Environmental Impact Assessment
Executive Summary

Proposed Residential cum Passive Recreational Development within "Recreation" Zone and "Residential (Group C)" Zone at Various Lots in DD 104, Yuen Long, N.T.

環境影響評估

行政摘要

新界元朗丈量約份第 104 約內多個地段

「康樂」及「住宅(丙類)」地帶內之住宅暨休閒康樂發展

Prepared by
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in association with

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ENVIRON

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Table of Contents

List of Figures

1. INTRODUCTION

1.1 Background

1.1.1 The Project is proposed for a low-rise residential cum passive recreation development. The Project Site, with a total area of about 9 ha, comprises various lots in D.D. 104 near Fairview Park, Yuen Long. The site is sandwiched between Yau Pok Road and existing Fairview Park development (**Figure 1**).

1.1.2 Pursuant to the requirement of the Environmental Impact Assessment Ordinance, An Environmental Impact Assessment (EIA) has been undertaken to provide a detailed assessment of the nature and extent of potential environmental impacts associated with the construction and operation (i.e. occupation of the Site by residents upon completion of proposed development) of the Project, including air quality, noise, water quality, waste management, ecology, fisheries, cultural heritage, landscape and visual resources, and recommendations for mitigation measures to comply with environmental legislations and standards. The impact assessments in the EIA have been conducted by qualified and experienced environmental consultants in association with consultants in various expert fields including ecology, fisheries, engineering, planning, architectural, traffic, cultural heritage, landscape and urban design.

1.1.3 This Executive Summary provides a summary of the key findings of the EIA study.

1.2 Project Location

1.2.1 The Project Site is located in between Yau Pok Road and an existing large-scale residential development – Fairview Park. The site is bounded by Yau Pok Road and Ngau Tam Mei Main Drainage Channel to its immediate east; Fairview Park to its immediate west, southwest and northwest; a planned residential site to its immediate northeast; and the existing Fairview Park Boulevard to its southeast. Several existing residential developments including Palm Springs, Royal Palms, Yau Mei San Tsuen and Wo Shang Wai are located to the further north, Villa Camellia, Helene Terrace, Greenery Garden, Meister House to the further southeast of the site. **Figure 1** shows the location and environs of the Project Site. Between the eastern boundary of the Project Site and the Yau Pok Road, a cycle track linking the existing local cycle track networks of Yuen Long to Sheung Shui will be constructed by the Government.

1.2.2 Further to the east across the said drainage channel is an area already designated by the Government for residential use and village type development under the statutory town plan in addition to a few existing villages, such as Chuk Yuen Tsuen, Tai Yuen Villa and Ha San Wai Tsuen as well as low density development such as Hang Fook Garden. A few open storage uses are also witnessed much further east.

1.3 EIAO and Designated Projects

1.3.1 Residential or recreational developments within Deep Bay Buffer Zones 1 or 2 are designated projects under the Environmental Impact Assessment Ordinance (EIAO), of which environmental impact assessment (EIA) is required to be conducted. As the Project falls within Deep Bay Buffer Zone 2 (**Figure 1**) and comprises residential development cum passive recreational development, an EIA is required for the Project.

Palm Springs
加州花園

Royal Palms
加州豪園

Fairview Park
錦繡花園

"OU" Site
「其他指定用途」
住宅用地

Yau Mei San Tsuen 攸美新村

Project Site
項目地點

Yau Pok Road 悠望路

Ngau Tam Mei Drainage Channel
牛潭尾的排水道

"R(D)" Site
「住宅(丁類)」
用地

Ha Chuk Yuen Road 下竹園路

Castle Peak Road 青山公路

Government's Proposed Cycle Track (Indicative)
政府擬議單車徑(參考用)

Chuk Yuen Tsuen 竹園村

Tai Yuen Villa 泰苑小築

Kam Pok Road 錦雹路

"V" Sites
「鄉村式發展」
用地

Hang Fook Garden
幸福花園

San Tin Highway 新田公路

Deep Bay Buffer Zone 2
后海灣2號緩衝區

Ha San Wai Tsuen
下新圍村

Helene Terrace
明珠花園

Villa Camllia
海錦花園

Fairview Park Boulevard 錦繡花園大道南

Royal Camellia
海錦豪園

Greenery Gardens
御翠園

Meister House
首譽

Man Yuen Chuen
文苑村

Legend 圖例

Project Site Boundary 項目範圍

Boundary of Deep Bay Buffer Zone 2
后海灣2號緩衝區

Figure 附圖: 1	ENVIRON
Title 名稱: Location and Environ of the Project 項目位置及附近環境	Drawn by: HN Checked by: Tc
Project 項目: EIA for Proposed Residential and Passive Recreation Development within "Recreation" (REC) and "Residential (Group C)" Zones at Various Lots in DD 104, Yuen Long, N.T. 新界元朗DD104多個地段「康樂」及「住宅(丙類)」地帶內之住宅暨休閒康樂發展環境影響評估	Rev.: 1.3 Date: Feb 2014

1.4 Project Description

1.4.1 The Project comprises low-rise residential development in the southern portion and a landscape pond, landscape area and some passive recreational and supporting uses in the northern portion of the site (**Figure 2**) to complement the Government's cycle track development at the eastern boundary of the Project Site. The southern portion of the Project Site will replace the existing wasteland with low density residential development, residential clubhouse and swimming pool in line with the existing Fairview Park development and the planned residential developments on the adjacent sites. A total of 106 houses (2 storeys (6.6m) above one storey basement carpark) is proposed to be developed on the Project Site.

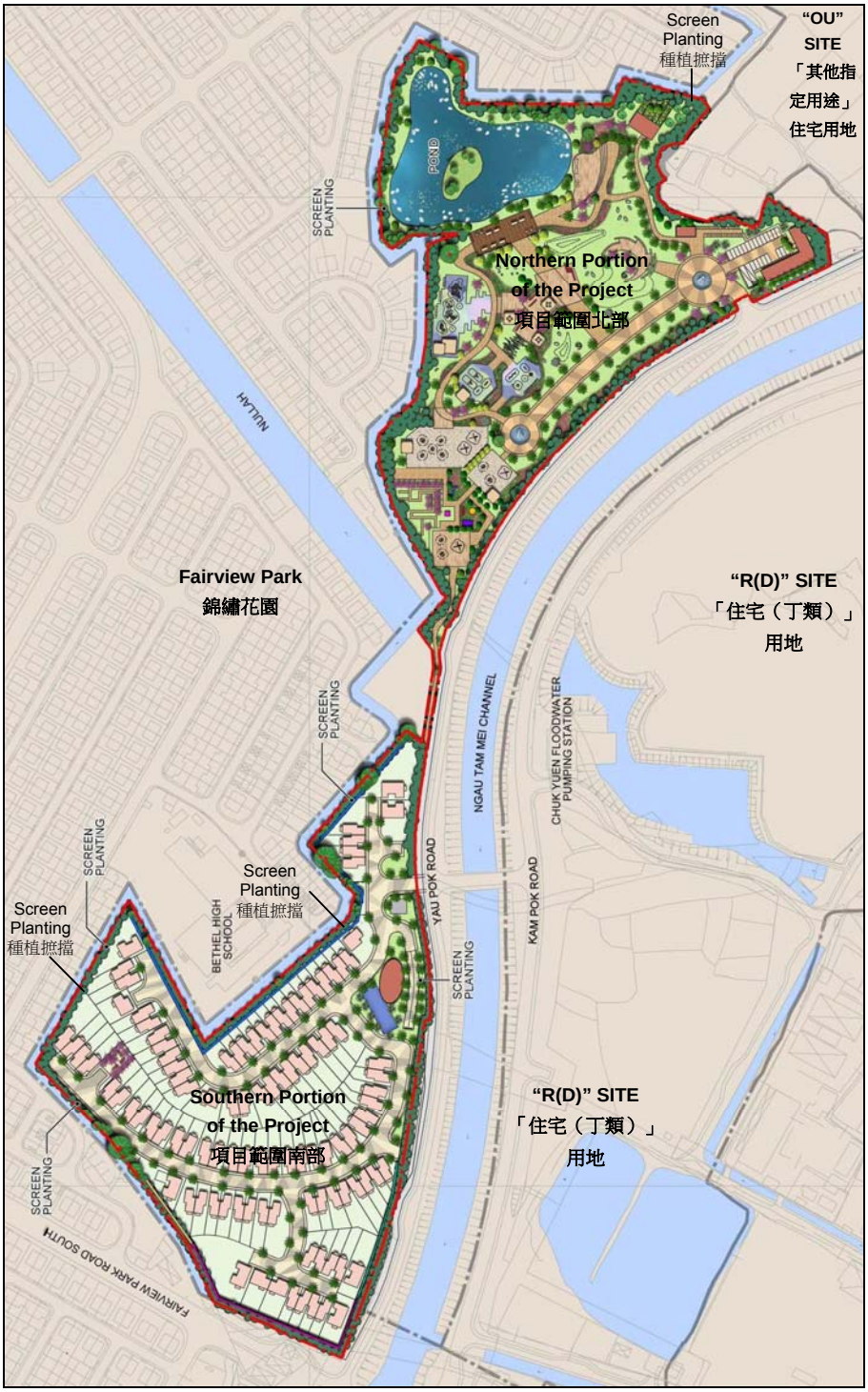


Figure 2
Conceptual Layout of the Project

2. KEY FINDINGS OF ENVIRONMENTAL IMPACT ASSESSMENT

2.1 General

2.1.1 The potential environmental issues associated with the construction and operation of the Project, key findings, conclusions and recommendations are summarised in the following sections.

2.2 Air Quality

2.2.1 During the construction phase of the Project, fugitive dust emissions from the site formation works due to earth movement activities and transportation of excavated/ fill materials are the major sources of air pollution. The predicted unmitigated dust levels due to this Project are provided below:

	TSP (1-hr)	**RSP (24 hours) ***	**RSP (Annual)**	**PM2.5 (24 hours) ***	**PM2.5 (Annual)**
Predicted Range, $\mu g/m^3$	616 – 7,989	133 - 537	44 - 190	95 - 216	31 - 75
No. of Exceedance	n/a	>9	n/a	>9	n/a
Compliance with Air Quality Criteria?	No	No	No	No	No
Air Quality Criteria, $\mu g/m^3$	500	100	50	75	35
No. of Exceedance Allowed	n/a	9	n/a	9	n/a

Remark: * The daily levels are based on the 1st highest concentrations at the receivers. Based on predicted results, the maximum predicted concentrations as well as no. of exceedances have exceeded the AQO criteria. Thus, the dust level cannot comply with the relevant air quality criteria / AQOs.

2.2.2 However, no unacceptable air quality impacts are anticipated with the following mitigation measures in place: dust control measures required under the Air Pollution Control (Construction Dust) Regulation, e.g. imposing hard paving on the designated haul road; spraying water on areas with active site formation works during day-time (including holidays); enclosing dump trucks of transporting dusty materials with impervious sheeting, etc.; good housekeeping practice by the works contractors; and the project specific measures recommended in the EIA report (e.g. arranging site formation of the northern portion and the southern portion of Project Site to carry out separately with a view to avoiding concurrent works; minimizing the working area so that each construction site will be divided into different sub-zones with only one sub-zone under construction in any one time, etc.). The predicted mitigated dust levels due to this Project are provided below:

	TSP (1-hr)	RSP (24 hours) *	RSP (Annual)	PM2.5 (24 hours) *	PM2.5 (Annual)
Predicted Range, $\mu g/m^3$	158 - 405	111 - 131	43.2 – 44.2	83 - 94	30.7 – 31.0
No. of Exceedance	n/a	3	n/a	3	n/a
Compliance with Air Quality Criteria?	Yes	Yes	Yes	Yes	Yes
Air Quality Criteria, $\mu g/m^3$	500	100	50	75	35
No. of Exceedance Allowed	n/a	9	n/a	9	n/a

Remark: * The daily levels are based on the 1st highest concentrations at the receivers. Based on predicted results, the maximum predicted concentrations exceed the AQO limit, but no. of exceedances is still within the AQO criteria. Thus, the dust level can comply with the relevant air quality criteria / AQOs.

2.2.3 Monitoring is recommended during construction to ensure proper implementation of the mitigation measures, and to minimize the construction dust level as far as practicable.

2.2.4 As the proposed development are residential dwellings, during operational phase or when the residents live in these dwellings, there will be no planned dust generating or air pollutant emission sources or activities from them. Sewage generated by the proposed development will be discharged to the public sewerage system at the proposed Ngau Tam Mei Pumping Station. Thus, the Project Site itself will not contribute to any air pollution or odour nuisance. There is also no air quality impact relating to industrial chimney emissions as no chimneys are identified within the Assessment Area. Although the Project is adjacent to existing road network, sufficient setback distance has already been incorporated between the development and the roads, hence the impact from vehicular emission from the road is insignificant. Overall, no unacceptable air quality impacts are expected to occur.

2.2.5 In brief, with the implementation of the mitigation measures as recommended in the EIA report, no adverse air quality impact due to the Project is anticipated.

2.3 Noise

Construction Phase

2.3.1 The use of Powered Mechanical Equipment for various construction activities will be the primary potential noise source during the construction phase of the Project. Without mitigation measures, the predicted unmitigated construction noise level at representative noise sensitive receivers (NSRs) would range from 73dB(A) to 87dB(A), which exceeds the relevant construction noise criteria (i.e. 75dB(A) for residential uses; and 70dB(A) for educational institutions (65B(A) during school examination period)) at most of the NSRs. However, with the adoption of a combination of noise mitigation measures such as use of quiet type equipment, scheduling of construction programme to avoid concurrent works, and provision of movable and fixed temporary noise barriers, the predicted mitigated construction noise level would only range from 60dB(A) to 74dB(A), which comply with the relevant construction noise criteria. In addition, to ensure that the construction noise will not affect the nearby school in the Fairview Park, a short section of temporary noise barriers (up to 9m high to shield the

school from potential construction noise) is proposed primarily along the boundary facing the subject School. From the above, no adverse construction noise impact due to the Project or the nearby concurrent projects is anticipated.

2.3.2 Monitoring of the construction noise is recommended in the EIA report to ensure proper implementation of the mitigation measures, and to minimize the noise level as far as practicable.

Operational Phase

2.3.3 Regarding the traffic noise impact from the adjacent roads on future residents of the Site, the predicted unmitigated road traffic noise level would range from 66dB(A) to 76dB(A) at some of the NSRs, which exceeds the relevant noise criteria of 70dB(A). However, with the implementation of noise mitigation measures such as boundary noise barriers and fixed glazing/ blank façade for some affected units, the noise level could be reduced to 57dB(A)-70dB(A), which complies with the relevant noise criteria. There will be no unacceptable noise impacts from road traffic noise. The proposed boundary noise barriers, ranging from 2.5m to 4.5m proposed respectively on part of the south-eastern, southern and south-western portion of the site boundary, would not only shield the Project Site from traffic noise but also potential noise from the nearby petrol filling station. The predicted noise level at the worst affected NSRs due to operation of petrol filling station, would be reduced from 56dB(A)-58dB(A) (unmitigated scenario) to 50dB(A) (mitigated scenario) during day-time; and from 51dB(A)-53dB(A) (unmitigated scenario) to 45dB(A) (mitigated scenario) during night-time, which meet the relevant noise criteria of 50dB(A) and 45dB(A) for day-time and night-time periods, respectively.

2.3.4 An evaluation conducted on potential industrial noise from activities within open storage sites to the further east of the Project Site has found no adverse noise impacts on this Project and therefore no noise mitigation measure is necessary. The predicted noise level due to operation of the open storage site would be up to 53dB(A) (day-time) and 43dB(A) (night-time), which complies with the relevant noise criteria of 55dB(A) and 45dB(A), respectively.

2.3.5 From the above, it is concluded that with the adoption of the noise mitigation measures recommended in the EIA report, there will be no unacceptable noise impacts.

2.4 Water Quality

2.4.1 The Project will involve land-based works only. During construction of this Project, the major potential water quality impact will be from surface runoff and soil erosion of exposed surfaces. To alleviate the impacts, the EIA report recommends the adoption of good site practices and construction of a properly designed temporary drainage system within the site in accordance with the requirements stipulated in Professional Persons on Environmental Consultative Committee Practice Notes on the Site Drainage (ProPECC PN 1/94). The peripheral site drainage system will divert surface runoff away from the Fairview Park Nullah and will be equipped with sand/silt removal facilities to properly treat the surface runoff collected prior to the discharge to the Ngau Tam Mei Drainage Channel. Pursuant to the “Water Pollution Control Ordinance”, applications to the EPD for Discharge Licences are required prior to the commencement of the construction works and occupation of the development. In addition, regular environmental audits, as part of the proposed Environmental Monitoring and Audit (EM&A), including regular water quality monitoring and site inspections will be undertaken routinely in order to ensure the recommended mitigation measures are properly implemented.

2.4.2 Upon occupation of the Site, all domestic sewage generated will be discharged to the public sewerage system at Yau Pok Road. The Project will not have population intake until the commissioning of the planned local public sewerage works. Thus, there will be no net increase in pollution loading to Deep Bay areas. With appropriate drainage system equipped with sand traps within the proposed development to collect surface runoff, there will be no adverse water quality impact during the operation of the Project as the increase in surface runoff from this Project is insignificant when compared with the capacity of the trained downstream Ngau Tam Mei Drainage Channel and Fairview Park Nullah, which are engineered drainage channels designed for collecting stormwater. The proposed water pond in the northern portion of the Project Site has been designed so that it will be self-contained and there is no outlet connecting to nearby channel/inland water, as such there will be no discharge during operational phase. Surface runoff will be diverted away from the pond area by drainage channels.

2.4.3 With the adoption and implementation of the mitigation measures recommended in the EIA report, no adverse water quality impact is anticipated during construction or operation of the Project.

2.5 Sewerage and Sewage Treatment

2.5.1 Potential wastewater sources during the operational phase would be the sewage and wastewater generated from residential houses, recreational facilities and public toilets. The sewage generated from the Project Site will be discharged into the planned public sewerage system under Drainage Services Department's Public Work Programme No. 4215DS and 4235DS. Thus, there will be no net increase in pollution loading to Deep Bay areas.

2.5.2 Hydraulic analysis has been conducted which shows that these proposed public sewerage collection systems have adequate spare capacity to convey the additional sewage generated from the Project Site. Also the future capacity of the Yuen Long Sewage Treatment Works is capable of receiving the additional flow from the Project Site.

2.5.3 The proposed development will not have population intake until the commissioning of the aforesaid public sewerage works for connection. All the sewers and sewerage facilities within the proposed development before the terminate manholes will be constructed, operated and maintained by the owners of the Site. The sewers outside the development connecting the terminal manholes to the future public sewer works will be maintained by Drainage Services Department subject to their agreement in the detailed design stage.

2.5.4 In conclusion, as the sewage generated from the Project Site will be discharged into planned public sewers, no adverse sewerage impact is anticipated and no EM&A requirement is necessary.

2.6 Waste Management

2.6.1 The waste streams that would be generated during the construction phase of the Project include site clearance, excavated soil, construction and demolition materials, chemical waste from the maintenance of construction plant and equipment, and general refuse from the workforce. Opportunities for reduction in waste generation through recovery, reuse or recycling have been identified in the assessment.

2.6.2 The appropriate disposal method for each type of waste generated from the construction method was identified. Opportunities for reducing construction waste generation and maximizing re-use on-site were evaluated. Environmental mitigation measures and good practices have been recommended in the EIA report in order to mitigate the environmental impacts.

2.6.3 Provided that the recommended practices are strictly followed, no adverse impacts to the environment associated with waste generated by the construction phase of the Project are anticipated.

2.6.4 As the Project is not a high-density development, the development even when fully occupied will generate limited amount of domestic waste. Standard approach that is widely adopted in other parts of Hong Kong shall be adopted for the handling and disposal of this small quantity of waste during the operational phase. Waste generated will be collected and disposed of properly by a licensed contractor using refuse collection vehicles. Thus, no adverse waste management issues are expected to arise during operation of the Project.

2.7 Ecology

2.7.1 The Project Site mainly comprises grassland/shrubland and urbanized area. There are also an abandoned pond and other miscellaneous areas (e.g. small pieces of reed, agricultural land and seasonally wet grassland). The existing habitats are found to be of 'very low' to 'low to moderate' ecological value with 'very low' to 'low' faunal usage, and the loss of these habitats are found to be of 'low' ecological significance. Given the above, the Project Site is not considered to be of sufficient ecological value that it should be avoided and retained in its present form, and that no mitigation measures are required.

2.7.2 All habitats on-site will be lost, except for the pond in the northern portion of the site, which will be retained and enhanced in landscape terms.

2.7.3 The Project is not anticipated to result in any adverse ecological impact to the area. However, in order to ensure that no unforeseen adverse ecological impact is resulted during the construction, a construction phase ecological monitoring programme will be implemented for the Project.

Project Site – Northern Portion

Project Site – Southern Portion

2.8 Fisheries

2.8.1 No active fish pond would be directly impacted due to the Project. Indirect impacts during construction and operation phases would be insignificant given that appropriate mitigation measures (i.e. measures for water quality impact) are implemented.

2.8.2 No significant fisheries impact is anticipated, and no specific mitigation measure would be required for both construction and operation phases of the Project.

2.9 Cultural Heritage

2.9.1 A Cultural Heritage Impact Assessment has been carried out for the Project. The assessment area has been determined to contain no site of archaeological interest or areas of archaeological potential. Thus, no direct and indirect impacts to any terrestrial archaeology are anticipated during the construction of the Project. In addition, no land use features or declared monuments that may carry specific cultural meanings were identified within the Project Site, thus there is no cultural element concerned. Therefore, no specific mitigation measures would be required during construction and operation phases of the Project.

2.10 Landscape and Visual

2.10.1 The major sources of landscape and visual impacts arisen from the proposed development will be due to the removal of existing vegetation, the presence of the construction sites / new structures, and the enhancement works of the existing pond.

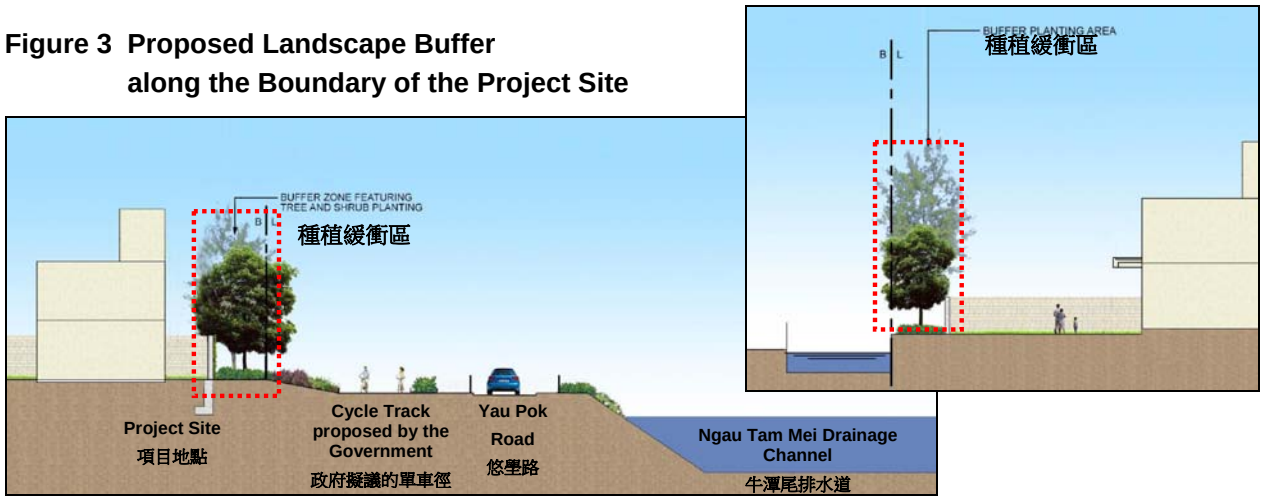
2.10.2 These impacts will be mitigated during construction by various measures, such as the proper preservation of existing healthy unaffected trees, advance tree planting, the appropriate screening of construction works and the control of night-time lighting. A short section of temporary noise barriers (up to 9m high to shield the school from potential construction noise) proposed primarily along the boundary facing the subject School will be carefully designed in visual terms. Subject to further liaison with school and key stakeholders, the noise barriers design and finishes, such as opaque and non-reflective material with colour blending in with the environment, will be sensitively selected to reduce visual impact and to avoid bird strike.

2.10.3 When the development comes into operation, impacts will be mitigated by new, healthy planting throughout the development, landscape buffer along the boundary (**Figure 3**), a landscape pond and a landscape area. These features (especially the landscape pond created by enhancing the existing pond) will uplift the overall landscape amenity.

2.10.3 The visual impact of the 2.5m to 4.5m high permanent noise barrier will be mitigated by very careful choice of acceptable material (e.g. opaque and non-reflective material with colour blending in with the environment), landscape buffer (**Figure 4**) and landscape treatment of the noise barrier (**Figure 5**).

2.10.4 The assessment concluded that the residual landscape and visual impacts of the proposed development will be acceptable with mitigation measures during construction and operation phases.

Figure 3 Proposed Landscape Buffer along the Boundary of the Project Site



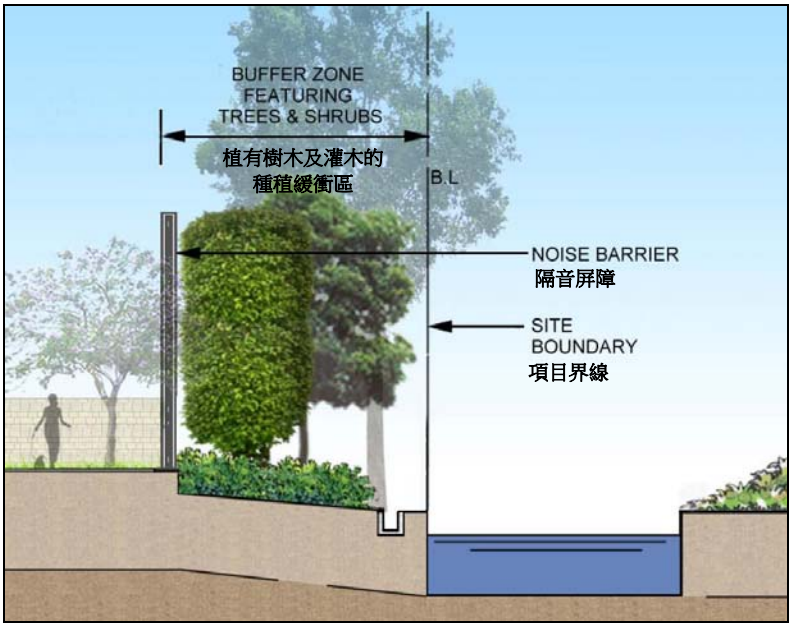


Figure 4
Illustrative Section of Noise Barrier Buffered & Visually Enhanced by Peripheral Planting

Figure 5 Conceptual View of a Section of Noise Barrier with Proper Peripheral Landscape Treatment

3. ENVIRONMENTAL MONITORING AND AUDIT

3.1.1 An environmental monitoring and audit (EM&A) programme will be implemented for the Project during the construction and operational phases, to check sufficiency and effectiveness of the recommended mitigation measures to ensure compliance with relevant statutory criteria and requirements.

3.1.2 Details of the EM&A programme, mitigation measures required during construction and operational phases, and requirements are provided in the EM&A Manual of the EIA report. An Environmental Team (ET) comprises suitably qualified staff and specialists shall be appointed to carry out the recommended EM&A works for the project. The Independent Checker (Environment) (IEC) shall advise the Engineer or Engineer's representative on environmental issues related to the project and audit ET's EM&A works. A summary of key EM&A monitoring schedule is provided below:

EM&A Monitoring Schedule

Environmental Aspects	**EM&A Requirement**
General	Construction Phase: • Site Surveillance – once per week during construction phase by ET; • Environmental complaints investigation – upon receipt of complaints by ET and IEC; • Reporting – baseline monitoring report; monthly EM&A reports; quarterly EM&A summary reports; and final EM&A reports by ET.
Noise	Construction Phase: Monitoring noise level at nearby sensitive receivers. • Baseline Monitoring: Monitoring for 14 days prior to commissioning of construction works by ET. • Impact Monitoring: Weekly monitoring throughout the construction phase by ET. Operational Phase: Nil
Air Quality	Construction Phase: Monitoring dust level at nearby sensitive receivers. • Baseline monitoring by ET: Monitoring for 14 days prior to commissioning of construction works by ET. • Impact monitoring: Monitoring every six days and throughout the construction phase by ET. Operational Phase: Nil
Water Quality	Construction Phase: Monitoring water quality at nearby nullah and Ngau Tam Mei Drainage Channel by ET. • Baseline Monitoring:

	3 days a week and for 4 weeks prior to commissioning of construction works by ET. • Impact Monitoring: 3 days a week throughout the construction phase by ET. Operational Phase: Nil
Waste Management	Construction Phase: Monitoring on waste generation, disposal and minimisation by ET and Engineer. Auditing on contractor(s) waste management performance. Operational Phase: Nil
Landscape and Visual	Detailed Design: Monitoring design works against recommendations of landscape and visual in the EIA during detailed design stage by a Registered Landscape Architect. Construction Phase: • Baseline Monitoring: Prior to construction works. • Impact Monitoring: Monitoring and auditing on the implementation of landscape construction works and subsequent maintenance operations by a Registered Landscape Architect. Operational Phase: Nil
Ecology	Construction Phase: • Baseline Monitoring: A four-month baseline survey prior to site clearance and construction activities. • Impact Monitoring: Regular site visit and faunal survey during construction (weekly and monthly) by a qualified ecologists and/ or professionals at immediate surrounding habitats and identified habitats downstream which might be affected. Operational Phase: Nil
Fisheries	Construction Phase: Nil Operational Phase: Nil

4. OVERALL CONCLUSION

4.1.1 The findings of this EIA have provided information on the nature and extent of environmental impacts arising from the construction and operation of the Project Site.

4.1.2 Based on the results of the Assessment, the EIA study concludes that the Project would be environmentally acceptable and would comply with all environmental legislations and standards. The EIA Study has also predicted that after the adoption of appropriate mitigation measures, there would be no adverse residue impacts. An environmental monitoring and audit programme has been recommended to monitor the implementation of the mitigation measures and to ensure compliance with environmental standards.