

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

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

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

**FURTHER INFORMATION (4)  
May 2023**

**S12A AMENDMENT OF PLAN APPLICATION  
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**CONTENT**

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**CONTENTS**

**Response-to-Comment – EPD**

**Revised Environmental Assessment Report**

**Landfill Gas Hazard Assessment Report**

**Response-to-Comment – SWD**

**S12A AMENDMENT OF PLAN APPLICATION  
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**RESPONSE-TO-COMMENT – EPD**

**PROPOSED REZONING FROM “R(C)” TO “G/IC”  
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**AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,  
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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 – EPD  
(updated 13 April 2023)**

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

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Comments	Response
<p>(b) Please delete “active” in the 1<sup>st</sup> bullet point.</p> <p>4. Section 2.4</p> <p>(a) Please identify the nearest ASRs in the vicinity of the proposed development and provide their separation distance from the subject boundary.</p> <p>(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.</p> <p>(c) Please clarify whether there are any concurrent projects in the surrounding area and their cumulative air quality impact shall be assessed.</p> <p>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:</p> <p><b><u>Operational air quality impacts</u></b></p> <p>(a) <b>Odour impact from the proposed on-site STP:</b> Please incorporate R-t-C #6(a), (b) and (c) in this section. As mentioned in R-t-C #6(a),</p>	<p>(b) The 1<sup>st</sup> bullet point has been revised.</p> <p>(a) The nearest ASRs would be located.</p> <p>(b) The Project Site Area is only about 736m<sup>2</sup> 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 truck would be limited. No significant dust impact from the construction works is anticipated.</p> <p>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.</p> <p>(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</p> <p>Noted. R-t-C #6(a), (b) and (c) have been incorporated.</p>

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<p>(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.</p> <p>(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.</p> <p>(b) <b>Cooking Fume/ odour from the proposed kitchen:</b> 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.</p> <p>6. Section 6: Please clarify if there is any adverse air quality/ odour impact arising from</p>	<p>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.</p> <p>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-site STP is anticipated</p> <p>The recommendations on EPD’s Control of Oily Fume and Cooking Odour from Restaurants and Food Business have been incorporated.</p> <p>R-t-C#7 have also been incorporated.</p> <p>The tentative location of the STP/Kitchen exhaust has been designed as far as possible all</p>

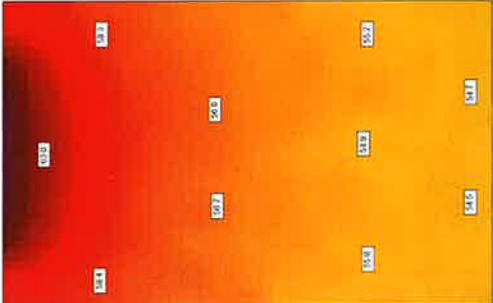
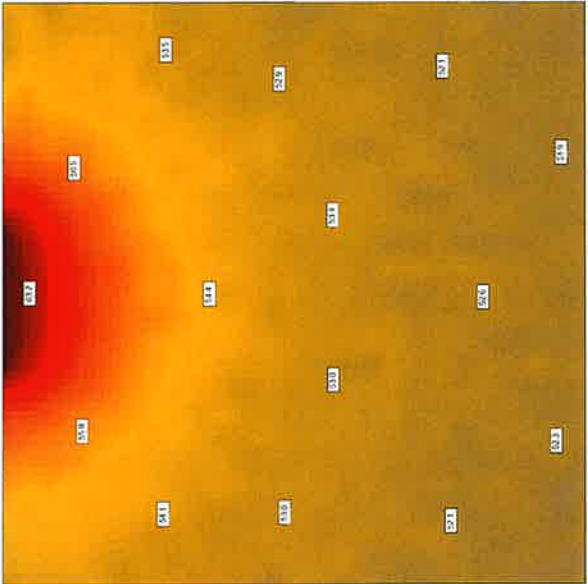
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<b>Comments</b>	<b>Response</b>
<p>the proposed on-site STP and kitchen under “Air Quality” section.</p> <p>7. Figure 2.1.1: Please delete “active” in the remark.</p> <p>8. R-t-C 6(a): The brochure of the deodorization adsorption system could not be found in the report. Please supplement.</p> <p>9. R-t-C 7: The catalogue of the grease filter could not be found in the report. Please supplement.</p> <p>10. Please highlight all the changes/ amendments in the next submission for review.</p> <p><u>Comments on Noise Impact Assessment</u></p> <p>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.</p> <p>2. Section 3.3.5</p> <p>(i) Architectural fins with acoustic windows were proposed to mitigate the traffic noise impact. Please note that the noise reduction performance of combined noise</p>	<p>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-site STP/Kitchen is anticipated.</p> <p>Revised.</p> <p>Added at Appendix 2.2.</p> <p>Added at Appendix 2.3.</p> <p>Noted.</p> <p>Layout plan and room size of the dormitories are attached.</p> <p>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.</p> <p>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</p>

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<b>Comments</b>	<b>Response</b>
<p>mitigation measures for traffic noise impact will need to be further substantiated; mock-up test may be required to demonstrate that adequate noise reduction can be achieved.</p> <p>(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 may be required to demonstrate that adequate noise reduction can be achieved.</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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).</p>

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Comments	Response
	<p>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.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>Interior noise distribution In small room 2.5 x 4m</p> </div> <div style="text-align: center;">  <p>Interior noise distribution in large room 6 x 6m</p> </div> </div>



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<p>(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.</p> <p>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.</p>	<p>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.</p> <p>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.</p> <p>The proposed SAM would be in the form of 50mm thick rockwool covered in waterproof acoustic transparent member and perforated panel.</p> <p>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.</p> <p>Anyhow, sound absorption material is proposed to be added to the architectural feature and the void area as per EA para. 3.3.5.</p> <p>Section 3.4.2 and Figure 3.2.4 Updated accordingly.</p>

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Comments	Response
<p><u>Comments on water quality impact</u></p> <p>1. Para.5 under section 4.3: Marine Water Quality in Hong Kong in 2021 has been issued, please update the data and text.</p> <p>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.</p> <p>3. Para.6 under section 4.3: Please provide a table listing out representative WSRs, if any, within 500m of the project boundary.</p> <p>4. Para.5 under section 4.4: Please confirm if demolition works of existing House will be involved.</p> <p>5. Section 4.5: Previous comment has not been addressed, please provide the amount of sewage flow generated, size of STP, etc.</p> <p>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 <b>tertiary</b> sewage treatment plant (STP)...” in the relevant parts.</p> <p>development shall be equipped with on-site tertiary sewage treatment facility. A typical tertiary treatment standard is attached below for reference.</p>	<p>Noted and revised.</p> <p>Noted and revised.</p> <p>The WSRs shown in Figure has been listed out for ease reference.</p> <p>Will be involved. The relevant text has been added.</p> <p>The major parameter has been listed and details were shown in Appendix 4.1.</p> <p>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.</p>



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Comments	Response														
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Parameter</th> <th style="width: 80%;">Tertiary Effluent Standards (Upper Limit) *</th> </tr> </thead> <tbody> <tr> <td>BOD5</td> <td>10 mg/L</td> </tr> <tr> <td>TSS</td> <td>10 mg/L</td> </tr> <tr> <td>TN</td> <td>20 mg/L</td> </tr> <tr> <td>TP</td> <td>2 mg/L</td> </tr> <tr> <td>Ammonia-N</td> <td>5 mg/L</td> </tr> <tr> <td>E. coli</td> <td>100units/100mL</td> </tr> </tbody> </table> <p>*Depending on the water body receiving the discharge, the more stringent set of the effluent standards (those listed in the table or the WPCO TM) should be adopted as appropriate.</p> <p><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.</p>	Parameter	Tertiary Effluent Standards (Upper Limit) *	BOD5	10 mg/L	TSS	10 mg/L	TN	20 mg/L	TP	2 mg/L	Ammonia-N	5 mg/L	E. coli	100units/100mL	<p>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.</p>
Parameter	Tertiary Effluent Standards (Upper Limit) *														
BOD5	10 mg/L														
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Comments	Response
<p><u>Comments on landfill gas hazard assessment</u></p> <p>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.</p>	<p>Landfill gas hazard assessment was submitted in previous FI dated Feb 2023. The same has been supplemented again in this FI.</p>

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**AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,  
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**REVISED ENVIRONMENTAL ASSESSMENT REPORT**



**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**

12 May 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

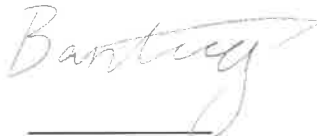
***Prepared By:***

**NOVOX Limited**

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<b>Project:</b>	Proposed Residential Care Home for Elderly at 81 San Tam Road, Yuen Long, N.T.				
<b>Document No.:</b>	C220410W-01				
Revision	Issue Date	Description	Author	Checker	Approver
A	08/07/2022	First Issue	PL	EN	BW
B	12/07/2022	Revised according to comment	PL	EN	BW
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

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..	24
4.5	WATER QUALITY IMPACTS AND MITIGATIONS DURING OPERATION PHASE	25
5	WASTE MANAGEMENT .....	28
5.1	INTRODUCTION.....	28
5.2	LEGISLATIONS, STANDARDS AND GUIDELINES .....	28
5.3	WASTE MANAGEMENT IMPLICATIONS OF THE CONSTRUCTION PHASE....	28
5.4	WASTE MANAGEMENT IMPLICATIONS OF THE OPERATIONAL PHASE .....	30
5.5	LAND CONTAMINATION .....	31
6	CONCLUSION	33
APPENDIX 1.1.	SITE LAYOUT PLAN & SURROUNDING ENVIRONMENT .....	35
APPENDIX 2.1.	AIR QUALITY SENSITIVE RECEIVERS & EMISSION SOURCES .....	38
APPENDIX 2.2.	BROCHURE OF THE DEODORIZATION SYSTEM .....	41
APPENDIX 2.3.	BROCHURE OF THE GREASE FILTER .....	42
APPENDIX 3.1.	TRAFFIC NOISE IMPACT ASSESSMENT.....	43

APPENDIX 3.2. FIXED SOURCE NOISE ASSESSMENT..... 54  
APPENDIX 4.1. WATER QUALITY STANDARD ..... 60  
APPENDIX 5.1 FSD AND EPD'S REPLY ON LAND CONTAMINATION ..... 62

## 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<sup>2</sup> 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 <sup>[1]</sup> (µg/m <sup>3</sup> )	Allowable number of exceedances
Sulphur Dioxide (SO <sub>2</sub> )	10-minute	500	3
	24-hour	50	3
Respirable Suspended Particulates (PM <sub>10</sub> ) <sup>[2]</sup>	24-hour	100	9
	Annual	50	Not Applicable
Fine Suspended Particulates (PM <sub>2.5</sub> ) <sup>[3]</sup>	24-hour	50	35
	Annual	25	Not Applicable
Nitrogen Dioxide (NO <sub>2</sub> )	1-hour	200	18
	Annual	40	Not Applicable
Ozone (O <sub>3</sub> )	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 293 Kelvin 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 22<sup>nd</sup> June 2022 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<sup>2</sup> 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  $\mu\text{g}/\text{m}^3$  monitored at this station for the year 2017-2021 are summarized in Table 2 below. In 2021, all measured parameters complied with the AQO except Ozone recorded non-compliance with the 8-hour AQO ( $160 \mu\text{g}/\text{m}^3$  with allowance of 9 exceedances of AQO limit per year).

**Table 2 EPD Air Quality Monitoring Record at Yuen Long Monitoring Station in 2017-2021**

Pollutant	Averaging Time	Conc. Limits ( $\mu\text{g}/\text{m}^3$ )	No. of Exceedances Allowed	Concentrations ( $\mu\text{g}/\text{m}^3$ ) [1]					Remarks
				2017	2018	2019	2020	2021	
PM <sub>10</sub>	24-hour	100	9	87	75	83	77	73	10th highest conc.
	Annual	50	Not Applicable	40	37	37	30	30	/
PM <sub>2.5</sub>	24-hour	50	35	39	34	34	28	31	36th highest conc.
	Annual	25	Not Applicable	22	20	20	16	17	/
NO <sub>2</sub>	1-hour	200	18	156	150	161	135	148	19th highest conc.
	Annual	40	Not Applicable	41	43	44	32	40	/
SO <sub>2</sub>	10-minute	500	3	80	52	42	26	24	4th highest conc.
	24-hour	50	3	20	17	11	10	14	4th highest conc.
CO	1-hour	30,000	0	1,450	1,720	2,150	1,530	2,090	1st highest conc.
	8-hour <sup>[2]</sup>	10,000	0	1,324	1,574	1,903	1,279	1,591	1st highest conc.

O <sub>3</sub>	8-hour <sup>[2]</sup>	160	9	<b>175</b>	<b>162</b>	<b>200</b>	154	<b>178</b>	10th highest conc.
Note: [1] <b>Bolded</b> 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	<i>Type of Road</i>		
	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 2021 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 a view to achieving a better air quality environment, the project proponent proposed to incorporate a separation distance of more than 20m and more than 5m between the sensitive uses of this Project and from the road kerb of the San Tin Highway and San Tam Road, respectively, which satisfies the buffer distance requirement for active and passive recreation uses according to Chapter 9, Environment of the Hong Kong Planning Standard and Guidelines (HKPSG) as shown in Section 2.1.3. No adverse vehicular emission impact is anticipated upon incorporation of the relevant buffer distance stipulated under the HKPSG into the layout design. 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 and fresh air intake shall be 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 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 C (i.e. 22m between the Site and ASR) and Maple Garden Block G3 (i.e. 51m between the Site and ASR). This may cause short-term air quality (i.e., dust) impacts on the surrounding air sensitive receivers.
- However, the Project Site Area is only about 736m<sup>2</sup> 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 truck 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 would 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 potential air quality impacts include the dust and exhaust emissions arising from the construction (e.g., demolition, site formation, foundation and formworks etc.). This may cause short-term air quality (i.e., dust) impacts on the surrounding air sensitive receivers as shown in **Figure 2.1.2**.
  - 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 STP will serve less than 2000 population, 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, or enclosed to minimize adverse impact.
    - Ventilation exhaust pipes should be taken to roof level, or else odour treatment or masking facilities may be required.
  - 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, which included a FRP vessel with activated carbon media, pre-filter, post-filter and dehumidifier. The deodorization adsorption system will have minimum odour removal efficiency of 99.5% at 5ppm H<sub>2</sub>S concentration. The deodorization adsorption system will have minimum service life for 12 months continuous operation for 5ppm H<sub>2</sub>S loading. 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 washing sludge to dispose to Government sewage treatment plant. It will be eliminated outdoor release during wet sludge disposal service.
  - The tentative location of the STP exhaust has been designed as far as possible all nearby ASRs. Considering that at source mitigation measures (e.g. deodorization adsorption system) would be applied, no adverse odour impact from the proposed on-site STP 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  $L_{10}(1\text{-hour})$  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<sub>90</sub>(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><u>B</u></b>	<b><u>C</u></b>
(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	<b><u>C</u></b>
Day (0700 to 1900 hours)	60	<b><u>65</u></b>	<b><u>70</u></b>
Evening (1900 to 2300 hours)			
Night (2300 to 0700 hours)	50	<b><u>55</u></b>	<b><u>60</u></b>

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  $L_{10}(1\text{-hour})$  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.  $L_{10}(1\text{-hour})$  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).

**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						Noise Criteria, dBA
	L <sub>10, 1 hour</sub> , 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						Noise Criteria, dBA
	L <sub>10, 1 hour</sub> , dBA						
	2/F	3/F	4/F	5/F	6/F	7/F	
W01	<u>68.8</u>	<u>67.8</u>	<u>67.8</u>	<u>67.8</u>	<u>67.9</u>	<u>68.0</u>	70
W02	<u>67.8</u>	<u>68.0</u>	<u>68.1</u>	<u>68.1</u>	<u>68.2</u>	<u>68.4</u>	70
W03	<u>68.3</u>	<u>69.6</u>	<u>69.7</u>	<u>69.8</u>	<u>69.9</u>	<u>70.0</u>	70
W04	<u>69.0</u>	<u>69.8</u>	<u>69.8</u>	<u>69.9</u>	<u>70.0</u>	<u>70.0</u>	70
W05	<u>69.7</u>	63.0	63.8	65.2	66.6	67.8	70
W06	<u>69.8</u>	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	<u>64.8</u>	<u>68.5</u>	<u>69.2</u>	<u>69.3</u>	<u>69.3</u>	70
W12	56.7	69.1	<u>66.7</u>	<u>67.4</u>	<u>67.5</u>	<u>67.5</u>	70
W13	59.3	65.6	<u>65.7</u>	<u>66.5</u>	<u>66.6</u>	<u>66.7</u>	70
W14	63.2		<u>64.7</u>	<u>65.5</u>	<u>65.7</u>	<u>65.7</u>	70
W15	60.4		<u>64.3</u>	<u>65.3</u>	<u>65.5</u>	<u>65.5</u>	70
W16	58.2		69.9	<u>64.1</u>	<u>64.2</u>	<u>64.3</u>	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
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**Remarks:**

- Noise reduction by acoustic fin is capped at 3dB(A) for conservatism.

68.8	North Façade
	East Façade
	Void in South Façade
<u>68.8</u>	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 <b>Appendix 3.2</b> )
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.

### 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 2021 is extracted, reference from “Marine Water Quality in Hong Kong in 2021” by EPD.

- In 2021, the overall WQO compliance rate for Deep Bay WCZ was 60%, 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 NH<sub>3</sub>-N WQOs 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 2021

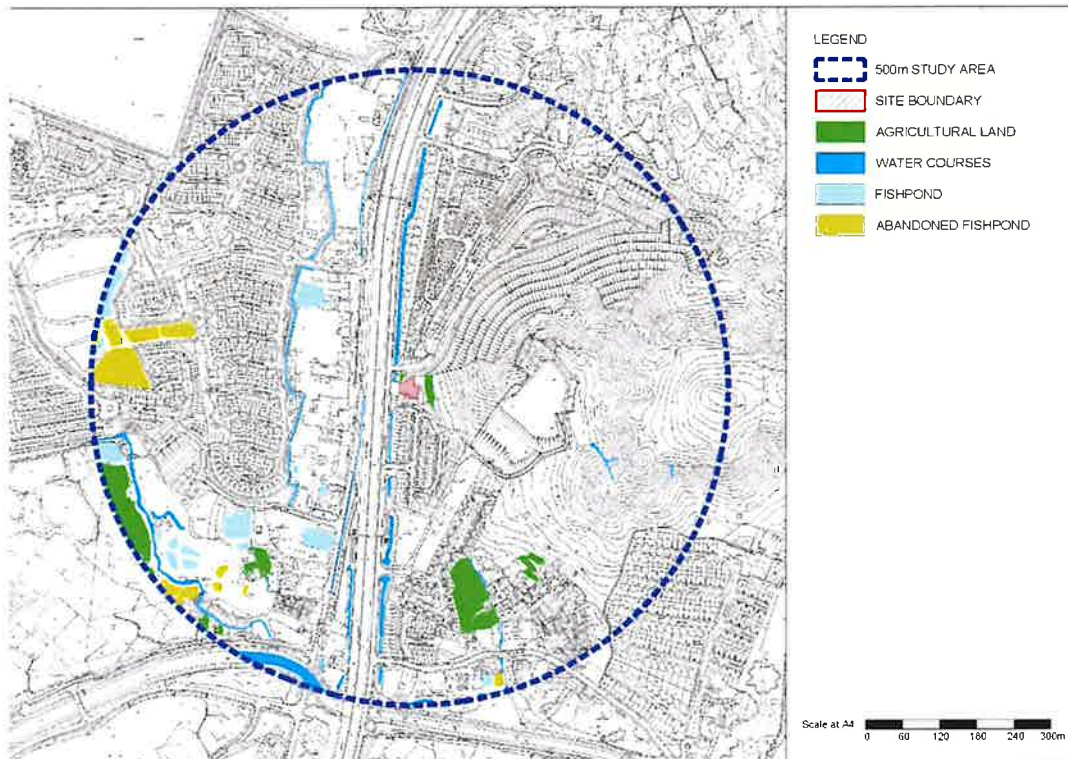
Parameter	DM1 (Nearest to the Stie)
Temperature (°C)	26.4 (17.6 - 32.6)
Salinity	16.2 (9.4 - 22.2)
Dissolved Oxygen (mg/L)	5.5 (4.0 - 7.7)
Dissolved Oxy gen (% Saturation)	74 (56 - 101)
pH	7.3 (6.9 - 7.8)
Secchi Disc Depth (m)	1.0 (0.9 - 1.3)
Turbidity (NTU)	23.6 (9.8 - 38.0)
Suspended Solids (mg/L)	29.5 (13.0 - 57.0)
5-day Biochemical Ox y gen Demand (mg/L)	2.5 (1.1 - 12.0)
Ammonia Nitrogen (mg/L)	0.417 (0.150 - 0.950)
Unionised Ammonia (mg/L)	0.005 (0.002 - 0.009)
Nitrite Nitrogen (mg/L)	0.152 (0.060 - 0.260)
Nitrate Nitrogen (mg/L)	1.260 (0.490 - 2.700)
Total Inorganic Nitrogen (mg/L)	1.83 (0.82 - 3.41)

Total Kjeldahl Nitrogen (mg/L)	0.75 (0.51 - 0.86)
Total Nitrogen (mg/L)	1.95 (1.55 - 2.23)
Orthophosphate Phosphorus (mg/L)	0.159 (0.110 - 0.220)
Total Phosphorus (mg/L)	0.20 (0.14 - 0.26)
Silica (as SiO <sub>2</sub> ) (mg/L)	6.18 (1.40 - 11.00)
Chlorophy ll-a (µg/L)	8.3 (1.7 - 15.0)
E.coli (count/100mL)	160 (23 - 1600)
Faecal Coliforms (count/100mL)	400 (86 - 3000)

- 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 Figure below and the representative WSRs are listed below –

▪ WSR1	▪ Agricultural Land
▪ WSR2	▪ Water Course
▪ WSR3	▪ Fishpond
▪ WSR4	▪ Abandoned Fishpond





#### 4.4 WATER QUALITY IMPACTS AND MITIGATIONS DURING CONSTRUCTION

- Proposed construction works mainly involve excavation of soil, piling and building construction works. During construction phase of the Project, the primary sources of potential impacts to water quality will be from pollutants in site run-off, which may enter surface waters directly or enter storm drains. The primary pollutant will be mainly suspended solids.
- Pre-bored piling works will be adopted for foundation works. Significant amount of water will be used for ground boring and drilling for site investigation or rock/soil anchoring.
- Spillage, hydraulic leakage and runoff from the surface of standby construction equipment during rainy conditions may also release oil and lubricants to the environment if surface runoff is not adequately controlled.
- Sewage generated by the workforce will not be directly disposed of. Instead, chemical toilets will be provided at the work sites. Regular cleansing and servicing of these toilets should be provided for the chemical toilets to maintain their proper operation. No canteen will be provided in the project site.
- Wastewater may also be generated from building construction activities including demolition of existing building, concreting, plastering, internal decoration, cleaning of works and similar activities.
- The potential impacts of land-based construction activities on water quality can be readily controlled by appropriate on-site measures pursuant to the *ProPECC Note PN*

1/94. The applicable measures should be implemented and will be sufficient to control/prevent impacts to the water sensitive receivers in the vicinity of the works area and downstream.

- In particular, the following measures should be properly implemented to mitigate any potential adverse water quality impacts:
  - Recirculate and reuse wastewater generated from onsite facilities, e.g., wheel washing facilities, and piling works, as far as practicable, after sedimentation.
  - Provide and maintain adequately designed treatment system for all wastewater generated on site, including but not limited to runoff, onsite facilities, piling and building construction works, etc., in case disposal is required.
  - Provide and maintain chemical toilets for workers on site.
  - Provide and maintain sufficient drip trays for all generators, oil, chemicals, and chemical waste containers.
- Water discharge license should be obtained for the Project during the entire construction phase. All the requirements and conditions as stipulated on the license shall be followed and complied with.

#### 4.5 WATER QUALITY IMPACTS AND MITIGATIONS DURING OPERATION PHASE

- 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.
- 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-site 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 4.1**. The major parameter of the STP is listed in below -

▪ Total Daily Flow	▪ 77.5m <sup>3</sup> /day
--------------------	---------------------------

▪ Average Hourly Flow (DWF)	▪ 3.23m <sup>3</sup> /hr
▪ Peak Hourly Rate (6 x DWF)	▪ 19.38 m <sup>3</sup> /hr
▪ Size of MBR Tank	▪ 34.97 m <sup>3</sup> /hr
▪ Size of Equalization Tank	▪ 19.38 m <sup>3</sup> /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 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.

- 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	<ul style="list-style-type: none"> <li>• CONCRETE FROM DEMOLITION OF EXISTING PROPERTY</li> <li>• EXCAVATED MATERIALS (EXCLUDING TOPSOIL)</li> </ul>



WASTE TYPE	POSSIBLE WASTE GENERATED FROM THE PROJECT
NON-INERT C&D WASTE	<ul style="list-style-type: none"> <li>• FELLED TREES</li> <li>• REMOVED PLANT</li> <li>• TOPSOIL</li> <li>• DISCARDED FURNITURE</li> <li>• DAMAGED SCAFFOLDING BAMBOO</li> <li>• WOOD FORMWORK</li> <li>• USED PACKAGING MATERIALS</li> </ul>
GENERAL REFUSE	<ul style="list-style-type: none"> <li>• WASTEPAPER</li> <li>• FOOD DEBRIS</li> <li>• PACKAGING MATERIAL</li> </ul>
CHEMICAL WASTE	<ul style="list-style-type: none"> <li>• SPENT LUBRICATING OIL</li> <li>• PAINT</li> </ul>

- 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.

## 6 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
- 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  $L_{10}(1 \text{ hour})$  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

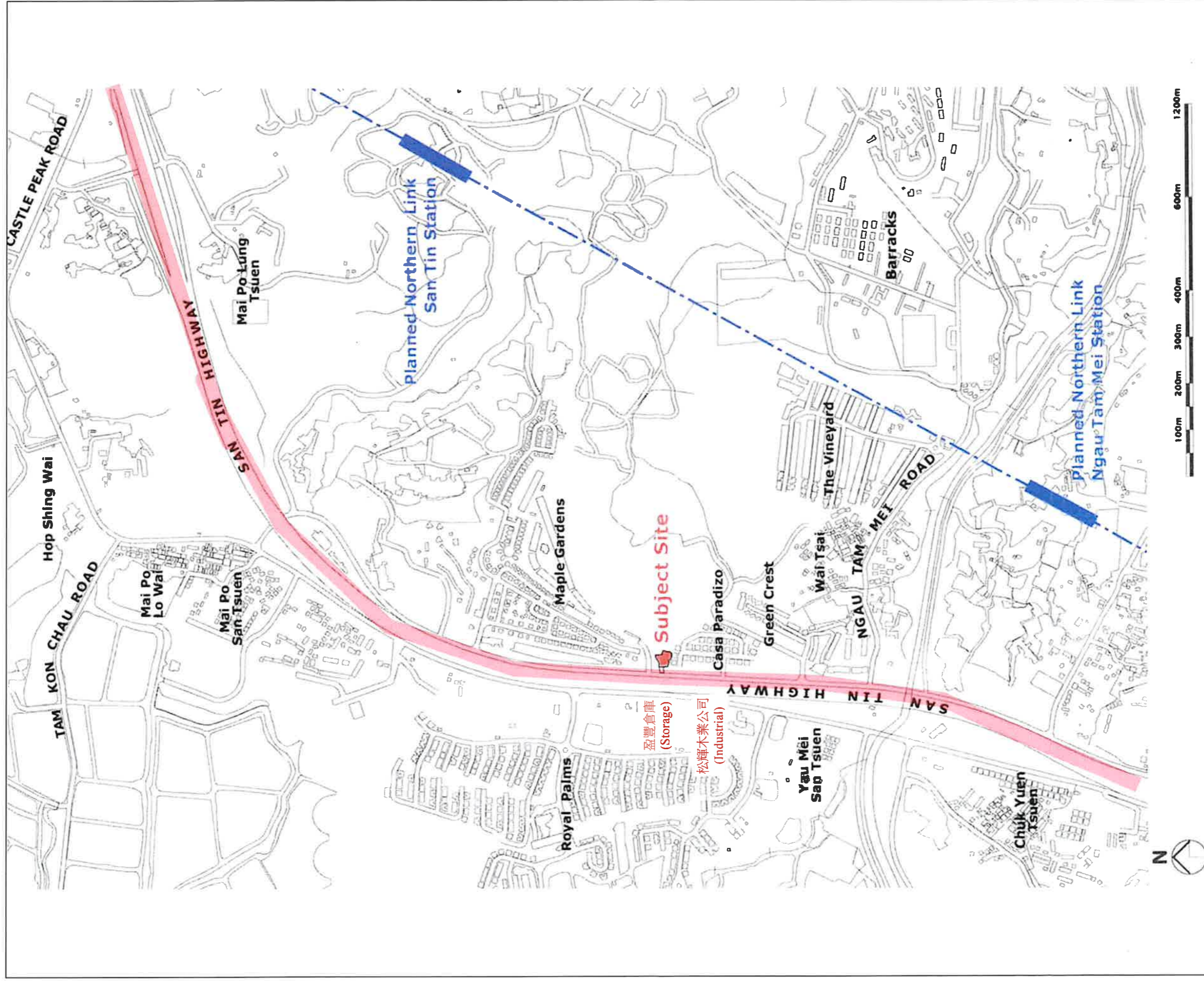
- With a properly designed sewerage and drainage system, no insurmountable water quality impacts would be generated from the construction and operation phases of the Project.

### 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.

**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 TITLE:  
**SITE LAYOUT PLAN AND SURROUNDING ENVIRONMENT**

DRAWING No.:  
**C220410W-01**

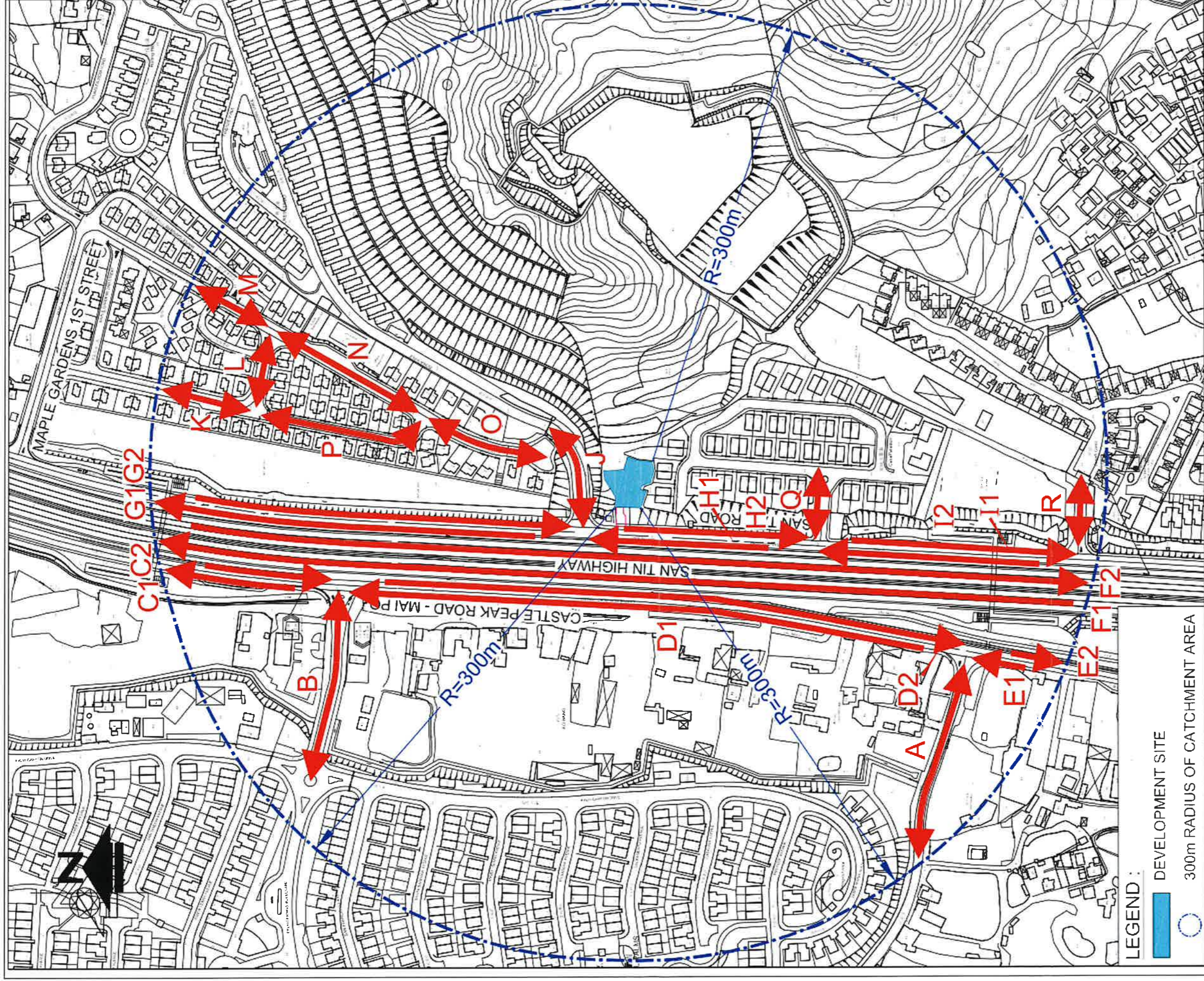
Figure  
**1.1.1**

SCALE:  
**N.T.S.**

REV:  
**A**

LEAD ARCHITECT:		PREPARED BY	Phoenix Lee
ENVIRONMENTAL CONSULTANT:		CHECKED BY	Eddy Ng
		APPROVED BY	Banning Wong





LEGEND:

- DEVELOPMENT SITE
- 300m RADIUS OF CATCHMENT AREA

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

DRAWING No.:  
C220410W-01  
1.1.2

LEAD ARCHITECT:  
*R. Lee Architects (PPL) Ltd*

ENVIRONMENTAL CONSULTANT:



PREPARED BY  
Phoenix Lee

CHECKED BY  
Eddy Ng

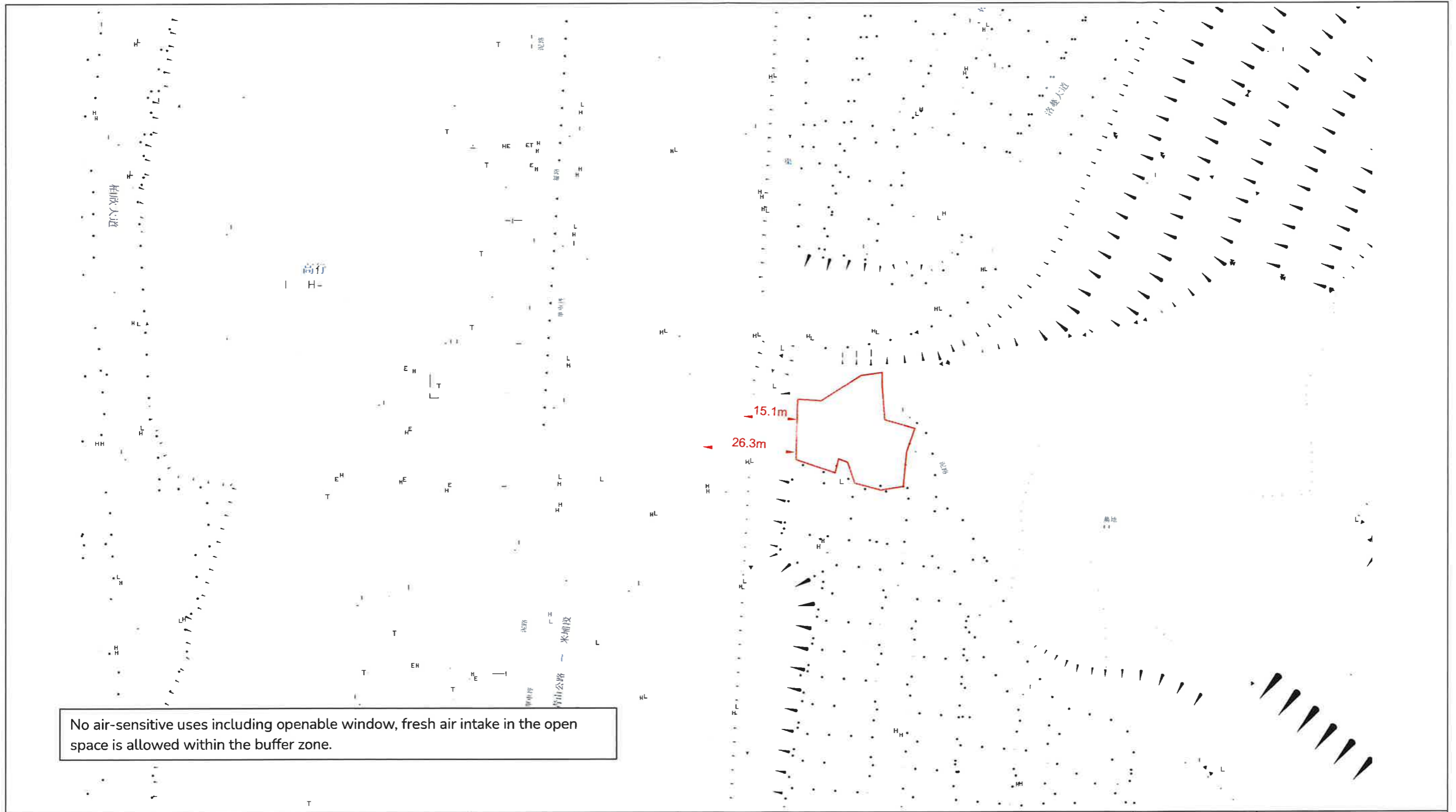
APPROVED BY  
Banting Wong

SCALE:  
N.T.S.

REV:  
A

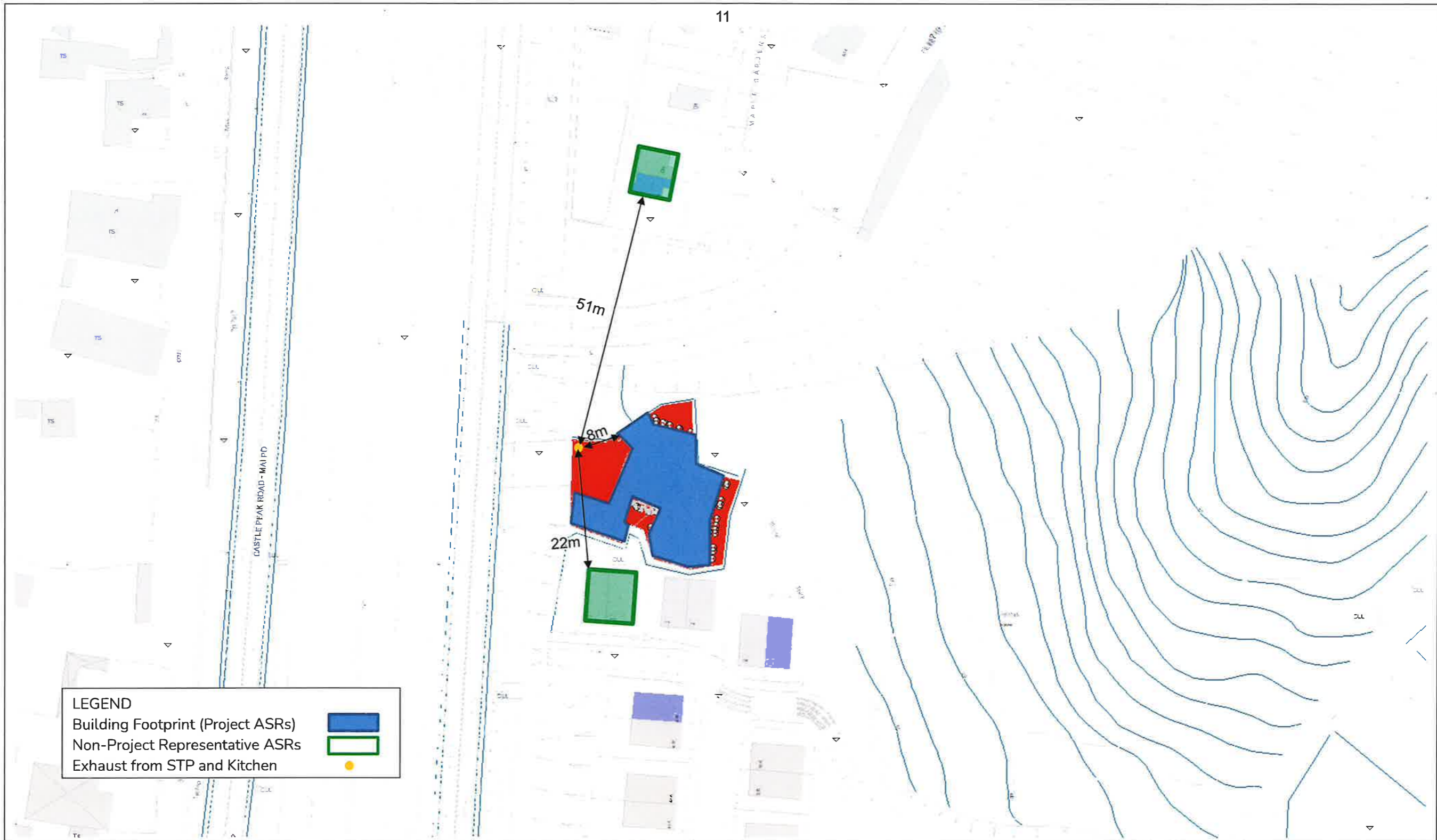


## **APPENDIX 2.1. AIR QUALITY SENSITIVE RECEIVERS & EMISSION SOURCES**



No air-sensitive uses including openable window, fresh air intake in the open space is allowed within the buffer zone.

<p>PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.</p>	<p>DRAWING No.: C220410W-01    Figure 2.1.1</p>		<p>LEAD ARCHITECT: </p>	<p>ENVIRONMENTAL CONSULTANT: </p>	<p>PREPARED BY Phoenix Lee</p>
<p>DRAWING TITLE: REPRESENTATIVE ASRS &amp; BUFFER DISTANCE FROM VEHICLE SOURCES</p>	<p>SCALE: N.T.S.</p>	<p>REV: A</p>			<p>CHECKED BY Eddy Ng</p>
					<p>APPROVED BY Banting Wong</p>

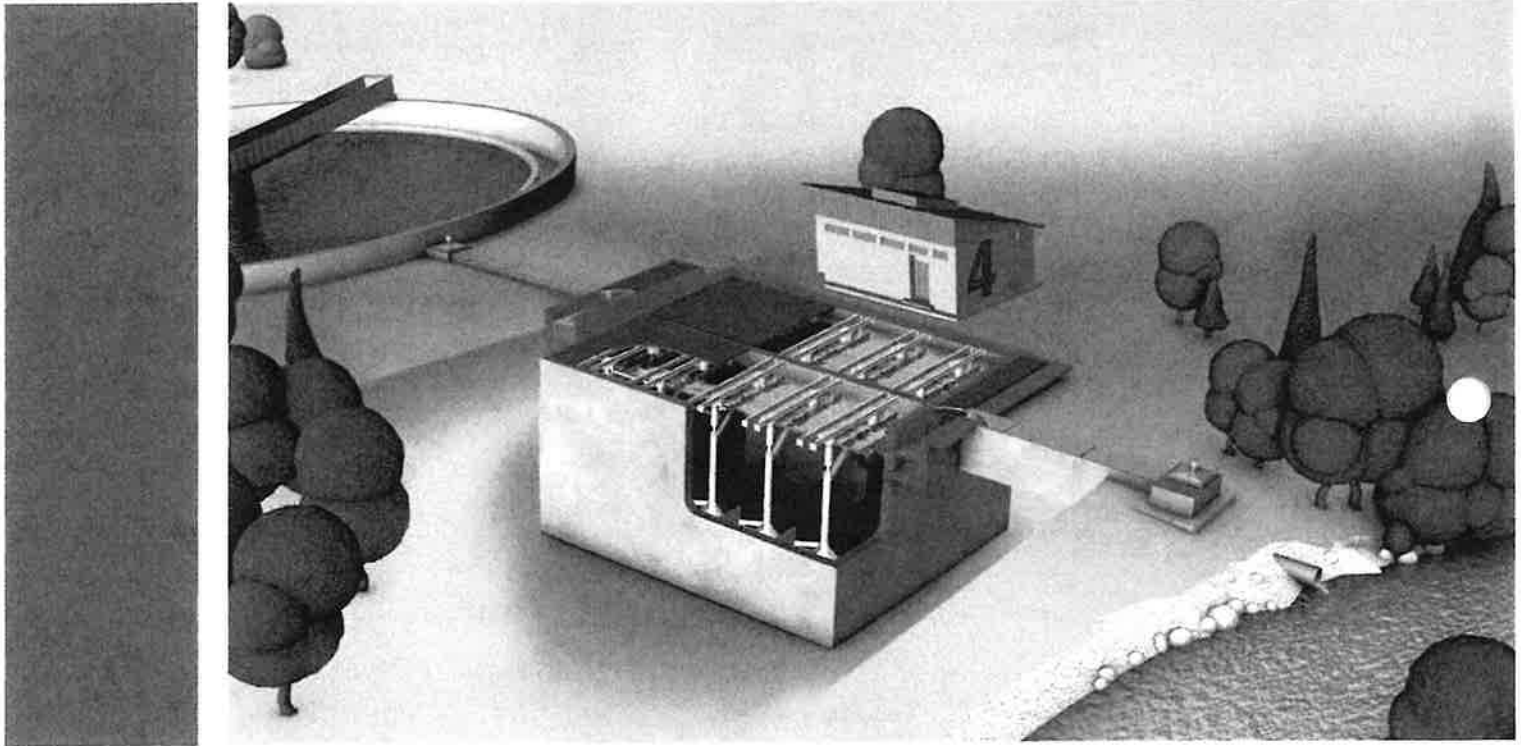


**LEGEND**

- Building Footprint (Project ASRs)
- Non-Project Representative ASRs
- Exhaust from STP and Kitchen

<p><b>PROJECT:</b> PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.</p>	<p><b>DRAWING NO.:</b> C220410W-01 <b>Figure 2.1.2</b></p>	<p><b>LEAD ARCHITECT:</b> <i>R. Lee Architects (HK) Ltd</i></p>	<p><b>ENVIRONMENTAL CONSULTANT:</b> <b>NOVOX</b></p>	<p><b>PREPARED BY</b> Phoenix Lee</p>	<p><b>CHECKED BY</b> Eddy Ng</p>
<p><b>DRAWING TITLE:</b> INDICATIVE LOCATION OF THE EXHAUST OF STP AND KITCHEN</p>	<p><b>SCALE:</b> N.T.S.</p>	<p><b>REV:</b> A</p>		<p><b>APPROVED BY</b> Banting Wong</p>	

## **APPENDIX 2.2. BROCHURE OF THE DEODORIZATION SYSTEM**



## HUBER Active Carbon Filter CONTIFLOW® GAK

- ▶ Simple process for the removal of trace substances (fourth treatment stage)
- ▶ No shutdowns necessary for cleaning
- ▶ Reuse of the activated carbon

More information,  
downloads and  
current news





## The challenge – Our solution

The demands on the effluent quality of municipal and industrial sewage plants are becoming increasingly challenging and complex, particularly with regard to dissolved organic substances.

Especially municipal sewage plant effluents are among the most critical paths of entry for micropollutants into surface waters. Many of these so-called trace substances are hazardous to the environment and health, are not readily biodegradable and can accumulate in the environment.

With the HUBER Active Carbon Filter CONTIFLOW® GAK, HUBER has developed a versatile and reliable key component for the removal of trace substances (fourth treatment stage), which, cleverly combined with the HUBER Pile Cloth Media Filter Rotafilt® or the HUBER Sandfilter CONTIFLOW®, represents an ideally matched process solution.

However, also in industrial wastewater treatment, the HUBER activated carbon filter CONTIFLOW® GAK finds a steadily growing field of application. Especially when it comes to removing dissolved organic COD compounds and pollutants to meet stricter discharge criteria, adsorptive treatment stages with the HUBER Active Carbon Filter CONTIFLOW® GAK are the technology of choice.

## Functional description

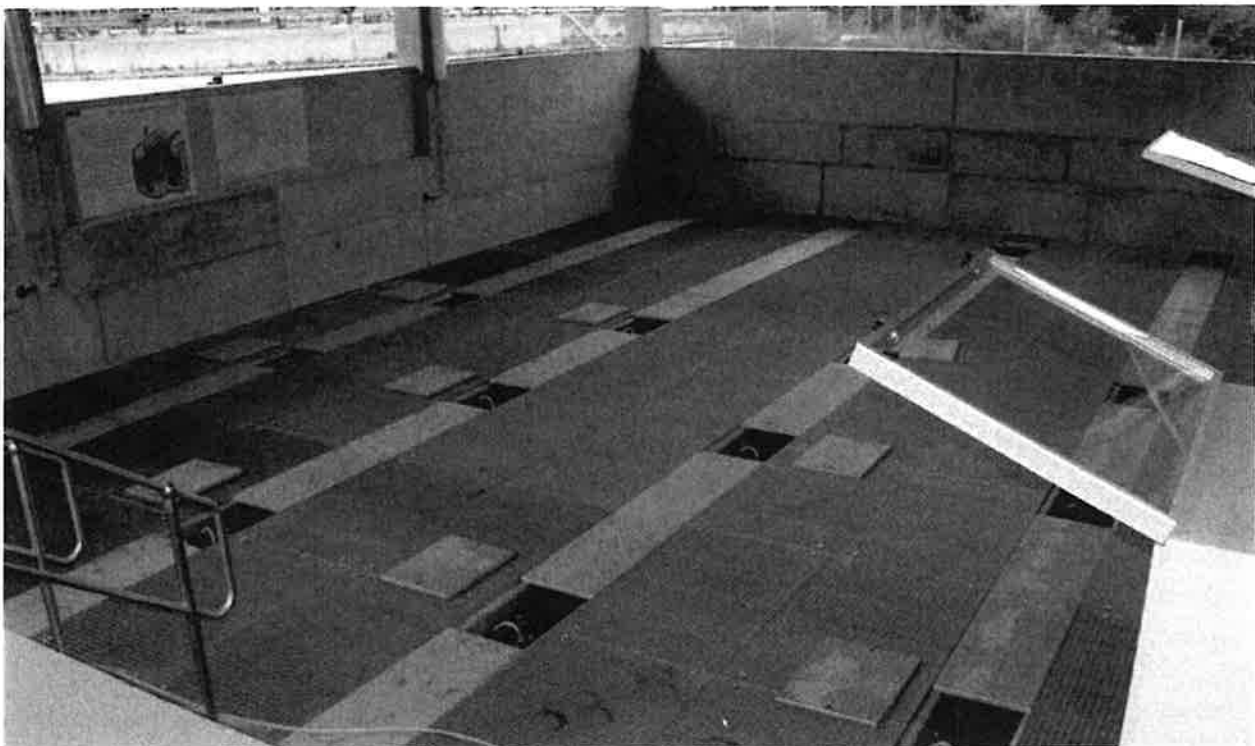
The HUBER Active Carbon Filter CONTIFLOW® GAK is an upflow active carbon adsorber with granulated activated carbon (GAC) as filling. It has a modular design and is available as a stainless steel tank or optionally as concrete construction.

The HUBER Active Carbon Filter CONTIFLOW® GAK is designed for continuous operation. This means that no feed interruptions are necessary for cleaning the activated carbon.

As the inflow slowly streams through the activated carbon bed from bottom to top, dissolved organic particles such as trace substances are adsorbed on the large inner surface of the activated carbon. The purified water flows off via a weir in the upper part of the filter.

As the pressure loss increases, the activated carbon is gently conveyed from the bottom of the hopper into the scrubber located at the top, where it is cleaned from particulate residues. The particles are separated with a small partial flow, the so-called wash water.

The activated carbon, which has been cleaned of solids but is still partially loaded with micropollutants, then falls back down onto the filter bed, creating an internal activated carbon circuit. As operation progresses, the loading on the internal surface of the carbon slowly increases.



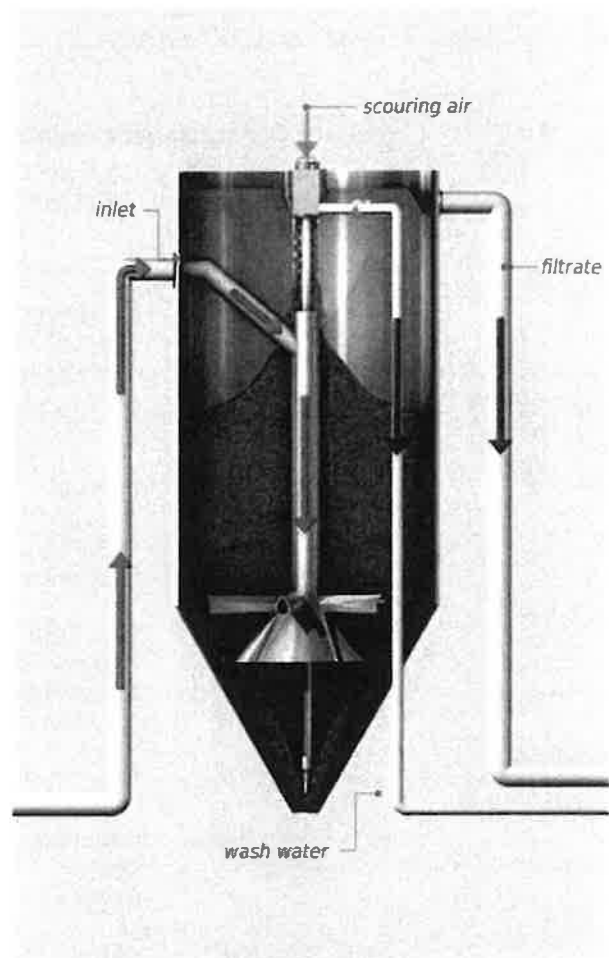
*HUBER Active Carbon Filter CONTIFLOW® GAK (tank design).*

## Applications

- ▶ Adsorption of trace substances in advanced wastewater treatment (fourth treatment stage)
- ▶ Biological secondary filtration for the removal of trace substances following ozonisation (BAC filtration)
- ▶ Removal of dissolved COD compounds in industrial wastewater treatment (process wastewater, recirculation water)

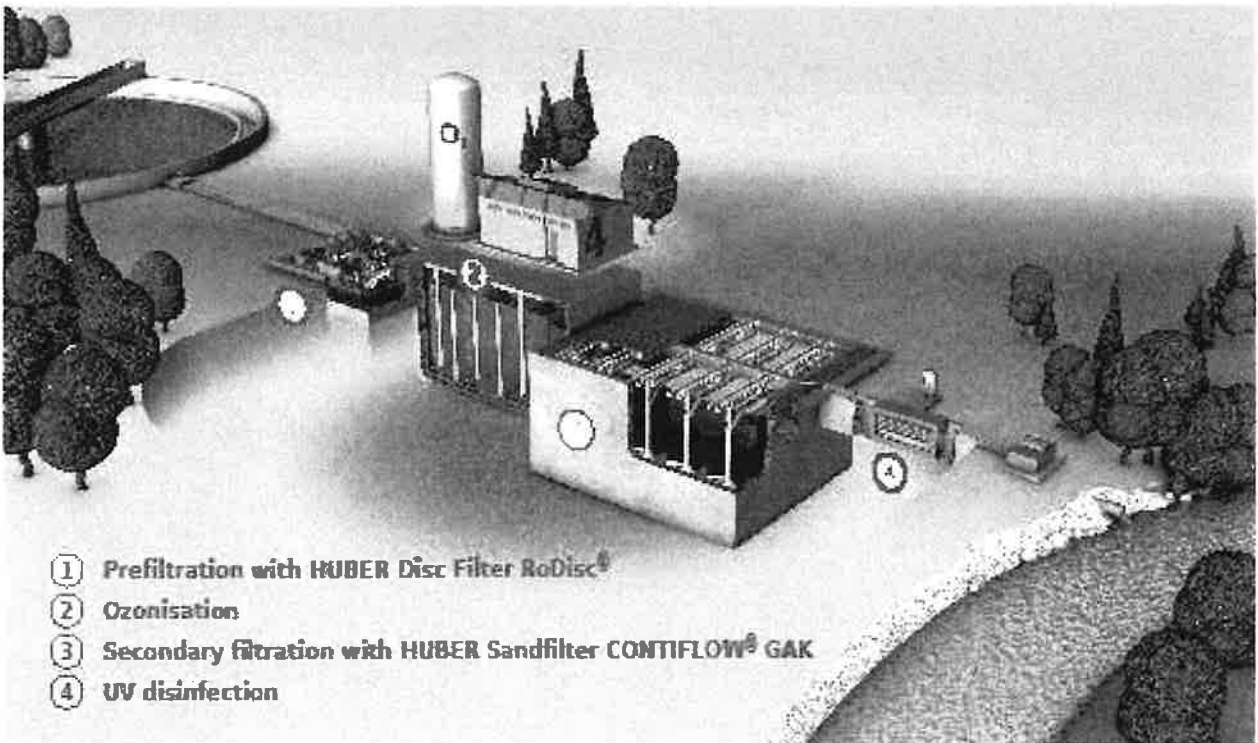
## Filter sizes

	08	50 C	51	72
<b>Filter surface</b>	0.8 m <sup>2</sup>	5.0 m <sup>2</sup>	5.1 m <sup>2</sup>	7.2 m <sup>2</sup>
<b>Max. throughput</b>	8 m <sup>3</sup> /h	35 m <sup>3</sup> /h	35 m <sup>3</sup> /h	50 m <sup>3</sup> /h
<b>Max. air volume</b>	1.0 Nm <sup>3</sup> /h	1.5 Nm <sup>3</sup> /h	1.5 Nm <sup>3</sup> /h	2.5 Nm <sup>3</sup> /h



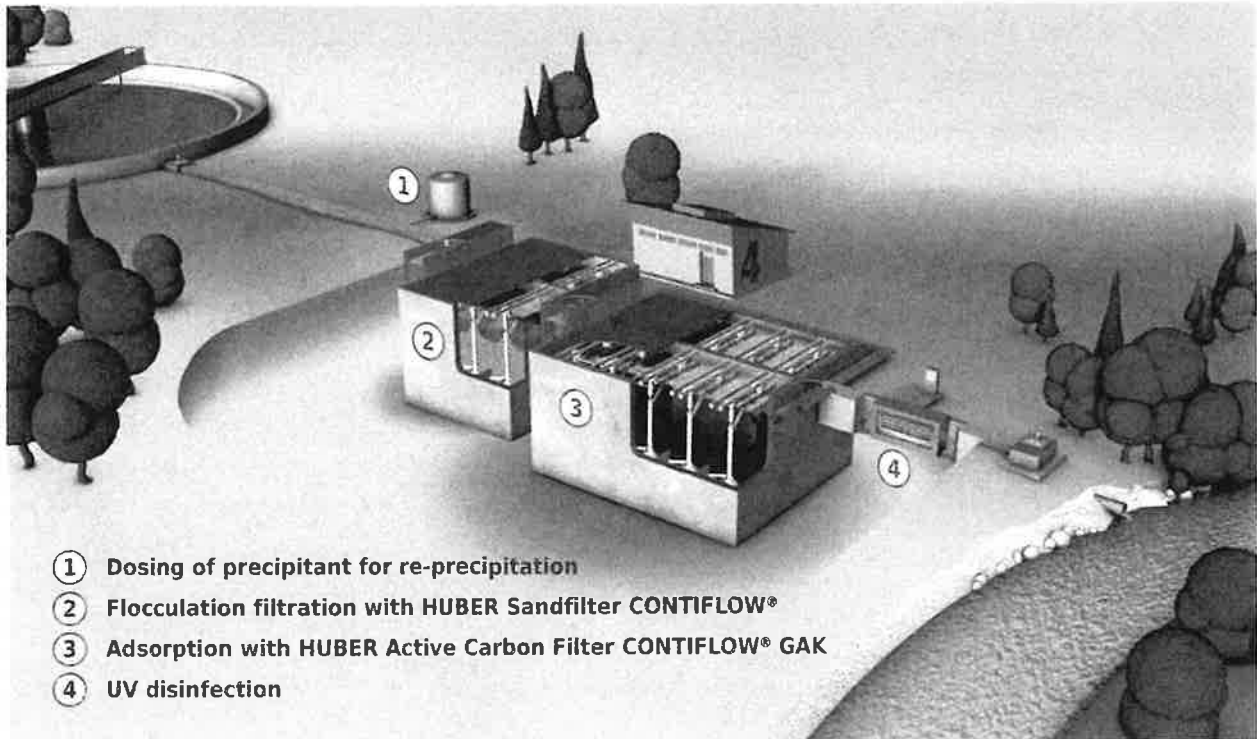
HUBER Active Carbon Filter CONTIFLOW® GAK.

## Solution concepts



- ① Prefiltration with HUBER Disc Filter RoDisc®
- ② Ozonisation
- ③ Secondary filtration with HUBER Sandfilter CONTIFLOW® GAK
- ④ UV disinfection

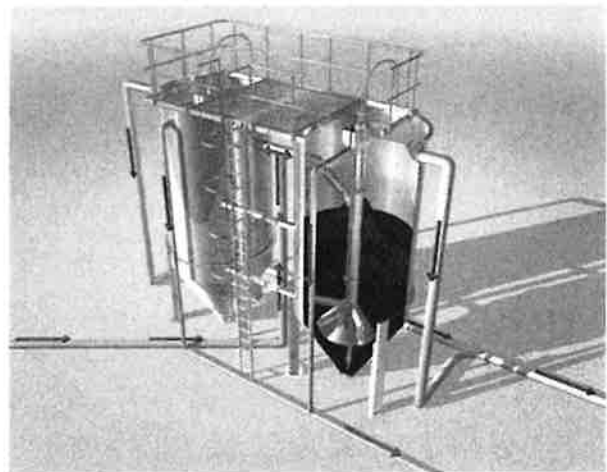
Variant 1: Combination of ozonisation with subsequent activated carbon filtration (GAK), upstream cloth filtration (police filter) and downstream UV disinfection.



*Variant 2: Flocculation filtration for phosphorus elimination with subsequent activated carbon filtration (GAK) and downstream UV disinfection.*

## All advantages at a glance

- ▶ Easy to retrofit on existing sewage treatment plants due to modular design
- ▶ No complex carbon dosing technology as with PAC processes
- ▶ No dirt and dust loads as with PAC processes
- ▶ No precautions for explosion protection as with PAC processes
- ▶ No secondary filtration required as with PAC processes
- ▶ No shutdowns necessary for cleaning the activated carbon bed
- ▶ Activated carbon can be regenerated and largely reused



*HUBER Active Carbon Filter CONTIFLOW® GAK (tank design).*

### HUBER SE

Industriepark Erasbach A1 | 92334 Berching  
 Phone: +49 8462201-0 | info@huber.de  
[www.huber.de](http://www.huber.de)

HUBER Active Carbon Filter CONTIFLOW® GAK  
 Subject to technical modification | 0,1 / 3 – 5.2022 – 4.2018

## **APPENDIX 2.3. BROCHURE OF THE GREASE FILTER**

ALL STAINLESS GREASE FILTER

# PLUS ONE & PLUS ONE SUPER

除油率  
Oil removal  
89.27%



加

一

超

級

加

一

使用不銹鋼製的廚房油煙網  
使廚房更安全、更舒適

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

## KAWASHO

日本廚房工業會  
的認定品。  
適合總類各消防  
器具有關除去油  
煙的厚則。日本  
廚房工業會認可  
商標。請以安心  
使用。

JAPAN KITCHEN SPACE  
EQUIPMENT ASSOCIATION

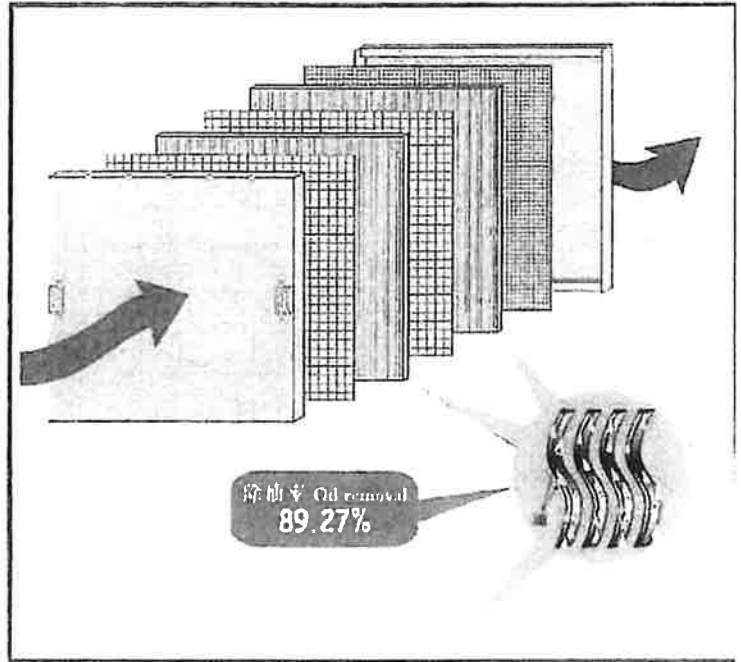


## 「超級加一」及「加一」的油濾光片

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

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

(特許取得 第3141063號)



## 「超級加一」及「加一」的6個特性優秀點

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



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

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

## **Specification :-**

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

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

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

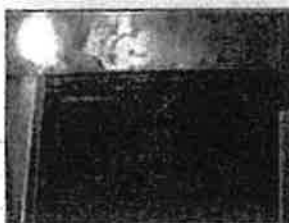
## **GUIDELINES ON FIRE PREVENTION**

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

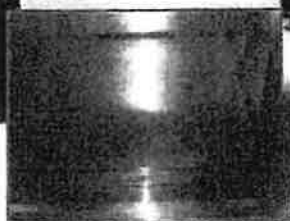
## **INEFFICIENT SUCTION AND RETENTION OF OIL IN THE FUMES**

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

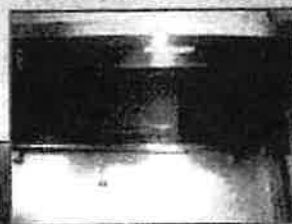
Due to the poor retention of oil by the filter, the filter clogs easily, Causing Oxidation. To overcome all the above problem, our company, the Totaru Plan (m) Sdn. Bhd, has invented the latest state-of-the art cooker hood. It is super efficient in oil retention and provides the highest standard in ventilation.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



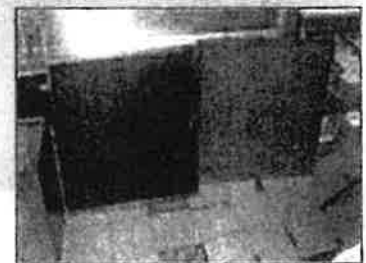
• Before Installation  
未安裝 Kawasho 隔油煙網前



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

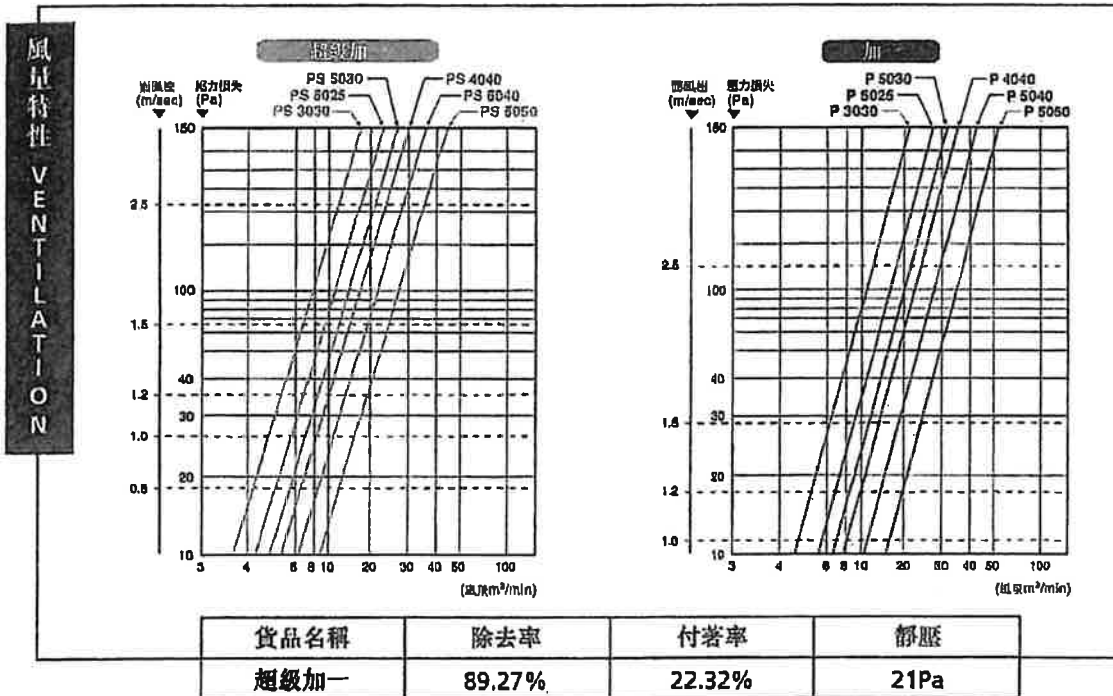


• Air duct and hood are still in  
clean condition  
風槽及煙罩內能仍然保持清潔



• Front and rear of Filter  
隔油網的前後面

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



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

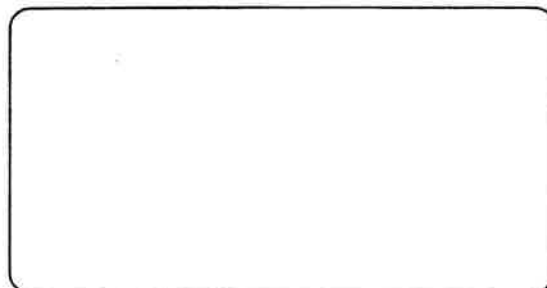
生產商  
川鉄商事株式会社  
Tel : 03-5203-5141

總部  
株式会社  
Tel : 045-471-8800

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

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

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



# GREASE COOL & FILTER CLEANER

**SUPER GREASE FILTER POWDER CLEANER**

**STAINLESS GREASE FILTER CLEANER**

超力油煙網清潔粉劑

不銹鋼油煙網清潔劑



業用ステンレ製グリマフィルター

Yokohama, Japan

## DIRECTIONS FOR USE 使用方法

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

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

TOTARU PLAN (HK) LTD.

# TOTARU G.F.BOX

Stainless Steel Grease Filter Cleaning Box

不銹鋼隔油網清潔箱



業務用ステンレ製箱

Yokohama, Japan



STAINLESS STEEL BOX

規格

SPECIFICATIONS

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

TOTARU PLAN (HK) LTD.

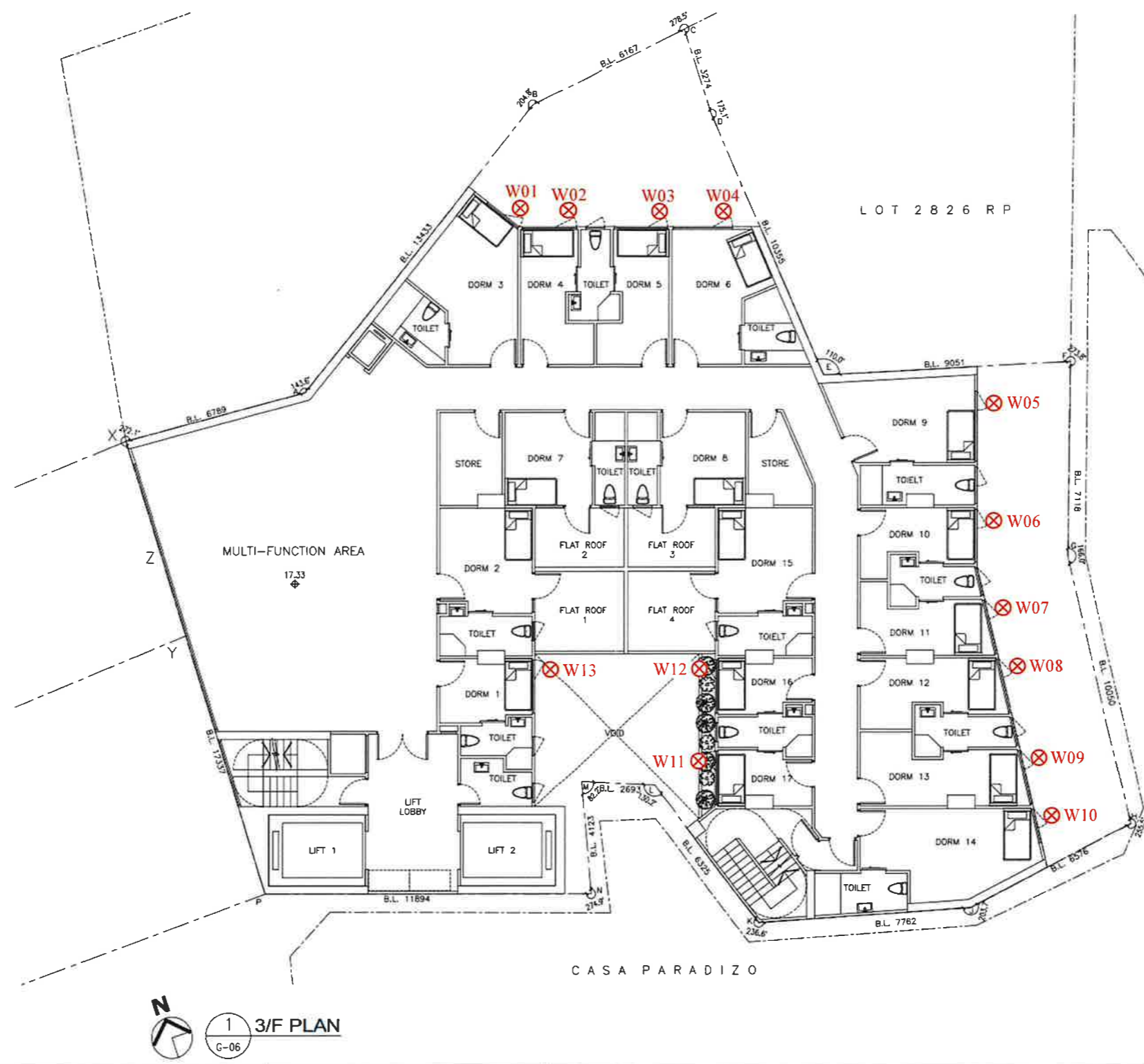
## **APPENDIX 3.1. TRAFFIC NOISE IMPACT ASSESSMENT**



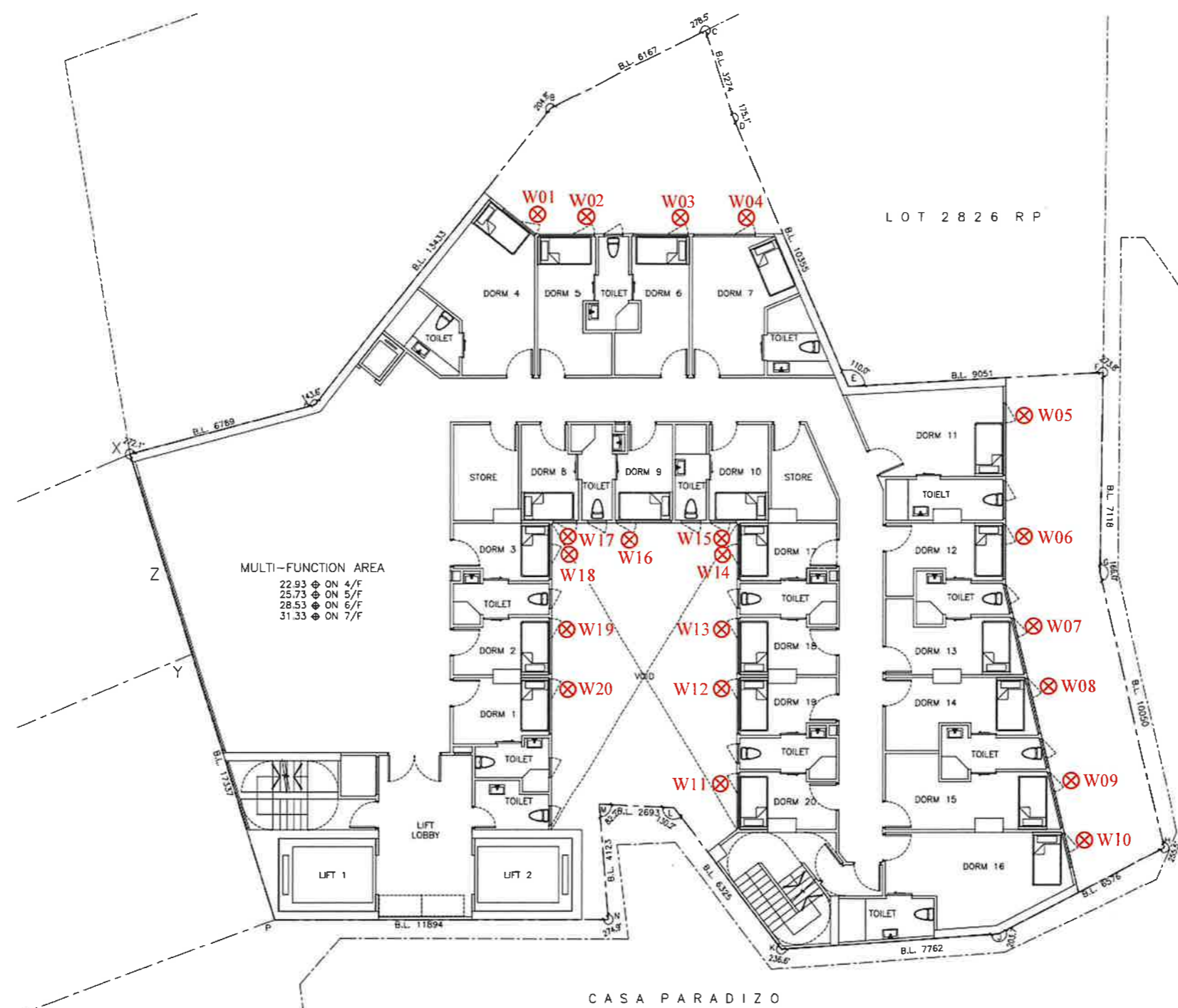


PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.		DRAWING No.: C220410W-01 Figure 3.1.1		LEAD ARCHITECT: 		ENVIRONMENTAL CONSULTANT: 		PREPARED BY Phoenix Lee
DRAWING TITLE: REPRESENTATIVE NOISE SENSITIVE RECEIVERS FOR TRAFFIC NOISE IMPACT ASSESSMENT (2/F)		SCALE: 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: 		ENVIRONMENTAL CONSULTANT: 		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** TYPICAL FLOOR PLAN PLAN  
G-07

<p>PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.</p>	<p>DRAWING No.: C220410W-01 Figure 3.1.3</p>	<p>LEAD ARCHITECT: <i>R. Lee Architects (HK) Ltd</i></p>	<p>ENVIRONMENTAL CONSULTANT: <b>OVOX</b></p>	<p>PREPARED BY Phoenix Lee</p>
<p>DRAWING TITLE: REPRESENTATIVE NOISE SENSITIVE RECEIVERS FOR TRAFFIC NOISE IMPACT ASSESSMENT (4/F TO 7/F TYPICAL)</p>	<p>SCALE: N.T.S.</p>	<p>REV: A</p>		<p>CHECKED BY Eddy Ng</p>
				<p>APPROVED BY Banting Wong</p>

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		
4F	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		
5F	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

DRAWING TITLE:  
 REPRESENTATIVE NOISE SENSITIVE RECEIVERS FOR TRAFFIC NOISE  
 IMPACT ASSESSMENT (4/F TO 7/F TYPICAL)

SCALE:  
 N.T.S.

REV:  
 A

LEAD ARCHITECT:



ENVIRONMENTAL CONSULTANT:

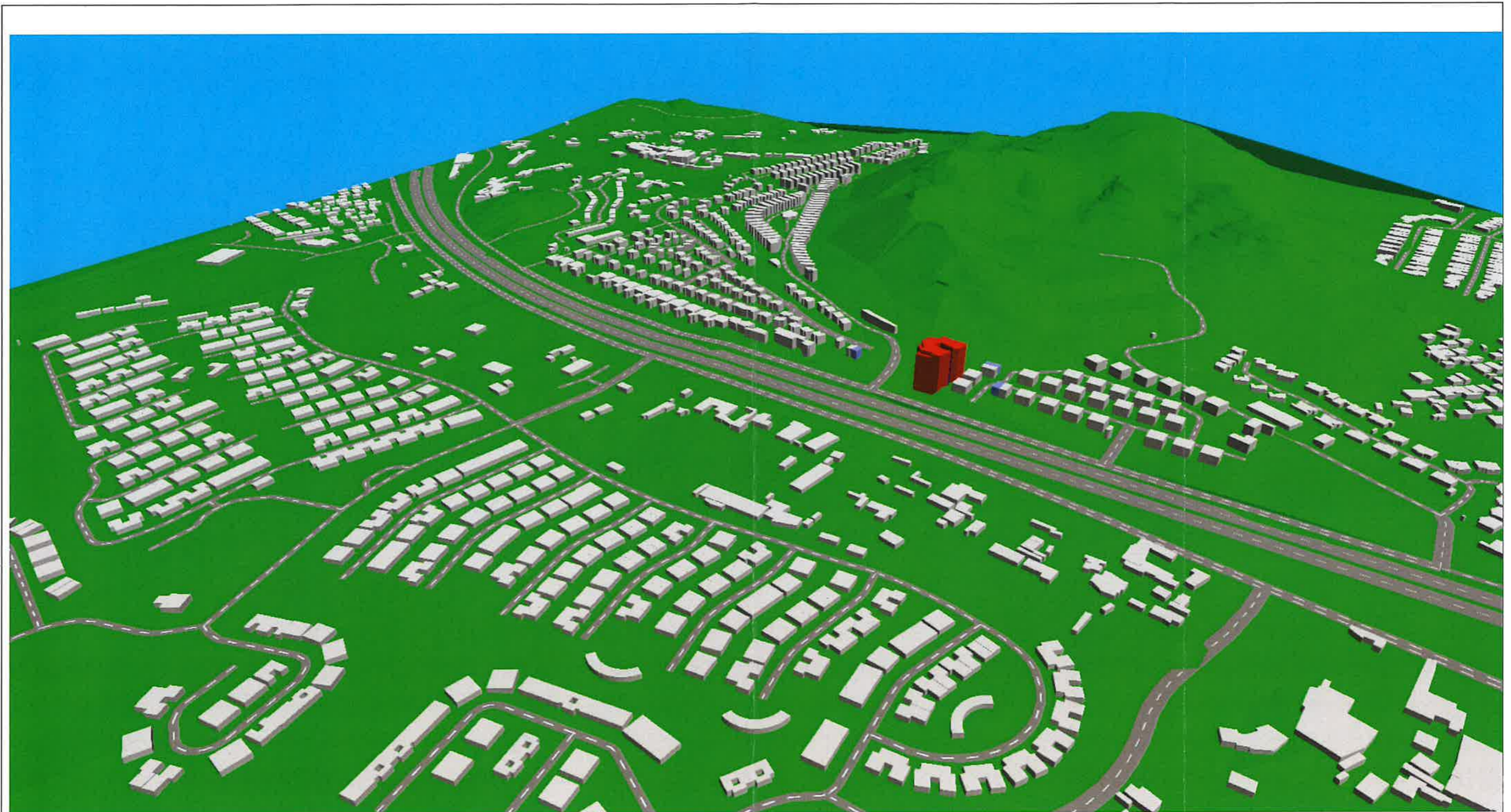


PREPARED BY Phoenix Lee

CHECKED BY Eddy Ng

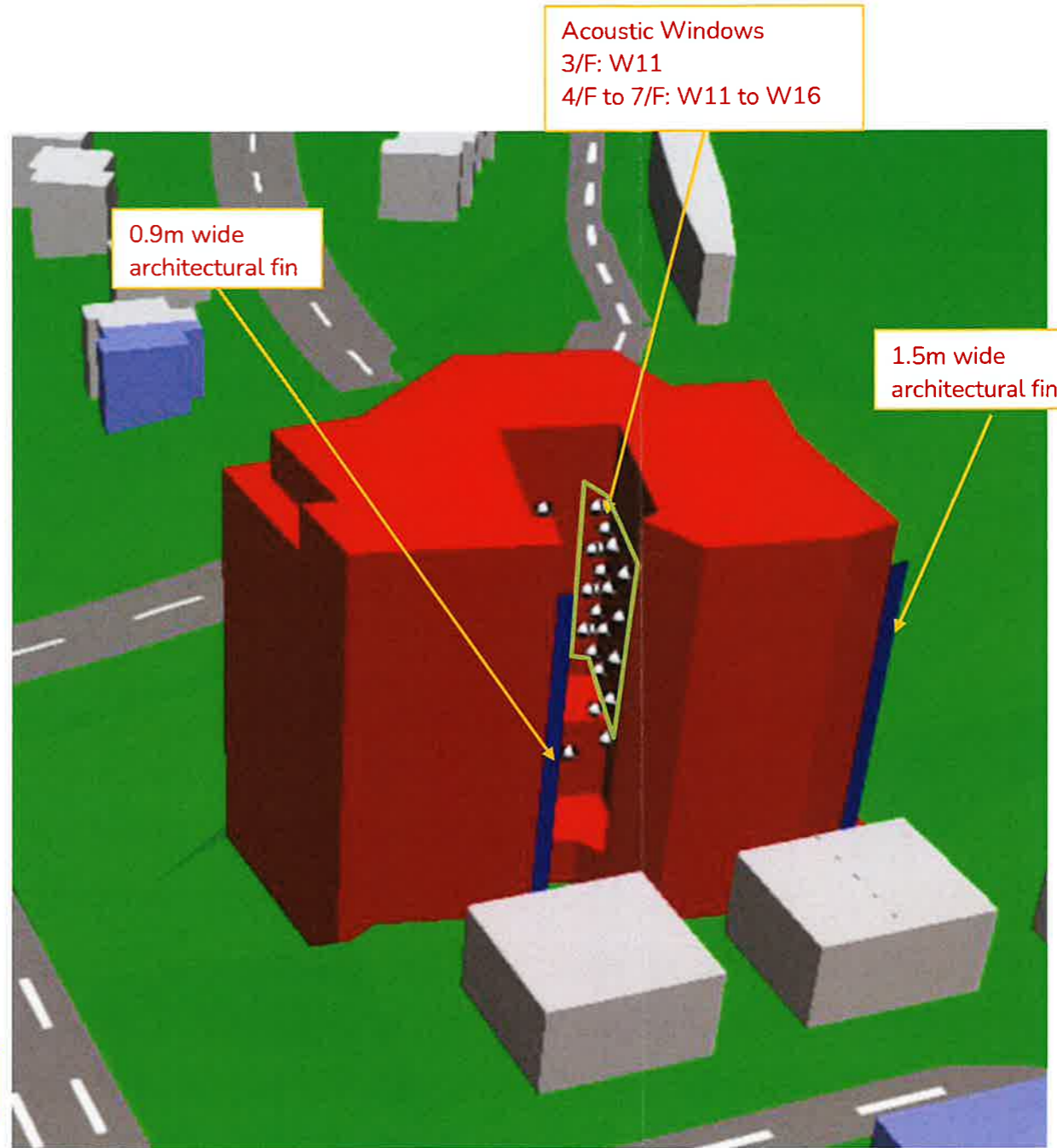
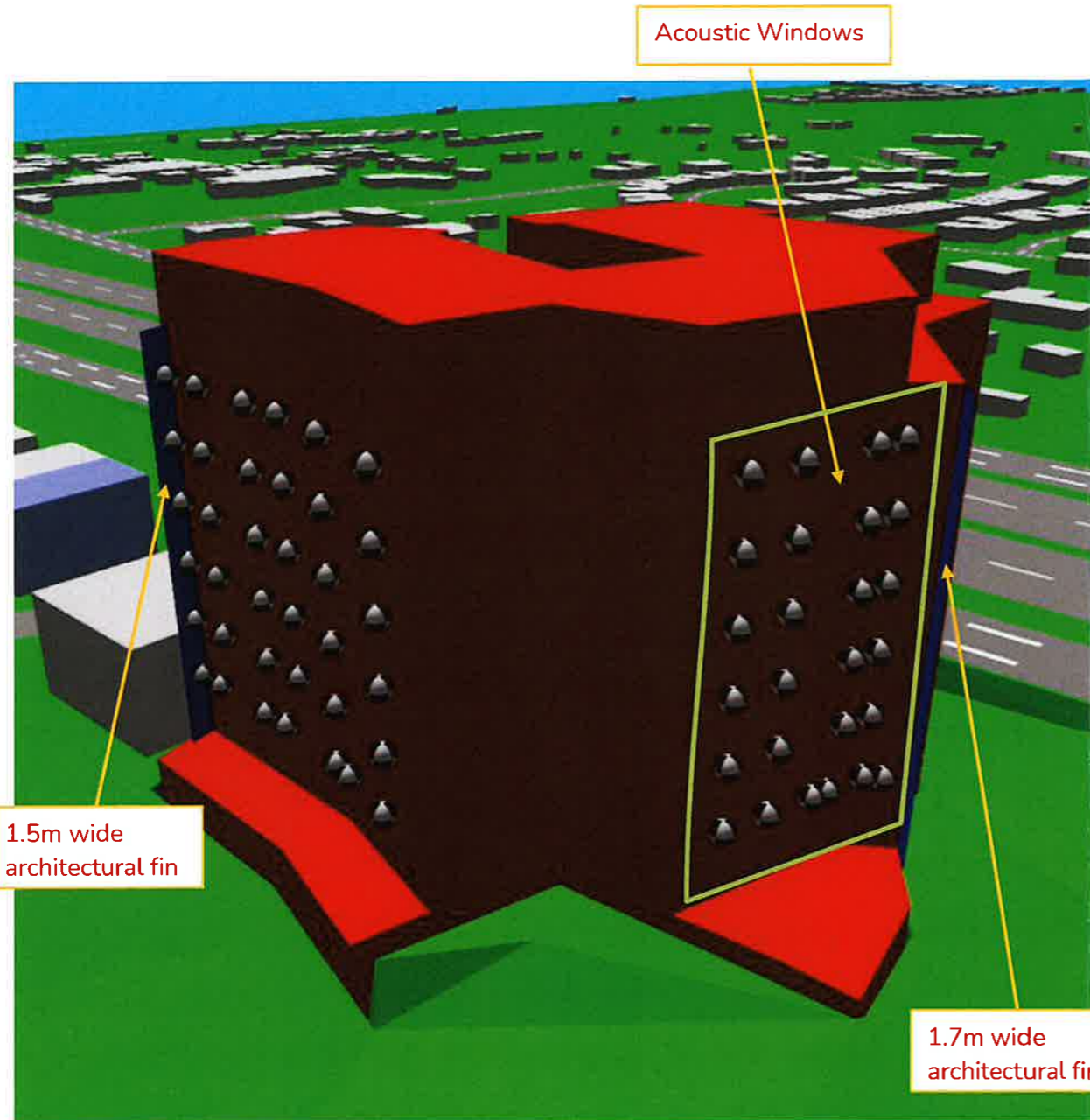
APPROVED BY Banting Wong







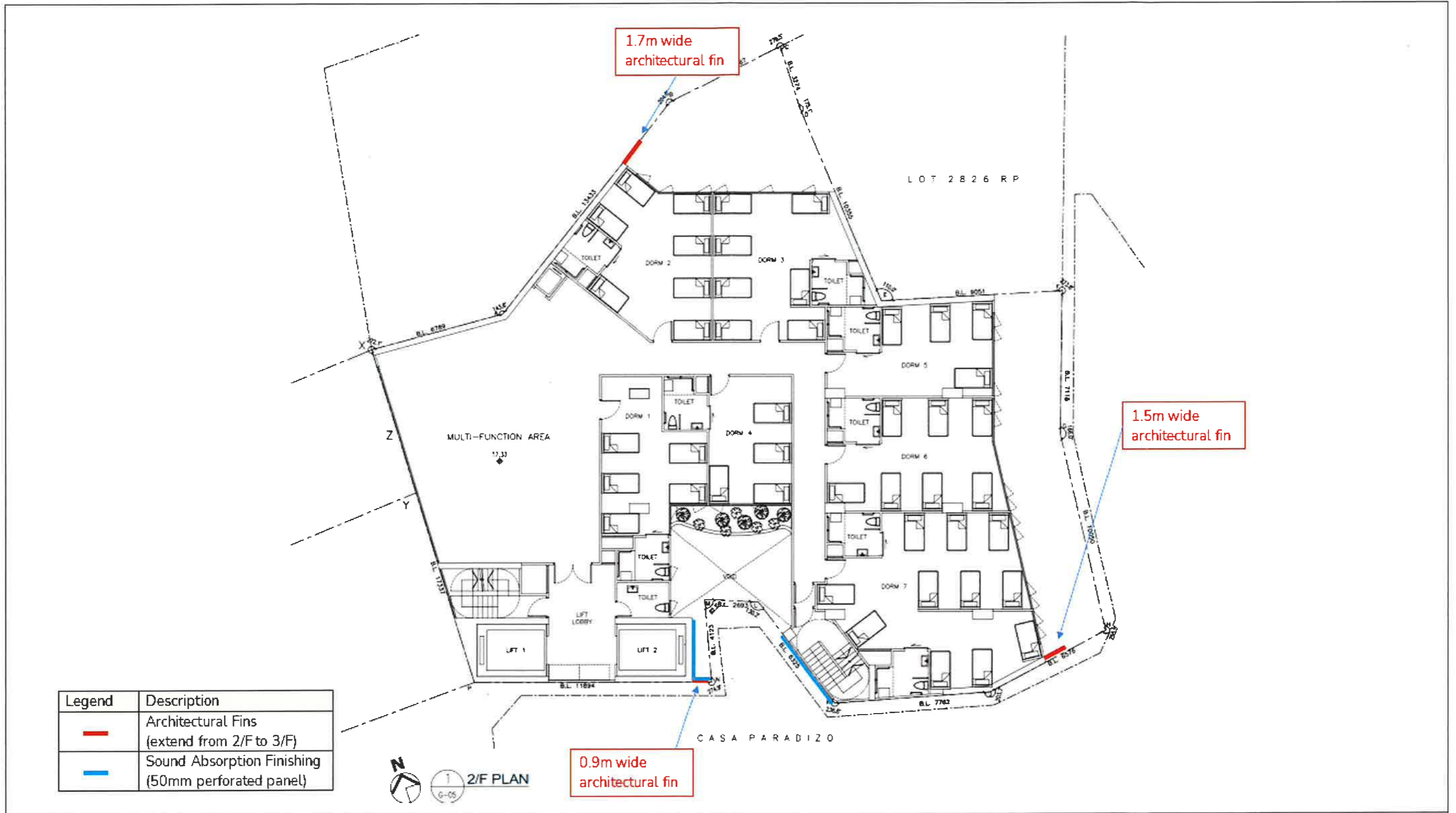
<p>PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.</p>	<p>DRAWING NO.: C220410W-01    Figure 3.1.4</p>	<p>LEAD ARCHITECT: <i>R. Lee Architects (HK) Ltd</i></p>	<p>PREPARED BY Phoenix Lee</p>
<p>DRAWING TITLE: 3D VIEW OF NOISE MODEL, NOISE SOURCES AND REPRESENTATIVE NSRS</p>	<p>SCALE: N.T.S.</p>	<p>REV: A</p>	<p>ENVIRONMENTAL CONSULTANT: <b>OVOX</b> CHECKED BY Eddy Ng</p>
			<p>APPROVED BY Banting Wong</p>



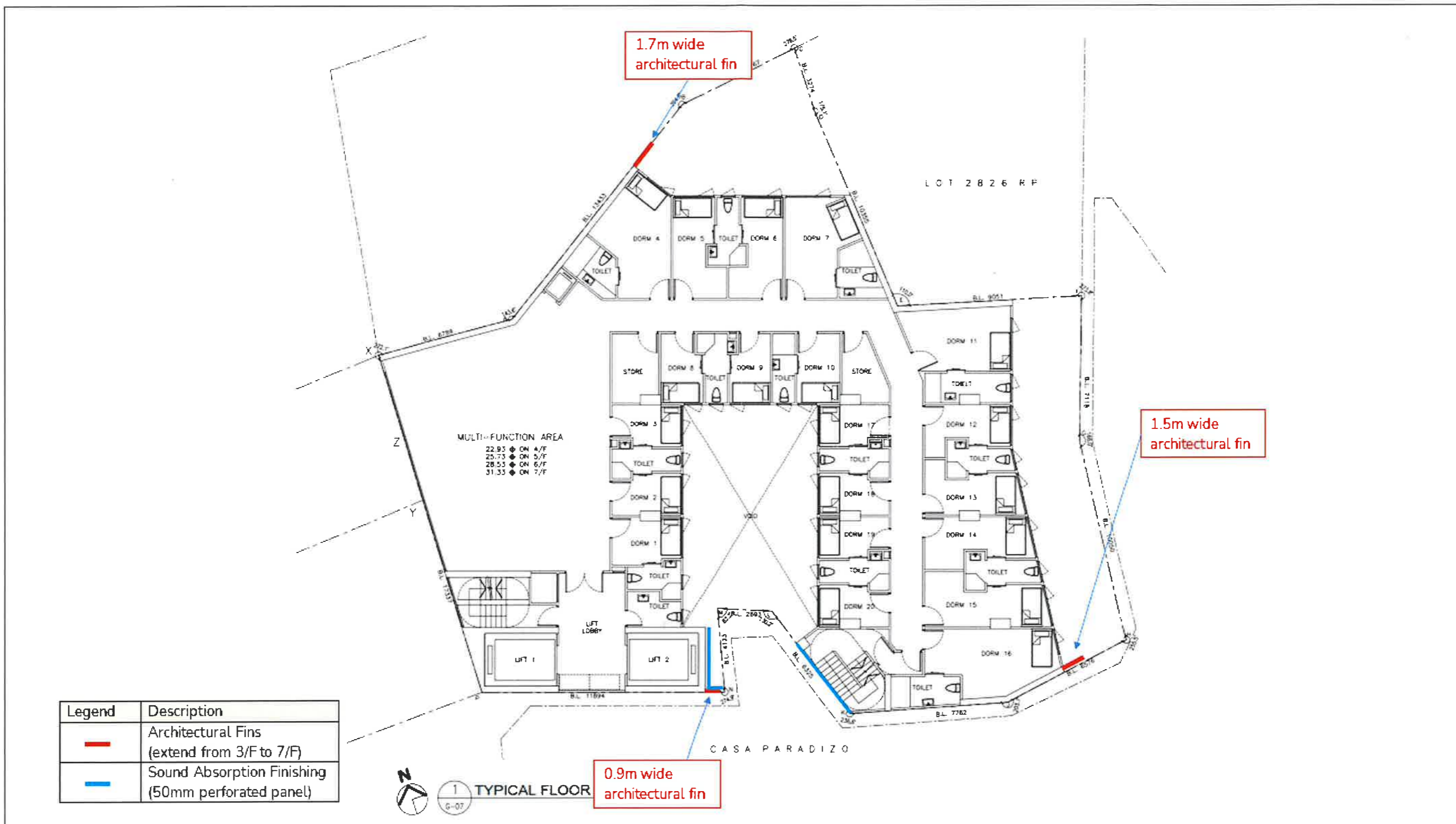


PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING NO.: C220410W-01    Figure 3.1.5		LEAD ARCHITECT: 	ENVIRONMENTAL CONSULTANT: 	PREPARED BY Phoenix Lee
	DRAWING TITLE: 3D VIEW OF NOISE MITIGATION MEASURES	SCALE: N.T.S.			REV: A
APPROVED BY Banting Wong					

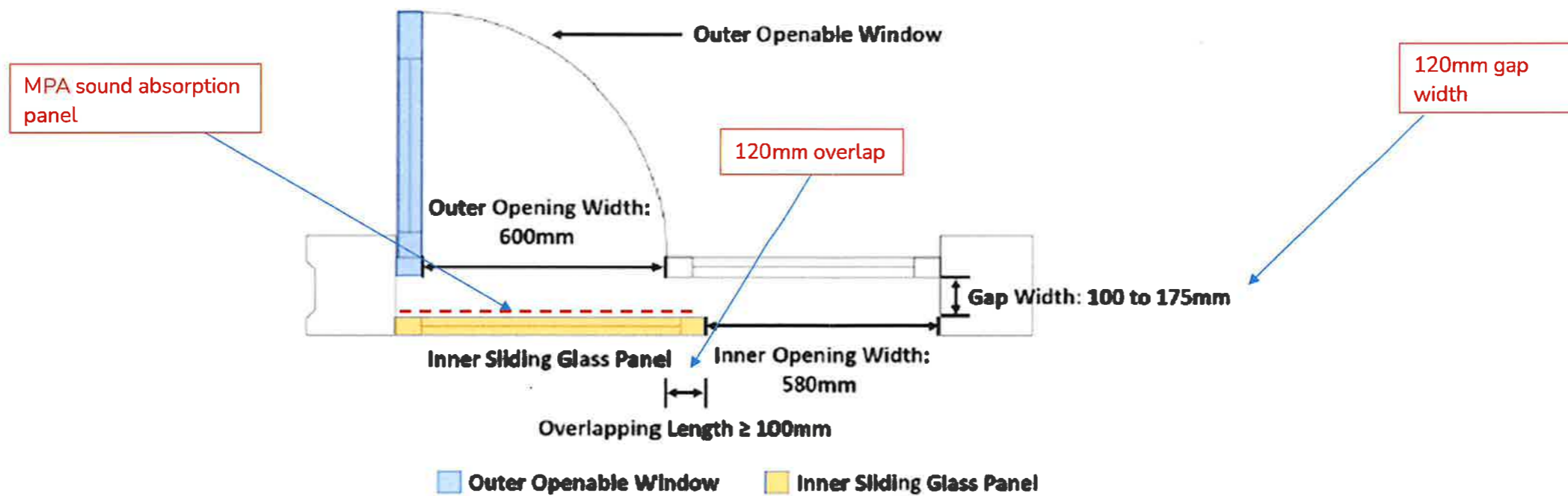
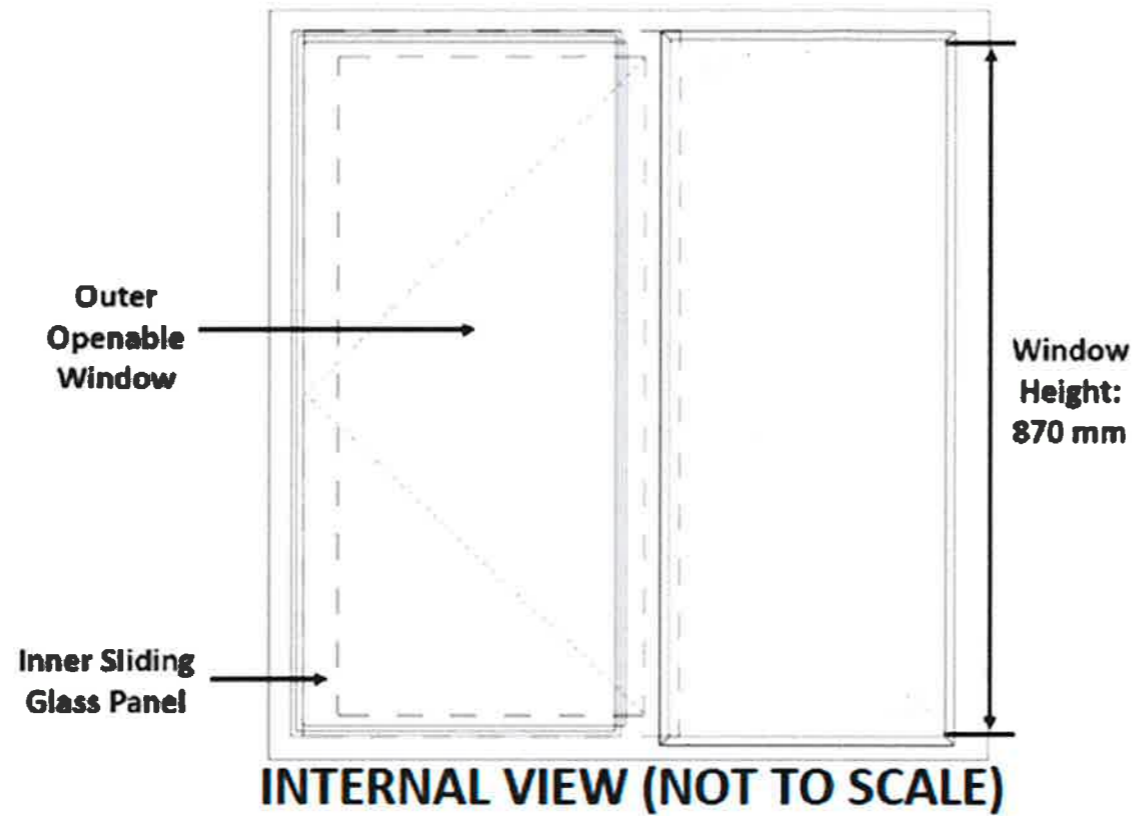




PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING No.: C220410W-01    Figure 3.1.6		LEAD ARCHITECT: 	ENVIRONMENTAL CONSULTANT: 	PREPARED BY Phoenix Lee	
	DRAWING TITLE: ACOUSTIC MITIGATION MEASURES FOR ROAD TRAFFIC NOISE (2/F)	SCALE: N.T.S.	REV: A			CHECKED BY Eddy Ng
						APPROVED BY Banting Wong

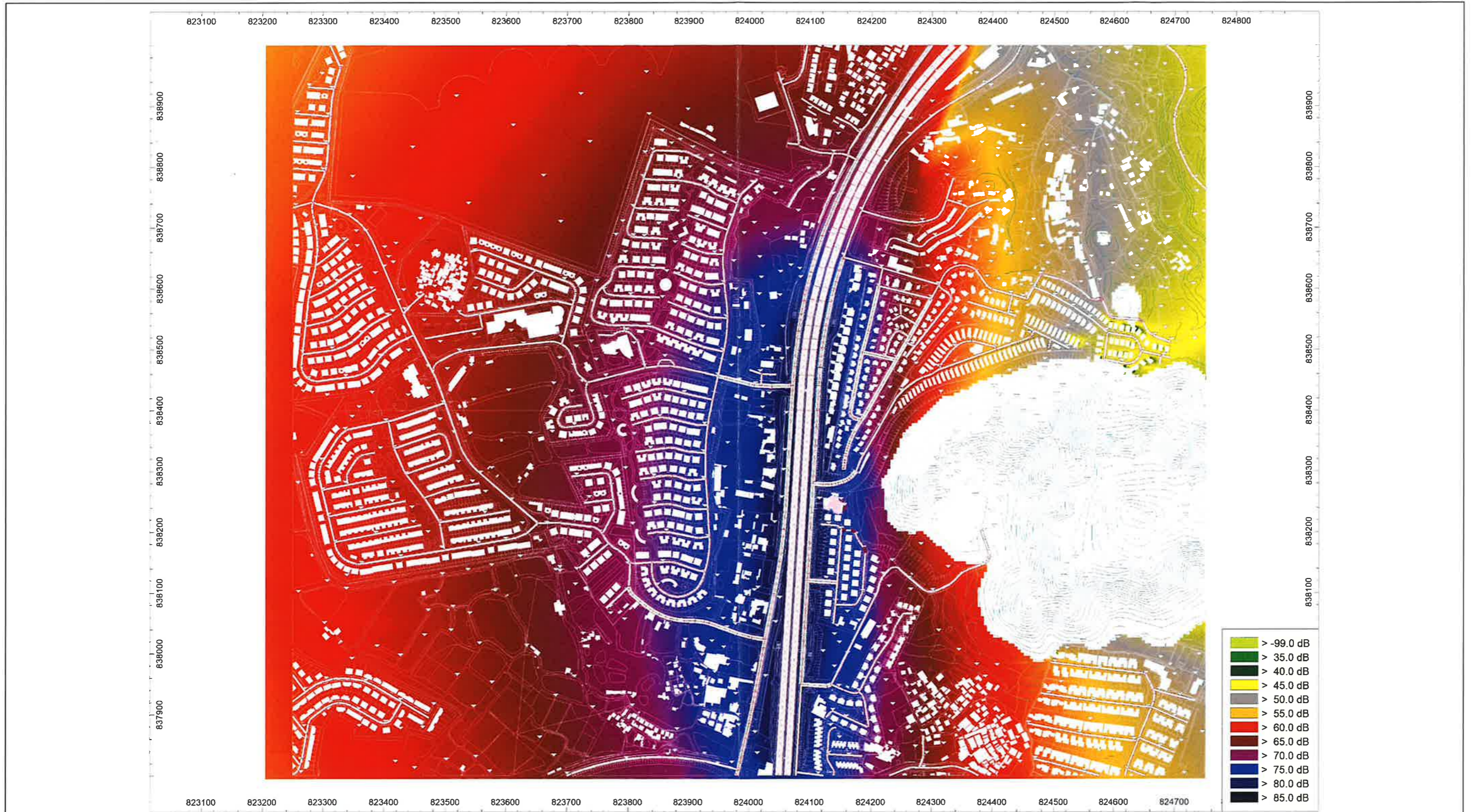


PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING No.: C220410W-01 Figure 3.1.7		LEAD ARCHITECT: 	ENVIRONMENTAL CONSULTANT: 	PREPARED BY Phoenix Lee
	DRAWING TITLE: ACOUSTIC MITIGATION MEASURES FOR ROAD TRAFFIC NOISE (3/F to 7/F)	SCALE: N.T.S.			REV: A
			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 3.1.8		LEAD ARCHITECT: 	ENVIRONMENTAL CONSULTANT: 	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	



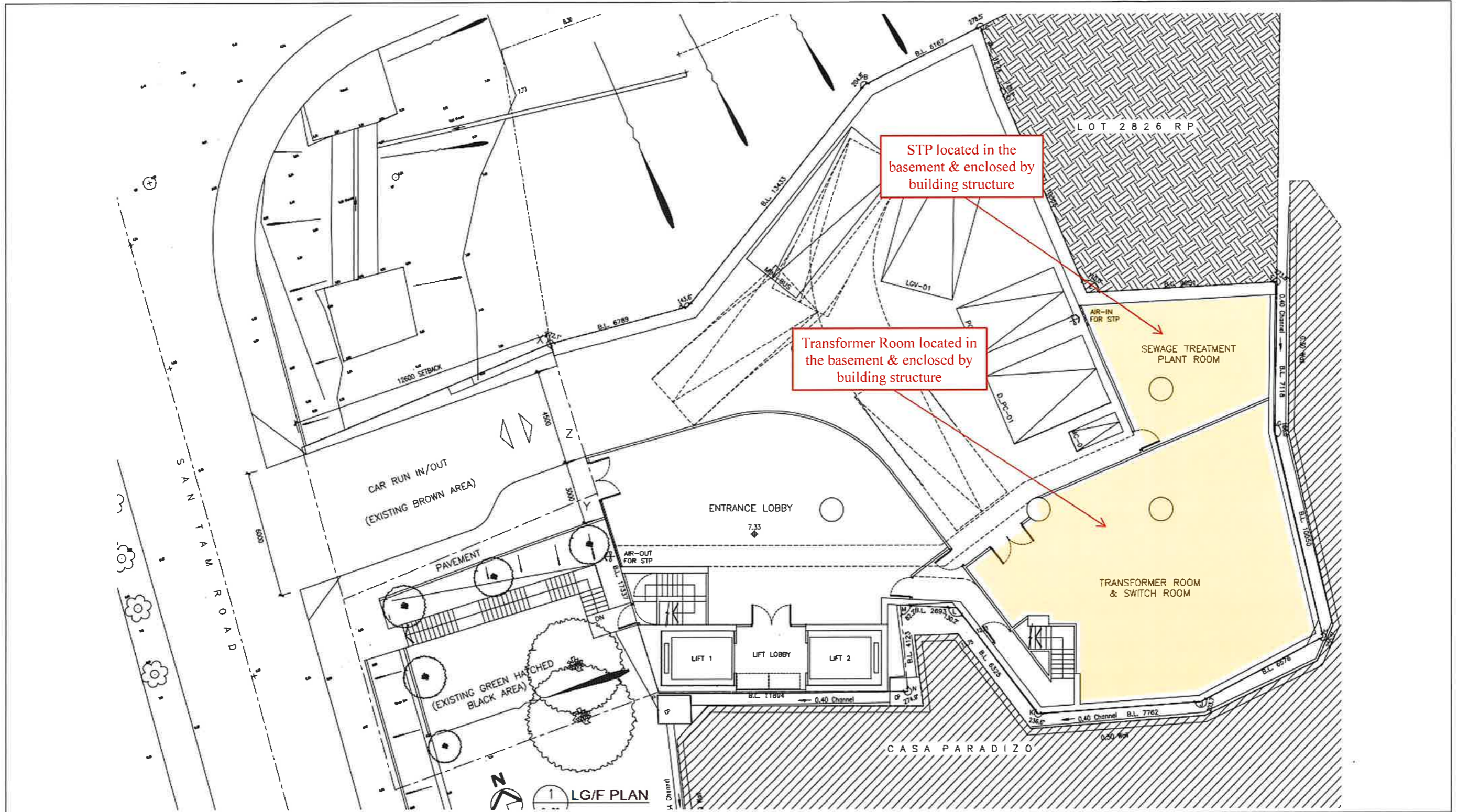


<p>PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.</p>	<p>DRAWING No.: C220410W-01    Figure 3.1.9</p>	<p>LEAD ARCHITECT: <i>R. Lee Architects (HK) Ltd</i></p> <p>ENVIRONMENTAL CONSULTANT: <b>OVOX</b></p>	<p>PREPARED BY Phoenix Lee</p>	<p>CHECKED BY Eddy Ng</p>
<p>DRAWING TITLE: NOISE CONTOUR OF ROAD TRAFFIC NOISE IMPACT (MITIGATED)</p>	<p>SCALE: N.T.S.</p>	<p>REV: A</p>	<p>APPROVED BY Banting Wong</p>	



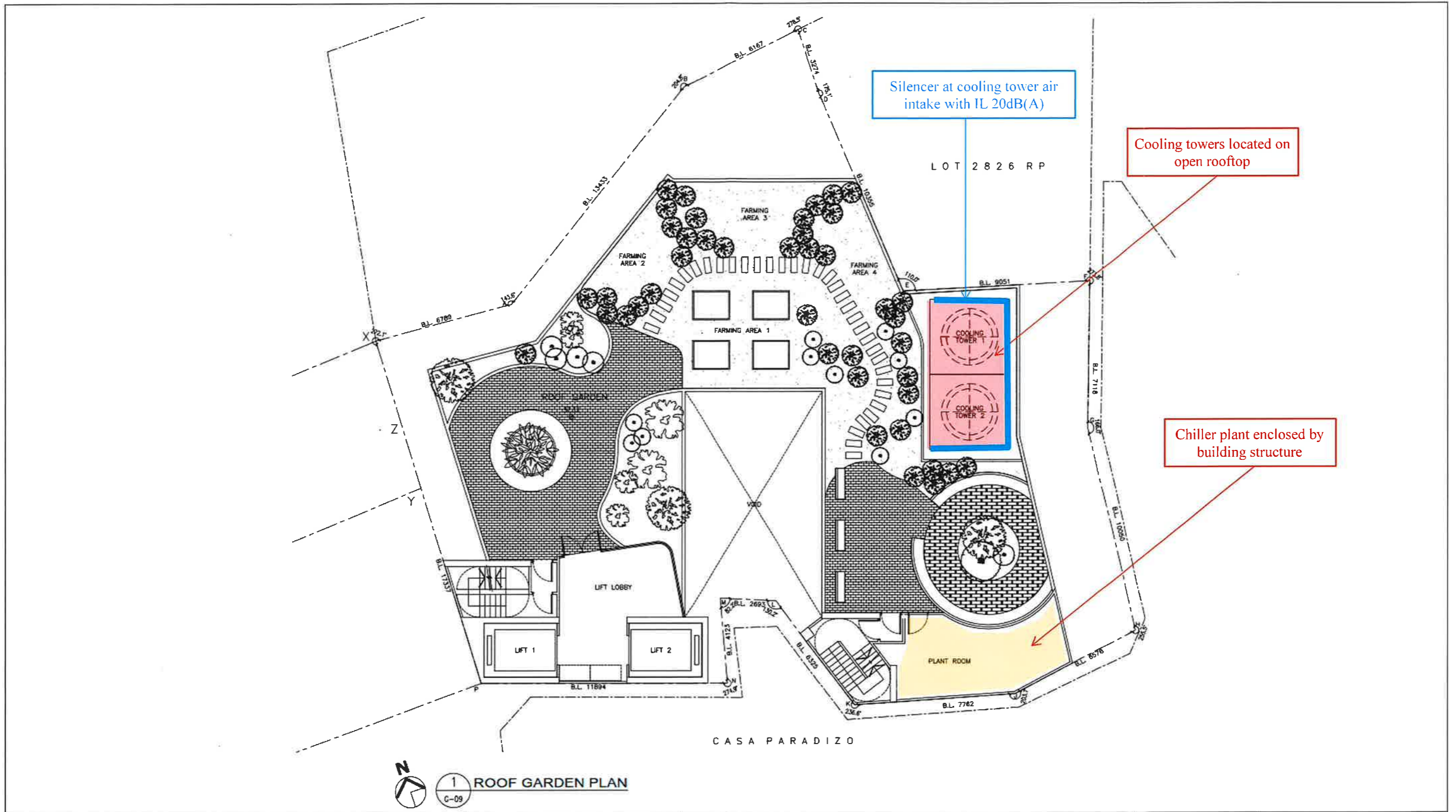
## **Appendix 3.2. FIXED SOURCE NOISE ASSESSMENT**





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: 		ENVIRONMENTAL CONSULTANT: 		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		





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: <i>R. Lee Architects (HK) Ltd</i>		ENVIRONMENTAL CONSULTANT: <b>OVOX</b>		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



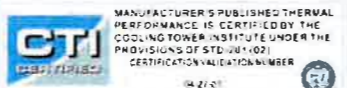
The **RYOWO** Group is the pioneer and manufacturer of fiberglass-reinforced polyester (FRP) cooling towers in Hong Kong.

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



THE COOLING TOWER YOU CAN RELY ON

MODEL DESIGNATION

STD-201 Certified Line

**FWS-300-15-AS/L**

Model Nos

- /E is for integrated drift eliminator
- /AE is for additional drift eliminator
- /L is for additional louver installed in front of air inlet face
- /SLF is for super low noise fan
- GI - for FRP Casing & Basin, HDG Structure
- SS - for FRP Casing & Basin, SS Structure
- AG - for HDG Casing, Basin & Structure
- AS - for SS Casing, Basin, SS Structure



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.

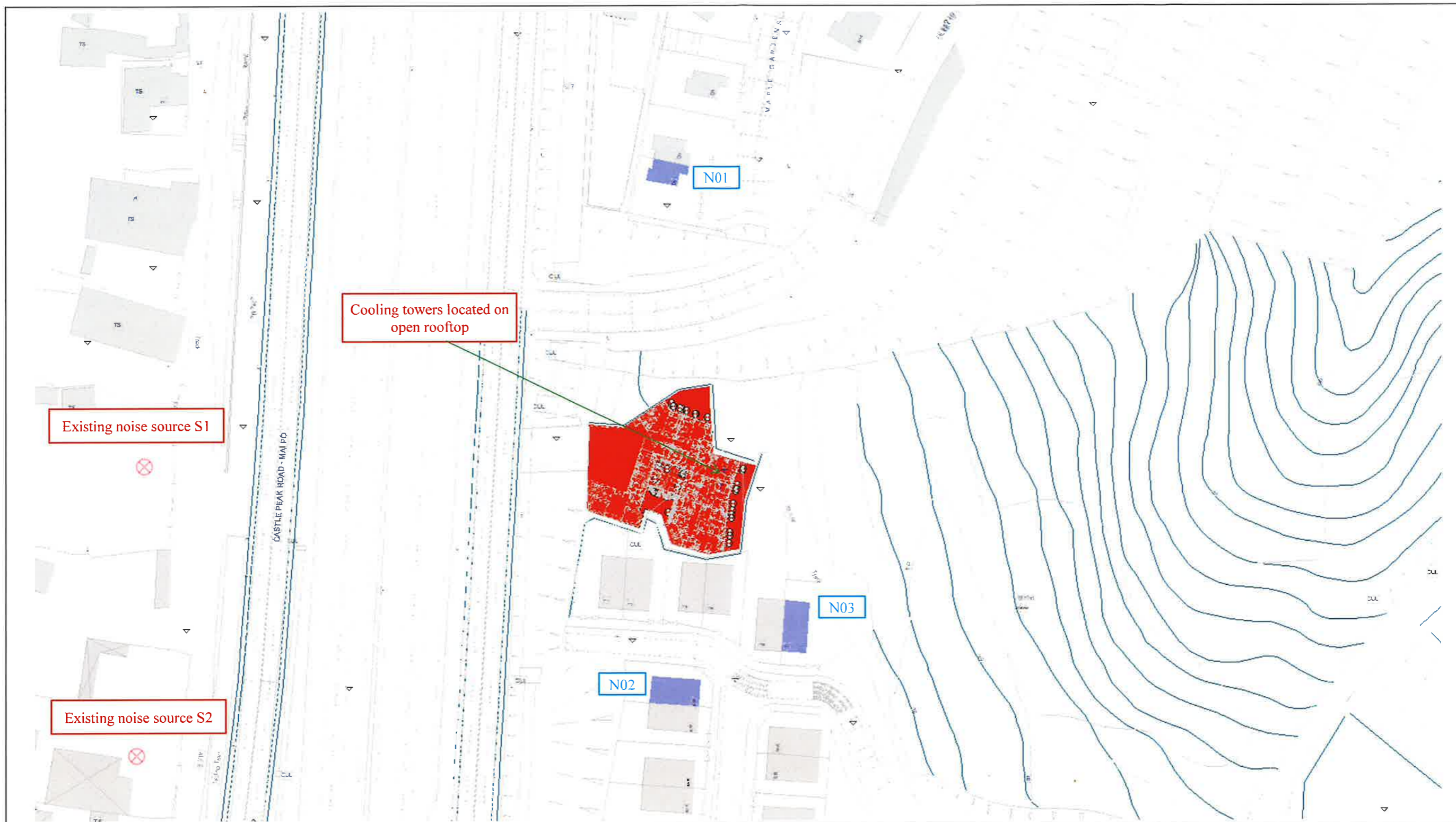
Model	Nominal Water Flow M <sup>3</sup> /hr	Dimension				Fan Motor kW	Fan Dia. mm	Piping			Sound Power Level	Weight		
		L mm	W mm	H mm	In mm			Out mm	Di mm	Dry Kg		Wet Kg		
FWS-91-4	91			3675	3.7						88	1335	2300	
FWS-92-5.5	107	4000	2000	4125	4705	8.5	1600	100x2	150	25	90	91	1385	2350
FWS-94-7.5	119			4745	7.5						93	1400	2365	
FWS-127-5.5	127			4305	5.5						80	1550	3000	
FWS-127-7.5	141	4400	2400	4125	4745	7.5	1800	100x2	150	25	50	94	1585	3015
FWS-127-11	160			4825	11						92	1690	3700	
FWS-169-7.5	169			4745	7.5						94	1650	3080	
FWS-169-11	192	4400	2600	4125	4825	11	2000	125x2	200	25	50	94	1760	3270
FWS-169-15	213			4820	15						94	1770	3780	
FWS-200-7.5	190			4745	7.5						91	2105	4000	
FWS-200-11	215	4600	2800	4145	4855	11	2400	125x2	200	40	80	95	2250	4055
FWS-200-15	244			4910	15						95	2255	4060	
FWS-240-7.5	210			4985	7.5						90	2890	5000	
FWS-240-11	240	4800	3200	4345	5085	11	2400	125x2	200	40	80	93	2945	5055
FWS-240-15	265			5110	15						94	2990	5060	
FWS-275-7.5	225			4745	7.5						89	3050	5160	
FWS-275-11	254	5200	3200	4145	4885	11	2600	150x2	200	40	80	92	3105	5215
FWS-275-15	285			4910	15						94	3110	5220	
FWS-300-7.5	235			4895	7.5						89	3310	6500	
FWS-300-11	270			5065	11						91	3365	6555	
FWS-300-15	300	6000	3200	4345	5110	15	2400	150x2	200	40	80	93	3370	6560
FWS-300-18.5	320			5175	18.5						94	3410	6600	
FWS-300-22	340			5215	22						95	3470	6660	
FWS-340-7.5	260			4745	7.5						88	3405	6505	
FWS-340-11	300			4855	11						91	3490	6650	
FWS-340-15	320	6100	3200	4345	4910	15	2600	150x2	250	80	80	93	3495	6655
FWS-340-18.5	350			5175	18.5						94	3505	6665	
FWS-340-22	375			5215	22						95	3565	6745	
FWS-380-7.5	275			4965	7.5						89	3580	6720	
FWS-380-11	315			4845	11						91	3635	6825	
FWS-380-15	350	5200	3800	5425	4910	15	3000	150x2	250	80	80	93	3640	6830
FWS-380-18.5	375			4985	18.5						94	3680	6870	
FWS-380-22	400			4995	22						95	3740	6930	
FWS-400-7.5	285			4985	7.5						87	3640	7000	
FWS-400-11	325			4985	11						89	3685	7055	
FWS-400-15	360	6600	3600	4345	5110	15	3000	125x4	250	80	80	91	3690	7060
FWS-400-18.5	385			5175	18.5						93	3700	7100	
FWS-400-22	410			5195	22						94	3750	7160	
FWS-400-30	450			5255	30						94	3820	7185	
FWS-500-7.5	305			4990	7.5						87	4230	8000	
FWS-500-11	345			4970	11						90	4285	8055	
FWS-500-15	385	6000	4200	5355	4915	15	3400	125x4	250	80	80	91	4290	8060
FWS-500-18.5	410			4985	18.5						93	4325	8100	
FWS-500-22	435			4920	22						94	4390	8120	
FWS-500-30	485			4920	30						95	4415	8155	
FWS-540-7.5	315			4990	7.5						87	4350	8090	
FWS-540-11	360			4970	11						89	4405	8155	
FWS-540-15	400			4915	15						91	4410	8160	
FWS-540-18.5	430	6800	3800	5355	4985	18.5	3000	125x4	250	80	80	93	4450	8180
FWS-540-22	455			4920	22						94	4510	8240	
FWS-540-30	500			4940	30						95	4535	8275	
FWS-600-11	435			4925	11						89	5015	9000	
FWS-600-15	485			4900	15						91	5020	9005	
FWS-600-18.5	520	3000	4200	5500	4965	18.5	3700	150x4	300	80	80	92	5060	9045
FWS-600-22	550			4945	22						94	5120	9085	
FWS-600-30	610			4945	30						95	5180	9110	
FWS-600-37	680			4945	37						96	5330	9300	
FWS-700-11	515			4945	11						89	8600	12000	
FWS-700-15	570			4930	15						91	8655	12005	
FWS-700-18.5	610	7000	5000	5500	4985	18.5	3700	150x4	300	80	80	92	8690	12055
FWS-700-22	645			4945	22						93	8745	12120	
FWS-700-30	720			4945	30						95	8780	12145	
FWS-700-37	785			4945	37						96	8970	12335	
FWS-800-11	555			7155	11						88	6905	14880	
FWS-800-15	615			7200	15						90	6910	14885	
FWS-800-18.5	655	7500	6000	6400	7205	18.5	4200	150x4	300	80	80	91	6945	14920
FWS-800-22	695			7205	22						93	7010	14985	
FWS-800-30	760			7365	30						95	7035	15010	
FWS-800-37	820			7365	37						96	7225	15200	
FWS-800-45	880			7405	45						99	7255	15240	
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<sup>-12</sup> Watt.  
 4/Data and specifications are subjected to change without prior notice.



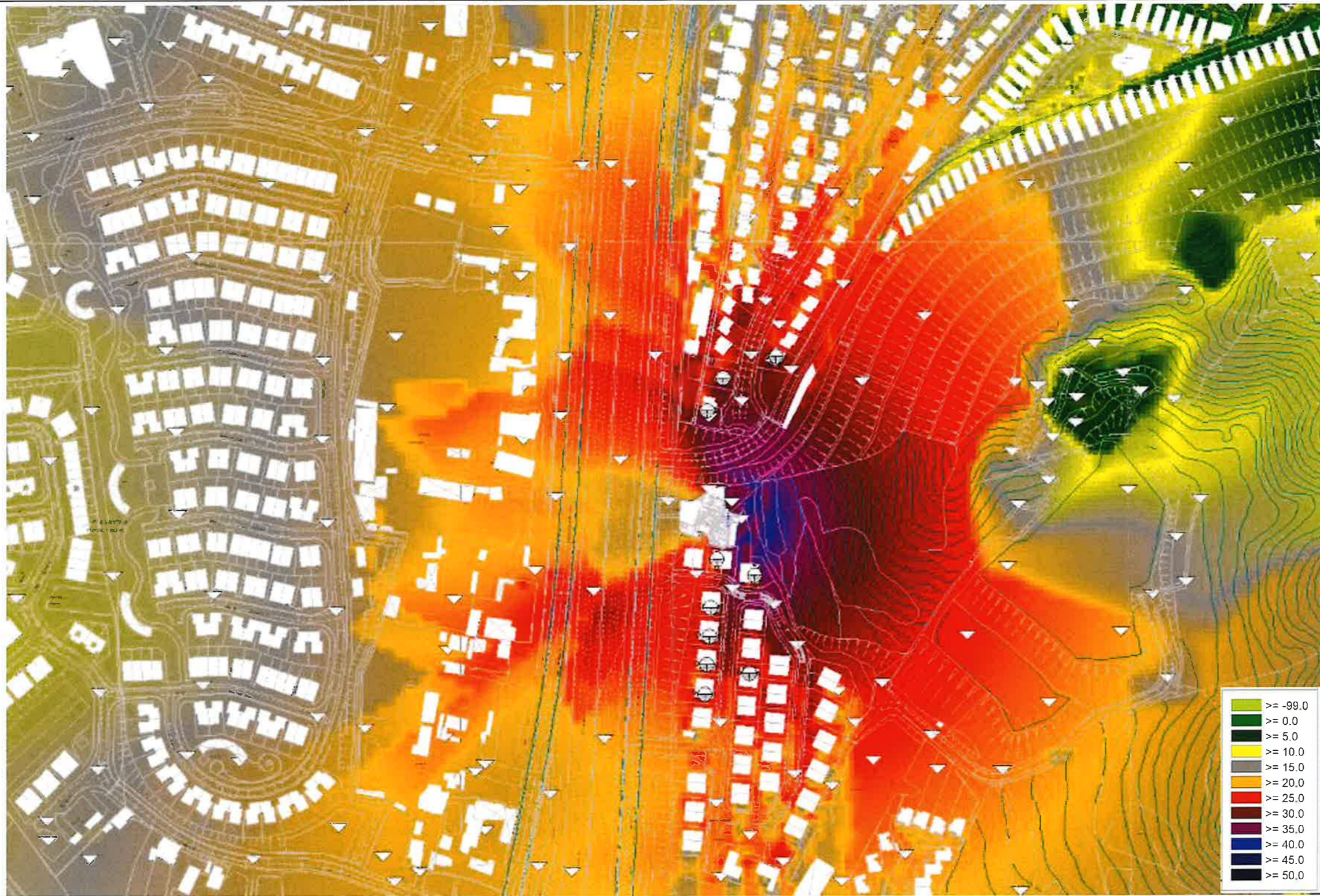
PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.	DRAWING No.: C220410W-01 Figure 3.2.3	LEAD ARCHITECT: 	ENVIRONMENTAL CONSULTANT: 	PREPARED BY Phoenix Lee
DRAWING TITLE: ACOUSTIC DATA FOR PROPOSED COOLING TOWERS	SCALE: N.T.S.	REV: A		CHECKED BY Eddy Ng
				APPROVED 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
APPROVED BY Banting Wong					





<p>PROJECT: PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY AT 81 SAN TAM ROAD, YUEN LONG, N.T.</p>	<p>DRAWING No.: C220410W-01    Figure 3.2.5</p>		<p>LEAD ARCHITECT: </p>	<p>ENVIRONMENTAL CONSULTANT: </p>	<p>PREPARED BY Phoenix Lee</p>
<p>DRAWING TITLE: NOISE CONTOUR OF FIXED SOURCE NOISE IMPACT (MITIGATED)</p>	<p>SCALE: N.T.S.</p>	<p>REV: A</p>			<p>CHECKED BY Eddy Ng</p>
					<p>APPROVED BY Banting Wong</p>



## **Appendix 4.1. WATER QUALITY STANDARD**

Determinand	Flow rate	≤ 10	> 10 and	> 200 and	> 400 and	> 600 and	> 800 and	> 1000	> 1500	> 2000	> 3000	> 4000	> 5000 and
	(m <sup>3</sup> /day)	≤ 10	≤ 200	≤ 400	≤ 600	≤ 800	≤ 1000	and ≤ 1500	and ≤ 2000	and ≤ 3000	and ≤ 4000	and ≤ 5000	≤ 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 (°C)	45	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	1
Suspended solids	50	50	50	50	50	50	50	25	25	25	25	25	25
BOD	20	20	20	20	20	20	20	10	10	10	10	10	10
COD	80	80	80	80	80	80	80	50	50	50	50	50	50
Oil & Grease	20	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	1
Boron	5	4	3	2.5	2	1.6	1.1	0.8	0.5	0.4	0.3	0.2	0.2
Barium	5	4	3	2.5	2	1.6	1.1	0.8	0.5	0.4	0.3	0.2	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	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	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	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	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	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	0.1
Sulphide	5	5	5	5	5	5	2.5	2.5	1.5	1	1	1	0.5
Total residual chlorine	1	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	50
Total phosphorus	10	10	10	10	10	10	8	8	5	5	5	5	5
Surfactants (total)	15	15	15	15	15	15	10	10	10	10	10	10	7
E. coli (count/100ml)	1000	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:



ENVIRONMENTAL CONSULTANT:



PREPARED BY  
Phoenix Lee

CHECKED BY  
Eddy Ng

APPROVED BY  
Banting Wong

DRAWING TITLE:  
STANDARDS FOR EFFLUENTS DISCHARGED INTO THE COASTAL WATERS OF  
DEEP BAY WATER CONTROL ZONE

SCALE:  
N.T.S.

REV:  
A

**APPENDIX 5.1 FSD AND EPD'S REPLY ON LAND CONTAMINATION**

消防處  
香港九龍尖沙咀東部廣道1號  
消防處總匯大廈



**FIRE SERVICES DEPARTMENT**  
FIRE SERVICES HEADQUARTERS BUILDING,  
No. 1 Hong Chong Road,  
Tsim Sha Tsui East, Kowloon,  
Hong Kong.

本處編號 OUR REF. : (120) in FSD GR 6-5/4 R Pt. 44  
來函編號 YOUR REF. :  
電子郵件 E-mail : hkfsoenq@hksfd.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, Fokun, Sbatin  
**(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  
已提及之日期與索引編號應於引文內

**Eddy NG (Novox)**

From: leclau@epd.gov.hk  
Sent: Wednesday, June 29, 2022 4:02 PM  
To: eddyng@novox.com.hk  
Cc: arthurlau@epd.gov.hk; leclau@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@HKBARO on 29/06/2022 15:57

From: "Eddy NG (Novox)" <eddy.ng@novox.com.hk>  
To: <leclau@epd.gov.hk>  
Cc: <banting.wong@novox.com.hk>  
Date: 29/06/2022 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.

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: 	ENVIRONMENTAL CONSULTANT: 	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

**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.**

**LANDFILL GAS HAZARD ASSESSMENT REPORT**

**May 2023**



# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	Background	1
1.2	Study Objectives	1
1.3	Report Structure	2
<b>2</b>	<b>Site Context</b>	<b>3</b>
2.1	Site Location and Its Environs	3
2.2	Proposed Development	3
<b>3</b>	<b>Information of Ngau Tam Mei Landfill</b>	<b>4</b>
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
<b>4</b>	<b>Qualitative Source-Pathway-Target Analysis</b>	<b>6</b>
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
<b>5</b>	<b>Recommendations and Protection Measures</b>	<b>13</b>
5.1	Construction Stage	13
5.1.1	<i>Precautionary Measures</i>	13
5.1.2	<i>LFG Monitoring during Construction Stage</i>	14
5.2	Operational Stage	16
5.2.1	<i>Protection and Precautionary Measures</i>	16
5.2.2	<i>LFG Monitoring during Operational Stage</i>	18
<b>6</b>	<b>Conclusion</b>	<b>21</b>

## **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 (October 2013 to September 2015)
- 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 October 2013 to September 2015)
- 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<sup>2</sup>.

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 Multi-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<sup>3</sup>. 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 October 2013 to September 2015 are summarised in Table 4.3.

**Table 4.3 Landfill Gas Monitoring Data in Ngau Tam Mei Landfill (October 2013 to September 2015)**

Landfill Gas Monitoring Wells	Range of Concentration (%V/V)	
	Methane (CH <sub>4</sub> )	Carbon Dioxide (CO <sub>2</sub> )
A451	<0.1 - 0.1	<0.1 - 9.8
A452	<0.1	1.6 - 23.0
A453	<0.1	<0.1 - 3.8
A454	<0.1	3.3 - 18.8
A455	<0.1 - 0.1	0.1 - 3.4
A456	<0.1	0.2 - 6.6
A457A	<0.1	<0.1 - 0.3
A458	<0.1	0.3 - 9.0
A459	<0.1	1.8 - 15.1
A460	<0.1	2.7 - 11.6
A461	<0.1	2.8 - 7.7
DH403	<0.1 - 0.1	0.3 - 7.9
DH405	<0.1	0.6 - 10.3
DH407	<0.1 - 0.1	0.1 - 10.7
DH408	<0.1	<0.1 - 5.0

4.2.1.3

As the concentration of methane in most of the perimeter gas monitoring wells were below the limit of detection of 0.1%, 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 23.0%) 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	Rlsk
<p><u>Ngau Tam Mei Landfill</u></p> <p>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 &lt;0.1% to 23.0%) were much higher than ambient level in many monitoring locations.</p> <p><b>(Medium Source)</b></p>	<p><u>Man-made Pathways</u></p> <p>There are no utilities or services directly linking between Ngau Tam Mei Landfill and the proposed development.</p>	<p><u>Shallow excavations during construction stage</u></p> <p>Shallow excavation for utilities installation and garden establishment.</p> <p><b>(Low Sensitivity Target)</b></p>	<p><b>Very Low</b></p>
	<p><u>Natural Pathways</u></p> <p>The Site is located more than 100m away from the edge of the Ngau Tam Mei Landfill.</p>	<p><u>Deep excavations during construction stage</u></p> <p>Deep excavations for services including lower ground sewage treatment plant.</p> <p><b>(Medium Sensitivity Target)</b></p>	<p><b>Low</b></p>
	<p><b>(Long / indirect Pathway)</b></p>	<p><u>Maintenance of services during operational stage</u></p> <p>Manholes or inspection chambers of utilities or services, electric meter room and lower ground sewage treatment plant.</p> <p><b>(Medium Sensitivity Target)</b></p>	<p><b>Low</b></p>
		<p><u>Ground floor areas within building blocks during operational stage</u></p> <p>Ground floor areas of the proposed development is only accessible to the residents and visitors.</p> <p><b>(Medium Sensitivity Target)</b></p>	<p><b>Low</b></p>

## 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 <sub>4</sub> )	>10% LEL (i.e. > 0.5 % by volume)	<ul style="list-style-type: none"> <li>Prohibit hot works</li> <li>Ventilate to restore CH<sub>4</sub> to below 10% LEL</li> </ul>
Methane (CH <sub>4</sub> )	>20% LEL (i.e. > 1 % by volume)	<ul style="list-style-type: none"> <li>Stop works</li> <li>Evacuate personnel / prohibit entry</li> <li>Increase ventilation to restore CH<sub>4</sub> to below 10% LEL</li> </ul>
Carbon Dioxide (CO <sub>2</sub> )	>0.5%	<ul style="list-style-type: none"> <li>Ventilate to restore CO<sub>2</sub> to less than 0.5%</li> </ul>
	>1.5%	<ul style="list-style-type: none"> <li>Stop works</li> <li>Evacuate personnel / prohibit entry</li> <li>Increase ventilation to restore to less than 0.5%</li> </ul>
Oxygen (O <sub>2</sub> )	<19%	<ul style="list-style-type: none"> <li>Ventilate trench / void to restore O<sub>2</sub> level to more than 19%</li> </ul>
	<18%	<ul style="list-style-type: none"> <li>Stop works</li> <li>Evacuate personnel / prohibit entry</li> <li>Increase ventilation to restore O<sub>2</sub> to more than 19%</li> </ul>

## 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<sup>3</sup> 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 <sub>4</sub> or 0.5% CO <sub>2</sub> , whichever is exceeded	<p><u>Trigger level:</u></p> <ul style="list-style-type: none"> <li>• Stop hot works;</li> <li>▪ Inform the property management;</li> <li>▪ Immediate mitigation measures such as mechanical ventilation shall be provided;</li> <li>• Report to EPD;</li> <li>• Further investigation to be undertaken within the Site;</li> <li>• Increase the gas monitoring frequency to weekly.</li> </ul>
1 % v/v (20% LEL) CH <sub>4</sub> or 1.5% CO <sub>2</sub> , whichever is exceeded	<p><u>Action level:</u></p> <ul style="list-style-type: none"> <li>• Stop all works;</li> <li>• Evacuate personnel / prohibit entry;</li> <li>▪ Inform the property management;</li> <li>▪ Immediate mitigation measures such as mechanical ventilation shall be provided;</li> <li>• Report to EPD;</li> <li>• Further investigation to be undertaken within the Site;</li> <li>• Increase the gas monitoring frequency to daily.</li> </ul>

*Note: Oxygen (O<sub>2</sub>) should also be monitored for reference.*

*\* - CO<sub>2</sub> 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)

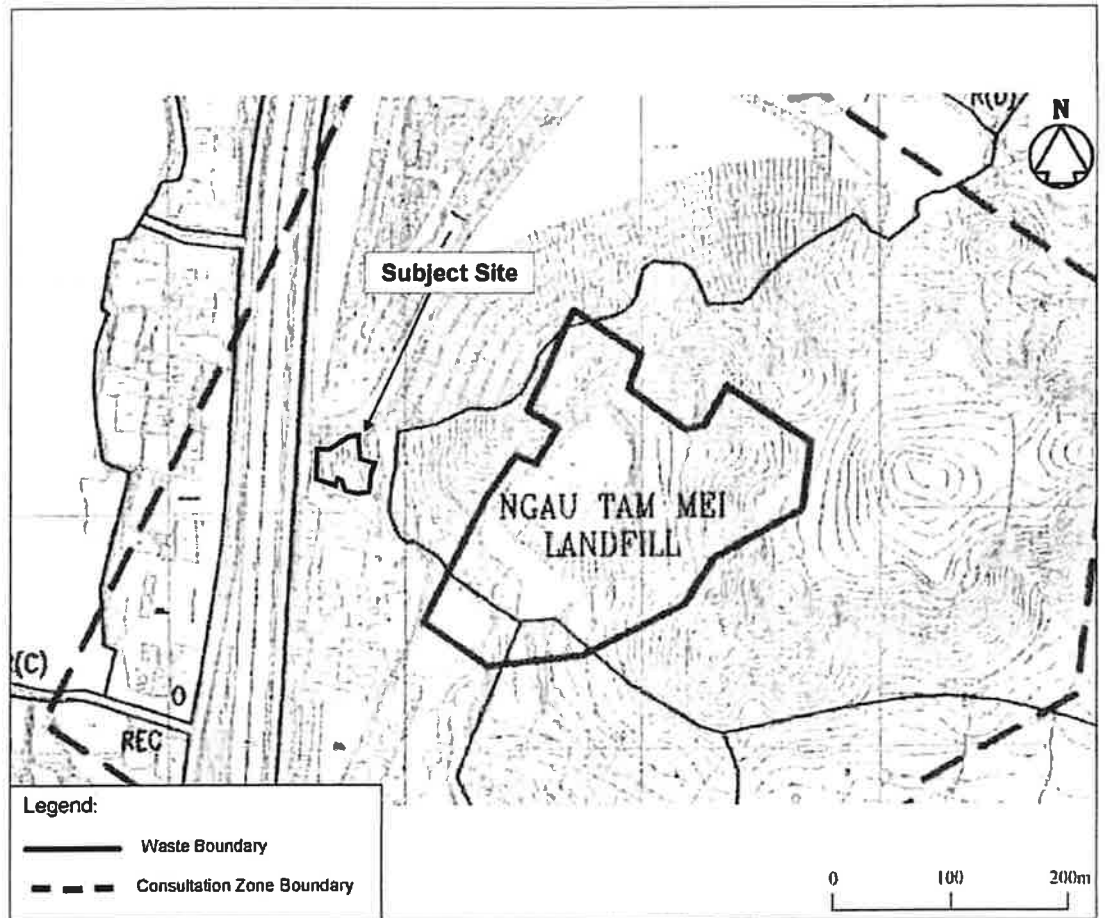
AT LOT 4823 IN D.D.104, 81 SAN TAM ROAD,  
SAN TIN, N.T.

FIGURES

**Location of the  
Proposed  
Development  
and Ngau Tam  
Mei Landfill**

**Figure 1.1**

Scale: As Shown  
Date: March 2016  
Rev.: 1

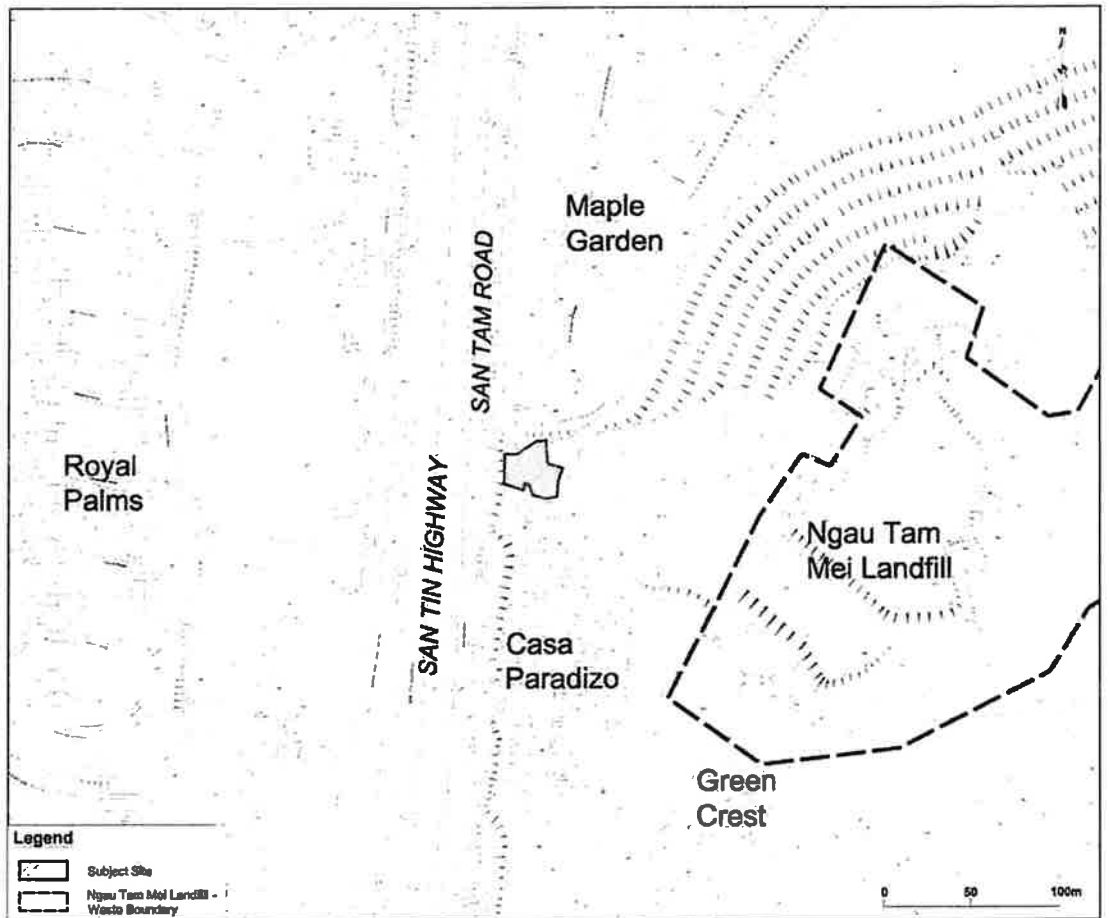




Site Location and  
Its Environs

Figure 2.1

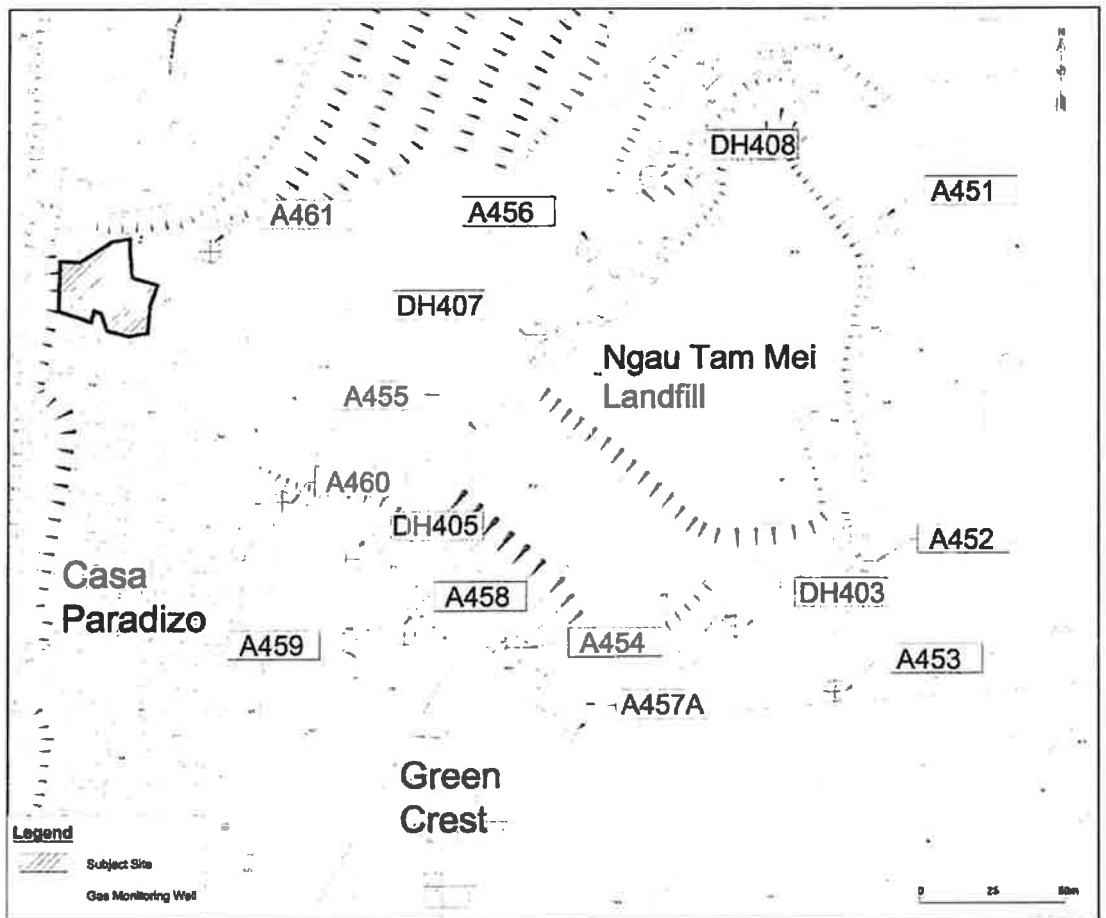
Scale: As Shown  
Date: December 2015  
Rev.: 0



**Locations of  
Relevant Gas  
Monitoring Wells  
at Ngau Tam Mei  
Landfill**

**Figure 3.1**

Scale: As Shown  
Date: December 2015  
Rev: 0



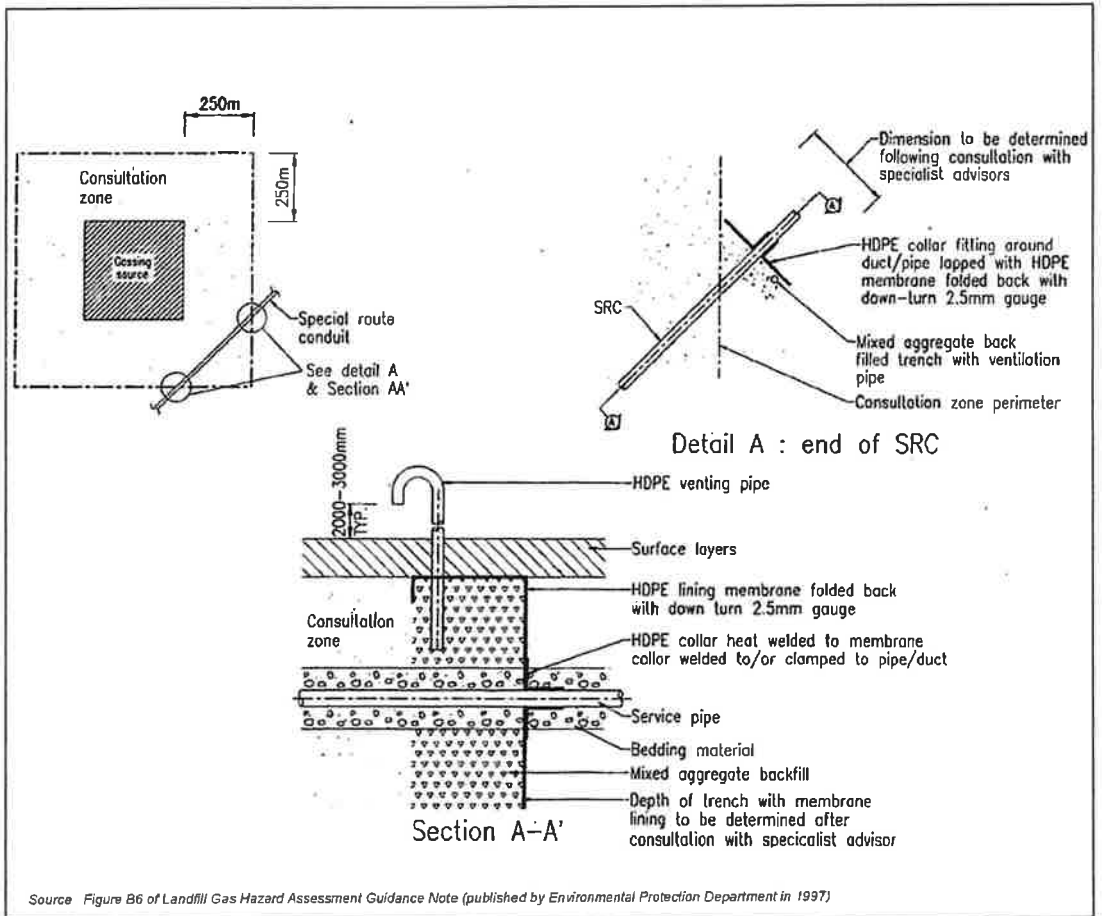
**Typical Design  
for Services  
Passing Through  
the Consultation  
Zone – Special  
Route Conduit  
(SRC)**

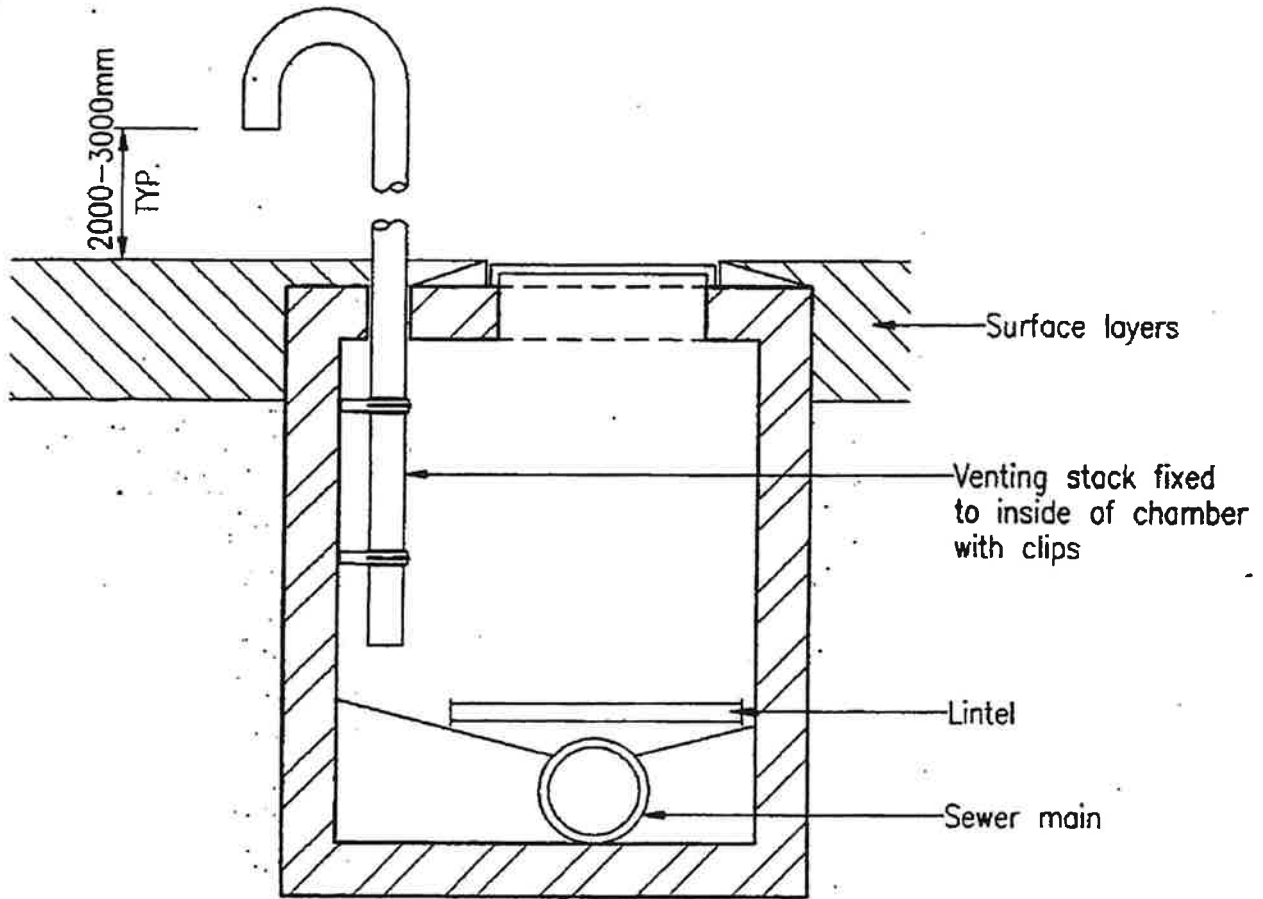
**Figure 5.1**

Scale: NTS

Date: December 2015

Rev.: 0





Source: Figure B3 of Landfill Gas Hazard Assessment Guidance Note (published by Environmental Protection Department in 1997)

Landfill Gas Hazard Assessment  
Report

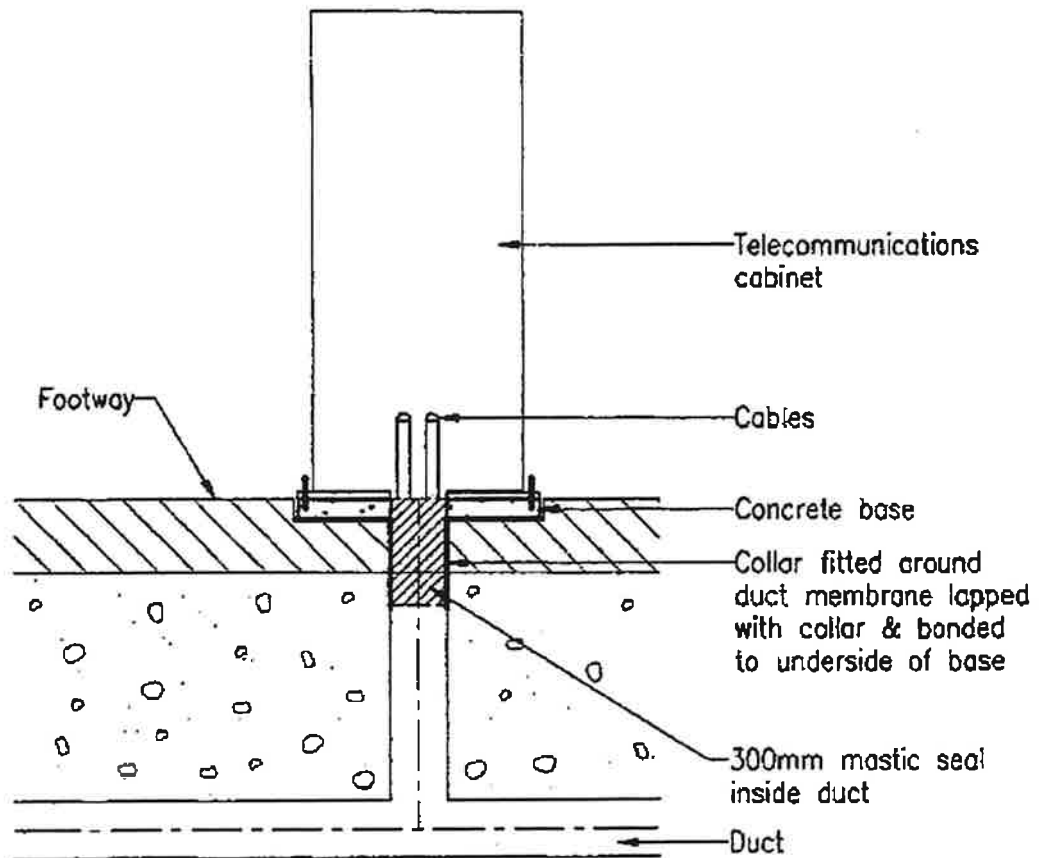
## Typical Design of Vented Manhole within Consultation Zone

**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

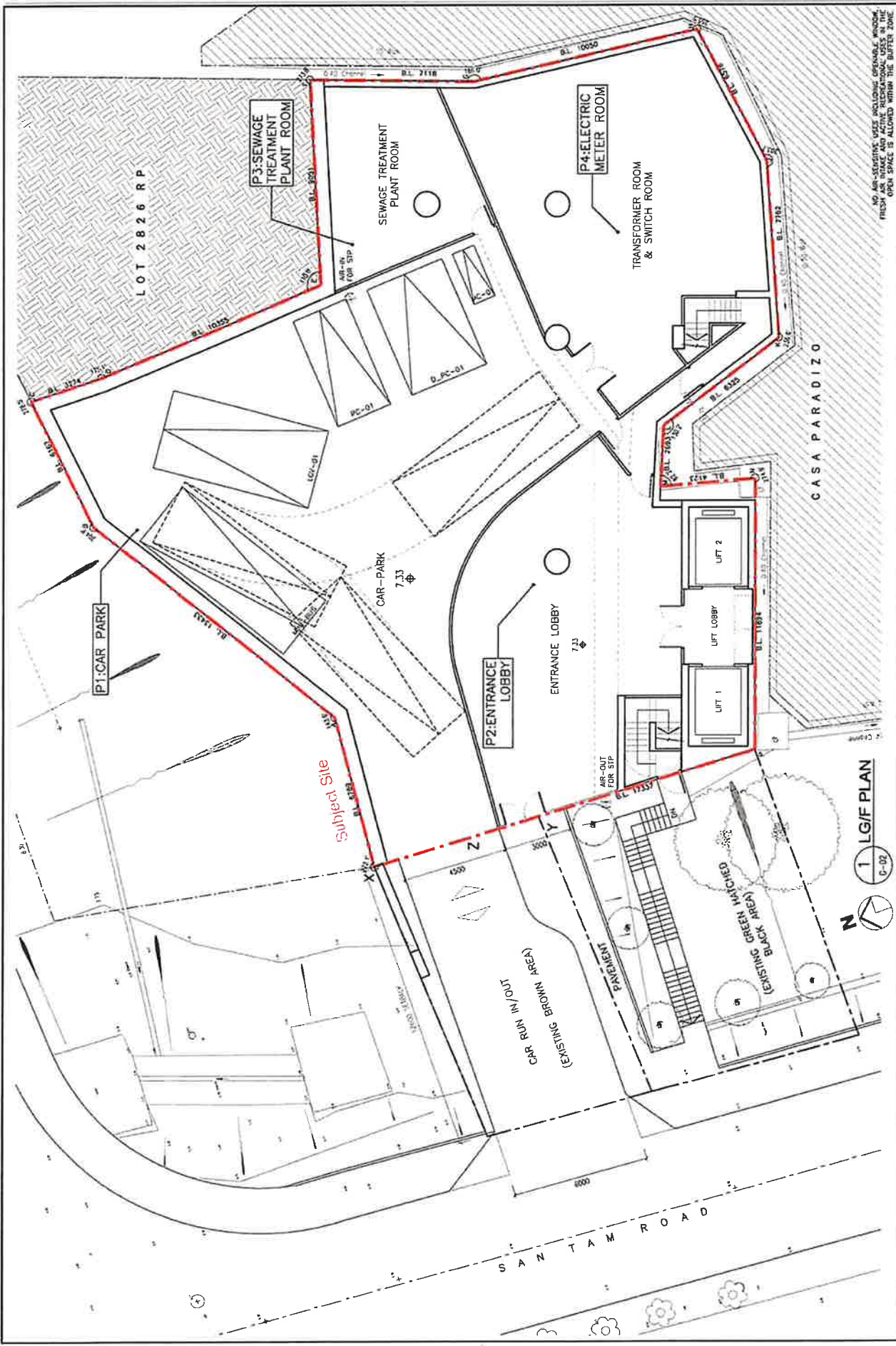
Figure 5.2

Scale: NTS

Date: December 2015

Rev.: 0





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

Drawn under license by the Survey Department of the Government of the Hong Kong Special Administrative Region. This drawing is for the design and construction of the proposed building. It is not to be used for any other purpose without the written consent of the Survey Department. This drawing is not for construction purposes unless expressly indicated.

FIGURE 5.4 1:225 (A4) A DEC 2022

PROPOSED LANDFILL GAS MONITORING LOCATION (LG/F)

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



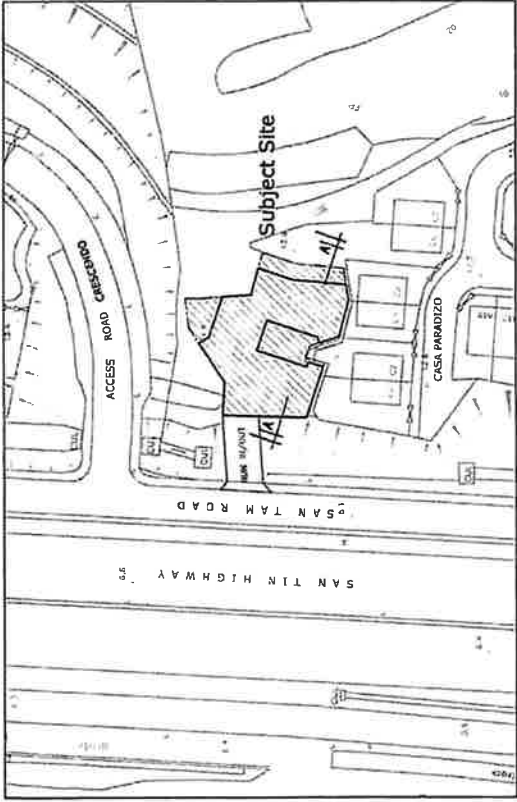
S12A AMENDMENT OF PLAN APPLICATION  
APPROVED NGAU TAM MEI  
OUTLINE ZONING PLAN NO. S/YL-NTM/12

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 A

DEVELOPMENT LAYOUT PLANS



**BLOCK PLAN** SCALE - 1:1000

**DEVELOPMENT SCHEDULE:**

Site Area : 736.3 m<sup>2</sup> (7926 ft<sup>2</sup>)  
 Class of Site : A  
 Proposed Plot Ratio For Non-Domestic : 7.33  
 Proposed Site Coverage above For Non-Domestic (Above 15m) : 75.558%

Maximum Gross Floor Area : 5400 m<sup>2</sup> (58125.6 ft<sup>2</sup>)  
 Proposed Building Height : 36.93 mPD  
 Absolute Height : 29.6 m  
 Proposed No. Of Storeys : 10 STOREYS

Proposed Gross Floor Area : 352,479 m<sup>2</sup>  
 LG/F (ENTRANCE & CARPARK) : 617,819 m<sup>2</sup>  
 1/F (WELLNESS CENTRE + SKY GARDEN) : 595,090 m<sup>2</sup> (45 nos. of bed)  
 2/F (RICHE) : 556,330 m<sup>2</sup> (17 nos. of bed)  
 4/F - 7/F (RICHE) : 556,330 m<sup>2</sup> x 4 storeys = 2,225,322 m<sup>2</sup> (20 nos. of bed x 4 storeys)  
 8/F (ADMIN OFFICE + STAFF QUARTER) : 426,802 m<sup>2</sup>

**TOTAL** : 5400.000 m<sup>2</sup> ( 142 nos. of bed )

**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.

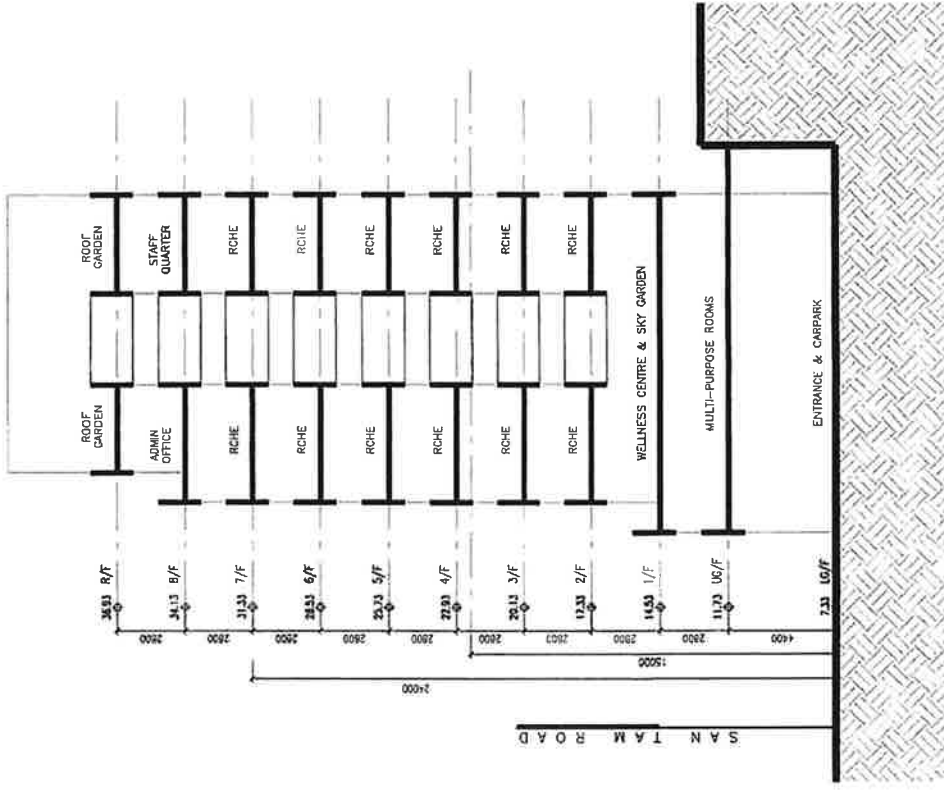
2202  
 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY  
 at 81 SAN TAM ROAD,  
 YUEN LONG, N.T.

**DEVELOPMENT SCHEDULE & SECTION**

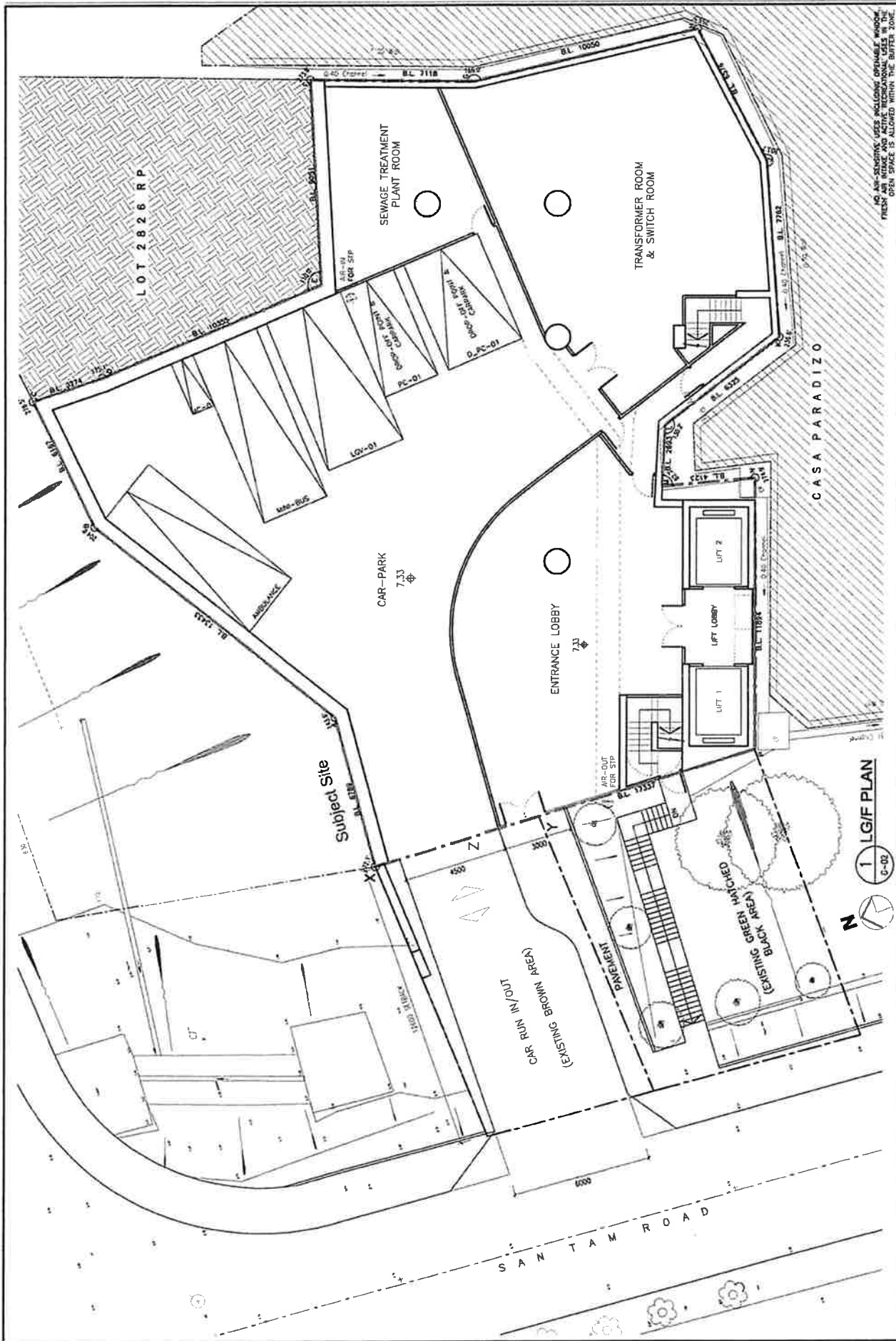
G-01 N.T.S. (A3)

JULY, 2002

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**SECTION A-A** SCALE - 1:200



NO AIR-SEATING USES INCLUDING OPTIMALE 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 LG/F PLAN  
 G-02

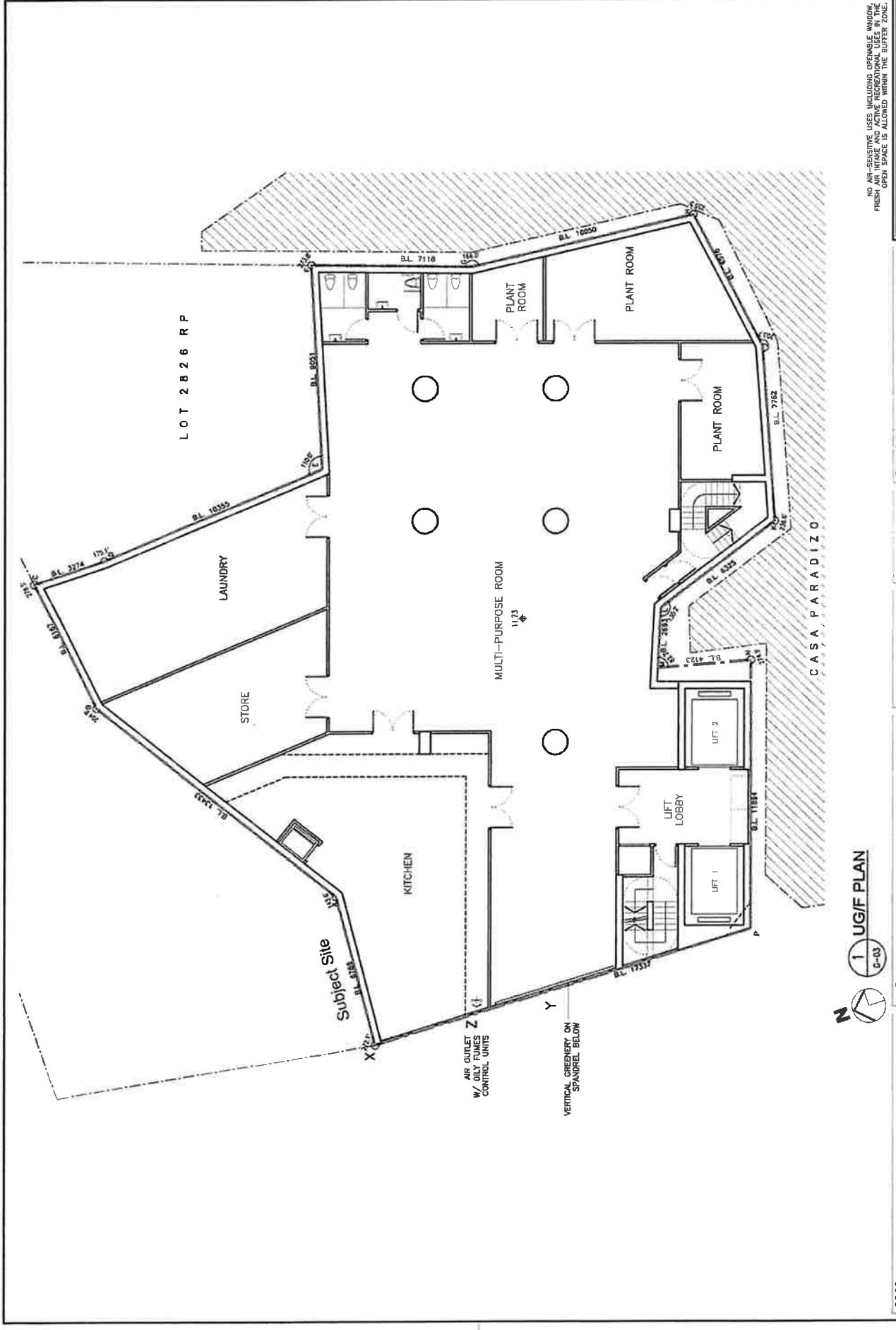
DEC 2002  
 OCT 2002  
 JULY 2002

C  
 B  
 A

1:150 (A3)  
 1:225 (A4)

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

DO NOT SCALE DRAWING  
 CONSTRUCTION AND MATERIALS TO BE USED IN THE WORK SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS AND APPROVED BY THE ARCHITECT. THE ARCHITECT'S OFFICE SHALL BE RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF THE WORK. THE ARCHITECT'S OFFICE SHALL BE RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF THE WORK. THE ARCHITECT'S OFFICE SHALL BE RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF THE WORK.



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

PLANNING  
RELEVANT

DRAWN TO SCALE  
OCT. 2022  
JULY 2022

B A

1:150 (A3)  
1:225 (A4)

G-03

UG/F PLAN  
G-03

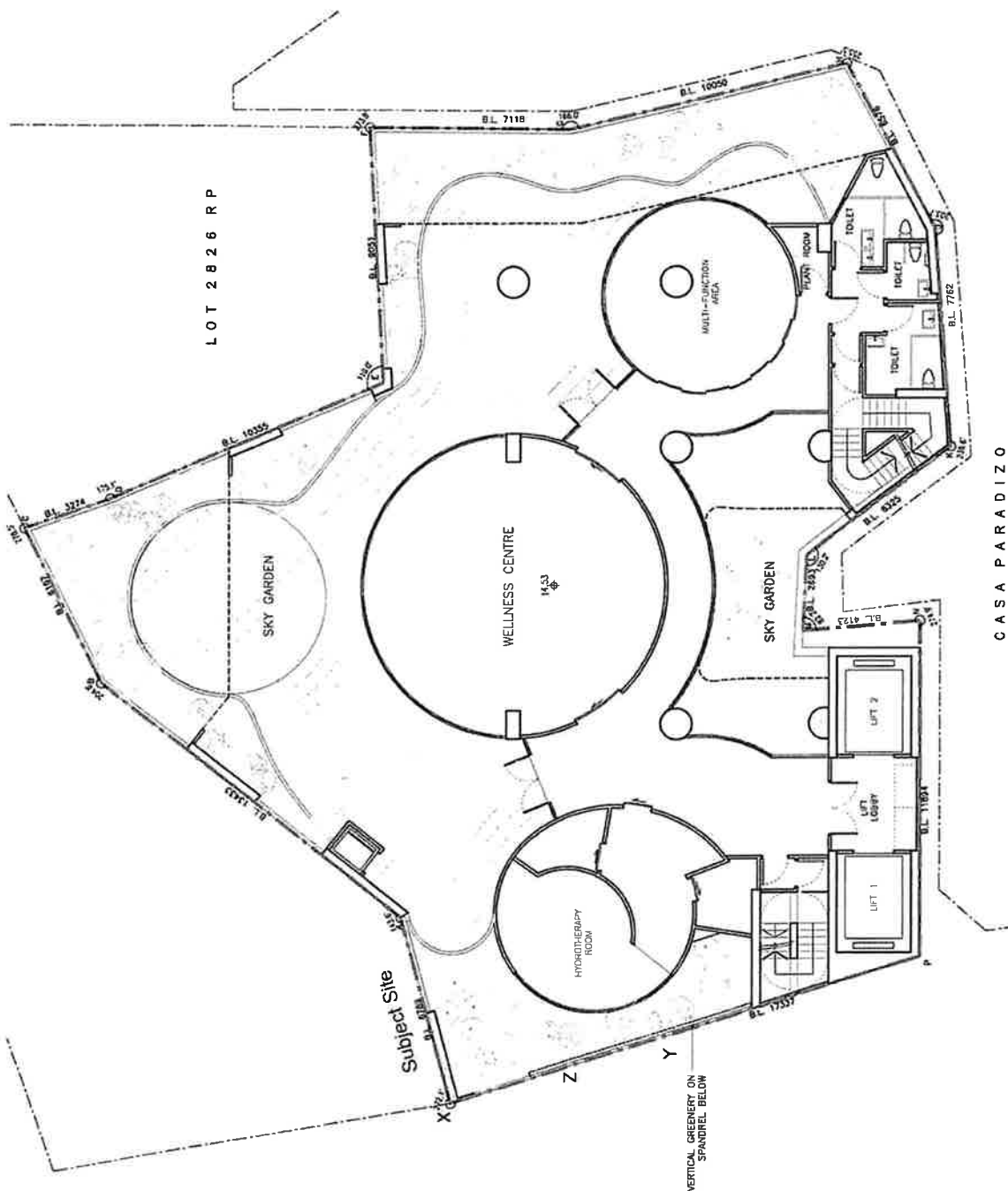
UG/F PLAN  
MULTI-PURPOSE ROOMS

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



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

RLBP



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

1/1F PLAN  
 WELLNESS CENTRE & SKY GARDEN

G-04  
 1:150 (A3)  
 1:225 (A4)

B  
 A

GCT. 2022  
 JULY, 2022

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

Drawn to scale  
 The drawings show the design intent of the architect only. Contractors are required to  
 submit shop drawings where appropriate.  
 This drawing is not for construction purposes unless otherwise approved. (1/1F) plans  
 are not to scale.

VERTICAL GREENERY ON  
 SPANDREL BELOW

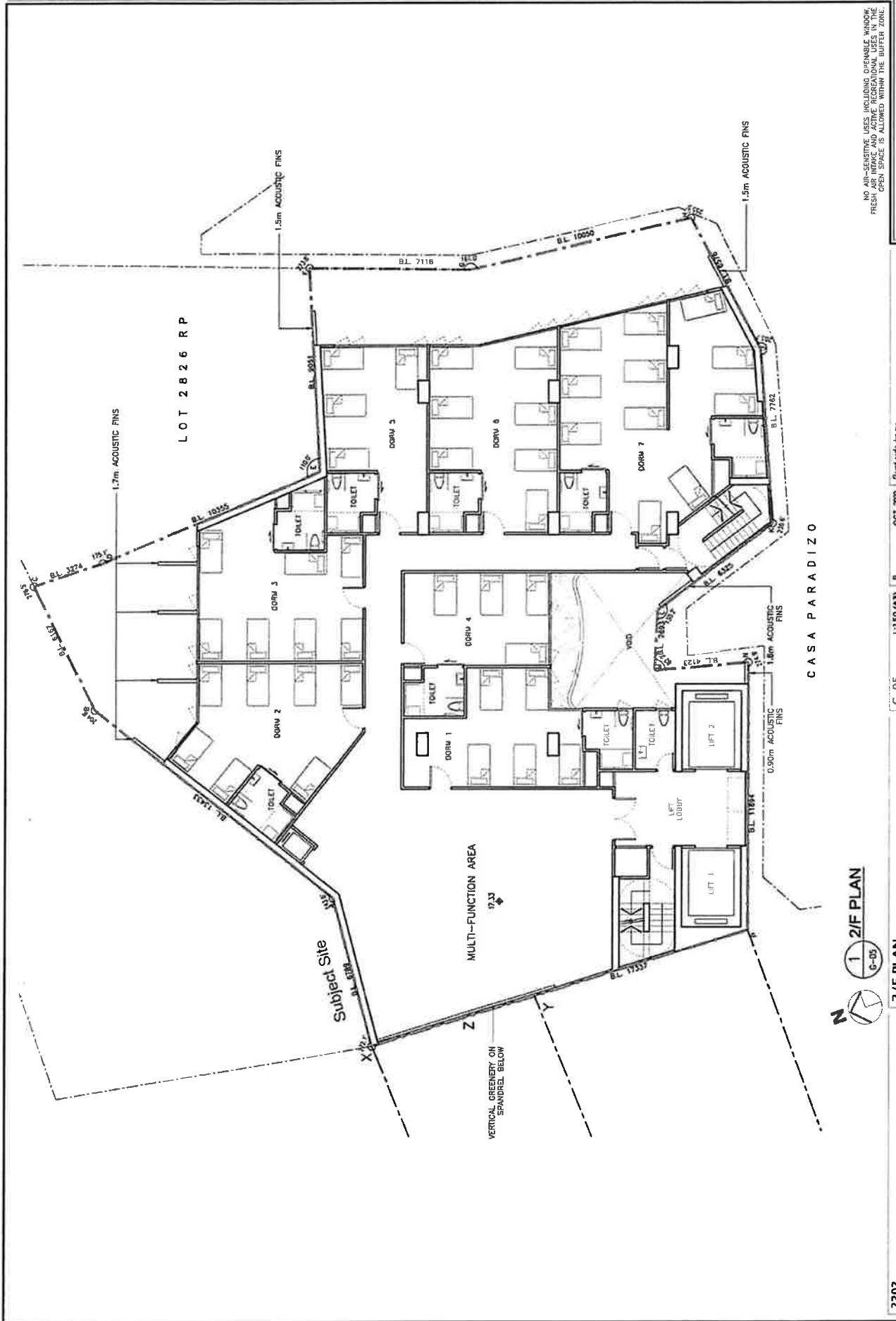
2202  
 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY  
 at 81 SAN TAM ROAD,  
 YUEN LONG, N.T.

1/1F PLAN  
 WELLNESS CENTRE & SKY GARDEN

G-04  
 1:150 (A3)  
 1:225 (A4)

B  
 A

GCT. 2022  
 JULY, 2022



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

**REPLACED**

**2202**  
**PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY**  
**32, 81 SAN TAM ROAD,**  
**YUEN LONG, N.T.**

**Z/F PLAN**  
**RCHE**

**1 2/F PLAN**  
**G-05**

**G-05**  
**1:150 (A3)**  
**1:225 (A4)**

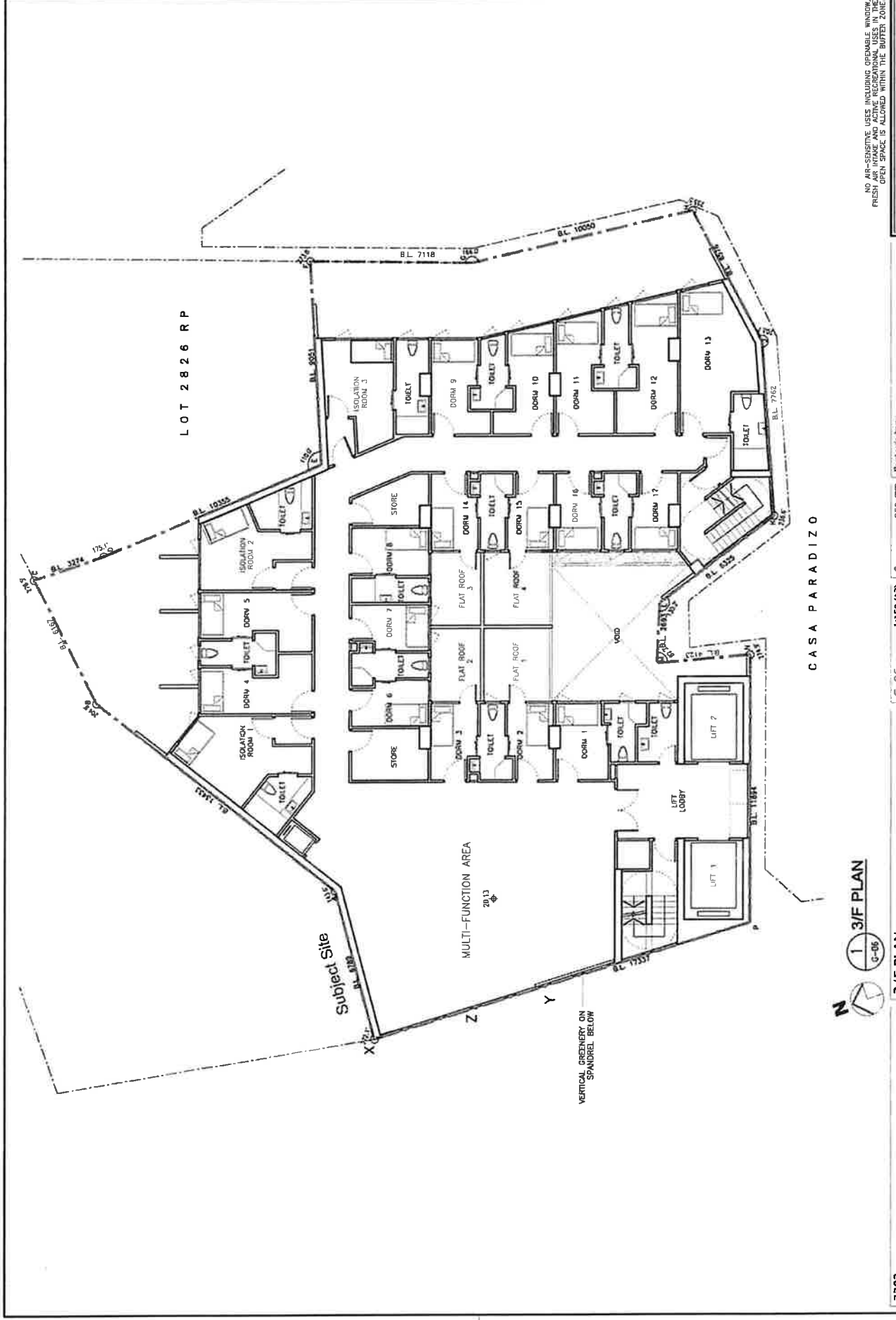
**OCT. 2022**  
**JULY 2022**

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

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

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

RELEAS



CASA PARADIZO

1 3/F PLAN
   
 G-06

2202  
 PROPOSED RESIDENTIAL CARE HOME FOR ELDERLY  
 4081 YUEN LONG ROAD,  
 YUEN LONG, N.T.

3/F PLAN  
RCHE

G-06

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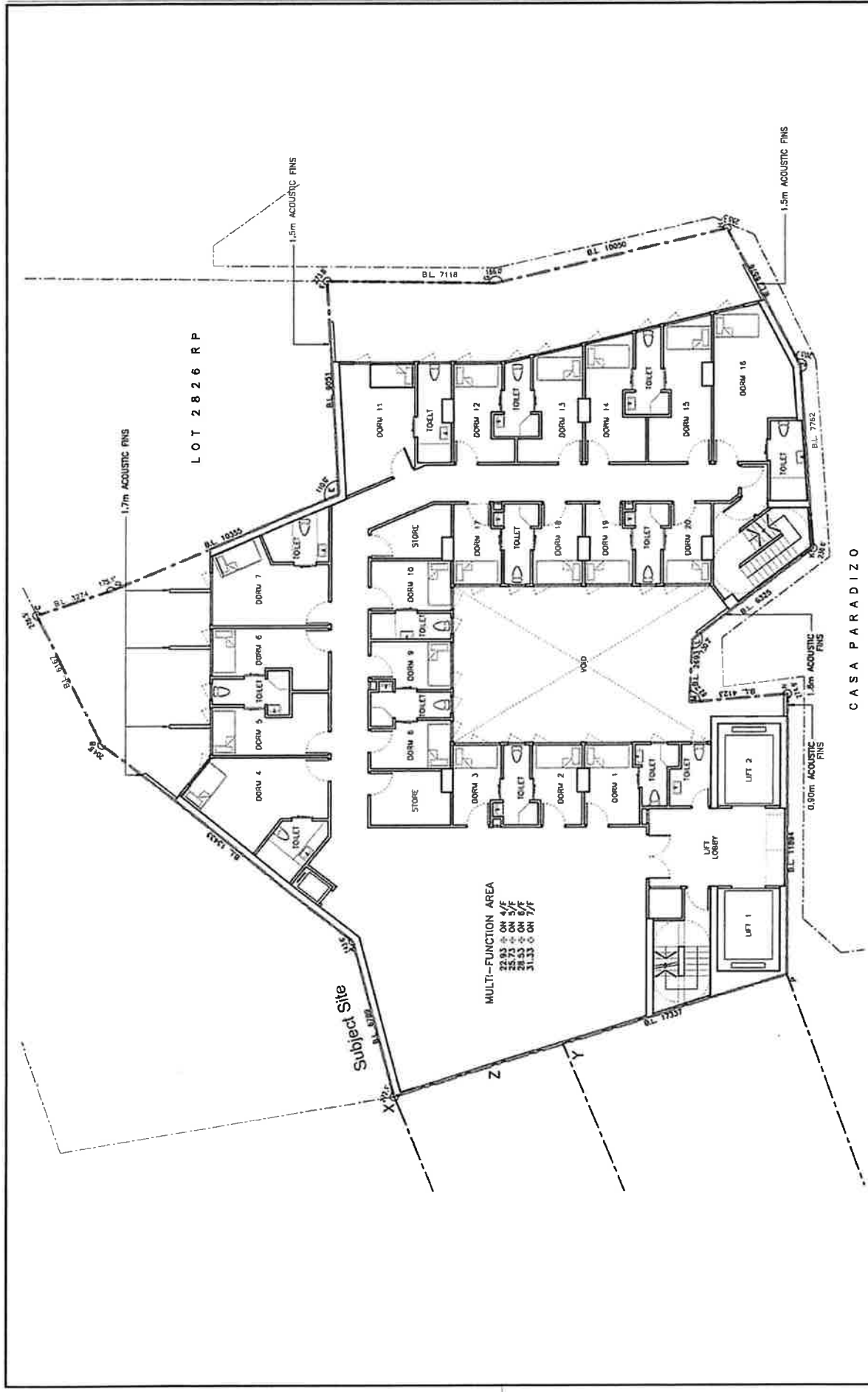
C B A

DEC. 2022  
OCT. 2022  
JULY 2022

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 Checked by: [Name]  
 Approved by: [Name]  
 Date: [Date]  
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NO AIR-SENSITIVE USES INCLUDING OPENABLE WINDOW, FRESH AIR INTAKE AND EXHAUST SYSTEMS, OR OPEN SPACE IS ALLOWED WITHIN THE BUFFER ZONE.

RL 1012



LOT 2826 R/P

CASA PARADIZO

MULTI-FUNCTION AREA  
 32.93 ON 4/F  
 25.73 ON 5/F  
 28.53 ON 6/F  
 31.33 ON 7/F

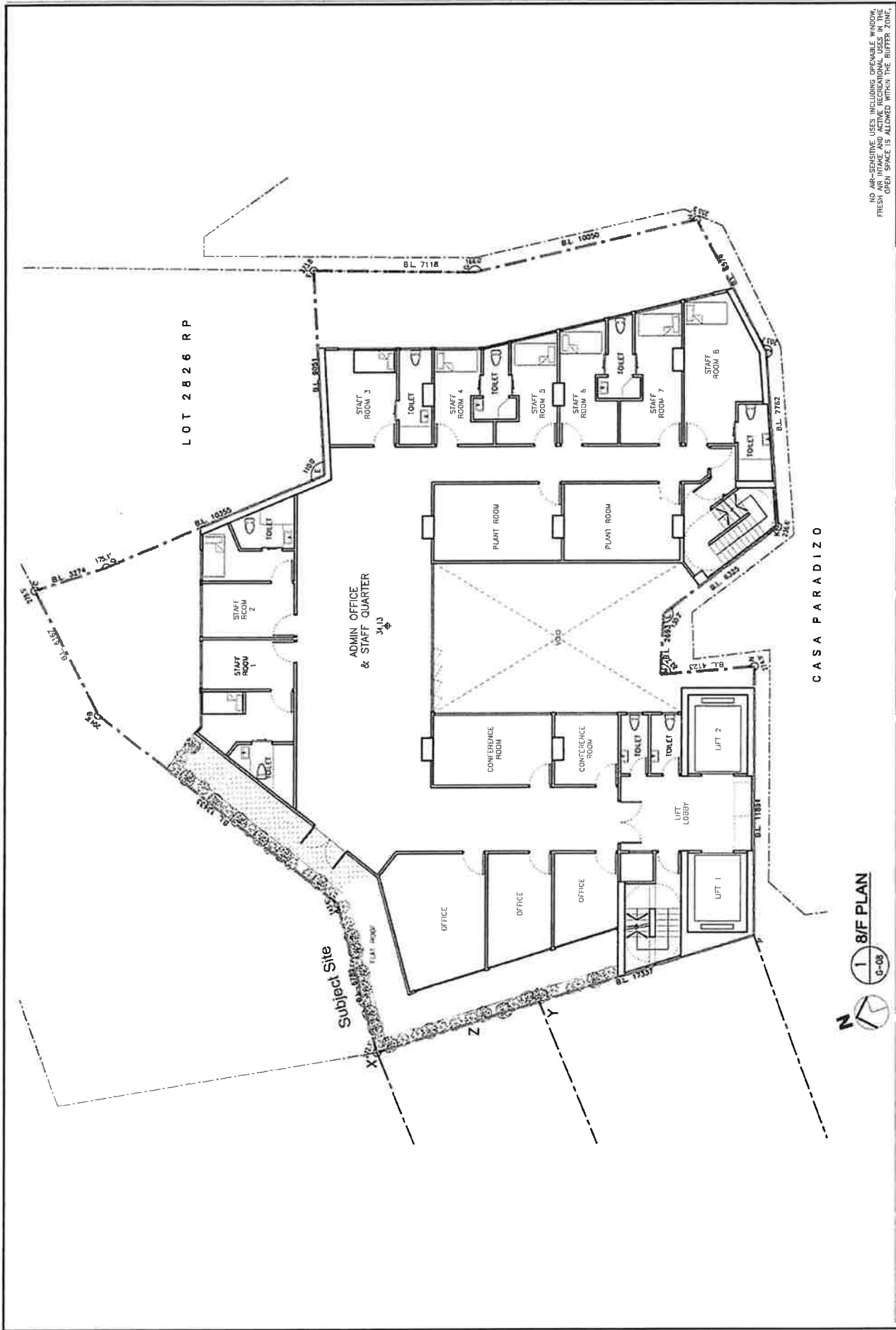
1 TYPICAL FLOOR PLAN PLAN  
 RCHE

TYPICAL FLOOR PLAN PLAN  
 RCHE

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

DATE	DESCRIPTION
OCT 7, 2022	REVISED
JULY 7, 2022	REVISED
B	A
1:155 (A3)	1:225 (A4)
G-07	

Drawn and checked by: [Name], [Title]  
 The drawings show the design stage of the building. All construction are required to be done in accordance with the approved plans.  
 The drawings are for the purpose of [Purpose].  
 The drawings are not for construction purposes unless expressly 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.

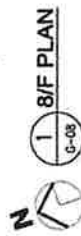
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DCT. 2022  
JULY 2022

G-08 1:150 (A3) B  
1:225 (A4) A

8/F PLAN  
ADMIN OFFICE & STAFF QUARTER

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

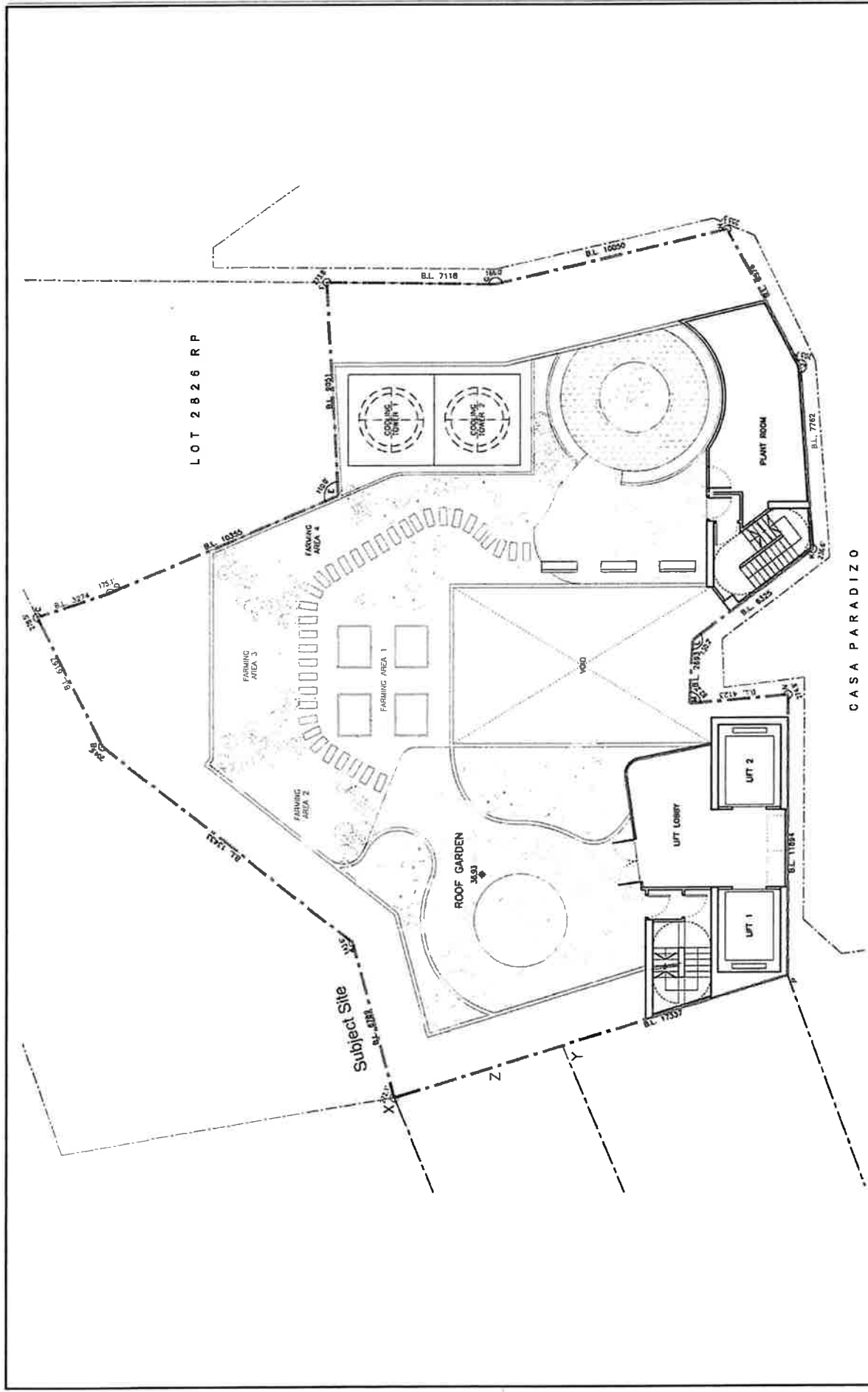


KLING



NO AIR-SENSITIVE USES INCLUDING OPENABLE WINDOW, FRESH AIR INTAKE AND ACOUSTIC TREATMENT USES. THE OPEN SPACE IS AROUND THE BUFFER ZONE.

2022



**1 ROOF GARDEN PLAN**

G-09

1:150 (A3)  
1:225 (A4)

B A

OUT. 2022  
JULY 2022

Drawings should be used to verify each step in the construction process. The drawings are for general information only. The drawings are not for construction purposes unless expressly stated.

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

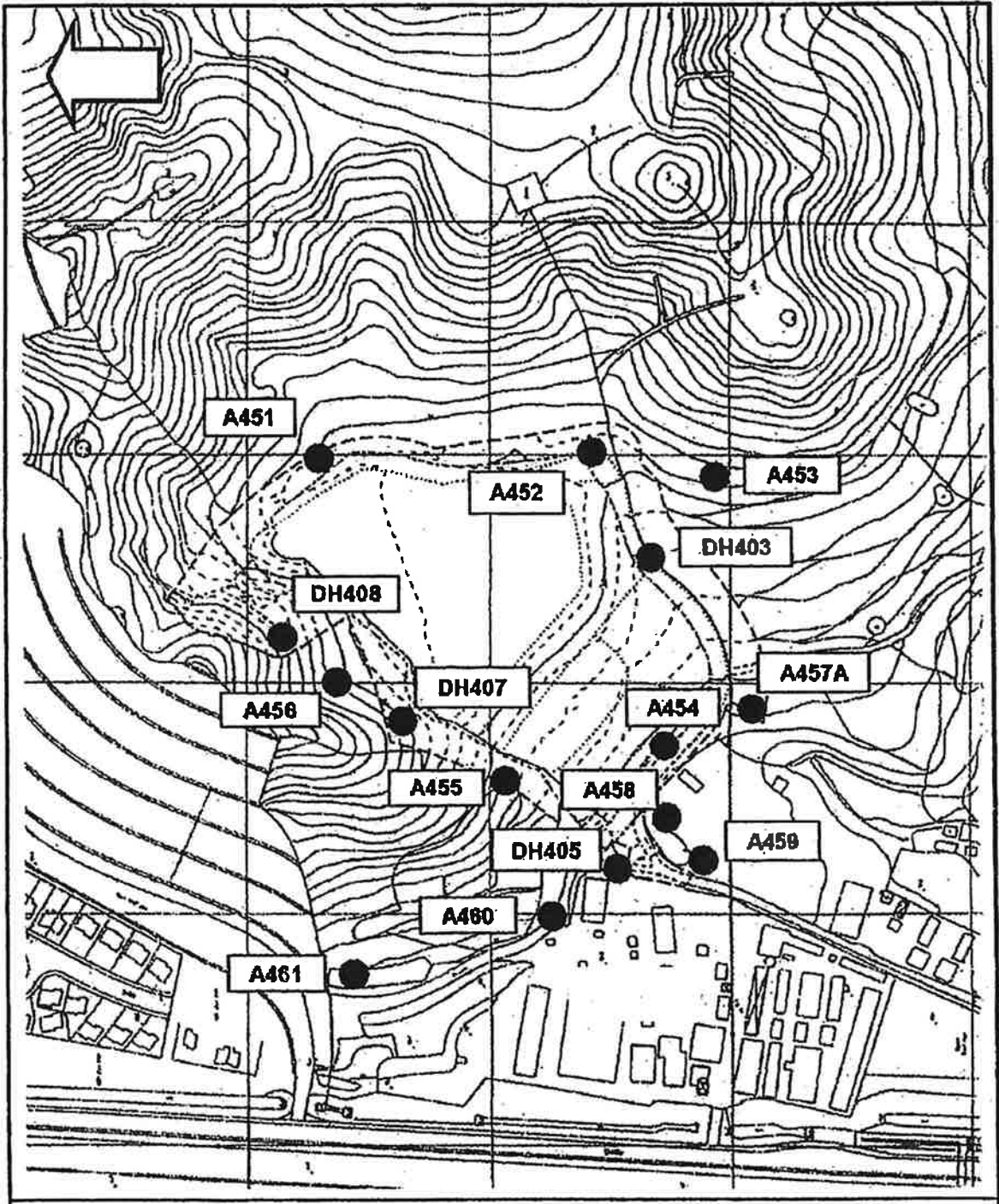
S12A AMENDMENT OF PLAN APPLICATION  
APPROVED NGAU TAM MEI  
OUTLINE ZONING PLAN NO. S/YL-NTM/12

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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 17-Jul-2020      GEM-2000  
 Weather Condition: Sunny

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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 14-Aug-2020      GEM-2000  
 Weather Condition: Sunny

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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 25-Sep-2020      GEM-2000  
 Weather Condition: Sunny

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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 22-Oct-2020      GEM-5000  
 Weather Condition: Sunny

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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 18-Nov-2020      GEM-5000  
 Weather Condition: Cloudy

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	Remark
A451	14:17	<0.1	6.2	17.2	27.0	0	
A452	14:53	<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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 18-Dec-2020      GEM-5000  
 Weather Condition: Sunny

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	1.3	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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 15-Jan-2021      GEM-5000  
 Weather Condition: Sunny

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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 05-Feb-2021      GEM-5000  
 Weather Condition: Sunny

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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 11-Mar-2021      16-Mar-2021      GEM-5000  
 Weather Condition: Sunny      Sunny

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbars)	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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 16-Apr-2021  
 Weather Condition: Cloudy

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbars)	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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 18-May-2021 20-May-2021      GEM-5000  
 Weather Condition: Sunny      Sunny

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbars)	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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 18-Jun-2021  
 Weather Condition: Fine

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbars)	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	14:40	<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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 16-Jul-2021      GEM-5000  
 Weather Condition: Cloudy

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbars)	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	2.6	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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 13-Aug-2021      GEM-5000  
 Weather Condition: Cloudy

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbars)	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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 27-Sep-2021      GEM-5000  
 Weather Condition: Fine

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbars)	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	30.2	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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 27-Oct-2021      GEM-5000  
 Weather Condition: Cloudy

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbars)	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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 18-Nov-2021      GEM-5000  
 Weather Condition: Sunny

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	14:34	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	
DH401	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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 16-Dec-2021      GEM-5000  
 Weather Condition: Sunny

Well No.	Time	Methane (%)	Carbon Dioxide (%)	Oxygen (%)	Temperature (°C)	Relative Pressure (mbar)	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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 20-Jan-2022      GEM-5000  
 Weather Condition: Sunny

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      Equipment Used: Landfill gas monitor  
 Date of Monitoring: 18-Feb-2022      GEM-5000  
 Weather Condition: Fine

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                      Equipment Used: Landfill gas monitor  
Date of Monitoring: 17-Mar-2022                      GEM-5000  
Weather Condition: Cloudy

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                      Equipment Used: Landfill gas monitor  
Date of Monitoring: 14-Apr-2022                      GEM-5000  
Weather Condition: Sunny

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                      Equipment Used: Landfill gas monitor  
Date of Monitoring: 20-May-2022                      GEM-5000  
Weather Condition: Sunny

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                      Equipment Used: Landfill gas monitor  
Date of Monitoring: 10-Jun-2022                      GEM-5000  
Weather Condition: Cloudy

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	29.3	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



***Introduction***

8.1 During the construction phase, hazards may arise which are related either to the flammability of landfill gas or to its 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**

<b>Parameter</b>	<b>Measurement</b>	<b>Action</b>
O <sub>2</sub>	< 19%	Ventilate trench/void to restore O <sub>2</sub> to >19%



Parameter	Measurement	Action
	< 18%	Stop works evacuate personnel/prohibit entry increase ventilation to restore O <sub>2</sub> to >19%
CH <sub>4</sub>	> 10% LEL	Post 'No Smoking' signs prohibit hot works ventilate to restore CH <sub>4</sub> to <10% LEL
	>20% LEL	Stop works evacuate personnel/prohibit entry increase ventilation to restore CH <sub>4</sub> to <10% LEL
CO <sub>2</sub>	>0.5%	ventilate to restore CO <sub>2</sub> to <0.5%
	> 1.5%	Stop works evacuate personnel/prohibit entry increase ventilation to restore CO <sub>2</sub> 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.**

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

**RESPONSE-TO-COMMENT – SWD**

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

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



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

Comments	Response
<p>2. Comments of the Director of Social Welfare, Social Welfare Department (DSW, SWD)</p> <p>as follows:</p> <p><u>RCHE Services Perspective</u></p> <p><u>(A) Applicant’s R-to-C</u></p> <p><u>(i) Boundary/ Extent of the RCHE</u></p> <ul style="list-style-type: none"> <li>● 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.</li> </ul> <p><u>(ii) 24 height restriction of RCHE</u></p> <ul style="list-style-type: none"> <li>● 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.</li> </ul> <p><u>(iii) Isolation Measures</u></p> <ul style="list-style-type: none"> <li>● As per our advice, protected lobbies to the 3 no. isolation rooms of area at not more</li> </ul>	<p>Noted.</p> <p>Noted.</p> <p>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.</p> <p>Noted.</p>

**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. V/YL-NTM/9  
Response-to-Comment – SWD  
(updated 13 April 2023)**

Comments	Response
<p>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.</p> <p><b><u>(B) Revised RCHE Layout Plan</u></b></p> <p>(i) Bed spacing requirement</p> <ul style="list-style-type: none"> <li>● 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.</li> </ul> <p>(ii) Dimension of lifts</p> <ul style="list-style-type: none"> <li>● 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.</li> </ul> <p>(iii) Location of car parking spaces</p> <ul style="list-style-type: none"> <li>● 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.</li> </ul> <p>(iv) Usages of non-standard facilities of RCHE, including Wellness Centre, Hydrotherapy, Sky Garden, Roof Garden, Farming Areas and Staff Quarter</p>	<p>Bed spacing revised as per your comment. Please refer to G-05 rev. D to G-07 rev. D.</p> <p>Noted.</p> <p>Noted.</p>

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Response-to-Comment – SWD  
(updated 13 April 2023)**

Comments	Response
<ul style="list-style-type: none"> <li>● 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.</li> <li>● 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.</li> </ul> <p><b><u>(C) Views on the Applicant’s Intention for Joining the Premium Concession Scheme</u></b></p> <ul style="list-style-type: none"> <li>● 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.</li> <li>● Subject to comments from other government bureau/ departments, please be advised</li> </ul>	<p>Noted.</p> <p>Noted. We will submit the application and comply with the conditions and all relative</p>

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S12A Application for Planning Application No. Y/YL-NTM/9  
Response-to-Comment – SWD  
(updated 13 April 2023)**

Comments	Response
<p>that we shall only support the setting up of a RCHE and consider recommending Premium Concession for the proposed RCHE on the conditions that –</p> <p>(a) the proposed RCHE should be a satisfactory design as agreed by the Social Welfare Department (SWD);</p> <p>(b) there shall be no financial implications, both capital and recurrent, to the Government;</p> <p>(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</p> <p>(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.</p> <ul style="list-style-type: none"> <li>● 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;</li> </ul>	<p>guidelines.</p>

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Response-to-Comment – SWD  
(updated 13 April 2023)**


<b>Comments</b>	<b>Response</b>
<p>(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 providing a quality RCHE, the applicant should study the references in details for the design/ planning of the RCHE.</p> <p><b><u>RCHE Licensing Perspective</u></b></p> <p>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.</p> <p>“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</p>	<p>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.</p>



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Response-to-Comment – SWD  
(updated 13 April 2023)**

Comments	Response
<p>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”.</p>	




1 2/F PLAN  
G-05

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

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

2/F PLAN  
 RCHE

G-05  
 1:150 (A3)  
 1:225 (A4)

D  
 C  
 B  
 A  
 MAY. 2023  
 APR. 2023  
 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 expressly certified.






1 3/F PLAN  
G-06

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

3/F PLAN  
 RCHE

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

D  
 C  
 B  
 A  
 MAY. 2023  
 APR. 2023  
 OCT. 2022  
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**1 TYPICAL FLOOR PLAN PLAN**  
G-07

CASA PARADIZO

LOT 2826 RP

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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)  
1:225 (A4)

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

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