

Implementation Schedule of Recommended Mitigation Measures

12. IMPLEMENTATION SCHEDULE OF RECOMMENDED MITIGATION MEASURES

12.1 Construction Phase

Impacts on the nearby sensitive receivers were identified during various construction stages. Appropriate mitigation measures such as good site practices, the use of quiet plant, temporary noise barriers, reducing the operation of construction plant and avoidance of simultaneous noisy activities have been recommended to reduce the construction noise impacts.

To reduce the dust nuisance associated with the works, the requirements stated in *Air Pollution (Construction Dust) Regulation* should be followed and incorporated into the contract specification for implementation.

A practicable environmental implementation schedule of the Project during the construction phase has been proposed and is shown by *Table 12.1a*. All the requirements stated in the implementation schedule should be included in the Contract of Works (Particular Specifications) for the Contractor to undertake in order to avoid adverse environmental impacts. The effectiveness of the recommended measures will be monitored through the EM&A exercise during the construction period. The engineer as well as the contractor is responsible to act accordingly once the defined action and limit levels have been reached where appropriate.

12.2 Operational Phase

Adverse noise impacts from road traffic were predicted at identified sensitive receivers. Direct technical remedies in the form of roadside barriers and low noise road surfacing have been recommended in order to reduce the noise impacts from traffic. Given that the use of direct measures were exhausted, together with the potential site constraints of the Projects and other engineering factors, the need to use indirect measures was considered.

A practicable environmental implementation schedule of the Project during the operational phase has been proposed and is shown by *Table 12.2a*. All the requirements stated in the implementation schedule should be considered in order to avoid adverse environmental impacts.

Implementation Schedule of Recommended Mitigation Measures

Table 12.1a Implementation Schedule for Construction Phase Environmental Mitigation Measures

No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
Noise							
1	Good Site Practice	<p>The following package of measures shall be implemented during each phase of construction:</p> <ul style="list-style-type: none"> • only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction phase; • machines and plant that may be in intermittent use shall be shut down between work periods or throttled down to a minimum; • plant known to emit noise strongly in one direction shall, where possible, be orientated to direct noise away from nearby NSRs; • silencers or mufflers on construction equipment shall be utilised and shall be maintained in accordance with the manufacturer's recommendations; • mobile plant shall be sited as far away from NSRs as possible; and • material stockpiles and other structures shall be effectively utilised, where practicable, to screen noise from on-site construction activities. 	Contractor	Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites	Throughout construction period	NCO, ProPECC PN2/93, EIAO & E/AOTM (Annex 5)	Section 5.2.4.1

Implementation Schedule of Recommended Mitigation Measure

No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
2	Specific Noise Control Measures	The following package of noise control measures (items 2A-2D) shall be implemented at the times and locations specified in order to achieve the required noise criteria:					
2A	Use of Quieter Plant	<p>The Contractor may be able to obtain particular models of plant that are quieter than standard types given in the <i>Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM)</i>.</p> <p>Quiet plant is defined as Power Mechanical Equipment (PME) whose actual Sound Power Level (SWL) is less than the value specified in GW-TM for the same piece of equipment. Examples of SWLs for specific silenced PME taken from the British Standard <i>Noise Control on Construction and Open Sites, BS5228: Part 1: 1997</i>, are listed below:</p> <ul style="list-style-type: none"> • Bulldozer, Table C.3 Ref 65, SWL 111 dB(A) • Mobile Crane, Table C.7 Ref 110, SWL 106 dB(A) • Air Compressor, Table C.7 Ref 25, SWL 98 dB(A) • Concrete Pump, Table C.6 Ref 36, SWL 106 dB(A) • Dump Truck, Table C.9 Ref 29, SWL 109 dB(A) • Excavator <p>- for trenching, Table C.3 Ref 97, SWL 105 dB(A)</p> <p>- for ground excavation, Table C.3 Ref 35, SWL 106 dB(A)</p> <ul style="list-style-type: none"> • Generator, Table C.7 Ref 62, SWL 100 dB(A) 	Contractor	<p>Yuen Long construction site (Castle Peak Road, Long Yat Road, Roads L1, L2, L3 and 6/L3)</p> <p>Tin Shui Wai construction site (Ping Ha Road, Tin Yiu Road and Tin Fuk Road)</p> <p>Tuen Mun Centre construction site (Pui To Road and Tuen Mun Heung Sze Wui Road)</p>	<p>During road construction stage (excavation, placement of road base, kerbing / concreting for concrete carriageway, levelling of new road and road paving), drainage works (excavation, preparation of formation, laying of pipes, construction of manhole, backfilling and reinstatement of pavement), and barrier construction in Yuen Long and Tin Shui Wai (excavation for foundation and erection of barrier)</p>	NCO, ProPECC PN2/93, EIAO & EIAOTM (Annex 5)	Section 5.2.4.2

Implementation Schedule of Recommended Mitigation Measures

No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
2A	Use of Quieter Plant (Cont.)	<ul style="list-style-type: none"> • Lorry, Table C.9 Ref 27, SWL 105 dB(A) • Loader, Table C.3 Ref 97, SWL 105 dB(A) • Concrete Lorry Mixer, Table C.6 Ref 35, SWL 100 dB(A) • Vibratory Roller, Table C.3 Ref 115, SWL 102 dB(A) • Grader, Table C.3 Ref 76, SWL 111 dB(A) • Breaker, Table C.2 Ref 10, SWL 110 dB(A) • Road Roller, Table C.8 Ref 27, SWL 104 dB(A) • Poker Vibrator, Table C.6 Ref 32, SWL 100 dB(A) 					
2B	Use of Temporary and Movable Noise Barriers	<p>It is anticipated that a movable noise barrier with a footing (which has been designed to appropriate engineering standards) and a small cantilevered upper portion can be located within a few metres of a static plant and within about 5 m of more mobile equipment such as excavator and mobile crane etc. such that the line of sight could be blocked by the barriers viewed from the NSRs. The estimated noise reduction by means of screening, provided that the barriers are carefully located, can provide at least 5 dB noise attenuation for mobile equipment and about 10 dB for relative stationary construction plant.</p>	Contractor	<p>Yuen Long construction site (Castle Peak Road, Long Yat Road and Roads L1, L3 and 6/L3)</p> <p>Tin Shui Wai construction site (Ping Ha Road, Tin Yiu Road and Tin Fuk Road)</p> <p>Tuen Mun Centre construction site (Pui To Road and Tuen Mun Heung Sze Wui Road)</p>	<p>During road construction stage (excavation, placement of road base, levelling of new road and road paving), drainage works (excavation, preparation of formation, laying of pipes and backfilling), and barrier construction in Yuen Long and Tin Shui Wai (excavation for foundation and erection of barrier)</p>	<p>NCO, ProPECC PN2/93, EIAO & EIAOTM (Annex 5)</p>	<p>Section 5.2.4.3 and Table 5.4a</p>

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No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
2C	Restriction of Plant Usage On-site During Critical Construction Stages	The percentage of time that the noisy equipment is in operation may need to be controlled so as to reduce the noise emissions during critical construction stages. Imposing restriction on PME usage by limiting the operating time of PMEs to 50% (i.e. PMEs in operation for 15 minutes within a 30 minutes time slot), could achieve a reduction in noise emission by 3 dB. The use of PMEs on site such as excavator, grader, concrete pump, dump truck, asphalt paver, loader and breaker shall follow this operational restriction. Simultaneous noisy activities should also be avoided to eliminate cumulative noise impact.	Contractor	Yuen Long construction site (Castle Peak Road and Road L1) Tin Shui Wai construction site (Ping Ha Road, Tin Yiu Road and Tin Fuk Road) Tuen Mun Centre construction site (Pui To Road and Tuen Mun Heung Sze Wui Road)	During road construction stage (excavation, placement of road base, levelling of new road and road paving), drainage works (excavation and preparation of formation) and barrier construction in Yuen Long and Tin Shui Wai (excavation for foundation)	NCO, ProPECC PN2/93, EIAO & EIAOTM (Annex 5)	Section 5.2.4.4 and Table 5.4a
2D	Substitution of Noisy Construction Equipment and Further Restriction on Plant Usage	Use lorry of 10t or other model with a SWL of 98 dB(A) or lower to substitute dump truck in order to reduce the noise emissions from construction works. Further restriction on plant usage during excavation works and road paving activities should be implemented by limiting the operating time to 30%.	Contractor	Tin Shui Wai construction site (Ping Ha Road, Tin Yiu Road and Tin Fuk Road) and Tuen Mun Centre construction site (Pui To Road and Tuen Mun Heung Sze Wui Road)	During all excavation works for drainage and road construction, foundation construction for noise barrier and road paving activities	NCO, EIAO & EIAOTM	Section 5.2.5 and Table 5.4a

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No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
Air Quality							
3	Dust	<p>In addition to compliance with the Air Pollution Control (Construction Dust) Regulations, the following mitigation measures will be implemented to limit the dust emissions:</p> <ul style="list-style-type: none"> • the heights from which materials are dropped should be controlled to a minimum practical height to control fugitive dust arising from unloading; • materials should not be loaded to a level higher than the side and tail boards, and should be dampened or covered before transport; and • water sprays should be applied to maintain the worksite wet. 	Contractor	Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites	Throughout construction period	APCO, APC(CD)R, EIAO & EIAOTM (Annex 4 & 12)	Section 6.2.2
Water Quality							
4	Construction Runoff	<p>Exposed soil areas shall be minimised to reduce the potential for increased siltation, contamination of runoff, and erosion. Construction runoff related impacts associated the construction activities shall be controlled through the use of appropriate mitigation measures which include:</p> <ul style="list-style-type: none"> • Use of sediment traps; and • Adequate maintenance of drainage systems to prevent flooding and overflow. <p>The boundaries of critical areas of earthworks shall be marked and surrounded by dykes or embankments for flood protection. Temporary ditches shall be provided to facilitate runoff discharge into appropriate watercourses, via a silt retention pond. Permanent drainage channels shall incorporate sediment basins or traps and baffles to enhance deposition rates.</p>	Contractor	Yuen Long and Tin Shui Wai construction sites	During periods of excavation	WPCO, EIAO, EIAOTM (Annex 6 & 14) and ProPECC PN 1/94 (Appendix A1)	Section 7.2.2

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No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
5	Construction Runoff - Programming	Construction works shall be programmed to avoid or if this is not practicable, to minimise surface excavation works during the rainy season (April to September). All exposed earth areas shall be completed as soon as possible after earth works have been completed, or alternatively, where practicable, within 14 days of the cessation of earthworks. If excavation of soil cannot be avoided during the rainy season, or at any time of year when rainstorms are likely, exposed slope surfaces should be covered by tarpaulin or other means.	Contractor	Yuen Long and Tin Shui Wai construction sites	During periods of excavation	WPCO, EIAO, EIAOTM (Annex 6 & 14) and ProPECC PN 1/94 (Appendix A2)	Section 7.2.2
6	Sediment tanks	Sediment tanks of sufficient capacity shall be used for settling surface runoff prior to disposal. The system capacity shall be flexible and able to handle multiple inputs from a variety of sources and particularly suited to applications where the influent is pumped.	Contractor	Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites	During periods of excavation	WPCO, EIAO, EIAOTM (Annex 6 & 14) and ProPECC PN 1/94 (Appendix A2)	Section 7.2.2
7	Manholes	Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers.	Contractor	Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites	Throughout construction period	WPCO, EIAO, EIAOTM (Annex 6 & 14) and ProPECC PN 1/94 (Appendix A2)	Section 7.2.2

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No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
8	Drainage	All temporary and permanent drainage pipes and culverts provided to facilitate runoff discharge shall be designed for the controlled release of storm flows. All sediment traps shall be regularly cleaned and maintained. The temporarily diverted drainage shall be reinstated to its original condition when the construction work has finished or the temporary diversion is no longer required.	Contractor	Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites	Throughout construction period	WPCO, EIAO and TM (Annex 6 & 14)	Section 7.2.2
9	Wheel Washes	Sand and silt in the wash water from the wheel washing facilities shall be settled out and removed before discharging into storm drains. A section of the road between the wheel washing bay and the public road shall be paved with backfall to prevent wash water or other site runoff from entering public road drains.	Contractor	Exit of Yuen Long construction site	Throughout construction period	WPCO, EIAO and TM (Annex 6 & 14)	Section 7.2.2
10	Oil interceptors	Oil interceptors shall be provided in the drainage system downstream of any oil/fuel pollution sources associated with construction, and regularly emptied to prevent the release of oils and grease into the storm water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain.	Contractor	Yuen Long construction site	Throughout construction period	WPCO, EIAO and TM (Annex 6 & 14)	Section 7.2.2
11	General Construction Activities	Debris and rubbish on site shall be collected, handled and disposed of properly to prevent it from entering the water column and causing water quality impacts. All fuel tanks and storage areas shall be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank, to prevent spilled fuel oils from reaching the receiving water bodies.	Contractor	Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites	Throughout construction period	WPCO, EIAO & EIAOTM (Annex 6 & 14)	Section 7.2.2

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No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
12	Sewage Effluent	Construction workforce sewage is expected to be connected to the existing trunk sewer or sewage treatment facilities, although precise information on the size of the on-site workforce is not available at this stage. Construction sewage may need to be handled by portable chemical toilets and sewage holding tanks if the construction workers are likely to be dispersed along the alignment. Appropriate and adequate portable toilets shall be provided by a licensed contractor who will be responsible for undertaking the related disposal and maintenance activities in accordance with all related legislation and guidelines.	Contractor	Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites	Throughout construction period	WPCO, EIAO & EIAOTM (Annex 6 & 14)	Section 7.2.2
Landscape and Visual							
13	General	<p>The following mitigation measures shall be implemented to mitigate the landscape and visual impacts associated with the construction phase:</p> <ul style="list-style-type: none"> • Control of night time lighting; • Where hoarding is erected, it shall be of an appropriate decorative type; • Advance planting for screening and mitigation during the construction phase (this will only be feasible on those parts of the site where the planting will not hinder the construction works or be damaged by the construction activities); • Dust control measures to prevent the deterioration of adjacent landscape elements; and • Careful positioning of construction plant. 	Contractor	Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites	Throughout construction period	EIAO & EIAOTM (Annex 18)	Sections 8.3.3, 8.4.3 & 8.5.3

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No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
14	Specific Landscape and Visual Mitigation Measures - Yuen Long	<p>The following site specific landscape and visual mitigation measures shall be incorporated at the Yuen Long Worksite:</p> <p>Storage and re-use of topsoil in areas impacted by the road improvements;</p> <p>Dust control measures to prevent the deterioration of adjacent landscape elements;</p> <p>Transplantation of existing trees impacted by the road improvements to compensatory planting sites or offsite to amenity sites identified by Government Departments;</p> <p>Stabilisation and planting of all disturbed areas without a permanent surface treatment</p> <p>Compensatory new tree and shrub planting; consideration should be given to the feasibility of advance planting works;</p> <p>Reprovisioning of a children's playground at Tai Wai Tsuen;</p> <p>Consideration should be given to the design and surface treatment of any hoardings used to screen works areas (especially those adjacent to pedestrian environments);</p> <p>Consideration should be given to the sensitive design of the noise barrier at Road L1; careful choice of materials, colours and textures and associated planting;</p> <p>Control of lighting during night construction activity;</p> <p>Amenity roadside tree and shrub planting to screen the road alignment and associated structures, particularly new Roads L1 and L2. Advance planting works should be considered.</p>	<p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor and Regional Services Department</p> <p>Contractor</p> <p>Contractor & Highways Department</p> <p>Contractor</p> <p>Highways Department</p> <p>Contractor</p> <p>Contractor</p>	<p>Yuen Long construction site</p> <p>Yuen Long construction site</p> <p>Yuen Long construction site</p> <p>Yuen Long construction site</p> <p>Yuen Long construction site</p> <p>Yuen Long construction site</p> <p>Yuen Long construction site</p> <p>Yuen Long construction site</p> <p>Yuen Long construction site</p>	<p>During periods of excavation period</p> <p>Throughout construction period</p> <p>At earliest opportunity on possession of site</p> <p>Following completion of construction works</p> <p>Following completion of construction works</p> <p>At earliest opportunity</p> <p>Throughout construction period</p> <p>Detailed Design Stage</p> <p>Throughout construction period</p> <p>Following completion of construction works</p>	<p>EIAO & EIAOTM (Annex 18)</p> <p>EIAO & EIAOTM (Annex 18) & APC (Const Dust) Regs</p> <p>EIAO & EIAOTM (Annex 18)</p> <p>EIAO & EIAOTM (Annex 18)</p> <p>EIAO & EIAOTM (Annex 18)</p> <p>EIAO & EIAOTM (Annex 18)</p> <p>EIAO & EIAOTM (Annex 18)</p> <p>EIAO & EIAOTM (Annex 18)</p> <p>EIAO & EIAOTM (Annex 18)</p>	<p>Section 8.3.3.1</p> <p>Section 8.3.3.1</p> <p>Section 8.3.3.1</p> <p>Section 8.3.3.1</p> <p>Section 8.3.3.1</p> <p>Section 8.3.3.1</p> <p>Section 8.3.3.1</p> <p>Section 8.3.3.2</p> <p>Section 8.3.3.2</p> <p>Section 8.3.3.2</p> <p>Section 8.3.3.2</p>

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No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
15	Specific Landscape and Visual Mitigation Measures - Tin Shui Wai Worksite	<p>The following site specific landscape and visual mitigation measures shall be incorporated at the Tin Shui Wai Worksite:</p> <p>Storage and re-use of topsoil in areas impacted by the road improvements;</p> <p>Dust control measures to prevent the deterioration of adjacent landscape elements;</p> <p>Transplantation of existing trees impacted by the road improvements to compensatory planting sites or offsite to amenity sites identified by and agreed with Government Departments;</p> <p>Stabilisation and planting of all disturbed areas without a permanent surface treatment</p> <p>Compensatory new tree and shrub planting for lost vegetation; consideration should be given to advance planting works; and</p> <p>Consideration should be given to the design and surface treatment of any hoardings used to screen works areas (especially those adjacent to pedestrian environments);</p>	Contractor	Tin Shui Wai construction site	During periods of excavation	EIAO & EIAOTM (Annex 18)	Section 8.4.3.1
			Contractor	Tin Shui Wai construction site	Throughout construction period	EIAO & EIAOTM (Annex 18 & APC (Const Dust) Regs.)	Section 8.4.3.1
			Contractor	Tin Shui Wai construction site	At earliest opportunity on possession of site, and prior to any EPIW works that may impact upon the trees	EIAO & EIAOTM (Annex 18)	Section 8.4.3.1
			Contractor	Tin Shui Wai construction site	Following completion of construction works	EIAO & EIAOTM (Annex 18)	Section 8.4.3.1
			Contractor	Tin Shui Wai construction site	Following completion of construction works	EIAO & EIAOTM (Annex 18)	Section 8.4.3.1
			Contractor	Tin Shui Wai construction site	Throughout construction period	EIAO & EIAOTM (Annex 18)	Section 8.4.3.2

Implementation Schedule of Recommended Mitigation Measures

No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
15	Specific Landscape and Visual Mitigation Measures - Tin Shui Wai Worksite (Cont.)	<p>Consideration should be given to the sensitive design of the noise barriers with careful choice of materials, colours and textures and associated planting;</p> <p>Control of lighting during night construction activity;</p> <p>Amenity roadside tree and shrub planting to screen the road alignment and associated structures, advance planting works should be considered, particularly new Roads L1 and L2</p>	<p>Highways Department</p> <p>Contractor</p> <p>Contractor</p>	<p>Tin Shui Wai construction site</p> <p>Tin Shui Wai construction site</p> <p>Tin Shui Wai construction site</p>	<p>Detailed Design Stage</p> <p>Throughout construction period</p> <p>Following completion of construction works</p>	<p>EIAO & EIAOTM (Annex 18)</p> <p>EIAO & EIAOTM (Annex 18)</p> <p>EIAO & EIAOTM (Annex 18)</p>	<p>Section 8.4.3.2</p> <p>Section 8.4.3.2</p> <p>Section 8.4.3.2</p>
16	Specific Landscape and Visual Mitigation Measures - Tuen Mun Centre construction site	<p>The following site specific landscape and visual mitigation measures shall be incorporated at the Tuen Mun Centre construction site:</p> <p>Dust control measures during the construction period to prevent the deterioration of adjacent landscape elements;</p> <p>Storage and re-use of topsoil in areas impacted by the road improvements;</p> <p>Transplantation of existing trees impacted by the road improvements or offsite to amenity sites identified by and agreed with Government Departments;</p>	<p>Contractor</p> <p>Contractor</p> <p>Contractor</p>	<p>Tuen Mun Centre construction site</p> <p>Tuen Mun Centre construction site</p> <p>Tuen Mun Centre construction site</p>	<p>Throughout construction period</p> <p>Throughout construction period</p> <p>During periods of excavation</p> <p>At earliest opportunity on possession of site, and prior to any EPIW works that may impact upon the trees</p>	<p>EIAO & EIAOTM (Annex 18 & APC (Const Dust) Regs.)</p> <p>EIAO & EIAOTM (Annex 18)</p> <p>EIAO & EIAOTM (Annex 18)</p>	<p>Section 8.5.3.1</p> <p>Section 8.5.3.1</p> <p>Section 8.5.3.1</p>

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No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
16	Specific Landscape and Visual Mitigation Measures - Tuen Mun Centre construction site (Cont.)	Stabilisation and planting of all disturbed areas where appropriate; Compensatory new tree and shrub planting; consideration should be given to the feasibility of advance planting works.	Contractor	Tuen Mun Centre construction site	Following completion of construction works	EIAO & EIAOTM (Annex 18)	Section 8.5.3.1
			Contractor	Tuen Mun Centre construction site	Following completion of construction works	EIAO & EIAOTM (Annex 18)	Section 8.5.3.1
		Amenity roadside tree and shrub planting to screen the road works.	Contractor	Tuen Mun Centre construction site	Following completion of construction works	EIAO & EIAOTM (Annex 18)	Section 8.5.3.2
		Consideration should be given to the design and surface treatment of any hoardings used to screen works areas (especially those adjacent to pedestrian environments);	Contractor	Tuen Mun Centre construction site	Throughout construction period	EIAO & EIAOTM (Annex 18)	Section 8.5.3.2
		Control of lighting during night construction activity;	Contractor	Tuen Mun Centre construction site	Throughout construction period	EIAO & EIAOTM (Annex 18)	Section 8.5.3.2
Waste Management							
17	Waste - General	The Contractor shall submit a site specific Waste Management Plan for the construction phase to EPD. The Plan shall be verified by the Independent Environmental Consultant (IEC) and shall describe the arrangements for avoidance, reuse, recovery and recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities and shall take into account the recommendations of the EIA report.	Contractor	Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites	Prior to the commencement of construction works	EIAO & EIAOTM (Annex 15)	Section 9.2.3

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18	Storage, Collection and Transport of Waste	<p>The following site specific mitigation measures shall be implemented to minimise potential waste impacts:</p> <ul style="list-style-type: none"> Minimise windblown litter and dust during transportation by either covering trucks or transporting wastes in enclosed containers. Obtain the necessary waste disposal permits from the appropriate authorities, if they are required, in accordance with the <i>Waste Disposal Ordinance</i> (Cap 354), <i>Waste Disposal (Chemical Waste) (General) Regulation</i> (Cap 354), the <i>Crown Land Ordinance</i> (Cap 28), <i>Dumping At Sea Ordinance</i> (Cap 466) and <i>Works Branch Technical Circular No.</i> Develop procedures such as a ticketing system to facilitate tracking of loads, particularly for chemical waste, and to ensure that illegal disposal of wastes does not occur; Maintain records of the quantities of wastes generated, recycled and disposed. Segregation and sort the waste into 3 categories: <ul style="list-style-type: none"> public fill (e.g. concrete and rubble) for re-use on-site or at public filling areas; recyclable waste (e.g. steel and papers); waste which cannot be re-used and/or recycled for landfill disposal. 	<p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p>	<p>Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites</p> <p>Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites</p> <p>Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites</p> <p>Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites</p> <p>Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites</p>	<p>Throughout the construction phase</p> <p>Throughout the construction phase</p> <p>Throughout the construction phase</p> <p>Throughout the construction phase</p> <p>Throughout the construction phase</p>	<p>EIAO & EIAOTM (Annex 15)</p> <p>EIAO & EIAOTM (Annex 15)</p> <p>EIAO & EIAOTM (Annex 15)</p> <p>EIAO & EIAOTM (Annex 15)</p> <p>EIAO & EIAOTM (Annex 15)</p>	<p>Section 9.2.3</p> <p>Section 9.2.3</p> <p>Section 9.2.3</p> <p>Section 9.2.3</p> <p>Section 9.2.3</p>

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No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
18	Storage, Collection and Transport of Waste (Cont.)	The sorting process shall be carefully monitored to avoid mixing of the 3 categories. Different types of materials/wastes shall be stockpiled and stored in different containers or skips to enhance re-use or recycling of the materials and proper disposal.	Contractor	Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites	Throughout the construction phase	EIAO & EIAOTM (Annex 15)	Section 9.2.3
19	General construction waste	General construction waste shall be removed from site as soon as practicable in order to avoid adverse environmental impacts due to on-site storage of the material. General construction waste with more than 20% (by volume) inert material shall not be disposed of at landfills. The contractor shall recycle as much as possible of the construction waste, and subject to the availability of sufficient space on-site, the Contractor shall segregate wastes before disposing of inert materials (concrete, soil, cement/bentonite, etc.) at public filling areas and the degradable wastes (wood, paper, plastic, etc.) at landfills. The production of general construction wastes should be minimised by the careful control of ordering procedures which can result in surplus materials.	Contractor Contractor	Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites	Throughout the construction phase Throughout the construction phase	Waste Disposal Ordinance and subsidiary legislation Waste Disposal Ordinance and subsidiary legislation	Section 9.2.3 Section 9.2.3
20	Chemical Wastes	Storage, handling, transport and disposal of chemical wastes should be undertaken in accordance with the <i>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i> .	Contractor	Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites	Throughout the construction phase	Waste Disposal Ordinance and subsidiary legislation	Section 9.2.3
21	General Refuse	General refuse generated on-site should be stored in enclosed bins or compaction units separate from construction and chemical wastes. A reputable waste collector shall be employed by the contractor to remove general refuse from the site, separately from construction and chemical wastes, on a daily basis to minimise odour, pest and litter impacts.	Contractor	Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites	Throughout the construction phase	Waste Disposal Ordinance and subsidiary legislation	Section 9.2.3

Implementation Schedule of Recommended Mitigation Measures

No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
21	General Refuse (Cont.)	<p>If a canteen is provided, reusable rather than disposable dishware shall be used if feasible to minimise waste.</p> <p>Separate labelled bins shall be provided for the collection of aluminium cans to facilitate recycling.</p> <p>If the volume of office paper wastes is large enough to warrant collection, the Contractor shall participate in a local collection scheme (if available), to facilitate recycling</p>	<p>Contractor</p> <p>Contractor</p> <p>Contractor</p>	<p>Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites</p> <p>Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites</p> <p>Yuen Long, Tin Shui Wai and Tuen Mun Centre construction sites</p>	<p>Throughout the construction phase</p> <p>Throughout the construction phase</p> <p>Throughout the construction phase</p>	<p>Waste Disposal Ordinance and subsidiary legislation</p> <p>Waste Disposal Ordinance and subsidiary legislation</p> <p>Waste Disposal Ordinance and subsidiary legislation</p>	<p>Section 9.2.3</p> <p>Section 9.2.3</p> <p>Section 9.2.3</p>
EM&A Requirements - Construction Phase							
22	Noise Monitoring	Noise monitoring should be undertaken at the following locations, as part of the EM&A programme during the construction period of the Project in Yuen Long, Tin Shui Wai and Tuen Mun Centre. (Additional monitoring locations may be considered necessary in agreement with the EPD).					
22A	Yuen Long	<p>Yuen Long</p> <ul style="list-style-type: none"> • NSR 6 - Nam Pin Wai (east) • NSR 10 - Tai Wai Tsuen (west) • NSR 17 - Residential Development in Area 15 (north-west) 	Contractor	Yuen Long	Throughout construction phase	EIAO & EIAOTM (Annex 21)	Section 11.7

Implementation Schedule of Recommended Mitigation Measure

No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
22B	Tin Shui Wai	<p>Tin Shui Wai</p> <ul style="list-style-type: none"> • NSR 29 - Tin Shing Court (east) • NSR 33 - QE School Old Student's Association Primary School • NSR 36 - Yiu Foo House (south) - Tin Yiu Estate 	Contractor	Tin Shui Wai	Throughout construction phase	EIAO & EIAOTM (Annex 21)	Section 11.7
22C	Tuen Mun Centre	<p>Tuen Mun Centre</p> <ul style="list-style-type: none"> • NSR 61 - Koon Hing Building • NSR 65 - Castle Peak Catholic Primary School (south façade) 	Contractor	Tuen Mun Centre	Throughout construction phase	EIAO & EIAOTM (Annex 21)	Section 11.7
23	Air Quality Monitoring	<p>Dust monitoring should be undertaken at the following locations, as part of the EM&A programme during the construction period of the Project in Yuen Long, Tin Shui Wai and Tuen Mun Centre to ensure the efficacy of the recommended mitigation measures. (Additional monitoring locations may be considered necessary in agreement with the EPD.)</p>	Contractor	Yuen Long, Tin Shui Wai and Tuen Mun Centre	Throughout construction phase	EIAO & EIAOTM (Annex 21)	Section 11.8
23A	Yuen Long	<ul style="list-style-type: none"> • ASR 17 - Residential Development in Area 15 (north-west) 	Contractor	Yuen Long	Throughout construction phase	EIAO & EIAOTM (Annex 21)	Section 11.8
23B	Tin Shui Wai	<p>Tin Shui Wai</p> <ul style="list-style-type: none"> • ASR 36 - Yiu Foo House (south) - Tin Yiu Estate 	Contractor	Tin Shui Wai	Throughout construction phase	EIAO & EIAOTM (Annex 21)	Section 11.8

Implementation Schedule of Recommended Mitigation Measures

No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
23C	Tuen Mun Centre	Tuen Mun Centre <ul style="list-style-type: none"> ASR 65 - Castle Peak Catholic Primary School (south façade) 	Contractor	Tuen Mun Centre	Throughout construction phase	EIAO & EIAOTM (Annex 21)	Section 11.8
24	Vibration Monitoring - Tin Shui Wai	Vibration monitoring will be required at the Pagoda in Tin Shui Wai to ensure the vibration limits are not exceeded. Note: It is anticipated that the West Rail Phase I vibration monitoring will be undertaken at the same time as that required for the EPIW works. As the same Contractor is likely to undertake both items of construction work, vibration monitoring will be undertaken under the West Rail Phase I Contract and data sharing implemented to avoid the need for duplication in measurement.	Contractor	Tin Shui Wai	Throughout construction phase	EIAO & EIAOTM (Annex 21)	Section 11.12

Table 12.2a Implementation Schedule for Operational Phase Environmental Mitigation Measures

No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
Noise							
1	Yuen Long	<p>The following mitigation measures shall be provided at Yuen Long to mitigate the operational road noise:</p> <ul style="list-style-type: none"> • 3 m high vertical barrier of length 35 m at Road L1 (Figure 5.3g refers). • Define extent of indirect technical remedies (ITR) required at the Sun Yuen Long Centre. • Define extent of indirect technical remedies (ITR) required at the proposed residential development in CDA 12 and CDA15. 	<p>Contractor</p> <p>KCRC</p> <p>Highways Department</p>	<p>Road L1</p> <p>Sun Yuen Long Centre</p> <p>Residential developments in CDA 12 and CDA15</p>	<p>Before completion of road works</p> <p>Before completion of road works</p> <p>Upon completion of the detailed design of the residential developments in CDA 12 and CDA15</p>	<p>EIAO</p> <p>EIAO</p> <p>EIAO</p>	<p>Section 5.3.4.1</p> <p>Section 5.3.5</p> <p>Section 5.3.5</p>
1	Yuen Long (Cont.)	<ul style="list-style-type: none"> • Install indirect technical remedies, in the form of suitable window glazing and air-conditioning to protect the affected NSRs at the Sun Yuen Long Centre. • Install indirect technical remedies, in the form of suitable window glazing and air-conditioning to protect the affected NSRs at the proposed residential development in CDA 12 and CDA15. 	<p>KCRC</p> <p>KCRC</p>	<p>Sun Yuen Long Centre</p> <p>Residential developments in CDA 12 and CDA15</p>	<p>Before completion of road works</p> <p>If practicable before completion of road works, alternatively during</p>	<p>EIAO</p> <p>EIAO</p>	<p>Section 5.3.5</p> <p>Section 5.3.5</p>

Implementation Schedule of Recommended Mitigation Measures

No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
					construction of residential developments		
2	Tin Shui Wai	<p>The following mitigation measures shall be provided at Tin Shui Wai to mitigate the operational road noise:</p> <ul style="list-style-type: none"> • 5 m high absorptive noise barrier (135 m long) on the outside edge of drainage reserve and next to the eastbound carriageway of Ping Ha Road (Figure 5.3h refers). • 7m high barrier integrated with the proposed footbridge at Ping Ha Road (70 m long) (Figure 5.3h refers) • 4.5 m high barrier integrated with the proposed footbridge at Tin Fuk Road (35 m long) (Figure 5.3i refers). • Application of low noise road surfacing on the east bound carriageway of Tin Fuk Road (approximately 290 m long), Tin Yiu Road (north and south bound carriageways, approximately 120 m long) and Ping Ha Road West (east and west bound carriageways, approximately 240 m long) (Figures 5.3h&i refer). 	<p>Contractor</p> <p>Contractor</p> <p>Contractor</p> <p>Contractor</p>	<p>Ping Ha Road</p> <p>Ping Ha Road</p> <p>Tin Fuk Road</p> <p>Ping Ha Road, Tin Yiu Road and Tin Fuk Road</p>	<p>Before completion of road works</p> <p>Before completion of road works</p> <p>Before completion of road works</p> <p>Before completion of road works</p>	<p>EIAO</p> <p>EIAO</p> <p>EIAO</p> <p>EIAO</p>	<p>Section 5.3.4.2</p> <p>Section 5.3.4.2</p> <p>Section 5.3.4.2</p> <p>Section 5.3.4.2</p>
	Tin Shui Wai (Cont.)	<ul style="list-style-type: none"> • Define extent of indirect technical remedies (ITR) required at QE School Old Student's Association Primary School • Install indirect technical remedies, in the form of suitable window glazing and air-conditioning to protect the affected NSRs (QE School Old Student's Association Primary School). 	<p>KCRC</p> <p>KCRC</p>	<p>QE School Old Student's Association Primary School</p> <p>QE School Old Student's Association Primary School</p>	<p>Before completion of road works</p> <p>Before completion of road works</p>	<p>EIAO</p> <p>EIAO</p>	<p>Section 5.3.5</p> <p>Section 5.3.5</p>

Implementation Schedule of Recommended Mitigation Measure

No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
3	Operational EM&A Requirements - Noise Monitoring	<p>Noise monitoring should be conducted during the operational phase so as to ensure the noise levels are comparable to the predicted results of the EIA Study.</p> <p>Traffic noise levels shall be measured at representative locations in Yuen Long, Tin Shui Wai and Tuen Mun Centre as agreed with the EPD, within the first year of the road opening. The recommended monitoring locations are detailed below. Additional monitoring locations may be necessary in agreement with the EPD.</p>	KCRC	Yuen Long, Tin Shui Wai and Tuen Mun Centre	During first year of operation	EIAO & EIAOTM (Annex 21)	Section 11.7.2
3A		<p>Yuen Long</p> <ul style="list-style-type: none"> • NSR 6 - Nam Pin Wai (east) • NSR 10 - Tai Wai Tsuen (west) • NSR 17 - Residential Development in Area 15 (north-west) 	KCRC	Yuen Long	During first year of operation	EIAO & EIAOTM (Annex 21)	Section 11.7.2
3B		<p>Tin Shui Wai</p> <ul style="list-style-type: none"> • NSR 29 - Tin Shing Court (east) • NSR 33 - QE School Old Student's Association Primary School • NSR 36 - Yiu Foo House (south) - Tin Yiu Estate 	KCRC	Tin Shui Wai	During first year of operation	EIAO & EIAOTM (Annex 21)	Section 11.7.2
3C		<p>Tuen Mun Centre</p> <ul style="list-style-type: none"> • NSR 61 - Koon Hing Building • NSR 65 - Castle Peak Catholic Primary School (south façade) 	KCRC	Tuen Mun Centre	During first year of operation	EIAO & EIAOTM (Annex 21)	Section 11.7.2

Implementation Schedule of Recommended Mitigation Measures

No.	Environmental Issue	Environmental Mitigation Measures	Implementation Agent	Location	Implementation Stages	Relevant Environmental Legislation and Guidelines	EIA Reference
4	Maintenance of Noise Mitigation Measures	Noise barriers, both reflective and absorptive should be maintained in order to ensure the acoustic performance of the proposed measures. Low noise road surfacing proposed in Tin Shui Wai should be inspected on a routine basis regarding any defects, cracks or other physical deterioration and provide re-surfacing as and when required.	Highways Department	Yuen Long and Tin Shui Wai	Operational Phase	EIAO	Section 5.3.4
Landscape and Visual							
5	Maintenance	After an initial 12 month maintenance period of planting works by the implementing Contractor, the Highways Department will assume the long term maintenance responsibility of hard landscape elements such as planter walls and tree grilles, and the Regional Services Department will maintain the soft landscaping.	Highways Department and Regional Services Department	Yuen Long, Tin Shui Wai and Tuen Mun Centre	Throughout operational stage		Sections 8.3.3.1, 8.4.3.1 and 8.5.3.1