Attachment 2

Revised Environmental Assessment

EnviroSolutions & Consulting Ltd

[redacted]

Proposed Religious Institution (the Supreme Kwan Ti Temple) and Improvement to the Existing Access Road, Tai Tong, Yuen Long
Environmental Assessment Report

Prepared for:

Kwan Ti Culture Service Limited

22 September 2026

EnviroSolutions & Consulting Ltd
[redacted]

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Environmental Assessment Report

Prepared for
Kwan Ti Culture Service Limited

For and on behalf of
EnviroSolutions & Consulting

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1 PROJECT BACKGROUND

1.1 Introduction

1.1.1 It is planned to develop a temple for Kwan Ti ("the Proposed Development") at DD 117 Tai Tong Shan Road Lots Nos. 1622, 1624, 1629, 1630 S.A, 1630 S.B, 1630 S.C, 1630 S.D, 1631, 1632, 1633, 1634, 1635 and 1636 (Part), and the adjoining government land, Yuen Long, N.T., Hong Kong ("the Site"). The site area is approx. 18,325m^2.

1.1.2 The Site is zoned "Recreation" ("REC") and Green Belt ("GB") under the Approved Tai Tong Outline Zoning Plan ("OZP") No. S/YL-TT/20. EnviroSolutions & Consulting Limited ("ESC" or "the Consultant") was previously engaged to support a planning application (No. A/YL-TT/685) under Section 16 of the *Town Planning Ordinance* ("TPO"), which was withdrawn in 2025. A further application (No. A/YL-TT/751), based on a scale-down development proposal, was subsequently submitted but withdrawn in January 2026 following a meeting with the Development Bureau ("DevB") and Planning Department ("PlanD").

1.1.3 To facilitate the Proposed Development, it is now proposed to rezone the Site from REC and GB to a more appropriate zoning, such as Government, Institution or Community ("GIC") on the approved Tai Tong Outline Zoning Plan No. S/YL-TT/20, through a rezoning application under Section 12A of TPO.

1.1.4 EnviroSolutions & Consulting Ltd ("ESC") has been appointed to prepare this Environmental Assessment ("EA") to support the S.12A application for the Proposed Development.

1.2 Site Description

1.2.1 The site location and its environs are summarized below and shown in **Figure 1-1**:

- To the North: Tai Tong Kwan Ti Square, Tai Tong Organic EcoPark
- To the East: access road, slopes
- To the South: Tai Tong Lychee Valley
- To the West: natural stream, Tai Tong Riding Club

1.2.2 The development schedule of the Proposed Development is shown below:

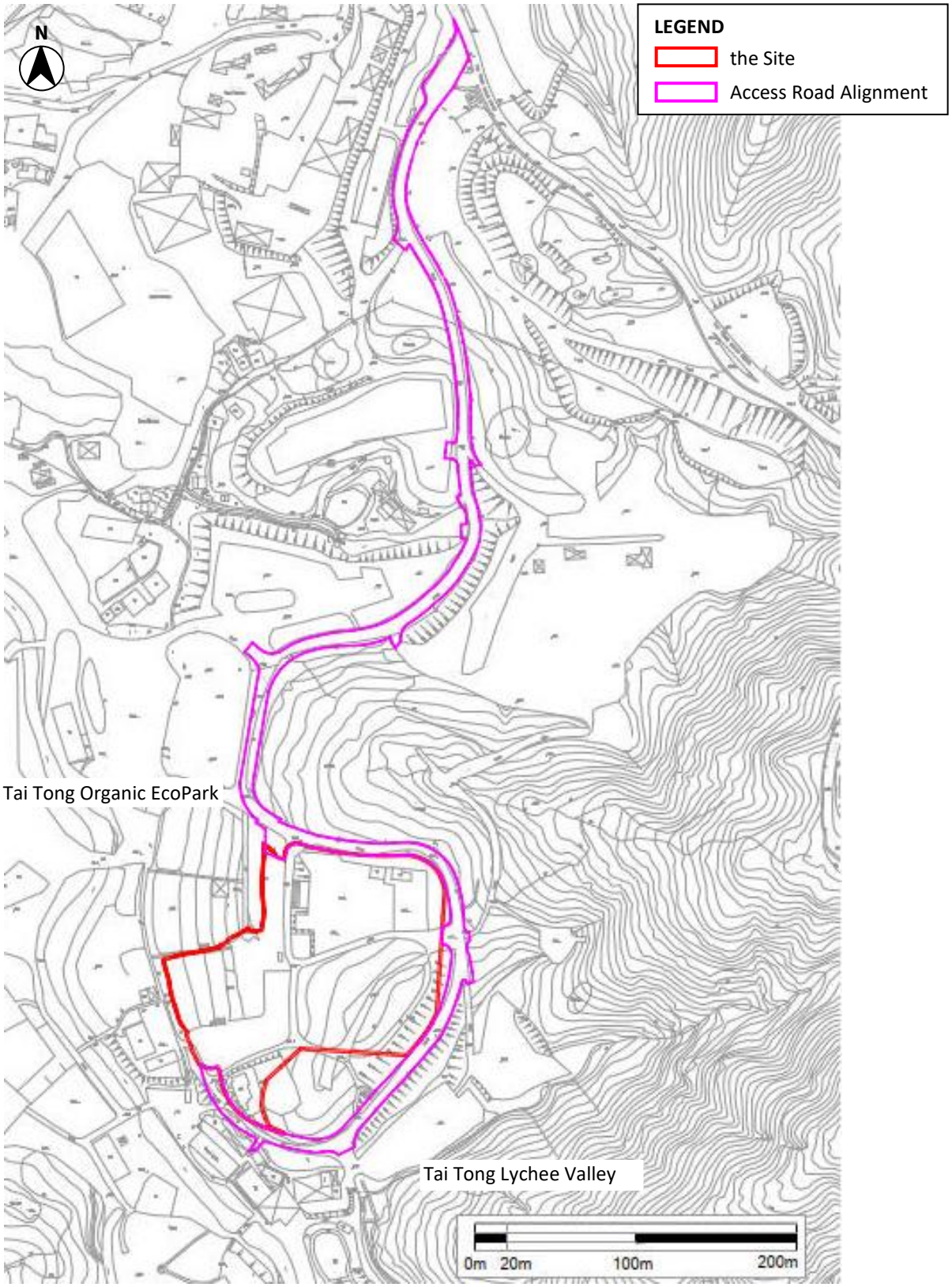
Site Area	About 18,325m^2
Maximum Building Height	29.99m

1.3 Objectives of the Report

1.3.1 The objectives of this EA Report are to:

- Identify and qualitatively assess the potential environmental impacts arising from the construction and operation of the Proposed Development, in terms of air quality, noise, water quality and waste management and land contamination review.
- Recommend appropriate measures to mitigate any impacts if necessary.

Figure 1-1 Site Location and its Environs



2 AIR QUALITY

2.1 Introduction

2.1.1 This section provides an assessment of the potential air quality impact arising from the Proposed Development during construction and operation phases. Mitigation measures are recommended, where necessary, as part of the assessment.

2.2 Environmental Legislation and Standards

Air Quality Objectives

2.2.1 The prevailing Air Quality Objectives ("AQOs") established under the *Air Pollution Control Ordinance* ("APCO") (Cap. 311) are given in **Table 2-1**.

Table 2-1 Hong Kong Air Quality Objectives

POLLUTANT	AVERAGING TIME	CONCENTRATION LIMIT [Note 1] (µg/m³)	NUMBER OF EXCEEDANCES ALLOWED
Sulphur Dioxide (SO_2)	10-minute	500	3
	24-hour	40	3
Respirable Suspended Particulates ("RSP" or "PM_{10}") [Note 2]	24-hour	75	9
	Annual	30	Not applicable
Fine Suspended Particulates ("FSP" or "$PM_{2.5}$") [Note 3]	24-hour	37.5	18
	Annual	15	Not applicable
Nitrogen Dioxide (NO_2)	1-hour	200	18
	24-hour	120	9
	Annual	40	Not applicable
Ozone (O_3)	8-hour	160	9
	Peak season	100	Not applicable
Carbon Monoxide (CO)	1-hour	30,000	0
	8-hour	10,000	0
	24-hour	4,000	0
Lead (Pb)	Annual	0.5	Not applicable

Notes:

1. All measurements of the concentration of gaseous air pollutants, i.e. SO_2, NO_2, O_3 and CO, are to be adjusted to a reference temperature of 293 Kelvin and a reference pressure of 101.325 kilopascal.
2. RSP means suspended particles in air with a nominal aerodynamic diameter of 10µm or less.
3. FSP means suspended particles in air with a nominal aerodynamic diameter of 2.5µm or less.

Air Pollution Control (Construction Dust) Regulation

2.2.2 Enacted under Section 43 of the APCO, the *Air Pollution Control (Construction Dust) Regulation* defines notifiable and regulatory works to ensure effective dust abatement measures have been properly implemented to reduce dust emissions for a number of construction activities.

2.2.3 The Regulation requires that advance notice is given to EPD for any notifiable work[Ref.#1] and the contractor shall ensure that the notifiable and regulatory works are carried out in accordance with the Schedule of the Regulation, which also includes dust control and suppression measures.

Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation

2.2.4 This Regulation takes effect on June 2015 and required Non-road Mobile Machinery ("NRMM"), except those exempted, to comply with the prescribed emission standards. From 1 September 2015, all regulated machines sold or leased for use in Hong Kong must be approved or exempted with a proper label in a prescribed format issued by EPD. Starting from 1 December 2015, only approved or exempted NRMMs with a proper label are allowed to be used in specified activities and locations including construction sites, container terminals and back up facilities, restricted areas of the airport, designated waste disposal facilities and specified processes.

Hong Kong Planning Standards and Guidelines ("HKPSG")

2.2.5 The minimum buffer distances required between different types of roads and open spaces are recommended in Chapter 9 Environment of HKPSG and are summarised in **Table 2-2** for ease of reference.

Table 2-2 HKPSG Minimum Setback Distances of Different Road Types

POLLUTION SOURCE	TYPE OF ROAD	BUFFER DISTANCE	PERMITTED USES
Road and Highways	Trunk Road and Primary Distributor	>20m	Active and passive recreational use
		3 – 20m	Passive recreational use
		<3m	Amenity areas
	District Distributor	>10m	Active and passive recreational use
		<10m	Passive recreational uses
	Local Distributor	>5m	Active and passive recreational use
		<5m	Passive recreational use
	Under Flyovers	-	Passive recreational use

Source: Adapted from Table 3.1 of Chapter 9 Environment of HKPSG

2.2.6 The minimum buffer distances required between the industrial areas (chimneys) and open spaces are recommended in Chapter 9 Environment of HKPSG and are summarised in **Table 2-3** for ease of reference.

[1] Notifiable works include site formation, reclamation, demolition of a building, work carried out in any part of a tunnel that is within 100m of any exit to the open air, construction of the foundation of a building, construction of the superstructure of a building and road construction work.

Table 2-3 HKPSG Minimum Setback Distances for Industrial Areas (Chimneys)

POLLUTION SOURCE	DIFFERENCE IN HEIGHT BETWEEN INDUSTRIAL CHIMNEY EXIT AND THE SITE	BUFFER DISTANCE	PERMITTED USES
Industrial Areas	<20m	> 200m	Active and passive recreational use
		5 – 200m	Passive recreational uses
	20m – 30m (*)	> 100m	Active and passive recreational use
		5 – 100m	Passive recreational uses
	30m – 40m	> 50m	Active and passive recreational use
		5 – 50m	Passive recreational uses
	> 40m	> 10m	Active and passive recreational uses

Notes :

(a) In situations where the height of chimneys is not known, use the set of guidelines marked with an asterisk for preliminary planning purpose and refine as and when more information is available.

(b) The buffer distance is the horizontal, shortest distance from the boundary of the industrial lot, the position of existing chimneys or the edge of road kerb, to the boundary of open space sites.

(c) The guidelines are generally applicable to major industrial areas but NOT individual large industrial establishments which are likely to be significant air pollution sources. Consult EPD when planning open space sites close to such establishments.

(d) Amenity areas are permitted in any situation.

2.3 Identification of Air Sensitive Receiver ("ASRs")

2.3.1 Thirteen representative ASRs within 500m assessment area of the Site have been identified for this assessment. The representative ASRs are shown in **Figure 2-1** and summarised in **Table 2-4**.

Table 2-4 Representative ASRs within 500m Assessment Area of the Site

ASR ID	DESCRIPTION	USE	APPROX. SEPARATION DISTANCE TO THE TEMPLE SITE/ ACCESS ROAD, m
ASR 1	Kwan Ti Square	Religious	0
ASR 2	Tai Tong Lychee Valley	Recreational	53
ASR 3	Tai Tong Organic EcoPark	Recreational	15
ASR 4	Tai Tong Riding Club	Recreational	25
ASR 5	Village Houses	Residential	35
ASR 6	Village Houses	Residential	130
ASR 7	Jockey Club Recreation and Sports Pavilion	Recreational	340
ASR 8	Po Leung Kuk Jockey Club Tai Tong Holiday Camp	Recreational	365
ASR 9	Auto Repair Shop	Commercial	180
ASR 10	GREENOBO Campsite	Campsite	40
ASR 11	Art Farm	Campsite	70
ASR 12	Restaurant	Restaurant	10
ASR 13	Tai Tong Organic EcoPark Workshop	Recreational	10

2.4 Air Quality Impact During Construction Phase

2.4.1 Particulate Matters ("PM") and gaseous emission are the major impact sources that will be generated during construction activities, such as excavation, stockpiling, earth moving, transferring or handling of dusty materials, and use of construction vehicles and powered mechanical equipment ("PME").

2.4.2 Based on the current scheme, approx. 49,209m^3 of inert C&D materials may be generated throughout the construction period, of which 5,368 m^3 will be reused on-site as fill materials as described in **Paragraphs 5.3.13** to **5.3.14**. Accordingly, approximately 43,841 m^3 of inert C&D materials will be disposed of at the available public fill reception facilities. Assuming a construction period of 2 years with 6 working days a week, a material bulk factor of 1.4 has been adopted. On this Basis, approximately 107 m^3 of excavated materials will be generated per day on average (i.e. 43,841 m^3 x 1.4 / (6 x 4 x 24 days)). Assuming the capacity of an average dump truck is 7.5 m^3, it is estimated that about 15 dump trucks per day will be required for material removal.

2.4.3 Given the relatively small number of truck trips per day, the potential air quality impact arising from the operation of dump trucks can be controlled with the implementation of mitigation measures as detailed in **Paragraphs 2.4.6 to 2.4.8**. In addition, only a limited numbers of diesel-powered machinery to be used at the site. The type and number of such equipment will be further reviewed and optimised during the detailed design stage, taking into account the site conditions and construction methods, to minimise potential air quality impacts.

2.4.4 Based on the available information from public domain and a site visit conducted on 13 March 2025, no concurrent project within 500m of the assessment area is observed. Nonetheless, there may be concurrent projects in the future. Concurrent projects in the future, if any, will be further reviewed when the construction programme is available, and the cumulative construction air quality impact, if any, will be further assessed. In any case, close liaison with the contractors of all concurrent projects will be maintained to avoid overlapping of heavy or dusty construction works as far as practicable in order to minimise the potential cumulative impacts.

2.4.5 The *Air Pollution Control (Construction Dust) Regulation, Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation and Air Pollution Control (Fuel Restriction) Regulations* stipulated several air quality control measures. With the implementation of control measures and good practices as detailed in **Paragraphs 2.4.6 to 2.4.8**, particulate matter and gaseous emissions arising from construction activities and operation of on-site diesel-powered mechanical equipment can be effectively controlled. Therefore, no adverse construction air quality impact is expected.

Mitigation Measures

2.4.6 The following good practices and control measures shall be implemented during the construction phase to control air quality impact on the surrounding air sensitive uses:

- Hard paving surface on open area, regular spraying water on exposed site surfaces and unpaved roads to reduce dust emissions, particularly during dry weather.
- Before, during and immediately after any excavation or earth moving operation, the working site shall be sprayed with water to keep the surface wet.

- Spraying water frequently for extra dusty areas and areas close to ASRs.
- Any stockpile of dusty materials shall be either covered entirely by impervious sheeting, placed in an area sheltered on the top and three sides, or sprayed with water so as to maintain the entire surface wet.
- Before loading, unloading or transfer any dusty materials, wet the dusty materials as far as practicable.
- Before, during and immediately after uprooting of trees, shrubs, or vegetation or for the removal of boulders, poles, pillars or temporary or permanent structures, the working area shall be watered so as to maintain the entire surface wet.
- All demolished items (including trees, shrubs, vegetation, boulders, poles, pillars, structures, debris, rubbish and other items arising from the site clearance) that may generate dust particles shall be covered entirely by impervious sheeting or placed in an area sheltered on the top and three sides within a day of demolition.
- Tarpaulin covering of all dusty vehicles loads transported to, from and between site locations.
- Vehicle washing facilities including a high-pressure water jet shall be provided at every discernible or designated vehicle exit point. The area for vehicle washing and the section of the road between the washing facilities and the exit point shall be paved with concrete, bituminous materials or hardcore.
- At least 2.4m high hoarding from ground level shall be provided along site boundary where adjoins a road, streets or accessible to other public premises except for a site entrance or exit.
- Where possible, wet the surface of façade grinding work.
- Equip vacuum cleaner on grinder for façade grinding work to collect dusty particles where possible.
- Main haul road shall be kept wet by spraying water. Imposition of speed controls for vehicles on site haul roads and confine haulage and delivery vehicles to designated roadways inside the site.
- A portion of any road leading only to a construction site that is within 30m of a discernible or designated vehicle entrance or exit shall be kept clear of dusty materials.
- Where possible, routing of vehicles and positioning of construction plant should be at the maximum possible distance from the 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 three sides.
- Higher hoarding of >3m shall be erected at the work boundary close to the ASRs in close proximity to the Site (e.g. ASR1, ASR3, ASR12 and ASR13).
- Exempted NRMMs shall be avoided, and electric power supply shall be provided for on-site machinery as far as practicable.
- Liquid fuel with a sulphur content of no more than 0.001% by weight should be used.

2.4.7 Many construction plants are driven by fuel combustion, use of construction plants could be a source of PM, NO_2, SO_2 or CO. The *Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation* provides guidance on control of emission from the use of

construction plants. The *Air Pollution Control (Fuel Restriction) (Amendment) Regulation*s shall also be fully complied with for the machinery to be used during the construction stage to minimise any aerial emissions. Therefore, it is expected that the emissions from the use of construction plants will be controlled and no adverse air quality impact is anticipated.

2.4.8 In addition, the EPD's *Recommended Pollution Control Clause ("RPCC") for Construction Contract* in COP should be incorporated in the relevant works contract. The RPCC are generally good engineering practice to minimise inconvenience and environmental nuisance to nearby residents and other sensitive receivers. The general requirements are summarised below:

- The Contractor shall observe and comply with the APCO and its subsidiary regulations, particularly the Air Pollution Control (Open Burning) Regulation, Air Pollution Control (Construction Dust) Regulation, Air Pollution Control (Non-road Mobile Machinery (Emission) Regulation, Air Pollution Control (Fuel Restriction) Regulations and Air Pollution Control (Smoke) Regulation.
- The Contractor shall undertake at all times to prevent air nuisance and smoke as a result of his activities, and minimise the emission of air pollutants from construction plant and equipment.
- The Contractor shall ensure that there will be adequate water supply / storage for dust suppression.
- The Contractor shall devise, arrange methods of working and carrying out the works in such a manner as to minimise air quality impacts on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these methods are implemented.
- For better smoke control, the Contractor shall not use diesel hammer for percussive piling.
- Before commencement of any work, the Engineer may require the methods of working, plant, equipment and air pollution control system to be used on the site to be made available for inspection and approval to ensure that they are suitable for the Project.

2.4.9 With the implementation of the above mitigation measures and good site practice, no adverse air quality impact during construction stage is anticipated. Nevertheless, a monitoring and audit programme for air quality during construction phase would be further reviewed and considered in the detailed design stage.

2.5 Air Quality Impact During Operation Phase

Chimney Emission

2.5.1 A site visit was conducted on 13 March 2025 to look for any underlying air pollution sources in the vicinity of the Site. Through the site visit and desktop review, no chimney was found within 500m assessment area from the Site. The buffer distance between industrial chimneys and air sensitive uses recommended in Table 3.1 of Chapter 9 in HKPSG can be fulfilled. Therefore, no adverse air quality impact from chimney emission is expected during operation phase.

Emergency Generator

2.5.2 Emergency generator will be employed to back up the firefighting equipment in the event of main power failure. The emergency generator is generally driven by diesel engine and will be accommodated within a dedicated generator room, the indicative location is shown in **Figure 2-1**. The generator will be operated infrequently, solely in the event of main power failure and for routine functional testing of approximately 30 minutes once every two months. The design and installation of the emergency generator, including exhaust discharge arrangement and fuel specifications, will make reference to 'Guidelines on Application for Installation of Emergency Generator' issued by EPD. Given the infrequent operation of the emergency generator and the implementation appropriate exhaust design and fuel control measures in accordance with the EPD guidelines, no adverse air quality impact is anticipated during the operation phase.

Vehicular Emission from Open Road

2.5.3 The local access road is the major road along the boundary of the Site as shown in **Figure 2-2**. With reference to the *Annual Traffic Census 2024* published by the Transport Department ("TD"), no relevant information regarding the road type of the local access road is provided. As advised by the traffic consultant received with no comment from TD, the local access road should be classified as a Local Distributor ("LD"). Hence, the buffer distance of 5m for LD has been adopted for the local access road. There is no other road except the local access road located in the vicinity of the Proposed Development. The TD's reply for road type is provided in **Appendix A**.

2.5.4 As illustrated in **Figure 2-2**, majority of the Site can fulfil the 5m buffer distance requirement, except small part of areas along southeast boundary of the Site. ASR 12 to the southwest of the Site is also partially within the buffer zone. According to desktop review, and the site visits conducted on 5 January 2024 and 13 March 2025, some windows were observed located within the buffer zone at ASR 12. However, these are clerestory windows which should be for provision of sunlight only and are not expected to be opened for ventilation. As confirmed with the property owner, those clerestory windows and glazed doors within the buffer zone will not be opened during the normal operation. Therefore, there are no air sensitive uses located within the buffer zone for ASR 12, and no adverse air quality impact is anticipated at ASR 12. Photographs of ASR 12 is shown in **Figure 2-2** for reference. For the areas of the Site located within the buffer zone, the following requirements should be met to avoid adverse air quality impact from traffic emission:

- No fresh air intake/openable window of air sensitive uses shall be located within the buffer zone.
- Any air sensitive uses within the buffer zone shall rely on fresh air intake/openable window located out of the buffer zone for ventilation.
- There shall be no recreational use in open space for the Proposed Development within the buffer zone from all nearby roads.

2.5.5 A separate Traffic Impact Assessment ("TIA") prepared by the Traffic Consultant has concluded that the additional traffic trips related to the Proposed Development can be absorbed by the nearby road network. Hence, no adverse traffic congestion is expected. Nonetheless, administrative measures (e.g. special traffic arrangements, adoption of appointment system to control the number of visitors, etc.) would be further reviewed and

adopted as far as practicable to minimize the potential vehicular emission in the detailed design stage. Therefore, no adverse traffic congestion problem leading worsening of vehicular emission impact is expected.

2.5.6 According to the Planning Statement, it is proposed to have an indoor carpark at the lower ground floor of the Proposed Development. A total of 34 parking spaces will be provided for private cars and motorcycles only (i.e. 30 parking spaces for private cars and 4 for motorcycles). Loading/unloading provision will be provided on the ground floor for coaches, taxi or light buses. In normal day, only 3 coaches per hour will visit the site, while in ceremony/ event day there is 12 coaches per hour will visit the site. After loading and unloading, coaches will leave the Site. For the design and operation of the car park, reference shall be made to *Professional Persons Environmental Consultative Committee ("ProPECC") Practice Note for Control of Air Pollution in Car Parks* ("ProPECC PN2/96"), which provides guidelines for air quality standards in car parks, monitoring of CO, and design considerations for ventilation and exhaust systems. Given that booking in advance is required for use of the indoor car park, and the loading/unloading provision, a large number of vehicles is not expected within the Proposed Development, no adverse vehicular emission impact is expected due to the operation of the car park. The detailed design of the car park will be available during the detailed design stage. The indicative location of the indoor car park ventilation exhausts, subject to the detailed design, is shown in **Figure 2-1**.

Incense/Joss Paper Burning

2.5.7 As the Proposed Development is a religious institution, there will be incense/joss paper burning activity during operation phase. Incense/joss paper burning is described below:

1. As indicated in Appendix II of the Planning Statement, three events related to Kwan Ti worship were conducted each year from 2021 to 2023. In order to allow more Kwan Ti worship, no more than eight events per year for Kwan Ti worship will be held at the Proposed Development.
2. To minimise the impact to the surrounding ASRs, the incense burning activity will be allowed in the Ceremonial Main Court of the Proposed Development only, which is located no less than 20m from the closest ASR, as shown in **Figure 2-3**.
3. With reference to other temples' arrangement, such as Wong Tai Sin Temple, each visitor will be allowed to burn no more than three incense sticks with low emission to be bought from the Proposed Temple to minimise the air quality impact.
4. Moreover, a smokeless incense/joss paper furnace will be provided for the Proposed Development to further mitigate the smoke generated from burning activity. One unit of smokeless incense/joss paper furnace will be provided and sited as far as practicable from the ASRs. In addition, the exhaust outlet will be oriented, where practicable, to avoid the direct discharge of emissions towards any ASRs. The proposed furnace location is on the southern side of the Ceremonial Main Court, as shown in **Figure 2-3**.
5. All joss paper burning activities will only be carried out in the smokeless incense/joss paper furnace to be located within the Ceremonial Main Court shown in **Figure 2-3**.
6. During the event day, approximate 30kg/ hour of joss paper will be treated/ burnt; while only approximate 5kg/ hour of joss paper will be treated/ burnt in normal day. In any case, no more than 80kg/hour and 10kg/hour of joss papers will be treated/burnt in event days and normal days, respectively.

7. The Applicant has committed to minimising joss paper burning. To accommodate these occasional situations, a smokeless incense/joss paper furnace with a capacity of at least 80kg/hour should be adopted. An example of such a furnace with a capacity of 80 kg/hour which is designed for temples is provided in **Appendix B**. The measures outlined in **paragraph 2.5.8** shall be strictly implemented, maintained and monitored.
8. The smokeless incense/joss paper furnace will be routinely inspected and will be given proper maintenance and repair as needed. An operation manual will be prepared by the Applicant for the smokeless incense/joss paper during the detailed design stage. The manual shall include daily inspection by the trained staff, monthly inspection to be carried out by the furnace supplier or experienced contractor, provision of spare parts for repair and maintenance and prohibition of burning activities during breakdown or malfunction of the smokeless incense/joss paper furnace.

2.5.8 The Applicant shall implement good operation practices and administrative measures as recommended in the *Guidelines on Air Pollution Control for Joss Paper Burning at Chinese Temples, Crematoria and Similar Places* published by EPD, including:

- Limiting the burning of incense/joss paper to no more than 90% of the capacity of the smokeless incense/joss paper furnace, which is capped at 70 kg/hour for this case, in order to avoid overloading.
- Encouraging visitors to adopt green worship practices such as flower/fruit worship practices and using electric incense sticks.
- Allowing the smokeless incense/joss paper furnace to be used in the Main Court upon request only.
- Ensuring that air pollution control equipment is switched on and functioning properly before any burning activities.
- Providing training to designated employees on the proper use of the smokeless incense/joss paper furnace.
- Prohibiting all persons other than trained employees from burning incense/joss paper or operating the smokeless incense/joss paper furnace.
- Disallowing any joss paper burning without the operation of the smokeless incense/joss paper furnace.
- Requiring visitors to burn only incense/joss paper supplied by the Applicant to control the quantity and quality of burning materials.
- Providing guidance to users to minimise the quantity of burning materials and remove non-paper materials (such as plastic wrapping) before burning.

2.5.9 With the implementation of the measures above, no adverse air quality impact is expected from the burning activity.

On-Site Sewage Treatment

2.5.10 Either on-site sewage holding tanks or Septic Tank/Soakaway Pit System will be provided within the Proposed Development, as discussed in **Paragraph 4.6.3**, sewage generated from the Proposed Development will be temporarily stored in sewage storage tanks and tankered away for off-site disposal in a Sewage Treatment Facility (Option 2) or diverted to Septic Tank/Soakaway Pit System (Option 1). For Option 1, five (5) septic tanks with a total

capacity of 200 m^3 shall be provided. For Option 2, six (6) sewage holding tanks with a total capacity of 66 m^3 shall be provided.

2.5.11 The Septic Tank/Soakaway Pit System under Option 1 will be designed in accordance with EPD's ProPECC PN 1/23 *Drainage Plans subject to Comment by the Environmental Protection Department -Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations* which has been described in the Sewerage Impact Assessment ("SIA") Report appended to the Planning Application. All septic tanks/sewage holding tanks will be enclosed except for the inlet and outlet. All exhaust air from the sewage holding or septic tanks will be routed to deodourisation unit equipped with activated carbon filtration prior to discharge to the atmosphere. The potential location and direction of the exhaust outlet, subject to the detailed design, is shown in **Figure 2-1**. The deodourisation unit shall achieve at least 99.5% odour removal efficiency for general odour with reference to other site with similar mitigation measures [Ref.#2]. Given that septic tanks/sewage holding tanks will be enclosed and the exhaust air will be treated by deodourisation unit prior to discharge, no adverse odour impact from on nearby ASRs is anticipated.

2.6 Conclusion

2.6.1 With the implementation of the recommended mitigation measures and good site practice, adverse air quality impact during the construction phase is not anticipated.

2.6.2 For the operation phase, as there are no active chimneys within 200m of the site boundary of the Proposed Development, no adverse air quality impact from industrial emission is anticipated. Given the infrequent operation of the emergency generator and the implementation appropriate exhaust design and fuel control measures in accordance with the EPD guidelines, no adverse air quality impact is anticipated. For vehicular emission, no air sensitive use including openable window, fresh air intake and recreational use in open space will be located within the 5m buffer zone of the local access road as stipulated in Chapter 9 of HKPSG. Besides, with the implementation of mitigation measures mentioned in **Paragraph 2.5.5**, no adverse traffic congestion problem leading worsening of vehicular emission impact is expected. Hence, no adverse air quality impact from vehicular emission is anticipated.

2.6.3 Moreover, a series of mitigation measures have been proposed to control/minimise the air quality impact from incense/joss paper burning activities. Therefore, no adverse air quality impact from incense/joss paper burning activity is anticipated during operation of the Proposed Development. With regard to odour, exhaust air from the sewage storage tanks/ septic tanks will be routed to a deodourisation unit equipped with activated carbon filtration prior to discharge to the atmosphere. The deodourisation unit will achieve an odour removal efficiency of at least 99.5% for general odours. Given the implementation of the proposed odour mitigation measures, no adverse odour impact from the Proposed Development is anticipated.

2.6.4 Overall, no adverse air quality impact is anticipated during the construction and operation phases of the Proposed Development.

[2] Outlying Islands Sewerage Stage 1, Phase II Package J – Sok Kwu Wan Sewage Collection, Treatment & Disposal Facilities, 2003 (No. 091/2003)

Figure 2-1 Representative ASRs within 500m Assessment Area of the Site, Emergency Generator Room and Indicative Ventilation Exhaust Location of Indoor Car Park

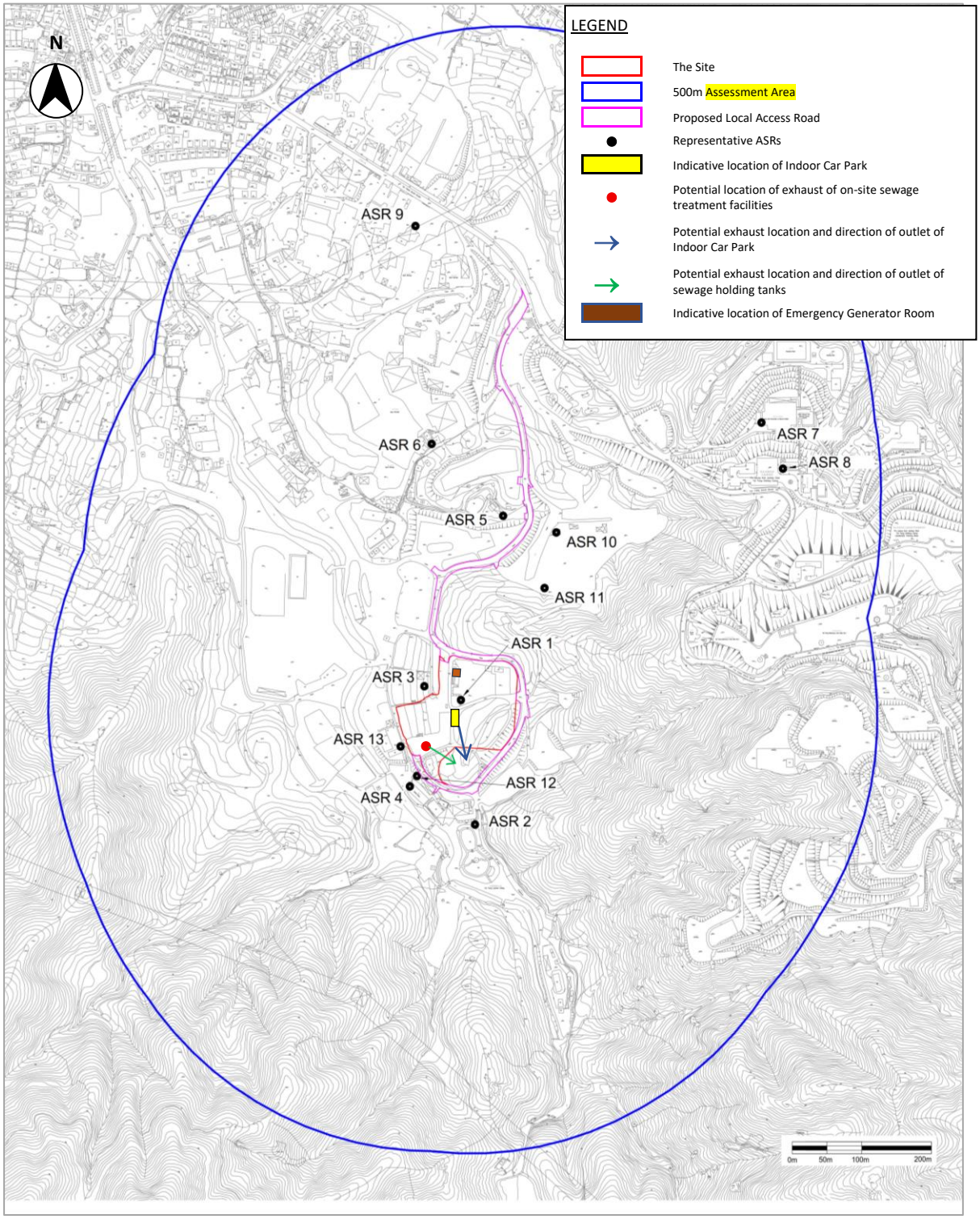
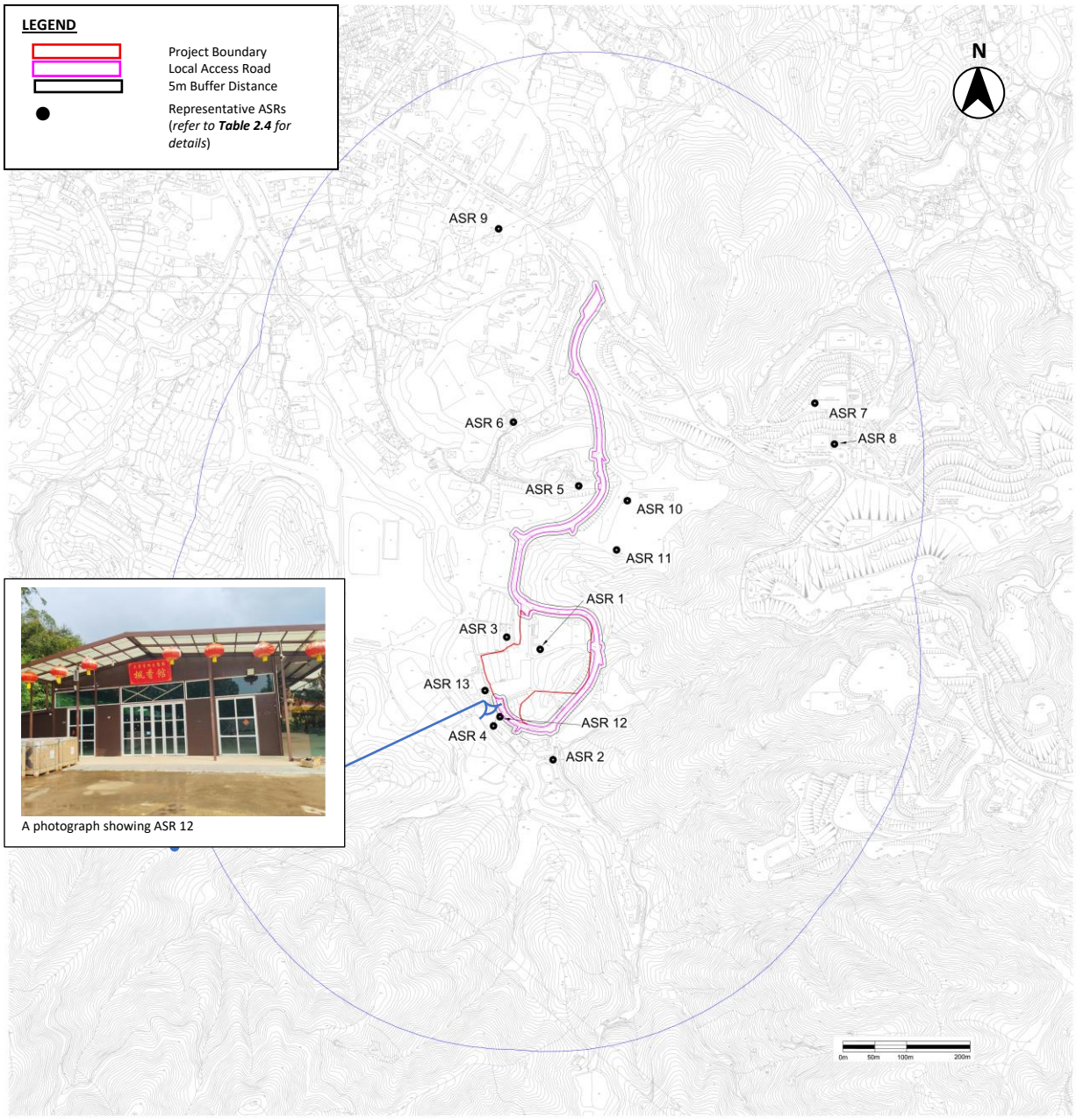
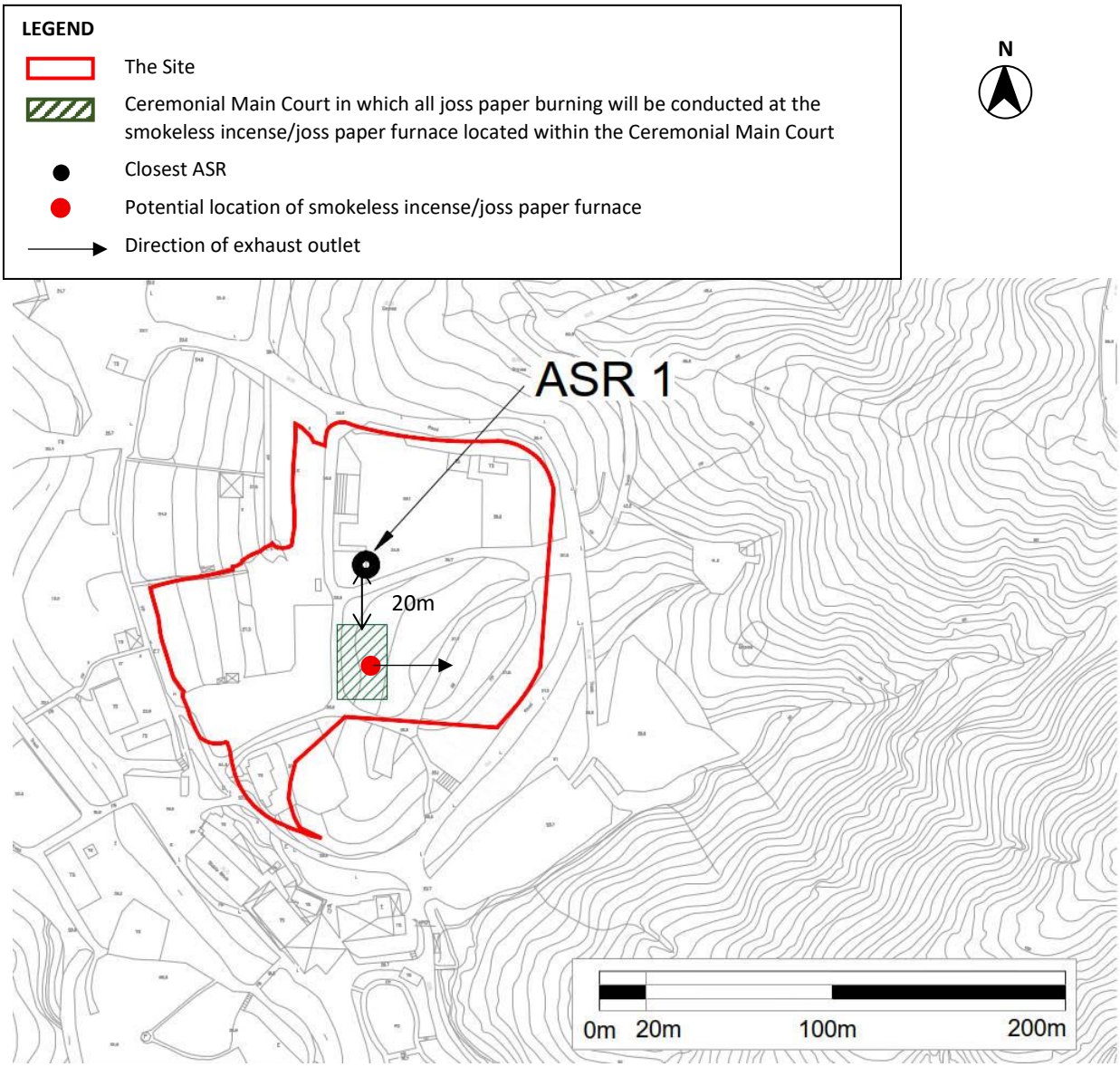


Figure 2-2 Buffer Distance Requirement from the Surrounding Road



Remark: There shall be no air sensitive uses including openable window, fresh air intake and recreational uses in open space within the buffer zone.

Figure 2-3 Separation Distance between Ceremonial Main Court and the Closest ASR



3 NOISE

3.1 Environmental Legislation and Standards

3.1.1 The principal legislation controlling environmental noise impact is the *Noise Control Ordinance* ("NCO"). In addition, some other key environmental legislation and standards applicable to noise control in Hong Kong are as follows:

- Hong Kong Planning Standards and Guidelines ("HKPSG")
- Professional Persons Environmental Consultative Committee Practice Notes ("ProPECCPNs") including
  - Application of Sound Insulation in Residential Buildings to Reduce Noise Transmission Between Units ("ProPECC PN 3/23")
  - Planning of Residential Developments Against Road Traffic Noise ("ProPECC PN 4/23")
  - Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact ("ProPECC PN 5/23")
  - Minimizing Noise from Construction Activities ("ProPECC PN1/24")

3.1.2 Since the Proposed Development will not provide residential buildings or uses, ProPECC PN 3/23, ProPECC PN 4/23 and ProPECC PN 5/23 do not apply for this application.

NCO (Cap. 400)

3.1.3 The NCO enables regulations and Technical Memoranda ("TMs") to be enacted, which introduces detailed control criteria, measurement procedures and other technical matters. The TMs of NCO include:

- TM on Noise from Percussive Piling ("PP-TM")
- TM on Noise from Construction Work other than Percussive Piling ("GW-TM")
- TM for the Assessment of Noise from Places Other Than Domestic Premises, Public Places or Construction Sites ("IND-TM")

3.1.4 The Site does not fall within a Designated Area ("DA") in accordance with EPD's Plan No. EPD/AN/NT-03 for Tuen Mun, Sham Tseng and Ma Wan and Plan No. EPD/AN/NT-01 for Yuen Long, Tin Shui Wai, Mai Po, Shek Kong and Kwu Tung. Therefore, DA-TM is not applicable.

3.1.5 In addition, the following requirements are given under the NCO:

- Hand-held breakers having a mass of above 10kg and any air compressor capable of supplying compressed air at 500kPa pressure or above must be fitted with Noise Emission Label issued under the *Noise Control (Hand Held Percussive Breakers) Regulation and Noise Control (Air Compressors) Regulation* of NCO.
- Construction Noise Permit ("CNP") must be applied by the Contractor from EPD for any percussive piling at any time other than restricted hours, or any other construction activities conducted within restricted hours (for all days 7pm to 7am the next day and at all times on Public Holidays or Sundays) as defined in NCO.

3.1.6 For fixed plant noise during operation phase, the requirements of IND-TM shall be complied with. Table 2 of IND-TM stipulates the day, evening and night time Acceptable Noise Levels ("ANLs") for Noise Sensitive Receivers ("NSRs") according to the corresponding Area Sensitive Rating ("ASR"), which is determined by Influencing Factors ("IFs") in accordance with the IND-TM. These are summarised in **Table 3-1**.

Table 3-1 Acceptable Noise Levels for Fixed Noise Source

TIME PERIOD	ANL, dB(A)		
	ASR "A"	ASR "B"	ASR "C"
Day (0700 to 1900 hours)	60	65	70
Evening (1900 to 2300 hours)			
Night (2300 to 0700 hours)	50	55	60

HKPSG

3.1.7 The noise criteria for planned fixed source shall follow the requirements of Table 4.1 of Chapter 9 of HKPSG:

a. 5 dB(A) below the appropriate ANLs shown in Table 2 of IND-TM, and
b. The prevailing background noise levels

3.1.8 As recommended in Table 4.1 of Chapter 9 Environment of HKPSG, standards for road traffic noise in terms of $L_{10(1\text{-}hr)}$ for the following uses relying on opened windows for ventilation are shown in **Table 3-2**.

Table 3-2 HKPSG Standards for Road Traffic Noise Standards

USES	NOISE STANDARDS $L_{10(1\text{-}Hr)}$, dB(A)
All domestic premises including temporary housing accommodation	70
Hotels and hostels	70
Offices	70
Educational institutions including kindergartens, child care centres and all others where unaided voice communication is required	65
Places of public worship and courts of law	65
Hospitals, clinics, convalescences and residential care homes for the elderly, - diagnostic rooms, - wards	55

ProPECC PN 1/24 – Minimizing Noise from Construction Activities

3.1.9 For noise arising from construction activities (other than percussive piling) during normal working hours (7am to 7pm from Monday to Saturday, not including general holidays), the noise criteria as shown in **Table 3-3** and control measures for construction noise impact during normal working hours can be referred to ProPECC PN 1/24.

Table 3-3 Construction Noise Criteria for Non-Restricted Hours

NOISE SENSITIVE RECEIVERS	$L_{eq\ (30min)}$, dB(A)
All domestic premises Temporary housing accommodation Hostels Convalescences homes Homes for the aged	75 dB(A)
Places of public worship Courts of law Hospitals and medical clinics Educational institutions (including kindergartens and nurseries)	70 dB(A) (or 65 dB(A) during examination)

3.2 Identification of Noise Sensitive Receiver ("NSRs")

3.2.1 The first layer NSRs within 300m study area of the Site have been identified as the representative NSRs for this assessment. The locations of the representative NSRs are shown in **Figure 3-1** and summarised in **Table 3-4**.

Table 3-4 Representative NSRs within 300m Study Area of the Site

NSR ID	DESCRIPTION	USE	APPROX. SEPARATION DISTANCE TO THE TEMPLE SITE/ ACCESS ROAD, m
NSR 1	Kwan Ti Square	Religious	0
NSR 2	Art Farm	Campsite	70
NSR 3	GREENOBO Campsite	Campsite	40
NSR 4	Village Houses	Residential	35
NSR 5	Village Houses	Residential	130

3.2.2 The proposed Taoist Cultural Centre within the Site will be equipped with air-conditioning system and would not rely on openable window for ventilation. Therefore, no adverse noise impact is anticipated and no noise assessment is required for the proposed Taoist Cultural Centre.

3.3 Noise Impact During Construction Phase

3.3.1 Various construction activities such as site clearance, excavation, piling and building works will be the key noise sources generated during the construction phase. In particular, the use of Powered Mechanical Equipment ("PME") and the vehicle movement within the Site are the major noise sources. Detailed information on the construction activities of the Proposed Development has yet to be determined at the planning stage. As the site is close to NSRs, noise generated from the Proposed Development would affect the nearby NSRs. Appropriate mitigation measures will therefore be implemented to minimize the potential noise impact to the nearby NSRs.

3.3.2 Local access road improvement works will be carried out in association with the Proposed Development. The works are minor in nature and involve localized excavation, concreting and road reinstatement works. The construction activities will utilize a limited number of Powered Mechanical Equipment (PME), including excavators, vibratory pokers and small compaction equipment (e.g. mini rollers or plate compactors), due to site area constraints. Construction vehicle movements, including concrete mixer trucks and dump trucks for the

delivery and removal of construction materials, will be infrequent. Considering the small scale and localised nature of the works together with the limited construction vehicle movement, adverse noise impacts arising from the construction of local road improvements work are not anticipated.

Mitigation Measures

3.3.3 Construction should be carried out during non-restricted hours as far as practicable. The mitigation measures and sample contractual specifications recommended in ProPECC PN 1/24 should be implemented where applicable. In addition, the following measures and on-site practices are recommended in order to minimise the potential construction noise impacts as far as practicable:

- The Contractor shall devise, arrange methods of working and carry out the Works in such a manner so as to minimise noise impacts on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these methods are implemented
- Quality Powered Mechanical Equipment (QPME)and quieter construction methods/equipment should be adopted as far as practicable
- Use of Non-percussive pile driving methods such as hydraulic press-in method, vibration or jacking method for installing or extracting sheet piles as far as practicable
- Use of Non-percussive equipment such as hydraulic crusher, sawing, coring machines etc. for demolition and concrete breaking work
- Close all hoods, cover panels and inspection hatches of powered mechanical plant such as generators, air compressors etc. during operation
- Provide noise dampening materials inside and outside refuse chutes during building construction
- Fit mufflers or silencers, and dampening layer with steel collars to hand-held pneumatic breakers
- Use of non-explosive chemical expansion agents instead of explosive chemicals or expansive compounds
- Use of prefabricated structure / sections to replace in-situ construction to reduce the amount of mechanical equipment used on site
- Use of self-compacting concrete (without the aid of a vibrator e.g. poker for compaction) for in-situ concreting
- Noisy equipment and noisy activities should be located as far away from the NSRs as far as practicable
- Provide an acoustic screen or enclosure shield the public or NSR from the noisy activities

3.3.4 If PME is required for any construction work during restricted hours, a CNP shall be applied for as specified in the NCO. The GW-TM can be referred to for the noise criteria and assessment procedures for obtaining a CNP.

3.3.5 In addition, the EPD's ("RPCC") for Construction Contracts should be incorporated in the relevant works contract. The RPCC are generally good engineering practices to minimize

inconvenience and environmental nuisance to nearby residents and other sensitive receivers. The general requirements as summarised as follows:

- The Contractor shall observe and comply with the NCO and its subsidiary regulation.
- The Contractor shall ensure that all plant and equipment to be used on the Site are properly maintained in good operating condition and noisy construction activities shall be effectively sound-reduced by means of silencers, mufflers, acoustic linings and shields, acoustic sheds or screen or other means, to avoid disturbance to nearby noise sensitive receivers.
- For carrying out any construction work other than percussive piling during the time period from 0700 to 1900 hours on any day not being a general holiday (including Sundays), the Contractor shall comply with the following requirements.
  - The noise level measured at 1m from most affected external façade of the nearby noise sensitive receivers from the construction works alone during any 30-minute period shall not exceed an equivalent sound level ("Leq") of 75dB(A).
  - The noise level measured at 1m from most affected external façade of the nearby schools from the construction works alone during any 30-minute period shall not exceed Leq of 70dB(A) [65dB(A) during school examination period]. The Contractor shall liaise with the schools and/or the Examination Authority to ascertain the exact dates and times of all examination periods during the course of the contract.
  - Should the limits stated in the above be exceeded, the construction shall stop and shall not recommence until appropriate measures acceptable to the Engineer that are necessary for compliance have been implemented.
  - The Contractor shall adopt, where necessary and practicable, the use of quieter construction equipment and/or methods when carrying out the construction works, including demolition works, foundation works, site formation works, road opening works during restricted hours.
- Before commencement of any work, the Engineer may require the methods of working, plant equipment and sound-reducing measures to be used on the Site to be made available for trial demonstration inspection and approval to ensure that they are suitable for the project.
- The Contractor shall devise, arrange methods of working and carry out the Works in such a manner so as to minimise noise impacts on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these methods are implemented.
- Notwithstanding the requirements and limitations set out in the bullet above and subject to compliance with the second and fifth bullet above, the Engineer may upon application in writing by the Contractor, allow the use of equipment and the carrying out of any construction activities for any duration provided that the Engineer is satisfied with the application which, in Engineer's opinion, is considered to be of absolute necessity and adequate noise insulation has been provided to the schools to be affected, or of emergency nature, and not in contravention with the NCO in any respect.
- The Contractor shall, when necessary, apply for a construction noise permit in accordance with the Noise Control (General) Regulations prior to the commencement of the relevant part(s) of the works, display the permit as required and provide a copy to the Engineer.

- Measures that are to be taken to protect adjacent schools and adjacent noise sensitive receivers, if necessary, shall include, but not be limited to, adequate noise barriers. The barriers shall be of substantial construction and designed to reduce transmission of noise. The location and details of the barriers shall be submitted to the Engineer for approval before works commence adjacent to schools and other NSRs.

3.3.6 With the implementation of the aforementioned mitigation measures, noise generated from the construction of the Proposed Development will be minimized and no adverse construction noise impact is expected.

3.4 Noise Impact During Operation Phase

3.4.1 The potential major noise sources during the operation of the Proposed Development will be from Mechanical and Electrical ("M&E") equipment, such as air conditioning systems and the emergency generator. At the planning stage, detailed information and exact locations of the fixed plants has yet to be determined.

3.4.2 The identified NSRs are located in an area characterised mainly by village houses and low-rise developments and are not affected by influencing factors (IFs). As such, an Area Sensitivity Rating (ASR) of "A" has been assumed for the existing NSRs. The criteria would be 55 dB(A) for day and evening time and 45dB(A) for night-time. The Noise Control Authority would decide the Area Sensitivity Rating (ASR) at the time of assessment based on the contemporary situations / conditions. The ASR assumed in this Report are for indicative assessment only. Given the generally quiet surrounding environment of the NSRs, the prevailing background noise levels may be lower than ANL-5dB for both daytime and night-time periods. It is recommended that prevailing background noise measurement be conducted at detailed design stage to confirm the applicable noise criteria and to finalise the required fixed plant noise mitigation measures, ensuring full compliance with relevant requirements under the HKPSG and NCO.

3.4.3 Air Conditioner type will be Window type, Split type and/or Variable Refrigerant Volume ("VRV")/ Variable Refrigerant Flow ("VRF"). Noise arising from VRV would be insignificant. Quiet air conditioning system will be selected as far as practicable and will be located away from the nearest NSRs to minimise noise impact. Hence, VRV is recommended to be implemented in the Proposed Development.

3.4.4 Fixed plant noise would be generated from the Proposed Development. Since all fixed plants such as emergency generator and other M&E equipment will be located inside M&E room and within enclosed concrete structure, adverse noise impact directly from the fixed plants is not expected. As noise may emit from louvre of the E&M room, suitable at source noise control measures such as quieter plant, silencers, acoustic linings and acoustic louvers will be adopted when necessary.

3.4.5 60-seater coaches will be provided for staff and visitors. According to the Planning statement, the operation time of the shuttle service is from 7:30am to 5:30pm. According to the Table 4.5 of TIA report, the Proposed Development would generate an additional 6 coaches per hour during normal operation and 24 coaches per hours during ceremony/ event days (two-way traffic) of the Proposed Development. As the additional traffic generated by the Proposed Development would not occur during the early morning and nighttime period, and the small increase in traffic flow on the existing road network, the corresponding increase in traffic noise would be insignificant. Therefore, adverse road

traffic noise impact arising from the project-generated traffic at nearby NSRs is not anticipated.

3.4.6 According to the Planning Statement, the operation hours of the Proposed Development is from 8:00am to 6:00pm. Thus, there will be no night time operation. The Proposed Development will have tours, exhibitions and performances. Each session will be kept at 1-2 hours long. Moreover, during event days, the 4,000 visitors expected to attend worshipping activities will be divided into 500 visitors per hour. Hence, noise generation from worshipping activities will be minimised.

3.4.7 In view of the potential noise impact arising from worshipping activities/events on nearby NSRs, majority of worshipping activities will be conducted indoors within the Grand Hall of the Supreme Kwan Ti as far as practicable. Appropriate management measures will be implemented to minimise potential noise impact to the surrounding neighbourhood. In addition, it is recommended that future operator maintain communication with nearby local communities and promptly address any noise concerns during operation.

3.4.8 To ensure the fixed plant noise generated by the Proposed Development would not cause excessive impact to nearby noise sensitive receivers, potential fixed noise sources within the Proposed Development shall be properly designed to meet the relevant noise criteria as stipulated in Chapter 9 of the HKPSG and NCO. Provisions shall be made to control the fixed noise sources by suitable at source noise control measures such as quieter plant, silencers, acoustic linings and acoustic louvers when necessary. With the implementation of the abovementioned mitigation measures, adverse noise impact from operation of the Proposed Development is not anticipated.

3.4.9 The Proposed Development is a traditional Chinese Kwan Ti Temple. According to the Applicant, no public address ("PA") system will be provided, as there is generally no operational need for amplified broadcasting of voice, music or other sounds within the temple.

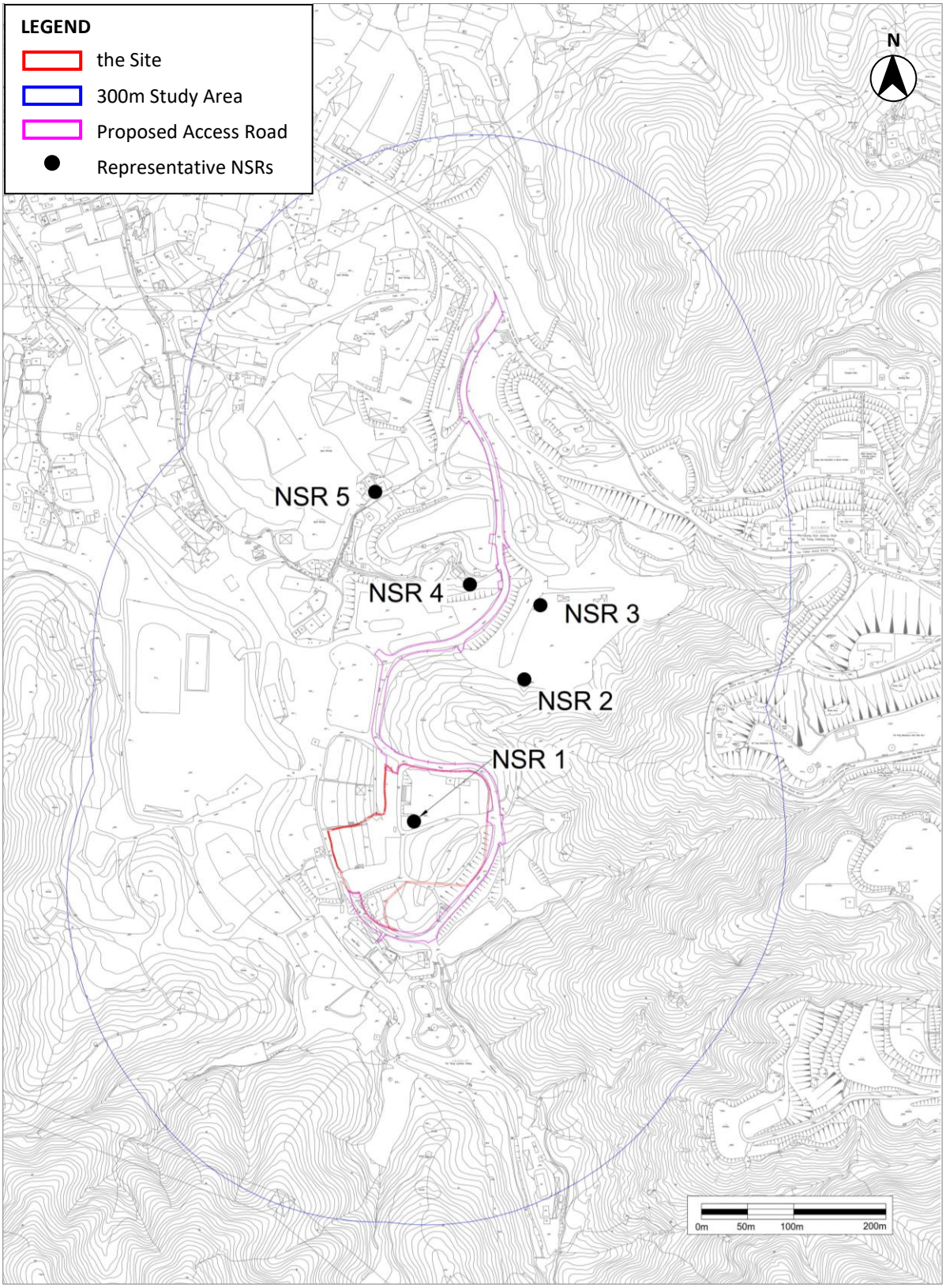
3.5 Conclusion

3.5.1 With the implementation of the recommended mitigation measures and good site practice, no adverse construction noise impact is anticipated.

3.5.2 With the implementation of VRV air conditioner and M&E equipment being enclosed in M&E room, no significant adverse noise impact is anticipated during operation of the Proposed Development. In addition, the increase in road traffic generated by the Proposed Development is expected to be insignificant and would not result in adverse road traffic noise impact at the nearby NSRs. Therefore, no adverse operational noise impact is anticipated.

3.5.3 Overall, no adverse noise impacts are anticipated during the construction and operation phases of the Proposed Development.

Figure 3-1 Representative NSRs within 300m Study Area of the Site



4 WATER QUALITY

4.1 Introduction

4.1.1 This section provides an assessment of the potential water quality impact arising from the Proposed Development during construction and operation phases. Mitigation measures are recommended, where necessary, as part of the assessment

4.2 Environmental Legislation and Standards

Water Pollution Control Ordinance (Cap. 358)

4.2.1 The *Technical Memorandum – Standards for Effluent Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters* ("WPCO-TM") is issued under Section 21 of the *Water Pollution Control Ordinance* ("WPCO"). All discharges into government sewerage systems, marine and inland waters are required to comply with the standards stipulated in the WPCO-TM. WPCO also provides the main statutory framework for the protection and control of water quality in Hong Kong, such as setting Water Quality Objectives ("WQOs") for each of the ten Water Control Zones (WCZs").

Construction Site Drainage, ProPECC PN2/24

4.2.2 With reference to *Professional Persons Environmental Consultative Committee ("ProPECC") Practice Note Construction Site Drainage* ("ProPECC PN2/24"), various guidelines for the handling and disposal of construction site discharges are included. The guidelines include the use of sediment traps, wheel washing facilities for vehicles leaving the Site, adequate maintenance of drainage systems to prevent flooding, overflow, sewage collection and treatment, and comprehensive waste management (collection, handling, transportation, and disposal) procedures.

Drainage Plan subject to Comment by the Environmental Protection Department, ProPECC PN1/23

4.2.3 With reference to *ProPECC Practice Note Drainage Plan subject to Comment by the Environmental Protection Department – Building (Standards of Sanitary Fitments, Plumbing, Drainage Works and Latrines) Regulations* ("ProPECC PN1/23"), various guidelines for the pollution control for discharge to storm drains and foul sewers, such as the use of grease trap for wastewater from the restaurant kitchen, the use of silt removal facilities for open surface channel led to stormwater drains, etc., are included. The guidelines also include the requirements for submission of drainage plans.

Protection of Natural Streams/Rivers from Adverse Impacts Arising from Construction Works, ETWB TCW No. 5/2005

4.2.4 Various procedures, guidelines and precautionary mitigation measures were circulated in *Protection of Natural Streams/Rivers from Adverse Impacts Arising from Construction Works* ("ETWB TCW No. 5/2005") to reinforce existing measures for protection of natural streams/rivers from construction works.

4.3 Identification of Water Control Zone ("WCZ") and Water Sensitive Receiver ("WSR")

4.3.1 The Site is situated in Deep Bay WCZ. With reference to Annex 14 of the *Technical Memorandum on Environmental Impact Assessment Process* ("EIAO-TM"), several inland water courses within 500m study area were identified as potential WSRs through desktop study, using topographic map of GeoInfo Map and site visit. The identified WSRs are summarised in **Table 4-1** and shown in **Figure 4-1**. Potential water quality impacts during construction and operation phase are discussed below.

Table 4-1 Identified Water Sensitive Receivers

WSRs ID	DESCRIPTION	TYPE	STATUS (ACTIVE/INACTIVE)	DISTANCE FROM THE SITE, m
W1	Watercourse to the west of the Site	Natural watercourse	Active	40
W2	Pond to the north of the Site	Pond	Active	180
W3	Watercourse to the north of the Site	Modified watercourse	Active	190
W4	Pond to the north of the Site	Pond	Active	200
W5	Watercourses to the northeast of the Site	Natural watercourse	Active	200
W6	Watercourse to the southeast of the Site	Natural watercourse	Active	10
W7	Watercourses to the south of the Site	Natural watercourse	Active	45
W8	Pond to the south of the Site	Pond	Active	60
W9	Watercourse to the southwest of the Site	Modified watercourse	Active	90
W10	Watercourses to the south of the Site	Natural watercourse	Active	250

4.4 Water Quality Impacts During Construction Phase

4.4.1 Muddy runoff from the Site may be generated during construction phase, especially during the rainy season.

4.4.2 Wash water from vehicles and equipment; silt from any on-site stockpiles of soil, cement and grouting materials; and accidental spillage of chemicals such as fuels, oil and lubricants for the machinery and equipment may potentially be carried away by construction site runoff and introduced into the water bodies. If these pollution sources are not properly controlled, it would lead to increased amounts of suspended solids, grease and oil, pH, Biochemical Oxygen Demand ("BOD"), etc. in the drainage system. Potential muddy runoff from construction of the Proposed Development will be properly handled/treated before discharge and good construction practices would be implemented in accordance with Practice Note for Professional Persons on Construction Site Drainage (ProPECC PN 2/24), no adverse water quality impacts from the Proposed Development is anticipated.

4.4.3 Wastewater would also be generated from sewage effluent from the construction workers on-site during construction phase. With provision of portable chemical toilets and proper disposal of sewage, no adverse water quality impact is anticipated.

Mitigation Measures

4.4.4 During construction phase, adequate capacity and number of portable toilets with adequate frequency for offsite disposal to be supplied, maintained and emptied by a licensed collector should be provided for construction workers.

4.4.5 The construction contractor shall follow good site practices and ensure proper implementation of the mitigation measures as specified in Practice Note for Professional Persons on Construction Site Drainage (ProPECC PN 2/24). The key measures are as follows:

- Surface run-off from construction sites should be directed into storm drains via suitable sand/silt removal facilities such as sand traps, silt traps and sediment basins. Temporary construction drainage or earth bunds or sand bag barriers should be provided on site to guide storm water to these silt removal facilities. Where needed, perimeter channels at site boundaries should be provided to stop storm run-off from outside the Site from washing across the Site. Catchpits and perimeter channels should be constructed before commencement of site formation works and earthworks. Silt removal facilities, channels and manholes should be adequately maintained and cleared of deposited silt and grit regularly, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.
- Construction works should be scheduled so as to minimise soil excavation works during rainy reasons (generally from April to September). If soil excavation works could not be avoided in these months or at any time of year when rainstorms are likely, temporarily exposed slope surfaces should be covered by waterproof material (e.g. by tarpaulin), and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds, to prevent soil erosion. Intercepting channels should be provided along the edge of the excavation area to prevent storm runoff from washing across exposed soil surfaces. Arrangements should always be in place to ensure that adequate surface protection measures can be safely carried out well before the onset of a rainstorm.
- Upon completion of earthworks, the resulting final surfaces should be well compacted, and the subsequent permanent works or surface protection works should be carried out immediately after the final surfaces are formed to minimise erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided when necessary.
- Measures should be taken to prevent rainwater from getting into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. If pumping of rainwater out from trenches is required, the effluent should be discharged into storm drains via silt removal facilities.
- Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.
- Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.

- All vehicles and plants should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. A wheel washing bay should be provided at every site exit if practicable to wash off any mud or dirt and wash-water should have sand and silt settled out or removed before being discharged into storm water drains. The section of construction road between the wheel washing bay and the public road should be paved to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.
- Discharge of surface run-off into foul sewers shall be avoided to prevent overloading of the foul sewerage system.
- Any chemical waste such as waste oil should be collected and stored at properly designed chemical waste storage area with reference to the requirements stipulated in the *Waste Disposal Ordinance*.
- Water used in ground boring and drilling during site investigation or rock/soil anchoring should be treated by passing it through a sedimentation tank and re-used on site as far as practicable. Surface runoff shall be discharged in storm drains via silt removal facility as a last resort.
- Construction plants should be sited as far as practicable from watercourses to avoid adverse impact on the surface water.
- Temporary storage area for equipment, chemicals, fuel and other materials should be located away from watercourses as far as practicable.
- Proper shoring shall be implemented in order to avoid soil or mud to flow into nearby watercourses.
- Any service shop and maintenance facilities should be located on hard standings within a bounded area with sumps and oil interceptors. Any vehicle maintenance work or equipment with the potential for leakage and spillage should only be done within areas equipped to control any discharges from leakage and spillage.

4.4.6 In addition, the EPD's RPCC for Construction Contract should be incorporated in the relevant works contract. The RPCC are generally good engineering practice to minimise inconvenience and environmental nuisance to nearby residents and other sensitive receivers. The general requirements are summarised below:

- The Contractor shall observe and comply with WPCO and its subsidiary regulation.
- The Contractor shall carry out the Works in such as manner as to minimise adverse impacts on the water quality during execution of the works. In particular the Contractor shall arrange his method of working to minimise the effects on the water quality within and outside the Site, on the transport routes and at the loading, dredging and dumping areas.
- The Contractor shall follow the practices, and be responsible for the design, construction, operation and maintenance of all the mitigation measures as specified in the ProPECC PN 2/24 "Construction Site Drainage" issued by the Director of Environmental Protection. The design of the mitigation measures shall be submitted by the Contractor to the Engineer for approval.
- The Contractor shall not discharge directly or indirectly or cause or permit or suffer to be discharged into any public sewer, stormwater drain, channel, stream-course or sea any trade effluent or foul or contaminated water or cooling or hot water without the prior written consent of the Engineer in consultation with the Director of Environmental

Protection and Director of Water Supplies, who may as a condition of granting his consent require to the Contractor to provide, operate and maintain at the Contractor's own expense to the satisfaction of the Engineer suitable works for the treatment and disposal of such trade effluent or foul or contaminated or cooling or hot water. The design of such treatment works shall be submitted to the Engineer for approval not less than one month before commencement of the relevant works.

- If any office, site canteen or site toilet facilities is/are erected, foul water effluent shall be directed to a foul sewer or to a sewage treatment and disposal facilities either directly or indirectly by means of pumping or other means approved by the Engineer.

4.4.7 All site discharges should be treated as necessary in accordance with the terms and conditions of the Discharge License.

4.4.8 With the implementation of the mitigation measures and good site practices above, no adverse water quality impact during construction phase is anticipated.

4.5 Water Quality Impacts During Operation Phase

4.5.1 Majority of the sewage generated during operation phase would be sewage and grey water from toilets used by on-site staff and visitors. As concluded in the separate Sewerage Impact Assessment ("SIA") Report, the total estimated Average Dry Weather Flow ("ADWF") from operation of the Proposed Development is calculated to be 22.1m^3/day on normal days and 55.1m^3/day on ceremony/event days, respectively. The sewage generated from operation of the Proposed Development will either be treated by Septic Tank/Soakaway Pit System (Option 1) or Off-Site Disposal by temporary storage in sewage storage tanks and then tankered-away to a Sewage Treatment Plant (Option 2). For Option 1, five (5) septic tanks with a capacity of about 40m^3 each shall be provided. For Option 2, six (6) sewage holding tanks with a total capacity of 66m^3 will be proposed to temporarily store the sewage before final off-site disposal. Any wastewater generated from the smokeless incense/joss paper furnace will be separately collected and tankered away for off-site treatment and disposal. Such wastewater will not be discharged into the sewage holding tanks or the Septic Tank/Soakaway Pit System and has therefore not been included in the above sewerage impact assessment. With the provision of Option 1 or Option 2, no adverse sewerage impact from the Proposed Development is anticipated.

4.5.2 If option 1 ST/S is adopted in operation phases, it Is noted that the applicant shall ensure that the design, construction, operation and maintenance of the onsite STS comply with the requirements under ProPECC PN1/23 and should be duly certified by an Authorised Person. Soil percolation test, minimum clearance distance requirements are required as stated in requirement shown in **Section 4.2** and no overflow should be allowed.

4.5.3 A Drainage Impact Assessment (Project Profile) ("DIA (PP)") has been carried out. As mentioned in the DIA (PP), the stormwater runoff will be properly diverted to the stream to the west of the Site. In order to reduce pollution due to runoff, silt/sand traps should be provided for the drainage systems of open areas in accordance with ProPECC PN1/23. In addition, Best Management Practices for stormwater discharge shall be incorporated to minimise stormwater pollution arising from the Proposed Development.

4.5.4 With implementation of the recommended mitigation measures and good site practices above, no adverse water quality impacts on the WSRs from the operation of the Proposed Development is anticipated.

4.6 Conclusion

4.6.1 During construction phase, water quality impacts can be properly controlled with the implementation of good site practice, as stated in **Sections 4.4.4** to **4.4.7**. Adequate capacity and number of portable toilets will be provided for construction workers on-site. With the provision, implementation and maintenance of the recommended measures, no adverse water quality impacts from the Site during construction phase are anticipated.

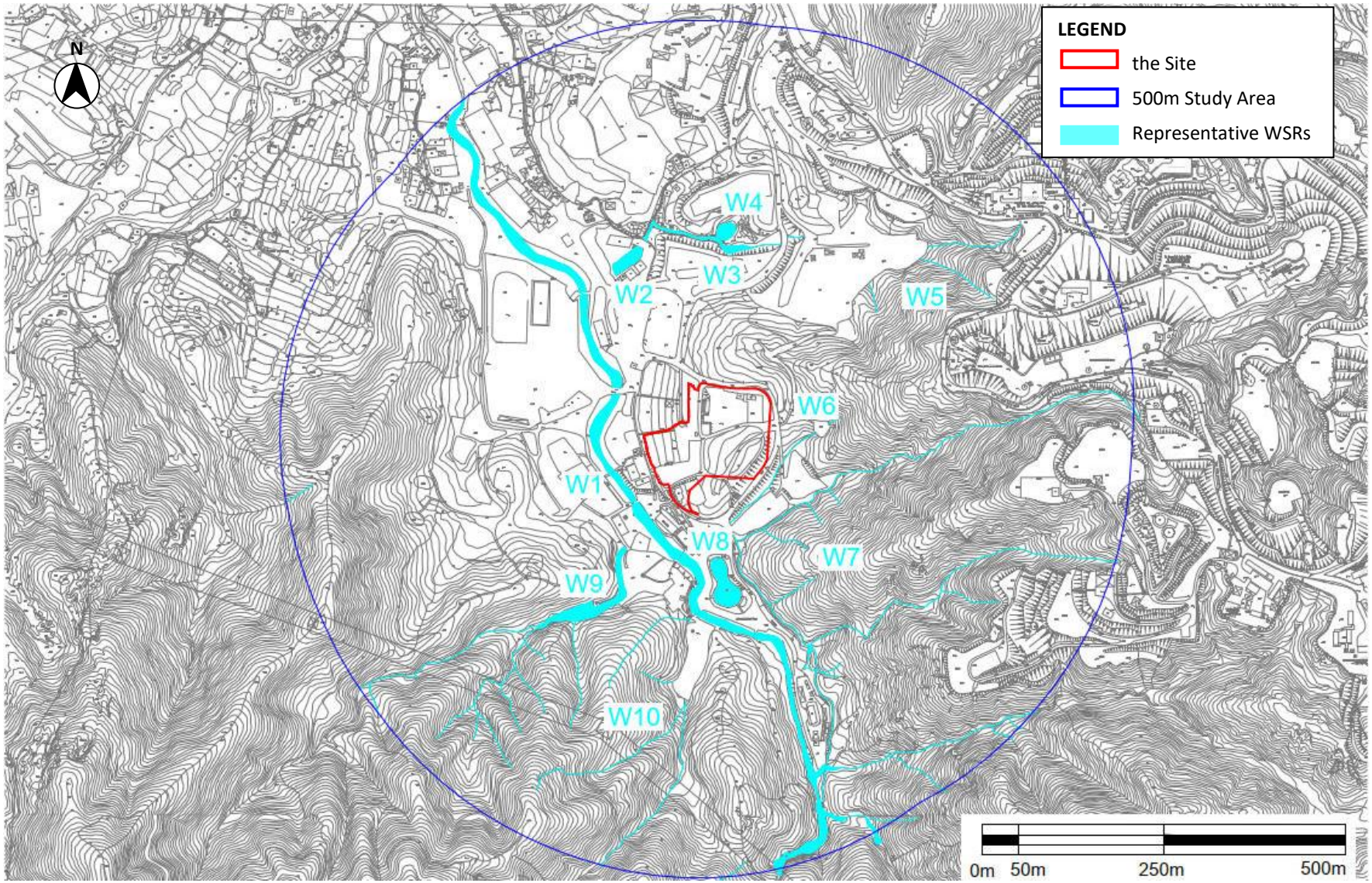
4.6.2 The contractor shall apply for a Discharge Licence from EPD under the WPCO. All site discharged shall be treated in accordance with the terms and conditions of the Discharge Licence.

4.6.3 During operation phase, sewage generated from toilets will be temporarily stored in sewage holding tanks and tankered away for off-site disposal at a Sewage Treatment Facility or treated with Septic Tank/Soakaway Pit System provided in the Proposed Development. The SIA Report has concluded that there will be no adverse sewerage impact from the Proposed Development. Any wastewater generated from the smokeless incense/joss paper furnace will be separately collected and tankered away for off-site treatment and disposal.

4.6.4 Moreover, with reference to the DIA (PP), no adverse water quality impact due to runoff is expected.

4.6.5 Overall, no adverse water quality impacts are anticipated during the construction or operation phase of the Proposed Development.

Figure 4-1 Representative WSRs within 500m Study Area of the Site



5 WASTE MANAGEMENT

5.1 Introduction

5.1.1 This section provides an assessment of the potential impact related to waste management arising from the Proposed Development during construction and operation phases. Mitigation measures are recommended, where necessary, as part of the assessment.

5.2 Environmental Legislation and Standards

Waste Management

5.2.1 The key environmental legislation and standards applicable to waste management in Hong Kong are as follows:

- Waste Disposal Ordinance (Cap. 354) ("WDO")
- Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C)
- Waste Disposal (Charges for Disposal of Chemical Waste) Regulation (Cap. 354J)
- Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)
- Land (Miscellaneous Provisions) Ordinance (Cap. 28)
- Public Health and Municipal Services Ordinance (Cap.132BK) – Public Cleansing and Prevention of Nuisances Regulation
- ETWB Technical Circular (Works) No. 22/2003A, Additional Measures to improve Site Cleanliness and Control Mosquito Breeding on Construction Sites
- Development Bureau ("DevB") Technical Circular (Works) No. 6/2010, Trip Ticket System for Disposal of Construction & Demolition Materials
- Civil Engineering and Development Department ("CEDD") Technical Circulars (CEDD TC No. 11/2019), Management of Construction and Demolition Materials
- Building Department Practice Note for Authorised Persons, Registered Structural Engineers and Registered Geotechnical Engineers Waste Minimisation – Construction and Demolition Waste ("ADV-19")
- Building Department Practice Note for Authorised Persons, Registered Structural Engineers and Registered Geotechnical Engineers Waste Minimisation – Provision of Fitments and Fittings in New Buildings ("APP-114")
- Building Department Practice Note for Registered Contractors ("PNRC 17"), Control of Environmental Nuisance from Construction Sites
- CEDD Project Administration Handbook for Civil Engineering Works ("PAH")
- EPD Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes
- EPD Recommended Pollution Control Clauses ("RPCC") for Construction Contracts

5.3 Waste Management Impacts During Construction Phase

5.3.1 The key potential waste sources during the construction phase are:

- Inert Construction and Demolition ("C&D") materials (e.g. waste concrete, surplus soil, waste asphalt etc.)
- Non-inert C&D Materials (e.g. wood and plastics)
- Chemical wastes such as waste battery and waste lubricating oil from vehicles/plant maintenance
- General refuse generated by site workers

Inert C&D Materials

5.3.2 Inert C&D materials are those which do not decompose, such as debris, rubble, earth and concrete, and which are suitable for land reclamation and site formation.

5.3.3 There are two major phases during construction stage, site formation and building works. Each major phase will include sub-Phases. The tentative sequences will include site clearance, excavation and construction of the new buildings. The major source on inert C&D materials during construction will be site clearance, excavation or re-profile works, superstructure and construction of the new buildings for the Proposed Development.

Inert C&D Materials from Site Formation

5.3.4 Inert C&D materials may be generated during site formation stage, including site clearance, excavation or re-profile works. The Site area is approximately 18,325m^2 and about 30% of the site is paved, i.e. 5,497.5 m^2. Assuming the thickness of paving is 0.2m, approx. 1,100 m^3 (i.e. 5,497.5m^2 x 0.2m) inert C&D materials will be generated from the removal of paving.

5.3.5 The current elevation of the Site ranges from 23.6mPD to 38.0mPD. According to the Indicative Layout and Section Plans of the Proposed Development, excavation works shall be required for part of the Site. For a conservative estimation, it is assumed to excavate an average depth of 10m across 25% of the Site area, i.e. 4,581.3m^2. Hence, approx. 45,813 m^3 of excavated materials will be generated from excavation works.

Inert C&D Materials from Superstructure

5.3.6 Construction waste will also be generated during construction of the Proposed Development. This will comprise inert C&D materials, such as concrete waste, waste from blockwork and brickwork; and non-inert C&D materials (or C&D waste) from timber formwork, packaging waste and other non-inert wastes.

5.3.7 In accordance with Section 3.2 of A Guide for Managing and Minimizing Building and Demolition Waste published by the Hong Kong Polytechnic University in May 2001 ("the Guide"), it provides a "waste index" for building waste generation in Hong Kong based on the Gross Floor Area ("GFA") of three different building types as follows:

- Private Housing Projects 0.250m^3/m^2 GFA
- Government Housing Projects 0.174m^3/m^2 GFA
- Commercial Office Projects 0.200m^3/m^2 GFA

5.3.8 To provide a conservative estimate of building waste from the Proposed Development, the "waste index for Commercial Office Projects are adopted. However, as noted above, in

addition to inert C&D materials, this "waste index" also include non-inert C&D materials (or C&D wastes), such as timber formwork, packaging waste and other wastes, and the Guide does not identify what proportion of building waste is inert C&D materials and what proportion is non-inert C&D materials (or C&D waste).

5.3.9 With reference to Plate 2.12 of EPD's *Monitoring of Solid Waste in Hong Kong – Waste Statistics for 2024*, 90% of construction waste was either reused on-site or sent to the public fill reception facilities, implying that such construction wastes should be inert C&D materials. The proportion of inert C&D materials in the "waste index" can therefore be estimated by applying the Hong Kong-wide proportion of inert C&D materials in construction waste, i.e. 90%, to the "waste index" as follows:

$$\text{Waste Index}_{\text{Inert C\&D materials (Commercial Office Projects)}} = 0.90 \times 0.200\text{m}^3/\text{m}^2 \text{ GFA}$$

$$= 0.18\text{m}^3/\text{m}^2 \text{ GFA}$$

5.3.10 The proportion of inert C&D materials of building waste from the Proposed Development with a GFA of about 12,756m^2, can therefore be estimated as follows:

$$\text{Building Waste} = \text{Waste Index}_{\text{Inert C\&D materials (Commercial Office Projects)}} \times \text{GFA}$$

$$= 0.18 \times 12{,}756$$

$$= 2{,}296.08\text{m}^3$$

5.3.11 Hence, approx. 2,296m^{3}of building wastes would be generated during construction of the Proposed Development.

5.3.12 **Table 5-1** summarises the total estimated inert C&D materials generated during construction stage.

Table 5-1 Total Estimated Inert C&D Materials Generated During Construction

INERT C&D MATERIAL TYPE	ESTIMATED INERT C&D MATERIAL GENERATION (m^3)
STAGE: SITE FORMATION	
Removal of Paving	1,100 m^3
Excavation works	45,813 m^3
STAGE: CONSTRUCTION OF SUPERSTRUCTURE	
Building Waste	2,296 m^3
Total	**49,209 m^3**

5.3.13 In total, approx. 49,209m^3 of inert C&D materials may be generated throughout the construction period. Assuming the construction period to be two years with six working days a week and four weeks a month, the daily inert C&D material generation rate will be approx. 85m^3/day (i.e. 49,209m^3/ (6 x 4 x 24) days).

5.3.14 Inert C&D materials should be reused on-site as far as practicable. Approximately 5,368 m^3 of excavated materials arising from site formation works will be reused on-site as fill materials for general filling. The potential for further on-site reuse of inert C&D materials or their reuse or recycled off-site, will be further explored at a later stage of the Project as far as practicable.

5.3.15 Agreement from the Public Fill Committee (PFC) for the disposal of inert C&D materials to the public fill reception facilities, such as Fill Bank at Tuen Mun Area 38, will be obtained prior to the commencement of the construction works.

5.3.16 With the provision and implementation of the recommended mitigation measures mentioned below, no adverse waste management impact from the handling, transportation or disposal of inert C&D materials during construction of the Proposed Development is anticipated.

Non-Inert C&D Materials

5.3.17 Non-inert C&D materials (or C&D waste), are those which can decompose such as bamboo, timber, vegetation, packaging waste and other organic material, and which are therefore unsuitable for land reclamation.

5.3.18 The major source of non-inert C&D materials during construction stage will be removal of topsoil and vegetation, and tree felling works during site formation and the non-inert C&D material component of building waste such as timber formwork and packaging waste.

5.3.19 Topsoil is the uppermost layer of soil capable of growing and supporting vegetation. The Site area is approximately 18,325 m^2 and about 70% of the site is unpaved, i.e. 12,827.5m^2. Assuming the average depth of the topsoil is 0.25 m, approx. 3,207m^3 (i.e. 12,827.5m^2x 0.25m) topsoil will be generated during site formation works.

5.3.20 The building waste in the "waste index" provided in the Guide also includes inert C&D materials. Since Plate 2.12 of Waste Statistics for 2024 shows that in 2024, 9% of C&D waste was disposed of at landfills. The proportion of non-inert C&D materials (or C&D waste) in the "waste index" can be estimated by applying the Hong Kong-wide proportion of non-inert C&D materials (or C&D waste) in construction waste, i.e. 9%, to the "waste index" as follows:

$$\text{Waste Index}_{\text{Inert C\&D materials (Commercial Office Projects)}} = 0.09 \times 0.200\ m^3/m^2\ \text{GFA}$$

$$= 0.018\ m^3/m^2\ \text{GFA}$$

5.3.21 Given the total GFA of the Proposed Development is approx. 12,756m^2, the non-inert C&D materials (or C&D waste) components in building waste can therefore be estimated as follows:

$$\text{Building Waste} = \text{Waste Index}_{\text{Non-Inert C\&D materials (Commercial Office Projects)}} \times \text{GFA}$$

$$= 0.018 \times 12{,}756$$

$$= 229.608m^3$$

5.3.22 Hence, approx. 230m^3 of building waste would be generated during construction of the Proposed Development.

Table 5-2 Total Estimated Non-Inert C&D Materials Generated During Construction

NON-INERT C&D MATERIAL TYPE	ESTIMATED NON-INERT C&D MATERIAL GENERATION (m^3)
STAGE: SITE FORMATION	
Topsoil	3,207 m^3
STAGE: CONSTRUCTION OF SUPERSTRUCTURE	
Building Waste	230 m^3
Total	**3,437** m^3

5.3.23 In total, approx. 3,437 m^3 of non-inert C&D materials may be generated throughout the construction period. Assuming the construction period to be two years with six working days a week and four weeks a month, the daily non-inert C&D material generation rate will be approx. 6m^3/day (i.e. 3,437m^3/ (6 x 4 x 24) days).

5.3.24 Non-inert C&D materials generated during construction should be sorted on-site. Recyclable materials, such as metal, paper product, timber and plastics, should be collected by local recyclers for recycling. Timber and woody materials generated from tree felling works will be sent to the Yard Waste Recycling Centre in Y.PARK for recycling prior to disposal at the designated landfill site. All non-inert C&D materials should be recycled as far as possible and landfill disposal should only be adopted as the last resort. The nearest disposal facility is West New Territories ("WENT") Landfill. Disposal of C&D wastes of landfills would be agreed with relevant authorities.

5.3.25 It is expected that no more than 10% of the generated non-inert building waste can be recycled or reused. This means that the expected amount of non-inert C&D waste to be reused or recycled on-site is 344 m^3 at most.

5.3.26 If 10% C&D waste can be reused/recycled on-site, the surplus C&D waste mainly comprising topsoil will be approx. 3,093 m^3 in total. Assuming the construction period to be 2 years with six working days a week and four weeks a month, the total daily C&D waste for off-site disposal at WENT Landfill would be approx. 5.4 m^3/day (i.e. 3,093 m^3/ (6 x 4 x 24 days).

5.3.27 Considering the above estimation, and with the implementation of the recommended good site practice and mitigation measures, no adverse waste impact from the handling, transportation or disposal of non-inert C&D materials (or C&D waste) during construction of the Proposed Development is anticipated.

General Refuse

5.3.28 General refuse from workers is similar to domestic waste and comprises packaging and organic material.

5.3.29 The number of workers will depend on the contractor and the construction methods employed. For a conservative estimation, the number of construction workers for the Proposed Development should be no more than 50 per day.

5.3.30 According to Plate 2.7 of Waste Statistics for 2024, the per capita domestic waste disposal rate in 2024 was 0.86 kg/person/day, although the per worker generation rate of general refuse will likely be less than this. For a conservative approach, the per capita domestic

waste disposal rate in 2024 has been adopted for general refuse generation by construction workers. Since every worker is expected to generate general refuse, the total general refuse generated by construction workers is estimated as follows:

General Refuse/Day = No. of workers/day x per capita generation rate

= 50 workers x 0.86kg/workers/day

= 43kg/day

Total General Refuse = General Refuse/Day x Construction Duration

= 43kg/day x 6 days/week x 4 weeks/month x 24 months

= 24,768kg or 25 tonnes

5.3.31 General refuse generated during construction should be sorted on-site. Recyclable materials, such as metal, paper product and plastics should be collected by local recyclers for recycling. All general refuse should be recycled as far as possible and landfill disposal should only be adopted as the last resort.

5.3.32 According to Plate 3.2 of Waste Statistics for 2024, in 2024 the recovery rate of domestic waste is approx. 22%. It is therefore assumed that 22% of general refuse, i.e., approx. 5,449kg of general refuse, would be reused and recycled by the recyclers. The surplus general refuse of 19,2319 kg or 33.54 kg/day (i.e. 43kg x 78%) in average would be disposed of at landfill.

5.3.33 Given the above, no adverse waste impact from the handling, transportation or disposal of general refuse from workforce during construction of the Proposed Development is anticipated.

Chemical Waste

5.3.34 No hazardous materials or hazardous wastes are expected to be generated during the construction phase. Only limited amount of chemical waste which is expected to be less than 1 tonne of chemical waste including waste batteries, lubricating oil and waste paints may be generated given the small scale of the works. Other chemical wastes include waste lamp will be generated and the amount will be insignificant.

5.3.35 The Contractor shall register as a Chemical Waste Producer under the WDO. All chemical waste shall be stores at a properly designed chemical waste storage area located within the construction site in accordance with EPD's *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*. A licensed collector shall be employed to handle and dispose of all chemical wastes, e.g. at the Chemical Waste Treatment Centre ("CWTC") at Tsing Yi, or other facility approved by EPD.

5.3.36 Given the above, no adverse waste impact from the handling, transportation or disposal of chemical waste during the construction of the Proposed Development is anticipated.

Summary

5.3.37 The type of waste and their estimated quantities generated during the construction phase are summarised in **Table 5-3**.

Table 5-3 Estimation of Wastes to be Generated During Construction Phase

WASTE TYPE	ESTIMATED QUANTITY	SOURCES OF WASTE	TREATMENT
INERT C&D MATERIAL			
Paving	1,100 m^3	Site clearance	On-site reuse/recycle Off-site reuse/recycle Delivered to public fill reception facilities
Excavated materials	45,813 m^3	Excavation and site formation works	
Building waste	2,296 m^3	Superstructure construction	
NON-INERT C&D MATERIAL			
Topsoil	3,207 m^3	Site clearance and formation	On-site sorting for reuse/recycle Disposal of at landfill
Building Waste	230 m^3	Superstructure construction	
OTHERS			
General Refuse	25 tonnes	Construction staff	On-site sorting for reuse/recycle Disposal of at landfill
Chemical Waste	<1 tonnes	Waste batteries, lubricating oil and waste paints, etc.	All to be collected by the licensed chemical waste collector and treated in the CWTC.

Mitigation Measures

5.3.38 Waste management shall be controlled through contractual requirements as well as through statutory requirements.

5.3.39 A Waste Management Plan ("WMP") should be developed by the contractor and submitted to the Project Engineer/Architect for approval in accordance with ADV-19 before the commencement of any construction works. The objectives of the WMP will be to identify any potential environmental impacts from the generation of waste at the Site; to recommend appropriate waste handling, collection, sorting, disposal and recycling measures in accordance with requirements of the current regulations; and to categorise and permit segregation of C&D materials where practicable (i.e. inert material/non-inert material) for disposal considerations i.e. public fill reception facilities/landfill.

5.3.40 The contractors should adopt good housekeeping practices with reference to the WMP such as waste segregation prior to disposal. Besides the provision of stockpiling and segregating areas at site, effective collection of site wastes is required to prevent waste materials being blown around by wind, flushed or leached into nearby waters, or creating odour nuisance pest and vermin problems. Waste storage areas should be well maintained and cleaned regularly.

5.3.41 A trip-ticket system should be established in accordance with DevB TC(W) No. 6/2010 and the *Waste Disposal (Charges for Disposal of Construction Waste) Regulation* to monitor the disposal of public fill and solid wastes at public fill reception facilities and landfills, and to control fly-tipping. A trip-ticket system should be included as one of the contractual requirements for the contractor to strictly implement. Dump trucks with mechanical cover shall be used to minimise windblown litter and dust during transportation of waste.

5.3.42 Whenever there are excess recyclable construction materials, including bricks, plastics and metals, reuse and recycling should be carried out as far as practicable to minimise the amount of waste disposal. Other inert materials such as concrete, asphalt, etc. should be delivered to public fill reception facilities. Non-inert and non-recyclable wastes should be disposed at designated landfill site.

5.3.43 General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the construction contractor to remove general refuse from the Site, separately from C&D materials. Preferably an enclosed and covered area should be provided to reduce the occurrence of "wind-blown" materials.

5.3.44 For chemical waste, the Contractor should follow the 'trip-ticket' system of which the arrangement of production, collection and disposal in accordance with the *Waste Disposal (Chemical Waste) (General) Regulation*.

5.3.45 In addition, the EPD's RPCC for Construction Contract should be incorporated in the relevant works contract. The RPCC are generally good engineering practice to minimise inconvenience and environmental nuisance to nearby residents and other sensitive receivers. The general requirements are as follows:

- The Contractor shall observe and comply with the WDO and its subsidiary.
- The Contractor shall submit to the Engineer for approval a waste management plan with appropriate mitigation measures including allocation of an area for waste segregation and shall ensure that the day-to-day site operations comply with the approved waste management plan.
- The Contractor shall minimise the generation of waste from his work. Avoidance and minimisation of waste generation can be achieved through changing or improving design and practices, careful planning and good site management.
- The Contractor shall ensure that different types of wastes are segregated on-site and stored in different containers, skips or stockpiles to facilitate reuse / recycling of waste and, as the last resort, disposal at different outlets as appropriate.
- The reuse and recycling of waste shall be practised as far as possible. The recycled materials shall include paper / cardboard, timber and metal etc.
- The Contractor shall ensure that C&D materials are sorted into public fill (inert portion) and non-inert C&D materials (non-inert portion). The public fill which comprises soil, rock, concrete, brick, cement plaster/mortar, inert building debris, aggregates and asphalt shall be reused such as earth filling, reclamation, site formation works, etc. as far as practicable, and delivered to public fill reception facility as the last resort. The non-inert C&D materials which comprises metal, timber, paper, glass, etc. shall be reused and recycled as far as practicable, and, as the last resort, disposal of at landfills.
- The Contractor shall record the amount of waste generated, recycled and disposed of (including the disposal sites).
- The Contractor shall use a trip ticket system for the delivery of C&D materials to any designated public fill reception facility and/or landfill.
- Training shall be provided for workers about the concepts of site cleanliness and appropriate waste management procedure, including waste reduction, reuse and recycling.

- The Contractor shall not permit sewage and untreated effluent containing sand, cement, silt or any other suspended or dissolved material to flow from the Site onto any adjoining land, or allow any solid waste including refuse which is not part of the final product from waste processing plants to be deposited anywhere within the Site and the adjoining land. He shall arrange removal of such matter from the Site in a proper manner to the satisfaction of the Engineer in consultation with the EPD.
- The Contractor shall apply for registration as chemical waste producer under the *Waste Disposal (Chemical Waste) (General) Regulation* when chemical waste is produced. All chemical waste shall be properly stored, labelled, packaged and collected in accordance with the Regulation.
- Fly-tipping or disposal of C&D materials at locations other than the designated locations shall be prohibited. In order to review the trip-ticket record as mentioned in **Paragraph 5.3.41** above, the following measures may be considered when necessary:
  - All dump trucks engaged on-site for delivery of inert and non-inert C&D material from the site to the designated disposal locations, including PFRFs, landfills etc., should be equipped with GPS or equivalent system for tracking and monitoring of their travel routings and parking locations by the Contractor to prohibit illegal dumping and landfilling of materials.
  - The data collected by GPS or equivalent system should be recorded properly for checking and analysis the travel routing and parking locations of dump truck engaged on-site.

5.4 Waste Management Impacts During Operation Phase

5.4.1 During the operation phase, some Municipal Solid Waste ("MSW") will be generated. This includes general refuse, food waste, food packaging, paper, cans, plastic bottles etc. from onsite staff and visitors. According to Waste Statistics for 2024, the most recent domestic waste disposal rate is 0.86kg/person/day.

5.4.2 As advised by the Applicant, the Proposed Development will have an estimated 1,000 visitors and 60 staff on Normal Days and 4,000 visitors and 150 staff on Ceremony/Event Days. In General, there will be less than 30 ceremony days per year. As a result, the total domestic waste to be generated every year is estimated to be approx. 412,456kg or 413 tonnes (i.e. (4,150 persons x 30 days/year +1,060 persons x 335 days/year) x 0.86 kg/person/day).

5.4.3 With reference to Plate 3.2 of Waste Statistics for 2024, the recovery rate of domestic waste is 22%. Therefore, it is estimated that 22% of domestic waste (i.e. 91 tonnes/year) could be reused and recycled. The remaining municipal solid waste of 322 tonnes/year would be disposed of at a landfill managed by EPD.

5.4.4 The quantity of MSW generated by the visitors and staff during daily operation will not result in major environmental concerns with a proper waste management, such as to be collected regularly by registered waste collectors and to be disposed of at a landfill managed by EPD. There is no adverse waste impact from handling, transportation or disposal are anticipated. Nevertheless, to minimize MSW generation, mitigation measures shown in **Paragraphs 5.4.5** and **5.4.6** should be implemented. With the implementation of the mitigation measures, there should be no adverse waste impact from the handling, transportation or disposal of domestic waste during the operation of the Proposed Development.

Mitigation Measures

5.4.5 The operator shall encourage reuse and recycling of MSW in line with government policy. The waste management hierarchy shall be adopted by the building management to manage commercial wastes in a suitable manner. The waste management hierarchy is a concept which shows the desirability of various waste management methods and comprises the following in order of preference:

- Avoidance
- Minimisation
- Recycling/reuse

5.4.6 MSW such as general refuse, food waste, food packaging, paper, can, plastic bottles, etc., which shall be collected and stored in appropriate waste receptacles with a secure lid to minimize the potential adverse impact due to wind blowing away garbage and to improve hygiene. Recyclable and non-recyclable waste shall be regularly collected by waste collectors and taken off-site for recycling or disposal, respectively.

5.5 Conclusion

5.5.1 With the development of WMP and to implement the good site practices recommended therein, the waste generation during construction phase can be greatly reduced. Provided that good site practices as recommended in above will be followed, there should be no adverse impacts related to the management, handling and transportation of waste during the construction phase.

5.5.2 During the operation phase, the major type of waste generated will be MSW from on-site staff and visitors. Since MSW will be collected on a regular basis by registered waste collectors and will be disposed at a landfill managed by EPD, no adverse waste impacts from handling, transportation, or disposal are anticipated during operation.

5.5.3 With the implementation of the recommended mitigation measures, adverse waste management impact during the construction and operation phases of the Proposed Development is not anticipated.

6 LAND CONTAMINATION

6.1 Environmental Legislation and Standards

6.1.1 The following legislation, standards and guidelines were taken reference to for conducting the land contamination assessment:

- EPD Guidance Note for Contaminated Land Assessment and Remediation.
- EPD Practice Guide for Investigation and Remediation of Contaminated Land.
- Guidance Manual for Use of Risk-Based Remediation Goals for Contaminated Land Management.

6.2 Assessment Methodology

6.2.1 Land contamination assessment would be conducted according to EPD's Practice Guide. A site appraisal has been conducted as part of the land contamination assessment to determine whether there is any potential for land contamination in the Site.

6.2.2 In the case that potential land contamination issues are identified, a complete land contamination assessment with the following steps should be undertaken:

1. Design a site investigation ("SI") strategy and prepare a Contamination Assessment Plan ("CAP") for EPD's approval
2. Upon EPD's approval of the CAP, conduct SI according to the approved CAP
3. Upon completion of SI, interpret the results and prepare a Contamination Assessment Report ("CAR") for EPD's approval
4. Plan and design remediation strategy and prepare a Remediation Assessment Plan ("RAP") for EPD's approval
5. Carry out remediation works according to the approved RAP
6. Prepare a Remediation Report ("RR") for EPD's endorsement

6.3 Site Appraisal

Review of Historical Use

6.3.1 Aerial photographs records provided in **Appendix C** show that the Site was partly an agriculture land with some forest area in the 1960s until present, in which the historical agricultural activities unlikely caused land contamination. In Year 2006, it was observed that a suspected residential unit and some roads were constructed on the Site. The building remains unchanged on the site until Year 2023. The historical land uses of the Project Site based on the aerial photographic records is summarised in **Table 6-1.**

Table 6-1 Historical Land Uses of the Project Site

PHOTO ID	HISTORICAL LAND USES
1963_1963-7821	Agriculture land with some woodland
1973_03409	No major change was observed
1982_42282	No major change was observed

PHOTO ID	HISTORICAL LAND USES
1994_CN08852	No major change was observed
2006_CW73435	A suspected residential unit and some roads were built
2014_CS48313	No major change was observed
2023_E189910C	More access roads were present and some agricultural land was replaced with an artificial grass land.

6.3.2 Based on the preliminary review on the historical aerial photographs and documents on the website, no existing and previous development with potential land contamination activities on the Site is identified. Hence, no land contamination issue is anticipated.

6.4 Conclusion

6.4.1 No suspected land contaminated activities were found based on the historical aerial photographs. As such, steps 1 to 6 of **Paragraph 6.2.2** are not required. Hence, no adverse impact from the land contamination issue is anticipated and site investigation is considered not necessary.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1.1 This EA has indicated that the Proposed Development will not generate any unacceptable environmental impacts during construction and operation phases, provided that all the recommended mitigation measures and good site practice are strictly implemented.

7.1.2 Specific conclusions for air quality, noise, water quality, waste management and land contamination are as follows:

Air Quality

7.1.3 With the implementation of the recommended mitigation measures and good site practice, no adverse air quality impacts during construction phases are anticipated.

7.1.4 No adverse air quality impact associated with the Proposed Development is anticipated during operation phase with the implementation of the proposed mitigation measures.

7.1.5 Overall, no adverse air quality impact is anticipated during the construction or operation phases of the Proposed Development.

Noise

7.1.6 Overall, with the implementation of the noise mitigation measures, no adverse impact during the construction or operation phase of the Proposed Development is anticipated.

Water Quality

7.1.7 During construction phase, water quality impact will be properly controlled with the implementation of good site practice. Portable toilets, when necessary will be provided for construction workers on-site. Provided these measures are implemented, no adverse water quality impact is anticipated during the construction phase.

7.1.8 The Contractor shall apply for a Discharge Licence under the WPCO and the effluent discharged from the construction site shall comply with the terms and conditions of the Discharge Licence.

7.1.9 During operation phase, no adverse water quality impact is anticipated from stormwater/ sewage from on-site staff and visitors. The stormwater runoff arising from the Proposed Development will be passed through silt/sand traps before discharged into the stream to the west of the Site. On the other hand, sewage generated by on-site staff and visitors will be treated by the on-site Septic Tank/Soakaway Pit System or collected in sewage holding tanks and tankered away for off-site disposal. Any wastewater generated from the smokeless incense/joss paper furnace will be separately collected and tankered away for off-site treatment and disposal.

7.1.10 Overall, no adverse water quality impacts are anticipated during the construction or operation phase of the Proposed Development.

Waste Management

7.1.11 With the development of WMP and to implement the good site practices recommended therein, the waste generation during construction phase can be greatly reduced. Provided

that good site practices will be followed, there should be no adverse impacts related to the management, handling and transportation of waste during the construction phase.

7.1.12 During the operation phase, the major type of waste generated will be MSW. Since MSW will be collected on a regular basis by waste collectors and will be disposed at a landfill managed by EPD, no adverse waste management impact from handling, transportation, or disposal are anticipated during operation.

7.1.13 With the implementation of the recommended mitigation measures, no adverse waste management impact during the construction and operation phases of the Proposed Development is anticipated.

Land Contamination

7.1.14 No suspected land contaminated activities were found based on the historical aerial photographs. Hence, no adverse impact from land contamination issue is anticipated and site investigation is considered not necessary.

Appendix A TD's Reply for Road Type

From: Chi Wai IP <chiwaiip@td.gov.hk>
Sent: Thursday, 24 October 2024 10:47 am
To: Horace Mak
Cc: catherinachu@ctaconsultants.com; edmundyip@ctaconsultants.com
Subject: Re: Pre-submission enquiry of s.16 planning application-Proposed Religious Institution (the Supreme Kwan Ti Temple) and Improvements to the Tai Tong Kwan Ti Square at Tai Tong, Yuen Long - Proposed Road Type for Widened/Improved Access Rd

Importance: High

Dear Horace

Please note that the access road connecting to the subject site and Tai Tong Shan Road is not managed by this department and we have no comment on your proposed road type for the widened/improved access road as Local Distributor for your environmental assessment.

Regards,
Louis IP
E/YLS, TE(NTW), TD
Tel: 2399 2565

From: "Horace Mak" <horacemak@ctaconsultants.com>
To: "'Chi Wai IP'" <chiwaiip@td.gov.hk>
Cc: [redacted]
Date: 2024/10/14 上午 08:46
Subject: Pre-submission enquiry of s.16 planning application-Proposed Religious Institution (the Supreme Kwan Ti Temple) and Improvements to the Tai Tong Kwan Ti Square at Tai Tong, Yuen Long - Proposed Road Type for Widened/Improved Access Rd

Dear Louis,

We refer to the captioned subject.

As per comment #13 from EPD **(see attached comment highlighted)**, road type of the widened/improved access road **(location please see attached mark-up drawing Figure 1_1)** is required to be confirmed/endorsed by TD for their further consideration of the Air Quality Impact Assessment.

As stipulated in Annual Traffic Census 2022, road type of Tai Tong Road (from Hop Yick Road to Sham Chung Road) is classified as Rural Road (RR). Taking into consideration that the widened/improved access road is only a local road connecting Tai Tong Shan Road and numerous developments along both sides of the road, and its road hierarchy is much lower than that of Tai Tong Road, it is envisaged that the **widened/improved access road** should be classified as **"Feeder Road/Local Road" or "Local Distributor" (the lowest road type under the road hierarchy)** and hence we would like to seek for your comment/confirmation on that.

1

Should you have any queries or require further information, please do not hesitate to contact me or our Ms. Catherina Chu at 2214 0849.

Thank you very much for your kind attention and we are looking forward to your favourable reply at your earliest convenience.

Best Regards,

Horace Mak

[redacted]

[attachment "EPD - Comments on EA & SIA (highlighted).pdf" deleted by Chi Wai IP/TD/HKSARG]
[attachment "FIG 1_1 - SITE LOCATION PLAN (highlighted).pdf" deleted by Chi Wai IP/TD/HKSARG]

2

Appendix B Example of Smokeless Incense/Joss Paper Furnace

hkpc 生產力局

「清煙」環保化寶爐

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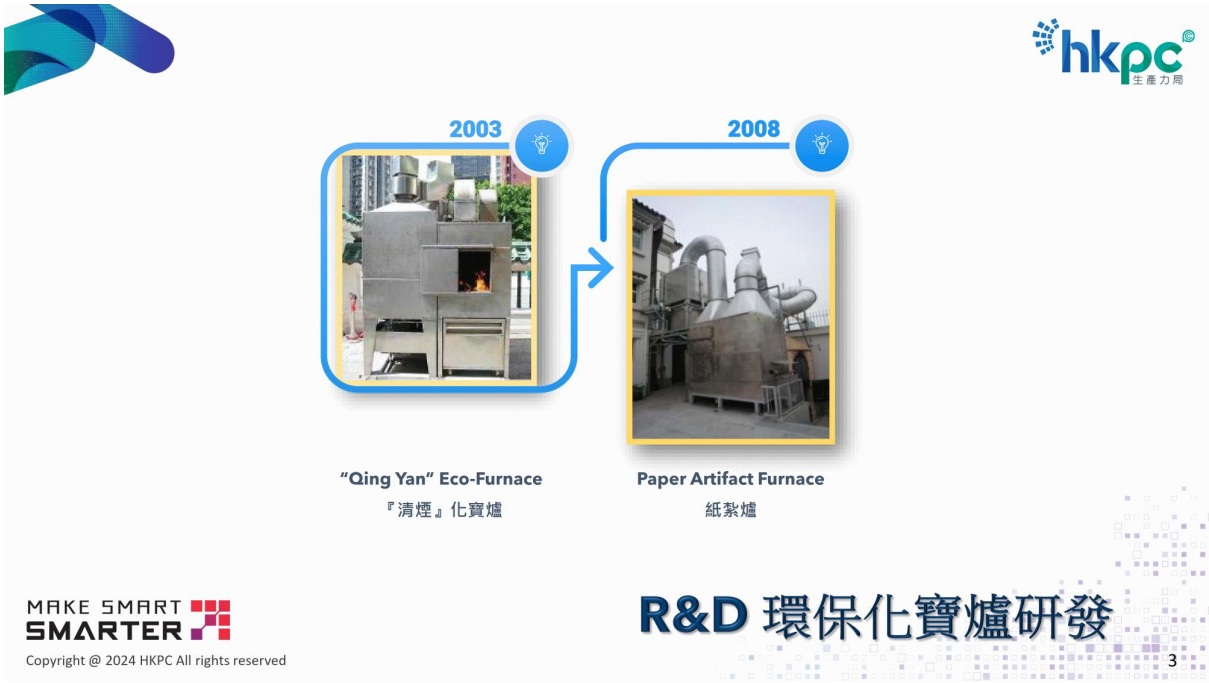
hkpc
2003
2008
"Qing Yan" Eco-Furnace
『清煙』化寶爐
Paper Artifact Furnace
紙紮爐
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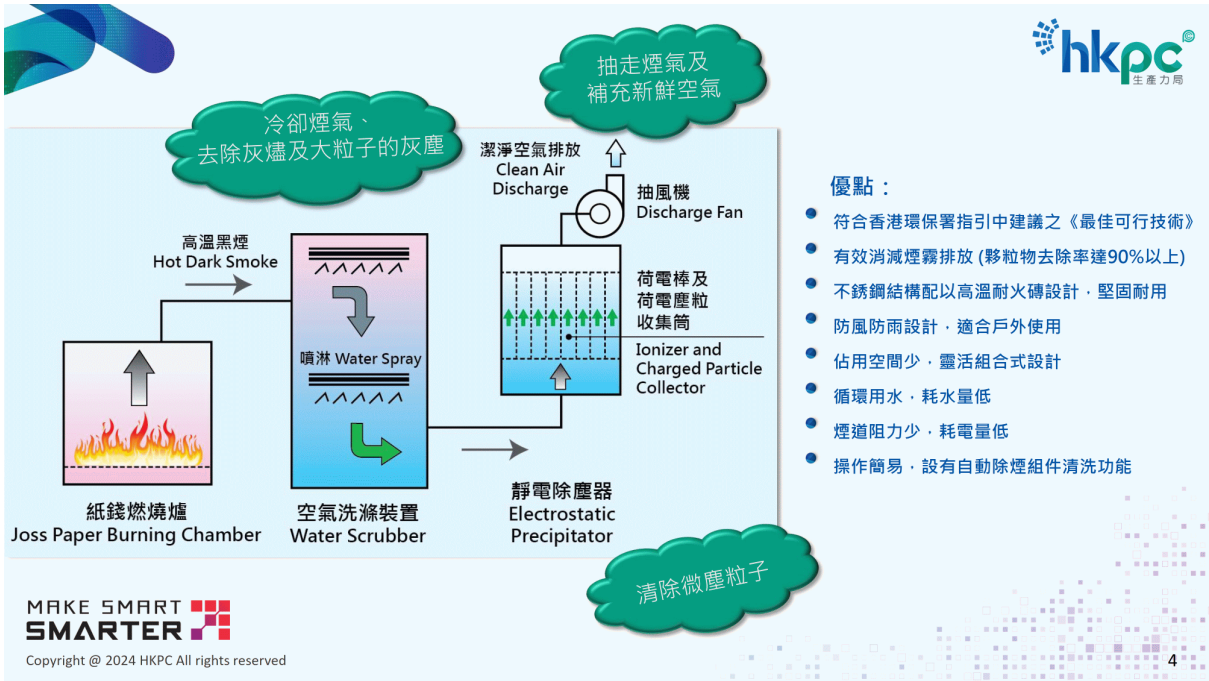
R&D 環保化寶爐研發
3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抽走煙氣及
補充新鮮空氣
冷卻煙氣、
去除灰燼及大粒子的灰塵
潔淨空氣排放
Clean Air
Discharge
抽風機
Discharge Fan
高溫黑煙
Hot Dark Smoke
噴淋 Water Spray
荷電棒及
荷電塵粒
收集筒
Ionizer and
Charged Particle
Collector
紙錢燃燒爐
Joss Paper Burning Chamber
空氣洗滌裝置
Water Scrubber
靜電除塵器
Electrostatic
Precipitator
清除微塵粒子
優點：
符合香港環保署指引中建議之《最佳可行技術》
有效消減煙霧排放 (夥粒物去除率達90%以上)
不銹鋼結構配以高溫耐火磚設計，堅固耐用
防風防雨設計，適合戶外使用
佔用空間少，靈活組合式設計
循環用水，耗水量低
煙道阻力少，耗電量低
操作簡易，設有自動除煙組件清洗功能
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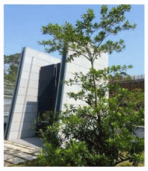
4



	地點	客戶	年份
1.	上環文武廟	東華三院	2003
2.	紅磡觀音廟	華人廟宇委員會	2004
3.	赤柱天后廟	赤柱街坊福利會	2005
4.	旺角水月宮	東華三院	2005
5.	上環通善壇(2台)	通善壇	2006
6.	天后天后廟	康民署/仁利建築	2006
7.	九龍城侯王廟	偉業聯和/華人廟宇委員會	2006
8.	紅磡觀音廟	華人廟宇委員會	2006
9.	大坑蓮花宮	華人廟宇委員會	2007
10.	鑽石山火葬場(4台)	食環署/建築署/華潤營造	2008
11.	黃大仙祠	色善園	2009
12.	北區醫院	醫院管理局	2010
13.	大埔那打素醫院	醫院管理局	2011
14.	大埔醫院	醫院管理局	2011
15.	沙田醫院	醫院管理局	2011
16.	沙田威爾斯親王醫院	醫院管理局	2012
17.	秀茂坪天后廟	藝琳建築	2012
18.	和合石骨灰墓園(12台)	食環署/建築署/安保工程	2012
19.	和合石火葬場(3台)	食環署/建築署/宏宗建築	2012
20.	北大嶼山醫院	醫院管理局	2013
21.	柴灣敬連臣角火葬場(3台)	食環署/建築署/順昌機電	2013/2015
22.	將軍澳醫院	醫院管理局	2014
23.	忠和精舍(2台)	忠和精舍	2014
24.	赤柱天后廟	赤柱街坊福利會	2018
25	上環文武廟	東華三院	2018
26.	屯門曾咀骨灰墓園(30台)	食環署/建築署/南龍機電	2019
27.	新界法醫學大樓 (富山公眾殮房)	衛生署	2022

總數: 77台

"Qing Yan" Eco-Furnace
清煙化寶爐

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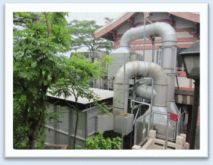
5

Paper Artifact Furnace 紙紮爐



項目	地點	開始運作年份
1.	大圍寶福紀念館（殯儀館）	2008
2.	九龍塘一佛堂	2009
3.	大角咀九龍殯儀館	2010
4.	沙田寶福山（骨灰龕）	2011
5.	澳門永念庭（骨灰龕）	2012
6.	大圍寶福紀念館新系統	2015
7.	鑽石山殯儀館	2015
8.	世界殯儀館	2015
9.	香港殯儀館	2016
10.	澳門鏡湖殯儀館	2017
11.	萬國殯儀館	2022

總數: 11台

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系統	『清煙』化寶爐	紙紮爐除煙系統
適合燃燒祭品	小型紙紮祭品如紙錢、衣包	大型紙紮祭品 / 大量燃燒小型紙祭品
處理量	每小時40公斤 或 每小時80公斤	每小時400公斤
設備尺寸	1800(W) x 1800(D) x 2900mm(H) 或 1800(W) x 5500(D) x 2900mm(H)	除煙設備空間約12m x 7m x 5m(H)
燃燒室尺寸	(40公斤 /小時) 內部： 750(W) x 800(D) x 1100mm(H) 爐口： 700(W) x 400mm(H) (80公斤 /小時) 內部：1200(W) X 850(D) X 1100mm(H) 爐口：1100(W) X 700mm(H)	內部： 1300(W) x 2500(D) x 2000mm(H) 爐口： 1300(W) x 1600mm(H)
適合場所	廟宇、道觀、火葬場、骨灰安置場所等	殯儀館及墳場等
安裝時間	約24 星期	約28 星期

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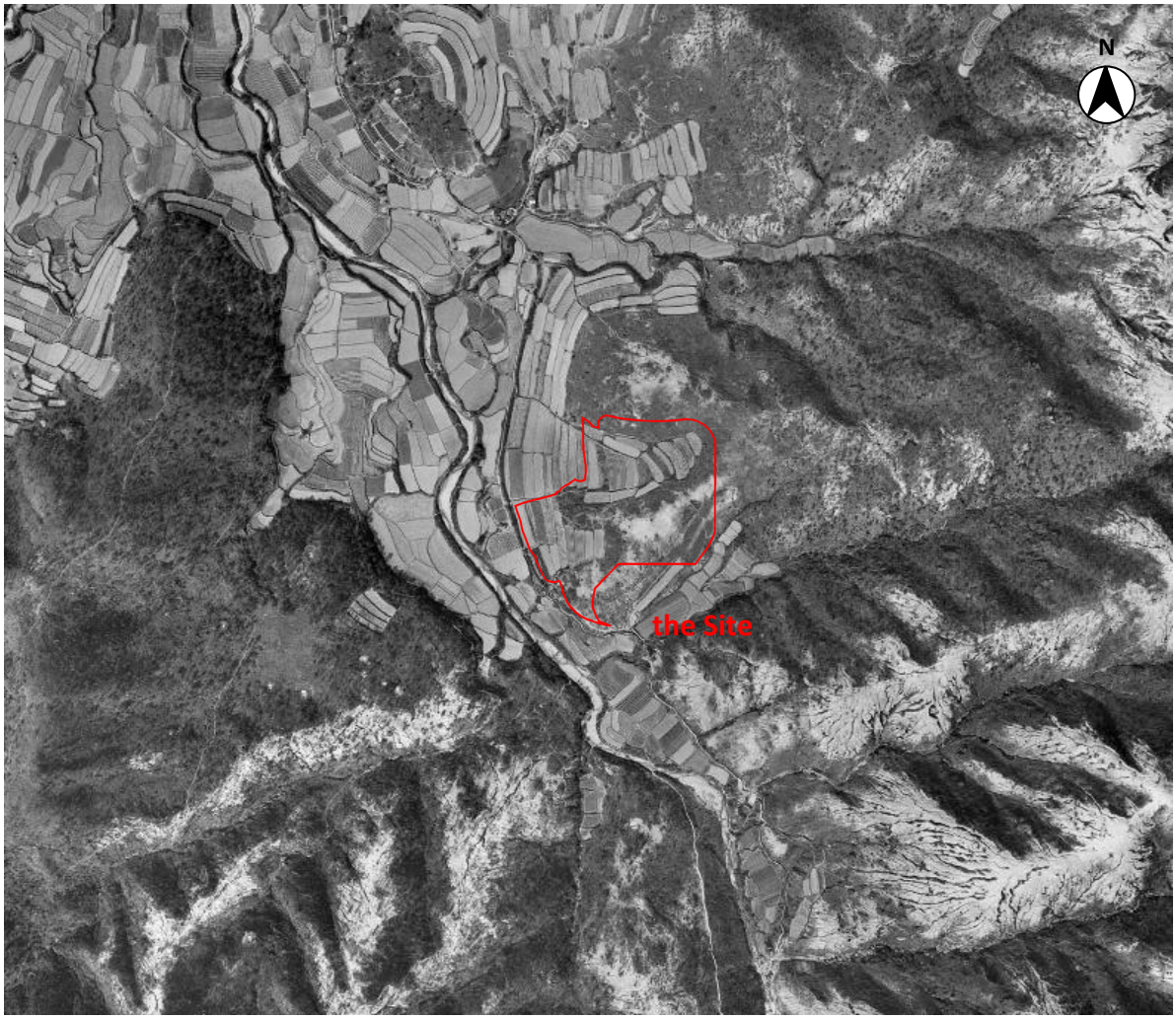
Appendix C Historical Aerial Photographs

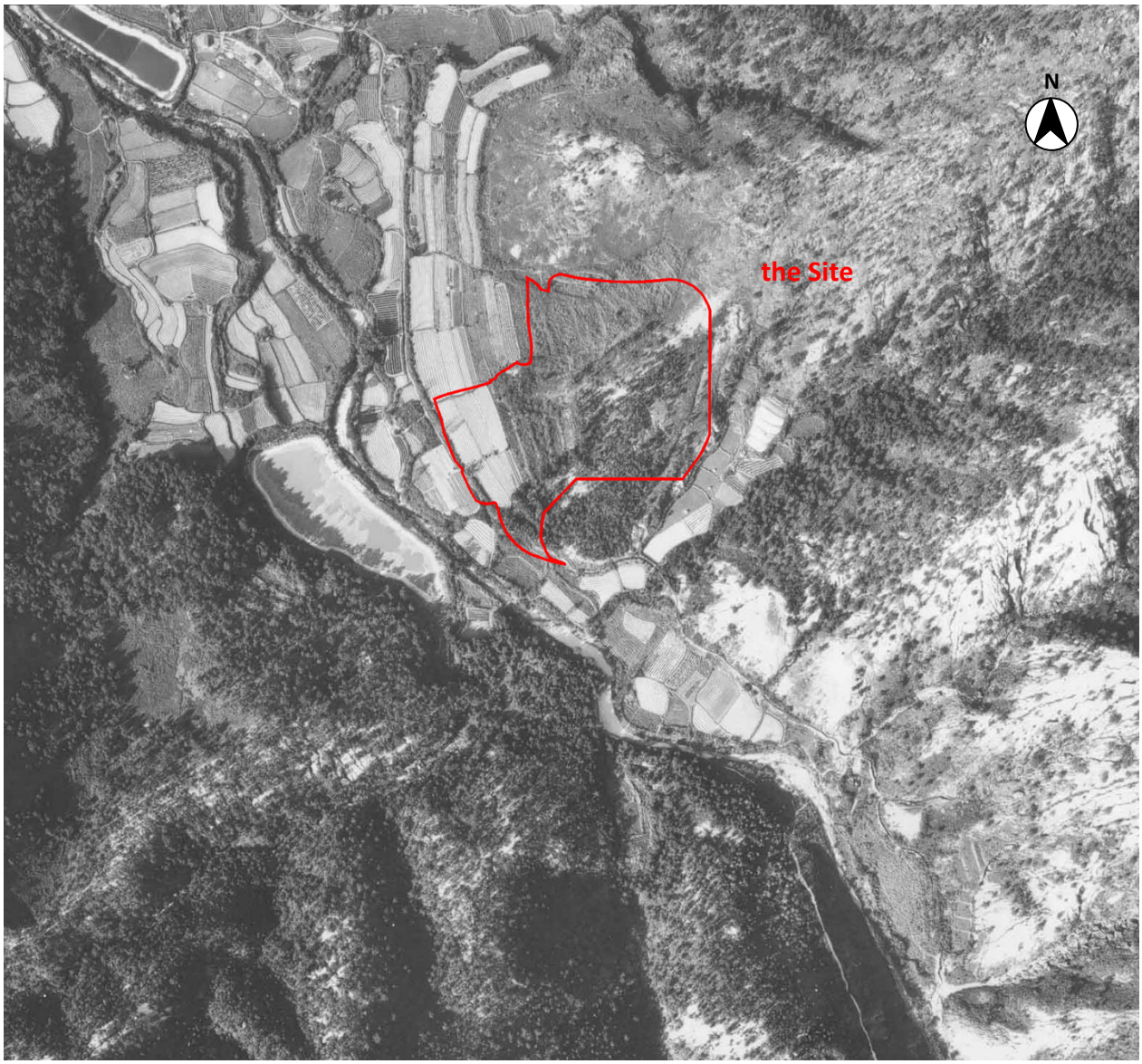
Figure C-1 Aerial Photograph in Year 1963



Source: Lands Department

In 1963, the Site was an partly an agriculture land and partly bare land. No activities likely to result in land contamination were observed.

Figure C-2 Aerial Photograph in Year 1973



Source: Lands Department

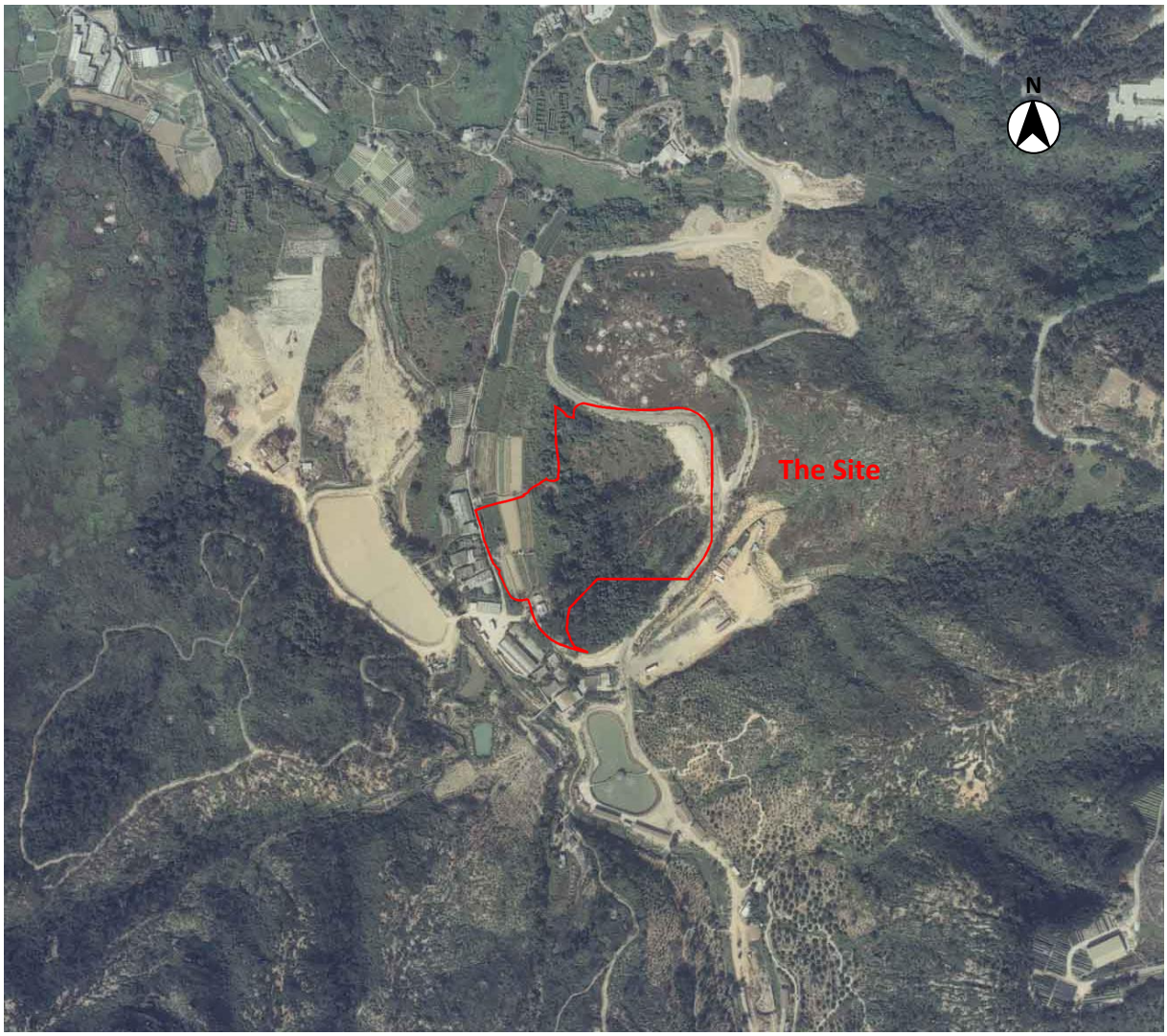
In 1973, the Site was partly an agriculture land with some forest area. No activities likely to result in land contamination were observed.

Figure C-3 Aerial Photograph in Year 1982

Source: Lands Department

In 1982, the Site was partly an agriculture land with some forest area and bare land. No activities likely to result in land contamination were observed.

Figure C-4 Aerial Photograph in Year 1994



Source: Lands Department

In 1994, the Site was partly an agriculture land with some forest area and bare land. No activities likely to result in land contamination were observed.

Figure C-5 Aerial Photograph in Year 2006

Source: Lands Department

In 2006, the Site was partly an agriculture land with some forest area. A building and some roads were built, but no activities likely to result in land contamination were observed.

Figure C-6 Aerial Photograph in Year 2014

Source: Lands Department

In 2014, the Site remains unchanged. No activities likely to result in land contamination were observed.

Figure C-7 Aerial Photograph in Year 2023

Source: Lands Department

In 2023, the Site remains unchanged. Some more roads were presented and some agricultural area was removed and an artificial grass land was presented. No activities likely to result in land contamination were observed.

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