13. SCHEDULE OF RECOMMENDED MITIGATION MEASURES

13.1 Introduction

Schedules of all mitigation measures recommended in this EIA Report are given within Tables 13.1 to 13.6 for each environmental aspect.

Table 13.1	Air Quality – Schedule of Recommended Mitigation Measures
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Impact	Mitigation Measures	Timing	Responsibility
Air Quality during construction	Restricting heights from which materials are dropped, as far as practicable to minimise the fugitive dust arising from unloading/loading.	During construction	Contractor
	All stockpiles of excavated materials or spoil of more than 50m ³ shall be enclosed, covered or dampened during dry or windy conditions.	During construction	Contractor
	Effective water sprays shall be used to control potential dust emission sources such as unpaved haul roads and active construction areas.	During construction	Contractor
	All spraying of materials and surfaces shall avoid excessive water usage.	During construction	Contractor
	Vehicles that have the potential to create dust while transporting materials shall be covered, with the cover properly secured and extended over the edges of the side and tail boards.	During construction	Contractor
	Materials shall be dampened, if necessary, before transportation.	During construction	Contractor
	Travelling speeds shall be controlled to reduce traffic induced dust dispersion and re- suspension within the site from the operating haul trucks.	During construction	Contractor
	Vehicle washing facilities shall be provided to minimise the quantity of material deposited on public roads.	During construction	Contractor
Air Quality during Operation	Not required	N/A	N/A

Table 13.2 Noise – Schedule of Recommended Mitigation Measures

Impact	Mitigation Measures	Timing	Responsibility
Noise during construction	Use of silenced plant or plant equipped with mufflers or dampers in substitute of ordinary plant.	During construction	Contractor
	Reduce the number of equipment and their percentage on-time.	During construction	Contractor
	3.5 m and 5.5 m high temporary noise barrier at culvert construction work area (Fig 5.6.1).	During construction	Contractor
	3 m high temporary noise barrier along the northern edge of Bridge 12 at ground level (Fig 5.6.2).	During construction	Contractor
	2 m high temporary noise barrier along the northern edge of Bridge 12 at bridge level (Fig 5.6.2).	During construction	Contractor
	2.5 m high temporary noise barrier along Tai Wo Service Road West (Fig 5.6.3).	During construction	Contractor
	3.5 m high temporary noise barrier along Tai Wo Service Road West near Wai Tau Tsuen (Fig 5.6.3).	During construction	Contractor
	3.5 m high temporary noise barrier along Tai Wo Service Road West near Tai Hang (Fig 5.6.3).	During construction	Contractor
	7 m high temporary noise barrier along Tai Wo Service Road West near Tai Wo Footbridge work area (Fig 5.6.4).	During construction	Contractor
	7 m high temporary noise barrier near Kiu Tau Footbridge work area (Fig 5.6.4).	During construction	Contractor
	2.5 m high temporary noise barrier near river diversion work area (Fig 5.6.5).	During construction	Contractor
Noise during operation	Noise barriers of varying heights as shown on Drawings 551/R/9002 to 9016.	During design	Designer to implement in the engineering design
	Low noise reducing surfacing along both the widened and reconstructed sections of the works	During design	Designer to implement in the engineering design

Table 13.3 Water Quality – Schedule of Recommended Mitigation Measures

Impact	Mitigation	Timing	Responsibility
Water quality during construction	 Demolition and reconstruction of bridges Prevent off-site migration through use of sheet piles. Minimise duration of works as far as practical. All sewer and drainage connections should be sealed to prevent debris, soil, sand etc, from entering public sewers/drains. Site surface runoff should be settled to remove sand/silt before it is discharged into the existing storm drains. 	During construction	Contractor
	 River training works Inspection and testing of water quality in the nullah on the Tai Po River and in the Ma Wat River immediately downstream of culvert N490, between the rubber dam and the water intake channel. 	During construction	Contractor
	 Road Widening Works and Earthworks Wastewater generated from any concrete batching washdown of equipment or similar activities should be discharged into foul sewers, after the removal of settable solids, and pH adjustment as necessary. All sewage discharges from the study area should meet the TM standards and approval from EPD through the licensing process is required. Sand traps, oil interceptors and other pollution prevention installations should be provided, properly cleaned and maintained. Runoff from exposed working areas, unfinished slopes and from unlined temporary channels should be directed to stilling basins and/or silt traps before discharging to the drainage outfalls. Regular inspections of stilling basins and/or silt traps is required to ensure that sediment is not conveyed into the existing drainage system. Open stockpiles should be covered with a tarpaulin cover. During the wet season, any exposed top soils should be covered with a tarpaulin, shotcreted or hydroseeded. Sand and silt from wash-water from vehicle washing should be settled out before discharging into storm drains. Fuels should be stored in bunded areas such that spillage can be easily collected. 	During construction	Contractor

Impact	Mitigation	Timing	Responsibility
Water Quality during operation	Contaminants present in the run off during normal operation will by their chemical nature be strongly absorbed onto the particulate phase. The use of silt or sand traps, preferably built into the road drainage system will control both the suspended solids in the run off and the contaminants absorbed onto them. These traps should be maintained regularly and frequently cleaned to prevent the accumulation of solids with the resultant reduction in retention time and thus efficiency.	During design	Designer to implement in the engineering design

Table 13.4 Waste – Schedule of Recommended Mitigation Measures

Impact	Mitigation	Timing	Responsibility
Waste management during construction	 General Waste Transport of wastes off site as soon as possible. Maintenance of accurate waste records. Minimisation of waste generation for disposal (via reduction/recycling/re-use). No on-site burning will be permitted. Use of re-useable metal hoardings/signboards. 	During construction	Contractor
	 Vegetation from site clearance Segregation of materials to facilitate disposal. Mulching to reduce bulk and where possible review opportunities for the possible beneficial use within landscaping areas. 	During construction	Contractor
	Demolition WastesSegregation of materials to facilitate disposal.Appropriate stockpile management.	During construction	Contractor
	 Excavated Materials Segregation of materials to facilitate disposal / reuse. Appropriate stockpile management. Re-use of excavated material on or off site (where possible). Special handling and disposal procedures in the event that contaminated materials are excavated. 	During construction	Contractor
	 Construction Wastes Segregation of materials to facilitate recycling/reuse (within designated area in appropriate containers/stockpiles). Appropriate stockpile management. Planning to reduce over ordering and waste generation. Recycling and re-use of materials where possible (e.g. metal, wood from formwork) For material which cannot be re-used/recycled, collection should be carried out by an approved waste contractor for landfill disposal. 	During construction	Contractor
	 Bentonite Slurries Bentonite slurries should be reused as far as possible. Disposal in accordance with Practice Note For Professional Persons ProPECC PN 1/94. 	During construction	Contractor

Impact	Mitigation	Timing	Responsibility
	Chemical Wastes	During construction	Contractor
	Storage within locked, covered and bunded area.		
	• The storage area shall not be located adjacent to sensitive receivers e.g. drains.		
	• Minimise waste production and recycle oils/solvents where possible.		
	• A spill response procedure shall be in place and absorption material available for minor spillages.		
	• Use appropriate and labelled containers.		
	• Educate site workers on site cleanliness/waste management procedures.		
	• If chemical wastes are to be generated, the contractor must register with EPD as a chemical waste producer.		
	• The chemical wastes shall be collected by a licensed chemical waste collector.		
	Municipal Wastes	During construction	Contractor
	• Waste shall be stored within a temporary refuse collection facility, in appropriate containers prior to collection and disposal.		
	• Regular, daily collections are required by an approved waste collector.		
Waste management during operation	Not required.	N/A	N/A

Table 13.5 Ecology – Schedule of Recommended Mitigation Measures

Impact	Mitigation Measures	Timing	Responsibility
Ecology during construction	 Accurate Delineation of Works Area Boundaries of proposed works areas shall be clearly identified and separated from external areas by a physical barrier to prevent encroachment of adjacent habitats. Individual trees which fall within the works areas but which work plans show do not require removal are to be retained and fenced off to maximise protection. 	During construction	Contractor
	 Vegetation Clearance No fires shall be lit within the works area for the purpose of burning cleared vegetation. The Contractor shall give consideration to mulching the cleared vegetation for recycling within the works area / adjacent land. 	During construction	Contractor
	 Dust generation There are a number of measures which shall be taken as specified in the Air Pollution Control (Construction Dust) Regulation on 'Dust Control Requirements, including the following key measures to be applied during construction: vehicle washing facilities to be provided at every discernible or designated vehicle exit point; all temporary site access roads shall be sprayed with water to suppress dust as necessary; all dusty materials should be sprayed with water immediately prior to any handling; and all debris should be covered entirely by impervious sheeting or stored in a sheltered debris collection area. 	During construction	Contractor
	 Surface Run-off In general, mitigation measures shall be in accordance with ProPECC PN1/94 on 'Construction Site Drainage'. Key measures include: Bund and cover stock piles to avoid run-off; Channel any run-off through a system of oil, grease and sediment / silt traps and reuse water on site where ever practical; All vehicle maintenance to be undertaken within a bunded area; and Maximise vegetation retention on-site to maximise absorption (minimise transport). 	During construction	Contractor

Impact	Mitigation Measures	Timing	Responsibility
Ecological impact during operation phase	 Compensatory ecological planting To be conducted over approx. 15 hectares, including native and exotic species. Specific planting details as in Section 8.4 and Section 9 of the EIA. 	During construction and operation	Contractor (during construction); LCSD/AFCD* (during operation)

Note: * The division of vegetation planting and maintenance responsibilities shall follow the guidelines stipulated in Works Branch Technical Circular (WBTC) 24/94.

Impact	Mitigation Measures	Timing	Responsibility
Landscape & Visual during construction	 Preservation of Existing Vegetation Trees identified for retention within the project limit would be protected during the works. The tree transplanting and planting works shall be implemented by approved Landscape Contractors 	During construction	Contractor
	 Temporary Works Areas Where feasible the works areas would be screened using hoarding and existing vegetation would be retained where possible to reduce the landscape and visual impacts arising from the construction activity. The landscape of these works areas would be restored following the completion of the construction phase. 	During construction	Contractor
	 Hoarding A hoarding would be erected where practicable in the most visually sensitive locations to screen the temporary construction works from the local VSR's, 	During construction	Contractor
	 Top Soils The works will result in disturbance to extensive areas of topsoil. Topsoil worthy of retention should be stockpiled for use following completion of the civil engineering works. It should either be temporarily vegetated with hydroseeded grass or turned over on a regular basis. 	During construction	Contractor
	 Protection of Important Landscape Features Important features such as temples, Island House and kilns within the study area, although remote from the proposed works retained and adequately protected. 	During construction	Contractor
Landscape during operation	 Footpath and Cycleway Two lengths of footpath / cycleway embankment would be reinstated between the reprovisioned footbridge at Nam Wah Po and the existing interchange Wo Hop Shek. Tree planting along the line of the reprovisioned footpath would provide shade for pedestrians. 	During Operation	Designer to implement during engineering design

Table 13.6 Landscape and Visual Impact – Schedule of Recommended Mitigation Measures

Impact	Mitigation Measures	Timing	Responsibility
Landscape during operation	 Compensatory Planting The loss of existing vegetation would be a primary source of both the landscape and visual impacts. The road widening would be facilitated through the construction of extensions to the embankment and would have a soft finish. The embankments and cuttings would be planted with a mix of tree and shrub planting. Identifying a corridor separate from the utility corridors that impede landscape works. Tree and shrub screen planting including roadside and amenity planting. In certain locations, woodland planting would be appropriate with the species mix reflecting those affected with the eventual long-term objective of creating native woodland. Create a fast vegetative cover to ensure soil stability and quick visual effect for planting of disturbed areas. The long-term aim would be to allow native species to become dominant. Use of ornamental species in urban locations such as areas adjacent to residential development or on urban sections of the highway. Use of low growing shrub planting in the central reserve of the highway where the forward visibility splays allow. Robust plant species would be used which have a low maintenance requirement. 	During Operation	Designer to implement during engineering design
Visual Impact during operation	 Engineering Structures The structures should aim to "touch" the ground as lightly as possible in order to minimise disturbance to the existing landscape and vegetation below the structures. Landform and vegetation in areas disturbed by construction works will be reinstated to blend with the existing landscape patterns; Maintenance access roads shall be sensitively designed to minimise visual intrusion and physical disruption of the existing landscape. Lighting along the roadside should be designed to avoid excessive light spillage raising the levels of ambient light levels in the local areas and in views from the VSR's. New structures should aim to match those existing along Tolo Highway for visual compatibility. Drainage should where possible be concealed in the structure. Vegetation to be proposed below viaducts where light levels allow. The advice of ACABAS should be incorporated into the detailed design. 	During Operation	Designer to implement during engineering design

Impact	Mitigation Measures	Timing	Responsibility
	 Noise Barriers The design of the barriers shall be responsive to the landscape through which the highway would pass through the use of colour panels extract the main colour elements from the landscape. The use of a combination of opaque, tinted and clear panels would further reduce the visual impact caused by these structures and in some locations allow vehicle travellers views of the surrounding countryside and maintain existing views across the road corridor. The advice of ACABAS should be incorporated into the detailed design. 	During operation	Designer to implement during design
Visual Impact during operation	 Footbridges The proposed footbridges would be located along the northern section of the scheme where the highway would pass through what is essentially a rural landscape, the concept for the design of the external finishes for the footbridges is to respond to the rural landscape character of the area. The selection of colours and finishes have been designed to match the tones found in the existing views of the road corridor and so be as visually recessive as possible. Therefore the basic concept is to reflect the colours and tones of the landscape which the bridge structure would be viewed against. The advice of ACABAS should be incorporated into the detailed design. 	During operation	Designer to implement during design
	 Slopes The proposed alignment would require extensive earthworks and the formation of a new embankment along the roadside. The extent of the works, and therefore the slopes, would be minimised to avoid excessive disturbance to the existing vegetation. The opportunity would be taken where possible to give the proposed earthworks a less engineered appearance through for example designing slopes with a more naturalistic form. The design principles recommended in WBTC 25/93 on Control of Visual Impact of Slopes should be closely followed during the detailed design of the slopes to mitigate potential impacts. 	During operation	Designer to implement during design

Table 13.7 Cultural Heritage Impact – Schedule of Recommended Mitigation Measures

Impact	Mitigation Measures	Timing	Responsibility
Archaeological Impact during construction	Archaeological Monitoring works shall be carried out in areas defined in Figures 10.1 & 10.2	During construction	Contractor/Resident Site Staff
	Specification clauses to be included in the construction contract to ensure that construction works in the proximity to Wun Yiu kiln and Yuen Chau Tsai is carried out as unobstructively as possible to avoid any damage and discourage visitors to the site.	During design	Designer to implement during engineering design