1.1	Site Location Plan
Figure 2.1	Ground Floor Plan
Figure 2.2	Public Transport Services in the Vicinity
Figure 3.1(Rev.A)	Identified Critical Junctions
Figure 3.2	Existing Junction Layout of San Tam Road / Castle Peak Road – Mai Po (A)
Figure 3.3	Existing Junction Layout of San Tam Road / Access Road (B)
Figure 3.4	Existing Junction Layout of San Tam Road / Ngau Tam Mei Road (C)
Figure 3.5	Existing Junction Layout of San Tam Road / Chun Shin Road (D)
Figure 3.6	Existing Junction Layout of San Tam Road / Chuk Yau Road (E)
Figure RC-01	Existing Junction Layout of Fairview Park Interchange (F)
Figure 3.7(Rev.A)	2022 Observed Traffic Flows
Figure 3.8	Index Plan for Link Flow
Figure 4.1(Rev.A)	Adjacent Development in the Vicinity
Figure 4.2(Rev.A)	2030 Reference Traffic Flows
Figure 4.3(Rev.A)	2030 Design Traffic Flows
Figure RC-02	Proposed Improvement Junction Layout of Fairview Park Interchange (F) under Planning Application No. A/YL-NSW/241

1. INTRODUCTION

1.1 Background

1.1.1 The application site is located at Lot no. 4823 in D.D. 104, San Tin, Yuen Long, New Territories. The site location is shown in **Figure 1.1**.

1.1.2 The applicant intends to convert an existing house to proposed Residential Care Home for the Elderly (RCHE). A Section 12A application to the approved Ngau Tam Mei Outline Zoning Plan S/YL-NTM/12 to rezone the site from "R(C)" to "G/IC" is required.

1.1.3 In support of the aforesaid application, a traffic impact assessment is required to review and appraise any possible traffic impact induced by the proposed development on the adjacent road network.

1.1.4 CTA Consultants Limited (CTA) was therefore commissioned as the traffic consultant to prepare the Traffic Impact Assessment (TIA) and provide technical justifications in supporting the application from traffic engineering point of view.

1.2 Study Objectives

1.2.1 Main objectives of this study are listed below:

- To assess the existing and proposed traffic arrangement & provision of internal transport facilities at the subject site;
- To assess the existing traffic condition in the vicinity of the proposed development;
- To estimate traffic trips related to the proposed development;
- To carry out forecasts about traffic demand of the adjacent road network in design year 2030;
- To appraise any possible traffic impact induced by the proposed development on the adjacent road network;
- To recommend traffic improvement measures to alleviate any foreseeable traffic problem to the surrounding road network, if any.

2. THE PROPOSED DEVELOPMENT

2.1 Site Location

2.1.1 The application site is located at Lots no. 4823 in D.D. 104, San Tin, Yuen Long, New Territories. The site location is shown in **Figure 1.1**.

2.2 Development Proposal

2.2.1 Parameters of the proposed development are listed in **Table 2.1**.

Table 2.1 Parameters of the Proposed Development

	Proposed Scheme
Proposed Use	Residential Care Home for the Elderly (RCHE)
Site Area	About 736.3 m^2
Total Accountable GFA	About 5,400 m^2
No. of Storeys	10
No. of Beds	142

2.2.2 It is anticipated that the proposed development will be completed in year 2027. Therefore, design year 2030 (i.e., 3 years after the planned completion year of the proposed development) is adopted for the Traffic Impact Assessment.

2.3 Provision of Internal Transport Facilities

2.3.1 It is revealed that there is no parking standard for "Residential Home for Elderly" in HKPSG, therefore, the parking provision of other existing RCHEs has been referenced and are summarized in **Table 2.2** below:

Table 2.2 Examples of Existing RCHE

Name of RCHE	Location	No. of beds	No. of Staff	Observed no. of Parking Provision	Parking Facilities[1][2][3] (Category 1/2/3)
Assemblies of God Holy Light Church Aged Home	91 Sung Ching Sun Tsuen, Tai Tong Road, Yuen Long	60	19	Nil	Category 1
Chinese Christian Worker's Fellowship Wah Hei Elderly Home (Comet Mansion	G/F & M/F, Shop 27, Comet Mansion, 45-67 Fung Cheung Road, Yuen Long	105	29	Nil	Category 1
Pok Oil Hospital Jockey Club Care and Attention Home	Lot 1392 & 837 R.P. in D.D. 115, Au Tau, Yuen Long	213	124	Nil	Category 2
Po Leung Kuk Tin Yan Home for the Elderly cum Green Joy Day Care Centre for the Elderly	3/F and 4/F, Ancillary Facilities Block, Tin Yan Estate, Tin Shui Wai	106	74	Nil	Category 2
Yan Oi Tong Tin Ka Ping Care and Attention Home	G/F & 1/F, Wah Ping House, Long Ping Estate, Yuen Long	85	51	Nil	Category 2
T.W.G.Hs. Y. C. Liang Memorial Home for the Elderly	G/F & 1/F, Yiu Yat House, Tin Yiu Estate, Tin Shui Wai	88	47	Nil	Category 1
Caritas Ying Shui Home	3/F, Ying Shui House, Shui Pin Wai Estate, Yuen Long	75	47	Nil	Category 2
Salvation Army Kam Tin Residence for Senior Citizens (The)	103 Kam Tin Road, Yuen Long	150	81	1 car parking space + 1 light bus parking spaces	Category 3
Pok Oi Hospital Yeung Chun Pui Care and Attention Home	58 Sha Chau Lei Tsuen, Ha Tsuen, Yuen Long	143	92	2 car parking spaces + 1 light bus parking spaces	Category 3
Pok Oi Hospital Tai Kwan Care & Attention Home	G/F-3/F & KW307, Shui Kwok House, Tin Shui Estate, Tin Shui Wai, Yuen Long	109	75	Nil	Category 2
Ching Chung Taoist Association of Hong Kong Limited Ching Chung Care and Attention Home for the Aged	57 Sha Chau Lei Chuen, Ping Ha Road, Yuen Long	120	61	1 car parking space + 1 light bus parking spaces	Category 3

Notes:

(1) Category 1 refers to homes with nil provision of car parking spaces within the Site and no public car parking spaces can be found in the close proximity.

(2) Category 2 refers to homes with nil provision of car parking spaces within the Site but may use the public car parking spaces of nearby car park.

(3) Category 3 refers to homes with provision of car parking spaces within the Site.

Proposed Internal Transport Facilities Provision

2.3.2 With reference to **Table 2.2** above, only one to two private parking spaces are provided by other RCHE. Taking reference to Salvation Army Kam Tin Residence for Senior Citizens, it has 1 car parking space and 1 light bus parking spaces for 150 beds are sufficient for their daily operation needs. Taking into consideration that 142 beds will be provided in our proposed development, the parking provision should be sufficient for the daily operation needs of the proposed development. The internal transport facilities provisions are proposed and summarized as **Table 2.3** below:

Table 2.3 Proposed Provisions of Internal Transport Facilities

Type	Proposed Dimensions	Proposed Number of Spaces
Private Car	5m(L) x 2.5m(W) x 2.4m(H)	1
Private Cars for Disabilities	5m(L) x 3.5m(W) x 2.4m(H)	1
Minibus	8m(L) x 3m(W) x 3.6m(H)	1
Light Goods Vehicle (LGV)	7m(L) x 3.5m(W) x 3.6m(H)	1
Motorcycle	2.4m(L) x 1m(W) x 2.4m(H)	1

Note:

The provision of PV parking space for disabilities is determined by referring to "Parking for persons with disabilities" stipulated in the latest HKPSG that 1 accessible parking space should be provided for 1-50 parking spaces

2.3.3 The ground floor layout plan of the proposed development showing the proposed internal transport provision is shown in **Figures 2.1 (Rev.A)**.

2.4 Public Transport Services in the Vicinity

2.4.1 Numerous road-based public transport services, for instance, franchised buses and GMB are also provided in vicinity of the proposed development. Details of the current services of franchised buses and GMB routes within the catchment area of 500 meters are listed in **Table 2.4** and shown in **Figure 2.2**.

Table 2.4 Public Transport Services in the Vicinity

Service	Route	Origin - Destination	Frequency (mins)
Franchised Bus	76K	Sheung Shui (Ching Ho) – Long Ping Estate	20 - 30
GMB	76	Yuen Long (Fook Hong Street) – Siu Hom Tsuen	15 - 20
	75	Yuen Long (Fook Hong Street) – Ha Wah Tsuen	15 - 20
	37	Yuen Long (Fook Hong Street) – Yau Tam Mei Village Office	12 - 15

3. EXISTING TRAFFIC CONDITION

3.1 Existing Road Network

3.1.1 The existing road network in the vicinity of the proposed development with critical junctions is illustrated diagrammatically in **Figure 3.1**. The proposed development will be mainly served by San Tam Road.

3.1.2 San Tam Road is an undivided two-lane two-way rural road. It is the major road connecting Castle Peak Road – Mai Po and San and Tin Highway.

3.2 Critical Junctions

3.2.1 Five junctions are identified to be critical for the Traffic Impact Assessment due to the proposed development. Relevant details are listed in **Table 3.1** and shown in **Figure 3.1**. Existing junction layouts are shown in **Figures 3.2** to **Figure 3.6,** and **Figure RC-01** respectively.

Table 3.1 Identified Critical Junctions

Ref.	Junction	Type	Figure No.
A	San Tam Road / Castle Peak Road – Mai Po	Priority	3.2
B	San Tam Road / Access Road	Priority	3.3
C	San Tam Road / Ngau Tam Mei Road	Priority	3.4
D	San Tam Road / Chun Shin Road	Priority	3.5
E	San Tam Road / Chuk Yau Road	Priority	3.6
F	Fairview Park Interchange	Roundabout	RC-01

3.2.2 In order to study the existing traffic condition of the above critical junctions, traffic survey in the form of manual-classified count was carried out during the Weekday AM and PM peak periods on a typical weekday on 13 June 2022 from 07:30AM to 09:30AM and 17:30PM to 19:30PM respectively. The survey provides most up-to-date details of the traffic condition within the study area. Based on the observed traffic flows, it reveals

that Weekday AM peak hour occurred from 08:15AM to 09:15AM, and PM peak hour occurred from 17:30PM to 18:30PM.

3.2.3 Due to effect of COVID-19, the surveyed traffic flows may be much less that of the normal conditions. The COVID-19 factor has been derived by comparing the selected ATC core station with the ATC 2015-2019 record flow as shown in **Table RC-1**. A percentage of 1.33% per annum is found and applied to ATC 2019 record flows to generate a year 2021 reference flows as shown in **Table RC-2**.

Table RC-1 Historical Traffic Data from the ATC

Station	Road Name	2015	2016	2017	2018	2019	2015 to 2019
5016	San Tin Highway, Castle Peak Road & San Tam Road	86,180	92,230	90,650	86,230	90,860	1.33%

Table RC-2 Comparison of 2021 Reference Flows and ATC 2021 Record Flow

Station	Road Name	ATC 2019 Record Flow	2021 Reference Flows (2019ATC Record Flow x 1.33%)	ATC 2021 Record Flow
5016	San Tin Highway, Castle Peak Road & San Tam Road	90,860	93,295	86,620

3.2.4 To compare with 2021 reference flows with ATC 2021 record flows and hence the COVID-19 factor of 1.08 is adopted and applied to 2022 existing traffic flows, e.g.:

COVID-19 factor:
2019 ATC record flow x adopted growth factor from 2015-2019 ATC record flow /2021 ATC record flow =1.08

3.2.5 The 2022 traffic flows are presented in **Figure 3.7 (Rev.A)**. The operational performances of the critical junctions are listed in **Table 3.3** below.

Table 3.3 Operational Performances of Critical Junctions in 2022

Ref.	Junction	Method of Control	Year 2022 DFC (1)	
			AM Peak	PM Peak
A	Castle Peak Road - Mai Po / San Tam Road	Priority	0.20	0.22
B	San Tam Road / Access Road	Priority	0.03	0.03
C	San Tam Road / Ngau Tam Mei Road	Priority	0.33	0.38
D	San Tam Road / Chun Shin Road	Priority	0.09	0.08
E	San Tam Road / Chuk Yau Road	Priority	0.56	0.43
F	Fairview Park Interchange	Roundabout	0.80	0.79

Note:

(1) DFC = Design Ratio of Flow to Capacity for Priority Junction/Roundabout

3.3 Road Link Assessment

3.3.1 Apart from junction capacity assessment, road link assessments were also carried out for the identified road links as illustrated in **Figure 3.8.** Performance of these road links were assessed in terms of traffic volume/ capacity (V/C) ratio and the results are presented in **Table 3.4**.

Table 3.4 Road Link Assessment in Observed Year 2022

Road Section	Index	Direction	Capacity (pcu/hr) (C)(1)(2)	AM Peak		PM Peak	
				Flow (pcu/hr) (V)	Flow / Capacity (V/C)	Flow (pcu/hr) (V)	Flow / Capacity (V/C)
San Tam Road (Between Junction A and Junction B)	LA	Two-way	1,332	205	0.15	230	0.17
San Tam Road (Between Junction B and Junction C)	LB	Two-way	1,332	270	0.20	270	0.20

San Tam Road (Between Junction C and Junction D)	LC	Two-way	1,332	535	0.40	560	0.42
San Tam Road (Between Junction D and Junction E)	LD	Two-way	1,332	600	0.45	595	0.45

Notes:

(1) Reference has been made to the TPDM Volume 2 Chapter 2.4 for the lane capacity.
(2) PCU factor of 1.2 has been applied to the calculation of the Lane capacity.

3.3.2 The junction assessment and road link assessment results in **Table 3.3** and **Table 3.4** indicate that all critical junctions and critical links are at present operating with ample capacities during the AM and PM peak hours.

4. FUTURE TRAFFIC CONDITION & TRAFFIC IMPACT ASSESSMENT

4.1 Design Year

4.1.1 It is anticipated that the proposed development would be completed in 2027 tentatively. In order to assess the possible traffic impacts to the local road network due to the proposed development, year 2030 (i.e., 3 years after completion) has been adopted as the design year for this study.

4.2 Traffic Forecast

4.2.1 To estimate the reference traffic flow in year 2030 (without the proposed development) in the local road network, an appropriate growth factor was identified for the area in the first instance. The following approaches have been adopted to derive the growth factor for the traffic assessment.

Historical Trend

4.2.2 Numerous traffic-count stations are located in the vicinity of the proposed development. The traffic counts reported in the Annual Traffic Census (ATC), which is published by Transport Department, over a period of five years, i.e., 2015 to 2020 are summarized in **Table 4.1**.

Table 4.1 Historical Traffic Data from Annual Traffic Census (ATC)

ATC Stn.	Road Name	Annual Average Daily Traffic (AADT)						Avg. Annual Growth Rate (2015-2019)
		2015	2016	2017	2018	2019	2020	
5016	San Tin Highway, Castle Peak Rd & San Tam Rd (From Kam Tin Road to Fairview Park Boulevard)	86,180	92,230	90,650	86,230	90,860	81,870	1.33%

5257	Castle Peak Rd - Tam Mi,Mai Po & San Tin (From Fairview Paark Boulevard to Lok Ma Chau Road)	10,510 *	10,940 *	10,770 *	11,980	11,910	11,420 *	3.18%
5297	San Tam Rd (From Castle Peak Road - Mai Po to Fairview Park Boulevard RA)	6,140 *	6,400 *	6,300 *	8,540	7,530	7,220 *	5.23%
5505	San Tam Road (From Fairview Park Boulevard RA to End)	12,090	12,590*	12,390*	12,700*	13,330	13,420	2.47%
5508	San Tin Highway (From Fairview Park Boulevard to Lok Ma Chau Road)	85,910	90760*	90,110*	92,980*	80,460	82,010	-1.63%
Total		**200,830**	**212,920**	**210,220**	**212,430**	**204,090**	**195,940**	**0.40%**

Notes:
1.*AADT estimated by Growth factor
2. Due to Covid-19, the data for 2020 are considered not accurate and not included.

Planning Data

4.2.3 Reference has also been made to the "Projections of Population Distribution 2019-2029" published by Planning Department's Working Group on Population Distribution Projections. The annual growth rates of the Tertiary Planning Units in the vicinity are summarized in **Table 4.2**.

Table 4.2 Projected Populations of Selected Tertiary Planning Units

Tertiary Planning Units (TPU)	Projected Population		Annual Average Growth Rate (2019-2025)
	2019	2025	
543&546	4,300	5,000	2.55%
544	3,000	3,000	0.00%
541	19,400	18,200	-1.60%
542	13,800	14,100	0.36%
525	1,400	1,600	2.25%

526	11,200	12,400	1.71%
Total	**53,100**	**54,300**	**0.37%**

4.2.4 Reference has also been made to the latest 2019-Based Territorial Population Employment Data Matrices (TPEDM) planning data published by the Planning Department for projection of population and employment within the study district. The average annual growth rates in terms of population and employment from 2019 to 2031 are tabulated in **Table 4.3**.

Table 4.3 2019-Based Planning Data from 2019 to 2031

Yuen Long				
Data	**Year**			**Average Annual Growth Rate (2019-2031)**
	2019	**2026**	**2031**	
Population	175,150	172,350	159,850	-0.76%
Employment	68,100	70,700	70,250	0.26%
Total	**243,250**	**243,050**	**230,100**	**-0.46%**

Adopted Growth Rate

4.2.5 A.A.D.T. of ATC indicates that the traffic flow of the local road network has an average annual growth rate of +0.40% from year 2015 to year 2019.

4.2.6 The population projections of selected Tertiary Planning Units show that an annual growth rate of 0.37% is expected in the study area.

4.2.7 Whilst, the planning data indicates that the population and employment of the study area are expected to grow with an average annual growth rate of -0.46%.

4.2.8 As a conservative approach, annual growth rate **+1% p.a.** is adopted for this traffic impact assessment. It is deemed sufficient to allow for any unexpected future growth as a result of some changes in land use or development in the study area.

4.3 Reference Traffic Flow in Year 2030

4.3.1 The year 2030 reference traffic flow is estimated by applying the adopted growth rate to the year 2022 surveyed traffic flow.

Planned Developments in the Vicinity

4.3.2 To fully reflect the traffic growth that would contribute to the adjacent road network, latest planning data has been obtained from Planning Department. The future planned developments in the vicinity provided and agreed by Planning Department are summarized in below **Table 4.4**.

Table 4.4 Planned Developments in the Vicinity

Application No.	Type	Key Development Parameters[1]
Ongoing S12A Applications in the Vicinity[1]		
Y/YL-NTM/5	Residential	1,980 residential units
Y/YL-NTM/6	Residential	• 1,990 residential units • 6,485m^2 commercial GFA
Y/YL-NTM/7	Residential	• 12,575 residential units • 39,265m^2 commercial GFA • Neighbourhood Elderly Centre (NEC) • Child Care Centre (CCC)
Y/YL-MP/6	Residential	• 3,090 residential units • 2,363m^2 retail GFA • 6-classroom kindergarten • 100-place RCHE • Neighbourhood Elderly Centre (NEC)
Y/YL-ST/1	Residential	• 2,075m^2 Retail GFA • 4,176 residential units • 100-place child care centre • 6-classroom kindergarten
Y/YL-NSW/7	Residential	• 900m^2 Retail GFA • 1,997 residential units • 4-classroom kindergarten • 100-place child care centre
Y/YL-NTM/8	Residential	• 6,276 residential units • 67,000m^2 GFA for GIC facilities
Y/YL-MP/6	Residential	3,090 residential units
Y/YL-MP/7	Residential	1,228 residential units

Y/YL-MP/8	Residential	1,249 residential units
Y/YL-NSW/8	Residential	• 6,825 residential units • 750m² retail GFA • 4 nos. of GIC facilities - 1 no. of NEC - 100-place CCC - 100-place RCHE - 80-place Day Care Centre for Elderly
Y/YL-NSW/9	Residential	• 3,115 residential units • 6,000m² Retail GFA • 1 Primary school • 3 Kindergartens • 1 relocated soy sauce factory
Approved S16 Applications in the Vicinity(1)		
A/YL-MP/247	Residential	Domestic GFA about 16,200m² for 105 houses
A/YL-MP/287	Residential	Domestic GFA about 7,540m² for 65 houses
A/YL-NSW/274	Residential	Domestic GFA about 70,328m² for 1,518 flats
A/YL-NTM/178-2	Residential	Domestic GFA about 45,197m² for 300 houses
A/YL-MP/291	Residential	268 houses
A/YL-NSW/241	Retail	37,171 m² retail GFA

Note:

(1) Information provided and agreed by Planning Department on email dated 23 December 2022.

4.3.3 Given the information listed out in **Table 4.4**, traffic trips generation of the future planned developments have been taken into consideration based on the completion year of the planned developments. Therefore, the future planned developments that have been included in the assessment of 2030 Reference traffic flow are listed out in **Table 4.5** and diagrammatically shown in **Figure 4.1 (Rev.A)**.

Table 4.5 Selected Future Planned Developments for Assessment

Application No.	Type	Key Development Parameters(1)
Ongoing S12A Applications in the Vicinity(1)		
Y/YL-NTM/6	Residential	• 1,990 residential units • 6,485m² commercial GFA
Approved S16 Applications in the Vicinity(1)		
A/YL-MP/247	Residential	Domestic GFA about 16,200m² for 105 houses
A/YL-MP/287	Residential	Domestic GFA about 7,540m² for 65 houses
A/YL-NSW/274	Residential	Domestic GFA about 70,328m² for 1,518 flats

A/YL-NTM/178-2	Residential	Domestic GFA about 45,197m^2 for 300 houses
A/YL-MP/291	Residential	268 houses
A/YL-NSW/241	Retail	37,171 m^2 retail GFA

Note:

(1) Information provided and agreed by Planning Department on email dated 23 December 2022.

4.3.4 The traffic trips generated and attracted by the selected developments in vicinity are summarized in the **Table 4.6**.

Table 4.6 Estimated Traffic Generations & Attractions of the Selected Developments in Vicinity

Application No.	Key Development Parameters	Estimated Trip Generation (pcu/hr)			
		AM Peak		PM Peak	
		Gen.	Att.	Gen.	Att.
Y/YL-NTM/6	1,990 residential units	60(1)	60(1)	45(1)	55(1)
A/YL-MP/247	Domestic GFA about 16,200m^2 for 105 houses	29(2)	19(2)	17(2)	25(2)
A/YL-MP/287	Domestic GFA about 7,540m^2 for 65 houses	15(2)	8(2)	7(2)	10(2)
A/YL-NSW/274	Domestic GFA about 70,328m^2 for 1,518 flats	95(2)	65(2)	46(2)	61(2)
A/YL-NTM/178-2	Domestic GFA about 45,197m^2 for 300 houses	84(2)	54(2)	50(2)	72(2)
A/YL-MP/291	268 houses	87(1)	70(1)	76(1)	109(1)
A/YL-NSW/241	37,171 m^2 retail GFA	86(1)	91(1)	116(1)	133(1)

Notes:

(1) Information as obtained from submitted TIA reports.

(2) Traffic Trips have been estimated by the trip generation and attraction rates as stipulated in Volume 1 Chapter 3 Annex C Table 1 of the latest T.P.D.M.

4.3.5 The 2030 reference traffic flows are presented in **Figure 4.2 (Rev.A)**.

2030 Reference Flows (without proposed development) = **2022 Traffic Flows** x **Adopted Growth Factor i.e. +1 % p.a. for 8 years** + **Adjacent Developments**

4.4 Traffic Trips of the Proposed Development

4.4.1 It is noted that traffic rates of both generation and attraction for proposed development uses are not specified in the latest Transport Planning & Design Manual (TPDM).

4.4.2 The estimation of traffic trips related to the proposed development is based on in-house surveys carried out at Tung Wah Group of Hospitals - Wong Cho Tong Social Service Building and summarized in the **Table 4.7**.

Table 4.7 In-house Traffic Trip Rates of Proposed Development

Use	Units / Parameters	AM Peak		PM Peak	
		Gen.	Att.	Gen.	Att.
Traffic Trip Rate					
TWGHs Wong Cho Tong Social Service Building – IN/OUT of Building	(pcu/hr)	14	11	14	11
TWGHs Wong Cho Tong Social Service Building – Loading/Unloading activities of Building	(pcu/hr)	10	8	10	8
Total Trip	(pcu/hr)	24	19	24	19
Adopted Traffic Trip Rates (278 beds)	**(pcu/hr/bed)**	**0.0863**	**0.0684**	**0.0432**	**0.0576**

4.4.3 Based on the in-house traffic trip rates related to the proposed development, the estimated traffic trips of the proposed development are calculated and shown in below **Table 4.8**.

Table 4.8 Traffic Trips of the Proposed Development

Proposed Development	Parameter	Trip Generation (pcu/hr)			
		Weekday AM Peak		Weekday PM Peak	
		Gen.	Att.	Gen.	Att.
RCHE	142 beds	12	10	6	8

4.5 Traffic Forecast for Design Year 2030

4.5.1 The net traffic trips of the proposed development are superimposed onto the year 2030 reference traffic flow (without the proposed development) as shown in **Figure 4.2 (Rev.A)** to derive the year 2030 design traffic flow (with the proposed development).

Year 2030 Design Flow (with the Proposed Development) = **Year 2030 Reference Flow (without the Proposed Development)** + **Traffic Trips of the Proposed Development**

4.5.2 The traffic flow during AM and PM peak periods in the design year 2030 (with the proposed development) are shown in **Figure 4.3 (Rev.A)**.

4.6 Operational Assessment

4.6.1 To assess traffic impacts due to the proposed development, operational assessment of the critical junctions identified in Chapter 3 are carried out for both reference (without the proposed development) and design (with the proposed development) scenarios in year 2028. The results are summarized in **Table 4.9**.

Table 4.9 Operational Performance of Critical Junctions in Year 2030

Ref.	Junction	Method of Control	Year 2030 DFC [1]			
			Reference Scenario (Without the Proposed Development)		Design Scenario (With the Proposed Development)	
			AM Peak	PM Peak	AM Peak	PM Peak
A	Castle Peak Road - Mai Po / San Tam Road	Priority	0.29	0.29	0.30	0.29
B	San Tam Road / Access Road	Priority	0.03	0.04	0.03	0.04
C	San Tam Road / Ngau Tam Mei Road	Priority	0.36	0.42	0.36	0.42
D	San Tam Road / Chun Shin Road	Priority	0.16	0.10	0.16	0.10
E	San Tam Road / Chuk Yau Road	Priority	0.63	0.48	0.63	0.48
F	Fairview Park Interchange	Roundabout	**1.27**	**1.03**	**1.28**	**1.04**

Note:

(1) DFC = Design Ratio of Flow to Capacity for Priority Junction/Roundabout

Table 4.10 Road Link Assessment in Reference Year 2030

Road Section	Index	Direction	Capacity (pcu/hr) (C)[1][2]	AM Peak		PM Peak	
				Flow (pcu/hr) (V)	Flow / Capacity (V/C)	Flow (pcu/hr) (V)	Flow / Capacity (V/C)
San Tam Road (Between Junction A and Junction B)	LA	Two-way	1,332	270	0.20	290	0.22
San Tam Road (Between Junction B and Junction C)	LB	Two-way	1,332	360	0.27	345	0.26
San Tam Road (Between Junction C and Junction D)	LC	Two-way	1,332	645	0.48	665	0.50
San Tam Road (Between Junction D and Junction E)	LD	Two-way	1,332	745	0.56	705	0.53

Notes:

(1) Reference has been made to the T.P.D.M. Volume 2 Chapter 2.4 for the lane capacity.
(2) PCU factor of 1.2 has been applied to the calculation of the Lane capacity.

Table 4.11 Road Link Assessment in Design Year 2030

Road Section	Index	Direction	Capacity (pcu/hr) (C)[1][2]	AM Peak		PM Peak	
				Flow (pcu/hr) (V)	Flow / Capacity (V/C)	Flow (pcu/hr) (V)	Flow / Capacity (V/C)
San Tam Road (Between Junction A and Junction B)	LA	Two-way	1,332	275	0.21	290	0.22
San Tam Road (Between Junction B and Junction C)	LB	Two-way	1,332	375	0.28	360	0.27
San Tam Road (Between Junction C and Junction D)	LC	Two-way	1,332	660	0.50	670	0.50
San Tam Road (Between Junction D and Junction E)	LD	Two-way	1,332	760	0.57	720	0.54

Notes:
(1) Reference has been made to the TPDM Volume 2 Chapter 2.4 for the lane capacity.
(2) PCU factor of 1.2 has been applied to the calculation of the Lane capacity.

4.6.2 The junction assessment and road link assessment results in **Table 4.9, 4.10** and **4.11** reveal that all the junctions and critical links will operate with ample capacities in both reference and design scenarios in year 2030, except the junction of Fairview Park Interchange (F).

4.7 Proposed Junction Improvement Scheme

4.7.1 Junction improvement were proposed for Fairview Park Interchange under approved planning application no. A/YL-NSW/241. It is proposed local widening for the approaching arm of San Tin Highway southbound slip road and the approaching arm of

San Tam Road southbound. The proposed junction improvement under A/YL-NSW/241 is shown in **Figure RC-02**.

4.7.2 Junction improvement were proposed for Fairview Park Interchange under approved planning application no. A/YL-NSW/241. It is proposed local widening for the approaching arm of San Tin Highway southbound slip road and the approaching arm of San Tam Road southbound. The proposed junction improvement under A/YL-NSW/241 is shown in **Figure RC-02**.

4.7.3 The assessment result after the mitigation measure is presented in **Table 4.12**

Table 4.12 Operational Performance in 2030 Reference Case and Design Case – for the Improvement Proposal under no. A/YL-NSW/241 for Junction F

Ref.	Junction	Method of Control	Year 2030 DFC(1) Reference Scenario (With Proposed Improvement under no. A/YL-NSW/241)		Year 2030 DFC (1) Design Scenario (With Proposed Improvement under no. A/YL-NSW/241)	
			AM Peak	AM Peak	AM Peak	PM Peak
F	Fairview Park Interchange	Roundabout	1.27	1.03	1.28	1.04

Note:
(1) DFC = Design Ratio of Flow to Capacity for Priority Junction/Roundabout

4.7.4 Apart from the junction improvement scheme proposed under the approved A/YL-NSW/241, numerous on-going planning applications (e.g. Y/YL-NSW/7, Y/YL-MP/6, Y/YL-MP/7, Y/YL-MP/8, etc.) in the vicinity have also proposed further improvement schemes for the junction of Fairview Park Interchange. Also, it is noticeable that the traffic trips generation of the proposed development is very minimal and have insignificant impact to the local road network. Hence, it is envisaged that the proposed improvement schemes under other planning applications will allow the junction of Fairview Park Interchange to accommodate the traffic trips of the proposed development. Insurmountable impact to the adjacent road network will not be occurred.

5. SUMMARY AND CONCLUSION

5.1 Summary

5.1.1 The application site intends to redevelop to Residential Care Home for the Elderly (RCHE).

5.1.2 CTA Consultants Limited (CTA), are therefore commissioned as the traffic consultant to prepare the Traffic Impact Assessment (TIA) and provide technical justifications in supporting the application from traffic engineering point of view.

5.1.3 To appraise the existing traffic condition, a vehicular survey in the form of manual-classified count was conducted at the surrounding road network of the proposed development. Current operational performance of the critical junctions and critical road links have been assessed with the observed traffic flow. The results reveal that all critical junctions and critical road links are at present operating within its capacities.

5.1.4 Assessment of operational performance of the critical junctions and critical road links indicates that all critical junctions and critical road links will still operate within their capacities in both reference and design scenarios in year 2030, except for the junction of Fairview Park Interchange (F).

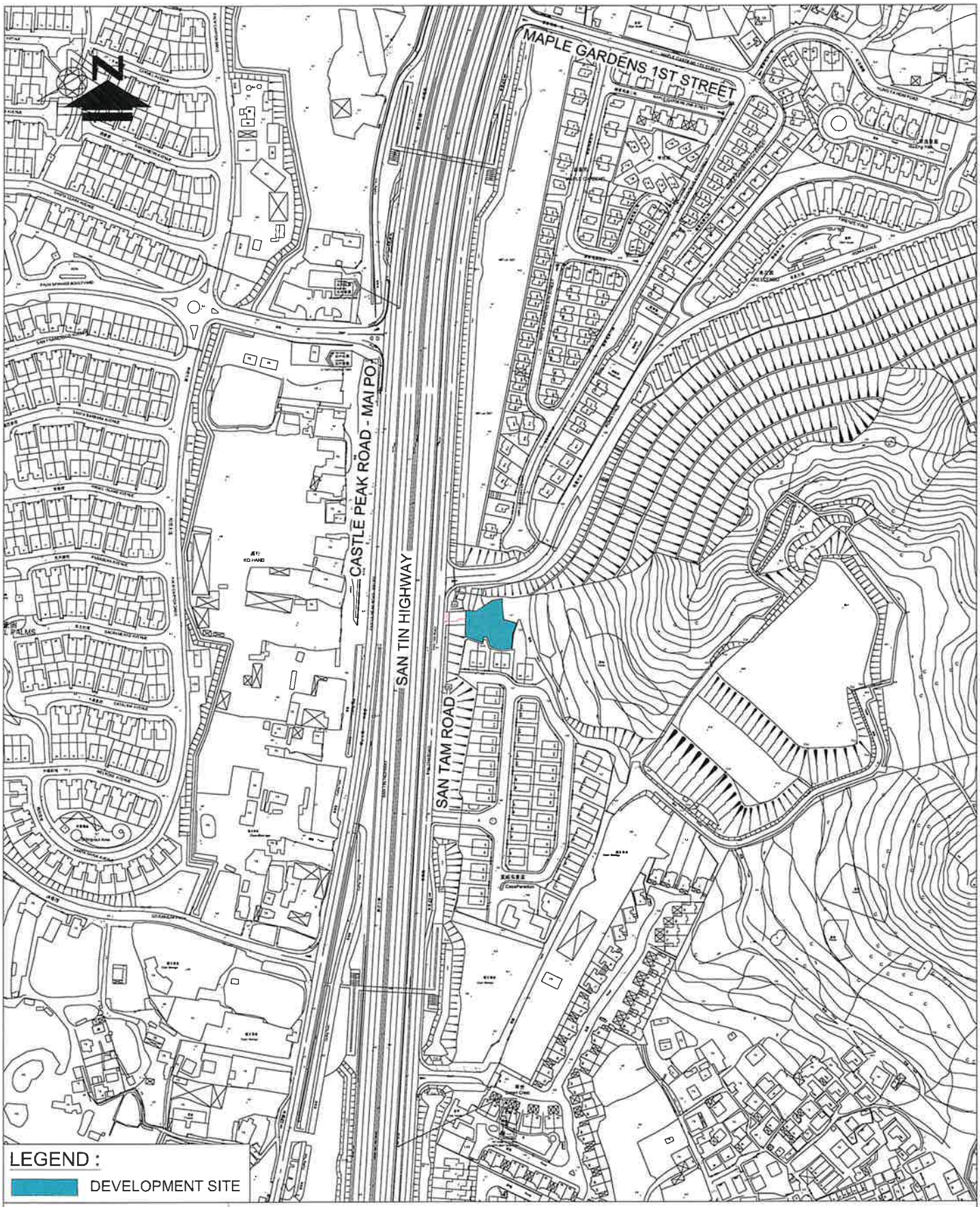
5.1.5 Junction improvement for Fairview Park Interchange (F) is proposed under the approved planning application no. A/YL-NSW/241. In addition, further improvement is also proposed under various on-going applications. Considered that the traffic generation of the proposed development is very minimal and would not have significant impact to the adjacent road network, the junction improvement works by other planning applications would be able to accommodate the traffic flows of the proposed development.

5.1.6 The traffic generated by the proposed development would induce insignificant impact on the surrounding road network. Therefore, the application is supported from the traffic points of view.

5.2 Conclusion

5.2.1 In conclusion, this Traffic Impact Assessment (TIA) study demonstrated that the related traffic trips related to the proposed development can be absorbed by the nearby road network and no significant traffic impact will be induced.

5.2.2 Therefore, the proposed redevelop of RCHE is reckoned feasible from traffic engineering point of view.



LEGEND :

DEVELOPMENT SITE

FIGURE NO.: 1.1	PROJECT TITLE: 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 DD 104, 81 San Tam Road, San Tin, N.T.
PROJECT NO.: 22069HK	DRAWING TITLE: SITE LOCATION PLAN
SCALE: 1 : 3250 @A4 / DATE: 05 JUL 2022	CTA Consultants Limited 志達顧問有限公司

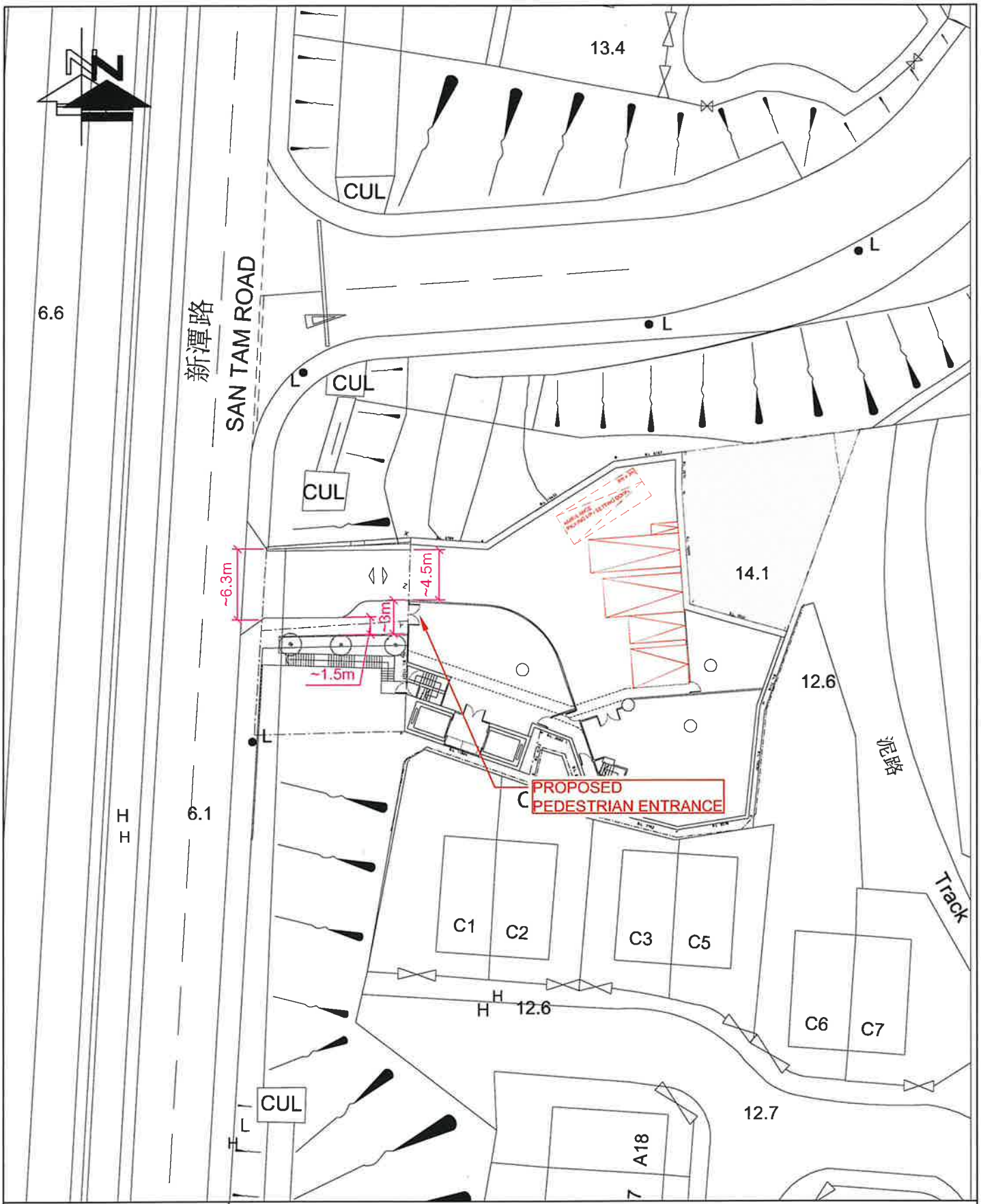


FIGURE NO.: 2.1(REV.A)	PROJECT TITLE:	S12A Amendment of Plan Application, Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12 Proposed Rezoning from "R(C)" to "G/IC" for a Proposed "Social Welfare Facilities" (Residential Care Homes for the Elderly) (RCHE) At Lot 4823 in DD 104, 81 San Tam Road, San Tin, N.T.
PROJECT NO.: 22069HK	DRAWING TITLE:	GROUND FLOOR PLAN
SCALE: 1 : 350 @A4 / DATE: 03 JAN 2023		CTA Consultants Limited 志達顧問有限公司



LEGEND :

- DEVELOPMENT SITE
- BUS STOP
- GMB STOP

FIGURE NO.: 2.2	PROJECT TITLE: 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 DD 104, 81 San Tam Road, San Tin, N.T.
PROJECT NO.: 22069HK	DRAWING TITLE: PUBLIC TRANSPORT SERVICES IN THE VICINITY
SCALE: 1 : 5400 @A4 / DATE: 06 JUL 2022	CTA Consultants Limited 志達顧問有限公司



FIGURE NO.: 3.1(REV A)	PROJECT TITLE: 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 DD 104, 81 San Tam Road, San Tin, N.T.
PROJECT NO.: 22069HK	DRAWING TITLE: IDENTIFIED CRITICAL JUNCTIONS
SCALE: 1 : 10000 @A4 / DATE: 08 DEC 2022	CTA Consultants Limited 志達顧問有限公司

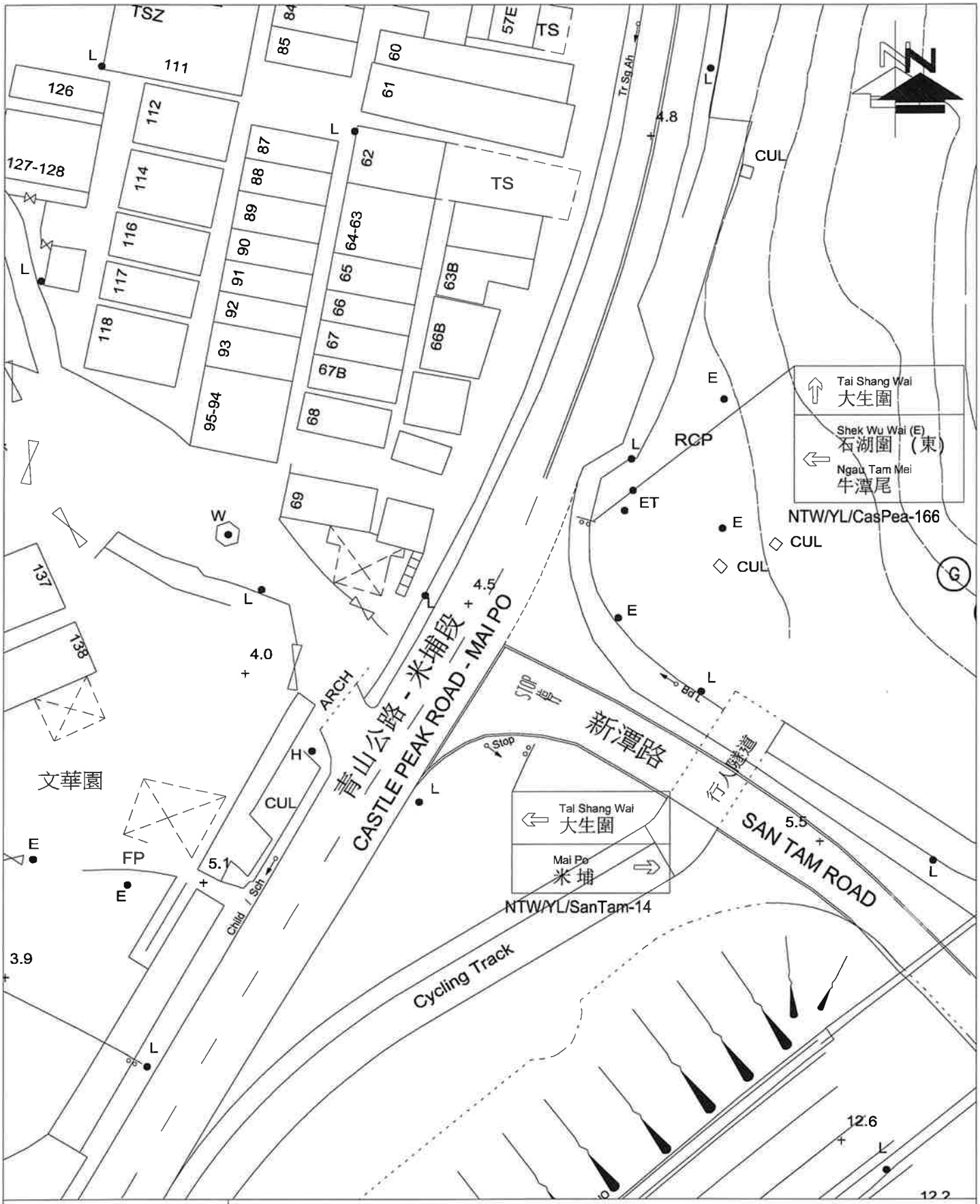


FIGURE NO.: 3.2	PROJECT TITLE: S12A Amendment of Plan Application, Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12 Proposed Rezoning from "R(C)" to "G/IC" for a Proposed "Social Welfare Facilities" (Residential Care Homes for the Elderly) (RCHE) At Lot 4823 in DD 104, 81 San Tam Road, San Tin, N.T.	
PROJECT NO.: 22069HK	DRAWING TITLE:	
SCALE: 1 : 500 @A4 / DATE: 28 JUN 2022	EXISTING JUNCTION LAYOUT OF SAN TAM ROAD / CASTLE PEAK ROAD - MAI PO (A)	CTA Consultants Limited 志達顧問有限公司

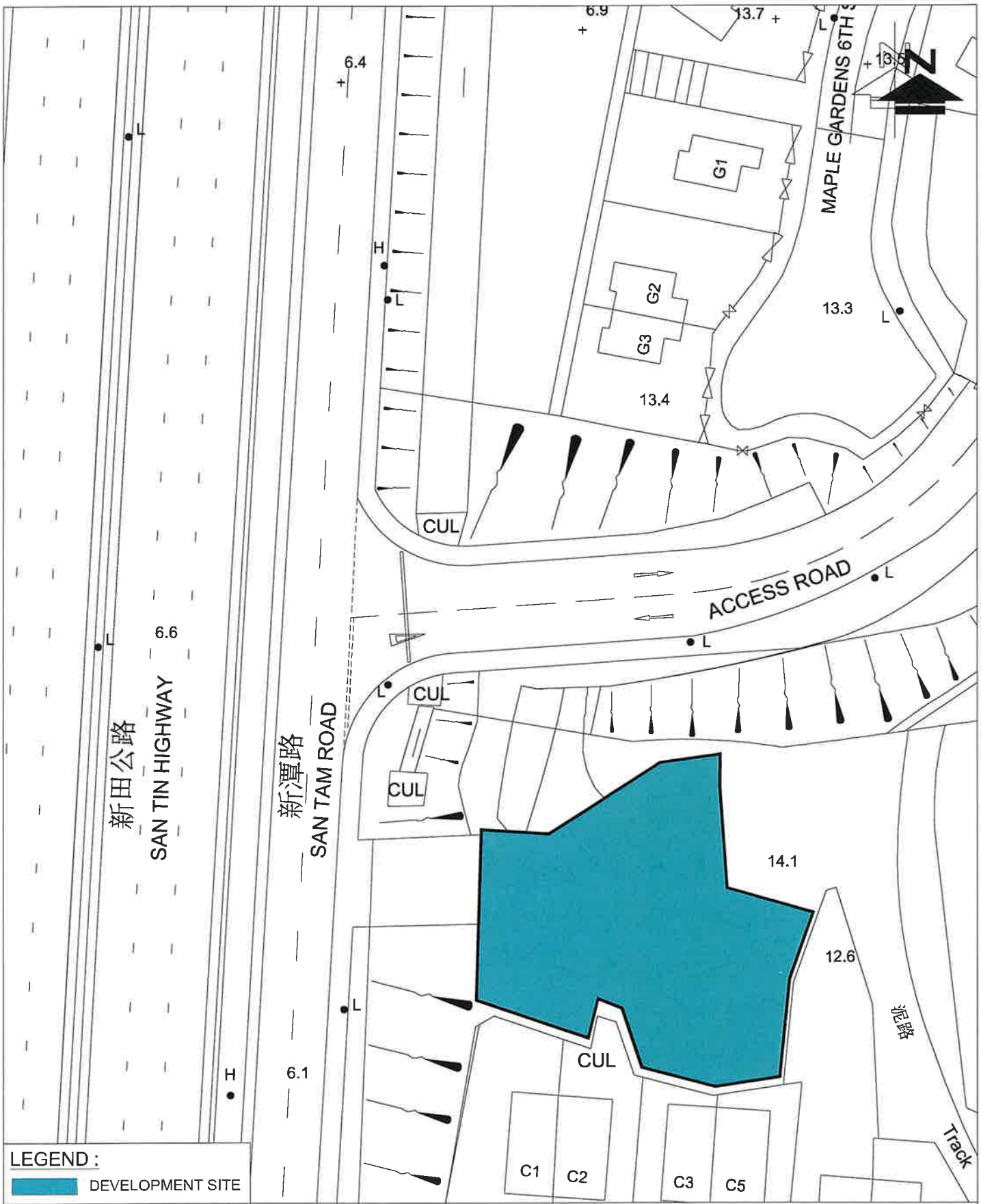


FIGURE NO.: 3.3	PROJECT TITLE: S12A Amendment of Plan Application, Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12 Proposed Rezoning from "R(C)" to "G/IC" for a Proposed "Social Welfare Facilities" (Residential Care Homes for the Elderly) (RCHE) At Lot 4823 in DD 104, 81 San Tam Road, San Tin, N.T.
PROJECT NO.: 22069HK	DRAWING TITLE: EXISTING JUNCTION LAYOUT OF SAN TAM ROAD / ACCESS ROAD (B)
SCALE: 1 : 500 @A4	DATE: 28 JUN 2022

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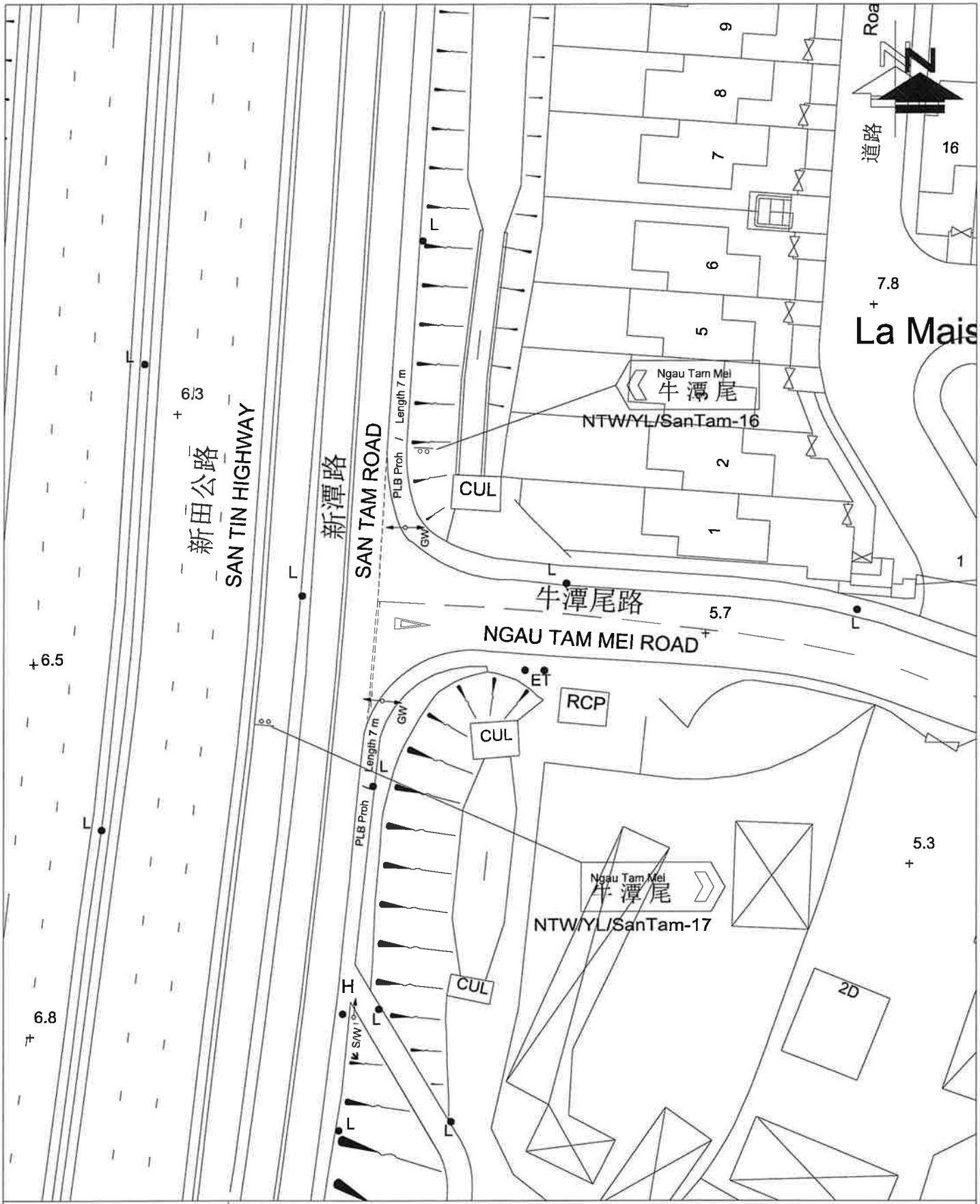


FIGURE NO.: 3.4	PROJECT TITLE: S12A Amendment of Plan Application, Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12 Proposed Rezoning from "R(C)" to "G/IC" for a Proposed "Social Welfare Facilities" (Residential Care Homes for the Elderly) (RCHE) At Lot 4823 in DD 104, 81 San Tam Road, San Tin, N.T.	
PROJECT NO.: 22069HK	DRAWING TITLE: EXISTING JUNCTION LAYOUT OF SAN TAM ROAD / NGAU TAM MEI ROAD (C)	CTA Consultants Limited 志達顧問有限公司
SCALE: 1 : 500 @A4 / DATE: 28 JUN 2022		

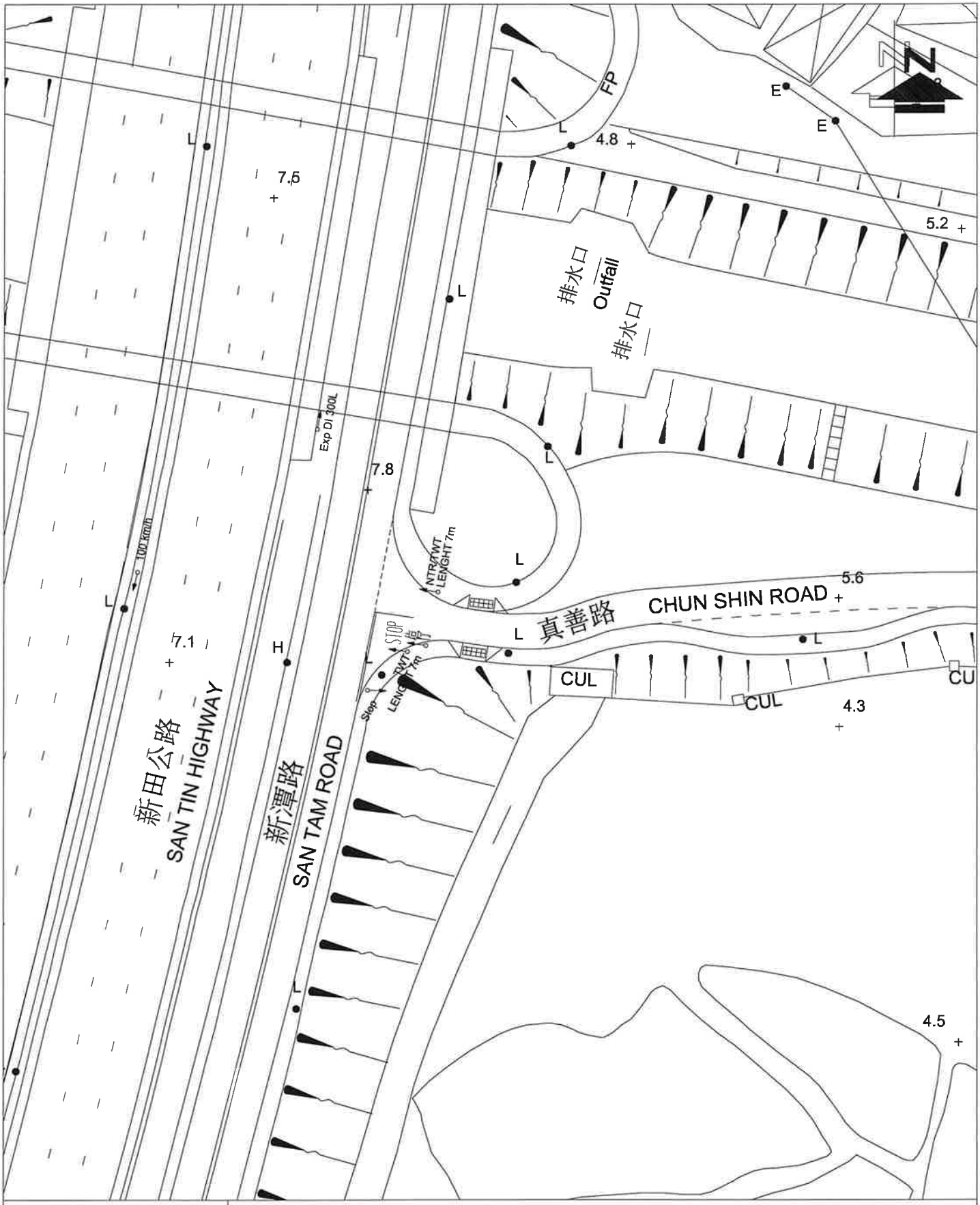


FIGURE NO.: 3.5	PROJECT TITLE: S12A Amendment of Plan Application, Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12 Proposed Rezoning from "R(C)" to "G/IC" for a Proposed "Social Welfare Facilities" (Residential Care Homes for the Elderly) (RCHE) At Lot 4823 in DD 104, 81 San Tam Road, San Tin, N.T.	
PROJECT NO.: 22069HK	DRAWING TITLE: EXISTING JUNCTION LAYOUT OF SAN TAM ROAD / CHUN SHIN ROAD (D)	CTA Consultants Limited 志達顧問有限公司
SCALE: 1 : 500 @A4 / DATE: 28 JUN 2022		

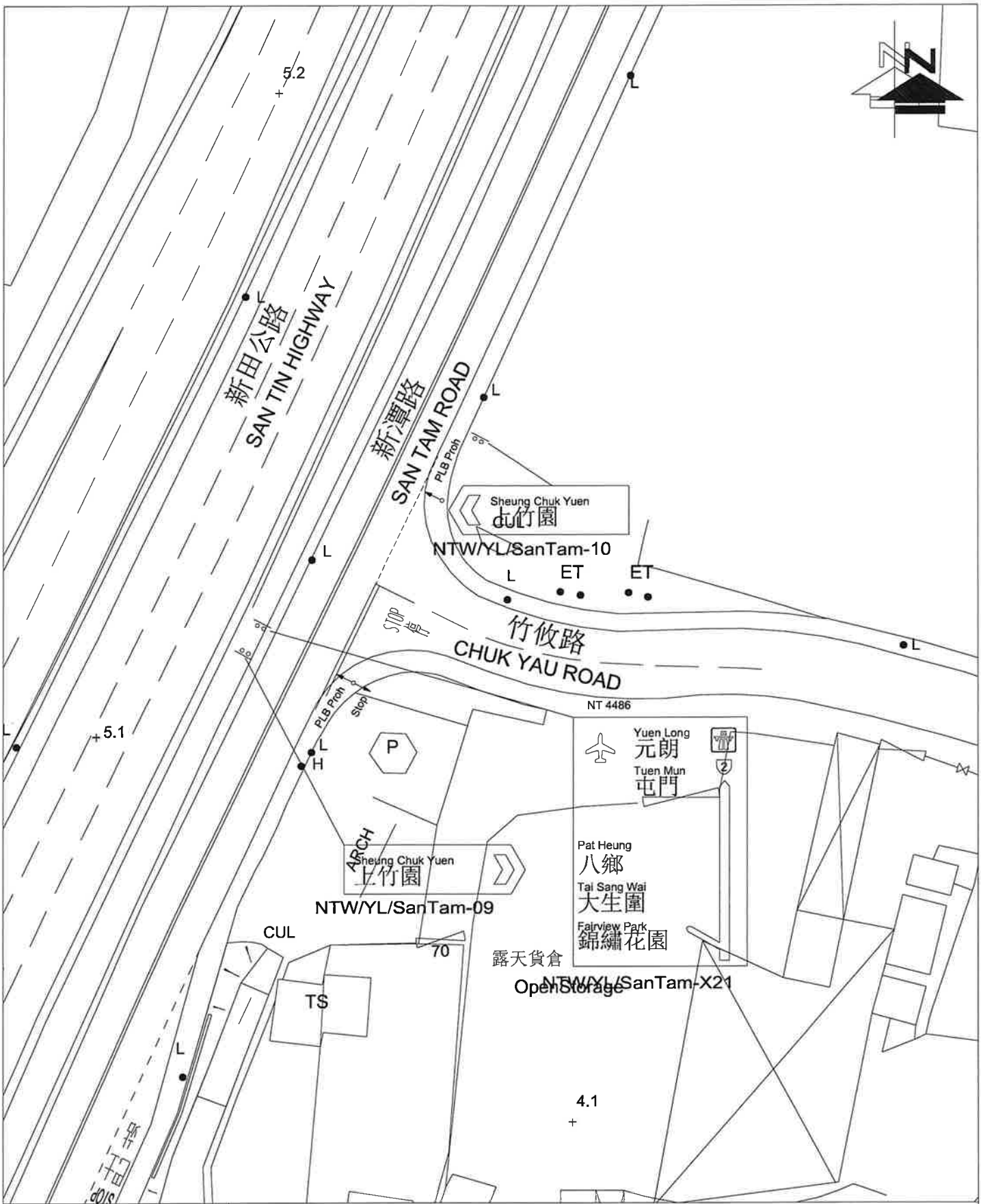


FIGURE NO.: 3.6	PROJECT TITLE: S12A Amendment of Plan Application, Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12 Proposed Rezoning from "R(C)" to "G/IC" for a Proposed "Social Welfare Facilities" (Residential Care Homes for the Elderly) (RCHE) At Lot 4823 in DD 104, 81 San Tam Road, San Tin, N.T.
PROJECT NO.: 22069HK	DRAWING TITLE: EXISTING JUNCTION LAYOUT OF SAN TAM ROAD / CHUK YAU ROAD (E)
SCALE: 1 : 500 @A4 / DATE: 28 JUN 2022	CTA Consultants Limited 志達顧問有限公司

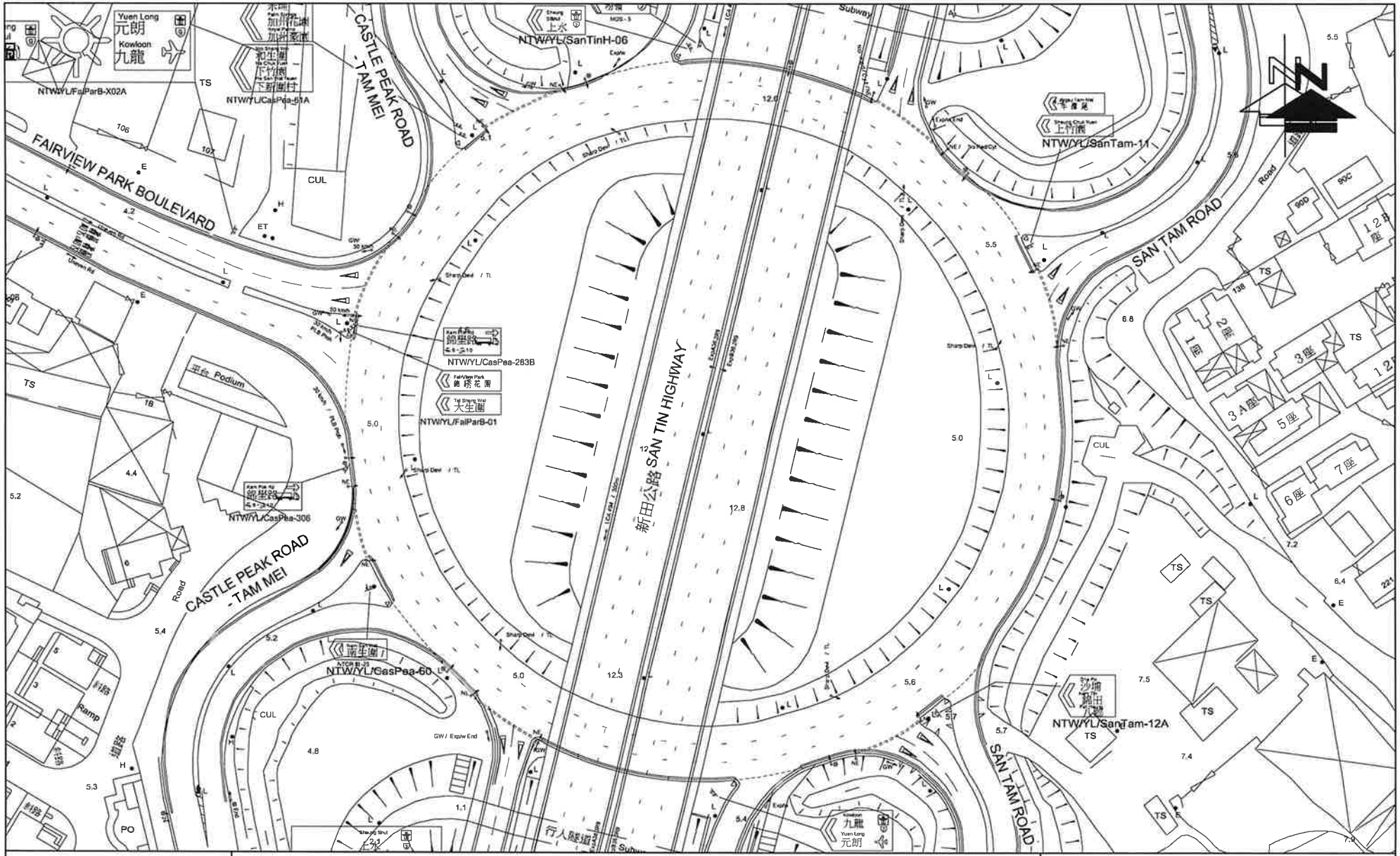


FIGURE NO.: RC-01	PROJECT TITLE: S12A Amendment of Plan Application, Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12 Proposed Rezoning from "R(C)" to "G/IC" for a Proposed "Social Welfare Facilities" (Residential Care Homes for the Elderly) (RCHE) At Lot 4823 in DD 104, 81 San Tam Road, San Tin, N.T.	CTA Consultants Limited 志達顧問有限公司
PROJECT NO.: 22069HK	DRAWING TITLE: EXISTING JUNCTION LAYOUT OF FAIRVIEW PARK INTERCHANGE (F)	
SCALE: 1 : 1000 @A4 / DATE: 08 DEC 2022		

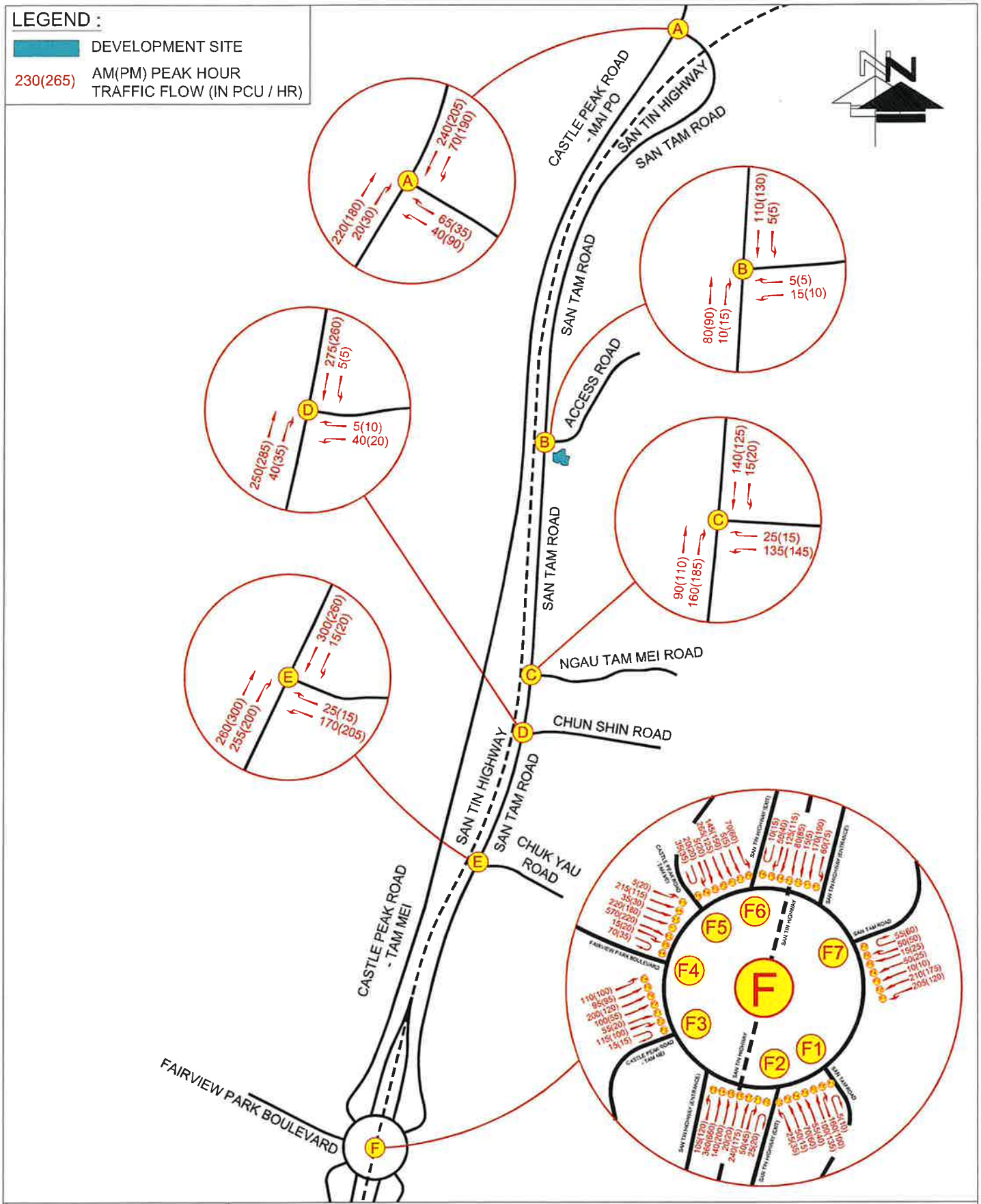


FIGURE NO.: 3.7(REV A)	PROJECT TITLE: S12A Amendment of Plan Application, Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12 Proposed Rezoning from "R(C)" to "G/IC" for a Proposed "Social Welfare Facilities" (Residential Care Homes for the Elderly) (RCHE) At Lot 4823 in DD 104, 81 San Tam Road, San Tin, N.T.
PROJECT NO.: 22069HK	DRAWING TITLE: 2022 OBSERVED TRAFFIC FLOWS
SCALE: N.T.S. @A4 / DATE: 21 DEC 2022	CTA Consultants Limited 志達顧問有限公司

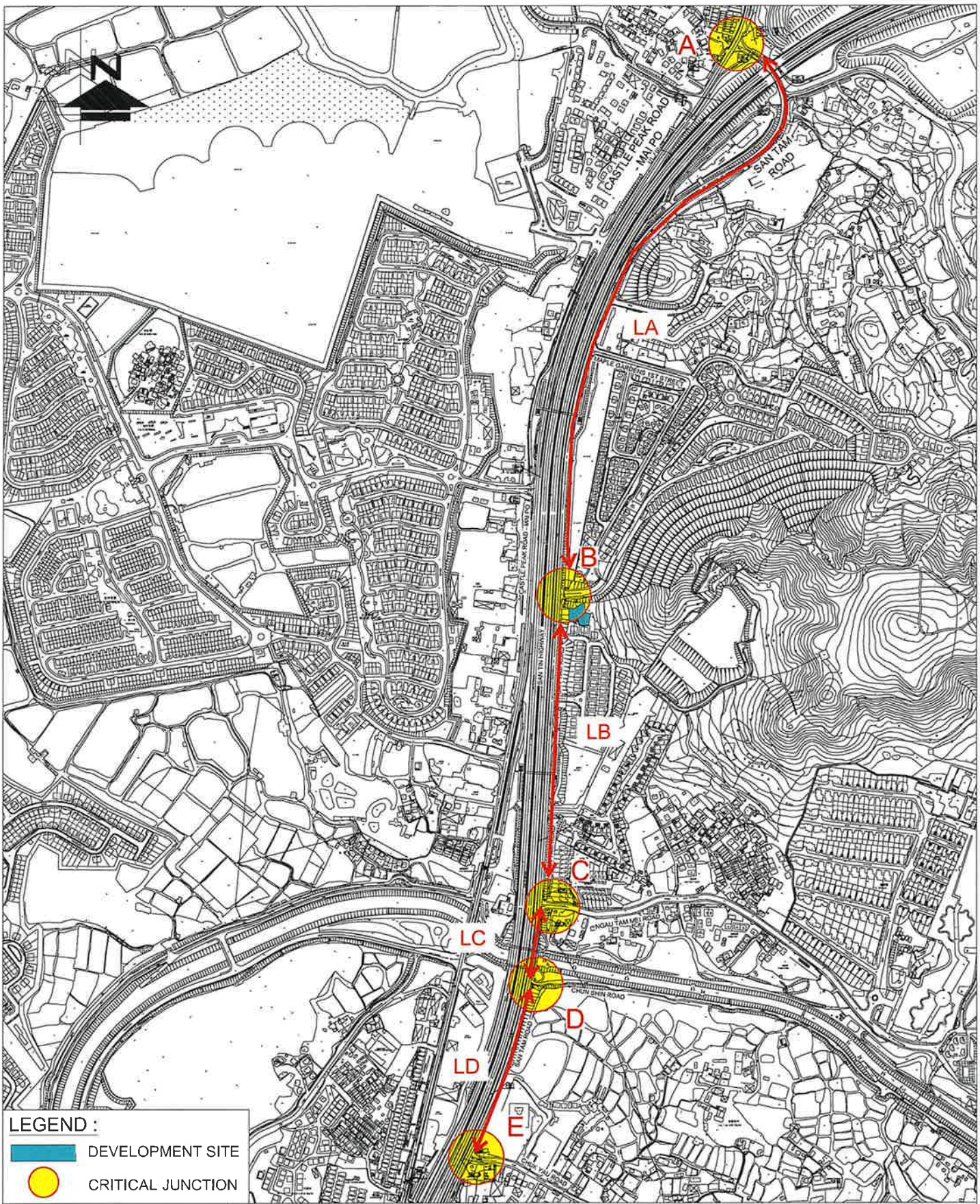


FIGURE NO.: 3.8	PROJECT TITLE: S12A Amendment of Plan Application, Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12 Proposed Rezoning from "R(C)" to "G/IC" for a Proposed "Social Welfare Facilities" (Residential Care Homes for the Elderly) (RCHE) At Lot 4823 in DD 104, 81 San Tam Road, San Tin, N.T.
PROJECT NO.: 22069HK	DRAWING TITLE: INDEX PLAN FOR LINK FLOW
SCALE: 1 : 7500 @A4 / DATE: 13 JUL 2022	CTA Consultants Limited 志達顧問有限公司

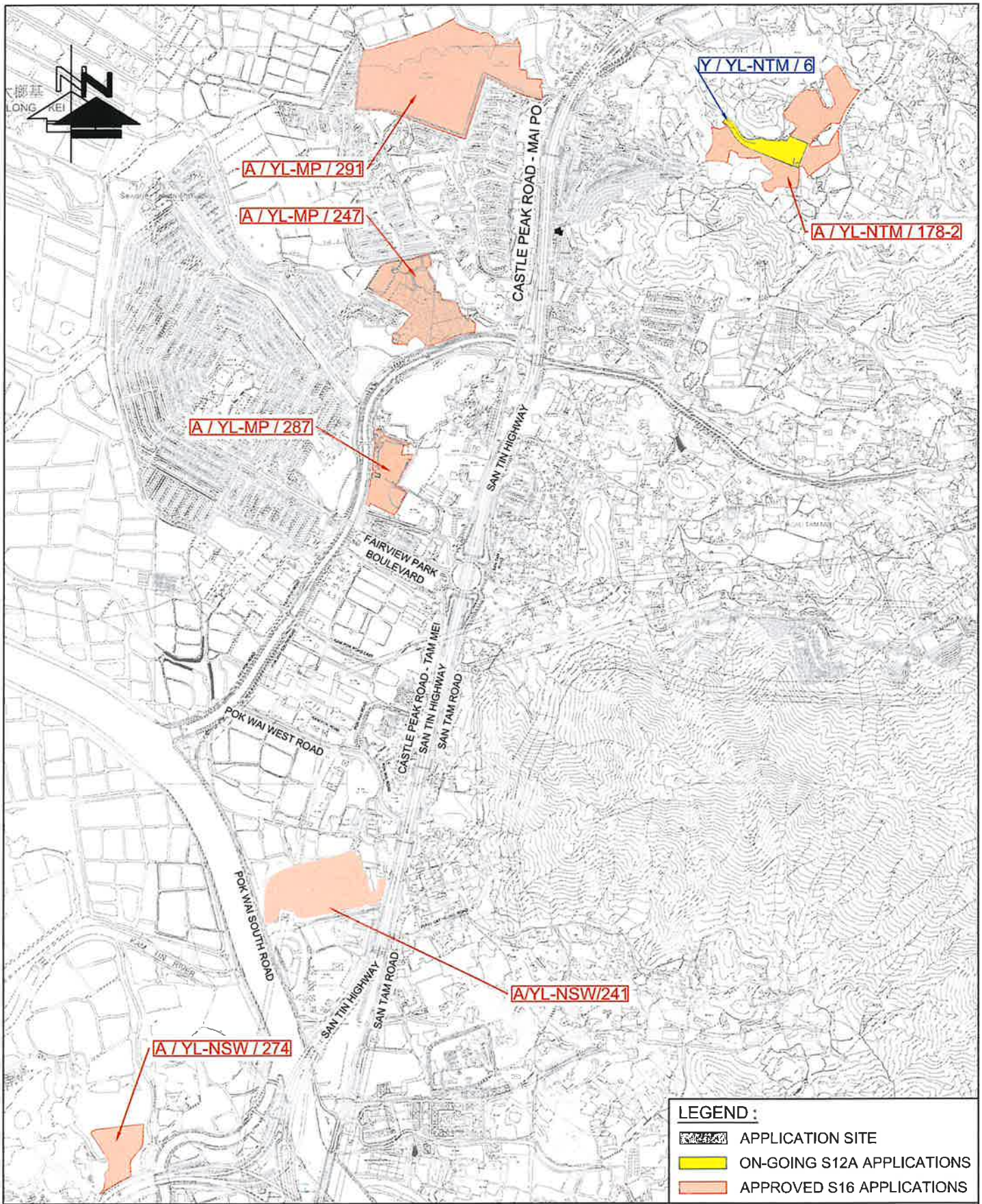


FIGURE NO.: 4.1(REV.A)	PROJECT TITLE: S12A Amendment of Plan Application, Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12 Proposed Rezoning from "R(C)" to "G/IC" for a Proposed "Social Welfare Facilities" (Residential Care Homes for the Elderly) (RCHE) At Lot 4823 in DD 104, 81 San Tam Road, San Tin, N.T.
PROJECT NO.: 22069HK	DRAWING TITLE: ADJACENT DEVELOPMENT IN THE VICINITY
SCALE: 1 : 20000 @A4 / DATE: 28 Dec 2022	CTA Consultants Limited 志達顧問有限公司

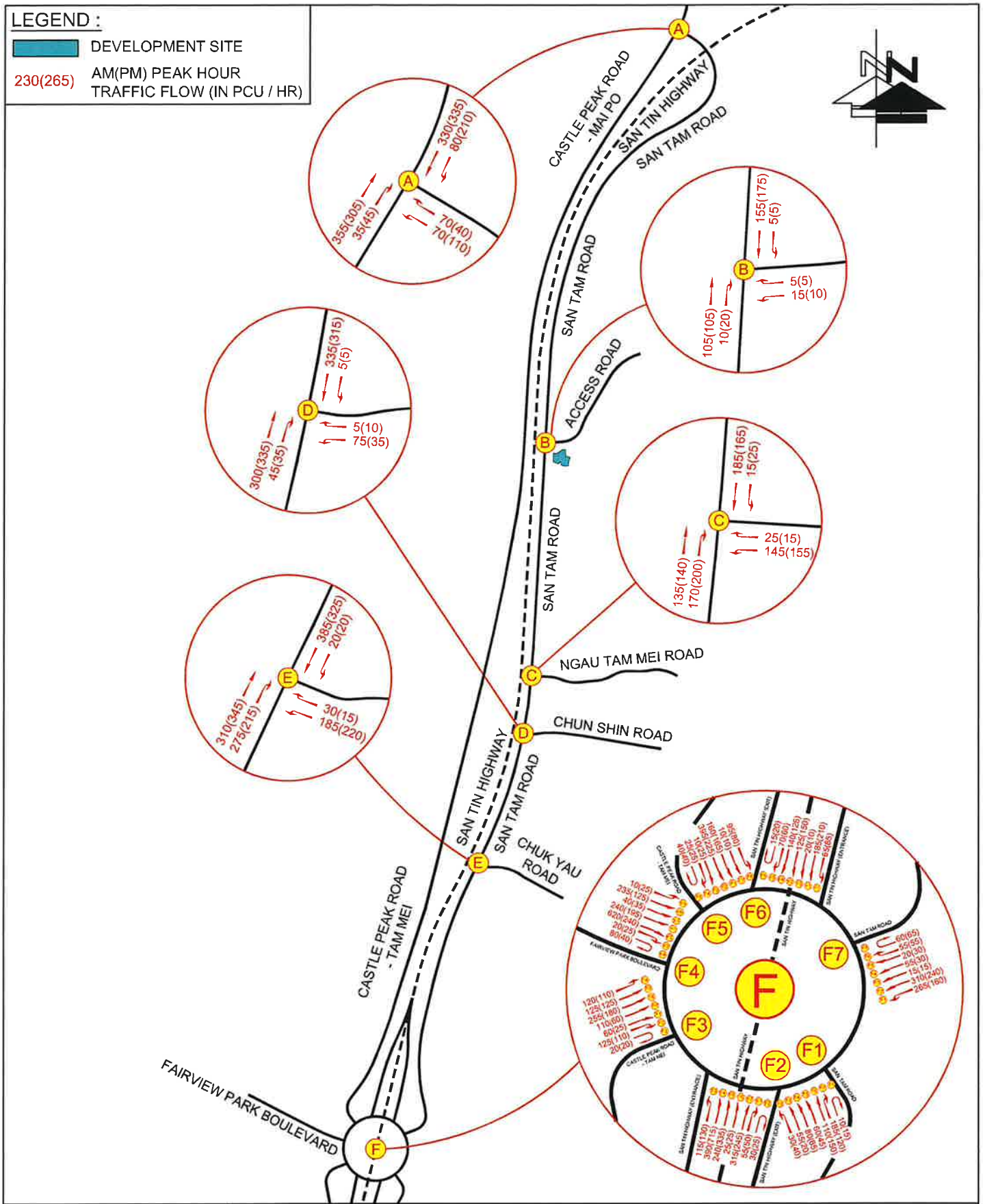


FIGURE NO.: 4.2(REV A)	PROJECT TITLE:	S12A Amendment of Plan Application, Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12 Proposed Rezoning from "R(C)" to "G/IC" for a Proposed "Social Welfare Facilities" (Residential Care Homes for the Elderly) (RCHE) At Lot 4823 in DD 104, 81 San Tam Road, San Tin, N.T.
PROJECT NO.: 22069HK	DRAWING TITLE:	2030 REFERENCE TRAFFIC FLOWS
SCALE: N.T.S. @A4 / DATE: 21 DEC 2022		CTA Consultants Limited 志達顧問有限公司

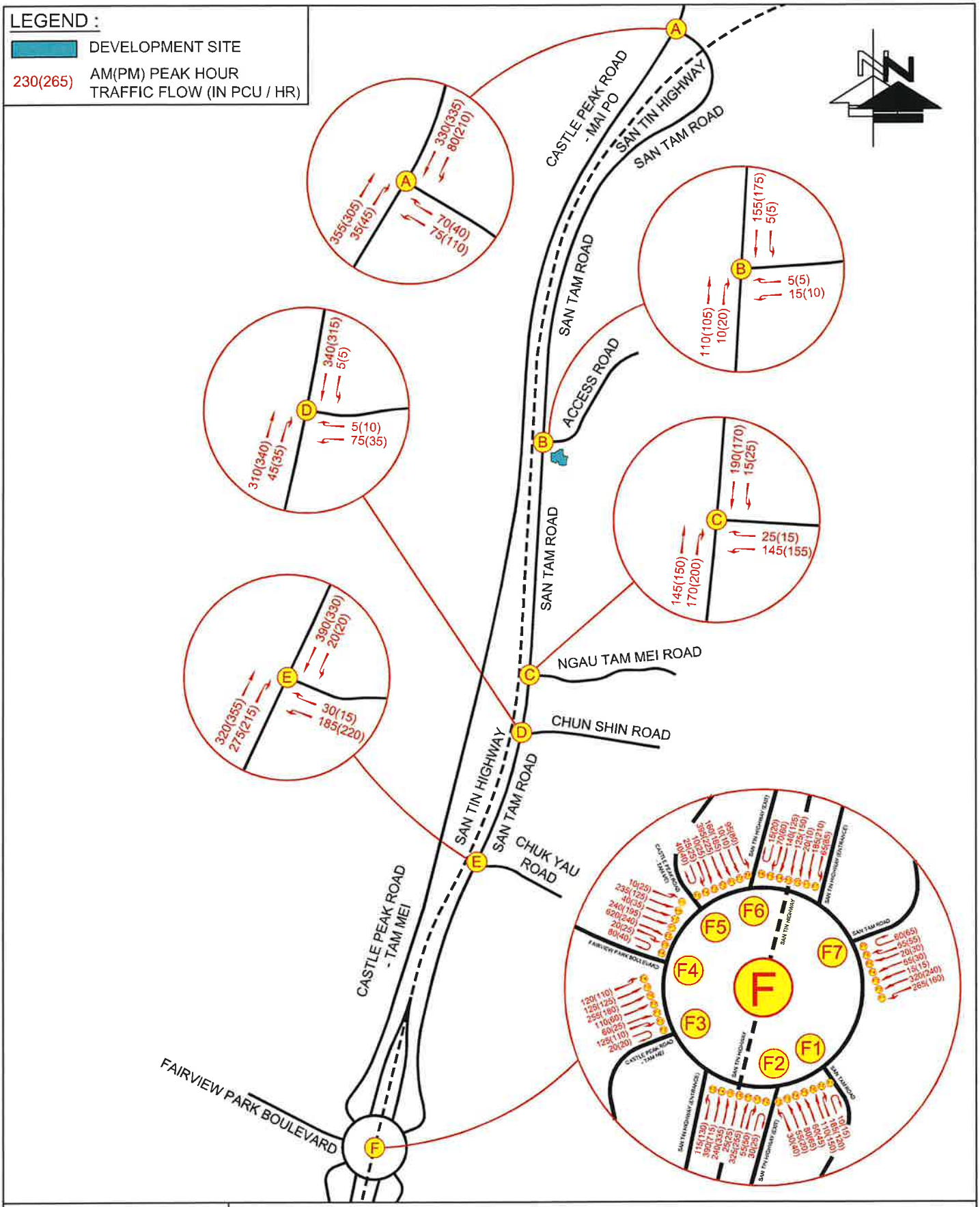


FIGURE NO.: 4.3(REV A)	PROJECT TITLE:	S12A Amendment of Plan Application, Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12 Proposed Rezoning from "R(C)" to "G/IC" for a Proposed "Social Welfare Facilities" (Residential Care Homes for the Elderly) (RCHE) At Lot 4823 in DD 104, 81 San Tam Road, San Tin, N.T.
PROJECT NO.: 22069HK	DRAWING TITLE:	2030 DESIGN TRAFFIC FLOWS
SCALE: N.T.S. @A4 / DATE: 21 DEC 2022		CTA Consultants Limited 志達顧問有限公司

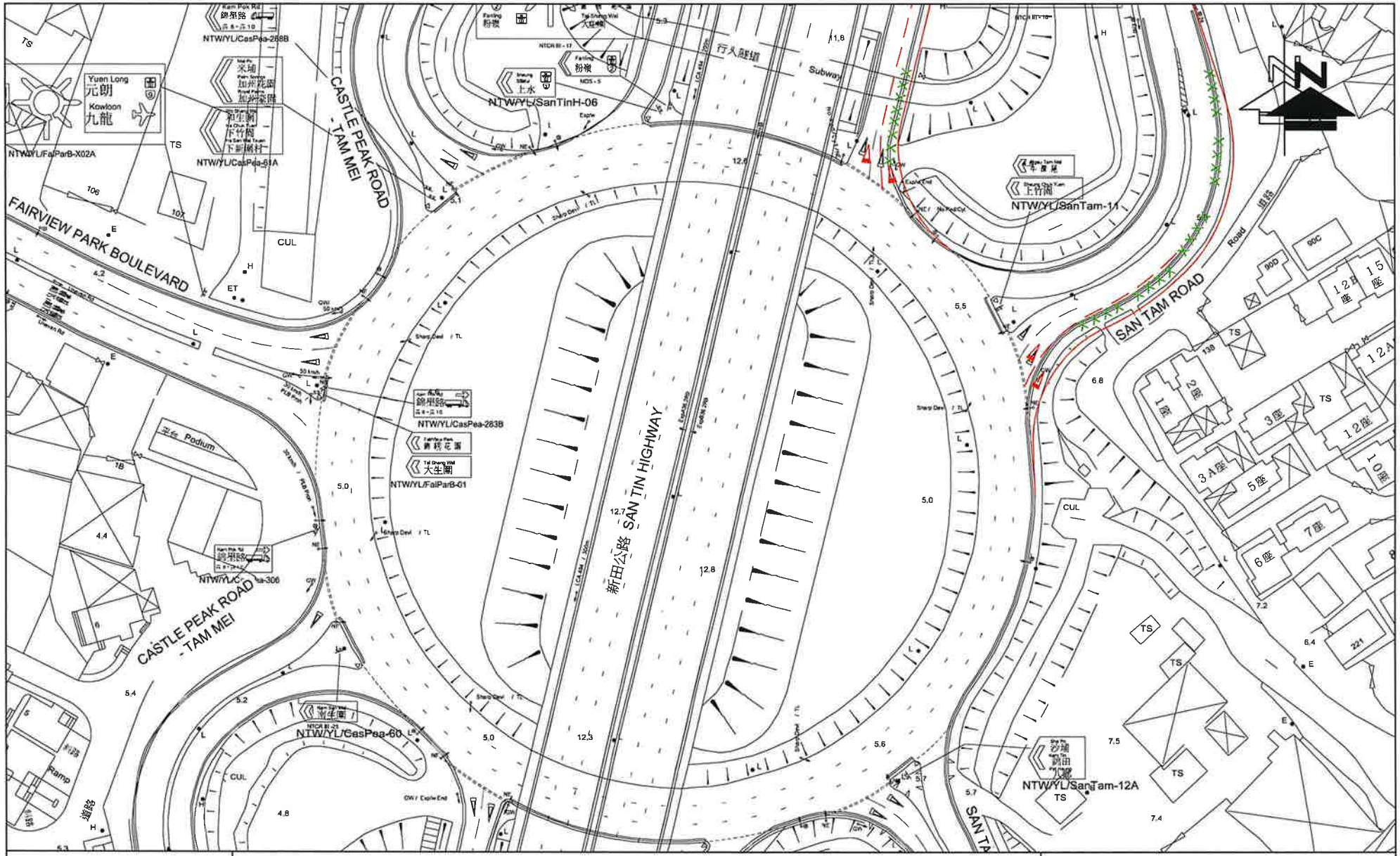


FIGURE NO.: RC-02	PROJECT TITLE: S12A Amendment of Plan Application, Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12 Proposed Rezoning from "R(C)" to "G/IC" for a Proposed "Social Welfare Facilities" (Residential Care Homes for the Elderly) (RCHE) At Lot 4823 in DD 104, 81 San Tam Road, San Tin, N.T.
PROJECT NO.: 22069HK	DRAWING TITLE: PROPOSED IMPROVEMENT JUNCTION LAYOUT OF FAIRVIEW PARK INTERCHANGE (F) UNDER PLANNING APPLICATION NO.A/YL-NSW/241
SCALE: 1 : 1000 @A4	DATE: 28 DEC 2022

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Appendix 1

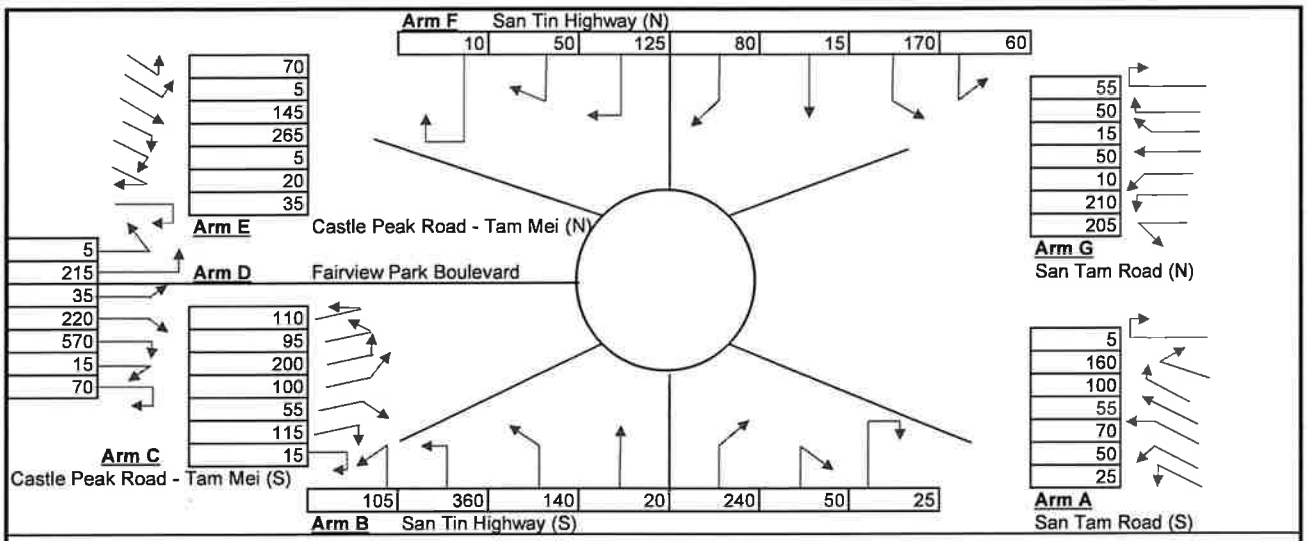
Junction Calculation Sheets

Roundabout Junction Calculation

Roundabout Junction: (F) Fairview Park Interchange

Design Year : OBSERVED CASE

Scenario : AM PEAK Date : 2021



Input Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
V	=	Approach half width (m)	5.5	6	5	7	5	6.3	5.5
E	=	Entry width (m)	7.8	9	5.8	10	10	7.3	8
L	=	Effective length of flare (m)	5	10	5	10	5	4.5	10
R	=	Entry radius	20	20	25	20	20	18	20
D	=	Inscribed circle diameter (m)	140	140	140	140	140	140	140
A	=	Entry angle (degree)	50	65	50	55	50	41	57
Q	=	Entry flow (pcu/hr)	465	940	690	1130	545	510	595
Qc	=	Circulating flow across entry (pcu/hr)	1805	1045	1705	1590	2325	2205	2060

Output Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
S	=	Sharepness of flare = 1.6*(E-V)/L	0.74	0.48	0.26	0.48	1.60	0.36	0.40
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)	0.93	0.88	0.94	0.91	0.93	0.96	0.91
X_2	=	V+((E-V)/(1+2*S))	6.43	7.53	5.53	8.53	6.19	6.88	6.89
M	=	Exp((D-60)/10)	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96
F	=	303*X_2	1948.42	2281.78	1675.32	2584.78	1875.71	2085.98	2087.33
Td	=	1+(0.5/(1+M))	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fc	=	0.21*Td*(1+0.2*X_2)	0.48	0.53	0.44	0.57	0.47	0.50	0.50
Qe	=	Capacity = K*(F-Fc*Qc)	1006.66	1521.40	866.28	1535.22	728.46	942.22	959.36
DFC	=	Entry Flow/Capacity = Q/Qe	0.46	0.62	0.80	0.74	0.75	0.54	0.62

DFC of Critical Approach = 0.80

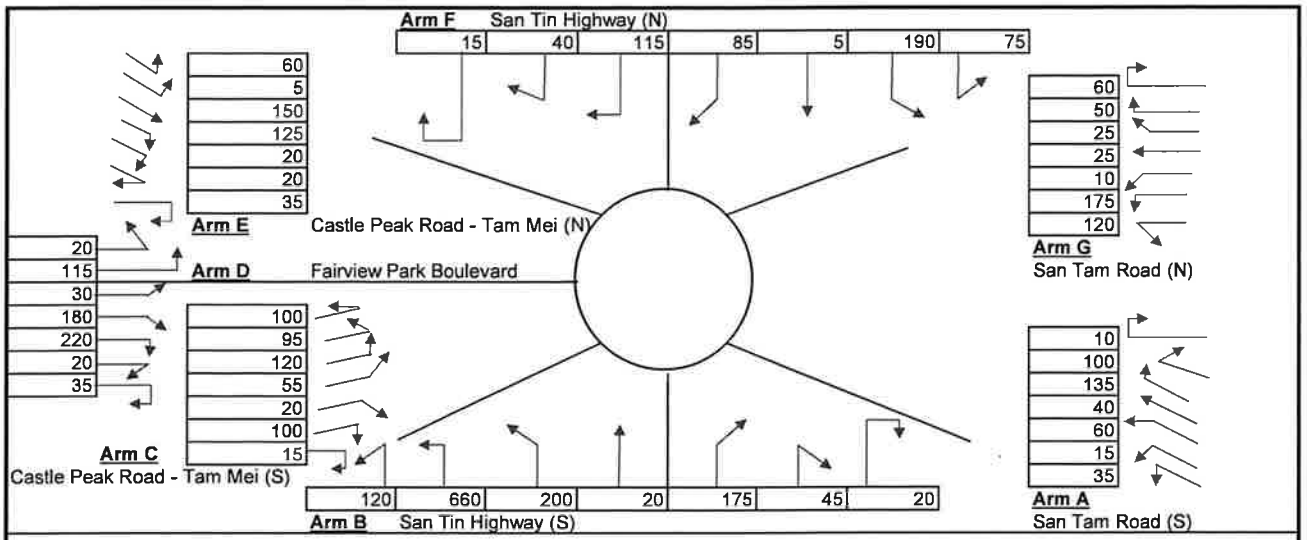
CTA

Roundabout Junction Calculation

Roundabout Junction: (F) Fairview Park Interchange

Design Year: OBSERVED CASE

Scenario: PM PEAK Date: 2022



Input Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
V	=	Approach half width (m)	5.5	6	5	7	5	6.3	5.5
E	=	Entry width (m)	7.8	9	5.8	10	10	7.3	8
L	=	Effective length of flare (m)	5	10	5	10	5	4.5	10
R	=	Entry radius	20	20	25	20	20	18	20
D	=	Inscribed circle diameter (m)	140	140	140	140	140	140	140
A	=	Entry angle (degree)	50	65	50	55	50	41	57
Q	=	Entry flow (pcu/hr)	395	1240	505	620	415	525	465
Qc	=	Circulating flow across entry (pcu/hr)	1215	930	1885	1375	1540	1440	1465

Output Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
S	=	Sharepness of flare = 1.6*(E-V)/L	0.74	0.48	0.26	0.48	1.60	0.36	0.40
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)	0.93	0.88	0.94	0.91	0.93	0.96	0.91
X_2	=	V+((E-V)/(1+2*S))	6.43	7.53	5.53	8.53	6.19	6.88	6.89
M	=	Exp((D-60)/10)	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96
F	=	303*X_2	1948.42	2281.78	1675.32	2584.78	1875.71	2085.98	2087.33
Td	=	1+(0.5/(1+M))	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fc	=	0.21*Td*(1+0.2*X_2)	0.48	0.53	0.44	0.57	0.47	0.50	0.50
Qe	=	Capacity = K*(F-Fc*Qc)	1270.29	1574.58	791.41	1646.82	1071.86	1307.48	1228.67
DFC	=	Entry Flow/Capacity = Q/Qe	0.31	0.79	0.64	0.38	0.39	0.40	0.38

DFC of Critical Approach = 0.79

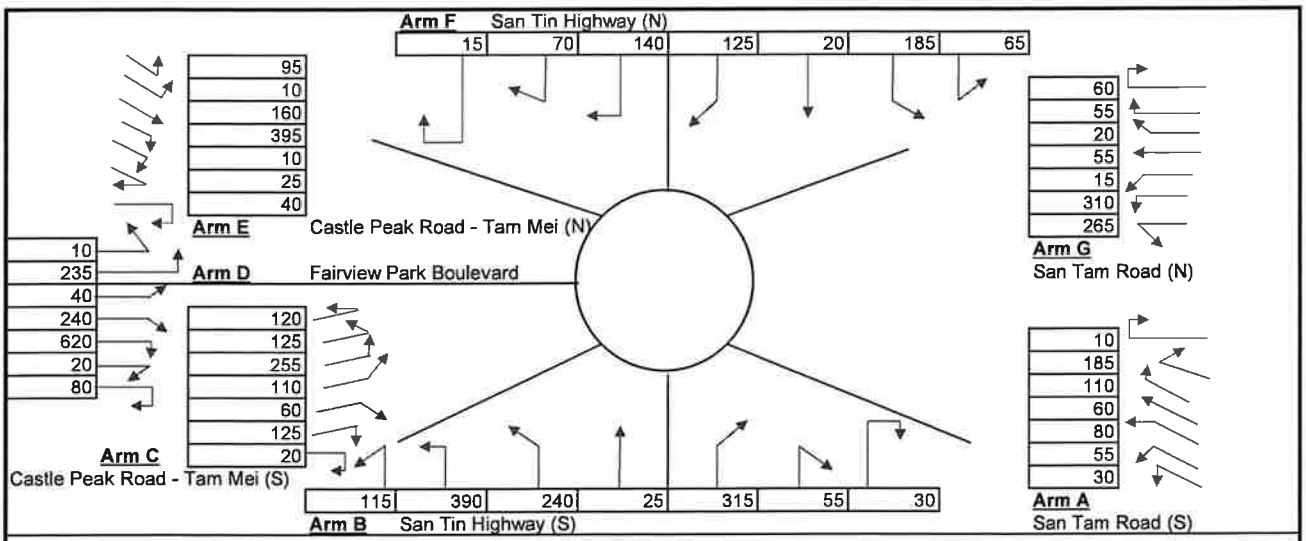
CTA

Roundabout Junction Calculation

Roundabout Junction (F) Fairview Park Interchange

Design Year : REFERENCE CASE

Scenario : AM PEAK Date : 2030



Input Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
V	=	Approach half width (m)	5.5	6	5	7	5	6.3	5.5
E	=	Entry width (m)	7.8	9	5.8	10	10	7.3	8
L	=	Effective length of flare (m)	5	10	5	10	5	4.5	10
R	=	Entry radius	20	20	25	20	20	18	20
D	=	Inscribed circle diameter (m)	140	140	140	140	140	140	140
A	=	Entry angle (degree)	50	65	50	55	50	41	57
Q	=	Entry flow (pcu/hr)	530	1170	815	1245	735	620	780
Qc	=	Circulating flow across entry (pcu/hr)	2250	1250	2060	1985	2665	2610	2445

Output Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
S	=	Sharepness of flare = 1.6*(E-V)/L	0.74	0.48	0.26	0.48	1.60	0.36	0.40
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)	0.93	0.88	0.94	0.91	0.93	0.96	0.91
X_2	=	V+((E-V)/(1+2*S))	6.43	7.53	5.53	8.53	6.19	6.88	6.89
M	=	Exp((D-60)/10)	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96
F	=	303*X_2	1948.42	2281.78	1675.32	2584.78	1875.71	2085.98	2087.33
Td	=	1+(0.5/(1+M))	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fc	=	0.21*Td*(1+0.2*X_2)	0.48	0.53	0.44	0.57	0.47	0.50	0.50
Qe	=	Capacity = K*(F-Fc*Qc)	807.82	1426.60	718.63	1330.18	579.72	748.85	785.10
DFC	=	Entry Flow/Capacity = Q/Qe	0.66	0.82	1.13	0.94	1.27	0.83	0.99

DFC of Critical Approach = 1.27

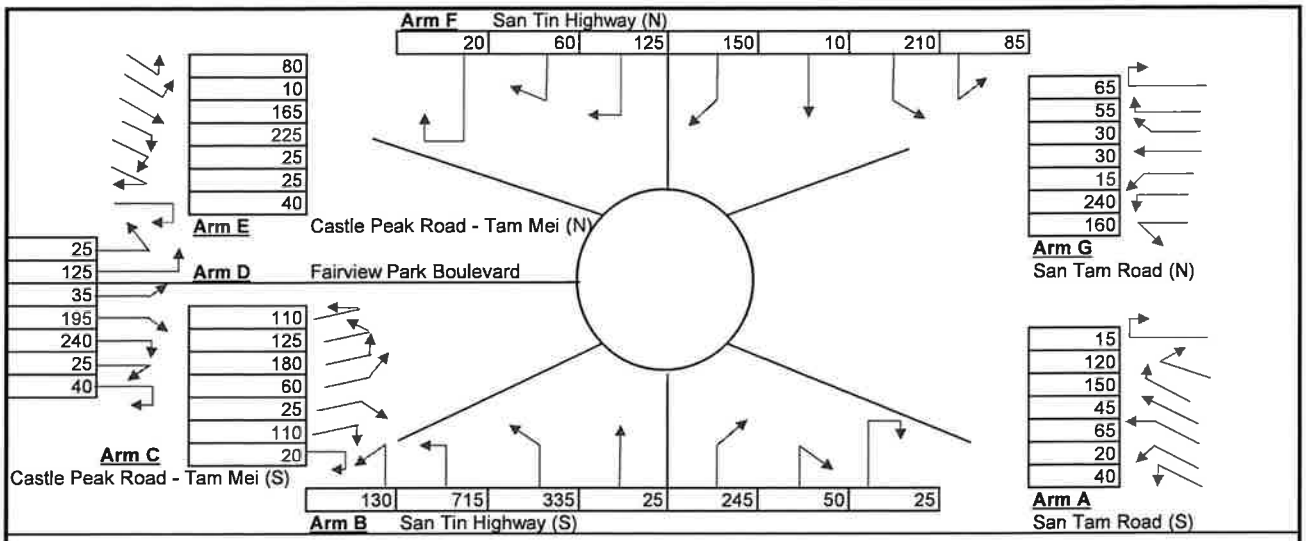
CTA

Roundabout Junction Calculation

Roundabout Junction: (F) Fairview Park Interchange

Design Year: REFERENCE CASE

Scenario: PM PEAK Date: 2030



Input Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
V	=	Approach half width (m)	5.5	6	5	7	5	6.3	5.5
E	=	Entry width (m)	7.8	9	5.8	10	10	7.3	8
L	=	Effective length of flare (m)	5	10	5	10	5	4.5	10
R	=	Entry radius	20	20	25	20	20	18	20
D	=	Inscribed circle diameter (m)	140	140	140	140	140	140	140
A	=	Entry angle (degree)	50	65	50	55	50	41	57
Q	=	Entry flow (pcu/hr)	455	1525	630	685	570	660	595
Qc	=	Circulating flow across entry (pcu/hr)	1575	1140	2280	1800	1825	1760	1800

Output Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
S	=	Sharepness of flare = 1.6*(E-V)/L	0.74	0.48	0.26	0.48	1.60	0.36	0.40
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)	0.93	0.88	0.94	0.91	0.93	0.96	0.91
X_2	=	V+((E-V)/(1+2*S))	6.43	7.53	5.53	8.53	6.19	6.88	6.89
M	=	Exp((D-60)/10)	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96
F	=	303*X_2	1948.42	2281.78	1675.32	2584.78	1875.71	2085.98	2087.33
Td	=	1+(0.5/(1+M))	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fc	=	0.21*Td*(1+0.2*X_2)	0.48	0.53	0.44	0.57	0.47	0.50	0.50
Qe	=	Capacity = K*(F-Fc*Qc)	1109.43	1477.47	627.12	1426.21	947.18	1154.69	1077.04
DFC	=	Entry Flow/Capacity = Q/Qe	0.41	1.03	1.00	0.48	0.60	0.57	0.55

DFC of Critical Approach = 1.03

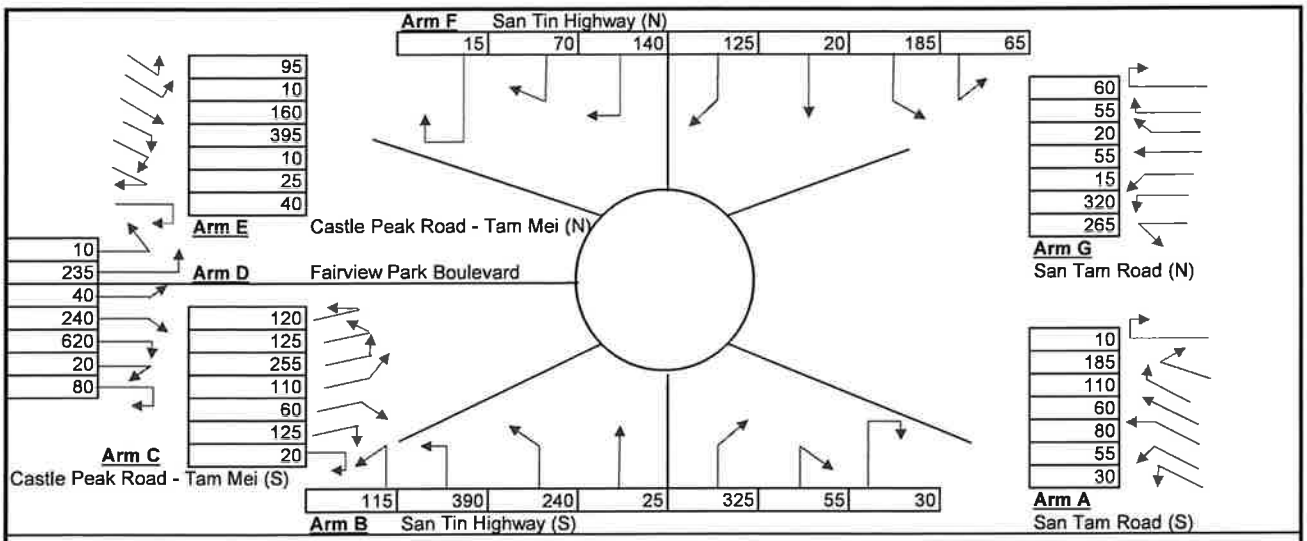
CTA

Roundabout Junction Calculation

Roundabout Junction (F) Fairview Park Interchange

Design Year : DESIGN CASE

Scenario : AM PEAK Date : 2030



Input Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
V	=	Approach half width (m)	5.5	6	5	7	5	6.3	5.5
E	=	Entry width (m)	7.8	9	5.8	10	10	7.3	8
L	=	Effective length of flare (m)	5	10	5	10	5	4.5	10
R	=	Entry radius	20	20	25	20	20	18	20
D	=	Inscribed circle diameter (m)	140	140	140	140	140	140	140
A	=	Entry angle (degree)	50	65	50	55	50	41	57
Q	=	Entry flow (pcu/hr)	530	1180	815	1245	735	620	790
Qc	=	Circulating flow across entry (pcu/hr)	2260	1250	2070	1995	2675	2620	2445

Output Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
S	=	Sharepness of flare = 1.6*(E-V)/L	0.74	0.48	0.26	0.48	1.60	0.36	0.40
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)	0.93	0.88	0.94	0.91	0.93	0.96	0.91
X_2	=	V+((E-V)/(1+2*S))	6.43	7.53	5.53	8.53	6.19	6.88	6.89
M	=	Exp((D-60)/10)	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96
F	=	303*X_2	1948.42	2281.78	1675.32	2584.78	1875.71	2085.98	2087.33
Td	=	1+(0.5/(1+M))	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fc	=	0.21*Td*(1+0.2*X_2)	0.48	0.53	0.44	0.57	0.47	0.50	0.50
Qe	=	Capacity = K*(F-Fc*Qc)	803.35	1426.60	714.47	1324.99	575.35	744.07	785.10
DFC	=	Entry Flow/Capacity = Q/Qe	0.66	0.83	1.14	0.94	1.28	0.83	1.01

DFC of Critical Approach = 1.28

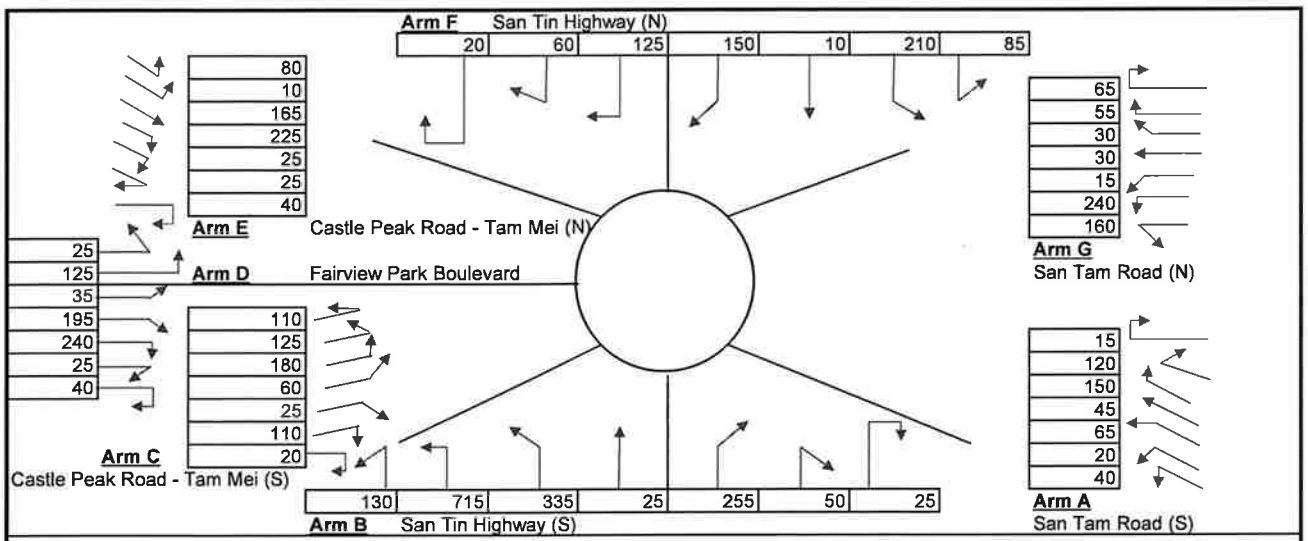
CTA

Roundabout Junction Calculation

Roundabout Junction: (F) Fairview Park Interchange

Design Year: DESIGN CASE

Scenario: PM PEAK Date: 2030



Input Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
V	=	Approach half width (m)	5.5	6	5	7	5	6.3	5.5
E	=	Entry width (m)	7.8	9	5.8	10	10	7.3	8
L	=	Effective length of flare (m)	5	10	5	10	5	4.5	10
R	=	Entry radius	20	20	25	20	20	18	20
D	=	Inscribed circle diameter (m)	140	140	140	140	140	140	140
A	=	Entry angle (degree)	50	65	50	55	50	41	57
Q	=	Entry flow (pcu/hr)	455	1535	630	685	570	660	595
Qc	=	Circulating flow across entry (pcu/hr)	1575	1140	2290	1810	1835	1770	1800

Output Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
S	=	Sharepness of flare = 1.6*(E-V)/L	0.74	0.48	0.26	0.48	1.60	0.36	0.40
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)	0.93	0.88	0.94	0.91	0.93	0.96	0.91
X_2	=	V+((E-V)/(1+2*S))	6.43	7.53	5.53	8.53	6.19	6.88	6.89
M	=	Exp((D-60)/10)	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96
F	=	303*X_2	1948.42	2281.78	1675.32	2584.78	1875.71	2085.98	2087.33
Td	=	1+(0.5/(1+M))	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fc	=	0.21*Td*(1+0.2*X_2)	0.48	0.53	0.44	0.57	0.47	0.50	0.50
Qe	=	Capacity = K*(F-Fc*Qc)	1109.43	1477.47	622.96	1421.02	942.81	1149.92	1077.04
DFC	=	Entry Flow/Capacity = Q/Qe	0.41	1.04	1.01	0.48	0.60	0.57	0.55

DFC of Critical Approach = 1.04

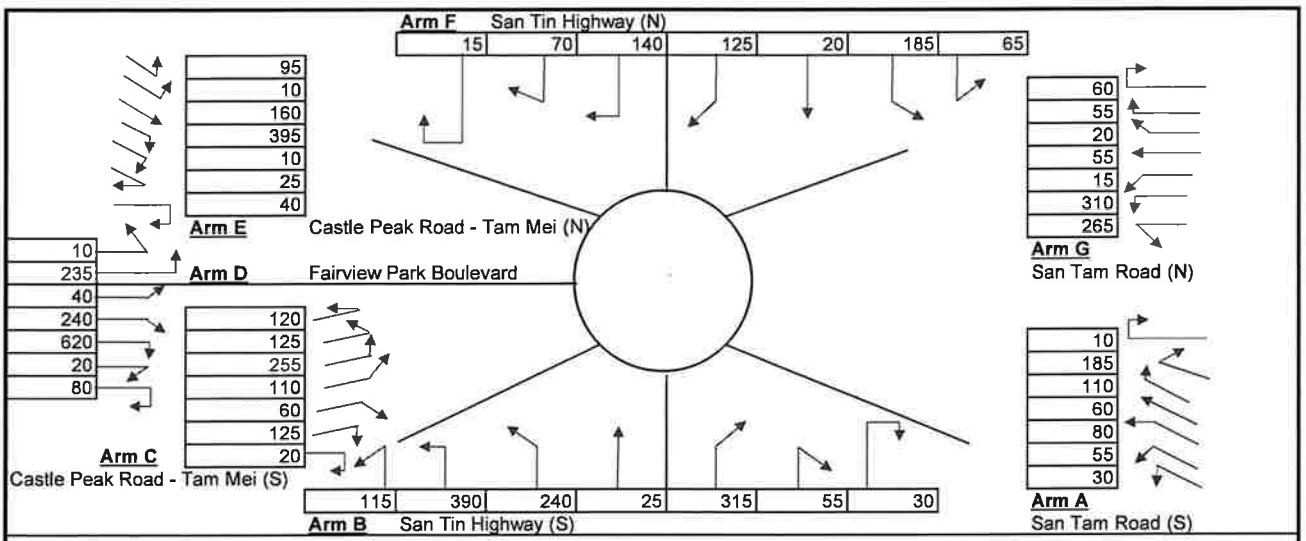
CTA

Roundabout Junction Calculation

Roundabout Junction: (F) Fairview Park Interchange

Reference Year: REFERENCE CASE (WITH IMPROVEMENT)

Scenario: AM PEAK Date: 2030



Input Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
V	=	Approach half width (m)	5.5	6	5	7	5	7.3	7.3
E	=	Entry width (m)	7.8	9	5.8	10	10	11	11
L	=	Effective length of flare (m)	5	10	5	10	5	20	20
R	=	Entry radius	20	20	25	20	20	25	25
D	=	Inscribed circle diameter (m)	140	140	140	140	140	140	140
A	=	Entry angle (degree)	50	65	50	55	50	25	35
Q	=	Entry flow (pcu/hr)	530	1170	815	1245	735	620	780
Qc	=	Circulating flow across entry (pcu/hr)	2250	1250	2060	1985	2665	2610	2445

Output Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
S	=	Sharepness of flare = 1.6*(E-V)/L	0.74	0.48	0.26	0.48	1.60	0.30	0.30
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)	0.93	0.88	0.94	0.91	0.93	1.03	0.99
X_2	=	V+((E-V)/(1+2*S))	6.43	7.53	5.53	8.53	6.19	9.62	9.62
M	=	Exp((D-60)/10)	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96
F	=	303*X_2	1948.42	2281.78	1675.32	2584.78	1875.71	2916.11	2916.11
Td	=	1+(0.5/(1+M))	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fc	=	0.21*Td*(1+0.2*X_2)	0.48	0.53	0.44	0.57	0.47	0.61	0.61
Qe	=	Capacity = K*(F-Fc*Qc)	807.82	1426.60	718.63	1330.18	579.72	1348.36	1403.40
DFC	=	Entry Flow/Capacity = Q/Qe	0.66	0.82	1.13	0.94	1.27	0.46	0.56

DFC of Critical Approach = 1.27

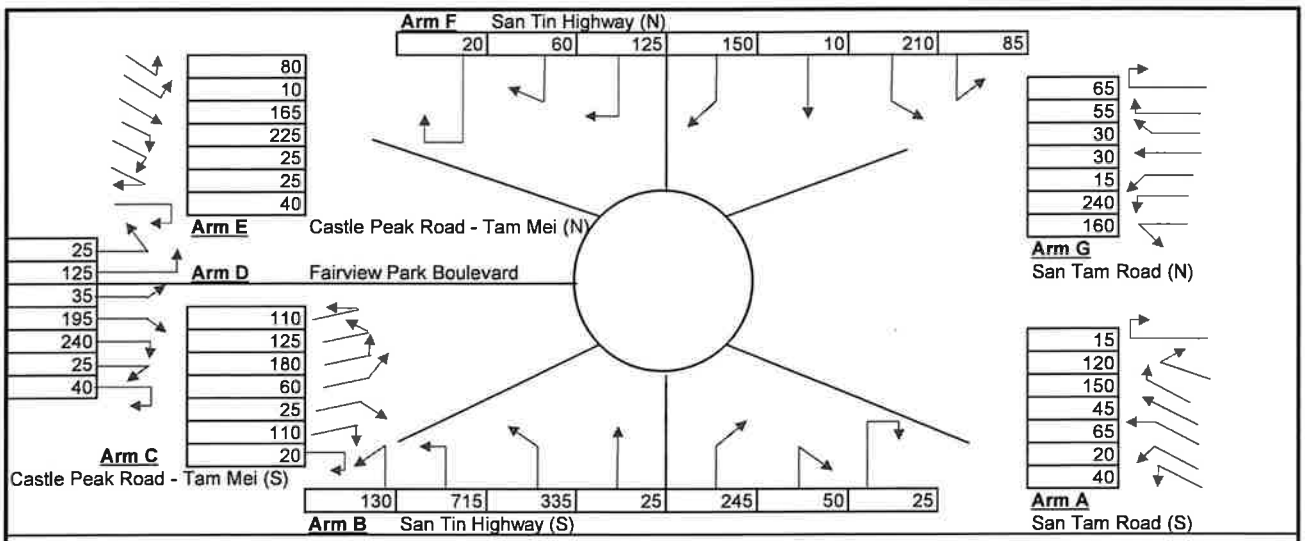
CTA

Roundabout Junction Calculation

Roundabout Junction: (F) Fairview Park Interchange

Reference Year : REFERENCE CASE (WITH IMPROVEMENT)

Scenario : PM PEAK Date : 2030



Input Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
V	=	Approach half width (m)	5.5	6	5	7	5	7.3	7.3
E	=	Entry width (m)	7.8	9	5.8	10	10	11	11
L	=	Effective length of flare (m)	5	10	5	10	5	20	20
R	=	Entry radius	20	20	25	20	20	25	25
D	=	Inscribed circle diameter (m)	140	140	140	140	140	140	140
A	=	Entry angle (degree)	50	65	50	55	50	25	35
Q	=	Entry flow (pcu/hr)	455	1525	630	685	570	660	595
Qc	=	Circulating flow across entry (pcu/hr)	1575	1140	2280	1800	1825	1760	1800

Output Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
S	=	Sharepness of flare = 1.6*(E-V)/L	0.74	0.48	0.26	0.48	1.60	0.30	0.30
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)	0.93	0.88	0.94	0.91	0.93	1.03	0.99
X_2	=	V+((E-V)/(1+2*S))	6.43	7.53	5.53	8.53	6.19	9.62	9.62
M	=	Exp((D-60)/10)	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96
F	=	303*X_2	1948.42	2281.78	1675.32	2584.78	1875.71	2916.11	2916.11
Td	=	1+(0.5/(1+M))	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fc	=	0.21*Td*(1+0.2*X_2)	0.48	0.53	0.44	0.57	0.47	0.61	0.61
Qe	=	Capacity = K*(F-Fc*Qc)	1109.43	1477.47	627.12	1426.21	947.18	1884.69	1796.64
DFC	=	Entry Flow/Capacity = Q/Qe	0.41	1.03	1.00	0.48	0.60	0.35	0.33

DFC of Critical Approach = 1.03

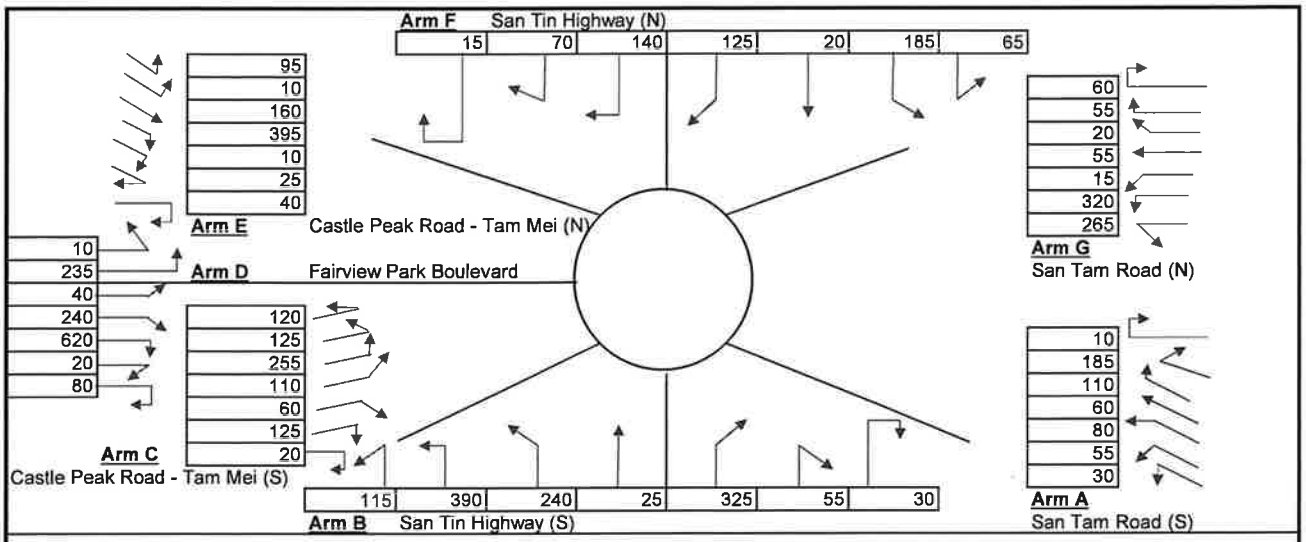
CTA

Roundabout Junction Calculation

Roundabout Junction: (F) Fairview Park Interchange

Reference Year : DESIGN CASE (WITH IMPROVEMENT)

Scenario : AM PEAK Date : 2030



Input Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
V	=	Approach half width (m)	5.5	6	5	7	5	7.3	7.3
E	=	Entry width (m)	7.8	9	5.8	10	10	11	11
L	=	Effective length of flare (m)	5	10	5	10	5	20	20
R	=	Entry radius	20	20	25	20	20	25	25
D	=	Inscribed circle diameter (m)	140	140	140	140	140	140	140
A	=	Entry angle (degree)	50	65	50	55	50	25	35
Q	=	Entry flow (pcu/hr)	530	1180	815	1245	735	620	790
Qc	=	Circulating flow across entry (pcu/hr)	2260	1250	2070	1995	2675	2620	2445

Output Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
S	=	Sharepness of flare = 1.6*(E-V)/L	0.74	0.48	0.26	0.48	1.60	0.30	0.30
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)	0.93	0.88	0.94	0.91	0.93	1.03	0.99
X_2	=	V+((E-V)/(1+2*S))	6.43	7.53	5.53	8.53	6.19	9.62	9.62
M	=	Exp((D-60)/10)	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96
F	=	303*X_2	1948.42	2281.78	1675.32	2584.78	1875.71	2916.11	2916.11
Td	=	1+(0.5/(1+M))	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fc	=	0.21*Td*(1+0.2*X_2)	0.48	0.53	0.44	0.57	0.47	0.61	0.61
Qe	=	Capacity = K*(F-Fc*Qc)	803.35	1426.60	714.47	1324.99	575.35	1342.05	1403.40
DFC	=	Entry Flow/Capacity = Q/Qe	0.66	0.83	1.14	0.94	1.28	0.46	0.56

DFC of Critical Approach = 1.28

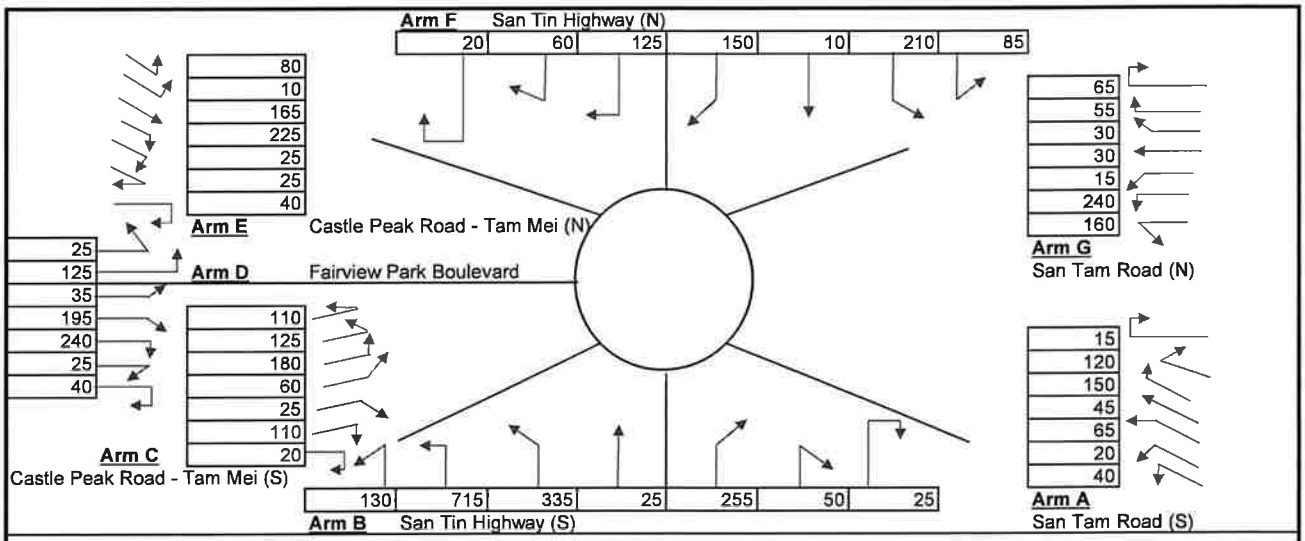
CTA

Roundabout Junction Calculation

Roundabout Junction: (F) Fairview Park Interchange

Reference Year : DESIGN CASE (WITH IMPROVEMENT)

Scenario : PM PEAK Date : 2030



Input Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
V	=	Approach half width (m)	5.5	6	5	7	5	7.3	7.3
E	=	Entry width (m)	7.8	9	5.8	10	10	11	11
L	=	Effective length of flare (m)	5	10	5	10	5	20	20
R	=	Entry radius	20	20	25	20	20	25	25
D	=	Inscribed circle diameter (m)	140	140	140	140	140	140	140
A	=	Entry angle (degree)	50	65	50	55	50	25	35
Q	=	Entry flow (pcu/hr)	455	1535	630	685	570	660	595
Qc	=	Circulating flow across entry (pcu/hr)	1575	1140	2290	1810	1835	1770	1800

Output Parameters			Arm A	Arm B	Arm C	Arm D	Arm E	Arm F	Arm G
S	=	Sharepness of flare = 1.6*(E-V)/L	0.74	0.48	0.26	0.48	1.60	0.30	0.30
K	=	1-0.00347*(A-30)-0.978*(1/R-0.05)	0.93	0.88	0.94	0.91	0.93	1.03	0.99
X_2	=	V+((E-V)/(1+2*S))	6.43	7.53	5.53	8.53	6.19	9.62	9.62
M	=	Exp((D-60)/10)	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96	2980.96
F	=	303*X_2	1948.42	2281.78	1675.32	2584.78	1875.71	2916.11	2916.11
Td	=	1+(0.5/(1+M))	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fc	=	0.21*Td*(1+0.2*X_2)	0.48	0.53	0.44	0.57	0.47	0.61	0.61
Qe	=	Capacity = K*(F-Fc*Qc)	1109.43	1477.47	622.96	1421.02	942.81	1878.38	1796.64
DFC	=	Entry Flow/Capacity = Q/Qe	0.41	1.04	1.01	0.48	0.60	0.35	0.33

DFC of Critical Approach = 1.04

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Junctions 8

PICADY 8 - Priority Intersection Module

Version: 8.0.5.523 [19102,19/06/2015]
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Filename: Junction 8 .arc8
Path: \\CTA_NAS01\Project\CTA Consultants Limited\CTA - Project\22069HK (ykl) - Prop Rezoning for Prop RCHE at 81 San Tam Rd, San Tin\Calculation
Report generation date: 28/12/2022 14:30:42

» **(Default Analysis Set) - 2030 Design, AM**
» **(Default Analysis Set) - 2030 Design, PM**
» **(Default Analysis Set) - 2022 Observed, AM**
» **(Default Analysis Set) - 2022 Observed, PM**
» **(Default Analysis Set) - 2030 Reference, AM**
» **(Default Analysis Set) - 2030 Reference, PM**

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	A1 - 2022 Observed							
Junction A - Stream B-AC	0.25	7.82	0.20	A	0.28	7.32	0.22	A
Junction A - Stream C-A	-	-	-	-	-	-	-	-
Junction A - Stream C-B	0.04	7.28	0.04	A	0.07	7.94	0.07	A
Junction A - Stream A-B	-	-	-	-	-	-	-	-
Junction A - Stream A-C	-	-	-	-	-	-	-	-
Junction B - Stream B-AC	0.03	5.35	0.03	A	0.03	5.51	0.02	A
Junction B - Stream C-A	-	-	-	-	-	-	-	-
Junction B - Stream C-B	0.02	6.72	0.02	A	0.03	6.85	0.03	A
Junction B - Stream A-B	-	-	-	-	-	-	-	-
Junction B - Stream A-C	-	-	-	-	-	-	-	-
Junction C - Stream B-AC	0.34	7.07	0.26	A	0.33	6.78	0.25	A
Junction C - Stream C-A	-	-	-	-	-	-	-	-
Junction C - Stream C-B	0.48	9.97	0.33	A	0.60	10.71	0.38	B
Junction C - Stream A-B	-	-	-	-	-	-	-	-
Junction C - Stream A-C	-	-	-	-	-	-	-	-
Junction D - Stream B-AC	0.10	7.08	0.09	A	0.07	7.57	0.06	A
Junction D - Stream C-A	-	-	-	-	-	-	-	-
Junction D - Stream C-B	0.09	7.77	0.09	A	0.08	7.62	0.08	A
Junction D - Stream A-B	-	-	-	-	-	-	-	-
Junction D - Stream A-C	-	-	-	-	-	-	-	-
Junction E - Stream B-AC	0.54	9.08	0.35	A	0.58	8.68	0.37	A
Junction E - Stream C-A	-	-	-	-	-	-	-	-
Junction E - Stream C-B	1.25	16.38	0.56	C	0.76	12.49	0.43	B
Junction E - Stream A-B	-	-	-	-	-	-	-	-
Junction E - Stream A-C	-	-	-	-	-	-	-	-
	A1 - 2030 Design							
Junction A - Stream B-AC	0.42	9.51	0.30	A	0.40	8.73	0.29	A

Junction A - Stream C-A	-	-	-	-	-	-	-	-
Junction A - Stream C-B	0.09	8.10	0.08	A	0.12	8.92	0.11	A
Junction A - Stream A-B	-	-	-	-	-	-	-	-
Junction A - Stream A-C	-	-	-	-	-	-	-	-
Junction B - Stream B-AC	0.03	5.48	0.03	A	0.03	5.65	0.03	A
Junction B - Stream C-A	-	-	-	-	-	-	-	-
Junction B - Stream C-B	0.02	6.85	0.02	A	0.04	7.06	0.04	A
Junction B - Stream A-B	-	-	-	-	-	-	-	-
Junction B - Stream A-C	-	-	-	-	-	-	-	-
Junction C - Stream B-AC	0.39	7.50	0.28	A	0.37	7.15	0.27	A
Junction C - Stream C-A	-	-	-	-	-	-	-	-
Junction C - Stream C-B	0.55	10.64	0.36	B	0.71	11.70	0.42	B
Junction C - Stream A-B	-	-	-	-	-	-	-	-
Junction C - Stream A-C	-	-	-	-	-	-	-	-
Junction D - Stream B-AC	0.19	7.78	0.16	A	0.11	7.74	0.10	A
Junction D - Stream C-A	-	-	-	-	-	-	-	-
Junction D - Stream C-B	0.11	8.14	0.10	A	0.08	7.84	0.08	A
Junction D - Stream A-B	-	-	-	-	-	-	-	-
Junction D - Stream A-C	-	-	-	-	-	-	-	-
Junction E - Stream B-AC	0.71	10.91	0.42	B	0.68	9.61	0.41	A
Junction E - Stream C-A	-	-	-	-	-	-	-	-
Junction E - Stream C-B	1.68	20.48	0.63	C	0.91	14.09	0.48	B
Junction E - Stream A-B	-	-	-	-	-	-	-	-
Junction E - Stream A-C	-	-	-	-	-	-	-	-
	A1 - 2030 Reference							
Junction A - Stream B-AC	0.40	9.47	0.29	A	0.40	8.73	0.29	A
Junction A - Stream C-A	-	-	-	-	-	-	-	-
Junction A - Stream C-B	0.09	8.10	0.08	A	0.12	8.92	0.11	A
Junction A - Stream A-B	-	-	-	-	-	-	-	-
Junction A - Stream A-C	-	-	-	-	-	-	-	-
Junction B - Stream B-AC	0.03	5.48	0.03	A	0.03	5.65	0.03	A
Junction B - Stream C-A	-	-	-	-	-	-	-	-
Junction B - Stream C-B	0.02	6.85	0.02	A	0.04	7.06	0.04	A
Junction B - Stream A-B	-	-	-	-	-	-	-	-
Junction B - Stream A-C	-	-	-	-	-	-	-	-
Junction C - Stream B-AC	0.39	7.47	0.28	A	0.37	7.12	0.27	A
Junction C - Stream C-A	-	-	-	-	-	-	-	-
Junction C - Stream C-B	0.55	10.60	0.36	B	0.71	11.65	0.42	B
Junction C - Stream A-B	-	-	-	-	-	-	-	-
Junction C - Stream A-C	-	-	-	-	-	-	-	-
Junction D - Stream B-AC	0.19	7.76	0.16	A	0.11	7.74	0.10	A
Junction D - Stream C-A	-	-	-	-	-	-	-	-
Junction D - Stream C-B	0.11	8.12	0.10	A	0.08	7.84	0.08	A
Junction D - Stream A-B	-	-	-	-	-	-	-	-
Junction D - Stream A-C	-	-	-	-	-	-	-	-
Junction E - Stream B-AC	0.70	10.83	0.42	B	0.68	9.56	0.41	A
Junction E - Stream C-A	-	-	-	-	-	-	-	-
Junction E - Stream C-B	1.67	20.34	0.63	C	0.91	14.03	0.48	B
Junction E - Stream A-B	-	-	-	-	-	-	-	-
Junction E - Stream A-C	-	-	-	-	-	-	-	-

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

"D1 - 2030 Design, AM " model duration: 8:00 - 9:30
"D9 - 2030 Design, PM" model duration: 8:00 - 9:30
"D10 - 2022 Observed, AM" model duration: 8:00 - 9:30
"D11 - 2022 Observed, PM" model duration: 8:00 - 9:30
"D12 - 2030 Reference, AM" model duration: 8:00 - 9:30
"D13 - 2030 Reference, PM" model duration: 8:00 - 9:30

Run using Junctions 8.0.5.523 at 28/12/2022 14:30:30

File summary

Title	(untitled)
Location	
Site Number	
Date	21/6/2022
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	user
Description	

Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin

(Default Analysis Set) - 2030 Design, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2030 Design, AM	2030 Design	AM		ONE HOUR	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
A	A	San Tam Road / Castle Peak Road - Mai Po	T-Junction	Two-way	A,B,C	9.24	A
B	B	San Tam Road / Access Road	T-Junction	Two-way	A,B,C	5.94	A
C	C	San Tam Road / Ngau Tam Mei Road	T-Junction	Two-way	A,B,C	9.07	A
D	D	San Tam Road / Chun Shin Road	T-Junction	Two-way	A,B,C	7.91	A
E	E	San Tam Road / Chuk Yau Road	T-Junction	Two-way	A,B,C	16.28	C

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Junction	Arm	Arm	Name	Description	Arm Type
A	A	A	(untitled)		Major
A	B	B	(untitled)		Minor
A	C	C	(untitled)		Major
B	A	A	untitled		Major
B	B	B	untitled		Minor
B	C	C	untitled		Major
C	A	A	untitled		Major
C	B	B	untitled		Minor
C	C	C	untitled		Major
D	A	A	untitled		Major
D	B	B	untitled		Minor
D	C	C	untitled		Major
E	A	A	untitled		Major
E	B	B	untitled		Minor
E	C	C	untitled		Major

Major Arm Geometry

Junction	Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	C	8.20		0.00		2.20	0.00		
B	C	6.90		0.00		2.20	0.00		
C	C	6.80		0.00		2.20	0.00		
D	C	6.65		0.00		2.20	0.00		
E	C	7.00		0.00		2.20	0.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Junction	Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
A	B	One lane	5.00										50	50
B	B	One lane	5.00										50	50
C	B	One lane	5.00										50	50
D	B	One lane	3.12										50	50
E	B	One lane	4.84										50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
A	B-A	622.329	0.102	0.259	0.163	0.370
A	B-C	786.649	0.109	0.276	-	-
A	C-B	573.963	0.201	0.201	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B	B-A	622.329	0.109	0.275	0.173	0.393
B	B-C	786.649	0.116	0.293	-	-
B	C-B	573.963	0.214	0.214	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
C	B-A	622.329	0.109	0.277	0.174	0.395
C	B-C	786.649	0.116	0.294	-	-
C	C-B	573.963	0.215	0.215	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
E	B-A	614.024	0.107	0.270	0.170	0.386
E	B-C	776.151	0.114	0.288	-	-
E	C-B	573.963	0.213	0.213	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
D	B-A	524.736	0.093	0.235	0.148	0.335
D	B-C	663.287	0.099	0.250	-	-
D	C-B	573.963	0.216	0.216	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Junction	Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	A	ONE HOUR	✓	410.00	100.000
A	B	ONE HOUR	✓	145.00	100.000
A	C	ONE HOUR	✓	390.00	100.000
B	A	ONE HOUR	✓	160.00	100.000
B	B	ONE HOUR	✓	20.00	100.000
B	C	ONE HOUR	✓	120.00	100.000
C	A	ONE HOUR	✓	205.00	100.000
C	B	ONE HOUR	✓	170.00	100.000
C	C	ONE HOUR	✓	315.00	100.000
D	A	ONE HOUR	✓	345.00	100.000
D	B	ONE HOUR	✓	80.00	100.000
D	C	ONE HOUR	✓	355.00	100.000
E	A	ONE HOUR	✓	410.00	100.000
E	B	ONE HOUR	✓	215.00	100.000
E	C	ONE HOUR	✓	595.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

		To		
		A	B	C
From	A	0.000	80.000	330.000
	B	70.000	0.000	75.000
	C	355.000	35.000	0.000

Turning Proportions (PCU) - Junction A (for whole period)

		To		
		A	B	C
From	A	0.00	0.20	0.80
	B	0.48	0.00	0.52
	C	0.91	0.09	0.00

Turning Counts / Proportions (PCU/hr) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.000	5.000	155.000
	B	5.000	0.000	15.000
	C	110.000	10.000	0.000

Turning Proportions (PCU) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.00	0.03	0.97
	B	0.25	0.00	0.75
	C	0.92	0.08	0.00

Turning Counts / Proportions (PCU/hr) - Junction C (for whole period)

		To		
		A	B	C
From	A	0.000	15.000	190.000
	B	25.000	0.000	145.000
	C	145.000	170.000	0.000

Turning Proportions (PCU) - Junction C (for whole period)

		To		
		A	B	C
From	A	0.00	0.07	0.93
	B	0.15	0.00	0.85
	C	0.46	0.54	0.00

Turning Counts / Proportions (PCU/hr) - Junction E (for whole period)

		To		
		A	B	C
From	A	0.000	20.000	390.000
	B	30.000	0.000	185.000
	C	320.000	275.000	0.000

Turning Proportions (PCU) - Junction E (for whole period)

		To		
		A	B	C
From	A	0.00	0.05	0.95
	B	0.14	0.00	0.86
	C	0.54	0.46	0.00

Turning Counts / Proportions (PCU/hr) - Junction D (for whole period)

		To		
		A	B	C
From	A	0.000	5.000	340.000
	B	5.000	0.000	75.000
	C	310.000	45.000	0.000

Turning Proportions (PCU) - Junction D (for whole period)

		To		
		A	B	C
From	A	0.00	0.01	0.99
	B	0.06	0.00	0.94
	C	0.87	0.13	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction B (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction B (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction C (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction C (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction E (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction E (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction D (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction D (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	B-AC	0.30	9.51	0.42	A
A	C-A	-	-	-	-
A	C-B	0.08	8.10	0.09	A
A	A-B	-	-	-	-
A	A-C	-	-	-	-
B	B-AC	0.03	5.48	0.03	A
B	C-A	-	-	-	-
B	C-B	0.02	6.85	0.02	A
B	A-B	-	-	-	-
B	A-C	-	-	-	-
C	B-AC	0.28	7.50	0.39	A
C	C-A	-	-	-	-
C	C-B	0.36	10.64	0.55	B
C	A-B	-	-	-	-
C	A-C	-	-	-	-
D	B-AC	0.16	7.78	0.19	A
D	C-A	-	-	-	-
D	C-B	0.10	8.14	0.11	A
D	A-B	-	-	-	-
D	A-C	-	-	-	-
E	B-AC	0.42	10.91	0.71	B
E	C-A	-	-	-	-
E	C-B	0.63	20.48	1.68	C
E	A-B	-	-	-	-
E	A-C	-	-	-	-

Main Results for each time segment

Main results: (08:00-08:15)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	109.16	108.26	0.00	589.85	0.185	0.22	7.461	A
A	C-A	267.26	267.26	0.00	-	-	-	-	-
A	C-B	26.35	26.13	0.00	511.89	0.051	0.05	7.407	A
A	A-B	60.23	60.23	0.00	-	-	-	-	-
A	A-C	248.44	248.44	0.00	-	-	-	-	-
B	B-AC	15.06	14.97	0.00	697.36	0.022	0.02	5.275	A
B	C-A	82.81	82.81	0.00	-	-	-	-	-
B	C-B	7.53	7.47	0.00	548.22	0.014	0.01	6.657	A
B	A-B	3.76	3.76	0.00	-	-	-	-	-
B	A-C	116.69	116.69	0.00	-	-	-	-	-
C	B-AC	127.98	127.09	0.00	696.96	0.184	0.22	6.309	A
C	C-A	109.16	109.16	0.00	-	-	-	-	-
C	C-B	127.98	126.76	0.00	540.84	0.237	0.31	8.670	A
C	A-B	11.29	11.29	0.00	-	-	-	-	-
C	A-C	143.04	143.04	0.00	-	-	-	-	-
D	B-AC	60.23	59.77	0.00	583.27	0.103	0.11	6.871	A
D	C-A	233.38	233.38	0.00	-	-	-	-	-
D	C-B	33.88	33.60	0.00	517.84	0.065	0.07	7.431	A
D	A-B	3.76	3.76	0.00	-	-	-	-	-
D	A-C	255.97	255.97	0.00	-	-	-	-	-
E	B-AC	161.86	160.50	0.00	630.64	0.257	0.34	7.636	A
E	C-A	240.91	240.91	0.00	-	-	-	-	-
E	C-B	207.03	204.35	0.00	508.31	0.407	0.67	11.753	B
E	A-B	15.06	15.06	0.00	-	-	-	-	-
E	A-C	293.61	293.61	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	130.35	130.07	0.00	568.26	0.229	0.29	8.211	A
A	C-A	319.14	319.14	0.00	-	-	-	-	-
A	C-B	31.46	31.41	0.00	499.84	0.063	0.07	7.684	A
A	A-B	71.92	71.92	0.00	-	-	-	-	-
A	A-C	296.66	296.66	0.00	-	-	-	-	-
B	B-AC	17.98	17.96	0.00	689.42	0.026	0.03	5.361	A
B	C-A	98.89	98.89	0.00	-	-	-	-	-
B	C-B	8.99	8.98	0.00	543.23	0.017	0.02	6.737	A
B	A-B	4.49	4.49	0.00	-	-	-	-	-
B	A-C	139.34	139.34	0.00	-	-	-	-	-
C	B-AC	152.83	152.58	0.00	684.56	0.223	0.28	6.764	A
C	C-A	130.35	130.35	0.00	-	-	-	-	-
C	C-B	152.83	152.47	0.00	534.41	0.286	0.39	9.417	A
C	A-B	13.48	13.48	0.00	-	-	-	-	-
C	A-C	170.81	170.81	0.00	-	-	-	-	-
D	B-AC	71.92	71.80	0.00	569.62	0.126	0.14	7.229	A
D	C-A	278.68	278.68	0.00	-	-	-	-	-
D	C-B	40.45	40.39	0.00	506.94	0.080	0.09	7.715	A
D	A-B	4.49	4.49	0.00	-	-	-	-	-
D	A-C	305.65	305.65	0.00	-	-	-	-	-
E	B-AC	193.28	192.79	0.00	604.85	0.320	0.46	8.726	A
E	C-A	287.67	287.67	0.00	-	-	-	-	-
E	C-B	247.22	246.04	0.00	495.56	0.499	0.97	14.356	B
E	A-B	17.98	17.98	0.00	-	-	-	-	-
E	A-C	350.60	350.60	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	159.65	159.16	0.00	538.05	0.297	0.42	9.489	A
A	C-A	390.86	390.86	0.00	-	-	-	-	-
A	C-B	38.54	38.46	0.00	483.18	0.080	0.09	8.094	A
A	A-B	88.08	88.08	0.00	-	-	-	-	-
A	A-C	363.34	363.34	0.00	-	-	-	-	-
B	B-AC	22.02	21.99	0.00	678.43	0.032	0.03	5.483	A
B	C-A	121.11	121.11	0.00	-	-	-	-	-
B	C-B	11.01	10.99	0.00	536.32	0.021	0.02	6.852	A
B	A-B	5.51	5.51	0.00	-	-	-	-	-
B	A-C	170.66	170.66	0.00	-	-	-	-	-
C	B-AC	187.17	186.77	0.00	667.16	0.281	0.39	7.487	A
C	C-A	159.65	159.65	0.00	-	-	-	-	-
C	C-B	187.17	186.58	0.00	525.52	0.356	0.54	10.602	B
C	A-B	16.52	16.52	0.00	-	-	-	-	-
C	A-C	209.19	209.19	0.00	-	-	-	-	-
D	B-AC	88.08	87.90	0.00	550.61	0.160	0.19	7.774	A
D	C-A	341.32	341.32	0.00	-	-	-	-	-
D	C-B	49.55	49.45	0.00	491.88	0.101	0.11	8.135	A
D	A-B	5.51	5.51	0.00	-	-	-	-	-
D	A-C	374.35	374.35	0.00	-	-	-	-	-
E	B-AC	236.72	235.76	0.00	567.08	0.417	0.70	10.836	B
E	C-A	352.33	352.33	0.00	-	-	-	-	-
E	C-B	302.78	300.10	0.00	477.94	0.634	1.64	19.933	C
E	A-B	22.02	22.02	0.00	-	-	-	-	-
E	A-C	429.40	429.40	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	159.65	159.64	0.00	538.03	0.297	0.42	9.513	A
A	C-A	390.86	390.86	0.00	-	-	-	-	-
A	C-B	38.54	38.53	0.00	483.18	0.080	0.09	8.096	A
A	A-B	88.08	88.08	0.00	-	-	-	-	-
A	A-C	363.34	363.34	0.00	-	-	-	-	-
B	B-AC	22.02	22.02	0.00	678.42	0.032	0.03	5.483	A
B	C-A	121.11	121.11	0.00	-	-	-	-	-
B	C-B	11.01	11.01	0.00	536.32	0.021	0.02	6.852	A
B	A-B	5.51	5.51	0.00	-	-	-	-	-
B	A-C	170.66	170.66	0.00	-	-	-	-	-
C	B-AC	187.17	187.16	0.00	667.09	0.281	0.39	7.500	A
C	C-A	159.65	159.65	0.00	-	-	-	-	-
C	C-B	187.17	187.16	0.00	525.52	0.356	0.55	10.637	B
C	A-B	16.52	16.52	0.00	-	-	-	-	-
C	A-C	209.19	209.19	0.00	-	-	-	-	-
D	B-AC	88.08	88.08	0.00	550.61	0.160	0.19	7.783	A
D	C-A	341.32	341.32	0.00	-	-	-	-	-
D	C-B	49.55	49.54	0.00	491.88	0.101	0.11	8.138	A
D	A-B	5.51	5.51	0.00	-	-	-	-	-
D	A-C	374.35	374.35	0.00	-	-	-	-	-
E	B-AC	236.72	236.69	0.00	566.62	0.418	0.71	10.909	B
E	C-A	352.33	352.33	0.00	-	-	-	-	-
E	C-B	302.78	302.61	0.00	477.94	0.634	1.68	20.475	C
E	A-B	22.02	22.02	0.00	-	-	-	-	-
E	A-C	429.40	429.40	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	130.35	130.82	0.00	568.22	0.229	0.30	8.240	A
A	C-A	319.14	319.14	0.00	-	-	-	-	-
A	C-B	31.46	31.54	0.00	499.84	0.063	0.07	7.689	A
A	A-B	71.92	71.92	0.00	-	-	-	-	-
A	A-C	296.66	296.66	0.00	-	-	-	-	-
B	B-AC	17.98	18.01	0.00	689.42	0.026	0.03	5.363	A
B	C-A	98.89	98.89	0.00	-	-	-	-	-
B	C-B	8.99	9.01	0.00	543.23	0.017	0.02	6.738	A
B	A-B	4.49	4.49	0.00	-	-	-	-	-
B	A-C	139.34	139.34	0.00	-	-	-	-	-
C	B-AC	152.83	153.22	0.00	684.45	0.223	0.29	6.783	A
C	C-A	130.35	130.35	0.00	-	-	-	-	-
C	C-B	152.83	153.40	0.00	534.41	0.286	0.41	9.462	A
C	A-B	13.48	13.48	0.00	-	-	-	-	-
C	A-C	170.81	170.81	0.00	-	-	-	-	-
D	B-AC	71.92	72.09	0.00	569.61	0.126	0.15	7.240	A
D	C-A	278.68	278.68	0.00	-	-	-	-	-
D	C-B	40.45	40.55	0.00	506.94	0.080	0.09	7.720	A
D	A-B	4.49	4.49	0.00	-	-	-	-	-
D	A-C	305.65	305.65	0.00	-	-	-	-	-
E	B-AC	193.28	194.21	0.00	604.27	0.320	0.48	8.800	A
E	C-A	287.67	287.67	0.00	-	-	-	-	-
E	C-B	247.22	249.83	0.00	495.56	0.499	1.03	14.803	B
E	A-B	17.98	17.98	0.00	-	-	-	-	-
E	A-C	350.60	350.60	0.00	-	-	-	-	-

Main results: (09:15-09:30)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	109.16	109.45	0.00	589.79	0.185	0.23	7.498	A
A	C-A	267.26	267.26	0.00	-	-	-	-	-
A	C-B	26.35	26.40	0.00	511.89	0.051	0.05	7.417	A
A	A-B	60.23	60.23	0.00	-	-	-	-	-
A	A-C	248.44	248.44	0.00	-	-	-	-	-
B	B-AC	15.06	15.08	0.00	697.35	0.022	0.02	5.278	A
B	C-A	82.81	82.81	0.00	-	-	-	-	-
B	C-B	7.53	7.54	0.00	548.22	0.014	0.01	6.660	A
B	A-B	3.76	3.76	0.00	-	-	-	-	-
B	A-C	116.69	116.69	0.00	-	-	-	-	-
C	B-AC	127.98	128.24	0.00	696.78	0.184	0.23	6.336	A
C	C-A	109.16	109.16	0.00	-	-	-	-	-
C	C-B	127.98	128.35	0.00	540.84	0.237	0.31	8.735	A
C	A-B	11.29	11.29	0.00	-	-	-	-	-
C	A-C	143.04	143.04	0.00	-	-	-	-	-
D	B-AC	60.23	60.35	0.00	583.25	0.103	0.12	6.888	A
D	C-A	233.38	233.38	0.00	-	-	-	-	-
D	C-B	33.88	33.95	0.00	517.84	0.065	0.07	7.442	A
D	A-B	3.76	3.76	0.00	-	-	-	-	-
D	A-C	255.97	255.97	0.00	-	-	-	-	-
E	B-AC	161.86	162.37	0.00	630.12	0.257	0.35	7.704	A
E	C-A	240.91	240.91	0.00	-	-	-	-	-
E	C-B	207.03	208.33	0.00	508.31	0.407	0.70	12.054	B
E	A-B	15.06	15.06	0.00	-	-	-	-	-
E	A-C	293.61	293.61	0.00	-	-	-	-	-

(Default Analysis Set) - 2030 Design, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2030 Design, PM	2030 Design	PM		ONE HOUR	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
A	A	San Tam Road / Castle Peak Road - Mai Po	T-Junction	Two-way	A,B,C	8.77	A
B	B	San Tam Road / Access Road	T-Junction	Two-way	A,B,C	6.46	A
C	C	San Tam Road / Ngau Tam Mei Road	T-Junction	Two-way	A,B,C	9.61	A
D	D	San Tam Road / Chun Shin Road	T-Junction	Two-way	A,B,C	7.78	A
E	E	San Tam Road / Chuk Yau Road	T-Junction	Two-way	A,B,C	11.75	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Junction	Arm	Arm	Name	Description	Arm Type
A	A	A	(untitled)		Major
A	B	B	(untitled)		Minor
A	C	C	(untitled)		Major
B	A	A	untitled		Major
B	B	B	untitled		Minor
B	C	C	untitled		Major
C	A	A	untitled		Major
C	B	B	untitled		Minor
C	C	C	untitled		Major
D	A	A	untitled		Major
D	B	B	untitled		Minor
D	C	C	untitled		Major
E	A	A	untitled		Major
E	B	B	untitled		Minor
E	C	C	untitled		Major

Major Arm Geometry

Junction	Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	C	8.20		0.00		2.20	0.00		
B	C	6.90		0.00		2.20	0.00		
C	C	6.80		0.00		2.20	0.00		
D	C	6.65		0.00		2.20	0.00		
E	C	7.00		0.00		2.20	0.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Junction	Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
A	B	One lane	5.00										50	50
B	B	One lane	5.00										50	50
C	B	One lane	5.00										50	50
D	B	One lane	3.12										50	50
E	B	One lane	4.84										50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
A	B-A	622.329	0.102	0.259	0.163	0.370
A	B-C	786.649	0.109	0.276	-	-
A	C-B	573.963	0.201	0.201	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B	B-A	622.329	0.109	0.275	0.173	0.393
B	B-C	786.649	0.116	0.293	-	-
B	C-B	573.963	0.214	0.214	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
C	B-A	622.329	0.109	0.277	0.174	0.395
C	B-C	786.649	0.116	0.294	-	-
C	C-B	573.963	0.215	0.215	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
E	B-A	614.024	0.107	0.270	0.170	0.386
E	B-C	776.151	0.114	0.288	-	-
E	C-B	573.963	0.213	0.213	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
D	B-A	524.736	0.093	0.235	0.148	0.335
D	B-C	663.287	0.099	0.250	-	-
D	C-B	573.963	0.216	0.216	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Junction	Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	A	ONE HOUR	✓	545.00	100.000
A	B	ONE HOUR	✓	150.00	100.000
A	C	ONE HOUR	✓	350.00	100.000
B	A	ONE HOUR	✓	180.00	100.000
B	B	ONE HOUR	✓	15.00	100.000
B	C	ONE HOUR	✓	125.00	100.000
C	A	ONE HOUR	✓	195.00	100.000
C	B	ONE HOUR	✓	170.00	100.000
C	C	ONE HOUR	✓	350.00	100.000
D	A	ONE HOUR	✓	320.00	100.000
D	B	ONE HOUR	✓	45.00	100.000
D	C	ONE HOUR	✓	375.00	100.000
E	A	ONE HOUR	✓	350.00	100.000
E	B	ONE HOUR	✓	235.00	100.000
E	C	ONE HOUR	✓	570.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

		To		
		A	B	C
From	A	0.000	210.000	335.000
	B	40.000	0.000	110.000
	C	305.000	45.000	0.000

Turning Proportions (PCU) - Junction A (for whole period)

		To		
		A	B	C
From	A	0.00	0.39	0.61
	B	0.27	0.00	0.73
	C	0.87	0.13	0.00

Turning Counts / Proportions (PCU/hr) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.000	5.000	175.000
	B	5.000	0.000	10.000
	C	105.000	20.000	0.000

Turning Proportions (PCU) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.00	0.03	0.97
	B	0.33	0.00	0.67
	C	0.84	0.16	0.00

Turning Counts / Proportions (PCU/hr) - Junction C (for whole period)

		To		
		A	B	C
From	A	0.000	25.000	170.000
	B	15.000	0.000	155.000
	C	150.000	200.000	0.000

Turning Proportions (PCU) - Junction C (for whole period)

		To		
		A	B	C
From	A	0.00	0.13	0.87
	B	0.09	0.00	0.91
	C	0.43	0.57	0.00

Turning Counts / Proportions (PCU/hr) - Junction E (for whole period)

		To		
		A	B	C
From	A	0.000	20.000	330.000
	B	15.000	0.000	220.000
	C	355.000	215.000	0.000

Turning Proportions (PCU) - Junction E (for whole period)

		To		
		A	B	C
From	A	0.00	0.06	0.94
	B	0.06	0.00	0.94
	C	0.62	0.38	0.00

Turning Counts / Proportions (PCU/hr) - Junction D (for whole period)

		To		
		A	B	C
From	A	0.000	5.000	315.000
	B	10.000	0.000	35.000
	C	340.000	35.000	0.000

Turning Proportions (PCU) - Junction D (for whole period)

		To		
		A	B	C
From	A	0.00	0.02	0.98
	B	0.22	0.00	0.78
	C	0.91	0.09	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction B (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction B (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction C (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction C (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction E (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction E (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction D (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction D (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	B-AC	0.29	8.73	0.40	A
A	C-A	-	-	-	-
A	C-B	0.11	8.92	0.12	A
A	A-B	-	-	-	-
A	A-C	-	-	-	-
B	B-AC	0.03	5.65	0.03	A
B	C-A	-	-	-	-
B	C-B	0.04	7.06	0.04	A
B	A-B	-	-	-	-
B	A-C	-	-	-	-
C	B-AC	0.27	7.15	0.37	A
C	C-A	-	-	-	-
C	C-B	0.42	11.70	0.71	B
C	A-B	-	-	-	-
C	A-C	-	-	-	-
D	B-AC	0.10	7.74	0.11	A
D	C-A	-	-	-	-
D	C-B	0.08	7.84	0.08	A
D	A-B	-	-	-	-
D	A-C	-	-	-	-
E	B-AC	0.41	9.61	0.68	A
E	C-A	-	-	-	-
E	C-B	0.48	14.09	0.91	B
E	A-B	-	-	-	-
E	A-C	-	-	-	-

Main Results for each time segment

Main results: (08:00-08:15)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	112.93	112.06	0.00	628.50	0.180	0.22	6.959	A
A	C-A	229.62	229.62	0.00	-	-	-	-	-
A	C-B	33.88	33.58	0.00	491.45	0.069	0.07	7.858	A
A	A-B	158.10	158.10	0.00	-	-	-	-	-
A	A-C	252.21	252.21	0.00	-	-	-	-	-
B	B-AC	11.29	11.23	0.00	675.40	0.017	0.02	5.420	A
B	C-A	79.05	79.05	0.00	-	-	-	-	-
B	C-B	15.06	14.94	0.00	545.01	0.028	0.03	6.789	A
B	A-B	3.76	3.76	0.00	-	-	-	-	-
B	A-C	131.75	131.75	0.00	-	-	-	-	-
C	B-AC	127.98	127.12	0.00	716.67	0.179	0.22	6.097	A
C	C-A	112.93	112.93	0.00	-	-	-	-	-
C	C-B	150.57	149.05	0.00	542.45	0.278	0.38	9.117	A
C	A-B	18.82	18.82	0.00	-	-	-	-	-
C	A-C	127.98	127.98	0.00	-	-	-	-	-
D	B-AC	33.88	33.62	0.00	551.01	0.061	0.06	6.955	A
D	C-A	255.97	255.97	0.00	-	-	-	-	-
D	C-B	26.35	26.14	0.00	521.90	0.050	0.05	7.258	A
D	A-B	3.76	3.76	0.00	-	-	-	-	-
D	A-C	237.15	237.15	0.00	-	-	-	-	-
E	B-AC	176.92	175.52	0.00	676.73	0.261	0.35	7.162	A
E	C-A	267.26	267.26	0.00	-	-	-	-	-
E	C-B	161.86	160.07	0.00	517.91	0.313	0.45	10.011	B
E	A-B	15.06	15.06	0.00	-	-	-	-	-
E	A-C	248.44	248.44	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	134.85	134.58	0.00	607.22	0.222	0.28	7.614	A
A	C-A	274.19	274.19	0.00	-	-	-	-	-
A	C-B	40.45	40.38	0.00	475.44	0.085	0.09	8.274	A
A	A-B	188.79	188.79	0.00	-	-	-	-	-
A	A-C	301.16	301.16	0.00	-	-	-	-	-
B	B-AC	13.48	13.47	0.00	666.06	0.020	0.02	5.516	A
B	C-A	94.39	94.39	0.00	-	-	-	-	-
B	C-B	17.98	17.96	0.00	539.39	0.033	0.03	6.903	A
B	A-B	4.49	4.49	0.00	-	-	-	-	-
B	A-C	157.32	157.32	0.00	-	-	-	-	-
C	B-AC	152.83	152.59	0.00	705.96	0.216	0.27	6.502	A
C	C-A	134.85	134.85	0.00	-	-	-	-	-
C	C-B	179.80	179.33	0.00	536.34	0.335	0.50	10.070	B
C	A-B	22.47	22.47	0.00	-	-	-	-	-
C	A-C	152.83	152.83	0.00	-	-	-	-	-
D	B-AC	40.45	40.39	0.00	535.85	0.076	0.08	7.266	A
D	C-A	305.65	305.65	0.00	-	-	-	-	-
D	C-B	31.46	31.42	0.00	511.80	0.061	0.06	7.493	A
D	A-B	4.49	4.49	0.00	-	-	-	-	-
D	A-C	283.18	283.18	0.00	-	-	-	-	-
E	B-AC	211.26	210.80	0.00	658.82	0.321	0.47	8.027	A
E	C-A	319.14	319.14	0.00	-	-	-	-	-
E	C-B	193.28	192.65	0.00	507.04	0.381	0.60	11.426	B
E	A-B	17.98	17.98	0.00	-	-	-	-	-
E	A-C	296.66	296.66	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	165.15	164.70	0.00	577.42	0.286	0.40	8.713	A
A	C-A	335.81	335.81	0.00	-	-	-	-	-
A	C-B	49.55	49.43	0.00	453.29	0.109	0.12	8.910	A
A	A-B	231.21	231.21	0.00	-	-	-	-	-
A	A-C	368.84	368.84	0.00	-	-	-	-	-
B	B-AC	16.52	16.49	0.00	653.13	0.025	0.03	5.654	A
B	C-A	115.61	115.61	0.00	-	-	-	-	-
B	C-B	22.02	21.99	0.00	531.62	0.041	0.04	7.063	A
B	A-B	5.51	5.51	0.00	-	-	-	-	-
B	A-C	192.68	192.68	0.00	-	-	-	-	-
C	B-AC	187.17	186.80	0.00	690.90	0.271	0.37	7.137	A
C	C-A	165.15	165.15	0.00	-	-	-	-	-
C	C-B	220.20	219.39	0.00	527.88	0.417	0.70	11.638	B
C	A-B	27.53	27.53	0.00	-	-	-	-	-
C	A-C	187.17	187.17	0.00	-	-	-	-	-
D	B-AC	49.55	49.45	0.00	514.58	0.096	0.11	7.738	A
D	C-A	374.35	374.35	0.00	-	-	-	-	-
D	C-B	38.54	38.46	0.00	497.83	0.077	0.08	7.836	A
D	A-B	5.51	5.51	0.00	-	-	-	-	-
D	A-C	346.82	346.82	0.00	-	-	-	-	-
E	B-AC	258.74	257.89	0.00	633.28	0.409	0.68	9.568	A
E	C-A	390.86	390.86	0.00	-	-	-	-	-
E	C-B	236.72	235.53	0.00	491.99	0.481	0.90	13.969	B
E	A-B	22.02	22.02	0.00	-	-	-	-	-
E	A-C	363.34	363.34	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	165.15	165.14	0.00	577.40	0.286	0.40	8.732	A
A	C-A	335.81	335.81	0.00	-	-	-	-	-
A	C-B	49.55	49.54	0.00	453.29	0.109	0.12	8.916	A
A	A-B	231.21	231.21	0.00	-	-	-	-	-
A	A-C	368.84	368.84	0.00	-	-	-	-	-
B	B-AC	16.52	16.51	0.00	653.12	0.025	0.03	5.654	A
B	C-A	115.61	115.61	0.00	-	-	-	-	-
B	C-B	22.02	22.02	0.00	531.62	0.041	0.04	7.063	A
B	A-B	5.51	5.51	0.00	-	-	-	-	-
B	A-C	192.68	192.68	0.00	-	-	-	-	-
C	B-AC	187.17	187.17	0.00	690.83	0.271	0.37	7.146	A
C	C-A	165.15	165.15	0.00	-	-	-	-	-
C	C-B	220.20	220.18	0.00	527.88	0.417	0.71	11.697	B
C	A-B	27.53	27.53	0.00	-	-	-	-	-
C	A-C	187.17	187.17	0.00	-	-	-	-	-
D	B-AC	49.55	49.54	0.00	514.56	0.096	0.11	7.741	A
D	C-A	374.35	374.35	0.00	-	-	-	-	-
D	C-B	38.54	38.53	0.00	497.83	0.077	0.08	7.837	A
D	A-B	5.51	5.51	0.00	-	-	-	-	-
D	A-C	346.82	346.82	0.00	-	-	-	-	-
E	B-AC	258.74	258.72	0.00	633.18	0.409	0.68	9.612	A
E	C-A	390.86	390.86	0.00	-	-	-	-	-
E	C-B	236.72	236.67	0.00	491.99	0.481	0.91	14.093	B
E	A-B	22.02	22.02	0.00	-	-	-	-	-
E	A-C	363.34	363.34	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	134.85	135.28	0.00	607.19	0.222	0.29	7.634	A
A	C-A	274.19	274.19	0.00	-	-	-	-	-
A	C-B	40.45	40.57	0.00	475.44	0.085	0.09	8.280	A
A	A-B	188.79	188.79	0.00	-	-	-	-	-
A	A-C	301.16	301.16	0.00	-	-	-	-	-
B	B-AC	13.48	13.50	0.00	666.05	0.020	0.02	5.516	A
B	C-A	94.39	94.39	0.00	-	-	-	-	-
B	C-B	17.98	18.01	0.00	539.39	0.033	0.03	6.907	A
B	A-B	4.49	4.49	0.00	-	-	-	-	-
B	A-C	157.32	157.32	0.00	-	-	-	-	-
C	B-AC	152.83	153.19	0.00	705.86	0.217	0.28	6.519	A
C	C-A	134.85	134.85	0.00	-	-	-	-	-
C	C-B	179.80	180.58	0.00	536.34	0.335	0.51	10.141	B
C	A-B	22.47	22.47	0.00	-	-	-	-	-
C	A-C	152.83	152.83	0.00	-	-	-	-	-
D	B-AC	40.45	40.55	0.00	535.83	0.076	0.08	7.269	A
D	C-A	305.65	305.65	0.00	-	-	-	-	-
D	C-B	31.46	31.53	0.00	511.80	0.061	0.07	7.496	A
D	A-B	4.49	4.49	0.00	-	-	-	-	-
D	A-C	283.18	283.18	0.00	-	-	-	-	-
E	B-AC	211.26	212.09	0.00	658.70	0.321	0.48	8.077	A
E	C-A	319.14	319.14	0.00	-	-	-	-	-
E	C-B	193.28	194.42	0.00	507.04	0.381	0.63	11.559	B
E	A-B	17.98	17.98	0.00	-	-	-	-	-
E	A-C	296.66	296.66	0.00	-	-	-	-	-

Main results: (09:15-09:30)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	112.93	113.20	0.00	628.44	0.180	0.22	6.989	A
A	C-A	229.62	229.62	0.00	-	-	-	-	-
A	C-B	33.88	33.96	0.00	491.45	0.069	0.07	7.870	A
A	A-B	158.10	158.10	0.00	-	-	-	-	-
A	A-C	252.21	252.21	0.00	-	-	-	-	-
B	B-AC	11.29	11.31	0.00	675.38	0.017	0.02	5.422	A
B	C-A	79.05	79.05	0.00	-	-	-	-	-
B	C-B	15.06	15.08	0.00	545.01	0.028	0.03	6.795	A
B	A-B	3.76	3.76	0.00	-	-	-	-	-
B	A-C	131.75	131.75	0.00	-	-	-	-	-
C	B-AC	127.98	128.22	0.00	716.52	0.179	0.22	6.121	A
C	C-A	112.93	112.93	0.00	-	-	-	-	-
C	C-B	150.57	151.06	0.00	542.45	0.278	0.39	9.211	A
C	A-B	18.82	18.82	0.00	-	-	-	-	-
C	A-C	127.98	127.98	0.00	-	-	-	-	-
D	B-AC	33.88	33.94	0.00	550.97	0.061	0.07	6.965	A
D	C-A	255.97	255.97	0.00	-	-	-	-	-
D	C-B	26.35	26.40	0.00	521.90	0.050	0.05	7.268	A
D	A-B	3.76	3.76	0.00	-	-	-	-	-
D	A-C	237.15	237.15	0.00	-	-	-	-	-
E	B-AC	176.92	177.40	0.00	676.58	0.261	0.36	7.218	A
E	C-A	267.26	267.26	0.00	-	-	-	-	-
E	C-B	161.86	162.53	0.00	517.91	0.313	0.46	10.148	B
E	A-B	15.06	15.06	0.00	-	-	-	-	-
E	A-C	248.44	248.44	0.00	-	-	-	-	-

(Default Analysis Set) - 2022 Observed, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2022 Observed, AM	2022 Observed	AM		ONE HOUR	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
A	A	San Tam Road / Castle Peak Road - Mai Po	T-Junction	Two-way	A,B,C	7.73	A
B	B	San Tam Road / Access Road	T-Junction	Two-way	A,B,C	5.81	A
C	C	San Tam Road / Ngau Tam Mei Road	T-Junction	Two-way	A,B,C	8.52	A
D	D	San Tam Road / Chun Shin Road	T-Junction	Two-way	A,B,C	7.41	A
E	E	San Tam Road / Chuk Yau Road	T-Junction	Two-way	A,B,C	13.21	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Junction	Arm	Arm	Name	Description	Arm Type
A	A	A	(untitled)		Major
A	B	B	(untitled)		Minor
A	C	C	(untitled)		Major
B	A	A	untitled		Major
B	B	B	untitled		Minor
B	C	C	untitled		Major
C	A	A	untitled		Major
C	B	B	untitled		Minor
C	C	C	untitled		Major
D	A	A	untitled		Major
D	B	B	untitled		Minor
D	C	C	untitled		Major
E	A	A	untitled		Major
E	B	B	untitled		Minor
E	C	C	untitled		Major

Major Arm Geometry

Junction	Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	C	8.20		0.00		2.20	0.00		
B	C	6.90		0.00		2.20	0.00		
C	C	6.80		0.00		2.20	0.00		
D	C	6.65		0.00		2.20	0.00		
E	C	7.00		0.00		2.20	0.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Junction	Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
A	B	One lane	5.00										50	50
B	B	One lane	5.00										50	50
C	B	One lane	5.00										50	50
D	B	One lane	3.12										50	50
E	B	One lane	4.84										50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
A	B-A	622.329	0.102	0.259	0.163	0.370
A	B-C	786.649	0.109	0.276	-	-
A	C-B	573.963	0.201	0.201	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B	B-A	622.329	0.109	0.275	0.173	0.393
B	B-C	786.649	0.116	0.293	-	-
B	C-B	573.963	0.214	0.214	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
C	B-A	622.329	0.109	0.277	0.174	0.395
C	B-C	786.649	0.116	0.294	-	-
C	C-B	573.963	0.215	0.215	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
E	B-A	614.024	0.107	0.270	0.170	0.386
E	B-C	776.151	0.114	0.288	-	-
E	C-B	573.963	0.213	0.213	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
D	B-A	524.736	0.093	0.235	0.148	0.335
D	B-C	663.287	0.099	0.250	-	-
D	C-B	573.963	0.216	0.216	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Junction	Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	A	ONE HOUR	✓	260.00	100.000
A	B	ONE HOUR	✓	105.00	100.000
A	C	ONE HOUR	✓	240.00	100.000
B	A	ONE HOUR	✓	115.00	100.000
B	B	ONE HOUR	✓	20.00	100.000
B	C	ONE HOUR	✓	95.00	100.000
C	A	ONE HOUR	✓	155.00	100.000
C	B	ONE HOUR	✓	160.00	100.000
C	C	ONE HOUR	✓	250.00	100.000
D	A	ONE HOUR	✓	280.00	100.000
D	B	ONE HOUR	✓	45.00	100.000
D	C	ONE HOUR	✓	290.00	100.000
E	A	ONE HOUR	✓	315.00	100.000
E	B	ONE HOUR	✓	195.00	100.000
E	C	ONE HOUR	✓	515.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

		To		
		A	B	C
From	A	0.000	70.000	190.000
	B	65.000	0.000	40.000
	C	220.000	20.000	0.000

Turning Proportions (PCU) - Junction A (for whole period)

		To		
		A	B	C
From	A	0.00	0.27	0.73
	B	0.62	0.00	0.38
	C	0.92	0.08	0.00

Turning Counts / Proportions (PCU/hr) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.000	5.000	110.000
	B	5.000	0.000	15.000
	C	85.000	10.000	0.000

Turning Proportions (PCU) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.00	0.04	0.96
	B	0.25	0.00	0.75
	C	0.89	0.11	0.00

Turning Counts / Proportions (PCU/hr) - Junction C (for whole period)

		To		
		A	B	C
From	A	0.000	15.000	140.000
	B	25.000	0.000	135.000
	C	90.000	160.000	0.000

Turning Proportions (PCU) - Junction C (for whole period)

		To		
		A	B	C
From	A	0.00	0.10	0.90
	B	0.16	0.00	0.84
	C	0.36	0.64	0.00

Turning Counts / Proportions (PCU/hr) - Junction E (for whole period)

		To		
		A	B	C
From	A	0.000	15.000	300.000
	B	25.000	0.000	170.000
	C	260.000	255.000	0.000

Turning Proportions (PCU) - Junction E (for whole period)

		To		
		A	B	C
From	A	0.00	0.05	0.95
	B	0.13	0.00	0.87
	C	0.50	0.50	0.00

Turning Counts / Proportions (PCU/hr) - Junction D (for whole period)

		To		
		A	B	C
From	A	0.000	5.000	275.000
	B	5.000	0.000	40.000
	C	250.000	40.000	0.000

Turning Proportions (PCU) - Junction D (for whole period)

		To		
		A	B	C
From	A	0.00	0.02	0.98
	B	0.11	0.00	0.89
	C	0.86	0.14	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction B (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction B (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction C (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction C (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction E (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction E (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction D (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction D (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	B-AC	0.20	7.82	0.25	A
A	C-A	-	-	-	-
A	C-B	0.04	7.28	0.04	A
A	A-B	-	-	-	-
A	A-C	-	-	-	-
B	B-AC	0.03	5.35	0.03	A
B	C-A	-	-	-	-
B	C-B	0.02	6.72	0.02	A
B	A-B	-	-	-	-
B	A-C	-	-	-	-
C	B-AC	0.26	7.07	0.34	A
C	C-A	-	-	-	-
C	C-B	0.33	9.97	0.48	A
C	A-B	-	-	-	-
C	A-C	-	-	-	-
D	B-AC	0.09	7.08	0.10	A
D	C-A	-	-	-	-
D	C-B	0.09	7.77	0.09	A
D	A-B	-	-	-	-
D	A-C	-	-	-	-
E	B-AC	0.35	9.08	0.54	A
E	C-A	-	-	-	-
E	C-B	0.56	16.38	1.25	C
E	A-B	-	-	-	-
E	A-C	-	-	-	-

Main Results for each time segment

Main results: (08:00-08:15)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	79.05	78.46	0.00	607.95	0.130	0.15	6.792	A
A	C-A	165.63	165.63	0.00	-	-	-	-	-
A	C-B	15.06	14.94	0.00	534.60	0.028	0.03	6.925	A
A	A-B	52.70	52.70	0.00	-	-	-	-	-
A	A-C	143.04	143.04	0.00	-	-	-	-	-
B	B-AC	15.06	14.97	0.00	708.42	0.021	0.02	5.191	A
B	C-A	63.99	63.99	0.00	-	-	-	-	-
B	C-B	7.53	7.47	0.00	555.46	0.014	0.01	6.569	A
B	A-B	3.76	3.76	0.00	-	-	-	-	-
B	A-C	82.81	82.81	0.00	-	-	-	-	-
C	B-AC	120.46	119.64	0.00	708.25	0.170	0.20	6.107	A
C	C-A	67.76	67.76	0.00	-	-	-	-	-
C	C-B	120.46	119.35	0.00	548.92	0.219	0.28	8.359	A
C	A-B	11.29	11.29	0.00	-	-	-	-	-
C	A-C	105.40	105.40	0.00	-	-	-	-	-
D	B-AC	33.88	33.63	0.00	585.47	0.058	0.06	6.520	A
D	C-A	188.21	188.21	0.00	-	-	-	-	-
D	C-B	30.11	29.87	0.00	528.41	0.057	0.06	7.218	A
D	A-B	3.76	3.76	0.00	-	-	-	-	-
D	A-C	207.03	207.03	0.00	-	-	-	-	-
E	B-AC	146.81	145.67	0.00	659.37	0.223	0.28	6.992	A
E	C-A	195.74	195.74	0.00	-	-	-	-	-
E	C-B	191.98	189.70	0.00	523.52	0.367	0.57	10.710	B
E	A-B	11.29	11.29	0.00	-	-	-	-	-
E	A-C	225.86	225.86	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	94.39	94.24	0.00	594.52	0.159	0.19	7.194	A
A	C-A	197.78	197.78	0.00	-	-	-	-	-
A	C-B	17.98	17.95	0.00	526.96	0.034	0.04	7.072	A
A	A-B	62.93	62.93	0.00	-	-	-	-	-
A	A-C	170.81	170.81	0.00	-	-	-	-	-
B	B-AC	17.98	17.96	0.00	702.65	0.026	0.03	5.257	A
B	C-A	76.41	76.41	0.00	-	-	-	-	-
B	C-B	8.99	8.98	0.00	551.87	0.016	0.02	6.630	A
B	A-B	4.49	4.49	0.00	-	-	-	-	-
B	A-C	98.89	98.89	0.00	-	-	-	-	-
C	B-AC	143.84	143.62	0.00	698.57	0.206	0.26	6.482	A
C	C-A	80.91	80.91	0.00	-	-	-	-	-
C	C-B	143.84	143.53	0.00	544.05	0.264	0.35	8.980	A
C	A-B	13.48	13.48	0.00	-	-	-	-	-
C	A-C	125.86	125.86	0.00	-	-	-	-	-
D	B-AC	40.45	40.40	0.00	573.82	0.071	0.08	6.748	A
D	C-A	224.74	224.74	0.00	-	-	-	-	-
D	C-B	35.96	35.90	0.00	519.57	0.069	0.07	7.443	A
D	A-B	4.49	4.49	0.00	-	-	-	-	-
D	A-C	247.22	247.22	0.00	-	-	-	-	-
E	B-AC	175.30	174.94	0.00	639.78	0.274	0.37	7.732	A
E	C-A	233.73	233.73	0.00	-	-	-	-	-
E	C-B	229.24	228.36	0.00	513.73	0.446	0.79	12.574	B
E	A-B	13.48	13.48	0.00	-	-	-	-	-
E	A-C	269.69	269.69	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	115.61	115.36	0.00	575.89	0.201	0.25	7.813	A
A	C-A	242.22	242.22	0.00	-	-	-	-	-
A	C-B	22.02	21.98	0.00	516.40	0.043	0.04	7.281	A
A	A-B	77.07	77.07	0.00	-	-	-	-	-
A	A-C	209.19	209.19	0.00	-	-	-	-	-
B	B-AC	22.02	21.99	0.00	694.66	0.032	0.03	5.351	A
B	C-A	93.59	93.59	0.00	-	-	-	-	-
B	C-B	11.01	10.99	0.00	546.91	0.020	0.02	6.716	A
B	A-B	5.51	5.51	0.00	-	-	-	-	-
B	A-C	121.11	121.11	0.00	-	-	-	-	-
C	B-AC	176.16	175.82	0.00	685.07	0.257	0.34	7.064	A
C	C-A	99.09	99.09	0.00	-	-	-	-	-
C	C-B	176.16	175.66	0.00	537.33	0.328	0.48	9.939	A
C	A-B	16.52	16.52	0.00	-	-	-	-	-
C	A-C	154.14	154.14	0.00	-	-	-	-	-
D	B-AC	49.55	49.46	0.00	557.61	0.089	0.10	7.084	A
D	C-A	275.26	275.26	0.00	-	-	-	-	-
D	C-B	44.04	43.96	0.00	507.34	0.087	0.09	7.768	A
D	A-B	5.51	5.51	0.00	-	-	-	-	-
D	A-C	302.78	302.78	0.00	-	-	-	-	-
E	B-AC	214.70	214.06	0.00	611.59	0.351	0.53	9.041	A
E	C-A	286.27	286.27	0.00	-	-	-	-	-
E	C-B	280.76	278.98	0.00	500.19	0.561	1.23	16.138	C
E	A-B	16.52	16.52	0.00	-	-	-	-	-
E	A-C	330.31	330.31	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	115.61	115.60	0.00	575.88	0.201	0.25	7.821	A
A	C-A	242.22	242.22	0.00	-	-	-	-	-
A	C-B	22.02	22.02	0.00	516.40	0.043	0.04	7.281	A
A	A-B	77.07	77.07	0.00	-	-	-	-	-
A	A-C	209.19	209.19	0.00	-	-	-	-	-
B	B-AC	22.02	22.02	0.00	694.66	0.032	0.03	5.351	A
B	C-A	93.59	93.59	0.00	-	-	-	-	-
B	C-B	11.01	11.01	0.00	546.91	0.020	0.02	6.716	A
B	A-B	5.51	5.51	0.00	-	-	-	-	-
B	A-C	121.11	121.11	0.00	-	-	-	-	-
C	B-AC	176.16	176.16	0.00	685.01	0.257	0.34	7.073	A
C	C-A	99.09	99.09	0.00	-	-	-	-	-
C	C-B	176.16	176.15	0.00	537.33	0.328	0.48	9.967	A
C	A-B	16.52	16.52	0.00	-	-	-	-	-
C	A-C	154.14	154.14	0.00	-	-	-	-	-
D	B-AC	49.55	49.54	0.00	557.60	0.089	0.10	7.084	A
D	C-A	275.26	275.26	0.00	-	-	-	-	-
D	C-B	44.04	44.04	0.00	507.34	0.087	0.09	7.770	A
D	A-B	5.51	5.51	0.00	-	-	-	-	-
D	A-C	302.78	302.78	0.00	-	-	-	-	-
E	B-AC	214.70	214.68	0.00	611.34	0.351	0.54	9.075	A
E	C-A	286.27	286.27	0.00	-	-	-	-	-
E	C-B	280.76	280.67	0.00	500.19	0.561	1.25	16.380	C
E	A-B	16.52	16.52	0.00	-	-	-	-	-
E	A-C	330.31	330.31	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	94.39	94.63	0.00	594.50	0.159	0.19	7.204	A
A	C-A	197.78	197.78	0.00	-	-	-	-	-
A	C-B	17.98	18.01	0.00	526.96	0.034	0.04	7.075	A
A	A-B	62.93	62.93	0.00	-	-	-	-	-
A	A-C	170.81	170.81	0.00	-	-	-	-	-
B	B-AC	17.98	18.00	0.00	702.64	0.026	0.03	5.259	A
B	C-A	76.41	76.41	0.00	-	-	-	-	-
B	C-B	8.99	9.00	0.00	551.87	0.016	0.02	6.633	A
B	A-B	4.49	4.49	0.00	-	-	-	-	-
B	A-C	98.89	98.89	0.00	-	-	-	-	-
C	B-AC	143.84	144.17	0.00	698.48	0.206	0.26	6.497	A
C	C-A	80.91	80.91	0.00	-	-	-	-	-
C	C-B	143.84	144.32	0.00	544.05	0.264	0.36	9.016	A
C	A-B	13.48	13.48	0.00	-	-	-	-	-
C	A-C	125.86	125.86	0.00	-	-	-	-	-
D	B-AC	40.45	40.54	0.00	573.81	0.071	0.08	6.751	A
D	C-A	224.74	224.74	0.00	-	-	-	-	-
D	C-B	35.96	36.04	0.00	519.57	0.069	0.08	7.445	A
D	A-B	4.49	4.49	0.00	-	-	-	-	-
D	A-C	247.22	247.22	0.00	-	-	-	-	-
E	B-AC	175.30	175.92	0.00	639.45	0.274	0.38	7.776	A
E	C-A	233.73	233.73	0.00	-	-	-	-	-
E	C-B	229.24	230.96	0.00	513.73	0.446	0.83	12.807	B
E	A-B	13.48	13.48	0.00	-	-	-	-	-
E	A-C	269.69	269.69	0.00	-	-	-	-	-

Main results: (09:15-09:30)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	79.05	79.21	0.00	607.91	0.130	0.15	6.813	A
A	C-A	165.63	165.63	0.00	-	-	-	-	-
A	C-B	15.06	15.08	0.00	534.60	0.028	0.03	6.929	A
A	A-B	52.70	52.70	0.00	-	-	-	-	-
A	A-C	143.04	143.04	0.00	-	-	-	-	-
B	B-AC	15.06	15.08	0.00	708.41	0.021	0.02	5.193	A
B	C-A	63.99	63.99	0.00	-	-	-	-	-
B	C-B	7.53	7.54	0.00	555.46	0.014	0.01	6.569	A
B	A-B	3.76	3.76	0.00	-	-	-	-	-
B	A-C	82.81	82.81	0.00	-	-	-	-	-
C	B-AC	120.46	120.68	0.00	708.09	0.170	0.21	6.130	A
C	C-A	67.76	67.76	0.00	-	-	-	-	-
C	C-B	120.46	120.78	0.00	548.92	0.219	0.28	8.414	A
C	A-B	11.29	11.29	0.00	-	-	-	-	-
C	A-C	105.40	105.40	0.00	-	-	-	-	-
D	B-AC	33.88	33.94	0.00	585.45	0.058	0.06	6.527	A
D	C-A	188.21	188.21	0.00	-	-	-	-	-
D	C-B	30.11	30.17	0.00	528.41	0.057	0.06	7.228	A
D	A-B	3.76	3.76	0.00	-	-	-	-	-
D	A-C	207.03	207.03	0.00	-	-	-	-	-
E	B-AC	146.81	147.18	0.00	659.01	0.223	0.29	7.037	A
E	C-A	195.74	195.74	0.00	-	-	-	-	-
E	C-B	191.98	192.92	0.00	523.52	0.367	0.59	10.922	B
E	A-B	11.29	11.29	0.00	-	-	-	-	-
E	A-C	225.86	225.86	0.00	-	-	-	-	-

(Default Analysis Set) - 2022 Observed, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2022 Observed, PM	2022 Observed	PM		ONE HOUR	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
A	A	San Tam Road / Castle Peak Road - Mai Po	T-Junction	Two-way	A,B,C	7.44	A
B	B	San Tam Road / Access Road	T-Junction	Two-way	A,B,C	6.18	A
C	C	San Tam Road / Ngau Tam Mei Road	T-Junction	Two-way	A,B,C	8.89	A
D	D	San Tam Road / Chun Shin Road	T-Junction	Two-way	A,B,C	7.60	A
E	E	San Tam Road / Chuk Yau Road	T-Junction	Two-way	A,B,C	10.49	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Junction	Arm	Arm	Name	Description	Arm Type
A	A	A	(untitled)		Major
A	B	B	(untitled)		Minor
A	C	C	(untitled)		Major
B	A	A	untitled		Major
B	B	B	untitled		Minor
B	C	C	untitled		Major
C	A	A	untitled		Major
C	B	B	untitled		Minor
C	C	C	untitled		Major
D	A	A	untitled		Major
D	B	B	untitled		Minor
D	C	C	untitled		Major
E	A	A	untitled		Major
E	B	B	untitled		Minor
E	C	C	untitled		Major

Major Arm Geometry

Junction	Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	C	8.20		0.00		2.20	0.00		
B	C	6.90		0.00		2.20	0.00		
C	C	6.80		0.00		2.20	0.00		
D	C	6.65		0.00		2.20	0.00		
E	C	7.00		0.00		2.20	0.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Junction	Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
A	B	One lane	5.00										50	50
B	B	One lane	5.00										50	50
C	B	One lane	5.00										50	50
D	B	One lane	3.12										50	50
E	B	One lane	4.84										50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
A	B-A	622.329	0.102	0.259	0.163	0.370
A	B-C	786.649	0.109	0.276	-	-
A	C-B	573.963	0.201	0.201	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B	B-A	622.329	0.109	0.275	0.173	0.393
B	B-C	786.649	0.116	0.293	-	-
B	C-B	573.963	0.214	0.214	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
C	B-A	622.329	0.109	0.277	0.174	0.395
C	B-C	786.649	0.116	0.294	-	-
C	C-B	573.963	0.215	0.215	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
E	B-A	614.024	0.107	0.270	0.170	0.386
E	B-C	776.151	0.114	0.288	-	-
E	C-B	573.963	0.213	0.213	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
D	B-A	524.736	0.093	0.235	0.148	0.335
D	B-C	663.287	0.099	0.250	-	-
D	C-B	573.963	0.216	0.216	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Junction	Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	A	ONE HOUR	✓	395.00	100.000
A	B	ONE HOUR	✓	125.00	100.000
A	C	ONE HOUR	✓	210.00	100.000
B	A	ONE HOUR	✓	135.00	100.000
B	B	ONE HOUR	✓	15.00	100.000
B	C	ONE HOUR	✓	105.00	100.000
C	A	ONE HOUR	✓	145.00	100.000
C	B	ONE HOUR	✓	160.00	100.000
C	C	ONE HOUR	✓	295.00	100.000
D	A	ONE HOUR	✓	265.00	100.000
D	B	ONE HOUR	✓	30.00	100.000
D	C	ONE HOUR	✓	320.00	100.000
E	A	ONE HOUR	✓	280.00	100.000
E	B	ONE HOUR	✓	220.00	100.000
E	C	ONE HOUR	✓	500.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

		To		
		A	B	C
From	A	0.000	190.000	205.000
	B	35.000	0.000	90.000
	C	180.000	30.000	0.000

Turning Proportions (PCU) - Junction A (for whole period)

		To		
		A	B	C
From	A	0.00	0.48	0.52
	B	0.28	0.00	0.72
	C	0.86	0.14	0.00

Turning Counts / Proportions (PCU/hr) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.000	5.000	130.000
	B	5.000	0.000	10.000
	C	90.000	15.000	0.000

Turning Proportions (PCU) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.00	0.04	0.96
	B	0.33	0.00	0.67
	C	0.86	0.14	0.00

Turning Counts / Proportions (PCU/hr) - Junction C (for whole period)

		To		
		A	B	C
From	A	0.000	20.000	125.000
	B	15.000	0.000	145.000
	C	110.000	185.000	0.000

Turning Proportions (PCU) - Junction C (for whole period)

		To		
		A	B	C
From	A	0.00	0.14	0.86
	B	0.09	0.00	0.91
	C	0.37	0.63	0.00

Turning Counts / Proportions (PCU/hr) - Junction E (for whole period)

		To		
		A	B	C
From	A	0.000	20.000	260.000
	B	15.000	0.000	205.000
	C	300.000	200.000	0.000

Turning Proportions (PCU) - Junction E (for whole period)

		To		
		A	B	C
From	A	0.00	0.07	0.93
	B	0.07	0.00	0.93
	C	0.60	0.40	0.00

Turning Counts / Proportions (PCU/hr) - Junction D (for whole period)

		To		
		A	B	C
From	A	0.000	5.000	260.000
	B	10.000	0.000	20.000
	C	285.000	35.000	0.000

Turning Proportions (PCU) - Junction D (for whole period)

		To		
		A	B	C
From	A	0.00	0.02	0.98
	B	0.33	0.00	0.67
	C	0.89	0.11	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction B (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction B (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction C (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction C (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction E (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction E (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction D (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction D (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	B-AC	0.22	7.32	0.28	A
A	C-A	-	-	-	-
A	C-B	0.07	7.94	0.07	A
A	A-B	-	-	-	-
A	A-C	-	-	-	-
B	B-AC	0.02	5.51	0.03	A
B	C-A	-	-	-	-
B	C-B	0.03	6.85	0.03	A
B	A-B	-	-	-	-
B	A-C	-	-	-	-
C	B-AC	0.25	6.78	0.33	A
C	C-A	-	-	-	-
C	C-B	0.38	10.71	0.60	B
C	A-B	-	-	-	-
C	A-C	-	-	-	-
D	B-AC	0.06	7.57	0.07	A
D	C-A	-	-	-	-
D	C-B	0.08	7.62	0.08	A
D	A-B	-	-	-	-
D	A-C	-	-	-	-
E	B-AC	0.37	8.68	0.58	A
E	C-A	-	-	-	-
E	C-B	0.43	12.49	0.76	B
E	A-B	-	-	-	-
E	A-C	-	-	-	-

Main Results for each time segment

Main results: (08:00-08:15)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	94.11	93.45	0.00	662.47	0.142	0.16	6.320	A
A	C-A	135.51	135.51	0.00	-	-	-	-	-
A	C-B	22.59	22.40	0.00	514.16	0.044	0.05	7.319	A
A	A-B	143.04	143.04	0.00	-	-	-	-	-
A	A-C	154.33	154.33	0.00	-	-	-	-	-
B	B-AC	11.29	11.23	0.00	686.85	0.016	0.02	5.328	A
B	C-A	67.76	67.76	0.00	-	-	-	-	-
B	C-B	11.29	11.21	0.00	552.25	0.020	0.02	6.654	A
B	A-B	3.76	3.76	0.00	-	-	-	-	-
B	A-C	97.87	97.87	0.00	-	-	-	-	-
C	B-AC	120.46	119.67	0.00	727.11	0.166	0.20	5.919	A
C	C-A	82.81	82.81	0.00	-	-	-	-	-
C	C-B	139.28	137.94	0.00	550.53	0.253	0.33	8.698	A
C	A-B	15.06	15.06	0.00	-	-	-	-	-
C	A-C	94.11	94.11	0.00	-	-	-	-	-
D	B-AC	22.59	22.41	0.00	541.45	0.042	0.04	6.934	A
D	C-A	214.56	214.56	0.00	-	-	-	-	-
D	C-B	26.35	26.14	0.00	530.85	0.050	0.05	7.129	A
D	A-B	3.76	3.76	0.00	-	-	-	-	-
D	A-C	195.74	195.74	0.00	-	-	-	-	-
E	B-AC	165.63	164.38	0.00	692.12	0.239	0.31	6.807	A
E	C-A	225.86	225.86	0.00	-	-	-	-	-
E	C-B	150.57	149.00	0.00	529.12	0.285	0.39	9.433	A
E	A-B	15.06	15.06	0.00	-	-	-	-	-
E	A-C	195.74	195.74	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	112.37	112.20	0.00	648.66	0.173	0.21	6.709	A
A	C-A	161.82	161.82	0.00	-	-	-	-	-
A	C-B	26.97	26.93	0.00	502.55	0.054	0.06	7.568	A
A	A-B	170.81	170.81	0.00	-	-	-	-	-
A	A-C	184.29	184.29	0.00	-	-	-	-	-
B	B-AC	13.48	13.47	0.00	679.76	0.020	0.02	5.402	A
B	C-A	80.91	80.91	0.00	-	-	-	-	-
B	C-B	13.48	13.47	0.00	548.03	0.025	0.03	6.733	A
B	A-B	4.49	4.49	0.00	-	-	-	-	-
B	A-C	116.87	116.87	0.00	-	-	-	-	-
C	B-AC	143.84	143.63	0.00	718.78	0.200	0.25	6.258	A
C	C-A	98.89	98.89	0.00	-	-	-	-	-
C	C-B	166.31	165.92	0.00	545.98	0.305	0.43	9.462	A
C	A-B	17.98	17.98	0.00	-	-	-	-	-
C	A-C	112.37	112.37	0.00	-	-	-	-	-
D	B-AC	26.97	26.93	0.00	527.80	0.051	0.05	7.187	A
D	C-A	256.21	256.21	0.00	-	-	-	-	-
D	C-B	31.46	31.42	0.00	522.48	0.060	0.06	7.330	A
D	A-B	4.49	4.49	0.00	-	-	-	-	-
D	A-C	233.73	233.73	0.00	-	-	-	-	-
E	B-AC	197.78	197.39	0.00	677.65	0.292	0.41	7.489	A
E	C-A	269.69	269.69	0.00	-	-	-	-	-
E	C-B	179.80	179.29	0.00	520.42	0.345	0.52	10.537	B
E	A-B	17.98	17.98	0.00	-	-	-	-	-
E	A-C	233.73	233.73	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	137.63	137.35	0.00	629.46	0.219	0.28	7.312	A
A	C-A	198.18	198.18	0.00	-	-	-	-	-
A	C-B	33.03	32.97	0.00	486.50	0.068	0.07	7.936	A
A	A-B	209.19	209.19	0.00	-	-	-	-	-
A	A-C	225.71	225.71	0.00	-	-	-	-	-
B	B-AC	16.52	16.50	0.00	669.95	0.025	0.03	5.508	A
B	C-A	99.09	99.09	0.00	-	-	-	-	-
B	C-B	16.52	16.49	0.00	542.20	0.030	0.03	6.847	A
B	A-B	5.51	5.51	0.00	-	-	-	-	-
B	A-C	143.13	143.13	0.00	-	-	-	-	-
C	B-AC	176.16	175.84	0.00	707.12	0.249	0.33	6.771	A
C	C-A	121.11	121.11	0.00	-	-	-	-	-
C	C-B	203.69	203.03	0.00	539.70	0.377	0.60	10.671	B
C	A-B	22.02	22.02	0.00	-	-	-	-	-
C	A-C	137.63	137.63	0.00	-	-	-	-	-
D	B-AC	33.03	32.97	0.00	508.71	0.065	0.07	7.567	A
D	C-A	313.79	313.79	0.00	-	-	-	-	-
D	C-B	38.54	38.47	0.00	510.91	0.075	0.08	7.620	A
D	A-B	5.51	5.51	0.00	-	-	-	-	-
D	A-C	286.27	286.27	0.00	-	-	-	-	-
E	B-AC	242.22	241.55	0.00	657.14	0.369	0.58	8.649	A
E	C-A	330.31	330.31	0.00	-	-	-	-	-
E	C-B	220.20	219.29	0.00	508.39	0.433	0.75	12.410	B
E	A-B	22.02	22.02	0.00	-	-	-	-	-
E	A-C	286.27	286.27	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	137.63	137.62	0.00	629.45	0.219	0.28	7.318	A
A	C-A	198.18	198.18	0.00	-	-	-	-	-
A	C-B	33.03	33.03	0.00	486.50	0.068	0.07	7.938	A
A	A-B	209.19	209.19	0.00	-	-	-	-	-
A	A-C	225.71	225.71	0.00	-	-	-	-	-
B	B-AC	16.52	16.52	0.00	669.95	0.025	0.03	5.508	A
B	C-A	99.09	99.09	0.00	-	-	-	-	-
B	C-B	16.52	16.51	0.00	542.20	0.030	0.03	6.847	A
B	A-B	5.51	5.51	0.00	-	-	-	-	-
B	A-C	143.13	143.13	0.00	-	-	-	-	-
C	B-AC	176.16	176.16	0.00	707.06	0.249	0.33	6.780	A
C	C-A	121.11	121.11	0.00	-	-	-	-	-
C	C-B	203.69	203.67	0.00	539.70	0.377	0.60	10.711	B
C	A-B	22.02	22.02	0.00	-	-	-	-	-
C	A-C	137.63	137.63	0.00	-	-	-	-	-
D	B-AC	33.03	33.03	0.00	508.70	0.065	0.07	7.567	A
D	C-A	313.79	313.79	0.00	-	-	-	-	-
D	C-B	38.54	38.53	0.00	510.91	0.075	0.08	7.620	A
D	A-B	5.51	5.51	0.00	-	-	-	-	-
D	A-C	286.27	286.27	0.00	-	-	-	-	-
E	B-AC	242.22	242.21	0.00	657.07	0.369	0.58	8.677	A
E	C-A	330.31	330.31	0.00	-	-	-	-	-
E	C-B	220.20	220.17	0.00	508.39	0.433	0.76	12.486	B
E	A-B	22.02	22.02	0.00	-	-	-	-	-
E	A-C	286.27	286.27	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	112.37	112.64	0.00	648.64	0.173	0.21	6.719	A
A	C-A	161.82	161.82	0.00	-	-	-	-	-
A	C-B	26.97	27.03	0.00	502.55	0.054	0.06	7.570	A
A	A-B	170.81	170.81	0.00	-	-	-	-	-
A	A-C	184.29	184.29	0.00	-	-	-	-	-
B	B-AC	13.48	13.50	0.00	679.75	0.020	0.02	5.405	A
B	C-A	80.91	80.91	0.00	-	-	-	-	-
B	C-B	13.48	13.51	0.00	548.03	0.025	0.03	6.737	A
B	A-B	4.49	4.49	0.00	-	-	-	-	-
B	A-C	116.87	116.87	0.00	-	-	-	-	-
C	B-AC	143.84	144.15	0.00	718.70	0.200	0.25	6.270	A
C	C-A	98.89	98.89	0.00	-	-	-	-	-
C	C-B	166.31	166.94	0.00	545.98	0.305	0.44	9.513	A
C	A-B	17.98	17.98	0.00	-	-	-	-	-
C	A-C	112.37	112.37	0.00	-	-	-	-	-
D	B-AC	26.97	27.03	0.00	527.78	0.051	0.05	7.192	A
D	C-A	256.21	256.21	0.00	-	-	-	-	-
D	C-B	31.46	31.53	0.00	522.48	0.060	0.06	7.335	A
D	A-B	4.49	4.49	0.00	-	-	-	-	-
D	A-C	233.73	233.73	0.00	-	-	-	-	-
E	B-AC	197.78	198.43	0.00	677.55	0.292	0.42	7.523	A
E	C-A	269.69	269.69	0.00	-	-	-	-	-
E	C-B	179.80	180.67	0.00	520.42	0.345	0.54	10.622	B
E	A-B	17.98	17.98	0.00	-	-	-	-	-
E	A-C	233.73	233.73	0.00	-	-	-	-	-

Main results: (09:15-09:30)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	94.11	94.28	0.00	662.44	0.142	0.17	6.337	A
A	C-A	135.51	135.51	0.00	-	-	-	-	-
A	C-B	22.59	22.63	0.00	514.16	0.044	0.05	7.326	A
A	A-B	143.04	143.04	0.00	-	-	-	-	-
A	A-C	154.33	154.33	0.00	-	-	-	-	-
B	B-AC	11.29	11.31	0.00	686.83	0.016	0.02	5.328	A
B	C-A	67.76	67.76	0.00	-	-	-	-	-
B	C-B	11.29	11.31	0.00	552.25	0.020	0.02	6.654	A
B	A-B	3.76	3.76	0.00	-	-	-	-	-
B	A-C	97.87	97.87	0.00	-	-	-	-	-
C	B-AC	120.46	120.67	0.00	726.98	0.166	0.20	5.941	A
C	C-A	82.81	82.81	0.00	-	-	-	-	-
C	C-B	139.28	139.68	0.00	550.53	0.253	0.34	8.770	A
C	A-B	15.06	15.06	0.00	-	-	-	-	-
C	A-C	94.11	94.11	0.00	-	-	-	-	-
D	B-AC	22.59	22.63	0.00	541.40	0.042	0.04	6.941	A
D	C-A	214.56	214.56	0.00	-	-	-	-	-
D	C-B	26.35	26.40	0.00	530.85	0.050	0.05	7.136	A
D	A-B	3.76	3.76	0.00	-	-	-	-	-
D	A-C	195.74	195.74	0.00	-	-	-	-	-
E	B-AC	165.63	166.02	0.00	691.99	0.239	0.32	6.851	A
E	C-A	225.86	225.86	0.00	-	-	-	-	-
E	C-B	150.57	151.10	0.00	529.12	0.285	0.40	9.536	A
E	A-B	15.06	15.06	0.00	-	-	-	-	-
E	A-C	195.74	195.74	0.00	-	-	-	-	-

(Default Analysis Set) - 2030 Reference, AM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2030 Reference, AM	2030 Reference	AM		ONE HOUR	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
A	A	San Tam Road / Castle Peak Road - Mai Po	T-Junction	Two-way	A,B,C	9.20	A
B	B	San Tam Road / Access Road	T-Junction	Two-way	A,B,C	5.94	A
C	C	San Tam Road / Ngau Tam Mei Road	T-Junction	Two-way	A,B,C	9.03	A
D	D	San Tam Road / Chun Shin Road	T-Junction	Two-way	A,B,C	7.89	A
E	E	San Tam Road / Chuk Yau Road	T-Junction	Two-way	A,B,C	16.17	C

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Junction	Arm	Arm	Name	Description	Arm Type
A	A	A	(untitled)		Major
A	B	B	(untitled)		Minor
A	C	C	(untitled)		Major
B	A	A	untitled		Major
B	B	B	untitled		Minor
B	C	C	untitled		Major
C	A	A	untitled		Major
C	B	B	untitled		Minor
C	C	C	untitled		Major
D	A	A	untitled		Major
D	B	B	untitled		Minor
D	C	C	untitled		Major
E	A	A	untitled		Major
E	B	B	untitled		Minor
E	C	C	untitled		Major

Major Arm Geometry

Junction	Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	C	8.20		0.00		2.20	0.00		
B	C	6.90		0.00		2.20	0.00		
C	C	6.80		0.00		2.20	0.00		
D	C	6.65		0.00		2.20	0.00		
E	C	7.00		0.00		2.20	0.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Junction	Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
A	B	One lane	5.00										50	50
B	B	One lane	5.00										50	50
C	B	One lane	5.00										50	50
D	B	One lane	3.12										50	50
E	B	One lane	4.84										50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
A	B-A	622.329	0.102	0.259	0.163	0.370
A	B-C	786.649	0.109	0.276	-	-
A	C-B	573.963	0.201	0.201	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B	B-A	622.329	0.109	0.275	0.173	0.393
B	B-C	786.649	0.116	0.293	-	-
B	C-B	573.963	0.214	0.214	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
C	B-A	622.329	0.109	0.277	0.174	0.395
C	B-C	786.649	0.116	0.294	-	-
C	C-B	573.963	0.215	0.215	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
E	B-A	614.024	0.107	0.270	0.170	0.386
E	B-C	776.151	0.114	0.288	-	-
E	C-B	573.963	0.213	0.213	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
D	B-A	524.736	0.093	0.235	0.148	0.335
D	B-C	663.287	0.099	0.250	-	-
D	C-B	573.963	0.216	0.216	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Junction	Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	A	ONE HOUR	✓	410.00	100.000
A	B	ONE HOUR	✓	140.00	100.000
A	C	ONE HOUR	✓	390.00	100.000
B	A	ONE HOUR	✓	160.00	100.000
B	B	ONE HOUR	✓	20.00	100.000
B	C	ONE HOUR	✓	115.00	100.000
C	A	ONE HOUR	✓	200.00	100.000
C	B	ONE HOUR	✓	170.00	100.000
C	C	ONE HOUR	✓	305.00	100.000
D	A	ONE HOUR	✓	340.00	100.000
D	B	ONE HOUR	✓	80.00	100.000
D	C	ONE HOUR	✓	345.00	100.000
E	A	ONE HOUR	✓	405.00	100.000
E	B	ONE HOUR	✓	215.00	100.000
E	C	ONE HOUR	✓	585.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

		To		
		A	B	C
From	A	0.000	80.000	330.000
	B	70.000	0.000	70.000
	C	355.000	35.000	0.000

Turning Proportions (PCU) - Junction A (for whole period)

		To		
		A	B	C
From	A	0.00	0.20	0.80
	B	0.50	0.00	0.50
	C	0.91	0.09	0.00

Turning Counts / Proportions (PCU/hr) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.000	5.000	155.000
	B	5.000	0.000	15.000
	C	105.000	10.000	0.000

Turning Proportions (PCU) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.00	0.03	0.97
	B	0.25	0.00	0.75
	C	0.91	0.09	0.00

Turning Counts / Proportions (PCU/hr) - Junction C (for whole period)

		To		
		A	B	C
From	A	0.000	15.000	185.000
	B	25.000	0.000	145.000
	C	135.000	170.000	0.000

Turning Proportions (PCU) - Junction C (for whole period)

		To		
		A	B	C
From	A	0.00	0.08	0.93
	B	0.15	0.00	0.85
	C	0.44	0.56	0.00

Turning Counts / Proportions (PCU/hr) - Junction E (for whole period)

		To		
		A	B	C
From	A	0.000	20.000	385.000
	B	30.000	0.000	185.000
	C	310.000	275.000	0.000

Turning Proportions (PCU) - Junction E (for whole period)

		To		
		A	B	C
From	A	0.00	0.05	0.95
	B	0.14	0.00	0.86
	C	0.53	0.47	0.00

Turning Counts / Proportions (PCU/hr) - Junction D (for whole period)

		To		
		A	B	C
From	A	0.000	5.000	335.000
	B	5.000	0.000	75.000
	C	300.000	45.000	0.000

Turning Proportions (PCU) - Junction D (for whole period)

		To		
		A	B	C
From	A	0.00	0.01	0.99
	B	0.06	0.00	0.94
	C	0.87	0.13	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction B (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction B (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction C (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction C (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction E (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction E (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction D (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction D (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	B-AC	0.29	9.47	0.40	A
A	C-A	-	-	-	-
A	C-B	0.08	8.10	0.09	A
A	A-B	-	-	-	-
A	A-C	-	-	-	-
B	B-AC	0.03	5.48	0.03	A
B	C-A	-	-	-	-
B	C-B	0.02	6.85	0.02	A
B	A-B	-	-	-	-
B	A-C	-	-	-	-
C	B-AC	0.28	7.47	0.39	A
C	C-A	-	-	-	-
C	C-B	0.36	10.60	0.55	B
C	A-B	-	-	-	-
C	A-C	-	-	-	-
D	B-AC	0.16	7.76	0.19	A
D	C-A	-	-	-	-
D	C-B	0.10	8.12	0.11	A
D	A-B	-	-	-	-
D	A-C	-	-	-	-
E	B-AC	0.42	10.83	0.70	B
E	C-A	-	-	-	-
E	C-B	0.63	20.34	1.67	C
E	A-B	-	-	-	-
E	A-C	-	-	-	-

Main Results for each time segment

Main results: (08:00-08:15)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	105.40	104.53	0.00	586.27	0.180	0.22	7.459	A
A	C-A	267.26	267.26	0.00	-	-	-	-	-
A	C-B	26.35	26.13	0.00	511.89	0.051	0.05	7.407	A
A	A-B	60.23	60.23	0.00	-	-	-	-	-
A	A-C	248.44	248.44	0.00	-	-	-	-	-
B	B-AC	15.06	14.97	0.00	697.60	0.022	0.02	5.273	A
B	C-A	79.05	79.05	0.00	-	-	-	-	-
B	C-B	7.53	7.47	0.00	548.22	0.014	0.01	6.657	A
B	A-B	3.76	3.76	0.00	-	-	-	-	-
B	A-C	116.69	116.69	0.00	-	-	-	-	-
C	B-AC	127.98	127.10	0.00	698.43	0.183	0.22	6.292	A
C	C-A	101.64	101.64	0.00	-	-	-	-	-
C	C-B	127.98	126.76	0.00	541.64	0.236	0.31	8.653	A
C	A-B	11.29	11.29	0.00	-	-	-	-	-
C	A-C	139.28	139.28	0.00	-	-	-	-	-
D	B-AC	60.23	59.77	0.00	584.35	0.103	0.11	6.857	A
D	C-A	225.86	225.86	0.00	-	-	-	-	-
D	C-B	33.88	33.60	0.00	518.65	0.065	0.07	7.419	A
D	A-B	3.76	3.76	0.00	-	-	-	-	-
D	A-C	252.21	252.21	0.00	-	-	-	-	-
E	B-AC	161.86	160.50	0.00	632.17	0.256	0.34	7.611	A
E	C-A	233.38	233.38	0.00	-	-	-	-	-
E	C-B	207.03	204.35	0.00	509.11	0.407	0.67	11.714	B
E	A-B	15.06	15.06	0.00	-	-	-	-	-
E	A-C	289.85	289.85	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	125.86	125.59	0.00	564.53	0.223	0.28	8.196	A
A	C-A	319.14	319.14	0.00	-	-	-	-	-
A	C-B	31.46	31.41	0.00	499.84	0.063	0.07	7.684	A
A	A-B	71.92	71.92	0.00	-	-	-	-	-
A	A-C	296.66	296.66	0.00	-	-	-	-	-
B	B-AC	17.98	17.96	0.00	689.72	0.026	0.03	5.358	A
B	C-A	94.39	94.39	0.00	-	-	-	-	-
B	C-B	8.99	8.98	0.00	543.23	0.017	0.02	6.737	A
B	A-B	4.49	4.49	0.00	-	-	-	-	-
B	A-C	139.34	139.34	0.00	-	-	-	-	-
C	B-AC	152.83	152.58	0.00	686.34	0.223	0.28	6.741	A
C	C-A	121.36	121.36	0.00	-	-	-	-	-
C	C-B	152.83	152.47	0.00	535.37	0.285	0.39	9.393	A
C	A-B	13.48	13.48	0.00	-	-	-	-	-
C	A-C	166.31	166.31	0.00	-	-	-	-	-
D	B-AC	71.92	71.80	0.00	570.92	0.126	0.14	7.210	A
D	C-A	269.69	269.69	0.00	-	-	-	-	-
D	C-B	40.45	40.39	0.00	507.91	0.080	0.09	7.699	A
D	A-B	4.49	4.49	0.00	-	-	-	-	-
D	A-C	301.16	301.16	0.00	-	-	-	-	-
E	B-AC	193.28	192.80	0.00	606.75	0.319	0.46	8.685	A
E	C-A	278.68	278.68	0.00	-	-	-	-	-
E	C-B	247.22	246.05	0.00	496.52	0.498	0.96	14.301	B
E	A-B	17.98	17.98	0.00	-	-	-	-	-
E	A-C	346.11	346.11	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	154.14	153.68	0.00	534.13	0.289	0.40	9.451	A
A	C-A	390.86	390.86	0.00	-	-	-	-	-
A	C-B	38.54	38.46	0.00	483.18	0.080	0.09	8.094	A
A	A-B	88.08	88.08	0.00	-	-	-	-	-
A	A-C	363.34	363.34	0.00	-	-	-	-	-
B	B-AC	22.02	21.99	0.00	678.79	0.032	0.03	5.480	A
B	C-A	115.61	115.61	0.00	-	-	-	-	-
B	C-B	11.01	10.99	0.00	536.32	0.021	0.02	6.852	A
B	A-B	5.51	5.51	0.00	-	-	-	-	-
B	A-C	170.66	170.66	0.00	-	-	-	-	-
C	B-AC	187.17	186.77	0.00	669.40	0.280	0.38	7.452	A
C	C-A	148.64	148.64	0.00	-	-	-	-	-
C	C-B	187.17	186.58	0.00	526.70	0.355	0.54	10.565	B
C	A-B	16.52	16.52	0.00	-	-	-	-	-
C	A-C	203.69	203.69	0.00	-	-	-	-	-
D	B-AC	88.08	87.90	0.00	552.22	0.160	0.19	7.747	A
D	C-A	330.31	330.31	0.00	-	-	-	-	-
D	C-B	49.55	49.45	0.00	493.07	0.100	0.11	8.113	A
D	A-B	5.51	5.51	0.00	-	-	-	-	-
D	A-C	368.84	368.84	0.00	-	-	-	-	-
E	B-AC	236.72	235.77	0.00	569.61	0.416	0.70	10.752	B
E	C-A	341.32	341.32	0.00	-	-	-	-	-
E	C-B	302.78	300.13	0.00	479.11	0.632	1.63	19.811	C
E	A-B	22.02	22.02	0.00	-	-	-	-	-
E	A-C	423.89	423.89	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	154.14	154.13	0.00	534.11	0.289	0.40	9.474	A
A	C-A	390.86	390.86	0.00	-	-	-	-	-
A	C-B	38.54	38.53	0.00	483.18	0.080	0.09	8.096	A
A	A-B	88.08	88.08	0.00	-	-	-	-	-
A	A-C	363.34	363.34	0.00	-	-	-	-	-
B	B-AC	22.02	22.02	0.00	678.79	0.032	0.03	5.480	A
B	C-A	115.61	115.61	0.00	-	-	-	-	-
B	C-B	11.01	11.01	0.00	536.32	0.021	0.02	6.852	A
B	A-B	5.51	5.51	0.00	-	-	-	-	-
B	A-C	170.66	170.66	0.00	-	-	-	-	-
C	B-AC	187.17	187.16	0.00	669.33	0.280	0.39	7.465	A
C	C-A	148.64	148.64	0.00	-	-	-	-	-
C	C-B	187.17	187.16	0.00	526.70	0.355	0.55	10.600	B
C	A-B	16.52	16.52	0.00	-	-	-	-	-
C	A-C	203.69	203.69	0.00	-	-	-	-	-
D	B-AC	88.08	88.08	0.00	552.22	0.160	0.19	7.756	A
D	C-A	330.31	330.31	0.00	-	-	-	-	-
D	C-B	49.55	49.54	0.00	493.07	0.100	0.11	8.116	A
D	A-B	5.51	5.51	0.00	-	-	-	-	-
D	A-C	368.84	368.84	0.00	-	-	-	-	-
E	B-AC	236.72	236.69	0.00	569.16	0.416	0.70	10.826	B
E	C-A	341.32	341.32	0.00	-	-	-	-	-
E	C-B	302.78	302.61	0.00	479.11	0.632	1.67	20.341	C
E	A-B	22.02	22.02	0.00	-	-	-	-	-
E	A-C	423.89	423.89	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	125.86	126.31	0.00	564.50	0.223	0.29	8.223	A
A	C-A	319.14	319.14	0.00	-	-	-	-	-
A	C-B	31.46	31.54	0.00	499.84	0.063	0.07	7.689	A
A	A-B	71.92	71.92	0.00	-	-	-	-	-
A	A-C	296.66	296.66	0.00	-	-	-	-	-
B	B-AC	17.98	18.01	0.00	689.71	0.026	0.03	5.359	A
B	C-A	94.39	94.39	0.00	-	-	-	-	-
B	C-B	8.99	9.01	0.00	543.23	0.017	0.02	6.740	A
B	A-B	4.49	4.49	0.00	-	-	-	-	-
B	A-C	139.34	139.34	0.00	-	-	-	-	-
C	B-AC	152.83	153.21	0.00	686.23	0.223	0.29	6.760	A
C	C-A	121.36	121.36	0.00	-	-	-	-	-
C	C-B	152.83	153.39	0.00	535.37	0.285	0.41	9.440	A
C	A-B	13.48	13.48	0.00	-	-	-	-	-
C	A-C	166.31	166.31	0.00	-	-	-	-	-
D	B-AC	71.92	72.09	0.00	570.91	0.126	0.15	7.218	A
D	C-A	269.69	269.69	0.00	-	-	-	-	-
D	C-B	40.45	40.55	0.00	507.91	0.080	0.09	7.704	A
D	A-B	4.49	4.49	0.00	-	-	-	-	-
D	A-C	301.16	301.16	0.00	-	-	-	-	-
E	B-AC	193.28	194.20	0.00	606.19	0.319	0.47	8.759	A
E	C-A	278.68	278.68	0.00	-	-	-	-	-
E	C-B	247.22	249.80	0.00	496.52	0.498	1.02	14.742	B
E	A-B	17.98	17.98	0.00	-	-	-	-	-
E	A-C	346.11	346.11	0.00	-	-	-	-	-

Main results: (09:15-09:30)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	105.40	105.67	0.00	586.20	0.180	0.22	7.498	A
A	C-A	267.26	267.26	0.00	-	-	-	-	-
A	C-B	26.35	26.40	0.00	511.89	0.051	0.05	7.417	A
A	A-B	60.23	60.23	0.00	-	-	-	-	-
A	A-C	248.44	248.44	0.00	-	-	-	-	-
B	B-AC	15.06	15.08	0.00	697.59	0.022	0.02	5.274	A
B	C-A	79.05	79.05	0.00	-	-	-	-	-
B	C-B	7.53	7.54	0.00	548.22	0.014	0.01	6.660	A
B	A-B	3.76	3.76	0.00	-	-	-	-	-
B	A-C	116.69	116.69	0.00	-	-	-	-	-
C	B-AC	127.98	128.24	0.00	698.25	0.183	0.23	6.317	A
C	C-A	101.64	101.64	0.00	-	-	-	-	-
C	C-B	127.98	128.35	0.00	541.64	0.236	0.31	8.718	A
C	A-B	11.29	11.29	0.00	-	-	-	-	-
C	A-C	139.28	139.28	0.00	-	-	-	-	-
D	B-AC	60.23	60.35	0.00	584.33	0.103	0.12	6.871	A
D	C-A	225.86	225.86	0.00	-	-	-	-	-
D	C-B	33.88	33.95	0.00	518.65	0.065	0.07	7.430	A
D	A-B	3.76	3.76	0.00	-	-	-	-	-
D	A-C	252.21	252.21	0.00	-	-	-	-	-
E	B-AC	161.86	162.37	0.00	631.65	0.256	0.35	7.678	A
E	C-A	233.38	233.38	0.00	-	-	-	-	-
E	C-B	207.03	208.32	0.00	509.11	0.407	0.70	12.021	B
E	A-B	15.06	15.06	0.00	-	-	-	-	-
E	A-C	289.85	289.85	0.00	-	-	-	-	-

(Default Analysis Set) - 2030 Reference, PM

Data Errors and Warnings

No errors or warnings

Analysis Set Details

Name	Roundabout Capacity Model	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
(Default Analysis Set)	N/A			100.000	

Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
2030 Reference, PM	2030 Reference	PM		ONE HOUR	08:00	09:30	90	15		

Junction Network

Junctions

Junction	Junction	Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
A	A	San Tam Road / Castle Peak Road - Mai Po	T-Junction	Two-way	A,B,C	8.77	A
B	B	San Tam Road / Access Road	T-Junction	Two-way	A,B,C	6.46	A
C	C	San Tam Road / Ngau Tam Mei Road	T-Junction	Two-way	A,B,C	9.57	A
D	D	San Tam Road / Chun Shin Road	T-Junction	Two-way	A,B,C	7.78	A
E	E	San Tam Road / Chuk Yau Road	T-Junction	Two-way	A,B,C	11.70	B

Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

Arms

Arms

Junction	Arm	Arm	Name	Description	Arm Type
A	A	A	(untitled)		Major
A	B	B	(untitled)		Minor
A	C	C	(untitled)		Major
B	A	A	untitled		Major
B	B	B	untitled		Minor
B	C	C	untitled		Major
C	A	A	untitled		Major
C	B	B	untitled		Minor
C	C	C	untitled		Major
D	A	A	untitled		Major
D	B	B	untitled		Minor
D	C	C	untitled		Major
E	A	A	untitled		Major
E	B	B	untitled		Minor
E	C	C	untitled		Major

Major Arm Geometry

Junction	Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
A	C	8.20		0.00		2.20	0.00		
B	C	6.90		0.00		2.20	0.00		
C	C	6.80		0.00		2.20	0.00		
D	C	6.65		0.00		2.20	0.00		
E	C	7.00		0.00		2.20	0.00		

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Junction	Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
A	B	One lane	5.00										50	50
B	B	One lane	5.00										50	50
C	B	One lane	5.00										50	50
D	B	One lane	3.12										50	50
E	B	One lane	4.84										50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
A	B-A	622.329	0.102	0.259	0.163	0.370
A	B-C	786.649	0.109	0.276	-	-
A	C-B	573.963	0.201	0.201	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B	B-A	622.329	0.109	0.275	0.173	0.393
B	B-C	786.649	0.116	0.293	-	-
B	C-B	573.963	0.214	0.214	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
C	B-A	622.329	0.109	0.277	0.174	0.395
C	B-C	786.649	0.116	0.294	-	-
C	C-B	573.963	0.215	0.215	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
E	B-A	614.024	0.107	0.270	0.170	0.386
E	B-C	776.151	0.114	0.288	-	-
E	C-B	573.963	0.213	0.213	-	-

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
D	B-A	524.736	0.093	0.235	0.148	0.335
D	B-C	663.287	0.099	0.250	-	-
D	C-B	573.963	0.216	0.216	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Flows

Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

Entry Flows

General Flows Data

Junction	Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	A	ONE HOUR	✓	545.00	100.000
A	B	ONE HOUR	✓	150.00	100.000
A	C	ONE HOUR	✓	350.00	100.000
B	A	ONE HOUR	✓	180.00	100.000
B	B	ONE HOUR	✓	15.00	100.000
B	C	ONE HOUR	✓	125.00	100.000
C	A	ONE HOUR	✓	190.00	100.000
C	B	ONE HOUR	✓	170.00	100.000
C	C	ONE HOUR	✓	340.00	100.000
D	A	ONE HOUR	✓	320.00	100.000
D	B	ONE HOUR	✓	45.00	100.000
D	C	ONE HOUR	✓	370.00	100.000
E	A	ONE HOUR	✓	345.00	100.000
E	B	ONE HOUR	✓	235.00	100.000
E	C	ONE HOUR	✓	560.00	100.000

Turning Proportions

Turning Counts / Proportions (PCU/hr) - Junction A (for whole period)

		To		
		A	B	C
From	A	0.000	210.000	335.000
	B	40.000	0.000	110.000
	C	305.000	45.000	0.000

Turning Proportions (PCU) - Junction A (for whole period)

		To		
		A	B	C
From	A	0.00	0.39	0.61
	B	0.27	0.00	0.73
	C	0.87	0.13	0.00

Turning Counts / Proportions (PCU/hr) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.000	5.000	175.000
	B	5.000	0.000	10.000
	C	105.000	20.000	0.000

Turning Proportions (PCU) - Junction B (for whole period)

		To		
		A	B	C
From	A	0.00	0.03	0.97
	B	0.33	0.00	0.67
	C	0.84	0.16	0.00

Turning Counts / Proportions (PCU/hr) - Junction C (for whole period)

		To		
		A	B	C
From	A	0.000	25.000	165.000
	B	15.000	0.000	155.000
	C	140.000	200.000	0.000

Turning Proportions (PCU) - Junction C (for whole period)

		To		
		A	B	C
From	A	0.00	0.13	0.87
	B	0.09	0.00	0.91
	C	0.41	0.59	0.00

Turning Counts / Proportions (PCU/hr) - Junction E (for whole period)

		To		
		A	B	C
From	A	0.000	20.000	325.000
	B	15.000	0.000	220.000
	C	345.000	215.000	0.000

Turning Proportions (PCU) - Junction E (for whole period)

		To		
		A	B	C
From	A	0.00	0.06	0.94
	B	0.06	0.00	0.94
	C	0.62	0.38	0.00

Turning Counts / Proportions (PCU/hr) - Junction D (for whole period)

		To		
		A	B	C
From	A	0.000	5.000	315.000
	B	10.000	0.000	35.000
	C	335.000	35.000	0.000

Turning Proportions (PCU) - Junction D (for whole period)

		To		
		A	B	C
From	A	0.00	0.02	0.98
	B	0.22	0.00	0.78
	C	0.91	0.09	0.00

Vehicle Mix

Average PCU Per Vehicle - Junction A (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction A (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction B (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction B (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction C (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction C (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction E (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction E (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Average PCU Per Vehicle - Junction D (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

Heavy Vehicle Percentages - Junction D (for whole period)

		To		
		A	B	C
From	A	0.0	0.0	0.0
	B	0.0	0.0	0.0
	C	0.0	0.0	0.0

Results

Results Summary for whole modelled period

Junction	Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
A	B-AC	0.29	8.73	0.40	A
A	C-A	-	-	-	-
A	C-B	0.11	8.92	0.12	A
A	A-B	-	-	-	-
A	A-C	-	-	-	-
B	B-AC	0.03	5.65	0.03	A
B	C-A	-	-	-	-
B	C-B	0.04	7.06	0.04	A
B	A-B	-	-	-	-
B	A-C	-	-	-	-
C	B-AC	0.27	7.12	0.37	A
C	C-A	-	-	-	-
C	C-B	0.42	11.65	0.71	B
C	A-B	-	-	-	-
C	A-C	-	-	-	-
D	B-AC	0.10	7.74	0.11	A
D	C-A	-	-	-	-
D	C-B	0.08	7.84	0.08	A
D	A-B	-	-	-	-
D	A-C	-	-	-	-
E	B-AC	0.41	9.56	0.68	A
E	C-A	-	-	-	-
E	C-B	0.48	14.03	0.91	B
E	A-B	-	-	-	-
E	A-C	-	-	-	-

Main Results for each time segment

Main results: (08:00-08:15)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	112.93	112.06	0.00	628.50	0.180	0.22	6.959	A
A	C-A	229.62	229.62	0.00	-	-	-	-	-
A	C-B	33.88	33.58	0.00	491.45	0.069	0.07	7.858	A
A	A-B	158.10	158.10	0.00	-	-	-	-	-
A	A-C	252.21	252.21	0.00	-	-	-	-	-
B	B-AC	11.29	11.23	0.00	675.40	0.017	0.02	5.420	A
B	C-A	79.05	79.05	0.00	-	-	-	-	-
B	C-B	15.06	14.94	0.00	545.01	0.028	0.03	6.789	A
B	A-B	3.76	3.76	0.00	-	-	-	-	-
B	A-C	131.75	131.75	0.00	-	-	-	-	-
C	B-AC	127.98	127.12	0.00	718.01	0.178	0.22	6.084	A
C	C-A	105.40	105.40	0.00	-	-	-	-	-
C	C-B	150.57	149.06	0.00	543.26	0.277	0.38	9.099	A
C	A-B	18.82	18.82	0.00	-	-	-	-	-
C	A-C	124.22	124.22	0.00	-	-	-	-	-
D	B-AC	33.88	33.62	0.00	551.22	0.061	0.06	6.952	A
D	C-A	252.21	252.21	0.00	-	-	-	-	-
D	C-B	26.35	26.14	0.00	521.90	0.050	0.05	7.258	A
D	A-B	3.76	3.76	0.00	-	-	-	-	-
D	A-C	237.15	237.15	0.00	-	-	-	-	-
E	B-AC	176.92	175.52	0.00	678.02	0.261	0.35	7.144	A
E	C-A	259.73	259.73	0.00	-	-	-	-	-
E	C-B	161.86	160.08	0.00	518.72	0.312	0.45	9.992	A
E	A-B	15.06	15.06	0.00	-	-	-	-	-
E	A-C	244.68	244.68	0.00	-	-	-	-	-

Main results: (08:15-08:30)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	134.85	134.58	0.00	607.22	0.222	0.28	7.614	A
A	C-A	274.19	274.19	0.00	-	-	-	-	-
A	C-B	40.45	40.38	0.00	475.44	0.085	0.09	8.274	A
A	A-B	188.79	188.79	0.00	-	-	-	-	-
A	A-C	301.16	301.16	0.00	-	-	-	-	-
B	B-AC	13.48	13.47	0.00	666.06	0.020	0.02	5.516	A
B	C-A	94.39	94.39	0.00	-	-	-	-	-
B	C-B	17.98	17.96	0.00	539.39	0.033	0.03	6.903	A
B	A-B	4.49	4.49	0.00	-	-	-	-	-
B	A-C	157.32	157.32	0.00	-	-	-	-	-
C	B-AC	152.83	152.59	0.00	707.59	0.216	0.27	6.483	A
C	C-A	125.86	125.86	0.00	-	-	-	-	-
C	C-B	179.80	179.33	0.00	537.30	0.335	0.50	10.043	B
C	A-B	22.47	22.47	0.00	-	-	-	-	-
C	A-C	148.33	148.33	0.00	-	-	-	-	-
D	B-AC	40.45	40.39	0.00	536.11	0.075	0.08	7.262	A
D	C-A	301.16	301.16	0.00	-	-	-	-	-
D	C-B	31.46	31.42	0.00	511.80	0.061	0.06	7.493	A
D	A-B	4.49	4.49	0.00	-	-	-	-	-
D	A-C	283.18	283.18	0.00	-	-	-	-	-
E	B-AC	211.26	210.80	0.00	660.40	0.320	0.46	7.999	A
E	C-A	310.15	310.15	0.00	-	-	-	-	-
E	C-B	193.28	192.66	0.00	507.99	0.380	0.60	11.393	B
E	A-B	17.98	17.98	0.00	-	-	-	-	-
E	A-C	292.17	292.17	0.00	-	-	-	-	-

Main results: (08:30-08:45)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	165.15	164.70	0.00	577.42	0.286	0.40	8.713	A
A	C-A	335.81	335.81	0.00	-	-	-	-	-
A	C-B	49.55	49.43	0.00	453.29	0.109	0.12	8.910	A
A	A-B	231.21	231.21	0.00	-	-	-	-	-
A	A-C	368.84	368.84	0.00	-	-	-	-	-
B	B-AC	16.52	16.49	0.00	653.13	0.025	0.03	5.654	A
B	C-A	115.61	115.61	0.00	-	-	-	-	-
B	C-B	22.02	21.99	0.00	531.62	0.041	0.04	7.063	A
B	A-B	5.51	5.51	0.00	-	-	-	-	-
B	A-C	192.68	192.68	0.00	-	-	-	-	-
C	B-AC	187.17	186.80	0.00	692.94	0.270	0.37	7.108	A
C	C-A	154.14	154.14	0.00	-	-	-	-	-
C	C-B	220.20	219.39	0.00	529.06	0.416	0.70	11.593	B
C	A-B	27.53	27.53	0.00	-	-	-	-	-
C	A-C	181.67	181.67	0.00	-	-	-	-	-
D	B-AC	49.55	49.45	0.00	514.92	0.096	0.11	7.732	A
D	C-A	368.84	368.84	0.00	-	-	-	-	-
D	C-B	38.54	38.46	0.00	497.83	0.077	0.08	7.836	A
D	A-B	5.51	5.51	0.00	-	-	-	-	-
D	A-C	346.82	346.82	0.00	-	-	-	-	-
E	B-AC	258.74	257.90	0.00	635.28	0.407	0.68	9.517	A
E	C-A	379.85	379.85	0.00	-	-	-	-	-
E	C-B	236.72	235.54	0.00	493.17	0.480	0.90	13.908	B
E	A-B	22.02	22.02	0.00	-	-	-	-	-
E	A-C	357.83	357.83	0.00	-	-	-	-	-

Main results: (08:45-09:00)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	165.15	165.14	0.00	577.40	0.286	0.40	8.732	A
A	C-A	335.81	335.81	0.00	-	-	-	-	-
A	C-B	49.55	49.54	0.00	453.29	0.109	0.12	8.916	A
A	A-B	231.21	231.21	0.00	-	-	-	-	-
A	A-C	368.84	368.84	0.00	-	-	-	-	-
B	B-AC	16.52	16.51	0.00	653.12	0.025	0.03	5.654	A
B	C-A	115.61	115.61	0.00	-	-	-	-	-
B	C-B	22.02	22.02	0.00	531.62	0.041	0.04	7.063	A
B	A-B	5.51	5.51	0.00	-	-	-	-	-
B	A-C	192.68	192.68	0.00	-	-	-	-	-
C	B-AC	187.17	187.17	0.00	692.87	0.270	0.37	7.117	A
C	C-A	154.14	154.14	0.00	-	-	-	-	-
C	C-B	220.20	220.18	0.00	529.06	0.416	0.71	11.652	B
C	A-B	27.53	27.53	0.00	-	-	-	-	-
C	A-C	181.67	181.67	0.00	-	-	-	-	-
D	B-AC	49.55	49.54	0.00	514.91	0.096	0.11	7.735	A
D	C-A	368.84	368.84	0.00	-	-	-	-	-
D	C-B	38.54	38.53	0.00	497.83	0.077	0.08	7.837	A
D	A-B	5.51	5.51	0.00	-	-	-	-	-
D	A-C	346.82	346.82	0.00	-	-	-	-	-
E	B-AC	258.74	258.72	0.00	635.19	0.407	0.68	9.560	A
E	C-A	379.85	379.85	0.00	-	-	-	-	-
E	C-B	236.72	236.67	0.00	493.17	0.480	0.91	14.028	B
E	A-B	22.02	22.02	0.00	-	-	-	-	-
E	A-C	357.83	357.83	0.00	-	-	-	-	-

Main results: (09:00-09:15)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	134.85	135.28	0.00	607.19	0.222	0.29	7.634	A
A	C-A	274.19	274.19	0.00	-	-	-	-	-
A	C-B	40.45	40.57	0.00	475.44	0.085	0.09	8.280	A
A	A-B	188.79	188.79	0.00	-	-	-	-	-
A	A-C	301.16	301.16	0.00	-	-	-	-	-
B	B-AC	13.48	13.50	0.00	666.05	0.020	0.02	5.516	A
B	C-A	94.39	94.39	0.00	-	-	-	-	-
B	C-B	17.98	18.01	0.00	539.39	0.033	0.03	6.907	A
B	A-B	4.49	4.49	0.00	-	-	-	-	-
B	A-C	157.32	157.32	0.00	-	-	-	-	-
C	B-AC	152.83	153.19	0.00	707.49	0.216	0.28	6.500	A
C	C-A	125.86	125.86	0.00	-	-	-	-	-
C	C-B	179.80	180.57	0.00	537.30	0.335	0.51	10.113	B
C	A-B	22.47	22.47	0.00	-	-	-	-	-
C	A-C	148.33	148.33	0.00	-	-	-	-	-
D	B-AC	40.45	40.55	0.00	536.09	0.075	0.08	7.265	A
D	C-A	301.16	301.16	0.00	-	-	-	-	-
D	C-B	31.46	31.53	0.00	511.80	0.061	0.07	7.496	A
D	A-B	4.49	4.49	0.00	-	-	-	-	-
D	A-C	283.18	283.18	0.00	-	-	-	-	-
E	B-AC	211.26	212.08	0.00	660.27	0.320	0.48	8.048	A
E	C-A	310.15	310.15	0.00	-	-	-	-	-
E	C-B	193.28	194.42	0.00	507.99	0.380	0.63	11.521	B
E	A-B	17.98	17.98	0.00	-	-	-	-	-
E	A-C	292.17	292.17	0.00	-	-	-	-	-

Main results: (09:15-09:30)

Junction	Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
A	B-AC	112.93	113.20	0.00	628.44	0.180	0.22	6.989	A
A	C-A	229.62	229.62	0.00	-	-	-	-	-
A	C-B	33.88	33.96	0.00	491.45	0.069	0.07	7.870	A
A	A-B	158.10	158.10	0.00	-	-	-	-	-
A	A-C	252.21	252.21	0.00	-	-	-	-	-
B	B-AC	11.29	11.31	0.00	675.38	0.017	0.02	5.422	A
B	C-A	79.05	79.05	0.00	-	-	-	-	-
B	C-B	15.06	15.08	0.00	545.01	0.028	0.03	6.795	A
B	A-B	3.76	3.76	0.00	-	-	-	-	-
B	A-C	131.75	131.75	0.00	-	-	-	-	-
C	B-AC	127.98	128.22	0.00	717.87	0.178	0.22	6.109	A
C	C-A	105.40	105.40	0.00	-	-	-	-	-
C	C-B	150.57	151.06	0.00	543.26	0.277	0.39	9.190	A
C	A-B	18.82	18.82	0.00	-	-	-	-	-
C	A-C	124.22	124.22	0.00	-	-	-	-	-
D	B-AC	33.88	33.94	0.00	551.18	0.061	0.07	6.960	A
D	C-A	252.21	252.21	0.00	-	-	-	-	-
D	C-B	26.35	26.40	0.00	521.90	0.050	0.05	7.268	A
D	A-B	3.76	3.76	0.00	-	-	-	-	-
D	A-C	237.15	237.15	0.00	-	-	-	-	-
E	B-AC	176.92	177.40	0.00	677.87	0.261	0.36	7.202	A
E	C-A	259.73	259.73	0.00	-	-	-	-	-
E	C-B	161.86	162.53	0.00	518.72	0.312	0.46	10.127	B
E	A-B	15.06	15.06	0.00	-	-	-	-	-
E	A-C	244.68	244.68	0.00	-	-	-	-	-

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.

Consolidated Planning Statement

(Vol. 2)

RLEE

RLEE Architects (HK) Ltd

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"
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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 3

ENVIRONMENTAL IMPACT ASSESSMENT

RLEE

RLEE Architects (HK) Ltd

S12A Amendment of Plan Application,

Approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12

Proposed Rezoning from "R(C)" to "GIC" for a Proposed "Social Welfare Facilities"

At Lot 4823 in DD 104, 81 San Tam Road, San Tin

Environmental Assessment Report

17 November 2023

Ref No.: C220410W-01

Submitted to:
R LEE Architects (HK) Ltd
Unit 1601, 16/F Stelux House,
698 Prince Edward Road East,
San Po Kong, Kowloon

Prepared By:
NOVOX Limited
Phone: (852) 2690-9881
Fax: (852) 2600-4286
Address: Rm L, 7/F, Block II, 14-24 Au Pui Wan St, Fo Tan, N.T.
Email: info@novox.com.hk

Project:	Proposed Residential Care Home for Elderly at 81 San Tam Road, Yuen Long, N.T.
Document No.:	C220410W-01

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C	6/12/2022	Revised according to comment	PL	EN	BW
D	6/02/2023	Updated road traffic data	PL	EN	BW
E	12/05/2023	Revised according to comment	PL	EN	BW
F	24/05/2023	Include TD's reply	PL	EN	BW
G	03/08/2023	Revised according to DEP comment	PL	EN	BW
H	20/10/2023	Revised according to DEP comment	PL	EN	BW
I	08/11/2023	Revised according to DEP comment	PL	EN	BW
J	17/11/2023	Revised according to DEP comment	PL	EN	BW

Approved by:

Banting Wong
MSc, CEng, MIOA,
MHKIQEP, MHKIOA, AFCHKRI, MHKIEIA

Disclaimer:

- This report is prepared and submitted by Novox Limited with all reasonable skill to the best of our knowledge, incorporating our Terms and Conditions and taking account of the resources devoted to it by agreement with the client.
- We disclaim any responsibility to the client and others in respect of any matters outside the project scope.
- This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.

TABLE OF CONTENT

1 INTRODUCTION 1
1.1 BACKGROUND 1
1.2 THE PROJECT AREA 1
1.3 OBJECTIVE AND SCOPE OF ENVIRONMENTAL ASSESSMENT 1
2 AIR QUALITY IMPACT ASSESSMENT 2
2.1 AIR QUALITY STANDARDS 2
2.2 OPERATIONAL VECHICULAR EMISSION SOURCES 4
2.3 OPERATIONAL INDUSTRIAL EMISSION SOURCES 5
2.4 CONSTRUCTION DUST EMISSION SOURCES 5
2.5 OPERATION AIR QUALITY IMPACT 7
3 NOISE IMPACT ASSESSMENT 9
3.1 NOISE ENVIRONMENT 9
3.2 ENVIRONMENTAL LEGISLATION AND STANDARDS 9
3.3 ROAD TRAFFIC NOISE ASSESSMENT 11
3.4 FIXED SOURCE NOISE ASSESSMENT 16
3.5 CONSTRUCTION NOISE IMPACT 19
4 WATER QUALITY IMPACT ASSESSMENT 21
4.1 INTRODUCTION 21
4.2 LEGISLATIONS, STANDARDS AND GUIDELINES 21
4.3 IDENTIFICATION OF WATER SENSITIVE RECEIVERS 21
4.4 WATER QUALITY IMPACTS AND MITIGATIONS DURING CONSTRUCTION PHASE 23
4.5 WATER QUALITY IMPACTS AND MITIGATIONS DURING OPERATION PHASE 28
5 WASTE MANAGEMENT 31
5.1 INTRODUCTION 31
5.2 LEGISLATIONS, STANDARDS AND GUIDELINES 31
5.3 WASTE MANAGEMENT IMPLICATIONS OF THE CONSTRUCTION PHASE 31
5.4 WASTE MANAGEMENT IMPLICATIONS OF THE OPERATIONAL PHASE 33
5.5 LAND CONTAMINATION 34
6 LANDFILL GAS HAZARD ASSESSMENT 35
7 CONCLUSION 44
APPENDIX 1.1. SITE LAYOUT PLAN & SURROUNDING ENVIRONMENT 46
APPENDIX 2.1. AIR QUALITY SENSITIVE RECEIVERS & EMISSION SOURCES 49
APPENDIX 2.2. BROCHURE OF THE DEODRIZATION SYSTEM 52

APPENDIX 2.3. BROCHURE OF THE GREASE FILTER 53
APPENDIX 3.1. TRAFFIC NOISE IMPACT ASSESSMENT 54
APPENDIX 3.2. FIXED SOURCE NOISE ASSESSMENT 65
APPENDIX 4.1. WATER QUALITY STANDARD 71
APPENDIX 4.2. WATER SENSITIVE RECEIVERS 73
APPENDIX 4.3. PRELIMINARY DISCHARGE ROUTE AND DESIGN CALCULATION OF STP 74
APPENDIX 5.1 FSD AND EPD'S REPLY ON LAND CONTAMINATION 75
APPENDIX 7.1 TD'S REPLY ON TRAFFIC FORECAST 81

1 INTRODUCTION

1.1 BACKGROUND

Wonder Pacific Development Limited (the Applicant) intends to develop an 10-storey Residential Care Home for the Elderly (RCHE) (the Development) at Lot 4823 in D.D. 140 in 81 San Tam Road, San Tin (the Site).

For a proposed amendment to the approved Ngau Tam Mei Outline Zoning Plan No. S/YL-NTM/12, a planning application to the Town Planning Board (TPB) under Section 12A of the Town Planning Ordinance (TPO) is required for rezoning from "R(C)" zone to "G/IC" zone.

To satisfy the Section 12A planning application, Novox Ltd is commissioned to conduct an environmental assessment to evaluate the potential environmental impact based on the latest master layout plan.

1.2 THE PROJECT AREA

The Site area is approximately 736.3m^2 and it is located at Lot 4823 in D.D. 140 in 81 San Tam Road, as shown in **Appendix 1.1.** It locates within the R(C) zone of the OZP. The site is currently an existing House. The Proposed Development is an 10-storey RCHE which comprises a total 142 bed spaces. The anticipated year of construction completion and occupation is 2027.

The floor layout plans, and section diagrams of the Proposed Development are provided in the Planning Statement of the Planning Application.

1.3 OBJECTIVE AND SCOPE OF ENVIRONMENTAL ASSESSMENT

The key objectives of this EA are to identify environmental key issues and constraints of the project, to identify possible environmental impacts, to propose mitigation measures against any unacceptable environmental impacts during the construction and operation phases of the project, including

- Identify all sensitive receivers of the Proposed Development.
- Assess the potential air quality impact at the Proposed Development due to vehicular and any industrial emissions.
- Carry out a Noise Impact Assessment (NIA) during construction and operation of the RCHE Proposed Development.
- Assess the potential impact of water quality and waste management impact due to the Proposed Development.
- Recommend the necessary mitigation measures to alleviate any unacceptable impacts.

2 AIR QUALITY IMPACT ASSESSMENT

2.1 AIR QUALITY STANDARDS

The Air Pollution Control Ordinance (APCO) provides the statutory authority for controlling air pollutants from a variety of sources. The Hong Kong Air Quality Objectives (AQOs), which stipulate the statutory limits of air pollutants and the maximum allowable numbers of exceedance over specific periods should be met. With passage of Hong Kong's Air Quality Objectives (AQOs) in the Air Pollution Control Ordinance (Cap. 311), the latest AQOs as listed in Table 1 have been in effect.

Table 1 Hong Kong Air Quality Objectives

Pollutant	Averaging time	Concentration limit[1] ($\mu g/m^3$)	Allowable number of exceedances
Sulphur Dioxide (SO_2)	10-minute	500	3
	24-hour	50	3
Respirable Suspended Particulates (PM_{10}) [2]	24-hour	100	9
	Annual	50	Not Applicable
Fine Suspended Particulates ($PM_{2.5}$) [3]	24-hour	50	35
	Annual	25	Not Applicable
Nitrogen Dioxide (NO_2)	1-hour	200	18
	Annual	40	Not Applicable
Ozone (O_3)	8-hour	160	9
Carbon Monoxide (CO)	1-hour	30,000	0
	8-hour	10,000	0
Lead (Pb)	Annual	0.5	Not Applicable

Note: [i] All measurements of the concentration of gaseous air pollutants, i.e., sulphur dioxide, nitrogen dioxide, ozone and carbon monoxide, are to be adjusted to a reference temperature of 293Kelvin and a reference pressure of 101.325 kilopascal.
[ii] Respirable suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 10 μm or less.
[iii] Fine suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 2.5 μm or less.

2.1.1 The Site Environment

The existing environment of the proposed development is primarily affected by the local traffic such as San Tin Highway and San Tam Road. A site visit was carried out on 22nd June 2022 and 24th July 2023 within 500m study area of the project, and no chimneys were observed within 200m from the Site boundary during the site visit. The Site is used an existing House of GFA 294.258 m^2 and a plot ratio of 0.4. The uses adjoining to the Site is a small mountain full of greenery to the east, village houses namely Maple Garden and Casa Paradizo with 3 storeys to the north, and the south of the Site. Far away to the west of the Site are scattered building structures surrounding primarily for uses including warehouses,

workshops and with several village houses. As such, local traffic is considered to be the dominant emission source affecting the ambient air quality in these areas.

There is currently an air quality monitoring station operated by Environmental Protection Department (EPD) located outside the Project Site, namely Yuen Long Monitoring Station (situated at Yuen Long District Office, 269 Castle Peak Road). Despite this, in terms of geographical location, this monitoring station is considered the closest to the proposed Project Site. The annual average of air pollutants in $\mu g/m^3$ monitored at this station for the year 2018-2022 are summarized in Table 2 below. In 2022, all measured parameters complied with the AQO except Ozone recorded non-compliance with the 8-hour AQO (160 μg/m3 with allowance of 9 exceedances of AQO limit per year).

Table 2 EPD Air Quality Monitoring Record at Yuen Long Monitoring Station in 2018-2022

Pollutant	Averaging Time	Conc. Limits ($\mu g/m^3$)	No. of Exceedances Allowed	Concentrations ($\mu g/m^3$) [1]					Remarks
				2018	2019	2020	2021	2022	
PM_{10}	24-hour	100	9	75	83	77	73	56	10th highest conc.
	Annual	50	Not Applicable	37	37	30	30	25	/
$PM_{2.5}$	24-hour	50	35	34	34	28	31	30	36th highest conc.
	Annual	25	Not Applicable	20	20	16	17	16	/
NO_2	1-hour	200	18	150	161	135	148	122	19th highest conc.
	Annual	40	Not Applicable	**43**	**44**	32	40	37	/
SO_2	10-minute	500	3	52	42	26	24	21	4th highest conc.
	24-hour	50	3	17	11	10	14	7	4th highest conc.
CO	1-hour	30,000	0	1,720	2,150	1,530	2,090	1,700	1st highest conc.
	8-hour[2]	10,000	0	1,574	1,903	1,279	1,591	1,519	1st highest conc.

O_3	8-hour[2]	160	9	**162**	**200**	154	**178**	**194**	10th highest conc.

Note:
[1] **Bolded** concentrations indicate exceedance of the air quality objectives

2.1.2 Representative Air Quality Sensitive Receivers (ASRs)

All the residential units within the proposed development are identified as sensitive receivers for air quality impact assessment. **Appendix 2.1** shows the locations of Representative ASRs of proposed RCHE development.

2.1.3 Hong Kong Planning Standards and Guidelines (HKPSG)

According to Chapter 9, Environment of the Hong Kong Planning Standard and Guidelines (HKPSG), adequate buffer distance or screening should be provided between sensitive receptors and potential air pollution emitters. For roads that are distinguished as local distributor and truck road for active and passive recreational uses, the buffer distance must be greater than 5m and 20m respectively as shown in Table 3 below.

Table 3 Guidelines on Usage of Open Space Site

Pollution Source	**Parameter**	**Buffer Distance**	**Permitted Uses**
Road and Highways	*Type of Road*		
	Trunk Road and Primary Distributor	>20m	Active and passive recreation uses
		3 - 20m	Passive recreational uses
		<3m	Amenity areas
	District Distributor	>10m	Active and passive recreational uses
		<10m	Passive recreational uses
	Local Distributor	>5m	Active and passive recreational uses
		<5m	Passive recreational uses
	Under Flyovers		Passive recreational uses

2.2 OPERATIONAL VECHICULAR EMISSION SOURCES

2.2.1 Evaluation of Air Quality Impact

The development may be subject to vehicular emission impact from roads nearby during the operational phase of the project. According to the Annual Traffic Census 2022 published by

the Transport Department (TD), San Tam Road is classified as a rural road and San Tin Highway is classified as a trunk road. With reference to HKPSG, 20m buffer distance should be provided for the trunk road (e.g., San Tin Highway). As a conservative approach, San Tam Road is assumed as District Distributor and hence a 10m buffer distance shall be provided in accordance with the HKPSG's requirement. No air-sensitive uses including openable window, fresh air intake and recreational use in the open space is located within the said buffer distances, no adverse air quality impact is anticipated. The buffer distance between the said roads and the proposed RCHE development is shown in **Appendix 2.1**. In order to avoid adverse air quality impact from the traffic emission, a buffer zone is recommended for the Proposed Development with the following requirements:

- No air-sensitive uses including openable window, fresh air intake and recreational uses in open space is allowed within buffer zones.
- With the provision of the buffer zone, the buffer distances recommended in HKPSG will be satisfied. Therefore, no adverse air quality impact on the Site from traffic emission is anticipated.

2.3 OPERATIONAL INDUSTRIAL EMISSION SOURCES

2.3.1 Evaluation of Air Quality Impact

As discussed in Section 2.1.1, it has confirmed in a site visit carried out on 22 June 2022 and 24th July 2023 within 200m study area of the project, that no chimneys were observed within 200m from the Site boundary during the site visit. The uses adjoining to the Site is a small mountain full of greenery to the east, village houses namely Maple Garden and Casa Paradizo with 3 storeys to the north, and the south of the Site. To the west of the Site are scattered building structures surrounding primarily for uses including warehouses, workshops and with several village houses. It is confirmed that there is no air and odour emission sources in 200m study area by site survey. As such, local traffic is considered to be the dominant emission source affecting the ambient air quality in these areas. Thus, no adverse air quality impact to the proposed RCHE development due to industrial source emissions is anticipated.

2.4 CONSTRUCTION DUST EMISSION SOURCES

2.4.1 Evaluation of Air Quality Impact

The potential air quality impacts include the dust and exhaust emissions arising from the construction (e.g., demolition, site formation, foundation and formworks etc.). The nearest ASRs are Casa Paradizo Block C1 to C7 (i.e., 2m to 11m between the Site and ASR). The constructional works of the proposed project will impose potential air quality impacts on the nearby ASRs during the constructional stage (Figure 2.1.2 refers).

Given that the distance between the Site boundary and Casa Paradizo Block C1 to C7 is close (i.e., below 10m distance), the Site should erect higher hoarding (e.g., at least 3m high at the near side facing Casa Paradizo) to minimise the construction dust impact.

However, other ASRs are not immediately located besides the Project Site (e.g., 40m

between Site boundary and Maple Gardens Block G2&3) and the Site Area is only about 736m^2 which is a very small footprint. Considering the size of site formation and excavation is in a small scale, the amount of excavated material and number of dump trunk would be limited. No significant dust impact from the construction works is anticipated.

In order to further minimize the potential dust emissions and for good site practice, relevant mitigation measures under the Air Pollution Control (Construction Dust) Regulation should be incorporated in the relevant works contracts.

- Good practice and mitigation measures to be implemented during the construction phase are as follows:
- Regular watering to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather.
- Frequent watering for particularly dusty areas and areas close to ASRs.
- Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs.
- Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines.
- Tarpaulin covering of all dusty vehicle loads transported to and from the Site.
- Establishment and use of vehicle wheel and body washing facilities at the exit points of the Site.
- Use of water sprinklers at the loading area where dust generation is likely during the loading process of loose material, particularly in dry weather.
- Provision of not less than 2.4m high hoarding from ground level along site boundary where adjoins a road, streets or other accessible to the public except for a site entrance or exit.
- Imposition of speed controls for vehicles within the Site.
- Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from off-site ASRs.
- Every stock of more than 20 bags of cement or dry Pulverised Fuel Ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides.
- Electric power supply shall be provided for on-site machinery as far as practicable to minimize aerial emissions.

It is also suggested that the contractor should set up a communication channel (e.g. regular meeting) with the management office of Casa Paradizo to have a better dust control

management, if necessary. With implementation of the recommended mitigation measures, no adverse air quality impacts during construction are anticipated.

No concurrent project in the surrounding area. Given that there is no adverse air quality impact during the construction, no cumulative air quality impact due to the project thus be anticipated.

2.5 OPERATION AIR QUALITY IMPACT

2.5.1 Evaluation of Air Quality Impact

Odour Impact from the proposed on-site STP

The proposed on-site Sewage Treatment Plant (STP) with sewage treatment capacity storage time greater than 60 days is a potential source of odour impact to residents and the public in the vicinity during operation phase. The Proposed Development only have a total 142 bed spaces (far below than 2000 population). In addition, according to the STP design calculation in Appendix 4.3, the treatment capacity of the on-site STP is 77.5cu.m/day and serving 250head/Day.

Hence, EPD's Guidelines for the Design of Small Sewage Treatment Plant shall be followed for the STP as follows:

The STP should be sited with good buffering distance from houses, and enclosed to minimize adverse impact.

Ventilation exhaust pipes should be taken to roof level.

In order to reduce the odour nuisance from STP, a deodorization adsorption system (as shown in **Appendix 2.2**) is proposed to install for removal of odour from generated sources. The deodorization adsorption system will have minimum odour removal efficiency of 99.5% for H_2S. The deodorization adsorption system will have minimum service life for 12 months continuous operation for 5ppm H_2S loading. Replacement of the deodorizing filter will be taken place annually. Sufficient adsorption capacity of activated carbon will be installed. The odour removal air from the outlet of deodorization adsorption system will be exhausted through the air duct to high level. In addition, a wet sludge transfer pipe will be installed to draw wet sludge from the sludge holding tank at STP to the collection point adjacent to the entrance of development in fully close system for tanker collection of wet sludge to dispose to Government sewage treatment plant. No odour will be released during the wet sludge disposal process.

The tentative location of the STP exhaust has been designed as far away as possible from all nearby ASRs. Considering that the scale of the proposed STP is small and at source mitigation measures (e.g. deodorization adsorption system) would be applied, no adverse odour impact from the proposed on-stie STP is anticipated.

With reference to the EIA Report of Expansion of Sha Tau Kok Sewage Treatment Works (STKSTW), the treatment capacity is about 10,000m^3/day at ADWF with 99.5% removal efficiency, the nearest ASR (20m from the boundary of STKSTW) is 0.13 OU/m^3. Given that the capacity of the Project is far below than the STKSTW, it is anticipated that the odour

impact generated from the Project would not greater than the SKTSTW with same odour removal efficiency of 99.5%. With reference to contour map of averaged odour concentration (Figure 3.4 – 3.5) of the said EIA Report, no average odour concentration is found >5 OU/m^3. Therefore, it is anticipated that no adverse impact from the Project is anticipated.

Cooking Fume/odour from the proposed kitchen.

Kitchen will be provided at the Proposed Project. Oily fume and cooking odour emissions will potentially arising from the kitchen. In order to minimise the potential oily fume and odour emissions from the canteen/kitchen, the following considerations of positioning the exhaust outlets of the kitchen as recommended in the Control of Oil Fume and Cooling Odour from Restaurants and Food Business published by the Environmental Protection Department (EPD) shall be considered during the detailed design stage:

- locate the outlets at such a place where the ventilation is good and the emissions from them can be adequately dispersed without hindrance.
- provide sufficient separate distance from any sensitive receptor in the vicinity so that the emissions will not cause, or contribute to, an odour nuisance or other type of air pollution to the public.
- ensure the emission from the exhaust system will be directed vertically upwards, unless it can be demonstrated by an environmental professional that other direction is more advantageous in preventing the emission from causing air pollution problems.
- ensure the emission from the exhaust system will not be restricted or deflected by, for example, the use of plates or caps.

In order to minimise the impact of oily fume and cooling odour, the Applicant is committed to install a grease filter (as shown in **Appendix 2.3**) to control oily fume and cooking odour. Operation and maintenance of the exhaust system as well as the air pollution control equipment should be carried out by competent staff with sufficient training and relevant skills, and should be done in accordance with the manufacturer's specifications and specified procedures. To ensure proper performance, qualified professionals should be employed to undertake regular monitoring, inspection, cleaning and maintenance of components.

The tentative location of the Kitchen exhaust has been designed as far as possible all nearby ASRs. Considering that at source mitigation measure (e.g. grease filter) would be applied, no adverse odour impact from the proposed kitchen is anticipated.

3 NOISE IMPACT ASSESSMENT

3.1 NOISE ENVIRONMENT

3.1.1 The Site Environment

The Subject Site is surrounded by mainly low-rise residential development, including Maple Garden and Casa Paradizo. San Tin Highway is located near the western side of the development nearby which will generate road traffic noise impact. There exists operation for sales of building materials with open storage to the west as observed in onsite survey. No existing noise sources are operating at night time.

3.1.2 Representative Noise Sensitive Receivers (NSRs)

All the residential units within the proposed development are identified as sensitive receivers for noise impact assessment. Representative Noise Sensitive Receivers (NSRs) at each flat was selected for the quantitative traffic noise impact assessment, their locations and room sizes are shown in **Appendix 3.1**. The assessment points include all openable windows in habitable rooms such as living rooms and bedrooms. Windows in noise tolerance spaces such as toilets, bathroom and staircases are excluded.

There is no diagnostic rooms / wards in the proposed RCHE development. The Multi-Function Areas will not rely on operable window for ventilation.

The assessment points have been taken to be situated at 1.2 m above floor slabs and at 1 m away from the external facade of openable windows of habitable room of the flats.

3.2 ENVIRONMENTAL LEGISLATION AND STANDARDS

3.2.1 Road Traffic Noise Assessment Criteria

Noise standards are recommended in the *Hong Kong Planning Standards and Guidelines* (HKPSG) for planning against noise impact from road traffic. As stated in Table 4.1 of Chapter 9 of HKPSG, the criterion for road traffic noise impact on domestic premises (habitable rooms) is L_{10}(1-hour) 70dB(A). This criterion applies to uses which rely on openable windows for ventilation.

3.2.2 Fixed Noise Sources Assessment Criteria

Impacts of fixed noise sources within the Proposed Development on nearby noise sensitive buildings is governed by the Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (IND-TM) issued under the Noise Control Ordinance ("NCO") and sections of Chapter 9 of HKPSG.

In setting the ANL, reference has to be made to the Area Sensitive Rating ("ASR") in Table 1 of IND-TM reflecting the type of area where the noise sensitive receivers ("NSRs") are situated. The proposed development and surrounding existing residential developments are considered low density residential area. Future noise sensitive uses of the proposed

development are expected to be directly affected by San Tin Highway with Annual Average Daily Traffic ("AADT") in excess of 30,000 (i.e. influencing factor, IF). An ASR of "C" is considered representative of the noise sensitive uses. For NSRs without direct line of sight to San Tin Highway, An ASR of "B" is adopted. ANL and operation noise criteria for different Area Sensitivity Ratings (ASRs) are summarized in **Table 3-1** and **Table 3-2**.

According to the HKPSG, the level of the intruding noise at the façade of the nearest sensitive use should be at least 5 dB(A) below the appropriate ANL shown in the IND-TM or, in the case of the background being 5 dB(A) lower than the Acceptable Noise Level (ANL), the predicted noise level should not exceed the background.

Background noise level in terms of L_{90}(1-hr) will be measured onsite by future contractor so that it can be adopted for determining necessary noise mitigation measures to meet the requirement. Regarding the identified existing NSR discussed above, it is close to and directly affected by road traffic along San Tin Highway so that the background noise level is more likely to be higher than ANL-5.

Table 3-1 Area Sensitivity Rating (ASR)

Type of Area Containing NSR \ Degree to which NSR is affected by IF	Not Affected	Indirectly Affected	Directly Affected
(i) Rural area, including country parks or village type developments	A	B	B
(ii) Low density residential area consisting of low-rise or isolated high-rise developments	A	**B**	**C**
(iii) Urban area	B	C	C
(iv) Area other than those above	B	B	C

Table 3-2 Acceptable Noise Levels (ANLs)

Time Period \ ASR	A	B	C
Day (0700 to 1900 hours)	60	**65**	**70**
Evening (1900 to 2300 hours)			
Night (2300 to 0700 hours)	50	**55**	**60**

Remarks:

1) Prevailing background noise level to be measured by future contractor. Prevailing background noise level or ANL-5 will be finally adopted.

3.2.3 Construction Noise Assessment Criteria

The main piece of legislation controlling environmental noise nuisance impact is the *Noise Control Ordinance (NCO)*. The NCO enables regulations and Technical Memoranda (TM) to be made, which introduce detailed control criteria, measurement procedures and other

technical matters.

Construction noise is governed under the following TMs:

- Technical Memorandum on Noise from Percussive Piling (PP-TM).
- Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM).
- Technical Memorandum on Noise from Construction Work in Designated Areas (DA-TM).

During "Restricted Hours", defined as 7pm to 7am from Monday to Saturday and all day on public holidays, the construction contractor must apply for and receive a Construction Noise Permit (CNP) from EPD for percussive piling (at any time) or any other construction activities conducted. While there is no planned construction works to be carried out during the restricted hours, the relevant TMs should be followed in case there is any need to carry out works in such time period in future.

3.3 ROAD TRAFFIC NOISE ASSESSMENT

3.3.1 Assessment Model

The U.K. Department of Transport's procedure *"Calculation of Road Traffic Noise"* (CRTN) is used to predict the hourly L_{10}(1-hour) noise levels generated from road traffic at selected representative NSRs using proprietary noise prediction software CadnaA. Road traffic noise impacts on various floor levels on the respective residential blocks/houses have been predicted. Practicable environmental mitigation measures will be recommended where necessary. The predicted noise levels are compared with the relevant HKPSG noise standards (i.e. L_{10}(1-hour) 70dB(A)).

The assessment methodology was implemented using noise prediction software CadnaA, which is a graphically based computer programs in full compliance with the noise prediction methodologies as set out in CRTN.

This proprietary modeling software is capable of simulating various road traffic conditions, road conditions and the form of noise mitigation measures. All the topographic effect, distance information, view angle information, shielding effects, ground absorption and façade reflection can be accurately illustrated and computed.

Topographic barrier including surrounding building structures, retaining walls, and natural terrains etc. all provide screening or reflection effect to the noise source. This information is retrieved from the latest digital map data provided by Lands Department and digitized in the road traffic noise model.

For the propagation of noise, a worst-case hard ground as defined in CRTN was assumed throughout the Study Area.

A +2.5dB(A) correction for façade reflection was applied at receptor locations in accordance with CRTN.

3.3.2 Traffic Flow Data

The road layout defines the road width, opposing traffic lane separation, road surface type, traffic mix, traffic flow and design speed. For the purpose of this road traffic noise impact assessment, traffic flows have been forecasted for all major roads within 300m of the proposed development. The road network was divided into discrete segments, each of which was assigned a segment number.

The proposed development is scheduled for construction completion and operation in year 2027. Traffic forecast for year 2042 representing the worst situation within 15 years from the operation of the residential care home is provided by project traffic consultant and included in **Table 3-3**. The traffic forecast was conducted by the Project's traffic consultant and agreed with Transport Department (TD) and Planning Department (PlanD) as shown in **Appendix 7.1**.

Table 3-3 Year 2042 Traffic Forecast for Noise Impact Assessment

Road ID.	Road Name	Direction	Road Surface	Road Speed [km/h]	AM Peak		PM Peak	
					Traffic Flows [veh/hr]	% of HV *1	Traffic Flows [veh/hr]	% of HV *1
A	Geranium Path	Two-way	Impervious	50	30	10%	30	10%
B	Royal Palms Boulevar	Two-way	Impervious	50	580	10%	564	10%
C1	Castle Peak Road - Mai Po	NB	Impervious	50	770	34%	690	30%
C2	Castle Peak Road - Mai Po	SB	Impervious	50	1185	34%	640	23%
D1	Castle Peak Road - Mai Po	NB	Impervious	50	940	25%	900	19%
D2	Castle Peak Road - Mai Po	SB	Impervious	50	1490	20%	790	18%
E1	Castle Peak Road - Mai Po	NB	Impervious	50	915	23%	870	17%
E2	Castle Peak Road - Mai Po	SB	Impervious	50	1515	21%	815	20%
F1	San Tin Highway	NB	Pervious	100	4700	26%	4030	25%
F2	San Tin Highway	SB	Pervious	100	4815	30%	5025	20%
G1	San Tam Road	NB	Impervious	50	740	17%	595	10%
G2	San Tam Road	SB	Impervious	50	950	22%	650	20%
H1	San Tam Road	NB	Impervious	50	700	15%	670	10%
H2	San Tam Road	SB	Impervious	50	1005	20%	585	20%
I1	San Tam Road	NB	Impervious	50	685	15%	665	10%
I2	San Tam Road	SB	Impervious	50	1005	20%	585	20%
J	Access Road	Two-way	Impervious	50	25	10%	30	10%
K	Maple Gardens 5th Street	Two-way	Impervious	50	30	10%	30	10%
L	Maple Gardens 4th Street	Two-way	Impervious	50	30	10%	30	10%
M	Maple Gardens 6th Street	Two-way	Impervious	50	30	10%	30	10%

N	Maple Gardens 6th Street	Two-way	Impervious	50	30	10%	30	10%
O	Maple Gardens 6th Street	Two-way	Impervious	50	30	10%	30	10%
P	Maple Gardens 5th Street	One-way	Impervious	8	30	10%	30	10%
Q	Access Road	Two-way	Impervious	50	55	10%	55	10%
R	Access Road	Two-way	Impervious	50	55	10%	55	10%

Remarks:

1) HV includes Light Van, Public Light Bus, Light Goods Vehicle, Medium Goods Vehicle, Heavy Goods Vehicle and Container/Tractor, Coach and Bus.

3.3.3 Road Surface Conditions

The CRTN modelling method uses emission level adjustments to take into account the influence of various road surfaces and gradients on noise emission level. A -1dB correction to the basic road source noise level is applied to impervious road surface with traffic speed below 75km/hr, and -3.5dB correction to the basic road source noise level for pervious road surface.

3.3.4 Road Traffic Noise Impact for Baseline Scenario

Quantitative road traffic noise impact assessment has been carried out and compared against the criterion. Noise levels were calculated for the baseline scenario without noise mitigation in place. Predicted maximum traffic noise levels for each assessment point are shown in table below. The detailed noise model and contour map are shown in **Appendix 3.1** for reference. The assessment is based on conservation assumption of hard reflecting ground surface over the entire Study Area.

In the baseline scenario the building layout and orientation has been duly considered with respect to traffic noise impact. Whereas practicable, the housing units are oriented away from major roads. Noise tolerant facades are used for self-screening. Notwithstanding the above, there is still slight noise exceedance. Noise mitigation measures are necessary.

Table 3-4 Predicted Road Traffic Noise Impact for Unmitigated Scenario

Window ID	Predicted Noise Level $L_{10,\ 1\ hour}$, dBA						Noise Criteria, dBA
	2/F	3/F	4/F	5/F	6/F	7/F	
W01	77.8	76.7	76.7	76.8	76.8	76.9	70
W02	76.7	76.9	77.0	77.0	77.1	77.1	70
W03	76.9	76.8	76.9	76.9	77.0	77.0	70
W04	76.9	76.6	76.6	76.7	76.8	76.9	70
W05	76.8	63.9	64.8	66.0	67.2	68.3	70
W06	76.6	54.5	54.8	55.2	56.1	57.7	70
W07	57.2	54.0	54.2	54.6	55.6	57.3	70
W08	53.9	57.9	58.5	58.7	59.2	60.1	70

W09	52.9	64.8	66.6	66.9	67.0	67.2	70
W10	53.3	69.3	71.8	72.1	72.2	72.2	70
W11	54.8	72.4	75.3	75.9	76.0	75.9	70
W12	59.2	69.6	73.4	74.2	74.3	74.3	70
W13	62.0	68.1	72.4	73.3	73.4	73.5	70
W14	63.9		71.4	72.4	72.5	72.6	70
W15	62.0		71.0	72.2	72.4	72.4	70
W16	60.8		71.2	71.5	71.6	71.6	70
W17	59.5		67.3	67.3	67.4	67.6	70
W18			68.7	68.8	68.9	69.0	70
W19			68.7	68.8	68.9	69.0	70
W20			68.7	68.7	68.8	69.0	70

Remarks:

North Façade

East Façade

Void in South Façade

3.3.5 Road Traffic Noise Impact for Mitigated Scenario

Practicable noise mitigation noise measures have been incorporated in the building layout design, in accordance with Practice Note on Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact (PN_INMD), including:

At the northern façade, vertical architectural fin is provided. The fin extends 1.7m from the building façade.

At the eastern façade, a vertical architectural fin is provided at the southeast corners. The fin extends 1.5m from the building façade.

At the southern façade, NSRs are located within a building void with self noise screening. Yet there are still some NSRs having direct line of sight towards San Tin Highway, thus a vertical architectural fin is provided at entrance towards the building void to block the line of sight. The fin extends 0.9m from the building façade.

The maximum noise reductions by architectural fins are capped at 3dB for conservatism. For receivers with still having residual noise impact with the above architectural fins in place, acoustic window will be provided. An additional window layer is introduced to the conventional side-hung window in a staggering position. The outer window is a conventional push-pull type window whilst the inner one consists of a half-size sliding window. Making reference to PN_INMD, the proposed acoustic window configuration can offer an additional traffic noise reduction of 6dB(A). In detail design stage, mock-up test will be conducted to demonstrate that adequate noise reduction will be achieved.

Sound absorption material is proposed on the back side of architectural fin. Additional SAM are proposed at the entrance to the void area, as indicated in Figure 3.1.6 and 3.1.7. The proposed SAM would be in the form of 50mm thick rockwool covered in waterproof acoustic transparent member and perforated panel.

The location and details of mitigation measures are illustrated in **Appendix 3.1.**

With the above mitigation measures in place, predicted maximum traffic noise levels for each assessment point are shown below. Since all the noise assessment points comply with the HKPSG noise standard, the residual noise impact is considered to be satisfactory.

Table 3-5 Predicted Road Traffic Noise Impact for Mitigated Scenario

Window ID	Predicted Noise Level $L_{10,\ 1\ hour}$, dBA						Noise Criteria, dBA
	2/F	3/F	4/F	5/F	6/F	7/F	
W01	68.8	67.8	67.8	67.8	67.9	68.0	70
W02	67.8	68.0	68.1	68.1	68.2	68.4	70
W03	68.3	69.6	69.7	69.8	69.9	70.0	70
W04	69.0	69.8	69.8	69.9	70.0	70.0	70
W05	69.7	63.0	63.8	65.2	66.6	67.8	70
W06	69.8	52.7	52.7	53.0	54.3	56.5	70
W07	56.4	52.3	52.3	52.6	54.0	56.3	70
W08	53.2	55.4	56.0	56.2	56.6	57.4	70
W09	52.4	62.4	64.1	64.3	64.4	64.6	70
W10	52.2	66.6	69.0	69.3	69.4	69.5	70
W11	52.2	64.8	68.5	69.2	69.3	69.3	70
W12	56.7	69.1	66.7	67.4	67.5	67.5	70
W13	59.3	65.6	65.7	66.5	66.6	66.7	70
W14	63.2		64.7	65.5	65.7	65.7	70
W15	60.4		64.3	65.3	65.5	65.5	70
W16	58.2		69.9	64.1	64.2	64.3	70
W17	56.9		64.6	64.7	64.8	64.9	70
W18			66.2	66.3	66.4	66.7	70
W19			66.1	66.2	66.3	66.4	70
W20			66.0	66.1	66.2	66.3	70

Remarks:

- *Noise reduction by acoustic fin is capped at 3dB(A) for conservatism.*

North Façade

East Façade

Void in South Façade

68.8 *Underlined cells indicate façades with acoustic windows*

3.4 FIXED SOURCE NOISE ASSESSMENT

3.4.1 Assessment Model

Standard acoustical principles in accordance with *"ISO 9613-2:1996 Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation"* will be adopted for prediction of fixed noise impact. The general equation used to calculate the equivalent continuous sound pressure level at a receiver location arising from each individual noise source is described below:

$$L_{eq} = L_w + D_c - A_{div} - A_{atm} - A_{gr} - A_{bar} - A_{misc}$$

Where

L_w is the sound power level of the noise source;

D_c is the directivity factor of the noise source;

A_{div} is the attenuation due to geometrical divergence;

A_{atm} is the attenuation due to atmospheric absorption;

A_{gr} is the attenuation due to ground effect;

A_{bar} is the attenuation due to barrier;

A_{misc} is the attenuation due to miscellaneous other effects.

The prediction methodology described in ISO 9631-2 is implemented via noise prediction software CadnaA. A 3D model was constructed taking into account the topology and site layout plan. CadnaA is proprietary software for noise mapping of road traffic, railway as well as fixed industrial plants, etc. It has been used for city-scale Strategic Noise Mapping in Europe according to the EC Directive 2002/49/EC, the reliability has been well verified and accepted.

Topographic barrier including surrounding buildings, retaining walls, and natural terrains etc. all provide screening effect to the noise source. This information is retrieved from the latest digital map data provided by Lands Department.

The noise barriers within the proposed development include self-screening by noise tolerant building blocks and architectural fins. These barriers are constructed in the 3D model based on latest master layout plan. For calculation of barrier screening effect, maximum insertion loss is capped at 20dB for single barrier, 25dB for double barrier, according to ISO 9613.

For the propagation of noise, a worst-case hard ground was assumed throughout the Study Area. No ground attenuation effect is applied.

A +3.0dB(A) correction for façade reflection was applied at receptor locations.

3.4.2 Identified Existing Fixed Noise Sources

Site survey has been conducted on 22 June 2022 to identify any presence of industrial/fixed noisy facilities/activities. There exists operation for sales of building materials with open storage to the west as observed in onsite survey.

According to the onsite survey, there is no noticeable noise observed from open storage. The noise environment is dominated by road traffic, apparently from San Tin Highway.

To summarise, potential fixed/industrial noise sources were identified to the west of the Subject Site. Particulars of the identified fixed noise sources are presented below. No existing noise sources are operating at night time. The location of the noise sources are taken at nearest workshop areas where forklift, cranes and saw cuts would normally operate.

Table 3-6 Identified Fixed Noise Sources for Noise Impact Assessment

ID	Source Description	Source Location		Assumed SWL, dB(A)	Operation?		Reference
		Easting	Northing		0700-2300	2300-0700	
S1	盈豐倉庫 (Storage)	22.48355	114.05799	92	Y	N	Transitional Housing Development at Lots 111 (Part), 116 to 119 in D.D. 108 and Adjoining Government Land, Fan Kam Road, Pat Heung, N.T. - Environmental Assessment
S2	松輝木業公司 (Industrial)	22.48313	114.05794	92	Y	N	Transitional Housing Development at Lots 111 (Part), 116 to 119 in D.D. 108 and Adjoining Government Land, Fan Kam Road, Pat Heung, N.T. - Environmental Assessment

3.4.3 Identified Fixed Noise Source Generated by the Project

Planned fixed noise sources within the Proposed RCHE Development are identified as shown in **Appendix 3.2**

Among the identified sources, the dominate sources are two nos. of cooling towers located on the open rooftop having direct line of sight to NSRs. The noise may potentially affect Casa Paradizo and Maple Garden in the close proximity.

Most of the Mechanical and Electrical (M&E) equipment, such as chiller, water pumps, lift machines, etc. will be installed in enclosed plant rooms of the Proposed RCHE Development. Transformers and Sewage Treatment Plant will be located in the basement level and placed inside enclosed structure. The guidance of "Good Practices on Ventilation System Noise Control" and "Good Practices on Pumping System Noise Control" issued from EPD shall be referred to. Appropriate mitigation measures, where necessary, shall be provided to comply with the noise criteria.

Small power rating split type air conditioning systems will be installed for individual room. However, the noise impact of those small power rating outdoor units shall be minimal, and the contribution is hence not considered in the noise impact assessment.

3.4.4 Allowable Sound Power Level

At this stage the cooling towers for the project had not been confirmed as which shall be designed in future by the design and build contractor. As such the maximum allowable sound power level will be determined by back calculation from the separation distance between the noise source and nearby representative nearest noise sensitive receivers are given in table below.

A catalogue of low noise type cooling towers as shown in **Appendix 3.2** for reference. The Sound Power Level (SWL) of this cooling tower model is 93dB which is adopted in the noise model. The sound power level and noise mitigation requirements will be stipulated in the project contractor specification governing the equipment selection by the design and build contractor.

Table 3-7 Proposed Fixed Source Noise Mitigation Treatment

Noise Sources	Allowable SWL	Noise Mitigation Description (refer to Appendix 3.2)
Cooling Tower (Intake)	73 dB(A)	- Low noise type cooling tower - Intake silencer with IL of 20dB(A), the silencer is typically 900 to 1200 long subject to supplier model selection
Cooling Tower (Discharge)	93 dB(A)	- Low noise type cooling tower - No silencer to be provided since fan noise is directed upward in the open rooftop and not affecting low rise residential premises

3.4.5 Fixed Plant Noise Assessment Results

Based on the allowable SWL and two cooling towers in full load operation, the noise impact at the worst affected façade at nearby representative NSRs are tabulated below.

Table 3-8 Predicted Fixed Source Noise Impact to Surroundings

ID	NSR	Predicted Noise Level at Worst Façade, dB(A)	Nighttime Noise Criteria, ANL-5 dB(A)
N01	Maple Garden G3	34.8	55
N02	Casa Paradizo A18	32.4	55
N03	Casa Paradizo C7	39.7	50

As such, provided the fixed plant noise generation at the cooling tower does not exceed the allowable SWL, fixed plant noise impact towards the affected NSRs will not exceed the noise criteria stipulated in the HKPSG.

3.4.6 Fixed Plant Noise Assessment Results

There are also existing industrial fixed noise sources operating during daytime. The cumulative fixed noise impact is included in the fixed noise impact assessment for compliance check. Fixed plant noise impact towards the affected NSRs will not exceed the ANL noise criteria.

Table 3-9 Predicted Cumulative Fixed Source Noise Impact

ID	NSR	Predicted Noise Level at Worst Façade dB(A)			Day & Evening Criteria, ANL dB(A)
		Planned Fixed Plant Noise	Existing Fixed Plant Noise	Cumulative Noise	
N01	Maple Garden G3	34.8	47.2	47.4	70
N02	Casa Paradizo A18	32.4	49.0	49.1	70
N03	Casa Paradizo C7	39.7	37.9	41.9	65

3.5 CONSTRUCTION NOISE IMPACT

Various construction activities will be the key noise sources generated during the construction phase. In particular, the use of PME and the vehicle movement within the Site are the major potential noise sources. Construction shall be carried out during non-restricted hours as far as practicable. The mitigation measures recommended in ProPECC PN2/93 should be implemented where applicable. In addition, the following measures and on-site practice are recommended in order to minimize the potential construction noise impacts during daytime:

- Quiet PME and construction method should be adopted if possible.
- The Contractor shall devise and execute working methods to minimise the noise impacts on the surrounding sensitive uses, and provide experienced personnel with suitable training to ensure that those methods are implemented.
- Switch off idling equipment.
- Regular maintenance of equipment.
- Fit muffler or silencer for equipment.
- Noisy equipment and noisy activities should be located as far away from the NSRs as is practical.
- Use quiet construction method, e.g. use saw-cut or hydraulic crusher instead of excavator mounted percussive breaker.
- PME should be kept to a minimum and the parallel use of noisy equipment / machineries should be avoided.
- Erect noise barriers or noise enclosure for the PME if appropriate.

- Implement good house-keeping and provide regular maintenance to the PME.
- Spot check resultant noise levels at nearby NSRs.

If construction work involving use of PME will be required during restricted hours, a CNP shall be applied for under the NCO. The noise criteria and assessment procedures for obtaining a CNP are specified in GW-TM.

With the implementation of the abovementioned mitigation measures, adverse construction noise impact is not anticipated.

4 WATER QUALITY IMPACT ASSESSMENT

4.1 INTRODUCTION

This section reviews the water quality impacts from the Project. The potential environmental impacts from construction effluent generated by the proposed works and operation of the proposed residential home for elderly are assessed. Standards, guidelines and legislation, recommended mitigation measures and the disposal strategy are reviewed.

4.2 LEGISLATIONS, STANDARDS AND GUIDELINES

The following relevant Hong Kong legislations/guidelines governing water pollution control have been referenced in carrying out the assessment:

- Environmental Impact Assessment Ordinance and EIAO-TM (Annex 6 and 14);
- Water Pollution Control Ordinance (WPCO) (Cap. 358) (as amended by the Water Pollution Control (Amendment) Ordinance 1990 and 1993);
- Water Pollution Control (General) Regulations (as amended by the Water Pollution Control (General) (Amendment) Regulations 1990 and 1994);
- Water Pollution Control (Sewerage) Regulation;
- Water Quality Objectives (WQOs) for relevant Water Control Zones (WCZs);
- Practice Note for Professional Persons ProPECC Note PN1/94, Construction Site Drainage; and
- Practice Note for Professional Persons ProPECC Note PN 5/93, Drainage Plans subject to Comment by the Environmental Protection Department.
- ETWB TC(W) No. 5/2005 "Protection of Natural Streams/Rivers from Adverse Impacts Arising from Construction Works

4.3 IDENTIFICATION OF WATER SENSITIVE RECEIVERS

The project site is located within the Northwest of New Territories and within the catchment of the Deep Bay Water Control Zone.

No communal foul sewer connection is available for the project area.

The quality of effluent during the construction and operation phase of the projects will be bounded by the discharge standard of Deep Bay Water Control Zone, subject to the estimated discharge quantity. Standards for effluents discharged into the coastal waters of Deep Bay Water Control Zone is annexed in Cap. 358AK Technical Memorandum on Effluent Standards.

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 2022 is extracted, reference from "Marine Water Quality in Hong Kong in 2022" by EPD.

In 2022, the overall WQO compliance rate for the Deep Bay WCZ was 67%, as compared with ten-year average of 47% in 2009-2018. Overall, with the measures under the Deep Bay Water Pollution Control Joint Implementation Programme taken progressively by the governments of Hong Kong and Shenzhen, there have been significant water quality improvements in Deep Bay. In particular, there has been full compliance of the NH3-N WQO in the past seven years. Although Deep Bay, as compared with other WCZs, shows 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.

Summary of water quality statistics for the Deep Bay WCZ in 2022

Parameter	DM1 (Nearest to the Stie)
Temperature (°C)	24.8 (17.9 - 32.4)
Salinity	14.9 (0.5 - 23.3)
Dissolved Oxygen (mg/L)	6.5 (4.9 - 9.2)
Dissolved Oxy gen (% Saturation)	85 (63 - 123)
pH	7.4 (7.0 - 8.5)
Secchi Disc Depth (m)	1.1 (0.9 - 1.6)
Turbidity (NTU)	85.9 (9.8 - 288.0)
Suspended Solids (mg/L)	27.6 (7.0 - 58.0)
5-day Biochemical Ox y gen Demand (mg/L)	1.8 (<0.1 - 6.0)
Ammonia Nitrogen (mg/L)	0.538 (0.088 - 1.200)
Unionised Ammonia (mg/L)	0.008 (0.002 - 0.024)
Nitrite Nitrogen (mg/L)	0.161 (0.094 - 0.420)
Nitrate Nitrogen (mg/L)	1.200 0.840 - 1.800)

Total Inorganic Nitrogen (mg/L)	1.90 (1.13 - 2.61)
Total Kjeldahl Nitrogen (mg/L)	0.93 (0.46 - 2.10)
Total Nitrogen (mg/L)	2.29 (1.40 - 3.37)
Orthophosphate Phosphorus (mg/L)	0.120 (0.018 - 0.180)
Total Phosphorus (mg/L)	0.26 (0.16 - 0.41)
Silica (as SiO2) (mg/L)	5.74 (1.70 - 8.90)
Chlorophy ll-a (µg/L)	8.8 (2.1 - 45.0)
E.coli (count/100mL)	500 (31 - 4900)
Faecal Coliforms (count/100mL)	1200 (88 - 24000)

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. The Water Sensitive Receivers (WSRs) identified within 500m of the Project boundary that may potentially be affected are shown in **Appendix 4.2** and the representative WSRs are listed below –

WSR1	Agricultural Land
WSR2	Fishpond (Pond 13 to Pond 28)
WSR3	Abandoned Fishpond (Pond 1 to Pond 11)
WSR4	Nullah
WSR5	Drainage Channel
WSR6	Water Course

4.4 WATER QUALITY IMPACTS AND MITIGATIONS DURING CONSTRUCTION PHASE

Potential Impact

Proposed construction works mainly involve excavation of soil, piling and building

construction works. Key water pollution sources include:

General Construction Activities

General construction activities, including wheel washing, dust suppression from excavation and pilling works, concrete casting and utility installation, may generate wastewater which would contain high concentration of SS. Various construction works may also generate debris and waste such as packaging, construction materials and general refuse. Uncontrolled discharge of site effluents and waste generated from the construction works would lead to deterioration in water quality. Adoption of the guidelines and good site practices for handling and disposal of construction discharges as specified in **below mitigation section** would minimize the potential impacts.

Surface Runoff from Rainfall and Wind Erosion

In particular, surface runoff into receiving water courses during and immediate after rainstorm events is of major concern. During rainstorms, site runoff would wash away the soil particles on unpaved lands and areas with exposed topsoil. Sediment lade runoff and wind-blown dust would result in deteriorating water quality with increase of SS levels and turbidity and may result in induced effects on aquatic ecological resources. It is important that proper site practice and good site management (as specified in the ProPECC PN 1/94 "Construction Site Drainage") to be followed to prevent site runoff with high level of SS from entering the surrounding waters. With the implementation of appropriate measures to control runoff and drainage from the construction site, disturbance of water bodies would be avoided and deterioration in water quality would be minimal.

Spillage of Chemicals

Accidental spillage and the storage of chemicals used on-site, such as petroleum products, surplus adhesives, spent lubrication oil, grease and mineral oil, spent acid and alkaline solutions/solvent and other chemicals, may contaminate the surface soils. The contaminated soil particles may be washed away by construction site runoff or stormwater drainage and eventually may affect nearby water bodies. The potential impacts could however be mitigated by practical mitigation measures and good site practices as given in **below mitigation section**.

Sewage from the Construction Workforce

Sewage effluents will arise from the sanitary facilities provided for the on-site construction workforce. The characteristics of sewage would include high levels of BOD5, Ammonia and E. coli counts. This temporary sewage can be handled by providing adequate portable chemical toilets. Provided that sewage is not discharged directly into storm drains or inland waters adjacent to the construction site, and temporary sanitary facilities are used and properly maintained, it is unlikely that sewage generated from the sites would have a significant water quality impact.

Construction Works in Close Proximity of Nearby Water Bodies

Construction activities within or in close vicinity to nearby water bodies may affect the water quality due to potential release of wastewater which is generally with high

concentration of SS and elevated pH. Mitigation measures shall be implemented to control the release of wastewater into the adjacent water environment. With proper implementation of appropriate construction runoff control practices as referred to ProPECC PN 1/94 "Construction Site Drainage" and the provision of mitigation measures as described in the ETWB TC (Works) No. 5/2005 "Protection of natural streams/rivers from adverse impacts arising from construction works", it is anticipated that no unacceptable water quality impacts would be arising from the construction works nearby the water bodies.

Mitigation Measures

Dust Suppression

Water used in dust suppression should as far as practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater should be leaded to silt removal facilities before being discharged to the storm drain.

Wheel Washing Water

All vehicles and plant should be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing facility should be provided at every site exit if practicable and wheel-wash overflow shall be directed to silt removal facilities before being discharged to the storm drain. The site boundary between the wheel washing facility and the public road should be placed with sand bunds to prevent wheel-wash overflow from entering public road drains.

Wastewater from Concrete Casting

Wastewater generated from the washing down of mixing trucks and drum mixers and similar equipment should whenever practicable be recycled. The discharge of wastewater should be kept to a minimum. To prevent pollution from wastewater overflow, the pump sump of any water recycling system should be provided with an on-line standby pump of adequate capacity and with automatic alternating devices. Under normal circumstances, surplus wastewater may be discharged into foul sewers after treatment in silt removal.

Rubbish and Litter

Good site practices should be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the works area. It is recommended to clean the construction sites on a regular basis. Adequate refuse collection points shall be provided on-site.

Construction Site Runoff

The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" should be followed as far as practicable to minimise surface runoff and the chance of erosion. It is expected that the following measures recommended will effectively control runoff from the works sites and avoid water pollution downstream and shall be implemented during construction phase.

Surface runoff from construction sites should be discharged into storm drains via sand/silt

removal facilities such as sedimentation basin/tank. The treated effluent discharge from construction stages should be sited away from natural water course. Earth bunds or waterfilled barriers with geotextile sheet should be provided on site boundaries to intercept surface runoff from outside the site so that it will not wash across the site and to prevent surface runoff flowing out of the site. Bunds or sandbags should also be used within the site to direct surface runoff into the silt removal facilities. Stagnant surface runoff should be pumped to the silt removal facilities before discharged into storm drains.

Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system without having previously passed through sedimentation tank, and to prevent storm runoff from getting into foul sewers. Discharge of surface runoff into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.

Silt removal facilities and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to prevent local flooding.

Surface excavation should be carefully programmed to avoid wet-season operation. If it is unavoidable, any exposed top soils should be covered with a tarpaulin or other means. For the purpose of preventing soil erosion, temporary exposed slope surfaces should be covered e.g. by tarpaulin, as excavation proceeds. Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms.

Open stockpiles (e.g. aggregates, sand and fill material) should also be covered with a tarpaulin to avoid erosion during rainstorms. The washing of material from the stockpiles directly into the storm drains should be prevented by passing the runoff through sedimentation tank. Arrangements should always be in place in such a way that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm.

Spillage of Chemicals

Chemical waste, as defined under the Waste Disposal (Chemical Waste) (General) Regulation, includes any substance being scrap material, or unwanted substances specified under Schedule 1 of the Regulation. Substances likely to be generated by construction activities arise from the maintenance of construction plant and equipment of the Project. These include, but not limited to the following:

- Lubricating oil and waste fuel (diesel) from construction plant with improper maintenance;

- Spent solvents from equipment cleaning activities.

Due to the scale of an active work front of the Project, it is anticipated that no maintenance shop for construction plant and equipment would be operated on-site and storage fuel on-site is minimal. Drainage traps such as grease traps and petrol interceptors will be installed at each of the drainage outlets to filter out chemical pollutants from surface runoff.

Mitigation such as providing drip tray/proper storage of chemical containers will be strictly

implemented during the construction works. In case of any leakage on bare ground, oil and grease decontamination kit will be available on-site for clean-up of oil leakage. Any fuels should be stored in bunded areas such that spillage can be easily collected. The contractor shall prepare an oil / chemical clean-up plan in the Waste Management Plan before the commencement of construction works. It should ensure that leakages or spillages are contained and cleaned up immediately. Once spillage is identified on-site, the clean-up procedures should be carried out as below:

- Contact the site agent and/or foreman immediately and report the spillage;
- Identify the source of spillage and determine nature of the material;
- Stop leakage immediately where possible;
- Identify all current and potential affected areas according to the flow of spillage and stop the spillage from flowing to other works areas;
- Contain the surface runoff of spillage by using bunds made from available materials;
- After the surface runoff of spillage is contained, remove the materials (including contaminated soil where necessary) using pumps and/or absorbent materials; and
- Dispose of the materials, including the contaminated soil, as chemical waste

Waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance (Cap. 354). The contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap. 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation, should be observed and complied with for disposal of chemical wastes. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance (Cap. 354) details the requirements to deal with chemical wastes. General requirements are given as follows:

- Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport;
- Chemical waste containers should be suitably labelled, to notify and warn the personnel who are handling the wastes, to avoid accidents; and
- Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area

Sewage Effluent from Construction Workforce

Portable chemical toilets would be provided for handling the sewage effluent generated by the workforce. The number of the chemical toilets required for the construction sites would be subject to later detailed design, the capacity of the chemical toilets, and contractor's site practices. A licensed contractor would be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.

Domestic sewage generated by the construction workforce should be appropriately managed to avoid potential adverse impacts of uncontrolled sewage discharge into nearby water courses. Portable chemical toilets shall be appropriately located on-site in proximity to all major works areas where they shall remain and be maintained in good working order for the convenience of the workforce during the construction phase.

The provision of temporary toilet facilities within the water gathering ground, if any, is subject to approval of the Director of Water Supplies. As a minimum requirement, temporary toilet facilities must be located more than 30m from any watercourse.

Notices would be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project. Regular environmental audit on the construction site would be conducted in order to provide an effective control of any malpractices and achieve continual improvement of environmental performance on site.

Construction Works in Close Proximity of Nearby Water Bodies

The practices outlined in ETWB TC (Works) No. 5/2005 "Protection of natural streams/rivers from adverse impacts arising from construction works" should also be adopted where applicable to minimize the water quality impacts upon any natural streams or surface water systems. Relevant mitigation measures from the ETWB TC (Works) No. 5/2005 should be followed. Examples are shown below -

- Construction works close to the inland waters should be carried out in dry season as far as practicable where the flow in the surface channel or stream is low.
- The use of less or smaller construction plants may be specified in areas close to the water courses to reduce the disturbance to the surface water.
- Temporary storage of materials (e.g. equipment, chemicals and fuel) and temporary stockpile of construction materials should be located well away from any water courses during carrying out of the construction works.
- Stockpiling of construction materials and dusty materials should be covered and located away from any water courses.
- Construction debris and spoil should be covered up and/or disposed of as soon as possible to avoid being washed into the nearby water receivers.
- Proper shoring may need to be erected in order to prevent soil or mud from slipping into the watercourses.
- Fencing should be erected on the sides facing the nearest stream course to trap all wind-blown litters such as paper, plastic bags, bottles and boxes within the site from entering the nearby water bodies.

4.5 WATER QUALITY IMPACTS AND MITIGATIONS DURING OPERATION PHASE

Potential Impact

The Project is to build a residential care home for elderly, accommodating at most 142 nos. of bedspaces. Sewage from the residents as well as workers and visitors will be generated from bathing and showers, toilet flushing, pantry, toilet basins, etc.

Mitigation Measures

All storm water/rainwater from both open paved and developed areas of the site will be conveyed to the storm water drain.

The *ProPECC Note PN 5/93* provides guidelines and practices for handling, treatment, and disposal of various effluent discharges to stormwater drains and foul sewers. The design of site drainage and disposal of site effluents generated within the proposed development area should follow the relevant guidelines and practices as given in the *ProPECC Note PN 5/93*.

Since there is no communal foul sewer connection, an onsite tertiary sewage treatment plant (STP) will be installed to handle all sewage generated from the proposed residential care home before discharging offsite. Preliminary design of the on-stie tertiary STP according to Guidelines for the Design of Small Sewage Treatment Plants by EPD, 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. are annexed in **Appendix 4.3**. The major parameter of the STP is listed in below -

Total Daily Flow	77.5m^3/day
Average Hourly Flow (DWF)	3.23m^3/hr
Peak Hourly Rate (6 x DWF)	19.38 m^3/hr
Size of MBR Tank	34.97 m^3/hr
Size of Equalization Tank	19.38 m^3/hr

Proper operation and maintenance should be provided for the STP. Storm water/rainwater should be separated from the sewage collection network to avoid overload to the STP. The effluent standards are listed below

Parameter	Tertiary Effluent Standard (Upper Limit)*
BOD5	10mg/L
TSS	10mg/L
TN	20mg/L
TP	2mg/L
Ammonia N	5mg/L
E coli	100cfu/100ml

Note (*) – Depending on the water body receiving the discharge, the more stringent set of the effluent standards (those listed on the WPCO TM) should be adopted as appropriate.

Sewage will be treated by the onsite STP before discharge. The proposed discharge point is shown in **Appendix 4.3.** The detailed location of proposed discharge point would be finalized during the detailed design stage. The treated effluent discharge from operational stages should be sited away from natural water course.

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.

All storm water/rainwater from open paved and developed areas of the site will be conveyed to the storm water drain via properly designed surface drainage. Facilities such as standard gully grating, with spacing which is capable of screening off large substances such as fallen leaves and rubbish should be provided at the inlet of drainage system. Good management measures such as regular cleaning and sweeping open paved area of the site is suggested during operational phase to reduce the suspended solid or other unwanted pollutants or waste fall into the stormwater drain.

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.

Similar to that during the construction phase, a water discharge license should be obtained for the operation of the proposed residential care home for elderly. All the requirements and conditions as stipulated on the license shall be observed and complied with.

5 WASTE MANAGEMENT

5.1 INTRODUCTION

This section reveals and discusses types of wastes generated from the Project during construction and operation phases. Hence, proper waste management strategies are recommended to reduce, reuse, recycle and dispose of wastes.

5.2 LEGISLATIONS, STANDARDS AND GUIDELINES

The following relevant Hong Kong legislations and guidelines governing waste disposal and management have been referenced in carrying out the assessment:

- Waste Disposal Ordinance (Cap. 354);
- *A Guide to the Chemical Waste Control Scheme;*
- *A Guide to the Registration of Chemical Waste Producers;*
- Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes; and
    - *Code of Practice for the Management of Clinical Waste – Small Clinical Waste Producers.*

5.3 WASTE MANAGEMENT IMPLICATIONS OF THE CONSTRUCTION PHASE

Major construction activities for the Project include demolition of existing property, site clearance, piling, construction of substructure and superstructure. Considering the small scale of the Project, it is anticipated not much waste would be generated though the exact quantity will be subject to detailed construction methods.

Wastes generated from the Project during the construction phase generally consist of:

- Construction and demolition (C&D) waste;
- General refuse; and
- Chemical waste.
- Possible wastes generated from the Project are detailed in Table 5-1.
- Table 5-1 Possible Waste Generated During the Construction Phase

WASTE TYPE	POSSIBLE WASTE GENERATED FROM THE PROJECT
INERT C&D WASTE	• CONCRETE FROM DEMOLITION OF EXISTING PROPERTY • EXCAVATED MATERIALS (EXCLUDING TOPSOIL)

WASTE TYPE	POSSIBLE WASTE GENERATED FROM THE PROJECT
NON-INERT C&D WASTE	• FELLED TREES • REMOVED PLANT • TOPSOIL • DISCARDED FURNITURE • DAMAGED SCAFFOLDING BAMBOO • WOOD FORMWORK • USED PACKAGING MATERIALS
GENERAL REFUSE	• WASTEPAPER • FOOD DEBRIS • PACKAGING MATERIAL
CHEMICAL WASTE	• SPENT LUBRICATING OIL • PAINT

A Waste Management Plan (WMP) will be prepared to outline the estimated types and quantities of waste generated in the Project and formulate the approaches in dealing with them. Typical hierarchy of waste management, i.e., avoid, minimize, recycle and disposal as the last resort, will be adopted for the Project. The aims of the WMP are to:

- improve the resource efficiency.
- increase the waste and materials awareness of staff; and
- help to discharge duty of care obligations.

5.3.1 Waste Avoidance

To avoid generation of waste during the construction phase, good and detailed planning and smart procurement is crucial. The following approaches are suggested:

- avoid excess order;
- arrange delivery of goods according to construction progress;
- reject and return damaged goods;
- keep protective packaging on and ensure storage areas are secure and weatherproofs;
- minimize movement of goods to lower the chance of damage to goods; and
- eliminate over packaging and liaise with suppliers to return packaging materials to them.

5.3.2 Construction and Demolition Materials

Excavated materials, such as soil and rock, and demolition concrete should be reused for backfilling on site as far as practicable. Surplus materials of these inert types should be delivered to the Civil Engineering and Development Department (CEDD) managed public

fill reception points and/or sorting facilities. Prior licensing is required from the CEDD.

Non-inert C&D wastes, in particular steel bars and used cables from demolition works of this project, are recyclables and should be delivered to proper outlets for recycling. On the other hand, felled trees, removed plant and topsoil are normally not reusable and should be delivered to the landfill for disposal.

Considering that there are many types of wastes generated, proper sorting and segregation of various C&D wastes could minimize cross contamination and enhance waste recovery quantity.

A trip ticket system will be implemented for any wastes disposal to the public fill reception points, sorting facilities and landfills. All the disposal records should be properly maintained.

5.3.3 Chemical Waste

Chemicals, including lubricating oil, paint, thinner, etc. will be used in the Project. Should there be any chemical wastes generated in the Project, the Contractor is required to register as chemical waste producer pursuant to the Waste Disposal (Chemical Waste) (General) Regulation. Proper containers, labels and storage areas must be provided in accordance with the aforesaid regulation.

All the chemical waste should be collected by licensed chemical waste collector for disposal at the Chemical Waste Treatment Centre (CWTC) at Tsing Yi or other licensed chemical waste treatment/disposal facilities.

5.3.4 General Refuse

General refuse includes wastepaper, packaging materials and food debris generated by the workforce on site. No canteen will be provided on site during the construction phase. The quantity of general waste is anticipated minimal in view of the small scale of the construction works. Nonetheless, before offsite disposal, they should be segregated into recyclable and non-recyclable wastes and kept in different covered storage areas/bins, where all of them should be sufficiently maintained and cleaned, to avoid attracting vermin and pests. All the general refuse will be collected on-site, separately from C&D materials by an appropriate waste collector employed by the contractor to the landfill.

Training should be provided for all site workers about the concepts of site cleanliness and appropriate waste management procedure, including waste reduction, reuse and recycling. The training is expected to ensure their awareness of good waste management and the specific measures used at the site.

5.4 WASTE MANAGEMENT IMPLICATIONS OF THE OPERATIONAL PHASE

The project site will be converted into a residential care home for elderly. Wastes generated during operation phase includes:

- General refuse; and
- Clinical waste.

5.4.1 General Refuse

General refuse during the operation phase mainly comes from daily living of residents in the care home, e.g., food waste, packaging of goods, used plastic and glass bottles, bedding and blankets, etc., which are similar to those from general households. Considering the number of residents is low, the quantity of general waste should not be significant.

Solid waste should be properly kept in covered containers/storage areas to avoid attracting of vermin or pests. Recycling containers are recommended to be provided at suitable locations to encourage recycling in the care home.

5.4.2 Clinical Waste

Residential care home for elderly is considered as a small clinical waste producer. It is likely that some types of clinical wastes, particularly needles and sharps, would be generated from its operation. As such, the Operator of the care home should complete the "*Clinical Waste Producer Premises Code Request Form*" and manage the clinical waste in accordance with the *Code of Practice for the Management of Clinical Waste – Small Clinical Waste Producers*.

Clinical waste should be segregated from other wastes. Used needles and sharps are classified as Group 1 clinical waste and should be stored safely in sharps box, before transferring to a disposal site. Colour of the sharps box should be either in yellow or a combination of yellow and white and sealed with proprietary closure.

The care home operator shall engage the service of licensed collectors to collect and transport clinical waste to the CWTC for proper disposal. Alternatively, the clinical waste may also be delivered by a health professional under the clinical waste producer, if there is any, and subject to compliance of additional requirements as stipulated in the *Code of Practice for the Management of Clinical Waste – Small Clinical Waste Producers*.

The care home operator must also keep all the records of the clinical waste consigned to a licensed collector or delivered to a collection point or licensed disposal facility. To achieve it, it is suggested to retain the Waste Producer Copy of the Clinical Waste Trip Tickets of each delivery.

5.5 LAND CONTAMINATION

The subject lot is virgin land before existing development. Referring to the FSD's reply dated 6 December 2022, neither records of dangerous license, nor incidents of spillage / leakage of dangerous goods were found. Also, EPD has no record of any reported chemical spillage / leakage incident at the captioned locations as shown in Appendix 5.1. There was no record of chemical waste producers' registration found as per record inspection at EPD Territory Control Office dated 5 July 2022. Considering the historical land use of the site, it is confirmed that land contamination assessment was not required.

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.

6. LANDFILL GAS HAZARD ASSESSMENT REPORT

October 2023

RLEE

RLEE Architects (HK) Ltd

Contents

1 Introduction 1

1.1 Background 1

1.2 Study Objectives 1

1.3 Report Structure 2

2 Site Context 3

2.1 Site Location and Its Environs 3

2.2 Proposed Development 3

3 Information of Ngau Tam Mei Landfill 4

3.1 History of Ngau Tam Mei Landfill 4

3.2 Landfill Gas Management System 4

3.3 Leachate Management System 4

3.4 Landfill Gas Monitoring 5

4 Qualitative Source-Pathway-Target Analysis 6

4.1 Assessment Methodology 6

4.2 Source 7

4.3 Pathways 8

4.4 Targets 9

4.5 Summary of Qualitative Source-Pathway-Target Analysis 10

4.6 Site Categorisation 12

5 Recommendations and Protection Measures 13

5.1 Construction Stage 13

5.1.1 Precautionary Measures 13

5.1.2 LFG Monitoring during Construction Stage 14

5.2 Operational Stage 16

5.2.1 Protection and Precautionary Measures 16

5.2.2 LFG Monitoring during Operational Stage 18

6 Conclusion 21

List of Figures

Figure 1.1	Location of the Proposed Development and Ngau Tam Mei Landfill
Figure 2.1	Site Location and Its Environs
Figure 3.1	Locations of Relevant Gas Monitoring Wells at Ngau Tam Mei Landfill
Figure 5.1	Typical Design for Services Passing Through the Consultation Zone – Special Route Conduit (SRC)
Figure 5.2	Typical Surface Detail for Above Ground Termination of Services within Consultation Zone
Figure 5.3	Typical Design of Vented Manhole Within Consultation Zone
Figure 5.4	Proposed Landfill Gas Monitoring Locations

List of Tables

Table 4.1	Classification of Risk Category
Table 4.2	Summary of General Categorization of Risk
Table 4.3	Landfill Gas Monitoring Data in Ngau Tam Mei Landfill (July 2020 to June 2022)
Table 4.4	Source- Pathway-Target Analysis
Table 5.1	Detection Ranges of the Gas Monitoring Instrument
Table 5.2	Action Plan in the Event of Gas being detected (Construction Stage)
Table 5.3	Mechanical Ventilation Rate
Table 5.4	LFG Monitoring Frequency during the Operational Stage
Table 5.5	Action Plan in the Event of Gas being detected (Operational Stage)

List of Appendices

Appendix A	Development Layout Plans
Appendix B	Recent Gas Monitoring Data of Ngau Tam Mei Landfill (from July 2020 to June 2022)
Appendix C	"Hazards Arising during Construction" extracted from EPD's Landfill Gas Hazard Assessment Guidance Note

1 Introduction

1.1 Background

1.1.1.1 The project is a re-development of an existing Single Family House into a RCHE, Plans of which are attached as per Appendix A. (hereafter as "the proposed development") at Lot No. 4823 in D.D. 104, Yuen Long, near the Ngau Tam Mei Landfill (hereafter as "the Site").

1.1.1.2 The Site is located within the 250m consultation zone of the Ngau Tam Mei Landfill (refer to Figure 1.1). With reference to the "*Landfill Gas Hazard Assessment Guidance Note*" (Guidance Note) published by Environmental Protection Department (EPD), a Landfill Gas (LFG) Hazard Assessment should be conducted for both construction and operational stages.

1.1.1.3 A Landfill Gas Hazard Assessment Report for the existing house is submitted and approved by 04/2016. Although the Foot Print of the proposed development is different than before, the protective measure, both at construction and operation stages would be very similar. Those would be re-iterated in this Report.

1.2 Study Objectives

1.2.1.1 The objectives of this LFG Hazard Assessment are:

- To review background information of the Landfill, and particularly environmental monitoring records to identify potential sources of LFG;
- To identify the possible LFG pathways through ground or underground cavities, utilities or groundwater, and evaluate the conditions of these pathways through which the LFG must pass if it is to reach the works areas;
- To identify the elements of the proposed development (targets) that are sensitive to LFG exposure;
- To qualitatively assess the risks that LFG may pose to the target for each of Source-Pathway-Target combination; and
- To recommend suitable LFG protection measures for potential LFG migration and monitoring requirements, as necessary.

1.3 Report Structure

1.3.1.1 The remaining chapters of this report are shown below:

Chapter 2 – Site Context

Chapter 3 – Information of Ngau Tam Mei Landfill

Chapter 4 – Qualitative Source-Pathway-Target Analysis

Chapter 5 – Recommendations and Protection Measures

Chapter 6 – Conclusion

2 Site Context

2.1 Site Location and Its Environs

2.1.1.1 The proposed development located Along San Tam Road and surrounded by Maple Garden to the north, Ngau Tam Mei Landfill to the East, and Casa Paradizo to the south. Royal Palms is located further west to the Site crossing San Tam Road and San Tin Highway. The proposed development is situated in a "Residential Zone (Group C)" according to the Ngau Tam Mei Outline Zoning Plan (OZP S/YL-NTM/12) and proposed to re-zone to "G/IC" to facilitate a RCHE development. The Site area is approximately 730 m^2.

2.1.1.2 Figure 2.1 shows the Site location and its environs.

2.2 Proposed Development

2.2.1.1 The proposed development comprises a Ten-storeys building for a RCHE with various facilities including:

- LG/F Entrance & Carpark
- UG/F Muti-purpose Rooms
- 1/F Wellness Centre + Sky Garden
- 2/F RCHE
- 3/F RCHE
- 4/F-7/F RCHE
- 8/F Admin Office + Staff Quarter

2.2.1.2 The proposed layout plan is shown in Appendix A.

2.2.1.3 According to the latest programme, the occupancy date of the proposed development is expected to be in year 2027.

3 Information of Ngau Tam Mei Landfill

3.1 History of Ngau Tam Mei Landfill

3.1.1.1 The Ngau Tam Mei Landfill is located to the north-east of Yuen Long and to the east of the San Tin Highway. To the west of the landfill is the Maple Gardens residential development and immediately to the south west are the Casa Paradizo and Green Crest residential developments. Ngau Tam Mei Landfill situated in a small valley and prior to the formation of two platforms. It started to receive waste in Year 1973. Ngau Tam Mei Landfill has a total area of 2.0 hectares and an approximately 0.15 million tonnes of, mainly domestic and industrial wastes were deposited prior to its closure in Year 1975.

3.1.1.2 The restoration works generally included installation of a high integrity capping system on the two platforms, a leachate collection system, surface drainage systems, passive LFG management system. The restoration works were completed in Year 2000.

3.2 Landfill Gas Management System

3.2.1.1 At Ngau Tam Mei Landfill, the impermeable cap was installed on the platforms as part of the restoration work. The passive LFG management system constructed is driven by the differential between atmospheric pressure and LFG pressures within the waste. The system is a simple design, with no mechanically or electrically driven operations.

3.2.1.2 Following the completion of the restoration works, the landfill will be subject to a 30-year aftercare period during which a stringent monitoring programme has been implemented to ensure the integrity of the restoration works.

3.3 Leachate Management System

3.3.1.1 After the restoration works, leachate is collected and delivered to the Leachate Treatment Works at Gin Drinker Bay Landfill (GDB Landfill) for treatment and disposal. Prior to transferring of leachate to GDB Landfill, the collected leachate is stored in an underground leachate collection chamber with a capacity of approximately 50 m^3. A leakage detection system has been equipped to provide an early warning to any leakages. No leachate is discharged into the nearby surface waters.

3.4 Landfill Gas Monitoring

3.4.1.1 A post-restoration monitoring programme had been conducted under the restoration contract for the Ngau Tam Mei landfill. LFG (including methane and carbon dioxide) is monitored at the monitoring wells which installed outside the boundary of the landfill. The location of monitoring wells adjacent to the Site is shown on Figure 3.1. Recent gas monitoring data from July 2020 to June 2022 provided by EPD are attached in Appendix B. The Figure show a continuous low level of Methane throughout the period and it could conclude that same extra low Methane level are to be observed after June 2022.

3.4.1.2 According to Figure 3.1, no monitoring wells fall within the site boundary. Project Proponent should avoid interfering with nearby landfill facilities and take care of the nearby area to avoid any damage or interruption to the landfill restoration and aftercare works by EPD.

4 Qualitative Source-Pathway-Target Analysis

4.1 Assessment Methodology

4.1.1.1 A practice note for professional persons "*Landfill Gas Hazard Assessment for Developments adjacent to Landfills*" (ProPECC PN3/96) published by EPD in 1996 to set out the conditions under which a LFG Hazard Assessment may be required. ProPECC PN3/96 also provides guidance to relevant professionals on how to conduct such assessments.

4.1.1.2 Further details of the approach and methodology of the required assessment for LFG hazards are presented in "*Landfill Gas Hazard Assessment Guidance Note*" (Guidance Note).

4.1.1.3 These two documents are referred throughout the LFG Hazard Assessment. The assessment methodology is based on the "Source – Pathway – Target" model. The meaning of these three components are as follows:

- **Source** – location, nature and likely quantities/ concentrations of LFG which has the potential to affect the development.
- **Pathway** – the ground and groundwater conditions, through which LFG must pass in order to reach the development.
- **Target** – elements of the development that are sensitive to the effects of LFG.

4.1.1.4 The LFG source, identified pathway(s), and identified target(s) are then categorised in order to facilitate the assessment process. Having determined into which categories of source, pathway and target, the combination of landfill and development fall a preliminary assessment of the overall risk may be made by reference to Table 4.1.

Table 4.1 Classification of Risk Category

Source	Pathway	Target Sensitivity	Risk Category
Major	Very short/direct	High	Very High
		Medium	High
		Low	Medium
	Moderately short/direct	High	High
		Medium	Medium
		Low	Low
	Long/indirect	High	High
		Medium	Medium
		Low	Low

Source	Pathway	Target Sensitivity	Risk Category
Medium	Very short/direct	High	High
		Medium	Medium
		Low	Low
	Moderately short/direct	High	High
		Medium	Medium
		Low	Low
	Long/indirect	High	Medium
		Medium	Low
		Low	Very low
Minor	Very short/direct	High	High
		Medium	Medium
		Low	Low
	Moderately short/direct	High	Medium
		Medium	Low
		Low	Very low
	Long/indirect	High	Medium
		Medium	Low
		Low	Very low

4.1.1.5 Table 4.2 summarises the implications of each risk category, with reference to Table 4.1 of the Guidance Note.

Table 4.2 Summary of General Categorization of Risk

Category	Level of Risk	Implication
A	Very high (Undesirable)	The type of development being proposed is very undesirable and a less sensitive form of development should be considered. At the very least, extensive engineering measures, alarm systems and emergency action plans are likely to be required.
B	High	Significant engineering measures will be required to protect the planned development.
C	Medium	Engineering measures will be required to protect the planned development.
D	Low	Some precautionary measures will be required to ensure that the planned development is safe.
E	Very low (Insignificant)	The risk is so low that no precautionary measures are required.

4.2 Source

4.2.1.1 The Ngau Tam Mei Landfill has been restored with a capping system together with a passive LFG management system. LFG monitoring was conducted at a number of monitoring wells to detect any sign of off-site LFG migration.

4.2.1.2 The LFG monitoring data in Ngau Tam Mei landfill are obtained from EPD. The location of the LFG monitoring wells and LFG monitoring data are shown in Figure 3.1 and Appendix B respectively. The LFG monitoring data from July 2020 to June 2022) are summarized in Table 4.3.

Table 4.3 Landfill Gas Monitoring Data in Ngau Tam Mei Landfill (July 2020 to June 2022)

Landfill Gas Monitoring Wells	Range of Concentration (% V/V)	
	Methane (CH_4)	Carbon Dioxide (CO_2)
A451	<0.1	0.5 – 9.2
A452	<0.1	0.3 – 14.7
A453	<0.1	1.4 – 4.9
A454	<0.1	5.2 – 17.3
A455	<0.1 – 0.2	0.1 – 10.3
A456	<0.1	0.4 – 5.5
A457A	<0.1	<0.1
A458	<0.1	0.9 – 10.9
A459	<0.1	0.1 – 2.5
A460	<0.1	0.4 – 8.0
A461	<0.1	0.8 – 7.3
DH403	<0.1 – 0.1	0.2 – 12.4
DH405	<0.1	0.3 – 9.8
DH407	<0.1	<0.1 – 7.7
DH408	<0.1	0.1 – 6.9

4.2.1.3 As the concentration of methane in most of the perimeter gas monitoring wells were below the limit of detection of 0.2%, this suggests that off-site migration of methane towards the Site should be insignificant. However, the concentration of carbon dioxide (i.e. <0.1% to 17.3%) were found much higher than the ambient level in many monitoring locations. Owing to the high concentration of carbon dioxide, this may cause the risk of asphyxiation to workers especially those working in excavations or semi-confined spaces. Therefore, the LFG source of the Ngau Tam Mei Landfill is considered as **"Medium"**.

4.3 Pathways

4.3.1.1 LFG is generated under positive pressure as a result of microbial degradation of organic matter in the buried wastes. This will create a pressure gradient, causing migration of the gas to points of lower pressure. Migration pathways will therefore be determined by zones of lowest resistance to gas movement.

4.3.1.2 Based on the available underground services and utilities layout plan (including telephone lines, gas pipeline, water mains, electric cables, foul sewer and stormwater pipe), no existing services or utilities directly linking the Ngau Tam Mei Landfill and the proposed development was identified. The existing services or utilities are primarily associated with the utility entries from San Tam Road, hence can only form a secondary pathway for gas migration into the development via loose packed infill materials or possible open void conduits. The path length between Ngau Tam Mei Landfill and the existing underground services and utilities will be more than 100m. Therefore, the man-made pathways are categorised as **"Long / indirect"**.

4.3.1.3 For the natural pathways, the path length between Ngau Tam Mei Landfill and the proposed development will be more than 100m. Therefore, the natural pathways for the Ngau Tam Mei Landfill is categorised as **"Long / indirect"**.

4.4 Targets

4.4.1.1 In general, potential targets associated with proposed development include:

- Excavations for utilities installation, electric meter room and lower ground sewage treatment plant during construction stage;
- Manholes, inspection chambers or voids of services or utilities, electric meter room and lower ground sewage treatment plant during operational stage;
- Ground floor areas within the building blocks during operational stage.

4.4.1.2 It is anticipated that a shallow excavations for the utilities and garden establishment would be involved during the construction stage of the proposed development. Laying of some electric cables to the proposed development is anticipated, which may be sub-surface or on grade. According to Section 3.18 of the Guidance Note, the level of risk for shallow excavations is categorized as **"Low Sensitivity"**. However, deep excavations for the services including lower ground sewage treatment plant would be involved during the construction stage of the proposed development. According to Section 3.18 of the Guidance Note, the level of risk for deep excavations is categorised as **"Medium Sensitivity"**.

4.4.1.3 During operational stage, some manholes, inspection chambers or voids of services or utilities, electric meter room and lower ground sewage treatment plant will be present within the Site. There is a risk of asphyxiation to persons using poorly ventilated enclosed spaces, where gas is accumulated. However, these areas are restricted to only allow the authorised or well-trained personnel who have been briefed on the potential hazards relating to LFG and the specific safety procedures to be followed. Moreover, the residents and visitors shall not access to these areas during normal operation, and the sign indication and security system will be provided to prevent any unauthorised personnel access to the these

services. The risk level for these targets is also categorised as **"Medium Sensitivity".**

4.4.1.4 The use of Lower Ground Floor as Entrance Lobby & Car Park of the proposed development will be only accessed by the residents and visitor during operation stage. The risk level for the ground floor areas within the building block is therefore categorized as **"Medium Sensitivity"**.

4.5 Summary of Qualitative Source-Pathway-Target Analysis

4.5.1.1 Based upon the sources, pathways and targets classified above, the qualitative LFG hazard assessment for the proposed development is summarised in Table 4.4.

Table 4.4 Source- Pathway-Target Analysis

Source	Pathway	Sensitivity Target	Risk
Ngau Tam Mei Landfill The landfill started to receive waste in 1973. Recently obtained gas monitoring data in general show methane concentrations were below the limit of detection. However, the concentrations of carbon dioxide (range from <0.1% to17.3%)were much higher than ambient level in many monitoring locations. **(Medium Source)**	Man-made Pathways There are no utilities or services directly linking between Ngau Tam Mei Landfill and the proposed development. Natural Pathways The Site is located more than 100m away from the edge of the Ngau Tam Mei Landfill. **(Long / Indirect Pathway)**	Shallow excavations during construction stage Shallow excavation for utilities installation and garden establishment. **(Low Sensitivity Target)**	**Very Low**
		Deep excavations during construction stage Deep excavations for services including lower ground sewage treatment plant. **(Medium Sensitivity Target)**	**Low**
		Maintenance of services during operational stage Manholes or inspection chambers of utilities or services, electric meter room and lower ground sewage treatment plant. **(Medium Sensitivity Target)**	**Low**
		Ground floor areas within building blocks during operational stage Ground floor areas of the proposed development is only accessible to the residents and visitors. **(Medium Sensitivity Target)**	**Low**

4.6 Site Categorisation

4.6.1.1 According to the Guidance Note, for the purpose of categorising a site, the category is based on the highest level of risk nominated for any of the potential impacts identified.

4.6.1.2 Referring to Table 4.4, the overall risk level for the proposed development associated with the Ngau Tam Mei Landfill is classified as "**Low**", which falls into **Risk Category D**. For Risk Category D, "Some precautionary measures will be required to ensure that the planned development is safe" as stated in the Guidance Note. According to Table 4.2 of the Guidance Note, the generic protection measures will include "passive control of gas". The recommended protective measures during the construction and operational stages are provided and presented in the following section.

5 Recommendations and Protection Measures

5.1 Construction Stage

5.1.1 Precautionary Measures

5.1.1.1 In general, the contractor should be informed of the following:

- Potential presence of methane and carbon dioxide in soil voids;
- Physical and chemical nature of LFG;
- Fire and explosion hazard, toxicity effects and health hazards associated with LFG; and
- Methodologies / requirements for LFG monitoring.

5.1.1.2 Precautions should be clearly laid down and rigidly adhered to with respect to:

- Trenching and excavation; and
- Creation of confined or semi-confined spaces at, near to or below ground level such that potential hazards to workers due to LFG.

5.1.1.3 During construction stage, the following precautionary measures and safety clauses should be implemented and specified in tender / contract documentation:

- A properly trained Safety Officer should be present on-site during the construction period to oversee the possible LFG risks and be responsible for first aid, emergency and evacuation;
- The Safety Officer or professional Environmental Consultant should use an intrinsically safe portable instrument(s), appropriately calibrated and capable of monitoring methane, carbon dioxide and oxygen;
- All relevant construction workers who work in, or have responsibility for, "at risk" areas should be briefed of the potential risks associated with LFG and the necessary responses and actions needed;
- There should be proper warning of the potential hazards in the vicinity of excavations and proposals of "method-of-working" statements for these works covering all normal and emergency procedures to minimize the potential risk of LFG for agreement by the Engineer representative and the professional Environmental Consultant;
- There should be proper control of welding, flame cutting and any other hot works within trenches, confined spaces and excavation areas;
- A 'no smoking' policy should be strictly enforced;
- Naked flames are to be prohibited within any excavation or ground-level confined space unless otherwise agreed by the Safety Officer or professional Environmental Consultant;

- At a minimum, no work should be undertaken in the absence of fire extinguishers. There should be adequate provision of fire extinguishing equipment and fire-resistant clothing. Gas detection equipment and appropriate breathing apparatus should be available and used when entering confined spaces or trenches deeper than 2 metres;
- The contractor to propose appropriate locations and designs for mobile offices, equipment stores, mess rooms, etc. in accordance with the followings:
- Mobile offices, equipment stores, mess rooms etc. should be located on an area which has been proven to be gas free (by survey with portable gas detectors) and ongoing monitoring should be carried out to ensure that these areas remain gas free. The use of permanent gas detectors may be appropriate in some circumstances where there is a relatively high risk but for many developments it will be sufficient to have regular monitoring undertaken manually by the safety officer. The particular arrangements to be adopted at a specific site will need to be determined during the risk assessment/design of protection measures;
- Alternatively, such buildings should be raised clear of the ground. If buildings are raised clear of the ground, a minimum, clear separation distance (as measured from the highest point on the ground surface to the underside of the lowest floor joist) should be 500mm;
- Workers should be instructed to adopt good hygiene practices to prevent direct exposure to leachate or leachate-contaminated groundwater, if any. Workers should wash thoroughly after work, eat only in clean area after washing hands, and wear protective gear including gloves and appropriate clothing;
- Utility companies should be advised of the proposed development and cable/pipe laying being in the vicinity of the Ngau Tam Mei Landfill for their attention to observe the relevant regulations and requirements in such regards when inspection or works are being undertaken at the nearby area; and
- Relevant recommendations and requirements as stated in Section 8 of the Guidance Note (provided in Appendix C) should be incorporated in the tender / contract documents.

5.1.2 LFG Monitoring during Construction Stage

5.1.2.1 At a minimum, routine LFG monitoring should be undertaken twice per day at start of work during all excavation works below ground level deeper than 300 mm and/or after prolonged periods of enclosure/not ventilated. All measurements in excavations should be made with the extended monitoring tube located not more than 10 mm from the exposed ground surface. Monitoring should be performed properly to make sure that the area is free of LFG before enter into the area. The LFG monitoring should be undertaken by a trained Safety Officer or professional Environmental Consultant.

5.1.2.2 For excavations deeper than 1 m, measurements should be carried out:

- At the ground surface before excavation commences;
- Immediately before any worker enters the excavation;
- At the beginning of each working day for the entire period the excavation remains open; and
- Periodically through the working day whilst workers are in the excavation.

5.1.2.3 For excavations between 300 mm and 1 m deep, measurements should be carried out:

- Directly after the excavation has been completed; and
- Periodically whilst the excavation remains open.

5.1.2.4 For excavations less than 300 mm deep, monitoring may be omitted, at the discretion of the Safety Officer or Environmental Consultant.

5.1.2.5 Monitoring of methane, carbon dioxide and oxygen should be undertaken using appropriately calibrated portable gas detection equipment. Monitoring equipment should have, as a minimum, the indication ranges set out in Table 5.1:

Table 5.1 Detection Ranges of the Gas Monitoring Instrument

Gas	Range of Detection
Methane	0 - 100% Lower Explosive Limit (LEL) and 0 - 100% v/v
Carbon dioxide	0 - 100%
Oxygen	0 - 21%

5.1.2.6 All measurements should be recorded and kept on-site for ease of inspection. The routine monitoring reports should be endorsed and submitted to EPD by the Authorised Person (AP) or Project Architect for record at least once a month.

5.1.2.7 Depending on the results of the measurements, action required will vary and shall be set down by appropriately qualified person. At a minimum, these shall encompass those actions specified in Table 5.2.

Table 5.2 Action Plan in the Event of Gas being detected (Construction Stage)

Parameter	Measurement	Action
Methane (CH_4)	>10% LEL (i.e. > 0.5 % by volume)	• Prohibit hot works • Ventilate to restore CH_4 to below 10% LEL
Methane (CH_4)	>20% LEL (i.e. > 1 % by volume)	• Stop works • Evacuate personnel / prohibit entry • Increase ventilation to restore CH_4 to below 10% LEL
Carbon Dioxide (CO_2)	>0.5%	• Ventilate to restore CO_2 to less than 0.5%
	>1.5%	• Stop works • Evacuate personnel / prohibit entry • Increase ventilation to restore to less than 0.5%
Oxygen (O_2)	<19%	• Ventilate trench / void to restore O_2 level to more than 19%
	<18%	• Stop works • Evacuate personnel / prohibit entry • Increase ventilation to restore O_2 to more than 19%

5.2 Operational Stage

5.2.1 Protection and Precautionary Measures

5.2.1.1 As per general categorization of risk, the proposed development are in Category D for "Low" level of risk during operational stage.

5.2.1.2 In order to reduce the likelihood of LFG infiltration and accumulation, protection measures have to be adopted. The recommended protection measures are discussed in below.

5.2.1.3 The following passive control measures for proposed development should be included:

- Providing good and effective ventilation for the proposed development including electric meter room and lower ground sewage treatment plant (STP) to prevent the accumulation of landfill gas;

- Providing gas-resistant polymeric membranes which can be incorporated into the floor or wall construction as a continuous sealed layer. The membranes should be able to demonstrate low gas permeability and resistant to possible chemical attack and may incorporate aluminium wafers to improve performance;
- High density concrete can be applied at the lowest ground slab to enhance the resistance of gas permeation; and
- Passive control measures may be used in low and medium risk situations where gas emissions are expected to be at relatively low rates and concentrations and venting to atmosphere is unlikely to cause a hazard or nuisance due to the low concentration or high dilution which will occur.

5.2.1.4 Subsequent excavations or below ground works may be carried out in future years during maintenance stage. Such activities should be carried out with an awareness of the potential presence of LFG in the ground and appropriate precautionary measure as mentioned in Section 5.1 should be followed to guard against any hazard arising.

5.2.1.5 Mechanical ventilation system shall be provided for plant rooms including electric meter room and lower ground sewage treatment plant (STP) to prevent the accumulation of landfill gas. The designed mechanical ventilation rate at the plant rooms are summarised in the Table 5.3.

Table 5.3 Mechanical Ventilation Rate

Plant Room	Air change per hour (ACH)
Electric Meter Room	10
Sewage Treatment Plant (STP)	12

5.2.1.6 The mechanical ventilation system should be sufficient to remove any potential landfill gas build-up in the plant rooms. Moreover, the mechanical ventilation system would be provided with backup / standby units and temporary power supply units to ensure continued operation during maintenance or malfunction of the system.

5.2.1.7 The details of the adopted protective measures such as, the gas-resistant polymeric membranes specifications, construction drawings showing locations of installation, physical sample and construction certification report showing the membranes are installed according to specifications along with photos taken during construction should be endorsed and submitted to EPD by the Authorised Person (AP) or Project Architect during construction stage.

5.2.1.8 The lowest ground floor slab is of high density concrete made of high proportion of cement with a density of 450 kg/m^3 which can make the structure more resistant to gas permeation. Therefore, the potential of landfill gas infiltration through the underground soil into the building envelope should be minimal.

5.2.1.9 The concerned utility companies shall be informed of the proximity of the Site to the landfill and the associated hazards due to LFG. The Project Architect (R Lee Architects (HK) Limited) shall co-ordinate with the concerned contractor or utility companies in the design and maintenance of their facilities.

5.2.1.10 All ducts, chambers and manholes, if any, shall be sealed off from the ground to prevent ingress of LFG and facilitate venting to the atmosphere. Figure 5.1 and Figure 5.2 present typical designs for services passing through the consultation zone and above ground termination of the services within the consultation zone.

5.2.1.11 Vent pipes/ gridded manhole covers/ dense well-compacted concrete materials completed with gas-resistant membranes sealing may be incorporated in the underground utilities manholes or inspection chambers to avoid build-up of gas and provide resistance to gas permeation. Typical design of vented manhole are shown in Figure 5.3. Under all circumstances, care should be taken when accessing any manhole chambers especially those which are not fitted with vents and necessary safety procedures must be followed.

5.2.1.12 During the operational stage, any service voids, manholes, chambers or culvert within the Site, which is large enough to permit access to personnel should be subject to entry safety procedures. Works in confined spaces are controlled by the Factories and Industrial Undertakings (Confined Spaces) Regulation of the Factories and Industrial Undertakings Ordinance and the Safety Guide to Working in Confined Spaces should be followed to ensure compliance with the Regulation.

5.2.1.13 In general, when work is being undertaken in confined spaces, sufficient approved resuscitation equipment, breathing apparatus and safety torches should be made available. Persons involved in or supervising such work should be trained and practiced in the use of such equipment. A permit-to-work system for entry into confined spaces should be developed by an appropriately qualified person and the system should be consistently employed.

5.2.2 LFG Monitoring during Operational Stage

5.2.2.1 To safeguard the users of the proposed development from the possible hazards of asphyxiation effects of LFG, a LFG monitoring program shall be instituted. The objectives of monitoring during the operational stage of the Project are:

- To obtain early warning of potential problematic areas and permit timely remedial actions taken by the restoration contractor of the Landfill;
- To provide reassurance to the public; and
- To include methane, carbon dioxide and oxygen as determinants.

5.2.2.2 The sensitive rooms at the ground floor of the buildings might need to be monitored by gas detection equipment. Besides, there are sewage treatment plant room and manholes at the below ground floor as part of drainage / sewerage systems. Since these locations would be potentially at risk to gas ingress and gas accumulation, it should also be monitored by gas detection equipment and the monitoring work would be under the guidance of qualified safety officer. The performance

requirement of the portable gas detection equipment shall be referred to Section 5.1.2.5 and Table 5.1 of this report. The proposed monitoring locations are shown in Figure 5.4.

5.2.2.3 Table 5.4 presents a recommended LFG monitoring programme for the initial operational stage.

Table 5.4 LFG Monitoring Frequency during the Operational Stage

Period	Monitoring Frequency
First year after completion of the construction stage	Monthly
Second year after completion of the construction stage	Quarterly if LFG is not detected in the first year. Otherwise, the monitoring frequency will be maintained in monthly basis.
Monitoring can be ceased if no LFG is detected in the past 2-years monitoring	

5.2.2.4 A LFG monitoring report which summarises the monitoring results should be endorsed and submitted to EPD by the Authorised Person (AP) or Project Architect within 1 month of completion of the LFG monitoring. The frequency of submission of the LFG monitoring reports should follow Table 5.4.

5.2.2.5 Table 5.5 presents an action plan to specify the actions to be taken in response to gas detection. The future operator shall conduct further investigations and gas monitoring if necessary. A professional Environmental Consultant in this specific field should be engaged to interpret the results. Expert advice from the professional Environmental Consultant should be sought where necessary.

Table 5.5 Action Plan in the Event of Gas being detected (Operational Stage)

Parameter	Actions
All detectable levels	Confirm / verify the reading with a second instrument, monitor the trend of readings and carry out additional monitoring & investigation, if necessary
0.5 % v/v (10% LEL) CH_4 or 0.5% CO_2, whichever is exceeded*	<u>Trigger level:</u> • Stop hot works; • Inform the property management; • Immediate mitigation measures such as mechanical ventilation shall be provided; • Report to EPD; • Further investigation to be undertaken within the Site; • Increase the gas monitoring frequency to weekly.
1 % v/v (20% LEL) CH_4 or 1.5% CO_2, whichever is exceeded*	<u>Action level:</u> • Stop all works; • Evacuate personnel / prohibit entry; • Inform the property management; • Immediate mitigation measures such as mechanical ventilation shall be provided; • Report to EPD; • Further investigation to be undertaken within the Site; • Increase the gas monitoring frequency to daily.

Note: Oxygen (O_2) should also be monitored for reference.
** - CO_2 may be above the trigger / action levels due to decomposition of organic matters. In that case, the monitoring results should be interpreted by the qualified environmental consultant.*

6 Conclusion

6.1.1.1 Since the proposed development will be located within the consultation zone of the Ngau Tam Mei Landfill, this Landfill Gas Hazard Assessment was undertaken to assess the likelihood of LFG migration.

6.1.1.2 The results of the landfill gas hazard assessment shows the overall level of landfill gas risk posed by the Ngau Tam Mei Landfill to the proposed development is "Low".

6.1.1.3 Appropriate protection and precautionary measures including regular landfill gas monitoring during both of the construction and operation of the project have been recommended. Provided that all the recommended protection measures with the monitoring are implemented properly, the safety of the site workers and all personnel presence at the proposed development would be safeguarded and there would be no adverse impact anticipated on the feasibility of the proposed 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.

FIGURES

Landfill Gas Hazard
Assessment Report

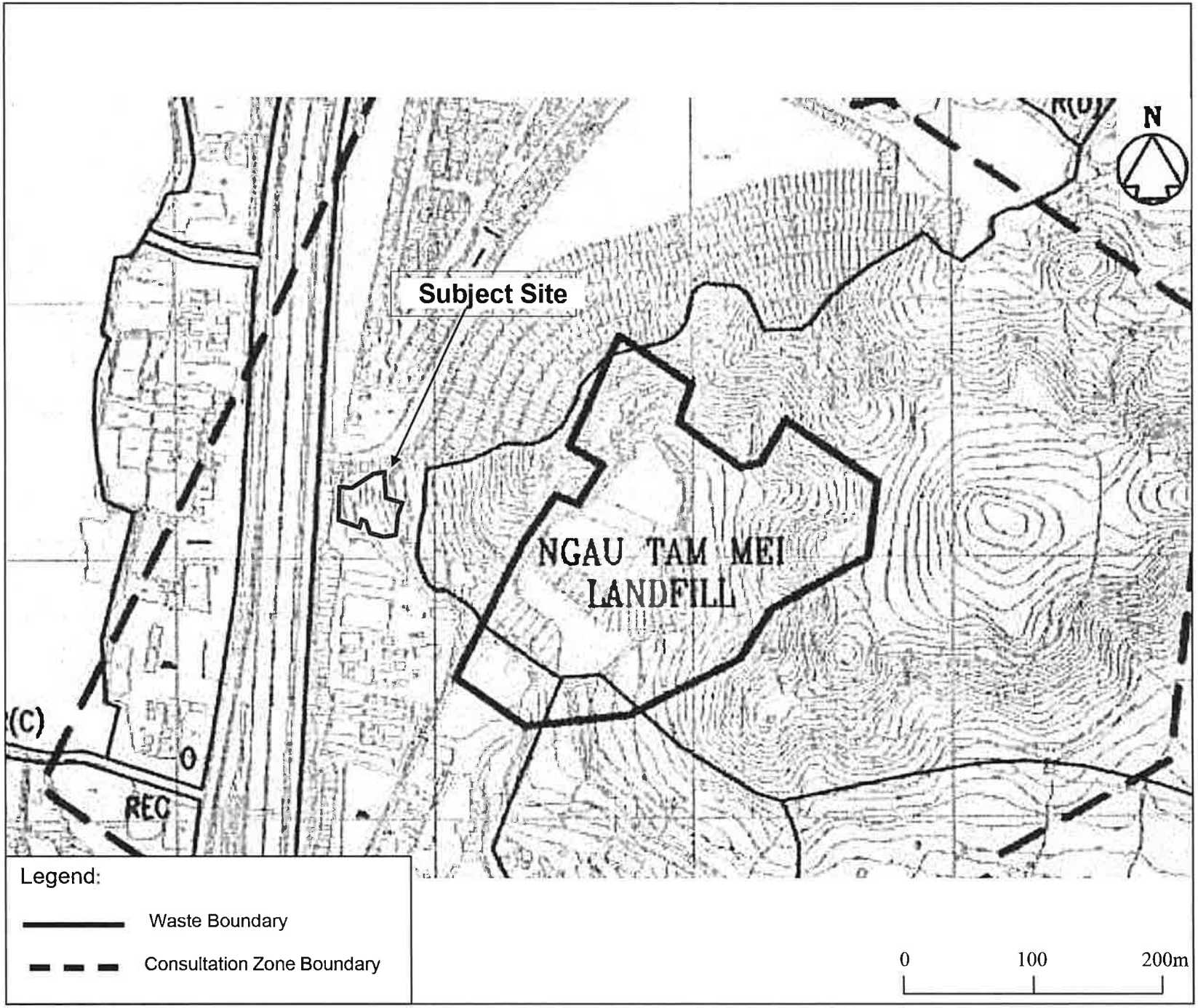
Location of the Proposed Development and Ngau Tam Mei Landfill

Figure 1.1

Scale: As Shown

Date: March 2016

Rev.: 1



Landfill Gas Hazard
Assessment Report

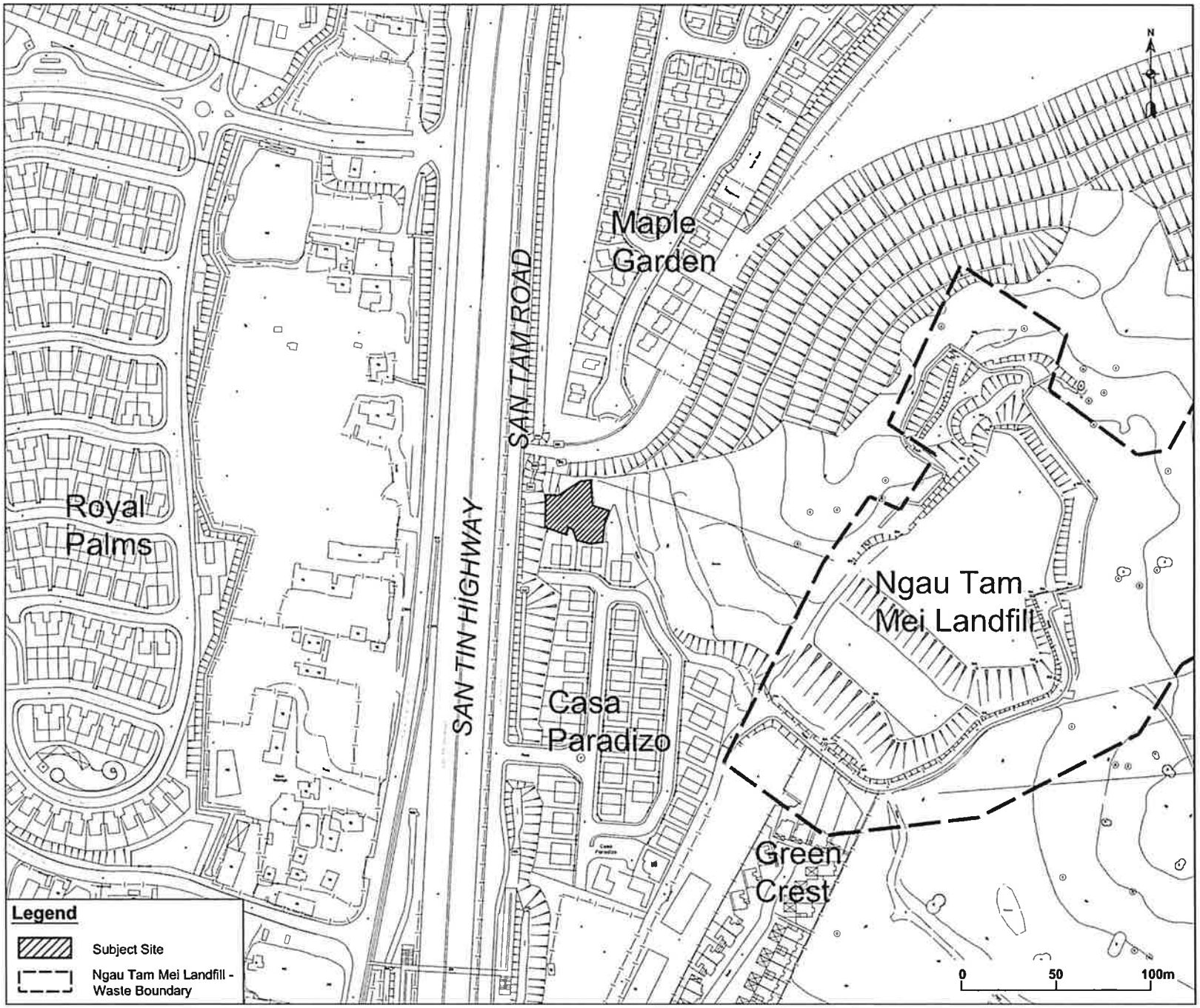
Site Location and Its Environs

Figure 2.1

Scale: As Shown

Date: December 2015

Rev.: 0



Landfill Gas Hazard Assessment Report

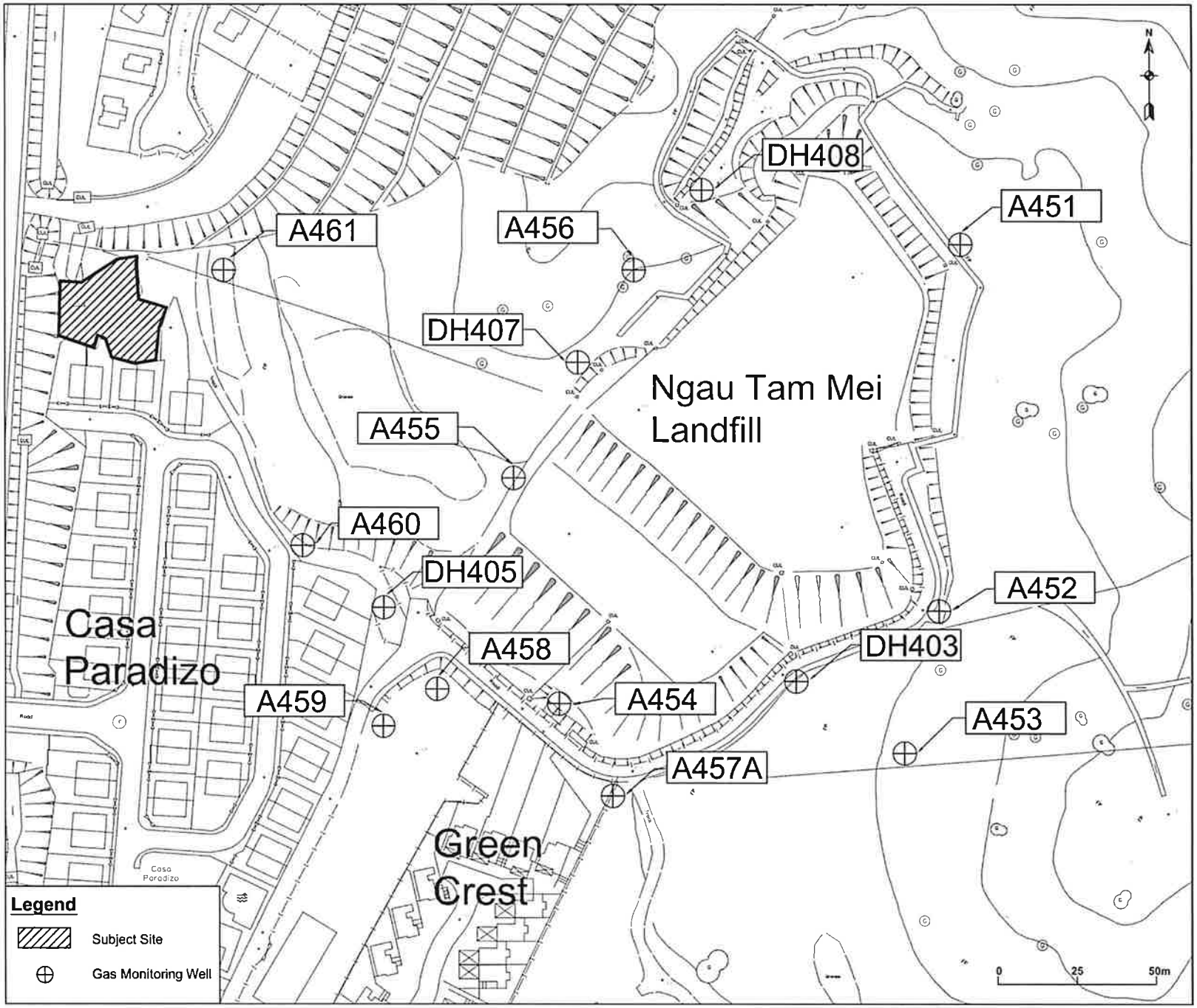
Locations of Relevant Gas Monitoring Wells at Ngau Tam Mei Landfill

Figure 3.1

Scale: As Shown

Date: December 2015

Rev.: 0



Landfill Gas Hazard
Assessment Report

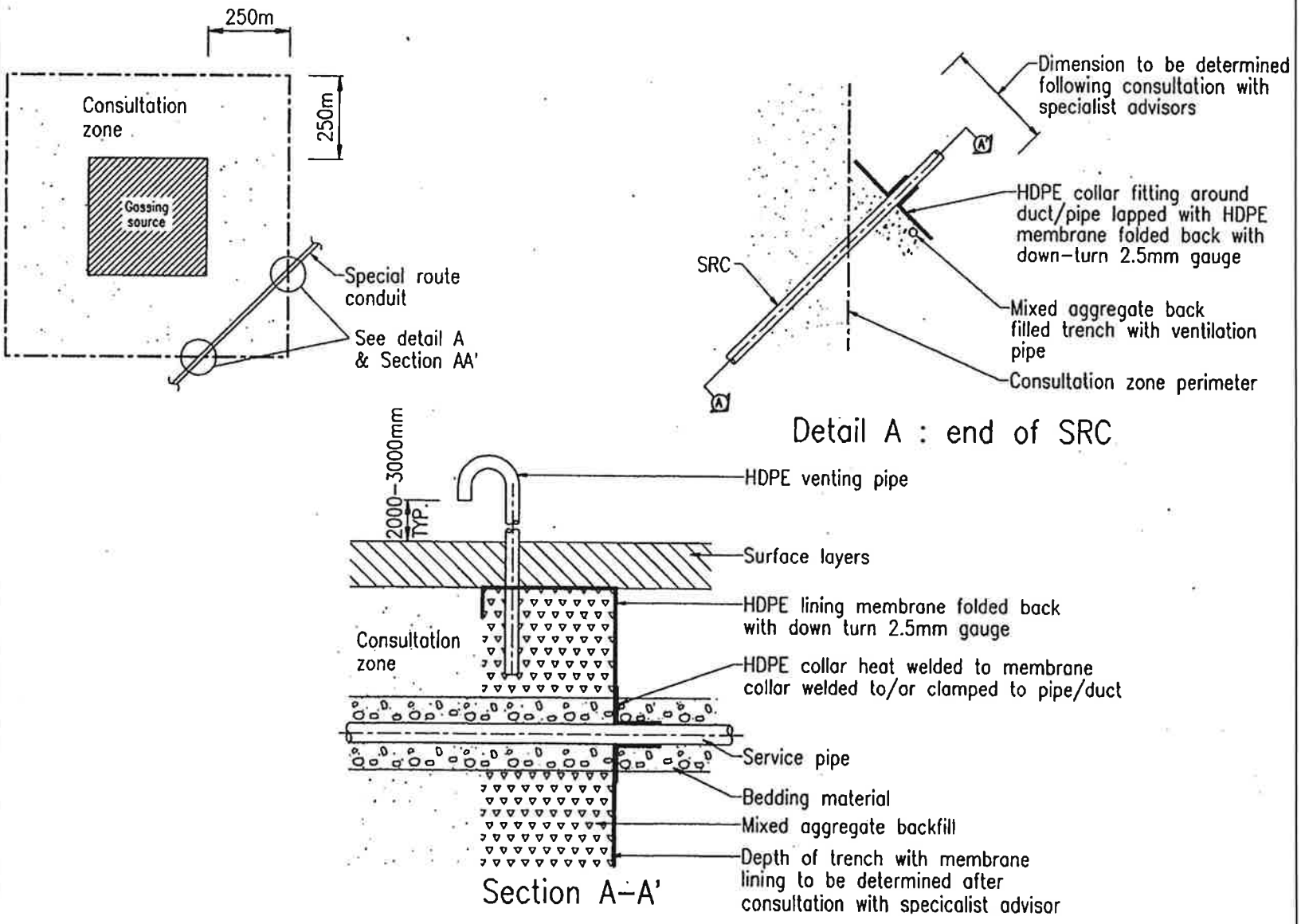
Typical Design for Services Passing Through the Consultation Zone – Special Route Conduit (SRC)

Figure 5.1

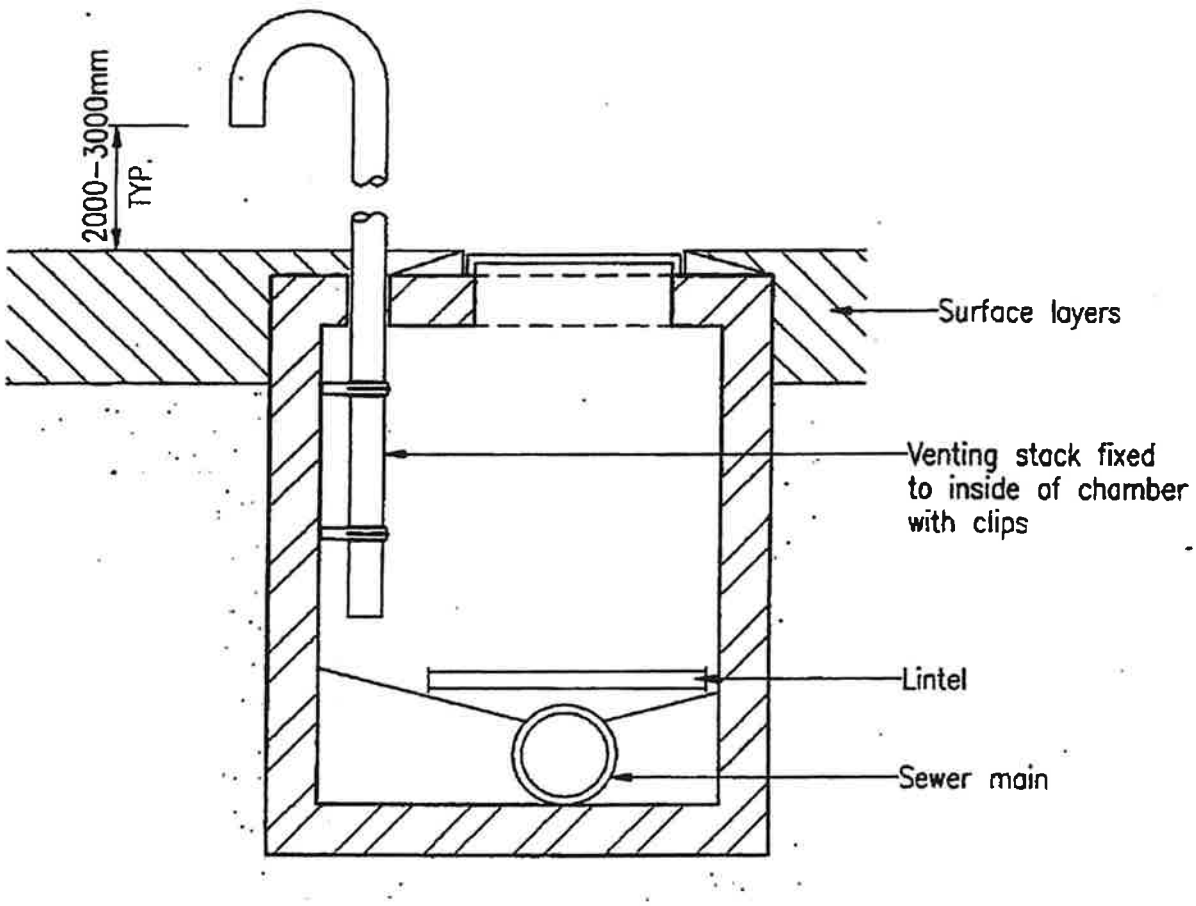
Scale: NTS

Date: December 2015

Rev.: 0



Source: Figure B6 of Landfill Gas Hazard Assessment Guidance Note (published by Environmental Protection Department in 1997)



Source: Figure B3 of Landfill Gas Hazard Assessment Guidance Note (published by Environmental Protection Department in 1997)

Landfill Gas Hazard Assessment Report

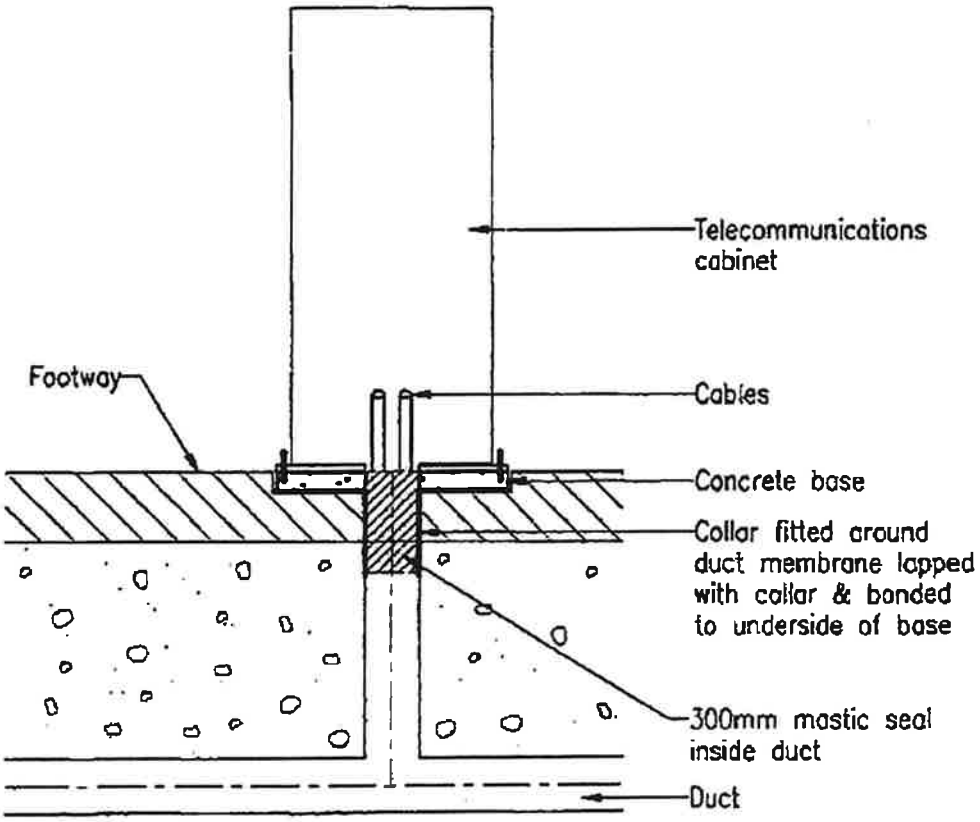
Typical Design of Vented Manhole within Consultation Zone

Figure 5.3

Scale: NTS

Date: December 2015

Rev.: 0



Source: Figure B7 of Landfill Gas Hazard Assessment Guidance Note (published by Environmental Protection Department in 1997)

Landfill Gas Hazard Assessment Report

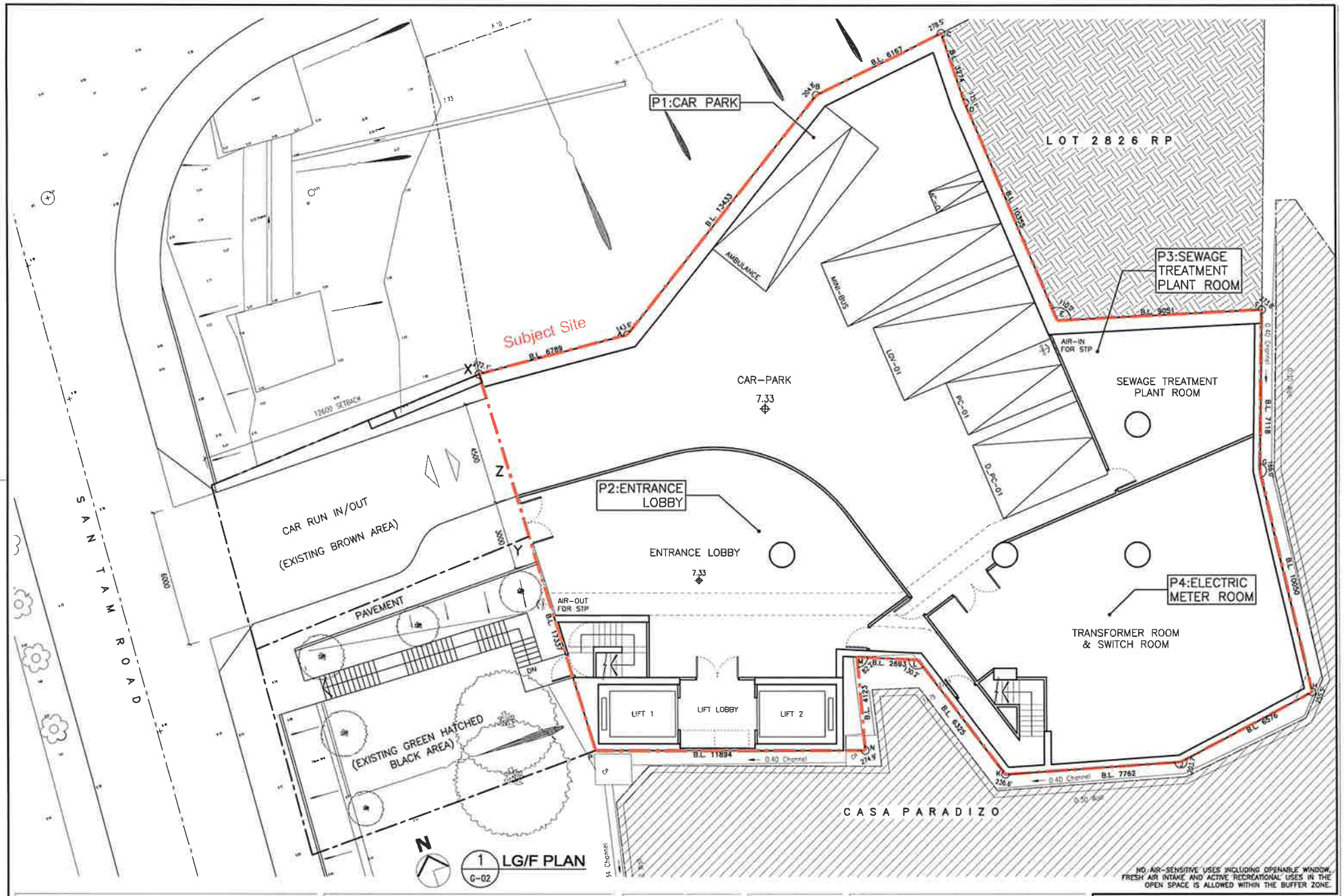
Typical Surface Detail for Above Ground Termination of Services within Consultation Zone

Figure 5.2

Scale: NTS

Date: December 2015

Rev.: 0



2202

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

PROPOSED LANDFILL GAS MONITORING LOCATION (LG/F)

FIGURE 5.4 1:225 (A4) A DEC. 2022

Do not scale drawing.
Contractors are required to verify exact dimensions on site.
The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate.
The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified.
This drawing is not for construction purposes unless expressedly certified.

RLEE

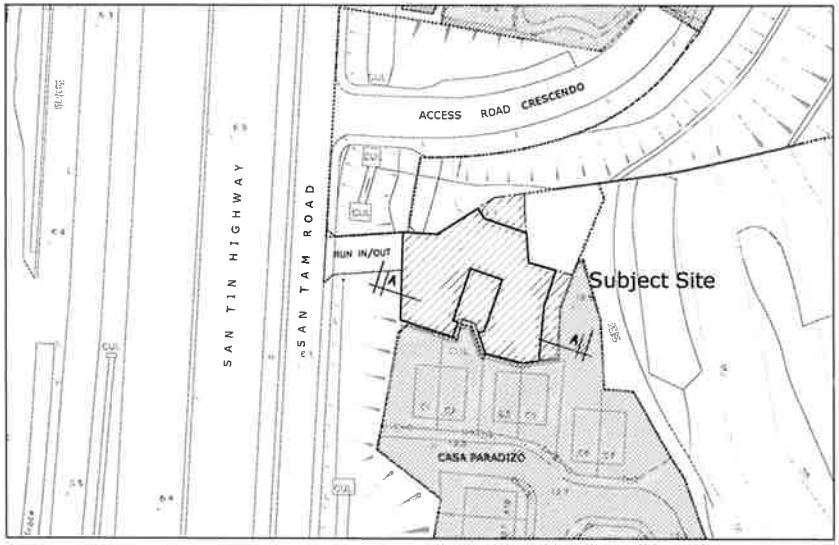
S12A AMENDMENT OF PLAN APPLICATION
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PROPOSED REZONING FROM "R(C)" TO "G/IC"
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(RESIDENTIAL CARE HOMES FOR THE ELDERLY)
(RCHE)

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

APPENDIX A

DEVELOPMENT LAYOUT PLANS



BLOCK PLAN SCALE – 1:1000

DEVELOPMENT SCHEDULE:

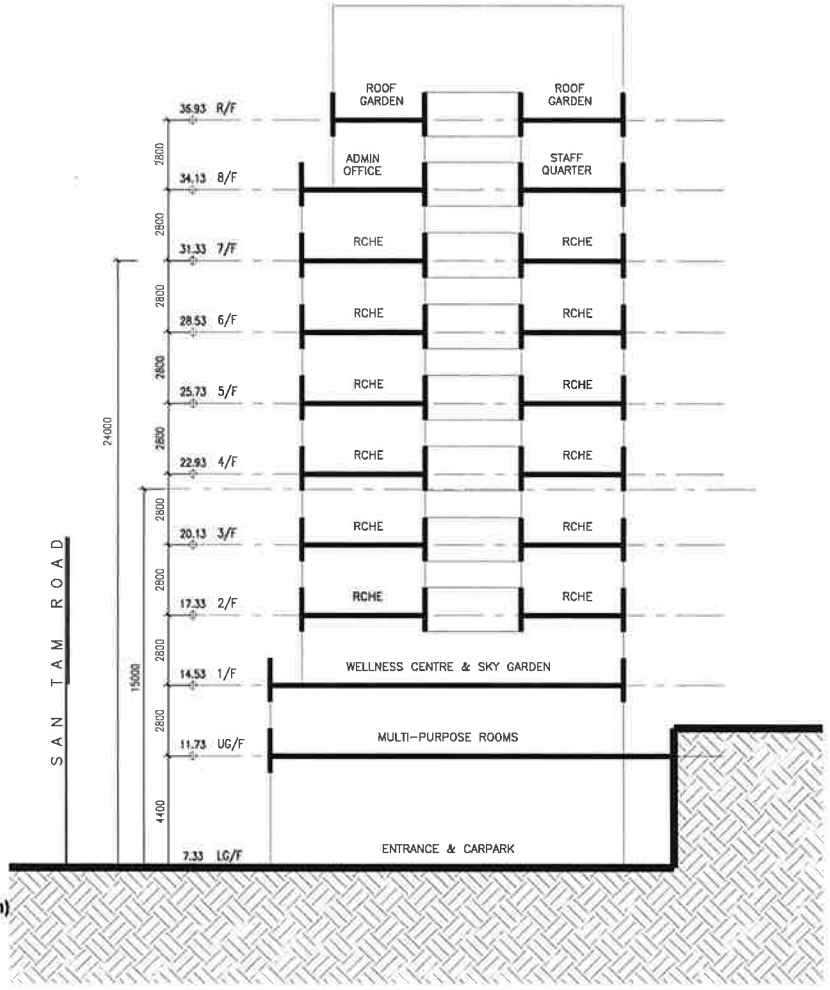
Site Area	:	736.3 m² (7926 ft²)
Class of Site	:	A
Proposed Plot Ratio For Non-Domestic	:	7.33
Proposed Site Coverage above For Non-Domestic (Above 15m)	:	75.558%
Maximum Gross Floor Area	:	5400 m² (58125.6 ft²)
Proposed Building Height	:	36.93 mPD
Absolute Height	:	29.6 m
Proposed No. Of Storey	:	10 STOREYS

Proposed Gross Floor Area

LG/F (ENTRANCE & CARPARK)	:	352.479 m²
UG/F (MULTI-PURPOSE ROOMS)	:	617.819 m²
1/F (WELLNESS CENTRE + SKY GARDEN)	:	626.160 m²
2/F (RCHE)	:	595.090 m² (45 nos. of bed)
3/F (RCHE)	:	556.330 m² (17 nos. of bed + 3 nos. of isolation room)
4/F - 7/F (RCHE)	:	556.330 m² x 4 storeys = 2225.32 m² (20 nos. of bed x 4 storeys)
8/F (ADMIN OFFIC + STAFF QUARTER)	:	426.802 m²
TOTAL	:	**5400.000 m² (142 nos. of bed + 3 nos. of isolation room)**

Parking Spaces :

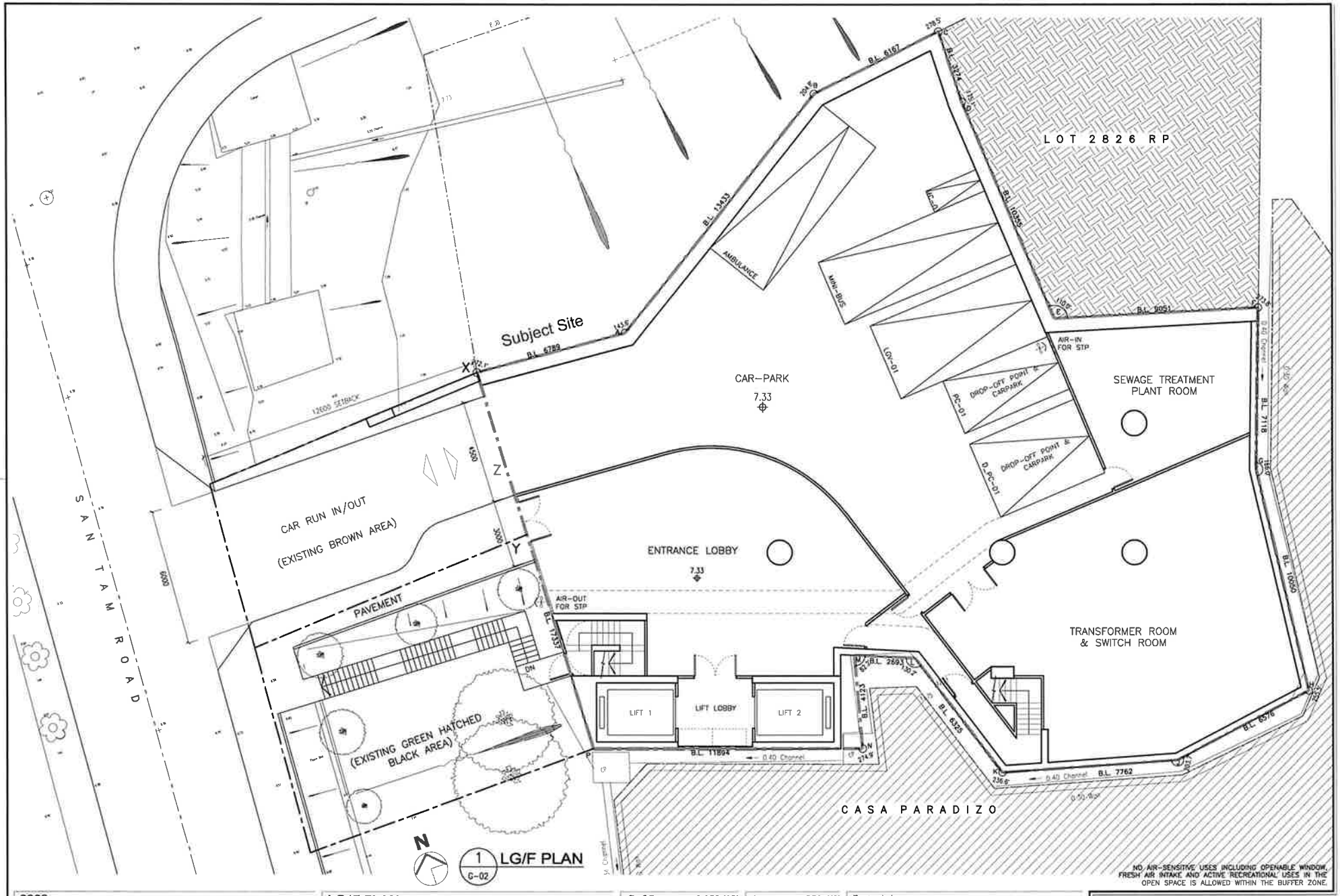
No. of LGV (3.5m x 7m x 3.6m H.)	: 1 Nos.
No. of Minibus (3m x 8m x 3.6m H.)	: 1 Nos.
No. of Private Car Parking (2.5m x 5m x 2.4m H.)	: 1 Nos.
No. of Accessible Private Car Parking (3.5m x 5m x 2.4m H.)	: 1 Nos.
No. of Motorcycle Parking (1m x 2.4m x 2.4m H.)	: 1 Nos.



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 OCT. 2022 A JULY. 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.	RLEE



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.

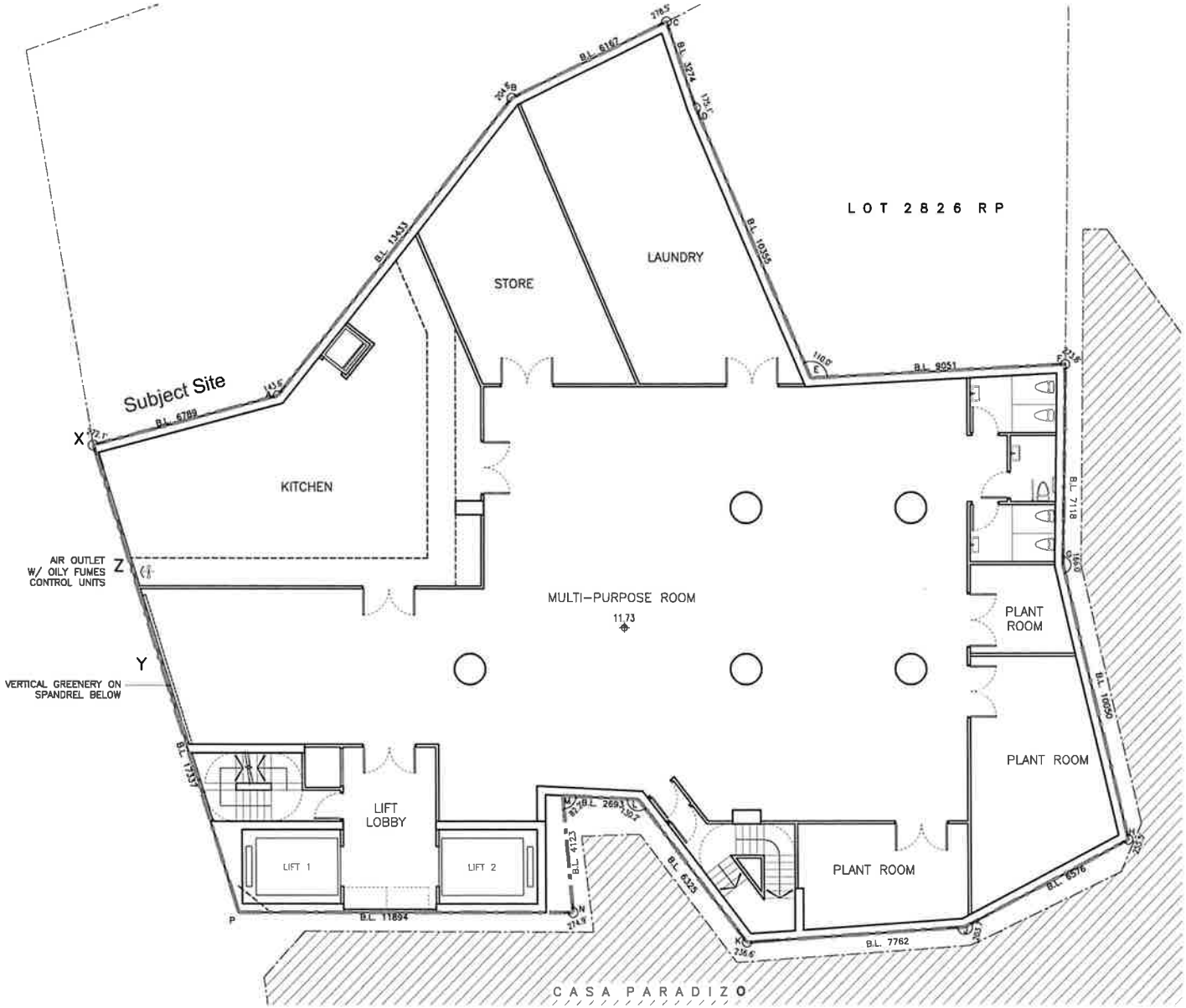
LG/F PLAN
ENTRANCE & CARPARK

G-02 | 1:150 (A3) 1:225 (A4)

C	DEC. 2022	
B	OCT. 2022	
A	JULY. 2022	

Do not scale drawing.
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RLEE



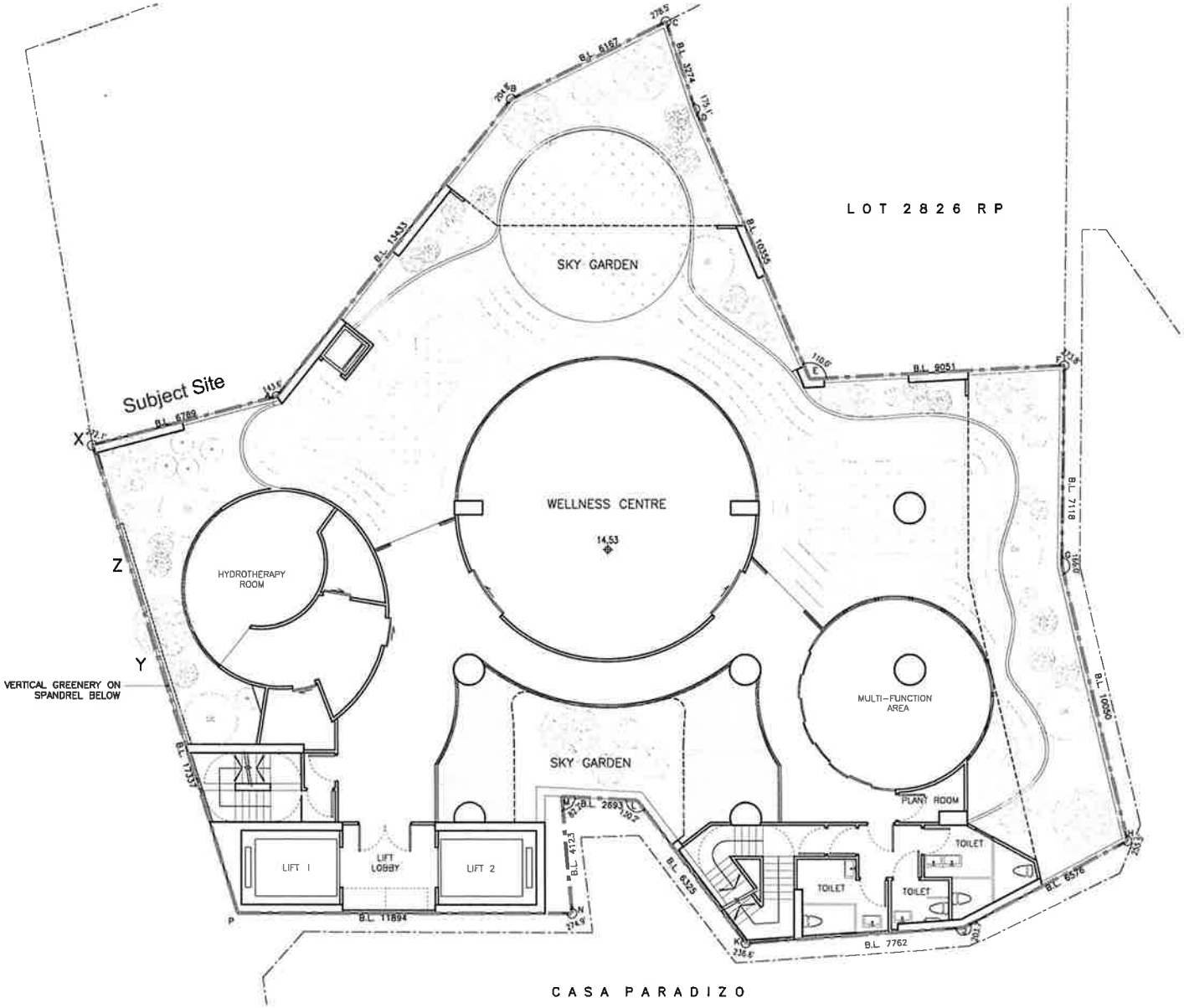
N

1 UG/F PLAN
G-03

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.	UG/F PLAN MULTI-PURPOSE ROOMS	G-03	1:150 (A3) 1:225 (A4)	B OCT. 2022 A JULY. 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

RLEE



N

1 G-04 1/F PLAN

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.

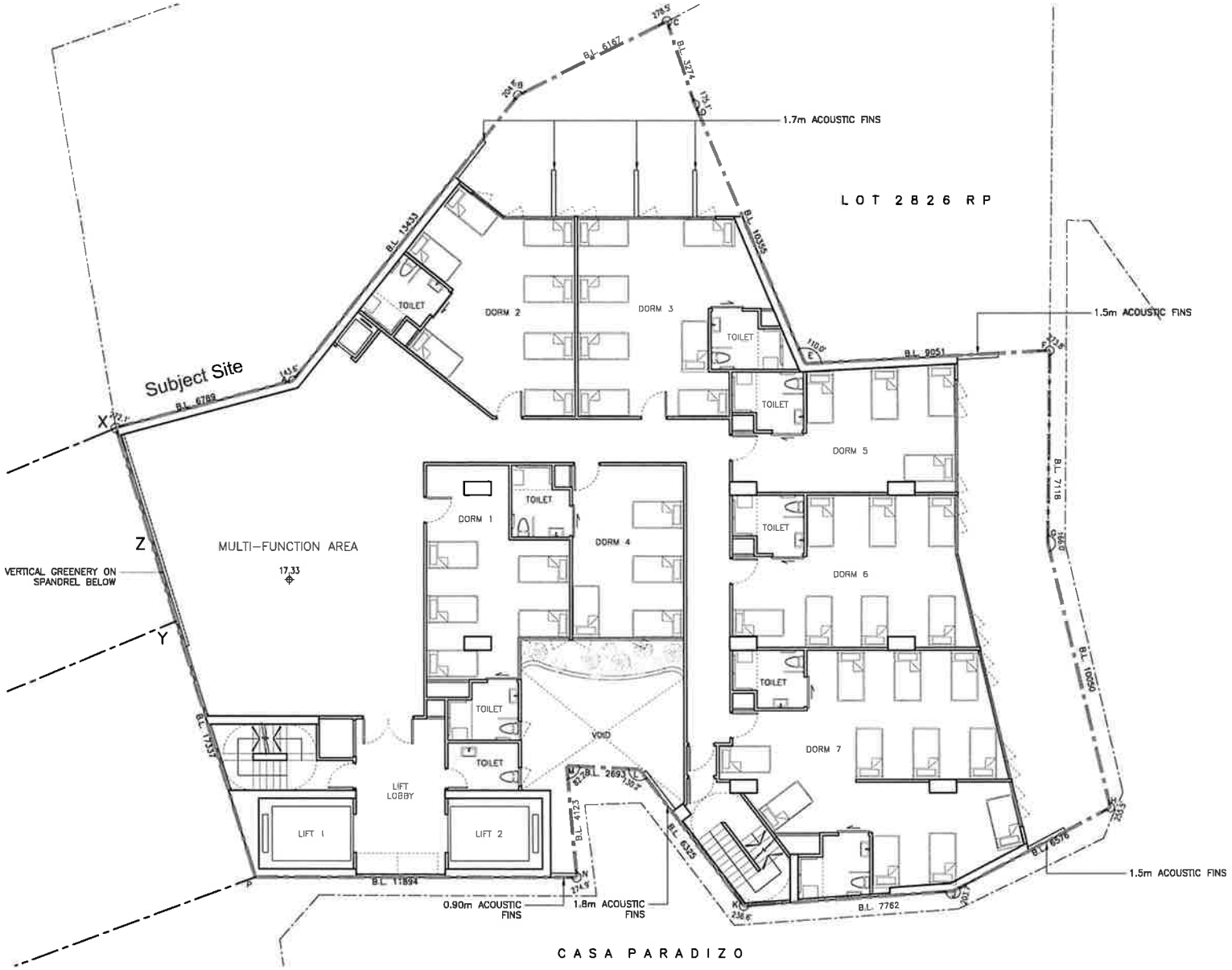
1/F PLAN
WELLNESS CENTRE & SKY GARDEN

G-04 1:150 (A3) 1:225 (A4)

B	OCT. 2022	
A	JULY. 2022	

Do not scale drawing.
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RLEE



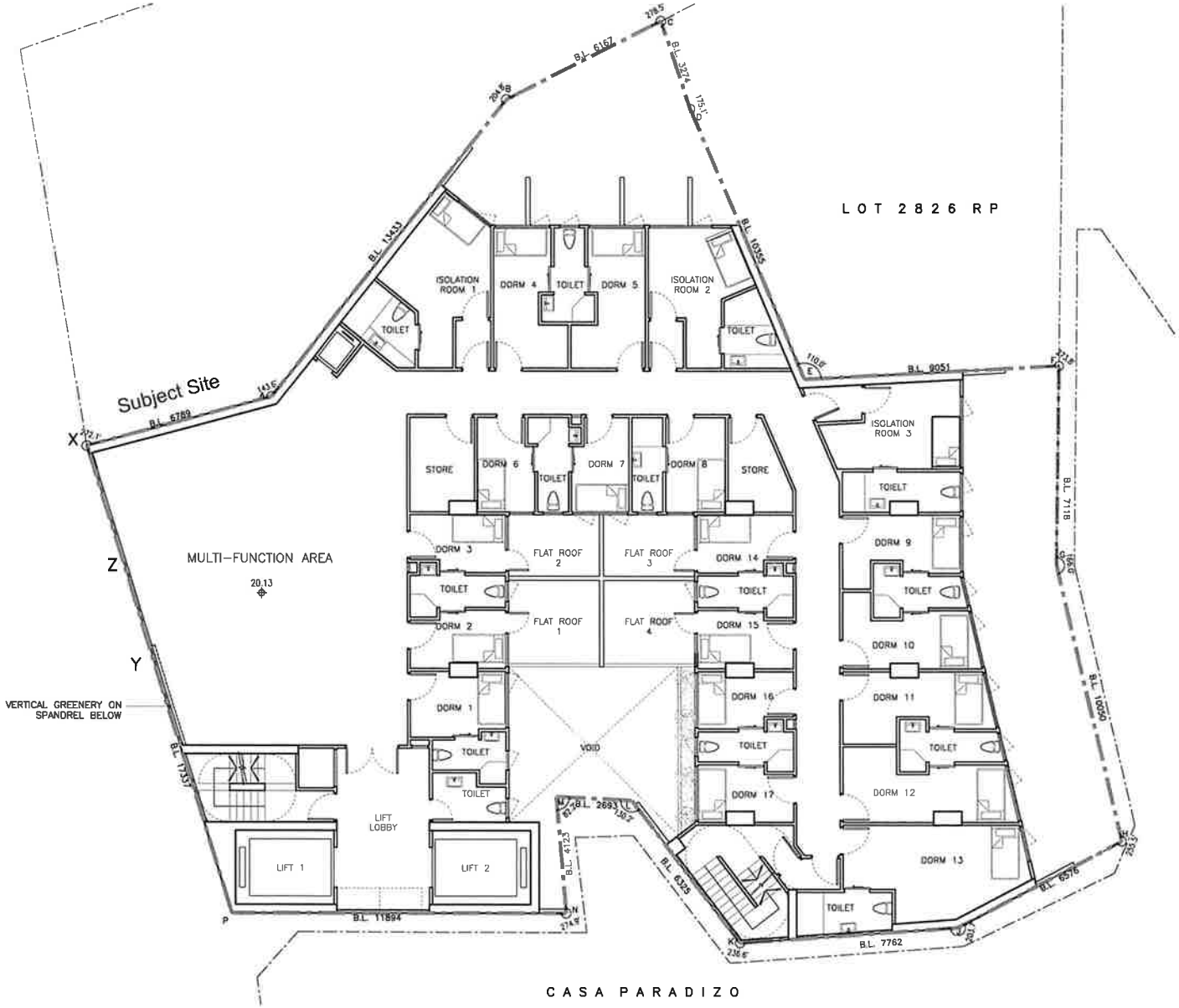
N

1 G-05 2/F PLAN

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) 1:225 (A4)	B OCT. 2022 A JULY. 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

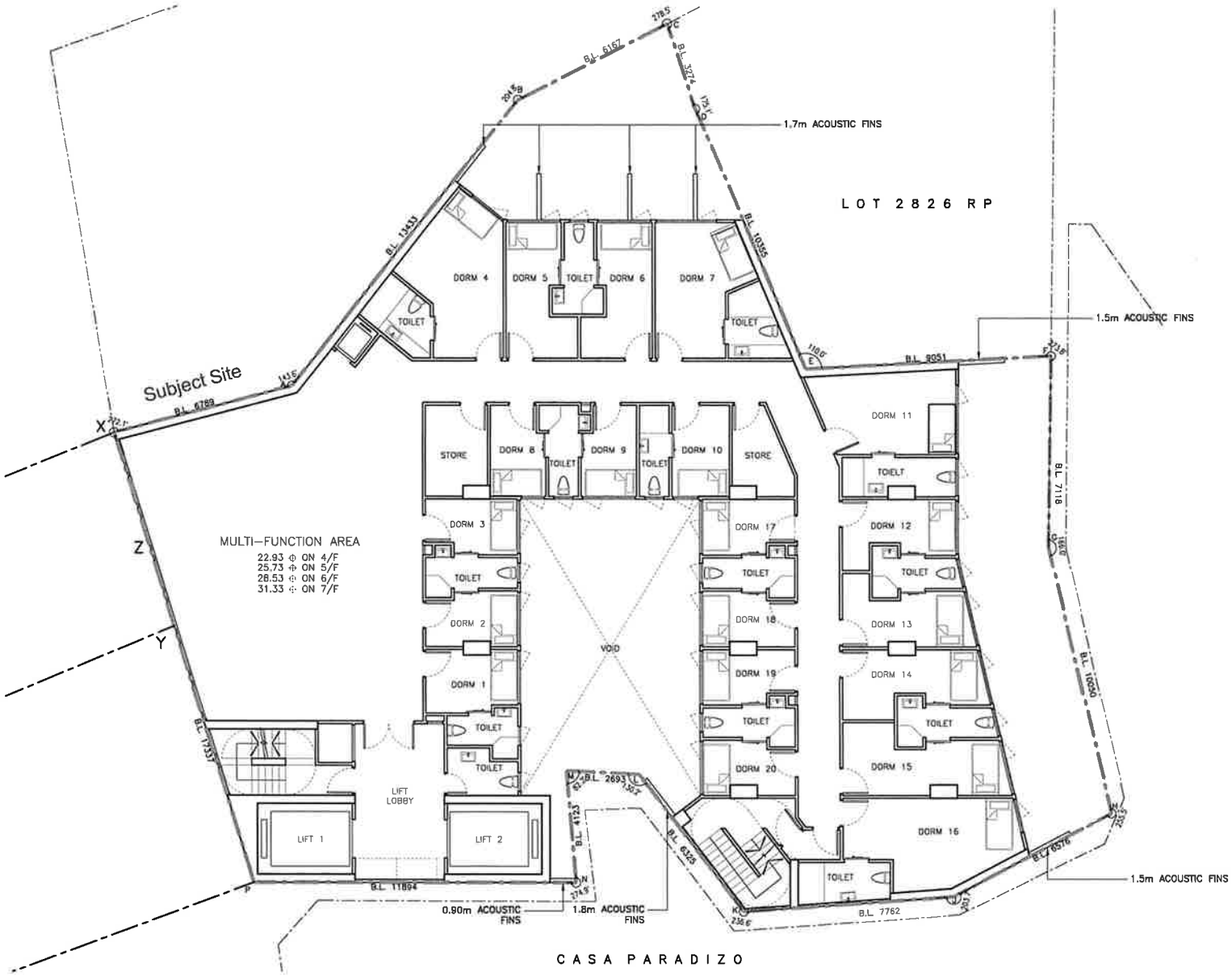
RLEE



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.	3/F PLAN RCHE	G-06	1:150 (A3) 1:225 (A4)	C DEC. 2022 B OCT. 2022 A JULY. 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. This drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

RLEE

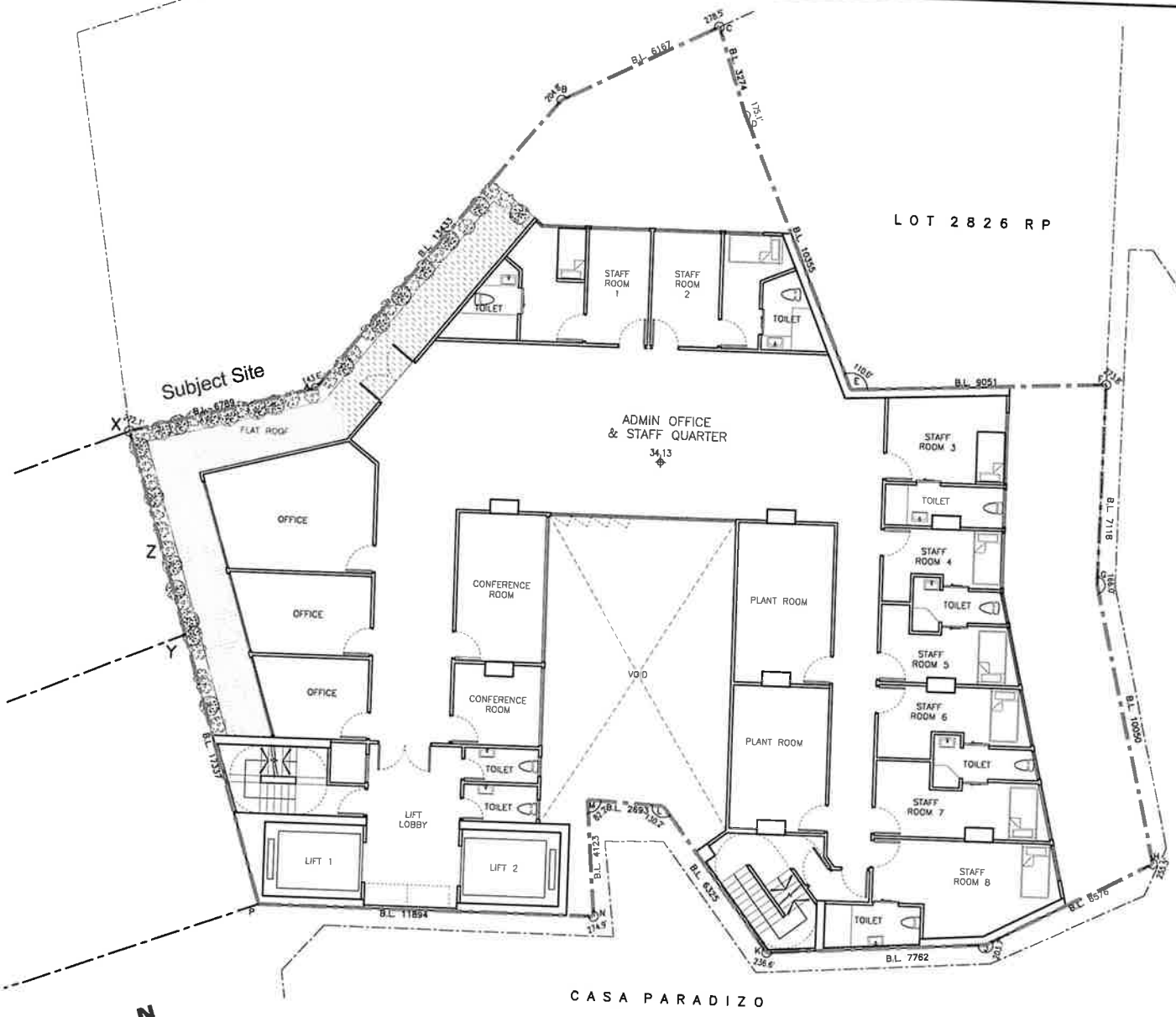


1 TYPICAL FLOOR PLAN PLAN
G-07

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) 1:225 (A4)	B A	OCT. 2022 JULY. 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

RLEE



N

1 / G-08 8/F PLAN

2202

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

8/F PLAN
ADMIN OFFICE & STAFF QUARTER

G-08

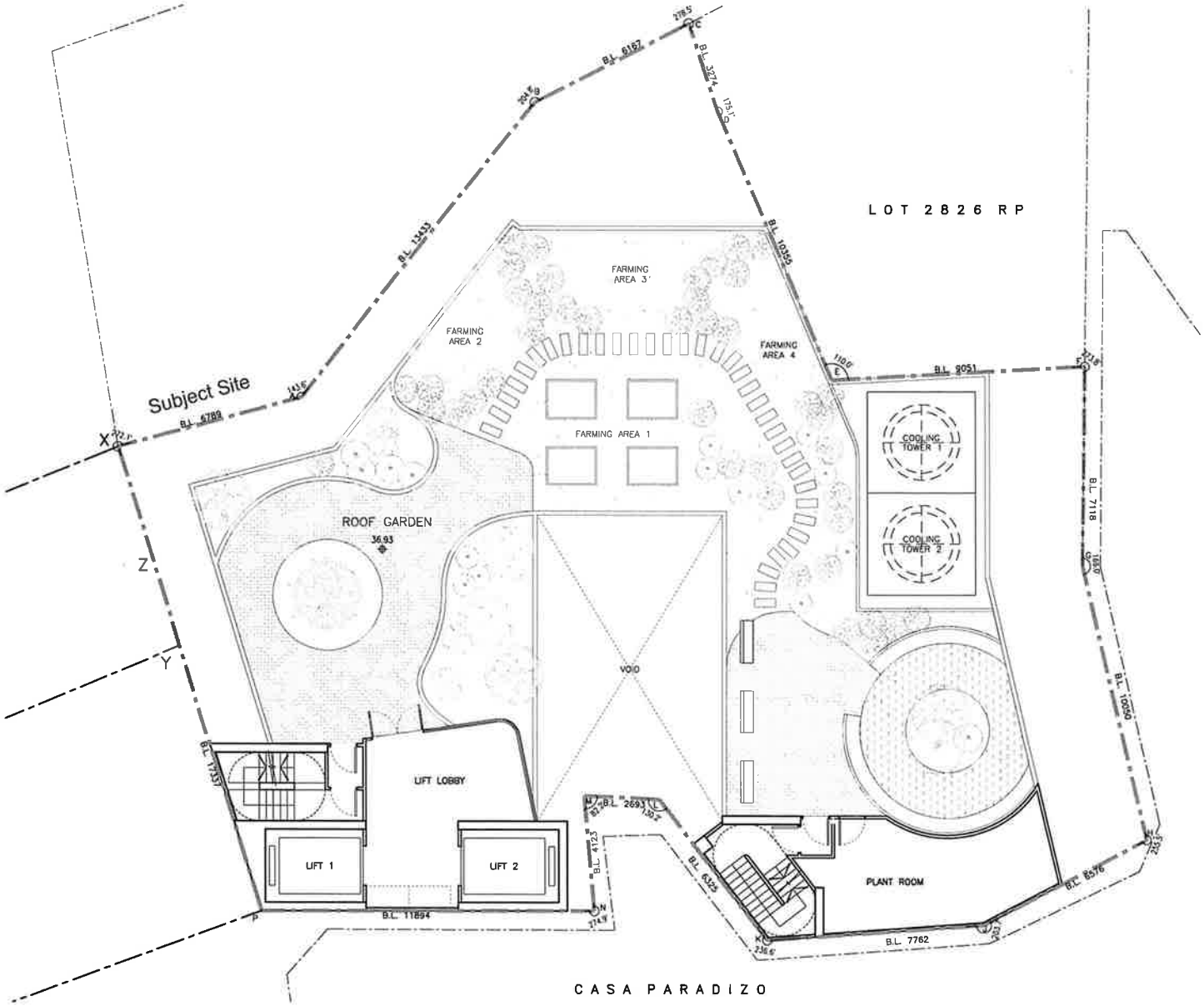
1:150 (A3)
1:225 (A4)

B	OCT. 2022	
A	JULY. 2022	

Do not scale drawing.
Contractors are required to verify exact dimensions on site.
The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate.
The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified.
This drawing is not for construction purposes unless expressedly certified.

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



N

1 G-09 ROOF GARDEN PLAN

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.	ROOF GARDEN PLAN	G-09	1:150 (A3) 1:225 (A4)	B A	OCT. 2022 JULY. 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

RLEE

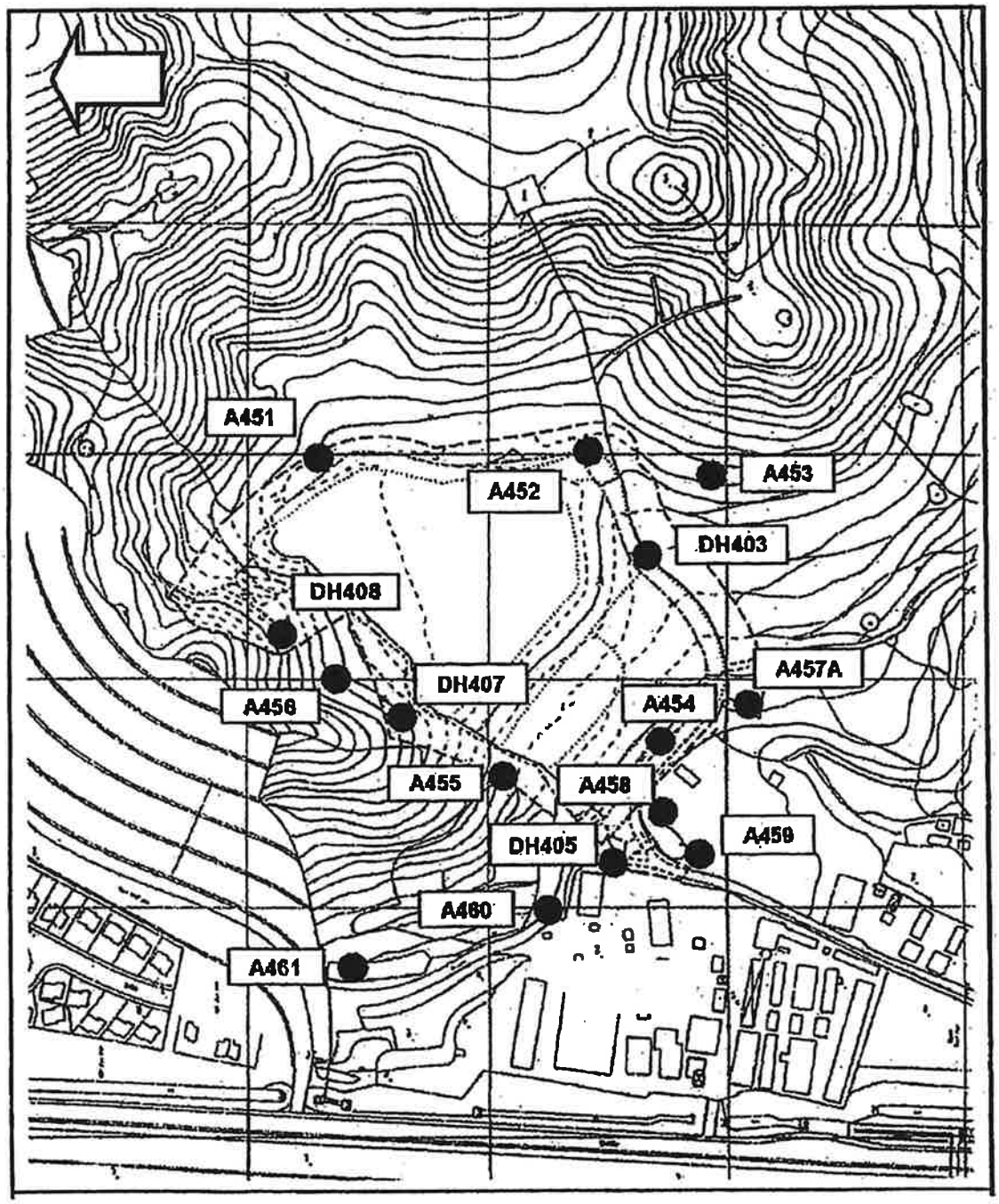
S12A AMENDMENT OF PLAN APPLICATION
APPROVED NGAU TAM MEI
OUTLINE ZONING PLAN NO. S/YL-NTM/12

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 B

RECENT GAS MONITORING DATA OF NGAU TAM MEI LANDFILL
(FROM JULY 2020 TO JUNE 2022)



Locations of Landfill Gas Migration Monitoring Wells

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 17-Jul-2020
Weather Condition: Sunny
Equipment Used: Landfill gas monitor GEM-2000

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	10:43	<0.1	4.4	15.4	28.1	0	
A452	10:39	<0.1	2.4	17.5	30.9	0	
A453	10:34	<0.1	1.4	18.4	32.1	0	
A454	10:22	<0.1	13.6	0.6	33.2	0	
A455	11:00	<0.1	1.7	18.1	33.8	0	
A456	10:51	<0.1	0.5	19.3	30.0	0	
A457A	9:55	<0.1	<0.1	14.9	31.1	0	
A458	10:02	<0.1	6.7	13.9	30.8	0	
A459	10:08	<0.1	0.3	19.0	34.8	0	
A460	10:14	<0.1	0.4	18.9	32.5	0	
A461	10:17	<0.1	0.8	18.7	31.0	0	
DH403	10:26	<0.1	1.6	18.2	31.5	0	
DH405	10:12	<0.1	5.4	14.8	35.8	0	
DH407	10:48	<0.1	<0.1	19.9	30.4	0	
DH408	10:54	<0.1	0.8	19.0	33.4	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 14-Aug-2020
Weather Condition: Sunny
Equipment Used: Landfill gas monitor GEM-2000

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	14:54	<0.1	6.3	12.6	30.6	0	
A452	14:46	<0.1	0.3	19.0	34.7	0	
A453	14:42	<0.1	4.3	15.4	32.5	0	
A454	14:29	<0.1	11.8	0.3	35.0	0	
A455	15:06	0.1	8.1	9.2	32.8	0	
A456	15:00	<0.1	3.0	16.5	30.3	0	
A457A	14:02	<0.1	<0.1	13.8	34.0	0	
A458	14:09	<0.1	4.5	15.3	34.0	0	
A459	14:13	<0.1	0.9	18.3	35.0	0	
A460	14:21	<0.1	0.7	17.9	35.0	0	
A461	14:24	<0.1	4.5	9.9	32.8	0	
DH403	14:38	<0.1	7.1	10.9	31.3	0	
DH405	14:17	<0.1	9.8	10.4	34.4	0	
DH407	14:56	<0.1	5.9	13.1	28.8	0	
DH408	15:03	<0.1	3.5	15.5	35.0	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 25-Sep-2020
Weather Condition: Sunny
Equipment Used: Landfill gas monitor GEM-2000

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	11:31	<0.1	7.6	11.0	28.3	0	
A452	11:28	<0.1	1.5	17.8	29.5	0	
A453	11:23	<0.1	4.8	15.2	27.8	0	
A454	11:14	<0.1	8.1	6.5	33.7	0	
A455	11:43	<0.1	5.3	14.2	26.9	0	
A456	11:36	<0.1	3.4	16.1	25.9	0	
A457A	11:08	<0.1	<0.1	10.7	31.2	0	
A458	11:00	<0.1	2.8	17.4	28.3	0	
A459	11:03	<0.1	1.7	17.8	28.7	0	
A460	11:51	<0.1	2.5	16.0	30.3	0	
A461	11:58	<0.1	6.0	10.3	29.2	0	
DH403	11:20	<0.1	7.4	11.3	28.5	0	
DH405	11:48	<0.1	6.5	14.6	35.1	0	
DH407	11:34	<0.1	6.6	12.3	27.1	0	
DH408	11:39	<0.1	4.4	15.2	28.7	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 22-Oct-2020
Weather Condition: Sunny
Equipment Used: Landfill gas monitor GEM-5000

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	10:39	<0.1	0.8	20.5	24.6	0	
A452	10:34	<0.1	5.5	15.8	22.5	0	
A453	10:29	<0.1	2.7	18.5	24.1	0	
A454	9:45	<0.1	16.7	0.4	29.8	0	
A455	11:06	<0.1	3.0	18.1	23.8	0	
A456	10:48	<0.1	0.5	21.1	23.2	0	
A457A	10:10	<0.1	<0.1	11.5	24.8	0	
A458	10:01	<0.1	4.2	17.0	26.0	0	
A459	10:05	<0.1	1.8	19.2	27.3	0	
A460	9:52	<0.1	8.0	6.5	24.5	0	
A461	9:56	<0.1	4.3	15.5	24.4	0	
DH403	10:23	<0.1	1.3	20.0	23.3	0	
DH405	9:50	<0.1	5.5	16.6	29.0	0	
DH407	10:45	<0.1	0.3	21.3	22.8	0	
DH408	10:52	<0.1	1.6	19.9	25.2	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 18-Nov-2020
Weather Condition: Cloudy
Equipment Used: **Landfill gas monitor GEM-5000**

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	14:17	<0.1	6.2	13.2	27.0	0	
A452	13:53	<0.1	3.8	18.6	26.9	0	
A453	14:22	<0.1	3.4	18.4	27.7	0	
A454	14:31	<0.1	16.1	5.3	31.1	0	
A455	14:12	<0.1	3.9	17.1	27.5	0	
A456	14:05	<0.1	1.8	19.7	27.5	0	
A457A	14:47	<0.1	<0.1	10.1	31.0	0	
A458	15:00	<0.1	8.5	12.8	29.4	0	
A459	15:05	<0.1	1.2	20.3	29.7	0	
A460	14:38	<0.1	5.3	12.5	28.7	0	
A461	14:41	<0.1	4.1	17.0	27.3	0	
DH403	14:26	<0.1	2.7	18.1	27.0	0	
DH405	14:34	<0.1	4.7	18.0	31.5	0	
DH407	14:01	<0.1	6.4	14.6	26.8	0	
DH408	14:09	<0.1	1.9	19.2	27.6	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 18-Dec-2020
Weather Condition: Sunny
Equipment Used: **Landfill gas monitor GEM-5000**

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	11:16	<0.1	7.0	14.0	16.6	0	
A452	11:13	<0.1	6.9	14.4	15.7	0	
A453	11:10	<0.1	1.6	20.1	16.1	0	
A454	11:03	<0.1	16.4	7.9	21.2	0	
A455	11:28	<0.1	7.0	14.4	16.6	0	
A456	11:22	<0.1	1.2	20.3	16.0	0	
A457A	10:42	<0.1	<0.1	12.1	18.4	0	
A458	10:31	<0.1	2.1	19.3	19.4	0	
A459	10:35	<0.1	2.5	18.9	20.4	0	
A460	10:54	<0.1	7.7	12.7	17.4	0	
A461	10:59	<0.1	5.8	17.2	17.2	0	
DH403	11:06	<0.1	7.7	14.2	15.5	0	
DH405	10:51	<0.1	7.0	15.7	21.3	0	
DH407	11:20	<0.1	4.2	18.0	15.3	0	
DH408	11:24	<0.1	4.0	18.3	25.5	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 15-Jan-2021
Weather Condition: Sunny
Equipment Used: **Landfill gas monitor GEM-5000**

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	13:38	<0.1	5.6	17.8	21.7	0	
A452	13:56	<0.1	9.2	14.6	19.5	0	
A453	14:00	<0.1	1.4	19.9	19.1	0	
A454	14:06	<0.1	16.3	9.2	24.5	0	
A455	13:49	0.1	6.2	16.4	20.5	0	
A456	13:44	<0.1	0.9	19.9	22.5	0	
A457A	14:34	<0.1	<0.1	14.8	25.2	0	
A458	14:42	<0.1	5.8	16.2	24.3	0	
A459	14:45	<0.1	2.0	19.8	25.8	0	
A460	14:12	<0.1	5.8	15.6	21.6	0	
A461	14:24	<0.1	4.3	17.9	20.7	0	
DH403	14:03	<0.1	9.5	11.1	19.8	0	
DH405	14:09	<0.1	8.2	14.5	23.6	0	
DH407	13:46	<0.1	7.7	12.4	19.4	0	
DH408	13:42	<0.1	4.8	18.5	25.6	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 05-Feb-2021
Weather Condition: Sunny
Equipment Used: **Landfill gas monitor GEM-5000**

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	13:46	<0.1	7.7	14.3	24.0	0	
A452	13:35	<0.1	14.7	6.5	23.5	0	
A453	14:15	<0.1	1.8	19.1	25.0	0	
A454	14:28	<0.1	15.6	8.7	29.7	0	
A455	14:05	<0.1	5.1	15.1	24.7	0	
A456	13:57	<0.1	1.3	19.3	26.4	0	
A457A	14:47	<0.1	<0.1	14.3	30.4	0	
A458	14:56	<0.1	4.8	16.3	28.3	0	
A459	15:02	<0.1	0.7	20.1	30.1	0	
A460	14:34	<0.1	5.6	15.9	25.1	0	
A461	14:37	<0.1	2.9	18.5	25.8	0	
DH403	14:19	0.1	3.8	17.2	23.5	0	
DH405	14:30	<0.1	4.9	16.6	27.3	0	
DH407	13:50	<0.1	6.2	12.6	25.2	0	
DH408	14:00	<0.1	1.3	19.3	30.8	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 11-Mar-2021 16-Mar-2021
Weather Condition: Sunny , Sunny
Equipment Used: **Landfill gas monitor GEM-5000**

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	14:00	<0.1	1.9	20.6	26.1	0	
A452	13:56	<0.1	5.7	15.2	25.4	0	
A453	13:53	<0.1	1.5	20.5	27.5	0	
A454	13:46	<0.1	15.3	6.0	28.9	0	
A455	14:10	<0.1	4.7	16.1	25.9	0	
A456	14:04	<0.1	2.5	20.2	26.9	0	
A457A	14:22	<0.1	<0.1	13.4	29.2	0	
A458	9:44	<0.1	10.2	9.8	25.5	0	
A459	14:32	<0.1	0.1	20.6	31.0	0	
A460	13:38	<0.1	5.3	17.4	25.3	0	
A461	13:41	<0.1	2.7	19.4	26.4	0	
DH403	13:49	0.1	4.7	17.0	28.0	0	
DH405	13:35	<0.1	4.6	17.3	27.4	0	
DH407	14:03	<0.1	5.3	16.1	26.2	0	
DH408	14:06	<0.1	2.7	20.1	28.4	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 16-Apr-2021
Weather Condition: Cloudy
Equipment Used: **Landfill gas monitor GEM-5000**

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	13:54	<0.1	5.4	16.2	26.0	0	
A452	11:54	<0.1	3.0	18.3	23.5	0	
A453	11:50	<0.1	2.9	18.9	24.7	0	
A454	11:42	<0.1	15.8	6.6	26.6	0	
A455	14:09	<0.1	2.9	18.0	26.6	0	
A456	14:02	<0.1	0.7	20.4	25.6	0	
A457A	13:29	<0.1	<0.1	13.1	27.1	0	
A458	13:40	<0.1	4.6	16.1	26.7	0	
A459	14:21	<0.1	0.3	20.9	26.4	0	
A460	11:34	<0.1	4.5	18.0	24.5	0	
A461	11:38	<0.1	2.7	19.5	24.7	0	
DH403	11:45	<0.1	1.6	20.0	24.0	0	
DH405	11:27	<0.1	4.3	18.3	25.2	0	
DH407	14:04	<0.1	5.4	15.0	24.9	0	
DH408	13:59	<0.1	0.7	20.3	26.0	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 18-May-2021, 20-May-2021
Weather Condition: Sunny , Sunny
Equipment Used: **Landfill gas monitor GEM-5000**

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	14:07	<0.1	4.8	16.5	33.0	0	
A452	13:58	<0.1	6.1	13.7	35.4	0	
A453	13:55	<0.1	3.9	16.9	33.6	0	
A454	13:46	<0.1	10.9	8.1	34.0	0	
A455	14:20	<0.1	4.4	15.9	37.1	0	
A456	14:02	<0.1	1.3	19.5	33.2	0	
A457A	14:32	<0.1	<0.1	14.1	36.7	0	
A458	14:40	<0.1	9.1	11.6	34.2	0	
A459	14:44	<0.1	0.6	20.7	34.5	0	
A460	13:40	<0.1	3.8	17.7	34.1	0	
A461	13:42	<0.1	3.7	17.7	33.9	0	
DH403	13:51	<0.1	8.2	12.9	35.0	0	
DH405	13:36	<0.1	4.2	17.5	33.2	0	
DH407	14:15	<0.1	5.1	15.3	33.3	0	
DH408	14:11	<0.1	1.3	20.2	36.6	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 18-Jun-2021
Weather Condition: Fine
Equipment Used: **Landfill gas monitor GEM-5000**

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	13:49	<0.1	6.1	14.4	33.9	0	
A452	13:53	<0.1	6.4	12.8	35.2	0	
A453	13:57	<0.1	4.2	15.9	34.5	0	
A454	14:05	<0.1	13.9	2.2	35.6	0	
A455	13:44	<0.1	4.4	15.5	35.2	0	
A456	13:38	<0.1	3.5	17.3	30.9	0	
A457A	14:30	<0.1	<0.1	12.9	37.0	0	
A458	14:39	<0.1	2.5	17.7	35.5	0	
A459	14:41	<0.1	1.1	18.6	38.8	0	
A460	14:10	<0.1	3.5	16.2	35.3	0	
A461	14:12	<0.1	4.2	15.2	35.3	0	
DH403	14:00	<0.1	10.2	9.7	34.2	0	
DH405	14:07	<0.1	4.3	16.1	37.3	0	
DH407	13:36	<0.1	5.9	14.3	32.5	0	
DH408	13:40	<0.1	1.3	19.1	34.6	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 16-Jul-2021
Weather Condition: Cloudy
Equipment Used: Landfill gas monitor GEM-5000

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	10:51	<0.1	5.1	15.3	29.7	0	
A452	10:47	<0.1	2.9	17.3	29.3	0	
A453	10:41	<0.1	3.0	17.7	30.0	0	
A454	10:33	<0.1	13.5	0.3	30.7	0	
A455	11:03	<0.1	0.2	20.2	29.1	0	
A456	10:57	<0.1	1.5	19.1	28.0	0	
A457A	10:04	<0.1	<0.1	11.3	29.8	0	
A458	10:15	<0.1	9.1	12.2	30.6	0	
A459	10:19	<0.1	1.8	18.8	31.7	0	
A460	10:26	<0.1	3.6	15.6	29.3	0	
A461	10:29	<0.1	3.2	15.8	28.4	0	
DH403	10:36	<0.1	6.8	13.4	28.9	0	
DH405	10:23	<0.1	1.2	19.3	30.2	0	
DH407	10:59	<0.1	2.1	18.5	27.2	0	
DH408	10:55	<0.1	0.1	20.2	29.6	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 13-Aug-2021
Weather Condition: Cloudy
Equipment Used: Landfill gas monitor GEM-5000

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	14:51	<0.1	9.2	10.6	28.2	0	
A452	14:36	<0.1	6.6	11.7	27.6	0	
A453	14:30	<0.1	4.7	15.4	28.5	0	
A454	14:16	<0.1	6.1	8.3	29.9	0	
A455	15:08	<0.1	10.3	9.0	29.2	0	
A456	14:58	<0.1	5.5	13.9	28.3	0	
A457A	15:22	<0.1	<0.1	11.0	31.4	0	
A458	13:51	<0.1	9.8	12.1	31.9	0	
A459	13:56	<0.1	1.6	18.3	30.2	0	
A460	14:08	<0.1	2.4	16.4	30.0	0	
A461	14:11	<0.1	6.5	8.5	29.8	0	
DH403	14:22	<0.1	12.2	8.1	27.9	0	
DH405	14:05	<0.1	6.4	14.4	30.4	0	
DH407	14:54	<0.1	6.5	13.3	27.8	0	
DH408	15:01	<0.1	6.0	13.6	29.8	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 27-Sep-2021
Weather Condition: Fine
Equipment Used: Landfill gas monitor GEM-5000

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	14:20	<0.1	7.4	11.4	28.8	0	
A452	14:17	<0.1	4.1	16.1	30.6	0	
A453	14:11	<0.1	4.3	16.1	30.5	0	
A454	14:01	<0.1	12.7	0.7	34.8	0	
A455	14:33	<0.1	8.7	11.2	29.4	0	
A456	14:26	<0.1	5.5	14.8	29.7	0	
A457A	14:48	<0.1	<0.1	9.3	36.0	0	
A458	13:42	<0.1	5.7	15.1	34.4	0	
A459	13:44	<0.1	1.8	18.3	33.3	0	
A460	13:52	<0.1	5.0	10.8	30.1	0	
A461	13:56	<0.1	5.8	11.7	30.3	0	
DH403	14:05	<0.1	9.1	10.6	30.2	0	
DH405	13:50	<0.1	7.2	14.1	33.2	0	
DH407	14:28	<0.1	6.4	13.4	29.1	0	
DH408	14:24	<0.1	3.2	16.9	32.1	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 27-Oct-2021
Weather Condition: Cloudy
Equipment Used: Landfill gas monitor GEM-5000

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	13:59	<0.1	3.0	16.6	25.5	0	
A452	13:56	<0.1	4.2	16.1	25.2	0	
A453	13:52	<0.1	2.5	18.6	26.0	0	
A454	13:46	<0.1	8.0	11.8	29.0	0	
A455	14:13	<0.1	6.1	13.3	25.9	0	
A456	14:05	<0.1	2.4	18.6	25.2	0	
A457A	14:46	<0.1	<0.1	13.8	28.8	0	
A458	14:34	<0.1	1.4	19.1	29.4	0	
A459	14:37	<0.1	1.6	18.5	30.0	0	
A460	14:22	<0.1	3.5	13.9	26.9	0	
A461	14:25	<0.1	4.9	10.9	27.0	0	
DH403	13:49	<0.1	8.6	11.9	25.6	0	
DH405	14:20	<0.1	0.3	20.1	27.8	0	
DH407	14:02	<0.1	5.4	13.7	24.2	0	
DH408	14:07	<0.1	6.7	13.5	25.8	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 18-Nov-2021
Weather Condition: Sunny
Equipment Used: Landfill gas monitor GEM-5000

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	14:38	<0.1	6.6	11.8	23.5	0	
A452	14:28	<0.1	10.8	9.8	23.9	0	
A453	14:21	<0.1	3.9	16.9	23.5	0	
A454	14:10	<0.1	16.8	0.6	27.6	0	
A455	14:54	0.2	10.2	9.3	24.5	0	
A456	14:46	<0.1	0.6	20.2	23.4	0	
A457A	14:03	<0.1	<0.1	10.6	29.9	0	
A458	13:49	<0.1	10.9	11.1	27.8	0	
A459	13:54	<0.1	2.1	18.1	30.4	0	
A460	13:37	<0.1	4.8	12.2	25.1	0	
A461	13:40	<0.1	7.3	12.1	24.2	0	
DH403	14:15	<0.1	3.5	17.3	24.1	0	
DH405	13:33	<0.1	3.1	18.1	26.3	0	
DH407	14:48	<0.1	7.5	9.7	22.4	0	
DH408	14:42	<0.1	6.9	13.9	27.5	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 16-Dec-2021
Weather Condition: Sunny
Equipment Used: Landfill gas monitor GEM-5000

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure	Remark
A451	14:13	<0.1	1.4	18.8	25.0	0	
A452	14:09	<0.1	3.9	16.1	25.3	0	
A453	14:04	<0.1	2.5	18.1	24.9	0	
A454	13:55	<0.1	17.3	2.0	26.9	0	
A455	14:28	<0.1	0.1	20.4	24.6	0	
A456	14:20	<0.1	0.4	19.9	24.8	0	
A457A	14:47	<0.1	<0.1	11.7	29.4	0	
A458	14:35	<0.1	1.4	19.0	26.5	0	
A459	14:38	<0.1	0.8	19.7	29.6	0	
A460	13:48	<0.1	6.5	10.5	26.5	0	
A461	13:50	<0.1	4.9	16.2	26.4	0	
DH403	13:59	<0.1	0.2	20.2	25.7	0	
DH405	13:44	<0.1	2.4	18.8	27.1	0	
DH407	14:18	<0.1	7.2	10.3	24.2	0	
DH408	14:23	<0.1	5.9	15.1	29.1	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 20-Jan-2022
Weather Condition: Sunny
Equipment Used: Landfill gas monitor GEM-5000

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	14:27	<0.1	1.1	19.6	19.2	0	
A452	14:23	<0.1	12.5	7.9	18.5	0	
A453	14:20	<0.1	2.1	18.9	20.5	0	
A454	14:12	<0.1	16.6	5.1	24.7	0	
A455	14:42	<0.1	2.8	17.9	20.1	0	
A456	14:34	<0.1	0.7	20.2	21.1	0	
A457A	14:05	<0.1	<0.1	12.4	27.3	0	
A458	13:52	<0.1	4.8	15.7	23.7	0	
A459	13:56	<0.1	1.9	19.0	26.7	0	
A460	13:39	<0.1	6.0	14.0	20.5	0	
A461	13:43	<0.1	5.5	16.3	20.7	0	
DH403	14:16	<0.1	9.3	12.0	21.1	0	
DH405	13:34	<0.1	4.7	16.7	23.2	0	
DH407	14:37	<0.1	7.3	10.3	19.4	0	
DH408	14:31	<0.1	3.7	17.5	24.1	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 18-Feb-2022
Weather Condition: Fine
Equipment Used: Landfill gas monitor GEM-5000

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	14:07	<0.1	0.5	20.4	18.3	0	
A452	14:35	<0.1	5.4	15.2	19.0	0	
A453	14:42	<0.1	2.2	19.6	18.0	0	
A454	14:52	<0.1	16.0	7.5	21.7	0	
A455	14:23	<0.1	4.2	16.3	19.1	0	
A456	14:17	<0.1	0.7	20.2	19.2	0	
A457A	15:16	<0.1	<0.1	13.6	23.6	0	
A458	15:29	<0.1	7.1	13.4	20.1	0	
A459	15:24	<0.1	0.7	20.6	22.5	0	
A460	15:02	<0.1	4.6	16.8	18.6	0	
A461	15:06	<0.1	5.2	17.0	17.6	0	
DH403	14:44	<0.1	7.8	13.4	17.7	0	
DH405	14:57	<0.1	4.6	17.1	19.8	0	
DH407	14:19	<0.1	7.0	11.6	18.3	0	
DH408	14:11	<0.1	5.2	16.4	21.8	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 17-Mar-2022
Weather Condition: Cloudy
Equipment Used: Landfill gas monitor GEM-5000

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	14:09	<0.1	6.6	14.2	25.9	0	
A452	14:29	<0.1	8.0	11.2	26.1	0	
A453	14:33	<0.1	2.7	18.5	26.4	0	
A454	14:04	<0.1	11.0	4.3	27.4	0	
A455	14:22	<0.1	3.1	17.3	27.8	0	
A456	14:16	<0.1	4.2	16.5	27.5	0	
A457A	13:57	<0.1	<0.1	14.0	29.0	0	
A458	13:41	<0.1	5.8	14.7	29.4	0	
A459	13:45	<0.1	1.2	19.1	30.0	0	
A460	13:32	<0.1	4.4	16.0	26.6	0	
A461	13:35	<0.1	3.1	17.0	26.9	0	
DH403	14:36	<0.1	2.0	19.1	26.0	0	
DH405	13:30	<0.1	4.9	16.2	28.9	0	
DH407	14:18	<0.1	6.2	12.6	25.7	0	
DH408	14:13	<0.1	2.0	18.9	28.2	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 14-Apr-2022
Weather Condition: Sunny
Equipment Used: Landfill gas monitor GEM-5000

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	11:48	<0.1	1.8	18.7	26.9	0	
A452	11:46	<0.1	0.6	19.5	26.0	0	
A453	12:06	<0.1	2.5	18.3	28.6	0	
A454	12:13	<0.1	10.6	1.9	30.3	0	
A455	11:59	<0.1	2.3	18.2	27.2	0	
A456	11:54	<0.1	2.6	18.2	29.2	0	
A457A	11:38	<0.1	<0.1	13.1	31.3	0	
A458	11:26	<0.1	2.1	18.5	30.7	0	
A459	11:29	<0.1	1.5	18.7	30.6	0	
A460	12:21	<0.1	3.6	15.7	28.2	0	
A461	12:23	<0.1	3.3	16.0	28.3	0	
DH403	12:10	<0.1	2.0	18.6	28.7	0	
DH405	12:18	<0.1	4.1	16.8	30.5	0	
DH407	11:57	<0.1	0.8	19.6	26.4	0	
DH408	11:52	<0.1	3.3	17.2	30.2	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 20-May-2022
Weather Condition: Sunny
Equipment Used: Landfill gas monitor GEM-5000

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	14:31	<0.1	8.2	10.6	30.1	0	
A452	14:20	<0.1	4.0	13.2	30.7	0	
A453	14:14	<0.1	4.3	15.7	31.0	0	
A454	11:55	<0.1	5.2	9.2	29.7	0	
A455	14:46	<0.1	0.4	19.6	31.8	0	
A456	14:36	<0.1	4.8	14.7	29.4	0	
A457A	15:11	<0.1	<0.1	13.1	35.7	0	
A458	14:59	<0.1	0.9	19.1	35.3	0	
A459	14:55	<0.1	1.3	18.2	36.2	0	
A460	14:10	<0.1	2.7	16.2	31.1	0	
A461	11:51	<0.1	4.9	11.2	28.8	0	
DH403	11:59	<0.1	9.5	9.3	29.8	0	
DH405	11:46	<0.1	3.8	17.1	28.9	0	
DH407	14:38	<0.1	6.4	11.8	27.2	0	
DH408	14:33	<0.1	3.8	16.1	31.4	0	

LANDFILL GAS MONITORING - FIELD MEASUREMENT

Name of Site : Ngau Tam Mei
Date of Monitoring: 10-Jun-2022
Weather Condition: Cloudy
Equipment Used: Landfill gas monitor GEM-5000

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	15:06	<0.1	6.0	13.4	26.1	0	
A452	15:03	<0.1	4.8	8.0	27.8	0	
A453	14:59	<0.1	4.9	14.6	28.3	0	
A454	14:48	<0.1	6.5	2.5	29.6	0	
A455	15:19	<0.1	4.7	13.7	28.3	0	
A456	15:12	<0.1	3.7	16.5	26.4	0	
A457A	14:32	<0.1	<0.1	12.9	29.2	0	
A458	14:39	<0.1	1.3	19.2	30.4	0	
A459	14:44	<0.1	0.7	19.7	30.9	0	
A460	15:33	<0.1	1.5	18.0	27.6	0	
A461	15:35	<0.1	4.6	9.2	27.3	0	
DH403	14:54	<0.1	12.4	6.6	29.8	0	
DH405	15:26	<0.1	8.0	12.8	29.2	0	
DH407	15:10	<0.1	5.9	12.9	26.3	0	
DH408	15:15	<0.1	5.8	13.4	27.0	0	

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 C

"HAZARDS ARISING DURING CONSTRUCTION"
EXTRACTED FROM EDP'S LANFILL GAS HAZARD
ASSESSMENT GUIDANCE NOTE

8 *HAZARDS ARISING DURING CONSTRUCTION*

Introduction

8.1 During the construction phase, hazards may arise which are related either to the flammability of landfill gas or to it's potentially asphyxiating properties. In particular cases, it is possible that toxicity effects may be significant. The following sub-sections of the Guidance Note may be used to form the basis of Specification Clauses for incorporation in Contract Documentation for developments within the Consultation Zone.

General Hazards Which May Be Encountered

8.2 The developer should be aware of, and should inform construction contractors accordingly, that methane and carbon dioxide are always likely to be present in the soil voids. In addition the developer should be aware of the potential hazards and other properties of landfill gas as described in Section 1.

Outline of Safety Requirements

8.3 In all construction work adjacent to landfill sites, safety procedures should be implemented to minimise the risks of:

- fires and explosions;
- asphyxiation of workers; and
- toxicity effects.

8.4 Precautions should be clearly laid down and rigidly adhered to with respect to:

- trenching and excavation; and

- creation of confined spaces at, near to or below ground level.

8.5 In addition to normal site safety procedures, gas detection equipment and appropriate breathing apparatus should be available and used when entering confined spaces or trenches deeper than 1 metre.

Additional General Requirements

8.6 During the construction phase, the following additional precautions should be followed.

Appointment of Safety Officer

8.7 For large developments, a Safety Officer, trained in the use of gas detection equipment and landfill gas-related hazards, should be present on site throughout the groundworks phase. The Safety Officer should be provided with an intrinsically safe portable instrument (or instruments), appropriately calibrated and capable of measuring the following gases in the ranges indicated:

methane	0-100% LEL and 0-100 % v/v
carbon dioxide	0-100%; and
oxygen	0-21%

8.8 For smaller developments, if a Safety Officer is not appointed, then expert opinion and advice should be sought on a regular basis.

Safety Measures

8.9 All personnel who work on site and all visitors to the site should be made aware of the possibility of ignition of gas in the vicinity of excavations. Safety notices should be posted warning of the potential hazards.

8.10 Those staff who work in, or have responsibility for 'at risk' areas, including all excavation workers, supervisors and engineers working within the Consultation Zone, should receive appropriate training on working in areas susceptible to landfill gas, fire and explosion hazards.

8.11 An excavation procedure or code of practice to minimise landfill gas related risk should be devised and carried out by the project proponent.

8.12 No worker should be allowed to work alone at any time in or near to any excavation. At least one other worker should be available to assist with a rescue if needed.

8.13 Smoking, naked flames and all other sources of ignition should be prohibited within 15m of any excavation or ground-level confined space. 'No smoking' and 'No naked flame' notices should be posted prominently on the construction site and, if necessary, special areas designated for smoking.

8.14 Welding, flame-cutting or other hot works should be confined to open areas at least 15m from any trench or excavation.

8.15 Welding, flame-cutting or other hot works may only be carried out in trenches or confined spaces when controlled by a 'permit to work' procedure, properly authorised by the Safety Officer (or, in the case of small developments, other appropriately qualified person).

8.16 The permit to work procedure should set down clearly the requirements for continuous monitoring for methane, carbon dioxide and oxygen throughout the period during which the hot works are in progress. The procedure should also require the presence of an appropriately qualified person, in attendance outside the 'confined area', who shall be responsible for reviewing the gas measurements as they are made, and who shall have executive responsibility for suspending the work in the event of unacceptable or hazardous conditions. Only those workers who are appropriately trained and fully aware of the potentially hazardous conditions which may arise should be permitted to carry out hot works in confined areas.

8.17 Ground level construction plant should be fitted with vertical exhausts at least 0.6m above ground level and with spark arrestors.

8.18 Any electrical equipment, such as motors and extension cords, should be intrinsically safe.

8.19 During piping assembly or conduiting construction, all valves/seals should be closed immediately after installation. As construction progresses, all valves/seals should be closed as installed to prevent the migration of gases through the pipeline/conduit. All

piping/conduiting should be capped at the end of each working day.

8.20 Mobile offices, equipment stores, mess rooms etc. should be located on an area which has been proven to be gas free (by survey with portable gas detectors) and ongoing monitoring should be carried out to ensure that these areas remain gas free. The use of permanent gas detectors may be appropriate in some circumstances where there is a relatively high risk but for many developments it will be sufficient to have regular monitoring undertaken manually by the safety officer. The particular arrangements to be adopted at a specific site will need to be determined during the risk assessment/design of protection measures.

8.21 Alternatively, such buildings should be raised clear of the ground. If buildings are raised clear of the ground, a minimum, clear separation distance (as measured from the highest point on the ground surface to the underside of the lowest floor joist) should be 500mm.

8.22 During construction, adequate fire extinguishing equipment, fire-resistant clothing and breathing apparatus (BA) sets should be made available on site.

- At larger developments, fire drills should be organised at not less than six monthly intervals.

- The developer should formulate a health and safety policy, standards and instructions for site personnel to follow.

Monitoring

8.23 Periodically during ground-works construction, the works area should be monitored for methane, carbon dioxide and oxygen using appropriately calibrated portable gas detection equipment.

8.24 The monitoring frequency and areas to be monitored should be set down prior to commencement of ground-works either by the Safety Officer or by an appropriately qualified person.

8.25 Routine monitoring should be carried out in all excavations, manholes and chambers and any other confined spaces that may have been created by, for example, the temporary storage of building materials on the site surface.

8.26 All measurements in excavations should be made with the monitoring tube located not more than 10mm from the exposed ground surface.

8.27 Monitoring of excavations should be undertaken as follows:

For excavations deeper than 1m, measurements should be made:

- at the ground surface before excavation commences;
- immediately before any worker enters the excavation;
- at the beginning of each working day for the entire period the excavation remains open; and
- periodically through the working day whilst workers are in the excavation.

For excavations between 300mm and 1m deep, measurements should be made:

- directly after the excavation has been completed; and
- periodically whilst the excavation remains open.

For excavations less than 300mm deep, monitoring may be omitted, at the discretion of the Safety Officer or other appropriately qualified person.

Actions in the Event of Gas Being Detected

8.28 Depending on the results of the measurements, actions required will vary and should be set down by the Safety Officer or other appropriately qualified person. As a minimum these should encompass those actions specified in *Table 8.1*.

Table 8.1 Actions in the Event of Gas Being Detected in Excavations

Parameter	Measurement	Action
O_2	< 19%	Ventilate trench/void to restore O_2 to >19%

Parameter	Measurement	Action
	< 18%	Stop works evacuate personnel/prohibit entry increase ventilation to restore O_2 to >19%
CH_4	> 10% LEL	Post 'No Smoking' signs prohibit hot works ventilate to restore CH_4 to <10% LEL
	>20% LEL	Stop works evacuate personnel/prohibit entry increase ventilation to restore CH_4 to <10% LEL
CO_2	>0.5%	ventilate to restore CO_2 to <0.5%
	> 1.5%	Stop works evacuate personnel/prohibit entry increase ventilation to restore CO_2 to <0.5%

Specific Advice Relating to the Drilling of Boreholes

8.29 As part of the site investigation and subsequent ground works for a development within a Consultation Zone, it will often be necessary to drill exploratory boreholes. Such work should be undertaken following the general advice given above. Specific recommendations relating to the drilling of boreholes within the Consultation Zone are presented below.

Supervision and Safety Management of Drilling Operations

8.30 Drilling should only proceed with adequate care and precautions against the potential hazards which may be encountered.

8.31 Before site works begin, the drilling contractor should devise a 'method-of-working' statement covering all normal and emergency procedures and the site supervisor and all operatives must be familiar with this statement.

8.32 The method-of-working statement should cover, *inter alia*:

- number of operatives;
- experience and special skills of operatives;

- normal method of operations;
- emergency procedures, including fire fighting;
- supervisors responsibilities;
- storage and use of safety equipment;
- safety procedures; and
- signs, barriers and guarding.

Safety Equipment and Clothing

8.33 An intrinsically safe, portable methane meter should be available at all times.

Other safety equipment should include:

- no smoking signs, to be placed prominently adjacent to the drilling area;
- portable fire extinguisher;
- high visibility clothing to be worn by all drilling operatives; and
- additional protective clothing should include stout industrial boots (with steel toe cap and insole), plastic hard hats, heavy duty waterproof industrial groves.

Working Procedures

8.34 On arrival at site the drilling rig should be set-up up-wind of the borehole location, 'No smoking' signs set out and the working area should be roped or coned-off.

8.35 When drilling on landfill sites, all spoil obtained from the borehole should be stockpiled alongside the borehole and disposed of (to an appropriately licensed disposal site) at the end of the working day. At the end of the working day all vehicles, the drilling rig and any hand tools should be hosed-down with clean water to remove deposits of excavated spoil. Suitable guards or barriers should be placed around the excavation or borehole to prevent access by unauthorised persons.

Safety Procedures

8.36 One person should be present at all times during drilling operations, with the sole responsibility of assuring the observance of all safety procedures. This person should be trained in the use of all recommended safety equipment.

8.37 Smoking should be prohibited anywhere on a landfill site and within 15 metres of a

boring or excavation at any locations within the Consultation Zone.

8.38 For large diameter boreholes, a working platform should be placed over the hole which will prevent accidental entry into the hole by operatives.

8.39 No worker should be allowed to work alone at any time near the edge of the well under construction. Another worker should always be present, beyond the area considered to be subject to the possible effects of landfill gas or cave-in.

8.40 Periodically during the well construction, the work areas should be monitored for levels of methane.

8.41 If the well construction is not completed by the end of the working day, the hole should be covered with a plate of sufficient overlap to prevent access to the hole and sufficient structural strength to support expected loads. The plate should be weighted down to discourage removal and, on landfill sites, the edges of the plate should be covered with sufficient depth of wet soil to prevent escape of gas.

8.42 All pipes or casings should be capped at the end of each working day.

8.43 Engine-driven rigs should have vertical exhaust stacks discharging not less than 1.5m above ground level and should have overspeed limits to prevent engine run away on ingested gas.

8.44 Diesel engine air-intakes should also be located not less than 1.5m above ground level.

8.45 Any electrical equipment should be intrinsically safe.

8.46 Additional safety advice and guidance may be found in 'Investigation into Establishing an Effective Practical Safe Working Practice When Drilling in Landfill Sites and Adjacent Areas and Contaminated Ground and Adjacent Areas' compiled by the British Drilling Association (1993).

Installation of Vertical Wells

8.47 To prevent uncontrolled gas release and to protect personnel from the risk of falling into the borehole, the open borehole should be covered with a sheet or plate strong enough to support personnel and having an overlap all round the borehole.

8.48 The drilling rig, boring machine or excavator should remain in place over the borehole and could be used as a support to assist placement of the casing.

8.49 The upper end of the well casing should be sealed, preferably with a fused or screwed end cap or alternatively with an inflatable bag type flow stopper, until the permanent headworks/monitoring tap is fitted. Landfill gas must not be allowed to vent freely at the site surface.

7 CONCLUSION

This Environmental Assessment presents the findings from assessing the potential impacts associated with the operation of the proposed RCHE development to confirm its environmental suitability. Key environmental concerns have been addressed and potential impacts assessed covering the following:

- Air Quality
- Noise
- Water Quality
- Waste Management
- Landfill Gas

Overall, it would be environmentally acceptable with no adverse impacts on the identified sensitive uses. Suitable noise mitigation measures are recommended to minimize noise impacts to meet the specified noise standard.

Air Quality

The development may be subject to vehicular emission impact from roads nearby during the operation of the project. However, no adverse vehicular emission impact is anticipated upon incorporation of the relevant buffer distance stipulated under the HKPSG into the layout design.

There is no chimney within 200m from site boundary, i.e., complying the buffer distance for chimney emissions under the HKPSG. Thus, no adverse air quality impact to the proposed residential development due to industrial chimney emissions is anticipated.

Noise

Road traffic would be the major source of noise nuisance during the Project operation. After implementation of recommended architectural fins, the predicted noise levels at all residential units comply with HKPSG $L_{10(1\ hour)}$ 70dB(A) noise criterion.

A catalogue of low noise type cooling towers as shown in Appendix 3.2 for reference. The Intake Silencers will be provided for the cooling towers located on open rooftop. The sound power level and noise mitigation requirements will be stipulated in the project contractor specification governing the equipment selection by the design and build contractor. Provided the fixed plant noise generation at the cooling tower does not exceed the allowable SWL, fixed plant noise impact towards the affected NSRs will not exceed the noise criteria stipulated in the HKPSG.

Water Quality

With a properly designed sewerage and drainage system, no insurmountable water quality impacts would be generated from the construction and operation phases of the Project.

Waste Management

The quantity of waste to be generated from the Project is anticipated not significant, considering the small project scale. Through proper project planning and execution, waste could be further avoided while useful materials could be reused or recycled. With implementation of the statutory procedures and recommended mitigation measures for offsite disposal of surplus excavated material, non-inert wastes, general refuse, chemical and clinical wastes, there should not be any insurmountable waste impact.

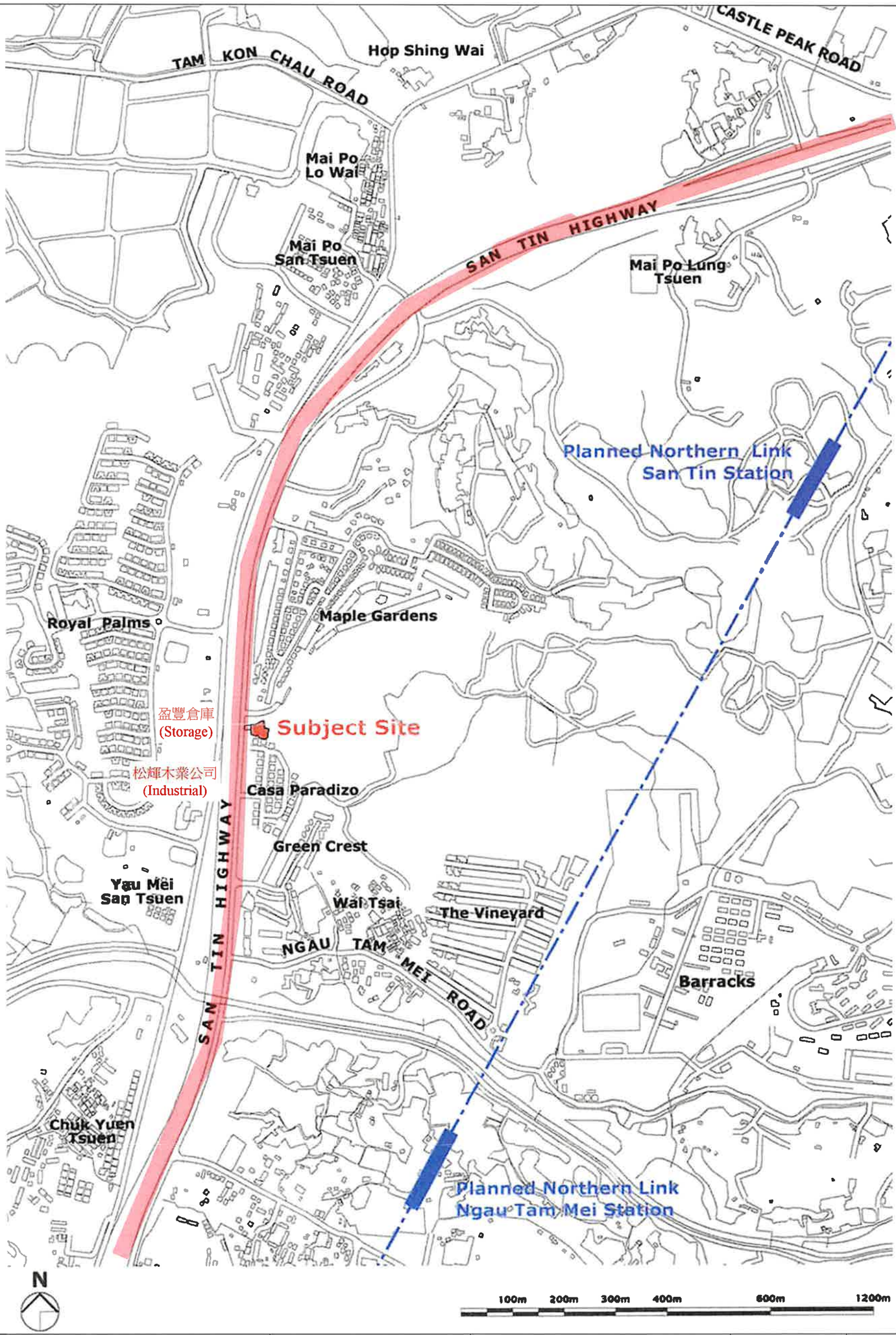
Landfill Gas

Since the proposed development will be located within the consultation zone of the Ngau Tam Mei Landfill, this Landfill Gas Hazard Assessment was undertaken to access the likelihood of LFG migration.

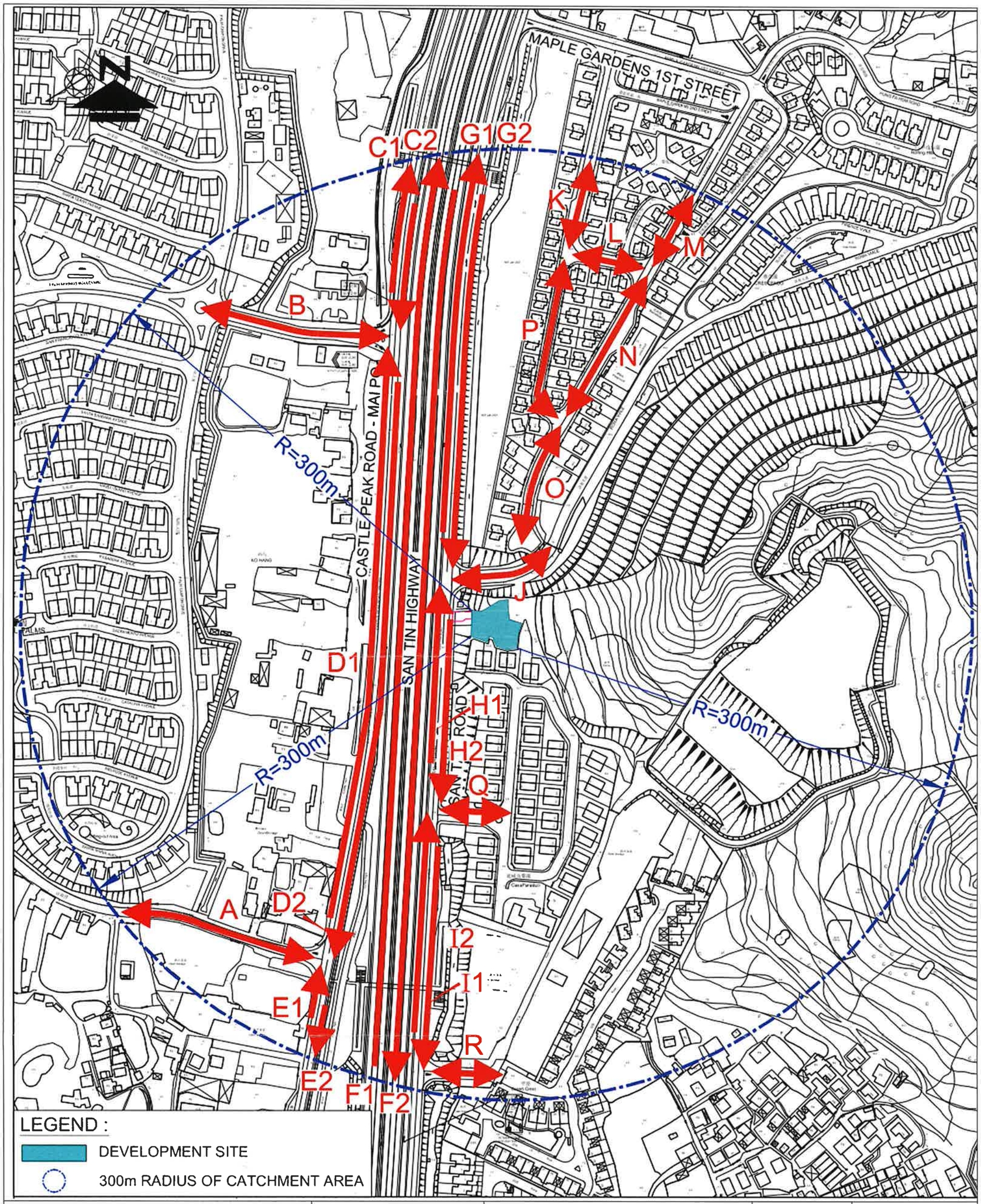
The results of landfill gas hazard assessment shows the overall level of landfill gas risk posed by the Ngau Tam Mei Landfill to the proposed development is "Low:.

Appropriate protection and precautionary measures including regular landfill gas monitoring during both the construction and operation of the project have been recommended. Provided that all the recommended protection measures with in monitoring are implemented properly, the safety of the site workers and all personnel presence in the proposed development would be safeguarded and there would be no adverse impact anticipated on the feasibility of the proposed development.

Appendix 1.1.
SITE LAYOUT PLAN & SURROUNDING ENVIRONMENT

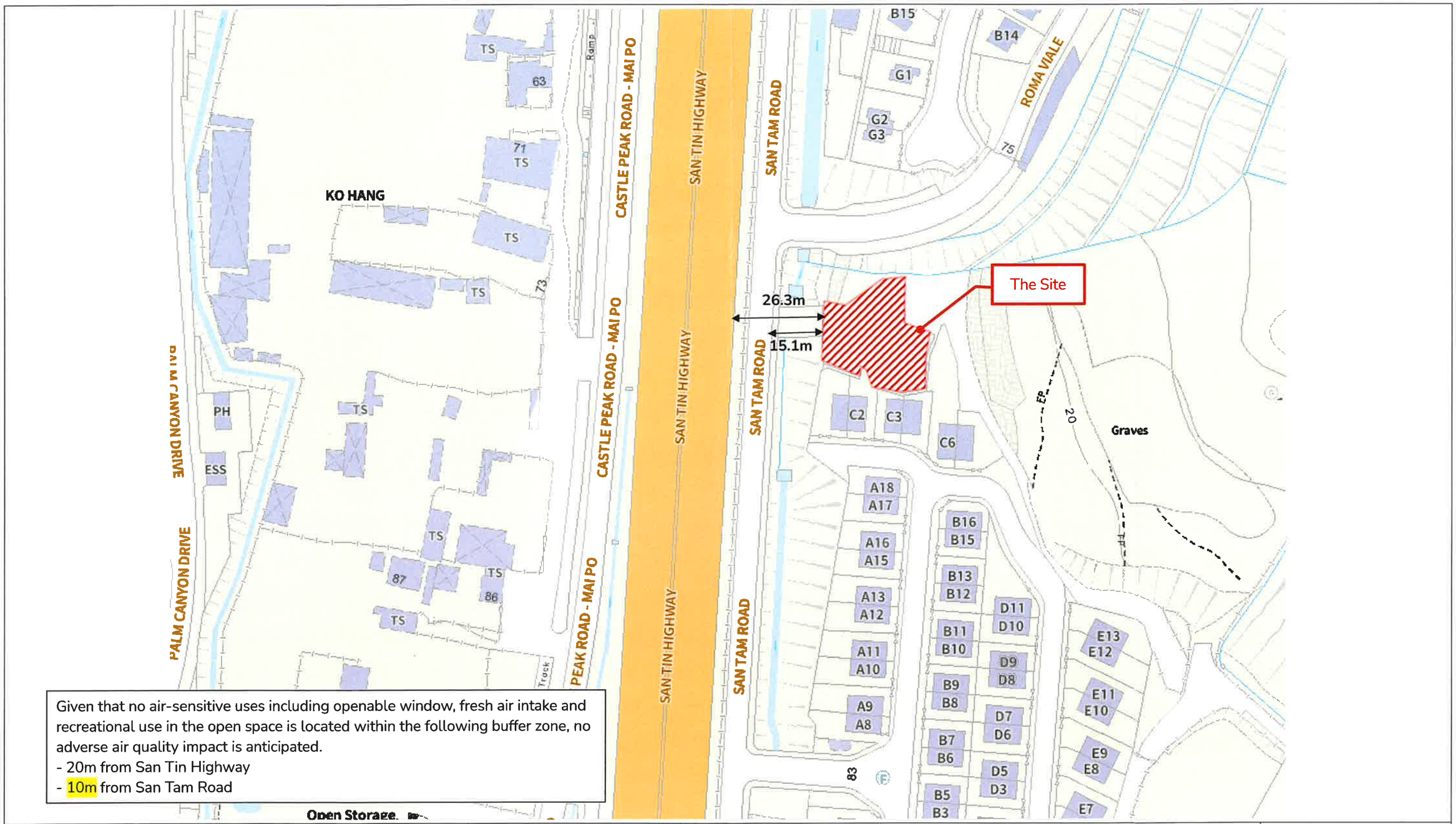


PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 1.1.1		LEAD ARCHITECT: R Lee Architects (HK) Ltd ENVIRONMENTAL CONSULTANT: Novox	PREPARED BY	Phoenix Lee
DRAWING TITLE: SITE LAYOUT PLAN AND SURROUNDING ENVIRONMENT	SCALE: N.T.S.	REV: A		CHECKED BY	Eddy Ng
				APPROVED BY	Banting Wong



PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 1.1.2		LEAD ARCHITECT: R Lee Architects (HK) Ltd ENVIRONMENTAL CONSULTANT: Novox	PREPARED BY	Phoenix Lee
DRAWING TITLE: LOCATION OF ADJACENT ROADS	SCALE: N.T.S.	REV: A		CHECKED BY	Eddy Ng
				APPROVED BY	Banting Wong

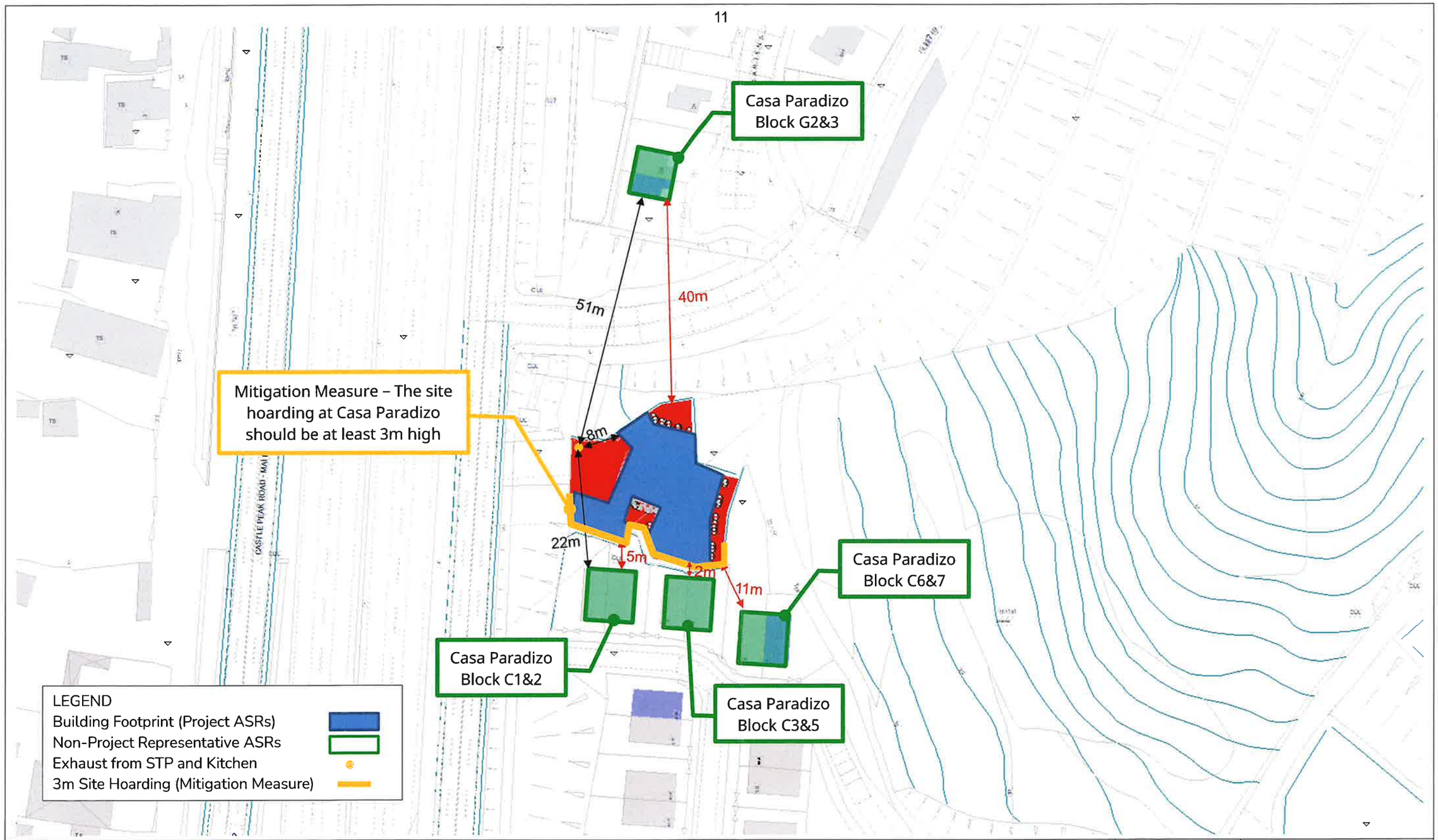
APPENDIX 2.1. AIR QUALITY SENSITIVE RECEIVERS & EMISSION SOURCES



Given that no air-sensitive uses including openable window, fresh air intake and recreational use in the open space is located within the following buffer zone, no adverse air quality impact is anticipated.
- 20m from San Tin Highway
- 10m from San Tam Road

PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 2.1.1		LEAD ARCHITECT:	ENVIRONMENTAL CONSULTANT:	PREPARED BY	Phoenix Lee
DRAWING TITLE: REPRESENTATIVE ASRS & BUFFER DISTANCE FROM VEHICLE SOURCES	SCALE: N.T.S.	REV: A			CHECKED BY	Eddy Ng
					APPROVED BY	Banting Wong

11



PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 2.1.2	LEAD ARCHITECT: R Lee Architects (HK) Ltd	PREPARED BY: Phoenix Lee
DRAWING TITLE: INDICATIVE LOCATION OF THE EXHAUST OF STP AND KITCHEN	SCALE: N.T.S. / REV: A	ENVIRONMENTAL CONSULTANT: Novox	CHECKED BY: Eddy Ng
			APPROVED BY: Banting Wong

APPENDIX 2.2. BROCHURE OF THE DEODRIZATION SYSTEM

Project : **Lot 4823, D.D. 104, 81 San Tam Road, San Tin, N. T.---**

STP For RCHE

Schedule of Equipment

Activated Carbon Filter

Description	Activated Carbon Filter
Branch	Rage
Country of origin	China
Material	Filter - Activity Carbon Filter Housing – Fiberglass Piping – uPVC
Capacity	180 m3/hr
Flange Diameter	150 mm
Pipe Diameter	150 mm
Accessories	Dehumidifier Hydrogen Sulphide Transmitter and Detector Humidity Transmitter Pressure Indicator Local Control panel Extraction Fan w/ Motor

Project : **Lot 4823, D.D. 104, 81 San Tam Road, San Tin, N. T.---**

STP For RCHE

The design air flow is according to Technical Schedule of tender specification to specify air flow rate (min. 180m3/hr). The flow rate of provided air fan and accessories, please refer to Attachment – catalogue 12 in item of HF-121B (for Fan) and catalogue 6 in item of Process Air (for Dehumidifier).

a) Calculation for Air Volume.

Tank area : 3.5 x 4.1m = 14.35 m2

Tank Depth : 3.05m

Water Depth of Pump Stop : 0.6m

Times of Air change : 5 times /hr

Tank max. air volume in sewage pump sump : (3.05 – 0.6)m x 14.35m2 = 35.15m3

Total Air Flow : 35.15 x 5 = 175.8m3/hr (take 180m3/hr)

b) Activated Carbon Filter contact time.

Design contact time : ≥ 2 sec.

Provided volume of activated carbon : 0.17 m3 (Refer to Attachment – Applicable Specification 1)

Air flow : 180 m3/hr (0.05 m3/sec)

Contact time : $\frac{0.17m3}{0.05m3/sec}$

= 3.4 sec. > 2 sec. (OK)

c) Calculation for Vent Duct Size.

Air duct area : Total air flow (m3/s) ÷ Velocity(m/s)

Take Velocity : 6m/s

Min. requirement Area for Vent Duct : 180m3/hr ÷ 6m/s = 0.0081m2

Adopted 0.15m x 0.15m duct = 0.0225m2 > 0.0081m2 , OK

Check air velocity passing through vent duct : $\frac{180\ m3/hr \div 3600s/hr}{0.0225m2}$ = 2.22m/s > 2 sec.(OK)

Therefore, the deodorizing adsorption system will have minimum odour removal efficiency of 99.5% at 5ppm H_2S concentration.

Above calculation is base on 1-year operation. A Storage of activated Carbon is standby to replace. The activated Carbon in the filter will be replaced if the gas detector find the odour release is beyond the calculation.

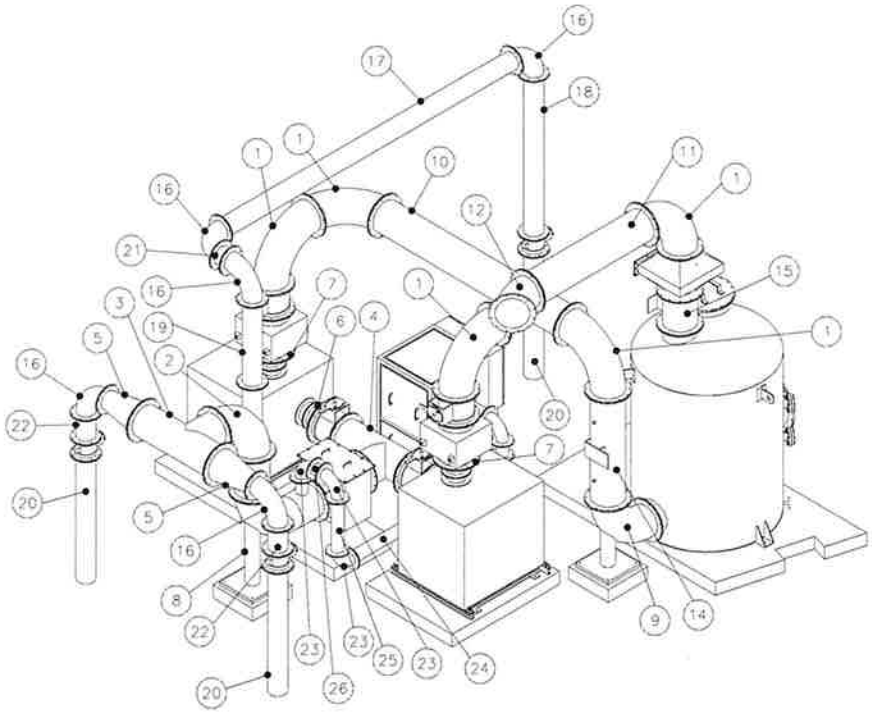
Hydrogen sulphide by volume. With reference to the EPD website, the 1 odour unit is 0.00047 ppm by volume. 5 OU is equivalent to 0.00235 ppm.

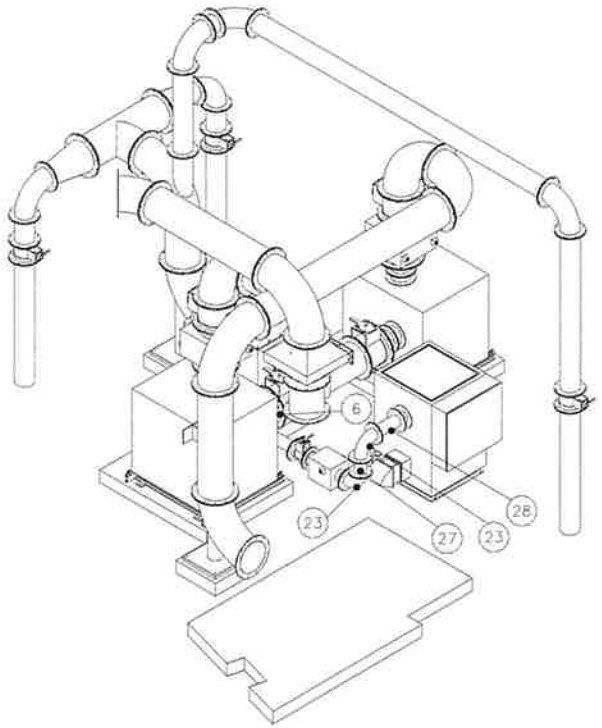
As such, 5ppm is equal to 5/0.00047 = 10638 OU. It is reasonable to assume that the small size on-site STP would not generate the odour unit higher than 5ppm.

The Applicant will ensure that the performance of the deodorizer can achieve the target odour removal efficiency of 99.5% at all time.

Equipment/ Material List of Deodorization Activated Carbon Adsorption Filter

Item	Description	Quantity
A	GRP air ductwork	
B	Flexible joint	
C	Flow switch for air duct	2 nos.
D	Diff pressure gage for pre-filter, after filter and carbon media	3 nos.
E	Electrochemical cell type H_2S detector in IP 65 enclosure	2 nos.
F	RH sensor	1 no
G	SS mist eliminator in SS house	1 no
H	Pre-filter in SS house	1 no
I	After filter in SS house	1 no
J	GRP Non-return damper	1 no
K	GRP Volume control damper	1 no
L	Extraction fan c/w acoustic enclosure	2 nos
M	Dehumidifier	1 no
N	Activated carbon filter Including GRP carbon vessel and activated carbon for initial fill up Local control panel with component	1 lot





註释：
1. 配件：管件数量如图示
2. 树脂：4183加阻燃
3. 表面：防UV树脂涂层，颜色RAL7032
4. 配件：除特别指明外，纤维管件厚度为
   直径 100 至 500 = 4毫米
5. 所有金属部份：S.S.316
6. 除特别指明外，所有尺寸均为毫米
7. 請與图號：MWPP2-PP-02
   MWPP2-PP-03
   MWPP2-PP-04 同時查看

图號：MWPP2-PP-01

REFERENCE PROJECT

Project : Proposed Development at Ma Wan Park Phase II, Ma Wan
(To be known as Ma Wan Lot No. 739, Ma Wan Village)

Equipment Schedule

12. Deodorization System

Description	Deodorization System
Manufacturer	ECOLO
Supplier	ECOLO HK
Model	Rage
Country of origin	China
Catalog Reference	Attached
Job Reference	Attached
Certificate	-
Material	Filter - Activity Carbon Filter Housing - Fiberglass
Capacity	1,500 m3 /hr
H2S concentration	5 ppm
H2S removal efficiency	≧99.5% efficiency at 5ppm conc.
Pipe Diameter	350 mm
Accessories	Dehumidifier Mist Eliminator Hydrogen Sulphide Transmitter and Detector Humidity Sensor and Transmitter Stainless Steel Local Control panel Extraction Fan w/ Motor Pre-filter and After-filter Differential Pressure Gauge Air Flow Switch Non-return damper and Volume control damper

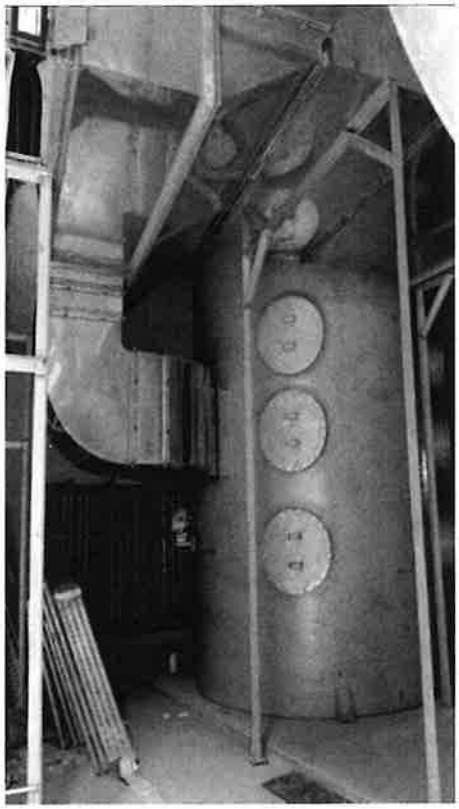
Rage Activated carbon adsorption tower is designed for industrial and municipal odour control. Activated carbon is the most widely used media for pollutant adsorption in gas phase. The carbon pellet has a very porous structure with a high surface-to-volume ratio, and enables the odorous compounds being 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 $KMNO_4$ 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.

Rage Engineered solutions for effective odor control.

Rage had been engaged for odor control solution since 70s, providing solution for a wide variety of processes. All system have been developed by our experienced engineering team specifically to meet the needs of our **environmental and industrial customers**.

Our extensive global experience and lessons learned are applied to our capabilities in:

- Design, equipment / accessories selection, planning
- Engineering
- Fabrication
- Existing installation upgrades
- After sales services

Rage ordering code shall be revised in the following ways as from October, 2014.

Activated carbon filter

TYPE	Materials	Capacity in m^3/h	Geometrical shape	No of bed	Type of carbon
ACF	**FRP** - Standard FRP		**C**- circular	**SB** – Single	**1** – One type
	XXX - To specify		**R**- rectangular or square	**DB** -Dual	**2** – Mixed type

Example of code : ACF-FRP-18000-R-DB-1 ; ACF-FRP-2500-C-SB-2

Biofilter

TYPE	Materials	Capacity in m^3/h	Geometrical shape	No of stage	No of pump	Type of pump
BIOF	**FRP** - Standard FRP		**C**- circular	**1-** One	**1-** One pump	**SUB** – Submersible
	XXX - To specify		**R**- rectangular or square		**2-** Two pumps	**NSU**- Non submersible

Example of code : BIOF-FRP-18000-R-1-2SUB ; BIOF-FRP-2500-C-1-2NSU

Biotrickling filter

TYPE	Materials	Capacity in m^3/h	Geometrical shape	No of stage	No of pump	Type of pump
BTF	**FRP** - Standard FRP		**C**- circular	**1-** One	**1-** One pump	**SUB** – Submersible
	XXX - To specify		**R**- rectangular or square	**2-** Two	**2-** Two pumps	**NSU**- Non submersible
					3- Three pumps	
					4- Four pumps	

Example of code : BTF-FRP-18000-R-1-2-SUB ; BTF-FRP-12500-C-2-4-NSU

Chemical scrubber

TYPE	Materials	Capacity in m^3/h	Geometrical shape	No of stage	No of pump	Type of pump
CSR	**FRP** - Standard FRP		**C**- circular	**1-** One	**1-** One pump	**SUB** – Submersible
	XXX - To specify		**R**- rectangular or square	**2-** Two	**2-** Two pumps	**NSU**- Non submersible
				3- Three	**3** Three pumps	
					4 Four pumps	
					5 Five pumps	
					6 Six pumps	

Example of code : CSR-FRP-18000-R-1-2-SUB ; CSR-FRP-12500-C-2-4-NSU

Sizing for the DO system at Ma Wan Park Phase 2

Date : 2021-12-13

Type of DO system : Activated Carbon Filter

1) **Carbon requirement**

Air volume : 0.417m^3/s (1,500m^3/h)

Air from dehumidifier 0.042m^3/s (150m^3/h)

Total air volume = 0.459m^3/s (1,650m^3/h)

Inlet H_2S concentration : 5ppm

Retention time : 3 seconds

Breakthrough period : 365 days

1.0ppm of H_2S eqv. to 1.3708mg/m^3

For 5ppm H_2S in 0.459m^3/s air stream, H_2S weight = 0.459 x 5 x 1.3708 = 3.146mg/s

Daily H_2S in weight in air stream = 0.272Kg/ day

H_2S in weight in air stream in 365 days = 99.28Kg or 99Kg

Absorption of H_2S by carbon = 150kg/ m^3

Carbon volume required for 365 days working period

= 99 / 150 = **0.66 m^3**

When based on 3 seconds retention time requirement

Carbon volume required : 0.459 x 3 = 1.377m^3

Carbon density : 530Kg/m3

Weight of carbon in the DO system : 1.377 x 530 = 730Kgs round up to **750Kgs (1.415m^3)**

2) **Carbon Tank**

Single bed Carbon tank shall be made. The tank is capable to carry 1.415m^3 carbon.

Carbon tank foot print size : (Ø1.5) = 1.767m^2 < available site area

Thickness of carbon bed (t): 0.8m

Overall size of carbon tank : **Ø1.5 x 2.2H m**

3) **Pressure drop across filter bed** (Air volume : 0.459m^3/s (1,650m^3/h))

Cross sectional area of filter bed : 1.767m^2

Air velocity per carbon bed (v) = 0.459 / 1.767 = **0.259 m/s** < 3m/s

Pressure Drop across filter bed = 10 x **t** x 923.2 $\mathbf{v}^{1.501}$ = 10 x **0.8** x 923.2 $(\mathbf{0.259})^{1.501}$

≈976Pa

A summary of Activated carbon filter system design

		Requirement	Design
1	**Activated carbon filter**		
	Air volume	1,500 m^3/h	0.416m^3/s
	Air volume from dehumidifier		150 m^3/h (0.042m^3/s)
	Total air volume in carbon filter		1,650 m^3/h (0.459m^3/s)
	Contact time	≧3 seconds	3 seconds
	Media - catalytic activated carbon		1.415 m^3
	Tank size		Ø1.5 x 2.2H m
	Net Weight of filter house		370Kg
	Operating weight		1,120Kg
	Configuration		Single bed / Circular
	Air volume per carbon bed		1,650 m^3/h (0.459m^3/s)
	Air velocity across carbon bed	<0.3m/s	0.259m/s
	DP across media		**976Pa**
2	**Pre Filter size**		600x600x50mm
	Air volume		0.459m^3/s
	Face velocity		1.275m/s
	DP across **Pre filter**		**50Pa**
2A	**Demister size**		600x 600x50mm
	DP across **Pre filter**		**70Pa**
3	**After Filter size**		600x600x50mm
	Air volume		0.459m^3/s
	Face velocity		1.275m/s
	DP across After filter		**60Pa**
	CARBON FILTER SYSTEM DP		**1, 156Pa**

Project：Proposed Development at Ma Wan Park Phase II, Ma Wan
(To be known as Ma Wan Lot No. 739, Ma Wan Village)

Equipment Schedule

12a. Activated carbon Filter

Manufacturer	Rage
Country of Origin	USA / China
Type	Activated carbon Filter
Code	ACF-FRP-1500-C-SB-1
Inlet air	1500m^3/h
Size (m)	1.5 x 2.2H
Housing Material	FRP
Geometrical shape of filter house	Circular
Media Volume	1.42 m^3
Media Load	750 Kg
Color	Signal Grey (RAL7004)
Media	Catalytic activated carbon

RAGE INC.
PLUMSTEADVILLE, PA 18949

Datasheet Carbon Media HCAT 4060_15

Description:

Catalytic activated carbons for H_2S treatment

Rage HCAT 4060 series of activated carbon is non-impregnated, activated carbons derived from coal or hardwood which is specially developed for the removal of Hydrogen Sulfide and Sulfur compounds from vapor streams. This series of products are well suited for use in sewage treatment plants and pumping stations where these compounds are typically found. Rage HCAT 4060 provides high H_2S absorption capacity but without the thermal risks associated with some chemically treated carbons.

Application

- **Hydrogen Sulfide removal**
- **VOCs absorption**
- **Odor Control**

TECHNICAL CHARACTERISTICS

Particulars	Test Standard	Value
Diameter	N/A	4.0 mm
CTC	ASTM D 3467- 2009	≧60%
Moisture	ASTM D 2867- 09	≦15%
Ash content	ASTM D 2866 11	≦16%
Iodine	ASTM D 4607- 2014	≧1000mg/g
Bulk density	ASTM D 2854- 09	530 ± 30g/l
Hardness	ASTM D 3802- 10	≧95%
H_2S absorption capacity	ASTM D6646 -2014	0.15 g/cc

Project：Proposed Development at Ma Wan Park Phase II, Ma Wan
(To be known as Ma Wan Lot No. 739, Ma Wan Village)

Equipment Schedule

12b. Activated Carbon

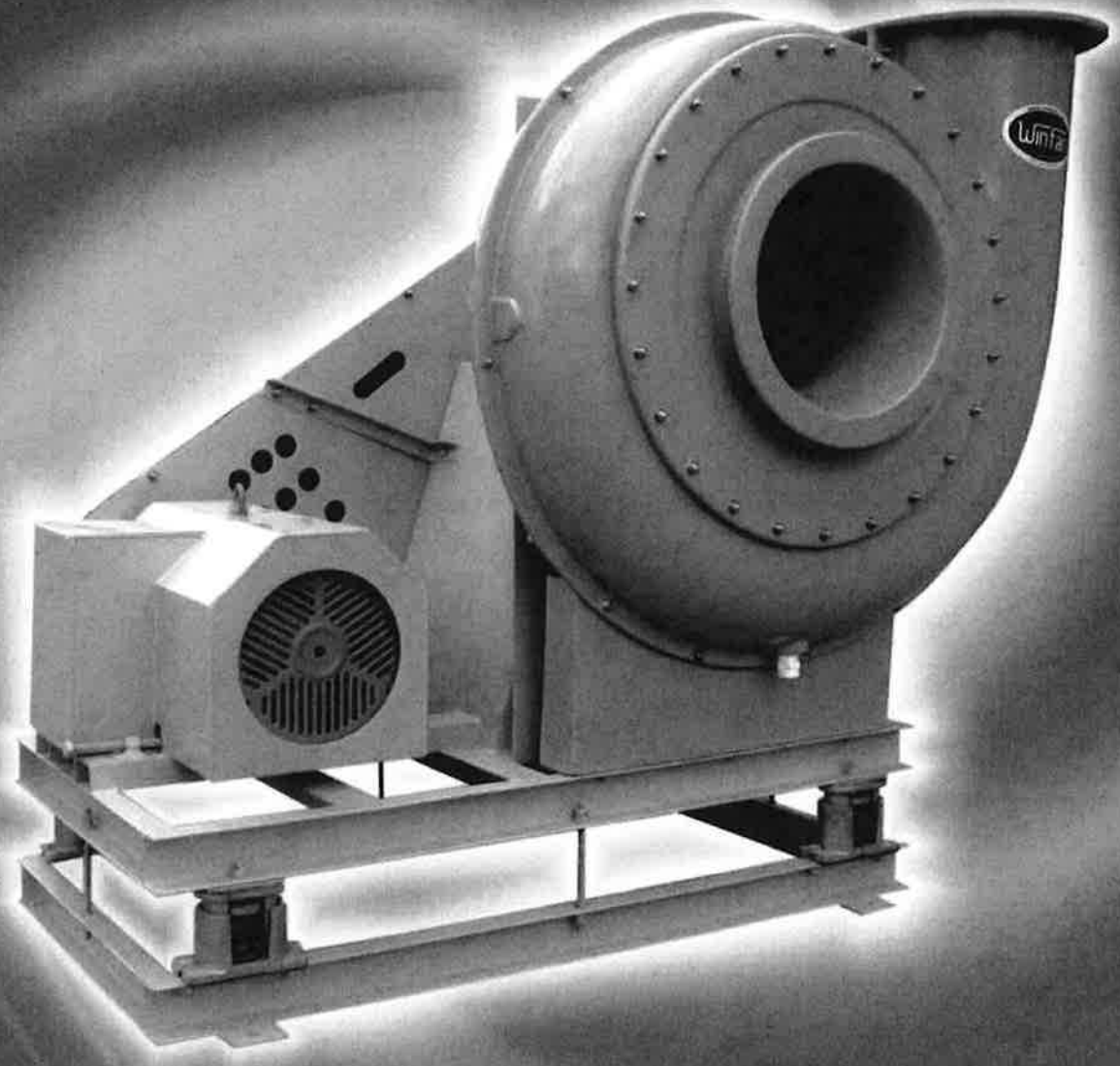
Manufacturer	Rage
Country of Origin	USA / China
Type	Catalytic activated carbon
Code	HCAT 4060_15
Nominal pellet diameter	4mm
CTC	≧60%
Moisture content	≦15%
Hardness	≧95%
Ash Content	≦16%
Iodine number	≧1000 mg/g
Bulk density	530 +/- 30 g/l
H2S adsorption capacity	≧0.15g/cc
Carbon weight for the system (Kgs)	750

BULLTIN:WF003
JANUARY,2007

頂裕工業專用送風機

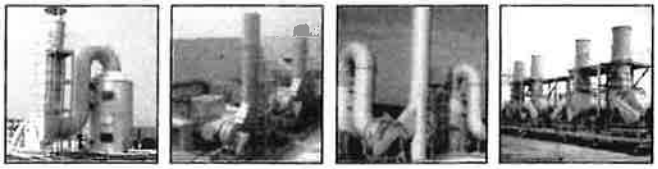
FRP 高壓系列

高性能・高效率・低震動・低噪音



蘇州頂裕風機科技有限公司

風機性能選用說明

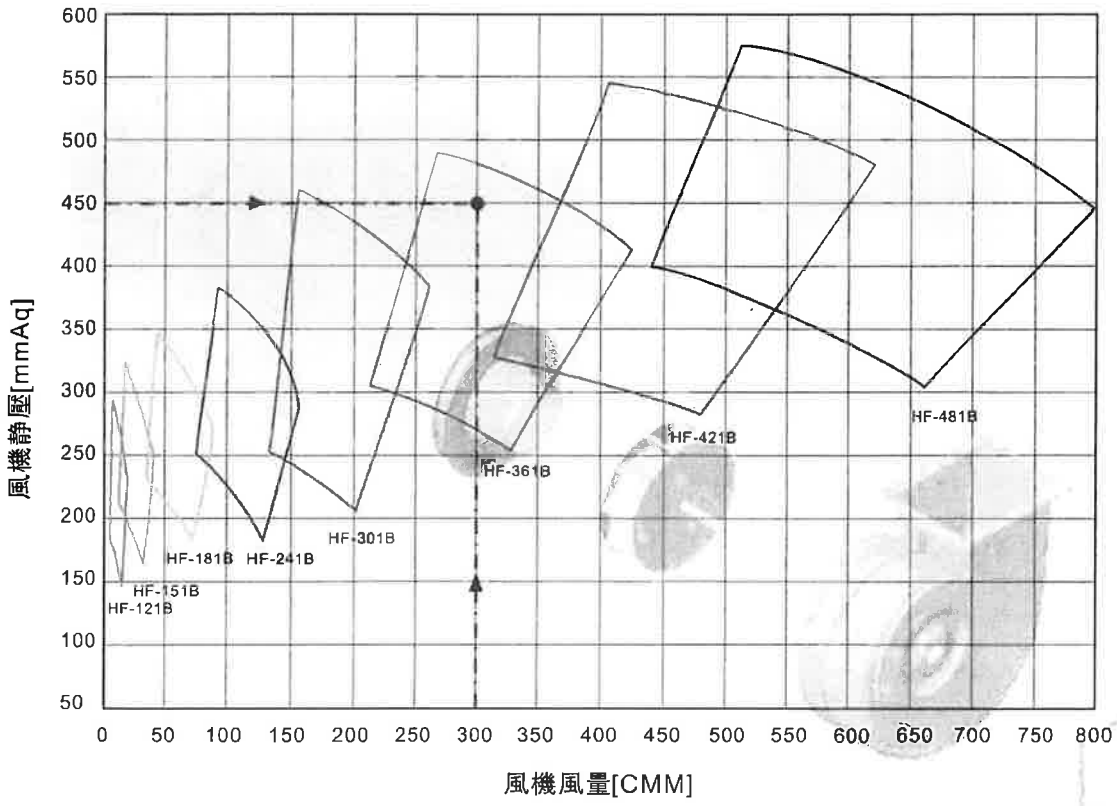


範　例：

若以需求風量300CMM, 靜壓450mmAq為例, 則根據下列性能曲線總表所表示，選出適用的HF-361B機型。

注：1CMM=60CMH　　1Pa=0.1mmAq

性能曲線總表

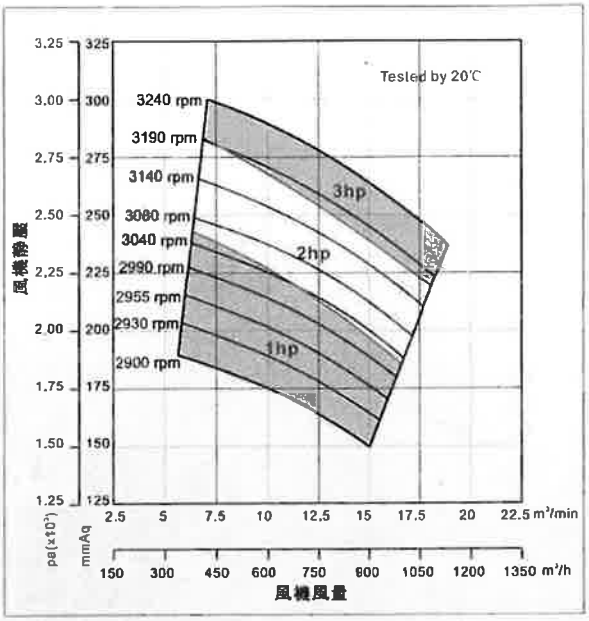


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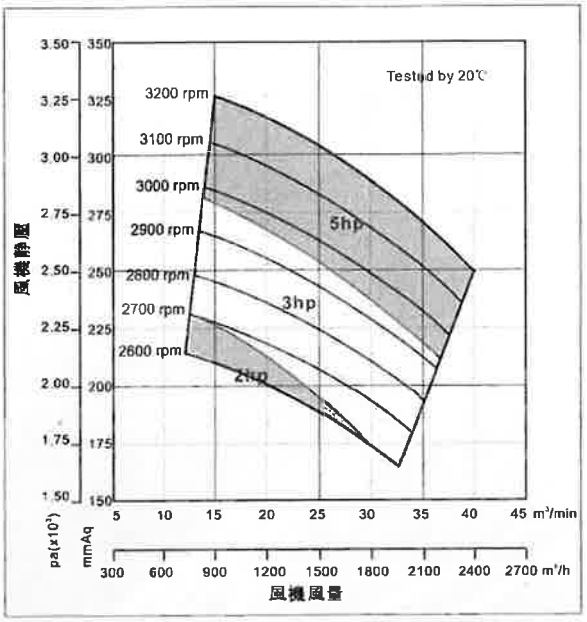
風機性能資料

HF-121B 151B 181B 241B

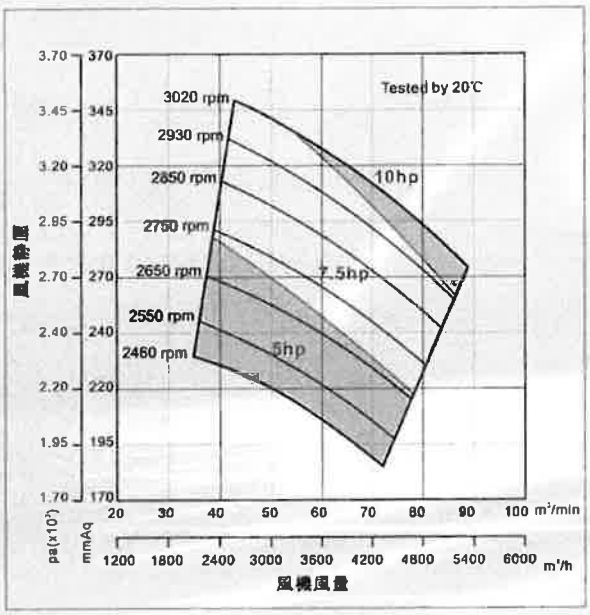
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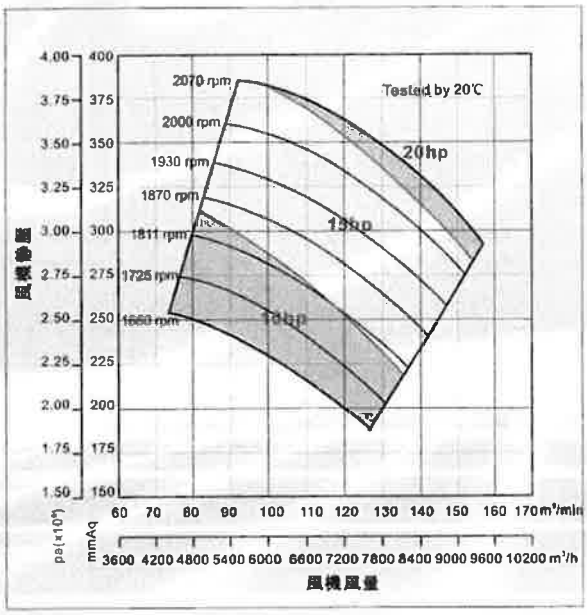
HF-151B



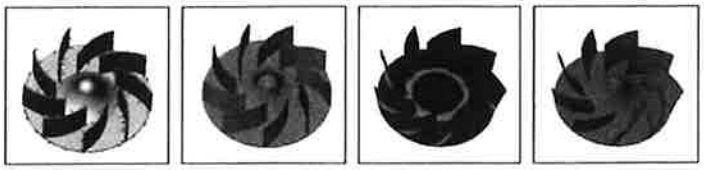
HF-181B



HF-241B

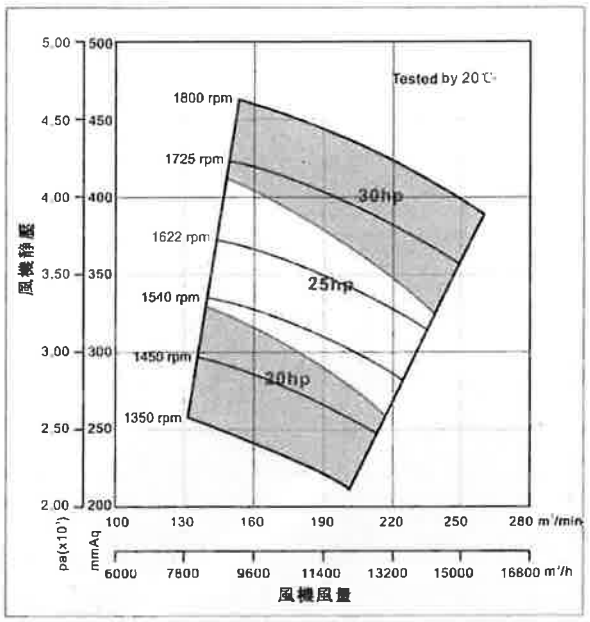


軸馬力不含皮帶傳動損失
量測空氣為標準狀態氣體

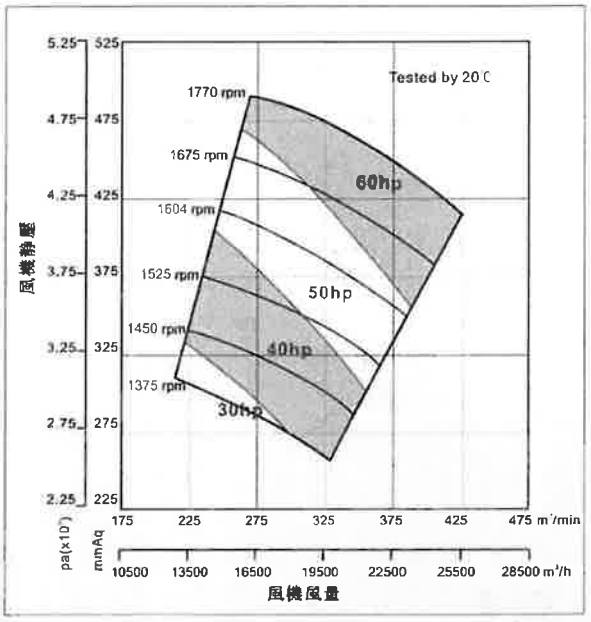


HF-301B 361B 421B 481B

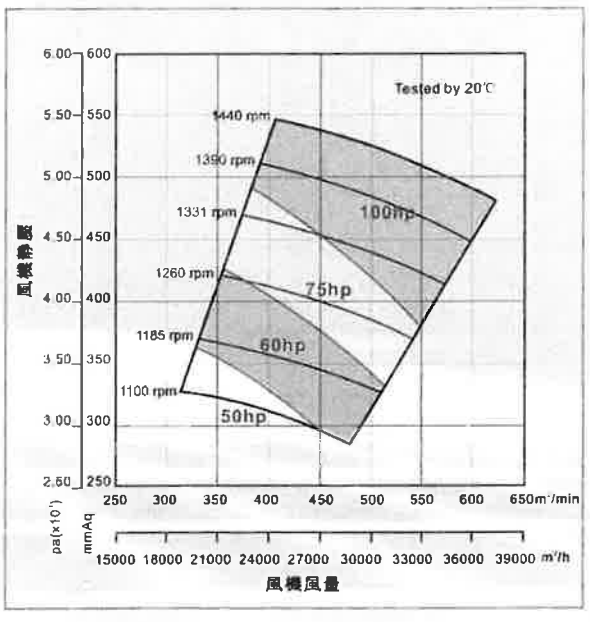
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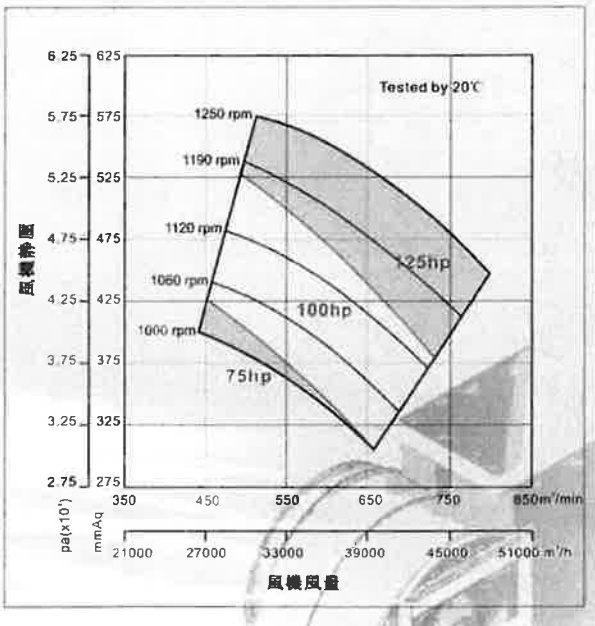
HF-361B



HF-421B



HF-481B



軸馬力不含皮帶傳動損失

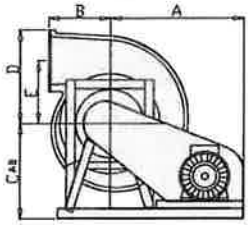
量測空氣為標準狀態氣體

WINFAN Technology Co., Ltd.

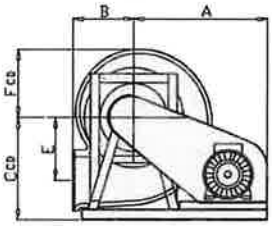
風機尺寸

HF-121B 151B 181B 241B 301B

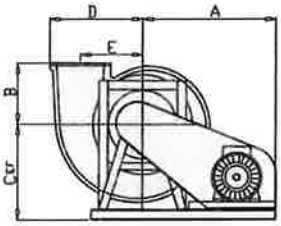
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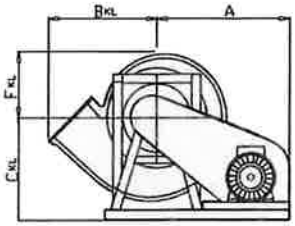
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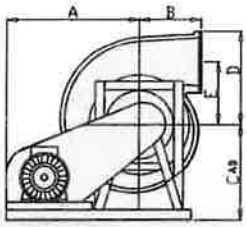
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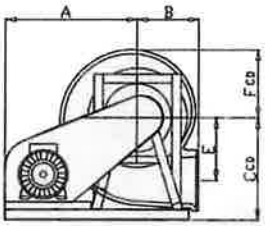
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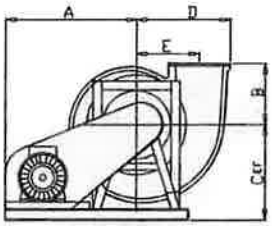
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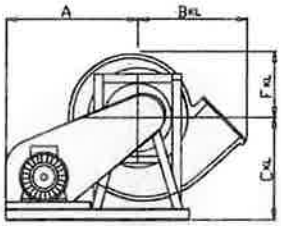
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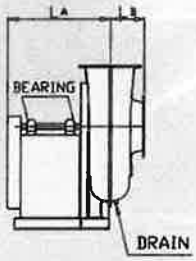
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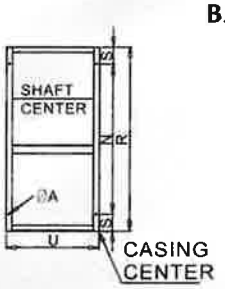
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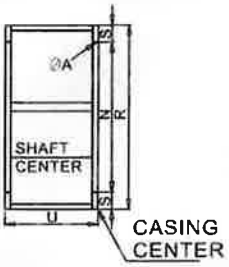


BODY



BASE





OUTLET&INLET



MODEL	BODY												
	A	B	B_{KL}	C_{AB}	C_{CD}	C_{EF}	C_{KL}	D	E	F_{CD}	F_{KL}	L_A	L_B
HF-121B	285	260	420	360	400	360	360	335	210	260	250	120	460
HF-151B	356	325	420	500	500	500	500	419	263	325	313	150	550
HF-181B	821	360	658	500	650	600	600	570	250	386	345	265	705
HF-241B	970	447	801	700	750	700	750	685	460	498	485	249	751
HF-301B	1120	600	1058	800	1100	950	950	896	586	632	584	343	910

MODEL	BASE					INLET	
	R	U	N	S	ØA	$ØC_1$	$ØC_2$
HF-121B	700	433	500	100	14	150	250
HF-151B	675	565	425	125	14	185	300
HF-181B	1147	646	897	125	14	400	500
HF-241B	1350	685	1100	125	14	350	450
HF-301B	1600	830	1350	125	14	500	600

★ For specific size ,please do not hesitate to contact with us.
★ It is correspond to class III

WINFAN TECHNOLOGY CO., LTD.

E-Mail: winfanblower@gmail.com

Description

2021/11/15

Job Description:	香港康丰	WINFAN Technology Co. Ltd.
Reference:	1650CMH2000PA	tel：0512-63296761
Fan Type:	HF-151B	fax：0512-63296760
Fan Model:	3KW-4P	Http://www.frpfan.com.tw

Shaft Power Calculation

Values are in accordance with AMCA Standard 210-99

Volume Flow Rate (CMH)	1650	Total Efficiency (η_T)%	68
Inlet Static Pressure (Pa)	-2000	Driver Efficiency (η_d)%	93
Outlet Static Pressure (Pa)	0	Safe factor (S_F)	1.2
Air Density (Kg/M^3)	1.2	Fan Inlet Area (m^2)	0.03
Brake Horsepower (BHP)	2.78	Fan Outlet Area (m^2)	0.03
Atmospheric Pressure (Pa)	101325		

1. Fan Inlet Total Pressure P_{T1} : -2000.00 Pa

$$P_{T1} = P_{S1} + P_{V1}$$

2. Fan Outlet Total Pressure P_{T2} : 127.71 Pa

$$P_{T2} = P_{V2} + P_{S2}$$

3. Total Pressure Air horsepower L_{PT}: 1.41 kw

$$L_{PT} = \frac{K}{K-1} \times \frac{(10336 + P_{T1}) \times Q}{6120} \times \left[\left(\frac{10336 + P_{T2}}{10336 + P_{T1}} \right)^{\left(\frac{K-1}{K}\right)} - 1 \right]$$

4. Brake Horsepower L_{BHP}: 2.08 kw / 2.78 hp

$$L_{BHP} = \frac{L_{PT}}{\eta_T}$$

5. Motor Output M_{output}: 2.23 kw / 2.99 hp

$$M_{output} = \frac{L_{BHP}}{\eta_d}$$

6. Rated Motor Power M_{rated}: 2.68 kw / 3.59 hp

$$M_{rated} = M_{output} \times S_f$$

Note : P_{S1} = Inlet Static Pressure P_{S2} = Outlet Static Pressure

P_{V1} = Inlet Velocity Pressure P_{V2} = Outlet Velocity Pressure

P_V = (V^2 × r) ÷ 19.6 V = Air Velocity

It is suggested to select motor power below:

4 HP* 4P

SuZhou DingYu Energy-efficient Equipment Co.,Ltd

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WINFAN TECHNOLOGY CO., LTD.

E-Mail: winfanblower@gmail.com

Description

2021/11/15

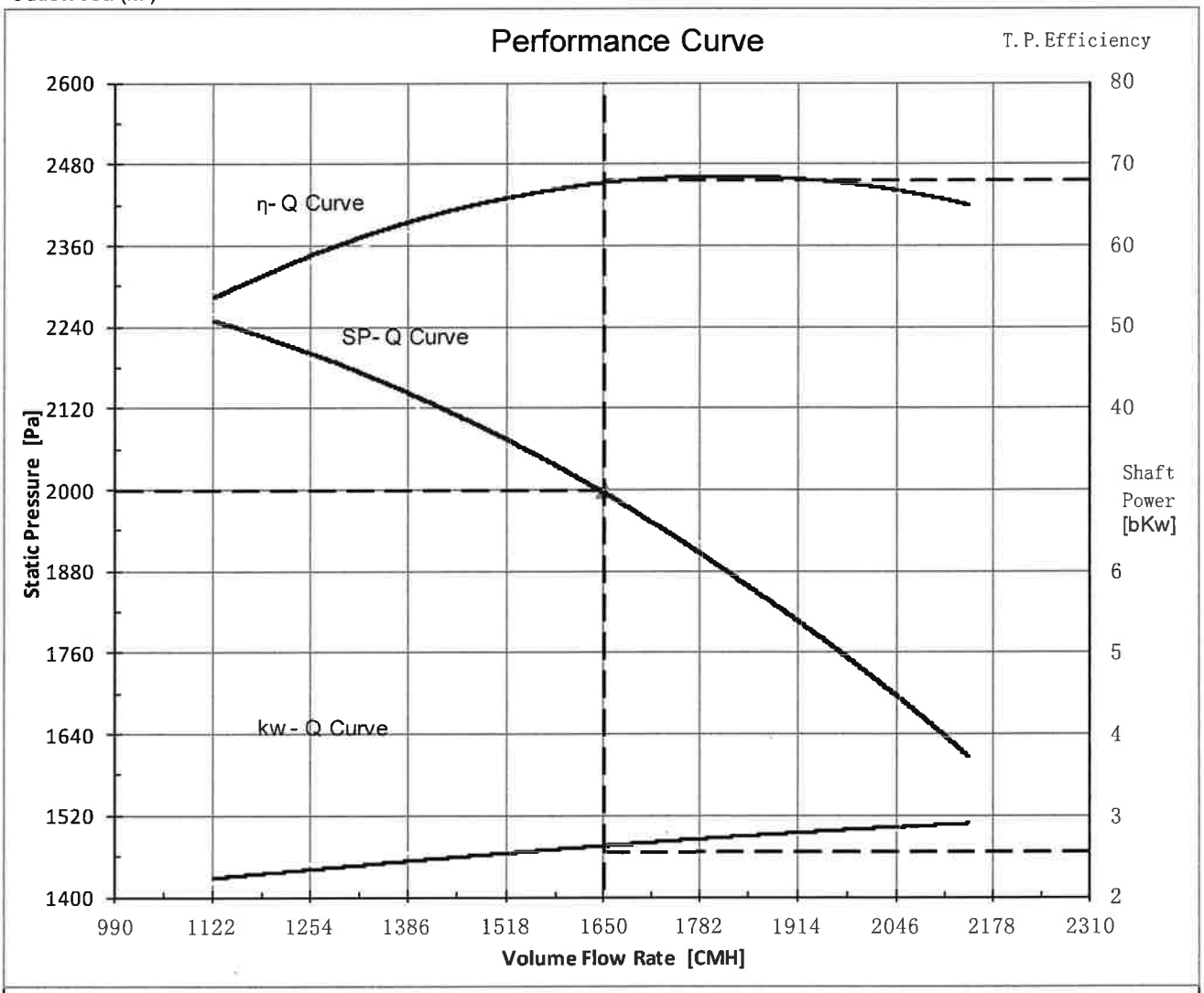
Job Description:	香港康丰
Reference:	**1650CMH2000PA**
Fan Type:	**HF-151B**
Fan Model:	**3KW-4P**

Winfan Technology Co., Ltd.
tel：0512-63296761
fax：0512-63296760
Http://www.frpfan.com.tw

Performance Curve

Values are in accordance with AMCA Standard 210-99

Volume Flow Rate (CMH)	1650
Static Pressure (Pa)20℃	2000
AIR Density (Kg/M^3)	1.200
FAN Speed (RPM)	3050
Total Efficiency (%)	68
Outlet Velocity (M/Sec)	14.59
Outlet Area (M^2)	0.031416



SuZhou DingYu Energy-efficient Equipment Co., Ltd 2021/11/15

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上海东元德高电机有限公司
地址：上海市长宁区中山西路1279弄6号321室
电话：021-51168255
Web：http://www.tecochina.net

TECO

三相异步电动机
SERIES THREE PHASE INDUCTION MOTORS

东元N系列标准电机
TecoNSeries Standard Motor
IEC-60034-30-1 2014/IE3
GB18613-2020/GB3

东元N系列高效率电机
TecoNSeries High Efficiency Motor
IEC-60034-30-1 2014/IE4
GB18613-2020/GB2

南昌 电话: 0791-88195999
东莞 电话: 0769-28826526
厦门 电话: 0592-5703299
天津 电话: 022-23859635
022-23859637
成都 电话: 13708017348
无锡 电话: 05 10-85342005



http://www.tecochina.net

东元集团简介

东元电机创立于1956年，以制造马达起家，至今东元集团已跨入重电、家电、信息、通讯、电子关键零组件、基础工程建设、金融投资及餐饮等多面向的发展领域，更积极参与国家重大工程建设，目前事业版图横跨全球5大洲、近50国。未来，东元将持续深耕核心事业，朝向智能化产品、提供系统解决方案等高附加价值方向积极发展，并致力于高科技事业之拓展，以「节能、减排、智能、自动」为目标，建构一个宏观、高质量的国际级品牌。

上海东元[illegible]电机有限公司
地址：上海市长宁区中山西路1279弄6号321室
电话：021-51168255
Web：http://www.tecochina.net

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All data presented is for reference only and subject to change without notice.



东元历史

1956年　东元电机股份有限公司成立于台湾三重市。
1965年　新北厂设置为当时第一座自动化电机生产工厂。
1966年　工具工厂完成（现为台产基地）。
1973年　冰水厂启用生产冷气机、电扇机。电冰箱等家电产品。
1979年　中坜一厂建厂完成导入全面自动化设备生产电机。
1983年　桃园厂启用生产电扇机。变频电子产品及电脑洗衣机等。
1987年　中坜二厂建厂完成与西屋合作生产超入型电机。
1991年　桃园冷气厂建厂完成。导入全面自动化生产家电产品。
1991年　马来西亚厂建厂完成。1994年分离压缩机厂建厂完成。
1995年　并购新加坡(WESTINGHOUSE)电机厂。
2002年　无锡东元电机建厂。
2003年　无锡东元正式投产。
2004年　无锡东元金一厂建厂。
2004年　江西东元电机建厂。
2012年　成立上海东元德盛电机有限公司作为东元集团在中国上海的销售服务中心。
2016年　无锡东元精密机械建厂


CERTIFICATE

WUXI TECO Electric & Machinery CO. LTD.

ISO 9001：2015

ANAB

IAF


CQC

职业健康安全管理体系认证证书

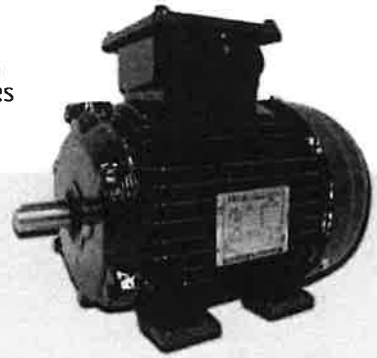
中国质量认证中心


CQC

环境管理体系认证证书

中国质量认证中心

三相异步电动机
SERIES THREE PHASE INDUCTION MOTORS



目 录
Contents

东元N系列三相异步电动机
Teco N Series Three Phase Induction Motors

技术数据Technical data.....1-7
噪声Noise levels.....8
铭板信息Nameplate.....9
轴承温升Bearing temperature rise.....10
产品编号Product Code.....11-12
包装Package.....13

特性表Datasheet
Teco N Series Three Phase Induction Motors

标准电机Standard Motor 380V 50HZ.....14-17
Model:TEV3
高效率电机High Efficiency Motor 380V/50HZ.....18-20
Model:TEV4

外形图Outline

IMB3(TEV3) 21-31
IMB5(TEV3) 32-38
IMB35(TEV3) 39-49
IMV1(TEV3) 50-59
IMB3(TEV4) 60-68
IMB5(TEV4) 69-75
IMB35(TEV4) 76-85
IMV1(TEV4) 86-95

技术数据

产品：三相异步电动机
设计依据：国际电工委员会IEC60034,中国国家标准GB755
额定电压：380V或其它电压
额定频率：50HZ或60HZ
输出功率：0.18～400kW
工作制：连续工作制
机座号：80-355C
防护等级：IP55
冷却方式：IC411
绝缘等级：F级绝缘
温升：S F 1.0(50Hz)时采用电阻法考核定子绕组温升不超过80℃

安装方式：IMB3(卧式带底座安装)，IMB5(卧式带法兰安装)，IMB35(卧式带底座和法兰安装)，IMV1(立式轴伸向下)及其它电动机安装型式安装尺寸参照附表。

●能效等级符合中国国家标准 GB18613-2020 能效，额定50HZ以外不在国家能效认证范围，特性值IE3特性有所差异，不表以GB特性为准

TECHNICAL DATA

Class: three phase induction motors
Design standard: IEC 60034 GB 755
Rated voltage: 380V or other voltage
Rated frequency: 50Hz or 60Hz
Output range: 0.18～400kW
Time duty: Continuous S1(S F: 1.0)
Frame Nos: 80-355C
Protection grade: Totally enclosed(IP55)
Cooling method: Self-circulation Surface cooling(C411)
Stator insulation: Class F insulation system
Temperature rise: Not to Exceed 80 C Rise by Resistance Method; S F 1.0(50Hz)

Mounting: IMB3,IMB35,IMB5,IMV1 or others For typical performance and dimensions of series motor refer to table hereunder.

● GB18613-2020 Frame frequency beyond 50Hz is not the part of GB If GB Jacket does not correspond to IE3 GB shall be governs

适用条件

电源条件： 电压波动率在10%以内，频率波动率在±5%以内，电压及频率综合波动率10%以内。但频率波动率不超过±5%。

使用场所： 室内、无easy燃气体环境
环境温度： -15~40℃
环境湿度： 相对湿度90%以下(但不能结露)
海拔高度： 海拔1000m以下
传动方式： 皮带轮传动，但是2P 45kW及以上，6&8P 37kW及以上使用联轴器。
旋转方向： 可双向旋转，当电源电线与电动机出线端子采用一致的，面向轴伸端看为顺时针方向旋转。
起动方式： 全压直接起动或Y-△起动
涂装： GB3(IE3: 蓝色 Munsell 5PB 3/8
GB2(IE4) 浅灰色 NO.700 Munsell N5
要求： 安装联轴器或皮带轮，应用加热法装好并轻轻敲入，禁止以外力敲击轴承安装，如有特殊需要请另行洽谈。

APPLICATION

Power source conditions: Voltage ± 10%, Frequency ±5%, and 10% Max of Combined Voltage and Frequency But Frequency Variation Does Not Exceed ±5%.
Place: Indoor Non-hazardous
Ambient temperature: -15~40 ;
Relative humidity: Less than 90% RH(Non-condensation)
Altitude: Less than 1,000 meters
Drive method: Belt Service,However 2 Pole 45 kW and Up 4、6&8Pole F# 250 and Above Coupling Service is the Way.
Direction of rotation: CW According to IEC Definition, Suitable For Bi-Directional Operation.
Method of starting: Full voltage direct on-line or Y-Δ starting
Painting: GB3(IE3: Purple Munsell 5PB 3/8
GB2(IE4: Light Gray NO.700 Munsell N5
Requirement: Bushing, coupling and belt should be heated and pushed onto the shaft attention with slight axial force. Do not hammer to prevent bearing damage if need special requirement further discussion will be demanded
Drive method: Belt direct coupling gear and so on

电机特点

IP55防护结构,防尘,防水花及油污,铸铁框架,结构强壮,符合国际标准,安全更具保障性

采用东元B级绝缘,耐热强度高,抗电冲击强,绝缘寿命长,在恶劣环境下也能胜任

使用著名品牌之轴承,著名硅厂之硅钢片,性能更具保障

规范化的设计、优质的材料、先进的加工设备和完善的质量保证体系,这些表现在效率高振动小、噪声低、安全可靠

选用:依据客户需要可搭配热保护器, PTC,空间加热器。RTD,PT100及其它

注:

自2021年3月起东元电机中小型电机,某些机种已经开始加装 VB-100 自带屏智慧型振摇仪,提供即时振动运转数值、振动健康指数预知马达检修时程,让您的工厂设备智慧升级,不停工、不怠慢,随时处于最佳产能状态。

CHARACTER

The protection enclosure is IP55,protect dust,drip and oil,Cast iron Frame strong configuration,which is accord to international standards and safety safeguarded further.

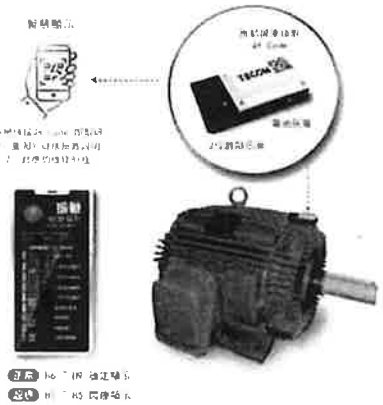
The stator insulation is class F of TECO insulation system with good heatproof quality,

strong resistance to electrical sparks,long insulation life and can be competent in the bad environment.

These ranges use bearing famous brand company and the silicon steel sheet are come from famous national steel company.

Standardized design, high quality material, advanced processing equipment and consummation quality guarantee system,it is embody in the high efficency,low vibrate and reliable safety.

the thermistor,PTC,Heater,RTD,PT100 or others can be providedaccord ing to the needs of purchaser.





振动 Vidration

所有电动机转子都使用平衡旋转级（标准）振动等级进行动态平衡。电动机在空载时测得振动速度有效值不超过下表中的相应限值。

Motors are dynamically balanced to severity grade A rating, a half key. Table below contains the effective vibration values for unloaded motors.

振动等级 Vibration grade	轴高 Shaft height mm	80(含)以下	132(含)以下	160以上
A	安装方式 Mounting	速度 毫米/秒 Velocity mm/s	速度 毫米/秒 Velocity mm/s	速度 毫米/秒 Velocity mm/s
	自由悬置 Free suspension	1.6	2.2	2.8
	刚性安装 Rigid mounting	1.0	1.4	2.3

最高转速 Max.rpm

鼠笼型感应电动机的安全运行转速

除非铭牌上另行标明,含额电压为1000V及以下、机座号355及以下的所有单速三相鼠型感应电动机应能在表列出的转速之内安全连续运行

电压1000V及以下三相鼠型感应电动机最大安全运行转速

Safe running speed for the squirrel-cage induction motors

Unless otherwise the name plate specifies, all the squirrel cage, 3 phase, induction motors lower than 1000V and smaller than 355 Frame Size can safely run continuously at the speed in the table below

The safe Max. rpm for the squirrel-cage, 3 phase induction motors of 1000V or lower.

单位为转/每分钟rpm/min

机座号 Frame Size	2极 2Pole	4极 4Pole	6极 6Pole	8极 8Pole
80	3200	3600	2400	1800
90	**3200**	**3600**	**2400**	**1800**
100	3200	3600	2400	1800
112	**3200**	**3600**	**2400**	**1800**
132	3600	3600	2400	1800
160	**4500**	**2700**	**2400**	**1800**
180	4500	2700	2400	1800
200	**4500**	**2300**	**1800**	**1350**
225	3600	2300	1800	1350
250	**3600**	**2300**	**1800**	**1350**
280	3600	2300	1800	1350
315	**3600**	**2300**	**1800**	**1350**
355	3600	2300	1800	1350

注:当电动机是于额定转速以上运行时，例如，当应用调速控制时,其噪声和振动强度将会增大。要求电动机调精细的校平以满足在额定转速以上的加速能力。此外,轴承寿命可能会受影响。应关注加油的时间和时间补充油脂量及其寿命。

——仅供参考

Note: When the motors run above the rated speed, for example, using in speed controller, the noise and vibration will increase. In this situation, the motors are required to be corrected to satisfy the acceleration ability above the rated speed. Besides, the bearing lifetime will decrease. Pay attention to the time for adding the oil and grease to insure its lifetime.

油脂寿命 Grease life (Horizontal installation)

机座号 Frame Size	极数 Poles	润滑脂寿命 Grease Lifetime up to CT 40°C
免加油润滑型轴承的润滑脂 Grease for permanent lubrication bearing		
80~225	2, 4, 6, 8	20000 小时 (h) (B3 安装)
可再润滑型轴承的润滑脂 Grease for regreasable bearing		
250~280	2	3000 小时 (h)
250~280	4, 6, 8	8000 小时 (h)
315~355	2	2000 小时 (h)
315~355	4, 6, 8	4000 小时 (h)

注

1. 当环境温度每升高10°C，或滑脂寿命以及更换时间减少一半。
2. 适合B3安装,B5和三电机安装及垂直安装请咨询。

Note:

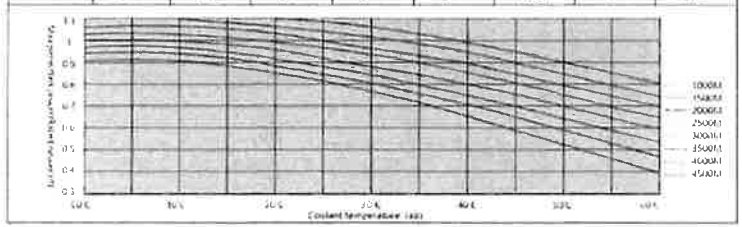
1. If the coolant temperature is increased by 10K the grease lifetime will be halved.
2. 20000 h apply to foot-mounted installed motors without any transmission.

TECO

海拔 Site altitude above sea level

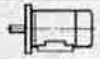
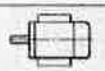
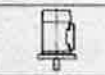
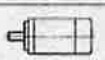
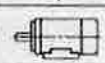
1. 电机由于环境温度及海拔高度的功率输出变化The changes of the output of the motors for the environmental temperature and elevation.
2. 可使用功率=额定功率×系数% Available power = rated power X coefficient

Ambient temperature (air)	Max. permitted power in relation to ambient temperature and altitude above sea level Max. permitted power/Rated power PN							
	1000m	1500m	2000m	2500m	3000m	3500m	4000m	4500m
0°C			1.07	1.04	1.01	0.98	0.95	0.92
10°C		1.10	1.07	1.04	1.01	0.98	0.95	0.92
20°C	1.10	1.07	1.04	1.00	0.96	0.92	0.89	0.86
30°C	1.06	1.02	0.97	0.93	0.89	0.85	0.81	0.77
40°C	1.00	0.96	0.91	0.85	0.81	0.76	0.71	0.66
50°C	0.90	0.85	0.80	0.75	0.70	0.65	0.60	0.53
60°C	0.80	0.75	0.70	0.65	0.60	0.54	0.47	0.40

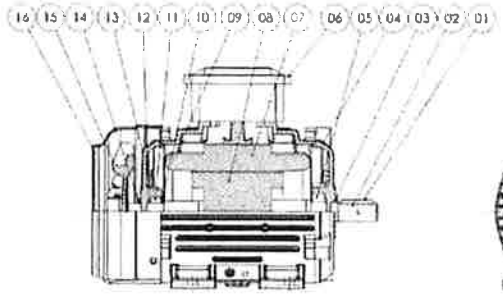


备注：当海拔较高，因空气稀薄，冷却效果差，为防止电机过热烧毁，需减小输出功率，保证电机安全运行。
Note: In high altitude areas, due to the thin air, the effect of cooling is bad,the temperature rise must be decreased to prevent the motors from destroyed over temp. to ensure the meters to run safely.

安装方式（IM）

底座脚安装		带凸缘安装		法兰与底座安装	
IM 1001 (IM B3)		IM 3001 (IM B5)		IM 2001 (IM B35)	
水平轴 脚贴地		水平轴 B Flange		水平轴 脚贴地 B Flange	
IM 1051 (IM B6)		IM 3011 (IM V1)		IM 2011 (IM V15)	
水平轴 轴看脚贴左侧地面		垂直轴 轴端向下 B Flange		垂直轴 轴端向下脚贴地面 B Flange	
IM 1061 (IM B7)		IM 3031 (IM V3)		IM 2031 (IM V36)	
水平轴 轴看脚贴右侧地面		垂直轴 轴端向上 B Flange		垂直轴 轴端向上脚贴地面 B Flange	
IM 1071 (IM B8)		IM 3601 (IM B14)		IM 2101 (IM B34)	
水平轴 脚贴天花板		水平轴 C Flange		水平轴 脚贴地 C Flange	
IM 1011 (IM V5)		IM 3611 (IM V18)		IM 2111 (IM V17)	
垂直轴 轴端向下脚贴地面		垂直轴 轴端向下 C Flange		垂直轴 轴端向下脚贴地面 C Flange	
IM 1031 (IM V6)		IM 3631 (IM V19)		IM 2131 (IM V37)	
垂直轴 轴端向上脚贴地面		垂直轴 轴端向上 C Flange		垂直轴 轴端向上脚贴地面 C Flange	

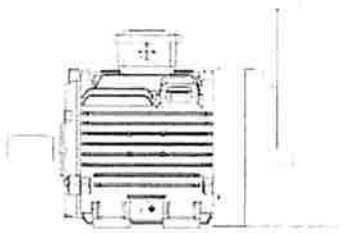
剖面图 Profile



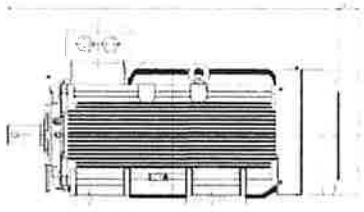
项目 ITEM	名称 NAME	项目 ITEM	名称 NAME
1	KEY（键）	9	FRAME（框架）
2	**SHAFT（轴）**	10	**STOP RING-BEARING**
3	V-Ring	11	BEARING（轴承）
4	**BRACKET（盖）**	12	**PRE-LOAD SPRING**
5	BEARING（轴承）	13	END BRACKET（端盖）
6	**TERMINAL BOX（接线盒）**	14	**V-RING**
7	STATOR（定子）	15	EXTERNAL FAN（风扇）
8	**ROTOR（转子）**	16	**FAN COVER（风罩）**

强冷风机资料
Force fan motors data

TECO



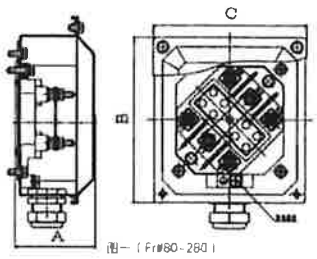
Fr#80~280



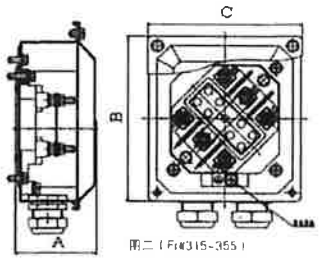
Fr#315~355

机座号 Frame Size	极数 Pole	电压 Voltage	频率 Frequency (Hz)	功率 Rated output (W)	电流 Current Value(A)	转速 Speed (rpm)	风量 Fan Power (m³/s)	风压 Fan Pressure (Pa)	L (mm)
80	2-8P	380V	50	35	0.1	2800	58	60	105.5
90	2-8P	380V	50	35	0.1	2800	91	80	108
100	2-8P	380V	50	40	0.1	2800	142	80	100
112	2-8P	380V	50	45	0.1	2800	229	80	82.5
132	2-8P	380V	50	45	0.25	1400	337	35	121
160	2-8P	380V	50	50	0.25	1400	609	40	105
180	2-8P	380V	50	75	0.25	1400	686	55	119
200	2-8P	380V	50	100	0.3	1400	1679	85	110
225	2-8P	380V	50	120	0.35	1400	1788	70	171.5
250	2-8P	380V	50	230	0.7	1400	1813	80	167.5
280	2-8P	380V	50	250	0.75	1400	2415	85	104.5
315	2-8P	380V	50	450	1.3	1390	6200	180	120(315S) 104(315M,L)
355	2-8P	380V	50	650	1.9	1390	6500	180	101(355M,L) 85(355C)

接线盒资料(钢板材质) Terminal box data
加热器参数 Space Heater



图一（Fr#80-280）



图二（Fr#315-355）

机座号 Frame Size	极数 Pole	接线柱数 Numberof terminals	接线柱规格 Contact Screw (mm)	进线孔直径 Outer Cable Diameter (mm)	出线孔口径 Cableentry size	进线孔数量	外形尺寸 Outline(mm) A	B	C	加热器规格型号 Spaces heater type
80	2P 4P-8P	6	M4	6~12	Φ21	1	60	110	110	1Φ 220V，20W
90	2P 4P-8P									
100	2P 4P-8P	6	M5	7~14	Φ26	1	68.5	127	120	1Φ 220V，30W
112	2P 4P-8P									
132	2P 4P-8P									1Φ 220V，40W
160	2P 4P-8P	6	M6	10~18	Φ35	1	81.5	166	160	
180	2P 4P-8P									1Φ 220V，50W
200	2P 4P-8P	6	M8	22~34	Φ52	1	89.5	212	196	
225	2P 4P-8P									1Φ 220V，60W
250	2P 4P-8P	6	M10	37~42	Φ65	1	115.5	245	224	
280	2P 4P-8P									
315	2P 4P-8P	6	M12	37~42	Φ65+Φ65	2	152	318	288	1Φ 220V，150W
355	2P 4P-8P	6	M16	45~52	Φ75+Φ75	2	188	408	372	1Φ 220V，200W

噪声 Noise levels

功率 kW	同步转速 r/min 3000 (2 极)	1500 (4 极)	1000 (6 极)	750 (8 极)
		dB(A) Lwa/Lpa		
0.55	/	66/56	63/53	63/53
0.75	**78/68**	**66/56**	**63/53**	**64/54**
1.1	78/68	66/56	63/53	64/54
1.5	**78/68**	**66/56**	64/54	**70/60**
2.2	78/68	70/60	70/60	71/61
3	**82/72**	**70/60**	**73/63**	**71/61**
4	83/73	72/62	73/63	72/61
5.5	**85/75**	**75/65**	**73/63**	**72/61**
7.5	85/75	76/66	73/62	72/61
11	**87/76**	**77/66**	**73/62**	**76/65**
15	87/76	77/66	77/66	79/68
18.5	**87/76**	**80/69**	**80/69**	**79/68**
22	88/77	80/69	80/69	79/68
30	**90/79**	**83/72**	**80/69**	**80/68**
37	90/79	84/73	82/70	82/70
45	**92/81**	**84/73**	**85/73**	**82/70**
55	92/80	85/73	85/73	88/83
75	**94/76**	**88/76**	**89/84**	**88/82**
90	94/82	88/76	89/83	88/81
110	**98/93**	**94/89**	**89/82**	**88/81**
132	98/92	94/88	89/82	92/84
160	**98/92**	**94/87**	**94/86**	**92/84**
200	98/91	94/87	94/86	92/84
250	**100/92**	**95/87**	**94/86**	**92/84**
315	100/92	95/87	94/86	/

备注：
Lpa-声压级
Lwa-声功率级
对试距离为1M
在50HZ电源供电下，容差为±3dB

Lpa-sound pressure level
Lwa-sound power level
1M away from the motor
Standard rated output at 50Hz,and the tolerance is ±3dB

铭板信息 Nameplate



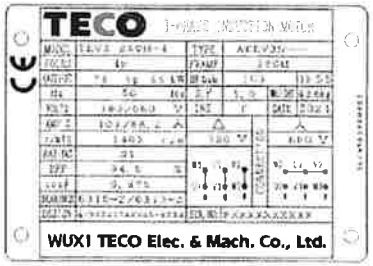


3C铭板





中英文铭板





全英文铭板（仅限外销使用）

轴承温升 Bearing temperature rise

注意!

轴承温升的高低比轴承本身实际温度更能反映出问题的状况。

如果轴承温升过甲太快或是有非常明显的振动或异音，电动机必须立刻停止运转，详细检查何题发生的原因，否则不得重新运转。

如果轴承温升及运转情况都正常的话，电动机必须继续运转直到轴承温度稳定为止，许可的温度值如下:

滚动轴承插入式温度检出器	警告值	跳脱值
轴承测试的温度	95℃	100℃

ATTENTION!

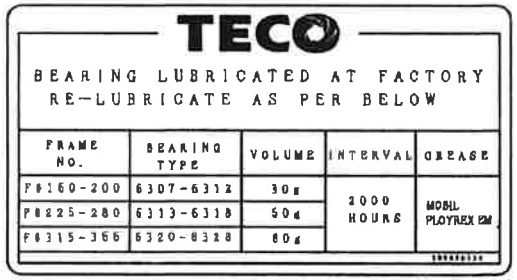
If the rate of rise in temperature is excessive or if the mo tor exhibits excessive vibration or noise,it should be shut down immediately and a thorough investigation made as to the cause before it is operated again.

Following the initial start-up, the bearing temperatures should be closely monitored.The rate of rise in bearing temperature is more indicative of impending trouble than is the actual temperature.

If the bearing temperature rise and motor operation appear to be normal, operation should continue until the bearing temperatures stabilize

Recommended limits on bearing temperatures are as follows:

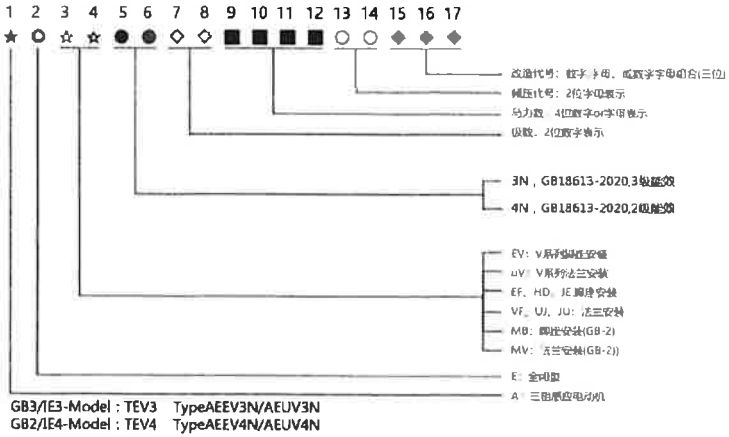
Anti-Friction Bearings.	**Alarm temperature**	**Trip temperature**
By permanently installed detector	**95℃**	**100℃**



标准:F#250开始给油　　润滑油铭板

*F#225及以下给油为特殊指定

产品编号 Product Code



GB3/IE3-Model : TEV3　TypeAEEV3N/AEUV3N

GB2/IE4-Model : TEV4　TypeAEEV4N/AEUV4N

TECO

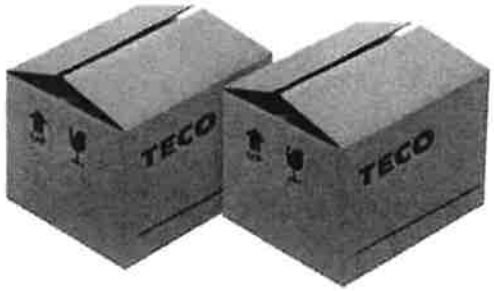
東元產品改造代碼對照表	
15~17碼代號	描述
—	標準
B04	鋁製外蓋，不銹鋼拉不取力出線接380v
B02	出線口向風扇
B03	V系列出線在頂，電出線孔朝左（軸向）
BN-	使用非鐵鑄造風扇
BN5	鋁鐵T箱（兩個出線孔，一個位不設，一個賽頭），鋁製散熱箱，不銹鋼拉不取
CF-	C-Face Flange（法蘭）
D01	出線接低部
FAN	強冷外扇
G01	出線接高部
-H-	出線接
-L1	長引線1000mm，T箱另附，壓接端子
-L2	長引線1500mm，T箱另附，壓接端子
-L3	長引線3000mm，T箱另附，壓接端子
-L4	長引線2000mm，T箱另附，壓接端子
LC-	座腳鋼用（D Flange）—IMB35
LG-	底上油漆
NP-	全英文銘牌
NP1	金屬板不銹，全英文銘牌
NP2	全英文銘牌，出廠標高點
NPF	SKF軸承，全英文銘牌
PA-	IP56
PA5	IP65
PAR	主電機IP56，編碼盒防護IP66，銘板FIP56
Q--	標準（依計劃EV13）
R0-	V系列側出線（與風軸T箱在右）
R1-	V系列側出線（面向風扇T箱在左）
S1-	NSK軸承
S1A	大之軸承
S1F	SKF軸承
SA-	雙出軸
SN2	軸材質鉻鉬鋼
SN3	軸材質鉻鉬鋼，副軸表面
TH-	附電熱器（單相，220V）
TH6	鑄鋁金屬型，加防凝結熱帶
TL-	附熱保護（PTC160）-3PCS/SET
TP-	附熱保護器（145℃）
VS-	自冷變頻規格（二次風冷水+熱保護器-145℃）
VS6	防滴水型，出線口朝風型，自冷變頻規格（二次風冷水+熱保護器-145℃）
W01	戶內型，附防雨罩
Y02	低噪音步，中噪音步
YB9	SKF軸承，中耐壓（B12）
YF5	自冷強制型（無風扇風罩）
YFB	SKF軸承，引線長IM.T箱另附，無罩無罩

包装
Package

TECO

1.纸箱包装

机座号 Fr#80 到 Fr#112 的包装为纸箱，如下图：



2.木条箱包装

机座号 Fr#132到Fr#355的包装为木条箱，如下图：



东元电机的包装也在不断的改进和更新中，如有更改，恕不另行通知。

特性表 Data Sheet

N系列标准电机（Nstandard Motors）

Model: TEV3

380V 50HZ

GB18613-2020GB3(IE3)

2极

OUTPUT				EFFICIENCY			POWER FACTOR			CURRENT		TORQUE						
		FULL LOAD	TRANS NO.	FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD	LOCKED ROTOR	FULL LOAD	LOCKED ROTOR	BREAK UP	BREAK DOWN	SD²	NOISE POWER	WEIGHT
KW	HP	rpm		(%)	(%)	(%)	(%)	(%)	(%)	(A)	%FLC	kg-m	%FLT	%FLT	%FLT	kg-m²	dB(A)	kg
0.75	1	2875	80M	80.7	78.3	75.1	83.5	77.0	65.5	1.69	780	0.254	260	275	335	0.006	78	17.0
1.1	1.5	2870	80M	82.7	83.0	81.3	85.0	78.5	68.5	2.50	800	0.373	300	295	350	0.007	78	18.5
1.5	2	2850	90S	84.2	85.4	85.8	90.5	87.0	78.0	2.99	800	0.512	220	210	280	0.012	78	25.0
2.2	3	2860	90L	85.9	86.7	86.8	89.5	85.0	75.5	4.38	850	0.748	245	235	315	0.014	78	27.5
3	4	2855	100L	87.1	88.3	88.4	90.0	86.5	78.5	5.81	880	1.022	255	240	355	0.025	82	38.0
4	5.5	2875	112M	88.1	89.0	88.9	91.0	87.5	80.0	7.58	950	1.354	270	250	380	0.046	83	48.0
5.5	7.5	2930	132S	89.2	89.6	89.5	88.0	84.0	77.5	10.9	800	1.826	205	205	340	0.075	85	63.0
7.5	10	2920	132S	90.1	90.9	90.8	87.0	84.5	77.5	14.5	725	2.499	185	195	315	0.081	85	66.0
11	15	2935	160M	91.2	92.0	92.0	90.0	89.0	83.5	20.1	775	3.647	230	165	285	0.183	87	105
15	20	2935	160M	91.9	92.0	92.0	89.0	85.5	77.5	27.9	885	4.973	275	230	330	0.205	87	112
18.5	25	2935	160L	92.4	93.0	93.0	90.0	89.5	84.0	33.8	810	6.144	245	200	295	0.237	87	126
22	30	2940	180M	92.7	92.7	92.5	87.0	85.0	77.0	41.4	780	7.281	225	160	275	0.263	88	156
30	40	2950	200L	93.3	93.5	92.5	90.0	90.0	86.5	54.3	775	9.895	200	145	270	0.602	90	236
37	50	2958	200L	93.7	94.5	94.0	91.0	90.5	87.0	65.9	815	12.18	195	145	280	0.733	90	273
45	60	2960	225M	94.0	94.0	93.5	91.0	91.0	85.0	78.8	810	14.78	150	140	290	1.187	92	295
55	75	2970	250M	94.3	94.5	94.0	91.5	90.0	86.5	96.8	800	18.02	150	130	315	1.544	92	416
75	100	2970	280S	94.7	94.0	93.6	92.0	89.0	87.0	134	800	24.61	155	135	300	1.935	94	505
90	125	2970	280M	95.0	95.0	94.0	90.5	90.0	82.5	159	830	29.53	150	135	285	2.483	94	571
110	150	2970	315S	95.2	95.0	94.3	91.0	89.5	85.4	193	834	36.09	230	200	280	3.200	98	786
132	175	2975	315M	95.4	95.1	94.4	91.0	90.5	87.0	231	755	43.24	150	130	280	4.800	98	835
160	215	2975	315L	95.6	95.5	94.5	91.0	90.5	87.0	278	764	52.41	160	140	270	5.200	98	910
200	270	2975	315L	95.8	95.8	94.8	91.0	90.5	86.0	346	735	65.51	150	140	260	8.000	98	1,175
250	335	2975	355M	95.8	95.5	94.6	90.5	89.0	84.0	438	740	81.89	140	115	260	8.800	100	1,414
315	420	2975	355L	95.8	95.5	94.6	91.0	89.0	84.0	548	740	103.2	140	115	260	10.40	100	1,564
355	475	2975	355C	95.8	95.5	94.6	92.0	90.5	85.5	612	840	116.3	120	120	260	16.00	100	2,200
400	540	2975	355C	96.0	96.0	94.8	92.0	91.0	87.5	690	850	131.0	120	120	260	20.00	100	2,550

NOTE: 1. The above are typical values based on test according to GB/T 1032 method B, IEC 60034-2-1:2014.
2. Tolerance according to GB 755, IEC 60034-1
3. Breakdown & Locked rotor torques are show as average expected volteges.
4. Noise : sound power level at no-load, dB(A), Tolerance + 3 dB(A)
5. Data subject to change without notice

特性表 Data Sheet

N系列标准电机（Nstandard Motors）

Model: TEV3

TECO

380V 50HZ

GB18613-2020GB3(IE3)

4极

OUTPUT				EFFICIENCY			POWER FACTOR			CURRENT		TORQUE						
		FULL LOAD	TRANS NO.	FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD	3/4 LOAD	1/2 LOAD	FULL LOAD	LOCKED ROTOR	FULL LOAD	LOCKED ROTOR	BREAK UP	BREAK DOWN	SD²	NOISE POWER	WEIGHT
KW	HP	rpm		(%)	(%)	(%)	(%)	(%)	(%)	(A)	%FLC	kg-m	%FLT	%FLT	%FLT	kg-m²	dB(A)	kg
0.55	0.75	1420	80M	80.8	81.5	79.5	75.0	65	51.0	1.38	640	0.37	300	270	320	0.010	66	18.5
0.75	1	1410	80M	82.5	81.8	79.7	73.5	64.0	50.0	1.88	640	0.518	315	280	335	0.013	66	17.0
1.1	1.5	1430	90S	84.1	84.4	83.2	79.5	71.5	57.5	2.50	720	0.748	255	205	280	0.019	66	25.0
1.5	2	1435	90L	85.3	84.1	82.2	75.0	65.5	51.5	3.56	760	1.017	300	235	335	0.023	66	28.5
2.2	3	1450	100L	86.7	87.3	86.9	81.0	73.5	60.5	4.76	735	1.476	200	160	270	0.045	70	38.0
3	4	1455	100L	87.7	87.7	86.2	78.0	70.5	57.5	6.66	780	2.006	250	240	335	0.052	70	42.0
4	5.5	1445	112M	88.6	88.4	87.9	82.0	76.5	65.5	8.37	715	2.693	245	205	280	0.083	72	47.0
5.5	7.5	1455	132S	89.0	89.4	90.3	85.0	80.5	70.0	11.0	735	3.678	245	205	300	0.132	75	65.0
7.5	10	1450	132M	90.4	90.8	90.4	85.0	80.0	69.5	14.6	780	5.033	270	225	330	0.172	75	79.5
11	15	1460	160M	91.4	92.0	91.5	85.0	81.0	71.0	21.5	775	7.331	230	185	270	0.368	77	113
15	20	1460	160L	92.1	92.5	92.5	85.0	81.5	71.4	28.1	810	9.987	250	195	285	0.480	77	130
18.5	25	1475	180M	92.8	94.0	93.8	86.0	82.4	75.0	35.7	790	12.20	215	160	255	0.704	80	165
22	30	1475	180L	93.0	93.5	93.0	85.0	81.8	74.1	42.3	785	14.51	190	145	245	0.789	80	176
30	40	1470	200L	93.6	94.5	94.5	86.0	84.5	77.0	56.6	830	19.85	250	205	280	1.451	83	256
37	50	1480	225S	93.9	94.5	94.0	85.5	82.0	73.0	70.0	760	24.33	210	175	300	1.896	84	290
45	60	1480	225M	94.2	94.5	94.6	85.0	80.0	70.4	85.4	735	28.98	210	175	290	1.979	84	319
55	75	1485	250M	94.6	94.6	94.0	87.5	84.5	77.0	101	780	36.04	210	185	265	3.911	85	426
75	100	1480	280S	95.0	95.0	94.6	86.0	82.0	73.0	141	770	49.36	160	150	300	5.033	88	545
90	125	1480	280M	95.2	95.2	94.7	85.0	81.0	71.3	169	780	59.28	175	165	300	6.112	86	615
110	150	1480	315S	95.4	95.2	94.8	88.0	86.5	80.5	198	725	72.43	210	180	270	7.600	84	916
132	175	1485	315M	95.6	95.5	94.8	88.0	87.5	83.0	238	700	86.62	180	170	230	10.40	94	895
160	215	1482	315L	95.8	95.8	94.8	88.0	87.0	83.5	289	700	105.2	180	170	230	11.60	94	1,055
200	270	1485	315L	96.0	95.6	95.2	88.0	87.0	84.5	360	700	131.2	180	170	230	14.00	94	1,215
250	335	1485	355M	96.0	95.8	96.3	87.0	84.5	77.5	455	740	164.1	150	170	230	27.80	95	1,564
315	420	1487	355L	96.0	95.8	95.3	87.0	84.5	77.5	573	740	206.4	180	170	260	31.20	95	1,764
355	475	1485	355C	96.0	95.8	95.3	89.0	87.5	81.0	631	780	233.0	200	180	280	35.80	95	2,350
400	540	1487	355C	96.0	95.8	95.3	89.5	88.0	83.0	707	780	262.1	200	180	260	42.80	95	2,630

NOTE: 1. The above are typical values based on test according to GB/T 1032 method B, IEC 60034-2-1:2014.
2. Tolerance according to GB 755, IEC 60034-1.
3. Breakdown & Locked rotor torques are show as average expected volteges.
4. Noise : sound power level at no-load, dB(A), Tolerance + 3 dB(A)
5. Data subject to change without notice

Project : Proposed Development at Ma Wan Park Phase II, Ma Wan
(To be known as Ma Wan Lot No. 739, Ma Wan Village)

Equipment Schedule

12c. Extraction Fan

Manufacturer	WINFAN
Country of Origin	China
Model	HF151B-3KW
Flow rate	0.46m^3/sec vs 2000Pa
Power transmission	Belt driven
Casing / Impeller	FRP
Shaft materials	SS316L
Motor mounting frame	SS316L
Fan base frame	SS41 with Epoxy painting
Bolt and nuts	SS316
Motor	TECO
Model	TEV3/100L-3KW-4P-B3
Frame size	100L
Operating Voltage	380VAC / 3 ph / 50Hz
Motor rating	3 kW
No of pole	4
Speed	1455RPM
IP rating	55
Insulation Class	F
Efficiency Class (IEC)	IE3
Fan and Motor weight (kg)	200 kg

Chapter One Main parameter

Main Parameters/Model		ZLMD-1
Process Air	Rated Airflow（m^3/h）	150
	Process ESP（Pa)	/
	Process Motor Power (kW)	0.12
Reactivation Air	Rated Airflow（m^3/h）	50
	Process ESP（Pa)	/
	React. Motor Power (kW)	0.037
Drive Motor	Motor Power (kW)	0.015
Reactivation Mode	Electric, Max Power(kW)	1.0
	Steam Pressure(Mpa)	/
	Steam, Steam Consumption（kg/h)	/
Installed Power	Electric Heating Mode (kW)	1.172
	Steam Heating Mode (kW)	/
Moisture Removal (kg/h)		0.6
Power source		220V/50Hz, 1phase
Approx. Size (L*W*H) mm		572×420×420
Approx. Weight(kg)		30
Latent heat temperature rise (kW/h)		**0.9~1.1**
Note	1. The desiccant dehumidifier will carry latent heat temperature rise to the dry room, please add the cooling capacity of the A/C to overcome the heat. 2. We provide the whole dehumidifier, users should provide the electricity for the reactivation of the dehumidifier, and also purchase and install the air pipe system themselves.	

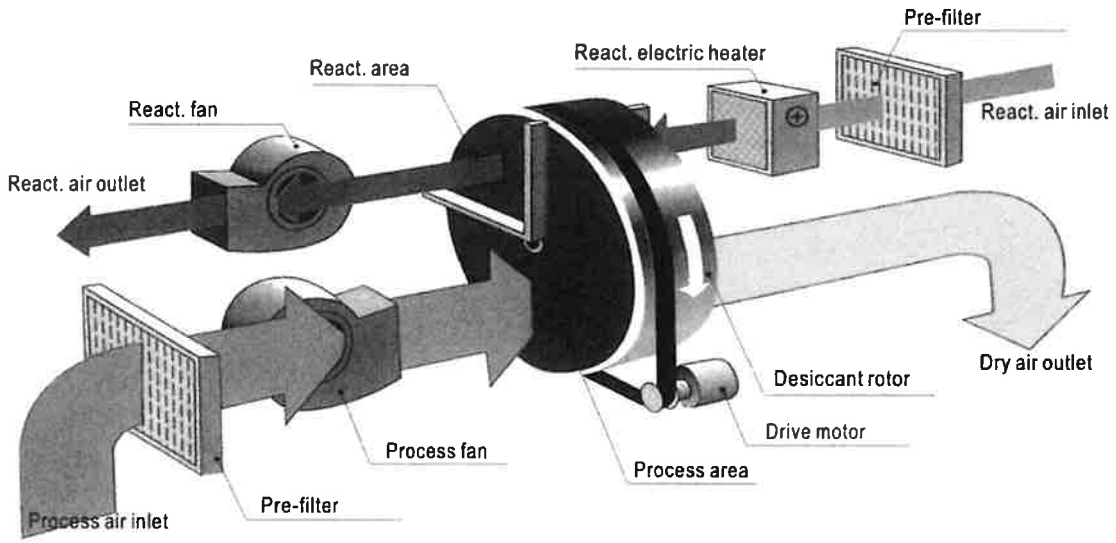
Chapter Two Structure and Work Principle

The core component of rotary dehumidifier is the 8-16 hour spin in turn densely cellular Conde desiccant wheel. The desiccant wheel on both sides by high-performance silicon fluorine rubber seals along the entire surface of the radial will be divided into 270 ° of the treatment area and 90 ° of the regeneration zone, when the moist air comes into the processing area, the air moisture in the desiccant wheel was adsorbed into dry air, dry air meet the need of dry place or gas production process.

With the increases of absorptive water in the absorption process, desiccant wheel gradually loss of moisture absorption capacity. In order to maintain constant moisture absorption capacity, rotary should be regenerated. So, tending to saturation the drive wheel driven by the motor slowly turns into the regeneration area, regeneration restored.

Heated to 100-140℃, the regeneration air and deal with the wind in the opposite direction enters into the regeneration zone, the moisture desorption in the wheel takes exhausted to outside by renewable wind. Desiccant wheel restore moisture absorption capacity and under the drive of low-level driver enters into the handling area to process and absorb the wind again.

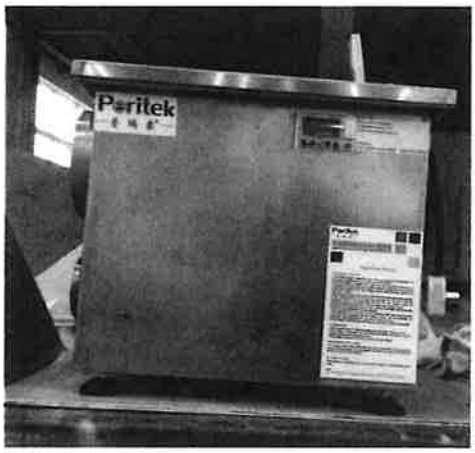
When wheel rotate constantly, dehumidify and regeneration continues. Thus, exporting the constant humidity and dry air won't stop.

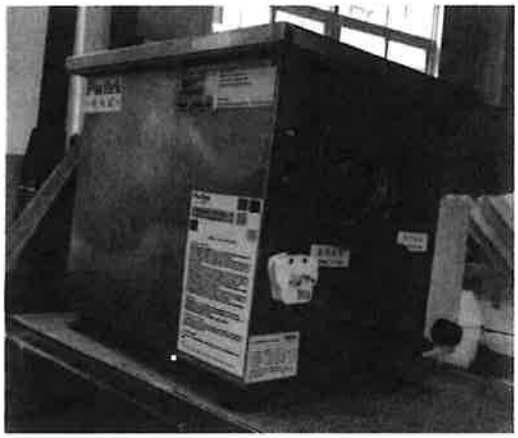


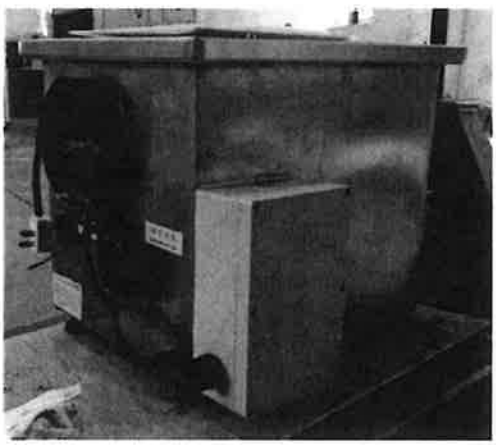
Chapter Three Main Components

Name	Manufacturer
Desiccant rotor	PURESCI, USA
Process fan	Hangzhou Dunli or equal
Reactivation fan	Hangzhou Dunli or equal
Reducer	JIAXUE GROUP or equal
Cabinet	Stainless Steel 316
Temperature and humidity probe	EYC

Pictures:

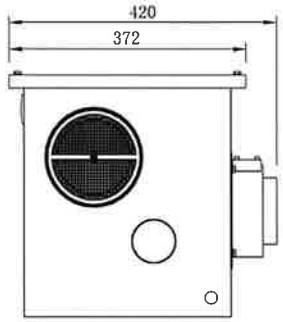


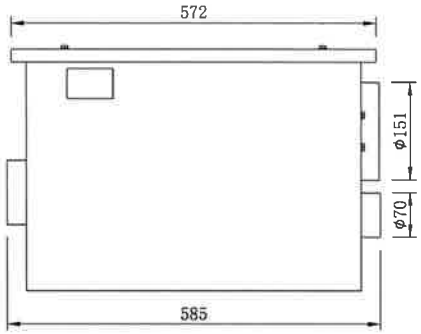


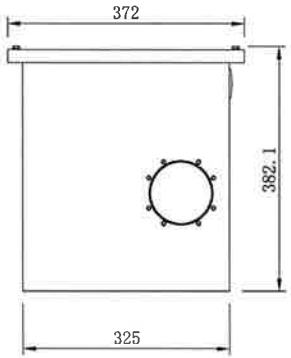


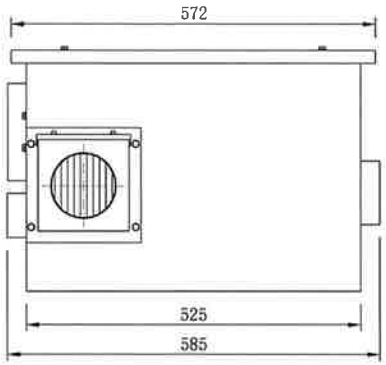


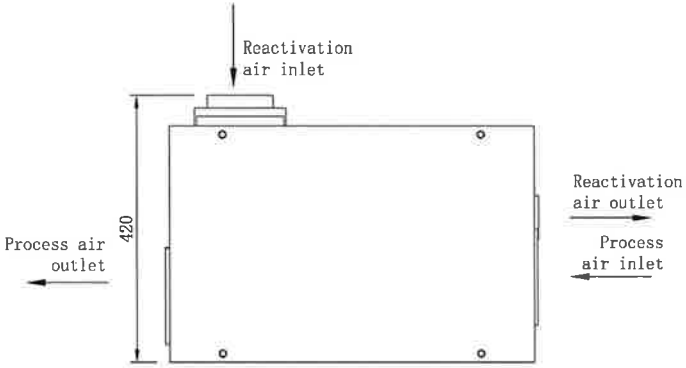
尺寸分段	0.5-6	>6-30	>30-120	>120-400	>400-1000	>1000-2000
未注公差值	±0.1	±0.2	±0.3	±0.5	±0.6	±1.2

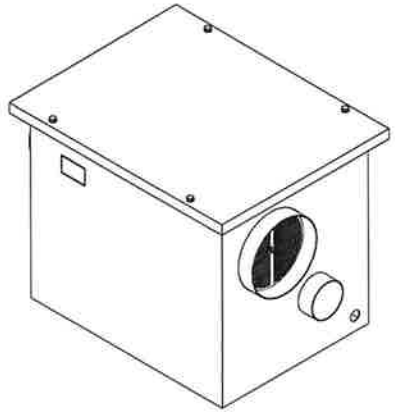












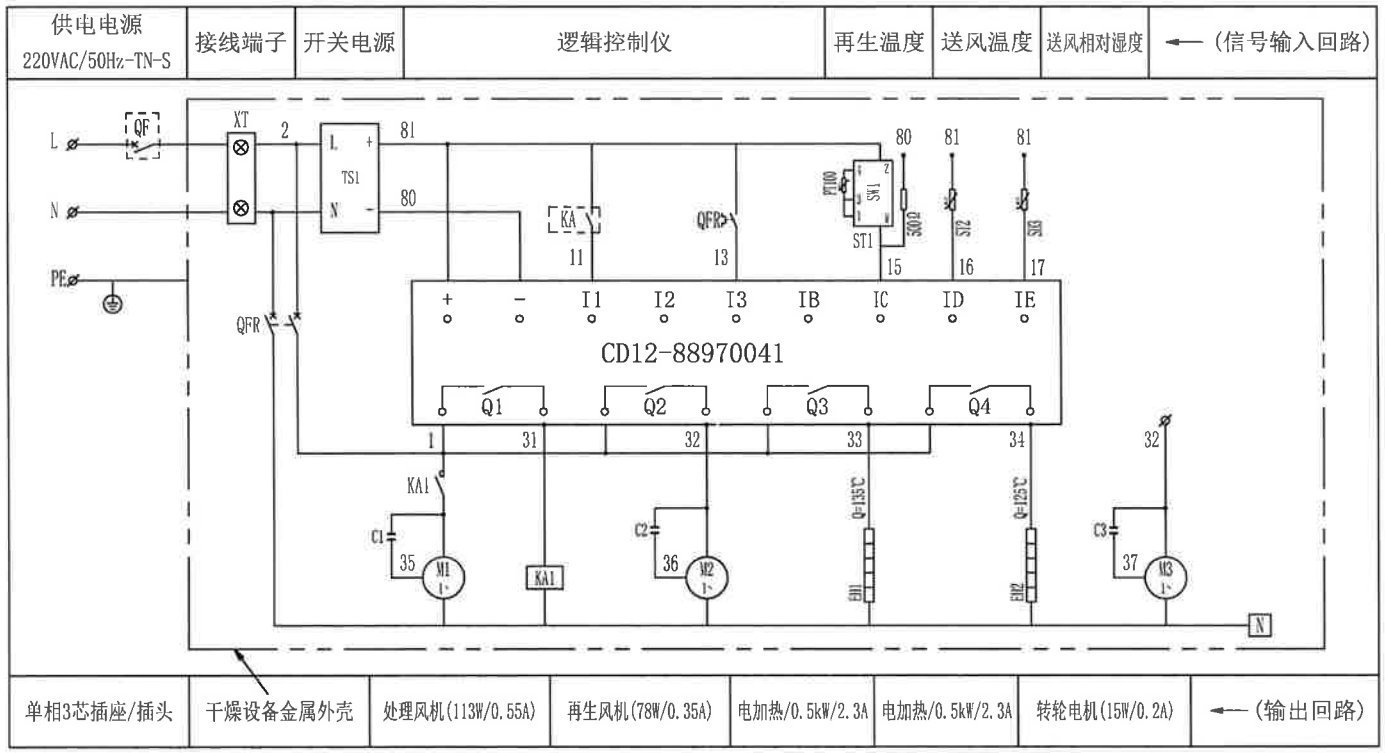
Rated process airflow, m³/h	150
Rated react, airflow, m³/h	50
React, heating power, kW	1.0
Process fan power, kW	0.12
React, fan power, kW	0.037
Rated dehumidify capacity, kg	0.6
Overall dimensions, mm	585×420×382

01	Agu30	2ed issue	Liao	Dong	Zhou	SUS316
00	Agu24	1st issue	Liao	Dong	Zhou	
REV.	Date	Revision	Drawn	Checked	Released	
设计			标准化			阶段标志 / 重量 / 比例 1:5
审核						共 页 第 页
工艺			批准			

HZ PERITECH

Outside drawing

ZLMD-1



XT1：电控柜接线端子

1	2	3	4	5	6	7	8
QFR		KA1		KA			
60	61	62	63	81	11		
报警信号		运行信号		开关机信号			



注：“QFR”为无源开关报警信号（断开--报警，闭合--复位）

备注：“QFR”用户实际接收信号（断开--复位，闭合--报警）



注：“KA” 为远程开关机信号，由用户提供无源接点（闭合--开机，断开--停机）



说明：1、供电电源为TNS或TNCS系统，电源侧装空气断路器；

2、用户必须选用单相三极电源插座，要求电源插座的接地保护线必须与合格的接地装置作永久的可靠电气连接，插座的永久保护接地线的截面应≥2.5mm² 铜芯线；

注意：严禁在设备运行时拔插头，若要使设备停止运行，则应按下按钮，等设备停机后，方可拔下插头。

普瑞泰® Peritek

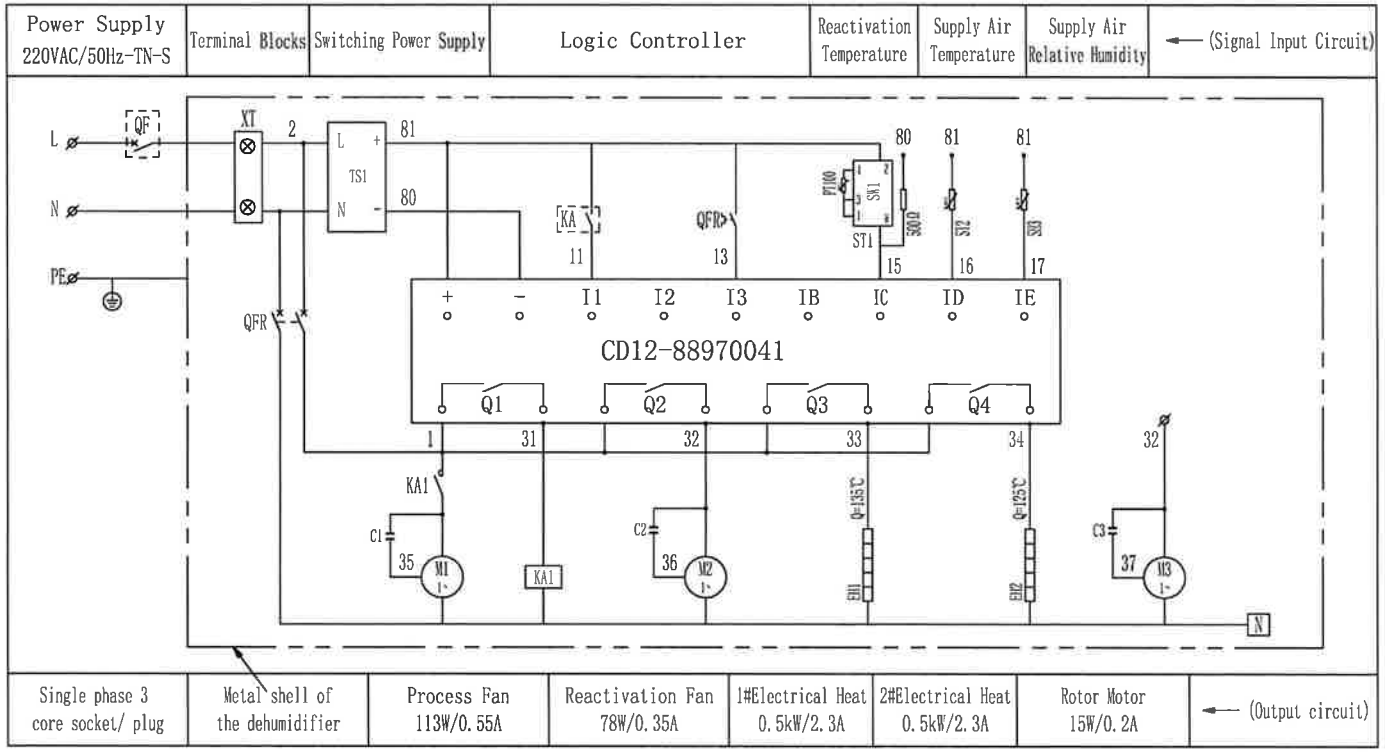
设计			标准化		
审核					
工艺			批准		

阶段标志	重量	比例
共 页	第 页	

杭州普瑞除湿设备有限公司

电气原理图

ZLMD-1



XT: Electric Control Cabinet Terminal Blocks

1	2	3	4	5	6	7	8
QFR		KA1		KA			
60	61	62	63	81	11		

Fault Signal　Running Signal　Remote On/off Signal

Fault Signal
QFR
60 — 61

Note: "QFR" is passive fault alarm signal(on--alarm, off--reset)

Remote On/off Signal
81 — KA — 11

Note: "KA" is remote on/off signal, users provide the passive contact. (on--start, off—stop)

Running Signal
KA1
62 — 63

Description:

1. The power supply is TNS or TNCS system, power supply should be installed with air circuit breaker.
2. The user must use single-phase three-pole socket, grounding protection wire of the power socket must be connected to the qualified grounding device constantly and reliably. The section of grounding protection wire electrical connections, socket of permanent protection grounding line cross should should ⩾2.5mm copper wire;

Note: it is strictly prohibited to pull the plug at run time, to stop running equipment you should press the button.

普瑞泰® Peritek

设计			标准化		
审核					
工艺			批准		

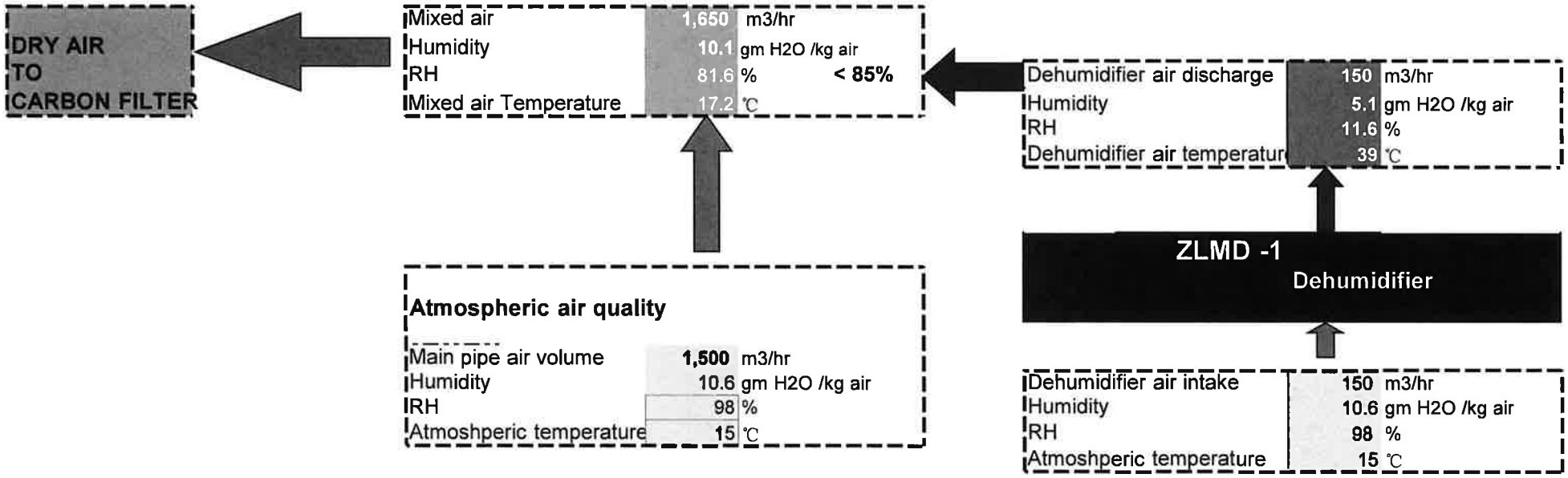
阶段标志	重量	比例
共　页　第　页		

HZ Peritech Dehumidifying Equipment Co., Ltd

Electronic Schematic Diagram

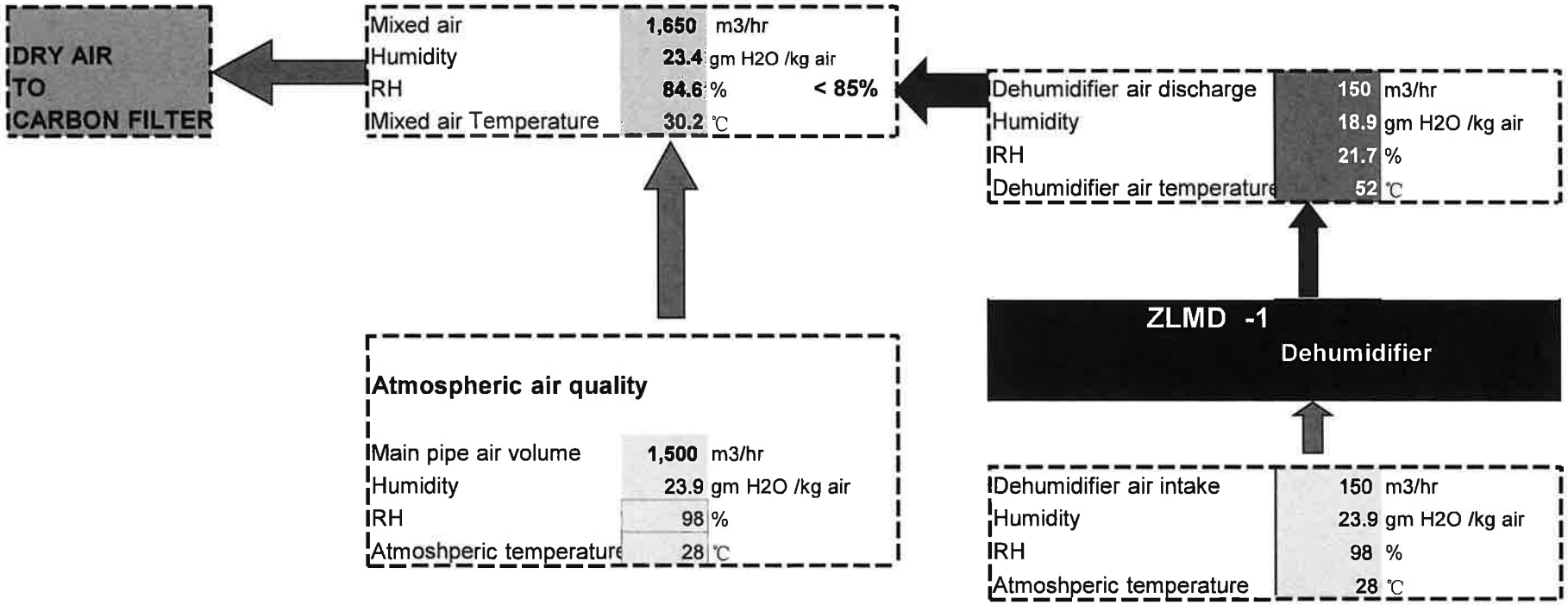
ZLMD-1

Calculation on the process air temperature and moisture content upstream the carbon filter (MWP2)



Lower Temperature

Calculation on the process air temperature and moisture content upstream the carbon filter (WMP2)



Higher Temperature

Project : Proposed Development at Ma Wan Park Phase II, Ma Wan
(To be known as Ma Wan Lot No. 739, Ma Wan Village)

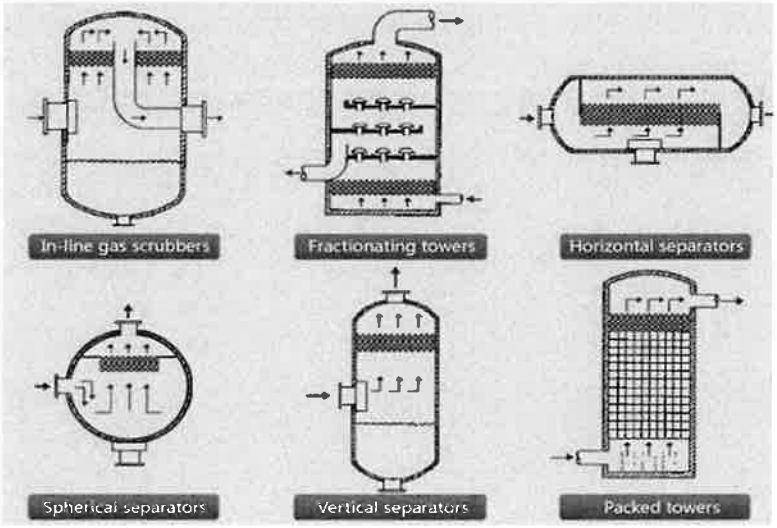
Equipment Schedule

12d. Dehumidifier

Manufacturer	Peritech
Country of Origin	China
Model	ZLMD-1
Type	Desiccant wheel
Material of construction	316 Stainless steel
Location	Indoor
Rated process air (m^3/h)	150 max
Electric power rating (kW)	1.5
Dehumidify capacity (kg/h)	1.5
Power input	220V/ 50Hz/ 1phase
Overall dimension (mm)	572L x 420W x 420H
Weight (Kg)	30

Mesh Mist Eliminator or Demister is a kind of vapor liquid separating device. It is widely used in the chemical, petroleum, medical, light, metallurgy and environmental protection industries. Rage sourced Mesh mist eliminator for a chemical scrubber or biofilter for odor control purpose shall be capable to separate 98- 99% liquid drop with diameter 5-10 microns at velocity of 1-5m/s.

Typical installation of demister



Forms available : Disc, Cube

Standard materials :

Metallic :- 321SS, 304SS, 316SS, Titanium

Non-metallic : - PTFE, Nylon yarn, PVC, Poly proplene

Other materials : Consult factory

Size : To order, made to fit the tower or vessel



P.P Mesh Demister (Poly propylene)



P.P Mesh Demister (Poly propylene)



P.P Mesh Demister (Poly propylene)



SUS Mesh Demister (SUS316L)



SUS Mesh Demister (SUS304)

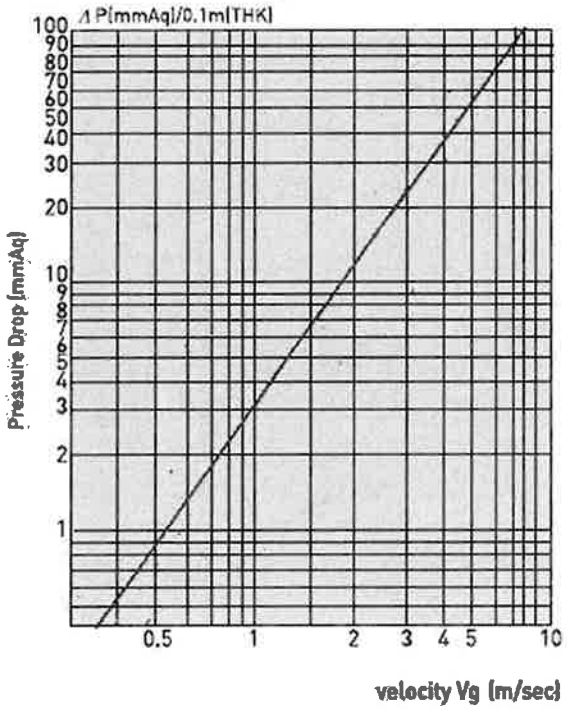


SUS Mesh Demister (SUS316)

Technical data of Mesh mist eliminator

Density (Kg/m^3)		Free area (%)		Surface area (m^2/m^3)		Equivalent Style		
SS	PP	SS	PP	SS	PP	Dae Shin	York	GOTO Shoji
193	42	97.6	95.4	378	690	DSM193	421	S370

The mist eliminator has high collection efficiency and low pressure drop. The following is chart for pressure Drop vs Air velocity.



Project : Proposed Development at Ma Wan Park Phase II, Ma Wan
(To be known as Ma Wan Lot No. 739, Ma Wan Village)

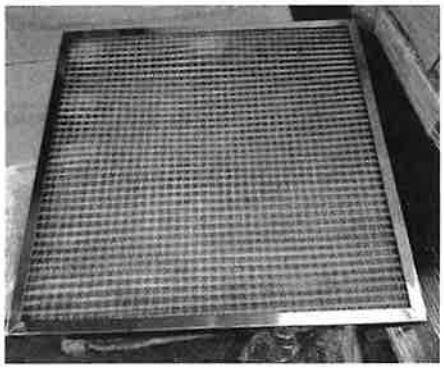
Equipment Schedule

12e. Mist Eliminator

Manufacturer	RAGE
Type	Mesh
Materials	316 stainless steel
Size (mm)	600 x 600
Mesh thickness (mm)	100
With grid thickness (mm)	150
Face velocity (m/s)	1.27
Removal efficiency	98-99% on 10 microns droplet
Housing for mist eliminator	Combined with pre-filter (see details in Pre-filter schedule)

ATF
AIRTENGGROUP

Introduction of 'ATF' air filter:



Product : Multi-layers air filter

Nominal size : 600 * 600 * 50mm (standard)
Measurement : 595 * 595*44mm
other size available on request.

Material :-
Frame : Aluminum (standard)
316SS (available on request)
Filter material : 316SS mesh washable
Efficiency : 40%
Static pressure : 60pa-80pa
Nominal air flow : 3,500m^3/h

Design features
Design for capture of bigger size dust and ash
Low head loss
Light and compact
Washable for reuse
Comply to ASHRAE 52-76, removal efficiency 40%

Applications :-
Pre-filter of air conditioning system
Pre-filter of a multi filtration system
Filter for air containing organic solvent

Project：Proposed Development at Ma Wan Park Phase II, Ma Wan
(To be known as Ma Wan Lot No. 739, Ma Wan Village)

Equipment Schedule

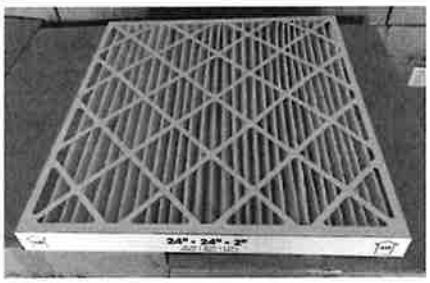
12f. Pre-filter

Manufacturer	ATF
Type	Pre-filter
Frame material	316SS
Filter material	316SS mesh
Size (mm)	600 x 600
Filter thickness (mm)	50
Face velocity (m/s)	1.27
Max. working temperature (℃)	100
Standard	ASHRAE 52-76
Removal Efficiency (%)	40
Material	316 stainless steel
Overall size (mm)	671 x 608 x 660L
End connections	Flange

ATF
AIRTENGGROUP

Introduction of 'ATF' air filter:





Product : Surface Pleated Panel Filter
Nominal size : 600 * 600 * 50mm (stock item)
Measurement : 595 * 595*44mm
other size available on request.

Material :-
Frame : Board frame (standard)
Aluminium /316SS (available on request)
Filter material : Synthetic, electrostatically charged media
Efficiency : 90 %
Initial static pressure : 50pa-80pa depends on velocity

Characteristics

- High initial efficiency and lower initial resistance
- Expanded metal pleat support grid laminated to the media pack to increase rigidity and help maintain proper spacing between pleats.
- Easy for handling

Applications

Capture for 0.5 μm and up fine particulate
Air conditioning system

Project : Proposed Development at Ma Wan Park Phase II, Ma Wan
(To be known as Ma Wan Lot No. 739, Ma Wan Village)

Equipment Schedule

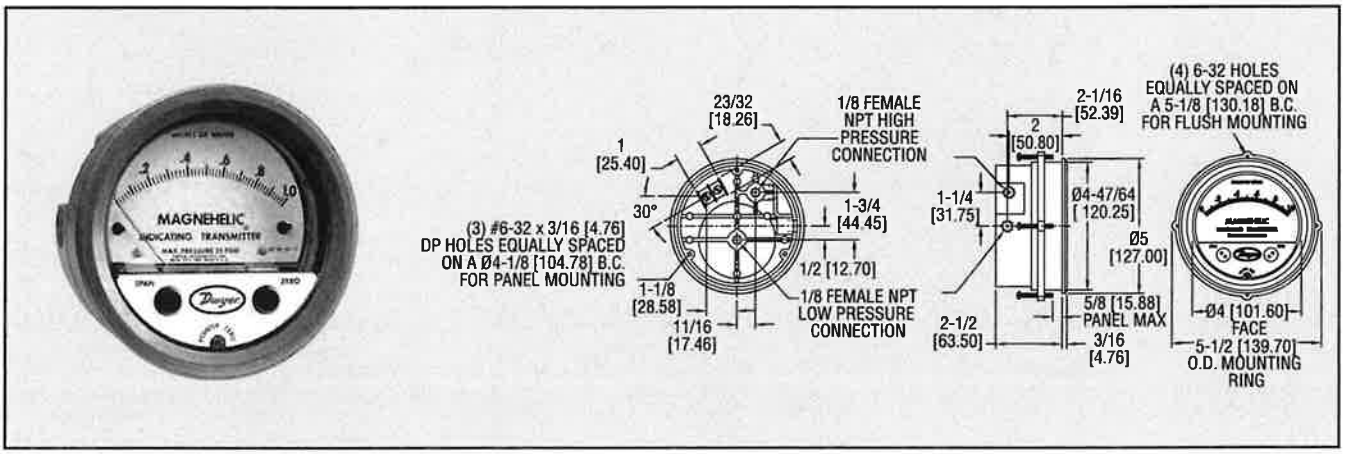
12g. After-filter

Manufacturer	ATF
Type	After-filter
Frame material	Paper
Filter material	Synthetic
Size (mm)	600 x 600
Filter thickness (mm)	50
Face velocity (m/s)	1.27
Max. working temperature (℃)	80
Standard	EN779 - G4
Removal Efficiency (% of particulate)	90
Material	316 stainless steel
Overall size (mm)	671 x 608 x 500L
End connections	Flange

Series 605

Magnehelic® Differential Pressure

Indicating Transmitter



The Series 605 Magnehelic® Indicating Transmitter provides for both visual monitoring and electronic control of very low differential pressure. The Series 605 is ideal for control applications in building HVAC systems where local indication is desired during routine maintenance checks or necessary when trouble shooting the system. The easily read dial gage is complimented by the two-wire, 4-20 mA control signal utilizing the time-proven Dwyer® Magnehelic® gage mechanical design and Series 600 transmitter technology. The 2-wire design with terminal strip on the rear simplifies connection in any 4-20 mA control loop powered by a 10-35 VDC supply.

Model	Range in w.c.	Maximum Pressure	Electrical Accuracy +/-%	Mechanical Accuracy +/-%
605-00N	.05-0-.20	25 psi (1.7 bar)	2	4
605-11	.25-0-.25	25 psi (1.7 bar)	2	3
605-0	0-.50	25 psi (1.7 bar)	2	3
605-1	0-1.0	25 psi (1.7 bar)	2	2
605-2	0-2.0	2 psi (13.79 kPa)	0.5	2
605-3	0-3.0	2 psi (13.79 kPa)	0.5	2
605-6	0-6.0	2 psi (13.79 kPa)	0.5	2
605-10	0-10	2 psi (13.79 kPa)	0.5	2
605-20	0-20.0	11 psi (75.8 kPa)	0.5	2
605-30	0-30	11 psi (75.8 kPa)	0.5	2
605-50	0-50	11 psi (75.8 kPa)	0.5	2
	Range in Pa			
605-60PA	0-60	25 psi (1.7 bar)	2	4
605-125PA	0-125	25 psi (1.7 bar)	2	3
605-250PA	0-250	25 psi (1.7 bar)	2	2
605-500PA	0-500	2 psi (13.79 kPa)	0.5	2

ACCESSORIES

A-298, Flat Aluminum Bracket - for flush mounting
A-370, Mounting Bracket - flush mount Series 605 Transmitter in bracket. Bracket is then surface mounted. Steel with gray hammertone epoxy finish

OPTION

For NIST traceable calibration certificate, add suffix -NIST to model numbers. Example: 605-3-NIST.

See page 567 for process tubing options.
See page 568 for static fitting options.

SPECIFICATIONS

GAGE SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Accuracy: See chart.
Stability: ±1% FS/yr.
Pressure Limits: See chart.
Temperature Limits: 20 to 120°F (-6.67 to 48.9°C).
Process Connections: 1/8" female NPT.
Size: 4" (101.6 mm) dial face, 5" (127 mm) OD x 2-11/16" (68.3 mm).
Weight: 1 lb, 12.6 oz (811 g).
Agency Approvals: CE.

TRANSMITTER SPECIFICATIONS

Accuracy: See chart (includes linearity, hysteresis, repeatability).
Temperature Limits: 20 to 120°F (-6.67 to 48.9°C).
Compensated Temperature Range: 32 to 120°F (0 to 48.9°C).
Thermal Effect: ±0.025% FS/°F (0.045% FS/°C).
Power Requirements: 10-35 VDC (2-wire).
Output Signal: 4 to 20 mA.
Zero and Span Adjustments: Protected potentiometers.
Loop Resistance: DC; 0-1250 Ω max.
Current Consumption: DC; 38 mA max.
Electrical Connections: Screw terminal block.
Mounting Orientation: Diaphragm in vertical position. Consult factory for other position orientations.

Project : Proposed Development at Ma Wan Park Phase II, Ma Wan
(To be known as Ma Wan Lot No. 739, Ma Wan Village)

Equipment Schedule

12h. Differential Pressure Gauge

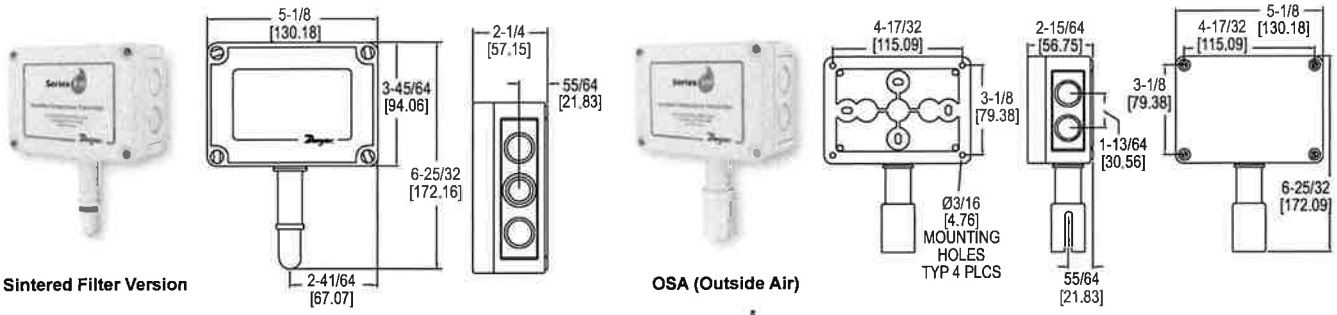
Manufacturer	DWYER
Country of Origin	USA
Type	Magnehelic DP Indicating Transmitter
Model	605-1.5KPa – 1 no 605-250Pa – 1 no 605-125Pa – 1 no
Measuring range	0 – 1500Pa (for carbon bed) 0 – 250Pa (for prefilter and demister) 0 - 125Pa (for after filter)
Accuracy	Electrical : +/- 0.5% Mechanical : +/-2%
Size	4" dial face
Display	Pointer
Connection	1/8" NPT (F) and 6mm PE tubing
Output signal	4-20mADC
Power requirement	10-35VDC (2-wire)

Dwyer

SERIES RHP

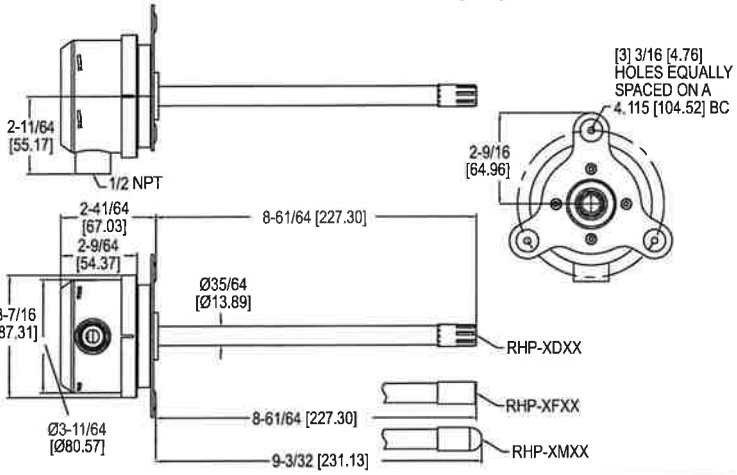
HUMIDITY/TEMPERATURE TRANSMITTER

Passive Temperature Outputs, Sintered Filter Options




Duct Mount


Duct Sintered



The **SERIES RHP** Temperature and Humidity Transmitter combine the voltage or current humidity transmitter output with a passive temperature thermistor or RTD output. Featuring polymer capacitance humidity sensors, models are available with 2%, 3% or 5% accuracies. Duct mounted transmitters are available with an optional two-line alpha numeric LCD display.

FEATURES/BENEFITS

- 2%, 3%, or 5% accuracy models
- Optional LCD display on duct mount models
- Radiation shield option for outdoor installation in direct sunlight

APPLICATIONS

- Air economizers
- Outdoor temperature and relative humidity reference
- Pool room humidity monitoring

MODEL CHART

Example	RHP	-2	D	1	A	-LCD	RHP-2D1A-LCD
Series	RHP						RH/passive temperature sensor transmitter
Accuracy		2					2% accuracy
		3					3% accuracy
		5					5% accuracy
Housing Type			D				Duct mount w/ membrane filter
			F				Duct mount w/ SS sintered filter
			M				Duct mount w/ HDPE filter
			O				OSA (outside air)
			S				OSA w/sintered filter*
			R				Radiation shield
RH Output				1			4 to 20 mA
				2			0 to 10 V
				3			0 to 5 VDC
Temperature Sensor					0		None
					1		4 to 20 mA
					2		0 to 10 VDC
					3		0 to 5 VDC
					A		10K @ 25°C thermistor type III
					B		10K @ 25°C thermistor type II
					C		3K @ 25°C thermistor
					D		100 Ω RTD DIN 385
					E		1K Ω RTD DIN 385
					F		20K Ω @ 25°C thermistor
Options						LCD	LCD display
						NIST	NIST traceable calibration certificate

*Use OSA with sintered filter models when purchasing Series RHRS radiation shield separately.

SPECIFICATIONS

Relative Humidity Range: 0 to 100% RH.
Temperature Range: -40 to 140°F (-40 to 60°C).
Accuracy, RH: RHP-2XXX ±2% 10-90% RH @ 25°C; RHP-3XXX ±3% 20-80% RH @ 25°C; RHP-5XXX ±5% 20-80% RH @ 25°C.
Accuracy, Thermistor Temp Sensor: ±0.2°C @ 25°C (±0.36°F @ 77°F).
Accuracy, RTD Temp Sensor: DIN Class B; ±0.3°C @ 0°C (±0.54°F @ 32°F).
Accuracy, Solid State Band Gap: ±0.9°F @ 77°F (±0.3°C @ 25°C).
Hysteresis: ±1%.
Repeatability: ±0.1% typical.
Temperature Limits: -40 to 140°F (-40 to 60°C).
Storage Temperature: -40 to 176°F (-40 to 80°C).
Compensated Temperature Range: -4 to 140°F (-20 to 60°C).
4 to 20 mA Loop Powered Models: Power requirements: 10 to 35 VDC; Output signal: 4 to 20 mA.
0-5/10V Output Models: Power requirements: 15 to 35 VDC or 15 to 29 VAC; Output signal: 0 to 10 V @ 5 mA max.
Solid State Band Gap Temperature Sensor Output Ranges: Switch selectable, -20 to 140°F (-28.9 to 60°C); 0 to 100°F (-17.8 to 37.8°C); 40 to 90°F (4.4 to 32.3°C); -4 to 140°F (-20 to 60°C).
Response Time: 15 seconds.
Electrical Connections: Removable screw terminal block.
Conduit Connection: Duct mount: 1/2" NPS; OSA: 1/2" (22.3 mm).
Drift: < 1% RH/year.
RH Sensor: Capacitance polymer.
Temperature Sensor: Types 1, 2, 3: Solid state band gap; Curves A, B, C: Thermistor; Curves D, E: Platinum RTD DIN 385.
Enclosure: Duct mount: PBT; OSA: Polycarbonate.
Enclosure Rating: Duct mount: NEMA 4X (IP66) for housing only; OSA: NEMA 4X (IP66).
Display: Duct mount only, optional 2-line alpha numeric, 8 characters/line.
Display Resolution: RH: 0.1%; 0.1°F (0.1°C).
Weight: Duct mount: .616 lb (.3 kg); OSA: 1 lb (.45 kg).
Agency Approvals: CE.
Warranty: 5 year limited warranty.

Project : Proposed Development at Ma Wan Park Phase II, Ma Wan
(To be known as Ma Wan Lot No. 739, Ma Wan Village)

Equipment Schedule

12i. RH Transmitter

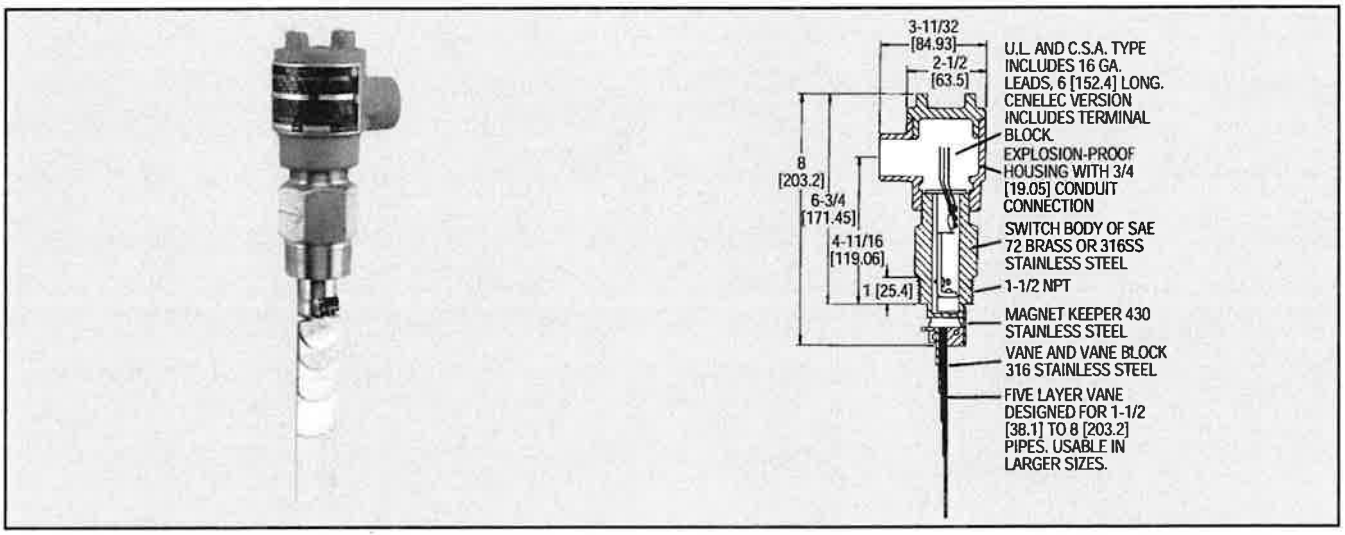
Manufacturer	Dwyer
Country of Origin	USA
Model	RHP-3D11
RH Range	0-100% RH
Temperature Range	-40 to 60℃
Accuracy	+/- 3% @20-80% RH @25℃ +/- 0.2℃ @25℃
Repeatability	+/- 0.1% typical
Response time	15 sec
Output signal	4 – 20mADC
Power requirement	10 – 35VDC
Mounting	Duct mount
Conduit connection	½" NPT (F)
Quantity	1 no

Series V4

FLOTECT® Vane Operated Flow Switch

Field Adjustable – Dependable Protection Against Flow Variation or Stopping in Pipelines for Fluids, Gases and Flowing Solids

Flow



Rugged and reliable the Series V4 Flotect® flow switch operates automatically to protect equipment and pipeline systems against damage from reduction or loss of flow. The V4 is time tested being installed in thousands of pipelines and processing plants around the world. A unique magnetically actuated switching design gives superior performance. There are no bellows, springs, or seals to fail. Instead, a free-swinging vane attracts a magnet within the solid metal switch body, actuating a snap switch by means of a simple lever arm.

FEATURES

- Leak proof body machined from bar stock
- Choice of custom vane calibrated for your application, Model V4, or field adjustable multilayer vane, Model V4-2-U (see set point chart)
- Weatherproof, designed to meet NEMA 4
- Explosion-proof (listing included in specifications)
- Installs directly and easily into pipeline with a thredolet, tee, or flange (see application drawings)
- Can be used in pipes 1-1/2" and up
- Electrical assembly can be easily replaced without removing the unit from installation so that the process does not have to be shut down
- High pressure rating of 1000 psig (69 bar) with the brass body and 2000 psig (138 bar) with the 316 SS body

APPLICATIONS

- Protects pumps, motors and other equipment against low or no flow
- Controls sequential operation of pumps
- Automatically starts auxiliary pumps and engines
- Stops liquid cooled engines, machines and processing when coolant flow is interrupted
- Shuts down burner when air flow through heating coil fails
- Controls dampers according to flow

Model	Description
V4-2-U	Brass body, universal vane
V4-SS-2-U	316SS* body, universal vane
V4	Brass body, custom vane
V4-SS	316SS* body, custom vane

*316SS body with 430SS magnet keeper.

Consult factory for price and availability of fittings for V4 installation. Thredolets, bushings, and tees are available in a variety of sizes and materials.

For custom vane models, please supply factory with following information: pipe size, flow direction (horizontal, up), mounting, pressure, temperature, specific gravity, flow rates (maximum normal, actuation/deactuation*), etc.
*When both values are supplied, note which is critical.

SPECIFICATIONS

Service: Gases or liquids compatible with wetted materials.
Wetted Materials:
Vane: 316 SS.
Body: Brass or 316 SS standard.
Magnet Keeper: 430 SS standard, 316 SS optional.
Options: Other materials also available, consult factory (e.g. PVC, Hastelloy, Nickel, Monel, Titanium).
Temperature Limit: -4 to 275°F (-20 to 135°C) standard, MT high temperature option 400°F (205°C) [MT option not UL, CSA, ATEX, or SAA].
Pressure Limit: Brass body 1000 psig (69 bar), 316 SS body 2000 psig (138 bar), optional 5000 psig (345 bar) available with 316 SS body and SPDT switch only.
Enclosure Rating: Weatherproof (meets NEMA 4 (IP65)) and Explosion-proof. Listed with UL and CSA for Class I, Groups C and D; Class II, Groups E, F, and G. ATEX CE 0344 Ex II 2 G EEx d IIB T6 -20°C≤Tamb≤75°C; EC-Type Certificate No.: KEMA 03ATEX 2383; SAA: Exd II C T6 (T amb=60°C). Zone I. Also FM approved.
Switch Type: SPDT snap switch standard, DPDT snap switch optional.
Electrical Rating: UL, FM, ATEX and SAA models 10A @ 125/250 VAC (V~). CSA models: 5A @ 125/250 VAC (V~); 5A res., 3A ind. @ 30 VDC (V⎓). MV option: 1A @125 VAC (V~); 1A res., .5A ind. @ 30 VDC (V⎓). MT option: 5A @ 125/250 VAC (V~). [MT and MV option not UL, CSA, FM, ATEX or SAA].
Electrical Connections: UL and CSA models: 16 AWG, 6" (152 mm) long. ATEX and SAA unit: Terminal block.
Conduit Connection: 3/4" female NPT.
Process Connection: 1-1/2" male NPT.
Mounting Orientation: Within 5° of vertical for proper operation. Units for horizontal installation (vertical pipe with up flow) available.
Set Point Adjustment: For universal vane: five vane combinations.
Weight: 4 lb 8 oz (1.9 kg).
Agency Approvals: UL, CSA, CE, FM, SAA, and ATEX.

OPTIONS (add as a suffix to the model number):
-D, DPDT contacts
-MV, Gold Plated Contacts, options for dry circuits (see electrical rating in specification, no listings or approvals)
-MT, High Temperature, option rated 400°F (204°C) (see electrical rating in specifications, no listings or approvals)
-TRI (increasing flow), -TRD (decreasing flow), Time Delay Relay, option with 2 SPDT contacts, adjustable from 0-1 to 0-31 minutes. (no listings or approvals)
-316, 316 SS Magnet Keeper, option to replace standard 430 SS
-SAA, SAA listed construction
-V, Vertical Up Flow, option for upward flow in vertical pipe
-AT, ATEX listed construction

V4 Universal Vane Flow Charts

Values shown in both charts are nominal. If normal flows exceed actuation rates by less than 10%, custom vanes are recommended.
Figures are based on standard vertical installation in a 1-1/2" Threaded Branch Connection in a horizontal run of pipe.

Approximate Actuation/Deactuation Flow Rates for Cold Water.
Upper Figures in GPM. Lower Figures in LPM.

Vane Layers	1.5" Pipe	2" Pipe	3" Pipe	4" Pipe	6" Pipe	8" Pipe	10" Pipe	12" Pipe	14" Pipe	16" Pipe	18" Pipe	20" Pipe
1	7-3	15-8	45-22	95-40	210-120	375-175	600-300	900-450	1200-600	1400-800	2000-1000	2400-1200
	26.67-11.67	56.7-30	167-83.3	367-150	800-450	1417-667	2267-1133	3400-1700	4550-2267	5300-3033	7567-3783	9083-4550
1&2		7-4	23-14	50-35	130-90	230-150	450-250	650-350	900-500	1200-650	1450-800	1800-1000
		26.7-15	86.7-53.3	190-132	500-333	867-567	1700-950	2467-1317	3400-1900	4550-2467	5483-3033	6817-3783
1,2,&3			11-7	27-19	80-60	160-115	300-180	450-275	600-350	750-450	1000-600	1200-700
			41.7-26.7	102-71.7	300-233	600-433	1133-683	1700-1033	2267-1317	2750-2083	3783-2267	4550-2650
1,2,3,&4				17-12	60-45	120-90	230-150	310-200	430-280	550-360	700-450	850-550
				65-45	233-167	450-333	867-567	1167-750	1633-1067	2083-1367	2650-1700	3217-2083
1,2,3,4,&5					40-30	80-65	135-100	200-140	290-200	360-250	460-325	575-400
					152-113	300-250	517-383	750-533	1100-750	1367-950	1733-1233	2183-1517

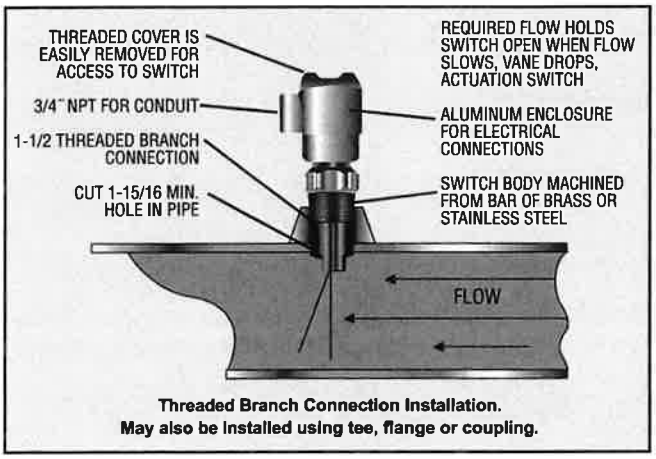
Actuation rates are based on cold water at a specific gravity of 1.0.
For fluids of different specific gravity, actuation rates may be approximated by dividing the rate shown by the square root of the specific gravity.

Approximate Actuation/Deactuation Flow Rates for Cold Air.
Upper Figures in SCFM. Lower Figures in LPS.

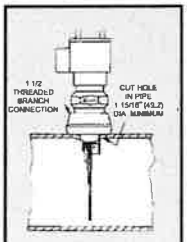
Vane Layers	1.5" Pipe	2" Pipe	3" Pipe	4" Pipe	6" Pipe	8" Pipe	10" Pipe	12" Pipe	14" Pipe	16" Pipe	18" Pipe	20" Pipe
1	32-17	65-32	210-105	400-200	950-475	1550-850	2400-1300	3450-1900	4700-2600	6400-3500	8000-4400	10000-5500
	15-8	30-20	100-50	190-90	450-220	730-400	1100-600	1600-900	2200-1200	3000-1700	3800-2100	4700-2600
1&2		23-13	120-70	195-140	550-375	1100-700	1850-1200	2700-1750	3400-2200	4800-3100	6000-3900	7400-4800
		10-6	60-30	90-70	260-180	520-330	870-570	1300-800	1600-1000	2300-1500	2800-1800	3500-2300
1,2,&3			60-48	135-100	375-265	725-500	1200-850	1850-1300	2600-1800	3350-2350	4300-3000	5300-3700
			30-20	60-50	180-130	340-240	570-400	870-610	1200-800	1600-1100	2000-1400	2500-1700
1,2,3,&4				65-50	260-200	500-400	875-700	1250-1000	1900-1500	2500-2000	3100-2500	3900-3100
				30-20	120-90	240-190	410-330	590-470	900-710	1200-900	1500-1200	1800-1500
1,2,3,4,&5					130-100	310-250	650-525	1000-800	1600-1250	2200-1750	2800-2250	3550-2850
					60-50	150-120	310-250	470-380	760-590	1040-830	1300-1100	1700-1300

Actuation rates are based on air at standard conditions. For gases at other pressures, temperatures, or specific gravities, consult factory for equivalent flow approximations.

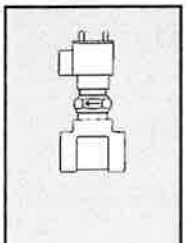
Application Drawings
For Flotect® Automatic Flow Switches



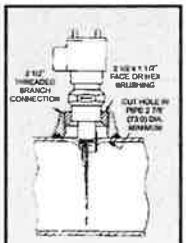
Threaded Branch Connection Installation.
May also be installed using tee, flange or coupling.



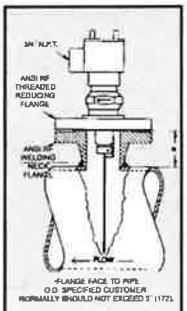
Standard Installation



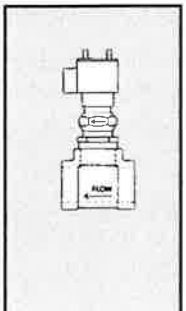
1-1/2" x 1-1/2" x 1-1/2" Tee Installation



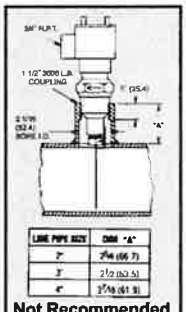
2-1/2" Threaded Branch Connection



Flange Installation



2" x 2" x 2" Tee Installation



Not Recommended, Unless Coupling is Bored Out to 2-1/16" (52.4) As Shown

Project : Proposed Development at Ma Wan Park Phase II, Ma Wan
(To be known as Ma Wan Lot No. 739, Ma Wan Village)

Equipment Schedule

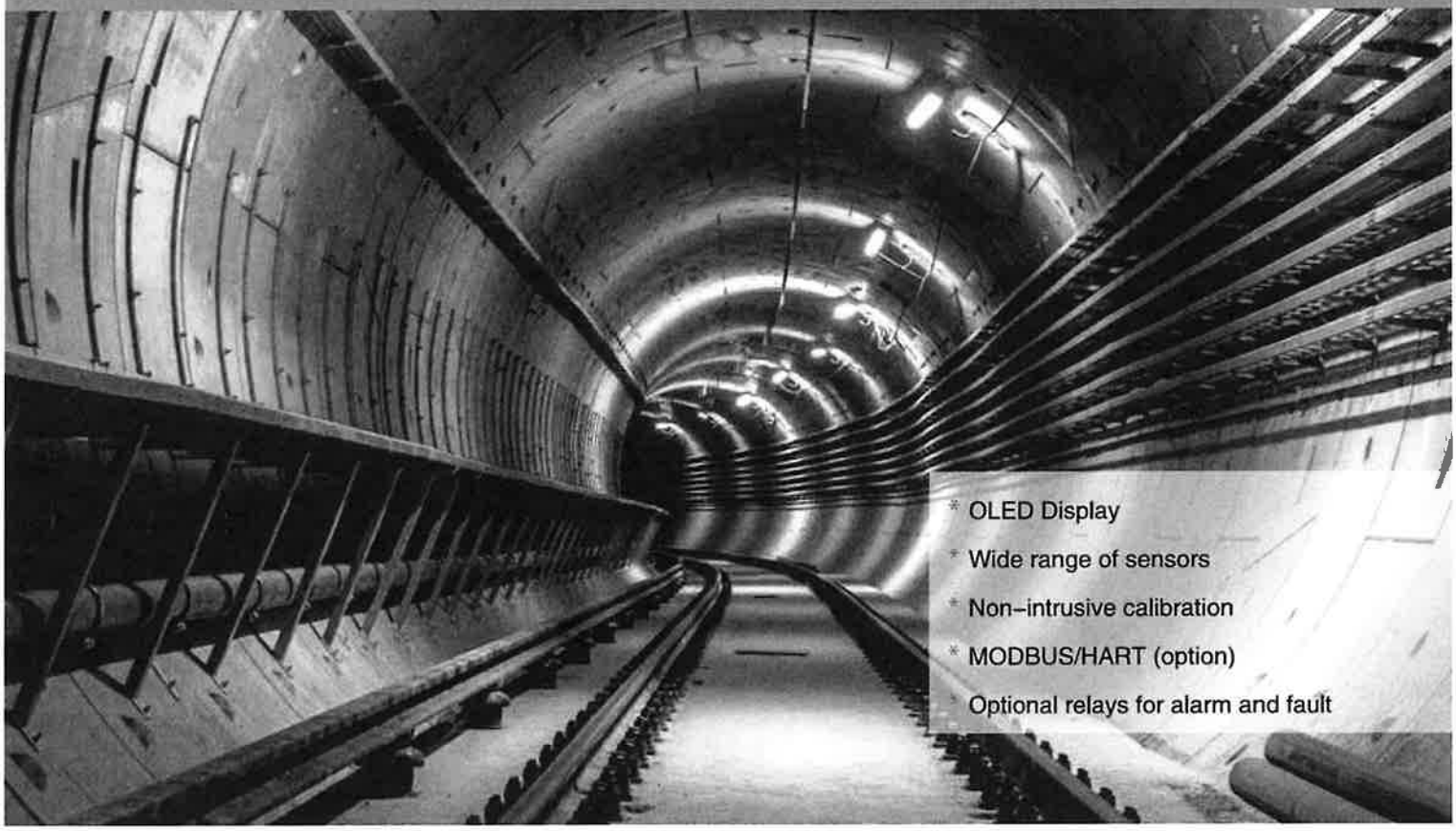
12j. Air Flow Switch

Manufacturer	Dwyer
Country of Origin	USA
Model	V4-SS-2-U
Material	316 SS body and vane
Range	upto 1,650m^3/h or 971scfm
Vane layer	One
Temperature limit	-20 to 135℃
Pressure limit	Upto 2000psig (138 bars)
Protection rating	NEMA4 (IP65)
Switch type	SPDT (10A/250VAC)
Conduit connection	¾" NPT (F)
Process connection	1-½" NPT (M)
Quantity	2 sets

CROWCON
Detecting Gas Saving Lives

Xgard Bright

Fixed Point Gas Detectors with OLED Display



* OLED Display
* Wide range of sensors
* Non-intrusive calibration
* MODBUS/HART (option)
* Optional relays for alarm and fault



Xgard Bright

Fixed Point Gas Detectors with OLED Display



When lives and property are at risk and you need gas detection equipment that is totally reliable, you need Crowcon. For over 47 years Crowcon has been developing and manufacturing high quality products with a reputation for reliability and technical innovation.

The Xgard Bright range is a comprehensive selection of fixed point gas detectors that meet the diverse requirements for gas detection in industries throughout the world, including water treatment, oil and gas, power, research facility and manufacturing installations.

Xgard Bright wide range of sensor options allow monitoring of flammable, toxic and oxygen gas in hazardous environment while providing ease of operation with one common look and feel. The need for training across products is greatly reduced as Xgard Bright supports over 20 different measurement with a single detector. The large LCD with OLED display allows user to configure and calibrate detector without the need to open the unit, saving both time and cost. Xgard Bright's compact design means smaller footprint and space saving.

Wide sensor option

- Supports flammable, toxic, oxygen, IR & PID sensor in one instrument
- Optional relay, MODBUS & Hart output
- Stainless steel or aluminium enclosure
- Explosion proof housing
- IP65 or IP66 rating (with weatherproof cap)

Ease of installation

- Plug in type terminal blocks for easy wiring
- Choice of M20 or ½" NPT conduit connection
- Plug in relay module
- Optional sounder/beacon

Compact size

- Small footprint
- Low power requirement (~3W max)
- Lightweight (1kg for Aluminum enclosure)
- Suitable for wall or 2" pipe mounting

Ease of operation

- Configuration via magnetic key
- Non-intrusive calibration without removing cover
- MODBUS or Hart communication for remote access

Xgard Bright Specification:

Junction box material	**Aluminium or 316 Stainless Steel**
Dimensions	156×166×109mm (6.1×6.5×4.3inches)
Weight	**Alloy: 1kg (2.2lbs) Stainless steel: 3.1kg (6.8lbs) approx.**
Ingress protection	IP65 or IP66 (with weatherproof cap)
Cable entries	**M20 or 1 /2" NPT or 3 /4" NPT**
Terminations	0.75~2.5mm^2
Sensor type	**Electrochemical/Pellistor/IR**
Operating temperature	-40~60°C (-40~140°F)
Humidity	**5%-90%RH**
Repeatability Zero drift	+/-2% FSD (Typ.) +/-2% FSD/$_{month}$ (Typ.)
Operating voltage	**10-30V dc**
Power requirements	3w max
Display	**OLED**
Alarm	Sound and Light (Opt)
Relay	**Alarm1/Alarm2/Fault Alarm**
Contact rating	1A@30V dc
Electrical output	**4~20mA (Three-Wire) /Modbus /HART(Optional)**
Approvals	ATEX: II 2 G Ex db IIC T6 Gb CCCF GB15322.1-2003, GB12358-2008 IECEx: Ex db IIC T6 Gb

Xgard Bright Gases and Ranges:

Gas type	Ranges Available:
Hydrogen (H_2)	0-100%LEL or 0-200,2000ppm
Methane (CH_4)	**0-100%LEL**
Ethane (C_2H_6)	0-100%LEL
Propane (C_3H_8)	**0-100%LEL**
Butane (C_4H_{10})	0-100%LEL
Pentane (C_5H_{12})	**0-100%LEL**
Ethylene (C_2H_4)	0-100%LEL
Petrol Vapour	**0-100%LEL**
LPG	0-100%LEL
Hydrogen sulphide(H_2S)	**0-1,5,10,20,25,50,100, 200,250,300,1000 ppm**
Oxygen (O_2)	0-25%vol
Carbon Monoxide(CO)	**0-25,50,100,200, 250,300,1000,2000 ppm**
Sulphur Dioxide (SO_2)	0-10,20,50,100,250 ppm
Nitric oxide (NO)	**25,50,100ppm**
Nitrogen Dioxide (NO_2)	0~10,50,100 ppm
Carbon Dioxide (CO_2)	**0~2%vv and 5%vv**
IR LEL	0-100% LEL

Notes: Other sensors and ranges may be available, please contact Crowcon.

Project : Proposed Development at Ma Wan Park Phase II, Ma Wan
(To be known as Ma Wan Lot No. 739, Ma Wan Village)

Equipment Schedule

12k. H2S Gas Detector

Manufacturer	Crowcon
Country of Origin	UK
Model	Xgard Bright
Type	Electromagnetic cell
Gas Type	Hydrogen Sulphide
Measuring range	0-20ppm (for activated carbon filter inlet) 0-1 ppm (for activated carbon filter outlet)
Output	4 – 20mA
Power requirement	10-30VDC
Operating temperature	-40 to 60℃
Operating humidity	5-90 %
Physical size	156 x 156 x 109mm
Weight	Approx 1 Kg
Material	Aluminum junction box
IP rating	IP65
Accessories	Air sampling box
Quantity	One each

RAGE INC.
PLUMSTEADVILLE, PA 18949

ECOLO
ENVIRONMENTAL INDUSTRIES

Job Reference of 'Rage' DO system for DSD

	Job Description	Type	Quantity	Air volume	Completion
1	Odour removal at RL P/S at Siu Ho Wan STW (Supply and installation)	Chemical Scrubber	1 set	0.4 m^3/s	2007
2	SO_2 fume recovery system at Stonecutter Island STW (Supply and installation)	A/C filter	1 set	0.17 m^3/s	2009
3	Odour removal at Shui Cheong Street Sewage Pumping Station (Supply and installation)	A/C filter	1 set	1.11m^3/s	2010 /12
4**	Odour removal at Siu Hong Sewage Pumping Station (Supply and installation)	Biofilter & A/C filter for polishing	1 each	0.14 m^3/s	2011 /6
5	Deodourising system for Shatin Sewage Treatment Works (Supply and installation)	Biotrickling filter	2 sets	19,000m^3/h 25,000m^3/h	2012 /2 2012 /6
6	Deodourising system for Sewage Pumping Station and Desilting Compound at Jordon Valley Box Culvert (Supply and installation)	A/C filter	2 sets	3.5 m^3/s 40.0m^3/s	2013 /6
7	Deodourising system for Siu Ho Wan Sewage Treatment Works (Supply and installation)	Biotrickling filter	1 set	8,800m^3/h	2014 /10
8 **	Upgrading of DOU system 2 at Pak Kok Sewage Pumping Station (Supply and installation)	Biofilter & A/C filter for polishing	1 each	850m^3/h	2014 /10

	Job Description	Type	Quantity	Air volume	Completion
9	Deodourising system for Wanchai East PTW - screening plant (Supply only)	Biotrickling filter	1 set	15,000m^3/h	2014 /4
10	Deodourising system for Wanchai East PTW - pumping station (Supply only)	Biotrickling filter	1 set	15,000m^3/h	2015 /1
11	Deodourising system for Tin Liu Ha SPS (Supply only)	Biofilter	1 set	648m^3/h	2015 /1
12	Deodourising system for Tong Min Tsuen SPS (Supply only)	Biofilter	1 set	720m^3/h	2015 /6
13	Deodourising system for North Point PTW (Supply only)	Biotrickling filter	1 set	10,000m^3/h	2015 /10
14	Deodourising system for Central PTW (Supply only)	Biotrickling filter	1 set	25,000m^3/h	2015 /10
15 **	Upgrading of DOU system at Stonecutter Island STW Sludge Holding Tank 1-5 (Supply and installation)	Biofilter & A/C filter for polishing	5 each	324m^3/h	2015 /11
16	Deodourising system for Wanchai East PTW (Supply only)	A/C filter	1 set	2,500m^3/h	2015/12

	Job Description	Type	Quantity	Air volume	Completion
17	Deodourising system for Central PTW (Supply only)	A/C filter	1 set	2,640m^3/h	2016/2
18	Deodourising system for North Point PTW (Supply only)	A/C filter	1 set	2,500m^3/h	2016/7
19 **	Upgrading of existing DO system (DO1) at Sham Tseng Sewage Treatment Works New DO system (DO2) at Sham Tseng Sewage Treatment Works (Supply and installation)	Biofilter Biofilter & A/C filter for polishing	1 set 1 set	6,000m^3/h 10,000m^3/h	2016 /12
20 **	Upgrading of existing DO system at So Kwun Wat Sewage Pumping Station (Supply and installation)	Biofilter & A/C filter for polishing	1 set	4500m^3/h	2017/ 5
21	Deodourising system for To Kwa Wan PTW (Supply & mechanical installation)	A/C filter	2 sets	720m^3/h	2018/10
22	Deodourising system for Shek Wu Hui Sewage Treatment Works (Supply and installation)	A/C filter	1 set	1,000m^3/h	2019/
23 **	Deodourising system for North West Kowloon PTW (Supply and installation)	Biofilter & A/C filter for polishing	1 set	4,000m^3/h	2019/
24	Temporary deodourising system for Shek Wu Hui Sewage Treatment Works (Supply and installation)	A/C filter	1 set	2,100m^3/h	2020/

RAGE INC.
PLUMSTEADVILLE, PA 18949

ECOLO
ENVIRONMENTAL INDUSTRIES

	Job Description	Type	Quantity	Air volume	Completion
25 **	Deodourising system for Ma On Shan area 108 Sewage Pumping Station (Supply and installation)	A/C filter	1 set	4,320m^3/h	2021/ 2

** Direct order from DSD

Updated on 2021-5

shall be incorporated. Operation of the cleansing unit shall not affect the detector output signal. A liquid sensing system shall be provided downstream of the detector head to inhibit the operation of the cleansing unit when the liquid level in the pipe falls below the designed operating level of the unit. The signal cable between the detector head and the transmitter shall have no cable joint.

(6) The indicating transmitter shall be installed at the control kiosk safe and easily accessible to the operator.

(7) The indicating transmitter shall be of minimum 50mm LCD type with scale calibrated in litres per second for the flow range as specified. The system shall be automatically adjusted to zero and no zero adjustment shall be required at start up or any time during subsequent operation.

(8) Installation of electromagnetic flowmeter shall be in accordance with manufacturer's recommendations. Sufficient straight run for inlet and outlet of flowmeter as recommended by the supplier shall be provided.

(9) The flowmeter shall be tested and certified by the manufacturer or approved equivalent for the accuracy limit. The test shall be carried out throughout the whole range of flow. Not less than four (4) test points shall be verified for the flowmeter during the test.

(10) The *Contractor* shall supply and deliver to the Site, one separate piece of spool pipe of each size for replacing the flowmeter detector head when the flowmeter would be removed from the pipework for maintenance. The ductile iron pipe section shall have the same nominal diameter and length as the flowmeter detection head. The ductile pipe section shall comply with the requirements as specified in this Particular Specification.

DEODORIZATION SYSTEM

General 32.43

(1) The *Contractor* shall design, supply, install, setup, test, commission and be liable to defects within the Defects Liability Period of one (1) set of Deodorization System complete with an activated carbon filter unit, extraction fans, volume control dampers, odor ducts, inlet and outlet hydrogen sulphide sensors, pre and after air filter, demister, dehumidifier and all other necessary accessories for the MWSPS.

COMPLY



(2) The deodorization system shall be designed according to the following table:

COMPLY

Type	Regenerated Type Catalytic Activated Carbon
Design Treatment Capacity	1,500 m^3/hr
Hydrogen Sulphide Concentration	Min. 5ppm
Design Removal Efficiency	99.5%
Design Breakthrough Time	Min. 12 Months
Odour Extraction Fan	1 duty 1 standby

DESIGN BREAKTHROUGH TIME 16 MONTHS

(3)

(3) All components of the deodorization system shall be fabricated from stainless steel 316 or glass fibre reinforced resin (GRP) or polyethylene (PE) unless otherwise specified. Supporting framework and maintenance platform for the deodorization system shall be made of GRP or stainless steel. The entire system shall be factory assembled.

FRAMEWORK & PLATFORM BY OTHERS

(4) The deodorizer manufacturer shall have a minimum of five (5) years' experience in supplying similar systems with successful operation. A work reference list showing similar installations including locations, names of clients and design capacity of the deodorizers shall be submitted to the *Architect* for approval.

COMPLY

(5) Activated carbon adopted for the deodorization system shall be appropriate type agreed and accepted by the *Architect*

Comply

(6) The *Contractor* shall provide the initial filling of the filter media at installation stage and arrange a complete replacement of the used filter media at the end of the Defects Liability Period. The *Contractor* shall provide test certificate to verify the capacity of the activated carbon for initial filling. The replacement filter media shall only be delivered to the Site towards the end of the period between completion date and the defects date as instructed by the *Architect*.

Comply

(7) The filter media shall be totally inorganic, non-toxic, and self-incombustible and shall not support any microbial growth. The design air velocity through the filter media shall be recommended by the manufacturer but not be greater than 0.3m/s.

Comply

(8) The corresponding breakthrough time of the activated carbon filter beds shall not be less than sixteen (16) months

Comply

under continuous design operating conditions.

Vessel of the Activated Carbon Filter Unit 32.44

Comply

(1) The vessel shall be constructed of corrosion resistant stainless steel 316 or glass reinforced plastic (GRP) or other material accepted by the *Architect*. The resin of the GRP shall be premium grade chemical resistant vinyl ester resin. The resin shall have fire resistance rating of Class 1 (frame spread rating less than 25) when tested in accordance with ASTM E-84 or equivalent. The external final coat shall be resin rich coat with pigment and with integral UV inhibitors in the resin applied. The construction of the GRP for the vessel shall have resin rich inner surface, an interior corrosion barrier, an interior structural layer and an exterior layer and UV resistant coating.

(2) The vessel shall be designed to support the required number of media layers and treatment stages. All materials of construction shall be corrosion resistant.

(3) Access manholes for inspections, removal and maintenance of all internal parts shall be provided. Access manholes shall be provided with flat GRP plate. Lifting and hold down lugs shall be provided.

Mist Eliminator 32.45

Comply

(1) A mist eliminator shall be located before the pre-filter unit. Mist eliminator shall meet the following performance criteria:

(a) The mist removal efficiency shall not be less than 98% on 20 micron moisture droplet.

(b) The demister shall be made of stainless steel housed in stainless steel frame.

Pre-filter and After-filter Unit 32.46

Comply

(1) A pre-filter and after-filter unit shall be installed at the inlet and outlet of the activated carbon filter respectively for the removal of particulate. It shall be in a readily accessible and removable frame and have an average efficiency of not less than 40% when tested in accordance with ASHRAE 52-76. The framework shall be made of stainless steel. The pre-filter shall be made of stainless steel. The pre-filter shall be designed so as to facilities side removal of the filter elements. After-filter shall have at least 90% particulate removal efficiency and shall be of disposable type.

Dehumidifier 32.47

Comply

(1) The *Contractor* shall design, supply, deliver to Site, install, setup, test, commission and be liable to defects within the Defects Liability Period of one (1) set of dehumidifiers for drying the incoming foul air to each deodorization system.

Comply

(2) Fresh air shall be drawn into the dehumidifier, dried and then discharged into the foul air stream. The mixed air is then conveyed to the activated carbon filter. No foul air shall be in

contact with the dehumidifier.


Comply

(3) Dehumidifier shall be provided to reduce the relatively humidity of the foul air to 85%RH (max) under any conditions.


Comply

(4) The dehumidifier shall be adsorption type and shall complete with high efficiency, incombustible, non-toxic silica gel impregnated rotor, process air fan, reactivation air fan, electrical heater, air filters, control panel and duct type remote humidistat. The rotor shall be washable.


Comply

(5) The cabinet of the dehumidifier constructed from stainless steel.

(6) Stainless steel or Glass Reinforced Plastic (GRP) weatherproof enclosure shall be provided for the dehumidifier.

Hydrogen Sulphide Sensors 32.48

(1) The *Contractor* shall provide electrochemical cell type hydrogen sulphide sensor for monitoring the concentrations of hydrogen sulphide diverted from the odour extraction locations of the MWSPS to the activated carbon filter. Measuring range of the hydrogen sulphide concentration shall from 0ppm to 20ppm as appropriate and shall be displayed on the Deodorization System Field Control Panel (Field Control Station). The enclosures for the sensor and transmitter shall have IP65 protection or better.


Comply

(2) The *Contractor* shall provide at the outlet of the activated carbon filter an electrochemical cell type hydrogen sulphide sensor for monitoring the concentrations of hydrogen sulphide. Measuring range of the hydrogen sulphide concentration shall from 0 ppb to 1,000 ppb as appropriate. The enclosures for the sensor and transmitter shall have IP65 protection or better.


Comply


Comply

(3) Inlet and outlet H_2S sensors measurement indication shall be available at the Deodorization System Field Control Panel, and MACS for monitoring, alarm and logging purpose.

Differential Pressure Sensors 32.49

(1) Differential pressure sensors including transmitters and indicators gauges shall be provided to measure the pressure drop across all filters, including activated carbon filters, pre-filter and after-filter.


Comply

(2) Filter high differential alarm shall be available in the Deodorization System Field Control Panel, and MACS for monitoring, alarm and logging purpose.

Supporting Framework and Maintenance 32.50

(1) Supporting frameworks, maintenance and access platforms and stairs including hand railing, toe boards, non-skid tread surface, etc. for the activated carbon absorber shall be

Platform

provided for the operation and maintenance (calibration, adjustment, replacement, etc.) and inspection of internals (e.g. instrumentation, media conditions, etc.) via the inspection ports. Appropriate access and guard railing around the perimeter of vessel top shall be provided for mist eliminator. The entire system shall be factory assembled and made of stainless steel or GRP. The supporting frameworks, maintenance and access platforms and stairs shall not impose undue stress on the vessel. The maintenance and access platform and stair shall be designed, certified and endorsed by a Registered Structural Engineer (RSE).

Odour Extraction Fans 32.51

(1) The odour extraction system shall be designed by the *Contractor* to meet the requirements of this Particular Specification. The odour extraction fans shall be capable of providing the sufficient odour extraction rate against the respective system losses.

(2) The *Contractor* shall provide one (1) duty and one (1) standby extraction fans for each of the Activated Carbon Filter. The extraction fans shall be heavy duty type equipped with non-return dampers to extract odour from the specified locations to the Activated Carbon Filter for treatment. Isolation dampers for duty and standby fan switching shall be provided.

(3) The fans shall be constructed of FRP with moulded reinforced housing. The resin of the FRP shall be premium grade chemical resistant vinyl ester resin. The resin shall have fire resistance rating of Class 1 (frame spread rating less than 25) when tested in accordance with ASTM E-84 or equivalent. The external final coat shall be resin rich coat with pigment and with integral UV inhibitors in the resin applied.

(4) The fans shall be designed for continuous operation. The fan shaft shall be constructed of stainless steel grade 316 and oversized to run below critical speed. The impeller and shaft assemblies shall be statically and dynamically balanced.

(5) The requirements of the drive motors are as follows:

(a) Motor: IP55 protection, 380V, 3-phase and 50 Hz

(b) Insulation Class: Class F insulation for Class B Operation

(6) The fans shall be provided with variable speed drive. The fan cowl of the motor shall be provided with separately-driven fan for motor cooling. The fan motor shall have a service factor of 1.15 times the rated shaft power and sized to operate throughout the entire fan performance curve.

(7) The fan shall not generate a noise level exceeding 70dBA measured at 1m from the fan in all directions at rated speed. Acoustic enclosure of approved design and silencer complete with stainless steel casing at the discharge outlet and/or the fan motor shall be provided to achieve this requirement. Access opening shall be provided for the acoustic enclosure.

Comply
SILENCER BY OTHERS

(8) The odour extraction fan control shall be designed so that the duty and standby extraction fan shall work on rotational basis once the duty extraction fan operates for an adjustable period of time (8-12hr).

Comply

Air/Odour Ductwork

32.52 (1) The *Contractor* shall provide ductwork connecting SPS and the activated carbon filter, tank vent ducts, and make-up air ducts, including dampers, valves, fittings, etc. and all other items necessary for the proper functioning of the Activated Carbon Filter.

NOTED

(2) All ductwork above ground including fittings shall be fabricated of stainless steel 316 or GRP. All ductwork shall be constructed to the recommendation of the U.K. Heating and Ventilation *Contractors* Association (HVCA) ductwork group as summarised in their publication DW/144: "Specification for Sheet Metal Ductwork - Low, Medium and High pressure/ Velocity Air Systems.

Comply

(3) All ductwork shall be designed for a maximum flow velocity of 5 m/s. No significant audible noise shall be generated through or from any ductworks.

Comply

(4) The odour ductwork shall be flanged connected. The maximum length of straight flanged ductwork shall be limited to 6m. Flanged connections shall be provided for connection to the deodorization system equipment, flanged expansion joints, volume control dampers, isolation dampers and other duct fittings such as elbows, crosses, tees, reducers, etc. Gaskets of EDPM shall be provided and all bolts, nuts and washers shall be stainless steel 316.

Comply

(5) Flanged expansion joints shall be provided where the ductwork connects to the deodorization system equipment, odour extraction points of the corresponding odour source and at suitable locations of the ductwork system to allow expansion and contraction due to temperature changes and differential settlement without damage to the ductwork system.

Comply

(6) Expansion joints shall be of a material resistant to UV light. Expansion joint material shall be stiff enough to prevent sagging or contraction due to internal vacuum. Expansion joints shall be capable of compressing and elongating 50mm at least and shall allow lateral deflection of up to 50mm at

Comply

least. Flanged expansion joints shall have split stainless steel or GRP retaining rings. Stainless steel bolts, nuts and washers shall be provided

(7) Volume control dampers shall be provided in the main air ducts, branch-offs and all odour extraction points and make-up air intake points for air volume regulation and balancing of the air distribution. All dampers shall be sufficiently rigid to prevent fluttering. Each air intake ductwork shall also be completed with a non-return damper to avoid the egress of foul gases.

COMPLY

(8) Isolation air dampers shall be provided at the inlets and outlets of the odour extraction fans.

COMPLY

(9) Dampers shall be of the butterfly type. Dampers shall be constructed of GRP with spindles constructed of stainless steel. The stainless steel damper shaft shall be fully encapsulated within the damper blade and supported with top and bottom bearings. The shaft bushing and sealing shall be by Telfon or similar seals. The sealing faces between the blade and damper body shall be neoprene or EPDM.

COMPLY

(10) Damper adjustment rods shall be sealed to prevent leakage of air. Suitable damper locking devices shall be provided and be positioned for easy access of rod adjustment and damper locking.

COMPLY

(11) All dampers shall have flanged ends. Stainless steel bolts, nuts and washers shall be provided.

COMPLY

(12) All ductwork shall be supported by hangers, brackets, and other appropriate form of supports made of stainless steel or GRP. Noise and vibration shall not be transmitted to the structure or any other element through hangers and brackets. Maximum sag of horizontal round duct shall not exceed 2 percent of diameter after installation. Support and hanger details and a detailed layout showing the locations of all duct supports and hangers shall be submitted to the *Architect* for approval.

BY CONTRACTOR

(13) The ductwork shall be installed and supported at overhead location and 2.4m clearance between the bottom of the ductwork and the floor shall be provided for the operational staff to pass through without obstruction. All damper locations shall also be easily accessible.

BY CONTRACTOR

(14) GRP or stainless steel access platforms and stairs including hand railings, toe boards, no-skid tread surface, etc. over the ductwork shall be provided if the ductwork obstructs the operational access passage.

BY OTHERS

BY CONTRACTOR

(15) The *Contractor* shall demonstrate the air tightness of the ductwork to the satisfaction of the *Architect.*

(16) Drains shall be provided at suitable locations of the odour ductwork to avoid the accumulation of condensation for the odour. The drains shall be completed with suitably sized stainless steel valve and pipeworks. The drains shall be connected to the nearest sewerage system.

COMPLY

Deodorization System Field Control Panel 32.53

(1) The *Contractor* shall provide a Deodorization System Field Control Panel adjacent to the Deodorization Unit.

COMPLY

(2) Deodorization System Field Control Panel shall include the following but not limited to the following:

COMPLY

(a) "Start" and "Stop" push buttons for the odour extraction fans and dehumidifier;

(b) System Emergency Stop Button;

(c) Inlet and outlet H_2S sensors measurements indications;

(d) Pre filter, activated carbon filter and after filters differential pressure measurements indications; and

(e) All necessary indication lamps for operation status indications and alarms annunciation.

NOTED

(3) Exact locations of this panel shall be proposed by the *Contractor* and agreed on site with the *Architect.*

Deodorization System Control Requirements 32.54

(1) The *Contractor* shall provide the control circuits and other accessories for the operation of the Deodorization System. The Deodorization System shall have three modes of operation, "Field Manual", "MACS Manual" and "MACS Auto". One (1) no. of three way selector switch with key lock "Field/Off/MACS" selector shall be provided on the Deodorization System Field Control Panel at the field.

COMPLY

(2) "Field Manual" Mode:

COMPLY

(a) Manual initiation of the odour extraction fans and dehumidifier via "Start" and "Stop" push buttons via the Deodorization System Field Control Panel.

COMPLY

(b) Operation status and monitoring of the extraction fans shall be available at the Deodorization System Field Control Panel and MACS interface.

(3) "MACS" Mode:

- "MACS Manual" and "MACS Auto" shall be selectable at the MACS interface.

Comply

(4) "MACS Manual" Mode:

(a) When Selected, manual operation of the Deodorization System at the MACS operator interface shall be enabled.

Comply

(5) "MACS Auto" Mode:

(a) When the selector is put in "MACS Auto" mode, the deodorization system shall be controlled automatically by the PLC operating with the odour extraction fan operating at the normal speed.

(b) Upon detection of failure of the duty odour extraction fan, the standby odour extraction fan shall cut in automatically to continue the operation.

Comply

(c) Operation status (Running/ Stop / Tripped/ Dehumidifier Tripped/ H_2S Breakthrough/ Emergency Stopped/ Power Availability) and monitoring (pre-filter, after-filter and activated carbon filter differential pressure drop) of the deodorization system shall be available both on the Field Control Panel and MACS interface. All alarms at the Field Control Panel and MACS shall be both visual and audible.

(d) The control shall also be designed such that the odour extraction fans shall operate on automatic duty rotation. The rotation shall be triggered by a settable timer control.

(6) On pressing the emergency stop buttons adjacent to the odour extraction fans, and dehumidifier, deodorization system field control panel, or on the corresponding switchboard section, the operation of all deodorization system equipment shall stop immediately regardless of its mode of operation. The control status of the Deodorization System shall be sent to the MACS system for control and indication purpose.

Comply

Commissioning Test of Deodorization System

32.55 (1) The design, supply and installation of the Deodorization System (DOU) shall be certified by the manufacturer of the equipment before commencing testing of the contaminant removal efficiency.

Comply

(2) The *Contractor* shall include in his scope of work all sampling and laboratory analysis tasks. Laboratory analyses

shall be done by an independent testing laboratory. The laboratory responsible of the testing shall have documented QA/QC standards for the analysis and accredited under HOKLAS for the testing laboratory shall obtain approval from the *Architect* before executing the work.

(3) Testing shall include H_2S testing as outlined below to demonstrate the H_2S removal efficiency of the DOU. Removal efficiency is defined as: % removal = (inlet concentration-outlet concentration)/inlet concentration x 100.

(4) The commissioning tests shall not be carried out until the *Contractor* is satisfied that the equipment has reached its optimum operational performance. The commissioning testing is to be carried out within forty-five (45) calendar days after completion of the activated carbon filter installation.

(5) The method statement for collection and testing procedures for analysis of the odorous air samples shall be submitted for approval by the *Architect.*

(6) The *Employer's* staff shall have personnel present during the testing who may take any samples, record procedures and operating conditions to confirm the measurements taken by the *Contractor*. The *Contractor* shall provide full access and cooperation

(7) The Deodorization System shall be operated, to the satisfaction of the *Architect*, for seven (7) consecutive calendar days without any major faults or alarms requiring attendance on the Site.

(a) At the completion of the commissioning tests for the Deodorization System, copies of the commissioning test data log sheets shall be provided by the *Contractor* to the *Architect.*

(b) If the Deodorization System fails to meet the performance requirements, the *Contractor* shall rectify the defects immediately. The *Contractor* shall, at no extra cost to this contract, carry out all work necessary to ensure that the equipment achieves the specified performance.

(c) When rectification work is complete, the Deodorization System shall be retested to verify that the specified performance has been achieved.

(8) During the seven-day testing period for the DOU, the following requirements are to be observed where applicable:

(a) The foul air flow rate and the inlet foul air pressure shall be maintained as close as practical to the design

BY CONTRACTOR, WILL PROVIDE TECHNICAL ADVICE WHERE NECESSARY

conditions. The *Contractor* must be satisfied that the air flow rate through the DOU is in accordance with the design flow rates and conditions before commencing the commissioning tests.

(b) The flow rate, the pressure losses across the vessel of the DOU shall be either recorded continuously by the online measurement (if applicable), or measured and recorded twice per day, e.g. once in the morning and once in the afternoon.

(c) The inlet and outlet gas temperature and humidity of the DOU are to be either continuously recorded by the online measurement (if applicable), or measured and recorded twice per day, e.g. once in the morning and once in the afternoon.

(d) The atmospheric temperature and humidity are to be either recorded continuously by the online measurement (if applicable), or measured and recorded twice per day, e.g. once in the morning and once in the afternoon.

(e) Other operating parameters such as any unusual events, etc., are to be recorded for each day of the test.

(f) Within ten (10) calendar days of the completion of the test period for the DOU, the *Contractor* shall provide a written test report showing all conclusions of the tests with reference to the performance criteria.

(g) The methods to obtain all measurements and make calculations shall be included in the commissioning test procedures and shall be carried out to the satisfaction of the *Architect*.

(h) At the completion of the commissioning tests for the DOU, copies of the commissioning test data log sheets shall be provided by the *Contractor* to the *Architect*.

(i) If the DOU fails to meet the performance requirements, the *Contractor* shall rectify the defects immediately. The *Contractor* shall, at no extra cost to this contract, carry out all work necessary to ensure that the equipment achieves the specified performance.

(j) When rectification work is complete, the DOU shall be retested to verify that the specified performance has been achieved.

(9) If after two re-tests for the Deodorization System and the performance requirements are still not met, the *Contractor* is required to make system modifications at the sole expense of the *Contractor*, or obtain a replacement at the expense of

BY CONTRACTOR, WILL PROVIDE TECHNICAL ADVICE WHERE NECESSARY

the *Contractor*. If system modifications are deemed necessary, additional tests shall be performed by the *Contractor* until the performance requirements are proven to be met. All costs associated with re-testing shall be borne by the *Contractor*.

(10) The maximum time between each re-test for the Deodorization System will be thirty (30) calendar days.

H_2S Sampling and Testing 32.56 (1) Permanent continuous online H_2S monitoring instruments for the inlet and outlet gas streams of the Deodorization System shall be provided after system calibration. The inlet and outlet readings are to be recorded for the seven (7) consecutive days corresponding with the test period.

NOTED

Analysis of Results 32.57 (1) H2S removal efficiency shall be calculated from the on-line monitoring results for the DOU. The commissioning tests shall be considered successful if, for each day of the test period, the average removal efficiency, at every 15 minutes, shall meet the required removal efficiency performance criteria as stipulated in this Particular Specification.

NOTED

~~LIFTING APPLIANCES~~

General 32.58 (1) The *Contractor* shall design, supply, deliver to the Site, install, test, commission and be liable to defects within the Defects Liability Period of the following lifting appliances of appropriate safe working load (S.W.L.).

(a) LA-SE-01

Serving Location	Sewage Pumping Station Plant Room & Sewage Wet Well
Equipment	Lifting Davit complete with electric chain hoist and lifting chain.
Minimum S.W.L.	500kg
Approx. Span/Length	Min. 1.5 m

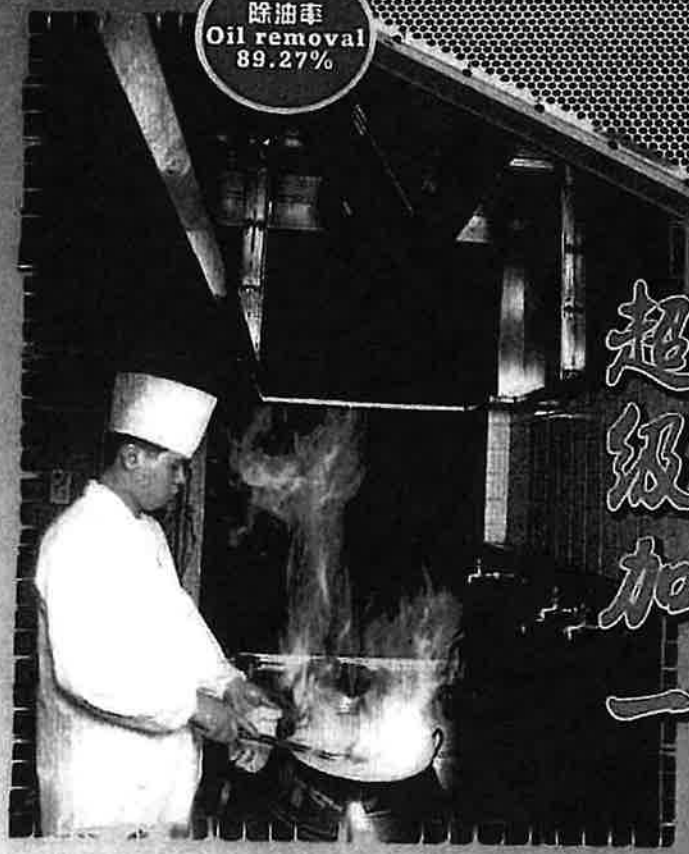
(b) LA-SE-02

Serving Location	Sewage Pumping Station Plant Room & Sewage Wet Well

APPENDIX 2.3. BROCHURE OF THE GREASE FILTER

All STAINLESS GREASE FILTER

PLUS ONE & PLUS ONE SUPER



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 除垢力強避異味
- Light-Weight Filter 耐用全不銹鋼製
- Not Easily Clogged 過濾網不易阻塞
- Save Maintenenance Fee 少維修墊錢省時

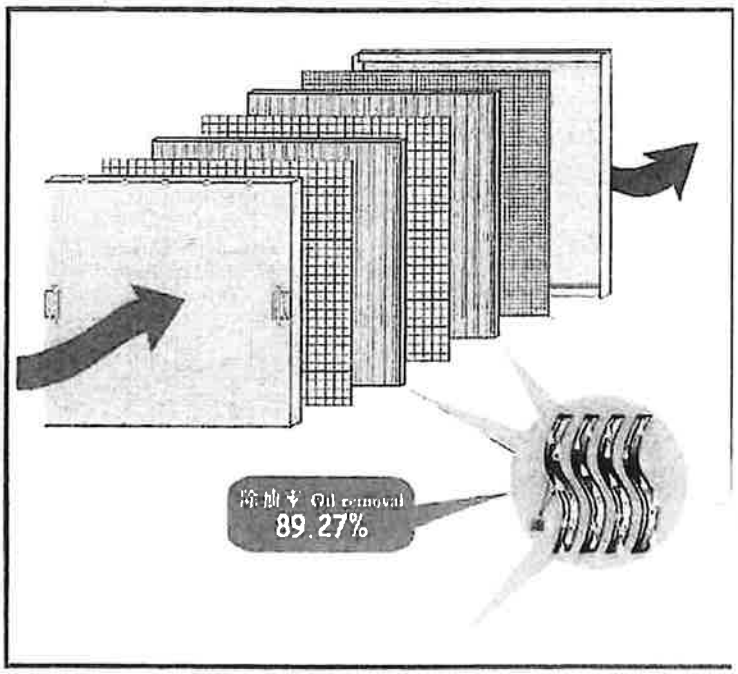
日本廚房工業會的認定品，適合排熱省消煙裝置有關除去油垢的準則，日本廚房工業會認可商標，請以放心使用。

JFEA

KAWASHO

「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 Businrss 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-say 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 casue fires.

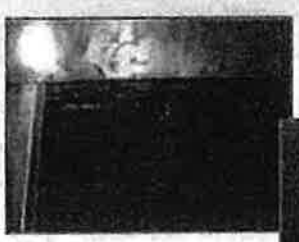
GUIDELINES ON FIRE PREVENTION

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 occur in kitchens.

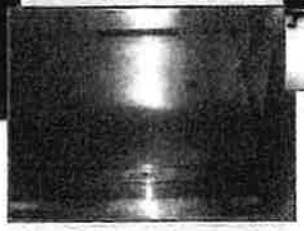
INEFFICIENT SUCTION AND RETENTION OF OIL IN THE FUMES

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 unhygenic ventilation system. The factors are the main causes of the high incidence of kitchen fires.

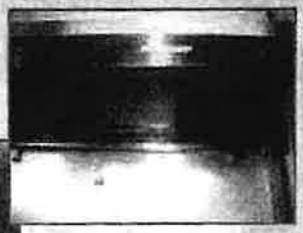
Due to the poor retention of oil by the filter, the filter clogs easily, Causing Oxidation. To overcome all the above problem, our company, the Totaru Plan (m) Sdn. Bhd, has invented the latest state-of-the art cooker hood. It is super efficient in oil retention and provides the highest standard in ventilation.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



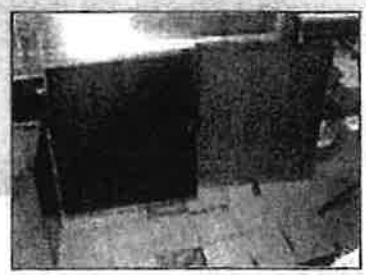
• Before Installation
未安裝 Kawasho 隔油烟網前



• Cleaned air duct and hood with Kawasho grease filter installed
清潔烟罩風槽後及安裝 Kawasho 隔油烟網



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

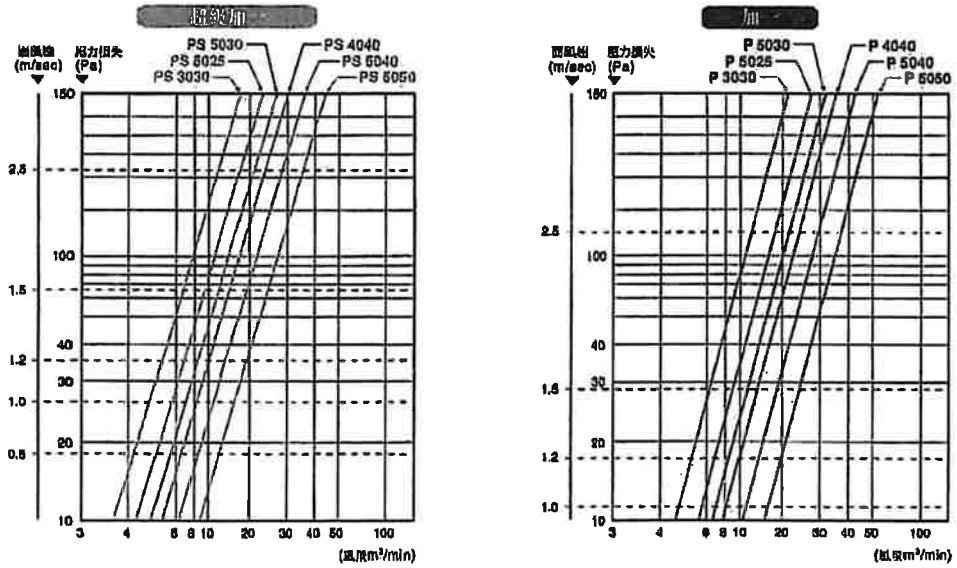


• Front and rear of Filter
隔油網的前後面

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

風量特性 VENTILATION



貨品名稱	除去率	付著率	靜壓
超級加一	89.27%	22.32%	21Pa



規格 SPECIFICATIONS	
桶子型號 Bucket Type	G. F. 5
桶子尺碼 Bucket Size	600(高)Hx540(長)Lx220(濶)W
裝量水容量 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(濶)W 3(塊用)Pieces 560(高)H x 520(長)L x 80(濶)W 2(塊用)Pieces

生產商
川鉄商事株式会社
Tel : 03-5203-5141

總部
株式会社
Tel : 045-471-8800

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

海外營業部
多德來(香港)有限公司
Tel : 852-2191-7686

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

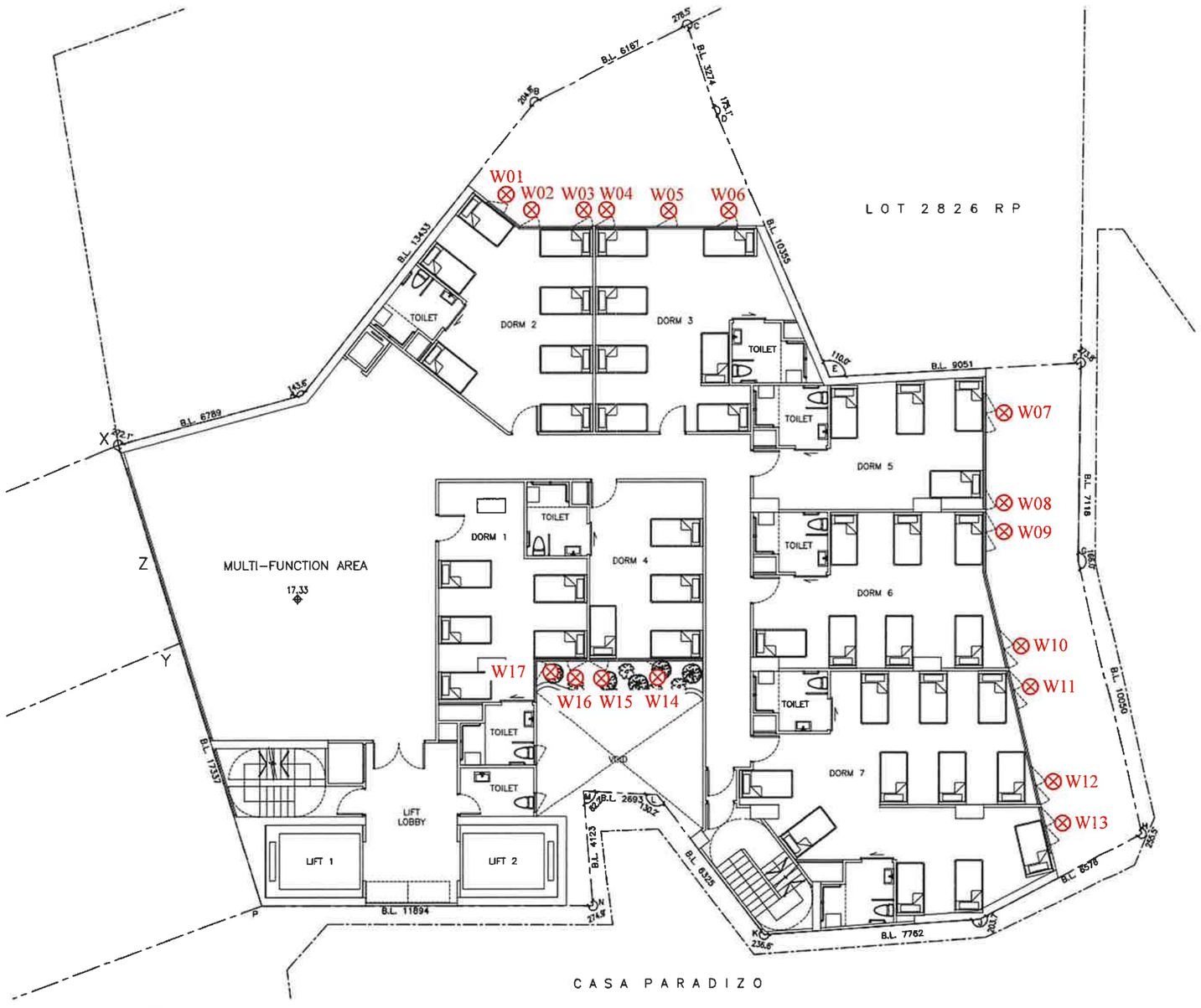
不 銹 鋼 隔 油 網 清 潔 箱



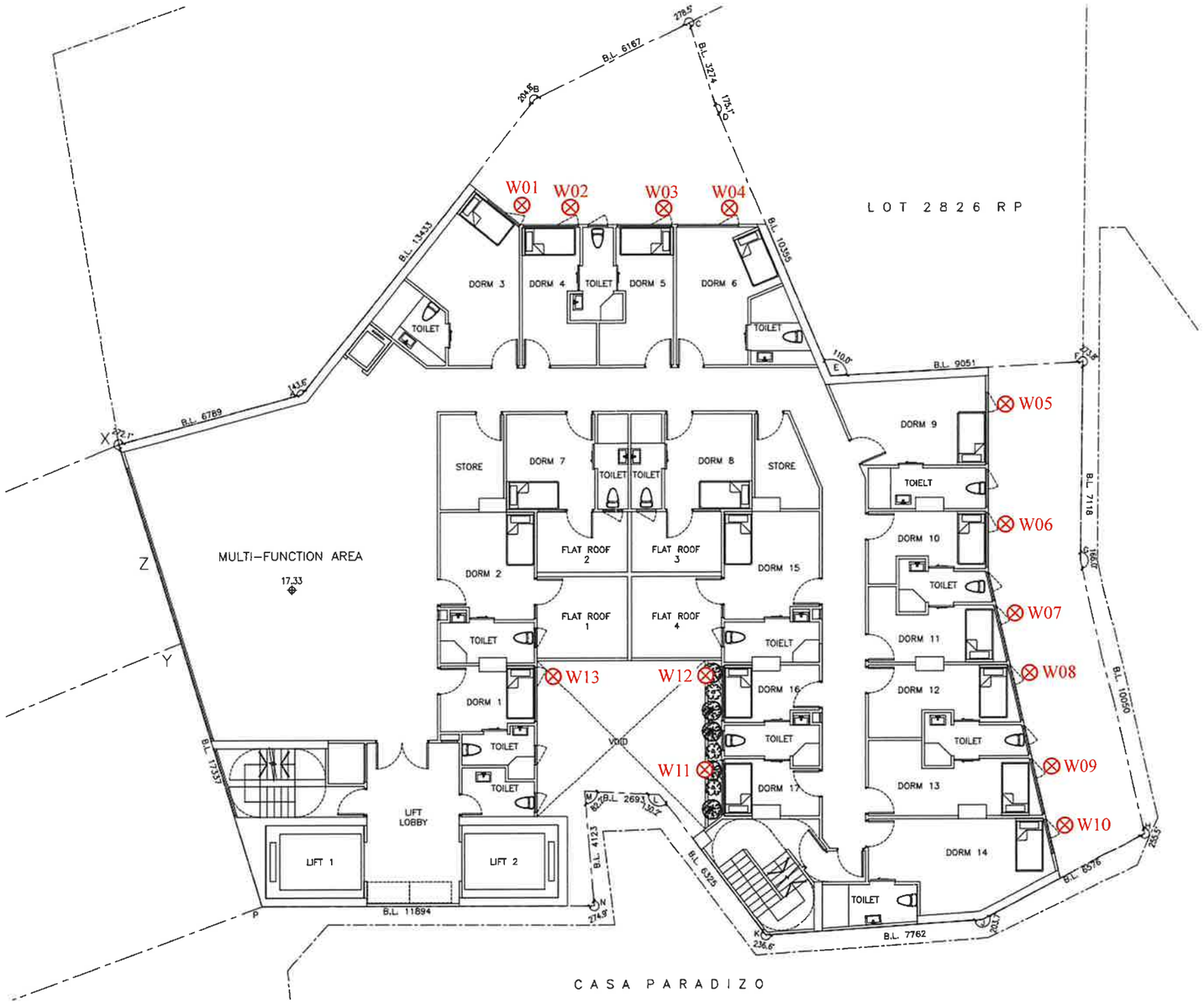
規格 SPECIFICATIONS	
桶子型號 Bucket Type	G.F.5
桶子尺碼 Bucket Size	600 (高)H x 540 (長)L x 220 (闊)W
裝置水容量 Capacity	70 (公升) Litres
隔油網容量 Filter Holding Capacity	5 (塊) Pieces
不銹鋼架 Stainless Steel Rack	(Grease Filter) 560 (高)H x 520 (長)L x 120 (闊)W 3(塊用)Pieces 560 (高)H x 520 (長)L x 80 (闊)W 2(塊用)Pieces

TOTARU PLAN (HK) LTD.

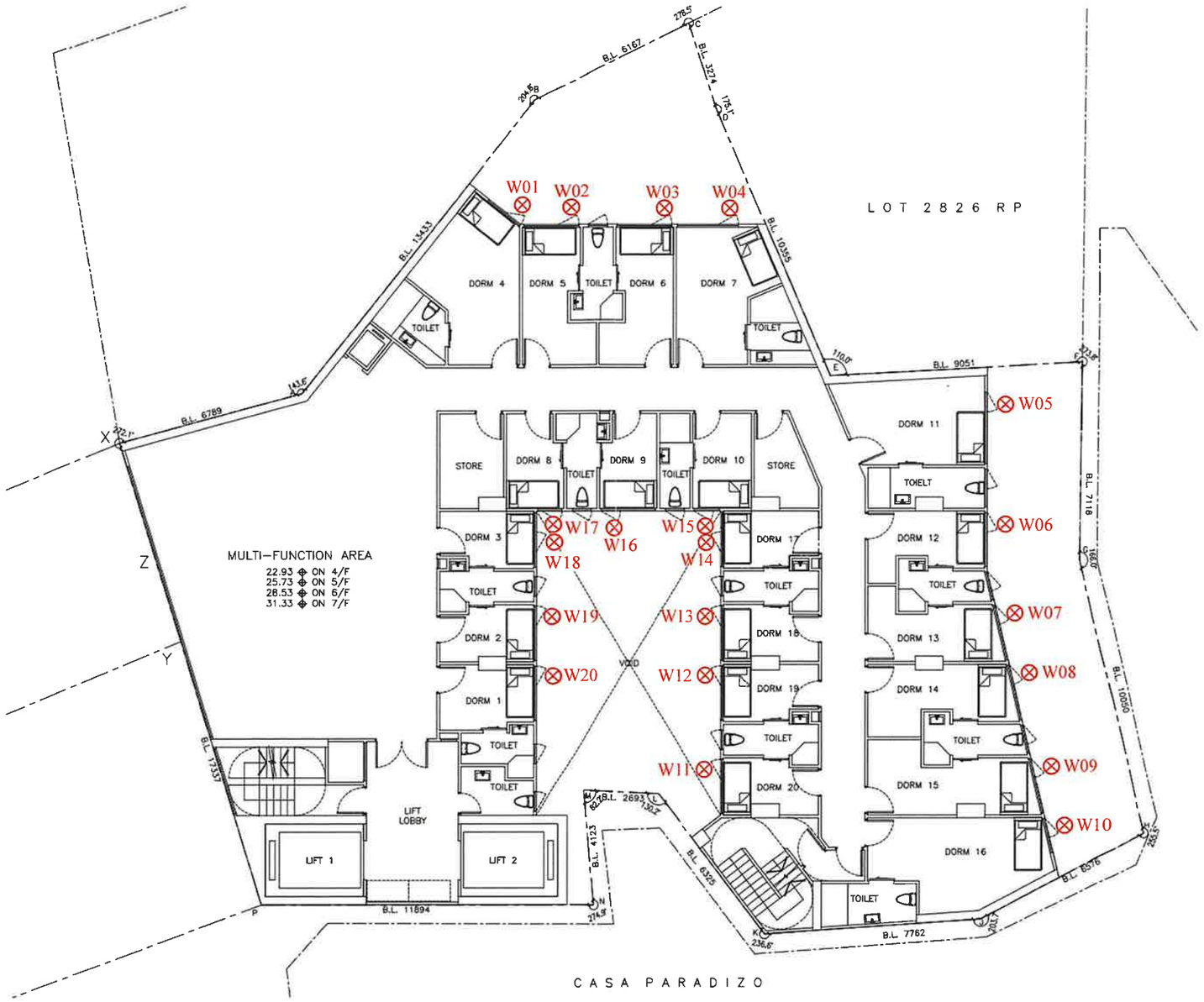
APPENDIX 3.1. TRAFFIC NOISE IMPACT ASSESSMENT



PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 3.1.1		LEAD ARCHITECT: R Lee Architects (HK) Ltd	ENVIRONMENTAL CONSULTANT: Novox	PREPARED BY	Phoenix Lee
DRAWING TITLE: REPRESENTATIVE NOISE SENSITIVE RECEIVERS FOR TRAFFIC NOISE IMPACT ASSESSMENT (2/F)	SCALE: N.T.S.	REV: A			CHECKED BY	Eddy Ng
					APPROVED BY	Banting Wong



PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 3.1.2		LEAD ARCHITECT: R Lee Architects (HK) Ltd	ENVIRONMENTAL CONSULTANT: Novox	PREPARED BY: Phoenix Lee
DRAWING TITLE: REPRESENTATIVE NOISE SENSITIVE RECEIVERS FOR TRAFFIC NOISE IMPACT ASSESSMENT (3/F)	SCALE: N.T.S.	REV: A			CHECKED BY: Eddy Ng APPROVED BY: Banting Wong

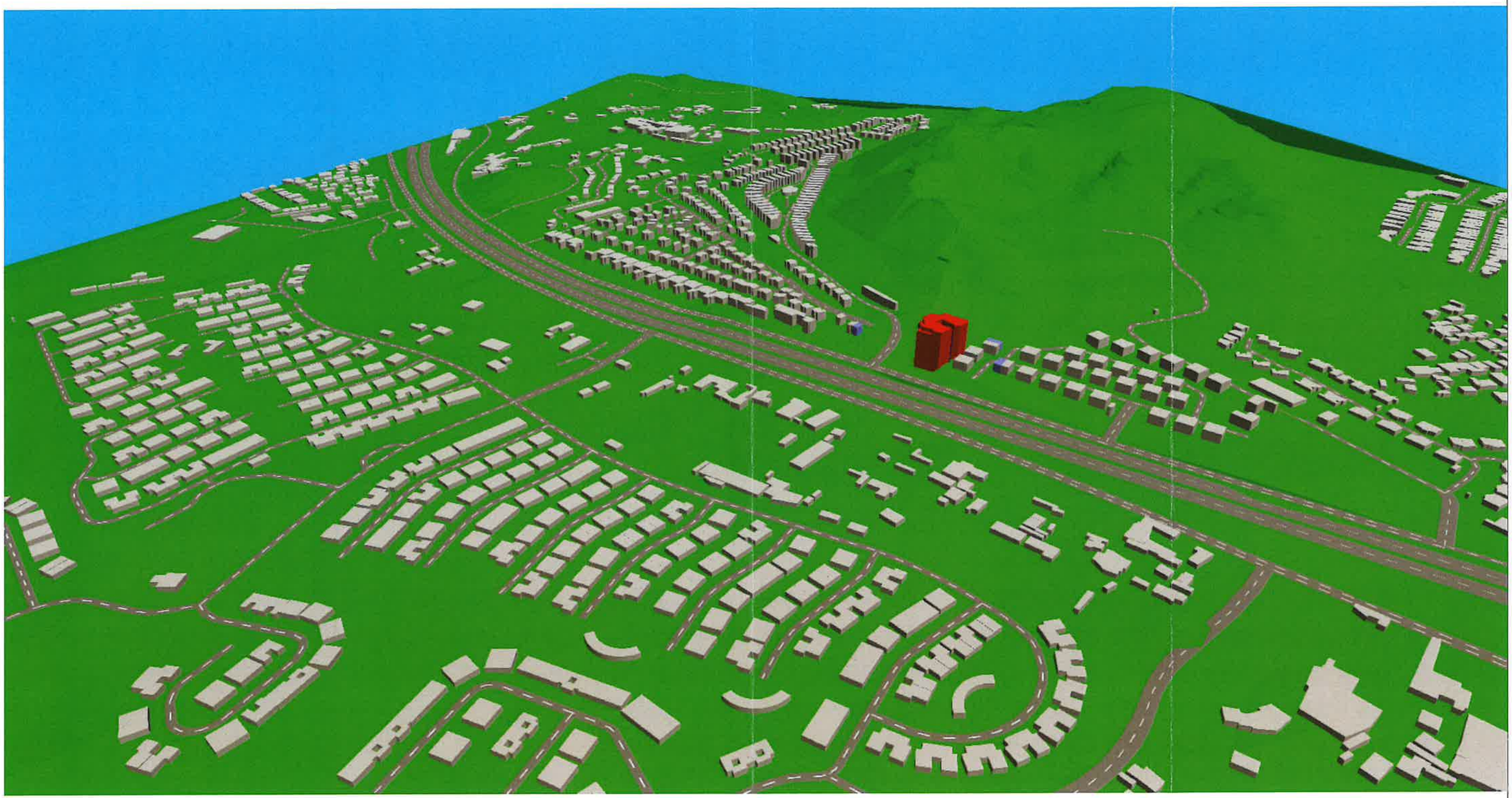


1 G-07 TYPICAL FLOOR PLAN PLAN

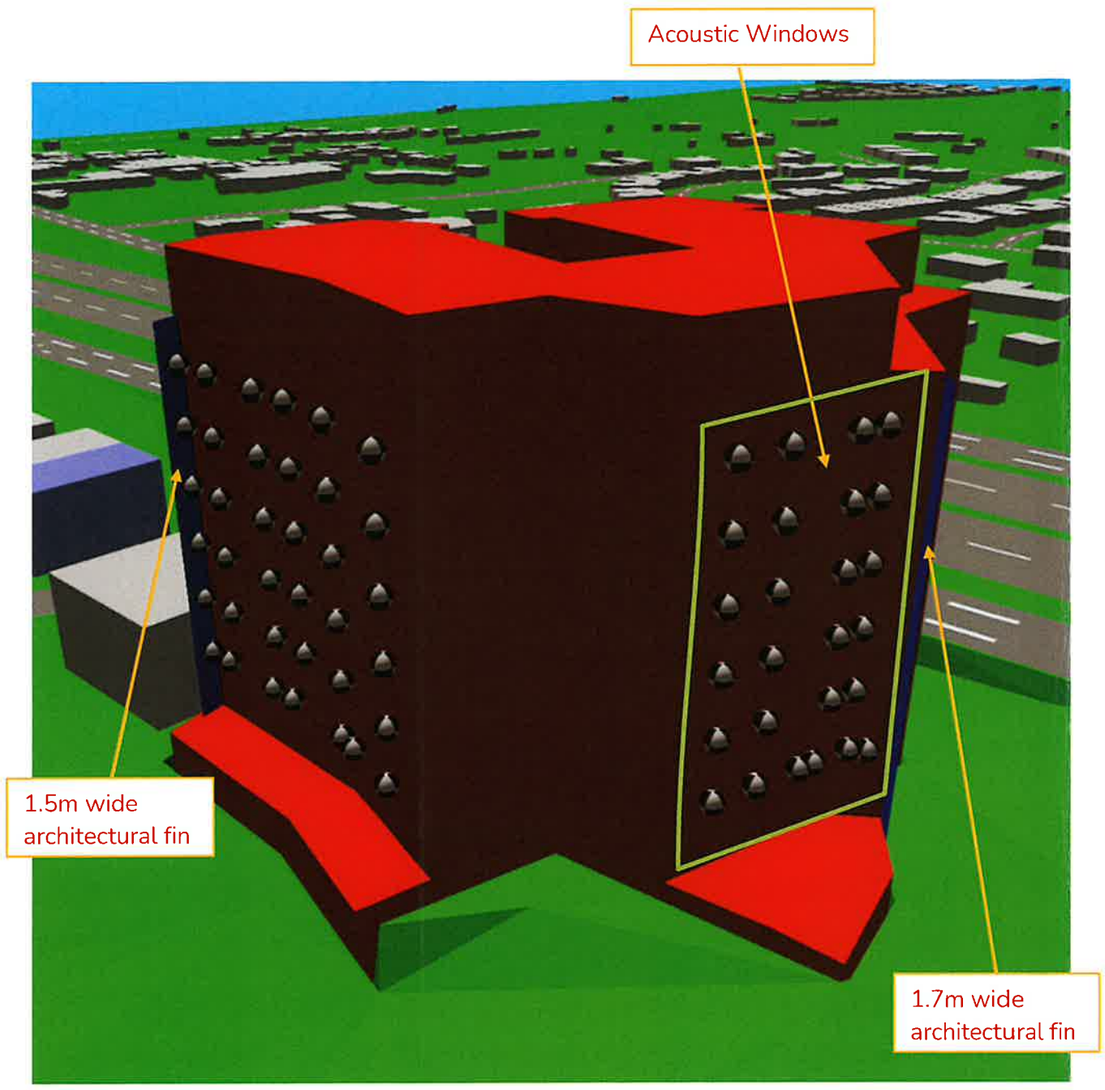
PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 3.1.3		LEAD ARCHITECT: R Lee Architects (HK) Ltd	ENVIRONMENTAL CONSULTANT: Novox	PREPARED BY	Phoenix Lee
DRAWING TITLE: REPRESENTATIVE NOISE SENSITIVE RECEIVERS FOR TRAFFIC NOISE IMPACT ASSESSMENT (4/F TO 7/F TYPICAL)	SCALE: N.T.S.	REV: A			CHECKED BY	Eddy Ng
					APPROVED BY	Banting Wong

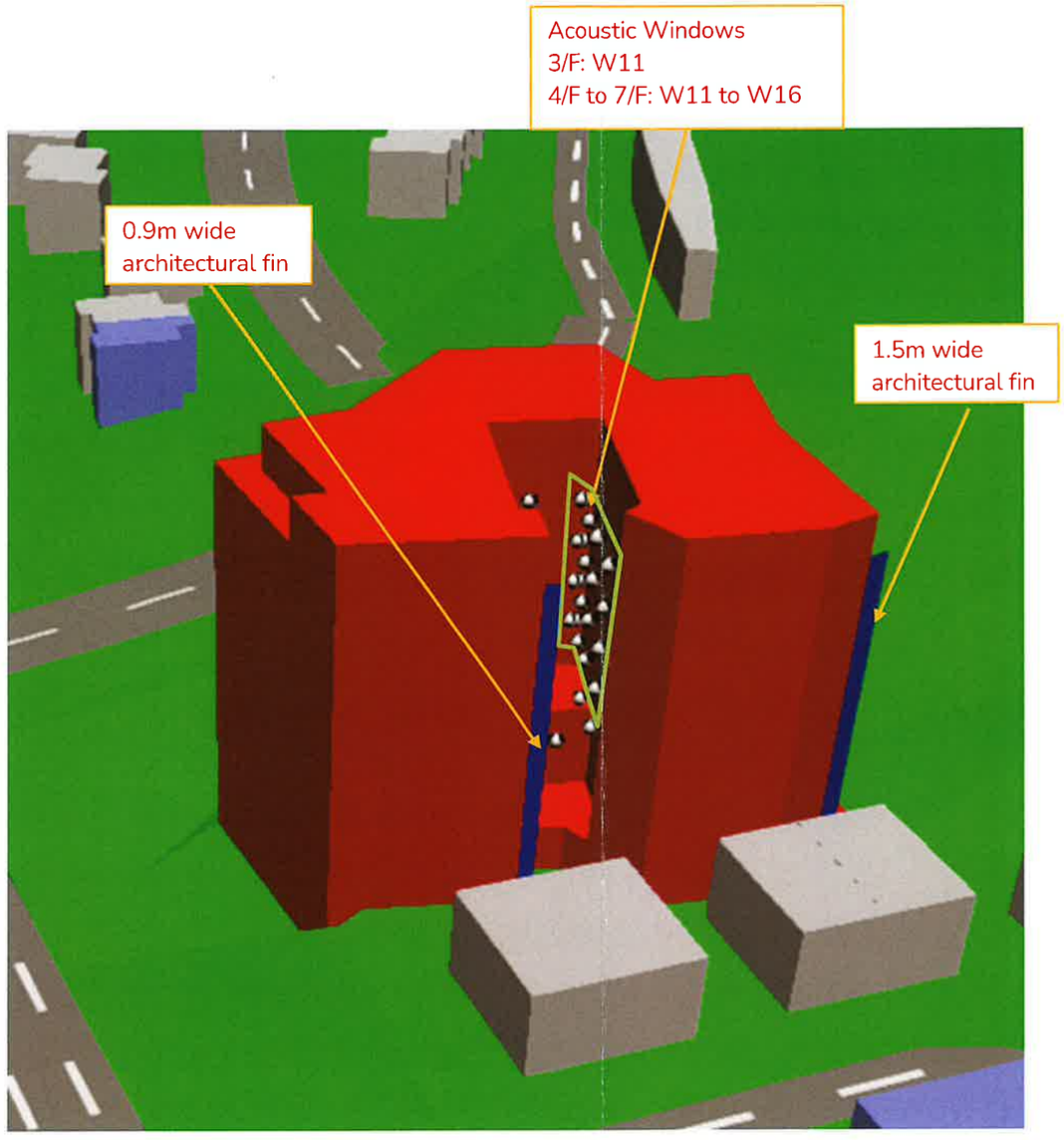
Floor	Dorm	Size(sq.m.)	traffic noise	fixed noise
2F	Dorm 1	33.724		
	Dorm 2	39.464		
	Dorm 3	41.985		
	Dorm 4	26.091		
	Dorm 5	30.522		
	Dorm 6	40.59		
	Dorm 7	68.644		
3F	Dorm 1	7.497		
	Dorm 2	6.403		
	Dorm 3	6.498		
	Dorm 4	10.788		
	Dorm 5	10.594		
	Dorm 6	6.603		
	Dorm 7	6.498		
	Dorm 8	7.225		
	Dorm 9	8.624		
	Dorm 10	9.698		
	Dorm 11	11.018		
	Dorm 12	12.735		
	Dorm 13	18.114		
	Dorm 14	6.498		
	Dorm 15	6.403		
	Dorm 16	6.298		
	Dorm 17	6.203		
	Isolation RM 1	14.435		
	Isolation RM 2	12.359		
	Isolation RM 3	12.711		
TF	Dorm 1	7.497		
	Dorm 2	6.403		
	Dorm 3	6.498		
	Dorm 4	16.798		
	Dorm 5	10.788		
	Dorm 6	10.594		
	Dorm 7	14.713		
	Dorm 8	6.603		
	Dorm 9	6.498		
	Dorm 10	7.225		
	Dorm 11	15.339		
	Dorm 12	8.624		
	Dorm 13	9.698		
	Dorm 14	11.018		
	Dorm 15	12.735		
	Dorm 16	18.114		
	Dorm 17	6.498		
	Dorm 18	6.403		
	Dorm 19	6.298		
	Dorm 20	6.203		
8F	Staff Rm. 1	18.277		
	Staff Rm. 2	16.564		
	Staff Rm. 3	12.94		
	Staff Rm. 4	8.624		
	Staff Rm. 5	9.698		
	Staff Rm. 6	11.018		
	Staff Rm. 7	12.735		
	Staff Rm. 8	18.114		

PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 3.1.4		LEAD ARCHITECT: R Lee Architects (HK) Ltd	PREPARED BY: Phoenix Lee
DRAWING TITLE: REPRESENTATIVE NOISE SENSITIVE RECEIVERS FOR TRAFFIC NOISE IMPACT ASSESSMENT (4/F TO 7/F TYPICAL)	SCALE: N.T.S.	REV: A	ENVIRONMENTAL CONSULTANT: Novox	CHECKED BY: Eddy Ng APPROVED BY: Banting Wong

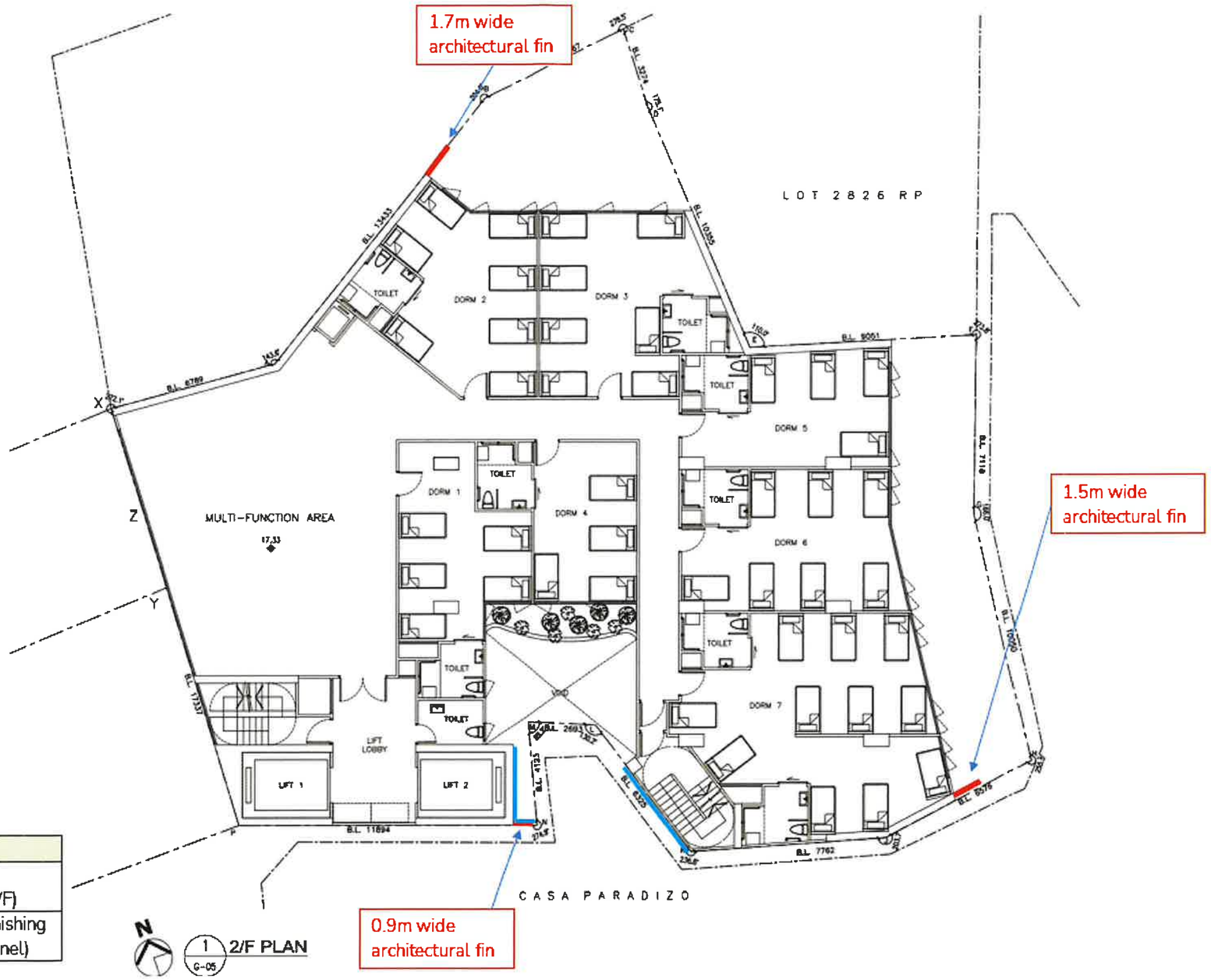


PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 3.1.4		LEAD ARCHITECT: R Lee Architects (HK) Ltd	PREPARED BY	Phoenix Lee
DRAWING TITLE: 3D VIEW OF NOISE MODEL, NOISE SOURCES AND REPRESENTATIVE NSRS	SCALE: N.T.S.	REV: A	ENVIRONMENTAL CONSULTANT: Novox	CHECKED BY	Eddy Ng
				APPROVED BY	Banting Wong





PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 3.1.5		LEAD ARCHITECT: R Lee Architects (HK) Ltd	ENVIRONMENTAL CONSULTANT: Novox	PREPARED BY	Phoenix Lee
DRAWING TITLE: 3D VIEW OF NOISE MITIGATION MEASURES	SCALE: N.T.S.	REV: A			CHECKED BY	Eddy Ng
					APPROVED BY	Banting Wong

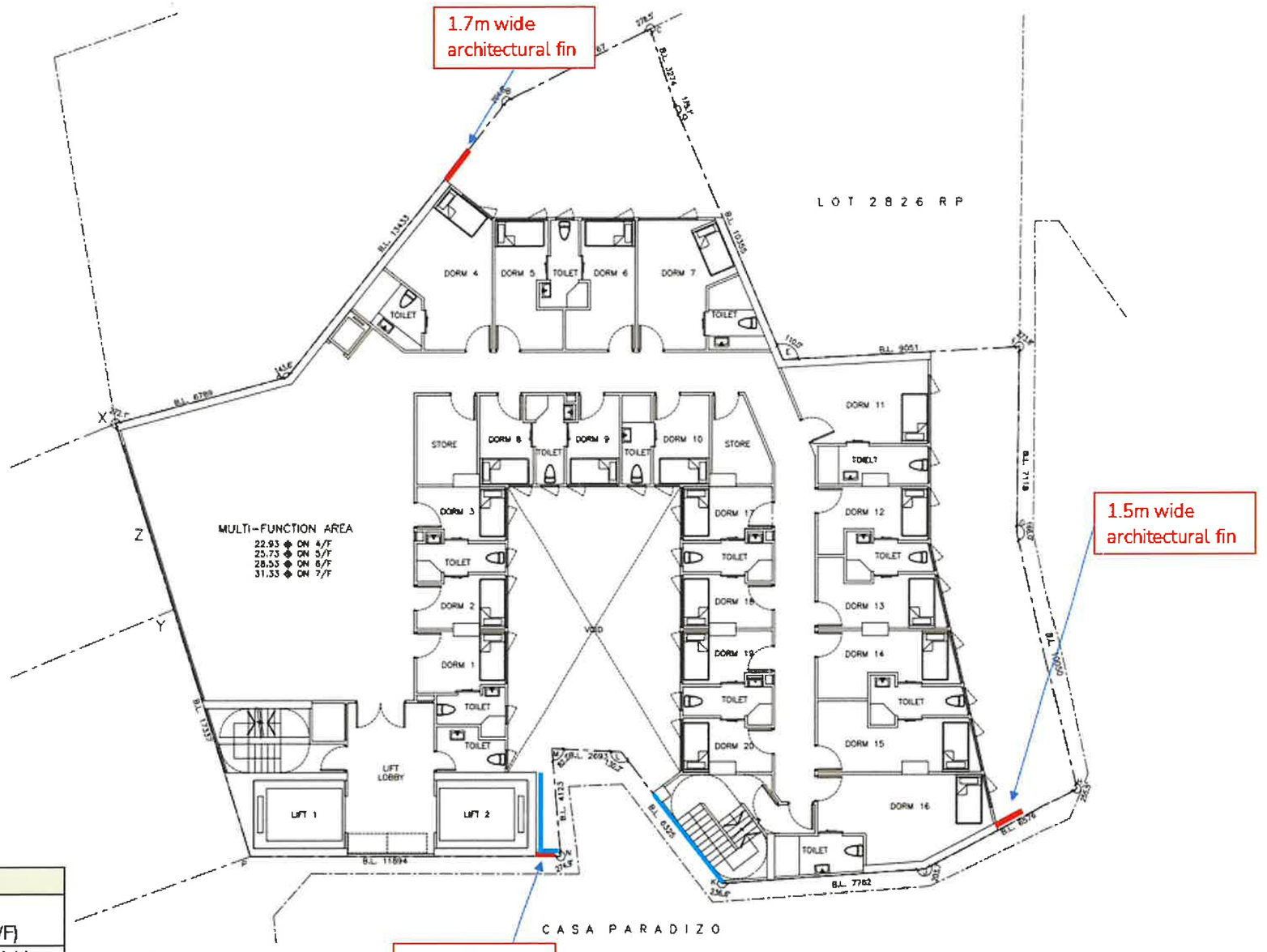


Legend	Description
	Architectural Fins (extend from 2/F to 3/F)
	Sound Absorption Finishing (50mm perforated panel)

N

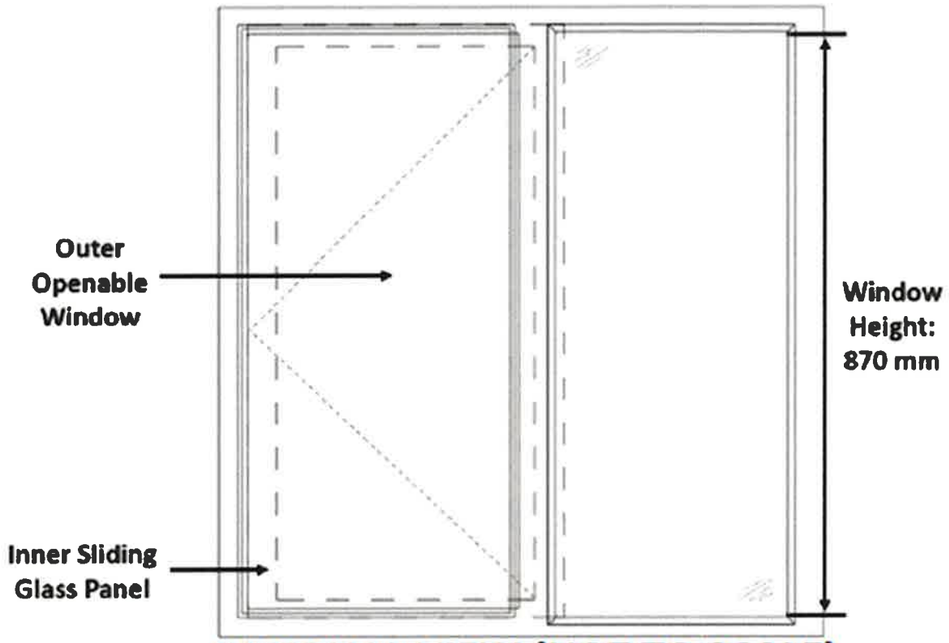
1 G-05 2/F PLAN

PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 3.1.6		LEAD ARCHITECT: R Lee Architects (HK) Ltd	ENVIRONMENTAL CONSULTANT: Novox	PREPARED BY: Phoenix Lee
DRAWING TITLE: ACOUSTIC MITIGATION MEASURES FOR ROAD TRAFFIC NOISE (2/F)	SCALE: N.T.S.	REV: A			CHECKED BY: Eddy Ng
					APPROVED BY: Banting Wong

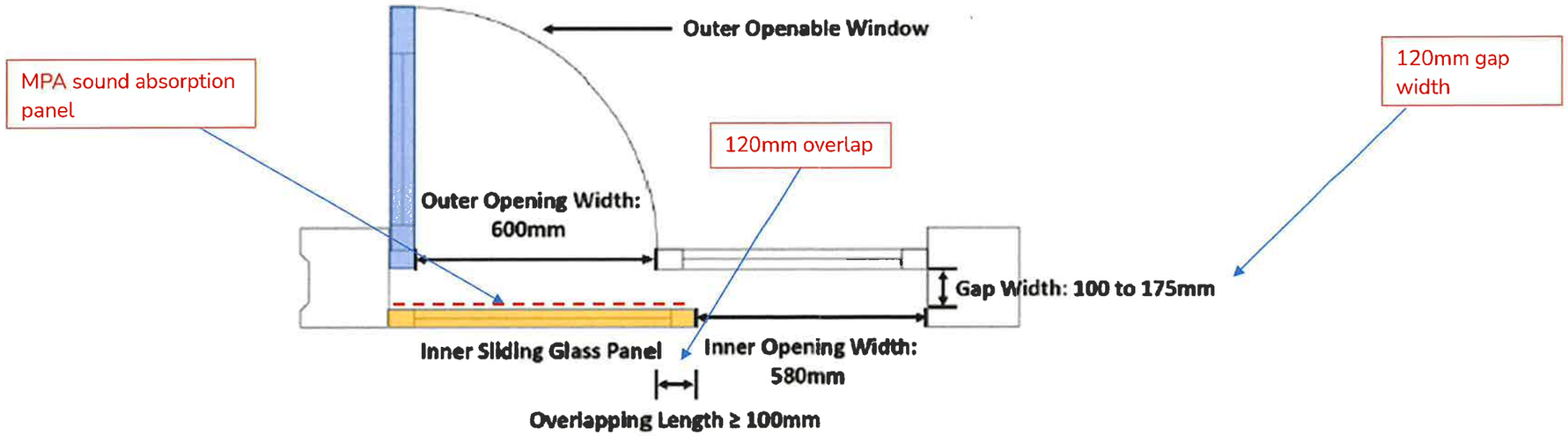


Legend	Description
	Architectural Fins (extend from 3/F to 7/F)
	Sound Absorption Finishing (50mm perforated panel)

PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 3.1.7		LEAD ARCHITECT: R Lee Architects (HK) Ltd	PREPARED BY: Phoenix Lee
DRAWING TITLE: ACOUSTIC MITIGATION MEASURES FOR ROAD TRAFFIC NOISE (3/F TO 7/F)	SCALE: N.T.S.	REV: A	ENVIRONMENTAL CONSULTANT: Novox	CHECKED BY: Eddy Ng
				APPROVED BY: Banting Wong



INTERNAL VIEW (NOT TO SCALE)

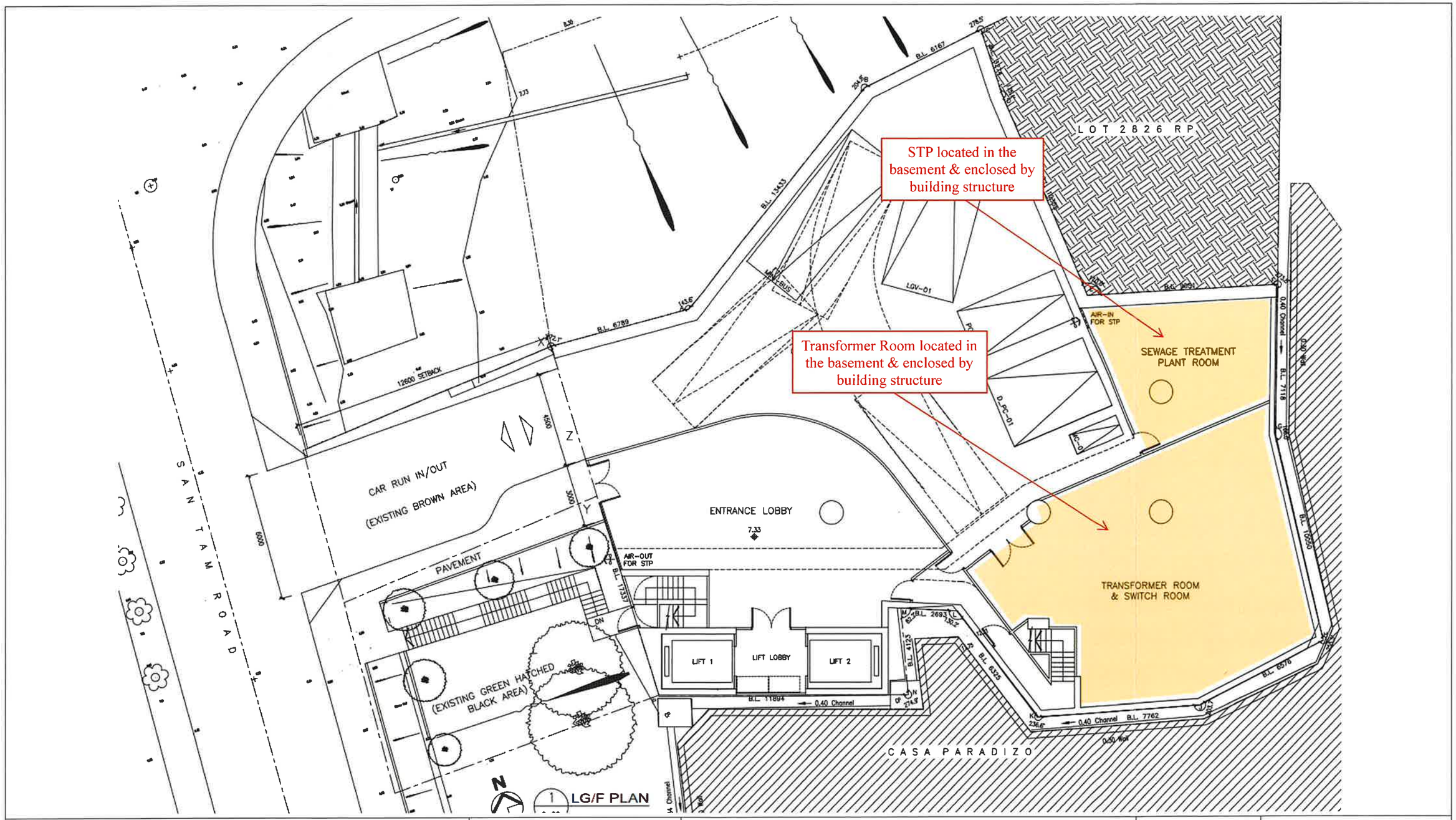


PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 3.1.8		LEAD ARCHITECT: R Lee Architects (HK) Ltd	ENVIRONMENTAL CONSULTANT: Novox	PREPARED BY	Phoenix Lee
DRAWING TITLE: ACOUSTIC MITIGATION MEASURES FOR ROAD TRAFFIC NOISE – ACOUSTIC WINDOW	SCALE: N.T.S.	REV: A			CHECKED BY	Eddy Ng
					APPROVED BY	Banting Wong

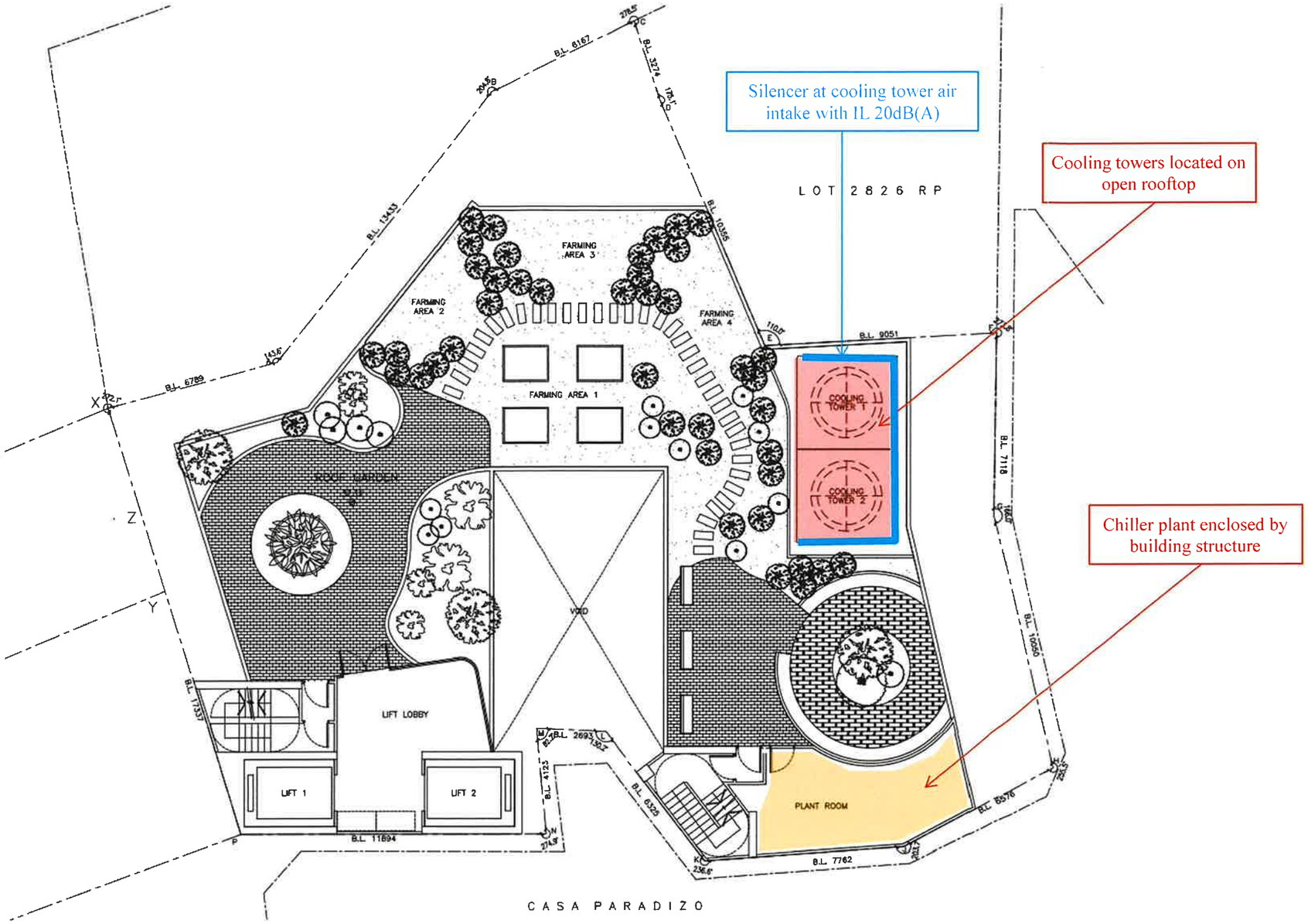


PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 3.1.9			PREPARED BY: Phoenix Lee
		LEAD ARCHITECT: R Lee Architects (HK) Ltd	ENVIRONMENTAL CONSULTANT: ÆCOM	CHECKED BY: Eddy Ng
DRAWING TITLE: NOISE CONTOUR OF ROAD TRAFFIC NOISE IMPACT (MITIGATED)	SCALE: N.T.S.	REV: A		APPROVED BY: Banting Wong

Appendix 3.2. FIXED SOURCE NOISE ASSESSMENT



PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 3.2.1		LEAD ARCHITECT: R Lee Architects (HK) Ltd	ENVIRONMENTAL CONSULTANT: Novox	PREPARED BY: Phoenix Lee
DRAWING TITLE: FIXED NOISE SOURCES LOCATIONS & MITIGATION TREATMENT (LG/F)	SCALE: N.T.S.	REV: A			CHECKED BY: Eddy Ng
					APPROVED BY: Banting Wong



1 G-09 ROOF GARDEN PLAN

PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 3.2.2		LEAD ARCHITECT: R. Lee Architects (HK) Ltd	ENVIRONMENTAL CONSULTANT: NOVOX	PREPARED BY: Phoenix Lee
DRAWING TITLE: FIXED NOISE SOURCES LOCATIONS & MITIGATION TREATMENT (R/F)	SCALE: N.T.S.	REV: A			CHECKED BY: Eddy Ng
					APPROVED BY: Banting Wong

1



The ryowo Group is the pioneer and manufacturer of fiberglass-reinforced polyester (FRP) cooling towers in Hong Kong.

We offer a full range of product lines in FRP, stainless steel and galvanized steel water-cooling towers. With our vital production station, Shenzhen RYOWO Cooling Tower Company Limited, we manufacture, market and service a full range of water-cooling towers. Over 90% of the cooling tower parts are from our own factory and, as a result, control of cost and quality are ensured.

RYOWO has been a member of the Cooling Technology Institute since 1982. With our own R&D Department and testing facilities, we have five lines of product which are CTI-201 certified.

In 2004, our R & D department successfully developed a CTI STD-201 rated product line, the FWS series, the highest standard of water-cooling towers with guaranteed cooling capacity. In order to expand the application of our cooling towers, we developed the integrated drift eliminator, and used the super low noise fan as an option in this series.

FWS

Low Noise Cross Flow Type

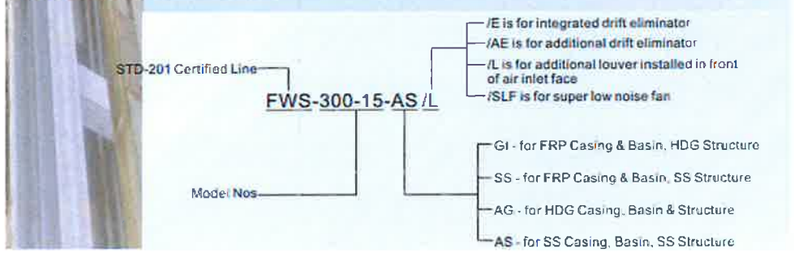


MANUFACTURER'S PUBLISHED THERMAL PERFORMANCE IS CERTIFIED BY THE COOLING TOWER INSTITUTE UNDER THE PROVISIONS OF STD-201 (02) CERTIFICATION VALIDATION NUMBER

M-27-01

THE COOLING TOWER YOU CAN RELY ON

MODEL DESIGNATION



ryowo

3 SPECIFICATION

Cooling Tower selected for 81 San Tam Road Yuen Long
Model FWS-94-7.5 by Ryowo, two units are required to be installed.

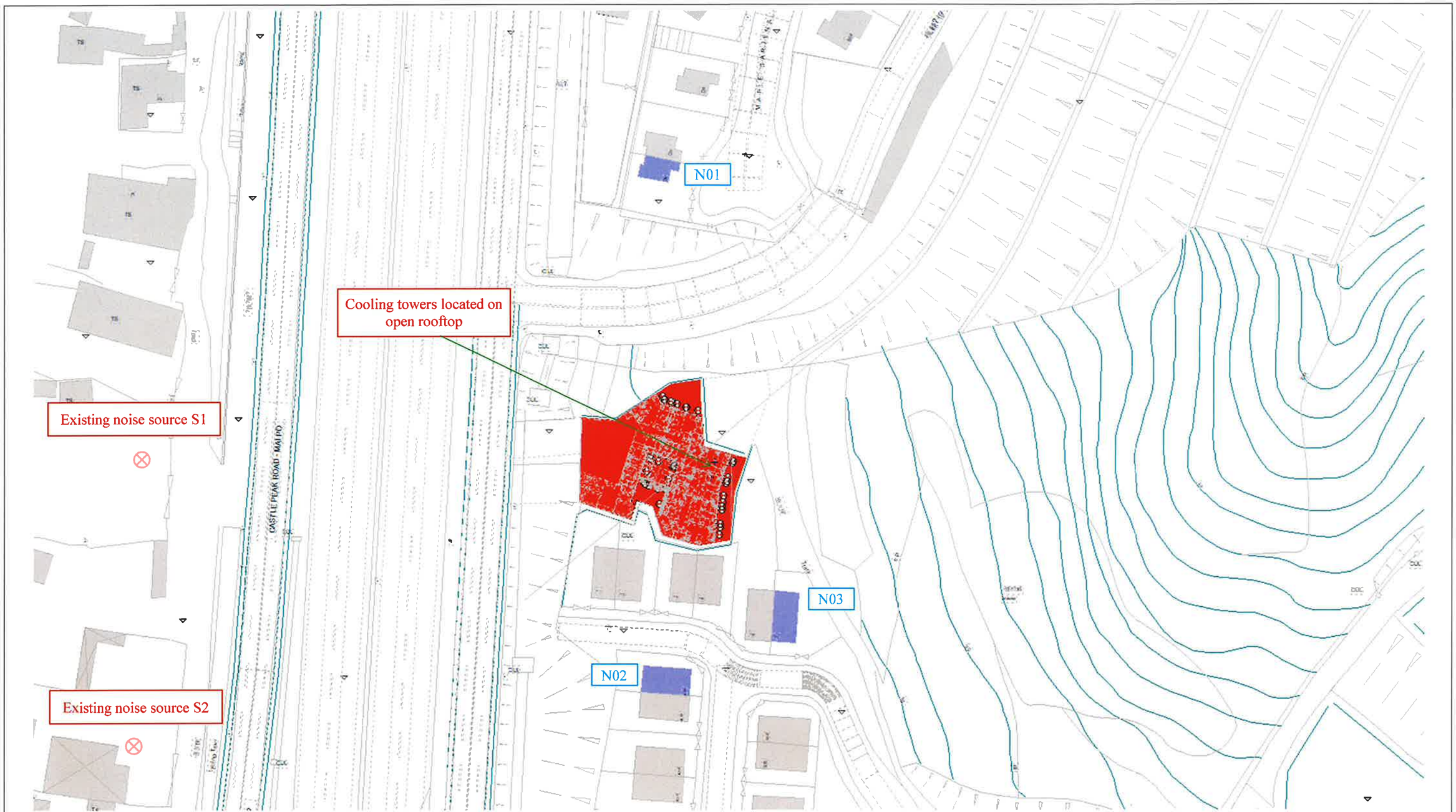
Model	Nominal Water Flow L/hr	Dimension L mm	W mm	h mm	H mm	Fan Motor kW	Fan Dia mm	Piping In mm	Out mm	Fe mm	Of mm	Dr mm	Sound Power Level	Weight Dry kgs	Wet kgs
FWS-94-3.7	94	4000	2000	4125	4625	3.7	1600	100x2	150	25	50	50	88	1335	2300
FWS-94-5.5	107				4705	5.5							91	1385	2350
FWS-94-7.5	119				4745	7.5							93	1400	2365
FWS-127-5.5	127	4400	2300	4125	4705	5.5	1800	100x2	150	25	50	50	90	1570	3000
FWS-127-7.5	141				4745	7.5							92	1585	3015
FWS-127-11	160				4825	11							94	1650	3080
FWS-169-7.5	169	4400	2600	4125	4745	7.5	2000	125x2	200	25	50	50	93	1690	3700
FWS-169-11	192				4825	11							94	1760	3770
FWS-169-15	212				4870	15							95	1770	3780
FWS-200-7.5	190	4600	2600	4125	4785	7.5	2400	125x2	200	40	80	50	91	2195	4000
FWS-200-11	215				4865	11							93	2250	4055
FWS-200-15	235				4910	15							95	2255	4060
FWS-250-7.5	210	4800	3200	4345	4985	7.5	2450	125x2	200	40	80	50	90	2890	5000
FWS-250-11	240				5065	11							93	2945	5055
FWS-250-15	265				5110	15							94	2950	5060
FWS-275-7.5	235	5200	3200	4145	4745	7.5	2900	150x2	200	40	80	50	89	3050	5160
FWS-275-11	255				4865	11							92	3105	5215
FWS-275-15	285				5910	15							94	3110	5220
FWS-300-7.5	235	6000	3200	4345	4895	7.5	2400	150x2	200	40	80	50	89	3310	6500
FWS-300-11	270				5065	11							91	3365	6555
FWS-300-15	300				5110	15							93	3370	6560
FWS-300-18.5	320				5175	18.5							94	3410	6600
FWS-300-22	340				5215	22							95	3470	6660
FWS-330-7.5	260	6300	3200	4145	4755	7.5	2900	150x2	250	50	80	50	88	3405	6595
FWS-330-11	300				4865	11							91	3460	6650
FWS-330-15	330				4910	15							93	3465	6655
FWS-330-18.5	350				5174	18.5							94	3505	6695
FWS-330-22	375				5215	22							95	3565	6755
FWS-350-7.5	275	5400	3600	5435	6065	7.5	3000	150x2	250	50	80	50	89	3580	6770
FWS-350-11	315				6145	11							91	3635	6825
FWS-350-15	350				6190	15							93	3640	6830
FWS-350-18.5	375				6255	18.5							94	3680	6870
FWS-350-22	400				6295	22							95	3740	6930
FWS-400-7.5	255	6600	3600	4345	4955	7.5	3000	125x4	250	50	80	50	87	3630	7000
FWS-400-11	325				5065	11							89	3685	7055
FWS-400-15	360				5110	15							91	3690	7060
FWS-400-18.5	385				5135	18.5							92	3730	7100
FWS-400-22	410				5195	22							93	3790	7160
FWS-400-30	450				5255	30							94	3820	7185
FWS-500-7.5	305	6000	4200	5355	5990	7.5	3400	125x4	250	50	80	50	87	4230	8000
FWS-500-11	345				6070	11							90	4285	8055
FWS-500-15	385				6115	15							91	4290	8060
FWS-500-18.5	410				6180	18.5							93	4325	8100
FWS-500-22	435				6220	22							94	4380	8170
FWS-500-30	485				6290	30							95	4415	8145
FWS-550-7.5	315	6600	3600	5455	5990	7.5	3000	125x4	250	50	80	50	87	4350	8080
FWS-550-11	360				6070	11							89	4405	8135
FWS-550-15	400				6115	15							91	4410	8140
FWS-550-18.5	430				6180	18.5							92	4450	8180
FWS-550-22	455				6220	22							94	4510	8240
FWS-550-30	500				6280	30							95	4535	8275
FWS-600-11	435	7000	4200	5500	6255	11	3700	150x4	300	50	80	50	89	5015	9000
FWS-600-15	485				6300	15							91	5020	9005
FWS-600-18.5	520				6365	18.5							92	5060	9045
FWS-600-22	550				6405	22							93	5120	9085
FWS-600-30	610				6465	30							95	5140	9110
FWS-600-37	650				6485	37							96	5330	9300
FWS-700-11	515	7000	5000	5500	6255	11	3700	150x4	300	50	80	50	89	5650	12000
FWS-700-15	570				6300	15							91	5655	12005
FWS-700-18.5	610				6365	18.5							92	5690	12055
FWS-700-22	645				6405	22							93	5755	12120
FWS-700-30	720				6465	30							95	5780	12145
FWS-700-37	765				6485	37							96	5970	12335
FWS-800-11	555	7500	5000	6400	7155	11	4200	150x4	300	50	80	50	88	6905	14880
FWS-800-15	615				7200	15							90	6910	14885
FWS-800-18.5	655				7265	18.5							91	6945	14920
FWS-800-22	695				7305	22							93	7010	14985
FWS-800-30	760				7365	30							95	7035	15010
FWS-800-37	820				7435	37							98	7225	15200
FWS-800-45	880				7495	45	4200	150x4	350	50	80	50	99	7255	15230
FWS-800-55	940				7495	55							100	7365	15340

Notes:

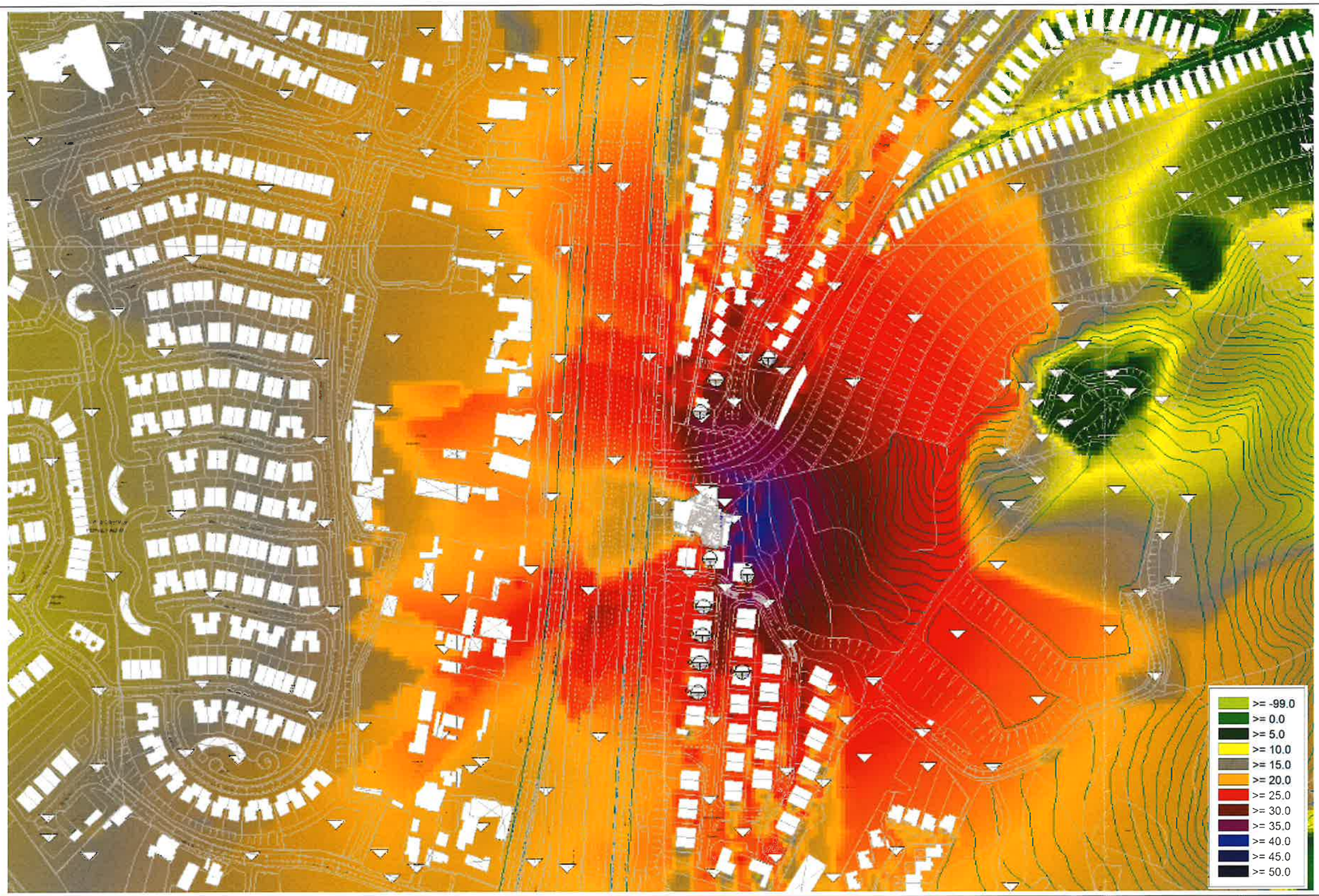
1/CTI Certification applies to the operation with the Wet Bulb Temp. between 12.8°C and 32.2°C, Max. Entering Water Temp. 51.7°C, Min. Range of 2.2°C and Min. Approach of 2.8°C.
2/The nominal water flows are based upon 37°C HWT, 32°C CWT, 28°C WBT, 32°C DBT and 101.3 kPa Barometric pressure.
3/Sound Power Level is in dBA re 10 ⁻¹² Watt.
4/Data and specifications are subjected to change without prior notice.

ryowo

PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 3.2.3	LEAD ARCHITECT: R Lee Architects (HK) Ltd	ENVIRONMENTAL CONSULTANT: Novox	PREPARED BY	Phoenix Lee
DRAWING TITLE: ACOUSTIC DATA FOR PROPOSED COOLING TOWERS	SCALE: N.T.S. / REV: A			CHECKED BY	Eddy Ng
				APPROVED BY	Banting Wong



PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 3.2.4		LEAD ARCHITECT:	ENVIRONMENTAL CONSULTANT:	PREPARED BY: Phoenix Lee
DRAWING TITLE: LOCATION OF FIXED NOISE SOURCES & REPRESENTATIVE NSRS	SCALE: N.T.S.	REV: A			CHECKED BY: Eddy Ng
					APPROVED BY: Banting Wong



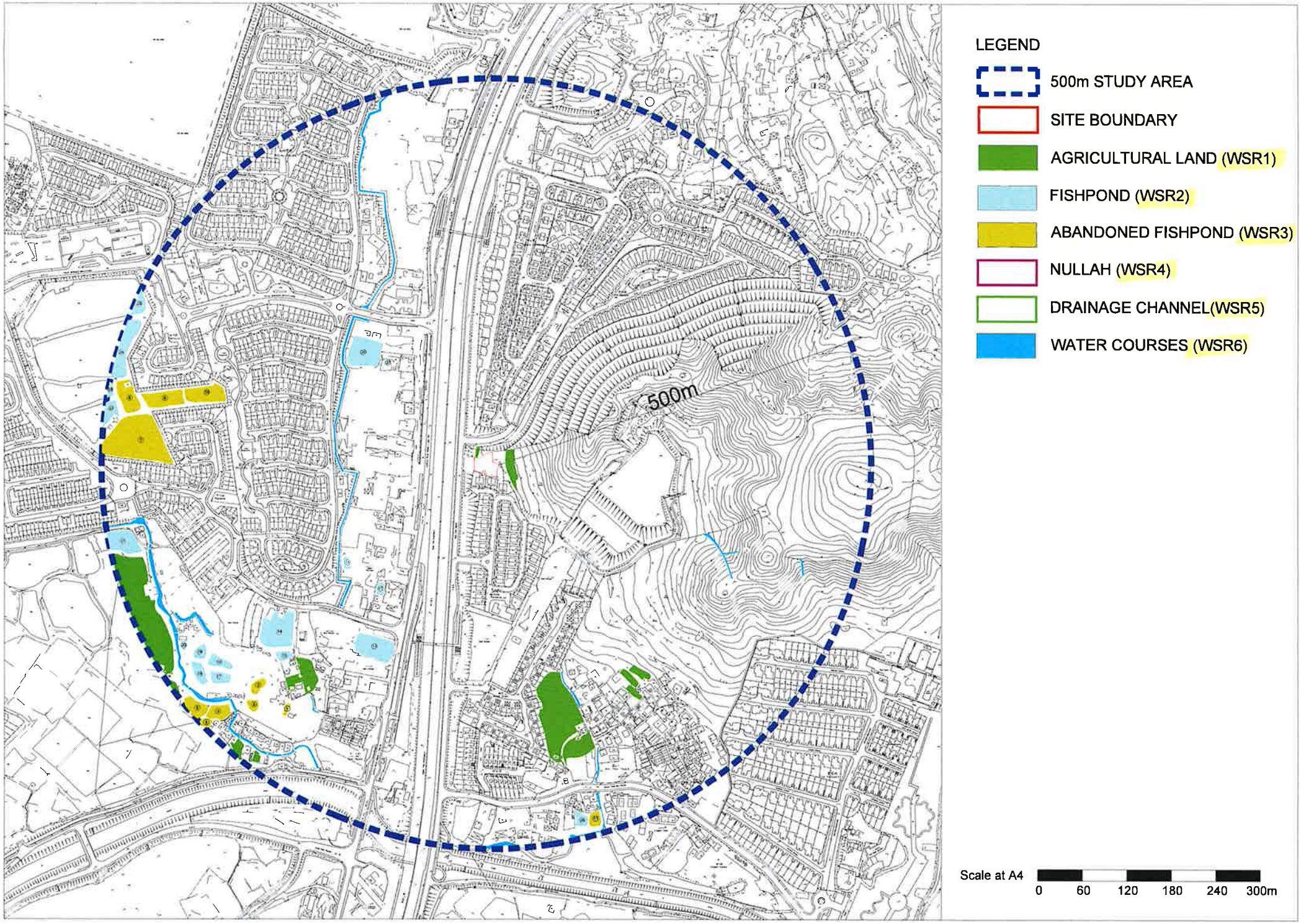
PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 3.2.5		LEAD ARCHITECT: R Lee Architects (HK) Ltd	ENVIRONMENTAL CONSULTANT: Novox	PREPARED BY: Phoenix Lee
DRAWING TITLE: NOISE CONTOUR OF FIXED SOURCE NOISE IMPACT (MITIGATED)	SCALE: N.T.S.	REV: A			CHECKED BY: Eddy Ng
					APPROVED BY: Banting Wong

Appendix 4.1. WATER QUALITY STANDARD

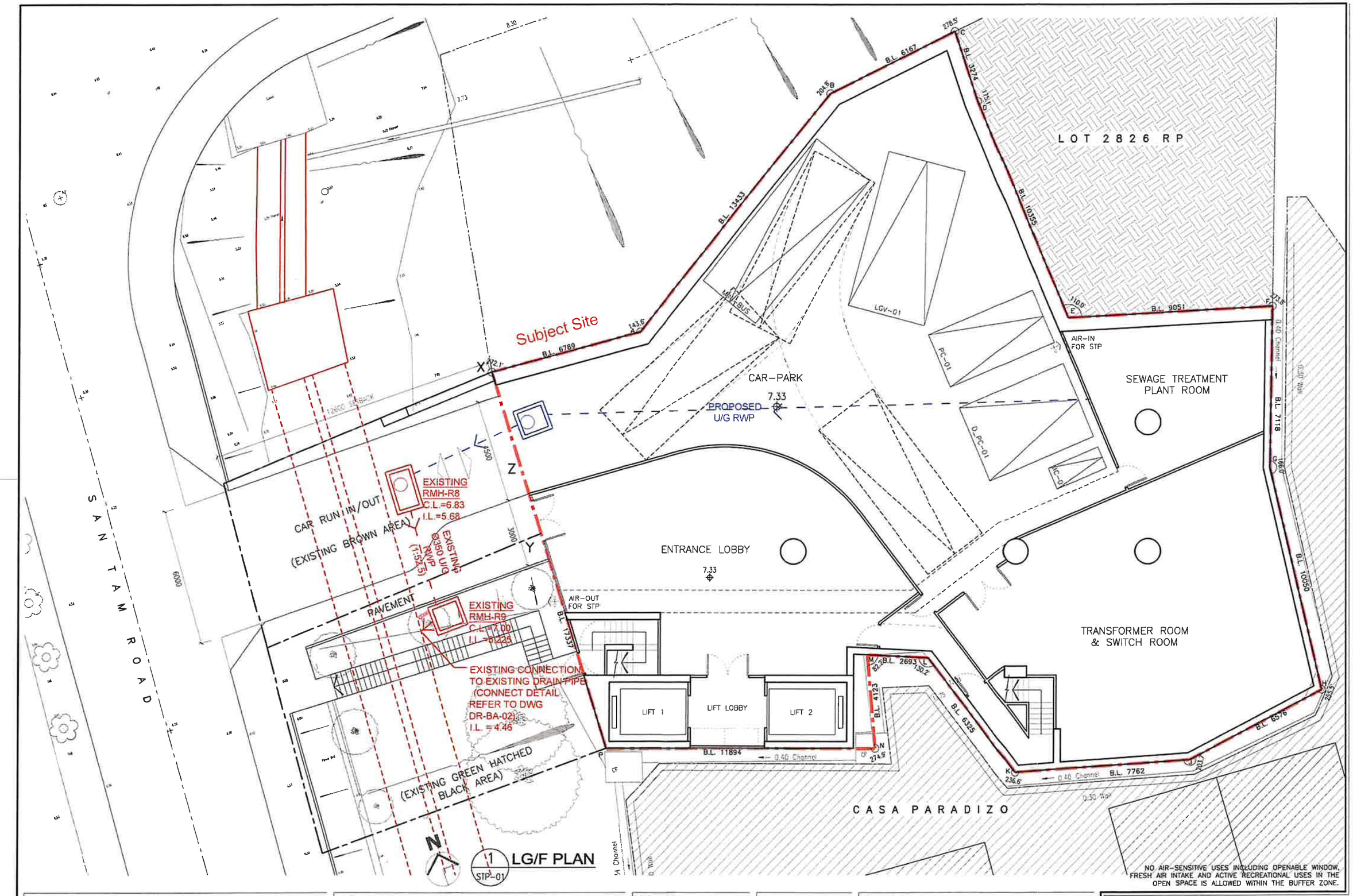
Flow rate (m^3/day) / Determinand	≦10	>10 and ≦200	>200 and ≦400	>400 and ≦600	>600 and ≦800	>800 and ≦1000	>1000 and ≦1500	>1500 and ≦2000	>2000 and ≦3000	>3000 and ≦4000	>4000 and ≦5000	>5000 and ≦6000
pH (pH units)	6-9	6-9	6-9	6-9	6-9	6-9	6-9	6-9	6-9	6-9	6-9	6-9
Temperature (℃)	45	45	45	45	45	45	45	45	45	45	45	45
Colour (lovibond units) (25mm cell length)	1	1	1	1	1	1	1	1	1	1	1.	1
Suspended solids	50	50	50	50	50	50	25	25	25	25	25	25
BOD	20	20	20	20	20	20	10	10	10	10	10	10
COD	80	80	80	80	80	80	50	50	50	50	50	50
Oil & Grease	20	20	20	20	20	20	10	10	10	10	10	10
Iron	10	10	10	7	5	4	3	2	1	1	1	1
Boron	5	4	3	2.5	2	1.6	1.1	0.8	0.5	0.4	0.3	0.2
Barium	5	4	3	2.5	2	1.6	1.1	0.8	0.5	0.4	0.3	0.2
Mercury	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cadmium	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Other toxic metals individually	1	0.5	0.5	0.5	0.4	0.4	0.25	0.2	0.15	0.1	0.1	0.1
Total toxic metals	2	1	1	1	0.8	0.8	0.5	0.4	0.3	0.2	0.14	0.1
Cyanide	0.1	0.1	0.1	0.1	0.1	0.08	0.06	0.04	0.03	0.02	0.01	0.01
Phenols	0.5	0.5	0.4	0.3	0.25	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Sulphide	5	5	5	5	5	5	2.5	2.5	1.5	1	1	0.5
Total residual chlorine	1	1	1	1	1	1	1	1	1	1	1	1
Total nitrogen	100	100	100	100	100	100	80	80	50	50	50	50
Total phosphorus	10	10	10	10	10	10	8	8	5	5	5	5
Surfactants (total)	15	15	15	15	15	15	10	10	10	10	10	7
E. coli (count/100ml)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 4.1.1		LEAD ARCHITECT: R Lee Architects (HK) Ltd	ENVIRONMENTAL CONSULTANT: Novox	PREPARED BY: Phoenix Lee
DRAWING TITLE: STANDARDS FOR EFFLUENTS DISCHARGED INTO THE COASTAL WATERS OF DEEP BAY WATER CONTROL ZONE	SCALE: N.T.S.	REV: A			CHECKED BY: Eddy Ng
					APPROVED BY: Banting Wong

Appendix 4.2. WATER SENSITIVE RECEIVERS


LEGEND
500m STUDY AREA
SITE BOUNDARY
AGRICULTURAL LAND (WSR1)
FISHPOND (WSR2)
ABANDONED FISHPOND (WSR3)
NULLAH (WSR4)
DRAINAGE CHANNEL(WSR5)
WATER COURSES (WSR6)
500m
Scale at A4
0
60
120
180
240
300m

Appendix 4.3. PRELIMINARY DISCHARGE ROUTE AND DESIGN CALCULATION OF STP



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.

LG/F PLAN
DISCHARGE ROUTE OF THE STP

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

Do not scale drawing.
Contractors are required to verify exact dimensions on site.
The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate.
The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified.
This drawing is not for construction purposes unless expressedly certified.

RLEE

Design Calculation

Revision 1

for

Sewage Treatment Plant (MBR)

For Ngau Tam Mei Lot no. 4823 in DD104 for

Residential Care Home Services

TABLE OF CONTENT

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^3/head/day
BOD_5 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^3/head/day
= 74 m^3/day

BOD_5 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^3/head/day
BOD_5 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^3/head/day
= 3.5 m^3/day

BOD_5 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^3/day
= 77.5 m^3/day

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

Peak Hourly (6 DWF)
= 3.23 m^3/hr x 6
= 19.38 m^3/hr

Design Flow (3DWF)
= 3.23 m^3/hr x 3
= 9.69 m^3/hr

Total BOD_5 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_5	:	≦ 10 mg/L
SS	:	≦ 10 mg/L
E. coli	:	≦ 100 count/100ml
TN	:	≦ 20mg/l
Amonia Nitrogen	:	≦ 5mg/l
TP	:	≦ 2mg/l

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 μm) 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

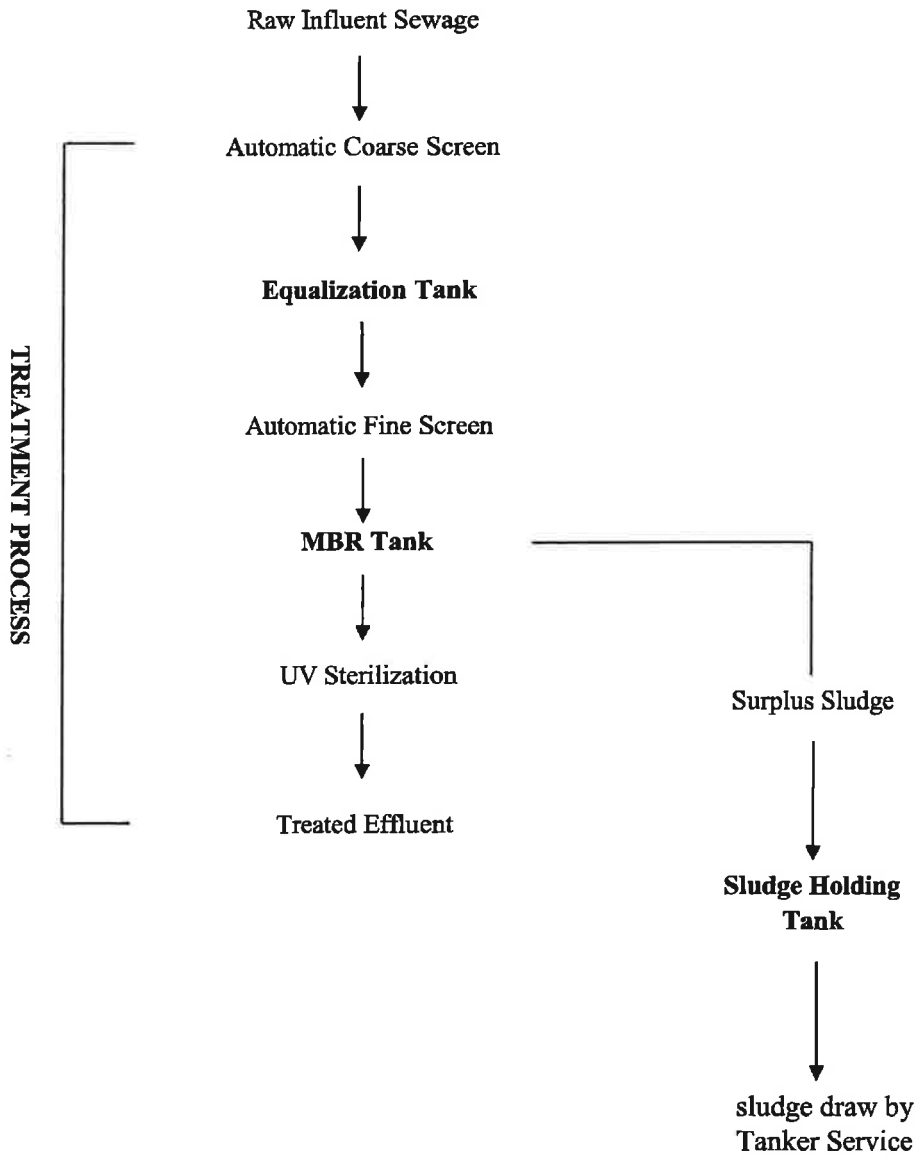
Waste sludge is an end product of all aerobic processes. It may be allowed to build up in the MBR Tank to a certain extent as an increase in mixed-liquor solids, or in the Sludge Holding Tank.

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^3/hr > Peak hourly flow 19.38 m^3/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)

= 2 hr x (19.38 – 9.69) m^3/hr
= 19.38 m^3

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^3

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

Pump start/stop frequency = $\frac{15 \times 9.69 m^3/hr \div 60 min/hr}{2.1}$

= 1.15 time/hr < 10 times/hr, **OK**

(iv) Air requirement for mixing = 20m^3/min per 1000m^3 of tank volume

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

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

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

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

Provide one sets of submersible ejector at air capacity 45 m^3/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 m^3/hr > Peak hourly flow 9.69 m^3/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 m^3

(ii) Retention time = $\frac{34.97 m^3}{9.69 m^3/hr}$

= 3.4 hrs > 3hrs, **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 kg/day x 0.925
= 11.24 kg/day (145.02 mg/l)

Assume MLSS = 5000 mg/l,

F/M ratio
= 11.24 kg/day / (5000 mg/l x 10^{-6} kg/mg x 10^3 l/m^3 x 47.25 m^3)
= 0.064 Kg BOD/ Kg MLSS –day

(iv) Nos. of Membrane module required

Design flux rate of membrane sheet = 35 litre/m^2-hr

Minimum filtration area required:
= (9.69 m^3/hr x 1000 l/m^3) / 35 litre/m^2-hr
= 277 m^2

Three sets of "Toray" NHP210-150S membrane module is adopted , each of membrane filtration aera of 105 m^2 to provide total filtration area of 315m^2 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)

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

= (77.5 m^3/day x 145.02mg/l) / 34.97 m^3
= 321.43 mg/l-day
= 0.321 Kg BOD/ m^3 –day

(vi) Ammonia Nitrogen removal

Assume Ammonia Nitrogen = 20mg/l

Ammonia Nitrogen of influent sewage : Total flow x 20mg/l
= 77.5m3/day x 20mg/l
= 1550 g/day
= 1.55 kg/day

(vii) Calculation of oxygen requirement

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

Minimum air requirement for BOD removal
= (145 - 20) mg/l x 77.5 m^3/day x 110 m^3/kg x 10^{-6} kg/mg x 10^3 l/m^3
= 1065.76 m^3/day
= 44.4 m^3/hr (0.74 m^3/min)

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

Total air required for air scour of membrane modules
= 1 m^3/min x 60 min x 3 modules
= 180 m3/hr (3 m^3/min)

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

Minimum air requirement for Ammonia Nitrogen removal
= (20 - 2) mg/l x 77.5 m^3/day x 380 m^3/kg x 10^{-6} kg/mg x 10^3 l/m^3
= 530.1 m^3/day
= 22.1 m^3/hr (0.368 m^3/min)

Total minimum air required for air blower
= (44.4 + 180 + 22.1) m^3/hr
= 246.5 m^3/hr(4.1 m^3/min)

Provide two air blowers (one duty and one standby) with airflow of 4.74m^3/min (284.4m3/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 m3

Pump start/stop frequency = $\frac{15 \times 9.69 m^3/hr \div 60 min/hr}{2.59}$

= 0.94 time/hr < 10 times/hr, OK

E. UV Sterilization

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

Dose requirement = 30000 $\mu W/cm^2$ 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 10^6 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
= $[(15/2)^2 - (2.8/2)^2]$ x π x 100 cm
= 17055 cm^3
= 17.055 L

Retention Time
=Volume / flow rate
= 17.055 L / (9.69m3/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 x 10^6 μW / (π x 15cm x 100cm)] x 1 x 0.9 x 0.8
= 42441 x 1 x 0.9 x 0.8
= 30558 $\mu W/cm^2$

UV Dose at Chamber wall
= Retention time x UV intensity at Chamber wall
= 6.34 sec. x 30558 $\mu W/cm^2$
= 193737 $\mu Ws/cm^2$ (>30000 $\mu Ws/cm^2$, **OK**)

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:

Tank Size = 2.9 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 = 2.9 m (L) x 3.7 m (W) x 2.7 m (WD)
= 28.97 m^3

With 7.5% BOD removed after fine bar screen
BOD loading for biological treatment
= 11.24 kg/day

BOD removal rate
= 77.5 m^3/day x 1000 litre/m^3 x (145 - 20) mg/liter x 10^{-6} kg/day
= 9.69 kg/day

Sludge yield from biological processes is taken as 1 kg solid/1 kg BOD removed. Therefore sludge production rate is calculated as follows:
Sludge production rate = 9.69 kg/day x 1.0 kg/kg BOD removal
= 9.69 kg/day

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

Volume of wet sludge produced = $\frac{9.69\ kg/day}{0.02x1.01x1000kg/m^3}$

$= 0.48\ m^3/day$

Storage time = $\left(\frac{28.97m^3}{0.48m^3/day}\right)$

$= 60.4$ days > 60days, **OK**

(ii) Air requirement for aeration and mixing

$= 30\ m^3/min$ per $1000m^3$ x tank volume
$= (30\ m^3/min \times 28.975\ m^3) / 1000\ m^3$
$= 0.87\ m^3/min$
$= 52.15\ m^3/hr$

Provide a submersible ejector with air flow of 80 m^3/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^3/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^3/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^3/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^3/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^2 area of membrane plat at pore size of 0.08 micron with flux rate of 35 litre/m^2/hr.

   3sets –"Liverani" model EP 40"-M TF non-submersible permeate pump, two duty and one standby, in flow capacity of 4.8 m^3/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^3/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 284.4m3/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 12m3/hr vs 5m c/w 0.4 kw motor (3ph/50Hz/380V), w/SS316 lifting chain

   1set – 'Tsurumi' model TOS-37BER5 submersible ejector, in $80m^3$/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 $24m^3$/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

APPENDIX 5.1 FSD AND EPD'S REPLY ON LAND CONTAMINATION

消 防 處
香港九龍何文田常安街1號
消防處總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS BI II DING,
No.1 Heung Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (120) in FSD GR 6-5/4 R Pt. 44
來函檔號 YOUR REF. :
電子郵件 E-mail : hkfsdenq@hkfsd.gov.hk
圖文傳真 FAX NO. : 2739 5879
電 話 TEL NO. : 2733 7741

6 December 2022

NOVOX Limited
Room L, 7/F, Block 2,
Kinho Industrial Building,
14-24 Au Pui Wan Street, Fotan, Shatin
(Attn: Mr. Eddy NG, Project Manager)

Dear Mr. NG,

Proposed Residential Care Home for Elderly at Lot 4823 in DD 104, 81 San Tam Road, Yuen Long
Request for Information of Dangerous Goods & Incident Records

I refer to your letter of 14.10.2022 regarding the captioned request and reply below in response to your questions:-

Please be advised that neither records of dangerous goods license, nor incidents of spillage / leakage of dangerous goods were found in connection with the given conditions of your request at the subject location.

If you have further questions, please feel free to contact the undersigned.

Yours sincerely,

(NG Wing-chit)
for Director of Fire Services

Ref. number and date should be quoted in reference to this letter
[illegible]

Eddy NG (Novox)

From: leolau@epd.gov.hk
Sent: Wednesday, June 29, 2022 4:02 PM
To: eddy.ng@novox.com.hk
Cc: arthurtau@epd.gov.hk; leolau@epd.gov.hk
Subject: Fw: Proposed RCHE at 81 San Tam Road - Request for information about Spillage/Leakage of Chemical Waste or Chemicals
Attachments: Proposed RCHE at 81 San Tam Road_RFI Chemical Leakage.pdf

Dear Sir/Madam,

Re. your letter and email of 28.6.2022 below.

This Office has no record of any reported chemical spillage / leakage incident at the captioned locations. Nonetheless, you are advised to check with other relevant parties / departments for such information as appropriate.

For record of Chemical Waste Producers Registration, a registry is available at our Territory Control Office in Wan Chai. Please contact our Mr. Eric FUNG at 2835 1027 or our Mr. MA at 6308 0705 for details during the office hours.

Yours faithfully,

(Leo K.Y. LAU)
for Director of Environmental Protection

Tel. - 2158 5833

---- Forwarded by Leo KY LAU/EPD/HKSARG on 29/06/2022 15:57 ----

From: "Eddy NG (Novox)" <eddy.ng@novox.com.hk>
To: <leolau@epd.gov.hk>
Cc: <banting.wong@novox.com.hk>
Date: 28/06/2022 15:03
Subject: Proposed RCHE at 81 San Tam Road - Request for information about Spillage/Leakage of Chemical Waste or Chemicals

Dear Sir,

A construction project is under planning at the captioned site. As part of the environmental assessment, we are required to undertake a land contamination assessment in order to identify any potential contaminated issues within the Project Area, shown in below Figure as per attached. For this, we would like to request for the following information of the Project Area:

- Any records of spillage/ leakage of chemical waste or chemicals at the Project Area.

1

PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 5.1.1		LEAD ARCHITECT: R Lee Architects (HK) Ltd	ENVIRONMENTAL CONSULTANT: NOVOX	PREPARED BY	Phoenix Lee
DRAWING TITLE: FSD AND EPD'S REPLY ON LAND CONTAMINATION	SCALE: N.T.S.	REV: A			CHECKED BY	Eddy Ng
					APPROVED BY	Banting Wong

APPENDIX 7.1 TD'S REPLY ON TRAFFIC FORECAST

CTA Consultants Limited
Transportation, Planning, Engineering, Research and Development
We commit We deliver

Our Ref: 22069HK/hor/ykl/04

By E-mail only
(Email: eddy.ng@novox.com.hk)

24 May 2023

Novox Limited
Room L, 7/F, Block 2, Kinho Industrial Building
14-24 Au Pui Wan Street
Fotan, Shatin
Hong Kong

Attn: Mr. Eddy Ng

Dear Sir,

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 DD 104, 81 San Tam Road, San Tin, N.T.
Year 2042 Traffic Forecasts for Traffic Noise Impact Assessment (TNIA)

We refer to our submission of traffic forecasts via our letter [Ref.: 22069HK/hor/ykl/03] dated 8 February 2023 and e-mail dated 23 May 2023, and the e-mail reply from Transport Department dated 22 and 23 May 2023 regarding the captioned subject.

We write to confirm that Transport Department's endorsed methodology prepared by us has been strictly adopted in preparing the traffic forecast for the Noise Impact Assessment Report prepared by Novox Limited.

Should you have any queries or require further information, please do not hesitate to contact the undersigned at 2214 0849.

Thank you very much for your kind attention.

Yours Faithfully,
For and on behalf of
CTA Consultants Ltd.

Horace Mak
Director

CTA Consultants Limited 志達顧問有限公司
Unit 2108, 21/F, Westlands Centre, 20 Westlands Road, Quarry Bay, Hong Kong
香港鰂魚涌華蘭路 20 號華蘭中心 21 樓 2108 室
Tel: (852) 2214 0849 / Fax: (852) 2214 0817
Email: cta@ctaconsultants.com / website: www.ctaconsultants.com

Subject: RE: S12A amendment of OZP no. S/YL-NTM/12 - Proposed RCHE at 81 San Tam Road, San Tin, NT

Chi Kong LEUNG <chikongleung@td.gov.hk>
to Agnes Lee, Evonne Li, Horace Mak, Ming Yip TSE
Tue, 23 May, 20:41

You are viewing an attached message. R Lee Architects (HK) Ltd Mail can't verify the authenticity of attached messages.

Dear Agnes,

I have no further comment on the captioned submission from traffic engineering point of view.

Thank you.

Regards,
Donald Leung
E/IP, TE/NTW
Transport Department
Tel. 2399 2778

From: "Agnes Lee" <agneslee@ctaconsultants.com>
To: "Chi Kong LEUNG" <chikongleung@td.gov.hk>
Cc: "Evonne Li" <evonneli@ctaconsultants.com>, "Horace Mak" <horacemak@ctaconsultants.com>, "Ming Yip TSE" <mingyiptse@td.gov.hk>
Date: 23/05/2023 03:48 PM
Subject: RE: S12A amendment of OZP no. S/YL-NTM/12 - Proposed RCHE at 81 San Tam Road, San Tin, NT

Dear Donald,

Please be advised that the value of trip generation attraction of Application no. YYL-NSW/9 in Table 3.10 was due to typos. Please find attached the replacement page for Table 3.10 for your review and reference.

Thanks.

Agnes Lee
CTA Consultants Limited
Unit 2108, 21/F, Westlands Centre, 20 Westlands Road, Quarry Bay, H. K.
Tel: (852) 2214 0849 Fax: (852) 2214 0817
Email : cta@ctaconsultants.com

From: Chi Kong LEUNG <chikongleung@td.gov.hk>
Sent: Monday, May 22, 2023 5:18 PM
To: Agnes Lee <agneslee@ctaconsultants.com>
Cc: 'Evonne Li' <evonneli@ctaconsultants.com>; 'Horace Mak' <horacemak@ctaconsultants.com>; Ming Yip TSE <mingyiptse@td.gov.hk>
Subject: RE: S12A amendment of OZP no. S/YL-NTM/12 - Proposed RCHE at 81 San Tam Road, San Tin, NT

PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01 Figure 6.1.1		LEAD ARCHITECT: R Lee Architects (HK) Ltd	ENVIRONMENTAL CONSULTANT: Novox	PREPARED BY	Phoenix Lee
DRAWING TITLE: TD'S REPLY ON TRAFFIC FORECAST	SCALE: N.T.S.	REV: A			CHECKED BY	Eddy Ng
					APPROVED BY	Banting Wong

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 4

LANDSCAPE MASTER PLAN

RLEE

RLEE Architects (HK) Ltd

CONTENTS

		Page
1.0	Introduction	1
2.0	Existing Site Condition	1-2
3.0	Proposed Development Perspective	3
4.0	Landscape Design Proposal	3
5.0	Landscape Design Objectives	4
6.0	Open Space	4
7.0	Green Coverage	5
8.0	Landscape Design Components	5-9
9.0	Soft Landscape Design Elements	10-15
10.0	Landscape Management and Maintenance	16

Tables

1 Existing Trees in Brown Area, Green Hatched Black Area and Site Area

2 Planting Species for Greenery Coverage, Green Hatched Black Area and Brown Area

Figure

1 Proposed RCHE Design

2 Landscape Master Plan

3 LG/F Landscape

4 1/F Landscape

5 2/F Landscape

6 3/F Landscape

7 8/F Landscape

8 R/F Landscape

9 Section AA Diagram

10 Section BB Diagram

11 Vertical Greening – Modular System

12 Perspective View through Sky Garden

13 Front View Showing Greenery

14 Green Coverage Calculation

15 Open Space Calculation

16 Tree Felling Proposal & Retained Tree Location

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^2 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.

3. Proposed Development Perspective

3.1 The proposed development is an 8-storey RCHE comprising about 142 bed spaces. It would make optimal use of scarce land resources to address the demand for elderly home care services in the vicinity.

Please refer to ***Figure 1*** for the Proposed RCHE Design.

3.2 The proposed development is accessible from San Tam Road at the run in/out provided. The access road will be reduced to 4.5 m wide in order to provide a pavement to the Entrance Lobby. Entrance Lobby, Car Park with accessible parking and loading/unloading bay together with all necessary Plant Rooms are provided on LG/F.

3.3 The proposed development has already set back by 12.6m from San Tam Road. The development will further set back above 2/F at the Northern & Eastern side. A Void on the Southern Side is designed to create "Stack Effect" for better ventilation.

4. Landscape Design Proposal

4.1 The Conceptual design of the Landscape Master Plan is illustrated as per ***Figure 2*** to ***Figure 8***, and Sections on ***Figures 9 & 10***. ***Figure 12*** shows the perspective view through the covered Sky Garden. ***Figure 13*** shows the front view form San Tam Road with the Landscaping features like the Vertical Greenery, etc.

4.2 The captioned Figures aim to introduce future landscape expectation and perspectives, providing a sense of the relationship between the landscape and Architecture to present the high quality and diverse open space and green coverage for the user.

4.3 The landscape design proposal will introduce the main concept followed by a brief of the landscape element planning with thoughtful arrangement with hard and soft landscape and components.

5. Landscape Design Objectives

5.1 The main design objectives for the landscape are listed below:

Propose a distinctive luxury landscape that is specially designed for elderly use.

Integrate the visual context of the development and preview the new look of the site and architecture.

Softened the visual impact for the surroundings with vegetation screening

Balancing the Green coverage and Open Space for the user to maximize the potential of the outdoor space

Adapting to the thermal climate of Hong Kong and ensuring the outdoor area is comfortable for the user through reasons in Hong Kong.

6. Open Space

6.1 The proposed development has provided a required amount of open space in accordance with the requirement of Hong Kong Planning Standard and Guidelines (HKPSG) with $1m^2$ per user for the proposed development. The components and facilities in the open space satisfy the requirement of the elderly and are easy to be managed by the staff.

6.2 Approx. 142 beds will be provided in the captioned development which indicates equal to the population of the development. ***Figure 15*** shows the scheme will provide not less than $142m^2$ of open space for the resident which satisfies the requirement of HKPSG and the needs of future residents.

6.3 All the landscaping and open space within the site boundary, Green Hatched Black Area and Brown Area would be constructed, managed, and maintained by the developer and relevant authorities after the completion of the Defects Liability Period and Establishment Period.

6.4 Due to the climate affecting the resident, Sky Garden on 1/F provide covered and outdoor open space for the elderly. This aims to provide an alternative option for the elderly so as to escape from direct sunlight and rain in summer.

7. Green Coverage

7.1 The Site Area of the proposed development does not conform to the minimum size requirement to provide Greenery coverage in the building. However, in order to improve the environmental quality of the urban space and open space, we are pleased to offer Greenery Space in accordance with the requirement for the development of 1000 m^2 - 2000 m^2 site area as detailed in Buildings Department Practice Notes PNAP APP-152, Sustainable Building Design Guidelines; and DEVB Technical Circular (Works) No. 3/2012. The design has included a minimum of 10% Greenery in the Primary Zone (15 m above main street level) and a total of 20% coverage.

7.2 The site area of the Proposed Development is 736.3 m^2. The Green Coverage shall not be less than 147.26 m^2 in total with and 73.63 m^2 in primary zone. ***Figure 14*** shows the location and amount of the Greenery Coverage.

7.3 On Sky Garden floor, part of the greenery will be extended to the covered area in order to maintain the consistency of the greenery view. Those species would be carefully selected in order to live in both outdoor and covered conditions.

7.4 Only Vertically uncovered Greenery Space has been counted as Green Coverage.

8. Landscape Design Components

8.1 The following description of the Components aim to improve the user experience for the potential user, staff, and visitor for the proposed development and minimize the visual impacts via various vegetation planting and greenery coverage. Facilitates and spaces are all accessible, barrier-free, and elderly-friendly to ensure the feasibility.

8.2 The Proposed Landscape design should refer to ***Figure 2*** to ***Figure 10*** and including several main components detailed as follow:

The Entrance Landscape

8.3 The gentle slope and trees in the Green Hatched Black Area between the application site and San Tam Road would be mostly retained the original form. Existing trees will reduce the noise from San Tam Highway and counselling the building block from the sight of the Highway to reduce the visual impact on the landscape view. ***Figure 3*** shows the landscape and the location of the trees in the Green Hatched Black Area.

Widened Pedestrian Pavement

8.4 The proposed Brown Area would undergo slight change to provide a pavement with the access road reduced to 4.5m wide. The Pavement leading to the Entrance door will be 3m wide which makes the main entrance more accessible for users with any equipment passing by. The pavement also provides a safer and independent path to separate pedestrian from vehicles.

Accessible Parking

8.5 The Car Park provides extra space for the loading/unloading bay & accessible Parking for visitor and resident, which complies with The Technical details and design on parking for drivers with disabilities in Volume 6 Chapter 8 of TPDM and the third schedule to the Building (Planning) Regulation (Cap 123F).

8.6 Signage clearly indicates the exact locations of the designated parking spaces for users for all the circulation. The signage will not be obscured and can be seen from the driver's seat.

Vertical Greenery

8.7 Vertical Greenerys are provided on Lower Floor Spandrels facing San Tam Road ***(Figure 13).*** Those would enhance the visual composition and signify the Entrance at the same time. Fixing and irrigation details are shown on ***Figure 11***.

Sky Garden on 1/F

8.8 The 1/F Sky Garden provides a diverse functional space that provides potential interest for the future user. The Sky Garden spaces are shaded and covered by the building block above. The covered open space allows the elderly to enjoy outdoor space in thermal climate and rainy seasons while escaping from direct sunlight and rain.

8.9 Considering the level of the sky garden might be seen by surrounding building users, the Sky Garden will be surrounded by trees and shrubs to secure user privacy while concealing the surrounding R(C) House from user perspectives. It also provides a natural context landscape view from sky garden to the small mountain at North-East side.

8.10 The Sky Garden provides better ventilation to the Podium and surrounding buildings by providing a ventilation channel from West to East to enhance the environmental sustainability of users and neighbourhood living space by achieving better air ventilation. ***Figure 4*** shows the layout plan of the 1/F Sky Garden and the connection between outdoor and indoors.

Lawn with functional Space on 1/F

8.11 The Lawn is located at the Northern setback platform on 1/F and to be surrounded by vegetation. As a semi-shaded area, the lawn enables use in various weather conditions to enjoy the natural context and to provide a flexible outdoor space for the management team and staff by holding different community events. It also allows interaction with the indoor multi-purpose room.

Japanese Zen Garden on 1/F

8.12 The Japanese Garden is located in the middle of 1/F at the bottom of the void. The Garden is referred to as the traditional Japanese Garden to present a peaceful, mysterious atmosphere. A wooden pavement Pavilion will be provided and surrounded the Japanese Garden. Residents can view the garden landscape by walking across the corridor of 2/F via the curtain glass or by stepping into the Pavilion in order to feel the Tranquillity of the garden.

8.13 In the middle of the Garden, the resident can create their own dry garden (枯山水庭園) which will provide calming effect with thoughtful and peaceful life sentiment.

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.

Urban Farming

8.18 The Farming area is located in the middle of the Roof Garden. The 300m soil layer for farming would be sunken to ensure the user remains accessed at the same level as other sections of the Roof Garden. Four deeper planters will also be provided for the diversity of vegetation planting experiences in urban farming. Both Farming and its products can consequence a better communication and social relationship for the resident to support their mental and psycho-health during accommodation.

Entertainment Playground

8.19 The End of the Eastern side of the Roof Garden is utilized as Entertainment Playground for the resident. This area will be installed with accessible elderly fitness equipment and seats for general sitting during exercise. The playground also provides a variety of spaces for low-impact exercise and muscle training during the daytime. Residents can jog, Tai-chi, and Fitness dance in the captioned area to strengthen their bodies.

Tranquillity Seating Place

8.20 The East End Corner of the Roof is surrounded by concrete seats with wooden paving. The circular seat provides a semi-enclosure and trees were planted in the middle of the space. The space provides a private space for the resident & their family to enjoy the eastern side landscape view and social activities.

9. Soft Landscape Design Elements

9.1 The proposed planting scheme aims to improve the living environment of the potential RCHE resident with Greenery. All trees can provide a secondary shade for the uncovered area for future use of the equipment mentioned. The use of trees, shrubs, and flowers will also provide a soft enclosure to characterize different open spaces and mark the boundary in a more comfortable way. The soft landscape will simulate a natural environment for the user but at the same time respond to the architecture to embrace both.

9.2 Soft Landscape can efficiently reduce the visual impact produced by the newly-built shape, which could benefit the surrounding residential housing by reducing visual impact and the uncomfortable feeling generated by the new development.

9.3 The selected vegetation will characterize the primary theme of the proposed environment, providing a colour version of the expectation of all the Greenery Area. The potential planting species will integrate into the architecture for a welcoming environment for the resident with different colours and textures.

Table 2 : Planting Species for Greenery Coverage, Green Hatched Black Area and Brown Area

Botanical Name	Size(mm)	Spacing(mm)
Trees		
Cinamomum burmannii	Heavy Standard	As shown
Terminalia mantaly	Heavy Standard	As shown
Large Specimen Shrub Species(multi-stem)		
Cascabela thevetia	1500 (h) x 1000 (s)	As shown
Hibiscus Syriacus	1500 (h) x 1000 (s)	As shown
Lagerstroemia Indica	1500 (h) x 1000 (s)	As shown
Murraya paniculata	1500 (h) x 1000 (s)	As shown
Shrub		
Brunfeisia calycina	300 x 300	250
Caesalpinia pulcherrima	300 x 300	250
Camellia sasanqua 'pink snow'	300 x 300	250
Clerdendrum myricoides ' Ugandense'	300 x 300	250
Dichroa febrifuga	300 x 300	250
Duranta repens 'Golden Leaves'	300 x 300	250

Botanical Name	Size(mm)	Spacing(mm)
Ficus microcarpa 'Crassifolia'	1200 x 500	400
Ficus microcarpa ' Golden Leaves'	500 x 500	400
Hibiscus rosa sinensis	500 x 500	400
Ixora coccinea 'Sunkist'	250 x 250	200
Murraya paniculata	300 x 300	250
Schefflera arboricola	600 x 600	500
Tabernaemontana divaricata 'Flore Pleno'	300 x 300	250
Small Shrub Species		
Plumbago auriculata	250 x 200	250
Blechnum orientale	250 x 200	250
Cuphea hyssopifolia	250 x 200	250
Dietes bicolor	250 x 200	250
Lantana montevidensis	250 x 200	250
Nephrolepis exaltata	250 x 200	250
Ground Cover		
Asparagus densiflorus ' Sprengeri'	250 x 200	250
Catharanthus roseus	250 x 200	250
Soleirolia soleirolii (Baby Tears)	250 x 200	250
Syngonium podophyllum	250 x 200	250
Lawn		
Axonopus compressus		

Note: The plant species listed above provide an indication of the future character of the proposed landscape areas only. The design will be subject to review during the detailed design stage of the project. These changes will be reflected in the Landscape Master Plan Submission.

Soil Depth for Greenery Area and Planters

9.4 Three soil depths will be applied in the proposed development to ensure adequate soil for the vegetation planted above. The tree planting area will incorporate at least 1200mm depth soil, 600mm depth for shrubs, and 300mm for the lawn excluding the depth of the drainage requirement. ***Figures 9 & 10*** show the different depths of the planter of the proposed development.

Irrigation and Drainage

9.5 A Manual system with lockable water points will be installed every 40m for the proposed Irrigation system for the development. The proposed source of water supply will be subject to final approval from the Water Services Department. Sub-soil drainage shall be provided for all planting areas with cellular drainage systems such as "Mira-drain" or an approved equivalent. ***Figure 10*** shows the Diagram of drainage outlet.

Feature Paving

9.6 Different paving will be used for aesthetic appearance and to identify different zone on the same level. The pavement on G/F in front of the Entrance Lobby promote the priority of space for pedestrian path while excluding vehicles to avoid accidents. It would be constructed with high-quality materials in feature patterns to respond to the architectural design & function, and to ensure the floor are flattened and easy to access for all residents.

9.7 Non-slip paving materials will be utilized at the site and the proposed finishes and materials are summarized below:

Access road and pedestrian pavements: Subtle shades of natural granite and concrete pavers designated to create visual continuity with the adjacent pedestrian pavement whilst creating a distinct identity at the threshold of the development.

Main Gardens: Combination of natural granite, concrete paving, recycled plastic timber decks, and specialist sport surfacing using both formal paving and naturalistic paving for horizontal surfaces building on the design theme for the architectural and landscape schemes.

9.8 Wherever possible all landscape areas will cater for multiple use needs including people with impaired ability and access for the disabled in accordance with Building Department's Design Manual Barrier Free Access 2008.

9.9 The landscape design considers the requirements of Chapter 6 of the DMBFA for the use of elderly residents whereby the landscape has been designed without steps, thresholds, small ramps, or kerbs, wherever possible. Where changes in level are unavoidable handrails or grab bars will be provided. Floor surface will comply with Division 4. Slip-resistant floor finishes and avoids the use of shiny and reflective floors such as marble, glazed tiles, and the like. Open jointed pavers or aeration paver blocks with uneven or very rough surface will be avoided at external open space.

Planter Walls

9.10 Where possible planters will be at-grade however where raised planters are required the planter walls and coping will be clad with the same cladding materials as building external cladding.

Lighting

9.11 The lighting design concept for the landscape areas should be designated to contribute to the quality of the development in nocturnal views, providing an aesthetically pleasing landscape through the highlighting of the landscape elements. All the landscape areas will be provided with sufficient illumination to meet the requirement of lighting standards, particularly for the entrance areas and pedestrian access paths. The lighting concept will include three types of lighting as follows:

- Amenity lighting highlighting feature trees, walls, sculptures, and planting through the use of spotlights and up-lightings;

- Area lighting involving the use of low-level lighting sources such as lighting bollards and recessed wall lights for sitting areas and main landscape spaces designed to avoid glare/light spillage to adjacent properties; and

- General safety lighting with the minimum lux level which will last between midnight and early morning. The covered area on 1/F will last 24 hours to ensure the illumination level of the areas.

Site Furniture

9.12 The landscape design would include the provision of the site furniture including seating. In addition to its functional attributes, it would also contribute to the perceived quality of the landscape. All the seat shall be provided with seating walls and some location shall potentially provide movable seating. These locations are preliminary at this stage being subject to the detailed design of the landscape spaces and their programme for use

Safety Requirement

9.13 All outdoor facilities will be designed, constructed, and operated in full compliance with relevant safety standards and guidelines.

10. Landscape Management and Maintenance

10.1 Upon completion of the construction works, a 12-months Defects Liability Period (DLP) will be implemented applying to the hard landscape whereby the specialist contractor will be responsible for the maintenance during the first year.

A. Routine Maintenance (Daily - Weekly)

- Rubbish and litter removal
- Sweeping and cleaning
- Water feature cleaning
- Damage inspection, repair of site furniture and light bulb replacement
- Routine management attendance, inspection, and cleaning of surface channels and subsoil drainage, in particular at elevated levels.

B. Annual/ Long-term Maintenance

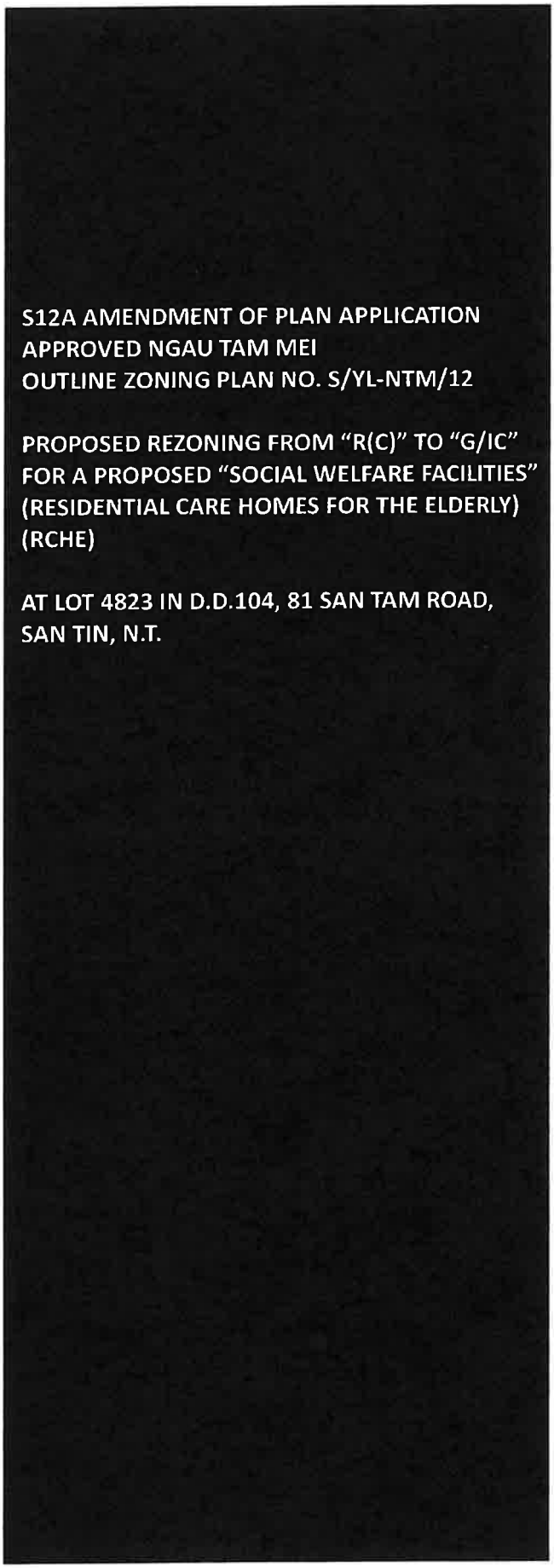
- Repainting
- Resurfacing of worn pavement
- Replacing worn parts of site furniture, lighting fixtures, and other facilities
- Replacement of damaged landscape furniture

10.2 Similarly, the softworks contractor will be responsible for a 12-month Establishment Period (EP) for the planting after practical completion. This allows a period of time for the proper establishment of the plants and the replacement of any losses.

10.3 At the end of the 12-month DLP/EP, the property owner will be responsible for arrangements to take care of all landscape areas within the development. This includes general tree care and proper tree maintenance in accordance with relevant guidelines promulgated by DEVB.

Tree Risk Assessment

10.4 A Tree Risk Assessment for the target area shall be conducted annually in accordance with the 'Handbook in Tree Management' promulgated by the GLTM Section of DEVB.



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

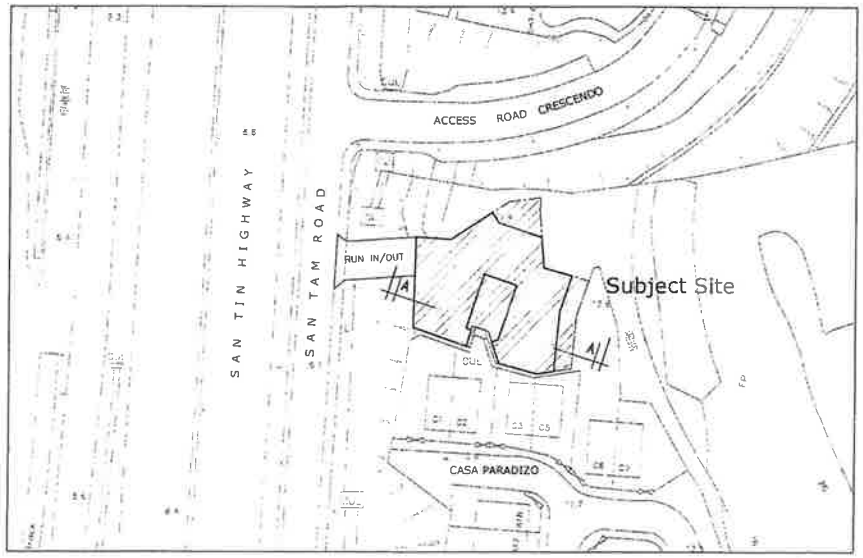
PROPOSED REZONING FROM "R(C)" TO "G/IC"
FOR A PROPOSED "SOCIAL WELFARE FACILITIES"
(RESIDENTIAL CARE HOMES FOR THE ELDERLY)
(RCHE)

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

FIGURE 1
PROPOSED RCHE DESIGN

RLEE

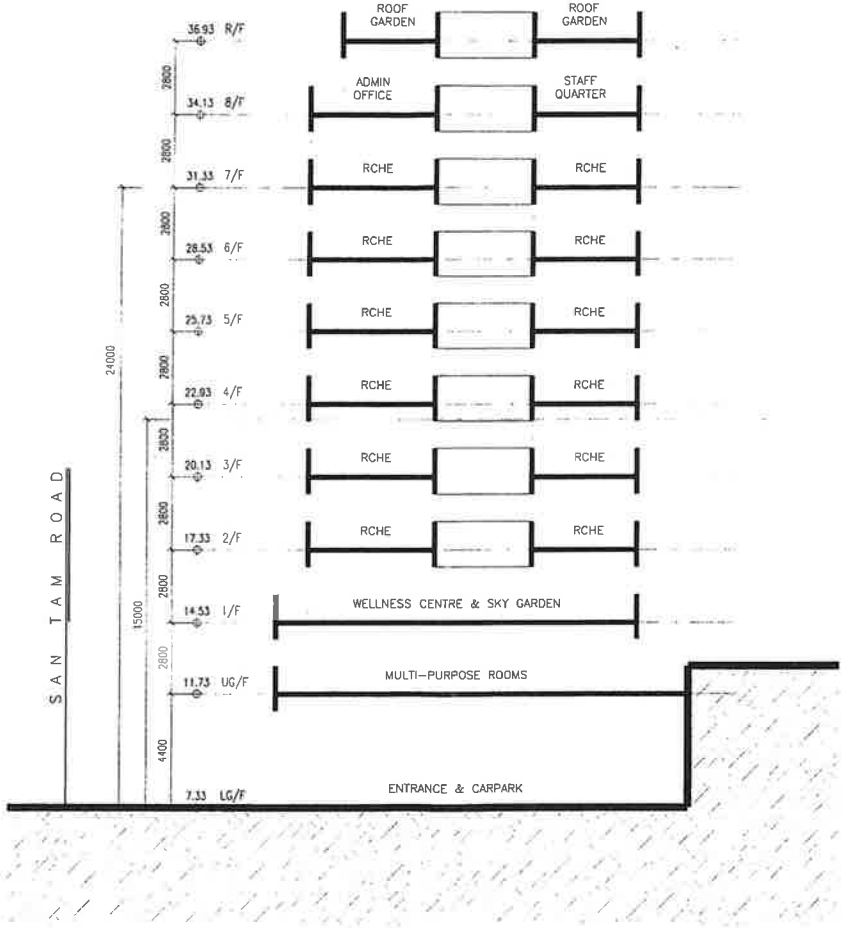
RLEE Architects (HK) Ltd



BLOCK PLAN SCALE – 1:1000

DEVELOPMENT SCHEDULE:

Site Area	:	736.3 m² (7926 ft²)	
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 m² (58125.6 ft²)	
Proposed Building Height	:	36.93 mPD	
Absolute Height	:	29.6 m	
Proposed No. Of Storey	:	10 STOREYS	
Proposed Gross Floor Area			
LG/F (ENTRANCE & CARPARK)	:	352.479 m²	
UG/F (MULTI-PURPOSE ROOMS)	:	617.819 m²	
1/F (WELLNESS CENTRE + SKY GARDEN)	:	626.160 m²	
2/F (RCHE)	:	595.090 m²	(45 nos. of bed)
3/F (RCHE)	:	556.330 m²	(17 nos. of bed + 3 nos. of isolation room)
4/F - 7/F (RCHE)	:	556.330 m² x 4 storeys = 2225.32 m²	(20 nos. of bed x 4 storeys)
8/F (ADMIN OFFIC + STAFF QUARTER)	:	426.802 m²	
TOTAL	:	**5400.000 m²**	**(142 nos. of bed + 3 nos. of isolation room)**



SECTION A-A SCALE – 1:200

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.

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.

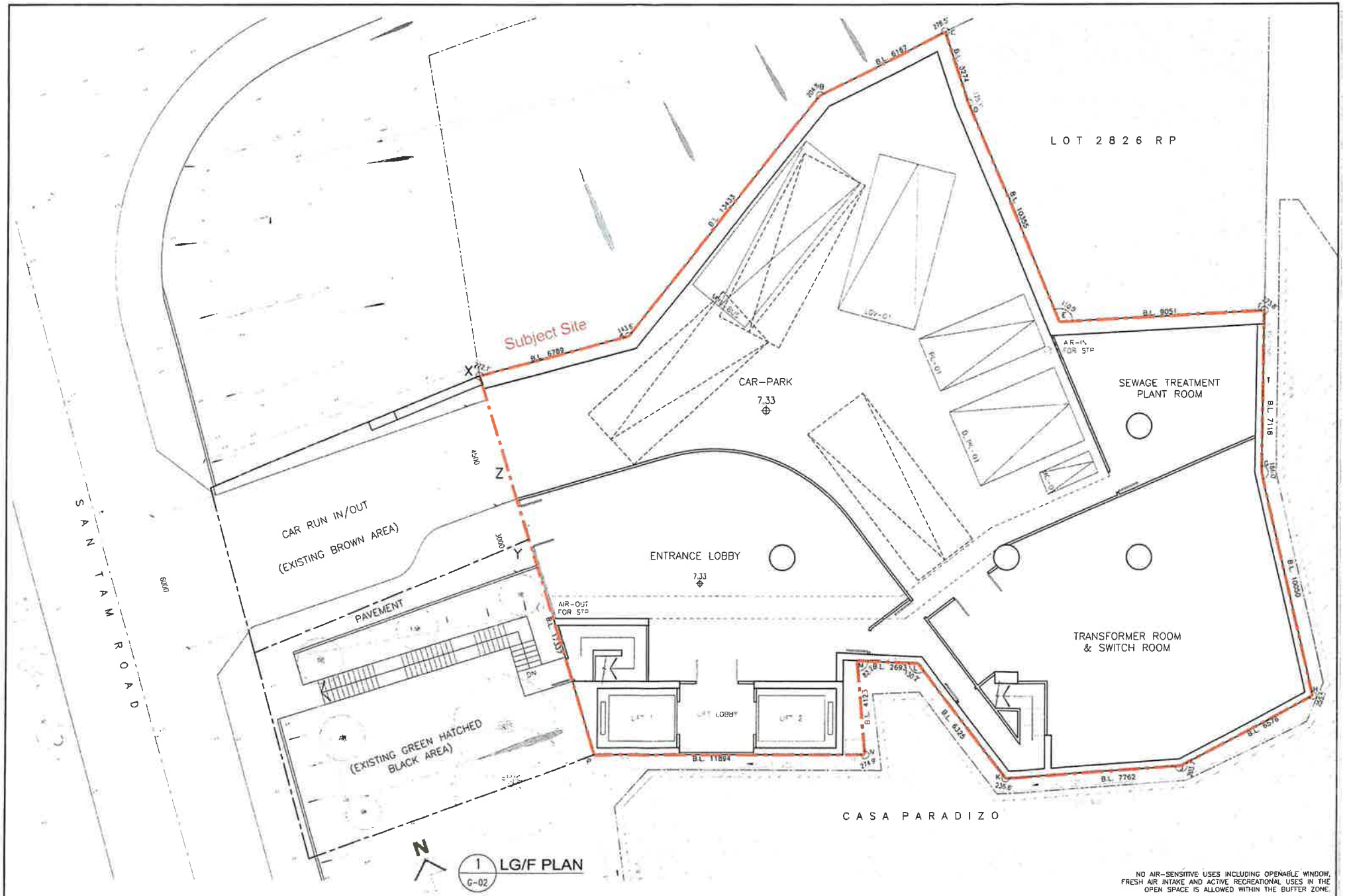
DEVELOPMENT SCHEDULE & SECTION

G-01 N.T.S. (A3)

B	OCT. 2022
A	JULY. 2022

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PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY
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YUEN LONG, N.T.

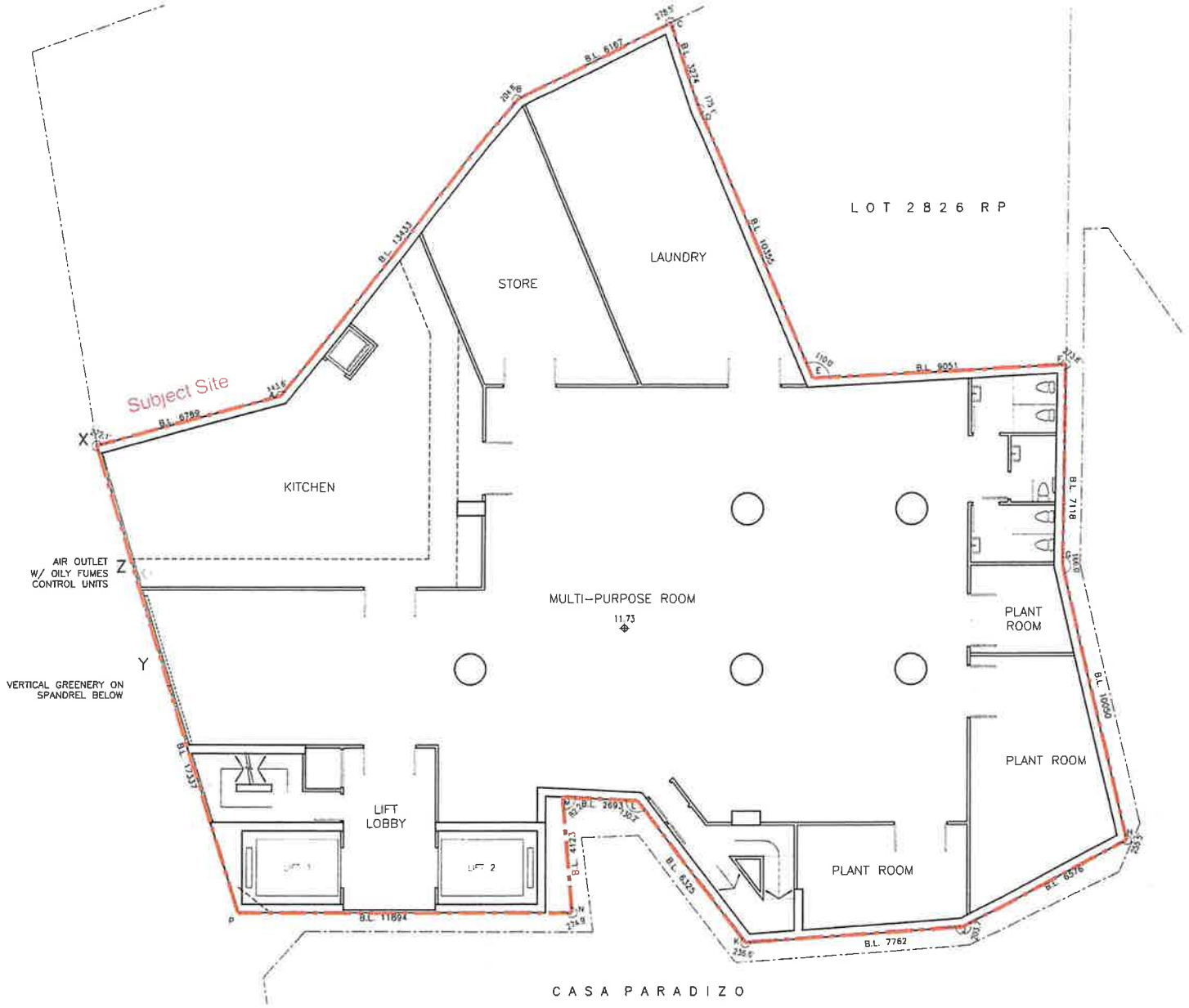
LG/F PLAN
ENTRANCE & CARPARK

G-02 1:150 (A3)

B	OCT 2022	
A	JULY 2022	

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RLEE



N

1 UG/F PLAN
G-03

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2202

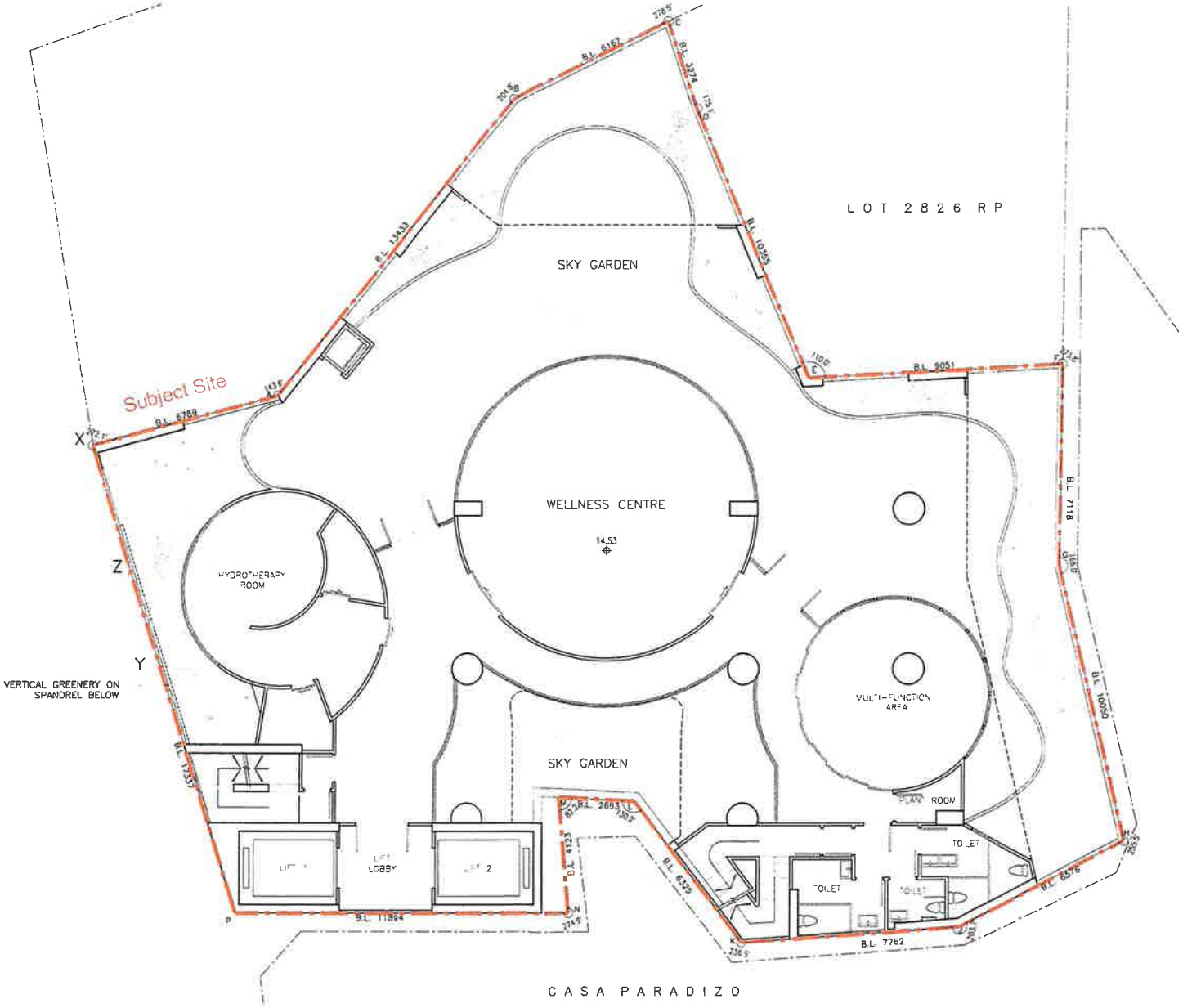
PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY
at 81 SAN TAM ROAD,
YUEN LONG, N.T.

UG/F PLAN
MULTI-PURPOSE ROOMS

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

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2202

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

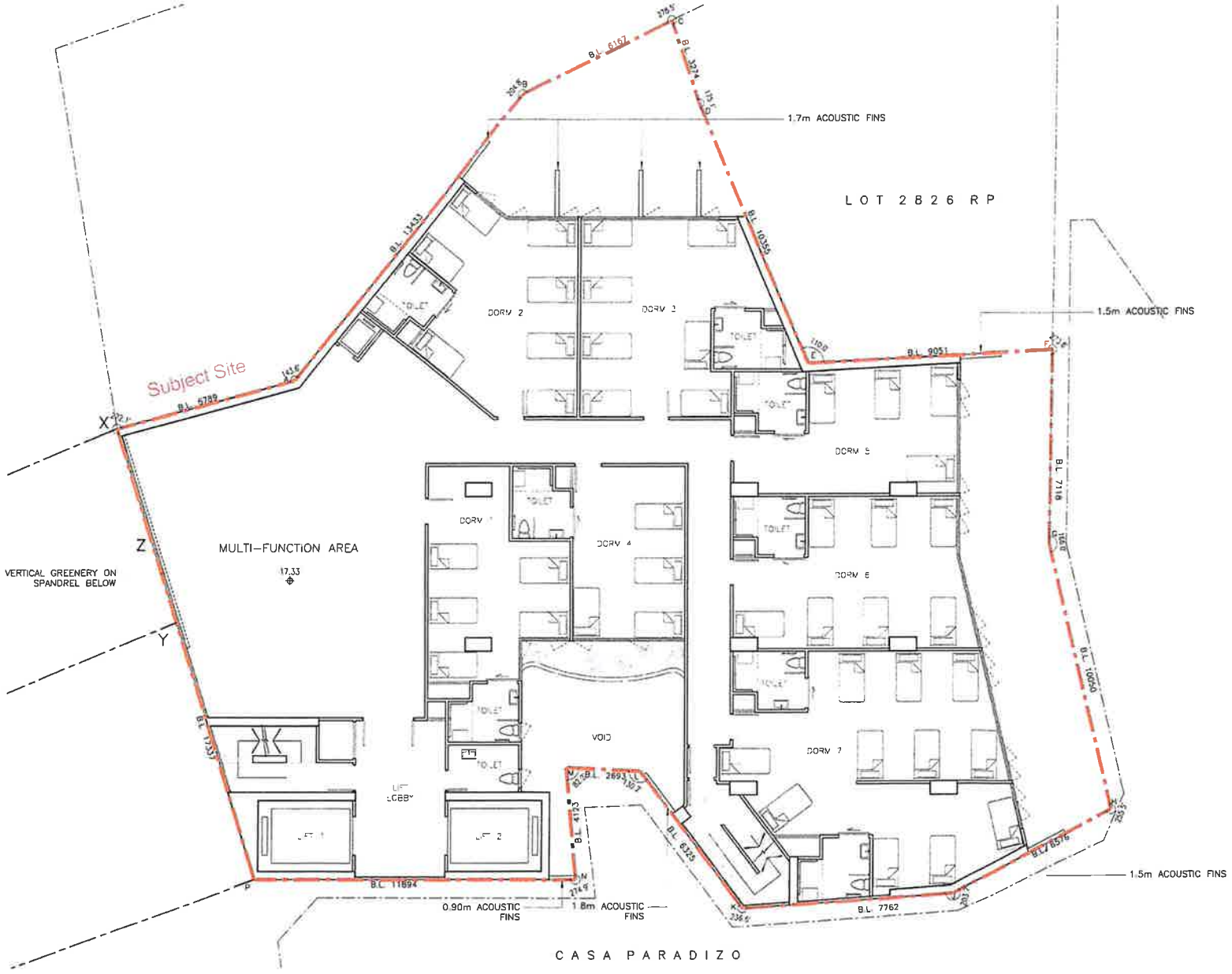
1/F PLAN
WELLNESS CENTRE & SKY GARDEN

G-04 1:150 (A3)

B	OCT. 2022	
A	JULY 2022	

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1 G-05 2/F PLAN

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 OCT. 2022 A JULY. 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified

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1 / G-06 3/F PLAN

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

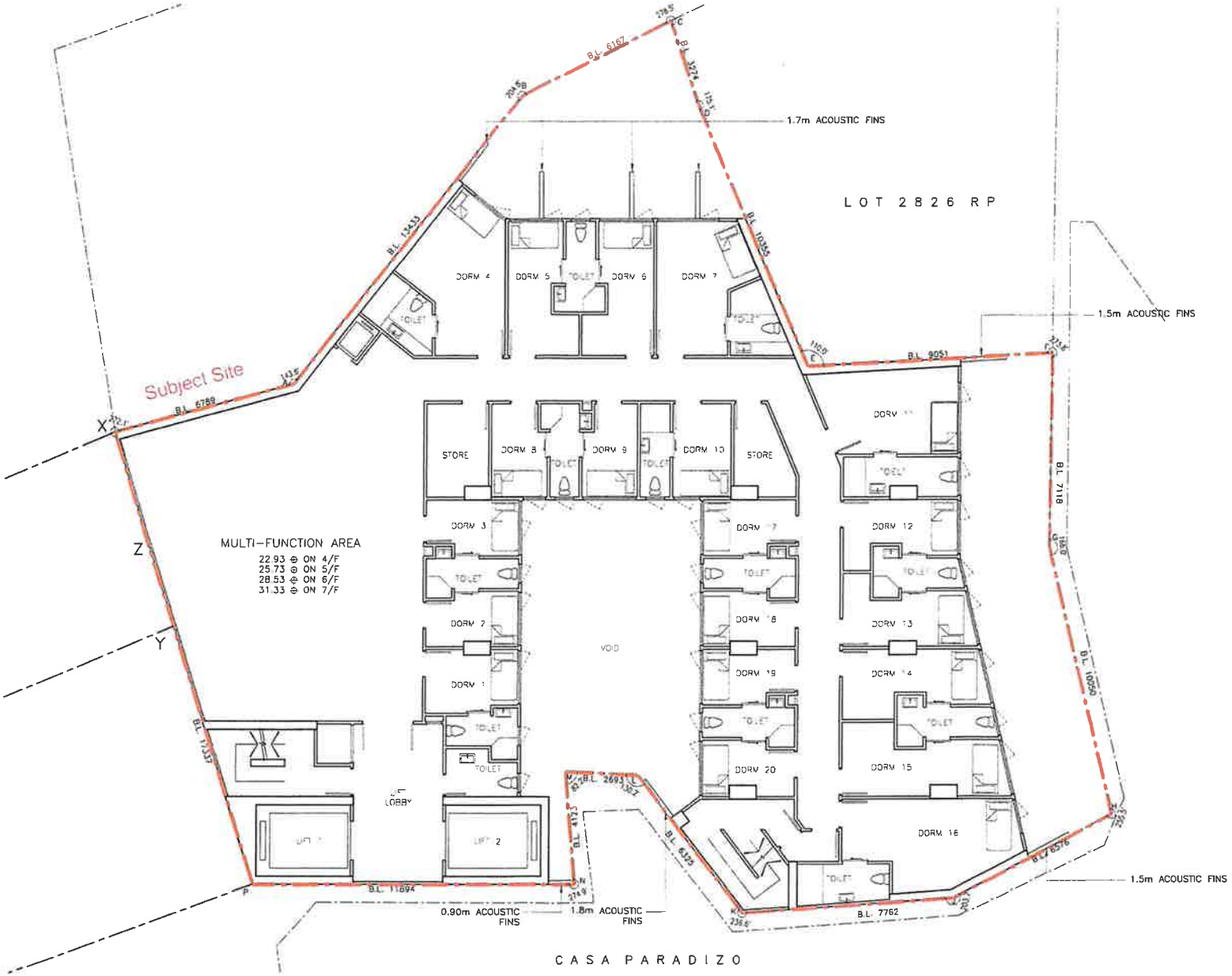
3/F PLAN
RCHE

G-06 1:150 (A3)

B OCT 2022
A JULY 2022

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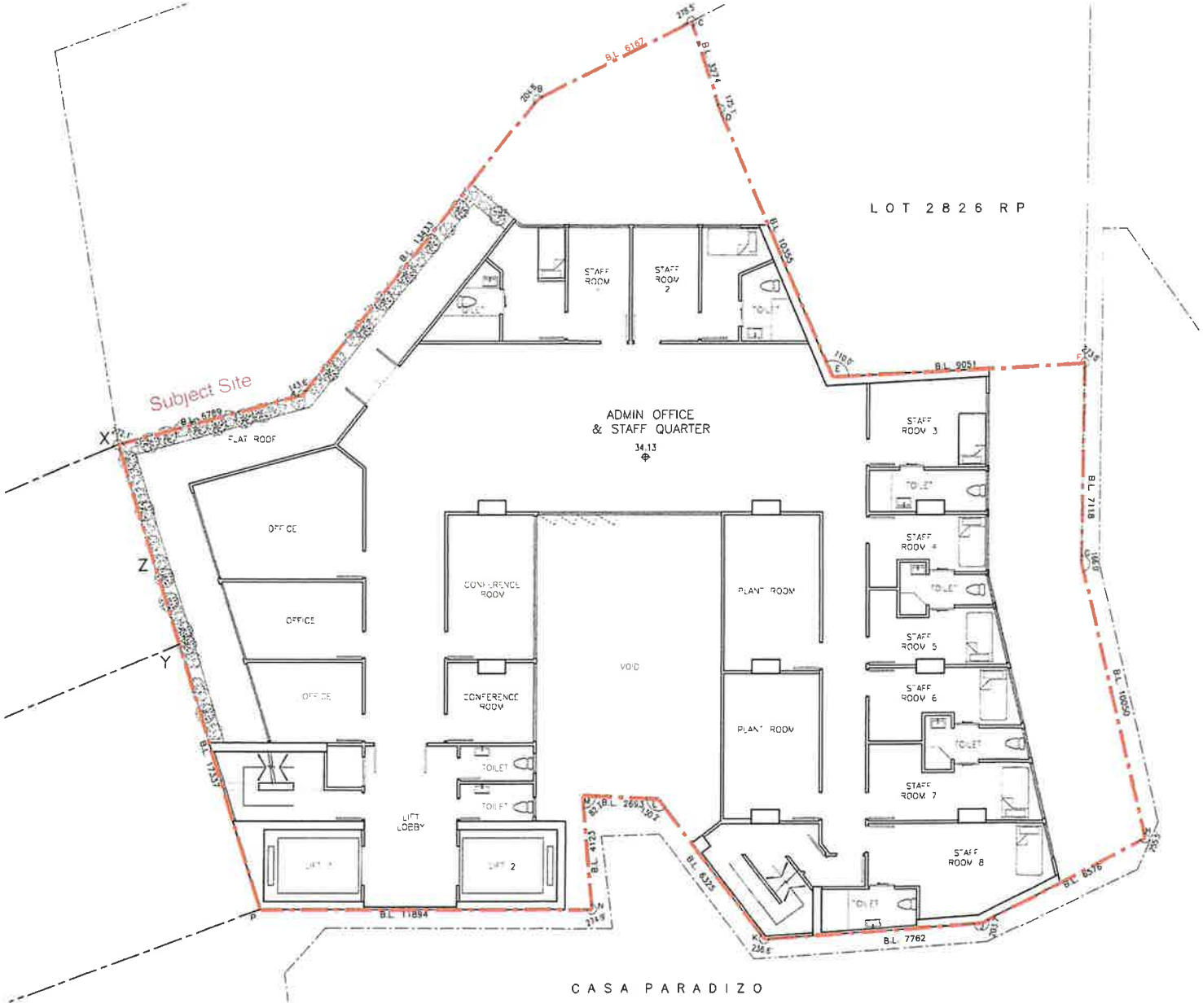
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2202 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.	TYPICAL FLOOR PLAN PLAN RCHE	G-07	1:150 (A3)	B OCT. 2022 A JULY. 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The drawings remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

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

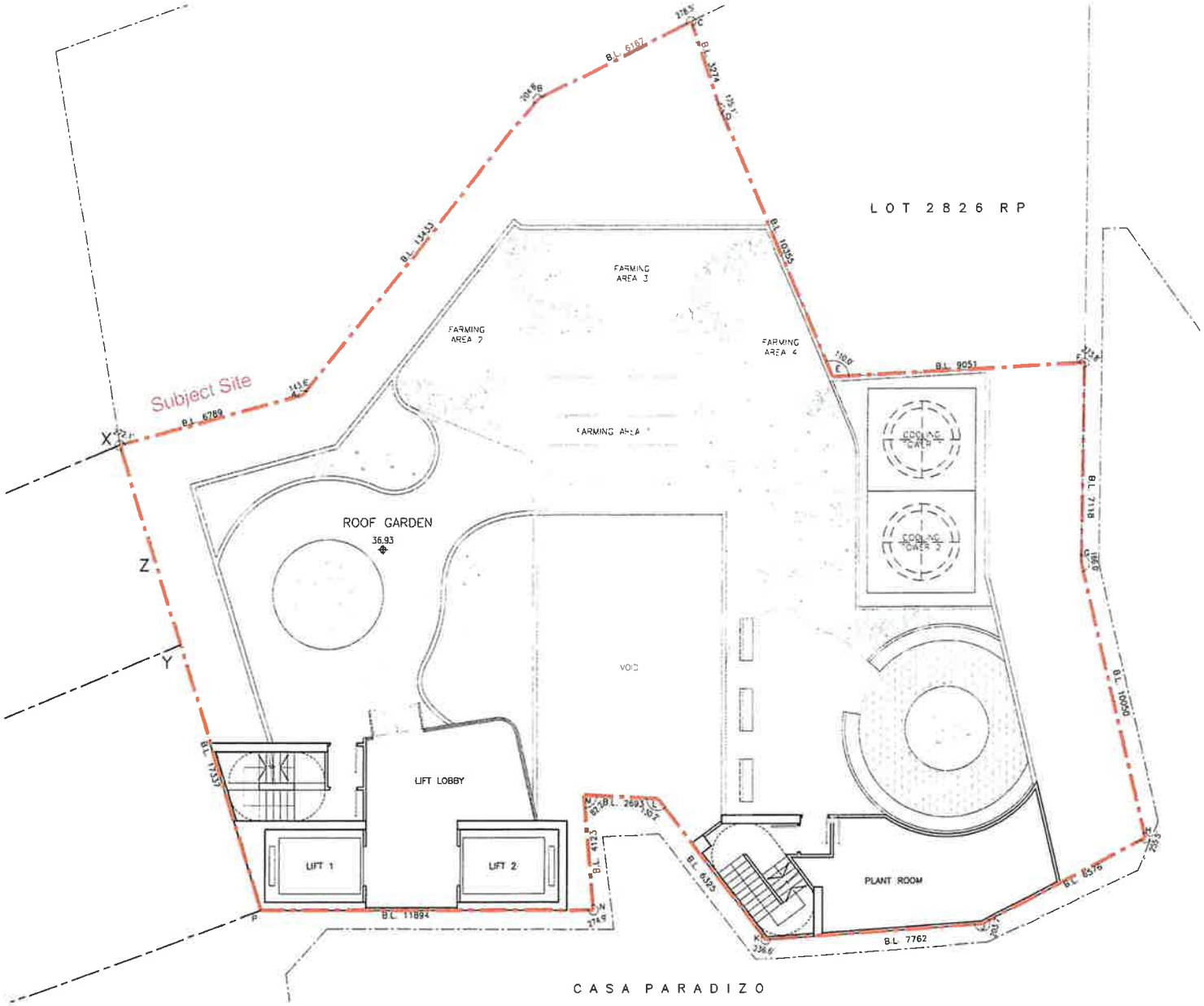
8/F PLAN
ADMIN OFFICE & STAFF QUARTER

G-08 | 1:150 (A3)

B	OCT. 2022
A	JULY. 2022

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RISE



1 G-09 ROOF GARDEN PLAN

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2202

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

ROOF GARDEN PLAN

G-09 1:150 (A3)

B	OCT 2022
A	JULY 2022

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2202 **PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.**	**LANDSCAPE MASTER PLAN**	**FIGURE 2** **1:150**	B OCT 2022 A JUL 2022 - MAY 2022	*Do not scale drawing.* *Contractors are required to verify exact dimensions on site.* *The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate.* *The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified.* *This drawing is not for construction purposes unless expressedly certified.*	RLEE

Entrance Landscape

Subject Site

Existing Brown Area

Vertical greenery on spendrel above

Pedestrian Pavement

Existing Green Hatched Black Area

SAN TAM ROAD

LOT 2826 RP

Accessible Parking

SEWAGE TREATMENT PLANT ROOM

ENTRANCE LOBBY

TRNSFORMER ROOM & SWITCH ROOM

CASA PARADIZO

B.L. 6167

B.L. 13433

B.L. 6789

B.L. 7118

B.L. 10050

B.L. 2693

B.L. 4123

B.L. 6325

B.L. 6576

B.L. 7762

B.L. 11894

7.33

N

2202 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.	LG/F LANDSCAPE	FIGURE 3	1:150	B OCT 2022 A JUL 2022 - MAY 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

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2202 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.	1/F LANDSCAPE	FIGURE 4 1:150	B A -	OCT 2022 JUL 2022 MAY.2022	*Do not scale drawing.* *Contractors are required to verify exact dimensions on site.* *The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate.* *The design remains to be the property of "R-ee Architects (HK) Ltd" unless otherwise specified.* *This drawing is not for construction purposes unless expressedly certified.*

RIBE



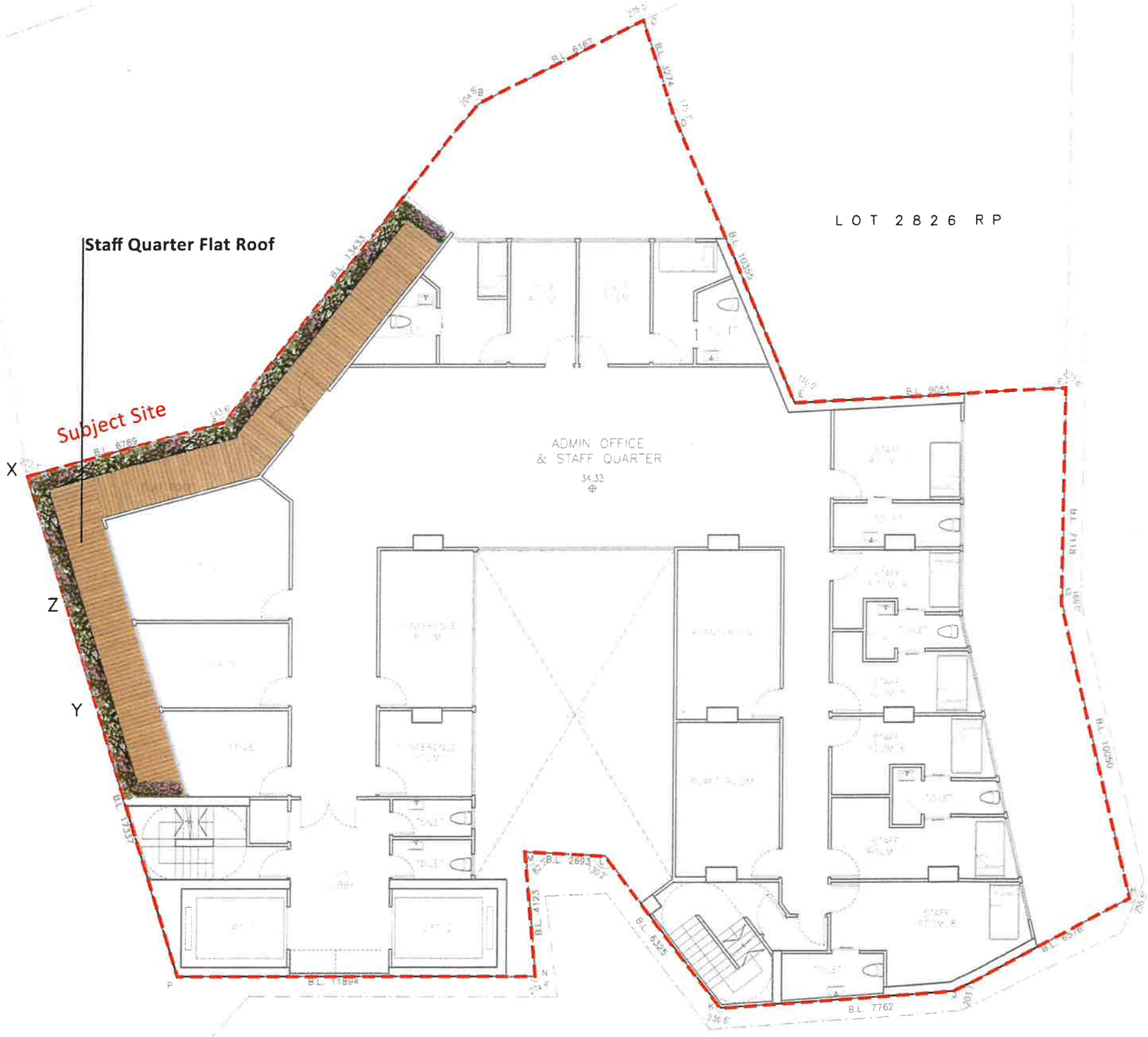
2202 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.	2/F LANDSCAPE	FIGURE 5 1:150	B OCT 2022 A JUL 2022 - MAY 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

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2202 **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	*Do not scale drawing.* *Contractors are required to verify exact dimensions on site.* *The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate.* *The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified.* *This drawing is not for construction purposes unless expressedly certified.*

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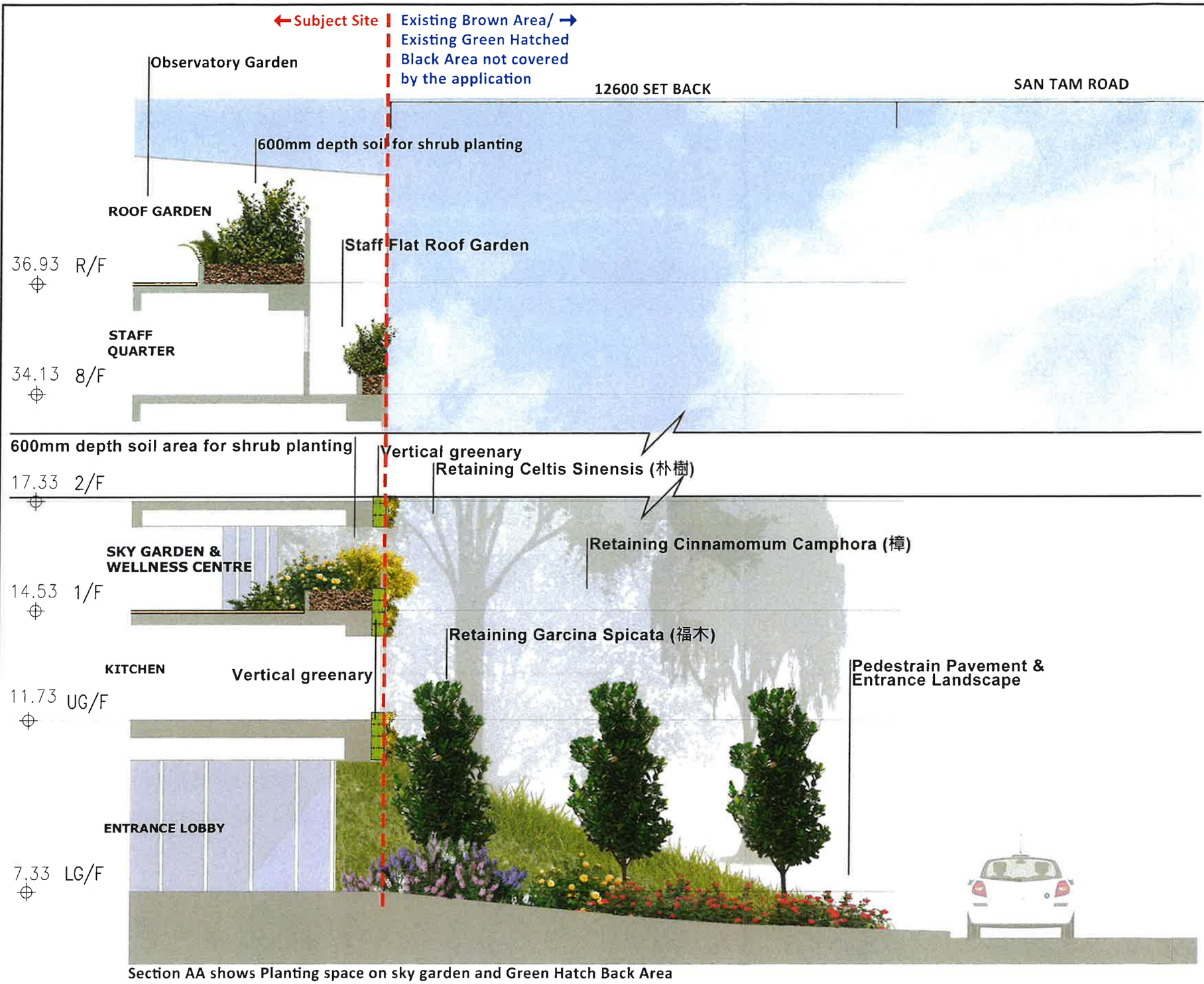
2202 **PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.**	**8/F LANDSCAPE**	**FIGURE 7** **1:150**	B OCT 2022 A JUL 2022 - MAY 2022	*Do not scale drawing.* *Contractors are required to verify exact dimensions on site.* *The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate.* *The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified.* *This drawing is not for construction purposes unless expressedly certified.*

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2202 **PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.**	**R/F LANDSCAPE**	**FIGURE 8** **1:150**	B A -	OCT 2022 JUL 2022 MAY 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

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Section AA shows Planting space on sky garden and Green Hatch Back Area



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

2202

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

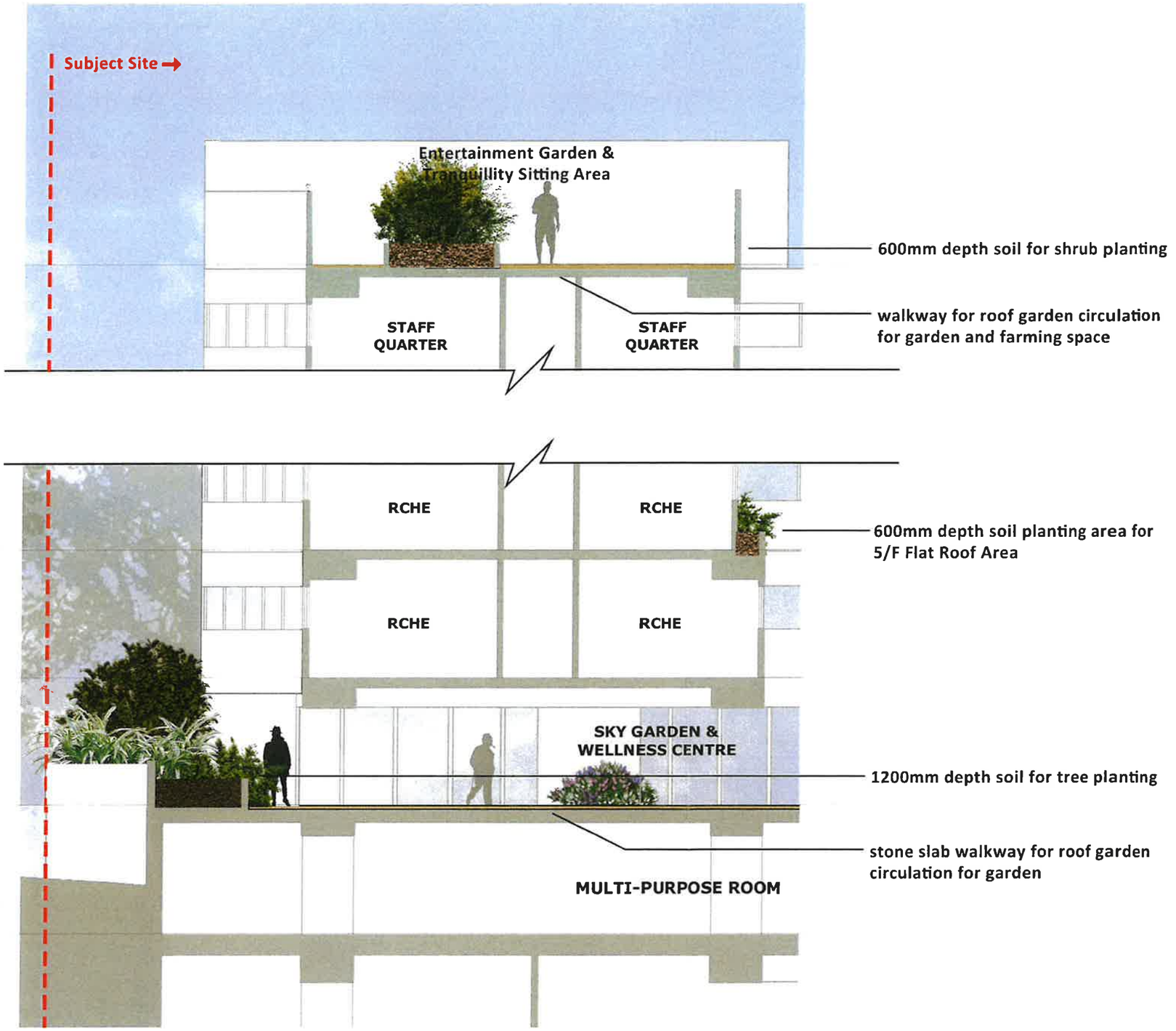
SECTION AA DIAGRAM

FIGURE 9 1:100

B	OCT 2022
A	JUL 2022
-	MAY 2022

Do not scale drawing.
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Section BB shows Planting space on sky garden



A — A Section Line

Boundary Line

Building Outline

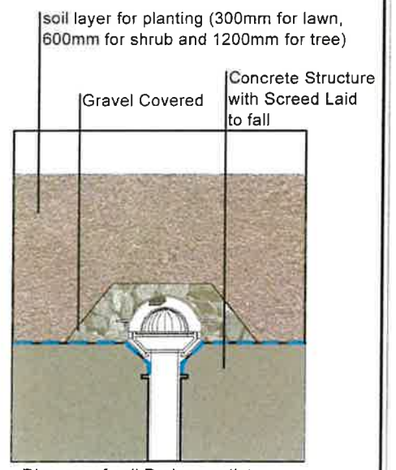
Level Mark

Planting Soil

Concrete Structure

Note:

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

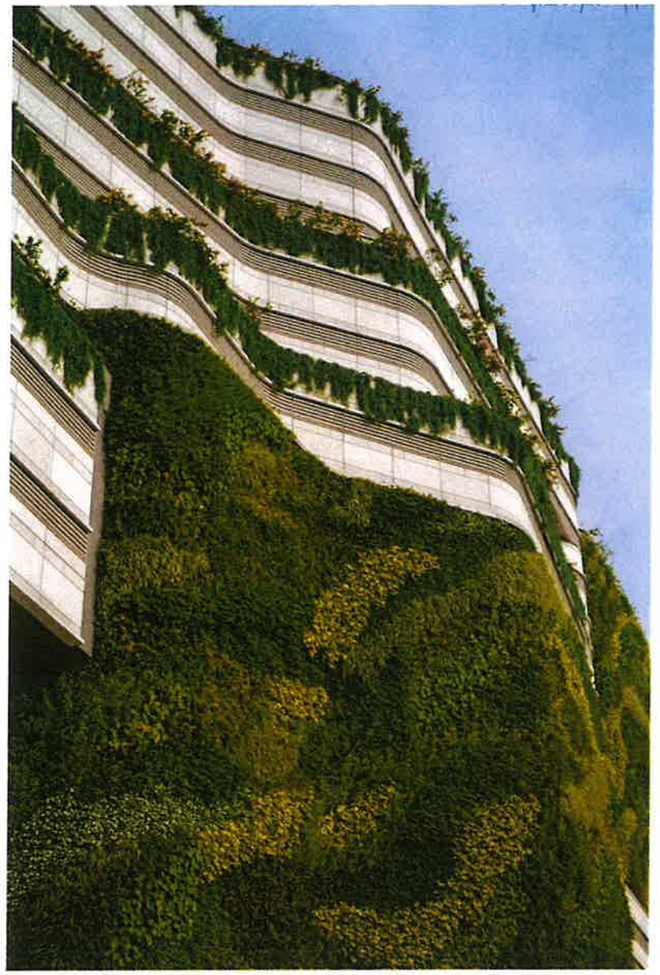


- Diagram of soil Drainge outlet

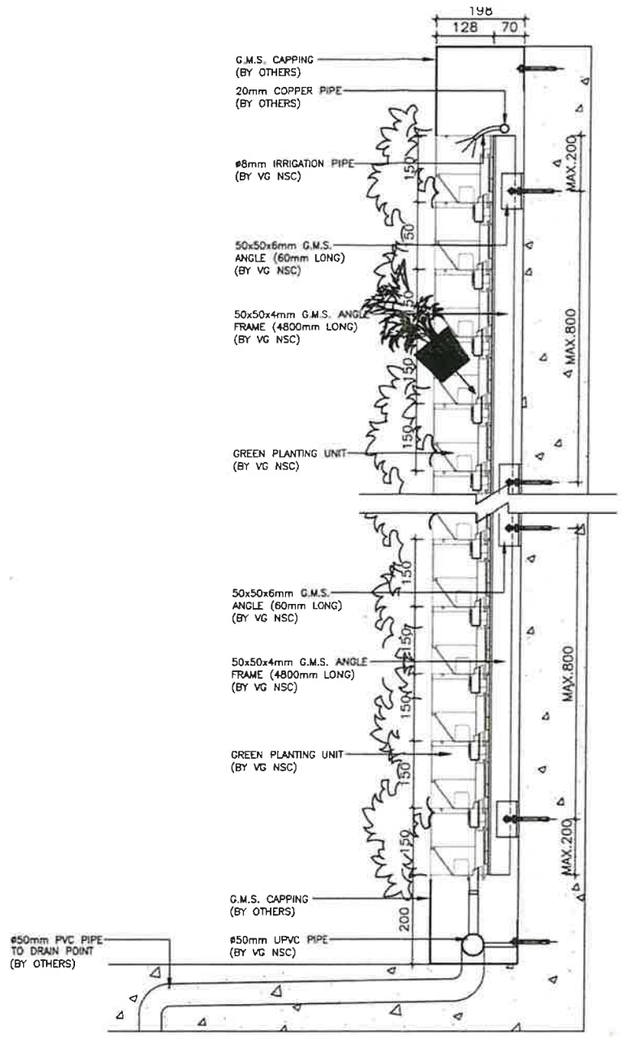
2202 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.	SECTION BB DIAGRAM	FIGURE 10	1:100	B OCT 2022 A JUL 2022 - MAY 2022

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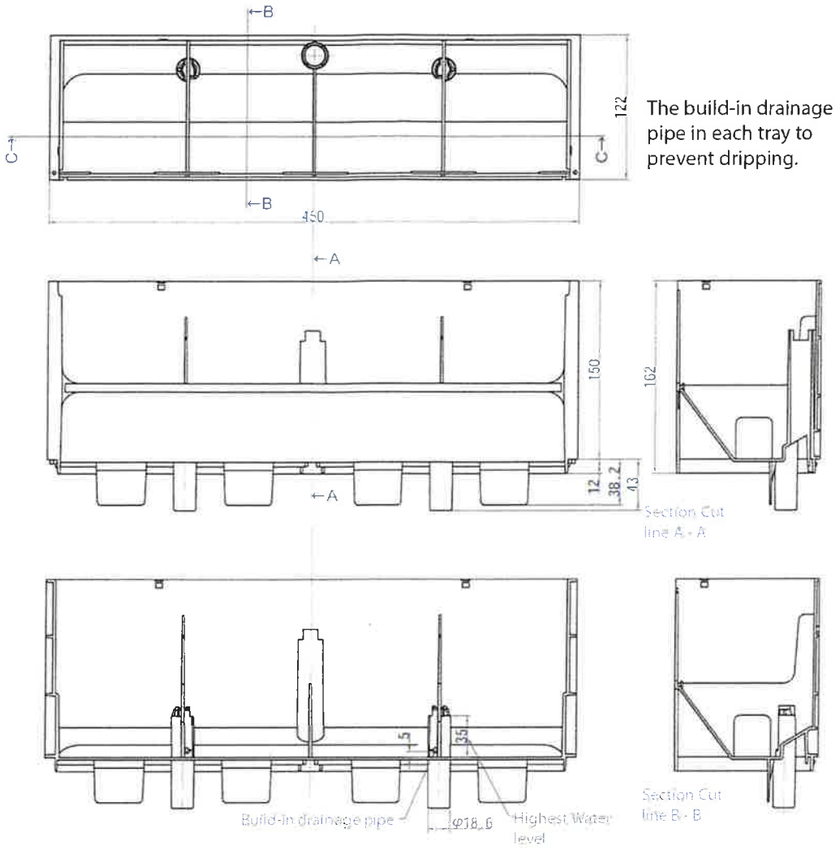
R-LEE



Example of Vertical Greenary

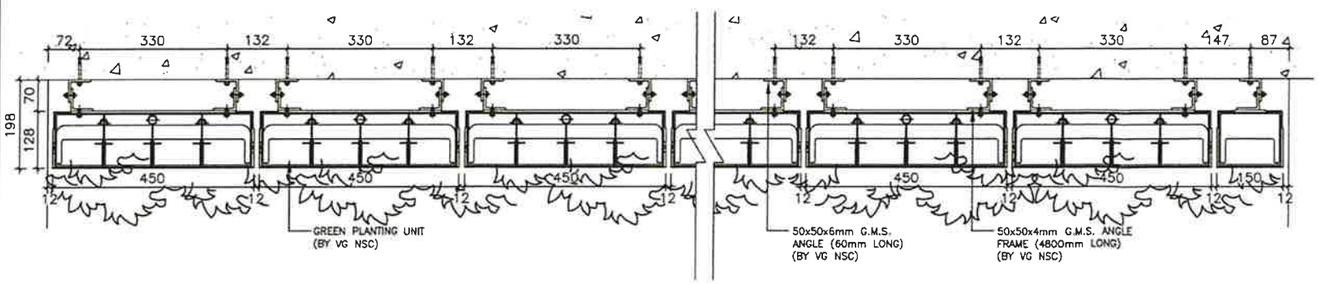


Section detail - 1:65



The build-in drainage pipe in each tray to prevent dripping.

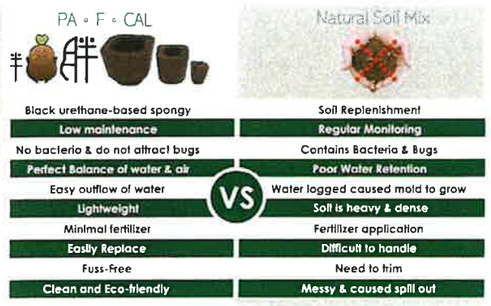
Modular design - 1:5



Detail plans - 1:12.5



Filling material



2202 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY at 81 SAN TAM ROAD, YUEN LONG, N.T.	VERTICAL GREENING - MODULAR SYSTEM	FIGURE 11 -	A -	JUL 2022 MAY 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

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2202

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

PERSPECTIVE VIEW THROUGH SKYGARDEN

Figure 12 NTS (A3)

A	JUL. 2022
-	MAY. 2022

Do not scale drawing.
Contractors are required to verify exact dimensions on site.
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The design remains to be the property of "R.Lee Architects (HK) Ltd" unless otherwise specified.
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PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY
at 81 SAN TAM ROAD,
YUEN LONG, N.T.

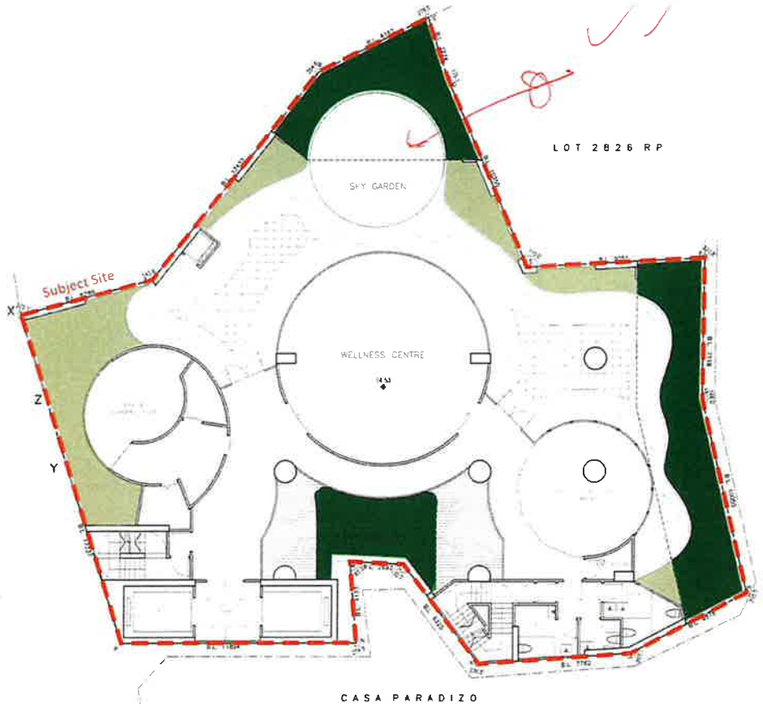
FRONT VIEW SHOWING GREENERY

Figure 13 NTS (A3)

A JUL. 2022
- MAY. 2022

Do not scale drawing.
Contractors are required to verify exact dimensions on site.
The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate.
The design remains to be the property of "R.Lee Architects (HK) Ltd" unless otherwise specified.
This drawing is not for construction purposes unless expressedly certified.

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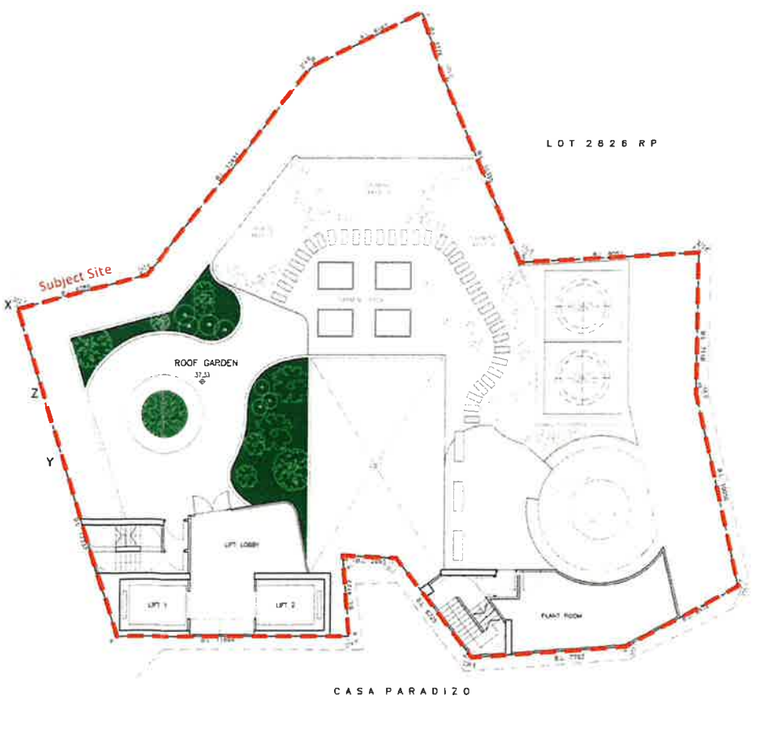




Covered green Area

Uncovered green Area





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

1/F uncovered area: 96.655m²
covered area:57.266m²

2/F uncovered area:6.844m²

3/F uncovered area:2.883m²

Total: 96.655 + 6.844 + 2.883 = 106.382m²
(14.442% > 10%)

Non-primary Zone:

R/F uncovered area: 42.062m²

Total: 42.062m² (5.713%)

Total Green Coverage:

106.382 + 42.062
=148.444m² (20.161% > 20%)

2202

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

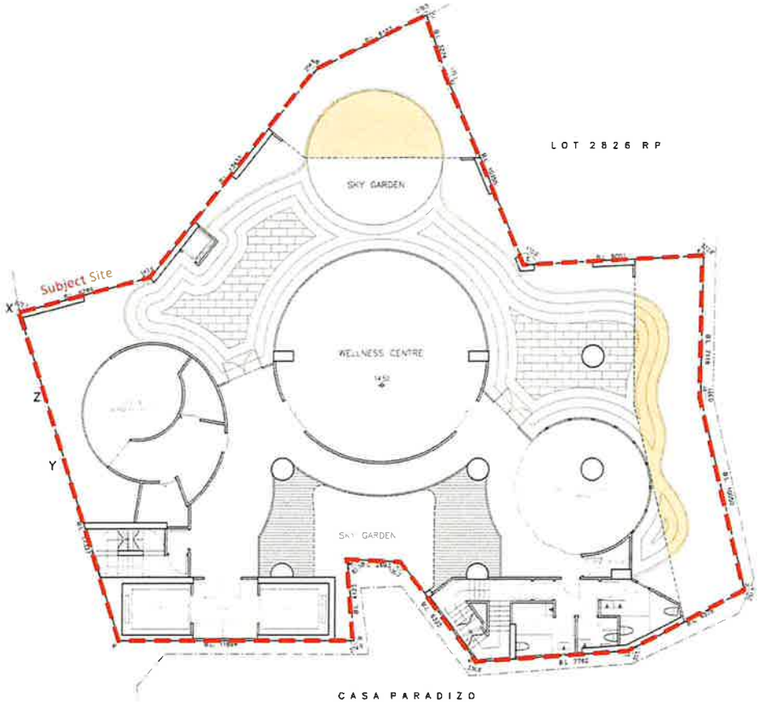
GREEN COVERAGE CALCULATION

FIGURE 14 **1:300**

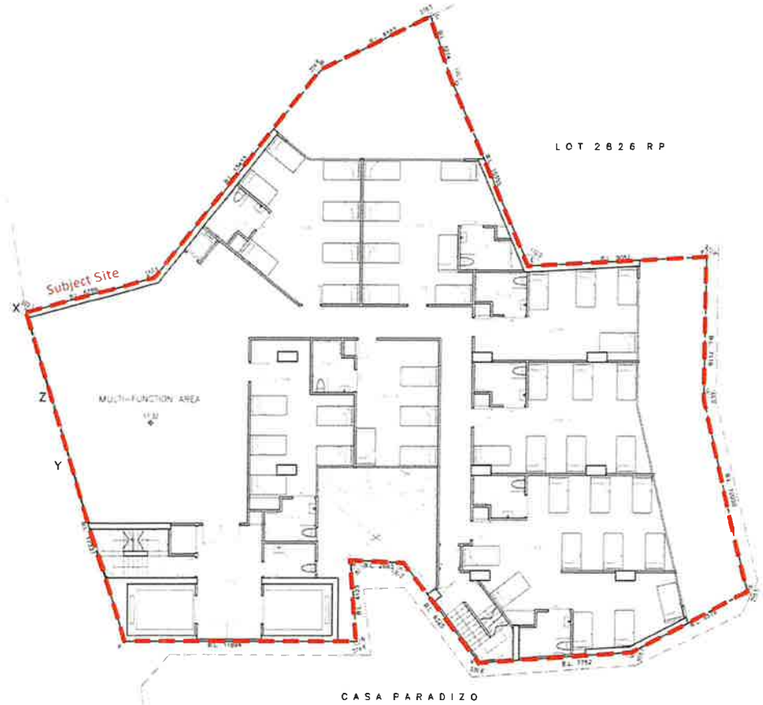
B	OCT 2022
A	JUL 2022
-	MAY 2022

Do not scale drawing.
Contractors are required to verify exact dimensions on site.
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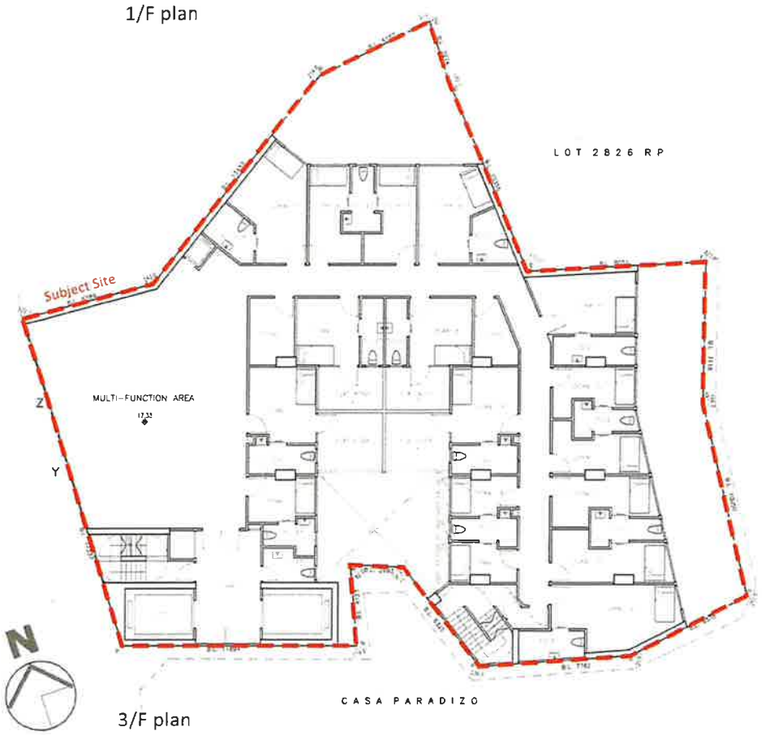
RLEE



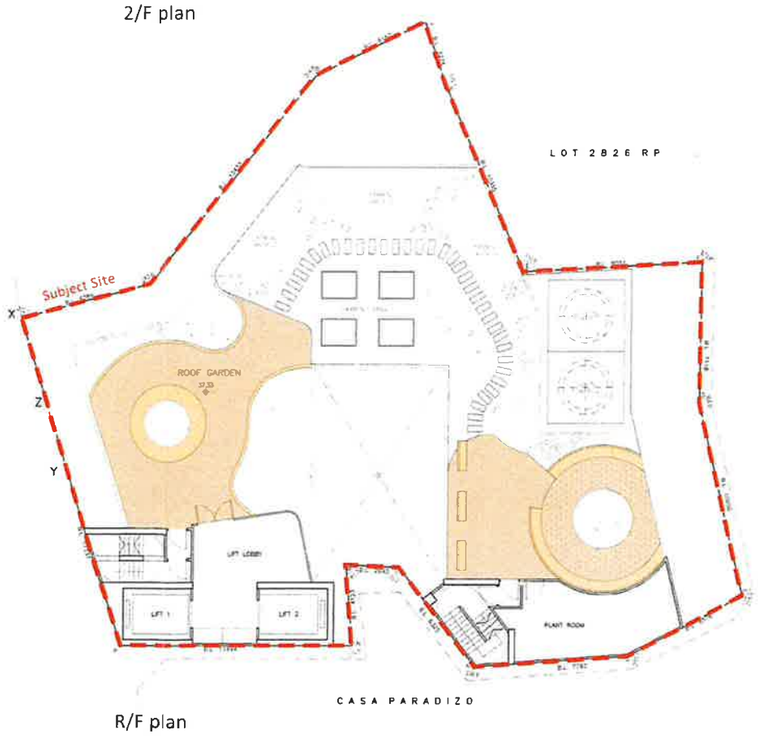
1/F plan



2/F plan



3/F plan



R/F plan

Open Space:

1/F uncovered area: 35.467m²
covered area: 157.516m²

R/F uncovered area: 148.153m²

Total: uncovered area:35.467 + 148.153 = 183.620m²
covered area: 157.516m2

Total Open Space Area: 183.620 + 157.516 =341.136m²

2202

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

OPEN SPACE CALCULATION

FIGURE 15 **1:300**

B	OCY 2022	
A	JUL 2022	
-	MAY 2022	

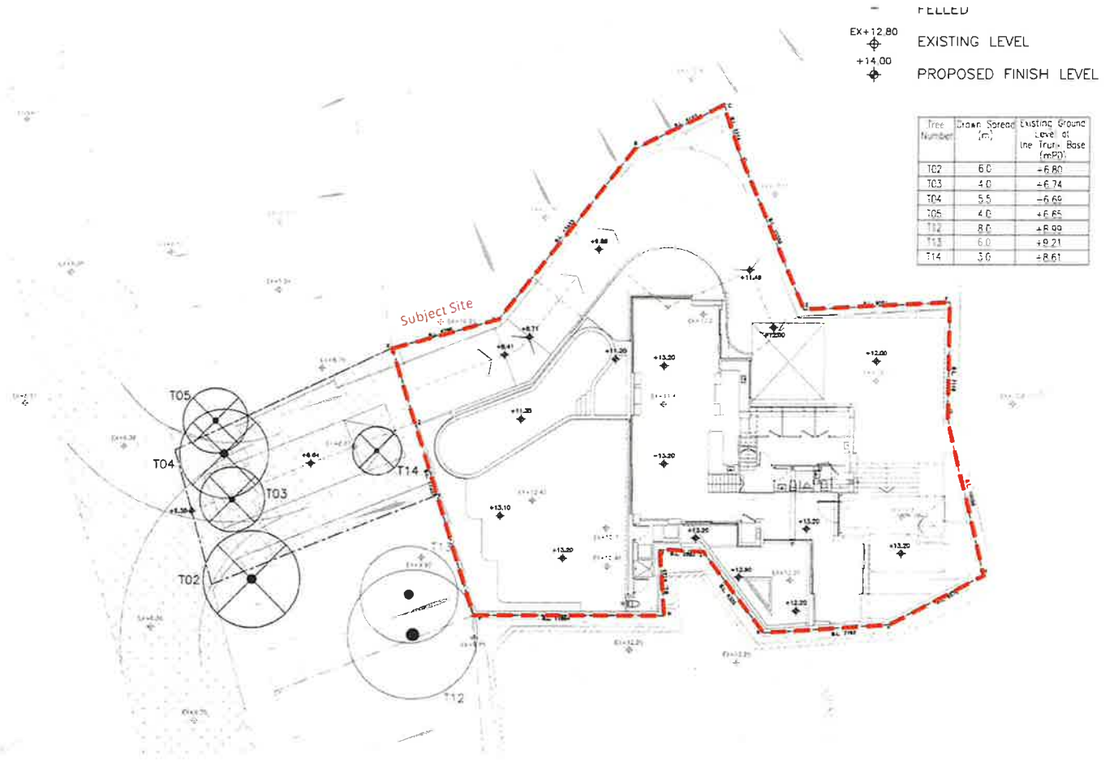
Do not scale drawing.
Contractors are required to verify exact dimensions on site.
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The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified.
This drawing is not for construction purposes unless expressedly certified.

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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

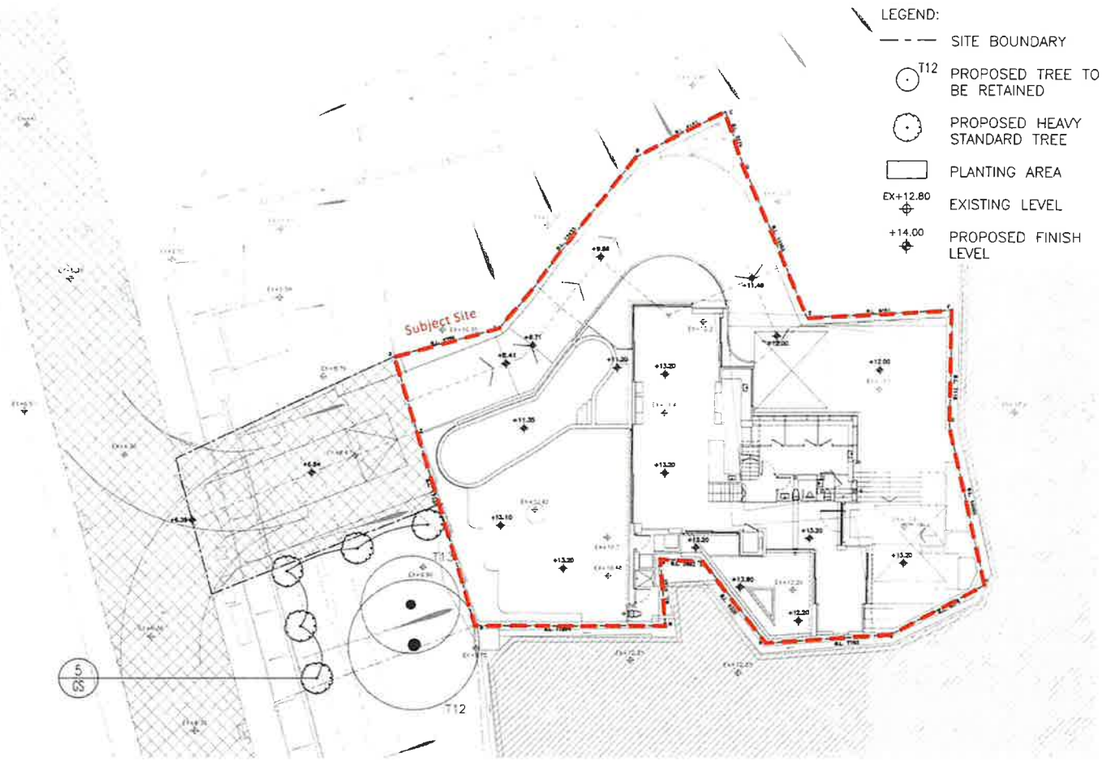
Tree No.	Species		Measurements			Amenity value	Form	Health condition	Structural Condition	Suitability for transplanting		OVT or Important Tree (IM)	Conservation status (**)	Recommendation	Department to provide expert advice to LandsD	Justification for Tree Felling
	Scientific name	Chinese name	Height (m)	DBH (mm)	Crown Spread (m)	(good/fair/poor)				(high/medium/low)	Remarks			(retain/transplant/fell)	(HyD, AFCD, LCSD, LandsD)	
T02	*Ficus microcarpa*	細葉榕	8.0	0.45	6.0	Low	Poor	Poor	Poor	Low	codominant trunk, unbalanced form	-	-	Fell	LCSD	1,2,7
T03	*Bombax ceiba*	木棉	8.0	0.15	4.0	Med	Fair	Poor	Fair	Low	Root embedded by concrete	-	-	Fell	LCSD	1, 2
T04	*Bombax ceiba*	木棉	10.0	0.23	5.5	Med	Fair	Poor	Fair	Low	Root embedded by concrete	-	-	Fell	LCSD	1,2
T05	*Bombax ceiba*	木棉	8.0	0.16	4.0	Med	Fair	Poor	Fair	Low	Root embedded by concrete	-	-	Fell	LCSD	1,2
T12	*Cinnamomum camphora*	樟	12.0	0.60	8.0	Med	Fair	Fair	Fair	Low	-	-	-	Retain	LCSD	-
T13	*Celtis sinensis*	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 Number	Crown Spread (m)	Existing Ground Level at the Trunk Base (mPD)
T02	6.0	+6.80
T03	4.0	+6.74
T04	5.5	+6.69
T05	4.0	+6.65
T12	8.0	+8.99
T13	6.0	+9.21
T14	3.0	+8.61

Tree Survey Plan before Existing House Development



Tree Compensatory Plan for the Existing House Developement

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

Compensatory Planting for Existing House Development

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

TREE FELLING PROPOSAL &
RETAINED TREE LOCATION

FIGURE 16 1:350

B	OCT 2022	
A	JUL 2022	
-	MAY 2022	

Do not scale drawing.
Contractors are required to verify exact dimensions on site.
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The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified.
This drawing is not for construction purposes unless expressedly certified.

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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.

APPENDIX 5

GEOTECHNICAL PLANNING REVIEW REPORT
FOR PLANNING APPLICATION

RLEE

RLEE Architects (HK) Ltd

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^2. 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.

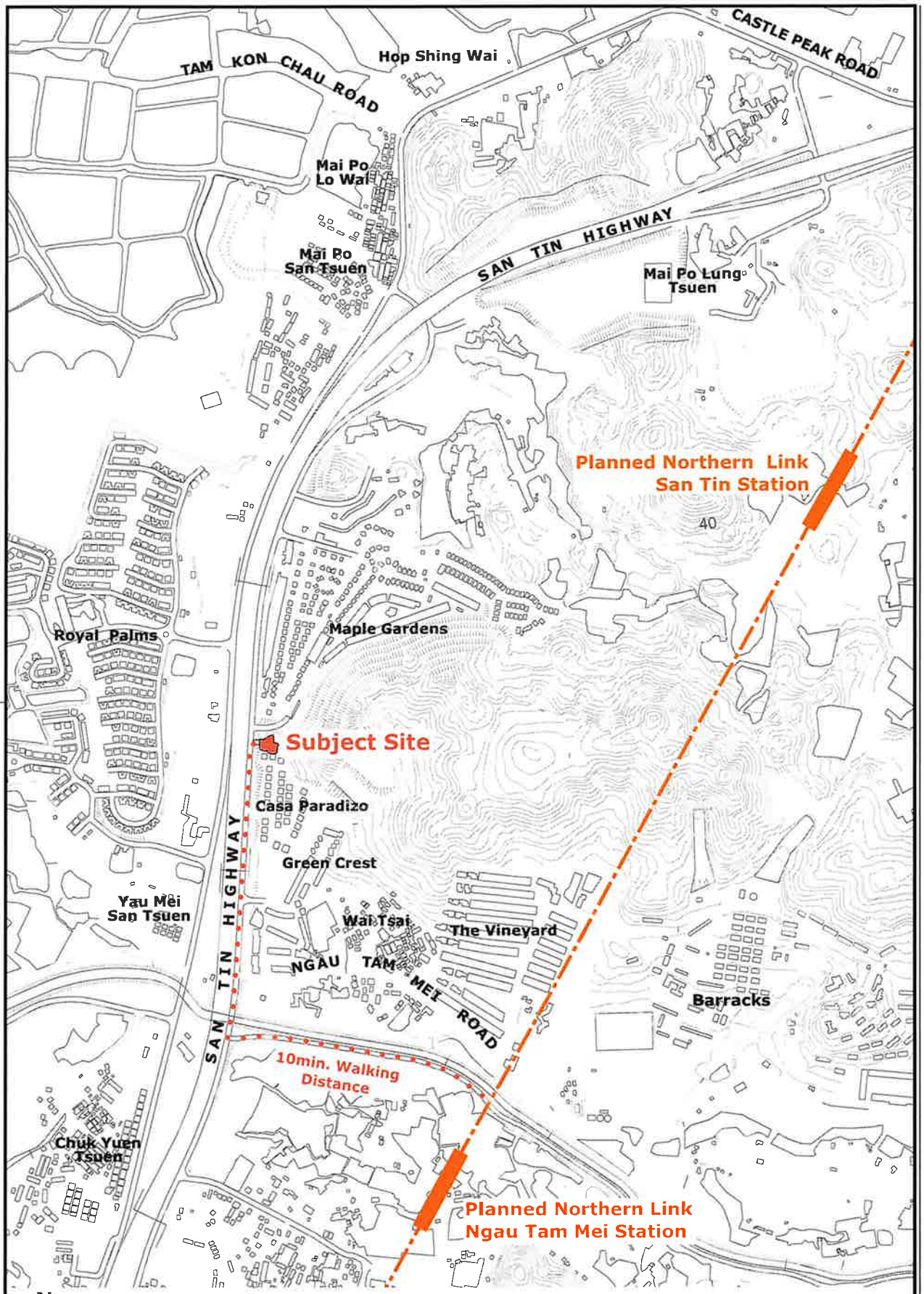


FIGURE NO.	TITLE	SCALE	
1	LOCATION PLAN	1:10000	
		DATE	JUL 2022

RLEE

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 four registered features of 2SE – C/C 312, 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.

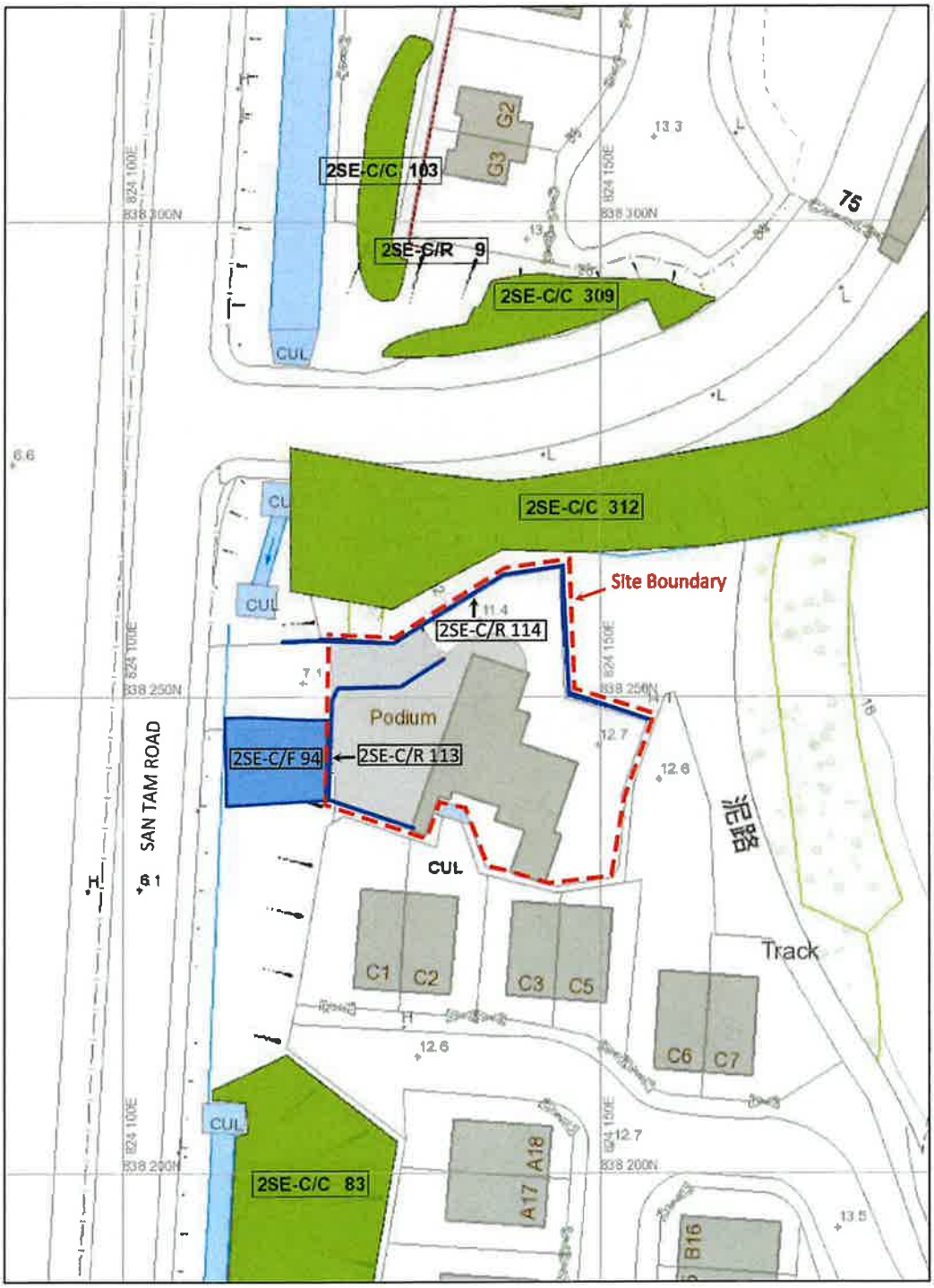

2SE-C/C 103
2SE-C/R 9
2SE-C/C 309
2SE-C/C 312
Site Boundary
2SE-C/R 114
Podium
2SE-C/F 94
2SE-C/R 113
SAN TAM ROAD
CUL
C1
C2
C3
C5
C6
C7
Track
A17
A18
B16
2SE-C/C 83
G2
G3
75

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/C 312

Feature No. 2SE – C/C 312 adjoins the proposed site to the North. The feature consists of a slope of Max. 18 m high, 85 m long and with an average angle of 26 deg. There are existing 400 mm surface channels located at the berm & crest and a 900 mm channel at the toe of the feature. The consequence-to-life category is 1, according to HKSS website of the GEO. The maintenance responsibility of the feature belongs to Lot 2086 in DD 105.

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 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 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 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.

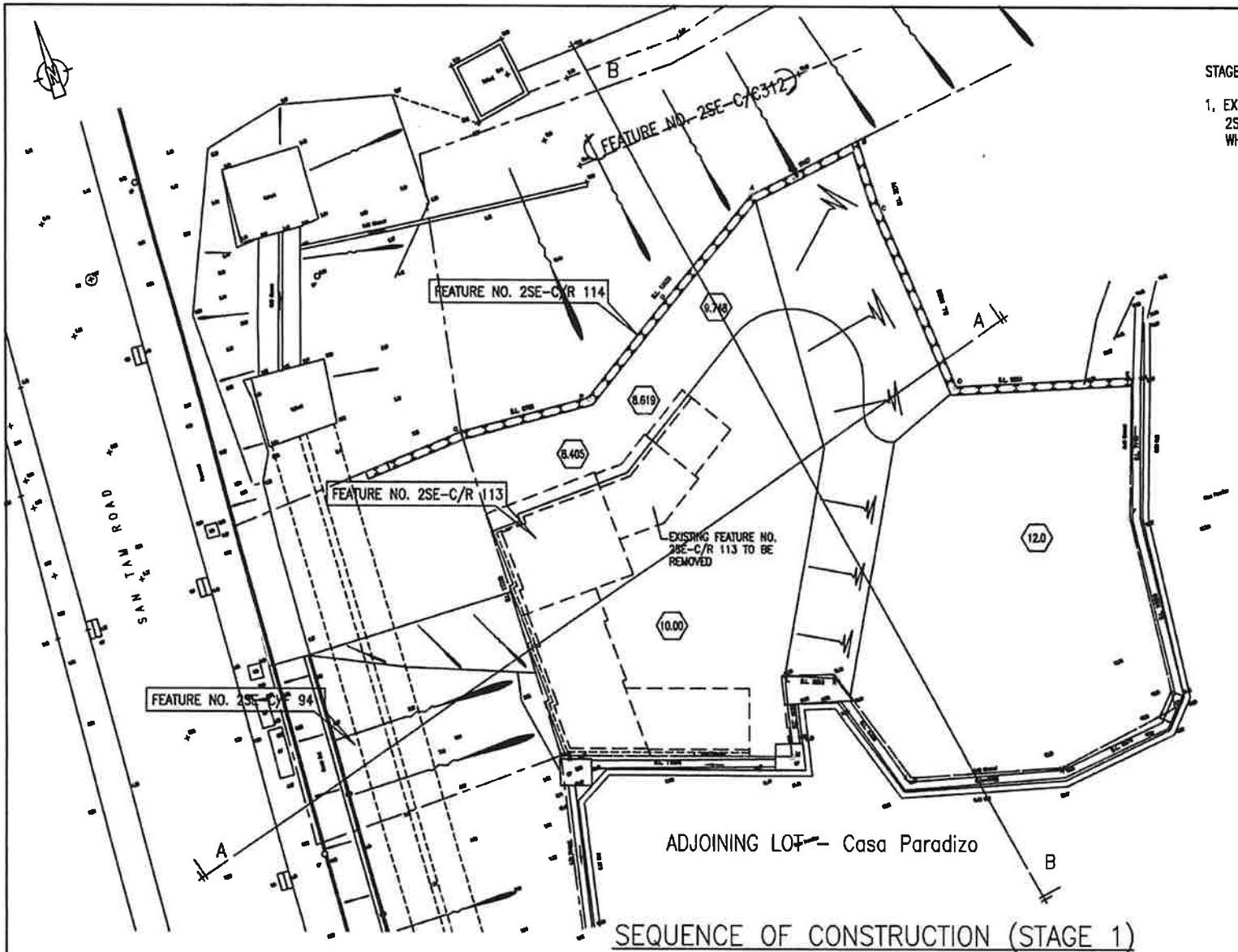
The borehole records are shown in Appendix 2. The information would be utilized in the Detail Design of the new RCHE Development.

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 stability of the feature 2SE-C/C 312 & 2SE-C/F94 will be reviewed in the design of the proposed development. If it is found not to be up to the required standard, those can be propped by a new supplementary retaining wall inside the proposed development. The supplementary wall will be integrated with the proposed building structure so that it is strong enough to lend support to those features.

The sequence of construction (Drawing GA-1 to GA-7) involves basically the following steps:

1. After existing buildings are demolished, excavate and remove the feature No. 2SE-C/R 113 down to the formation level which are match with existing ground level.
2. Install foundation socketed h-piles and pipe pile / sheet pile cofferdam.
3. Carry out ELS works sequentially down to the final excavation level at the western half of the site.
4. Construct the pile caps and structure with the cofferdam.
5. Employing the completed structure as stiff support, carry out ELS works for the remaining part of the site sequentially down to the final excavation level.
6. Construct the remaining pile cap and other related retaining structures.
7. Construct the superstructure above ground floor in the usual manner.

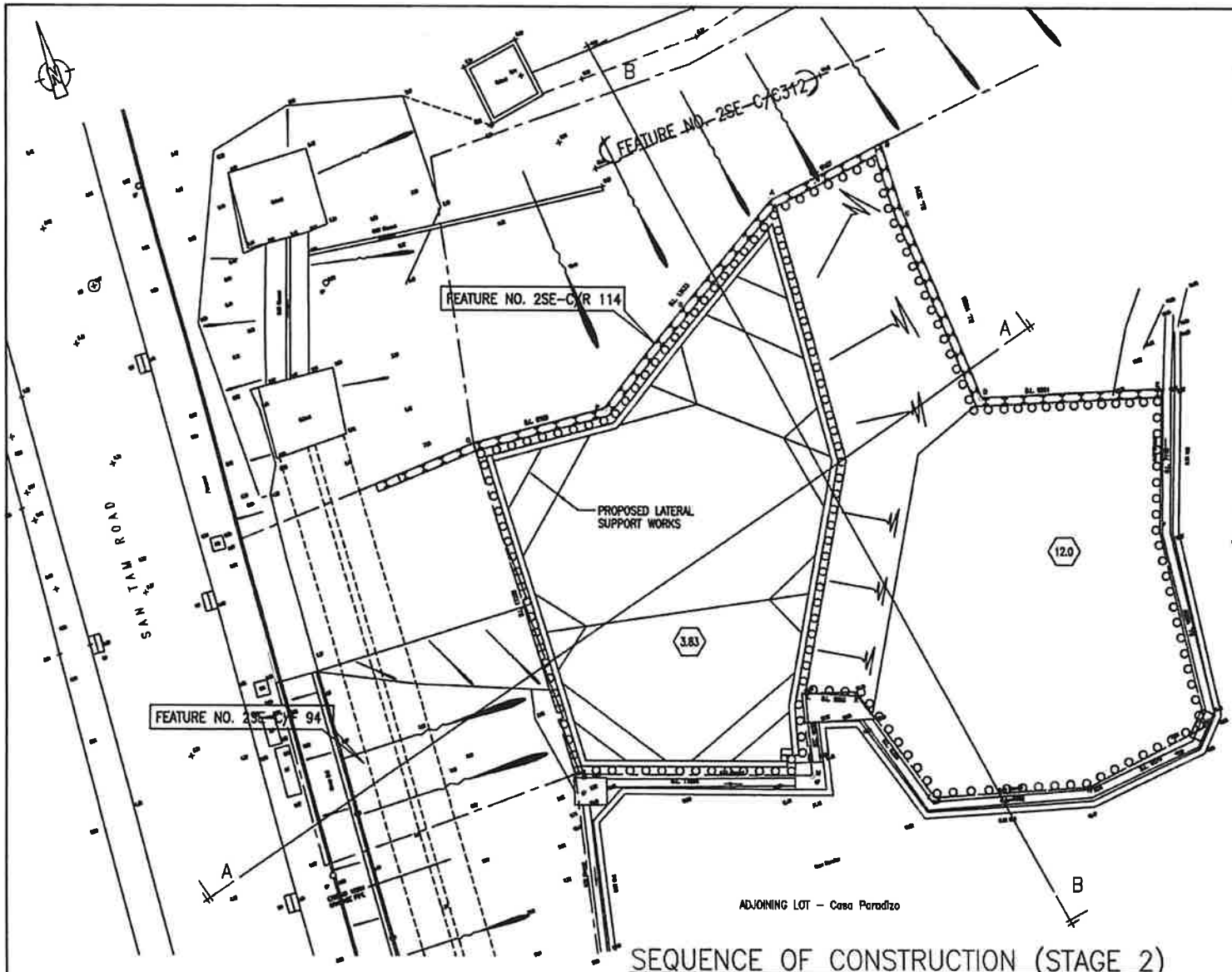


STAGE 1:

1, EXCAVATE AND REMOVE THE FEATRURE NO. 2SE-C/R 113 DOWN TO THE FORMATION LEVEL WHICH ARE MATCH WITH EXISTING GROUND LEVEL.

SEQUENCE OF CONSTRUCTION (STAGE 1)

Project: LOT NO. 4823 IN D.D. 104, YUEN LONG, NEW TERRITORIES	Drawing Title: SEQUENCE OF CONSTURCTION – STAGE 1	Drn. E.C.	Chd. R.L.	ARCHITECT: RLEE
		Scale 1:300	Date 1/2023	
		Drawing No. GA-1	Rev.	

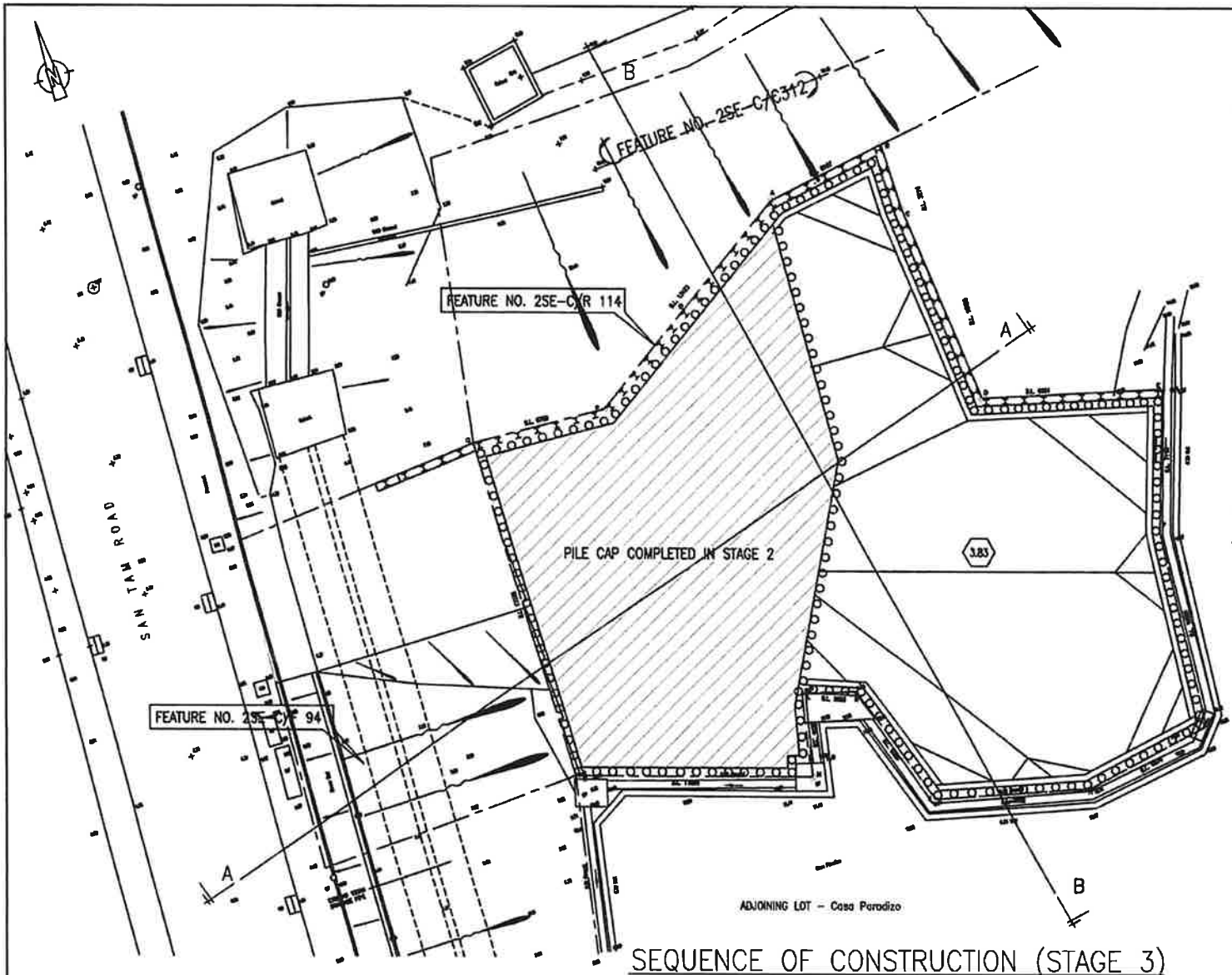


STAGE 2:

1. INSTALL FOUNDATION SOCKETED H-PILES AND PIPE PILE / SHEET PILE COFFERDAM.
2. CARRY OUT ELS WORKS SEQUENTIALLY DOWN TO THE FINAL EXCAVATION LEVEL AT THE WESTERN HALF OF THE SITE.
3. CONSTRUCT THE PILE CAPS AND STRUCTURE WITH THE COFFERDAM.

SEQUENCE OF CONSTRUCTION (STAGE 2)

Project: LOT NO. 4823 IN D.D. 104, YUEN LONG, NEW TERRITORIES	Drawing Title: SEQUENCE OF CONSTURCTION – STAGE 2	Drn. E.C.	Chd. R.L.	ARCHITECT: RLEE
		Scale 1:300	Date 1/2023	
		Drawing No. GA-2	Rev.	

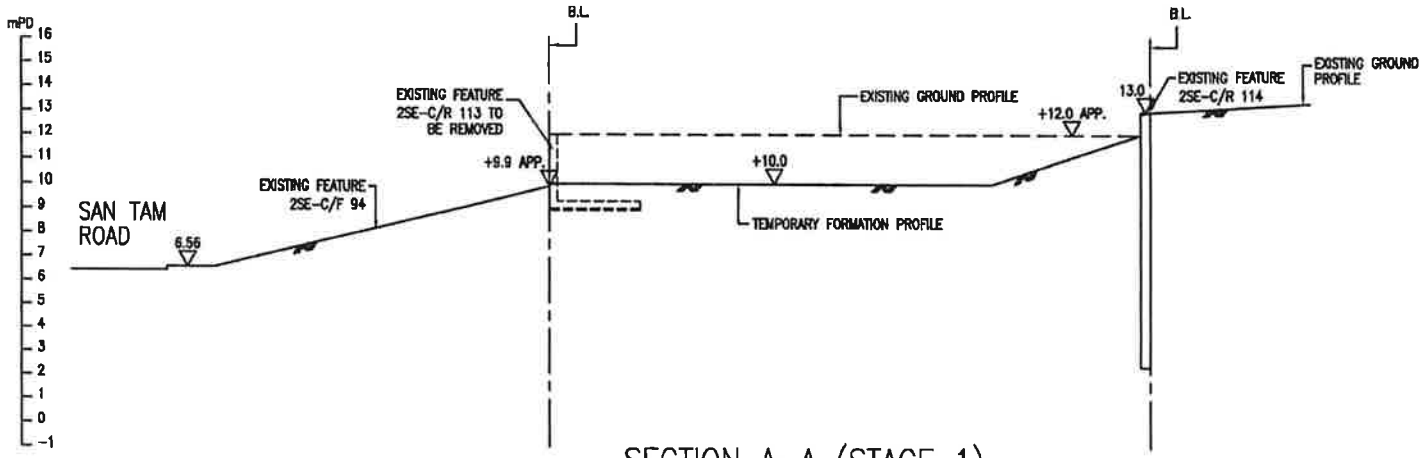


STAGE 3:

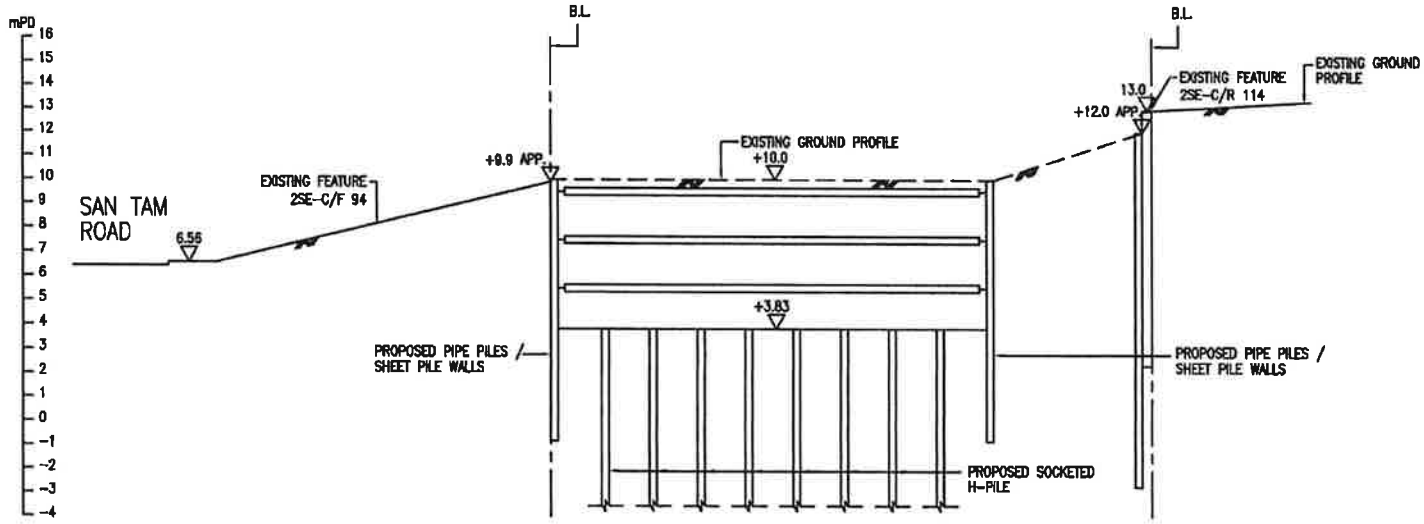
1. EMPLOYING THE COMPLETED STRUCTURE AS STIFF SUPPORT, CARRY OUT ELS WORKS FOR THE REMAINING PART OF THE SITE SEQUENTIALLY DOWN TO THE FINAL EXCAVATION LEVEL.
2. CONSTRUCT THE REMAINING PILE CAP AND OTHER RELATED RETAINING STRUCTURES.
3. CONSTRUCT THE SUPERSTRUCTURE ABOVE GROUND FLOOR IN THE USUAL MANNER.

SEQUENCE OF CONSTRUCTION (STAGE 3)

Project	Drawing Title	Drn.	Chd.	ARCHITECT
LOT NO. 4823 IN D.D. 104, YUEN LONG, NEW TERRITORIES	SEQUENCE OF CONSTURCTION – STAGE 3	E.C.	R.L.	RLEE
		Scale 1:300	Date 1/2023	
		Drawing No. GA-3	Rev.	

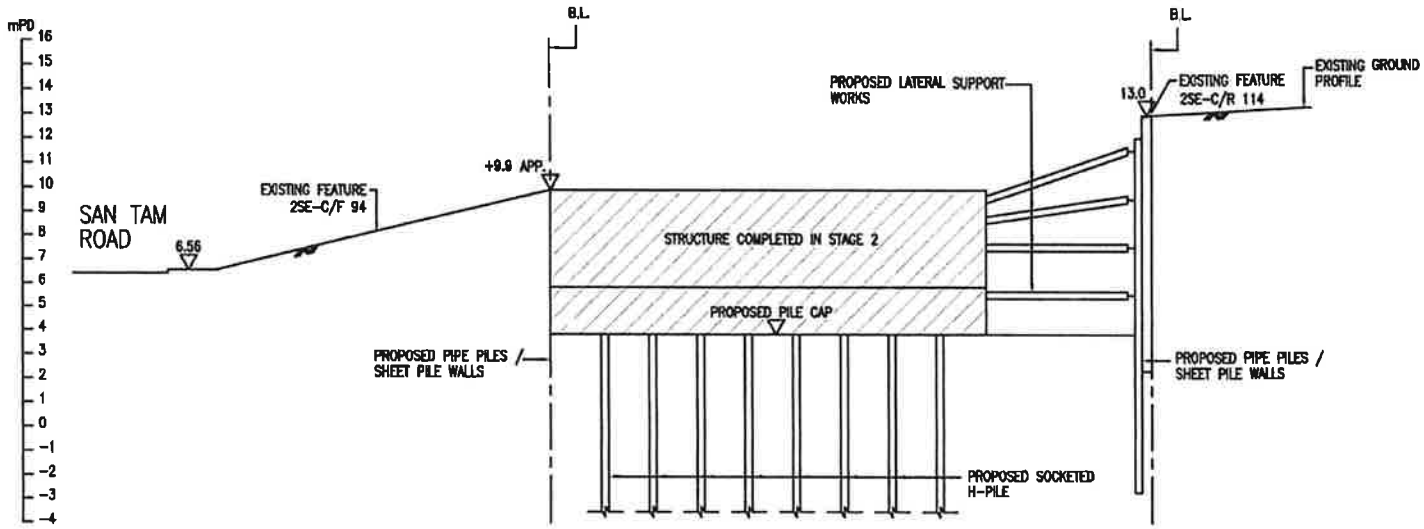


SECTION A–A (STAGE 1)



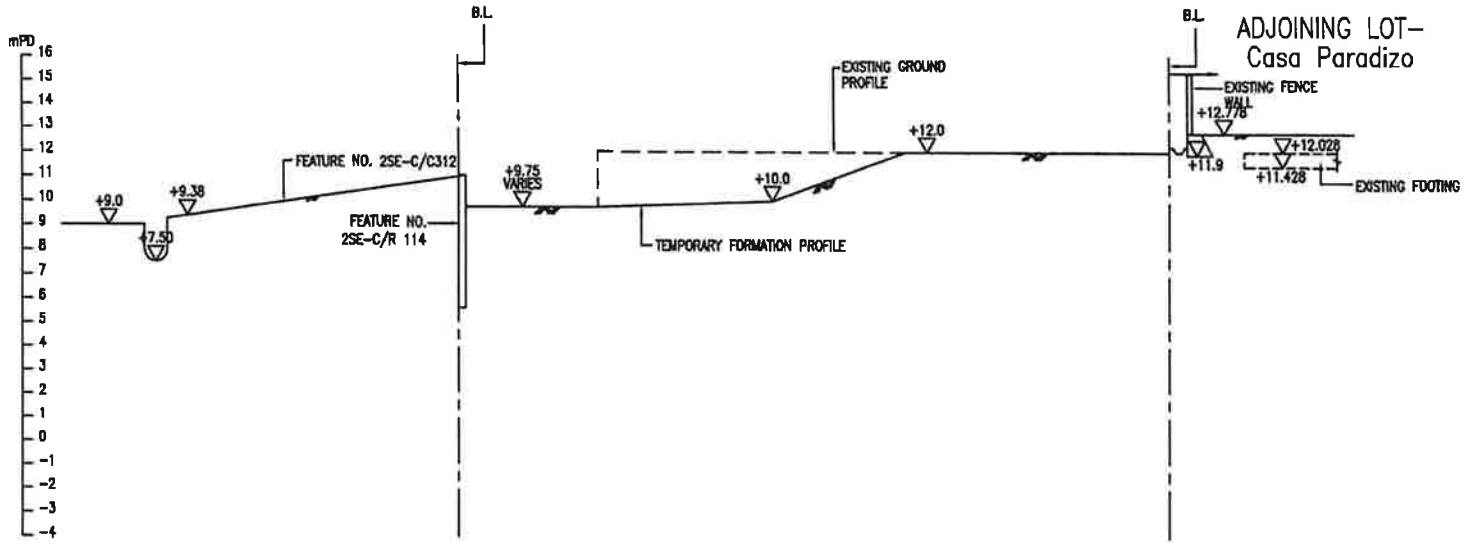
SECTION A–A (STAGE 2)

Project: LOT NO. 4823 IN D.D. 104, YUEN LONG, NEW TERRITORIES	Drawing Title: SEQUENCE OF CONSTURCTION – SECTION A–A (STAGE 1 AND STAGE 2)	Drn. E.C.	Chd. R.L.	ARCHITECT: RLEE www.rlee.com.hk
		Scale 1:300	Date 1/2023	
		Drawing No. GA–4	Rev.	

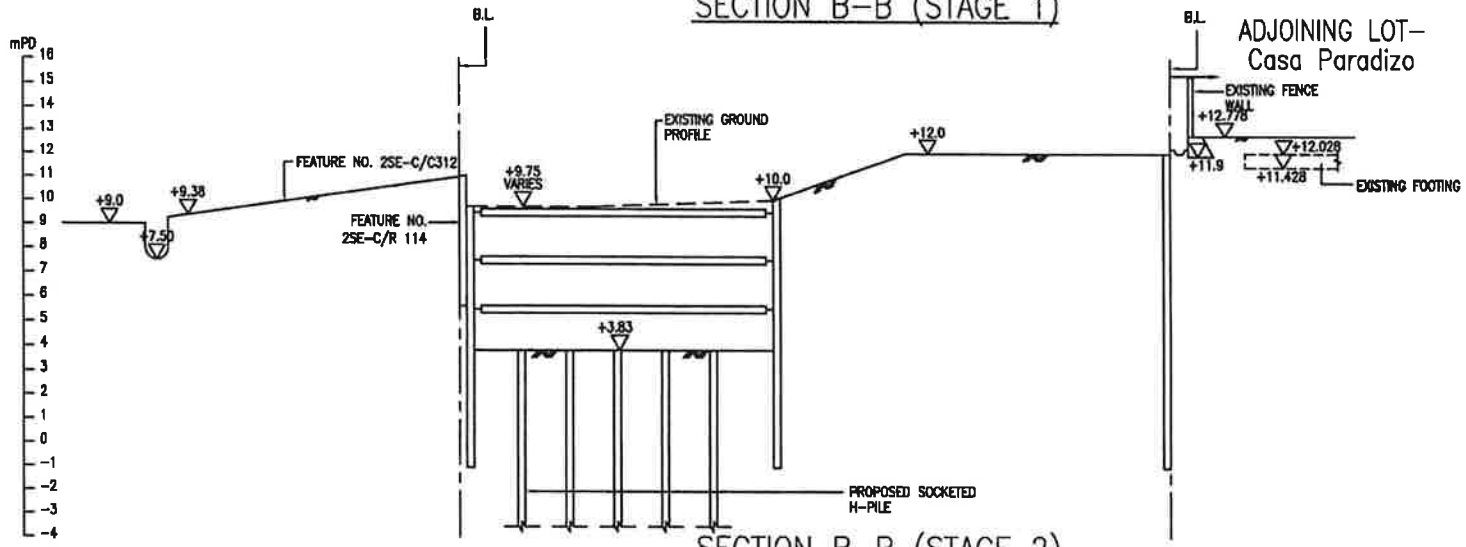


SECTION A-A (STAGE 3)

Project: LOT NO. 4823 IN D.D. 104, YUEN LONG, NEW TERRITORIES	Drawing Title: SEQUENCE OF CONSTURCTION – SECTION A-A (STAGE 3)	Drn. E.C.	Chd. R.L.	ARCHITECT: RLEE
		Scale 1:300	Date 1/2023	
		Drawing No. GA-5	Rev.	



SECTION B-B (STAGE 1)



SECTION B-B (STAGE 2)

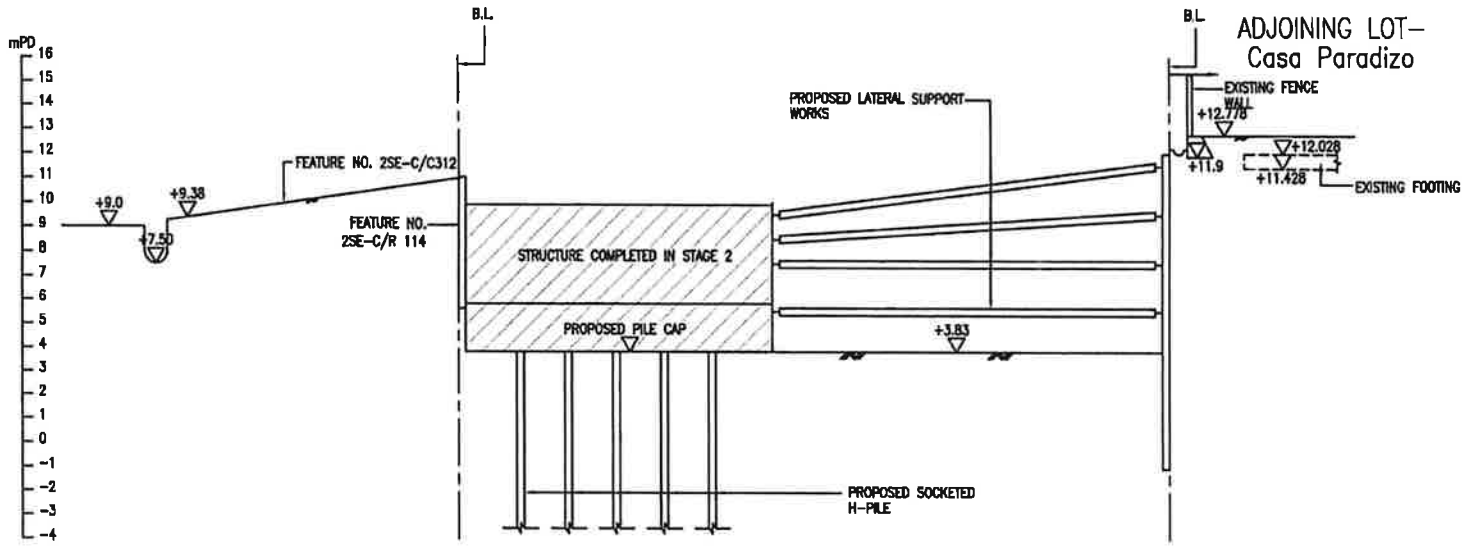
Project

LOT NO. 4823 IN D.D. 104, YUEN LONG, NEW TERRITORIES

Drawing Title

SEQUENCE OF CONSTURCTION - SECTION B-B(STAGE 1 AND STAGE 2)

Drn. E.C.	Chd. R.L.	ARCHITECT	
Scale 1:300	Date 1/2023	RLEE	
Drawing No. GA-6	Rev.		



SECTION B-B (STAGE 3)

Project: LOT NO. 4823 IN D.D. 104, YUEN LONG, NEW TERRITORIES	Drawing Title: SEQUENCE OF CONSTURCTION – SECTION B-B (STAGE 3)	Drn. E.C.	Chd. R.L.	ARCHITECT: RLEE
		Scale 1:300	Date 1/2023	
		Drawing No. GA-7	Rev.	

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. The stability of the feature 2SE-C/C 312 & 2SE-C/F94 will be reviewed in the design of the proposed development. If it is found not to be up to the required standard, those can be propped by a new supplementary retaining wall inside the proposed development. The supplementary wall will be integrated with the proposed building structure so that it is strong enough to lend support to those features. 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/C 312, 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.

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

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.

Additional Pages to

APPENDIX 1

BASIC INFORMATION

Location: D.D.105 Lot 2086, Ngau Tam Mei, Yuen Long

Date of Formation: post-1977

Date of Construction/ Modification: 01-12-2013

Approximate Coordinates: Easting : 824196 Northing : 838284

CONSEQUENCE-TO-LIFE CATEGORY

Facility at Crest: Undeveloped green belt

Distance of Facility from Crest (m): 0

Facility at Toe: Residential building

Distance of Facility from Toe (m): 0

Consequence-to-life Category: 1

Remarks: N/A

SLOPE PART

(1) Max. Height (m): 18 Length (m): 85 Average Angle (deg): 26

WALL PART

N/A

MAINTENANCE RESPONSIBILITY

Private Feature Party: DD105 LOT 2086 Agent: N/A

DETAILS OF SLOPE / RETAINING WALL

Date of Inspection: 07-09-2016

Data Source: AP

Slope Part Drainage: (1) Position: Berm Size(mm): 400
(2) Position: Crest Size(mm): 400
(3) Position: Toe Size(mm): 900

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: 3 Min. Berm Width (m): 0.6
Weepholes: Size (mm): N/A Spacing (m): N/A

WALL PART

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: Residential building

Distance from Toe(m): 0
Type of Crest Facility: Undeveloped green belt

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 E 824,144.44 N 838,262.20	W.O. No
MACHINE & No. XY2B		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
18.1.13	HX							A 0.50 B 1.00	+11.02	1.00			Firm, greyish yellow, sandy SILT with some gravels and roots. (FILL)
			100				(1, 1, 2, 2, 3, 5) N = 12	2.00 2.10 2.20 2.50 2.55 3.00					Firm, yellowish brown, fine sandy SILT. (COLLUVIUM)
			100				(1, 3, 3, 3, 4, 4) N = 14	4.00 4.10 4.20 4.50 4.55 5.00					
			100				(2, 3, 3, 4, 6, 9) N = 21	6.00 6.10 6.20 6.50 6.55	+5.02	7.00			
			63				(3, 4, 4, 5, 7, 7) N = 23	7.00 8.00 8.10 8.20 8.50 8.55					Firm to stiff, yellowish brown with reddish brown, fine sandy SILT. (RESIDUAL SOIL)
9 18.1.13 19.1.13		7.30m at 18:00 8.00m at 08:00						9.00	+3.02	9.00		V	Extremely weak, yellowish grey, completely decomposed fine ash TUFF. (Stiff, fine sandy SILT)
10			80					10.00	+2.02	10.00			

- 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

1. Prior to drilling an inspection pit was excavated by hand to 1.00m depth.
2. Constant head permeability tests were carried out at 6.00-7.00m and 8.00-9.00m depth.

AVANCE ENGINEERING (HK) LIMITED	DRILLHOLE RECORD	HOLE NO. BH 1
	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 824,144.44 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
10												V	As sheet 1 of 4.
11			73				(3, 3, 4, 6, 7, 8) N = 25	19 10.10 10.20 20 10.50 10.55 21 11.00					
12							(3, 4, 5, 6, 9, 12) N = 32	22 12.00 12.10 23 12.20 24 12.50 12.55					
13			85					25 13.00					
14							(2, 6, 6, 9, 13, 15) N = 43	26 14.00 14.10 27 14.20 28 14.50 14.55					
15			100					29 15.00					
16		7.80m at 18:00					(3, 4, 9, 9, 15, 20) N = 53	30 16.00 16.10 31 16.20 32 16.50 16.55					
17		8.00m at 08:00	100					33 17.00					
18							(4, 7, 7, 9, 9, 14) N = 39	34 18.00 18.10 35 18.20 36 18.50 18.55					
19								19.00	-6.98	19.00		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			0					20.00	-7.98	20.00			

- 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 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 E 824,144.44 N 838,262.20	W.O. No
MACHINE & No. XY2B		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
							50/40mm 200/40mm	38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 T2-101 T2-101 T2-101				V/IV	As sheet 2 of 4.
			95				(5, 7, 12, 14, 20, 24) N = 70						
			70				(3, 6, 21, 20, 30, 34) N = 105						
			100				(3, 6, 19, 22, 35, 37) N = 103						
			47						-15.73	-27.75		III	Moderately strong, greyish yellow, moderately decomposed fine ash TUFF with closely spaced joints and iron stained.
			95	0	0	NI							
			100	67	46	7.5							
			100	24	24	NI			-17.47	-29.49		V/IV	Extremely weak to very weak, greyish brown, completely to highly decomposed fine ash TUFF. (Very dense, silty sandy
									-17.98	-30.00			

- 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

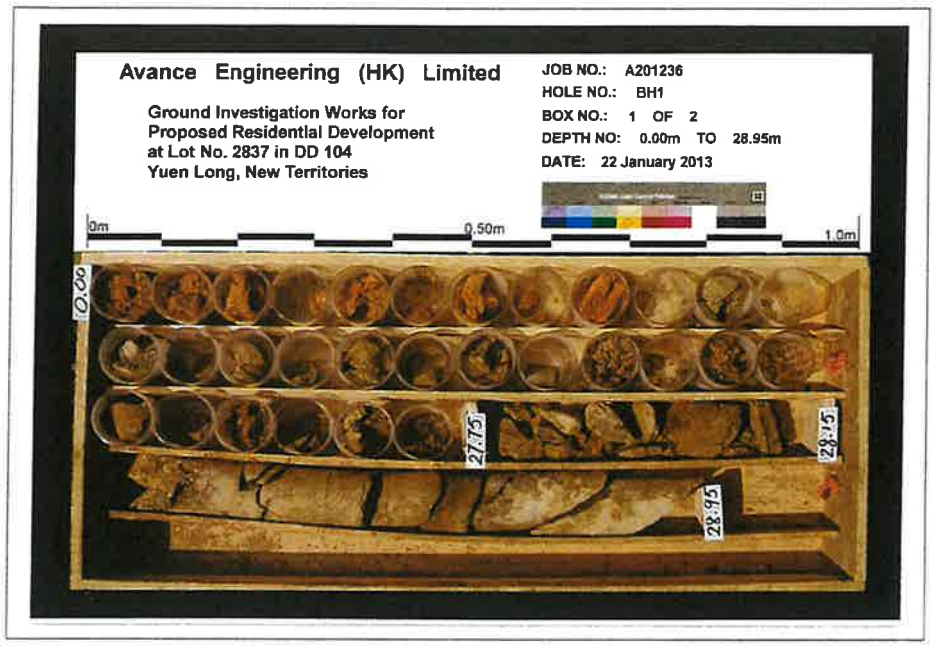
METHOD RC	CO-ORDINATES E 824,144.44 N 838,262.20	W.O. No
MACHINE & No. XY2B		DATE: 18/01/2013 to 21/01/2013
FLUSHING MEDIUM WATER	ORIENTATION VERTICAL	GROUND LEVEL +12.02 mPD

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												V/IV	coarse GRAVEL sized rock fragments)
31							50/43mm 200/40mm	53 30.50 54 30.60 30.63 30.65 31.00					
32			0				50/30mm 200/30mm	55 32.00 56 32.10 32.11 32.16 32.50					
33			0				50/20mm 200/20mm	57 33.50 58 33.60 33.64 34.00					
34			0				50/22mm 200/10mm	59 35.00 60 35.10 35.13 35.50					
35			0				50/30mm	61 35.50 62 36.60	-24.63	36.65			
36	HX 36.65												End of Investigation hole at 36.65m.
37													
38													
39													
40													

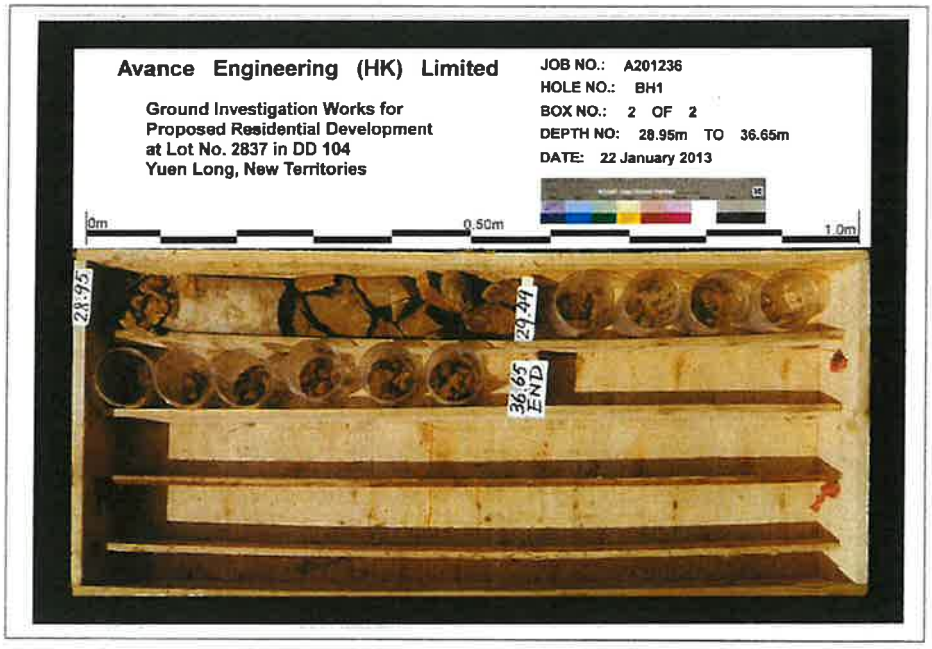
- Small Disturbed Sample
- Piston Sample
- U76 Undisturbed Sample
- U100 Undisturbed Sample
- Mazier Sample
- SPT Liner Sample
- Water Sample
- Standard Penetration Test
- In-situ Vane Shear Test
- Permeability Test
- Impression Packer Test
- Packer Test
- Piezometer Tip
- Standpipe Tip

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

REMARKS



BH1 – 1 OF 2



BH1 – 2 OF 2

AVANCE ENGINEERING (HK) LIMITED	DRILLHOLE RECORD	HOLE NO. BH 2
	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 E 824,124.52 N 838,244.82	W.O. No
MACHINE & No. XY2B		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
10.1.13	HX												Soft, greyish brown, sandy SILT with roots. (FILL)
			100				(1, 1, 2, 2, 3, 3) N = 10	A 0.50 B 1.00					
								2.00 2.10 2.20					
								2.50 2.55	+7.32	3.00			Firm, greyish brown, slightly fine sandy SILT. (COLLUVIUM)
			100				(1, 2, 2, 3, 4, 5) N = 15	4.00 4.10 4.20					
								4.50 4.55	+5.32	5.00			Stiff, reddish brown, slightly sandy SILT. (RESIDUAL SOIL)
			100				(2, 5, 7, 13, 13, 15) N = 48	6.00 6.10 6.20					
								6.50 6.55	+3.32	7.00		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)
			0				50/10mm 200/10mm	8.00 8.10 8.12 8.20	+2.12	8.20		IV/III	Weak to moderately strong, dark brown, highly to moderately decomposed fine ash TUFF with fractured. (CORESTONE)
		5.70m at 18:00	50					T2-101					
10.1.13		8.00m at 08:00						9.50	+0.82	9.50		V	Extremely weak, brownish grey, completely decomposed fine ash TUFF. (Hard, slightly fine sandy SILT)
11.1.13								10.00	+0.32	10.00			

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

LOGGED P.S. Wong

DATE 17/01/2013

CHECKED K.M. Lam

DATE 18/01/2013

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 E 824,124.52 N 838,244.82	W.O. No
MACHINE & No. XY2B		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												V	As Sheet 1 of 4.
11			100				326 65,139 200/130mm	15 11.00 16 11.10 17 11.35 18 11.40 11.50	-1.18	11.50		IV/III	Weak to moderately strong, dark brown, highly to moderately decomposed fine ash TUFF with fractured. (CORESTONE)
12			100					T2-101					
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	14.10		IV/III	Weak to moderately strong, greyish brown, highly to moderately decomposed fine ash TUFF. (CORESTONE) From 14.30-14.70m : Quartz vein.
15			80					T2-101	-3.98	14.30			
								15.35	-4.38	14.70			
								T2-101	-4.93	15.25			From 15.25-15.60m : Quartz vein.
16		5.80m at 18:00	87					16.10	-5.28	15.60			
		8.00m at 08:00							-5.78	16.10		V	Extremely weak, greyish brown, completely decomposed fine ash TUFF. (Stiff to very stiff, fine sandy SILT)
17			0				(27, 57, 100, 100) N = 200	21 17.10 22 17.20 23 17.45 24 17.50					
18			100					25 18.50 18.60 26 18.70					
19							(4, 4, 8, 10, 11, 19) N = 48	27 19.00 19.05					
20									-9.68	20.00			

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

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

REMARKS

AVANCE ENGINEERING (HK) LIMITED	DRILLHOLE RECORD	HOLE NO. BH 2
	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 E 824,124.52 N 838,244.82	W.O. No
MACHINE & No. XY2B		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
20												V	As Sheet 2 of 4.
21			100				(3, 5, 9, 13, 14, 19) N = 55	28 20.50 29 21.50 21.60 21.70 30 31 22.00 22.05					
22													
23								32 23.50					
24			100					33 24.50 24.60 34 24.70					
25							(11, 13, 22, 31, 50, 100) N = 203	35 25.00 25.05					
26			70					36 25.50					
27	HX 27.00						20/46 100/100mm 200/200mm	37 26.50 38 26.60 39 26.70 26.83 27.00	-16.68	27.00		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°.
28			100	12	12	9.1		T2-101 28.10					
29			83	38	33	8.6 NI		T2-101 29.30					
30			100	18	0	11.4		T2-101	-19.68	30.00			

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

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

REMARKS

AVANCE ENGINEERING (HK) LIMITED	DRILLHOLE RECORD	HOLE NO. BH 2
	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

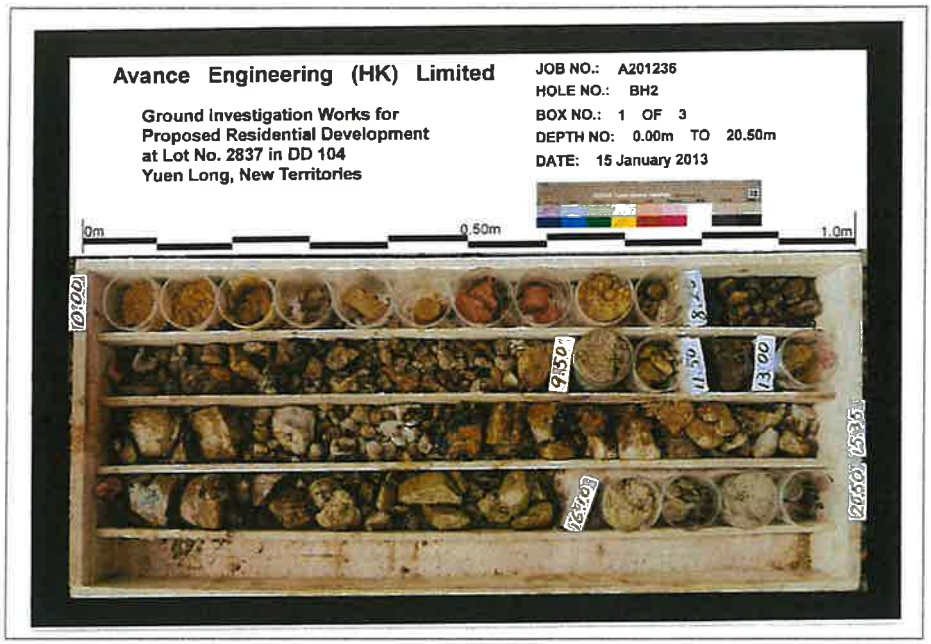
METHOD RC	CO-ORDINATES E 824,124.52 N 838,244.82	W.O. No
MACHINE & No. XY2B		DATE: 10/01/2013 to 12/01/2013
FLUSHING MEDIUM WATER	ORIENTATION VERTICAL	GROUND LEVEL +10.32 mPD

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
30			100	18	0	11.4		T2-101 30.30				III	As Sheet 3 of 4.
			100	0	0	NI		T2-101 30.75					
31						20.0							
			98	38	17	NI		T2-101					
32						9.5		32.08	-21.76	32.08			
													End of Investigation hole at 32.08m.
33													
34													
35													
36													
37													
38													
39													
40													

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

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

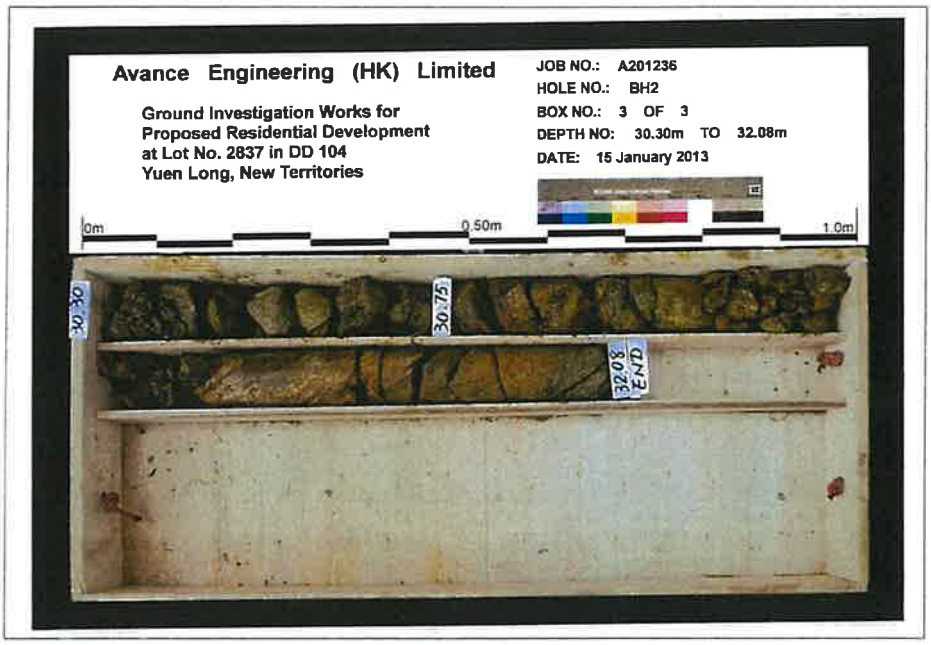
REMARKS



BH2 – 1 OF 3



BH2 – 2 OF 3


Avance Engineering (HK) Limited
Ground Investigation Works for
Proposed Residential Development
at Lot No. 2837 in DD 104
Yuen Long, New Territories
JOB NO.: A201236
HOLE NO.: BH2
BOX NO.: 3 OF 3
DEPTH NO: 30.30m TO 32.08m
DATE: 15 January 2013
0m
0.50m
1.0m
30.30
30.75
32.08
END

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 E 824,136.08 N 838,247.23	W.O. No
MACHINE & No. XY2B		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
15.1.13	PX												Firm, greyish brown, very sandy gravelly SILT with roots. (FILL)
	PX 1.00							B 1 1.00	+10.15	1.00			Firm, yellowish brown, sandy SILT with some gravels. (COLLUVIUM)
	HX		100				(2, 2, 3, 3, 3, 4) N = 13	2 2.00 3 2.10 2.20 4 2.50 2.55 5 3.00					
			100					6 4.00 7 4.10 4.20 8 4.50 4.55					
							(3, 4, 4, 4, 5, 5) N = 19	9 5.00	+6.15	5.00			
			100									VI	Stiff, reddish brown with white, fine sandy SILT. (RESIDUAL SOIL)
								10 6.00 11 6.10 6.20 12 6.50 6.55					
			100				(5, 5, 7, 9, 13, 13) N = 42	13 7.00	+4.15	7.00			
												V	Extremely weak, yellowish grey, completely decomposed fine ash TUFF. (Stiff, fine sandy SILT)
			100					14 8.00 15 8.10 8.20 16 8.50 8.55					
							(7, 7, 9, 11, 14, 17) N = 51	17 9.00					
			100					18 10.00	+1.15	10.00			

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

LOGGED P.S. Wong
DATE 19/01/2013
CHECKED K.M. Lam
DATE 21/01/2013

REMARKS
1. Prior to drilling an inspection pit was excavated by hand to 1.00m depth.
2. A standpipe installed to 10.00m depth.

AVANCE ENGINEERING (HK) LIMITED	DRILLHOLE RECORD	HOLE NO. BH 3
	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 E 824,136.08 N 838,247.23	W.O. No
MACHINE & No. XY2B		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
10							(5, 7, 11, 11, 13, 15) N = 50	19 18.10 18.20 20 10.50 10.55				V	As sheet 1 of 4.
11			100					21 11.00					
12							(5, 8, 11, 12, 16, 25) N = 64	22 12.00 12.10 12.20 23 12.50 12.55 24					
13		6.30m at 08:00						25 13.00					
14			100					26 14.00 14.10 14.20 27 14.50 14.55 28					
15							(7, 11, 14, 15, 21, 27) N = 77	29 15.00					
16			80					30 16.00 16.10 16.20 31 16.50 16.55 32					
17							(6, 13, 15, 15, 22, 25) N = 81	33 17.00					
18			100					34 18.00 18.10 18.20 35 18.50 18.55 36					
19							(5, 7, 11, 16, 19, 25) N = 71	37 19.00					
20			90					38 20.00	-8.85	20.00			

- 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 19/01/2013
CHECKED K.M. Lam
DATE 21/01/2013

REMARKS

AVANCE ENGINEERING (HK) LIMITED	DRILLHOLE RECORD	HOLE NO. BH 3
	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 E 824,136.08 N 838,247.23	W.O. No
MACHINE & No. XY2B		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
								39 20.10 40 20.28 20.33				V	As sheet 1 of 4.
21								41 21.00	-9.85	21.00		IV	Very weak, brownish grey, highly decomposed fine ash TUFF.
22			100					42 22.00 43 22.10 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 45 24.50 46 24.60 24.64					
25								25.00					
26			0					47 26.00 48 26.10 26.15					
27			0					26.50 49 27.50 50 27.60 27.63					
28		6.50m at 08:00	100					51 28.00					
29								52 29.00 53 29.10 29.13					
30									-18.85	30.00			

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

LOGGED P.S. Wong
DATE 19/01/2013
CHECKED K.M. Lam
DATE 21/01/2013

REMARKS

AVANCE ENGINEERING (HK) LIMITED	DRILLHOLE RECORD	HOLE NO. BH 3
	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 E 824,136.08 N 838,247.23	W.O. No
MACHINE & No. XY2B		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													
31	HX 31.65		100				50/30mm	54 30.50 55 31.50 56 31.60	-20.50	31.65		V/IV	As sheet 3 of 4.
32													End of Investigation hole at 31.65m.
33													
34													
35													
36													
37													
38													
39													
40													

- 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

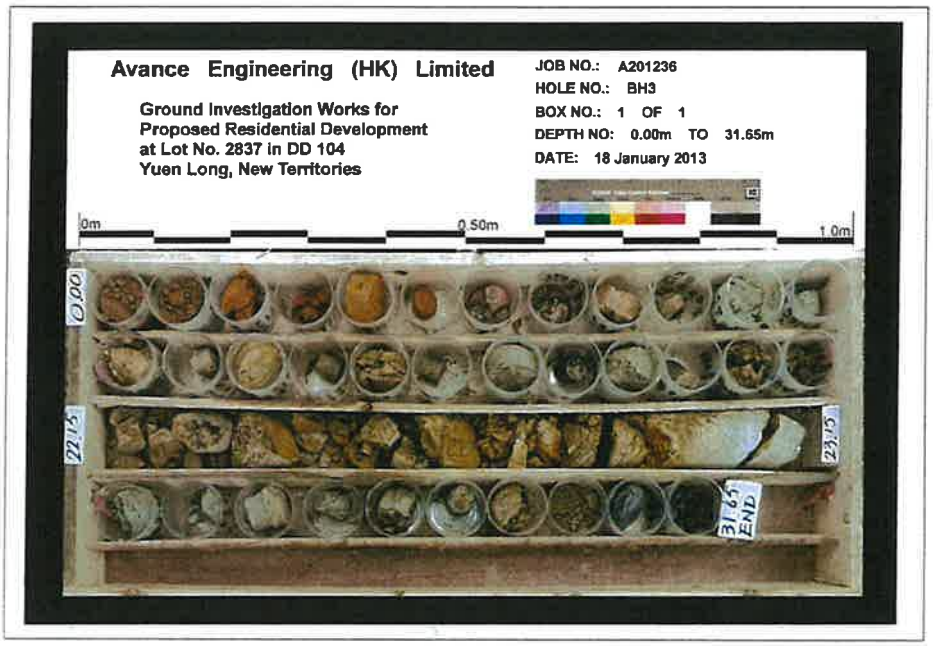
LOGGED P.S. Wong

DATE 19/01/2013

CHECKED K.M. Lam

DATE 21/01/2013

REMARKS


Avance Engineering (HK) Limited
Ground Investigation Works for
Proposed Residential Development
at Lot No. 2837 in DD 104
Yuen Long, New Territories
JOB NO.: A201236
HOLE NO.: BH3
BOX NO.: 1 OF 1
DEPTH NO: 0.00m TO 31.65m
DATE: 18 January 2013
0m
0.50m
1.0m
0.00
22.15
23.15
31.65
END

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 E 824,153.27 N 838,247.14	W.O. No
MACHINE & No. XY2B		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 B 1.00	+12.16	1.00			Firm, yellowish brown, sandy SILT with gravel and concrete fragments. (FILL)
			100				(1, 1, 3, 3, 3, 3) N = 12	2.00 2.10 2.20 2.50 2.55 3.00					Firm to stiff, yellowish brown, fine sandy SILT with gravels. (COLLUVIUM)
			100				(2, 3, 4, 4, 5, 6) N = 19	4.00 4.10 4.20 4.50 4.55 5.00	+8.16	5.00		VI	Stiff, yellowish brown and brownish yellow, fine sandy SILT. (RESIDUAL SOIL)
			100				(1, 3, 3, 3, 3, 8) N = 17	6.00 6.10 6.20 6.50 6.55 7.00					
			100				(2, 3, 5, 6, 8, 10) N = 29	8.00 8.10 8.20 8.50 8.55 9.00	+4.16	9.00		V	Extremely weak, yellowish grey, completely decomposed fine ash TUFF. (Stiff, fine sandy SILT)
			100					12.00	+3.16	10.00			

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

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

REMARKS
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.

AVANCE ENGINEERING (HK) LIMITED	DRILLHOLE RECORD	HOLE NO. BH 4
	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 E 824,153.27 N 838,247.14	W.O. No
MACHINE & No. XY2B		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
10 11 12 13 14 15 16 17 18 19 20		9.40m at 18:00 8.00m at 08:00	100 95 100 100 100				(3, 7, 7, 8, 10, 12) N = 37 (1, 10, 12, 14, 14, 16) N = 55 (1, 11, 20, 24, 32, 34) N = 110 (10, 15, 24, 39, 56, 59) N = 178 (12, 20, 25, 40, 53, 58) N = 176	19 10.10 10.20 20 10.50 10.55 21 11.00 22 12.00 12.10 12.20 23 24 12.50 12.55 25 13.00 26 14.00 14.10 14.20 27 28 14.50 14.55 29 15.00 30 16.00 16.10 16.20 31 32 16.50 16.55 33 17.00 34 18.00 18.10 18.20 35 36 18.50 18.55 37 19.00 38 20.00	-6.84	20.00		V	As sheet 1 of 4.

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 17/01/2013
CHECKED K.M. Lam
DATE 18/01/2013

REMARKS

AVANCE ENGINEERING (HK) LIMITED	DRILLHOLE RECORD	HOLE NO. BH 4
	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 E 824,153.27 N 838,247.14	W.O. No
MACHINE & No. XY2B		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
20		9.23m at 18:00					(10, 12, 15, 17, 22, 26) N = 00	39 20.10 20.20 40 20.50 20.55 41 21.00				V	As sheet 1 of 4.
21			100					42 22.00 22.10 43 22.21 44 22.26					
22								45 23.26 23.36 46 23.43 23.50					
23		9.30m at 18:00	100				50/0mm 200/0mm	T2-101 24.00	-10.44	23.60		III	Moderately strong, brownish grey, moderately decomposed fine ash TUFF. (CORESTONE)
24			93					T2-101 25.00					
25			97						-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				50/30mm 200/20mm	47 26.00 48 26.10 26.11 26.16 26.50					
27			0				50/20mm 200/20mm	49 27.50 50 27.60 27.65					
28			0					28.00					
29							50/20mm 200/20mm	51 29.00 52 29.10 29.14					
30								53 29.50	-16.84	30.00			

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

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

REMARKS

AVANCE ENGINEERING (HK) LIMITED	DRILLHOLE RECORD	HOLE NO. BH 4
	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

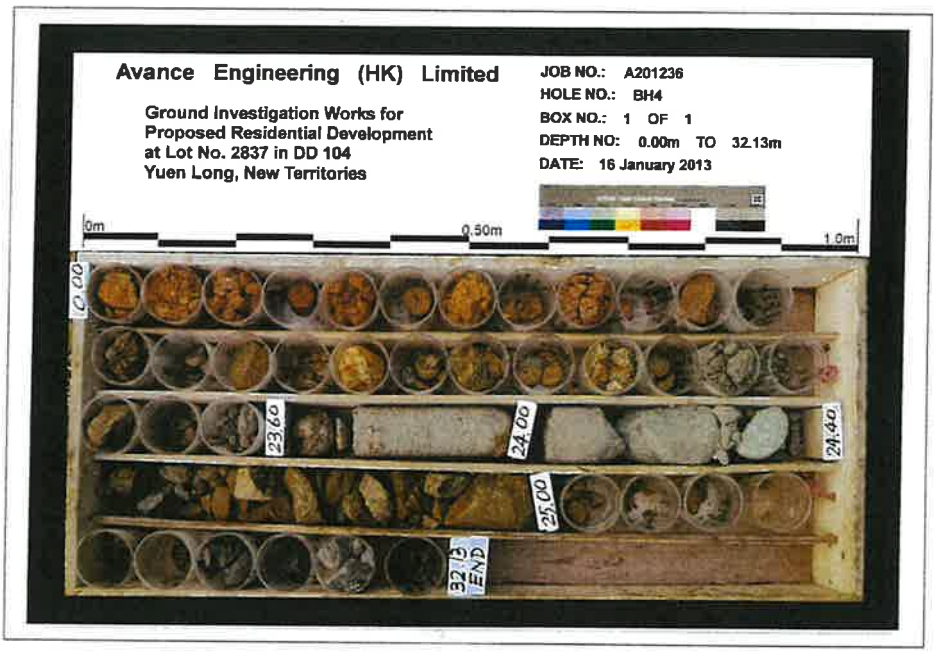
METHOD RC	CO-ORDINATES E 824,153.27 N 838,247.14	W.O. No
MACHINE & No. XY2B		DATE: 12/01/2013 to 16/01/2013
FLUSHING MEDIUM WATER	ORIENTATION VERTICAL	GROUND LEVEL +13.16 mPD

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
30			95					54 30.50 55 30.60 30.64				V/IV	As sheet 3 of 4.
31							50/20mm 200/20mm	56 31.00					
32 16.1.13	HX 32.13		95				50/10mm	57 32.00 58 32.10 32.13	-18.97	32.13			End of investigation hole at 32.13m.
33													
34													
35													
36													
37													
38													
39													
40													

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

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

REMARKS


Avance Engineering (HK) Limited
Ground Investigation Works for
Proposed Residential Development
at Lot No. 2837 in DD 104
Yuen Long, New Territories
JOB NO.: A201236
HOLE NO.: BH4
BOX NO.: 1 OF 1
DEPTH NO: 0.00m TO 32.13m
DATE: 16 January 2013
0m
0.50m
1.0m
0.00
23.60
24.00
24.40
25.00
32.13
END

BH4 – 1 OF 1

AVANCE ENGINEERING (HK) LIMITED	DRILLHOLE RECORD	HOLE NO. BH 5
	CONTRACT NO.	SHEET 1 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 E 824,143.98 N 838,236.29	W.O. No
MACHINE & No. XY2B		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
10.1.13	PX							A 0.50 B 1.00					Firm, brownish grey, fine sandy SILT with gravels. (FILL)
1	PX 1.00 HX							1	+11.24	1.00			Firm to stiff, yellowish brown, slightly fine sandy SILT. (COLLUVIUM)
2			100					2 2.00 3 2.10 2.20 4 2.50 2.55					
3							(23, 3, 4, 6, 8, 10) N = 28	5 3.00					
4			100					6 4.00 7 4.10 4.20 8 4.50 4.55					
5							(3, 4, 6, 9, 10, 12) N = 36	9 5.00	+7.24	5.00		VI	Stiff, yellowish brown and reddish brown, fine sandy SILT with gravel. (RESIDUAL SOIL)
6			100					10 6.00 11 6.10 6.20 12 6.50 6.55					
7							(4, 6, 8, 10, 12, 13) N = 43	13 7.00	+5.24	7.00		V	Extremely weak, greyish yellow, completely decomposed fine ash TUFF. (Stiff to hard, slightly sandy SILT)
8			95					14 8.00 15 8.10 8.20 16 8.50 8.55					
9 10.1.13 11.1.13		7.20m at 18:00					(3, 5, 7, 9, 11, 13) N = 40	17 9.00					
10		8.00m at 08:00	100					18 10.00	+2.24	10.00			

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 15/01/2013
CHECKED K.M. Lam
DATE 16/01/2013

REMARKS
1. Prior to drilling an inspection pit was excavated by hand to 1.00m depth.

AVANCE ENGINEERING (HK) LIMITED	DRILLHOLE RECORD	HOLE NO. BH 5
	CONTRACT NO.	SHEET 2 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 E 824,143.98 N 838,236.29	W.O. No
MACHINE & No. XY2B		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
							(5, 6, 8, 10, 12, 14) N = 44	19 18.10 18.26 20 10.50 10.55				V	As sheet 1 of 3.
11								21 11.00	+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)
12			100				(7, 14, 16, 26, 28, 30) N = 100	22 12.00 23 12.10 12.20 24 12.50 12.55					
13			95					25 13.00					
14							(10, 15, 21, 25, 29, 33) N = 105	26 14.00 27 14.10 14.20 28 14.50 14.55					
15							(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)
16			70	29	18	7.2		T2-101					
17								31 16.73 16.83	-4.49 -4.59	16.73 16.83		V IV/III	Extremely weak to weak, yellowish grey, completely to highly decomposed fine ash TUFF. (Hard, sandy SILT with some gravel sized rock fragments) Moderately weak to weak, greyish brown, highly to moderately decomposed fine ash TUFF with fractured. (CORESTONE)
18		7.50m at 18:00	25	0	0	NI		T2-101					
19		8.00m at 08:00	95				(6, 8, 15, 40, 48, 59) N = 162	32 18.19 33 19.19 19.39 34 35 19.69 19.74	-5.95	18.19		V	Extremely weak, greyish yellow, completely decomposed fine ash TUFF. (Hard to stiff, fine sandy SILT)
20								36 20.00	-7.76	20.00			

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

LOGGED P.S. Wong
DATE 15/01/2013
CHECKED K.M. Lam
DATE 16/01/2013

REMARKS

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

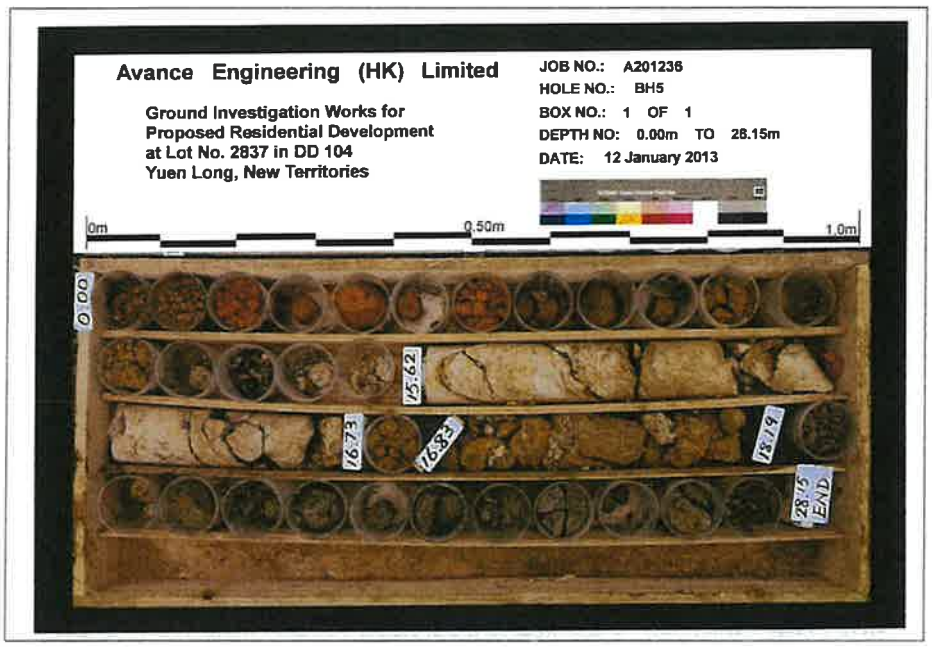
METHOD RC	CO-ORDINATES E 824,143.98 N 838,236.29	W.O. No
MACHINE & No. XY2B		DATE: 10/01/2013 to 12/01/2013
FLUSHING MEDIUM WATER	ORIENTATION VERTICAL	GROUND LEVEL +12.24 mPD

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
20													
21			100				(25, 35, 45, 46, 50 59) N = 200	37 21.00 21.10 38 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					40 22.00					
23							(27, 29, 40, 48, 52, 60) N = 200	41 23.00 23.10 42 23.20 43 23.50 44 23.60					
24			100					45 24.00 24.70 46 24.30					
25							(15, 33, 38, 46, 53, 64) N = 200	47 25.10 48 25.15					
26			100					49 26.15 26.25 50 26.35					
27							(22, 50, 42, 48, 51, 59) N = 200	51 26.65 52 26.70					
28	HX 28.15		95				50/10mm 200/20mm	53 27.70 27.80 54 27.83	-15.91	28.15			End of Investigation hole at 28.15m.
29													
30													

- 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 15/01/2013
CHECKED K.M. Lam
DATE 16/01/2013

REMARKS


Avance Engineering (HK) Limited
Ground Investigation Works for
Proposed Residential Development
at Lot No. 2837 in DD 104
Yuen Long, New Territories
JOB NO.: A201236
HOLE NO.: BH5
BOX NO.: 1 OF 1
DEPTH NO: 0.00m TO 28.15m
DATE: 12 January 2013
0m
0.50m
1.0m
0.00
15.62
16.73
16.83
18.19
28.15
END

BH5 – 1 OF 1

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 6

QUANTITATIVE RISK ASSESSMENT REPORT FOR
HIGH PRESSURE TOWN GAS PIPELINE

RLEE

RLEE Architects (HK) Ltd

Quantitative Risk Assessment for Section 12A Planning Application of a proposed RCHE at 81 San Tam Road, Yuen Long

February 2023

Submitted to

R Lee Architects (HK) Ltd

Prepared By

Meinhardt Infrastructure and Environment Ltd

Date	Revision	Prepared By	Checked By	Approved By
15 February 2023	0			
		Wilson PAU	Amy HO	Claudine LEE

CONTENTS

1 INTRODUCTION 1
1.1 Background 1
1.2 Scope of Work 1
1.3 Risk Criteria 1
1.4 Methodology 2
2 PROJECT DATA 3
2.1 The Project 3
2.2 Hazardous Facilities 3
3 BACKGROUND INFORMATION OF STUDY 4
3.1 Study Zone 4
3.2 Population 4
3.3 Source of Ignition 11
3.4 Meteorological Information 11
4 HAZARD IDENTIFICATION 13
4.1 Internal Causes 13
4.2 External Causes 13
5 FREQUENCY ASSESSMENT 15
5.1 Overview 15
5.2 EGIG Historical Failure Data 15
5.3 Analysis of Modification Factors 15
5.4 Adopted Failure Frequencies of the HPTGP 16
5.5 Event Outcome Frequencies 18
5.6 Event Tree Analysis 19
6 CONSEQUENCE ANALYSIS 20
6.1 Overview 20
6.2 Source Term Modelling 20
6.3 Physical Effect Modelling 20
6.4 Consequence Result 25
7 RISK ASSESSMENT 27
7.1 Risk Summation 27
7.2 Results of Individual Risk 27
7.3 Results of Societal Risk 27
8 Conclusion 30
9 Reference 31

List of Tables

Table 1 Gas Composition and its Physical Properties
Table 2 TPU Population information and assumptions
Table 3 Temporal Change of Population within a Week
Table 4 Population Data Within Study Zone
Table 5 Day Time Wind Direction Frequency at Wetland Park Weather Station (Year 2021)
Table 6 Night Time Wind Direction Frequency at Wetland Park Weather Station (Year 2021)
Table 7 Incident Causes for onshore pipeline gas leakage
Table 8 Breakdown of EGIG Incidents with reduction factors
Table 9 Hole Size Distribution of Underground Pipeline
Table 10 Failure of Pipework
Table 11 Base failure frequencies of hazardous scenarios
Table 12 Immediate Ignition Probability
Table 13 Ignition Probabilities Adopted in this Study
Table 14 Fatality Probability of Vapour Cloud Explosion
Table 15 Population with Fireball Shielding Factor
Table 16 Consequence Results of Fireball
Table 17 Consequence Results of Jet Fire
Table 18 Consequence Results of Flash Fire
Table 19 Consequence Results of Vapour Cloud Explosion
Table 20 Consequence Results of Toxic Effect
Table 21 F-N Data
Table 22 PLL Breakdown of HPTGP

List of Figures

Figure 1 Location of the Proposed Project and High Pressure Town Gas Pipeline
Figure 2 Societal Risk Guideline from Hong Kong Planning Standards and Guidelines
Figure 3 Quantitative Risk Assessment Methodology
Figure 4 Study Zone of the Proposed Project
Figure 5 Population Groups in the Vicinity in the Study Zone (200m Radius)
Figure 6 Individual Risk Contour of High Pressure Town Gas Pipeline
Figure 7 F-N Curves of High Pressure Town Gas Pipeline

List of Appendices

Appendix A Layout Plans of the Proposed Development
Appendix B Town Gas High Pressure Town Gas Pipeline Information
Appendix C Traffic Population Calculation
Appendix D Atmospheric Stability-Wind Speed Frequencies
Appendix E Event Tree Analysis of High Pressure Town Gas Pipeline

1 INTRODUCTION

1.1 Background

A S12A planning application, Planning Application No. Y/YL-NTM/9, was submitted to the Town Planning Board (TPB) to seek permission for amendments to rezone the application site at Lot 4823 in D.D.104, Ngau Tam Mei, Yuen Long (hereinafter referred as the "Project Site") from "Residential (Group C)" to "Government, Institution or Community". The Project Site has an area of 736.3 m^2, abutting San Tam Road, Yuen Long. It is planned to be developed for a Residential Care Home for the Elderly in 2027.

There is an underground high pressure town gas pipeline (HPTGP) running along San Tam Road near the Project Site. The HPTGP is classified as Notifiable Gas Installation (NGI) under the Gas Safety Ordinance Cap. 51. The locations of the Project Site and HPTGP are illustrated in **Figure 1**.

Meinhardt Infrastructure and Environment Limited (MIEL) was commissioned by R Lee Architects (HK) Limited (the Client) to undertake this Quantitative Risk Assessment (QRA) to determine the risk level posed by the HPTGP to the surrounding, including the proposed development, and to determine the compliance with the Hong Kong Risk Guidelines (HKRG) outlined in Chapter 12 of the Hong Kong Planning Standards and Guidelines (HKPSG), for the comments of DEMS.

1.2 Scope of Work

The objective of this study is to assess the potential risks associated with the underground HPTGP to the population in the vicinity including the future occupants of the proposed development in year 2027, and to determine whether any additional risk mitigation measures are required in the design of the proposed development.

The scope of the work of the QRA is set out as follows:

a) To identify all potential hazardous scenarios associated with the 1.6km section of underground HPTGP of 600mm diameter laid along San Tam Road, operated by The Hong Kong and China Gas Company (HKCG) and determine a set of relevant scenarios for the QRA;

b) execute a QRA and express the off-site risks in terms of individual risk (IR) contours, and societal risk (SR) FN curves;

c) compare the QRA results with the HKRG in future years; and

d) where the HKRG cannot be met, identify and assess practicable and cost-effective risk mitigation measures.

1.3 Risk Criteria

1.3.1 Hong Kong Risk Guidelines (HKRG)

Chapter 12.4 of the HKPSG [1] stipulates the risk guidelines to determine the acceptability of Potentially Hazardous Installation (PHI) in terms of individual and societal risks. These risk guidelines are also adopted to ascertain whether the risk levels posed by the NGIs are acceptable.

The individual and societal risk criteria for the risk assessment are described below:

i. **Individual Risk**: a measure of the frequency at which an individual at a specified distance from the hazardous installations is expected to sustain a specified level of harm from the realization of hazardous incident(s). The maximum level of off-site individual risk causing fatality of a person located 24 hours a day outside the facility of concern should not exceed 1×10^{-5} / year, i.e. 1 in 100,000 per year.

ii. **Societal Risk**: a measure of the relationship between the frequency of an incident and the number of fatalities that will result. It is typically expressed graphically by an F-N curve showing the cumulative frequency (F) of incidents causing N or more fatalities. The societal risk criteria are presented graphically as in **Figure 2**. There are three regions as described below:

- *Acceptable*: where the risk is low enough that no action is necessary;
- *Unacceptable*: where the risk is very high that it should be reduced regardless of the cost or else the project of concern should not proceed; and
- *ALARP (As Low As Reasonably Practicable)*: where the risk associated with the facility of concern should be reduced to a level "as low as reasonably practicable", in which the priority of measures is established on the basis of practicality and cost to implement versus the risk reduction achieved.

1.4 Methodology

1.4.1 Overall QRA Approach

The methodology of this study follows the HKRG stipulated in Section 4 of Chapter 12 of the HKPSG [1] and the guideline published by EMSD in 2021 - Quantitative Risk Assessment Study for High Pressure Town Gas Installations in Hong Kong [2]. The overall QRA methodology is shown schematically in **Figure 3**.

The major phases in QRA includes:

i. **Hazard Identification**: Identify hazard scenarios associated with the HPTGP, and then determine a set of relevant scenarios to be included in a QRA.

ii. **Frequency Assessment**: Assess the likelihood of occurrence of the identified hazard scenarios.

iii. **Consequence Assessment**: Assess the consequences and impact to the surrounding population.

iv. **Risk Summation and Assessment**: Evaluate the risk level, in terms of individual risk and societal risk. The risks will be compared with the criteria outlined in HKRG to determine their acceptability.

v. **Identification of Mitigation Measures**: Identify and assess practicable and cost-effective risk mitigation measures if necessary. The risks of mitigated cases will then be reassessed to determine the level of risk reduction.

1.4.2 Case Considered

This QRA will consider two scenarios in future year, 2027, including:

- Case 1 – Base Case in Year 2027: evaluating the risk level in year 2027 without proposed development;
- Case 2 – Operation Case in Year 2027: elevating the risk level in year 2027 with proposed development.

2 PROJECT DATA

2.1 The Project

The Project Site is located on San Tam Road, Yuen Long. The site area is approximately 736.3m^2 and is zoned as "Residential (Group C)" under the "R(C)" Zone on the approved Ngau Tam Mei Outline Zoning Plan (OZP) No. S/YL-NTM/12. An S12A application is submitted to the TPB to rezone the Site to "Government, Institution or Community" on the OZP for Proposed Residential Care Home for the Elderly (hereinafter referred as the "Proposed Development").

The Proposed Development involves one Residential Care Home for Elderly (RCHE) of a 10-storeys building comprising 142 beds, administration offices and recreational facilities. The proposed RCHE will accommodate a maximum of 142 elderlies and have 50 staffs who are divided in 2 shifts.

The layout plan of the Proposed Development is given in **Appendix A**.

2.2 Hazardous Facilities

2.2.1 Underground Town Gas Pipelines

Information of the underground HPTGP along San Tam Road in the vicinity of the Project Site had been obtained from HKCG.

The alignment of an 1.6km section of HPTGP is buried underground along San Tam Road as shown in **Figure 1**. The HPTGP has a diameter of 600mm with operating pressure of 35 bar(g) and can be isolated by 2 manual isolation valves 6.2km apart. It has a nominal wall thickness of 12.7 mm and is buried at a minimum depth of 1.1m.

The information of the pipeline is summarized in **Appendix B**.

2.2.2 Property of Town Gas

Town gas is colourless and buoyant under ambient conditions. Odorant is added to make it smell distinctive for easy detection of gas leakage. The main components of town gas are hydrogen and methane which are flammable. It also contains carbon dioxide and a small amount of carbon monoxide which are toxic and asphyxiating. **Table 1** lists its composition and physical properties.

Table 1 Gas Composition and its Physical Properties

Component	Percentage (%)	Physical Properties	Values
Hydrogen (H_2)	49	Calorific Value (MJ/m^3)	17.27
Methane (CH_4)	28.5	Specific Gravity	0.52
Carbon Dioxide (CO_2)	19.5	Wobbe Index (MJ/Nm^3)	24
Carbon Monoxide (CO)	3.0	Weaver Flame Speed (Dimensionless)	35
Total	**100**	Lower Flammable Limit (LFL) (%)	5.5

3 BACKGROUND INFORMATION OF STUDY

3.1 Study Zone

The Proposed Development at Project Site is subject to the risk of underground high pressure town gas pipeline. According to EMSD's guidance note [2], the highest risk 1.6 km section of underground HPTGP is studied in this QRA. The study zone is taken as the area covering 200m from section of the underground HPTGP concerned. The study zone is illustrated in **Figure 4**.

3.2 Population

3.2.1 Population in the Vicinity

The surrounding populations will be directly impacted by hazardous events arising from the loss of containment of town gas in the HPTGP. According to the Outline Zoning Plan (OZP), areas within the study zone are mainly Residential, Village type development, Open Space and Open Storage.

Population information were collected from desktop research and site survey conducted on 26th January, 2023. Pending and approved Planning Applications in the vicinity of the Project Site had been reviewed and there is no planned development falls into the study zone.

The future population within the study zone is estimated based on site observation and up-to-date data published by the Government Departments. The following information and assumptions were adopted in the estimation:

- Average residential household size estimated as shown in **Table 2** as per 2021 Population Census [3]; and
- Conservative assumption of annual residential population growth rate estimated as shown in **Table 2** as per population statistics in from 2021 Population By-Census [3] and the Projections of Population Distribution 2021 – 2029 [4]

Table 2 TPU Population information and assumptions

	TPU			
	541	**542**	**543 and 546**	**544**
Average residential household size	3.2	2.8	3.6	2.9
Annual residential population growth rate	0%	0.9%	2.1%	0.2%

The population groups considered within the study zone are illustrated in **Figure 5**. The population data are summarized in **Table 4**.

3.2.2 Transient Population

Transient population includes passengers of road transport (traffic population) as well as pedestrians along road sections.

The traffic population is estimated from the flow data of Annual Traffic Census 2021 [5] using the following formula:

$$\text{Traffic Population (ppl)} = \frac{\text{Traffic Flow } (^{\text{veh}}/_{\text{hr}}) \times {}^{\text{ppl}}/_{\text{veh}}}{\text{Speed } (^{\text{km}}/_{\text{hr}})} \times \text{Road length (km)}$$

The detailed transient population calculations are provided in **Appendix C**.

3.2.3 Temporal Variation of Population

To reflect the temporal changes in population within a week, the corresponding population proportion of the time periods are assumed based on observation from site survey and with reference to the approved EIA reports [6] .

Day time is defined as 07:00 to 19:00 and night time from 19:00 to 07:00 next day. The temporal changes of different population category are provided in **Table 3**.

Table 3 Temporal Change of Population within a Week

Category	Weekday Day (WDD)	Weekday Night (WDN)	Weekend Day (WED)	Weekend Night (WEN)
Agricultural (1)	100%	10%	100%	10%
Drug Rehab Centre (1)	100%	100%	100%	100%
Industrial (2)	100%	10%	40%	5%
Kindergarten (1)	100%	0%	0%	0%
Residential (2)	30%	100%	70%	100%
Restaurant (1)	50%	50%	100%	100%
Retail (1)	35%	20%	100%	35%
Road (3)	100%	37%	100%	37%
RCHE (1)	100%	100%	100%	100%
Residential Care Homes for Persons with Disabilities (RCHD) (1)	100%	100%	100%	100%
Storage (1)	100%	5%	100%	5%

Notes:
(1) Based on site survey and judgement
(2) Reference to HATS Stage 2A EIA [6]
(3) Annual Traffic Census 2021 [5]

3.2.4 Indoor and Outdoor Ratio

Building structures can offer some protection from fires for the occupants inside. An indoor ratio of 95% is applied to the population in residential, drug rehab centre, kindergarten, RCHE/RCHD, retail, restaurant and industrial buildings, while the remaining 5% of population is assumed to be outdoor, accounting for outdoor activities and walking on pathways.

At the proposed development, a total of 660 m^2 of communal space is available. To factor in the residents and staffs using outdoor facilities including sky garden and roof garden, the indoor ratio of ID PD01 in **Table 4** is reduced from 95% to 85% conservatively.

Population group of agricultural are considered 100% outdoor although greenhouse in farms may provide certain protection. Passengers in vehicles are considered as 100% outdoors population although vehicles may provide certain protection. Population group of storage is considered as 90% outdoor. Large steel container cargos and temporary admin office may provide protection to a certain extent.

Table 4 **Population Data Within Study Zone**

ID	Population Name	Population Category	Population in Year 2027	Temporal Population Change				Indoor Ratio	TPU	Remarks
				WDD	WDN	WED	WEN			
1	Scenic Heights	Residential	132	30%	100%	70%	100%	95%	543 & 546	Total of 33 blocks, providing 33 residential units. Assume average household size of 3.6 with 2.1% annual residential growth.
2	Maple Garden	Residential	639	30%	100%	70%	100%	95%	543 & 546	Total of 3 phases, 160 blocks, providing 160 residential units. Assume average household size of 3.6 with 2.1% annual residential growth.
3	Rolling Hills I	Residential	65	30%	100%	70%	100%	95%	543 & 546	Total of 2 phases, 70 blocks, 3 storeys per block, providing 70 residential units. Assume average household size of 3.6 with 2.1% annual residential growth.
4	Crescendo Milano	Residential	269	30%	100%	70%	100%	95%	543 & 546	Total of 67 blocks, with 3 storeys per block, providing 67 residential units. Assume average household size of 3.6 with 2.1% annual residential growth.
5	Casa Paradizo	Residential	232	30%	100%	70%	100%	95%	543 & 546	Total of 58 blocks, 2 storeys per block, providing 58 residential units. Assume average household size of 3.6 with 2.1% annual residential growth.
6	Green Crest	Residential	252	30%	100%	70%	100%	95%	543 & 546	Total of 63 blocks, 2 storeys per block, providing 63 residential units. Assume average household size of 3.6 with 2.1% annual residential growth.
7	La Maison Vineyard	Residential	105	30%	100%	70%	100%	95%	543 & 546	Total of 26 blocks, 2 storeys per block, providing 26 residential units. Assume average household size of 3.6 with 2.1% annual residential growth.

ID	Population Name	Population Category	Population in Year 2027	Temporal Population Change				Indoor Ratio	TPU	Remarks
				WDD	WDN	WED	WEN			
8	Motor vehicle dealer	Industrial	5	100%	10%	40%	5%	95%	543 & 546	Conservative assumption of 5 workers based on site survey.
9	Green Lion Farm	Agricultural	20	100%	10%	100%	10%	0%	544	Conservative assumption of 20 workers based on site survey.
10A	Yau Tam Mei Tsuen (Storage)	Storage	15	100%	5%	100%	5%	10%	544	From site survey, there are 3 village houses, each with large open storage area nearby. Assume 5 workers for each storage conservatively based on site survey.
10B	Yau Tam Mei Tsuen (Residential)	Residential	9	30%	100%	70%	100%	95%	544	From site survey, there are 3 village houses, each with large open storage area nearby. Assume average household size of 2.9 with 0.2% annual residential growth.
11	Sheung Chuk Yuen	Residential	80	30%	100%	70%	100%	95%	544	Total of 27 blocks, 3 storeys, providing 27 residential units. Assume average household size of 2.9 with 0.2% annual residential growth.
12	Kadoorie Villas	Residential	220	30%	100%	70%	100%	95%	544	Total of 73 blocks, 3 storeys per block, providing 75 residential units. Assume average household size of 2.9 with 0.2% annual residential growth.
13	San Wai Tsuen	Residential	30	30%	100%	70%	100%	95%	544	Total of 10 blocks, 3 storeys per block, providing 10 residential units. Assume average household size of 2.9 with 0.2% annual residential growth.
14	Ian court	Residential	337	30%	100%	70%	100%	95%	544	Total of 40 blocks, 2 storeys for blocks 1-5, 3 storeys for remaining 35 blocks, providing 115 residential units. Assume average household size of 2.9 with 0.2% annual residential growth.

ID	Population Name	Population Category	Population in Year 2027	Temporal Population Change				Indoor Ratio	TPU	Remarks
				WDD	WDN	WED	WEN			
15	Village type Development (Chuk Yuen Tsuen, Fortune Village, Tai Yuen Villa)	Residential	1444	30%	100%	70%	100%	95%	541	OZP village type development. A total of approximately 216 blocks, providing 451 residential units. Assume average household size of 3.2 with 0% annual residential growth.
16	EIS International Pre-school	Kindergarten	120	100%	0%	0%	0%	95%	541	Maximum capacity of 110 students and 10 teachers.
17	RCHE/RCHD	RCHE/RCHD	570	100%	100%	100%	100%	95%	541	According to info from Social Welfare Department. Total bed numbers and number of staffs of 4 RCHEs and 1 RCHD.
18	Restaurant	Restaurant	80	50%	50%	100%	100%	95%	541, 542	2 restaurants, assuming 40 customers and staff each based on site survey observation.
19	Yau Mei San Tsuen	Residential	72	30%	100%	70%	100%	95%	542	Total of 12 blocks, 2 storeys per block, providing 24 residential units. Assume average household size of 2.8 with 0.9% annual residential growth.
20	Christian New Life Association Mission Ark Yuen Long Centre	Drug Rehab Centre	30	100%	100%	100%	100%	95%	542	Residential Drug Treatment and Rehabilitation Centre of approximately 20 candidates and staffs. Conservatively assume as 30 people.
21	Village Houses (Geranium Path)	Residential	7	30%	100%	70%	100%	95%	542	2 village houses. Assume average household size of 2.8 with 0.9% annual residential growth.
22	Royal Palms	Residential	1243	30%	100%	70%	100%	95%	542	Total of 2 phases, 424 blocks, providing 424 residential units. Assume average household size of 2.8 with 0.9% annual residential growth.

ID	Population Name	Population Category	Population in Year 2027	Temporal Population Change				Indoor Ratio	TPU	Remarks
				WDD	WDN	WED	WEN			
23A	Ko Hang (Retail)	Retail	50	35%	20%	100%	35%	95%	542	5 retail stores in total, assume 10 workers each store conservatively.
23B	Ko Hang (residential)	Residential	13	30%	100%	70%	100%	95%	542	4 village houses. Assume average household size of 2.8 with 0.9% annual residential growth.
24	Royal Palms Sewage Treatment Plant	Industrial	5	100%	10%	40%	5%	95%	542	Conservative assumption of 5 workers.
25	Village Houses (Ko Hang)	Residential	18	30%	100%	70%	100%	95%	542	Total of 6 blocks, 3 storeys per block, providing 6 residential units. Assume average household size of 2.8 with 0.9% annual residential growth.
PD01	Proposed Development	RCHE	167	100%	100%	100%	100%	85%	543 & 546	Assumed no population in base case of year 2027. For operation case, 142 beds and 50 staffs working in 2 shifts. Project Info.
R01	San Tam Road	Road	74	100%	37%	100%	37%	0%	-	Refer Appendix C.
R02	San Tin Highway	Road	222	100%	37%	100%	37%	0%	-	Refer Appendix C.
R03	Castle Peak Rd - Tam Mi, Mai Po & San Tin	Road	71	100%	37%	100%	37%	0%	-	Refer Appendix C.

Note: In **Figure 5**, 10A and 10B shares the same area with label ID10; 23A and 23B shares the same area with label ID23 .

3.3 Source of Ignition

Flammable gas cloud from an accidental release can be ignited and led to fire or explosion if there are ignition sources present in the close proximity or along the dispersion path of the cloud. If the gas cloud is diluted outside flammable concentration range (i.e. below Lower Flammable Limit), or in the absent of ignition source, no fire hazard is expected. The energy level, timing, location and ignition effectiveness of ignition sources in the vicinity of hazardous installations affect the extent of gas cloud dispersion and its potential impacts.

Three types of ignition sources are defined in the SAFETI model:

- **Population sources:** account for human activities such as smoking, cooking, and using electrical appliances and are assigned implicitly to all population group by SAFETI v8.6.
- **Line source – transportation route segments**: account for the moving vehicles on roads. The ignition probabilities are calculated from traffic density, average vehicle speed, vehicle ignition efficiency and total length of the roads. Vehicle ignition efficiency is taken as 0.4 per 60 seconds [7].

3.4 Meteorological Information

Meteorological conditions affect the consequences of gas release, in particular wind direction, speed and stability which influences the direction and degree of turbulence of gas dispersion. Meteorological data from Wetland Park Weather Station (Year 2021) was collected from the Hong Kong Observatory and adopted in the consequence model to determine the various gas dispersion, fire and explosion effects [8]. In accordance with TNO Purple Book [7], all data collected will be rationalized into a set of weather classes. The meteorological data can be expressed in combination of wind speed and Pasquill stability classes. Pasquill classes (A to F) represent the atmospheric turbulence with class A being the most turbulent class while class F being the least turbulent class.

The six most dominant sets of wind speed-stability classes combination for both day-time and night-time are summarized in **Table 5** and **Table 6** respectively, and in **Appendix D**. The average ambient temperature adopted in the analysis is 25°C and the relative humidity is 78%.

Table 5 Day Time Wind Direction Frequency at Wetland Park Weather Station (Year 2021)

Direction	WEATHER CLASS						Total
	2.0B	1.5D	3.5D	6.0D	2.5E	1.5F	
0 – 30	4.54	1.82	0.05	0.00	0.23	3.58	10.22
30 – 60	6.69	1.97	0.56	0.00	0.25	1.44	10.90
60 – 90	14.26	3.36	0.63	0.00	0.43	1.61	20.29
90 – 120	4.90	2.32	0.63	0.00	0.35	1.82	10.02
120 – 150	3.05	0.88	0.38	0.00	0.18	0.93	5.43
150 – 180	6.66	1.84	0.98	0.00	0.20	1.56	11.25
180 – 210	7.22	1.24	0.86	0.00	0.28	0.93	10.52
210 – 240	3.99	0.25	0.10	0.00	0.03	0.20	4.57
240 – 270	2.09	0.35	0.00	0.00	0.00	0.15	2.60
270 – 300	2.70	0.63	0.00	0.00	0.00	0.25	3.58
300 – 330	4.11	0.40	0.03	0.00	0.00	0.23	4.77

Direction	WEATHER CLASS						Total
	2.0B	1.5D	3.5D	6.0D	2.5E	1.5F	
330 – 360	4.21	0.83	0.05	0.00	0.00	0.76	5.85
All	**64.42**	**15.90**	**4.26**	**0.00**	**1.94**	**13.47**	**100.00**

Table 6 Night Time Wind Direction Frequency at Wetland Park Weather Station (Year 2021)

Direction	WEATHER CLASS						Total
	2.0B	1.5D	3.5D	6.0D	2.5E	1.5F	
0 – 30	0.00	0.97	0.08	0.00	0.59	21.98	23.62
30 – 60	0.00	1.15	0.78	0.00	1.39	5.74	9.06
60 – 90	0.00	0.67	0.19	0.00	1.05	5.50	7.40
90 – 120	0.00	0.46	1.02	0.00	2.31	10.19	13.97
120 – 150	0.00	0.08	0.27	0.00	0.43	6.19	6.97
150 – 180	0.00	0.16	0.03	0.00	2.28	17.10	19.57
180 – 210	0.00	0.13	0.21	0.00	1.85	10.08	12.28
210 – 240	0.00	0.05	0.05	0.00	0.24	0.54	0.88
240 – 270	0.00	0.03	0.00	0.00	0.00	0.29	0.32
270 – 300	0.00	0.00	0.00	0.00	0.03	0.29	0.32
300 – 330	0.00	0.11	0.00	0.00	0.00	0.75	0.86
330 – 360	0.00	0.64	0.05	0.00	0.13	3.91	4.75
All	**0.00**	**4.45**	**2.68**	**0.00**	**10.29**	**82.57**	**100.00**

4 HAZARD IDENTIFICATION

The possible causes that lead to pipeline failure are discussed in the following sections for consideration in the risk assessment.

4.1 Internal Causes

4.1.1 Corrosion

Corrosion is one of the main contributors for pipeline failure. External corrosion of buried HPTGP may be due to the contact of stray DC electric earth current or contaminated ground. Internal corrosion occurs due to the presence of moistures and contaminants in the gas. The underground HPTGP carries dry town gas which is not expected to have any moisture and it is coated with epoxy internally to avoid corrosion. Nevertheless, loss of containment incident due to corrosion is still a credible scenario.

4.1.2 Material Defects

Material defect of HPTGP including welding failure and mechanical strength failure, etc., could occur for various reasons. HKCG adopted non-destructive testing (NDT) by X-ray for each butt weld and magnetic particle inspection (MPI)/ ultrasonic test for fillet welds of the underground pipeline according to IGEM/TD/1 [11]. Historical data showed that material failure leading to loss of containment is credible and such scenario is included in this QRA.

4.2 External Causes

4.2.1 Natural Hazards

Natural hazards such as earthquakes, storms, typhoons, subsidence and tsunamis may cause damages to the gas facilities and lead to loss of containment. This section will discuss the credibility of loss of containment due to these natural hazards with respect to Hong Kong's geographical location.

Earthquakes

Hong Kong is not located within the seismic belt. According to the Hong Kong Observatory, earthquakes occurring in the circum-Pacific seismic belt which passes through Taiwan and Philippines are too far away to affect Hong Kong significantly. Although there has not been any reported case of destructive earthquake tremor in Hong Kong, loss of containment incident due to earthquake is still considered credible to cause rupture of underground pipeline.

Subsidence/ Landslides

Excessive subsidence may lead to failure of the structure and ultimately loss of containment scenario. Subsidence is usually slow in movement and such movement can be observed and remedial action can be taken in time.

Considering that pipeline failures due to landslide have been reported by the EGIG, it is reviewed in frequency assessment of the underground HPTGP along San Tam Road (refer **Section 5.2 to 5.4**).

Lightning

Lightning sparks could ignite the combustible gas in air. In regards of the pipeline, lightning is considered by the EGIG and thus, is studied (refer **Section 5.2 to 5.4**).

Major Leakages of Underground Water Mains

Major leakage of underground water mains could be another concern to underground pipeline. In case if the water ejects towards the gas main, it carries the surrounding soil and sand and impacts on the surface of the pipes, resulting in damage on pipe wall and loss of containment.

Third Party Damages

Third party damage on gas pipeline includes the damage to pipes due to drilling, hammering, excavation works, etc. In fact, the potential of third party damage to the gas piping depends on the surrounding environment. Pipe wall thickness, buried depth, concrete cover and design factor have influence on whether third party damage would result in pipe damage.

In Hong Kong, excavation/ trenching works are well controlled. As per EMSD's Code of Practice on "Avoidance of Damage to Gas Pipes, 2nd Edition", utility mapping must be conducted to identify any underground utility within the site before any construction work commences. This could minimize the risk of damaging any existing underground utility. In addition, HKCG has issued a "Requirements for Construction Works Adjacent to Existing Gas Offtake Station and in the Vicinity of Gas Main", which the Contractor should strictly follow. Clearance distances from the underground HPTGP, as well as safety precautions during the construction works are indicated in the requirements.

Nevertheless, generic loss of containment due to third party damages is still considered credible in this study.

External Fire

External fire means the occurrence of a fire event which leads to the failure of the pipelines or equipment. The HPTGP is buried underground at a minimum depth of 1.1m. External fire from aboveground is considered not possible to damage underground gas pipelines. Hence, external fire causing loss of containment is not further assessed.

5 FREQUENCY ASSESSMENT

5.1 Overview

Frequency analysis involves estimation of failure frequencies resulting in a release of hazardous materials. This section examines the failure frequencies of the pipeline and the station that result in loss of containment. The analysis is based on the EMSD's Guidance Note [2] and historical data, with modifications to reflect the local factors, such as good safety practice, anchorage protection, pipeline integrity, etc.

5.2 EGIG Historical Failure Data

EGIG is an industry group of 15 major gas transmission system operators in Europe, which owns an extensive database of pipeline incident data since 1970. The failure frequency over the reporting period of 1970 – 2019 is 2.92×10^{-4} per km-year [9]. A steady reduction of the failure frequency over the last two decades is observed, showing improved safety performance. The recent failure frequency during 2007 – 2019 is significantly lower with only 1.28×10^{-4} per km-year.

The breakdown of the accident frequencies by causes for all types of pipelines is shown in **Table 7**. External interference remains the dominant cause for gas leakage.

Table 7 Incident Causes for onshore pipeline gas leakage

Causes	Distribution of Incidents	
	Period 1970-2019	Period 2010-2019
External interference	45.9%	27.3%
Corrosion (Internal and external)	17.1%	26.6%
Construction defect/ Material failure	16.4%	15.6%
Ground movement	8.6%	15.6%
Hot tap made by error	4.5%	1.6%
Other and unknown	7.5%	13.3%
Total	100%	100%

5.3 Analysis of Modification Factors

5.3.1 External Interference

The major contributor of external interference in Hong Kong is third party damage, such as the inadvertent damages during excavation. The degree of damage depends on surrounding environment, wall thickness, buried depth and protection from concrete cover.

The underground HPTGP in this study are of size 600mm (O.D. 24 inch) and the nominal wall thickness is 12.7 mm. The HPTGP are buried at a minimum depth of 1.1 m with concrete cover, giving significant protection to the pipeline against external interference.

In addition, the following practices are required while carrying out underground works to reduce the probability of third party damage to HPTGP:

- Contractor should carry out utility survey and trial trench inspection for any underground works before construction work commences.

- Much of the gas pipeline is laid under carriageway in which excavation is under stringent control. The HKCG's "Requirements for Construction Works in the Vicinity of Gas Main" and EMSD's Code of Practice on "Avoidance of Damage to Gas Pipe 2nd Edition" should be strictly followed for any underground excavation works to be done nearby the HKCG's gas pipeline.

Giving consideration to the above preventive measures, a reduction factor of 0.1 is applied to the failure frequencies of underground gas pipeline due to external interference to account for the pipeline design and the safe practices.

5.3.2 Corrosion (Internal and External)

There is a decreasing trend in incidents due to corrosion against year of construction. No leak case due to corrosion has been reported for pipeline which was constructed after 1994. In addition, internal corrosion is very unlikely since town gas is dry and free from corrosive gases. External corrosion of the pipeline is prevented by cathodic protection. Hence, a reduction factor of 0.5 is adopted for all pipelines with nominal wall thickness of 12.7mm.

5.3.3 Construction Defect/ Material Failure

There is a decreasing trend in incidents due to welding, mechanical strength and material failure against year of construction. Majority of incidents were caused by pipelines that were built before 1973. As per IGEM/TD/2 [10], the failure frequency due to material and construction defects reduces as the wall thickness increase. Moreover, The HKCG has adopted a NDT by X-ray for each butt weld and magnetic particle inspection/ ultrasonic test for fillet welds of the underground pipeline in accordance to IGEM/TD/1 [11] to prevent material and construction defects. Therefore, a reduction factor of 0.1 is adopted.

5.3.4 Ground Movement

Ground movement can be caused by a number of causes, e.g. subsidence, landslides or flooding. Pipes of smaller diameter are more susceptible to ground movement. The major cause of the ground movement failures was due to landslide. Considering the pipeline is not constructed in a hilly region, landslides are unlikely. The pipeline is buried with a cover of at least 1.1 m deep and with safety measure as described in "External Interference" section above. A reduction factor of 0.1 is assumed to reflect the actual situation.

5.3.5 Hot Tap Made by Error

"Hot tap made by error" means that a connection has been made by error to a live gas transmission pipeline. Hot tap is not used by the HKCG for gas transmission pipeline and thus is irrelevant to this study. A 100% reduction is adopted.

5.3.6 Other and Unknown

Others and unknown include failure caused by design error, lightning and maintenance error. The HKCG has extensive experience in designing and operating the underground gas pipes. It also applies stringent in-house procedures to monitor operation and maintenance of the gas pipes. The HPTGP is buried under the ground with a minimum concrete cover of 1.1m, lightning striking the pipeline is unlikely. A reduction factor of 0.1 is therefore assumed.

5.4 Adopted Failure Frequencies of the HPTGP

A direct application of the EGIG database is not appropriate to Hong Kong's situation. Reduction factors have been adopted to modify the failure rate to reflect the actual condition in Hong Kong. The breakdown of failure rates with reduction factors are listed in **Table 8**.

Table 8 Breakdown of EGIG Incidents with reduction factors

Causes	Failure Rate (per km-year)	Reduction Factor	Modified Failure Rate (per km-year)
External event for Pipe Diameter (23-29")	2.50E-05	0.1	2.50E-06
Corrosion (thickness10-15mm)	1.50E-06	0.5	7.50E-07
Construction defects/ material failure (Year of construction 1984-2019)	2.58E-05	0.1	2.58E-06
Ground movement (23-29")	1.63E-05	0.1	1.63E-06
Hot Tap made by error	0	0	0
Others and unknown	1.70E-06	0.1	1.70E-07
Total	7.03E-05		7.63E-06
Failure rate in this assessment			**1.00E-05**

Note: Based on 11th EGIG Report [9]

The modified failure rates from the EGIG database for pipeline are 7.63×10^{-6} per km-year for pipe of size 600mm. The modified failure rate for underground pipeline is conservatively taken as 1.0×10^{-5} per km year, as recommended in EMSD's Guidance Note [2].

5.4.1 Hole size Distribution

The failure of pipes and equipment may be resulted in gas leakage from various hole sizes. According to EMSD's Guidance Note [2], the hole size distributions of underground pipes are assumed as listed in **Table 9**.

The pipeline has a design factor of 0.3 or better and has a nominal thickness of 12.7 mm, which makes full bore rupture extremely unlikely. Nevertheless, it is considered in this study by allocating a probability of 1%.

Table 9 Hole Size Distribution of Underground Pipeline

Hole Size	Percentage
Full Bore	1%
100 mm	19%
50 mm	30%
25 mm	30%
10 mm	20%

5.4.2 Summary of Hazardous Failure Frequencies

The failure scenarios considered in this study is summarized in **Table 10**. The corresponding failure frequencies are tabulated in **Table 11**.

Table 10 Failure of Pipework

Facility	Scenarios
Underground High Pressure Pipelines (600mm)	• Partial failure: 10mm leak, 25mm leak, 50mm leak, 100mm leak (with 50% modelled as vertical release and 50% modelled as inclined release of 45°) • Catastrophic rupture: Full bore rupture

Table 11 Base failure frequencies of hazardous scenarios

Scenario Name	Description	Size of Release	Frequency (per km per year)
UG-10mm	Underground High Pressure Pipeline (50% vertical release and 50% inclined release)	10 mm (pin hole)	2.00×10^{-6}
UG-25mm		25 mm	3.00×10^{-6}
UG-50mm		50 mm	3.00×10^{-6}
UG-100mm		100 mm (puncture)	1.90×10^{-6}
UG-FB	Underground High Pressure Pipeline (Full Bore Rupture)	Full Bore	1.00×10^{-7}
		Sub-total	**1.00×10^{-5}**

5.5 Event Outcome Frequencies

5.5.1 Orientation of Release

Consequence of a pipeline failure varies by the orientation of the release. Failure can occur at top, bottom, or side of the pipe. Pressured gas releasing at the top of a pipe will result in an unobstructed vertical jet release; whereas releasing at bottom of the pipe will be a diffused jet due to loss of gas momentum by impinging with the surrounding. Releasing from side of the pipeline will result in an inclined or horizontal release.

It is assumed that partial pipeline failures will have an equal probability, i.e. 50%, to result in gas releasing from top and side. According to EMSD's Guidance Note [2], releasing from the side of underground pipes will be considered as inclined release only. The angle of inclined release is assumed be at 45 degrees.

Catastrophic rupture of underground pipes is assumed to be top release only to account for completely unobstructed jet release.

5.5.2 Ignition Probability

Pressurized town gas release from pipeline disperses and may subsequently be ignited if the gas concentration is within the flammability limits. Immediate ignition probabilities are adopted from EMSD's Guidance Note [2] as listed in **Table 12** below.

Table 12 Immediate Ignition Probability

Leak Size	Immediate Ignition Probability
Minor (< 1 kg/s)	0.01
Major (1-50 kg/s)	0.07
Massive (>50 kg/s)	0.3

According to EMSD's Guidance Note [2], delayed ignition probability is estimated as 40% of immediate unignited probability. The ignition probabilities adopted in this study are summarized in **Table 13** below.

Table 13 Ignition Probabilities Adopted in this Study

	Ignition Probability (Vertical/ Inclined Release)	
Leak Size	**Immediate**	**Delayed**
Very Small Leak (10mm)	0.01	0.40
Small Leak (25mm)	0.07	0.38
Medium Leak (50mm)	0.07	0.38
Large Leak (100mm)	0.07	0.38
Full Bore Rupture	0.3	0.28

Vapour cloud explosion (VCE) may occur if gas cloud is ignited at confined or congested area. In view of possible congestion between buildings / village houses, VCE is conservatively considered in massive town gas release. The probabilities of explosion, adopted from Cox, Lees and Ang [12], are 0.12 and 0.3 for large leaks (100mm) and full bore rupture respectively.

5.6 Event Tree Analysis

Event tree analysis (ETA) is used to develop the evolution of a failure event from its initial release to the final outcome scenarios, namely jet fire, flash fire, fireball, etc. It also shows different consequences of vertical and horizontal leak scenarios of the cases of immediate ignition and delayed ignition. The detailed event tree analysis is included in **Appendix E**.

6 CONSEQUENCE ANALYSIS

6.1 Overview

The consequence assessment is conducted in two steps:

- **Source term modelling** -- to determine the release rate, duration and quantity; and
- **Physical effects modelling** -- to determine the gas dispersion, fire and explosion effect zones based on the output of the source term modelling. The impact of the hazardous outcomes on the surrounding population would be analyzed.

In this study, the simulation software –SAFETI 8.6 developed by Det Norske Veritas (DNV) was employed to calculate the hazardous release and the effects zones.

6.2 Source Term Modelling

Town gas is modelled as a mixture of hydrogen, methane, carbon dioxide and carbon monoxide. For pipelines connecting to a gas distribution network, release duration is determined by respond time for isolation.

6.3 Physical Effect Modelling

6.3.1 Gas Dispersion

Discharge rates are calculated from leak hole sizes and operating conditions of the pipeline, which are assumed to be fixed for smaller leaks as the amount of gas leaked per unit time is small comparing to the overall amount available for release. The releases are modelled by assuming a section of 6.2km of HPTGP of diameter 600mm, which can be isolated by manual isolation valves located at approximately 0.33km downstream and 5.87km upstream of the section of HPTGP. The discharge rate is estimated based on the normal operation conditions a flow velocity of 20m/s with the release inventory calculated from the length of pipeline and the amount release before the time of isolation.

Transient nature of release is assumed for the case of full bore rupture. The release rate is expected to be very high in the first few seconds, followed by a rapid drop to a constant level. The initial release rate and quantity which is discharged to the release point in an event of fireball following the rupture of HPTGP are estimated from the empirical correlations developed by Bell and modified by Wilson [13][14]:

$$Q_0 = C_d A_p \psi \sqrt{\rho_0 P_0 \gamma (\frac{2}{\gamma+1})^{(\frac{\gamma+1}{\gamma-1})}}$$

$$Q_t = \frac{Q_0}{1+\alpha}(e^{\frac{-t}{\alpha^2\beta}} + \alpha e^{\frac{-t}{\beta}})$$

$$\alpha = \frac{W}{\beta Q_0}$$

$$\beta \approx \frac{L\sqrt{K_\gamma}}{C\sqrt{K_A}}$$

$$\beta \approx \frac{2L}{3C\sqrt{K_F}} \text{ for large holes where } \frac{K_A{}^2}{K_F K_\gamma} > 30$$

where

$$K_F = \frac{D_P}{\gamma f L_P}$$

$$K_A = \frac{A_h}{A_p}$$

$$K_\gamma = (\frac{\gamma+1}{2})^{\frac{\gamma+1}{\gamma-1}}$$

where Q_0 is initial mass discharge rate (kg/s)

Q_t is time dependent mass flow rate (kg/s)

W is inventory in the pipeline (kg)

C_d is discharge coefficient, assume 0.8

A_p is the cross sectional area of the pipeline (m^2)

Ψ is outflow coefficient, assume 1 for critical flow

ρ_0 is initial gas density (kg/m^3)

P_0 is initial gas pressure (N/m^3)

γ is gas specific heat ratio, 1.344 for town gas

t is the time in seconds

α is the non-dimensional mass conservation factor

β is the time constant for release rate in seconds

D_p is diameter of pipeline (m)

f is pipeline friction factor given by $f = [1/-2\log(\frac{\varepsilon}{3.715D_p})]^2$

ε is wall roughness of pipeline (m) taken as 45μm as per TNO [7]

In modelling fires following a rupture, the transient nature of the release should be estimated. The equation is used to estimate the mass inventory which is discharged to the release point in an event of fireball following the rupture of a high pressure pipeline as descripted in **Section 6.3.3**.

6.3.2 Jet Fire

A jet fire is developed when a jet of high velocity gas is ignited. The direction and orientation of fire depend on the release orientation, release velocity and wind direction. The majority concern regarding jet fire is the heat radiation effect generated from the fire. The thermal effect to adjacent population is quantified in the consequence model.

6.3.3 Fireball

Immediate ignition of an instantaneous release of massive inventory inside a pressurized vessel will result in a fireball. A fireball is characterized by its high thermal radiation intensity and short duration time. The principal hazard of fireball arises from thermal radiation, which is not significantly influenced by weather, wind direction or source of ignition.

Fireball is more likely for immediate ignition of instantaneous release and heat is evolved by radiation. The principal hazard of a fireball arises from its thermal radiations. As suggested in IGEM/TD/2 [10], the fireball resulted from an immediate ignition of a rupture case has a transient nature and can typically last for 30 seconds.

Due to its intensity, its effects are not significantly influenced by weather, wind direction or source of ignition. The size, height, shape, duration, heat flux and radiation of a fireball will be determined in the consequence analysis. A 100% fatality is assumed for anyone within the fireball radius.

The following equations from CCPS [13] are used to estimate of the fireball diameter (D) and duration (t).

$$D = 5.8M^{\frac{1}{3}}$$

$$t = 0.45M^{\frac{1}{3}}$$

where D is final diameter of fireball (m); t is fireball duration (s); M is mass of fuel (kg)

The mass of fuel is determined by calculating the quantity of fuel at each time step that can be consumed in a fireball with the same burning time as the time since the start of the release. By equating the two equations, the sizes of fireball are determined as approximately 15 tonnes for HPTGP of diameter 600 mm.

6.3.4 Thermal Radiation of Fires

Town gas contains methane and it is flammable gas upon ignition. The LFL for hydrogen, methane and CO is given below:

- Hydrogen: 4.0%;
- Methane: 5.0%; and
- CO: 12.5%

Carbon dioxide does not contribute to flammability. The LFL of town gas is estimated as 5.5%.

The major hazard of a jet fire, pool fire or fireball is the flame and the thermal radiation. Persons caught in the flame zone are considered be fatally injured. Persons outside the flame zone are determined by lethal probability using the following Probit equation [7]:

$$Pr = -36.38 + 2.56 \ln Q^{4/3t}$$

where Q is the thermal radiation intensity in W/m^2 and t is the exposure time in seconds.

A building is assumed to offer protection to its occupants against hazards from fires. The protection factor is assumed to be 50% for indoor population within fireball radius [2].

6.3.5 Flash Fire

A flash fire is the consequence of combustion of gas cloud resulting from delayed ignition. The flammable gas cloud can be ignited at its edge and cause a flash fire of the cloud within the LFL and Upper Flammable Limit (UFL) boundaries. Major hazards from a flash fire are thermal radiation and direct flame contact. Since the flash combustion of a gas cloud normally lasts for a short duration, the thermal radiation effect on people near a flash fire is limited. Humans who are encompassed outdoor by the flash fire is considered be fatally injured. A fatality rate of unity is assumed for outdoor population, and 90% protection factor is assumed for indoor occupants.

Since town gas is buoyant, this reduces the flash fire effects at ground level. However, the town gas plumes may be within the LFL which could have potential impact to the adjacent high rise buildings.

6.3.6 Vapor Cloud Explosion

If the vapour cloud passes through a congested area (e.g. cluster of pipe racks, a confined space) and be ignited, the confinement will limit the expansion of the burning cloud, causing an explosion and damage to the surroundings by the resulting overpressure. In SAFETI, the hazardous effects are modelled by two concentric circular areas corresponding to heavy and light building damage, respectively. Fatality rates for persons outdoors and indoors are determined from the HSE method [16], CIA guidelines [17] and TNO Purple Book [7].

Table 14 Fatality Probability of Vapour Cloud Explosion

Overpressure (barg)	Indoor Fatality Probability	Outdoor Fatality Probability
0.3	1	1
0.1	0.025	0

6.3.7 Toxic Effect

Town gas contains carbon dioxide and a small amount of carbon monoxide. Carbon dioxide can be considered as toxic due to the asphyxiating properties. The Immediate Dangerous to Life and Health (IDLH) value for carbon dioxide is 40,000 ppm. However, it is believed that people can find means of escape within 30 minutes without irreversible health effects.

The Probit Equation of toxic gas dispersion for carbon monoxide is adopted.

$$Pr = -37.98 + 3.7 \ln (C^*t) \text{ for CO,}$$

where C is concentration in ppm and t is exposure time in minutes.

The town gas dose level equivalent to 1% fatality for 10-minutes exposure is over 196,675 ppm, which is above the LFL. Gas cloud with such high concentration of town gas is likely to be ignited. According to consequence analysis (refer **Table 20**), the hazard zone of toxic release is small comparing with the flammable effects. Thus, the impact of toxic release of town gas is not further assessed in this study.

6.3.8 Indoor Protection Factor

Buildings are assumed to offer protection to occupants against fire. The protection factor is assumed to be 90% for population with flash fire envelope [2]. A 100% exposure is assumed for open space.

In case of fireball event, a protection factor of 50% is assumed for indoor population within fireball radius [18]. Fatality rate of 10% is assumed for indoor population within impact distance of thermal radiation from jet fire and fireball.

6.3.9 Shielding Factor

Shielding factors are assumed to account for protection by the front part of the building or by other buildings from fire effects [18]. A shielding factor of 0.5 is assigned to those buildings within the fireball radius, i.e. 74 m, and partly inside the fireball radius. Buildings that are outside the fireball are considered being protected by the buildings in the front. The shielding factor to the following populations:

Table 15 Population with Fireball Shielding Factor

Site ID	Description	Shielding Factor
1	Scenic Heights	0.5
2	Maple Garden	0.5
3	Rolling Hills I	0.5
4	Crescendo Milano	0.5
5	Casa Paradizo	0.5
6	Green Crest	0.5
7	La Maison Vineyard	0.5
10A	Yau Tam Mei Tsuen (Storage)	0.5
10A	Yau Tam Mei Tsuen (Residential)	0.5
11	Sheung Chuk Yuen	0.5
12	Kadoorie Villas	0.5
13	San Wai Tsuen	0.5
14	Ian court	0.5
15	Village type Development (Chuk Yuen Tsuen, Fortune Village, Tai Yuen Villa)	0.5
16	EIS International Pre-school	0.5
17	RCHE/RCHD	0.5
19	Yau Mei San Tsuen	0.5

Site ID	Description	Shielding Factor
20	Mission Ark Yuen Long Centre	0.5
21	Village Houses (Geranium Path)	0.5
22	Royal Palms	0.5
25	Village Houses (Ko Hang)	0.5
PD01	Proposed Development	0.5

6.3.10 Height Protection

People above the cloud height is not exposed to flash fire events. In another term, these populations are protected. Height protection factor may be considered when impacted areas of jet fire and flash fire are limited and do not cover the entire high-rise building, as recommended in EMSD's Guidance [2]. Since town gas is lighter than air, gas cloud release tends to lift off at height and may cover the village houses and even high rise buildings. Therefore, height protection factor is not considered in this study.

6.4 Consequence Result

Since the pipeline is covered with at least 1.1m earth, there is no immediate ignition source and no adequate air for fireball or jet fire to occur under normal circumstances. Fireball or jet fire from underground pipelines is only possible when all the earth cover of a local spot has been removed in the event of loss of containment. The HKCG has requirements for any excavation works to be carried out in the vicinity of gas mains, and boring and drilling in the vicinity of gas main is prohibited. Nonetheless, fireball and jet fire scenarios from the underground gas pipeline are considered as a conservative approach in this study.

The worst-case consequence results of fireball, jet fire, flash fire, vapour cloud explosion and toxicity for the pipeline and the station from a release source are tabulated in **Table 16** to **Table 20** below.

Table 16 Consequence Results of Fireball

Leak Size	Fireball Radius (m)	Fireball Duration (s)
Full bore rupture	74	10.4

Table 17 Consequence Results of Jet Fire

Leak Size	Effect Distance at Thermal Radiation of 12.5 kW/m^2 (m)	
	Vertical release	Inclined release
10 mm	2.19	5.54
25 mm	2.03	10.75
50 mm	3.42	18.24
100 mm	7.08	32.99

Table 18 Consequence Results of Flash Fire

Leak Size	Flash Fire Envelop, Distance at LFL (m)	
	Vertical release	Inclined release
10 mm	0.60	3.51

Leak Size	Flash Fire Envelop, Distance at LFL (m)	
	Vertical release	Inclined release
25 mm	0.94	8.57
50 mm	3.35	17.07
100 mm	7.01	34.59
Full bore rupture (600mm)(1)	34.95	N/A

Notes:
(1) Flash fire scenario under full bore rupture considers vertical release only.

Table 19 Consequence Results of Vapour Cloud Explosion

Leak Size	Distance at 0.3 barg (m)	
	Vertical release	Inclined release
100 mm	Not reached	38.67
Full bore rupture (600mm) (1)	64.45	N/A

Notes:
(1) Vapour cloud explosion scenario under full bore rupture considers vertical release only.

Table 20 Consequence Results of Toxic Effect

Leak Size	Maximum Distance at 1% Lethality (1) (m)	
	Vertical release	Inclined release
10 mm	0.1	0.7
25 mm	0.2	1.1
50 mm	0.2	1.3
100 mm	0.3	1.5
Full bore rupture (600mm)(2)	0.9	N/A

Notes:
(1) Based on an average exposure time of 10 minutes [7]
(2) Toxic release under full bore rupture is considered as vertical release only.

7 RISK ASSESSMENT

7.1 Risk Summation

Risk summation combines the estimation of the likelihood and consequence of hazardous event, as well as meteorological data and production in the hazard effect zones, to give a numerical measure of risks within the study zone of the 1.6 km section of HPTGP. The risk analysis is conducted by the simulation software – SAFETI 8.6 developed by DNV and the outcome results are presented in terms of individual risk (as individual risk contours) and societal risk (as F-N curves or PLL). The risk outcomes are compared to the criteria set out in the risk guidelines, as specified in **Section 1.3**.

7.2 Results of Individual Risk

The individual risk contours of the HPTGP is presented in **Figure 6**. The individual risk contours of the HPTGP corresponding to 1×10^{-5} per year does not appear and the maximum individual risk for the HPTGP is below 1×10^{-7} per year. Thus, the individual risk of the HPTGP satisfies with the individual risk criteria of the HKPSG.

7.3 Results of Societal Risk

The societal risk of the underground HPTGP in future year, Year 2027, is presented in **Figure 7**. Recapturing from **Section 1.4.2**, a total of two cases are studied namely:

- Case 1 – Base case; and
- Case 2 – Operation case

The F-N data are tabulated in **Table 21**. The societal risks of the underground HPTGP for both cases lie within the "ACCEPTABLE" region and satisfy the requirements of the HKPSG.

Table 21 F-N Data

No. of Fatality (N)	Frequency (per year)	
	Case 1 – Year 2027 without the proposed development	**Case 2 – Year 2027 with the proposed development**
1	1.36E-07	1.36E-07
2	6.57E-08	6.60E-08
3	6.24E-08	6.24E-08
4	6.15E-08	6.16E-08
5	6.05E-08	6.06E-08
6	5.95E-08	5.96E-08
8	5.75E-08	5.76E-08
10	5.45E-08	5.46E-08
12	5.16E-08	5.19E-08
15	4.69E-08	4.72E-08
20	4.17E-08	4.20E-08
25	3.41E-08	3.61E-08
30	2.56E-08	2.96E-08
40	4.10E-09	1.00E-08
50	8.74E-12	4.51E-09
60		4.31E-09
80		3.76E-09
90		1.50E-09
100		9.59E-19

Notes:
Values less than 1×10^{-9} per year are not shown in the figure of F-N curve

Societal risk can also be represented in the form of Potential Loss of Life (PLL). It expresses the risk to the population as a whole and for each scenario and its location. The PLL is an integrated measure of societal risk obtained by summing the product of each F-N pair:

$$PLL=f_1N_1+f_2N_2+\cdots+f_nN_n$$

PLL values of the top contributors are shown in **Table 22**. With the additional population brought by the Proposed Development, the total PLL of the HPTGP is increased by 17.5%, from 1.62×10^{-6} no. of fatality per year to 1.90×10^{-5} no. of fatality per year.

Table 22 PLL Breakdown of HPTGP

Case 1 – Year 2027 without the proposed development			**Case 2 – Year 2027 with the proposed development**		
Event	**PLL (per year)**	**% of total PLL**	**Event**	**PLL (per year)**	**% of total PLL**
Full bore rupture of underground pipeline	1.56E-06	96.20%	Full bore rupture of underground pipeline	1.84E-06	96.73%
100mm leak of underground pipeline	4.94E-08	3.05%	100mm leak of underground pipeline	5.00E-08	2.63%
50mm leak of underground pipeline	1.05E-08	0.65%	50mm leak of underground pipeline	1.05E-08	0.55%
Others	1.61E-09	0.10%	Others	1.61E-09	0.08%
Total PLL	**1.62E-06**	**100%**	**Total PLL**	**1.90E-06**	**100%**

8 Conclusion

This QRA has studied the risk impact of a section of HPTGP to the nearby proposed development at Lot 4823 in D.D.104, Ngau Tam Mei, Yuen Long and its surrounding population in the future year of 2027.

The results show that the proposed development would contribute slightly increased risk posed by the HPTGP. The overall risks in terms of individual risk and societal risk as a result of an increase in population from the proposed development are in the ACCEPTABLE region. The criteria stipulated in the Hong Kong Planning Standards and Guidelines are met. No limitation or constraint would be required to be imposed on the proposed development in related to the operation of the HPTGP.

9 Reference

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[2] *Guidance Note on Quantitative Risk Assessment Study for High Pressure Town Gas Installations in Hong Kong, Electrical and Mechanical Services Department, Hong Kong, 2021.*

[3] *2021 Population By-census,* Census and Statistics Department, Hong Kong

[4] *Projection of Population Distribution 2021-2029*, Planning Department.

[5] *The Annual Traffic Census 2021,* Transport Department of HKSAR, 2022

[6] *Harbour Area Treatment Scheme Stage 2A Environmental Impact Assessment,* Drainage Services Department, Hong Kong, 2008

[7] *Guidelines for Quantitative Risk Assessment "Purple Book"*, CPR18E, Committee for the Prevention of Disasters, 2005.

[8] *Hong Kong Observatory,* Hong Kong Special Administrative Region Government

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[10] *Institution of Gas Engineers & Managers, IGEM/TD/2 Edition 2 – Assessing the risks from high pressure Natural Gas pipelines, 2013.*

[11] *IGEM/TD/1 Edition 5 – Steel Pipelines and Associated Installation For High Pressure Gas Transmission, 2008*

[12] *Classification of Hazardous Locations, Institution of Chemical Engineers, Cox, A.W., Lees, F.P., Ang, M.L., Rugby, UK, 1990.*

[13] *Guideline for Use of Vapor Cloud Dispersion Model, Center for Chemical Process Safety of the American Institute of Chemical Engineers (CCPS), 1996*

[14] *Methods for Calculation of Physical Effects – Due to Release of Hazardous Materials (Liquids and Gases) "Yellow Book", CPR 14E, 2005*

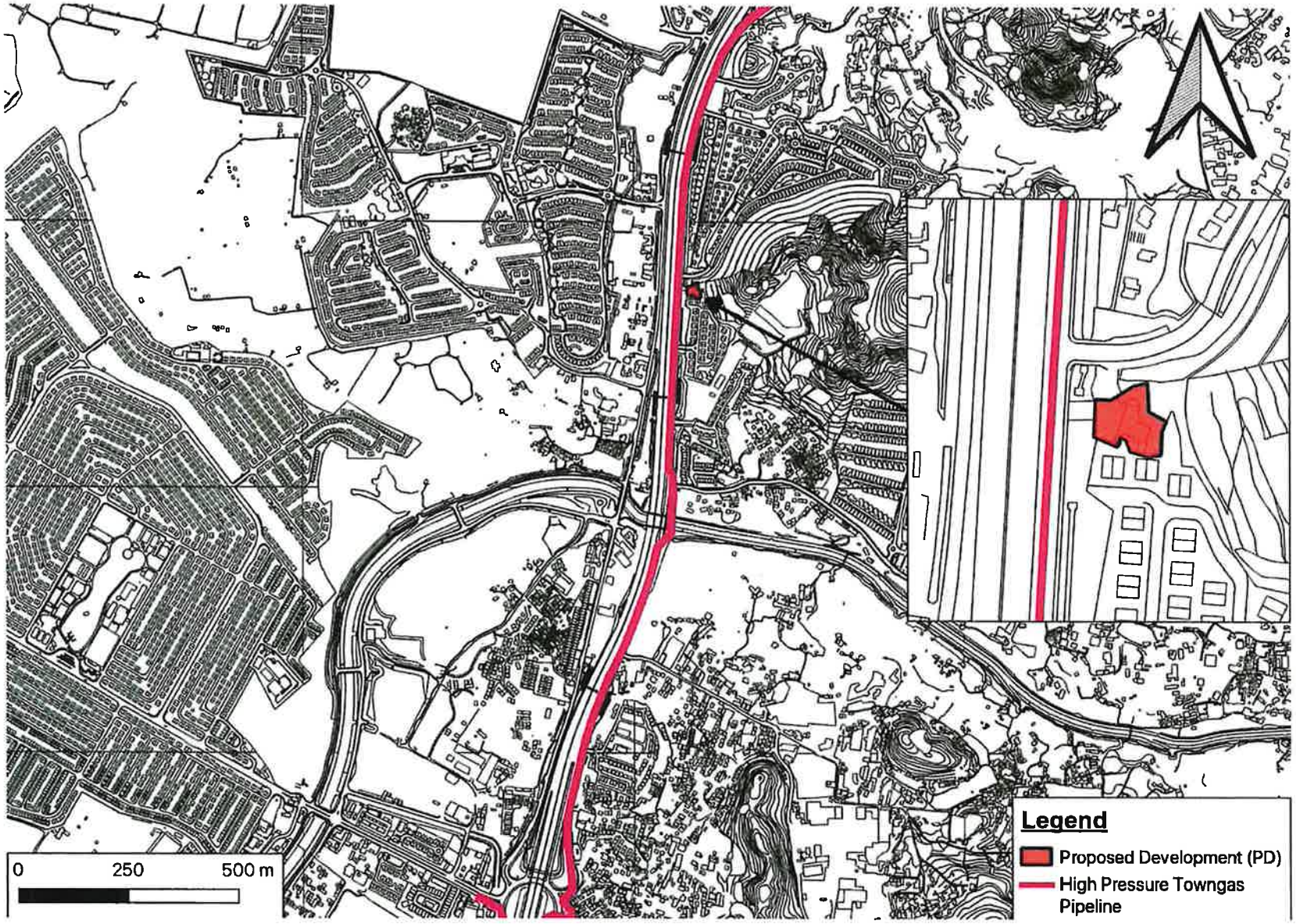
[15] *Guideline for Use of Vapor Cloud Dispersion Model, Center for Chemical Process Safety of the American Institute of Chemical Engineers (CCPS), 1996*

[16] *Development and Application of a Risk Assessment Tool (RISKAT) in the Health and Safety Executive, N. Hurst, C. Nussey and R. Pape, Chem. Eng. Res. Des., No. 67, 1989.*

[17] *Guidance for the Location and Design of Occupied Buildings on Chemical Manufacturing Sites, Chemical Industry Association (CIA), 1998.*

[18] *Quantitative Risk Assessment Methodology for LPG Installations, Dr. Alan B. Reeves, Francis C. Minah, Vincent H.K. Chow, Conference on Risk & Safety Management in the Gas Industry, EMSD & HKIE, Hong Kong, 1996*

Figures



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Quantitative Risk Assessment for S12A Planning Application of a proposed RCHE at 81 San Tam Road, Yuen Long

Figure 1 Location of the Proposed Project and High Pressure Town Gas Pipeline

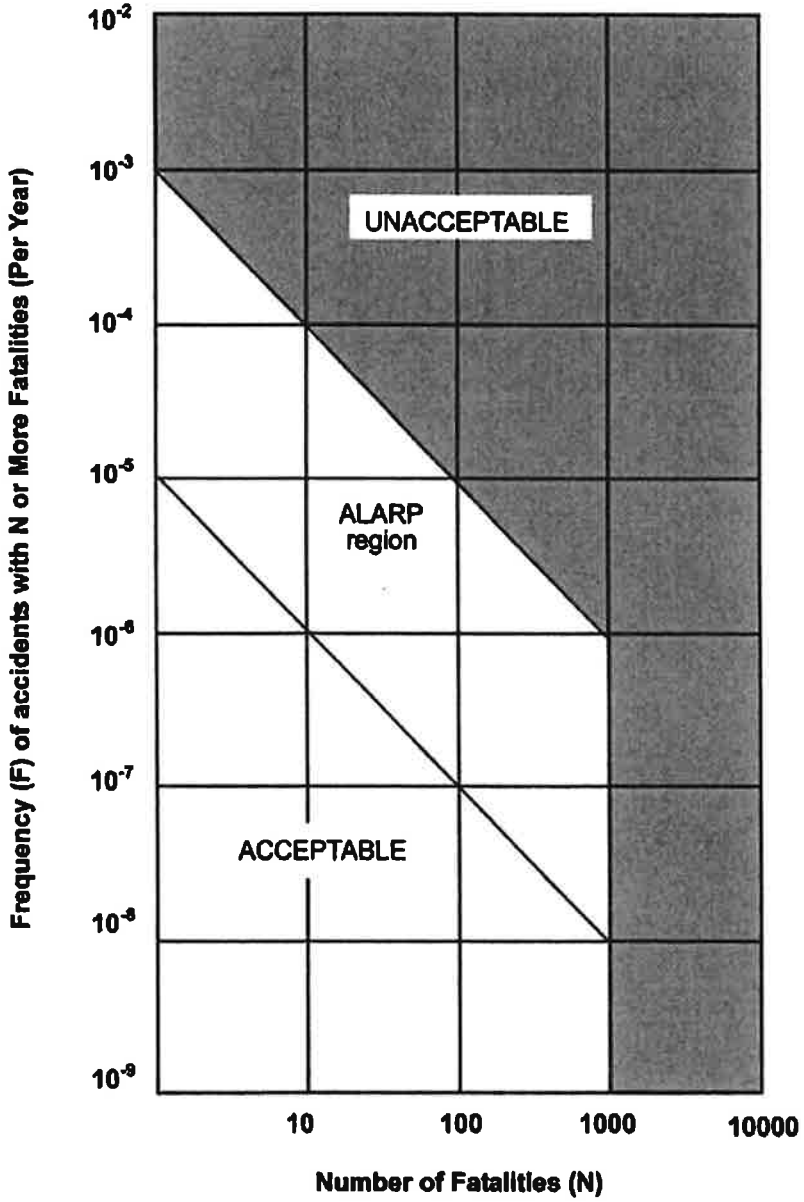
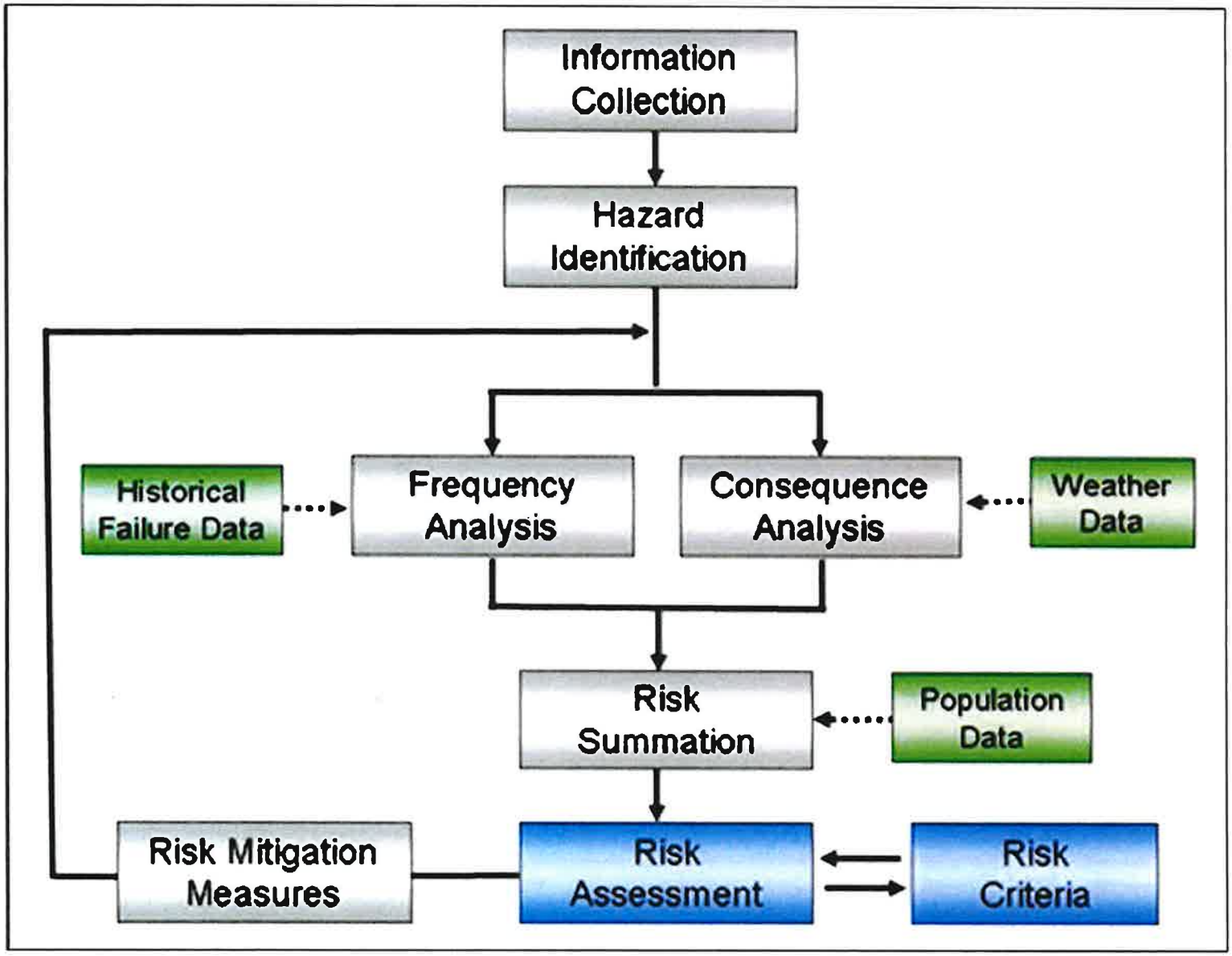
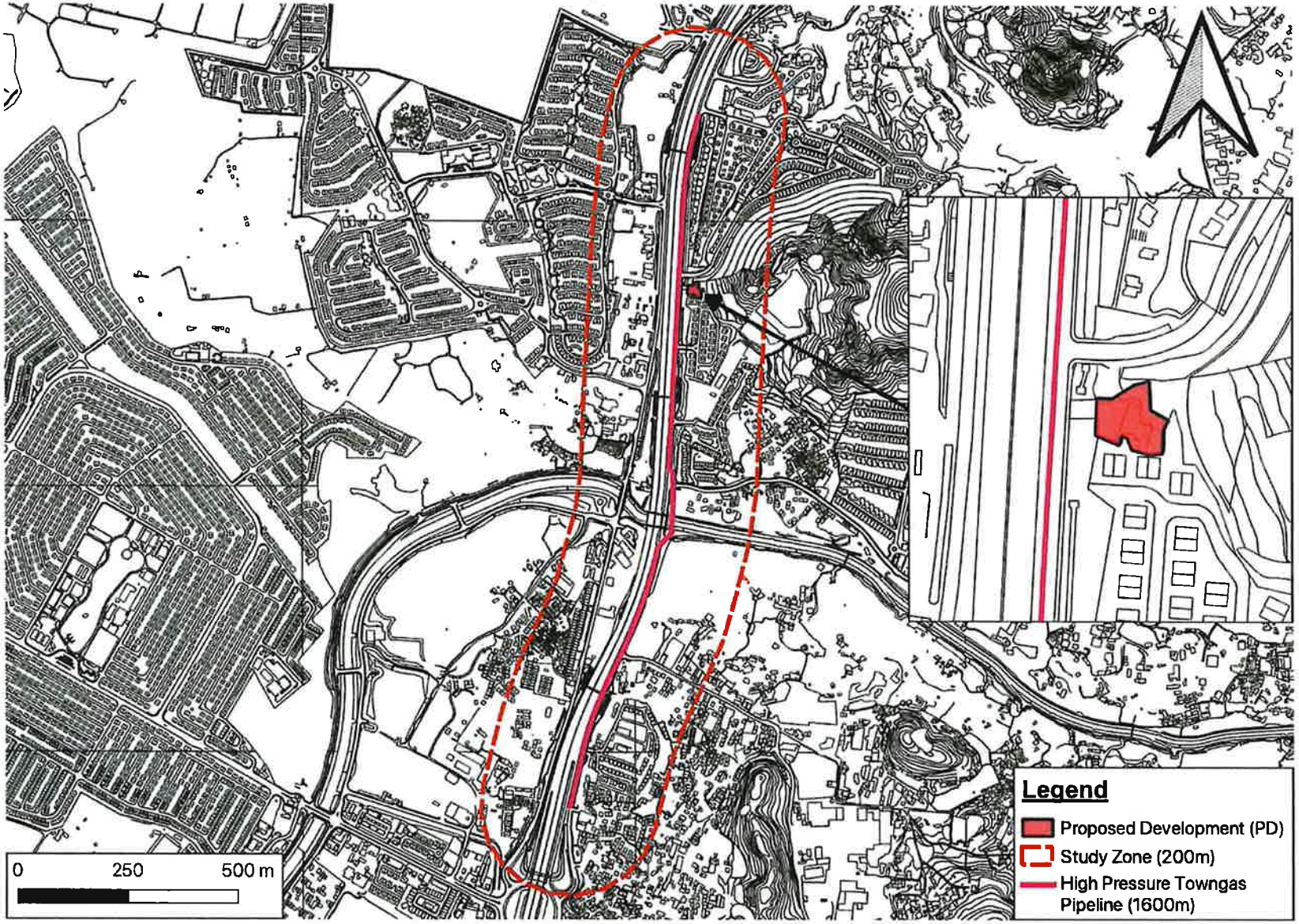


Figure 2 Societal Risk Guidelines from Hong Kong Planning Standards and Guidelines

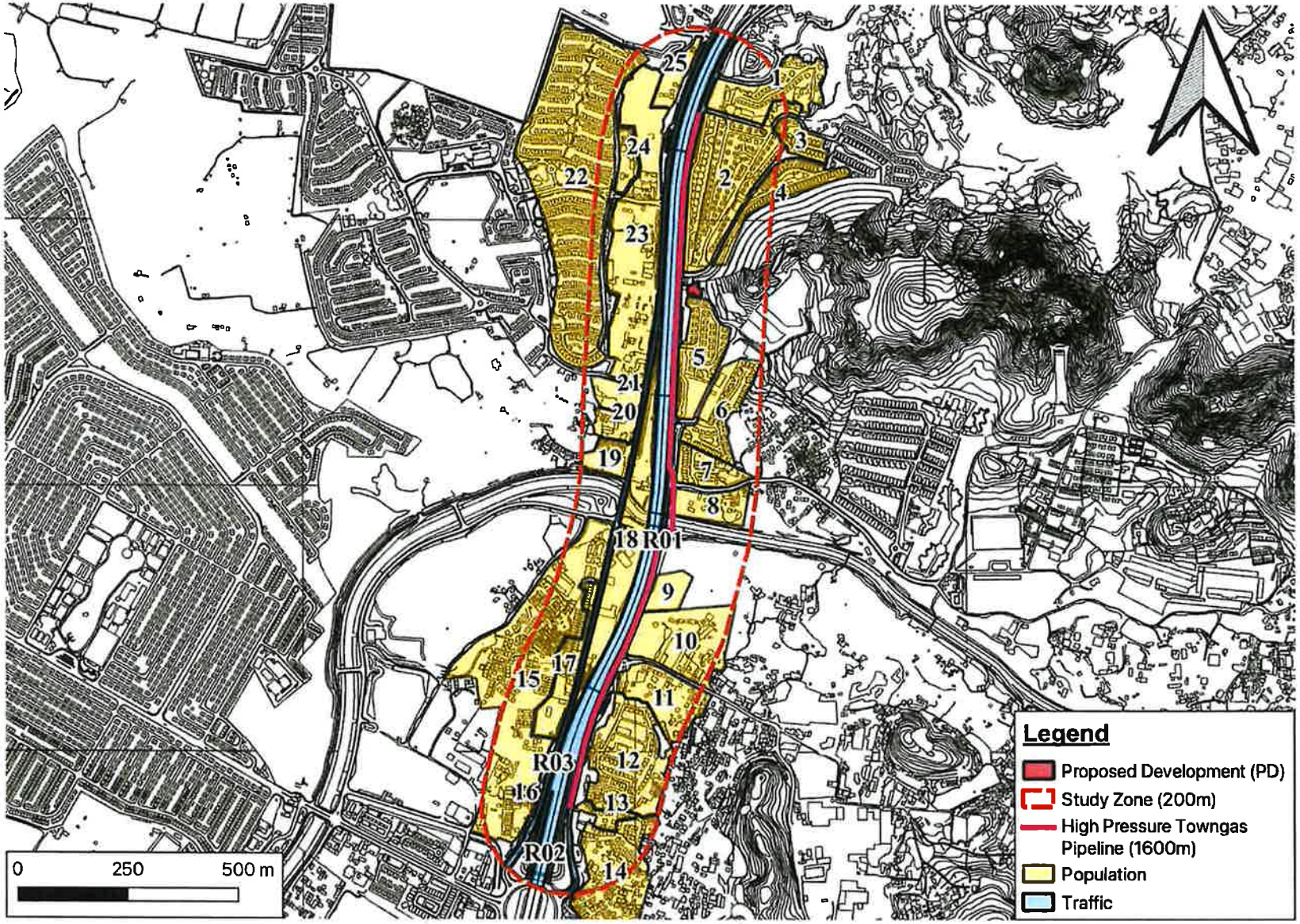

Information Collection
Hazard Identification
Historical Failure Data
Frequency Analysis
Consequence Analysis
Weather Data
Risk Summation
Population Data
Risk Mitigation Measures
Risk Assessment
Risk Criteria



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Quantitative Risk Assessment for S12A Planning Application of a proposed RCHE at 81 San Tam Road, Yuen Long

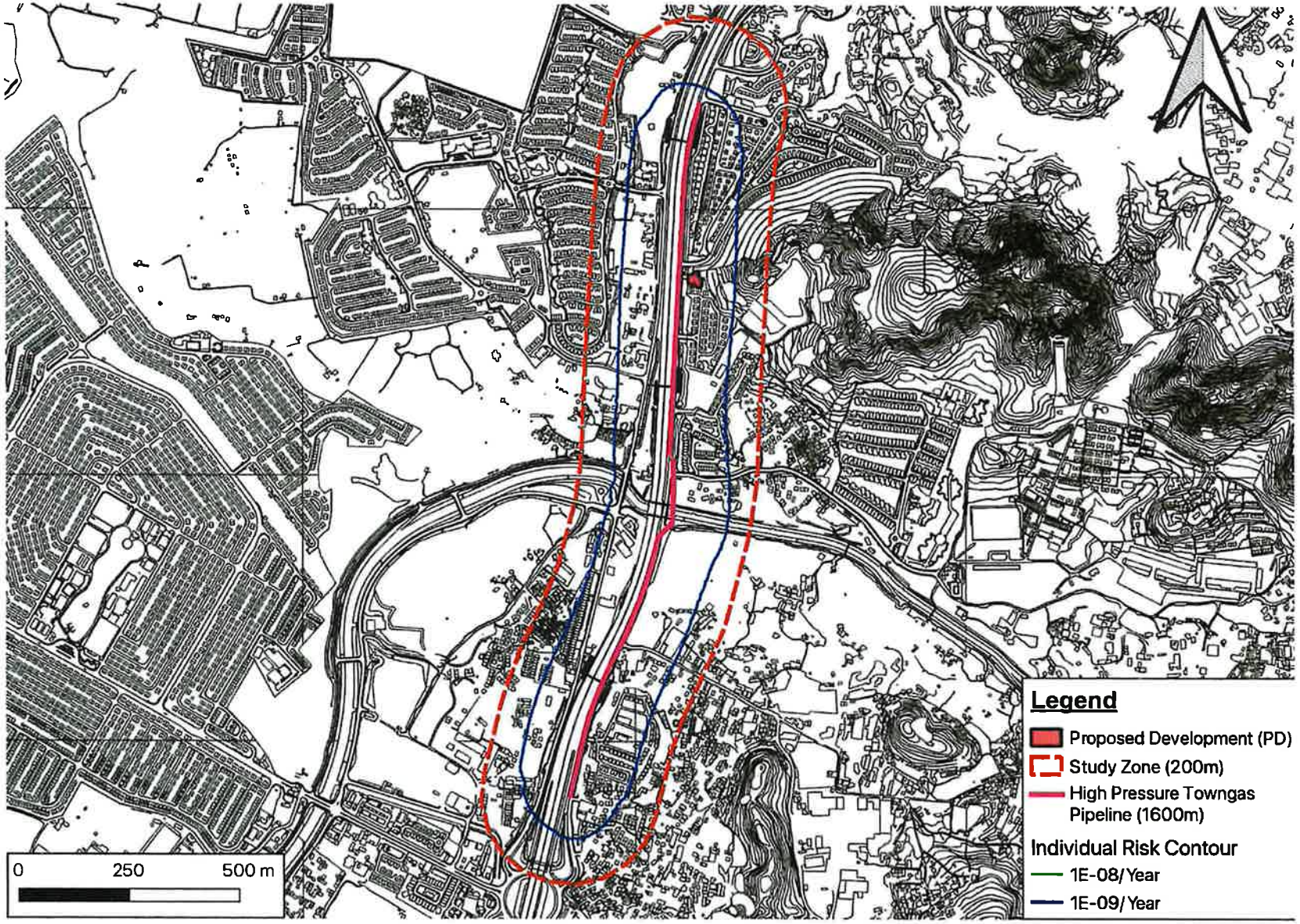
Figure 4 Study Zone of the Proposed Project



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Quantitative Risk Assessment for S12A Planning Application of a proposed RCHE at 81 San Tam Road, Yuen Long

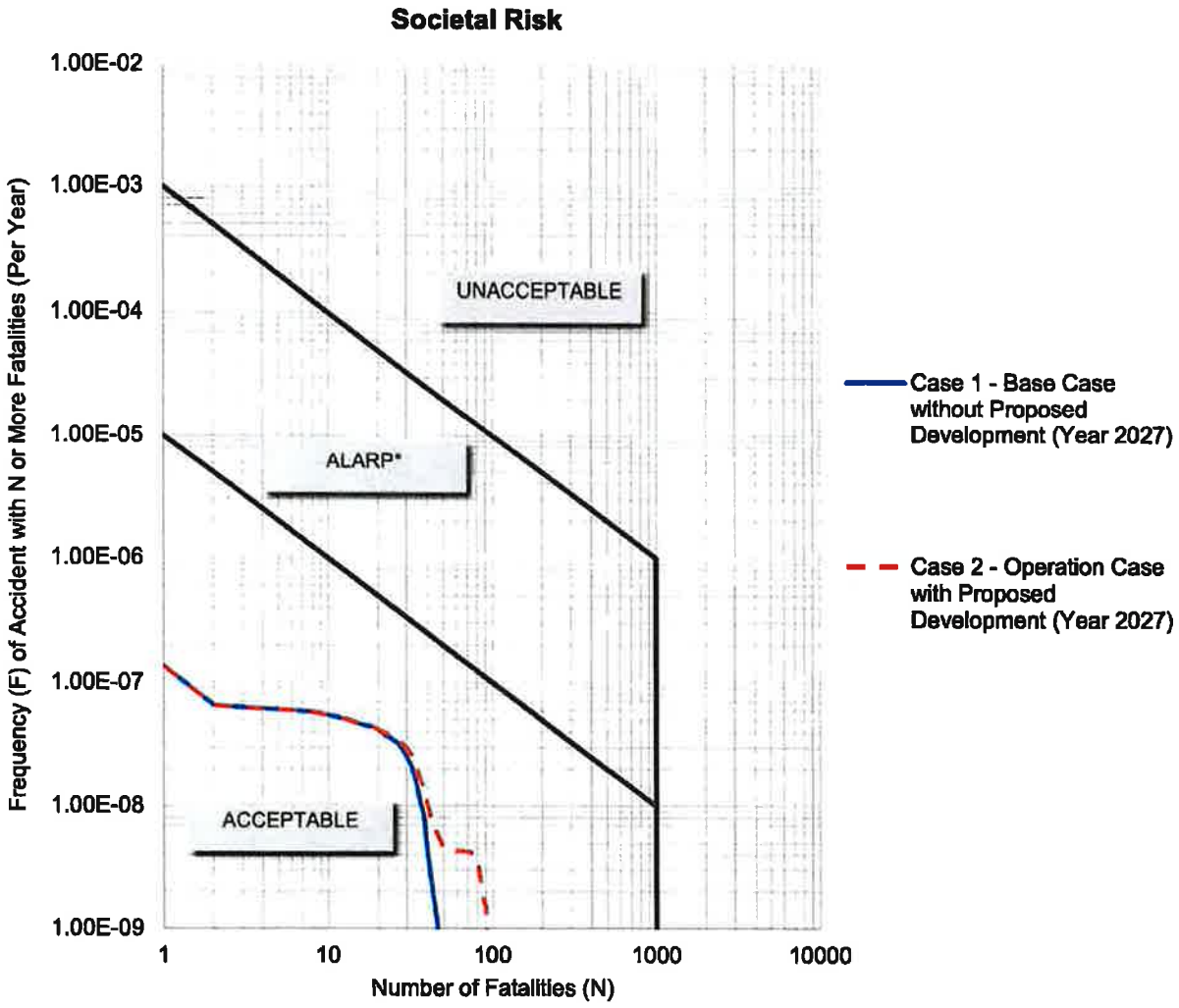
Figure 5 Population groups in the Vicinity in the Study Zone (200m radius)



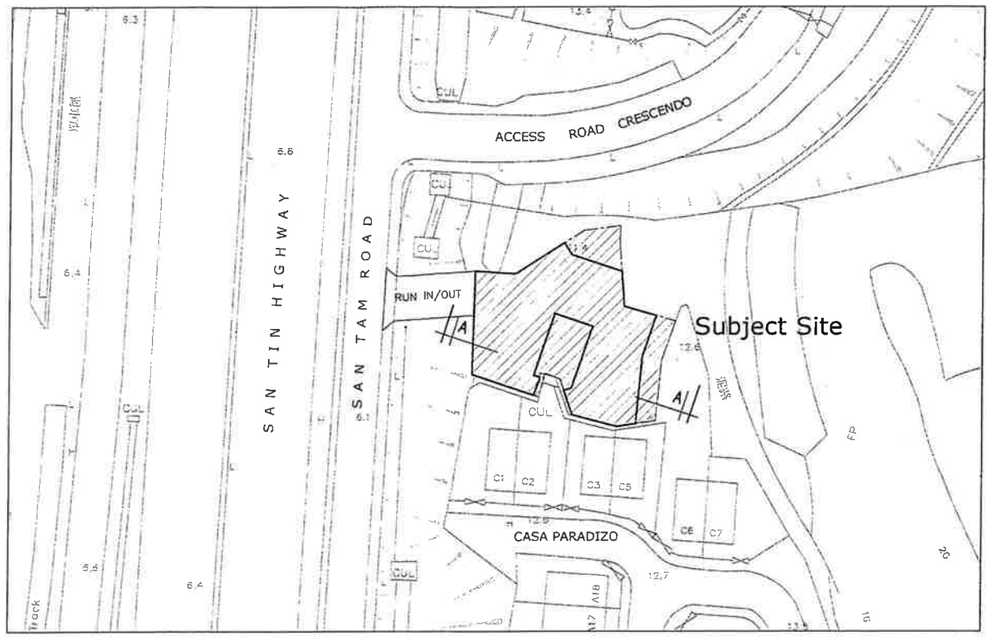
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Quantitative Risk Assessment for S12A Planning Application of a proposed RCHE at 81 San Tam Road, Yuen Long

Figure 6 Individual Risk Contour of High Pressure Town Gas Pipeline


Societal Risk
1.00E-02
1.00E-03
1.00E-04
1.00E-05
1.00E-06
1.00E-07
1.00E-08
1.00E-09
Frequency (F) of Accident with N or More Fatalities (Per Year)
UNACCEPTABLE
ALARP*
ACCEPTABLE
1
10
100
1000
10000
Number of Fatalities (N)
Case 1 - Base Case without Proposed Development (Year 2027)
Case 2 - Operation Case with Proposed Development (Year 2027)

Appendix A
Layout Plans of the Proposed Development



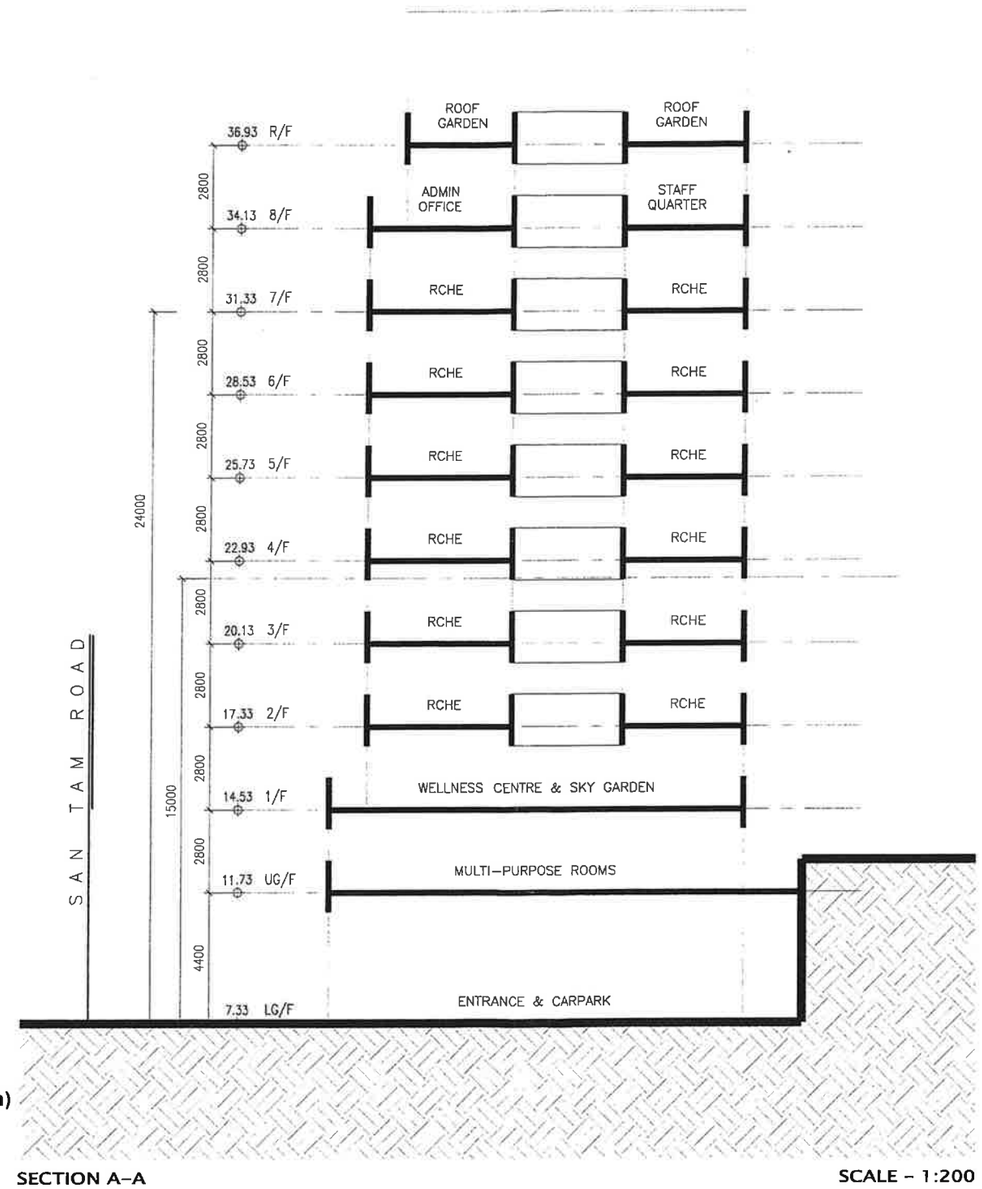
BLOCK PLAN **SCALE – 1:1000**

DEVELOPMENT SCHEDULE:

Site Area	:	736.3 m²	(7926 ft²)
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 m²	(58125.6 ft²)
Proposed Building Height	:	36.93 mPD	
Absolute Height	:	29.6 m	
Proposed No. Of Storey	:	10 STOREYS	
Proposed Gross Floor Area			
LG/F (ENTRANCE & CARPARK)	:	352.479 m²	
UG/F (MULTI-PURPOSE ROOMS)	:	617.819 m²	
1/F (WELLNESS CENTRE + SKY GARDEN)	:	626.160 m²	
2/F (RCHE)	:	595.090 m²	(45 nos. of bed)
3/F (RCHE)	:	556.330 m²	(17 nos. of bed + 3 nos. of isolation room)
4/F - 7/F (RCHE)	:	556.330 m² x 4 storeys = 2225.32 m²	(20 nos. of bed x 4 storeys)
8/F (ADMIN OFFIC + STAFF QUARTER)	:	426.802 m²	
TOTAL	:	**5400.000 m²**	**(142 nos. of bed + 3 nos. of isolation room)**

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.

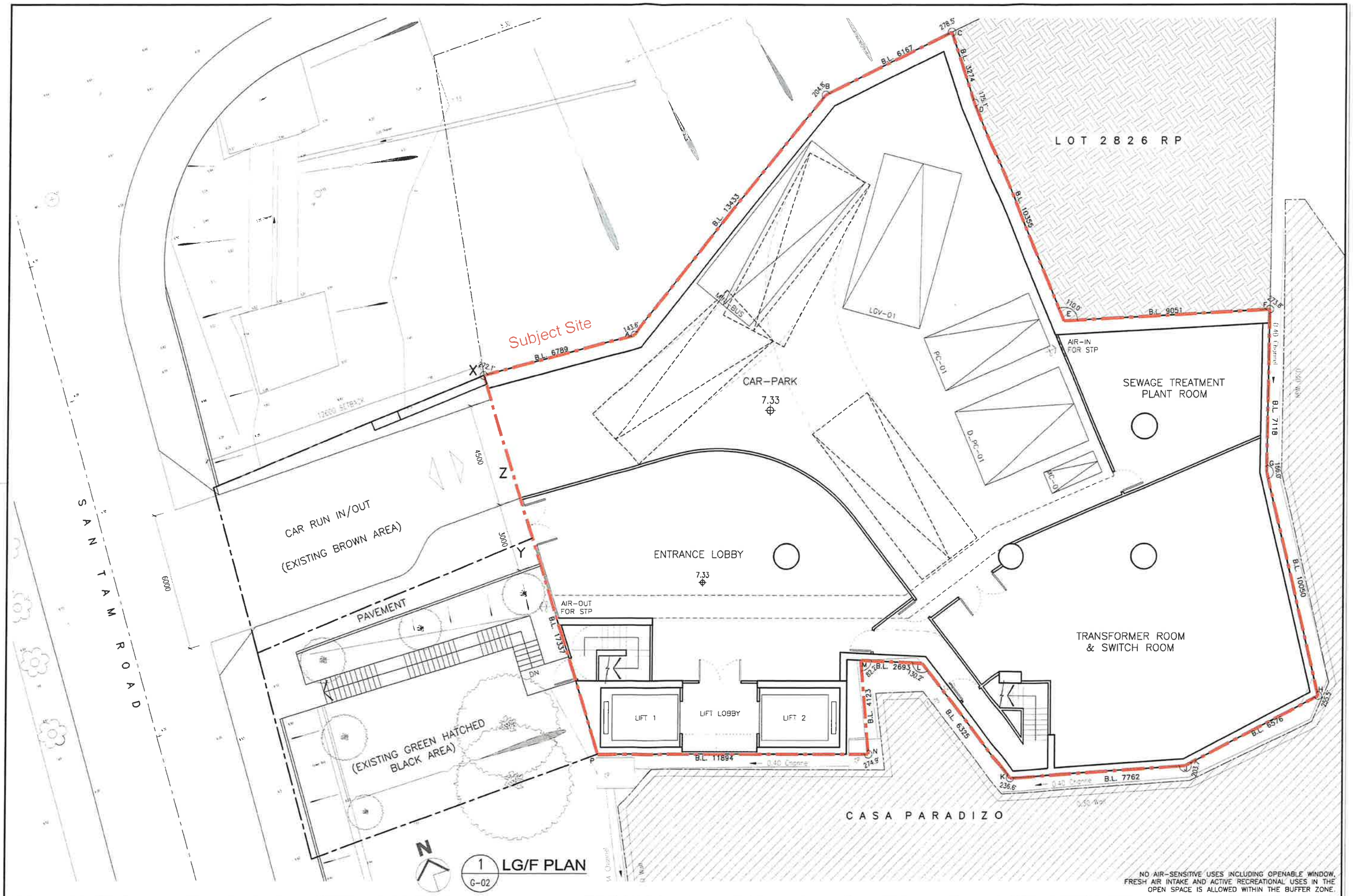
DEVELOPMENT SCHEDULE & SECTION

G-01 N.T.S. (A3)

B	OCT. 2022
A	JULY. 2022

Do not scale drawing.
Contractors are required to verify exact dimensions on site.
The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate.
The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified.
This drawing is not for construction purposes unless expressedly certified.

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PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY
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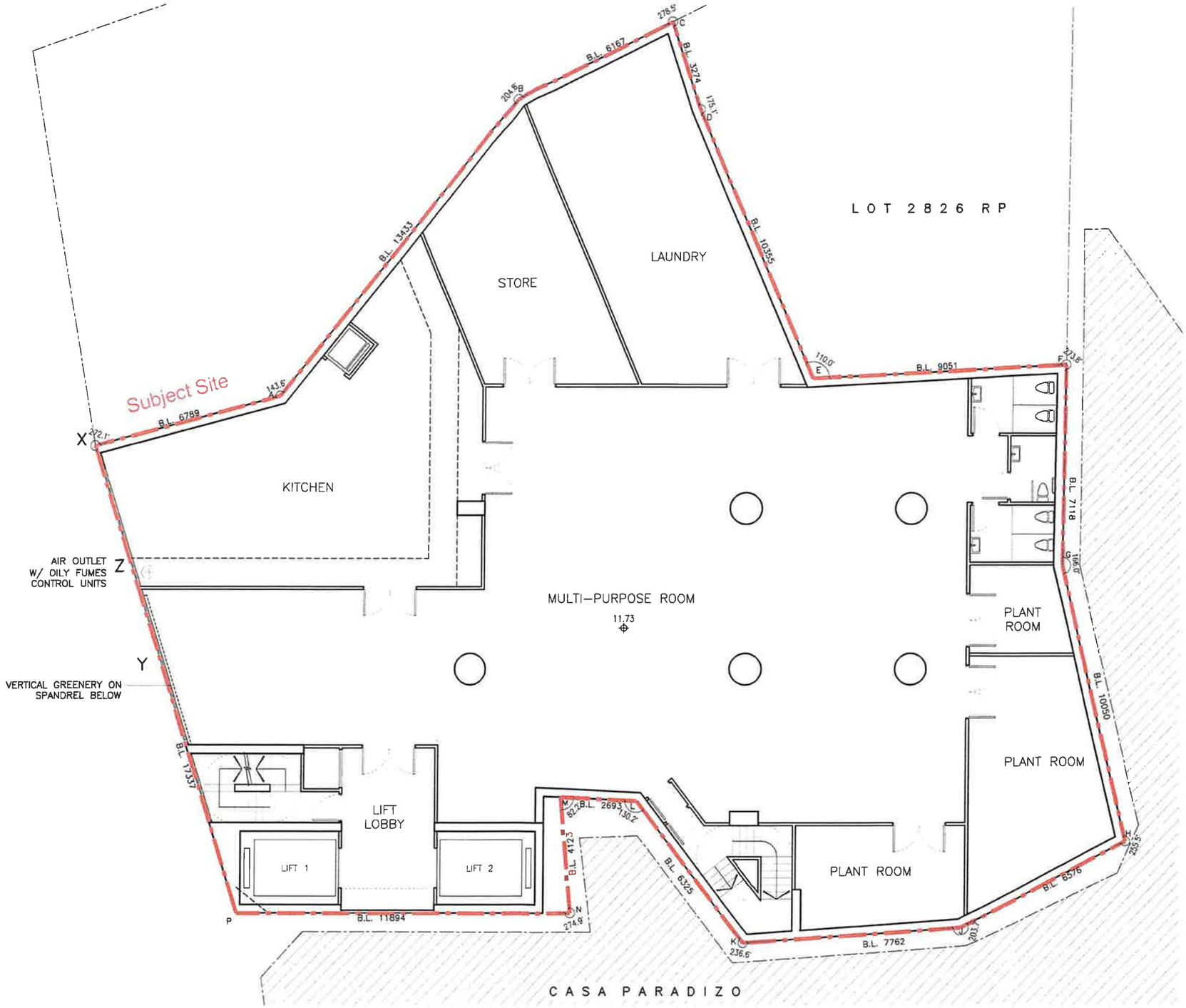
LG/F PLAN
ENTRANCE & CARPARK

G-02 1:150 (A3)

B	OCT. 2022	
A	JULY. 2022	

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N

1 UG/F PLAN
G-03

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

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PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY
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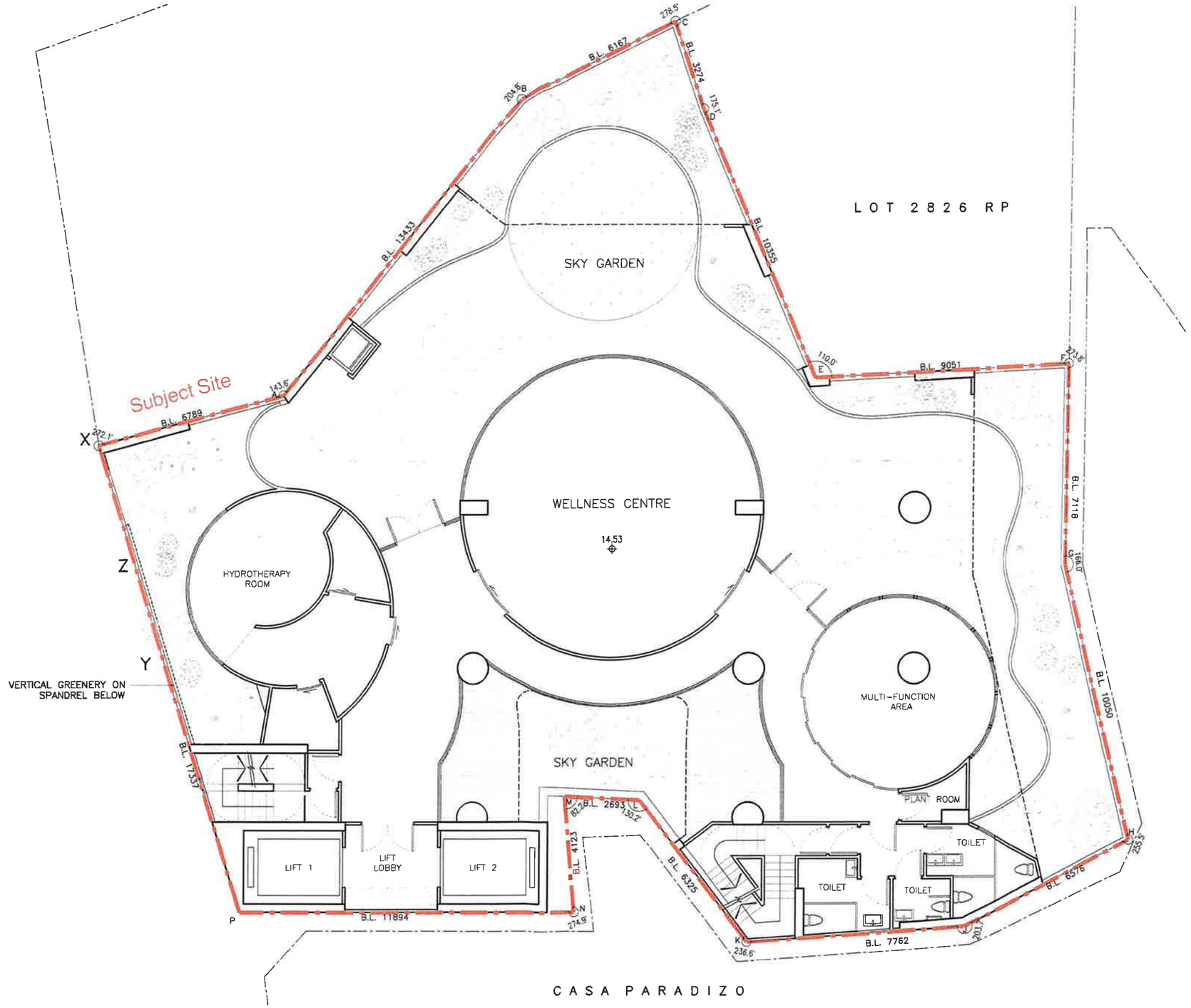
UG/F PLAN
MULTI–PURPOSE ROOMS

G-03 1:150 (A3)

B OCT. 2022
A JULY. 2022

Do not scale drawing.
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N

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

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.

1/F PLAN
WELLNESS CENTRE & SKY GARDEN

G-04 1:150 (A3)

B	OCT. 2022	
A	JULY. 2022	

Do not scale drawing.
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N

1 / G-05 2/F PLAN

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 OCT. 2022 A JULY. 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

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N

1 / G-06 3/F PLAN

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

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

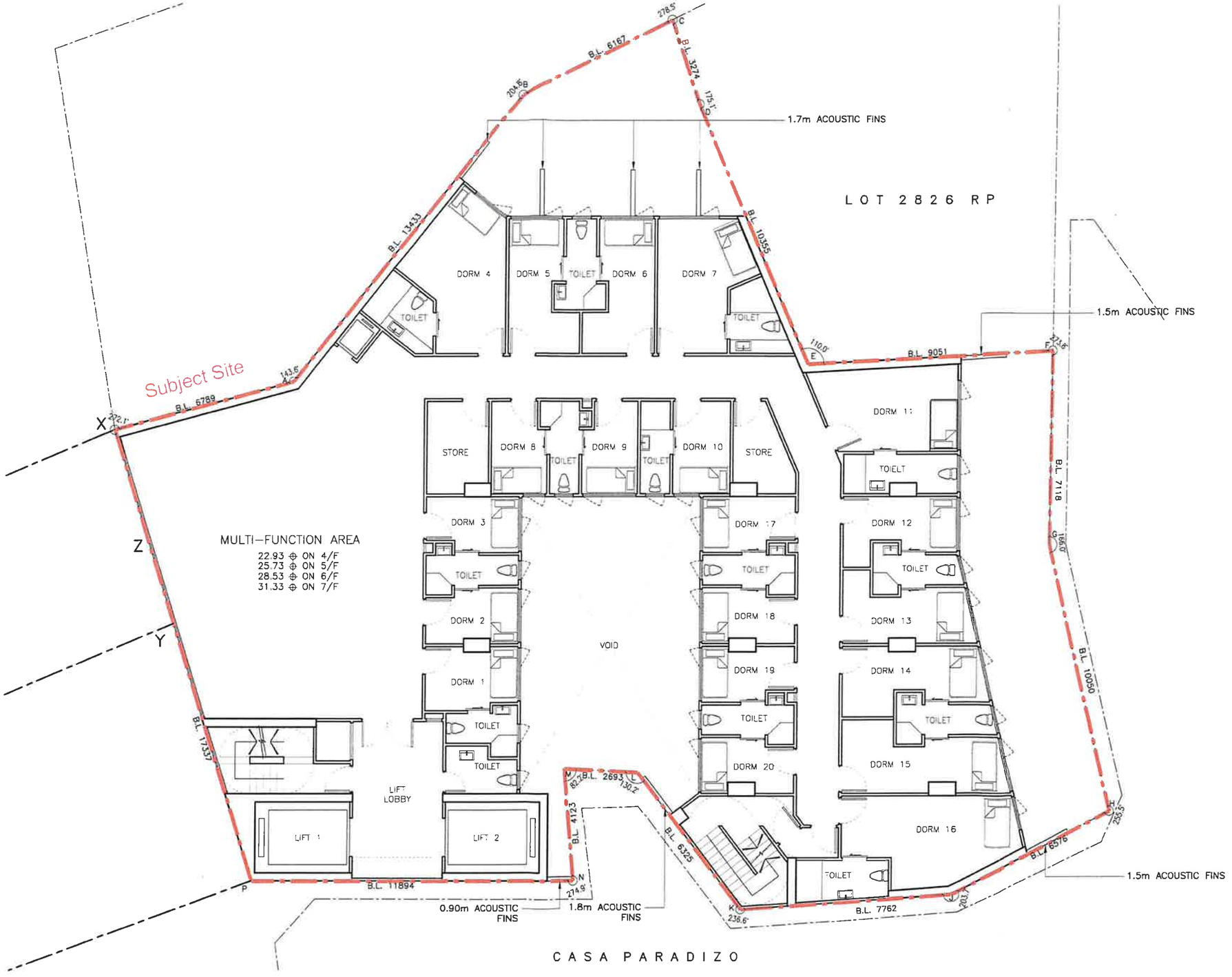
3/F PLAN
RCHE

G-06 1:150 (A3)

B	OCT. 2022	
A	JULY. 2022	

Do not scale drawing.
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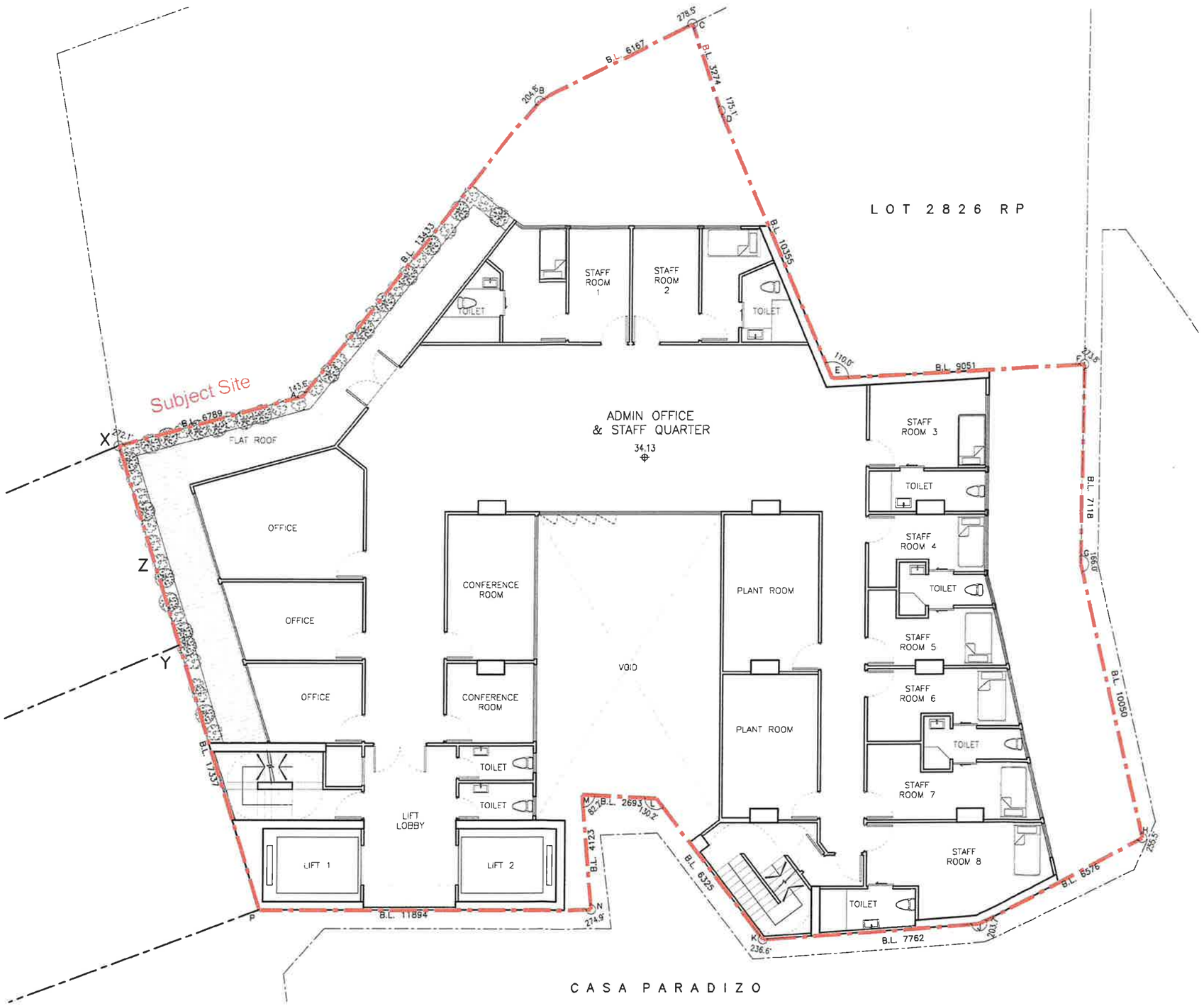
N

1 / G-07 TYPICAL FLOOR PLAN PLAN

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 OCT. 2022 A JULY. 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

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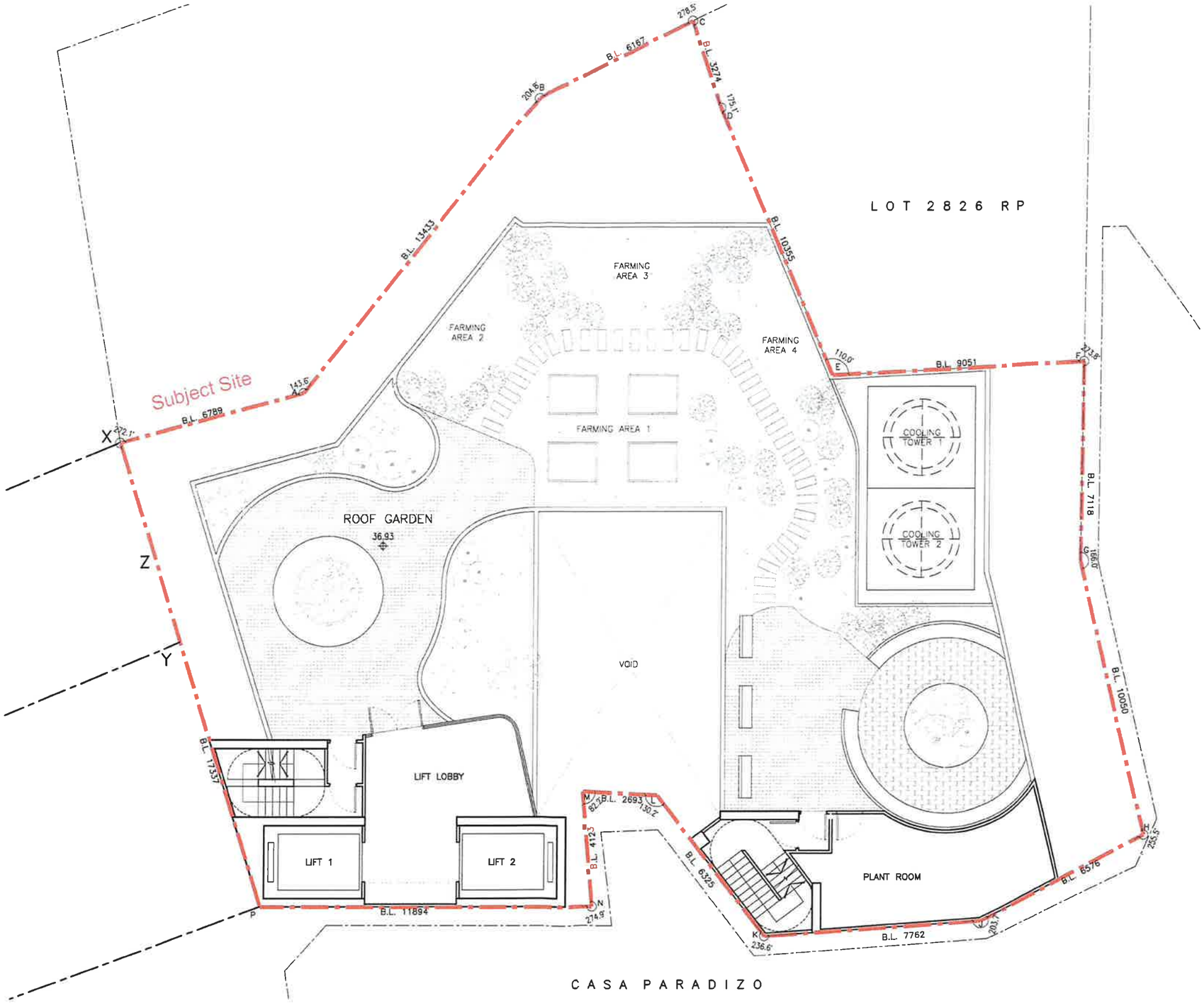
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1 / G-08 8/F PLAN

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.	8/F PLAN ADMIN OFFICE & STAFF QUARTER	G-08	1:150 (A3)	B OCT. 2022 A JULY. 2022	Do not scale drawing. Contractors are required to verify exact dimensions on site. The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate. The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified. This drawing is not for construction purposes unless expressedly certified.

RLEE



N

1 / G-09 ROOF GARDEN PLAN

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

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

ROOF GARDEN PLAN

G-09 1:150 (A3)

B	OCT. 2022	
A	JULY. 2022	

Do not scale drawing.
Contractors are required to verify exact dimensions on site.
The drawings show the design intent of the architect only, contractors are required to submit shop drawings where appropriate.
The design remains to be the property of "RLee Architects (HK) Ltd" unless otherwise specified.
This drawing is not for construction purposes unless expressedly certified.

RLEE

Appendix B
Town Gas High Pressure Town Gas Pipeline Information


和生圍
Wo Sheng Wai
加州花園
Palm Springs
加州豪園
Royal Palms
欣雅新村
Yau Ya San Tsuen
圍仔
Wai Tsai
欣澤居
Elegant Park
欣澤居新村
Yau Tam Mei San Tsuen
欣澤居村
Yau Tam Mei Tsuen
竹園村
Chuk Yuen Tsuen
上竹園
Shaung Chuk Yuen
下新圍
Ha San Wai
新圍村
Sun Wai Tsuen
福興里
Fuk Hing Lei
文苑村
Man Yuen Tsuen
伯安苑
Vila Camelia
Royal Palms
Golden Crown Garden
Hilane Terrace
Case Paradiso
Scenic Heights
Mayfair Gardens
Sterling Hill
Fanling Golf Course
Tai Tsuen
Works in progress
露天貨倉
Open Storage
污水處理廠
Sewage Treatment Works
煤氣
Towngas
The Hong Kong and China Gas Company Limited
網絡發展部
時間：11:00:56
比例：1 : 3000
xy (824025,837894)
圖例顯示的管道位置只作參考之用，其實際位置和深度仍須以人手開挖探出為準。在確認管道地點前工程，必須參照最新圖則。
修訂日期：Jan 13 2023

San Tam Road, Yuen Long - Technical Information

Pipe Diameter	600mm N.B.
Pipe Alignment	Please refer to the attached drawings
Pipe wall thickness	12.7mm
Minimum Depth	1.1m
Operating Pressure of pipeline	35 barg
Pipe Material	Steel
Material Grading (Pipe/ Fitting)	API 5L X42 / X52
External Coating	400 micron of fusion bonded epoxy coating
Year of Construction	1986 – 1989
Jointing Method	Butt Welding complied with BS P2
Non-Destructive Test of Jointing	100% X-Ray
Backfilling Material	Surrounded by 150mm Thick Zone 2 fresh sand
Cathodic Protection	Cathodic Protection System - Sacrificial Anode at about 300 m Interval
Isolation Valves (Cameron Full Bore Ball Valve)	Upstream: BV24066 Castle Peak Road - Chau Tau Downstream: BV24118 BV16116 Fairview Park Boulevard Round About
Pipe Length between isolation valves	6.2km

Appendix C
Traffic Population Calculation

All Information in this appendix was obtained from The Annual Traffic Census 2021.

i. Calculation of average occupancy

Station S5016	Motor Cycle	Private car	Taxi	Private light bus	Public light bus	Light Goods vehicle	Medium & heavy Goods vehicle	Non-franchised bus	Single-decker franchised bus	Double-decker franchised bus
Probability (%)	1.5	46.1	5.6	0.6	2.5	19.3	21.7	1.4	0.1	1.3
Occupancy (person/veh)	1.1	1.3	1.8	3.1	12.9	1.3	1.1	14.0	8.0	36.2

Note: Assume traffic occupancy of roads in Study Zone follows that of Traffic Station no. 5016 which is the nearest traffic stations with occupancy profile

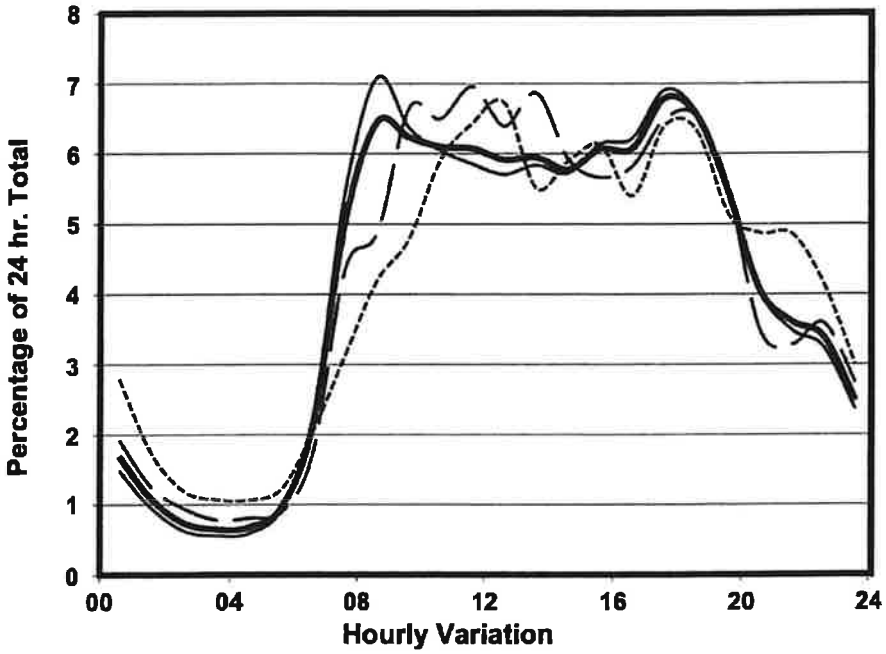
Average occupancy = $\sum(Probability_i \times Occupancy_i)/\sum Probability_i$ = **2.2**

ii. Calculation of growth factor

Road	2016 AADT (veh/day)	2017 AADT (veh/day)	2018 AADT (veh/day)	2019 AADT (veh/day)	2020 AADT (veh/day)	2021 AADT (veh/day)	Average annual growth rate (1)
R01 San Tam Road (2)	6400	6300	8540	7530	7220	7510	**5%**
R02 San Tin Highway (3)	90760	90110	92980	80460	82010	86000	**0%**
R03 Castle Peak Rd-Tam Mi, Mai Po & San Tin (4)	10940	10770	11980	11910	11420	11880	**2%**

Note: (1) Average annual growth rates are assumed to be zero as the calculated average annual growth rate is a negative value
(2) Information from S5297 – From Castle Peak Rd-Mai Po to Fairview Park Boulevard RA
(3) Information from S5508 – From Fairview Park Boulevard to Lok Ma Chau Rd
(4) Information from S5257 -- From Fairview Park Boulevard to Lok Ma Chau Rd

iii. Calculation of Traffic flow



Station S5016 all-day traffic hourly variation

Distribution of traffic in Day-time and night-time can be obtained from the all-day traffic hourly variation. Day-time: 07:00-19:00, Night-time: 19:00-07:00. The results are as follows:

Day-time variation	73.1%	Day-time ratio (1)	100.0%
Night-time variation	26.9%	Night-time ratio (2)	36.9%

Note: (1) Day-time ratio = Day-time variation/Day-time variation
(2) Night-time ratio= Night-time variation/Day-time variation

Road	2027 Forecasted AADT (1) (veh/day)	Day-time Hourly Traffic (2) (veh/hr)	Night-time Hourly Traffic (3) (veh/hr)
R01 San Tam Road	9932	605	54
R02 San Tin Highway	82010	4994	222
R03 Castle Peak Rd- Tam Mi, Mai Po & San Tin	13270	808	298

Note: (1) 2027 Forecasted AADT is obtained from 2021 AADT and average annual growth factor
(2) Day-time Hourly Traffic = 2027 Forecasted AADT × Day-time Variation /12 hours
(3) Night-time Hourly Traffic = 2027 Forecasted AADT × Night-time Variation /12 hours

iv. Calculation of Population (year 2027)

ID	Road Name	Average Occupancy	Speed (km/hr)	Road Length (m)	Day-time Traffic Population (1)	Pedestrian	Day-time Population (2)
R01	San Tam Road	2.2	50	2005	54	20	74
R02	San Tin Highway	2.2	100	2001	222	0	222
R03	Castle Peak Rd-Tam Mi, Mai Po & San Tin	2.2	70	1964	51	20	71

Note: (1) Day-time Traffic Population = Day-time Hourly Traffic × Average Occupancy × Road Length / Speed
(2) Day-time Population = Day-time Traffic Population + Pedestrian

Appendix D
Atmospheric Stability Class-Wind Speed Frequencies

Day Time Atmospheric Stability Class-Wind Speed Frequencies at Wetland Park Weather Station (Year 2021)

DAY	Stability Class						Total
Wind Speed	A	B	C	D	E	F	
0-2	25.6%	7.9%	0.0%	13.8%	0.0%	14.5%	61.8%
2-4	7.6%	14.3%	6.4%	6.3%	1.8%	0.4%	36.7%
4-6	0.0%	1.1%	0.3%	0.2%	0.0%	0.0%	1.5%
6-8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
>8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Night Time Atmospheric Stability Class-Wind Speed Frequencies at Wetland Park Weather Station (Year 2021)

NIGHT	Stability Class						Total
Wind Speed	A	B	C	D	E	F	
0-2	0.0%	0.0%	0.0%	3.8%	0.0%	82.3%	86.0%
2-4	0.0%	0.0%	0.0%	2.3%	8.8%	2.4%	13.5%
4-6	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.5%
6-8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
>8	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Appendix E
Event Tree Analysis of High Pressure Town Gas Pipeline

UNDERGROUND HIGH PRESSURE TOWNGAS PIPELINE

Underground Land Pipeline

Underground Land Pipeline Failure (per km-yr)
1.00E-05

Assume jet fire inclined from horizontal by 45 deg

Release Frequency (/km-yr)	Failure Probability	Release Orientation		Immediate Ignition		Delayed Ignition		Explosion after Ignition		Outcome Frequency (/km-yr)	Outcome Consequence
1.00E-05	0.20	Vertical	0.5	Yes	0.01					1.00E-08	Vertical jet fire
	leak 10mm 2.00E-06 /km-yr			No	0.99	Yes	0.4			3.96E-07	Flash fire
						No	0.6			5.94E-07	No ignition
		Inclined	0.5	Yes	0.01					1.00E-08	Inclined jet fire
				No	0.99	Yes	0.4			3.96E-07	Flash fire
						No	0.6			5.94E-07	No ignition
	0.30	Vertical	0.5	Yes	0.07					1.05E-07	Vertical jet fire
	leak 25mm 3.00E-06 /km-yr			No	0.93	Yes	0.38			5.30E-07	Flash fire
						No	0.62			8.65E-07	No ignition
		Inclined	0.5	Yes	0.07					1.05E-07	Inclined jet fire
				No	0.93	Yes	0.38			5.30E-07	Flash fire
						No	0.62			8.65E-07	No ignition
	0.30	Vertical	0.5	Yes	0.07					1.05E-07	Vertical jet fire
	leak 50mm 3.00E-06 /km-yr			No	0.93	Yes	0.38			5.30E-07	Flash fire
						No	0.62			8.65E-07	No ignition
		Inclined	0.5	Yes	0.07					1.05E-07	Inclined jet fire
				No	0.93	Yes	0.38			5.30E-07	Flash fire
						No	0.62			8.65E-07	No ignition
	0.19	Vertical	0.5	Yes	0.07					6.65E-08	Vertical jet fire
	leak 100mm 1.90E-06 /km-yr			No	0.93	Yes	0.38	Yes	0.12	4.03E-08	Flash fire followed by explosion
								No	0.88	2.95E-07	Flash fire
						No	0.62			5.48E-07	No ignition
		Inclined	0.5	Yes	0.07					6.65E-08	Inclined jet fire
				No	0.93	Yes	0.38	Yes	0.12	4.03E-08	Flash fire followed by explosion
								No	0.88	2.95E-07	Flash fire
						No	0.62			5.48E-07	No ignition
	0.01	Vertical	1	Yes	0.3					3.00E-08	Fireball
	Full bore rupture 1.00E-07 /km-yr			No	0.7	Yes	0.28	Yes	0.3	5.88E-09	Flash fire followed by explosion
								No	0.7	1.37E-08	Flash fire
						No	0.72			5.04E-08	No ignition

MEINHARDT

Meinhardt Infrastructure and Environment Ltd
邁進基建環保工程顧問有限公司

10/F Genesis
33-35 Wong Chuk Hang Road
Hong Kong
香港黃竹坑道33-35號
創協坊10樓

Tel 電話: +852 2858 0738
Fax 傳真: +852 2540 1580

mail@meinhardt.com.hk
www.meinhardt-china.com
www.meinhardtgroup.com

GOVERNMENT, INSTITUTION OR COMMUNITY

Column 1 Uses always permitted	Column 2 Uses that may be permitted with or without conditions on application to the Town Planning Board
Ambulance Depot Animal Quarantine Centre (in Government building only) Broadcasting, Television and/or Film Studio Eating Place (Canteen, Cooked Food Centre only) Educational Institution Exhibition or Convention Hall Field Study/Education/Visitor Centre Government Refuse Collection Point Government Use (not elsewhere specified) Hospital Institutional Use (not elsewhere specified) Library Market Place of Recreation, Sports or Culture Public Clinic Public Convenience Public Transport Terminus or Station Public Utility Installation Public Vehicle Park (excluding container vehicle) Recyclable Collection Centre Religious Institution Research, Design and Development Centre Rural Committee/Village Office School Service Reservoir Social Welfare Facility Training Centre Wholesale Trade	Animal Boarding Establishment Animal Quarantine Centre (not elsewhere specified) Columbarium Correctional Institution Crematorium Driving School Eating Place (not elsewhere specified) Firing Range Flat Funeral Facility Helicopter Fuelling Station Helicopter Landing Pad Holiday Camp Hotel House (other than rebuilding of New Territories Exempted House or replacement of existing domestic building by New Territories Exempted House permitted under the covering Notes) Off-course Betting Centre Office Petrol Filling Station Place of Entertainment Private Club Radar, Telecommunications Electronic Microwave Repeater, Television and/or Radio Transmitter Installation Refuse Disposal Installation (Refuse Transfer Station only) Residential Institution Sewage Treatment/Screening Plant Shop and Services Utility Installation for Private Project Zoo

Planning Intention

This zone is intended primarily for the provision of Government, institution or community facilities serving the needs of the local residents and/or a wider district, region or the territory. It is also intended to provide land for uses directly related to or in support of the work of the Government, organizations providing social services to meet community needs, and other institutional establishments.

就規劃申請/覆核提出意見 **Making Comment on Planning Application / Review**

參考編號 **Reference Number:**	220908-221644-52943
提交限期 **Deadline for submission:**	09/09/2022
提交日期及時間 **Date and time of submission:**	08/09/2022 22:16:44
有關的規劃申請編號 **The application no. to which the comment relates:**	Y/YL-NTM/9
「提意見人」姓名/名稱 **Name of person making this comment:**	小姐 Miss Lam Kimmy

意見詳情
Details of the Comment :

呢區其實都幾需要有老人院

就規劃申請/覆核提出意見 **Making Comment on Planning Application / Review**

參考編號 **Reference Number:**	220905-095349-03976
提交限期 **Deadline for submission:**	09/09/2022
提交日期及時間 **Date and time of submission:**	05/09/2022 09:53:49
有關的規劃申請編號 **The application no. to which the comment relates:**	Y/YL-NTM/9
「提意見人」姓名/名稱 **Name of person making this comment:**	先生 Mr. Chan Ching Wah

意見詳情
Details of the Comment :

我們反對 ！
由於該地區原本係低密度設計 ，
近年鄰近地區村鎮地區人口，車輛已經不斷增加 ，政府相關部門並無任何措施拓寬周邊交通網絡，
也無更新該區人口數據，忽然將有關地點變更為 老人院舍 ，
必然加重咗繁忙時段的道路擠塞情況 ！

本區居民對上述設施 强烈反對 ！
專此
加州花園 名仕居 業主委員會主席 陳清華

2

就規劃申請/覆核提出意見 **Making Comment on Planning Application / Review**

參考編號 **Reference Number:**	220905-202224-56774
提交限期 **Deadline for submission:**	09/09/2022
提交日期及時間 **Date and time of submission:**	05/09/2022 20:22:24
有關的規劃申請編號 **The application no. to which the comment relates:**	Y/YL-NTM/9
「提意見人」姓名/名稱 **Name of person making this comment:**	先生 Mr. cheung shek fai

意見詳情
Details of the Comment :

1. 由於北部都會區的發展，新潭路在未來幾年將興建多個大型屋苑，人口會以倍數激增，行駛新潭路之車輛會更頻繁，導致現有道路系統，包括現在交通壓力已極大的新潭路錦繡迴旋處路段出現比現時更嚴重的塞車情況，加上未來北環鐵路的興建，大型工程車輛使用這路段亦會大增，引致交通配套不勝負荷，緊急車輛出入新潭路救援亦會受阻。
2. 申請興建安老院的位置只有一個小路口連接新潭路，一旦有大型突發事故發生，如火警或天災，院友在申請興建的十層建築物內逃生將有困難，造成悲劇。
3. 申請興建安老院的地型狹窄，萬一出現大型突發事故，百多二百名院友及工作人員，當中可能包括一些需要使用輪椅人仕，如要緊急撤離到空曠地點，周邊空地根本不足夠容納這所有人數安全暫處，遠離危機。
4. 由於之前提到將來新潭路的道路系統及交通配套將會不勝負荷，平日要到這裏的救護車及消防車可能會被拖延救援。如有大型事故，緊急車輛在單線雙程的新潭路上停泊也有困難。
5. 多年的紀錄顯示每次颱風過後，新潭路兩旁必有大量樹木倒下，完全堵塞並停頓所有東西兩邊來往交通，要颱風過後數小時甚至2-3天才能通車。如批准興建老人院，要考慮院友可能會因道路全堵塞而影響到醫療救援。
6. 這個頗大院友容量的安老院會對現時服務能力早已飽和的博愛醫院帶來額外工作及資源壓力。
7. 根據香港法例第459A章《安老院規例》，安老院的 " 任何部分 " 所處高度，離地面不得超過24米，由於這個申請的位置面積狹窄，不應給予特殊轄免權。
8. 批核應考慮到政府的整體及長遠安老院建設計劃，充分使用集中配套資源於計劃中的屯門虎地超級老人院城。

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Comment on Town Planning Application Y/YL - NTM/9
09/09/2022 18:04

From: [redacted]
To: "tpbpd@pland.gov.hk" <tpbpd@pland.gov.hk>
File Ref:

1 attachment

kirin wong comment (PDF).pdf

致城市規劃委員會秘書：
專人送遞或郵遞：香港北角渣華道 333 號北角政府合署 15 樓
傳真：2877 0245 或 2522 8426
電郵：tpbpd@pland.gov.hk

To: Secretary, Town Planning Board
By hand or post: 15/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong
By Fax: 2877 0245 or 2522 8426
By e-mail: tpbpd@pland.gov.hk

有關的規劃申請編號 The application no. to which the comment relates Y/YL - NTM/9

意見詳情（ 如有需要，請另頁說明 ）
Details of the Comment (use separate sheet if necessary)

1. 建議中的老人院附近道路沒有咪錶停車場或多層停車場等設施， 前往探望老人家屬的私家車若違泊在老人院附近的路邊, 會嚴重影響附近車路的流量, 造成交通擠塞.

2. 可預見, 因老人院的存在, 應付老人院緊急事故的救援車輛, 如消防車, 救護車等發出的警號會嚴重影響附近民居的安寧。

3. 因老人院的存在, 探望老人家屬及老人院員工均需要利用交通工具往返老人院, 為此, 新潭路的車輛流量將不可避免地增加, 在上下班高峰時期, 尤其在新潭路往錦繡花園迴旋處一段, 擠塞情況將會惡化

4. 該建議中的老人院附近一帶均為低層的住宅用途建築物， 在此位置安插一幢8層高建築物會嚴重影響該區一帶開揚的景觀及空氣流通量. 此外, 若從建成的老人院高層往下望，附近低層住宅住戶的私隱將受嚴重影響

5. 當地公共交通並不能滿足在老人院上班及探望的親友。如公共交通經常滿載，會影響當區居民往返居所。

「提意見人」姓名 / 名稱 Name of person/company making this comment Kirin Wong

簽署 Signature _____ 日期 Date 9-9-2022

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Comments on Y/YL-NTM/9
09/09/2022 14:06

From: [redacted]
To: tpbpd@pland.gov.hk
File Ref:

1 attachment

Jacky comment.pdf

To whom It might concern , please see the following attachment for comments on project Y/YL-NTM/9 .

If encouter any questions or required more information , please do not hesitate to contact me via this email or mobile no. [redacted]

Best regards,
Jacky Wong

致城市規劃委員會秘書：
專人送遞或郵遞：香港北角渣華道 333 號北角政府合署 15 樓
傳真：2877 0245 或 2522 8426
電郵：tpbpd@pland.gov.hk

To: Secretary, Town Planning Board
By hand or post: 15/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong
By Fax: 2877 0245 or 2522 8426
By e-mail: tpbpd@pland.gov.hk

有關的規劃申請編號 The application no. to which the comment relates Y/YL - NTM/9

意見詳情（如有需要，請另頁說明）
Details of the Comment (use separate sheet if necessary)

1. 建議中的老人院附近道路沒有咪錶停車場或多層停車場等設施, 前往探病家屬人士的私家車若違泊在老人院附近的路邊, 會嚴重影響附近車路的流量, 造成交通擠塞.

2. 可預見, 應付緊急事故的救援車輛, 如消防車, 救護車等發出的警號會嚴重影響附近民居的安寧。

3. 因老人院的存在, 新新潭路的車輛流量將不可避免地增加, 在上下班高峰時期, 尤其在新潭路往錦繡花園迴旋處一段, 擠塞情況將會惡化

4. 該建議中的老人院附近一帶均為低層的住宅用途建築物, 在此位置安插一幢十層高建築物會嚴重影響該區一帶開揚的景觀

5. 當地公共交通並不能滿足在老人院上班及探望的親友。如公共交通經常滿載，會影響當區居住市民。

6.新潭路一帶用地普遍為住宅，將住宅用地改建為療養設施影響當地生活質素。

「提意見人」姓名／名稱 Name of person/company making this comment Jacky Wong

簽署 Signature Jacky 日期 Date 9-9-2022

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maggie comment.pdf
09/09/2022 14:13

From: [redacted]
To: tpbpd@pland.gov.hk
File Ref:

1 attachment

maggie comment.pdf

To whom It might concern , please see the following attachment for comments on project Y/YL-NTM/9 .

If encouter any questions or required more information , please do not hesitate to contact me via this email or mobile no. [redacted]

Best regards,
Maggie Wong

致城市規劃委員會秘書：
專人送遞或郵遞：香港北角渣華道 333 號北角政府合署 15 樓
傳真：2877 0245 或 2522 8426
電郵：tpbpd@pland.gov.hk

To: Secretary, Town Planning Board
By hand or post: 15/F, North Point Government Offices, 333 Java Road, North Point, Hong Kong
By Fax: 2877 0245 or 2522 8426
By e-mail: tpbpd@pland.gov.hk

有關的規劃申請編號 The application no. to which the comment relates Y/YL - NTM/9

意見詳情（ 如有需要，請另頁說明 ）
Details of the Comment (use separate sheet if necessary)

1. 建議中的老人院附近道路沒有咪錶停車場或多層停車場等設施, 前往探病家屬人士的私家車若違泊在老人院附近的路邊, 會嚴重影響附近車路的流量, 造成交通擠塞.

2. 可預見, 應付緊急事故的救援車輛, 如消防車, 救護車等發出的警號會嚴重影響附近民居的安寧。

3. 因老人院的存在, 新新潭路的車輛流量將不可避免地增加, 在上下班高峰時期, 尤其在新潭路往錦繡花園迴旋處一段, 擠塞情況將會惡化

4. 該建議中的老人院附近一帶均為低層的住宅用途建築物, 在此位置安插一幢十層高建築物會嚴重影響該區一帶開揚的景觀

5. 當地公共交通並不能滿足在老人院上班及探望的親友。如公共交通經常滿載，會影響當區居住市民。

6.新潭路一帶用地普遍為住宅，將住宅用地改建為療養設施影響當地生活質素。

「提意見人」姓名／名稱 Name of person/company making this comment Maggie Wong

簽署 Signature _____ 日期 Date 9-9-2022

☐ Urgent ☐ Return Receipt Requested ☐ Sign ☐ Encrypt ☐ Mark Subject Restricted ☐ Expand personal&publi

rocky comment.pdf
09/09/2022 21:41

From: [redacted]
To: tpbpd@pland.gov.hk
File Ref:

1 attachment

rocky comment.pdf

To whom It might concern , please see the following attachment for comments on project Y/YL-NTM/9 .

If encouter any questions or required more information , please do not hesitate to contact me via this email or mobile no. xxxxxxxx

Best regards,
Rocky Wong

致城市規劃委員會秘書：
專人送遞或郵遞：香港北角渣華道 333 號北角政府合署 15 樓
傳真：2877 0245 或 2522 8426
電郵：tpbpd@pland.gov.hk

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Details of the Comment (use separate sheet if necessary)

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2. 可預見, 應付緊急事故的救援車輛, 如消防車, 救護車等發出的警號會嚴重影響附近民居的安寧。

3. 因老人院的存在, 新新潭路的車輛流量將不可避免地增加, 在上下班高峰時期, 尤其在新潭路往錦繡花園迴旋處一段, 擠塞情況將會惡化

4. 該建議中的老人院附近一帶均為低層的住宅用途建築物, 在此位置安插一幢十層高建築物會嚴重影響該區一帶開揚的景觀

5. 當地公共交通並不能滿足在老人院上班及探望的親友。如公共交通經常滿載，會影響當區居住市民。

6.新潭路一帶用地普遍為住宅，將住宅用地改建為療養設施影響當地生活質素。

「提意見人」姓名／名稱 Name of person/company making this comment Rocky Wong

簽署 Signature RW 日期 Date 9-9-2022

-----Original Message-----
From: [redacted]
Sent: Friday, September 9, 2022 12:28 AM
To: DEVB Enquiry/DEVB <devbenq@devb.gov.hk>
Subject: 反對新田牛潭尾新潭路81號改建安老院

您好！

本人是新田牛潭尾新潭路[redacted]其中一單位業主，從政府網站上得知以上地址正在申請改建安老院，對此表示強烈反對，考慮如下：

1. 建議中改建的安老院，附近道路沒有咪錶停車場或多層停車場等設施，前往探望家屬人士的私家車、的士等，若違泊在安老院附近的路邊，會嚴重影響附近車路的流量，造成交通嚴重擠塞，新潭路及附近青山公路段交通將嚴重超負荷；
2. 可預見，應付緊急事故的救援車輛，包括消防車、救護車等發出的警號，會嚴重影響附近民居的安寧；

3. 因安老院的存在，新潭路的車輛流量將不可避免地增加，在上下班高峰時期，尤其在新潭路往錦繡花園迴旋處一段，目前已經常擠塞，而擠塞情況將會惡化，或直接造成交通意外；
4. 該建議中的安老院附近一帶均為低層的住宅用途建築物，在此位置安插一幢十層高建築物會嚴重影響該區一帶開揚的景觀，影響空氣流動，直接影響附近住宅屋苑，大大增長了新冠肺炎等病毒的轉播風險，直接影響附近居民的健康；
5. 新潭路段為擬興建的北環線必經路段，地鐵管道對10層高的安老院造成無可避免的噪音和震盪，住在安老院的老人無法安寧度日，直接影響老人的病情加重。

以上請予以慎重考慮，謝謝！

盼覆

潘蘊儀
手機號：（852）[redacted]

10

就規劃申請/覆核提出意見 Making Comment on Planning Application / Review

參考編號 **Reference Number:**	230130-175401-93803
提交限期 **Deadline for submission:**	10/02/2023
提交日期及時間 **Date and time of submission:**	30/01/2023 17:54:01
有關的規劃申請編號 **The application no. to which the comment relates:**	Y/YL-NTM/9
「提意見人」姓名/名稱 **Name of person making this comment:**	先生 Mr. Lee

意見詳情
Details of the Comment :

反對,附近只是2-3層的小平房,要建成10層樓高的巨型建築物勢必嚴重阻擋附近住宅景觀,通風,日照,嚴重影響附近樓宇居民的健康。而且老人院會經常召喚救護車,勢必影響附近寧靜的環境,而且本身地段也不便利救護車停泊。

12

就規劃申請/覆核提出意見 **Making Comment on Planning Application / Review**

參考編號 **Reference Number:**	230210-171314-42170
提交限期 **Deadline for submission:**	10/02/2023
提交日期及時間 **Date and time of submission:**	10/02/2023 17:13:14
有關的規劃申請編號 **The application no. to which the comment relates:**	Y/YL-NTM/9
「提意見人」姓名/名稱 **Name of person making this comment:**	小姐 Miss May Lo

意見詳情
Details of the Comment :

反對轉換用途,現在住宅用地都不夠,政府四處尋找可建屋的土地,還打算填海造地和利用郊野公園邊陲土地作住宅用途,但是次申請竟然將珍貴的住宅用地申請變成其他用途,完全漠視了全港市民對住宅用地的需求,實在不該。

13

就規劃申請/覆核提出意見 **Making Comment on Planning Application / Review**

參考編號 **Reference Number:**	230210-180748-76852
提交限期 **Deadline for submission:**	10/02/2023
提交日期及時間 **Date and time of submission:**	10/02/2023 18:07:48
有關的規劃申請編號 **The application no. to which the comment relates:**	Y/YL-NTM/9
「提意見人」姓名/名稱 **Name of person making this comment:**	小姐 Miss chengya

意見詳情
Details of the Comment :

反對申請，一般住宅發展應預留場所和處所予安老服務（特別是較院舍照顧服務更為與所在社區關係密切的社區照顧服務），以應付長者住戶的需要（即「自給自足」的原則）而不是把宿位集中於偏遠地方，純粹是把長者囚困於監獄式院舍，違反《安老服務計劃方案》所提出的「屋苑為本」規劃原則。

14

就規劃申請/覆核提出意見 **Making Comment on Planning Application / Review**

參考編號 **Reference Number:**	230210-192902-24546
提交限期 **Deadline for submission:**	10/02/2023
提交日期及時間 **Date and time of submission:**	10/02/2023 19:29:02
有關的規劃申請編號 **The application no. to which the comment relates:**	Y/YL-NTM/9
「提意見人」姓名/名稱 **Name of person making this comment:**	女士 Ms. PkCheung

意見詳情
Details of the Comment :

由於鄰近樓房只有兩三層樓高，於斜坡山丘再興建十層樓高之建築物，外觀上已經十分兀突，恍如一支煙通，嚴重阻礙附近居民之景觀。如果興建完成，將會增加越百人入住，加上每日眾多探訪者／救護車的往來，嚴重騷擾附近居民之日常寧靜生活。本人及附近之居民嚴重反對該幢建築物之興建。

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Y/YL-NTM/9 DD 104 Ngau Tam Mei
08/09/2022 02:54

From: [redacted]
To: tpbpd <tpbpd@pland.gov.hk>
File Ref:

Y/YL-NTM/9

Lot 4823 in D.D. 104, Nr Casa Paradizo, Ngau Tam Mei, Yuen Long

Site area : 736.3sq.m

Zoning: "Res (Group C)"

Proposed Amendment: Rezone to GIC / 142 Beds RCHE / PR 7.33 (0.04) / 10 Storeys (3 Storeys) / 100% SC / 184sq.m OS / 5 Vehicle Parking

Dear TPB Members,

Strongly object, this is an attempt to blatantly over develop the site under the guise of providing a community service.

The approved 2017 plan is for a two-storey private residence.

The proposed structure would have 100% site coverage. But every RCHE should be accessible by emergency services, so what if there is a fire at the back?

Covered Skygarden??? Ridiculous. Not only is this on the first floor it is also covered.

The roof garden could only be used by staff as the height exceeds that allowed for RCHE

*Section 20 of the Residential Care Homes (Elderly Persons) Regulation which stipulated that no part of an 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.*

The visual impact is also not acceptable in view of the surrounding low rise residential developments as the green tree line would be interrupted and exceeded.

While the provision of RCHE is fully supported, it is not acceptable that developers abuse the facilities in order to achieve an almost 200% increase in PR.

Mary Mulvihill

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Re: Y/YL-NTM/9 DD 104 Ngau Tam Mei
21/06/2023 02:21

From:
To: tpbpd <tpbpd@pland.gov.hk>
File Ref:

Dear TPB Members,

The Response to Comments raises a number of issues:

High levels of noise pollution on lower floors from the heavy traffic on nearby roads. Solution is acoustic windows. This is alarming in view of the recommendations during Covid that windows be opened in these facilities in order to ensure that the air is circulated and changed. A special interdepartmental task force set up to review the operation of care homes in 2022 encouraged care homes to join a scheme to improve on their ventilation conditions, as part of efforts to prevent another deadly Covid-19 outbreak at facilities for the elderly. Unfortunately much of the material is in Chinese so cannot copy and paste here.

Proximity to heavy traffic also indicates that air cons would be sucking in substantial quantities of pollution. Factor in also possible residue from the Ngau Tam Mei Landfill and the need for natural cross ventilation should be a priority.

Natural lighting and ventilation provision

Every room used for habitation or for the purpose of an office or kitchen in RCHEs shall be provided with adequate natural lighting and ventilation for compliance with sections 29, 30, 31, 32 and 33 of the Building (Planning) Regulations, (Cap.123 sub. leg. F). In other words, provision of **openable and prescribed windows** shall be provided for the above-mentioned facilities for habitable including Dormitory, End-of-life Care Room and Sick/ Isolation/ Quiet Room, etc.

In addition the development exceeds the stipulated height for RCHE

https://www.info.gov.hk/tpb/en/application_collection/A_YL_289/FI_20220414/Response_To_Comments_1.pdf

Section 20 of the Residential Care Homes (Elderly Persons) Regulation which stipulated that no part of an 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.

But this facility would be ten stories high. Some of the residential floor are above 24m and the roof garden almost at 40m. What is there were to be a fire and feeble

elderly were to be trapped at that height?

This is an example of sheer greed as the site currently accommodates a single low rise home.

Members should reject the application. Our elderly deserve better conditions.

Mary Mulvihill

From:
To: tpbpd <tpbpd@pland.gov.hk>
Date: Thursday, 8 September 2022 2:54 AM CST
Subject: Y/YL-NTM/9 DD 104 Ngau Tam Mei

Y/YL-NTM/9

Lot 4823 in D.D. 104, Nr Casa Paradizo, Ngau Tam Mei, Yuen Long

Site area : 736.3sq.m

Zoning: "Res (Group C)"

Proposed Amendment: Rezone to GIC / 142 Beds RCHE / PR 7.33 (0.04) / 10 Storeys (3 Storeys) / 100% SC / 184sq.m OS / 5 Vehicle Parking

Dear TPB Members,

Strongly object, this is an attempt to blatantly over develop the site under the guise of providing a community service.

The approved 2017 plan is for a two-storey private residence.

The proposed structure would have 100% site coverage. But every RCHE should be accessible by emergency services, so what if there is a fire at the back?

Covered Skygarden??? Ridiculous. Not only is this on the first floor it is also covered.

The roof garden could only be used by staff as the height exceeds that allowed for RCHE

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The visual impact is also not acceptable in view of the surrounding low rise residential developments as the green tree line would be interrupted and exceeded.

While the provision of RCHE is fully supported, it is not acceptable that developers abuse the facilities in order to achieve an almost 200% increase in PR.

Mary Mulvihill

就規劃申請/覆核提出意見 **Making Comment on Planning Application / Review**

參考編號 **Reference Number:**	230209-142124-54462
提交限期 **Deadline for submission:**	10/02/2023
提交日期及時間 **Date and time of submission:**	09/02/2023 14:21:24
有關的規劃申請編號 **The application no. to which the comment relates:**	Y/YL-NTM/9
「提意見人」姓名/名稱 **Name of person making this comment:**	先生 Mr. Edmond Fong for The Hong Kong and China Gas Company Limited

意見詳情
Details of the Comment :

Since the proposed development is in the close vicinity to our high pressure pipeline at San Tam Road, the project proponent should conduct a Quantitative Risk Assessment (QRA) to evaluate the potential risk and determine the necessary mitigation measures. The QRA should take into account the future population of the area, such as those in the existing buildings, in the proposed development, and in other approved developments, etc. where applicable. The project proponent should also consult our company in the design stage and closely coordinate with our company during the construction stage, and provide necessary protective measures.