9. SUMMARY AND CONCLUSION AND IMPLEMENTATION SCHEDULE

9.1 Introduction

9.1.1 The requirements for the Environmental Impact Assessment (EIA) are detailed in EIA Study Brief No. ESB-029/1999 (Annex A). The purpose of this EIA study is to provide information on the nature and extent of environmental impacts arising from the construction and operational of the proposed project. This information will contribute to decisions on:

(i) the overall acceptability of any adverse environmental consequences that are likely to arise as a result of the proposed project;

(ii) the conditions and requirements for the detailed design, construction and operation of the proposed project to mitigate against adverse environmental consequences wherever practicable; and

(iii) the acceptability of residual impacts after the proposed mitigation measures are implemented.

9.1.2 According to the EIA Study Brief, the scope of this EIA study shall cover all developments within the "Study Area" and any other works associated with these developments outside the Study area. The EIA study shall include specific impacts namely: noise impact, air quality impact, water pollution impact, ecological impact, cultural heritage impact, and landscape and visual impact.

9.2 Background

9.2.1 Territory Development Department (TDD) commissioned a consultant to conduct a feasibility study for housing development (the Study) in the Whitehead and Lee On area in Ma On Shan. The Study Area is about 60 hectares covering the Whitehead peninsula, the proposed Ma On Shan (MOS) Rail Wu Kai Sha Station and the private land in between Whitehead and Lee On. The Study is to establish a preferred development option for the Study Area. The Preferred Development Option will provide private housing development to accommodate a total number of about 6,800 flats for a about 17,000 residents and about 11 ha of recreational facilities such as water recreation centre, visitor / heritage / ecological centres, themed dining and botanical garden. The proposed development will involve site formation works and construction of infrastructure including building substructures, roads, drains & utilities, and landscape areas (the Project).

9.2.2 The proposed development intensity is a result of optimizing the development potential of the Study Area with respect to the major development parameters such as

size of the recreation use, overall population threshold and target housing number, the public views solicited from the consultations with Sha Tin District Council (STDC) and Town Planning Board (TPB) and the conclusion made by the Study Steering Group.

9.2.3 Whilst it is fully appreciated from the public consultations that there is a strong desire to limit the total population and development intensity of the Study Area, it is equally important to make use of the mass transportation system to achieve the best integration of transport and land use planning for the Study Area. With the implementation of the MOS Rail, higher intensity development should therefore be assumed at the Wu Kai Sha Station to optimize utilization of land in close proximity to rail station. To strike a balance, both the Study Steering Group and CPLD considered more appropriate to limit the development intensity of Wu Kai Sha Station to a plot ratio of 5 in the Preferred Development Option. For the Lok Wo Sha site, only a maximum plot ratio of 3 is proposed in view of its prominent location at the headland and hence the visual impact resulting from more intensive development.

9.2.4 The Project falls within Schedule 3 of the Environmental Impact Assessment Ordinance (EIAO) [Cap 499] and requires an EIA report to be approved under the EIAO. The Project also includes a number of Schedule 2 Designated Projects.

9.3 Purpose of Impacts Summary

9.3.1 This section of the report summarizes the findings of the EIA Study undertaken in accordance with the EIA Study Brief No. ESB-029/1999. The EIA has been carried out on the worst-case scenario (i.e. the preliminary Preferred Development Option). The preliminary Preferred Development Option and the Preferred Development Option are identical except that the plot ratios for the Wu Kai Sha Station Development are 6.5 for the former option and 5.0 for the latter option. The summary is intended to provide an overall appreciation of the key issues associated with the proposed development. The environmental impacts of the proposed development with respect to noise, air quality, water quality, ecology, cultural heritage and landscape & visual, and possible measures to alleviate the impacts are summarised below.

9.4 Noise

Construction Noise

9.4.1 Noise from the use of powered mechanical equipment during construction activities and the haulage of material may potentially cause exceedance of construction noise standard at the nearby existing noise sensitive receivers (NSRs) if construction noise is not appropriately mitigated.

9.4.2 The construction noise assessment shows that unmitigated noise levels might exceed EPD's recommended maximum noise levels for daytime construction work when construction activities occur in close proximity to NSRs or when several construction works occur simultaneously.

9.4.3 Exceedance of noise level is unavoidable because of the close proximity between the construction works and some of the NSRs. Adequate mitigation measures will be required for the construction works to meet the noise standard.

9.4.4 The use of quiet plant and working methods, reducing the number of equipment, restricting the extent of works and the use of temporary noise barriers to protect the nearby residences and schools have been recommended and would be sufficient to reduce noise levels to compliance levels at the NSRs.

9.4.5 A noise monitoring programme is proposed to ensure that construction noise is within the recommended criteria throughout the construction stage.

Operational Noise

Traffic Noise

9.4.6 Traffic noise assessment for the proposed development has been conducted. Most of the sensitive receivers within the proposed development will not be subject to traffic noise nuisance, except for some of the façades at the Wu Kai Sha Station Development due to the technical inapplicability of direct noise mitigation measure such as noise barrier at Sha On Street. Provision of window insulation and air-conditioning or special layout design has been proposed to resolve the traffic noise nuisance.

9.4.7 Residual impacts may arise at some units of the Symphony Bay and one village house at Lok Wo Sha. Eligibility test on these façades has been conducted, but none of these façades qualify for the noise insulation works under ExCo directive.

9.4.8 An operational traffic noise monitoring is proposed to check the effectiveness of the proposed mitigation measures such as boundary wall and environmentally friendly design layout.

Rail Noise

9.4.9 Rail noise assessment has been undertaken to investigate the potential noise impact from operational trains of MOS Rail on the proposed residential areas within the proposed development.

9.4.10 With the implementation of the recommended noise mitigation measures, the residential areas of the proposed development would not be subject to rail noise above the acceptable limits.

Fixed Noise

9.4.11 No existing industrial noise sources were identified during site surveys. An existing sewage pumping station is found to be located near Lee On Estate. With the enclosure and sufficient buffer distance, the fixed noise generated from the sewage pumping station does not pose any noise nuisance to the proposed development.

9.4.12 Potential fixed noise sources assessed include noise from public transport terminus / open coach parking, ventilation system of the proposed commercial centre within the proposed development and that of the indoor recreational centre, proposed salt water pumping station, and ventilation exhaust and plant rooms from MOS Rail Wu Kai Sha Station. Noise impacts on the nearby NSRs from these fixed noise sources will not be insurmountable provided that the noise levels from the different fixed plants do not exceed the maximum allowable sound pressure level (design noise limit) predicted in the assessment.

9.5 Air Quality

Construction Dust Impact

9.5.1 The construction dust impact assessment has identified Air Sensitive Receivers (ASRs) within the Study Area and the works with the potential to generate substantial dust have been identified.

9.5.2 Site formation and haul road traffic would potentially be the main causes of construction dust impact. With adequate dust suppression measures, dust levels from the Project will not exceed the Air Quality Objectives (AQOs) at nearby ASRs.

9.5.3 Mitigation measures such as watering of exposed areas or pavement of haulage route have been proposed to suppress dust generation. With the implementation of the recommended mitigation backed up by an EM&A programme, the Project should comply with the AQOs.

Operational Air Quality Impact

9.5.4 Assessment of the vehicular emission due to the major roads shows that the proposed buffer areas adjacent to the major traffic corridors such as Road T7, Sai Sha Road and proposed local roads are adequate. The predicted air pollutant concentrations at all the air sensitive receivers due to vehicular emission will comply with the AQOs. No mitigation measure will be required.

9.5.5 The air quality due to the chimney emissions within the vicinity of the Study Area will comply with the AQOs. Tai Po Industrial Estate will have minor impact on the Project. The predicted air pollutant concentrations at all the air sensitive receivers from industrial emission will comply with the AQOs.

9.5.6 Air quality impact due to cumulative effect from traffic emission and industrial emission has been assessed. Modelling results show that the air quality within Study Area is acceptable and below the AQOs.

9.5.7 The air quality associated with the proposed carparks is expected to be acceptable provided the design considerations stipulated in ProPECC PN2/96 – Control of Air Pollution in Car Parks are adhered to.

9.6 Water Quality

9.6.1 The water quality assessment has presented a review of the current situation in the Study Area, the potential impacts of the proposed development, the cumulative impacts of concurrent projects, and recommended a range of practical mitigation measures.

9.6.2 The proposed development provides an opportunity for improving the water quality of the area by installation of sewerage and drainage networks. Starfish Bay, a sensitive receiver, will benefit as no additional stormwater will be discharged into it in future. The waterfront at Whitehead will be preserved and better managed for visitors. All stormwater runoff from the proposed development to the north of Sai Sha Road will be discharged to the north and west of Whitehead at Tolo Harbour where stronger current could dilute and assimilate pollutants more effectively.

9.6.3 Full implementation of recommended mitigation measures during construction and operational phases will ensure that the proposed development will not have adverse impacts on the water quality.

9.7 Ecology

Construction Stage

9.7.1 The potential sources of impacts from project construction on ecology include: site formation, noise and disturbance, surface runoff, and suspended solid.

9.7.2 Site formation within the development boundary will cause direct and permanent loss of all habitats and their associated flora, with the exception of the preserved woodland and preserved plantation within the boundary. The estimated loss of habitat includes 0.48 ha woodland, 8.19 ha plantation, 2.66 ha grassland, 2.08 agriculture and 36.65 ha

disturbed/urbanised Area. Potential ecological impact on the woodlands and plantations are considered to be minor to moderate. Mitigation measures including compensatory planting for loss of woodland and plantations are required. Potential impacts to flora in grassland and agriculture habitats are considered minor, while loss of disturbed/urbanised area will cause minimal potential impacts. Mitigation measures are therefore not required for these habitats.

9.7.3 Since much of woodlands in the Study Area will be preserved, species of conservation importance (e.g., Crested Goshawk) are therefore not going to experience habitat loss. Potential impacts to fauna from habitat loss of other habitat types are considered minor. Considerable noise and visual disturbance may be generated during site formation and construction, potentially affecting the distribution and behaviour of fauna of the adjacent/remaining habitats. Most fauna recorded in the Study Area are disturbance tolerant, and alternative habitats are available in and near the Study Area, and the disturbance is going to be short term. Therefore, the impact from disturbance during the construction stage on terrestrial fauna is ranked as minor.

9.7.4 Impacts from excavation and surface runoff on benthos and other sessile or mobile organisms would be localised and would be self-correcting after project completion without active restoration efforts. Species of conservation value in aquatic ecology such as black corals outside the peninsula would not be impacted. Impacts are thus ranked as largely minor in nature.

Operational Stage

9.7.5 Potential impacts of project operation on terrestrial ecology include long term noise and light generated by road lighting and traffic. Based on the limited fauna community observed in the field and the urbanised nature of the surrounding habitat, and most terrestrial fauna in the Study Area are disturbance tolerant, some are even dwellers of urbanized areas potential impacts to fauna are ranked as minimal. In addition, a botanical garden has been included in the development plan. This will provide habitats for wildlife in the Study Area. The design of the walking trails within the Study Area is aimed to keep visitors away from entering the intertidal sandflat. This can prevent excessive human disturbance on the intertidal fauna. As a large percentage of land surfaces will still be covered by vegetation, and with the construction of the new drainage outlet at the northern and western shores of the peninsula, surface runoff into the sandflat is not expected to significantly increase. Potential impacts from surface runoff are thus ranked as minimal.

9.7.6 The mitigation measures recommended for water quality during construction and operational phases will serve to protect against unacceptable impacts to aquatic ecological environments.

9.8 Cultural Heritage

Archaeological Resources

9.8.1 The raised beach south of To Tau Tsuen has been shown to contain prehistoric archaeological deposits dated to the Late Neolithic (2500-1500 BC) period. The prehistoric site south of To Tau Tsuen should be avoided fully or integrated intact into the project design as open spaces and temporary shoring should be provided to retain the prehistoric site during the construction of the proposed Road D1 or any works associated with the Project.

9.8.2 There is a likelihood that prehistoric material may lie under To Tau Tsuen, located on the same sand body. If concrete at To Tau Tsuen is to be broken or any structures razed it is recommended that the opportunity be taken to test any exposed areas of the sand bar below, the Antiquities and Monuments Office should be notified of any such scheduled works.

9.8.3 The presence of the historical site of Qing (AD 1644-1911) and Song (AD 960-1279) period site in part of the central portion of the Study Area was confirmed by the field evaluation. Full evaluation was not possible at this stage due to restricted access. The portion of the historical archaeological site of Wu Kai Sha now under restricted access, will be fully tested before implementation of development. This should be laid down as a condition in the Outline Zoning Plan, planning brief, land exchange documents or Environmental Permit to alert the future developer or project proponent to include such a survey in the development process. The AMO should be consulted about the mitigation measures for the preservation of cultural relics identified during any future surveys, prior to their commencement. The archaeologist responsible for the survey should obtain a license from the authority before undertaking any fieldwork.

Cultural Heritage Resources

9.8.4 A total of 28 heritage features were recorded in the Built Heritage Survey. A total of two heritage grave features were recorded in the historical grave survey. The majority of the heritage and grave features will be indirectly impacted by the proposed development. All of the features will be preserved in-situ. The permanent grave features and the historical well associated with the village of Wu Kai Sha will require protective screening during the construction phases. The alignment of Road D1 (W) has been altered to avoid the other permanent grave feature.

9.9 Landscape and Visual

Landscape Impacts

9.9.1 The proposed development would result in significant impacts on existing landscape resources on site, principally areas of plantation, secondary woodland, existing natural soils. These would need to be cleared to make way for the proposed development,

although around the headland the proposed land uses would be able to incorporate existing woodland and soils into the design, thereby reducing actual losses. Landscape mitigation measures include extensive woodland and landscape planting and the re-use of soil materials from site, and these would effectively reduce long term impacts on woodland/plantation and soils to slight levels.

9.9.2 Impacts on agricultural land (moderate impact) would be permanent as it would not be practical to reprovision such elements within the nature of the proposed development.

9.9.3 Impacts on key affected landscape resources are quantified below in Table 9.1:

Table 9.1
Quantification Key Landscape Resources Affected by Works

Key Landscape Resource	Loss	Mitigation/ Compensation	Net Loss/Gain
Plantation	8.19ha	8.19 ha	None
Secondary Woodland	0.48ha	0.48 ha	None
Agricultural land	2.08ha	None.	2.08 ha
Grassland	2.66ha	None	2.66 ha

9.9.4 Impacts on the landscape character of the landscape will vary dramatically. The indirect impacts on the natural and tranquil qualities of the Whitehead Peninsula Coast (LCA2) and on Starfish Bay (LCA5) will be substantial during the construction and early years of the development reducing to moderate at Year 10.

9.9.5 In contrast to this, the impacts on the currently degraded landscape of the former Whitehead Detention Centre and on the existing Wu Kai Sha Station Development site will be negligible due to the incoherent and degraded character of these landscapes. With successful and diligent implementation of landscape mitigation measures, it is possible that impacts could be negligible when they mature at Year 10.

9.9.6 Direct and indirect impacts on the landscape of surrounding villages (LCAs 3 and 4) will be moderate during the construction period and early years of operation, reducing to slight at Year 10. The new development will be of a larger scale than the existing villages, but the presence of built development in these areas will serve to offset impacts somewhat.

9.9.7 Impacts on the rural fringe landscape of the Tolo Harbour Coastal Plain Landscape Character Area, during construction (moderate) would result from the introduction of large-scale building and infrastructure elements, into the landscape. These would reduce slightly in the long term during the operational phases with the growth of the extensive woodland and amenity planting proposed, but would remain as moderate impacts.

9.9.8 Impacts on the wider landscape character areas would be slight or negligible levels during both construction and operational phases.

Visual Impacts

9.9.9 There would be significant impacts on views to north and east of the villages of To Tau and Wu Kai Sha resulting in considerable permanent change to the views. Substantial level visual impacts during construction would be reduced by architectural treatment of the buildings and proposed mass planting to moderate levels in the long term operational phase.

9.9.10 There would also be a considerable permanent change in views of residents of high-rise developments in eastern Ma On Shan, resulting in a moderate visual impact after construction, reducing to slight in the long term. Recreational users of Ma On Shan Country Park would be similarly affected.

9.9.11 Relevant residents of Monte Vista would have their existing views of Tolo Harbour mostly obstructed by the Wu Ka Sha Station Development. Given the proximity and mass of the proposed development, the visual impact would be substantial. The proposed mitigation measures are not likely to reduce this significantly. Residents elsewhere in eastern Ma On Shan will experience visual impacts which will affect their views of the setting of Tolo Harbour. These include residents of Lee On Estate/Kam Lung Court, residents such as those in Saddle Ridge Court, Villa Athena and Villa Oceania/Bayshore Towers who will experience moderate or slight impacts after Year 10 of operation.

9.9.12 Views of residents of medium and low rise blocks at Cheung Muk Tau, Sai O, Tseung Kwan Lei, Kwun Hang, Nai Chung to the east of the site, and users of medium rise educational blocks at Li Po Chun United World College, would similarly be affected with moderate level impacts after construction, being reduced in the long term by planting along the site boundary to slightly impacts in the long term. The new high-rise buildings would be seen from Sham Chung across Three Fathoms Cove, in silhouette and against the sky and a backdrop of distant hills, resulting in a slight permanent change in their extensive views. Recreational users of Chinese YMCA of HK Wu Kai Sha Youth Village and Ma On Shan Town Park / Swimming Pool to the west would also be affected.

9.9.13 The development would be clearly visible in long range views of the development across Tolo Harbour from the low and medium rise residential settlements at on the hills above Tolo Harbour, at Ma Liu Shui / Kon Hang / Tsiu Hang / Tai Po Kau San Wai / Tai Po Kau Lo Wai / Lai Chi Hang / Ha Wong Yi Au, buildings at the Chinese University, and recreational users of the Plover Cove / Plover Cove Reservoir. As it is seen in the context of the surrounding urban development, the change in view is likely to be only slight.

9.9.14 Given its scale, the proposed development and the associated site formation and infrastructure would have relatively modest landscape and visual impacts. Most of the impacts could be effectively reduced by the proposed landscape mitigation measures, however it is recognised that there would be permanent changes in the extent and

quality of existing landscape resources, landscape character and visually sensitive receivers.

9.9.15 If the development is to proceed it is recommended that all the landscape mitigation measures described for both the construction phase (Table 8.6.3), and the operational phase (Table 8.7.3), be adopted in full. Supplementary assessment (with mitigation proposal) on the visual impacts is required to be prepared as necessary for the proposed Road D1 (Schedule 2 DP) before the applicants for this respective Environmental Permits are submitted.

9.10 Environmental Monitoring and Audit (EM&A) Requirements

9.10.1 The EIA Report identified the likely environmental impacts associated with the Project. It has been identified that these impacts can be minimised to acceptable levels with the implementation of the recommended mitigation measures. An EM&A programme has been recommended to ensure compliance with relevant environmental standards, to check the effectiveness of the recommended mitigation measures and to identify any further need for additional mitigation measures or remedial action. Details of the EM&A programme is provided in a stand alone EM&A Manual.

9.11 Overall Conclusion

9.11.1 The findings of the EIA Study has provided information on the nature and extent of environmental impacts arising from the construction and operation of the proposed development in the Study Area. Appropriate mitigation measures have been recommended, where environmental impacts are identified, in accordance with the Technical Memorandum on EIA Process.

9.11.2 In summary, the proposed development have achieved the following environmental objectives:

- to minimize visual impacts of future development by applying visual corridor and gradation concepts with development intensities decreasing from the south at the Wu Kai Sha Station to the north at the headland;
- to give full respect to the high ecological values of Starfish Bay and the existing woodlands and plantations in the Study Area. They have been preserved as much as possible in the layout;
- to improve the water quality impacts of the Tolo Harbour and Channel Water Control Zone by installation of sewerage and drainage networks;
- to incorporate environmentally-friendly concept in the layout e.g. a comprehensive pedestrian system to the railway station, so as to encourage the use of non-polluting transportation mode;

- to preserve the archaeological/cultural/heritage resources (including the pre-historic site, fung shui wood, shrines and well) identified within the Study Area in the layout design; and

- to minimize any potential environmental impacts arising from the surrounding road networks and drainage networks.

9.11.3 The findings of the EIA Study indicate that there will be limited residual environmental impacts after the implementation of the recommended mitigation measures. In conclusion, the proposed development would unlikely cause any insurmountable environmental impacts.

9.12 Summary of Mitigation Measures and Implementation Schedule

9.12.1 This section provides a consolidation of the mitigation measures for both the construction and operation phase of the Project as recommended in this EIA Study. The consolidation is presented in the form of an Implementation Schedule. Description of each column headings is tabulated in Table 9.2.

Table 9.2
Description of Column Headings for the Implementation Schedule

Column Heading	Description
EIA Ref.	Provides the section number or reference in the EIA Report.
EM&A Log Ref.	Provides the section number or reference in the EM&A Manual.
Environmental Protection Measures	Provides the recommended mitigation measures, courses of action or subsequent deliverables that are to be adopted, undertaken or delivered to avoid, minimise or ameliorate predicted environmental impacts.
Location / Duration of Measures / Timing of Completion of Measures	Provides the spatial area in which the recommended mitigation measures are to be implemented together with details of the programming or timing of their implementation.
Implementation Agent	Provides where the responsibility lies for the implementation of the recommended mitigation measures.
Implementation Stage	Provides the stage at which the recommended mitigation measures are to be implemented; either during the Design (Des), Construction (C), or Operation (O).
Relevant Legislation & Guidelines	Provides the controlling legislation or guidelines that are either required to be complied with, or should be complied with as good practice.

9.12.2 The Implementation Schedules for the recommended mitigation measures are summarised in Table 9.3.

Table 9.3
Implementation Schedule for Recommended Mitigation Measures

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
					Des	C	O	
		CONSTRUCTION PHASE MITIGATION MEASURES						
3.5	3.8	**NOISE (Construction Phase)**						
		Use of Quiet Plant						
3.5.21	3.8.2	The use of quiet plant (also referred as silenced equipment) can provide significant reduction in noise level. Quiet plant is defined as PME whose actual sound power level is less than the value specified in TM on Noise from Construction Work other than Percussive Piling for the same piece of equipment. To allow the Contractor some flexibility to select equipment to suit his needs, it is considered too restrictive to specify which specific items of silenced equipment to be used for the construction operations. It should be noted that various types of silenced equipment can be found in Hong Kong and are readily available on the market. BS 5228 also provide examples of quiet construction plant and their sound power level.	Site formation works for Lok Wo Sha near NSR C3 – Li Po Chun United World College; Construction of Road D1 (including the two slip roads to Road T7) and local roads near NSRs C1(To Tau), C2(Wu Kai Sha), C3(Li Po Chun United World College) & C7(future Wu Kai Sha Station developmet); building construction works near NSR C6(Monte Vista) / During the whole construction period / Before start of construction works	Construction Contractor		✓		TMEIA

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
					Des	C	O	
		Use of Movable (Mobile) Barriers						
3.5.23	3.8.3	Movable (mobile) barriers can be used to screen NSRs from particular items of plant or noisy operations. Movable barriers of 3 to 5 m height with a small cantilevered upper portion and skid footing can be located within a few metres of stationary plant (e.g. generator, compressor) and within about 5 m or more of a mobile equipment (e.g. excavator, mobile crane), such that the line of sight to the NSR is blocked by the barriers. It would be possible for the Contractor to provide purpose-built noise barriers or screens constructed of appropriate material with a minimum superficial density of 15 kg/m^2 located close to operating equipment. Certain types of stationary equipment, such as generators and compressors, can be completely screened by portable barriers giving a total noise reduction of 10 dB(A) or more.	Construction of Road D1 (including the two slip roads to Road T7) and local roads near NSRs C1 & C3 / During the whole construction period / Before start of construction works	Construction Contractor		✓		TMEIA
		Use of Temporary Noise Screening Structures or Purpose-built Temporary Noise Barriers						
3.5.25	3.8.4	Since some of the NSRs close to the Project area are typically low-rise village houses, it would be effective to have noise screening structures or temporary noise barriers purposely-built along the site boundary to provide additional protection to NSRs close to the construction site. This could be in the form of purposely-built site hoarding constructed from appropriate materials with a minimum superficial density of 15 kg/m^2. Merely using plywood would not be effective. The noise barrier should have a vertical height of 3.5 m or above, have no gaps or opening at joints. The Contractor should regularly inspect and maintain the noise barrier to ensure its effectiveness.	Construction of Road D1 (including the two slip roads to Road T7) and local roads near NSRs C1 & C3 / During the whole construction period / Before start of construction works	Construction Contractor		✓		TMEIA

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
					Des	C	O	
		Good Site Practices						
3.5.27	3.8.5	(a) Noisy equipment and activities should be sited by the Contractor as far from close-proximity sensitive receivers as practical. Prolonged operation of noisy equipment close to dwellings should be avoided. (b) The Contractor should minimise construction noise exposure to the schools (especially during examination periods) as much as possible. The Contractor should liaise with the school and the Examination Authority to ascertain the exact dates and times of all examination periods during the course of the contract and to avoid noisy activities during these periods. (c) Noisy plant or processes should be replaced by quieter alternatives where possible. Silenced diesel and gasoline generators and power units, as well as silenced and super-silenced air compressors, can be readily obtained. (d) Noisy activities should be scheduled to minimise exposure of nearby sensitive receivers to high levels of construction noise. For example, noisy activities can be scheduled for midday, or at times coinciding with periods of high background noise (such as during peak traffic hours). (e) Idle equipment should be turned off or throttled down. Noisy equipment should be properly maintained and used no more often than is necessary. (f) The power units of non-electric stationary plant and earth-moving plant should be quietened by vibration isolation and partial or full acoustic enclosures for individual noise-generating components.	All construction site / During the whole construction period / Before start of construction works	Construction Contractor		✓		TMEIA

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
					Des	C	O	
		(g) Construction activities should be planned so that parallel operation of several sets of equipment close to a given receiver is avoided, thus reducing the cumulative impacts between operations. The numbers of operating items of powered mechanical equipment should be minimised. Noise can be reduced by increasing the distance between the operating equipment and the NSRs or by reducing the number of items of equipment and / or construction activity in the area at any one time. (h) Construction plant should be properly maintained (well-greased, damage and worn parts promptly replaced) and operated. Construction equipment often has silencing measures built in or added on, e.g. bulldozer silencers, compressor panels, and mufflers. Silencing measures should be properly maintained and utilised. Where possible, rubber or damping materials should be introduced between metal panels to avoid rattle and reverberation of noise. (i) Equipment known to emit sound strongly in one direction, should where possible, be oriented so that the noise is directed away from nearby NSRs. (j) Material stockpiles and other structures (such as site offices) should be effectively utilised to shield construction noise. Noise can also be reduced by construction of temporary noise barriers which screen the lower floors from viewing the sites. Temporary noise barriers should be installed at active parts of construction areas where construction equipment is being operated in close proximity to NSRs.						

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
					Des	C	O	
		(k) The Contractor should devise, arrange methods of working and carry out the works in such manner as to minimise noise impacts on the surrounding environment, and should provide experienced personnel with suitable training to ensure that these measures are implemented properly.						
4.6	2.9	**AIR QUALITY (Construction Phase)**						
4.6.13	2.9.1	*Dust Mitigation Measures* (i) The Contractor shall observe and comply with the *Air Pollution Control Ordinance* and its subsidiary regulations, particularly the Air Pollution Control (Construction Dust) Regulation. (ii) The Contractor shall undertake at all times to prevent dust nuisance as a result of his activities. Effective dust suppression measures should be employed to ensure that the air quality, at the boundary of his site and at any ASRs, complies with the Hong Kong Air Quality Objectives. (iii) The Contractor shall ensure that there will be adequate water supply / storage for dust suppression purposes. (iv) The Contractor shall frequently clean and water the site to minimize fugitive dust emissions. (v) Effective water sprays shall be used during the delivery and handling of aggregate, and other similar materials, when dust is likely to be created and to dampen all stored materials during dry and windy weather. (vi) Watering of exposed surfaces shall be exercised as often as possible depending on the circumstance. (vii) Areas within the site where there is a regular movement of vehicles must be regularly watered.	Whole construction sites / Whole construction periods / Before start of construction works	Construction Contractor		✓		Air Pollution Control Ordinance, Air Pollution Control (Construction Dust) Regulation

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
					Des	C	O	
		(viii) Where dusty materials are being discharged to vehicle from a conveying system at a fixed transfer point, a three-sided roofed enclosure with a flexible curtain across the entry shall be provided. Exhausted fans shall be provided for this enclosure and vented to a suitable fabric filter system. (ix) The Contractor shall restricted all motorized vehicles within the site, excluding those on public roads, to a maximum speed of 15 km per hour and confine haulage and delivery vehicles to designated roadways inside the site. (x) Wheel washing facilities shall be installed and used by all vehicles leaving the site. No earth, mud, debris, dust and the like shall be deposited on public roads. Water in wheel cleaning facility shall be changed at frequent intervals and sediments shall be removed regularly. The Contractor shall submit detailed proposals for the wheel cleaning facilities to the Engineer prior to construction of the facility. Such wheel washing facilities shall be usable prior to any earthworks excavating activity on the site. The Contractor shall also provide a hard-surfaced road between any washing facility and the public road. (xi) The Contractor shall devise, arrange methods of working and carrying out the works in such a manner so as to minimize dust impacts on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these methods are implemented. (xii) All site vehicles' exhausts should be directed vertically upwards or directed away from the ground. (xiii) All stockpile of dusty material shall be either: (a) covered entirely by impervious sheeting; (b) placed in area sheltered on the top and the three sides; or (c) sprayed with water or a dust suppression chemical so as to maintain the entire surface wet.						

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
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5.4	4.9	**WATER QUALITY (Construction Phase)**						
5.4.18	4.9.2	Suspended solids in runoff should be reduced by the provision of a good surface drainage system with suitably designed catchpits to retain sediment. Silt removal devices should be well-maintained. For areas where no drainage is present or prior to drainage being constructed, sediment should be collected by excavating a pit into which surface runoff is directed and where settlement and/or infiltration can occur. A mobile sedimentation tank should also be provided to reduce the SS level of the wastewater.	Whole construction site / Whole construction phase / Before start of construction works	Construction Contractor		✓		WPCO / TM on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters
5.4.19	4.9.3	It should be noted that Starfish Bay is a water and ecological sensitive receiver. Any construction activities close to it should be regarded as of particular concern. Silt traps should be installed and well-maintained to prevent any silty runoff from entering Starfish Bay. All wastewater generated during construction must be monitored and treated as necessary prior to discharging into the north and west shore of Whitehead.	Whole construction site / Whole construction phase / Before start of construction works	Construction Contractor		✓		WPCO / TM on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters
5.4.20	4.9.4	Stockpiles should be covered during wet season to avoid generating silty runoff. A surrounding drainage system and the use of flat and exposed permeable area should be provided to facilitate control and infiltration of site runoff.	Whole construction site / Whole construction phase / Before start of construction works	Construction Contractor		✓		WPCO / TM on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters
5.4.21	4.9.5	Site cleanliness and immediate cleanup/remedial action in case of chemical spill (such as fuel) are the most effective mitigation measures to minimize water quality impacts from general site run-off and should be adhered to in all construction sites. In addition, adequate sanitary facilities for workers on site should be provided and grease trap facilities should be installed for any canteen facilities.	Whole construction site / Whole construction phase / Before start of construction works	Construction Contractor		✓		WPCO / TM on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters

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5.4.22	4.9.6	Concrete washings will increase pH in receiving waterbodies. Close monitoring of pH should be conducted to avoid damage to the marine ecology. Buffer agents should be added where necessary to neutralise concrete wastewaters before its discharge to stormdrains or watercourses. A particular location within the site away from any water receiver should be selected for washing the concrete mixer. Infiltration/sedimentation pits should be used to settle out washings before discharge/treatment. Bored-pile suspension should also be settled in infiltration/sedimentation pits.	Whole construction site / Whole construction phase / Before start of construction works	Construction Contractor		✓		WPCO / TM on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters
5.4.23	4.9.7	Oil interceptors should be installed for maintenance workshop and storage areas. These should be emptied regularly and should have a by-pass to prevent flushing during periods of heavy rain.	Whole construction site / Whole construction phase / Before start of construction works	Construction Contractor		✓		WPCO / TM on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters
5.4.24	4.9.8	A section of road between the wheel washing bay and the public road should be paved, with backfall, to prevent wash water or other site runoff from entering public road drains. Sand and grit from wheel washing bays should be settled out and removed before the water is discharged into storm drains. The wheel washing bay should be designed to reuse settled wheel washing water.	Whole construction site / Whole construction phase / Before start of construction works	Construction Contractor		✓		WPCO / TM on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters
5.4.25	4.9.9	For general construction works, mitigation measures and site practice for construction site drainage as stated in ProPECC PN 1/94 should be followed.	Whole construction site / Whole construction phase / Before start of construction works	Construction Contractor		✓		WPCO / TM on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters

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6.8	N/A	**ECOLOGY (Construction Phase)**						
6.8.2		Impacts to woodland and plantation on site has been partially avoided by preserving a total of 7.05 ha of plantation in 5 patches of "preserved plantation" and 1.98 ha of woodland in 4 patches of "preserved woodland". These include the 2 headlands where natural understorey of plantation is gradually established and the secondary woodland along the west coast and at the knoll.	The preserved plantation and preserved woodland as shown in the preliminary Preferred Development Option / During detailed design, construction and operation	PlanD / LandsD / Construction Contractor / TDD / Developer /	✓	✓	✓	PELB Technical Circular 1/97, WBTC 4/97 / TMEIA
6.8.3		Loss of woodland and plantation lying on the fringe of the preserved woodland area where no earthwork is required should also be minimised as possible.	Woodland and plantation lying on the fringe of the preserved woodland area / Whole construction phase / Before construction phase	TDD / Developer / Detailed Design Engineer / Construction Contractor	✓	✓		PELB Technical Circular 1/97, WBTC 4/97 / TMEIA
6.8.4		Mature native trees which are commercially unavailable or difficult to establish should be transplanted, where feasible. A tree survey should be performed at the detailed design stage to assess in details the overall suitability of a tree (based on conservation status, size, health, form, landscaping value, etc.) for transplantation.	The proposed development / During detailed design and construction phase / During detailed design and construction phase	TDD / Developer / Detailed Design Engineer / Construction Contractor	✓	✓		PELB Technical Circular 1/97, WBTC 4/97 / TMEIA
6.8.5		Loss of woodland/plantation can be mitigated by extending the existing secondary woodlands. A total size of 1.87 ha comprising several areas at the east and west of the proposed development will be available for this purpose ("Extension Area of Secondary Woodland" in Figure 6.5). Native tree and shrub species should be planted in order to ensure like-to-like mitigation for the function of the woodland.	The proposed development / During detailed design and construction phase / During detailed design and construction phase	Developer / Detailed Design Engineer / Construction Contractor	✓	✓		PELB Technical Circular 1/97, WBTC 4/97 / TMEIA

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6.8.6		The two compensatory planting areas of 1.07 ha in total on government land at the southeast end of the Study Area and the proposed Botanical Garden of about 4.12 ha in size at the northern end of the development area would potentially provide space for transplanted trees. They can also provide opportunities for compensatory planting for the loss of woodland/plantation, though plantation is not a natural habitat type. Other landscape planting in Whitehead Site 1 and roadside planting within the study area could also compensate part of the plantation loss.	The proposed development / During detailed design, construction and operation phase / During detailed design and construction phase	TDD / Detailed Design Engineer / Construction Contractor / AFCD to carry out maintenance of compensatory planting at the 1.07 ha land for ecological mitigation purpose / LCSD to maintain the Botanical Garden and public roadside planting	✓	✓	✓	PELB Technical Circular 1/97, WBTC 4/97 / TMEIA
6.8.7		Site runoff should be desilted and re-used on-site where possible. Runoff should not be discharged into the embayed sandflat area. These measures will reduce the potential for suspended sediments, organics and other contaminants to enter the local marine environment.	Whole construction site / Duration construction phase / Before start of construction works	Construction Contractor		✓		TMEIA / WPCO
6.8.8		Coffer dam silt curtain should be deployed during subtidal construction works if necessary. Given the scale of works involved, this mitigation measure should be able to prevent sedimentation during constructions.	Where construction works are undertaken close to the coast / Duration construction phase / Before start of construction works	Construction Contractor		✓		TMEIA / WPCO

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
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7.8	N/A	**CULTURAL HERITAGE (Construction Phase)** *Archaeological Resources*						
7.8.9, 7.10.1 & Table 7.8.3		• In accordance with the *Guidance Notes: Assessment of impact on sites of Cultural Heritage in Environmental Impact Assessment Studies (notes 19 – 21)*, the historical archaeological site of Wu Kai Sha, once clearly defined through field testing, and the prehistoric site south of To Tau Tsuen should be avoided fully or integrated intact into the project design as open spaces; • Temporary shoring should be provided when necessary to keep the prehistoric site undisturbed during the construction of the proposed Road D1(N) or any works associated with this project. Fencing should be provided along the section of Road D1(N) abutting the sand bar of the prehistoric archaeological site • If concrete at To Tau Tsuen is to be broken or any structures razed it is recommended that the opportunity be taken to test any exposed areas of the sand bar below; the AMO should be notified of any such scheduled works, license should be obtained from AMO before undertaking any fieldwork;	Whole construction site / Whole construction phase	PlanD / LandsD / Detailed Design Engineer / TDD / Developer / Construction Contractor	✓	✓		Guidance Notes: Assessment of impact on sites of Cultural Heritage in Environmental Impact Assessment Studies (notes 19 – 21) / TMEIA

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
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		• The central area presently covered in fill will require archaeological field evaluation at a later date and before the commencement of any building works or earthworks when access is available. It should be noted that the inability to carry out evaluation during this stage means that the normal EIA requirements have not been fulfilled. Postponement of evaluation to a later stage carries with it the risk that a major archaeological site may be confirmed which would have serious implications for future development of the site. Requirements in Annexes 10 and 19 of EIA TM should be strictly followed which includes the requirements for the mitigation measures for cultural relics identified by the survey; • Any archeological survey in To Tau Tsuen and in the area currently under restricted access which will be undertaken before implementation of the development, should be laid down as a condition in the OZP or Environmental Permit whichever is appropriate to alert the future developer or project proponent to include such survey in the development or project process. Requirements in Annexes 10 and 19 of EIA TM should be strictly followed which includes the requirements for the mitigation measures for cultural relics identified by the survey; • Methodology (based on Annexes 10 and 19 of EIA TM) and programme should be agreed in advance with the AMO for the above-mentioned additional field investigations. The AMO should also be notified at least two weeks before the commencement of the investigation for their necessary site monitoring on the survey; • The archaeologist responsible for any archaeological investigation should obtain a license from the Authority under the provision of the Antiquities and Monuments Ordinance (Cap. 53) before undertaking any fieldwork.						

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
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		• For the reasons of Unit 2 was untested under the archaeological field evaluation at this stage and cultural relics dated to Late Neolithic period, Song and Qing dynasties were discovered at Units 6 and 7 of Figure 7.9 and a piece of land as shown by Figure 7.46 presently covered by fill, it is recommended that further archaeological field evaluation will be required within the project limit of the proposed new roads of D1(E), D1(W) and D1(N) as shown by Figure 7.46, the further archaeological field evaluation shall be conducted before the commencement of the roads project. The purpose of the further archaeological field evaluation is to ensure that no cultural relic will be affected by the roads project during the construction stage. Requirements in Annexes 10 and 19 of EIA TM should be strictly followed which includes the requirements for mitigation measures for cultural relics identified by the survey. • Methodology (based on Annexes 10 and 19 of EIA TM) and programme should be agreed in advance with the AMO for the above mentioned additional field investigation. The AMO should also be notified at least two weeks before the commencement of the investigation for their necessary site monitoring on the survey; the archaeologist responsible for any archaeological investigation should obtain a license from the Authority under the provision of the Antiquities and Monuments Ordinance (Cap.53) before undertaking any fieldworks.						

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7.10.2, Tables 7.9.3 & 7.9.4		*Built Heritage* • The tree shrine (WH-99-25) in To Tau Tsuen should be preserved in situ. • Information on the history of To Tau Tsuen, gathered from desk based research and local informants should be presented as a cultural heritage tourism feature in an easily accessible form, such as poster boards along the waterfront footpath route and in the planned heritage centre. • The impacts from construction associated with the improvement of the existing road to the east of the fung shui hill should be kept to a minimum, for example, cutting of the slope should be avoided. • The land bordering the proposed cycle path along the western side of the fung shui hill should remain wooded. • The alignment of proposed Road D1(W) should be designed to allow preservation in-situ of permanent grave feature a. • Preservation in-situ with complementary landscaping should be provided to the Wu Kai Sha Village well. • Mitigation measures in the form of erection of protective fencing around the surface features of the Wu Kai Sha Village well during the construction phase should be implemented. • Mitigation measures in the form of erection of protective fencing around the surface features of the permanent grave features a and c during the construction phase should be implemented.	Whole construction site / Whole construction phase	PlanD / TDD / Detailed Design Engineer / Construction Contractor	✓	✓		Guidance Notes: Assessment of impact on sites of Cultural Heritage in Environmental Impact Assessment Studies (notes 19 – 21) / TMEIA

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
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8.6	5.2	**LANDSCAPE AND VISUAL QUALITY** **(Construction Phase)**						
8.6.29 - 8.6.30, Table 8.6.3 & Figure 8.21	Table 5.1	• Retention and protection of existing Starfish Bay and Wu Kai Sha Beaches. Physical measures implemented to prevent access. Regular checks should be carried out to ensure that the work site boundaries are not exceeded, hoarding is properly maintained and that no damage is being caused to the these areas. • Retention and protection of existing Natural Coastal topography and rock formations. Physical measures implemented to prevent access. Regular checks to be carried out to ensure that the work site boundaries are not exceeded, hoarding is properly maintained and that no damage is being caused to the these areas. • Retention and protection of existing Pine Woodland (7.05ha). Physical measures implemented to prevent access. Regular checks to be carried out to ensure that the work site boundaries are not exceeded, hoarding is properly maintained and that no damage is being caused to the these areas. • Minimisation the extent cutting into the areas of secondary woodland. 1.98ha of them is to be preserved. Extent of clearance to be agreed and marked on site. Regular checks to be carried out to ensure that the work site boundaries are not exceeded, hoarding is properly maintained and that no damage is being caused. • Decorative hoarding along southern boundary of the site, beaches at Starfish Bay and Wu Kai Sha and around To Tau and Wu Kai Sha Village areas. • Transplanting of trees that need to be removed and that stand a high chance of successfully re-establishing where feasible. • Topsoil stripped and stored for re-use in the construction of the soft landscape works.	Whole construction stage / Whole construction periods	Detailed Design Engineer / TDD / Developer / Construction Contractor	✓	✓		TMEIA

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
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		• The potential for soil erosion should be reduced by minimising the extent of vegetation disturbance on site and by providing a protective cover (e.g. plastic sheeting or a grass cover established by hydroseeding) over any exposed ground. • Control of night-time lighting. • Grass hydroseeding of slopes and development platforms as soon as they are completed.						
		OPERATIONAL PHASE MITIGATION MEASURES						
3.6		**NOISE (Operational Phase)**						
		Traffic Noise						
		Environmentally Friendly Layout Design						
3.6.3-3.6.7 & Table 3.6.6	3.9.13, Appendix A	Layout design based on the preliminary Preferred Development Option (the use of non-sensitive structures such as podium and commercial centre to shield traffic noise, setback from noisy roads, and orientation of residential blocks & schools)	The proposed development site / During the operational period / Provided before occupancy of proposed development	PlanD / LandsD / Developer / ArchSD	✓		✓	TMEIA
		Quiet Transportation Mode						
3.6.8-3.6.9	3.9.13 Appendix A	Provision of Sunken Road L1 and public walkway at central spine	Sunken road to be located at the junction of Local Roads L1 & L2; public walkway located at the central spine / During the operational period / Provided before occupancy of proposed development	PlanD / LandsD / Developer / TDD / HyD	✓		✓	TMEIA

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
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		Wu Kai Sha Station Development						
Table 3.6.6 & 3.6.31	3.9.13 Appendix A	• Mitigation measures such as installation of window insulation and air-conditioning or special building design (such as bay window to limit the angle of view or environmentally equivalent design) should be provided for the non-compliant units.	Applicable to the units exceeding the traffic noise criteria / During the operation period / Provided before occupancy of proposed development	PlanD / LandsD / Developer	✓		✓	TMEIA
		• Proposed residential blocks to be built on top of podium (20m)	Wu Kai Sha Station Development	Developer	✓		✓	TMEIA
		Lok Wo Sha Development						
Table 3.6.6 & 3.6.20	3.9.13 Appendix A	• The use of blank façade (or environmentally equivalent design) for NSR 18 facing Sai Sha Road and its roundabout.	Applicable to NSR 18 / During the operation period / Provided before occupancy of proposed development	PlanD / LandsD / Developer	✓		✓	TMEIA
		• Use of 3 storeys (20m) commercial centre to shield traffic noise from Sai Sha Road	South of Lok Wo Sha Development, next to Sai Sha Road	LandsD / PlanD and Developer	✓		✓	TMEIA
		• Proposed residential blocks to be built on top of 2 storeys (10m) carpark podium	The proposed Lok Wo Sha site	LandsD / PlanD and Developer				
		• In-situ preservation of 3 patches of woodland to the west and east of the development (also as part of ecological mitigation)	Western and eastern part of proposed Lok Wo Sha site	LandsD / PlanD and Developer				
		• Minimum setback distance of 15m from Road D1(W) (not applicable to the preserved woodlands)	Western part of proposed Lok Wo Sha site	LandsD / PlanD and Developer				
		• Minimum setback distance of 15m from Road D1(N)	Northern part of proposed Lok Wo Sha site	LandsD / PlanD and Developer				
		• Minimum setback distance of 20m at the northeast and 22m at the southeast from Road D1(E) (not applicable to the preserved woodlands)	Eastern part of proposed Lok Wo Sha site	LandsD / PlanD and Developer				
		• Minimum setback distance of 20m at the southwest and 15m at the southeast from Sai Sha Road	Northern part of proposed Lok Wo Sha site	LandsD / PlanD and Developer	✓		✓	TMEIA

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
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		Whitehead Site 2						
Table 3.6.6	3.9.13 Appendix A	• Proposed residential blocks to be built on top of 1 storey (5m) carpark podium	Whole Proposed Whitehead Site 2					
		• Minimum setback distance of 15m from Road D1(N)	Southern part of the proposed Whitehead Site 2	LandsD / PlanD and Developer	✓		✓	TMEIA
		• Minimum setback distance of 5m from Road L1	Western and Northern part of the proposed Whitehead Site 2	LandsD / PlanD and Developer	✓		✓	TMEIA
		Whitehead Site 3						
Table 3.6.6	3.9.13 Appendix A	• Proposed residential blocks to be built on top of 1 storey (5m) carpark podium	Whole Proposed Whitehead Site 3	LandsD / PlanD and Developer	✓		✓	TMEIA
		• Minimum setback distance of 5m from Road L2	Eastern and Northern part of the proposed Whitehead Site 2	LandsD / PlanD and Developer	✓		✓	TMEIA
		Proposed Secondary School at Whitehead Site 3						
3.6.22 & Table 3.6.6	3.9.13 Appendix A	• The use of approximately 90m long 3m tall boundary wall to shield traffic noise.	3m tall boundary wall located at the southern part of the proposed secondary school (approximately 90m long) / During the operation period / Provided before occupancy of proposed development	ArchSD	✓		✓	TMEIA
		• The school to be located at an orientation with the classroom block facing away from Road D1(N) i.e. facing north.	The Proposed Secondary School / During the operation period / Provided before occupancy of proposed development	ArchSD	✓		✓	TMEIA
		Proposed Primary School at Whitehead Site 3						
Table 3.6.6	3.9.13 Appendix A	• The school to be located at an orientation with the classroom block facing away from Road D1(N) i.e. facing north.	The Proposed Secondary School / During the operation period / Provided before occupancy of proposed development	ArchSD	✓		✓	TMEIA

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		Train Noise (MOS Rail)						
3.7.16	N/A	Lok Wo Sha Development to be protected by adequate setback based on the layout of the Preferred Development Option.	The proposed development site / During the operational period / Provided before occupancy of proposed development	PlanD / LandsD / Developer	✓		✓	NCO
3.7.17 - 3.7.18 & Table 3.7.6	N/A	Wu Kai Sha Development to be protected by approximately 60m long semi-enclosure or central plenum along the twin viaduct section. According to MOS Rail EIA, "*the Multi-plenum System provides the flexibility for future enhancement as edge wall barrier heights can be incrementally extended for increased noise attenuation from 1.2m up to full enclosure*". Mitigation measures will be subject to further review in the detail design stage of the Wu Kai Sha station development.	Approximately 60m long semi-enclosure or central plenum along the twin viaduct section of MOS Rail / During the operational period / Provided before occupancy of proposed development	PlanD / LandsD / Developer / KCRC	✓		✓	NCO
		Fixed Noise						
		Existing Sewage Pumping Station at Lee On Estate (Ma On Sha Area 108)						
3.8.11	N/A	The future upgrading works for the pumping station should have a maximum allowable sound power level emitting from the exhaust of not exceeding 92 dB(A), i.e. meet the TMEIA night-time criteria of 50 dB(A) for NSR 10 at a distance of 70m from the pumping station.	Existing Sewage Pumping Station at Lee On Estate (Ma On Sha Area 108) / During the operational period / Future upgrading works	DSD	✓		✓	NCO
		MOS Rail – Wu Kai Sha Station Ventilation Exhaust and Plant Room						
3.8.18 & Table 3.8.4	N/A	The ventilation exhaust and plant room of the MOS Rail – Wu Kai Sha Station should adhered to the maximum allowable sound power level as shown in Table 3.8.4. Locating noise source away from the NSRs and by orientating noise source away from the NSRs. Alternatively, the future detailed design of any fixed noise sources of Wu Kai Sha Station undertaking by KCRC will need to satisfy the TMEIA or findings of this EIA report.	MOS Rail – Wu Kai Sha Station Ventilation Exhaust and Plant Room/ During the operational period / Provided before occupancy of proposed development	KCRC	✓		✓	NCO

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		Proposed Utility Services & G/IC						
3.8.31 & Table 3.8.7	N/A	The exhaust of the ventilation system and any opening of the salt water pumping station at Whitehead should be located facing away from any NSRs, i.e. facing west. Louver or other acoustic reduction system should also be applied to the exhaust exit of the building. The maximum allowable sound pressure level (design noise limit) should not exceed 78 dB(A) as shown in Table 3.8.7.	The salt water pumping station at Whitehead / During the operational period / Provided before occupancy of proposed development	WSD	✓		✓	NCO
3.8.33 & Table 3.8.7	N/A	Noise from the ventilation system of the proposed Indoor Recreational Centre should be reduced by locating it as far from the NSRs as possible and by orientating the noise source away from the NSRs. It is recommended that the ventilation/cooling system at the indoor recreation centre should be located at the southern part of the indoor recreation centre with opening facing towards south. Incorporation of silencer and acoustic louver to the ventilation system. The maximum allowable sound pressure level (design noise limit) should not exceed 107 dB(A) as shown in Table 3.8.7.	The proposed Indoor Recreational Centre / During the operational period / Provided before occupancy of proposed development	LCSD / ArchSD	✓		✓	NCO
3.8.33 & Table 3.8.7	N/A	For the proposed commercial centre at Lok Wo Sha, the ventilation system should be located at the southern part of the commercial centre with opening facing towards either east or west. Incorporation of silencer and acoustic louver to the ventilation system. The maximum allowable sound pressure level (design noise limit) should not exceed 81 dB(A) as shown in Table 3.8.7.	The proposed commercial centre at Lok Wo Sha / During the operational period / Provided before occupancy of proposed development	PlanD / LandsD / Developer	✓		✓	NCO
4.7	N/A	**AIR QUALITY (Operational Phase)**						
		Carpark						
4.7.15 - 4.7.16		Installation of ventilation system within carpark	Underground public carpark at Whitehead Site 1 (Recreational site) and all carpark with parking spaces of more than 500 / During operation of the carpark / Before the operation of carpark	PlanD / LandsD / Developer	✓		✓	ProPECC PN 2/96

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5.5	N/A	**WATER QUALITY (Operational Phase)**						
		Sewage						
5.5.20		Sewage generated from the development should be discharged through sewerage network in Ma On Shan and transported to Shatin Sewage Treatment Works. No sewage should be discharged to Tolo Harbour.	The proposed development / During operation stage of the development / Sewerage system in place before operation	TDD to provide sewerage network for the proposed development / DSD to provide maintenance during operation	✓		✓	WPCO / Technical Memorandum on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters
		Stormwater Runoff						
5.5.21		All stormwater runoff generated north of the Study Area should be collected and discharged at the outfalls at the northern and western coast of Whitehead. No stormwater runoff due to the development to the north of Sai Sha Road should be discharged to Starfish Bay.	The proposed development / During operation stage of the development / Drainage system in place before operation	TDD to provide drainage network for the proposed development / DSD to provide maintenance during operation	✓		✓	WPCO / Technical Memorandum on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters
5.5.22		The box culvert being constructed under the Road T7 project will receive stormwater runoff from the areas south of Sai Sha Road and upstream in Ma On Shan Country Park. It will discharge to Starfish Bay. Stormwater runoff collected from the proposed Wu Kai Sha Station residential development above the PTI will also be discharged via the box culvert to Starfish Bay. Sotrmwater runoff from the covered part of the PTI will be discharged to public sewerage.	The proposed development / During operation stage of the development / Drainage system in place before operation	Developer to provide drainage connection to the box culvert / DSD to provide maintenance to Government drains during operation	✓		✓	WPCO / Technical Memorandum on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
					Des	C	O	
5.5.23		Standard pollution control measures such as catchpits and oil & grease traps should be incorporated into the drainage system of Wu Kai Sha development	Drainage system of Wu Kai Sha Station residential development / During operation stage of the residential development / Mitigation in place before operation	LandsD and/or PlanD to incorporate requirements into the land lease; Developer of Wu Kai Sha Station residential development to implement and to provide maintenance during operation	✓		✓	WPCO / Technical Memorandum on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters
5.5.24		Impacts from stormwater runoff should be mitigated through preventative and control measures. Prevention measures include sweeping of roads, minimising the use of excessive volumes of chemicals such as bleaching and cleaning materials in buildings, controlling the use of fertilisers in parks and maintaining a clean environment through raising public awareness.	The proposed development / During operation stage	Developer for the proposed residential development / HyD & FEHD for public roads, footpaths & cycletracks / LSCD for recreational areas			✓	WPCO
5.5.25		It is proposed that in the Lok Wo Sha and Whitehead areas, infiltration chambers should be installed as part of the stormwater management system.	Drainage system in Lok Wo Sha and Whitehead areas / During operation stage / Mitigation in place before operation	TDD / Developer to provide chambers for the development / DSD / Developer to provide maintenance during operation	✓		✓	WPCO / Technical Memorandum on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters
5.5.26		The chamber should be inspected and tested every 6-12 months. Any rubbish or debris that has accumulated in the chamber should be removed on a periodic basis.	Proposed infiltration chamber within the proposed development / During operation stage of the development	DSD / Developer			✓	TMEIA

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					Des	C	O	
5.5.27		The locations suitable for installation of infiltration chambers will depend on the depth of permeable layer underneath and should be determined in the detailed design stage.	Proposed infiltration chamber within the proposed development	TDD / Developer / Detailed Design Engineer	✓			TMEIA
7.8	N/A	**CULTURAL HERITAGE** **(Operational Phase)** *Archeological Resources*						
7.8.9, 7.10.1 & Table 7.8.3		Fencing should be provided along the section of Road D1(N) abutting the sand bar of the prehistoric archaeological site to prevent disturbances during the operational stage phase.	The section of Road D1(N) abutting the sand bar of the prehistoric archaeological site / Operation stage / Operation stage	Detailed Design Engineer / TDD / Construction Contractor / HyD to provide maintenance	✓	✓	✓	Guidance Notes: Assessment of impact on sites of Cultural Heritage in Environmental Impact Assessment Studies (notes 19 – 21) / TMEIA
		Built Heritage						
7.8.9, 7.10.2 & Table 7.8.3		Complementary landscaping should be implemented in the vicinity of the Wu Kai Sha Village Well.	Vicinity of the Wu Kai Sha Village Well / Operation stage / Operation stage	Detailed Design Engineer / TDD / Construction Contractor / LCSD to provide maintenance	✓	✓	✓	Guidance Notes: Assessment of impact on sites of Cultural Heritage in Environmental Impact Assessment Studies (notes 19 – 21) / TMEIA

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
					Des	C	O	
8.7	5.2	**LANDSCAPE AND VISUAL QUALITY** **(Operational Phase)**						
8.7.21 – 8.7.22, Table 8.7.3 & Figure 8.22	Table 5.2	• Building Height and development profile designed to compliment the existing topography and urban forms, in key views. Taller larger scale buildings to be set to the southern side of the site close to Ma On Shan hills and alongside existing high rise residential estates. The northern site should be retained for low-rise development. • Layout of the proposed development to avoid disturbance of existing Pine Coastal Woodland. 7.05ha of plantation preserved. • Layout of the proposed development to minimise disturbance of existing Secondary Woodland. 1.98ha of secondary woodland preserved. • Layout of the proposed development to avoid disturbance of existing knolls and grave sites within the site. • Layout of the proposed development to avoid disturbance of existing beaches and natural coastline. • The external appearance of building blocks should be carefully detailed in terms of form, colour and finishes such that they are visually integrated as much as possible into the surrounding landscape. The form and surface detailing of these structures should be carefully considered to reduce their apparent mass, and potential glare. • The new road structures, elevated viaducts, abutments, retaining walls, noise barriers should receive sensitive architectural and chromatic treatment. • Planting wide canopied shade trees along roadsides along the main road to provide shade and greenery. High quality hard landscape treatment of footpaths areas.	Whole Site / Whole operational phase	TDD / Developer / LCSD / HyD/ Detailed Design Engineer	✓		✓	TMEIA

EIA Ref.	EM&A Log Ref.	Environmental Protection Measures	Location / Duration of Measure / Timing of Completion of Measures	Implementation Agent	Implementation Stage			Relevant Legislation & Guidelines
					Des	C	O	
		• Planting of wide canopied shade trees, and high quality hard landscape treatment of pedestrian corridors to provide shade for pedestrians and an attractive green appearance from surrounding view points. • Hard and soft landscape treatment of open areas within residential development lots areas to the provide shade and shelter and a green appearance from surrounding view points. • Landscape treatment of recreational land uses with extensive tree planting throughout the areas to the provide shade and shelter and a green appearance from surrounding view points and screen ground level activity in views from the Harbour. Links should be made to surrounding recreational sites, including the proposed Ma On Shan Waterfront Promenade. The areas include 3.5ha in Botanical Garden and 2.23ha in other areas of Whitehead Site 1 to also compensate for woodland/plantation vegetation loss during construction. • Landscape treatment of car and coach parking areas with planting of wide canopied trees throughout the site to provide shade and shelter, and ornamental flowering trees and shrubs to a green appearance from surrounding areas. • Woodland tree and shrub planting should be undertaken to screen existing village settlement areas of To Tau and Wu Kai Sha. • Roadside woodland tree/shrub planting as a buffer / screen along Sai Sha Road or other proposed public / private roads within the proposed development whenever possible. • Secondary woodland planting (1.07ha) at the Government land near the proposed IRC to compensate for woodland/plantation vegetation lost during construction. • Secondary woodland planting proposed at the woodland extension (1.87ha) within the Lok Wo Sha Development to compensate for woodland / plantation vegetation lost during construction.						

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					Des	C	O	
		• Woodland tree and shrub planting to screen ecological habitat and recreational areas at the existing beaches of Starfish Bay and Wu Kai Sha from the development.						

Notes:

AFCD	:	Agriculture, Fisheries and Conservation Department
ArchSD	:	Architectural Services Department
DSD	:	Drainage Services Department
FEHD	:	Food and Environmental Hygiene Department
LandsD	:	Lands Department
LCSD	:	Leisure and Cultural Services Department
PlanD	:	Planning Department
TDD	:	Territory Development Department
WSD	:	Water Supplies Department
Des	:	Detailed Design Stage
C	:	Construction Stage
O	:	Operational Stage
APCO	:	Air Pollution Control Ordinance
NCO	:	Noise Control Ordinance
WPCO	:	Water Pollution Control Ordinance
TM	:	Technical Memorandum
TMEIA	:	Technical Memorandum on Environmental Impact Assessment Process
WBTC	:	Works Branch Technical Circular
N/A	:	Not Applicable
NSR C1	:	Construction Noise Sensitive Receivers at To Tau
NSR C2	:	Construction Noise Sensitive Receivers at Wu Kai Sha
NSR C3	:	Construction Noise Sensitive Receivers at Li Po Chun United World College
NSR C4	:	Construction Noise Sensitive Receivers at Symphony Bay
NSR C5	:	Construction Noise Sensitive Receivers at Cheung Muk Tau
NSR C6	:	Construction Noise Sensitive Receivers at Monte Vista
NSR C7	:	Construction Noise Sensitive Receivers at future Wu Kai Sha Station Development