Appendix 9.1 – Implementation Schedule of Recommended Mitigation Measures

Revised Austin Road Flyover EIA Report

APPENDIX 9.1 IMPLEMENTATION SCHEDULE OF RECOMMENDED MITIGATION MEASURES

This appendix presents the implementation schedule of mitigation measures for the Project. **Table 1** summarizes the details of the recommended mitigation measures for all works areas. For each recommended mitigation measures, both the location and timing for the measure have clearly been identified as well as the parties responsible for implementing the measure and for maintenance (where applicable).

Table 1 Implementation Schedule of Recommended Mitigation Measures

EIA Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing	Implementation	Implementat Stage*			Relevant Legislation &	
EIA Rei.	Environmental Protection Measures	of Completion of Measures	Agent	Des	С	0	Guidelines	
	ity Impact							
Construc	ction Phase	T	T	I	1	1		
3.8.1.1	The approved non-road mobile machinery (NRMMs) under NRMM Regulation (excluding exempted NRMMs) would be used on site and NRMMs supplied with mains electricity instead of diesel-powered should be adopted as far as possible to minimize the potential emission from	Construction Sites	Contractor		√		Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM)	
	NRMMs.						Air Pollution Control Ordinance (APCO)	
							Air Pollution Control (Construction Dust) Regulation	
							Air Pollution Control (Non- road Mobile Machinery) (Emission) Regulation	
3.8.1.2	Dust suppression measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices listed below shall be carried out to further minimize construction dust impact:	Construction Sites	Contractor		1		EIAO-TM APCO	
	Skip hoist for material transport should be totally enclosed by impervious sheeting.					Air Pollution Control (Construction Dust) Regulation		
	All dusty materials should be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty materials wet.						-	

EIA Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing	Implementation		ementa Stage*	ition	Relevant Legislation &
EIA Kei.		of Completion of Measures	Agent	Des	С	0	Guidelines
	All stockpiles of aggregate or spoil should be covered and/or water applied.						
	The height from which excavated materials are dropped should be controlled to a minimum practical height to limit fugitive dust generation from unloading.						
	Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites.						
	The load of dusty materials carried by a vehicle leaving a construction site should be covered entirely by clean impervious sheeting to ensure dust materials do not leak from the vehicle.						
	Erection of hoarding of not less than 2.4m high from ground level along the site boundary which adjoins a road, street, service lane or other area accessible to the public.						
Operatio	n Phase						
3.8.2.2	Although unacceptable air quality impact is not anticipated due to the Project during the operation phase, some mitigation measures such as relocation of fresh air intakes at elevated levels with AQO compliance and provision of air purification filters have been considered due to the high background level of NO ₂ . For the existing ASRs, planned ASRs under construction and planned ASRs with detailed design, these mitigation measures were considered not feasible in time as the designs have already been completed or in some cases even physical buildings have been completed. For the planned ASRs without detailed design, the future WKCD project owner(s) within the Study Area would be notified of the findings under this air quality impact assessment in EIA of Revised Austin Road Flyover for consideration so that the relevant mitigation measures could be implemented as far as practicable.	WKCD	WKCDA to notify the future WKCD project owner(s)			√	• EIAO-TM • APCO

EIA Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing	Implementation		ementa Stage*	ition	Relevant Legislation &
		of Completion of Measures	Agent	Des	С	0	Guidelines
Noise In	npact ction Phase						
					,		N : 0 : 10 F
4.8.1.1	Good Site Practices Good site practices listed below and the noise control requirements stated	Construction sites	Contractor		V		Noise Control Ordinance (NCO)
	in EPD's "Recommended Pollution Control Clauses for Construction						• EIAO-TM
	Contracts" should be included in the Contract Specification for the Contractors to follow and should be implemented to further minimize the potential noise impacts during the construction phase of the Project.						Technical Memorandum on Noise from Construction Work other than Percussive
	Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme.						Piling (GW-TM) • Recommended Pollution
	Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction programme.						Control Clauses for Construction Contracts
	Mobile plant, if any, should be sited as far away from noise sensitive receivers (NSRs) as possible.						
	Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.						
	Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs						
	Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.						
	uality Impact						
Construc	ction Phase	Г	T	1	I	1	T
5.9.1.2	Water used in ground boring and drilling for site investigation or rock / soil anchoring should as far as practicable be re-circulated after sedimentation. When there is a need for final disposal, the wastewater should be discharged into storm drains via silt removal facilities.	Construction Sites	Contractor		√		Water Pollution Control Ordinance (WPCO) EIAO-TM

EIA Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing	Implementation		ementa Stage*	ition	Relevant Legislation &	
EIA Rei.	Environmental Protection Measures	of Completion of Measures	Agent	Des	С	0	Guidelines	
5.9.1.3	All vehicles and plant should be cleaned before they leave a construction site to minimize the deposition of earth, mud, debris on roads. A wheel washing bay should be provided at every site exit if practicable and washwater should have sand and silt settled out or removed before discharging into storm drains. The section of construction road between the wheel washing bay and the public road should be paved with backfill to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.	Construction Sites	Contractor		√		WPCO Professional Persons Environmental Consultative Committee (ProPECC) Practice Note (PN) 1/94 Waste Disposal Ordinance (WDO)	
5.9.1.4	Good site practices should be adopted to remove rubbish and litter from construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis.	Construction Sites	Contractor		√		WPCO EIAO-TM	
5.9.1.5 – 5.9.1.6	The site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" should be followed where applicable to minimize surface runoff and the chance of erosion. Surface run-off from construction sites should be discharged into storm drains via adequately designed sand / silt removal facilities such as sand traps, silt traps and sedimentation basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Perimeter channels at site boundaries should be provided as necessary to intercept storm run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks.	Construction Sites	Contractor		V		WPCO EIAO-TM ProPECC PN 1/94	
5.9.1.7	Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly (as well as at the onset of and after each rainstorm) to prevent overflows and localized flooding. Before disposal at the public fill reception facilities, the deposited silt and grit should be solicited in such a way that it can be contained and delivered by dump truck instead of tanker truck. Any practical options for the diversion and realignment of drainage should comply with both	Construction Sites	Contractor		√ 		WPCO EIAO-TM	

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LIA Rei.		of Completion of Measures	Agent	Des	С	0	Guidelines	
	engineering and environmental requirements in order to provide adequate hydraulic capacity of all drains.							
5.9.1.8	Construction works should be programmed to minimize soil excavation in the wet season (i.e. April to September). If soil excavation cannot be avoided in these months or at any time of year when rainstorms are likely, temporarily exposed slope surfaces should be covered e.g. by tarpaulin, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels should be provided (e.g. along the crest / edge of excavation) to prevent storm runoff from washing across exposed soil surfaces.	Construction Sites	Contractor		√		• WPCO • EIAO-TM	
5.9.1.9	Earthworks final surfaces should be well compacted and the subsequent permanent work or surface protection should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary.	Construction Sites	Contractor		V		• WPCO • EIAO-TM	
5.9.1.10	Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in the wet season is necessary, they should be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities.	Construction Sites	Contractor		√		WPCOEIAO-TM	
5.9.1.11	Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric during rainstorms.	Construction Sites	Contractor		√		WPCOEIAO-TM	
5.9.1.12	Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.	Construction Sites	Contractor		√		WPCOEIAO-TM	

EIA Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing	Implementation		ementation Stage*		Relevant Legislation &
EIA Rei.		of Completion of Measures	Agent	Des	С	0	Guidelines
5.9.1.13	The discharge of effluent from the construction site shall apply a discharge license under the WPCO. The discharge quality must meet the requirements specified in the discharge license. All the construction site runoff and wastewater generated from the work areas should be treated to satisfy all the standards stipulated in the TM-DSS. Minimum distances of 100m should be maintained between the discharge points of construction site effluent and the existing seawater intakes, and no effluent shall be discharged into the typhoon shelter. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., shall be examined as far as practicable to minimize water consumption and reduce the effluent discharge volume.	Construction Sites	Contractor		√		WPCOEIAO-TMTM-DSS
5.9.1.14	Sufficient chemical toilets should be provided in the works areas. A licensed waste collector should be deployed to clean the chemical toilets on a regular basis.	Construction Sites	Contractor		√		WPCO EIAO-TM
5.9.1.15	Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the surrounding environment.	Construction Sites	Contractor		√		WPCO EIAO-TM
5.9.1.16	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The WDO (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation, should be observed and complied with for control of chemical wastes.	Construction Sites	Contractor		V		WPCOEIAO-TMWDO
5.9.1.17	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.	Construction Sites	Contractor		V		WPCO EIAO-TM
5.9.1.18	Disposal of chemical wastes should be carried out in compliance with the WDO. The Code of Practice on the Packaging, Labelling and Storage of	Construction Sites	Contractor		√		• WPCO

EIA Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing	Implementation Agent		ementa Stage*		Relevant Legislation &
EIA Ket.		of Completion of Measures		Des	С	0	Guidelines
	Chemical Wastes published under the WDO should be followed to avoid leakage or spillage of chemicals.						• EIAO-TM • WDO
Design a	nd Operation Phases						
5.9.2	Best Management Practices (BMPs) to reduce storm water and non-point source pollution are also proposed as follows:	Project Site	Project Proponent	√		$\sqrt{}$	WPCO ProPECC PN 5/93
	Design Measures						1101 200 1 11 0/00
	Exposed surface shall be avoided within the proposed development to minimize soil erosion. Development site shall be either hard paved or covered by landscaping area where appropriate to reduce soil erosion.						
	The existing watercourses in adjacent to the Project site will be retained to maintain the original flow path. The drainage system will be designed to avoid flooding.						
	Devices/ Facilities to Control Pollution						
	Screening facilities such as standard gully grating and trash grille, with spacing which is capable of screening off large substances such as fallen leaves and rubbish should be provided at the inlet of drainage system.						
	Road gullies with standard design and silt traps should be provided to remove particles present in stormwater runoff, where appropriate.						
	Administrative Measures						
	Good management measures such as regular cleaning and sweeping of road surface/ open areas are suggested. The road surface/ open area cleaning should also be carried out prior to occurrence rainstorm.						
	Manholes, as well as stormwater gullies, ditches provided at the Project site should be regularly inspected and cleaned (e.g. monthly). Additional inspection and cleansing should be carried out before forecast heavy rainfall.						

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EIA Rei.	Environmental Protection Measures	of Completion of Measures		Des	С	0	Guidelines	
Waste N	lanagement Implication			I				
6.7.1.1 – 6.7.1.2	Waste Management Hierarchy The waste management hierarchy should be applied: Avoidance and reduction of waste generation; Reuse of materials as far as practicable; Recovery and recycling of residual materials where possible; and Treatment and disposal according to relevant laws, guidelines and good practices. Recommendations of good site practices and waste reduction measures should be stated in order to achieve avoidance and minimization of waste generation in the hierarchy. EMP and trip-ticket system are recommended for monitoring management of waste.	Construction Sites	Contractor		\checkmark		 EIAO-TM ETWB TC(W) No. 19/2005 DEVB TC(W) No. 6/2010 	
6.7.2.1	 Good Site Practices Recommendations for good site practices during the construction phase include: Nomination of approved personnel, such as a site manager, to be responsible for good site practices, and making arrangements for collection of all wastes generated at the site and effective disposal to an appropriate facility; Training of site personnel in proper waste management and chemical waste handling procedures; Provision of sufficient waste reception/ disposal points, and regular collection of waste; Adoption of appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; 	Construction Sites	Contractor		√		EIAO-TM ETWB TC(W) No. 19/2005	

EIA Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing	Implementation		ementa Stage*	ition	Relevant Legislation &
EIA Ret.		of Completion of Measures	Agent	Des	С	0	Guidelines
	Provision of regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors;						
	Adoption of a recording system for the amount of wastes generated, recycled and disposed (including the disposal sites); and						
	 Preparation of a WMP, as part of the EMP, in accordance with ETWB TCW No. 19/2005 and submit to the Project Engineer / Architect for approval. 						
6.7.3.1	Waste Reduction Measures	Construction Sites	Contractor		√		• EIAO-TM
	Recommendations to achieve waste reduction include:						Waste Disposal Ordinance
	Segregate and store different types of construction related waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;						(WDO)
	Provide separate labelled bins to segregate recyclable waste such as aluminium cans from other general refuse generated by the work force, and to encourage collection by individual waste collectors;						
	Recycle any unused chemicals or those with remaining functional capacity;						
	Maximize the use of reusable steel formwork to reduce the amount of C&D material;						
	Adopt proper storage and site practices to minimize the potential for damage to, or contamination of, construction materials;						
	Plan the delivery and stock of construction materials carefully to minimize the amount of waste generated;						
	Adopt pre-cast construction method instead of cast-in-situ method for construction of concrete structures as much as possible; and						
	Minimize over ordering and wastage through careful planning during purchasing of construction materials.						

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EIA Rei.		of Completion of Measures	Agent	Des	С	0	Guidelines
6.7.4.1 –	Storage, Collection and Transportation of Waste	Construction Sites	Contractor		$\sqrt{}$		• EIAO-TM
6.7.4.2	Storage of materials on site may induce adverse environmental impacts if not properly managed. The following recommendations should be implemented to minimize the impacts:						• WDO
	Handle and store excavated materials well, such as soil to ensure secure containment to minimize the potential of pollution;						
	Maintain and clean storage areas routinely;						
	Provide stockpiling area with covers and water spraying system to prevent materials from wind-blown or being washed away; and						
	Designate different locations for stockpiling each material to enhance reuse.						
	Waste collectors should be employed for the collection and transportation of C&D materials, chemical waste (licensed waste collector required) and general refuse generated. The following recommendations should be implemented to minimize the impacts:						
	Remove waste in timely manner;						
	Employ the trucks with cover or enclosed containers for waste transportation;						
	Obtain relevant waste disposal permits from the appropriate authorities; and						
	Dispose of waste at licensed waste disposal facilities						
6.7.5.1 – 6.7.5.2	Construction and Demolition (C&D) Materials Implement a trip-ticket system to monitor, document and verify the disposal of C&D materials at landfills and public fill reception facilities, as appropriate, and to control fly tipping The C&D materials generated should be sorted on-site into inert C&D materials (that is, public fill) and non-inert C&D materials.	Construction Sites	Contractor	√	√		 ETWB TC(W) 33/2002 ETWB TC(W) 19/2005 DevB TC(W) 6/2010 WDO

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LIA Rei.		of Completion of Measures		Des	С	0	Guidelines
	Non-inert C&D materials, such as wood, plastic, steel and other metals should be reused or recycled and, as a last resort, disposed to landfill.						
	A suitable area should be designated within the site for temporary stockpiling of C&D materials and to facilitate the sorting process.						
	Within the stockpiling area, the following measures should be taken to control potential environmental impacts or nuisance:						
	 Proper handling and storage of excavated materials such as soil by means of covers and/or water spraying system to minimize the potential environmental impact and to prevent materials from wind-blown or being washed away; 						
	Covering materials during heavy rainfall;						
	Locating stockpiles to minimize potential visual impacts;						
	Minimizing land intake of stockpile areas as far as possible;						
6.7.6.1	Chemical Waste	Construction Sites	Contractor		√		• WDO
	The Contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.						Code of Practice on the Packaging, Labelling and Storage of Chemical Waste
	Chemical waste should be stored in appropriate containers and collected by a licensed chemical waste collector.						A Guide to the Chemical Waste Control Scheme
	Chemical waste (e.g. spent lubricant oil) should be disposed of at either the CWTC, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.						
6.7.7.1 –	General Refuse	Construction Sites	Contractor		V		• WDO
6.7.7.3	General refuse should be stored in enclosed bins or compaction units separately from C&D materials.						Public Health and Municipal Services Ordinance – Public Cleansing and

EIA Ref.	Environmental Protection Measures	Location / Duration of Measures / Timing	Implementation		ementa Stage*		Relevant Legislation &	
EIA Rei.		of Completion of Measures	Agent	Des	С	0	Guidelines	
	•	An enclosed and covered area is preferred to reduce the occurrence of wind-blown light materials.						Prevention of Nuisances Regulation (Cap. 132BK)
	•	The recyclable component of general refuse, such as aluminium cans, paper and cleansed plastic containers shall be separated from other wastes. Provision and collection of recycling bins for different types of recyclable waste shall be set up by the Contractor. The Contractor shall also be responsible for arranging recycling companies to collect these materials.						
	•	A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D materials.						
	•	The Contractor shall carry out an education programme for workers in avoiding, reducing, reusing and recycling of general refuse. Posters and leaflets advising on the use of the bins shall also be provided in the sites as reminders.						
Land Co	ntam	ination						
N/A	N/A		N/A	N/A				N/A
Landsca	ape ar	nd Visual Impact		1				
8.8.1.2	•	Preservation of Existing Vegetation: All the existing Trees to be retained and not to be affected by the Project shall be carefully protected during construction in accordance with DEVB TCW No. 4/2020-Tree Preservation and the latest Guidelines on Tree Preservation during Development issued by GLTM Section of DevB. Any existing vegetation which will not be affected by the Project shall be carefully preserved. Trees unavoidably affected by the works shall be transplanted as far as possible.	Construction Sites	Contractor		√		 EIAO-TM DEVB TCW No. 4/2020- Tree Preservation the latest Guidelines on Tree Preservation during Development issued by GLTM Section of DevB
	•	Compensatory Tree Planting: Any Trees to be removed under the Project shall be compensated in accordance with DEVB TCW No. 4/2020 - Tree Preservation. As indicated in Appendix C, implementation of compensatory tree planting onsite and offsite should be of a ration not less than 1:1 in terms of number. The						the latest Guidelines on Tree Transplanting issued by GLTM Section of DevB

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				Des	С	0	Guidelines
	number of compensatory trees shall not be lower than that of the number of trees removed including dead trees but excluding trees of undesirable species such as Leucaena leucocephala.						
	Control of Night-time Lighting Glare: Any lighting provision of the construction works at night shall be carefully control to prevent light overspill to the nearby VSRs and into the sky.						
	Erection of Decorative Screen Hoarding: Decorative Hoarding, which is compatible with the surrounding settings, shall be erected during construction to minimise the potential landscape and visual impacts due to the construction works and activities.						
	 Management of Construction Activities and Facilities: The facilities and activities at works sites and areas, which include site office, temporary storage areas, temporary works etc., shall be carefully managed and controlled on the height, deposition and arrangement to minimise any potential adverse landscape and visual impacts. 						
	Reinstatement of Temporarily Disturbed Landscape Areas: All hard and soft landscape areas disturbed temporarily during construction due to temporary excavations, temporary works sites and works areas shall be reinstated to equal or better quality, to the satisfaction of the relevant Government Departments.						
8.8.1.2	Aesthetically pleasing design of Highways Structures: Highways Structures proposed shall be sensitively designed in the regard of form, tonal colour and texture so as to minimise any potential adverse landscape and visual impact and match with the surroundings.	Project Site	Project Proponent	V	V		• EIAO-TM
	Shade-tolerant Shrub Planting at the Project Site after Completion of Engineering Works: The Project Site shall be planted with shade-tolerant shrub planting after completion of works.						

^{*}Des = Design; C = Construction; O = Operation